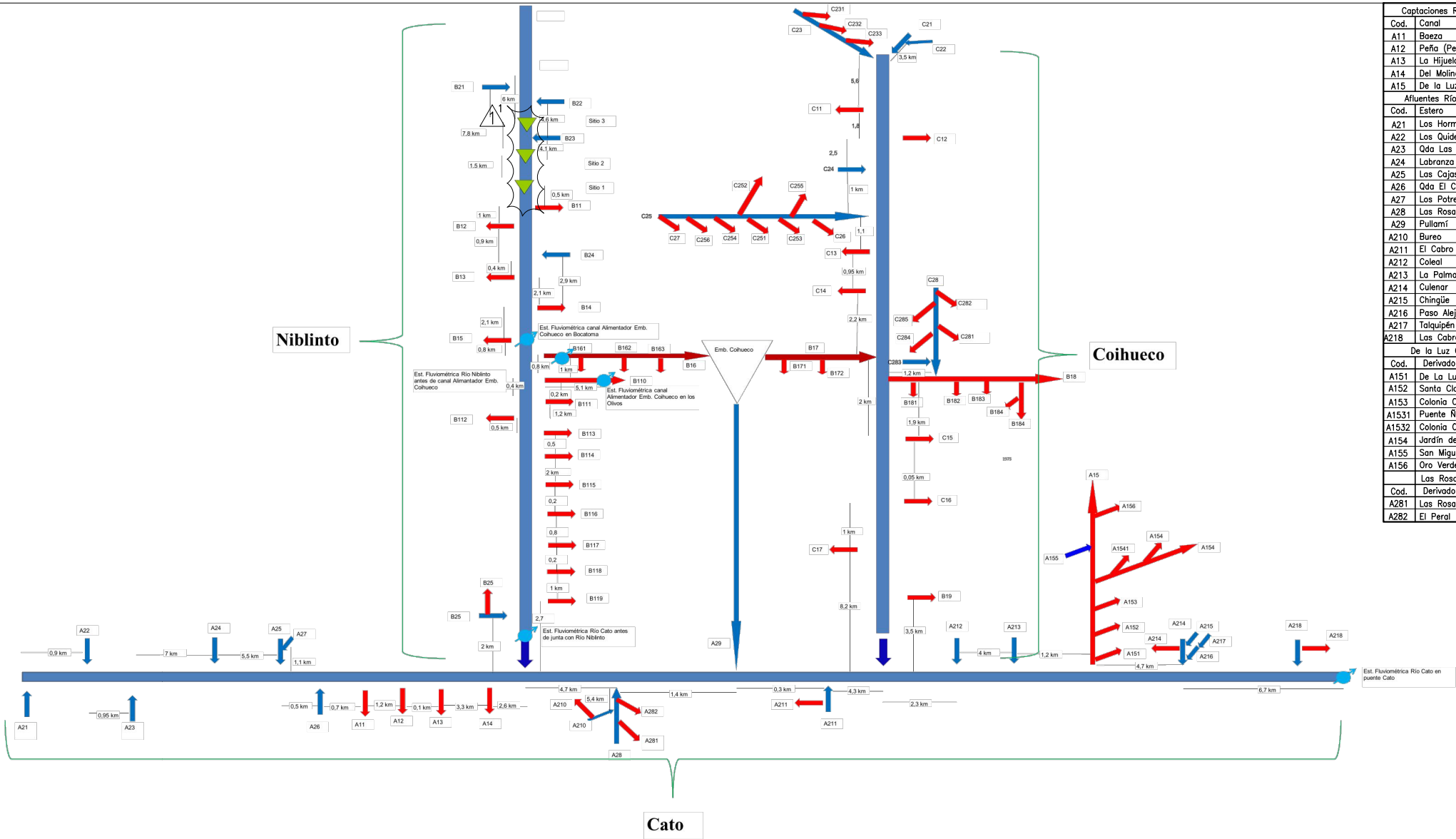
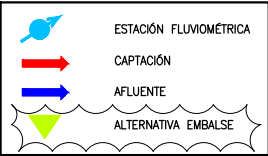


CUADRO DE CAPTACIONES Y AFLUENTES  
A LOS RÍOS CATO, NIBLINTO Y COIHUECO

| Captaciones Río Cato |                       | Captaciones Río Niblinto |                    | Captaciones Río Coihueco |                    |
|----------------------|-----------------------|--------------------------|--------------------|--------------------------|--------------------|
| Cod.                 | Canal                 | Cod.                     | Canal              | Cod.                     | Canal              |
| A11                  | Baeza                 | B11                      | Reveco             | C11                      | Santa Teresa       |
| A12                  | Peña (Peñón)          | B12                      | Gutiérrez          | C12                      | Miraflores         |
| A13                  | La Higuera            | B13                      | La Segunda         | C13                      | Quintana           |
| A14                  | Del Molino            | B14                      | El Peral           | C14                      | Molino Coihueco    |
| A15                  | De la Luz Cato        | B15                      | La Leonera         | C15                      | Esperanza          |
| Afluentes Río Cato   |                       | B16 Alimentador Riego    |                    | C16 Elgueta              |                    |
| Cod.                 | Estero                | Alimentador Embalse      |                    | C17 Corral de Piedra     |                    |
| A21                  | Los Hormigones        | B17                      | Matriz N° 1        | Afluentes Río Coihueco   |                    |
| A22                  | Los Quidefes          | B18                      | Matriz N° 2        | Cod.                     | Estero             |
| A23                  | Qda Las Tablas        | B19                      | Matriz N° 3        | C21                      | Coihueco           |
| A24                  | Labranza              | B110                     | Los Olivos         | C22                      | El salto           |
| A25                  | Las Cajas             | B111                     | Navarrete          | C23                      | Coique             |
| A26                  | Qda El Calabazo       | B112                     | La Primera         | C24                      | Qda Relbunco Sur   |
| A27                  | Los Patrerillos       | B113                     | El Chaimé          | C25                      | Relbunco           |
| A28                  | Las Rosas             | B114                     | El Bólido          | C26                      | Fundo Relbunco     |
| A29                  | Pullami               | B115                     | Vásquez            | C27                      | El Atravesado      |
| A210                 | Bureo                 | B116                     | Vegas de Niblinto  | C28                      | Paso Ancho         |
| A211                 | El Cabro              | B117                     | Pullami            | Embalse Coihueco         |                    |
| A212                 | Coleal                | B118                     | Córdova            | Cod.                     | Estero             |
| A213                 | La Palma Transvaal    | B119                     | Penroz             | C31                      | Matriz N° 1        |
| A214                 | Culenar               | Afluentes Río Niblinto   |                    | C32                      | Matriz N° 2        |
| A215                 | Chingüe               | Cod.                     | Estero             | C33                      | Esperanza          |
| A216                 | Paso Alejo            | B21                      | Qda. La Cuarta     | C34                      | Elgueta            |
| A217                 | Talquipén             | B22                      | El Imposible       | C35                      | Corral de Piedra   |
| A218                 | Las Cabras            | B23                      | San Miguel         | C36                      | Matriz N° 3        |
| De la Luz Cato       |                       | B24                      | Las Retamas        | El salto                 |                    |
| Cod.                 | Derivado –SD –SSD     | B25                      | Velásquez          | Cod.                     | Derivado–SD–SSD    |
| A151                 | De La Luz Cato        | Alimentador Riego        |                    | C221                     | Mardones           |
| A152                 | Santa Clara de Cato   | Cod.                     | Derivado–SD–SSD    | C222                     | Mora               |
| A153                 | Colonia O'Higgins     | B161                     | Alimentador        | C223                     | Quintana           |
| A1531                | Puente Nuble          | B162                     | Las Pataguas       | Coique                   |                    |
| A1532                | Colonia O'Higgins Sur | B163                     | Tierras Blancas    | Cod.                     | Derivado–SD–SSD    |
| A154                 | Jardín del Este       | Matriz N° 1              |                    | C231                     | Coique La Dehesa   |
| A155                 | San Miguel            | B171                     | Matriz N° 1        | C232                     | Freire             |
| A156                 | Oro Verde             | B172                     | Pullami            | C233                     | La Piña            |
| Las Rosas            |                       | Matriz N° 2              |                    | Relbunco                 |                    |
| Cod.                 | Derivado –SD –SSD     | B181                     | Matriz N° 2        | Cod.                     | Derivado–SD–SSD    |
| A281                 | Las Rosas             | B182                     | La Palma           | C251                     | El Coique          |
| A282                 | El Peral              | B183                     | Transvaal          | C252                     | Fundo Relbunco     |
|                      |                       | B184                     | Frutillar          | C253                     | Jorge De La Cerdá  |
|                      |                       | B1841                    | Frutillar San José | C254                     | Loma Bonita        |
|                      |                       |                          |                    | Fundo Relbunco           |                    |
|                      |                       |                          |                    | Cod.                     | Derivado–SD–SSD    |
|                      |                       |                          |                    | C261                     | Bellavista         |
|                      |                       |                          |                    | C262                     | Chamarro           |
|                      |                       |                          |                    | C263                     | El Carbón          |
|                      |                       |                          |                    | C264                     | Fundo Los Copihues |
|                      |                       |                          |                    | C265                     | San Antonio        |
|                      |                       |                          |                    | C266                     | Sanhueza Coihueco  |
|                      |                       |                          |                    | Paso Ancho               |                    |
|                      |                       |                          |                    | Cod.                     | Derivado–SD–SSD    |
|                      |                       |                          |                    | C281                     | Campo Nuevo        |
|                      |                       |                          |                    | C282                     | El Maqui           |
|                      |                       |                          |                    | C283                     | El Molino          |
|                      |                       |                          |                    | C284                     | La Reserva         |
|                      |                       |                          |                    | C285                     | Monte Verde        |



SIMBOLOGÍA



TÍTULO

FIG. N°  
3853-1000-IH-FIG-001

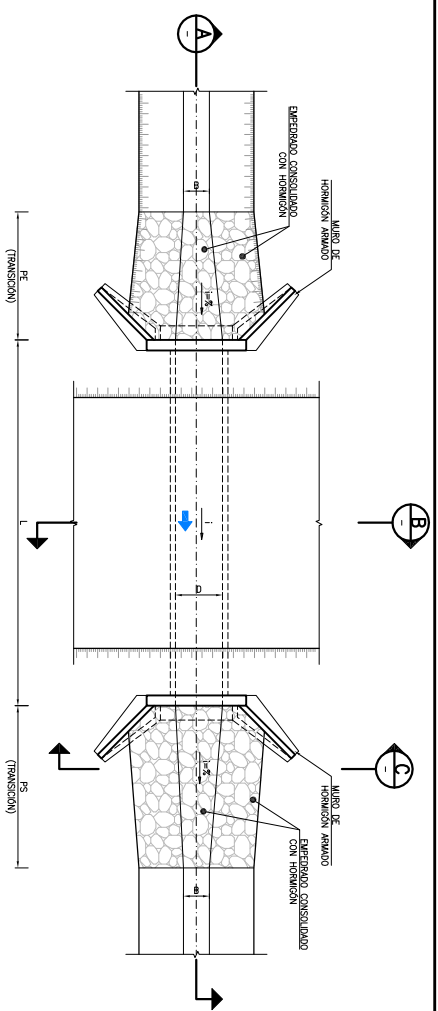
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S/E

REV.  
1

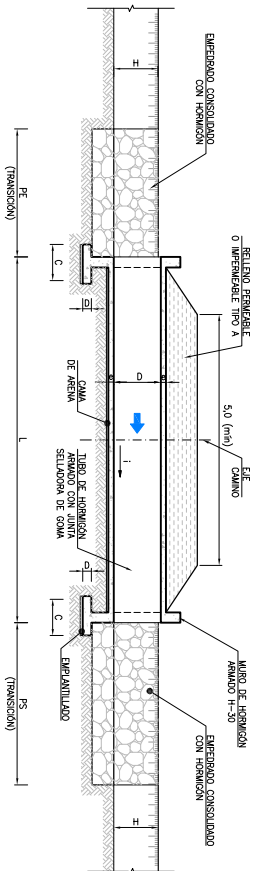




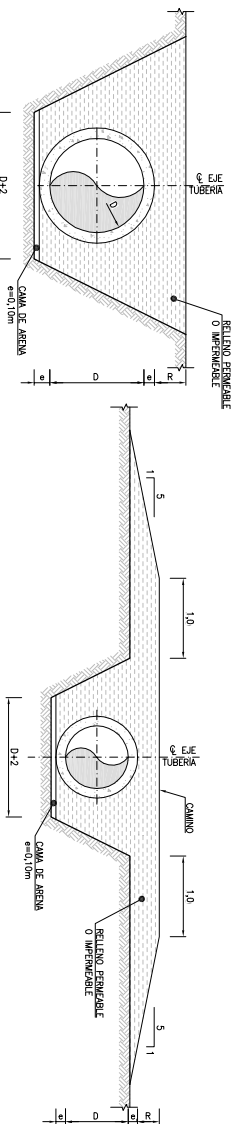




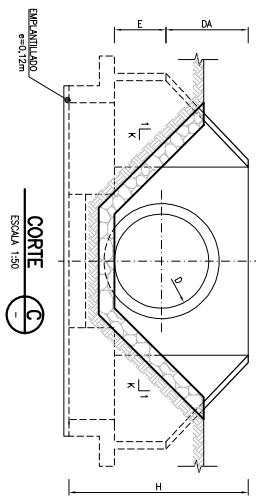
PLANTA CRUCE DE CAMINO PARA  
TUBOS DE HORMIGÓN ARMADO



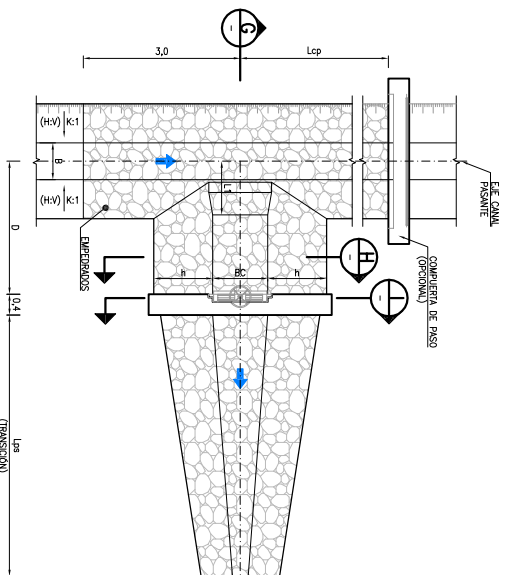
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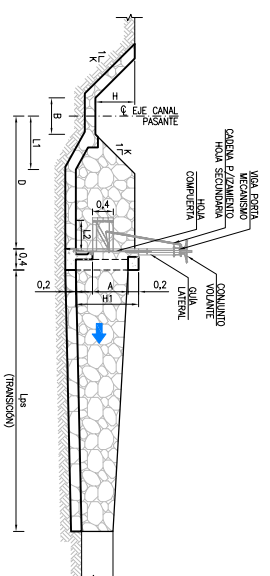
SECCIÓN B ALTERNATIVA CRUCE  
ESCALA 1:50 - EN TERRAPLEN



**CORTE**  
ESCALA 1:50



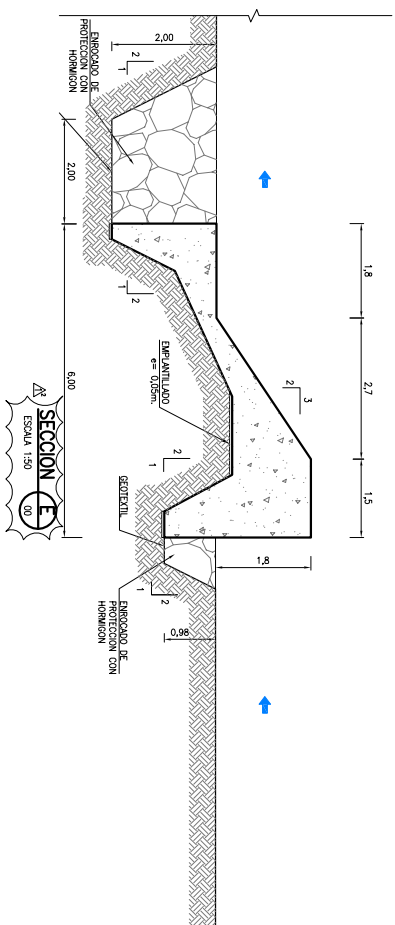
**PLANTA ENTREGA TIPO**  
**CIPOLETTI**  
ECCELTA 1-ED



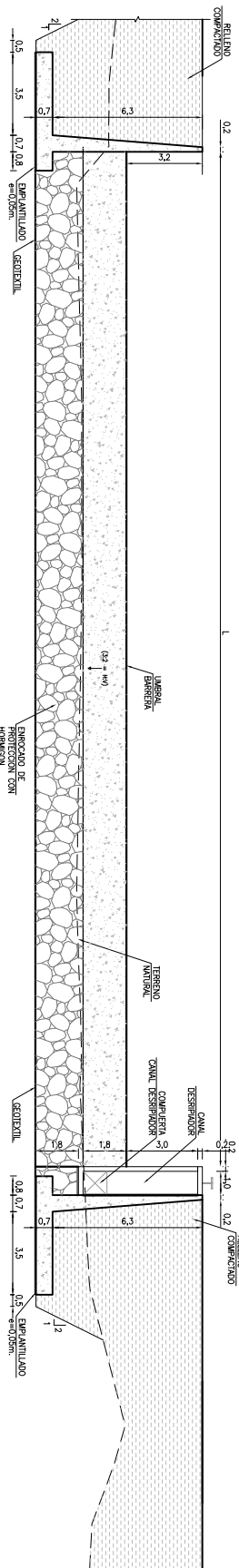
CORTE

ESCALA 1:50

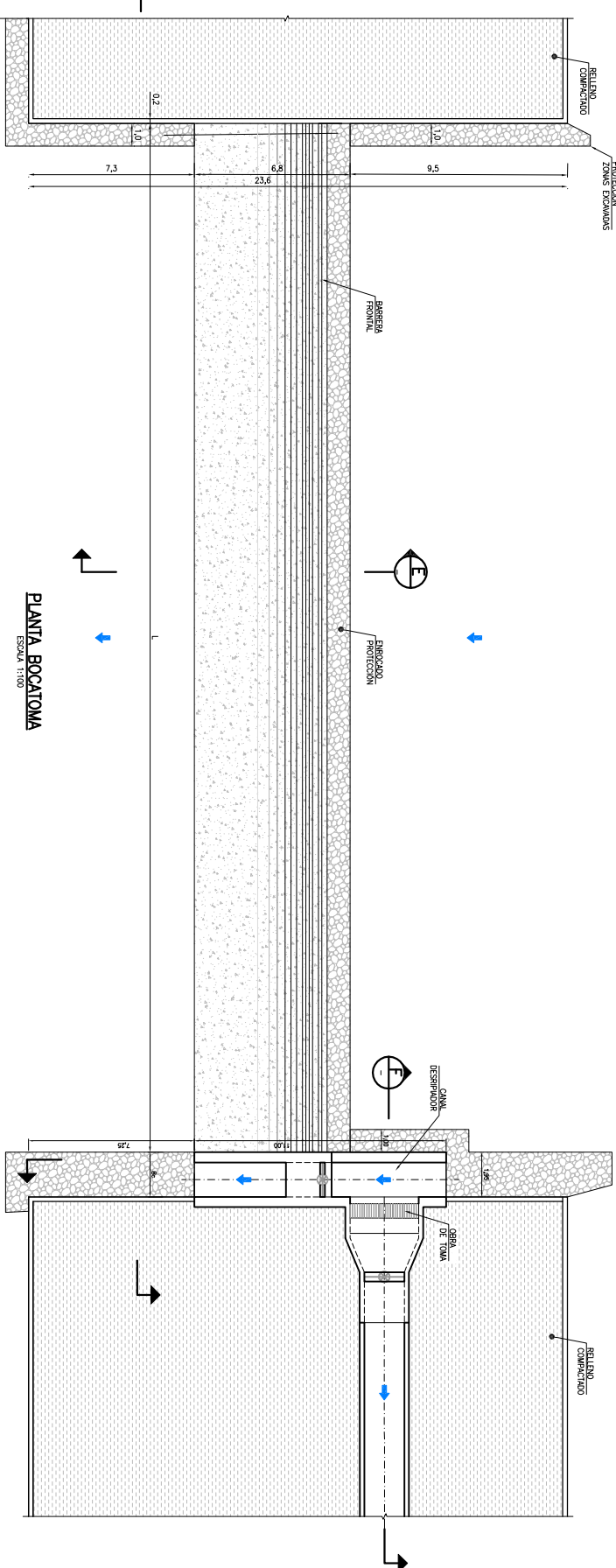
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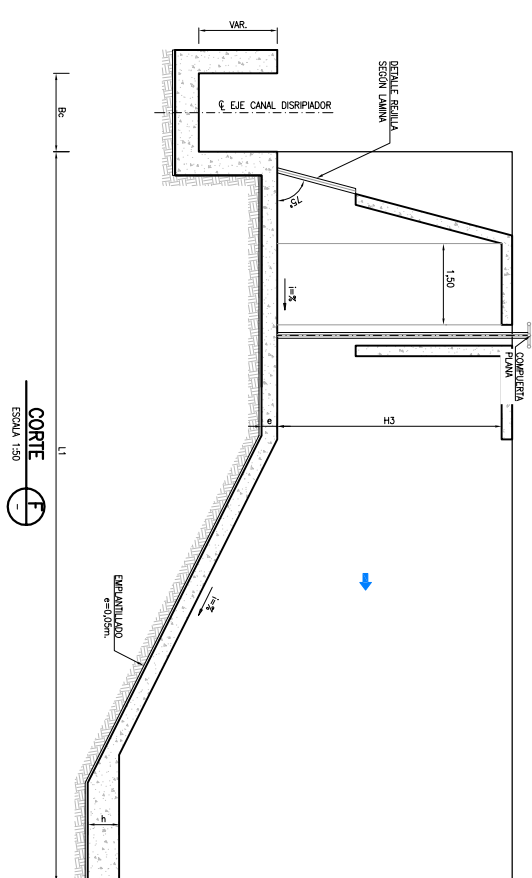
SECCION E  
ESCALA 1:50  
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SECTION D  
ESCALA 1:100



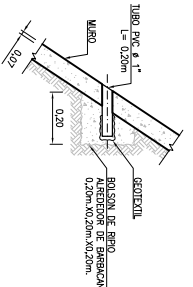
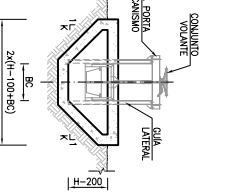
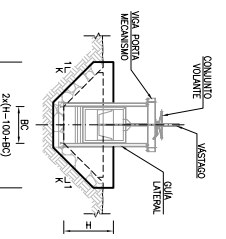
**PLANTA BOCATOMA**  
ESCALA 1:100



CORTE

ESCALA 1:50

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**BARBACANA DE MURO**

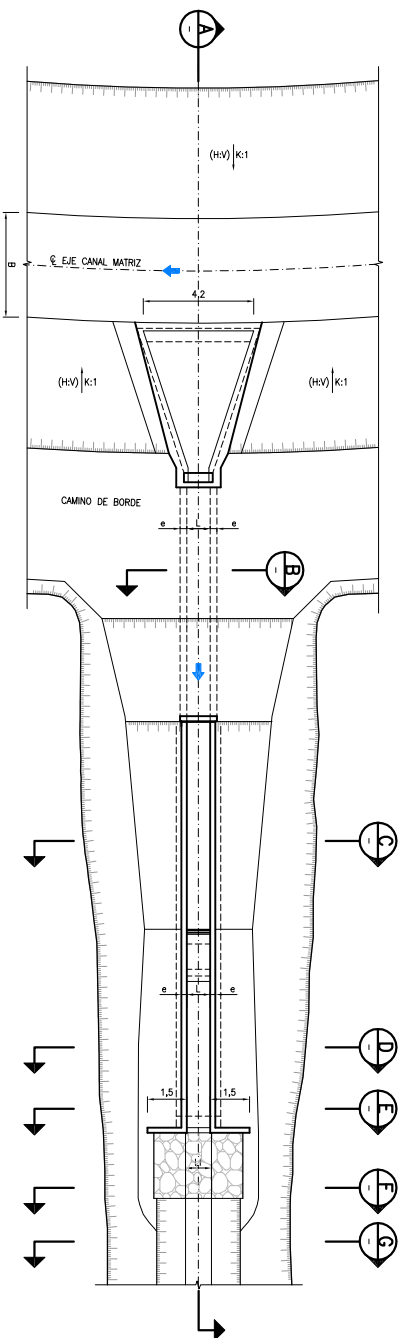
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|----------------------|----------|--------------------------------|--|-------|---|
| SESO                 | 84.5     | 2018.13                        |  | 1     | 1 |
| SEXO                 | F.2.5    | 2018.13                        |  | 2     | 2 |
| EST. OPERACION       | J.4.5    | 2018.13                        |  | 3     | 3 |
| EST. INVENTARIO      | 4.5.4    | 2018.13                        |  | 4     | 4 |
| 3853-2000-1H-PLA-015 |          |                                |  |       |   |
| NOMBRE               |          | FECHA                          |  | FOLIO |   |
| 1                    | 31.01.13 | MONTICOLA, D. MINICHO          |  | 1     | 1 |
| 2                    | 10.03.12 | AFERRODOR, CLARENTE            |  | 2     | 2 |
| 3                    | 21.11.12 | ROSSIGN, J. AFRERODOR CLARENTE |  | 3     | 3 |
| 4                    | 02.12.17 | ROSSIGN, J. AFRERODOR CLARENTE |  | 4     | 4 |
| 5                    | 02.12.17 | ROSSIGN, J. AFRERODOR CLARENTE |  | 5     | 5 |
| 6                    | 02.12.17 | ROSSIGN, J. AFRERODOR CLARENTE |  | 6     | 6 |
| 7                    | FECHA    | RECEPCION                      |  | 7     | 7 |
| 8                    | FECHA    | RECEPCION                      |  | 8     | 8 |

| DOCUMENTOS DE REFERENCIA | MODIFICACION | FECHA | APROBACION |  |             | DESCRIPCION                                                          | TITULO                                                     |
|--------------------------|--------------|-------|------------|-------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------|------------------------------------------------------------|
| -                        | -            | -     | -          |  |             | <b>APROBADO CLIENTE</b><br><b>EMBASE MINUTO - REGION DEL Bío-Bío</b> | <b>GRUPO TIPO</b><br><b>CANALES MATRICES Y DE TRANSASE</b> |
| -                        | -            | -     | -          | ESCALA                                                                              | INDICADORES | PROYECCION DEMOGRAFICA                                               | FECHA ANTERIOR                                             |
| -                        | -            | -     | -          |                                                                                     |             | WCSB4                                                                | GEODEN                                                     |
| -                        | -            | -     | -          |                                                                                     |             |                                                                      | FECHA                                                      |
| -                        | -            | -     | -          |                                                                                     |             |                                                                      | AGOSTO 2012                                                |
| -                        | -            | -     | -          |                                                                                     |             |                                                                      | ÚLTIMA                                                     |
| -                        | -            | -     | -          |                                                                                     |             |                                                                      | 3 DE 4                                                     |

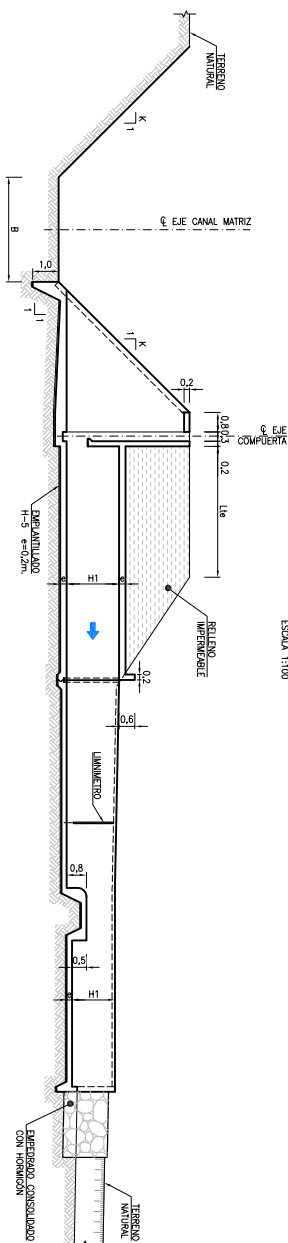




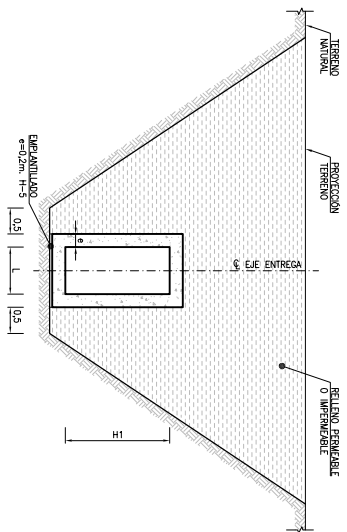
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| del PROYECTO         | 9.4C.  | 31.01.13 |       |
|                      | 9.4D.  | 31.01.13 |       |
|                      | 9.4E.  | 31.01.13 |       |
|                      | 9.4F.  | 31.01.13 |       |
|                      | 9.4G.  | 31.01.13 |       |
|                      | 9.4H.  | 31.01.13 |       |
|                      | 9.4I.  | 31.01.13 |       |
|                      | 9.4J.  | 31.01.13 |       |
|                      | 9.4K.  | 31.01.13 |       |
|                      | 9.4L.  | 31.01.13 |       |
|                      | 9.4M.  | 31.01.13 |       |
|                      | 9.4N.  | 31.01.13 |       |
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|                      | 9.4S.  | 31.01.13 |       |
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|                      | 9.4W.  | 31.01.13 |       |
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|                      | 9.4GN. | 31.01.13 |       |
|                      | 9.4GO. | 31.01.13 |       |
|                      | 9.4GP. | 31.01.13 |       |
|                      | 9.4GQ. | 31.01.13 |       |
|                      | 9.4GR. | 31.01.13 |       |
|                      | 9.4GS. | 31.01.13 |       |
|                      | 9.4GT. | 31.01.13 |       |
|                      | 9.4GU. | 31.01.13 |       |
|                      | 9.4GV. | 31.01.13 |       |
|                      | 9.4GW. | 31.01.13 |       |
|                      | 9.4GX. | 31.01.13 |       |
|                      | 9.4GY. | 31.01.13 |       |
|                      | 9.4GZ. | 31.01.13 |       |
|                      | 9.4HA. | 31.01.13 |       |
|                      | 9.4HB. | 31.01.13 |       |
|                      | 9.4HC. | 31.01.13 |       |
|                      | 9.4HD. | 31.01.13 |       |
|                      | 9.4HE. | 31.01.13 |       |
|                      | 9.4HF. | 31.01.13 |       |
|                      | 9.4HG. | 31.01.13 |       |
|                      | 9.4HH. | 31.01.13 |       |
|                      | 9.4HI. | 31.01.13 |       |
|                      | 9.4HJ. | 31.01.13 |       |
|                      | 9.4HK. | 31.01.13 |       |
|                      | 9.4HL. | 31.01.13 |       |
|                      | 9.4HM. | 31.01.13 |       |
|                      | 9.4HN. | 31.01.13 |       |
|                      | 9.4HO. | 31.01.13 |       |
|                      | 9.4HP. | 31.01.13 |       |
|                      | 9.4HQ. | 31.01.13 |       |
|                      | 9.4HR. | 31.01.13 |       |
|                      | 9.4HS. | 31.01.13 |       |
|                      | 9.4HT. | 31.01.13 |       |
|                      | 9.4HU. | 31.01.13 |       |
|                      | 9.4HV. | 31.01.13 |       |
|                      | 9.4HW. | 31.01.13 |       |
|                      | 9.4HX. | 31.01.13 |       |
|                      | 9.4HY. | 31.01.13 |       |
|                      | 9.4HZ. | 31.01.13 |       |
|                      | 9.4IA. | 31.01.13 |       |
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|                      | 9.4IC. | 31.01.13 |       |
|                      | 9.4ID. | 31.01.13 |       |
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|                      | 9.4IP. | 31.01.13 |       |
|                      | 9.4IQ. | 31.01.13 |       |
|                      | 9.4IR. | 31.01.13 |       |
|                      | 9.4IS. | 31.01.13 |       |
|                      | 9.4IT. | 31.01.13 |       |
|                      | 9.4IU. | 31.01.13 |       |
|                      | 9.4IV. | 31.01.13 |       |
|                      | 9.4IW. | 31.01.13 |       |
|                      | 9.4IX. | 31.01.13 |       |
|                      | 9.4IY. | 31.01.13 |       |
|                      | 9.4IZ. | 31.01.13 |       |
|                      | 9.4JA. | 31.01.13 |       |
|                      | 9.4JB. | 31.01.13 |       |
|                      | 9.4JC. | 31.01.13 |       |
|                      | 9.4JD. | 31.01.13 |       |
|                      | 9.4JE. | 31.01.13 |       |
|                      | 9.4JF. | 31.01.13 |       |
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|                      | 9.4JI. | 31.01.13 |       |
|                      | 9.4JJ. | 31.01.13 |       |
|                      | 9.4JK. | 31.01.13 |       |
|                      | 9.4JL. | 31.01.13 |       |
|                      | 9.4JM. | 31.01.13 |       |
|                      | 9.4JN. | 31.01.13 |       |
|                      | 9.4JO. | 31.01.13 |       |
|                      | 9.4JP. | 31.01.13 |       |
|                      | 9.4JQ. | 31.01.13 |       |
|                      | 9.4JR. | 31.01.13 |       |
|                      | 9.4JS. | 31.01.13 |       |
|                      | 9.4JT. | 31.01.13 |       |
|                      | 9.4JU. | 31.01.13 |       |
|                      | 9.4JV. | 31.01.13 |       |
|                      | 9.4JW. | 31.01.13 |       |
|                      | 9.4JX. | 31.01.13 |       |
|                      | 9.4JY. | 31.01.13 |       |
|                      | 9.4JZ. | 31.01.13 |       |
|                      | 9.4KA. | 31.01.13 |       |
|                      | 9.4KB. | 31.01.13 |       |
|                      | 9.4KC. | 31.01.13 |       |
|                      | 9.4KD. | 31.01.13 |       |
|                      | 9.4KE. | 31.01.13 |       |
|                      | 9.4KF. | 31.01.13 |       |
|                      | 9.4KG. | 31.01.13 |       |
|                      | 9.4KH. | 31.01.13 |       |
|                      | 9.4KI. | 31.01.13 |       |
|                      | 9.4KJ. | 31.01.13 |       |
|                      | 9.4KK. | 31.01.13 |       |
|                      | 9.4KL. | 31.01.13 |       |
|                      | 9.4KM. | 31.01.13 |       |
|                      | 9.4KN. | 31.01.13 |       |
|                      | 9.4KO. | 31.01.13 |       |
|                      | 9.4KP. | 31.01.13 |       |
|                      | 9.4KQ. | 31.01.13 |       |
|                      | 9.4KR. | 31.01.13 |       |
|                      | 9.4KS. | 31.01.13 |       |
|                      | 9.4KT. | 31.01.13 |       |
|                      | 9.4KU. | 31.01.13 |       |
|                      | 9.4KV. | 31.01.13 |       |
|                      | 9.4KW. | 31.01.13 |       |
|                      | 9.4KX. | 31.01.13 |       |
|                      | 9.4KY. | 31.01.13 |       |
|                      | 9.4KZ. | 31.01.13 |       |
|                      | 9.4LA. | 31.01.13 |       |
|                      | 9.4LB. | 31.01.13 |       |
|                      | 9.4LC. | 31.01.13 |       |
|                      | 9.4LD. | 31.01.13 |       |
|                      | 9.4LE. | 31.01.13 |       |
|                      | 9.4LF. | 31.01.13 |       |
|                      | 9.4LG. | 31.01.13 |       |
|                      | 9.4LH. | 31.01.13 |       |
|                      | 9.4LI. | 31.01.13 |       |
|                      | 9.4LJ. | 31.01.13 |       |
|                      | 9.4LK. | 31.01.13 |       |
|                      | 9.4LL. | 31.01.13 |       |
|                      | 9.4LM. | 31.01.13 |       |
|                      | 9.4LN. | 31.01.13 |       |
|                      | 9.4LO. | 31.01.13 |       |
|                      | 9.4LP. | 31.01.13 |       |
|                      | 9.4LQ. | 31.01.13 |       |
|                      | 9.4LR. | 31.01.13 |       |
|                      | 9.4LS. | 31.01.13 |       |
|                      | 9.4LT. | 31.01.13 |       |
|                      | 9.4LU. | 31.01.13 |       |
|                      | 9.4LV. | 31.01.13 |       |
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|                      | 9.4LX. | 31.01.13 |       |
|                      | 9.4LY. | 31.01.13 |       |
|                      | 9.4LZ. | 31.01.13 |       |
|                      | 9.4MA. | 31.01.13 |       |
|                      | 9.4MB. | 31.01.13 |       |
|                      | 9.4MC. | 31.01.13 |       |
|                      | 9.4MD. | 31.01.13 |       |
|                      | 9.4ME. | 31.01.13 |       |
|                      | 9.4MF. | 31.01.13 |       |
|                      | 9.4MG. | 31.01.13 |       |
|                      | 9.4MH. | 31.01.13 |       |
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|                      | 9.4MJ. | 31.01.13 |       |
|                      | 9.4MK. | 31.01.13 |       |
|                      | 9.4ML. | 31.01.13 |       |
|                      | 9.4MN. | 31.01.13 |       |
|                      | 9.4MO. | 31.01.13 |       |
|                      | 9.4MP. | 31.01.13 |       |
|                      | 9.4MQ. | 31.01.13 |       |
|                      | 9.4MR. | 31.01.13 |       |
|                      | 9.4MS. | 31.01.13 |       |
|                      | 9.4MT. | 31.01.13 |       |
|                      | 9.4MU. | 31.01.13 |       |
|                      | 9.4MV. | 31.01.13 |       |
|                      | 9.4MW. | 31.01.13 |       |
| </                   |        |          |       |



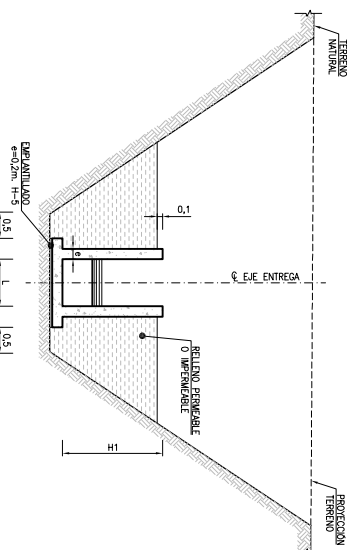
**PLANTA OBRA DE ENTREGA A DERIVADO**  
ESCALA 1:100



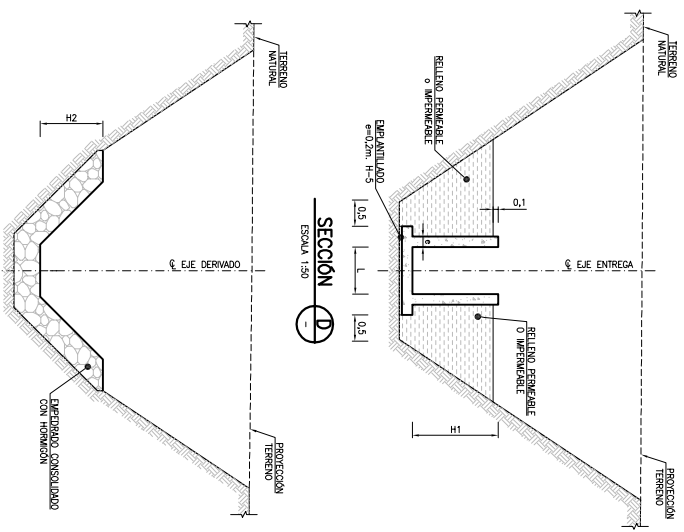
CORTE  
ESCALA K:100



SECCIÓN  
ESCALA 1:50



CORTE  
ESCALA 1:50

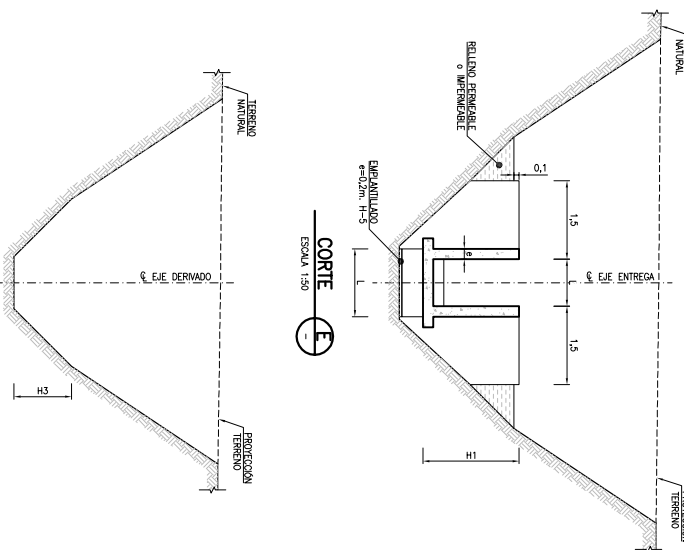


SECCIÓN

---

ESCALA 1:50

F



SECCIÓN **G**  
ESCALA 1:50  
-

| CANA       | KM       | Cand |     | B   | Tand | M   | L        |
|------------|----------|------|-----|-----|------|-----|----------|
|            |          | 0.2  | 0.5 | 1.5 | 1.0  | 0.5 | variable |
| TM362/M2/3 | 2824.00  | 0.2  | 0.5 | 1.5 | 1.0  | 0.5 | variable |
| TM362/M2/1 | 6648.00  | 0.9  | 1.0 | 1.5 | 1.0  | 0.7 | variable |
| TM362/M2/1 | 1420.00  | 0.9  | 1.0 | 1.5 | 1.0  | 0.7 | variable |
| TM362/M2/2 | 1073.00  | 5.3  | 1.0 | 1.2 | 1.0  | 1.5 | variable |
| TM362/M2/2 | 8897.00  | 5.3  | 1.0 | 1.2 | 1.0  | 1.5 | variable |
| TM362/M2/2 | 9816.00  | 5.3  | 1.0 | 1.2 | 1.0  | 1.5 | variable |
| TM362/M2/2 | 10670.00 | 5.3  | 1.0 | 1.2 | 1.0  | 1.5 | variable |
| TM362/M2/2 | 14281.00 | 5.3  | 1.0 | 1.2 | 1.0  | 1.5 | variable |
| TM362/M2/2 | 1844.00  | 2.7  | 1.5 | 1.5 | 1.0  | 1.0 | variable |
| TM362/M2/2 | 18890.00 | 2.7  | 1.5 | 1.5 | 1.0  | 1.0 | variable |
| TM362/M2/2 | 22184.00 | 2.7  | 1.5 | 1.5 | 1.0  | 1.0 | variable |
| TM362/M2/2 | 22930.00 | 2.7  | 1.5 | 1.5 | 1.0  | 1.0 | variable |
| TM362/M2/2 | 2373.00  | 2.7  | 1.5 | 1.5 | 1.0  | 1.0 | variable |
| TM362/M2/2 | 3084.00  | 2.7  | 1.5 | 1.5 | 1.0  | 1.0 | variable |
| TM362/M2/2 | 3379.00  | 2.7  | 1.5 | 1.5 | 1.0  | 1.0 | variable |

| CNNL   | $\ell$ | $\alpha$ | $\beta$      | $\kappa:1$ | $\eta$ |
|--------|--------|----------|--------------|------------|--------|
|        | (m)    | (m)      | ( $\ell+1$ ) |            | (m)    |
| MATR1  | 7.60   | 2.0      | 1.5          | 1          | 0.70   |
| MATR2  | 7.60   | 0.60     | 1.50         | 1          | 0.50   |
| MATR3  | 5.00   | 0.20     | 0.50         | 1.5        | 0.45   |
| MATR4  | 5.00   | 1.20     | 3.00         | 1.5        | 0.60   |
| MATR5  | 55.00  | 0.90     | 5.00         | 1          | 0.75   |
| MATR6  | 55.00  | 0.90     | 1.00         | 1.5        | 0.70   |
| TS6AS1 | 55.00  | 8.30     | 1.00         | 1.5        | 1.62   |
| TS6AS2 | 55.00  | 8.30     | 1.50         | 1.2        | 1      |
| TS6AS3 | 7.00   | 2.70     | 1.50         | 0.0        | 1.10   |

CUADRO DE PARÁMETROS DE DISEÑO CRUCE DE QUEBRADAS.  
(VER PLANO 3853-2000-IH-PLA-016)

CUADRO DE PARAMETROS DE DISEÑO BOCATOMA  
(VER PLANO 3853-2000-IH-PLA-015)

**CUADRO DE PARÁMETROS DE DISEÑO CALDAS**  
**(VER PLANO 3853-2000-IH-PLA-014)**

| Canal    | CAUTION | KM   | HZ  | ip %  | B    | k:1   | M    |
|----------|---------|------|-----|-------|------|-------|------|
|          | (m/s)   |      |     |       | (m)  | (m/s) | (m)  |
| Matrix 1 | 2.0     | 1000 | 2.0 | 0.65% | 2.00 | 1.50  | 0.70 |
|          | 2.0     | 1500 | 2.0 | 0.70% | 2.00 | 1.50  | 0.60 |
|          | 1.20    | 202  | 1.0 | 0.98% | 1.50 | 1.50  | 0.60 |
|          | 1.20    | 540  | 1.5 | 0.98% | 1.50 | 1.50  | 0.60 |
|          | 1.20    | 1262 | 2.0 | 0.98% | 1.50 | 1.50  | 0.60 |
|          | 1.20    | 1743 | 2.0 | 0.98% | 1.50 | 1.50  | 0.60 |
| Matrix 4 | 1.20    | 2024 | 2.0 | 0.98% | 1.50 | 1.50  | 0.60 |
|          | 1.20    | 2464 | 2.0 | 0.98% | 1.50 | 1.50  | 0.60 |
|          | 1.20    | 2956 | 1.5 | 0.98% | 1.50 | 1.50  | 0.70 |
|          | 1.20    | 3808 | 2.0 | 0.98% | 1.50 | 1.50  | 0.70 |
|          | 1.20    | 4274 | 2.0 | 0.98% | 1.50 | 1.50  | 0.70 |
|          | 1.20    | 9000 | 2.0 | 0.98% | 1.50 | 1.50  | 0.70 |
|          | 1.20    | 9748 | 2.0 | 0.98% | 1.50 | 1.50  | 0.70 |
|          | 1.20    | 6263 | 2.0 | 0.98% | 1.50 | 1.50  | 0.70 |

**CUADRO DE PARÁMETROS ENTREGA DERIVADO**

| Cenat   | Q    | KM      | I %   | B    |      | K : I | H    |
|---------|------|---------|-------|------|------|-------|------|
|         |      |         |       | (m)  | (Hv) |       |      |
| MATR1.1 | 0.60 | 1045.00 | 0.80% | 2.00 | 1.5  | 1.0   | 0.65 |
| MATR1.2 | 0.60 | 1441.00 | 0.15% | 1.50 | 1.0  | 1.0   | 0.50 |
| MATR2.1 | 0.60 | 1653.00 | 0.15% | 1.50 | 1.0  | 1.0   | 0.50 |
| MATR2.2 | 1.20 | 3370.00 | 0.09% | 1.00 | 1.5  | 1.0   | 0.70 |
| MATR4.1 | 1.30 | 954.00  | 0.25% | 3.00 | 1.0  | 1.0   | 0.75 |

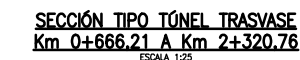
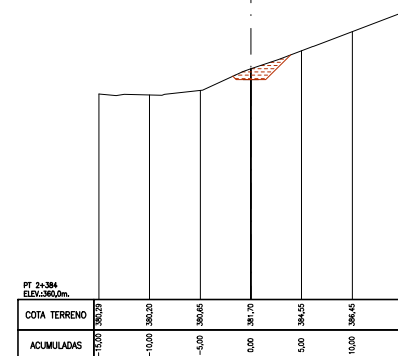
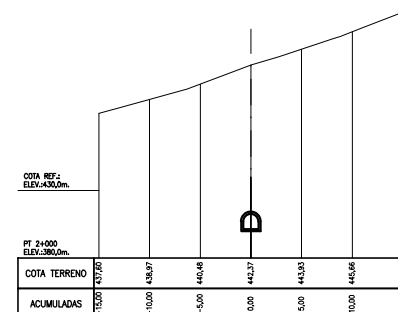
CUADRO DE PARÁMETROS DE DISEÑO CRUCE DE CAMINOS  
(VER PLANO 3853-2000-IH-PLA-015)

| CNAME   | KM       | Q       | B   | D   | K:1  | H   |      |
|---------|----------|---------|-----|-----|------|-----|------|
|         |          | (m/s)   | (m) | (m) | (Hz) | (m) |      |
| MATR2.1 | 1.000    | Purine  | 2.0 | 2.0 | 1.5  | 1.0 | 0.65 |
| MATR2.2 | 1.389    | Purine  | 2.0 | 2.0 | 1.5  | 1.0 | 0.65 |
| MATR2.3 | 2818.00  | Purine  | 2.0 | 2.0 | 1.5  | 1.0 | 0.65 |
| MATR2.4 | 3721.00  | Purine  | 2.0 | 2.0 | 1.5  | 1.0 | 0.65 |
| MATR2.5 | 7749.00  | Purine  | 2.0 | 2.0 | 1.5  | 1.0 | 0.65 |
| MATR2.6 | 12117.00 | Purine  | 2.0 | 2.0 | 1.5  | 1.0 | 0.70 |
| MATR2.7 | 100.00   | Tobacco | 0.6 | 0.5 |      |     |      |
| MATR2.8 | 746.00   | Tobacco | 0.6 | 0.5 |      |     |      |
| MATR2.9 | 2479.00  | Tobacco | 0.6 | 0.5 |      |     |      |
| MATR2.7 | 3331.00  | Purine  | 0.6 | 0.5 |      |     |      |
| MATR2.4 | 12386.00 | Purine  | 1.2 | 1.0 | 1.0  | 1.0 | 0.65 |
| MATR2.5 | 1566.00  | Tobacco | 1.0 |     | 0.60 |     |      |
| MATR2.5 | 2590.00  | Tobacco | 1.0 |     | 0.60 |     |      |
| MATR2.5 | 4791.00  | Tobacco | 1.0 |     | 0.60 |     |      |
| MATR2.5 | 6061.00  | Tobacco | 1.0 |     | 0.60 |     |      |
| MATR2.5 | 7521.00  | Tobacco | 0.4 |     | 0.40 |     |      |
| MATR2.5 | 7713.00  | Tobacco | 0.9 |     | 0.60 |     |      |
| MATR2.5 | 7714.00  | Tobacco | 0.9 |     | 0.60 |     |      |
| MATR2.5 | 8834.00  | Purine  | 5.3 | 1.0 | 0.60 |     |      |

NOTAS

1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).
3. SE ELIMINA IMBEBE DE REDUCIDO AL 50%.

|                          |              |       |            |                                                                                     |           |                                |                             |                                                                     |                  |                                              |  |
|--------------------------|--------------|-------|------------|-------------------------------------------------------------------------------------|-----------|--------------------------------|-----------------------------|---------------------------------------------------------------------|------------------|----------------------------------------------|--|
| DOCUMENTOS DE REFERENCIA | MODIFICACION | FECHA | APROBACION |  |           |                                |                             | RECOMENDACION                                                       |                  | TITULO                                       |  |
| -                        | -            | -     | -          |  |           |                                |                             | MEJORAMIENTO RIEGO RIO CATO<br>EMBALSE INBUNTO - REGION DEL BIO-BIO |                  | OBRAS TIPO<br>CAUALES MANTENES Y DE TRANSASE |  |
| -                        | -            | -     | -          | ESCALA                                                                              | INDICADOS | PROYECCION COORDINADA<br>WGS84 | FUENTE COORDINADA<br>GEODEN | FECHA<br>AGOSTO 2012                                                | UNIDAD<br>1 DE 4 |                                              |  |



**CUADRO DE CALICATAS**

| NOMBRE | COORDENADAS |           |
|--------|-------------|-----------|
|        | ESTE        | NORTE     |
| CI-10  | 252.519     | 5.936.868 |

**NOTAS**

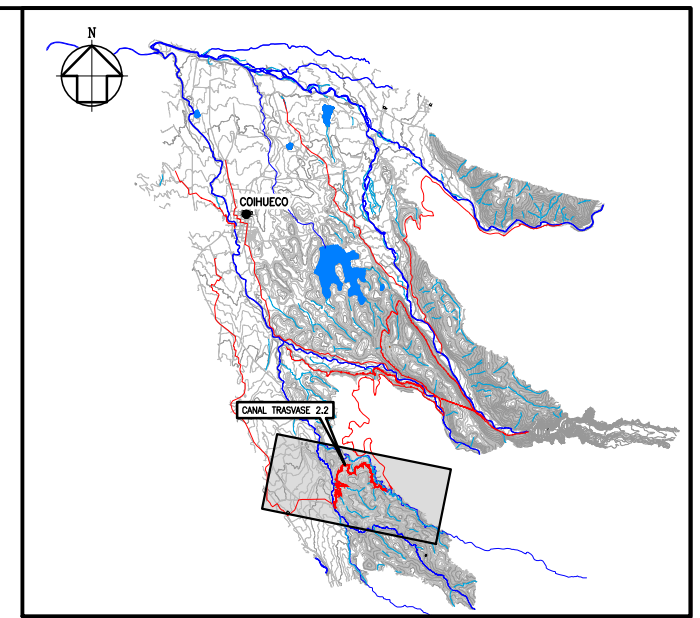
1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (mnm).
3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM WGS84, HUSO 18.
4. LEVANTAMIENTO AEROFOTOGRAMETRICO DIGITAL SECTOR CURACAUTIN, AGOSTO 2012.

ESCALA 1:5,000, PROPORCIONADA POR GEOCEN.

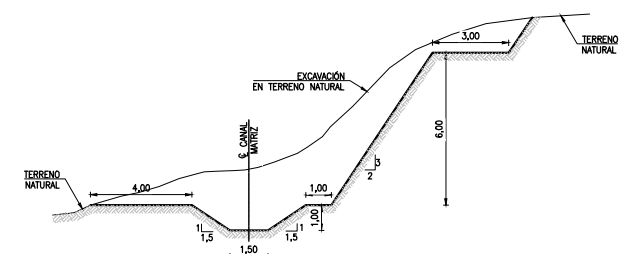
SE ELIMINA EL TITULO DE REDUCCION AL 50%.

| DOCUMENTOS DE REFERENCIA |  | MODIFICACIÓN | FECHA | APROBACIÓN |  | DESCRIPCIÓN                                                                                |                         | TÍTULO                                                                                         |             |        |
|--------------------------|--|--------------|-------|------------|---------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|-------------------------|------------------------------------------------------------------------------------------------|-------------|--------|
|                          |  |              |       |            |                                                                                       | <p><b>MEJORAMIENTO RIEGO RÍO CATO</b><br/><b>EMBALSE NIBLINTO – REGIÓN DEL BÍO-BÍO</b></p> |                         | <p><b>TÚNEL TRASVASE A SECTOR 3</b><br/><b>PLANTA, PERFIL LONGITUDINAL Y TRANSVERSALES</b></p> |             |        |
|                          |  |              |       |            |  | ESCALA                                                                                     | PRECEDENCIA CARTOGRAFÍA | FUENTE: CARTOGRAFÍA                                                                            | FECHA       | LÁMINA |
|                          |  |              |       |            |                                                                                       | INDICADAS                                                                                  | WSSB4                   | GEODEN                                                                                         | AGOSTO 2012 | 1 DE 1 |





CROQUIS DE UBICACIÓN  
S/E



SECCIÓN TIPO CANAL TRASVASE 2.2  
Km 0+000 A Km 6+533



| VÉRTICE | ESTE    | NORTE     |
|---------|---------|-----------|
| V-01    | 252.491 | 5.932.173 |
| V-02    | 251.907 | 5.932.531 |
| V-03    | 251.265 | 5.932.854 |
| V-04    | 250.734 | 5.932.989 |
| V-05    | 250.910 | 5.932.372 |
| V-06    | 250.647 | 5.931.974 |
| V-07    | 250.441 | 5.931.709 |
| V-08    | 250.460 | 5.931.504 |

CUADRO DE CALICATAS

| NOMBRE | COORDENADAS |           |
|--------|-------------|-----------|
|        | ESTE        | NORTE     |
| CI-02  | 248.669     | 5.931.389 |

### DESCRIPCIÓN DE OBRAS

CQ = Cruce de Quebrada  
CC = Cruce de Caminos  
BT = Bocatoma

### SIMBOLOGÍA

|                                                                                       |                           |                                                                                       |                                                      |
|---------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------|------------------------------------------------------|
|  | EJE CANAL MATRIZ          |  | V=0.1<br>VÉRTICE                                     |
|  | EXCAVACION CANAL          |  | SENTIDO DE ESCURRIMIENTO                             |
|  | CURVA PRINCIPAL           |  | EXCAVACION                                           |
|  | CURVA SECUNDARIA          |  | CL-X<br>CALICATA AREA DE RIEGO<br>PROPUESTA NUBLINTO |
|  | RIGOS                     |  | OBRA                                                 |
|  | RED DE CAÑALES EXISTENTES |  | CERCO                                                |
|  | EJE                       |  |                                                      |
|  | CAMINO EXISTENTE          |                                                                                       |                                                      |

**NOTAS**

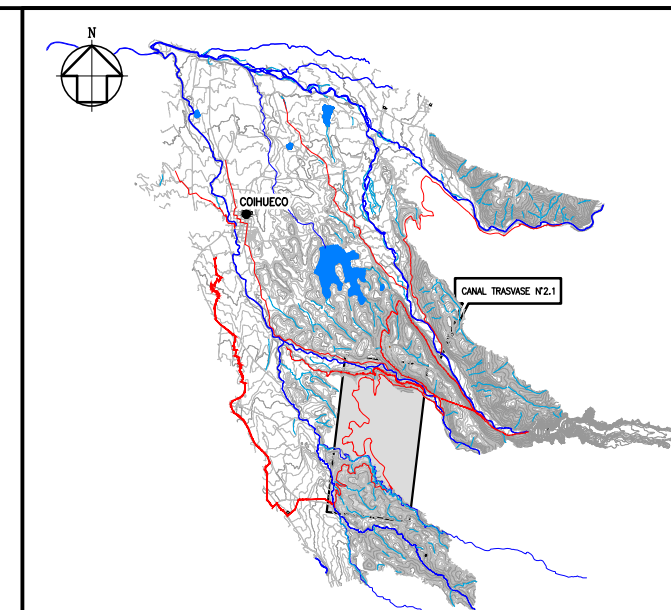
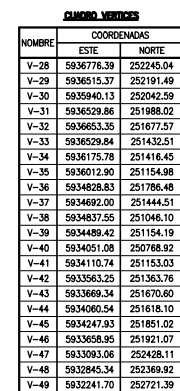
1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (msnm).
3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM, REFERIDAS AL DATUM WGS84, HUSO 18.
4. LEVANTAMIENTO AEROFOTOGRAFOMETRICO DIGITAL SECTOR CURACAUTIN, AGOSTO 2012.
5. ESCALA 1:5,000, PROPORCIONADA POR GEOCEN.

SE ELIMINA EL TUBO DE REDUCCION AL 50%.

PERFILES TRANSVERSALES CANAL TRASVASE 2.2 A SECTOR 3  
KM. 0+000 A KM. 6+533

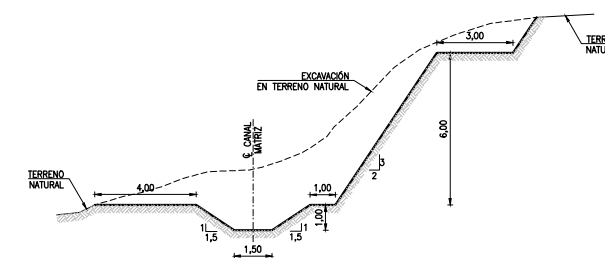
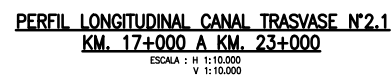
| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN |  | DESCRIPCIÓN                                                          |                        | TÍTULO                                                         |             |        |  |
|--------------------------|--------------|-------|------------|---------------------------------------------------------------------------------------|----------------------------------------------------------------------|------------------------|----------------------------------------------------------------|-------------|--------|--|
|                          |              |       |            |                                                                                       | MEJORAMIENTO REGIO RÍO CATO<br>EMBALSE NIBLINTO – REGIÓN DEL BÍO-BÍO |                        | CANAL TRASVERSE 2.2 A SECTOR 3<br>PLANTA Y PERFIL LONGITUDINAL |             |        |  |
|                          |              |       |            |  | ESCALA                                                               | PROYECCIÓN CARTOGRAFÍA | FUENTE CARTOGRAFÍA                                             | FECHA       | LÁMINA |  |
|                          |              |       |            |                                                                                       | INDICADAS                                                            | WGS84                  | GEOCEN                                                         | AGOSTO 2012 | 1 DE 1 |  |



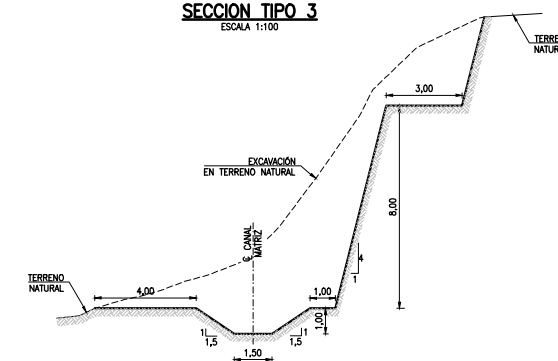


CROQUIS DE UBICACIÓN  
S/E

**PLANTA GENERAL CANAL TRASVASE N°2.1**  
**KM. 17+000 A KM. 29+201**  
Escala: 1:10,000



**SECCION TIPO 3**  
ESCALA 1:100



**SECCION TIPO 4**  
ESCALA 1:100

CUADRO CALICATAS

| NOMBRE | COORDENADAS |           |
|--------|-------------|-----------|
|        | ESTE        | NORTE     |
| CI-10  | 252.519     | 5.936.868 |

### CUADRO SECCIONES TIPO

| INICIO (km) | FIN (km) | SECCION |
|-------------|----------|---------|
| 17.000      | 17.696   | TIPO 3  |
| 17.696      | 18.027   | TIPO 4  |
| 18.027      | 18.430   | TIPO 3  |
| 18.430      | 18.801   | TIPO 4  |
| 18.801      | 19.820   | TIPO 3  |
| 19.820      | 20.110   | TIPO 4  |
| 20.110      | 28.540   | TIPO 3  |
| 28.540      | 28.980   | TIPO 4  |
| 28.980      | 29.216   | TIPO 3  |

## SIMBOLOGÍA

|                                                                                       |                           |                                                                                       |                          |
|---------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------|--------------------------|
|  | EJE CANAL MATRIZ          |  | CAMINO EXISTENTE         |
|  | EXCAVACIÓN CANAL          |  | VERTICE                  |
|  | 500                       |  | SENTIDO DE ESCURRIMIENTO |
|  | CURVA PRINCIPAL           |  | MAPMOSTERIA              |
|  | CURVA SECUNDARIA          |  | CLIC-X                   |
|  | RÍOS                      |  | OBRA                     |
|  | RED DE CANALES EXISTENTES |                                                                                       |                          |
|  | EJE                       |                                                                                       |                          |
|  | CERCO                     |                                                                                       |                          |

### DESCRIPCIÓN DE OBRAS

CQ = Cruce de Quebrada  
CC = Cruce de Caminos

[illegible]

**NOTAS**

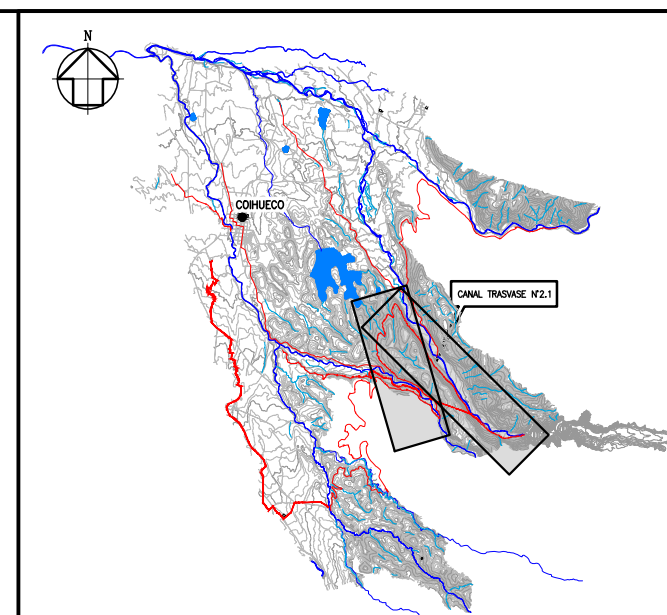
1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (msnm).
3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM, REFERIDAS AL DATUM WGS84, HUSO 18.
4. LEVANTAMIENTO AEROFOTOGRAMETRICO DIGITAL SECTOR CURAUCAUTIN, AGOSTO 2012.

ESCALA 1:5.000, PROPORCIONADA POR GEOCEN.

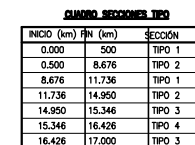
SE ELIMINA EL TIPO DE REDUCCION AL 50%

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN |  | DESCRIPCIÓN                                                                  |                        | TÍTULO                                                       |             |        |
|--------------------------|--------------|-------|------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------|------------------------|--------------------------------------------------------------|-------------|--------|
|                          |              |       |            |                                                                                       | <b>MEJORAMIENTO RIEGO RÍO CATO<br/>EMBALSE NIBLINTO – REGIÓN DEL BÍO-BÍO</b> |                        | <b>CANAL TRASVASE N°2.1<br/>PLANTA Y PERFIL LONGITUDINAL</b> |             |        |
|                          |              |       |            |  | ESCALA                                                                       | PROYECCIÓN CARTOGRAFIA | FUENTE CARTOGRAFIA                                           | FECHA       | LÁMINA |
|                          |              |       |            |                                                                                       | 1:10.000                                                                     | WGS84                  | GEODEN                                                       | AGOSTO 2012 | 2 DE 2 |

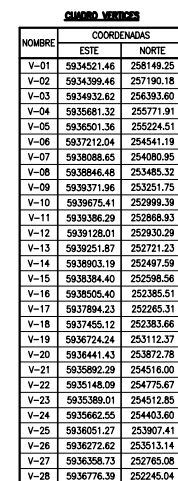




**CROQUIS DE UBICACIÓN**



| NOMBRE | COORDENADAS |           |
|--------|-------------|-----------|
|        | ESTE        | NORTE     |
| CI-10  | 252.519     | 5.936.868 |



The diagrams illustrate the cross-sections of a drainage canal, showing the excavation profile, the natural ground level, and the canal bed and banks. The diagrams are labeled "SECCIÓN TIPO 1" and "SECCIÓN TIPO 3", both at a scale of 1:100.

**SECCIÓN TIPO 1 (ESCALA 1:100):** This diagram shows a cross-section of a drainage canal. The canal bed is 1.00 wide. The left bank has a slope of 1:1.5 and a top width of 4.00. The right bank has a slope of 1:1.5 and a top width of 3.00. The total height of the right bank is 6.00. The canal is labeled "CANAL MAÍZ" and the excavation is labeled "EXCAVACIÓN EN TERRENO NATURAL".

**SECCIÓN TIPO 3 (ESCALA 1:100):** This diagram shows a cross-section of a drainage canal. The canal bed is 1.50 wide. The left bank has a slope of 1:1.5 and a top width of 4.00. The right bank has a slope of 1:1.5 and a top width of 3.00. The total height of the right bank is 6.00. The canal is labeled "CANAL MAÍZ" and the excavation is labeled "EXCAVACIÓN EN TERRENO NATURAL".

**SECCION TIPO 4**  
ESCALA 1:100



|                                                                                       |                           |                                                                                       |                                           |
|---------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------|-------------------------------------------|
|  | EJE CANAL MATRIZ          |  | CAMINO EXISTENTE                          |
|  | EXCAVACION CANAL          |  | VÉRTICE                                   |
|  | CURVA PRINCIPAL           |  | SENTIDO DE ESCURRIMIENTO                  |
|  | CURVA SECUNDARIA          |  | MAESTRERIA                                |
|  | RIOS                      |  | CAJALCATA AREA DE REGO PROPUUESTA NUBINTO |
|  | RED DE CANALES EXISTENTES |  |                                           |
|  | EJE                       |  | OBRA                                      |
|  | CERCO                     |                                                                                       |                                           |

|        |                   | NOMBRE               | FECHA    | FIRMA | ... | ... | ... | ... | ... | ... |
|--------|-------------------|----------------------|----------|-------|-----|-----|-----|-----|-----|-----|
|        | DISEÑO            | R.L.S.               | 31.01.13 |       |     |     |     |     |     |     |
|        | REVISO            | P.L.C.               | 31.01.13 |       |     |     |     |     |     |     |
|        | JEFE ESPECIALIDAD | J.M.A.               | 31.01.13 |       |     |     |     |     |     |     |
|        | JEFE PROYECTO     | A.G.M.               | 31.01.13 |       |     |     |     |     |     |     |
| NOMBRE |                   | 3853-2000-IH-PLA-009 |          |       |     |     |     |     |     |     |

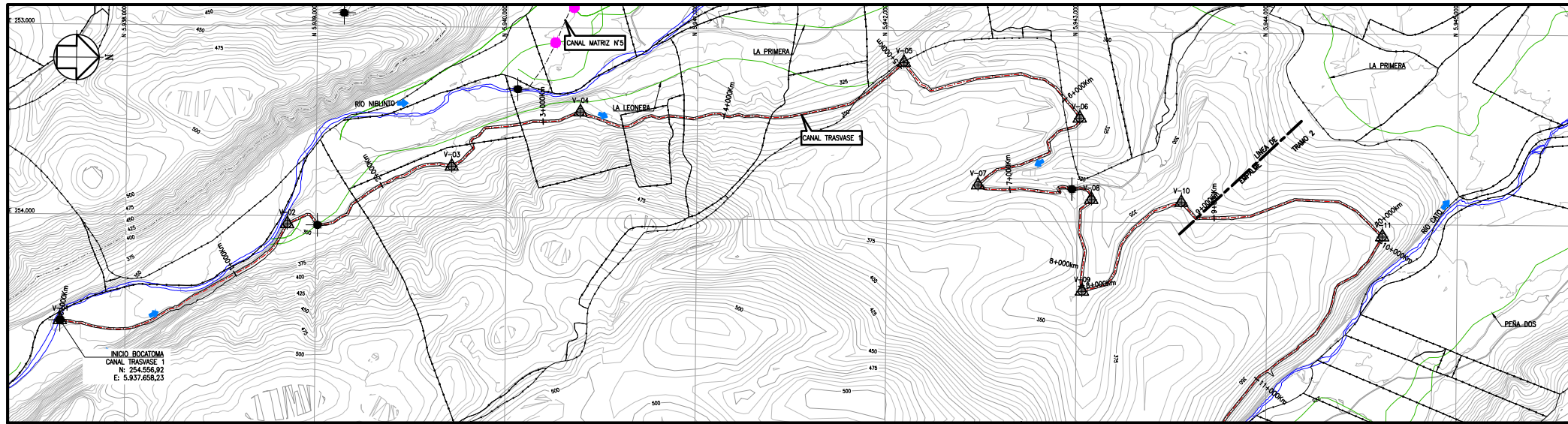
**NOTAS**

1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (mnm).
3. COORDENADAS EN SISTEMA DE PROTECCIÓN UTM. REFERIDAS AL DATUM WGS84, HUSO 18.
4. LEVANTAMIENTO AEROFOTOGRAFOMETRICO DIGITAL SECTOR CURACAUTIN, AGOSTO 2012.

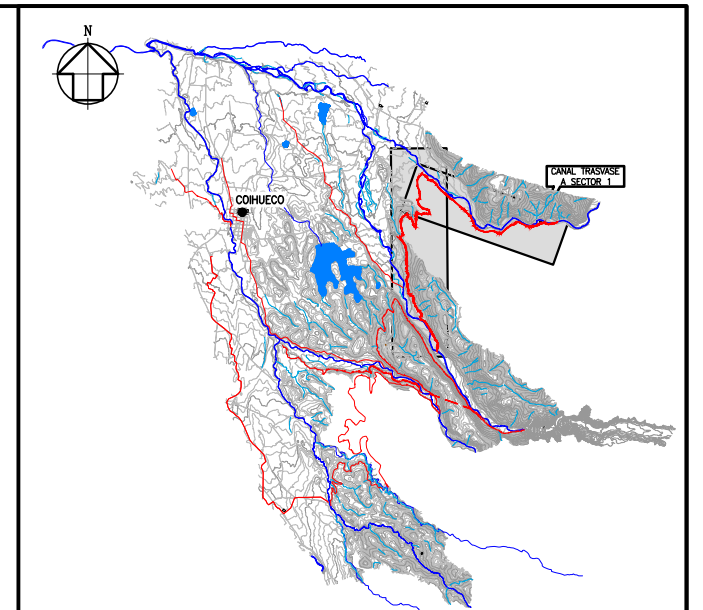
AS  **ESCALA 1:5.000 PROPORCIONADA POR GECON.**

**PLANIA DEL TIEMPO DE RECUPERACION A 50%**

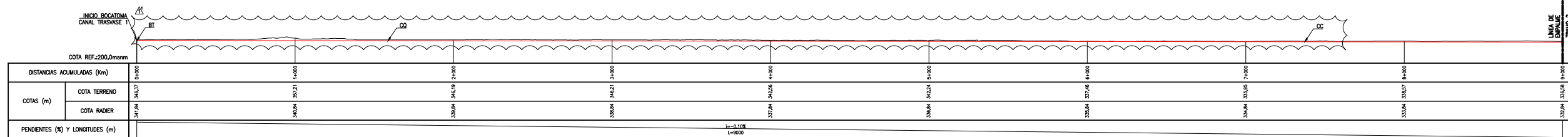




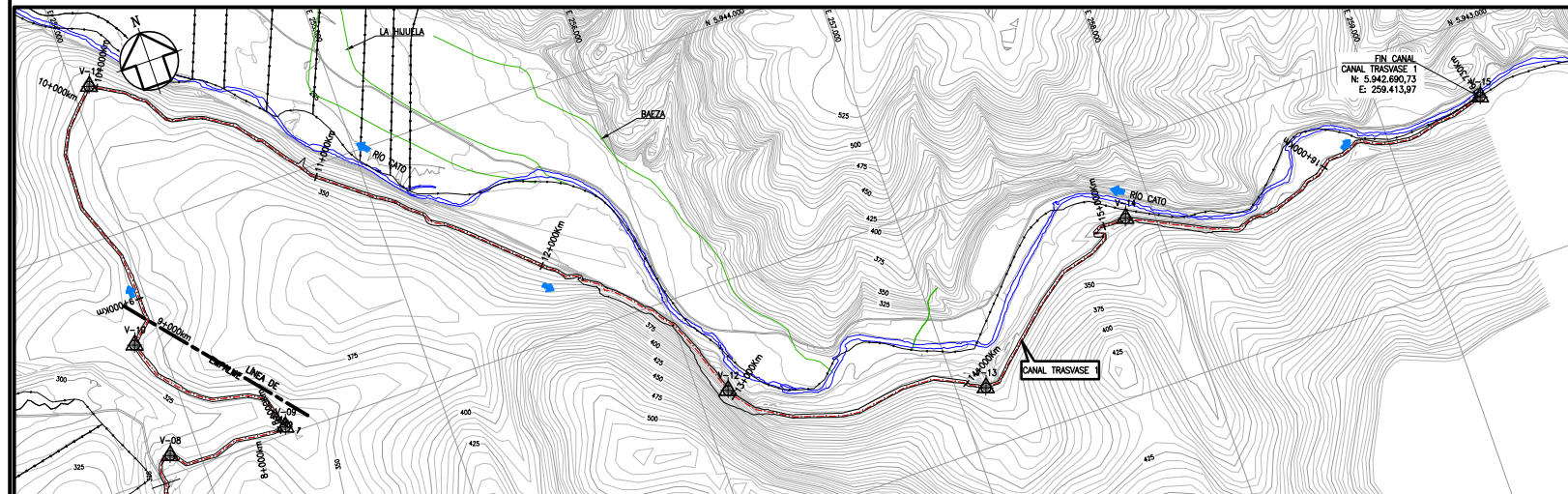
PLANTA CANAL TRASFASE 1 A SECTOR 1 – TRAMO 1  
KM. 0+000 A KM. 9+000  
ESCALA 1:10.000



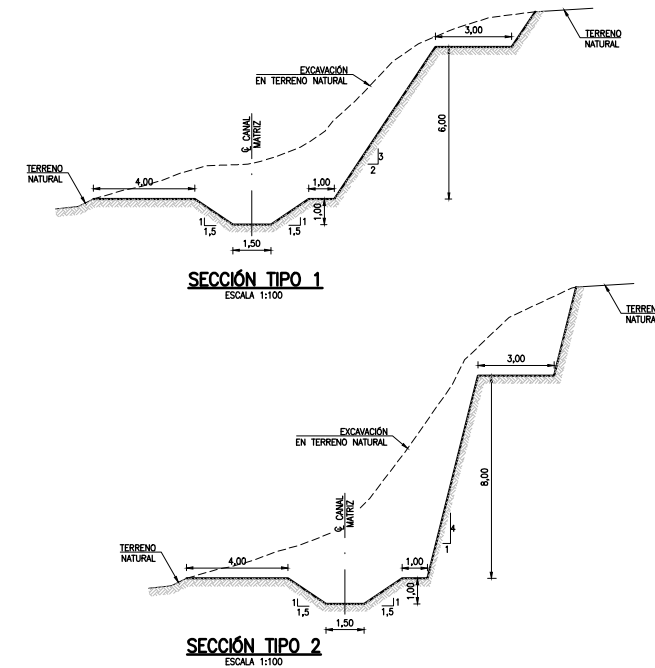
CROQUIS DE UBICACIÓN  
S/E



PERFIL LONGITUDINAL CANAL TRASFASE 1 A SECTOR 1 – TRAMO 1  
KM. 0+000 A KM. 9+000  
ESCALA : H 1:250  
V 1:250



PLANTA CANAL TRASFASE 1 A SECTOR 1 – TRAMO 2  
KM. 9+000 A KM. 16+839  
ESCALA 1:10.000



CUADRO SECCIONES TIPO

| INICIO (km) | FIN (km) | SECCIÓN |
|-------------|----------|---------|
| 0,000       | 320      | TIPO 1  |
| 320         | 1.470    | TIPO 2  |
| 1.470       | 10.760   | TIPO 1  |
| 10.760      | 16.730   | TIPO 2  |

CUADRO DE COORDENADAS

| VÉRTECE | ESTE   | NORTE   |
|---------|--------|---------|
| V-01    | 254557 | 5937658 |
| V-02    | 254043 | 5938849 |
| V-03    | 253733 | 5939712 |
| V-04    | 253443 | 5940385 |
| V-05    | 253169 | 5942084 |
| V-06    | 253454 | 5943010 |
| V-07    | 253810 | 5942479 |
| V-08    | 253881 | 5943075 |
| V-09    | 254364 | 5943029 |
| V-10    | 253894 | 5943548 |
| V-11    | 254066 | 5944606 |
| V-12    | 256120 | 5942573 |
| V-13    | 257117 | 5942336 |
| V-14    | 257883 | 5942701 |
| V-15    | 259414 | 5942691 |

SIMBOLOGÍA

|     |                           |     |                                                    |
|-----|---------------------------|-----|----------------------------------------------------|
| --- | EJE CANAL MATRIZ          | --- | CAMINO EXISTENTE                                   |
| --- | EXCAVACIÓN CANAL          | --- | VÉRTECE                                            |
| --- | CURVA PRINCIPAL           | --- | SENTIDO DE ESCURRIMIENTO                           |
| --- | CURVA SECUNDARIA          | --- | MAMPOSTERÍA                                        |
| --- | RÍOS                      | --- | CAICATA AREA DE RIESGO PROPUESTA NIBLINTO          |
| --- | RED DE CAÑALES EXISTENTES | --- | INTERSECCIÓN DE CAÑALES EXISTENTES CON PROYECTADOS |
| --- | EJE                       | --- | OBRA                                               |
| --- | CERCO                     | --- |                                                    |

DESCRIPCIÓN DE OBRAS

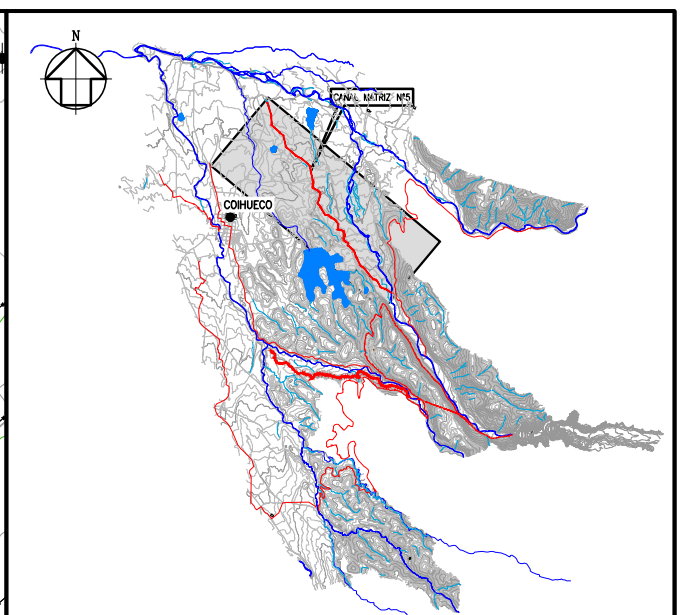
|    |                      |
|----|----------------------|
| CQ | = Cruce de Quebradas |
| BT | = Bocatomas          |
| CC | = Cruce de Caminos   |

- NOTAS
- DIMENSIONES EXPRESADAS EN METROS.
  - ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (mnm).
  - COORDENADAS EN SISTEMA DE PROYECCIÓN UTM, REFERIDAS AL DATUM WGS84, HUSO 18.
  - LEVANTAMIENTO AEROFOTODIGITAL DEL SECTOR CURACUANT, AGOSTO 2012.
- ESCALA 1:5.000, PROPORCIONADA POR GEODEN

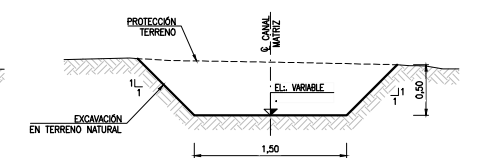
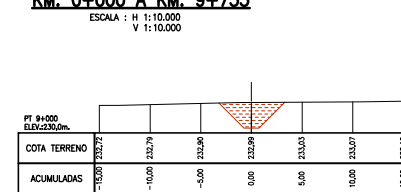
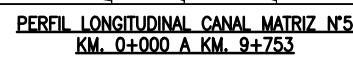
| LOGO              | NOMBRE               | FECHA    | FIRMA |  |  |  |  |
|-------------------|----------------------|----------|-------|--|--|--|--|
| ARCADIS CHILE     | ARCADIS CHILE        | 31.01.13 |       |  |  |  |  |
| Jefe Especialidad | J.E.                 | 31.01.13 |       |  |  |  |  |
| Jefe Proyecto     | J.P.                 | 31.01.13 |       |  |  |  |  |
| NOMBRE            | 3853-2000-IH-PLA-008 |          |       |  |  |  |  |

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN | DESCRIPCIÓN                                                          | FECHA       | APROBACIÓN |
|--------------------------|--------------|-------|------------|----------------------------------------------------------------------|-------------|------------|
|                          |              |       |            | MEJORAMIENTO RIEGO RÍO CATO<br>EMBALSE NIBLINTO - REGIÓN DEL BIO-BIO |             |            |
|                          |              |       |            | ESCALA                                                               | INDICADAS   |            |
|                          |              |       |            | PROYECCIÓN CARTOGRAFIA                                               | WGS84       |            |
|                          |              |       |            | FUENTE CARTOGRAFIA                                                   | GEODEN      |            |
|                          |              |       |            | FECHA                                                                | AGOSTO 2012 |            |
|                          |              |       |            | LÁMINA                                                               | 1 DE 1      |            |

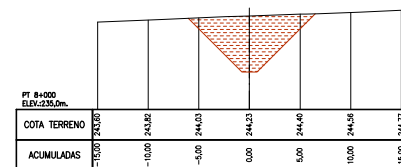
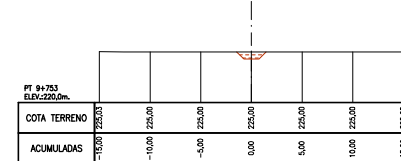




ESCALA 1:25



**SECCION TIPO CANAL MATRIZ N°5 – TRAMO 3**  
**KM. 5+236.61 A KM. 9+753.41**



CALA : H 1:250  
 V 1:250

|                                                                                       |                           |                                                                                       |                                                       |
|---------------------------------------------------------------------------------------|---------------------------|---------------------------------------------------------------------------------------|-------------------------------------------------------|
|  | EJE CANAL MATRIZ          |  | VERTICE                                               |
|  | EXCAVACIÓN CANAL          |  | SENTIDO DE ESCURRIMIENTO                              |
|  | CURVA PRINCIPAL           |  | MAMPUESTERIA                                          |
|  | CURVA SECUNDARIA          |  | EXCAVACIÓN                                            |
|  | RÍOS                      |  | CALICATA AREA DE RIEGO<br>PROPUESTA INGLUTO           |
|  | RED DE CANALES EXISTENTES |  | CCN                                                   |
|  | EJE DE CANALES EXISTENTES |  | INTERSECCIÓN DE CANALES<br>EXISTENTES CON PROYECTADOS |
|  | CAMINO EXISTENTE          |                                                                                       | OBRA                                                  |
|  | CERDO                     |                                                                                       |                                                       |

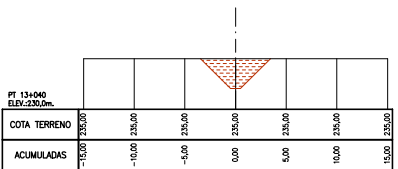
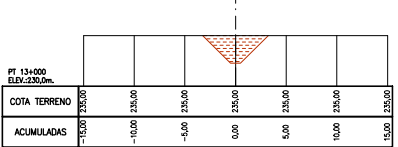
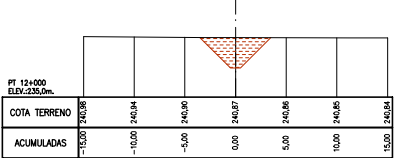
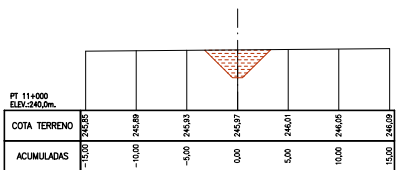
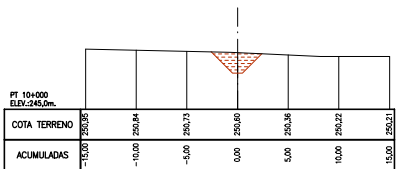
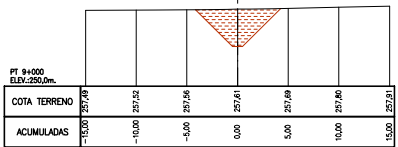
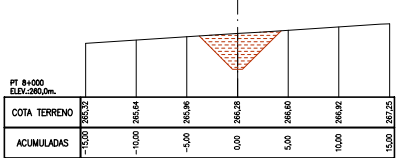
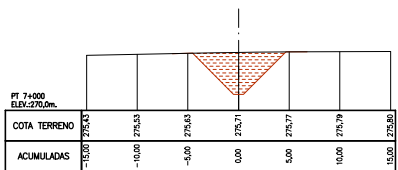
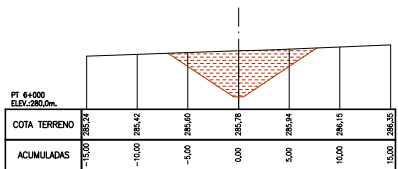
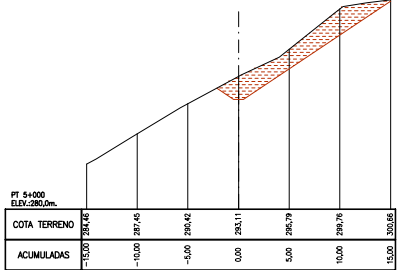
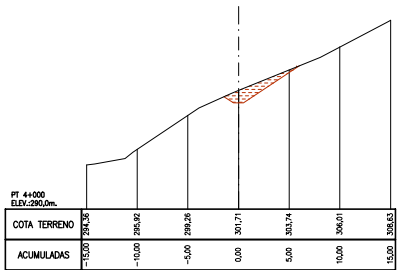
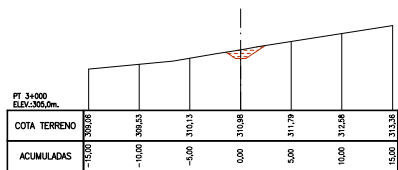
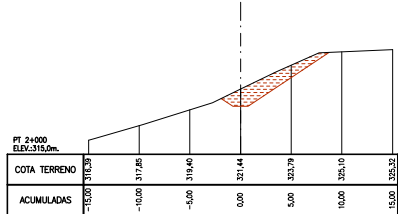
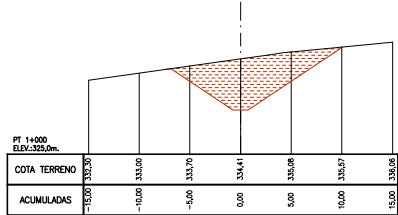
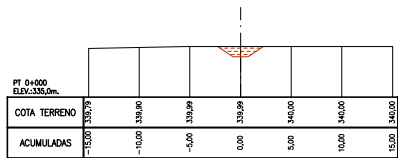
**NOTAS**

1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.)
3. COORDENADAS EN SISTEMA DE PROYECCION UTM. REFERIDAS AL DATUM WGS-84
4. LEVANTAMIENTO AEROFOTOGRAMETRICO DIGITAL SECTOR NUBLINTO, JUNIO 2012.

ESCALA 1:5.000, PROPORCIONADA GEODEN.

SE ELIMINA EL TIMBRE DE REDUCCION AL 50%.

|                          |              |       |            |                                                                                       |                                                                              |                         |                                                                         |             |        |
|--------------------------|--------------|-------|------------|---------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------|-------------------------------------------------------------------------|-------------|--------|
| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN |  | DESCRIPCIÓN                                                                  |                         | TÍTULO                                                                  |             |        |
|                          |              |       |            |                                                                                       | <b>MEJORAMIENTO RIEGO RÍO CATO<br/>EMBALSE NIBLINTO - REGIÓN DEL BÍO-BÍO</b> |                         | <b>CANAL MATRIZ N°5<br/>PLANTA, PERFIL LONGITUDINAL Y TRANSVERSALES</b> |             |        |
|                          |              |       |            |  | ESCALA                                                                       | PROYECCIÓN CARTOGRAFICA | FUENTE CARTOGRAFICA                                                     | FECHA       | LÁMINA |
|                          |              |       |            |                                                                                       | INDICADAS                                                                    | WGS84                   | GEDCEN                                                                  | AGOSTO 2012 | 1 DE 1 |



PERFILES TRANSVERSALES CANAL MATRIZ N°4  
KM. 0+000 A KM. 13+040  
ESCALA : H 1:250  
V 1:250

SIMBOLOGÍA

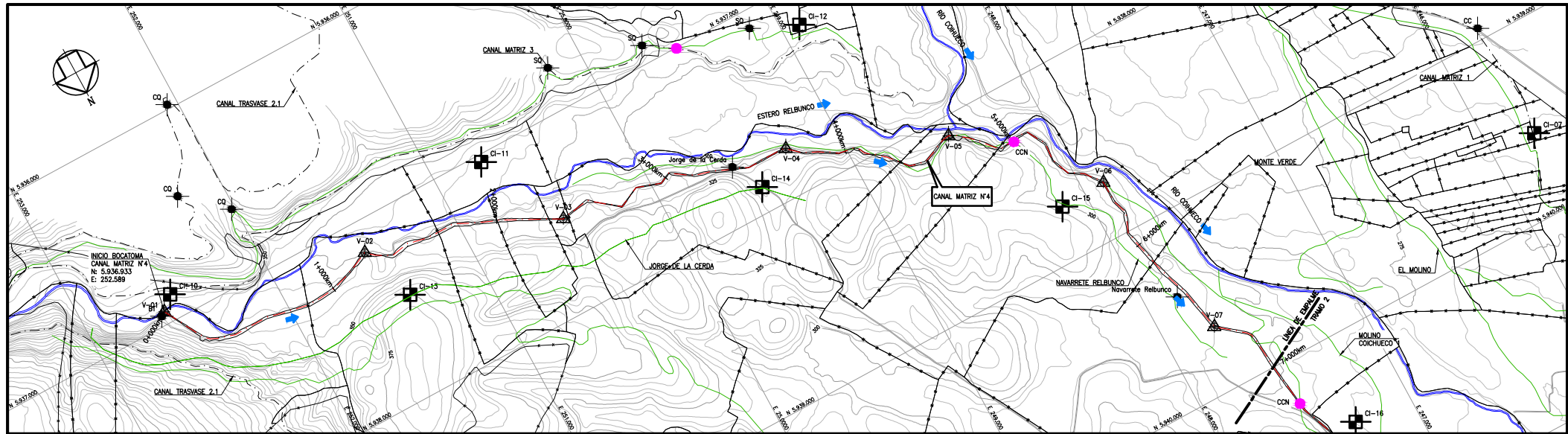
|     |                        |
|-----|------------------------|
| --- | EJE PERFIL TRANSVERSAL |
| --- | EXCAVACIÓN             |

- NOTAS
- DIMENSIONES EXPRESADAS EN METROS.
  - ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.)

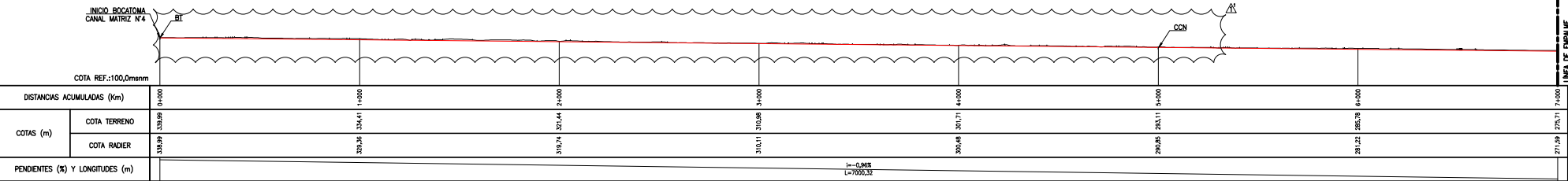
| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN | DESCRIPCIÓN                                                          | TÍTULO                                     |
|--------------------------|--------------|-------|------------|----------------------------------------------------------------------|--------------------------------------------|
|                          |              |       |            | MEJORAMIENTO RIEGO RÍO CATO<br>EMBALSE NIBLINTO - REGIÓN DEL BÍO-BÍO | CANAL MATRIZ N°4<br>PERFILES TRANSVERSALES |
|                          |              |       |            | ESCALA<br>INDICADAS                                                  | PROYECCIÓN CARTOGRAFÍA<br>WGS84            |
|                          |              |       |            | FECHA<br>AGOSTO 2012                                                 | LÁMINA<br>2 DE 2                           |

| NOMBRE            | FECHA                | FIRMA |  |  |  |  |  |
|-------------------|----------------------|-------|--|--|--|--|--|
| ALC.              | 31.01.13             |       |  |  |  |  |  |
| P.Z.C.            | 31.01.13             |       |  |  |  |  |  |
| JEFE ESPECIALIDAD | 31.01.13             |       |  |  |  |  |  |
| JEFE PROYECTO     | 31.01.13             |       |  |  |  |  |  |
| NOMBRE            | 3853-2000-IH-PLA-006 |       |  |  |  |  |  |

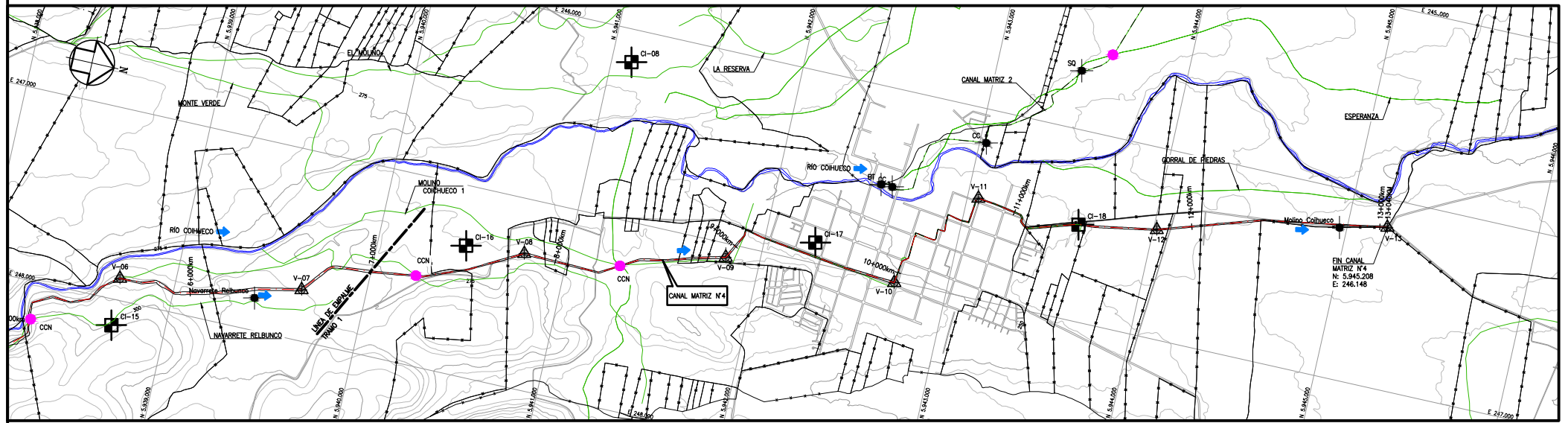




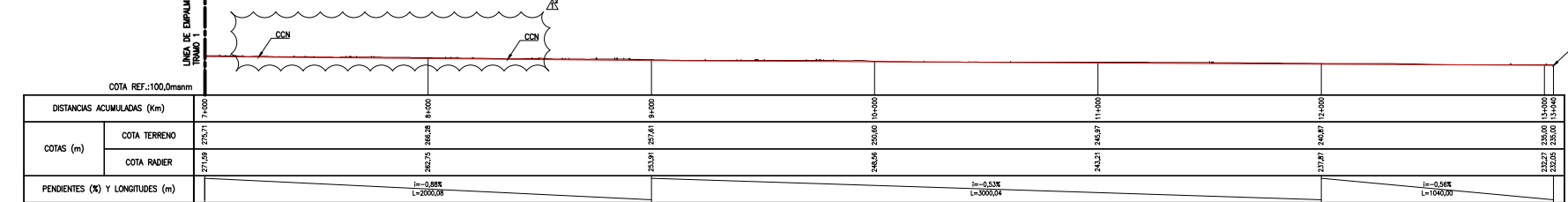
PLANTA CANAL MATRIZ N°4 - TRAMO 1  
KM. 0+000 A KM. 7+000  
ESCALA 1:10.000



PERFIL LONGITUDINAL CANAL MATRIZ N°4 - TRAMO 1  
KM. 0+000 A KM. 7+000  
ESCALA : H 1:10.000  
V 1:10.000



PLANTA CANAL MATRIZ N°4 - TRAMO 2  
KM. 7+000 A KM. 13+040  
ESCALA 1:10.000



PERFIL LONGITUDINAL CANAL MATRIZ N°4 - TRAMO 2  
KM. 7+000 A KM. 13+040  
ESCALA : H 1:10.000  
V 1:10.000

DESCRIPCIÓN DE OBRAS

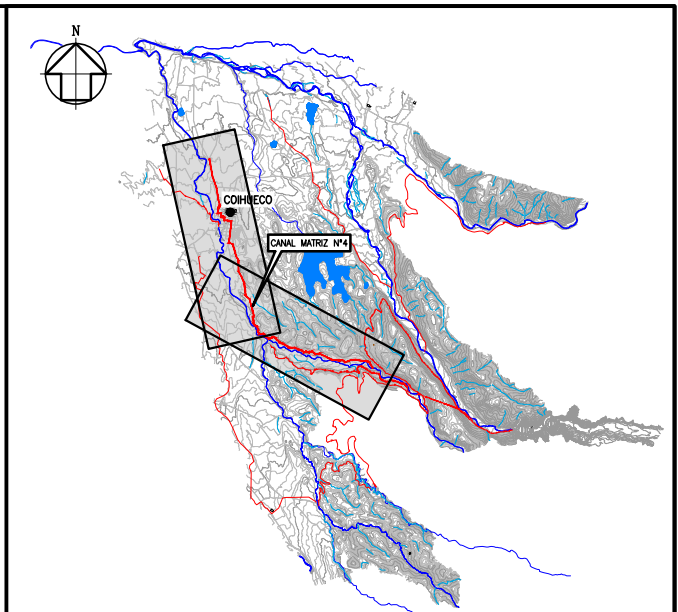
BT = Bocanoma  
CCN = Cruce de Canal

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN |
|--------------------------|--------------|-------|------------|
|                          |              |       |            |
|                          |              |       |            |
|                          |              |       |            |
|                          |              |       |            |

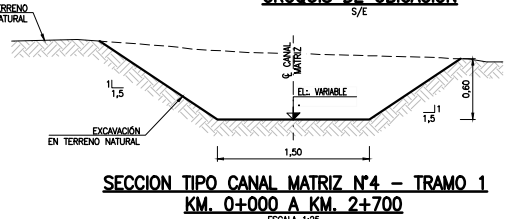


| DESCRIPCIÓN                                                         | FECHA                  | APROBACIÓN        |
|---------------------------------------------------------------------|------------------------|-------------------|
| MEJORAMIENTO RIEGO RÍO CATO<br>EMBALSE NIBLITO - REGIÓN DEL BIO-BIO |                        |                   |
| ESCALA                                                              | PROYECCIÓN CARTOGRAFIA | FECHA CARTOGRAFIA |
| INDICADAS                                                           | WGS84                  | GECCEN            |

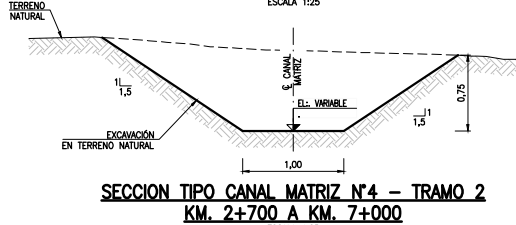
| FECHA       | LÁMINA |
|-------------|--------|
| AGOSTO 2012 | 1 DE 2 |



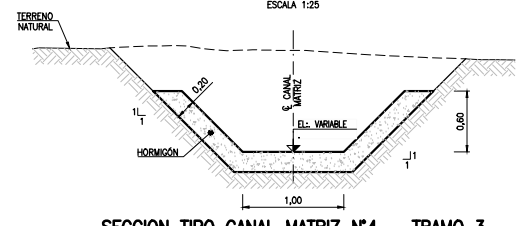
CROQUIS DE UBICACIÓN  
S/E



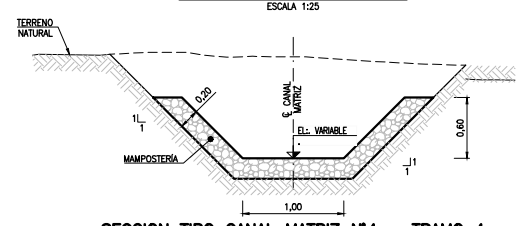
SECCION TIPO CANAL MATRIZ N°4 - TRAMO 1  
KM. 0+000 A KM. 2+700  
ESCALA 1:25



SECCION TIPO CANAL MATRIZ N°4 - TRAMO 2  
KM. 2+700 A KM. 7+000  
ESCALA 1:25



SECCION TIPO CANAL MATRIZ N°4 - TRAMO 3  
KM. 7+000 A KM. 12+000  
ESCALA 1:25



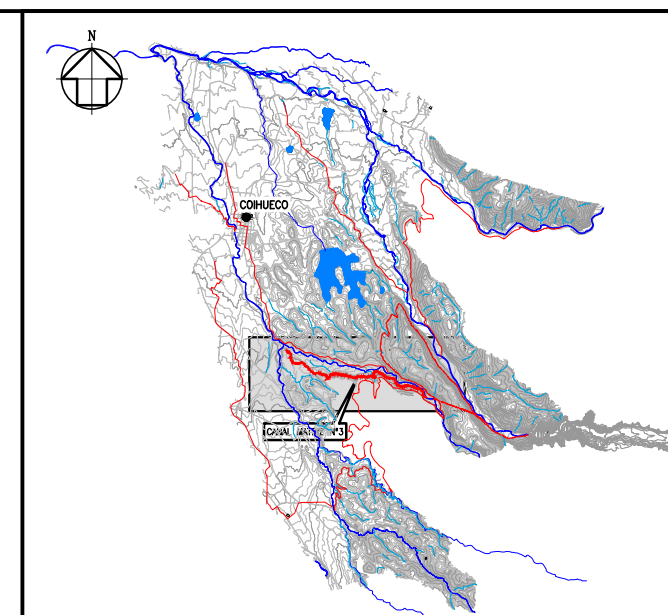
SECCION TIPO CANAL MATRIZ N°4 - TRAMO 4  
KM. 12+000 A KM. 13+040  
ESCALA 1:25

SIMBOLOGÍA

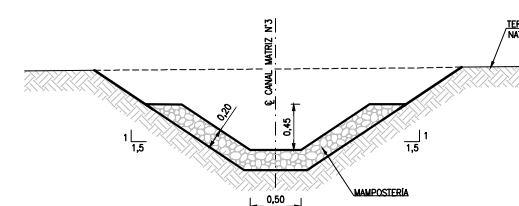
|     |                               |     |                                                    |
|-----|-------------------------------|-----|----------------------------------------------------|
| --- | EJE CANAL MATRIZ              | --- | CAMINO EXISTENTE                                   |
| --- | EXCAVACIÓN EN TERRENO NATURAL | --- | VERTICE                                            |
| --- | 525                           | --- | SENTIDO DE ESCURRIMIENTO                           |
| --- | CURVA PRINCIPAL               | --- | MAPOSTERIA                                         |
| --- | CURVA SECUNDARIA              | --- | CALICATA AREA DE RIEGO PROPIETARIA NIBLITO         |
| --- | RIOS                          | --- | INTERSECCIÓN DE CANALES EXISTENTES CON PROYECTADOS |
| --- | RED DE CANALES EXISTENTES     | --- | OBRA                                               |
| --- | EJE                           | --- |                                                    |
| --- | CERCO                         | --- |                                                    |

- NOTAS
- DIMENSIONES EXPRESADAS EN METROS.
  - ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (mm).
  - COORDENADAS EN SISTEMA DE PROYECCIÓN UTM, REFERIDAS AL DATUM WGS84, HUSO 18.
  - LEVANTAMIENTO AEROFOTOGRAFICO DIGITAL, SECTOR CURACAUTIN, AGOSTO 2012.
  - ESCALA 1:5.000, PROPORCIONADA POR GECCEN.
  - SE CERRA EL TUBO DE REDUCCIÓN AL 20%

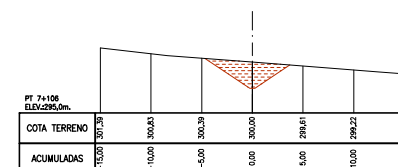
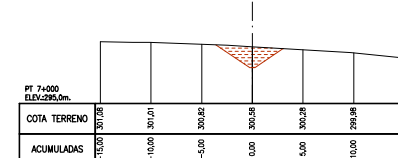
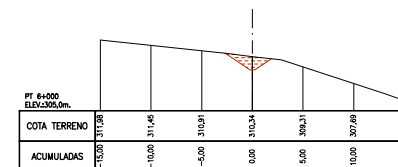
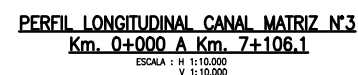




CROQUIS DE UBICACIÓN  
S/E



**SECCIÓN TIPO CANAL MATRIZ N°3**  
**Km 0+000 A Km 7+106.1**  
ESCALA 1:25



**PERFILES TRANSVERSALES CANAL MATRIZ N°3**  
**Km. 0+000 A Km. 7+106.1**  
ESCALA : H 1:250  
V 1:250

CUADRO DE CALICATAS

| NOMBRE | COORDENADAS |          |
|--------|-------------|----------|
|        | ESTE        | NORTE    |
| CI-10  | 252.519     | 5.936.86 |
| CI-11  | 250.734     | 5.937.03 |
| CI-12  | 248.904     | 5.937.20 |
| CI-13  | 251.401     | 5.937.47 |
| CI-14  | 249.487     | 5.937.86 |

## SIMBOLOGÍA

### DESCRIPCIÓN DE OBRAS

**NOTAS**

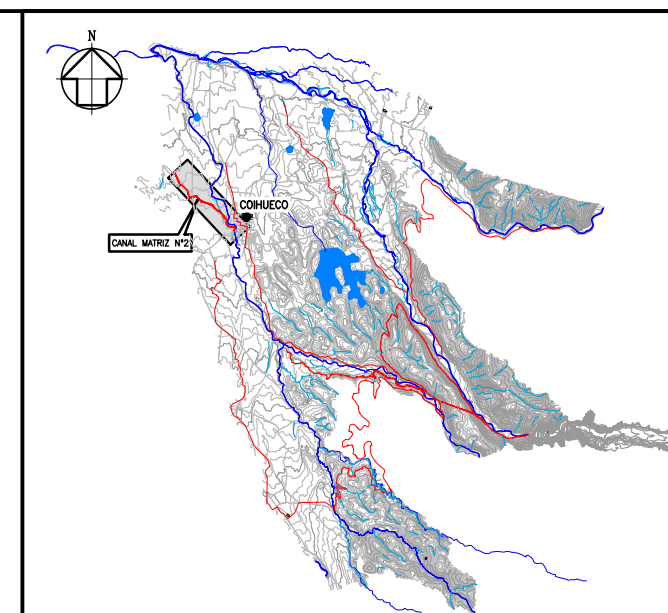
1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (mnm).
3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM, REFERIDAS AL DATUM WGS84, HUSO 18.
4. LEVANTAMIENTO AEROFOTOGRAFOMETRICO DIGITAL SECTOR CURACAUTIN, AGOSTO 2012.

ESCALA 1:5,000, PROPORCIONADA POR GEODEN.

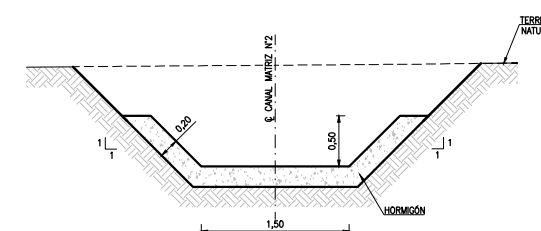
SE CLIMINA EL TIEMPO DE REDUCCION AL SOL.

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN |  | DESCRIPCIÓN                                                         | TÍTULO                                                          |                    |             |        |
|--------------------------|--------------|-------|------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------|--------------------|-------------|--------|
|                          |              |       |            |                                                                                       | ESCALA                                                              | PROYECCIÓN CARTOGRAFÍA                                          | FUENTE CARTOGRAFÍA | FECHA       | LÁMINA |
|                          |              |       |            |  | MEJORAMIENTO RIEGO RÍO CATO<br>EMBALSE NIBLITO – REGIÓN DEL BIO-BIO | CANAL MATRIZ N°3<br>PLANTA, PERFIL LONGITUDINAL Y TRANSVERSALES |                    |             |        |
|                          |              |       |            |                                                                                       | INDICADAS                                                           | WGS84                                                           | GECCEN             | AGOSTO 2012 | 1 DE   |

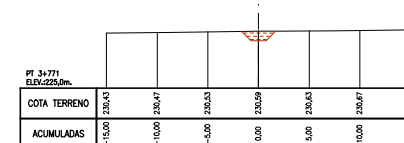
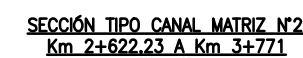
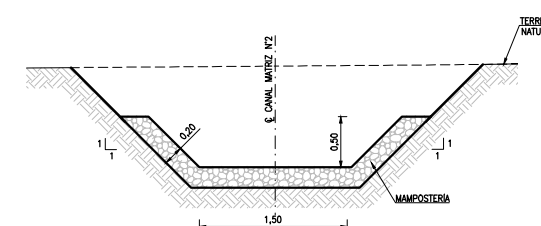




CROQUIS DE UBICACIÓN



**SECCIÓN TIPO CANAL MATRIZ N°2**  
**Km 0+000 A Km 2+622.23**



CUADRO DE CALICATAS

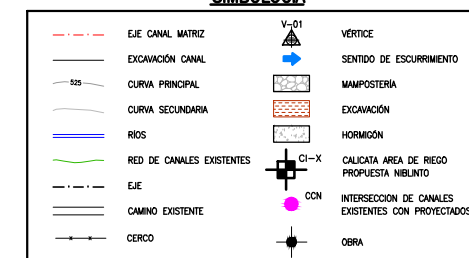
CUADRO DE COORDENADAS

| VERTICE | ESTE   | NORTE   |
|---------|--------|---------|
| V-01    | 246514 | 5942535 |
| V-02    | 246490 | 594270  |
| V-03    | 246209 | 594281  |
| V-04    | 246086 | 5943033 |
| V-05    | 245858 | 594331  |
| V-06    | 245197 | 594372  |
| V-07    | 244724 | 594387  |
| V-08    | 244358 | 594435  |
| V-09    | 244167 | 594480  |

### DESCRIPCIÓN DE OBRAS

|     |   |                  |
|-----|---|------------------|
| CC  | = | Cruce de Caminos |
| BT  | = | Bocatoma         |
| SQ  | = | Saque            |
| CCN | = | Cruce de Canal   |

## SIMBOLOGÍA

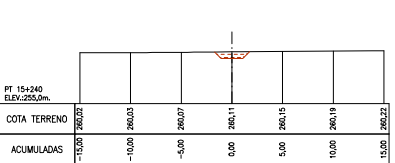
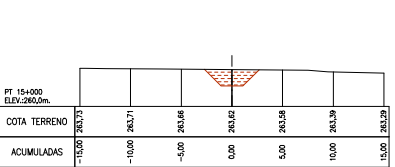
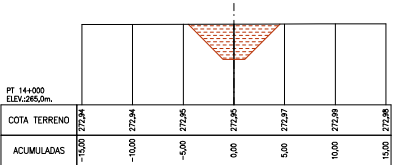
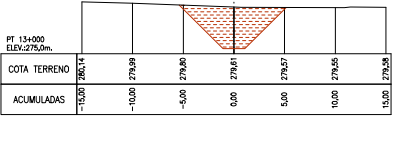
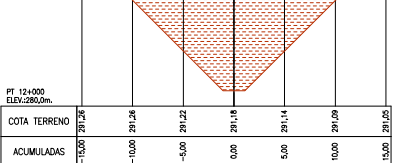
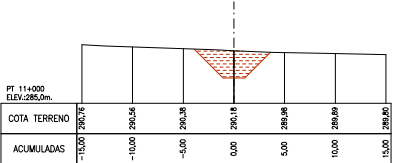
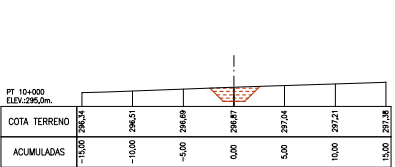
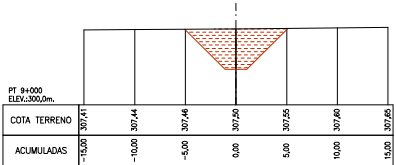
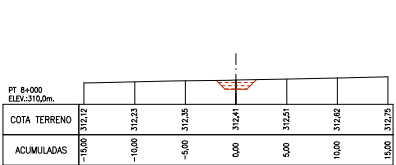
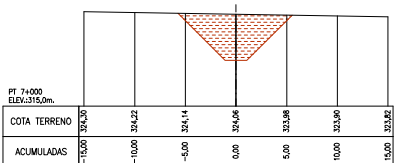
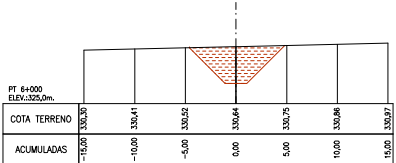
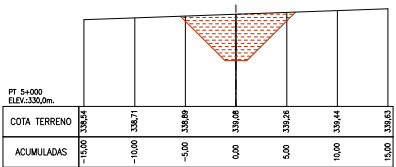
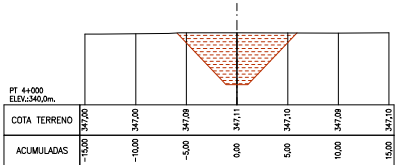
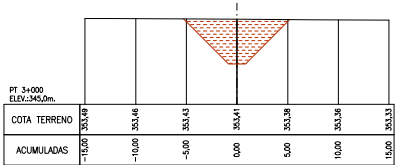
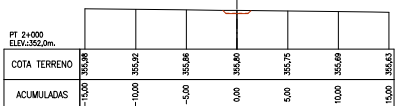
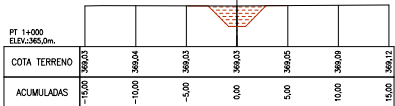
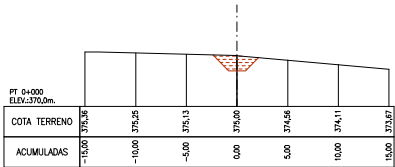


**NOTAS**

1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (mnm).
3. COORDENADAS EN SISTEMA DE PROYECCION UTM, REFERIDAS AL DATUM WGS84, HUSO 18
4. LEVANTAMIENTO AEROFOTOGRAMETRICO DIGITAL SECTOR CURACAUTIN, AGOSTO 2012.

ESCALA 1:5.000, PROPORCIONADA POR GEOCEN.

SE ELIMINA EL TUBO DE REDUCCION AL 50%.



PERFILES TRANSVERSALES CANAL MATRIZ N°1  
KM. 0+000 A KM. 15+240  
ESCALA : H 1:250  
V 1:250

**SIMBOLOGÍA**

--- EJE PERFIL TRANSVERSAL

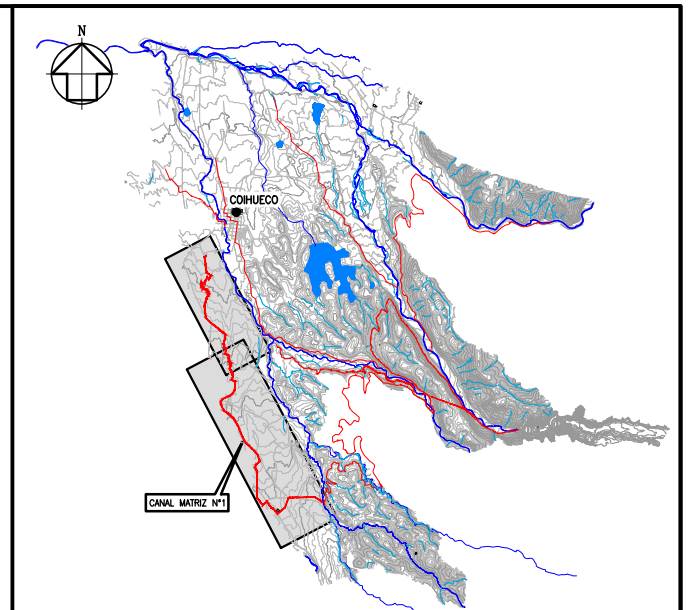
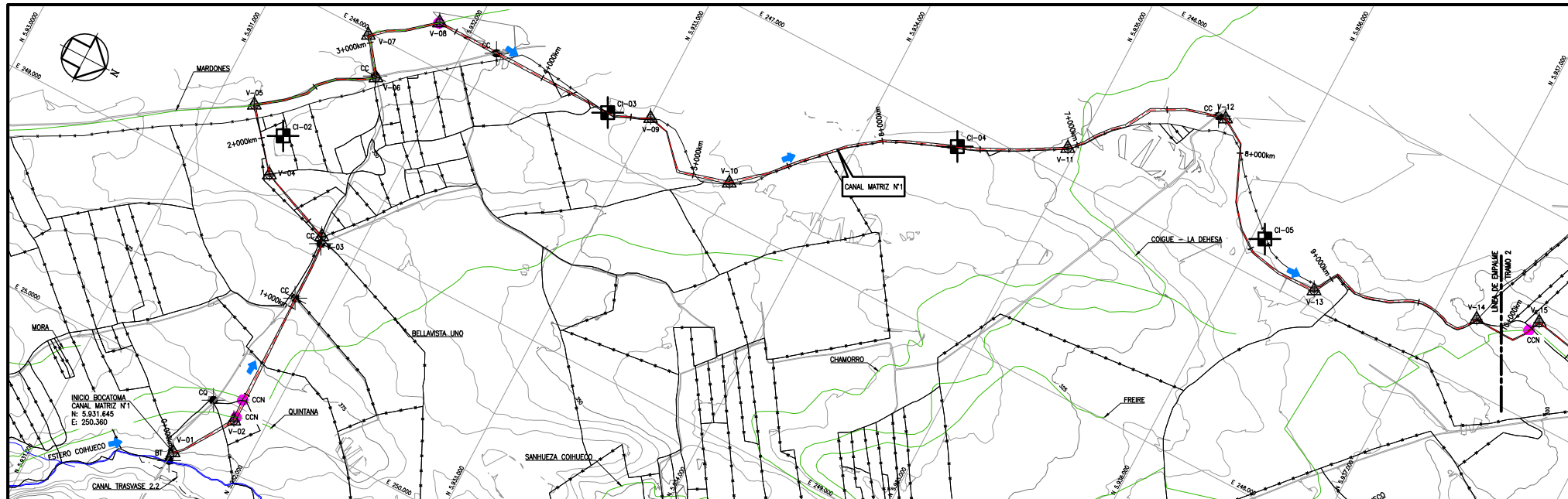
EXCAVACIÓN

NOTAS  
1. DIMENSIONES EXPRESADAS EN METROS.  
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.)

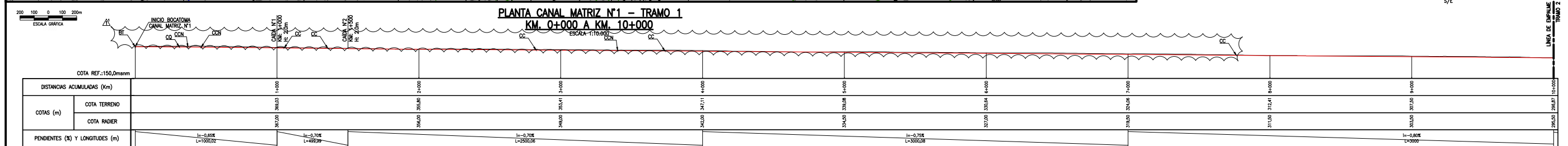
|        |                   |                      |       |   |                      |                               |                |   |
|--------|-------------------|----------------------|-------|---|----------------------|-------------------------------|----------------|---|
|        | NOMBRE            | FECHA                | FIRMA | - | -                    | -                             | -              | - |
|        | DISEÑO            | 01.11.2012           |       | - | -                    | -                             | -              | - |
|        | REVISÓ            | 06.11.2012           |       | - | -                    | -                             | -              | - |
|        | JEFE ESPECIALIDAD | 06.11.2012           |       | 0 | 07.11.12             | APROBADO CLIENTE              | R.P.Z.A.G.     |   |
|        | JEFE PROYECTO     | 06.11.2012           |       | B | 02.10.12             | REVISIÓN Y APROBACIÓN CLIENTE | R.P.Z.A.G.     |   |
| NOMBRE |                   | 3853-2000-IH-PLA-002 | FECHA |   | COORDINACIÓN INTERNA |                               | R.P.Z.A.G.     |   |
|        |                   |                      |       |   | DESCRIPCIÓN          |                               | DIS. REV. L.P. |   |

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN | DESCRIPCIÓN                           | TÍTULO                                     |
|--------------------------|--------------|-------|------------|---------------------------------------|--------------------------------------------|
| -                        | -            | -     | -          | MEJORAMIENTO RIEGO RÍO CATO           | CANAL MATRIZ N°1<br>PERFILES TRANSVERSALES |
| -                        | -            | -     | -          | EMBALSE NIBLINTO - REGIÓN DEL BÍO-BÍO |                                            |
| -                        | -            | -     | -          | ESCALA                                | FUENTE CARTOGRAFÍA                         |
| -                        | -            | -     | -          | INDICADAS                             |                                            |
| -                        | -            | -     | -          | PROYECCIÓN CARTOGRAFÍA                | FECHA                                      |
| -                        | -            | -     | -          | WGS84                                 |                                            |
| -                        | -            | -     | -          |                                       | LÁMINA                                     |
| -                        | -            | -     | -          |                                       |                                            |

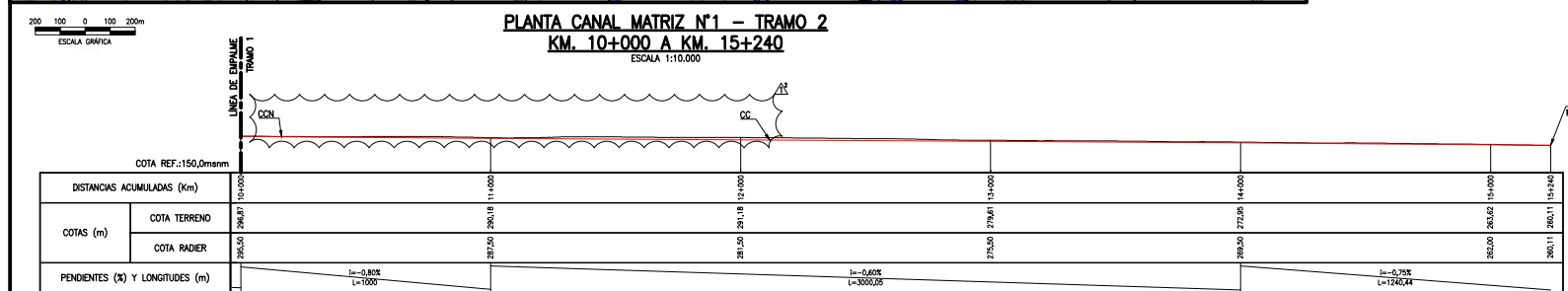
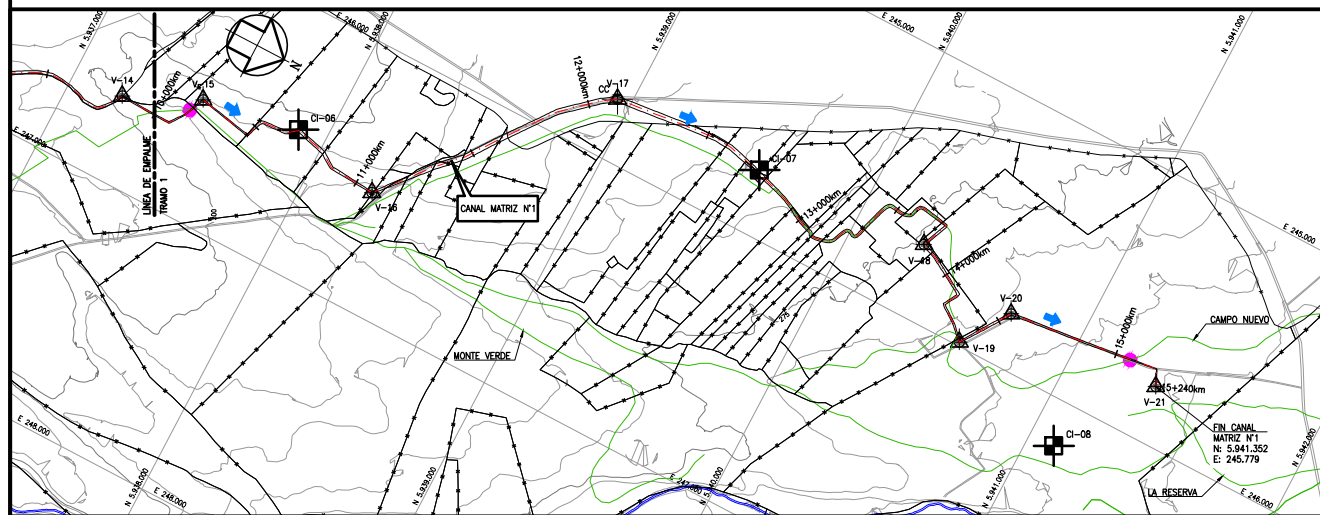




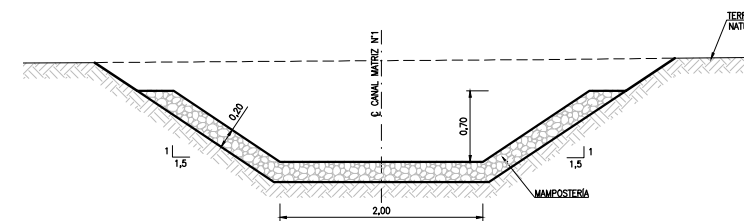
CROQUIS DE UBICACIÓN  
S/E



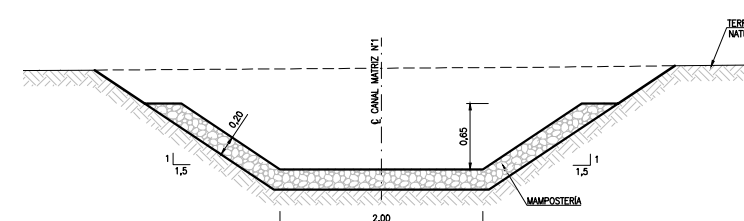
PERFIL LONGITUDINAL CANAL MATRIZ N°1 – TRAMO 1  
KM. 0+000 A KM. 10+000  
ESCALA : H 1:10.000  
V 1:10.000



PERFIL LONGITUDINAL CANAL MATRIZ N°1 – TRAMO 2  
KM. 10+000 A KM. 15+240  
ESCALA : H 1:10.000  
V 1:10.000



SECCIÓN TIPO CANAL MATRIZ N°1  
Km 0+000 A Km 1+000 Y KM. 11+000 A KM. 14+000  
ESCALA 1:25



SECCIÓN TIPO CANAL MATRIZ N°1  
Km 1+000 A Km 11+000 Y KM. 14+000 A KM. 15+240  
ESCALA 1:25

CUADRO DE COORDENADAS

| VERTICE | ESTE    | NORTE     |
|---------|---------|-----------|
| V-01    | 250.360 | 5.931.645 |
| V-02    | 250.072 | 5.931.844 |
| V-03    | 249.032 | 5.931.803 |
| V-04    | 248.878 | 5.931.420 |
| V-05    | 248.598 | 5.931.186 |
| V-06    | 248.187 | 5.931.670 |
| V-07    | 248.013 | 5.931.535 |
| V-08    | 247.787 | 5.931.827 |
| V-09    | 247.718 | 5.933.008 |
| V-10    | 247.823 | 5.933.514 |
| V-11    | 246.863 | 5.934.958 |
| V-12    | 246.355 | 5.935.601 |
| V-13    | 246.921 | 5.936.408 |
| V-14    | 246.664 | 5.937.209 |
| V-15    | 246.529 | 5.937.499 |
| V-16    | 246.542 | 5.938.259 |
| V-17    | 245.764 | 5.938.945 |
| V-18    | 245.709 | 5.940.282 |
| V-19    | 245.985 | 5.940.585 |
| V-20    | 245.791 | 5.940.714 |
| V-21    | 245.779 | 5.941.352 |

CUADRO DE CALICATAS

| NOMBRE | ESTE    | NORTE     |
|--------|---------|-----------|
| CI-01  | 249.970 | 5.930.045 |
| CI-02  | 248.669 | 5.931.389 |
| CI-03  | 247.794 | 5.932.798 |
| CI-04  | 247.117 | 5.934.456 |
| CI-05  | 246.804 | 5.936.063 |
| CI-06  | 246.458 | 5.937.886 |
| CI-07  | 245.752 | 5.939.570 |
| CI-08  | 246.173 | 5.941.105 |

SIMBOLOGIA

|       |                           |     |                                                    |
|-------|---------------------------|-----|----------------------------------------------------|
| ---   | EJE CANAL MATRIZ          | --- | CAMINO EXISTENTE                                   |
| - - - | EXCAVACIÓN CANAL          | ▲   | VERTICE                                            |
| - - - | CURVA PRINCIPAL           | →   | SENTIDO DE ESCURRIMIENTO                           |
| - - - | CURVA SECUNDARIA          | ■   | MANPOSTERIA                                        |
| ---   | RÍOS                      | +   | CALICATA AREA DE RIEGO PROPUESTA NIBLINTO          |
| ---   | RED DE CAÑALES EXISTENTES | +   | INTERSECCIÓN DE CAÑALES EXISTENTES CON PROYECTADOS |
| ---   | EJE                       | XX  | OBRA                                               |
| ---   | CERCO                     |     |                                                    |

DESCRIPCIÓN DE OBRAS

|     |                      |
|-----|----------------------|
| CC  | = Cruce de Quebradas |
| CC  | = Cruce de Caminos   |
| BT  | = Bocaneta           |
| CCN | = Cruce de Canal     |

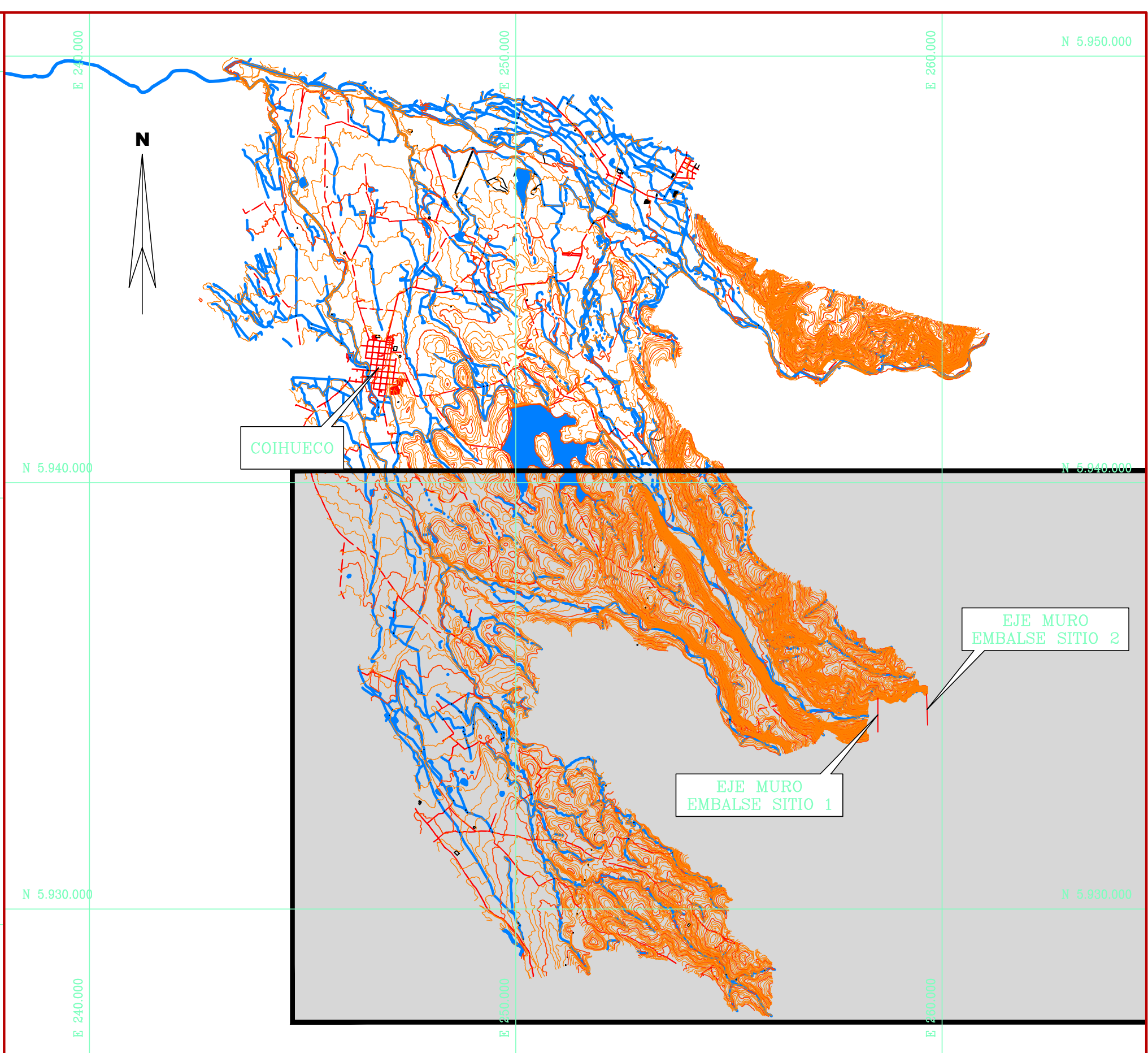
- NOTAS
- DIMENSIONES EXPRESADAS EN METROS.
  - ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).
  - COORDENADAS EN SISTEMA DE PROYECCIÓN UTM, REFERIDAS AL DATUM WGS-84.
  - LEVANTAMIENTO AEROFOTOGRAMETRICO DIGITAL SECTOR NIBLINTO, JUNIO 2012.
  - ESCALA 1:5.000, PROPORCIONADA GEODIN.
  - SE ELIMINA EL TITULO DE REDUCCION AL 50%.

|                   |                      |          |       |  |  |  |  |
|-------------------|----------------------|----------|-------|--|--|--|--|
| LOGO              | NOMBRE               | FECHA    | FIRMA |  |  |  |  |
| ARCADIS CHILE     | ALD.                 | 31.01.13 |       |  |  |  |  |
| JEFE ESPECIALIDAD | J.M.                 | 31.01.13 |       |  |  |  |  |
| JEFE PROYECTO     | A.M.                 | 31.01.13 |       |  |  |  |  |
| NOMBRE            | 3853-2000-IH-PLA-001 |          |       |  |  |  |  |

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN | DESCRIPCIÓN                                                         | ESCALA    | PROYECCIÓN CARTOGRAFICA | FECHA CARTOGRAFICA | FECHA       | LÁMINA |
|--------------------------|--------------|-------|------------|---------------------------------------------------------------------|-----------|-------------------------|--------------------|-------------|--------|
|                          |              |       |            | MEJORAMIENTO RIEGO RÍO CATO<br>EMBASE NIBLINTO - REGIÓN DEL BIO-BIO | INDICADAS | WGS84                   | GEODIN             | AGOSTO 2012 | 1 DE 2 |



ESCALA 1:20.000



ESCALA 1:100.000



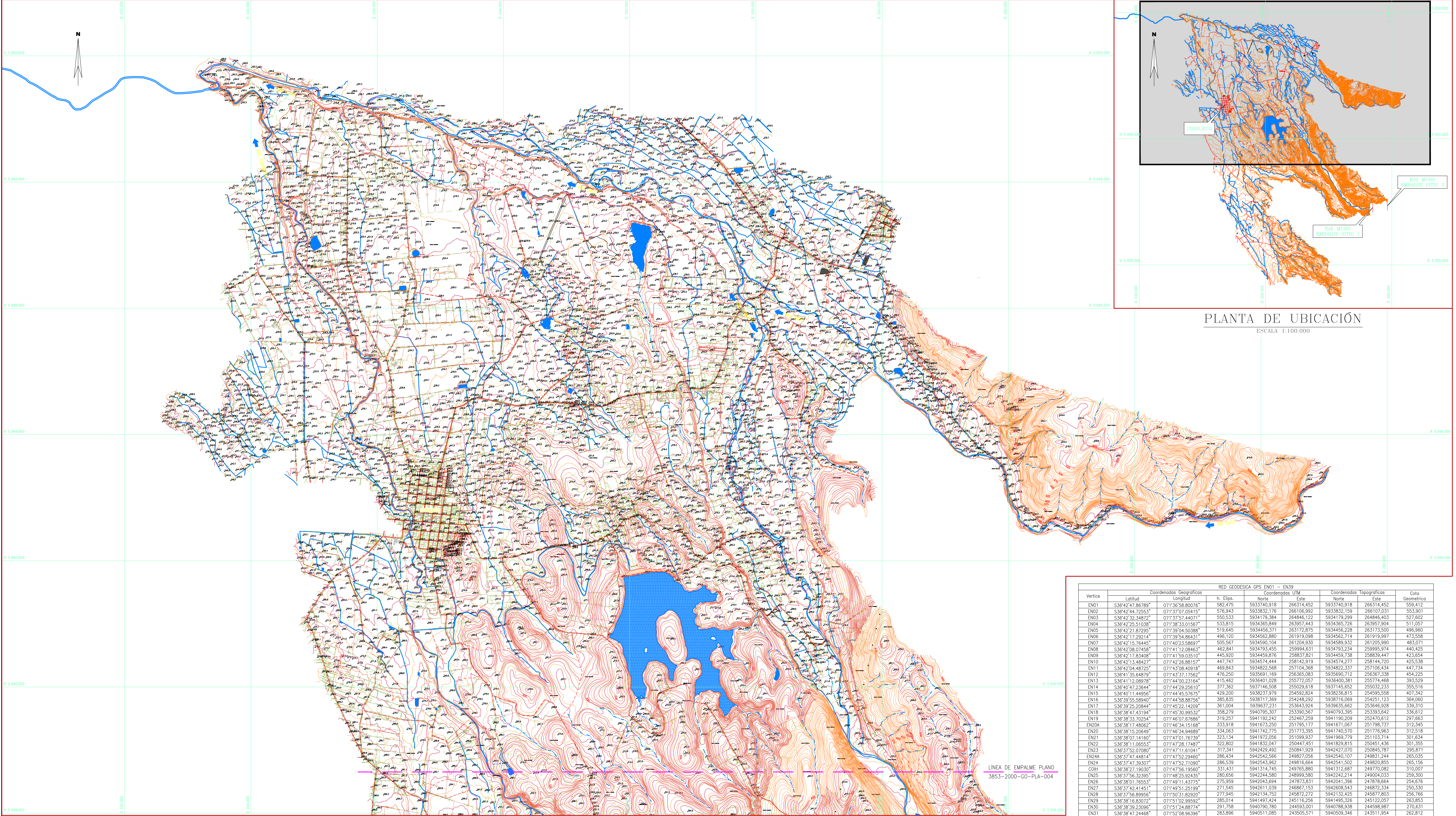
|    |     |    |
|----|-----|----|
| MB | REV | JD |
|----|-----|----|

|                                                                                       |                          |
|---------------------------------------------------------------------------------------|--------------------------|
|  | DRENAJE PRINCIPAL        |
|  | DRENAJE SECUNDARIO       |
|  | HUELLA                   |
|  | CERCO                    |
|  | RED VIAL DE TIERRA       |
|  | RED VIAL DE PAVIMENTADA  |
|  | CONSTRUCCIONES           |
|  | SENTIDO DE ESCURRIMIENTO |
|  | VEGETACIÓN               |

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN | N° DE CONTRATO               | INSPECTOR FISCAL | GOBIERNO DE CHILE<br>MINISTERIO DE OBRAS PÚBLICAS<br>COMISIÓN NACIONAL DE RIEGO                 | CLASIFICACIÓN    | PLANO N°                     | 3021-20000-IG-PLA-001        |  |
|--------------------------|--------------|-------|------------|------------------------------|------------------|-------------------------------------------------------------------------------------------------|------------------|------------------------------|------------------------------|--|
|                          |              |       |            | RITE. DEPTO. DE PRODUCTOS    | REVISORES        | ESTUDIO DE FACTIBILIDAD<br>MEJORAMIENTO RIEGO RIO CATO<br>EMBALSE NIBLINTO - REGIÓN DEL BÍO-BÍO | G                | LEVANTAMIENTO FOTOGRAMÉTRICO |                              |  |
|                          |              |       |            | RITE. DEPTO. DE CONSTRUCCIÓN | REVISORES        |                                                                                                 |                  | CATEGORÍA A                  | YACIMIENTOS E INUNDACION 2/2 |  |
|                          |              |       |            | SUBDIRECTOR DE RIEGO         |                  |                                                                                                 |                  | FECHA DE APROBACIÓN          |                              |  |
|                          |              |       |            |                              |                  | PROYECTO N° 3053                                                                                | ESCALA           | CÓDIGO                       | REVISIÓN                     |  |
|                          |              |       |            |                              |                  | REGIÓN IX                                                                                       | PROVINCIA SURILE | INDICADAS                    | INGRESO ARCHIVO N°           |  |



LEVANTAMIENTO FOTOGRAMÉTRICO  
ZONA PRESA, YACIMIENTOS E INUNDACIÓN 1/2  
ESCALA 1:20.000



PLANTA DE UBICACIÓN  
ESCALA 1:100.000

| Vertice | Coordenadas Geograficas |                  | RED GEODESICA GPS EN01 - EN39 |             | Coordenadas UTM |             | Coordenadas Topograficas |         | Cota Geométrica |
|---------|-------------------------|------------------|-------------------------------|-------------|-----------------|-------------|--------------------------|---------|-----------------|
|         | Latitud                 | Longitud         | h. Elips.                     | Norte       | Este            | Norte       | Este                     |         |                 |
| EN01    | S36°42'41.86789"        | 071°38'58.80076" | 582.475                       | 5933740.918 | 266314.452      | 5933740.918 | 266314.452               | 559.412 |                 |
| EN02    | S36°42'44.72553"        | 071°37'07.05415" | 576.943                       | 5933832.176 | 266106.992      | 5933832.159 | 266107.031               | 553.901 |                 |
| EN03    | S36°42'33.34872"        | 071°37'57.44071" | 550.533                       | 5934179.384 | 264846.122      | 5934179.299 | 264846.403               | 527.602 |                 |
| EN04    | S36°42'25.51038"        | 071°38'33.01567" | 533.815                       | 5934365.849 | 263957.443      | 5934365.726 | 263957.904               | 511.057 |                 |
| EN05    | S36°42'21.87295"        | 071°39'04.50388" | 519.645                       | 5934456.371 | 263172.875      | 5934456.228 | 263173.500               | 496.960 |                 |
| EN06    | S36°42'17.29214"        | 071°39'54.86451" | 496.120                       | 5934562.890 | 261919.098      | 5934562.714 | 261919.897               | 473.558 |                 |
| EN07    | S36°42'15.76445"        | 071°40'23.58697" | 505.567                       | 5934590.104 | 261204.930      | 5934589.932 | 261205.990               | 483.071 |                 |
| EN08    | S36°42'08.07458"        | 071°41'12.08463" | 462.841                       | 5934793.455 | 259994.631      | 5934793.234 | 259995.974               | 440.425 |                 |
| EN09    | S36°42'17.83408"        | 071°41'59.03510" | 445.920                       | 5934459.876 | 258837.821      | 5934459.738 | 258839.447               | 423.654 |                 |
| EN10    | S36°42'13.48422"        | 071°42'26.88157" | 447.747                       | 5934514.444 | 258142.919      | 5934514.277 | 258144.720               | 425.338 |                 |
| EN11    | S36°42'04.48725"        | 071°43'08.40918" | 469.843                       | 5934822.568 | 257104.368      | 5934822.537 | 257106.434               | 447.734 |                 |
| EN12    | S36°41'55.64879"        | 071°43'37.17562" | 476.250                       | 5935691.169 | 256365.083      | 5935690.712 | 256367.338               | 454.225 |                 |
| EN13    | S36°41'12.08978"        | 071°44'00.23164" | 415.462                       | 5936401.028 | 255772.057      | 5936400.381 | 255774.468               | 393.529 |                 |
| EN14    | S36°40'47.23644"        | 071°44'29.25610" | 377.362                       | 5937146.538 | 255029.818      | 5937145.852 | 255032.233               | 355.516 |                 |
| EN15    | S36°40'11.44956"        | 071°44'45.57675" | 429.200                       | 5938237.979 | 254592.824      | 5938236.815 | 254595.558               | 407.342 |                 |
| EN16    | S36°39'55.58940"        | 071°44'58.88756" | 385.835                       | 5938717.369 | 254248.292      | 5938716.069 | 254251.123               | 364.060 |                 |
| EN17    | S36°39'25.20844"        | 071°45'22.14209" | 361.004                       | 5939637.231 | 253643.924      | 5939635.662 | 253646.928               | 339.310 |                 |
| EN18    | S36°38'47.43194"        | 071°45'30.99532" | 358.279                       | 5940795.307 | 253390.567      | 5940793.395 | 253393.642               | 336.612 |                 |
| EN19    | S36°38'33.70294"        | 071°46'07.67686" | 319.257                       | 5941182.242 | 252467.259      | 5941180.209 | 252470.612               | 297.663 |                 |
| EN20A   | S36°38'17.48062"        | 071°46'34.15168" | 333.918                       | 5941673.250 | 251795.177      | 5941671.067 | 251798.137               | 312.345 |                 |
| EN20    | S36°38'15.20649"        | 071°46'34.94689" | 334.063                       | 5941722.775 | 251773.395      | 5941740.570 | 251776.963               | 312.518 |                 |
| EN21    | S36°38'07.14160"        | 071°47'01.76739" | 323.134                       | 5941972.056 | 251099.937      | 5941969.779 | 251103.714               | 301.634 |                 |
| EN22    | S36°38'11.06553"        | 071°47'28.17487" | 322.802                       | 5941832.047 | 250447.451      | 5941829.815 | 250451.436               | 301.355 |                 |
| EN23    | S36°37'52.07080"        | 071°47'11.61041" | 317.341                       | 5942429.492 | 250381.929      | 5942427.070 | 250385.787               | 295.871 |                 |
| EN24A   | S36°37'47.44814"        | 071°47'52.29460" | 286.434                       | 5942542.566 | 249827.056      | 5942540.107 | 249831.244               | 265.035 |                 |
| EN24    | S36°37'47.39307"        | 071°47'52.71090" | 286.539                       | 5942543.962 | 249816.664      | 5942541.502 | 249820.855               | 265.156 |                 |
| COH     | S36°38'27.19030"        | 071°47'56.19560" | 331.431                       | 5941314.745 | 249765.880      | 5941312.687 | 249770.082               | 310.007 |                 |
| EN25    | S36°37'56.32395"        | 071°48'25.92435" | 280.656                       | 5942244.580 | 248999.580      | 5942242.214 | 249004.033               | 259.300 |                 |
| EN26    | S36°38'01.76553"        | 071°49'11.43715" | 275.959                       | 5942034.604 | 247873.831      | 5942041.396 | 247876.664               | 254.676 |                 |
| EN27    | S36°37'42.41451"        | 071°49'51.25199" | 271.545                       | 5942611.039 | 246667.153      | 5942608.543 | 246672.334               | 250.330 |                 |
| EN28    | S36°37'56.89956"        | 071°50'31.82920" | 277.945                       | 5942134.752 | 245872.272      | 5942132.425 | 245877.803               | 256.766 |                 |
| EN29    | S36°38'16.83072"        | 071°51'02.99592" | 285.014                       | 5941497.424 | 245116.256      | 5941495.326 | 245122.057               | 263.853 |                 |
| EN30    | S36°38'39.23096"        | 071°51'24.88774" | 291.758                       | 5940790.780 | 244593.001      | 5940788.938 | 244598.987               | 270.631 |                 |
| EN31    | S36°38'47.24468"        | 071°52'08.96396" | 283.896                       | 5940511.085 | 243505.571      | 5940509.346 | 243511.954               | 262.812 |                 |
| EN32    | S36°38'59.37125"        | 071°52'40.84155" | 283.043                       | 5940115.570 | 242724.994      | 5940111.980 | 242731.667               | 261.967 |                 |
| EN33    | S36°39'31.50252"        | 071°52'59.67506" | 291.031                       | 5939109.096 | 242286.995      | 5939107.884 | 242293.829               | 269.958 |                 |
| EN34    | S36°39'56.83851"        | 071°53'33.49851" | 290.968                       | 5938302.828 | 241470.561      | 5938301.923 | 241477.701               | 269.913 |                 |
| EN35    | S36°40'18.43043"        | 071°53'52.67615" | 284.352                       | 5937622.887 | 241014.479      | 5937622.243 | 241021.793               | 263.313 |                 |
| EN36    | S36°40'48.32971"        | 071°53'59.37221" | 286.983                       | 5936696.228 | 240876.071      | 5936695.942 | 240883.435               | 265.936 |                 |
| EN37    | S36°41'19.96488"        | 071°53'19.47679" | 297.943                       | 5935874.303 | 241892.269      | 5935874.327 | 241899.244               | 276.837 |                 |
| EN38    | S36°41'44.68035"        | 071°53'33.39151" | 292.953                       | 5934978.741 | 241573.554      | 5934979.105 | 241580.647               | 271.847 |                 |
| EN39    | S36°42'13.46831"        | 071°53'41.25146" | 313.782                       | 5934085.472 | 241405.265      | 5934086.175 | 241412.419               | 292.670 |                 |

SIMBOLOGÍA

|  |                          |
|--|--------------------------|
|  | DRENAJE PRINCIPAL        |
|  | DRENAJE SECUNDARIO       |
|  | HUELTA                   |
|  | CERCO                    |
|  | RED VIAL DE TIERRA       |
|  | RED VIAL DE PAVIMENTADA  |
|  | CONSTRUCCIONES           |
|  | SENTIDO DE ESCURRIMIENTO |
|  | VEGETACIÓN               |

ARCADIS

LEVANTAMIENTO AEROFOTOGRAMETRICO DIGITAL  
SECTOR NIBLINTO  
ESCALA 1:2.000  
REALIZADO POR:  
**GEOTEC LTDA.**  
Av. Nos. Yagor P-81 05-1405 Yagor - Los Andes  
Fono: 9460727 - 9460763 www.geotec.cl  
VUELO: GEOTEC  
ESCALA 1:8.000, AÑO 2012  
DATUM SIRGAS  
APOYO TERRENO : GPS  
FECHA: ABRIL, 2012

NOTAS

- DIMENSIONES EXPRESADAS EN METROS.
- ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.)
- COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM SIRGAS, ZONA 19.
- LEVANTAMIENTO FOTOGRAMETRICO DIGITAL. ESCALA DEL FOTOGRAMA 1:8.000, ABRIL 2012.
- SE ELIMINA EL TITULO DE REDUCCION AL 50%.



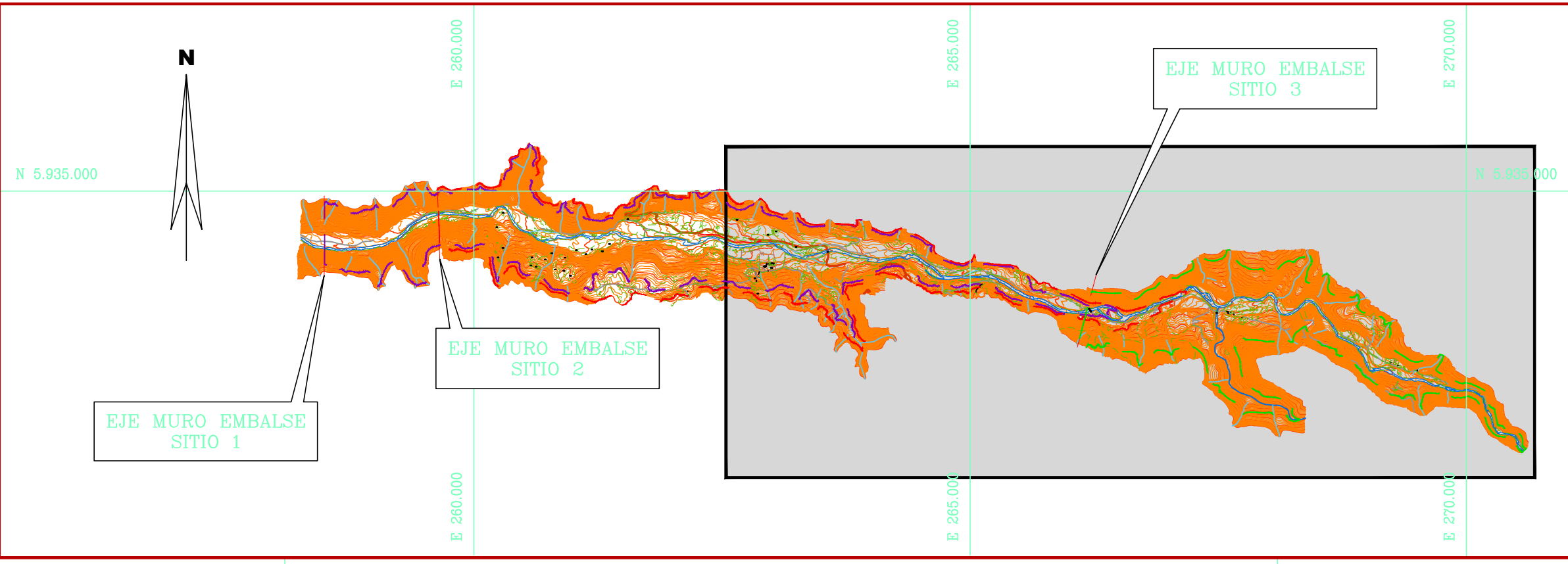
| DISEÑO            | NOMBRE     | FECHA      | FIRMA |  |          |                               |            |  |  |
|-------------------|------------|------------|-------|--|----------|-------------------------------|------------|--|--|
| REVISADO          | P. ZURIGA  | 31.01.2013 |       |  | 31.01.13 | MODIFICA LO INDICADO          | S.T.P.A.G. |  |  |
| JEFE ESPECIALIDAD | J. MONARES | 31.01.2013 |       |  | 22.11.12 | APROBADO CLIENTE              | S.T.P.A.G. |  |  |
| JEFE PROYECTO     | A. GOMEZ   | 31.01.2013 |       |  | 07.09.12 | REVISIÓN Y APROBACIÓN CLIENTE | S.T.P.A.G. |  |  |
|                   |            |            |       |  | 06.09.12 | COORDINACIÓN INTERNA          | S.T.P.A.G. |  |  |
|                   |            |            |       |  | NO.      | FECHA                         | REVISIONES |  |  |

3853-2000-GO-PLA-003

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN | Nº DE CONTRATO              | INSPECTOR FISCAL | MINISTERIO DE CHILE<br>MINISTERIO DE RIEGO Y AGUAS<br>COMISIÓN NACIONAL DE RIEGO                | CLASIFICACIÓN | PLANO Nº             | LEVANTAMIENTO FOTOGRAMETRICO<br>ZONA PRESA<br>YACIMIENTOS E INUNDACIÓN 1/2 |
|--------------------------|--------------|-------|------------|-----------------------------|------------------|-------------------------------------------------------------------------------------------------|---------------|----------------------|----------------------------------------------------------------------------|
|                          |              |       |            | JEFE DEPTO. DE PROYECTOS    | REVISORES        | ESTUDIO DE FACTIBILIDAD<br>MEJORAMIENTO RIEGO RIO CATO<br>EMBALSE NIBLINTO - REGIÓN DEL BÍO-BÍO | G             | 2003-2000-GO-PLA-003 |                                                                            |
|                          |              |       |            | JEFE DEPTO. DE CONSTRUCCIÓN | REVISORES        |                                                                                                 | CATEGORÍA A   |                      | FECHA DE APROBACIÓN                                                        |
|                          |              |       |            | SUBDIRECTOR DE RIEGO        |                  |                                                                                                 | ESCALA        |                      | REVISIÓN                                                                   |
|                          |              |       |            |                             |                  | PROYECTO Nº: 3853<br>REGION IX                                                                  | INDICADAS     |                      | INGRESO ARCHIVO Nº                                                         |
|                          |              |       |            |                             |                  | PROVINCIA: BÍBLE                                                                                |               |                      | 1                                                                          |



ESCALA 1:7.500



# PLANTA DE UBICACIÓN

ESCALA 1:50.000

| VERTICE | COORDENADAS GEOGRAFICAS |                  | RED GEOGRAFICA GPS EN01 - EN39 |             | COORDENADAS UTM |             | COORDENADAS TOPOGRAFICAS |           | COTA GEOMETRICA |
|---------|-------------------------|------------------|--------------------------------|-------------|-----------------|-------------|--------------------------|-----------|-----------------|
|         | LATITUD                 | LONGITUD         | H. ELIPS.                      | NORTE       | ESTE            | NORTE       | ESTE                     |           |                 |
| EN01    | S36°30'31.4460"         | W74°17'56.7638"  | 32.81,134                      | 591872.056  | 251088.937      | 591872.056  | 251088.937               | 25042,114 |                 |
| EN02    | S36°31'11.0553"         | W74°17'28.1748"  | 32,82,010                      | 591832.042  | 250447.455      | 591829.875  | 250447.455               | 25045,136 |                 |
| EN03    | S36°37'52.07080"        | W74°17'11.61041" | 31,37,341                      | 5942428,429 | 2508041,929     | 5942427,070 | 250845,787               | 258,871   |                 |
| EN04    | S36°37'47.48814"        | W74°17'52.29460" | 286,434                        | 594254,566  | 249827,056      | 594254,070  | 249831,244               | 265,035   |                 |
| EN05    | S36°37'47.39037"        | W74°17'52.70190" | 286,539                        | 594254,362  | 249816,664      | 594254,052  | 249820,855               | 265,156   |                 |
| COH     | S36°32'7.19030"         | W74°17'56.19560" | 331,433                        | 594131,745  | 24795,680       | 594132,687  | 247970,082               | 310,007   |                 |
| EN06    | S36°31'56.76525"        | W74°17'56.76525" | 275,959                        | 594228,260  | 24787,153       | 594228,260  | 24787,153                | 250,330   |                 |
| EN07    | S36°30'1.76533"         | W74°14'51.43732" | 275,959                        | 594204,634  | 24673,853       | 594204,396  | 246778,664               | 254,676   |                 |
| EN27    | S36°42.24.4451"         | W74°19'51.25199" | 271,545                        | 5942611,039 | 247867,153      | 594268,543  | 246873,334               | 250,330   |                 |
| EN28    | S36°56.89956"           | W75°01'31.82220" | 277,945                        | 5942134,752 | 245872,272      | 5942132,425 | 245871,003               | 256,766   |                 |
| EN29    | S36°38'18.83072"        | W75°02'10.99592" | 280,014                        | 594149,424  | 245116,256      | 594149,536  | 245127,057               | 263,853   |                 |
| EN30    | S36°38'39.23096"        | W75°02'48.84175" | 281,758                        | 594078,900  | 245393,001      | 594078,900  | 245393,001               | 270,900   |                 |
| EN31    | S36°38'47.24468"        | W75°02'48.84175" | 283,895                        | 594051,109  | 245393,001      | 594059,346  | 245311,954               | 262,812   |                 |
| EN32    | S36°39'47.31125"        | W75°02'14.88155" | 283,043                        | 594011,3570 | 24272,994       | 594011,357  | 242731,667               | 261,967   |                 |
| EN33    | S36°39'31.50252"        | W75°02'59.67506" | 291,031                        | 593910,906  | 242786,995      | 593910,784  | 242293,829               | 269,958   |                 |
| EN34    | S36°56.858651"          | W75°03'33.49851" | 290,968                        | 593830,828  | 241704,561      | 5938301,923 | 241477,701               | 269,913   |                 |
| EN35    | S36°40'18.43043"        | W75°03'52.67531" | 284,352                        | 593762,887  | 24014,079       | 593762,243  | 24013,973                | 265,313   |                 |
| EN36    | S36°40'48.32917"        | W75°03'52.67531" | 284,352                        | 593668,280  | 24014,079       | 593668,280  | 24013,973                | 265,313   |                 |
| EN37    | S36°41'15.86488"        | W75°03'47.82217" | 297,943                        | 593587,033  | 231892,269      | 593587,322  | 231899,244               | 276,837   |                 |
| EN38    | S36°41'44.68035"        | W75°03'33.39151" | 292,953                        | 593498,741  | 241753,554      | 593497,915  | 241580,647               | 271,847   |                 |
| EN39    | S36°42'13.46831"        | W75°03'41.25141" | 313,782                        | 593408,472  | 24054,265       | 593408,675  | 241412,419               | 292,670   |                 |

| VERTICE | COORDENADAS GEOGRAFICAS |                  | RED GEOGRAFICA GPS EN01 - EN39 |             | COORDENADAS UTM |             | COORDENADAS TOPOGRAFICAS |           | COTA GEOMETRICA |
|---------|-------------------------|------------------|--------------------------------|-------------|-----------------|-------------|--------------------------|-----------|-----------------|
|         | LATITUD                 | LONGITUD         | H. ELIPS.                      | NORTE       | ESTE            | NORTE       | ESTE                     |           |                 |
| EN01    | S36°30'31.4460"         | W74°17'56.7638"  | 32.81,134                      | 591872.056  | 251088.937      | 591872.056  | 251088.937               | 25042,114 |                 |
| EN02    | S36°31'11.0553"         | W74°17'28.1748"  | 32,82,010                      | 591832.042  | 250447.455      | 591829.875  | 250447.455               | 25045,136 |                 |
| EN03    | S36°37'52.07080"        | W74°17'11.61041" | 31,37,341                      | 5942428,429 | 2508041,929     | 5942427,070 | 250845,787               | 258,871   |                 |
| EN04    | S36°37'47.48814"        | W74°17'52.29460" | 286,434                        | 594254,566  | 249827,056      | 594254,070  | 249831,244               | 265,035   |                 |
| EN05    | S36°37'47.39037"        | W74°17'52.70190" | 286,539                        | 594254,362  | 249816,664      | 594254,052  | 249820,855               | 265,156   |                 |
| COH     | S36°32'7.19030"         | W74°17'56.19560" | 331,433                        | 594131,745  | 24795,680       | 594132,687  | 247970,082               | 310,007   |                 |
| EN06    | S36°31'56.76525"        | W74°17'56.76525" | 275,959                        | 594228,260  | 24787,153       | 594228,260  | 24787,153                | 250,330   |                 |
| EN07    | S36°30'1.76533"         | W74°14'51.43732" | 275,959                        | 594204,634  | 24767,833       | 594204,396  | 247678,664               | 254,676   |                 |
| EN27    | S36°42.24.4451"         | W74°19'51.25199" | 271,545                        | 5942611,039 | 24687,153       | 594268,543  | 246873,334               | 250,330   |                 |
| EN28    | S36°56.89956"           | W75°01'31.82220" | 277,945                        | 5942134,752 | 24587,272       | 5942132,425 | 24587,033                | 256,766   |                 |
| EN29    | S36°38'18.83072"        | W75°02'10.99592" | 280,014                        | 594149,424  | 24516,256       | 594149,536  | 245122,057               | 263,853   |                 |
| EN30    | S36°38'39.23096"        | W75°02'48.84175" | 281,758                        | 594078,900  | 24593,001       | 594078,900  | 24593,001                | 270,900   |                 |
| EN31    | S36°38'47.24468"        | W75°02'48.84175" | 283,895                        | 594051,109  | 24593,001       | 594059,346  | 24511,954                | 262,812   |                 |
| EN32    | S36°39'47.31125"        | W75°02'14.88155" | 283,043                        | 594011,350  | 24722,994       | 594011,350  | 24723,661                | 261,967   |                 |
| EN33    | S36°39'31.50252"        | W75°02'59.67506" | 291,031                        | 593910,906  | 24276,995       | 593910,784  | 24229,829                | 269,958   |                 |
| EN34    | S36°56.85865"           | W75°03'33.49851" | 290,968                        | 593802,828  | 24170,561       | 593801,923  | 241477,701               | 269,913   |                 |
| EN35    | S36°40'18.43043"        | W75°03'52.67531" | 284,352                        | 593762,887  | 24014,479       | 593762,243  | 24013,978                | 265,313   |                 |
| EN36    | S36°40'48.32939"        | W75°03'52.67531" | 284,352                        | 593668,288  | 24014,479       | 593668,288  | 24013,978                | 265,313   |                 |
| EN37    | S36°41'15.86488"        | W75°03'47.82217" | 297,943                        | 593587,033  | 231892,269      | 593587,327  | 231899,244               | 276,837   |                 |
| EN38    | S36°41'44.68035"        | W75°03'33.39151" | 292,953                        | 593498,741  | 241753,554      | 593497,955  | 241580,647               | 271,847   |                 |
| EN39    | S36°42'13.46831"        | W75°03'41.25145" | 313,782                        | 593408,472  | 24105,465       | 593406,175  | 24114,419                | 292,670   |                 |

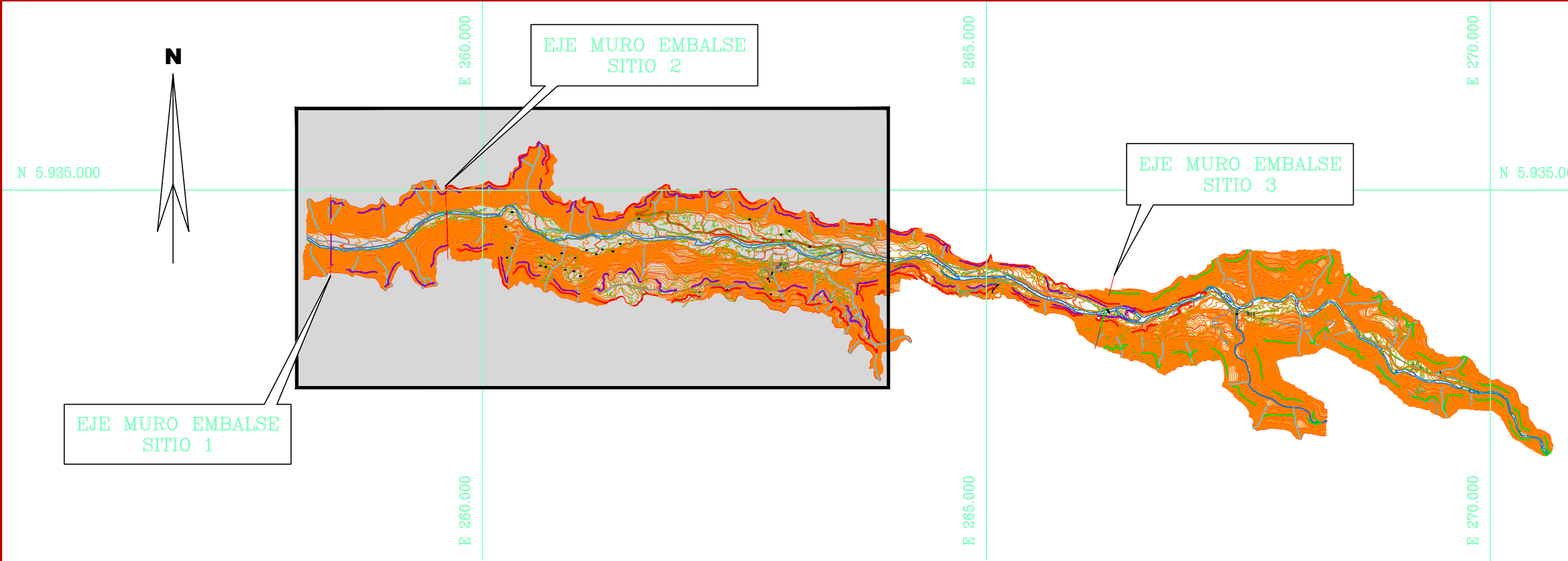
|                                                                                       |                         |
|---------------------------------------------------------------------------------------|-------------------------|
|  | DRENAJE PRINCIPAL       |
|  | DRENAJE SECUNDARIO      |
|  | HUELLA                  |
|  | CERCO                   |
|  | RED VIAL DE TIERRA      |
|  | RED VIAL DE PAVIMENTADA |
|  | CONSTRUCCIONES          |
|  | SENTIDO ESCURRIMIENTO   |
|  | VEGETACIÓN              |

1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.)
3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM SIRGAS, ZONA 19
4. LEVANTAMIENTO FOTOMETRICO DIGITAL. ESCALA DEL FOTOGRAMA 1:8.000, ABRIL 2012.
5. SE ELIMINA EL TÍMBRE DE REDUCCIÓN AL 50% 

[illegible]



ESCALA 1:5.000



PLANTA DE UBICACIÓN

ESCALA 1:50.000

| VERTICE | COORDENADAS GEOGRÁFICAS |                  | RED GEODÉSICA GPS EN 1983 |             | COORDENADAS UTM |             | COORDENADAS TOPOGRÁFICAS |          | COTA GEOMÉTRICA |
|---------|-------------------------|------------------|---------------------------|-------------|-----------------|-------------|--------------------------|----------|-----------------|
|         | LATITUD                 | LONGITUD         | H. ELIPS.                 | NORTE       | ESTE            | NORTE       | ESTE                     |          |                 |
| EN01    | 53°56'50.14160"         | 071°47'01.76739" | 323.134                   | 5941972.050 | 20599.937       | 5941969.779 | 2051.0374                | 301.6534 |                 |
| EN02    | 53°58'31.10653"         | 071°48'01.36872" | 323.682                   | 5941874.017 | 20599.580       | 5941874.015 | 2051.0374                | 301.6534 |                 |
| EN03    | 53°57'52.07080"         | 071°47'11.61041" | 317.341                   | 5942049.492 | 20584.929       | 5942427.070 | 205845.787               | 258.871  |                 |
| EN24A   | 53°56'47.44814"         | 071°47'52.29460" | 286.434                   | 5942545.566 | 204987.056      | 5942540.107 | 249831.244               | 265.035  |                 |
| EN25    | 53°56'47.394307"        | 071°47'52.71000" | 286.539                   | 5942543.562 | 249816.664      | 5942541.502 | 249826.055               | 265.107  |                 |
| COH     | 53°56'32.19030"         | 071°47'36.19560" | 331.431                   | 5942134.745 | 20495.870       | 5942131.687 | 249770.082               | 310.066  |                 |
| EN04    | 53°56'37.32995"         | 071°48'25.94354" | 280.656                   | 5942210.680 | 20495.580       | 5942210.680 | 249823.233               | 265.035  |                 |
| EN05    | 53°56'10.76553"         | 071°48'01.72772" | 280.656                   | 5942203.694 | 24783.813       | 5942041.996 | 247876.654               | 254.676  |                 |
| EN07    | 53°56'42.742145"        | 071°49'15.25199" | 295.434                   | 5942611.039 | 24686.153       | 5942608.543 | 246873.234               | 250.330  |                 |
| EN08    | 53°56'37.568956"        | 071°50'31.82920" | 277.945                   | 5942134.752 | 24587.272       | 5942132.425 | 245887.003               | 256.766  |                 |
| EN29    | 53°58'16.83072"         | 071°50'02.99592" | 285.014                   | 5941497.424 | 24116.256       | 5941495.326 | 245122.057               | 263.855  |                 |
| EN30    | 53°56'35.92396"         | 071°50'24.68774" | 295.358                   | 5940730.780 | 24493.001       | 5940788.635 | 244936.567               | 270.631  |                 |
| EN31    | 53°56'42.744498"        | 071°50'06.96367" | 295.434                   | 5940521.095 | 24493.001       | 5940529.346 | 244195.872               | 262.812  |                 |
| EN32    | 53°56'39.59172"         | 071°50'04.84155" | 293.045                   | 5940113.570 | 24272.994       | 5940111.980 | 242731.687               | 261.691  |                 |
| EN33    | 53°56'39.515022"        | 071°50'36.67506" | 291.031                   | 5939109.096 | 24286.995       | 5939107.884 | 242293.829               | 269.958  |                 |
| EN34    | 53°56'35.63851"         | 071°53'35.49651" | 290.968                   | 5938302.628 | 24170.561       | 5938301.923 | 241779.611               | 269.913  |                 |
| EN35    | 53°56'40.184034"        | 071°53'25.67121" | 284.352                   | 5937622.827 | 24109.479       | 5937622.243 | 241021.793               | 263.313  |                 |
| EN36    | 53°56'48.39271"         | 071°53'59.37271" | 288.983                   | 5936686.228 | 24059.071       | 5936695.942 | 240124.335               | 263.306  |                 |
| EN37    | 53°56'11.594498"        | 071°54'01.36872" | 295.434                   | 5935813.037 | 24014.785       | 5935813.037 | 240199.232               | 263.306  |                 |
| EN38    | 53°56'44.68035"         | 071°53'33.39511" | 292.953                   | 5934974.741 | 24157.555       | 5934976.105 | 241580.447               | 271.870  |                 |
| EN39    | 53°56'42.146831"        | 071°53'54.21456" | 315.782                   | 5934085.472 | 24105.265       | 5934066.175 | 241421.419               | 292.670  |                 |

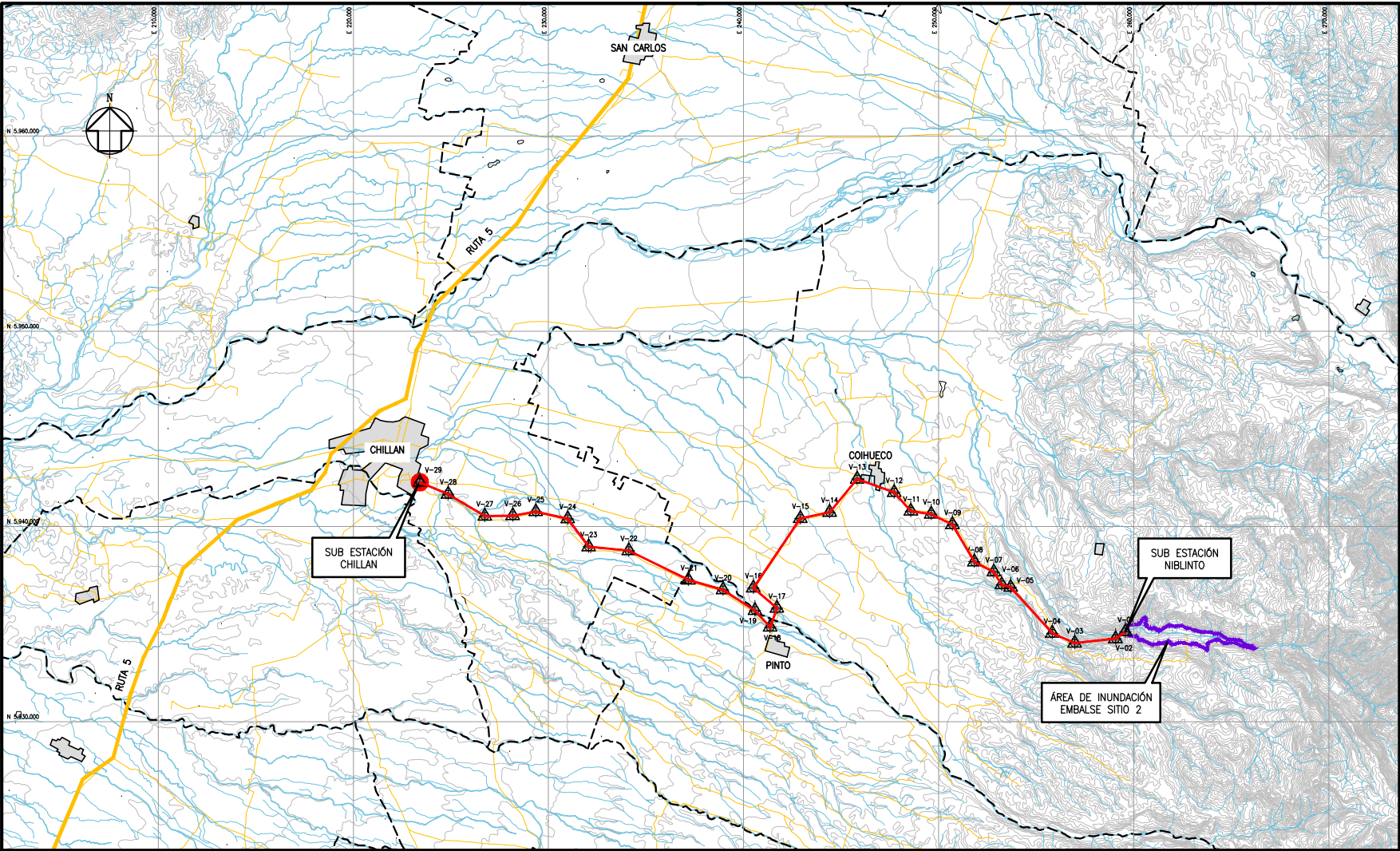
|                                                                                       |                         |
|---------------------------------------------------------------------------------------|-------------------------|
|  | DRENAJE PRINCIPAL       |
|  | DRENAJE SECUNDARIO      |
|  | HUELLA                  |
|  | CERCO                   |
|  | RED VIAL DE TIERRA      |
|  | RED VIAL DE PAVIMENTADA |
|  | CONSTRUCCIONES          |
|  | SENTIDO ESCURRIMIENTO   |
|  | VEGETACIÓN              |

NOTAS

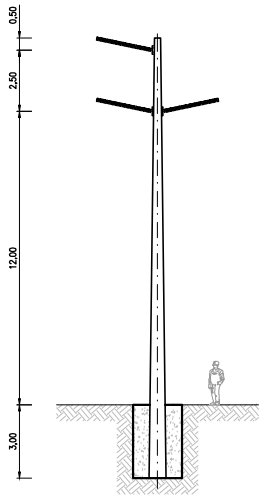
1. DIMENSIONES EXPRESADAS EN METROS.
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.)
3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM SIRGAS; ZONA 19.
4. LEVANTAMIENTO FOTOGRAMETRICO DIGITAL. ESCALA DEL FOTOGRAMA 1:8.000, ABRIL 2012.
5. SE ELIMINA EL TIMBRE DE REDUCCIÓN AL 50% 



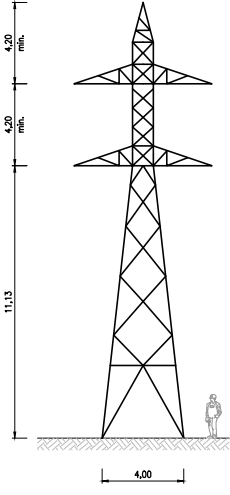




PLANTA LÍNEA DE TRANSMISIÓN ALTA TENSIÓN  
ESCALA 1:100.000



POSTE DE HORMIGÓN DE SUSPENSIÓN  
DE SIMPLE CIRCUITO  
ESCALA 1:100



ESTRUCTURA METÁLICA DE ANCLAJE Y REMATE  
DE SIMPLE CIRCUITO  
ESCALA 1:100

CUADRO DE COORDENADAS

| VÉRTECE | ESTE   | NORTE   | UBICACIÓN             |
|---------|--------|---------|-----------------------|
| 1       | 259310 | 5934510 | SUB-ESTACIÓN NIBLINTO |
| 2       | 259064 | 5934250 |                       |
| 3       | 256972 | 5934028 | RUTA N-49             |
| 4       | 255822 | 5934533 |                       |
| 5       | 253696 | 5936885 |                       |
| 6       | 253235 | 5937015 |                       |
| 7       | 252828 | 5937669 |                       |
| 8       | 251829 | 5938190 |                       |
| 9       | 250711 | 5940095 | RUTA N-51             |
| 10      | 249821 | 5940636 |                       |
| 11      | 248575 | 5940788 |                       |
| 12      | 247720 | 5941744 |                       |
| 13      | 240826 | 5942432 | RUTA N-55             |
| 14      | 244412 | 5940727 |                       |
| 15      | 242911 | 5940415 |                       |
| 16      | 240502 | 5939855 |                       |
| 17      | 241713 | 5935815 |                       |
| 18      | 241364 | 5934842 |                       |
| 19      | 240583 | 5935696 |                       |
| 20      | 238949 | 5936758 |                       |
| 21      | 237171 | 5937262 |                       |
| 22      | 234125 | 5938765 |                       |
| 23      | 232042 | 5938963 | SUB-ESTACIÓN CHILLAN  |
| 24      | 230987 | 5940396 |                       |
| 25      | 229353 | 5940758 |                       |
| 26      | 228171 | 5940554 |                       |
| 27      | 226737 | 5940534 |                       |
| 28      | 224860 | 5941857 |                       |
| 29      | 223410 | 5942266 |                       |

LÍNEA DE TRANSMISIÓN

| LARGO    | CARACTERÍSTICAS                                              |
|----------|--------------------------------------------------------------|
| 48,3 Km. | LÍNEA DE TRANSMISIÓN DE 66 KV<br>EN BASE A POSTE DE HORMIGÓN |

SIMBOLOGÍA

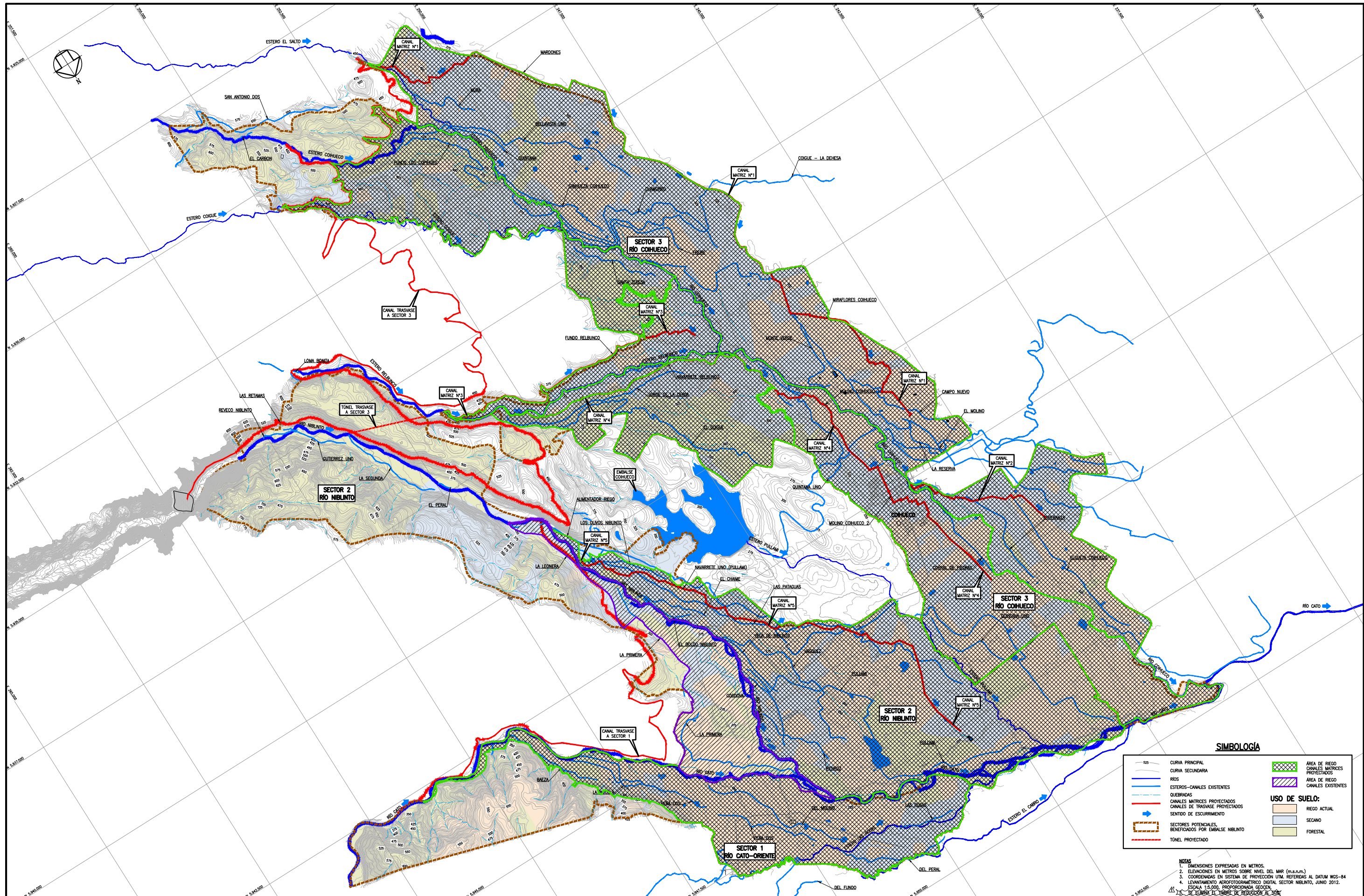
|  |                               |
|--|-------------------------------|
|  | LÍNEA DE TRANSMISIÓN          |
|  | INUNDACIÓN DE EMBALSE SITIO 2 |
|  | CURVA DE NIVEL                |
|  | CAUCE EXISTENTE               |
|  | VALADIZO                      |
|  | V-01<br>VÉRTECE               |

- NOTAS
- DIMENSIONES EXPRESADAS EN METROS.
  - ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).
  - COORDENADAS EN SISTEMA DE PROYECCIÓN UTM, REFERIDAS AL DATUM WGS84, HUSO 19.
  - FUENTE TOPOGRÁFICA OBTENIDA DEL GLOBAL MAPPER, DATUM WGS84.

|                             |        |          |          |          |                               |                |   |   |   |
|-----------------------------|--------|----------|----------|----------|-------------------------------|----------------|---|---|---|
|                             | NOMBRE | FECHA    | FRMA     | -        | -                             | -              | - | - | - |
|                             | DESAR  | VLC      | 31.01.13 | -        | -                             | -              | - | - | - |
|                             | REVIS  | VLC      | 31.01.13 | -        | -                             | -              | - | - | - |
|                             | APR    | 31.01.13 | 0        | 31.01.13 | APROBADO CLIENTE              | V.I.V.T.I.A.G. |   |   |   |
|                             | APR    | 31.01.13 | 8        | 02.10.12 | REVISIÓN Y APROBACIÓN CLIENTE | V.I.V.T.I.A.G. |   |   |   |
| NÚMERO 3853-1100-EL-PLA-001 |        |          |          |          |                               |                |   |   |   |
| FECHA 01.10.12              |        |          |          |          |                               |                |   |   |   |
| COORDINACIÓN INTERNA        |        |          |          |          |                               |                |   |   |   |
| DESARROLLO                  |        |          |          |          |                               |                |   |   |   |

|                          |              |       |            |                                                                      |                                                                              |
|--------------------------|--------------|-------|------------|----------------------------------------------------------------------|------------------------------------------------------------------------------|
| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN | DESCRIPCIÓN                                                          | TÍTULO                                                                       |
|                          |              |       |            | MEJORAMIENTO RIEGO RÍO CATO<br>EMBALSE NIBLINTO - REGIÓN DEL BIO-BIO | PLANTA LÍNEA DE TRANSMISIÓN ALTA TENSIÓN<br>PLANTA Y SECCIONES ESTRUCTURALES |
|                          |              |       |            | ESCALA INDICADAS                                                     | PROYECCIÓN CARTOGRAFIA WGS84                                                 |
|                          |              |       |            | FUENTE CARTOGRAFIA GLOBAL MAPPER                                     | FECHA OCTUBRE 2012                                                           |
|                          |              |       |            |                                                                      | LÁMINA 1 DE 1                                                                |





SIMBOLOGÍA

|  |                            |  |                                                         |
|--|----------------------------|--|---------------------------------------------------------|
|  | CURVA PRINCIPAL            |  | ÁREA DE RIEGO CANALES MATRICES PROYECTADOS              |
|  | CURVA SECUNDARIA           |  | ÁREA DE RIEGO CANALES EXISTENTES                        |
|  | RIOS                       |  | QUERBRADAS CANALES MATRICES PROYECTADOS                 |
|  | ESTEROS-CANALES EXISTENTES |  | CANALES DE TRASVASE PROYECTADOS                         |
|  | SENTIDO DE ESCURRIMIENTO   |  | SECTORES POTENCIALES, BENEFICIADOS POR EMBALSE NIBLINTO |
|  | TUNEL PROYECTADO           |  | FORESTAL                                                |

NOTAS

1. DIMENSIONES EXPRESADAS EN METROS.
  2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).
  3. COORDENADAS EN SISTEMA DE PROYECCION UTM, REFERIDAS AL DATUM WGS-84.
  4. LEVANTAMIENTO AEROFOTOGRAFICO DIGITAL, SECTOR NIBLINTO, JUNIO 2012.
- ESCALA 1:25.000, PROYECCION WGS-84, DATUM WGS-84, ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).

PLANTA GENERAL CANALES MATRICES PROYECTADOS  
ÁREAS DE RIEGO BAJO CANALES

ESCALA 1:25.000

| DOCUMENTOS DE REFERENCIA | MODIFICACIÓN | FECHA | APROBACIÓN |
|--------------------------|--------------|-------|------------|
|                          |              |       |            |
|                          |              |       |            |
|                          |              |       |            |
|                          |              |       |            |

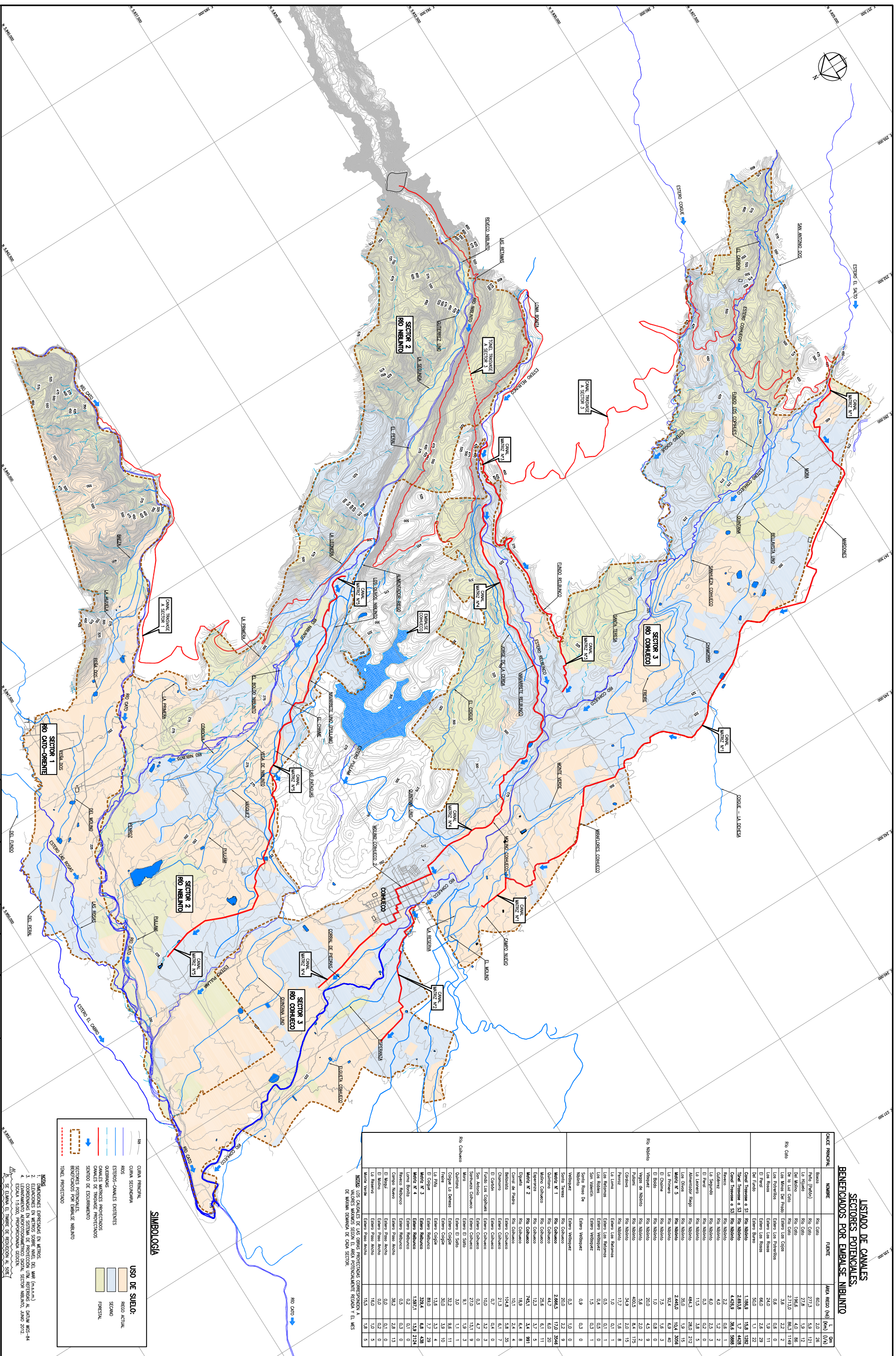


|                         |                                                                  |
|-------------------------|------------------------------------------------------------------|
| DESCRIPCION             | PARA APROBACION CLIENTE<br>EMBALSE NIBLINTO - REGION DEL BIO-BIO |
| ESCALA                  | 1:25.000                                                         |
| PROYECCION CARTOGRAFICA | WGS84                                                            |

|                     |                                                                            |
|---------------------|----------------------------------------------------------------------------|
| TITULO              | PLANTA GENERAL CANALES MATRICES PROYECTADOS<br>ÁREAS DE RIEGO BAJO CANALES |
| FUENTE CARTOGRAFICA | GEODEN                                                                     |
| FECHA               | AGOSTO 2012                                                                |
| LAMINA              | 4 DE 4                                                                     |

|                      |                  |          |       |             |  |  |  |
|----------------------|------------------|----------|-------|-------------|--|--|--|
|                      | NOMBRE           | FECHA    | FIRMA |             |  |  |  |
|                      | COORDINADOR      | 31.01.13 |       |             |  |  |  |
|                      | JEFE DE PROYECTO | 08.10.12 |       |             |  |  |  |
|                      | JEFE DE PROYECTO | 04.08.12 |       |             |  |  |  |
|                      | JEFE DE PROYECTO | 02.08.12 |       |             |  |  |  |
| NOMBRE               |                  | FECHA    |       | DESCRIPCION |  |  |  |
| 3853-1000-IH-LAM-004 |                  |          |       |             |  |  |  |

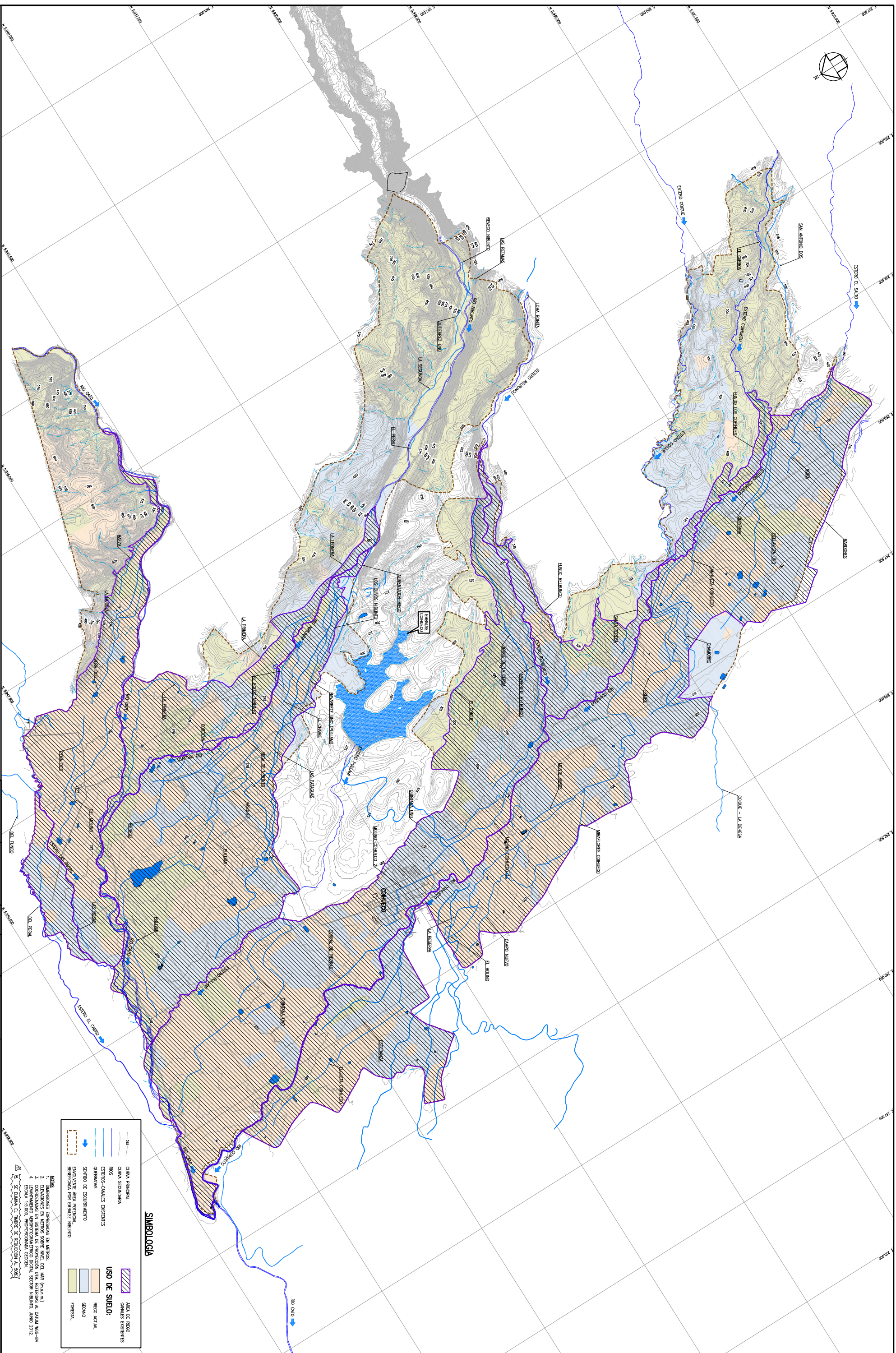




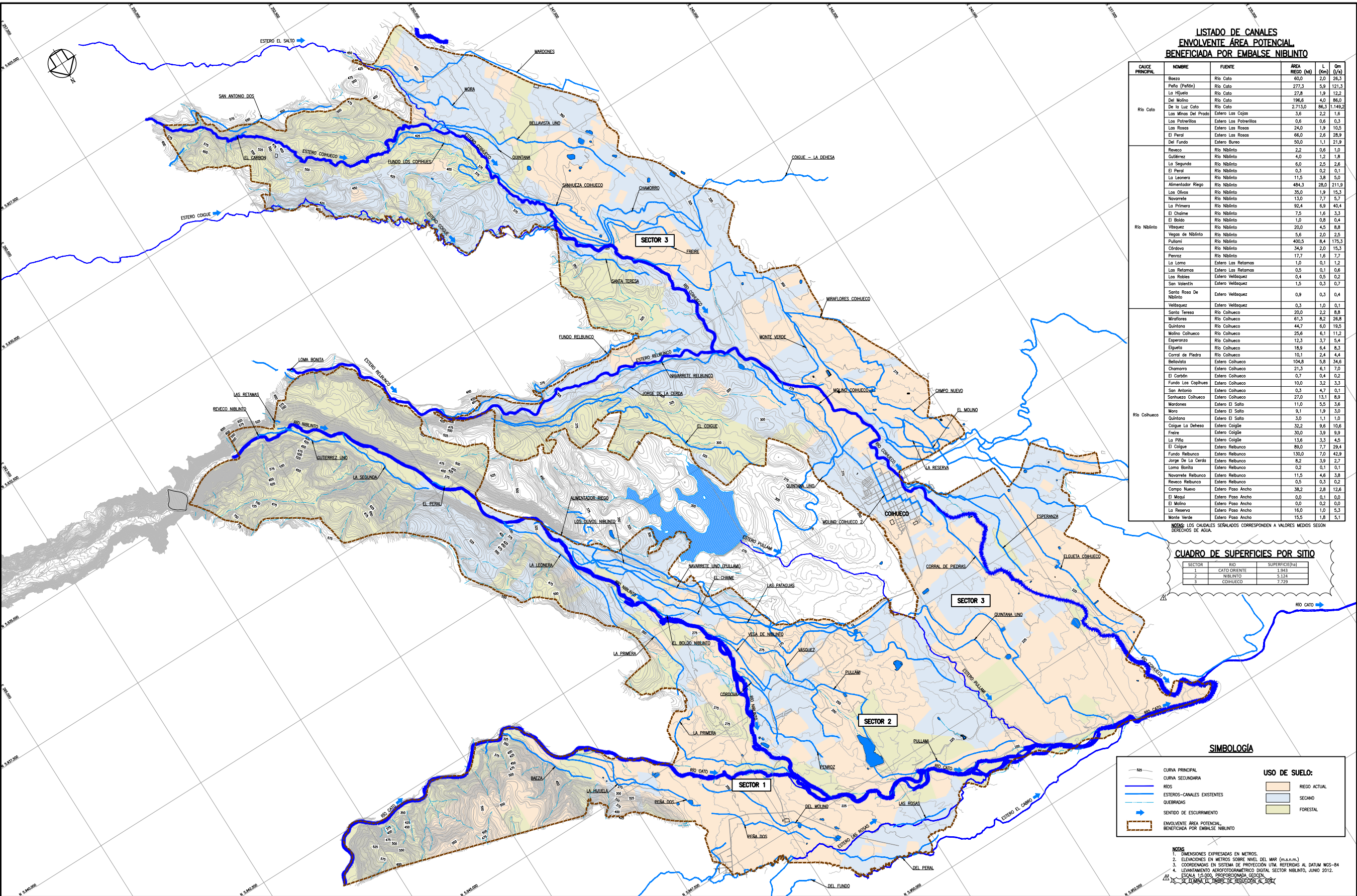
| CDUCE PRIMICIA | NOMBRE            | FUENTE             | MECA (MED) (km) | L (km) | Om    |
|----------------|-------------------|--------------------|-----------------|--------|-------|
| Rio Coto       | Brazo             | Rio Coto           | 60,0            | 20,0   | 20,0  |
|                | Puñi (Pavón)      | Rio Coto           | 277,3           | 59     | 121   |
|                | La Higüela        | Rio Coto           | 77,8            | 1,9    | 1,2   |
|                | El Mito           | Rio Coto           | 198,6           | 4,0    | 88    |
|                | En la Cruz Coto   | Rio Coto           | 215,0           | 8,65   | 114,9 |
|                | En la Cruz Páramo | Rio Coto           | 2,6             | 0,0    | 0,0   |
|                | La Cruz Páramo    | Ensero Las Páramos | 0,0             | 0,0    | 0,0   |
|                | Las Páramos       | Ensero Las Páramos | 1,9             | 11     | 11    |
|                | El Pavón          | Ensero Las Páramos | 24,0            | 19     | 11    |
|                | El Pavón          | Ensero Las Páramos | 24,0            | 19     | 11    |
| Rio Nishino    | Ensero Barro      | Ensero Barro       | 66,0            | 2,6    | 2,9   |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
| Rio Chichano   | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
| Rio Nishino    | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
| Rio Chichano   | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 22    |
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|                | Ensero Barro      | Ensero Barro       | 50,0            | 11     | 2     |

**NOTAS:** LOS CAUDALES DE LAS OBRAS PROYECTADAS CORRESPONDEN A VALORES MAXIMOS SEGUN EL AREA POTENCIALMENTE REGADA Y EL MES DE MAXIMA DEMANDA DE CADA SECTOR.









LISTADO DE CANALES  
ENVOLVENTE AREA POTENCIAL  
BENEFICIADA POR EMBALSE NIBLINTO

| CAUCE PRINCIPAL | NOMBRE                 | FUENTE                  | AREA REGO (m²) | L (m) | Qm (l/s) |
|-----------------|------------------------|-------------------------|----------------|-------|----------|
| Rio Cato        | Bosco                  | Rio Cato                | 60,0           | 2,0   | 25,3     |
|                 | Pefia (Peñón)          | Rio Cato                | 277,3          | 5,9   | 121,3    |
|                 | La Higuera             | Rio Cato                | 27,8           | 1,9   | 12,2     |
|                 | Del Molino             | Rio Cato                | 196,6          | 4,0   | 86,0     |
|                 | De la Luz Cato         | Rio Cato                | 2,713,0        | 86,2  | 1,149,2  |
|                 | Los Molinos Del Prado  | Estero Las Cogies       | 3,6            | 2,2   | 1,6      |
|                 | Los Polvorientos       | Estero Los Polvorientos | 0,6            | 0,6   | 0,3      |
|                 | Las Rosas              | Estero Las Rosas        | 24,0           | 1,9   | 10,5     |
|                 | El Peral               | Estero Las Rosas        | 66,0           | 2,6   | 28,9     |
|                 | Del Fundo              | Estero Bureo            | 50,0           | 1,1   | 21,9     |
| Rio Niblinto    | Reveco                 | Rio Niblinto            | 2,2            | 0,6   | 1,0      |
|                 | Culleres               | Rio Niblinto            | 4,0            | 1,2   | 1,8      |
|                 | La Segunda             | Rio Niblinto            | 6,0            | 2,5   | 2,6      |
|                 | El Peral               | Rio Niblinto            | 0,3            | 0,2   | 0,1      |
|                 | La Leonera             | Rio Niblinto            | 11,5           | 3,8   | 5,0      |
|                 | Alimentador Riego      | Rio Niblinto            | 484,3          | 28,0  | 211,9    |
|                 | Las Olivas             | Rio Niblinto            | 35,0           | 1,9   | 15,3     |
|                 | Navarrete              | Rio Niblinto            | 13,0           | 7,7   | 5,7      |
|                 | La Primera             | Rio Niblinto            | 92,4           | 6,9   | 40,4     |
|                 | El Chime               | Rio Niblinto            | 7,5            | 1,6   | 3,3      |
| Rio Colihueco   | El Boido               | Rio Niblinto            | 1,0            | 0,8   | 0,4      |
|                 | Visquez                | Rio Niblinto            | 20,0           | 4,5   | 8,8      |
|                 | Vegas de Niblinto      | Rio Niblinto            | 5,6            | 2,0   | 2,5      |
|                 | Pullam                 | Rio Niblinto            | 400,5          | 8,4   | 175,3    |
|                 | Córdova                | Rio Niblinto            | 34,9           | 2,0   | 15,3     |
|                 | Penroz                 | Rio Niblinto            | 17,7           | 1,6   | 7,7      |
|                 | La Loma                | Estero Las Retamas      | 1,0            | 0,1   | 1,2      |
|                 | Las Retamas            | Estero Las Retamas      | 0,5            | 0,1   | 0,6      |
|                 | Estero Velasquez       | Estero Velasquez        | 0,4            | 0,5   | 0,2      |
|                 | San Valentín           | Estero Velasquez        | 1,5            | 0,3   | 0,7      |
| Rio Colihueco   | Santa Rosa De Niblinto | Estero Velasquez        | 0,9            | 0,3   | 0,4      |
|                 | Velasquez              | Estero Velasquez        | 0,3            | 1,0   | 0,1      |
|                 | Santa Teresa           | Rio Colihueco           | 20,0           | 2,2   | 8,8      |
|                 | Miraflores             | Rio Colihueco           | 61,3           | 8,2   | 26,8     |
|                 | Quintana               | Rio Colihueco           | 44,7           | 6,0   | 19,5     |
|                 | Molino Colihueco       | Rio Colihueco           | 25,6           | 6,1   | 11,2     |
|                 | Esperanza              | Rio Colihueco           | 12,3           | 3,7   | 5,4      |
|                 | Elgueta                | Rio Colihueco           | 18,9           | 6,4   | 8,3      |
|                 | Corral de Piedra       | Rio Colihueco           | 10,1           | 2,4   | 4,4      |
|                 | Bellavista             | Estero Colihueco        | 104,8          | 5,9   | 34,8     |
| Rio Colihueco   | Chamorro               | Estero Colihueco        | 21,3           | 6,1   | 7,0      |
|                 | El Cardén              | Estero Colihueco        | 0,7            | 0,4   | 0,2      |
|                 | Fundo Las Cogies       | Estero Colihueco        | 10,0           | 3,2   | 3,3      |
|                 | San Antonio            | Estero Colihueco        | 0,3            | 4,7   | 0,1      |
|                 | Sanhueza Colihueco     | Estero Colihueco        | 27,0           | 13,1  | 8,9      |
|                 | Mardones               | Estero El Salto         | 11,0           | 5,5   | 3,6      |
|                 | Mora                   | Estero El Salto         | 9,1            | 1,9   | 3,0      |
|                 | Quintana               | Estero El Salto         | 3,0            | 1,1   | 1,0      |
|                 | Coigie La Dehesa       | Estero Coigie           | 32,2           | 9,6   | 10,6     |
|                 | Freire                 | Estero Coigie           | 30,0           | 3,9   | 9,9      |
| Rio Colihueco   | La Pila                | Estero Coigie           | 13,6           | 3,3   | 4,5      |
|                 | El Coigie              | Estero Reibunco         | 89,0           | 7,7   | 29,4     |
|                 | Fundo Reibunco         | Estero Reibunco         | 130,0          | 7,0   | 42,9     |
|                 | Jorge De La Cerdá      | Estero Reibunco         | 8,2            | 3,9   | 2,7      |
|                 | Loma Bonita            | Estero Reibunco         | 0,2            | 0,1   | 0,1      |
|                 | Navarrete Reibunco     | Estero Reibunco         | 11,5           | 4,6   | 3,8      |
|                 | Reveco Reibunco        | Estero Reibunco         | 0,3            | 0,2   | 0,2      |
|                 | Campo Nuevo            | Estero Paso Ancho       | 38,2           | 2,9   | 12,6     |
|                 | El Molino              | Estero Paso Ancho       | 0,0            | 0,1   | 0,0      |
|                 | La Reserva             | Estero Paso Ancho       | 16,0           | 1,0   | 5,3      |
| Rio Colihueco   | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |
|                 | Monte Verde            | Estero Paso Ancho       | 15,5           | 1,8   | 5,1      |

NOTAS: LOS CAUDALES SEÑALADOS CORRESPONDEN A VALORES MEDIDOS SEGUN DESARROLLO DE AGUA.

CUADRO DE SUPERFICIES POR SITO

| SECTOR | RIO          | SUPERFICIE (m²) |
|--------|--------------|-----------------|
| 1      | CATO ORIENTE | 1.943           |
| 2      | NIBLINTO     | 3.124           |
| 3      | COLIHUECO    | 7.729           |

SIMBOLOGIA

CURVA PRINCIPAL

CURVA SECUNDARIA

RIOS

ESTEROS-CANALES EXISTENTES

QUEBRADAS

SENTIDO DE ESCURRIMIENTO

ENVOLVENTE AREA POTENCIAL BENEFICIADA POR EMBALSE NIBLINTO

RIEGO ACTUAL

SECANO

FORESTAL

NOTAS:  
1. DIMENSIONES EXPRESADAS EN METROS.  
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).  
3. COORDENADAS EN SISTEMA DE PROYECCION UTM REFERIDAS AL DATUM WGS-84.  
4. LEVANTAMIENTO AEROFOTODIGITAL DIGITAL SECTOR NIBLINTO, JUNIO 2012.  
ESCALA 1:25.000, PROYECCION GEOSID.

ESCALA GRAFICA

0 250 500 750 1000

ARCADIS CHILE

3853-1000-IH-LAM-001

REVISOR

31.01.13

APROBADO CLIENTE

ADPZAG

JEFE PROYECTO

08.10.12

APROBADO CLIENTE

ADPZAG

JEFE PROYECTO

08.10.12

REVISIÓN Y APROBACIÓN INTERNA

ADPZAG

JEFE PROYECTO

08.10.12

COORDINACIÓN INTERNA

ADPZAG

JEFE PROYECTO

08.10.12

REVISIÓN Y APROBACIÓN INTERNA

ADPZAG

JEFE PROYECTO

08.10.12

COORDINACIÓN INTERNA

ADPZAG

PLANTA GENERAL

INFRAESTRUCTURA DE RIEGO EXISTENTE

ESCALA 1:25.000

DOCUMENTOS DE REFERENCIA

MODIFICACIÓN

FECHA

APROBACIÓN

DESCRIPCION

MEJORAMIENTO RIEGO RIO CATO

EMBALSE NIBLINTO - REGION DEL BIO-BIO

ESCALA

1:25.000

PROYECCION CARTOGRAFICA

WGS84

ENCUENTRO

GEOSID

FECHA

AGOSTO 2012

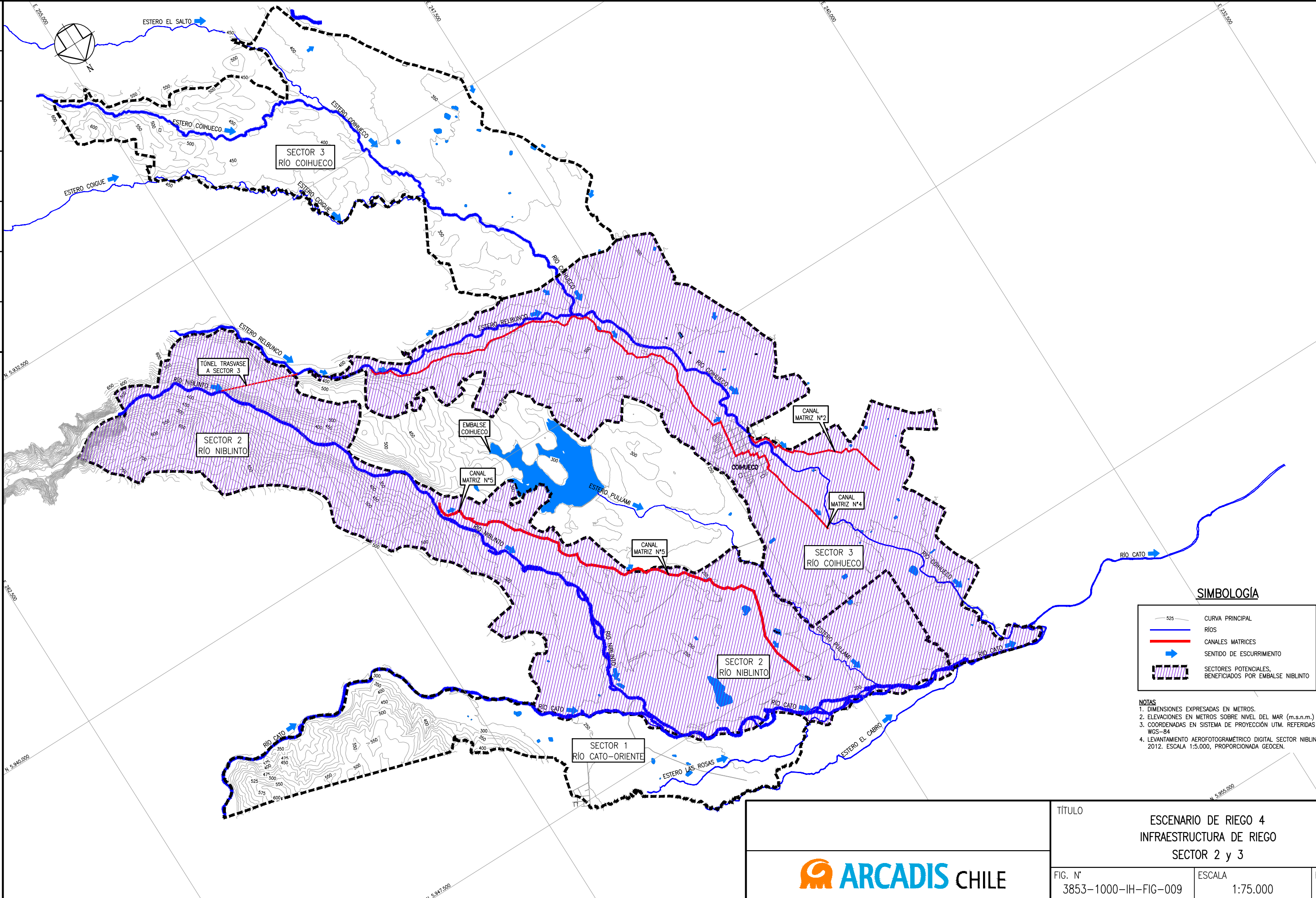
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1 DE 4



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|--------|--------|----------|--------|----------|--------|----------|
| PROY.  | DISEÑO | FECHA    | DIBUJÓ | FECHA    | REVISÓ | FECHA    |
| S.P.A. | S.P.A. | 01.08.12 | A.O.M. | 01.08.12 | P.Z.C. | 09.10.12 |

FECHA PLOTEO:



TÍTULO  
ESCENARIO DE RIEGO 4  
INFRAESTRUCTURA DE RIEGO  
SECTOR 2 y 3

FIG. N°  
3853-1000-IH-FIG-009

ESCALA  
1:75.000

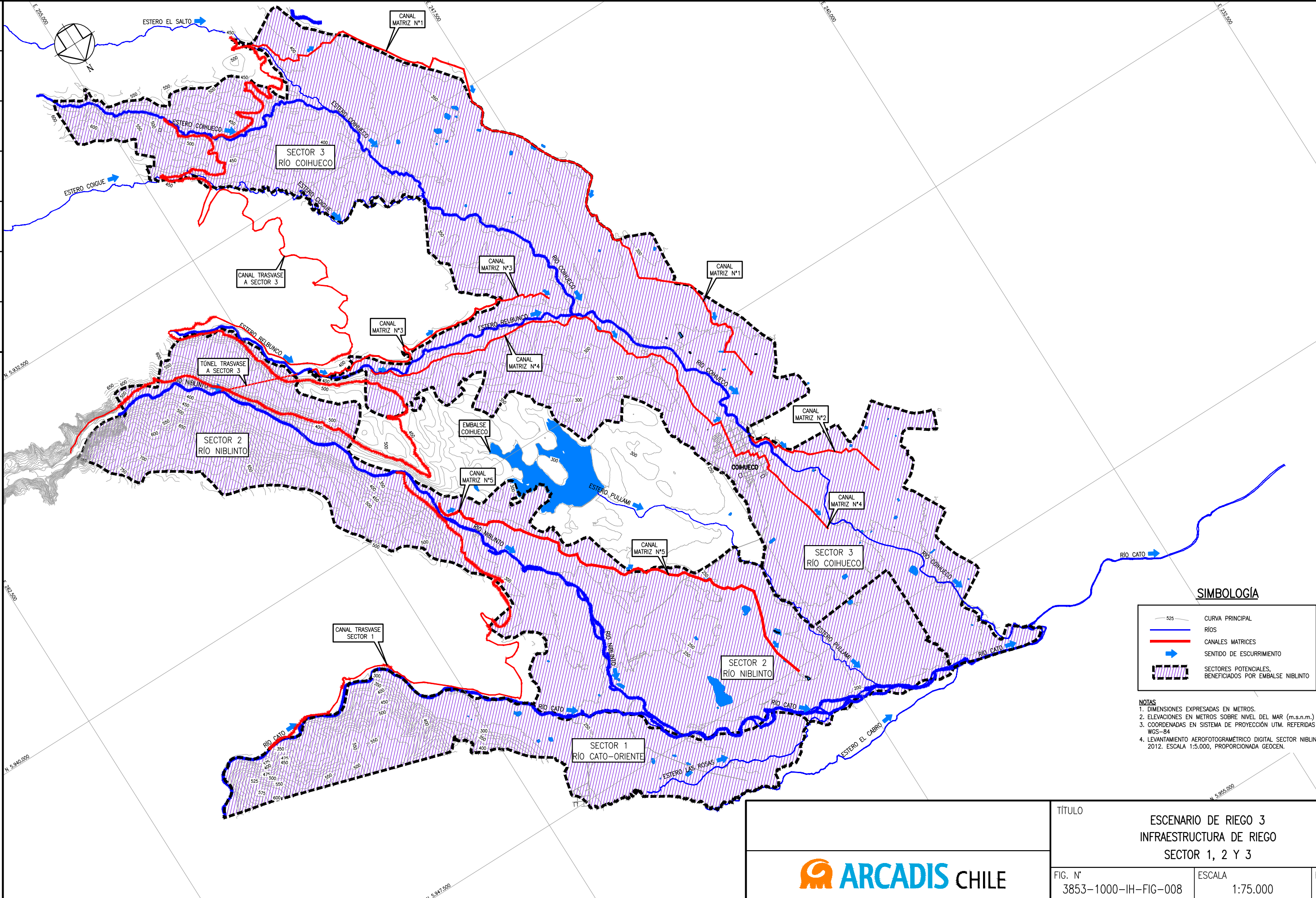
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ARCHIVO CAD:



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|--------|--------|----------|--------|----------|--------|----------|
| PROY.  | DISEÑO | FECHA    | DIBUJÓ | FECHA    | REVISÓ | FECHA    |
| A.O.M. | S.P.A. | 01.08.12 | A.O.M. | 01.08.12 | P.Z.C. | 09.10.12 |

FECHA PLOTEO:



#### SIMBOLOGÍA

|  |                                                         |
|--|---------------------------------------------------------|
|  | CURVA PRINCIPAL                                         |
|  | RIOS                                                    |
|  | CANALES MATRICES                                        |
|  | SENTIDO DE ESCURRIMIENTO                                |
|  | SECTORES POTENCIALES, BENEFICIADOS POR EMBALSE NIBLINTO |

- NOTAS
1. DIMENSIONES EXPRESADAS EN METROS.
  2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).
  3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM WGS-84.
  4. LEVANTAMIENTO AEROFOTOGRAMÉTRICO DIGITAL SECTOR NIBLINTO, JUNIO 2012. ESCALA 1:5.000, PROPORCIONADA GEOCEN.



TÍTULO

ESCENARIO DE RIEGO 3  
INFRAESTRUCTURA DE RIEGO  
SECTOR 1, 2 Y 3

FIG. N°  
3853-1000-IH-FIG-008

ESCALA  
1:75.000

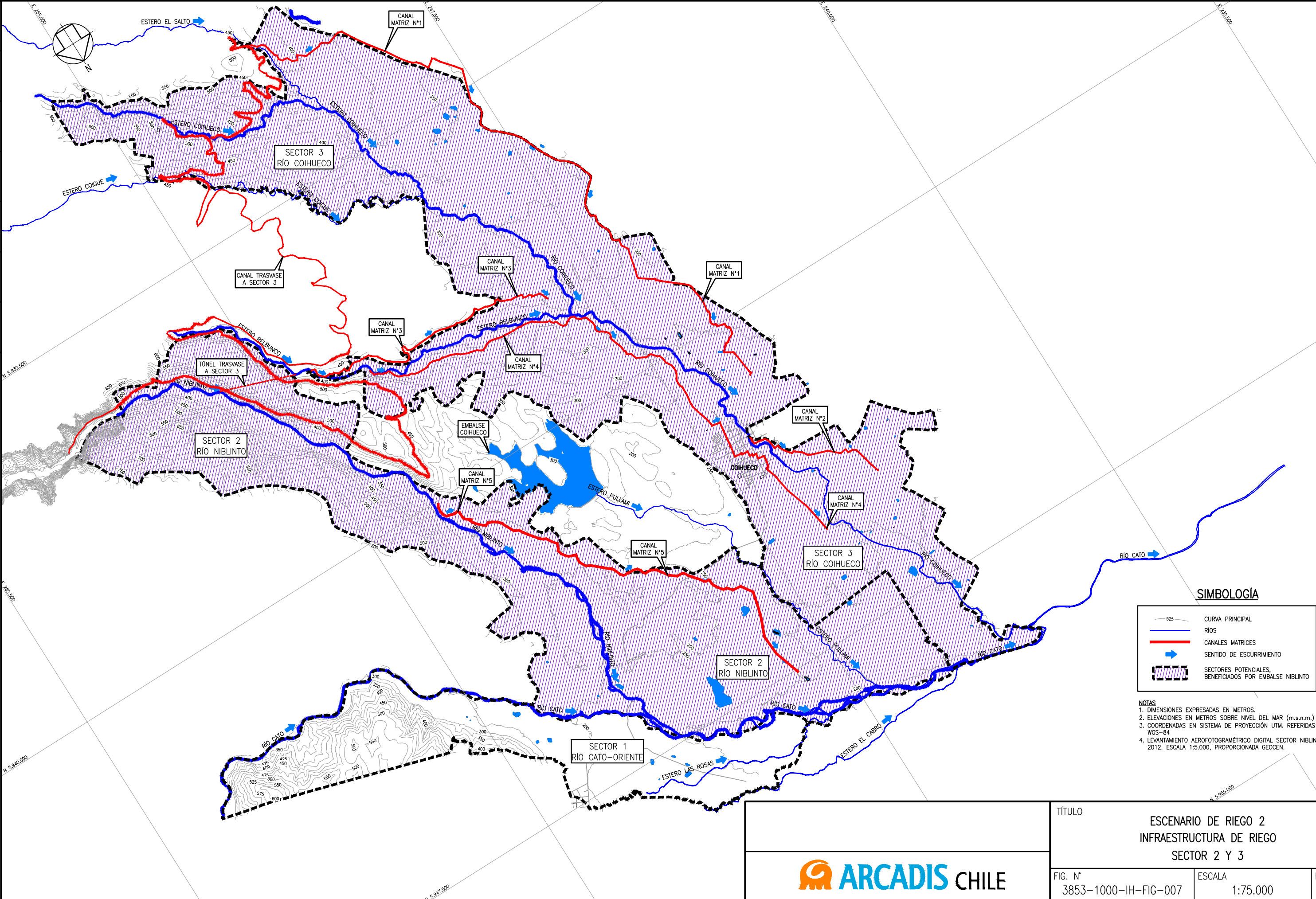
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| PROY.  | DISEÑO | FECHA    | DIBUJÓ | FECHA    | REVISÓ | FECHA    |
| A.O.M. | S.P.A. | 01.08.12 | A.O.M. | 01.08.12 | P.Z.C. | 09.10.12 |

FECHA PLOTEO:



### SIMBOLOGÍA

|  |                                                         |
|--|---------------------------------------------------------|
|  | CURVA PRINCIPAL                                         |
|  | RIOS                                                    |
|  | CANALES MATRICES                                        |
|  | SENTIDO DE ESCURRIMIENTO                                |
|  | SECTORES POTENCIALES, BENEFICIADOS POR EMBALSE NIBLINTO |

**NOTAS**  
 1. DIMENSIONES EXPRESADAS EN METROS.  
 2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).  
 3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM WGS-84.  
 4. LEVANTAMIENTO AEROFOTOGRAMÉTRICO DIGITAL SECTOR NIBLINTO, JUNIO 2012. ESCALA 1:5.000, PROPORCIONADA GEOCEN.



TÍTULO  
 ESCENARIO DE RIEGO 2  
 INFRAESTRUCTURA DE RIEGO  
 SECTOR 2 Y 3

FIG. N°  
 3853-1000-IH-FIG-007

ESCALA  
 1:75.000

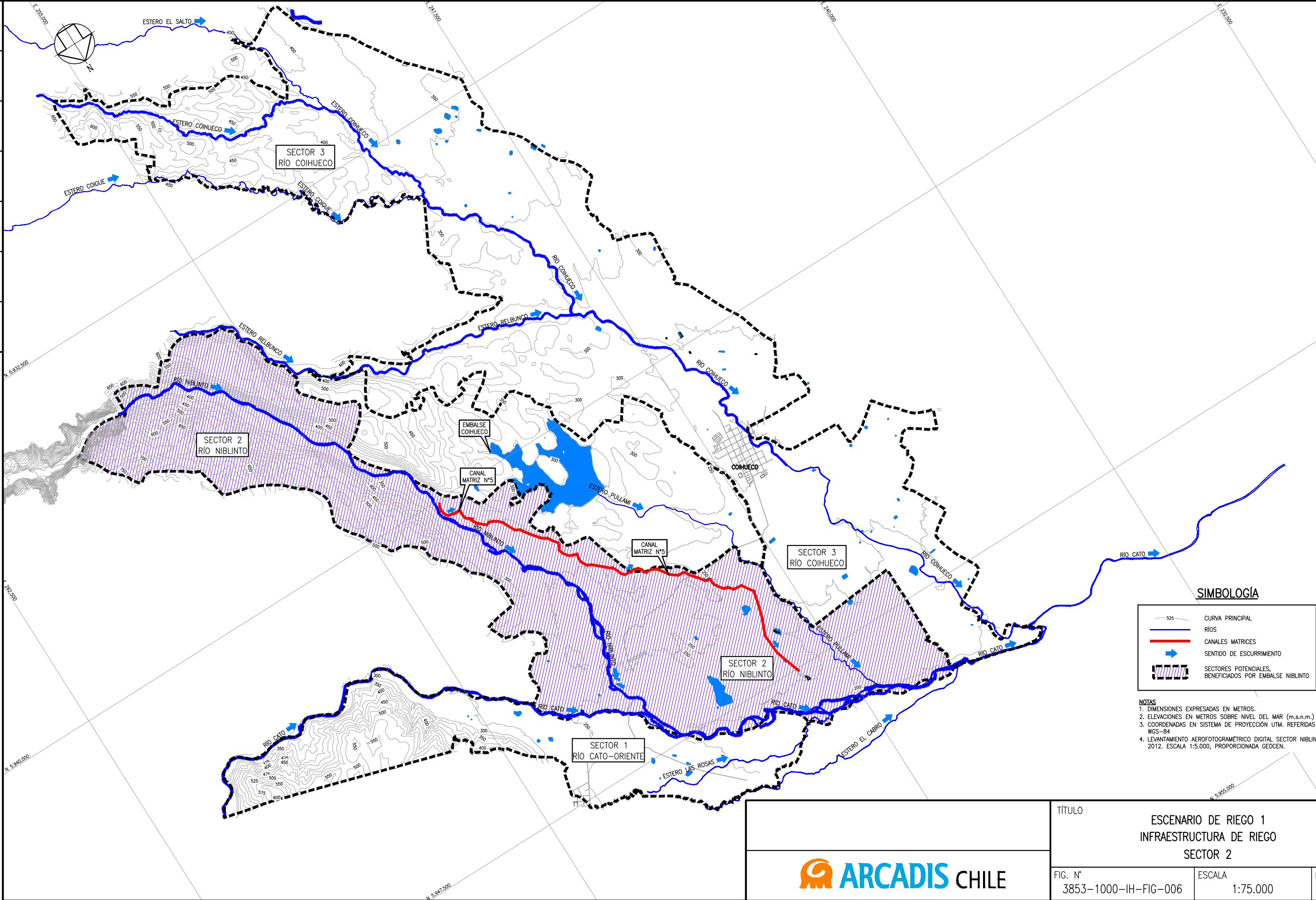
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ARCHIVO CAD:



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| PROY.  | DISEÑO | FECHA    | DIBUJÓ | FECHA    | REVISÓ | FECHA    |
| A.O.M. | S.P.A. | 01.08.12 | A.O.M. | 01.08.12 | P.Z.C. | 09.10.12 |

FECHA PLOTEO:



TÍTULO  
ESCENARIO DE RIEGO 1  
INFRAESTRUCTURA DE RIEGO  
SECTOR 2

FIG. N°  
3853-1000-IH-FIG-006

ESCALA  
1:75.000

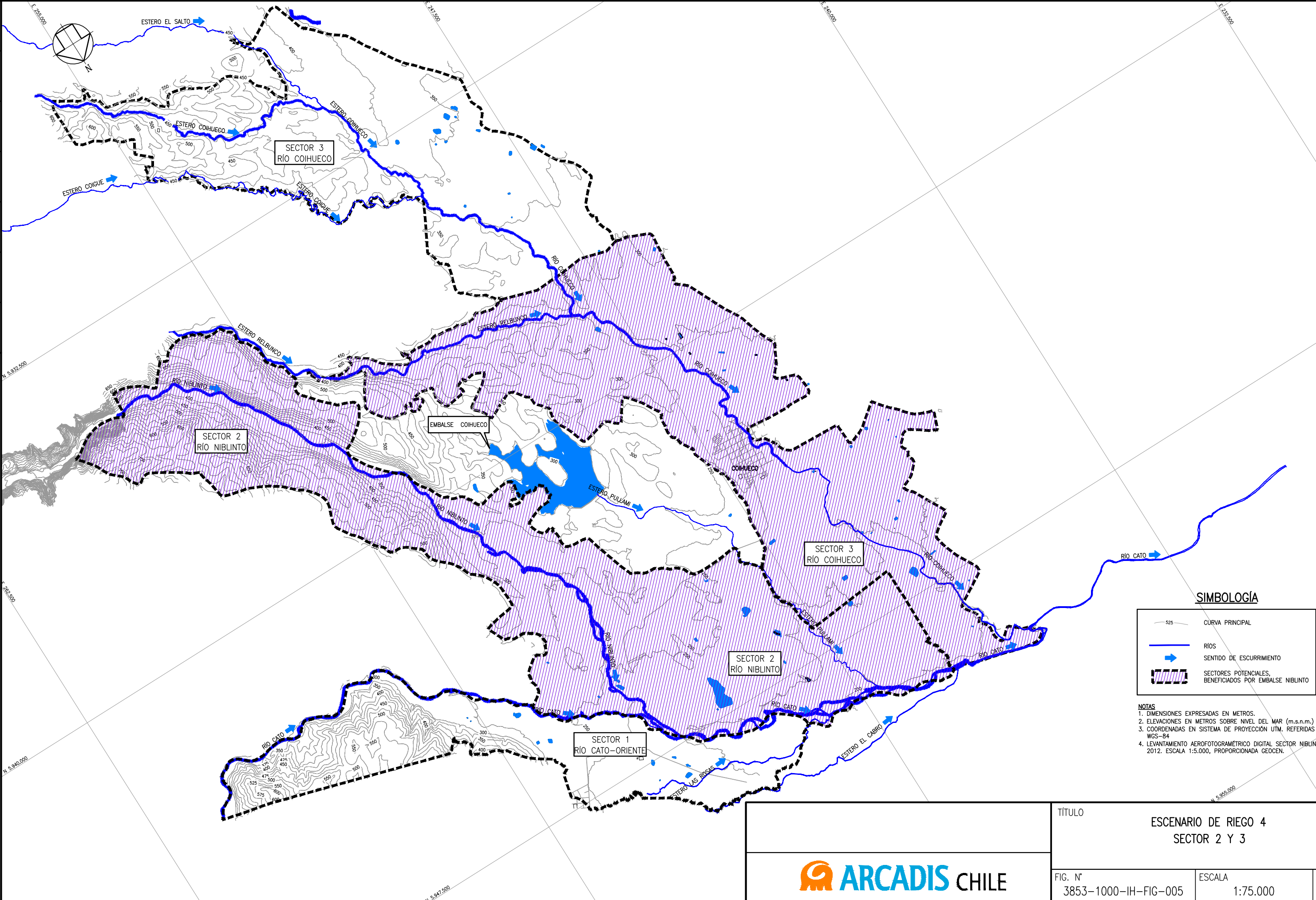
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ARCHIVO CAD:



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|--------|--------|----------|--------|----------|--------|----------|
| PROY.  | DISEÑO | FECHA    | DIBUJÓ | FECHA    | REVISÓ | FECHA    |
| S.P.A. | S.P.A. | 01.08.12 | A.O.M. | 01.08.12 | P.Z.C. | 09.10.12 |

FECHA PLOTEO:



#### SIMBOLOGÍA

|  |                                                         |
|--|---------------------------------------------------------|
|  | CURVA PRINCIPAL                                         |
|  | RIOS                                                    |
|  | SENTIDO DE ESCURRIMIENTO                                |
|  | SECTORES POTENCIALES, BENEFICIADOS POR EMBALSE NIBLINTO |

- NOTAS
1. DIMENSIONES EXPRESADAS EN METROS.
  2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.)
  3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM WGS-84
  4. LEVANTAMIENTO AEROFOTOGRAMÉTRICO DIGITAL SECTOR NIBLINTO, JUNIO 2012. ESCALA 1:5.000, PROPORCIONADA GEOCEN.



TÍTULO  
ESCENARIO DE RIEGO 4  
SECTOR 2 Y 3

FIG. N°  
3853-1000-IH-FIG-005

ESCALA  
1:75.000

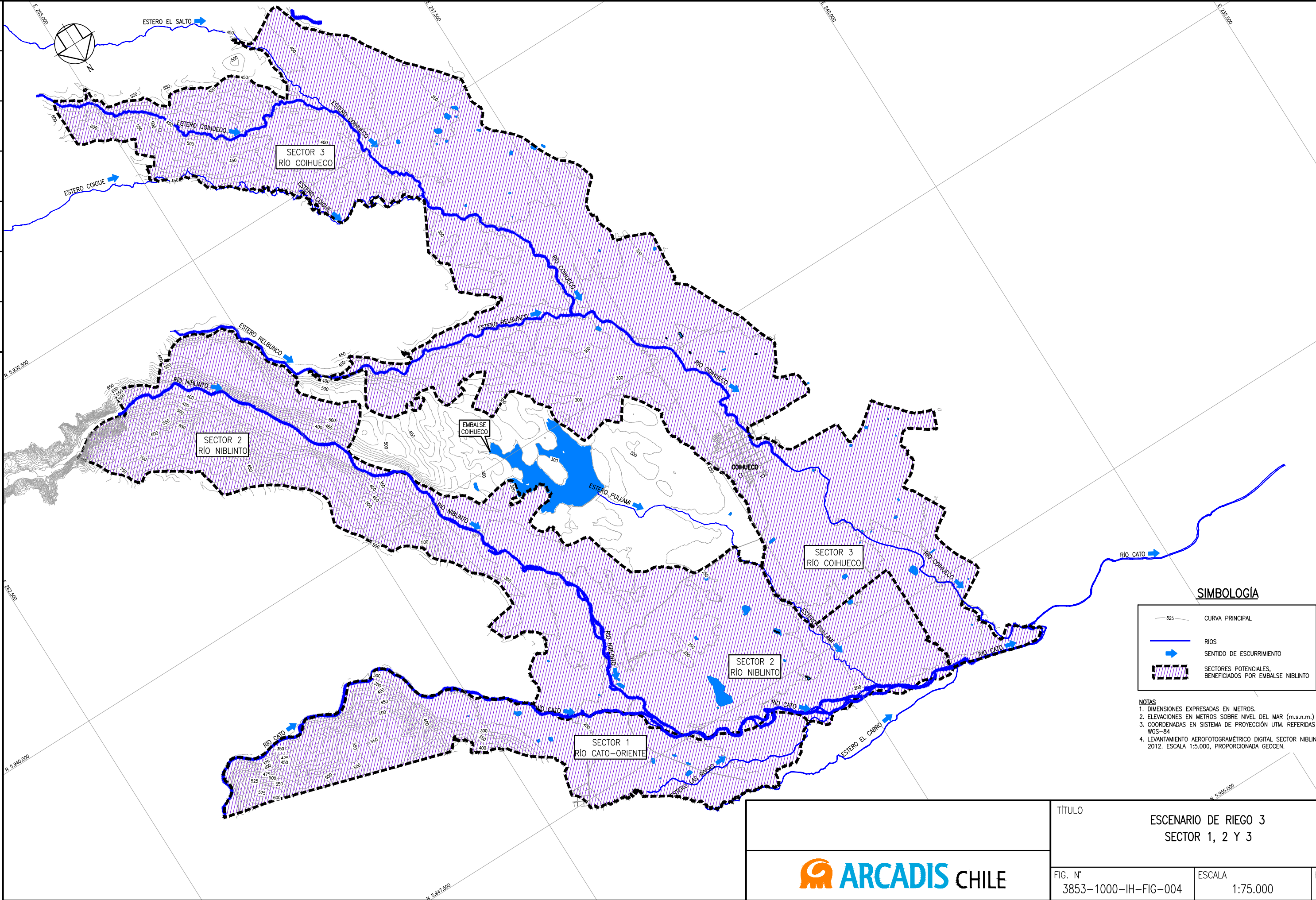
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ARCHIVO CAD:



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| PROY.  | DISEÑO | FECHA    | DIBUJÓ | FECHA    | REVISÓ | FECHA    |
| A.O.M. | S.P.A. | 01.08.12 | A.O.M. | 01.08.12 | P.Z.C. | 09.10.12 |

FECHA PLOTEO:



SIMBOLOGÍA

|  |                                                            |
|--|------------------------------------------------------------|
|  | CURVA PRINCIPAL                                            |
|  | RIOS<br>SENTIDO DE ESCURRIMIENTO                           |
|  | SECTORES POTENCIALES,<br>BENEFICIADOS POR EMBALSE NIBLINTO |

- NOTAS
1. DIMENSIONES EXPRESADAS EN METROS.
  2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).
  3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM WGS-84.
  4. LEVANTAMIENTO AEROFOTOGRAMÉTRICO DIGITAL SECTOR NIBLINTO, JUNIO 2012. ESCALA 1:5.000, PROPORCIONADA GEOCEN.

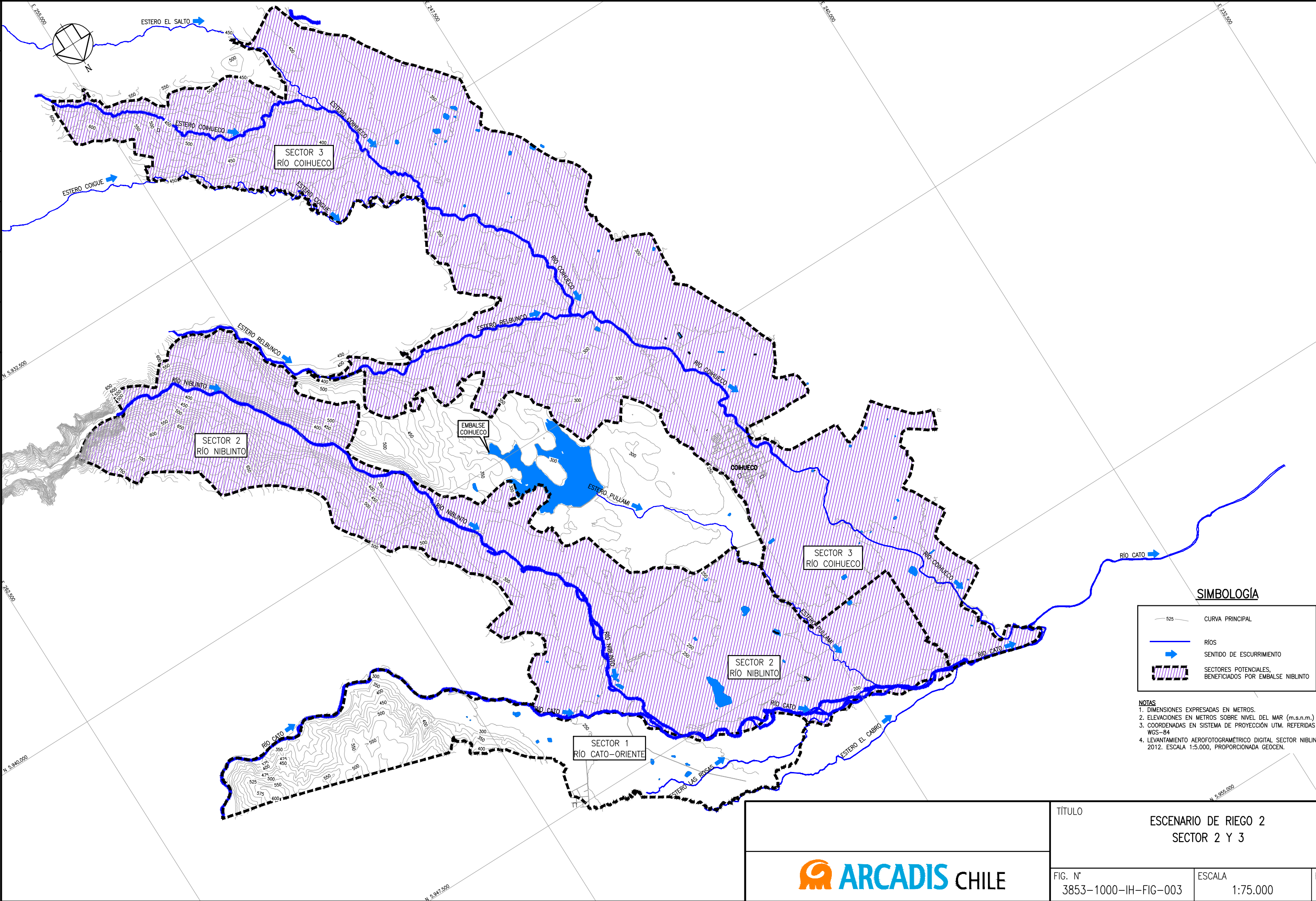
|  |        |                                         |           |
|--|--------|-----------------------------------------|-----------|
|  | TÍTULO |                                         |           |
|  |        |                                         |           |
|  |        | ESCENARIO DE RIEGO 3<br>SECTOR 1, 2 Y 3 |           |
|  |        | FIG. N°<br>3853-1000-IH-FIG-004         | REV.<br>0 |
|  |        | ESCALA<br>1:75.000                      |           |

ARCHIVO CAD:



|        |        |          |        |          |        |          |
|--------|--------|----------|--------|----------|--------|----------|
| PROY.  | DISEÑO | FECHA    | DIBUJÓ | FECHA    | REVISÓ | FECHA    |
| A.O.M. | S.P.A. | 01.08.12 | A.O.M. | 01.08.12 | P.Z.C. | 09.10.12 |

FECHA PLOTEO:



### SIMBOLOGÍA

|  |                                                         |
|--|---------------------------------------------------------|
|  | CURVA PRINCIPAL                                         |
|  | RIOS                                                    |
|  | SENTIDO DE ESCURRIMIENTO                                |
|  | SECTORES POTENCIALES, BENEFICIADOS POR EMBALSE NIBLINTO |

NOTAS  
1. DIMENSIONES EXPRESADAS EN METROS.  
2. ELEVACIONES EN METROS SOBRE NIVEL DEL MAR (m.s.n.m.).  
3. COORDENADAS EN SISTEMA DE PROYECCIÓN UTM. REFERIDAS AL DATUM WGS-84.  
4. LEVANTAMIENTO AEROFOTOGRAMÉTRICO DIGITAL SECTOR NIBLINTO, JUNIO 2012. ESCALA 1:5.000, PROPORCIONADA GEOCEN.



TÍTULO  
ESCENARIO DE RIEGO 2  
SECTOR 2 Y 3

FIG. N°  
3853-1000-IH-FIG-003

ESCALA  
1:75.000

REV.  
0

ARCHIVO CAD:



|        |        |          |        |          |        |          |
|--------|--------|----------|--------|----------|--------|----------|
| PROY.  | DISEÑO | FECHA    | DIBUJÓ | FECHA    | REVISÓ | FECHA    |
| A.O.M. | S.P.A. | 01.08.12 | A.O.M. | 01.08.12 | P.Z.C. | 09.10.12 |

FECHA PLOTEO:

