

Governo do Estado do Ceará
Secretaria dos Recursos Hídricos - SRH
Programa de Gerenciamento e Integração dos Recursos
Hídricos do Estado do Ceará - PROGERIRH



Contrato Nº 11 / PROGERIRH / CE / SRH / 2003

ELABORAÇÃO DOS ESTUDOS DE VIABILIDADES TÉCNICAS, AMBIENTAIS, ECONÔMICAS, EIAS - RIMAS, PROJETOS EXECUTIVOS, LEVANTAMENTOS CADASTRAIS E PLANOS DE REASSENTAMENTOS DE POPULAÇÕES, MANUAIS DE OPERAÇÃO E MANUTENÇÃO E AVALIAÇÃO FINANCEIRA E ECONÔMICA REFERENTES ÀS BARRAGENS: MAMOEIRO, RIACHO DO MEIO, MELANCIA, JATOBÁ E JUCÁ E ADUTORAS DE ANTONINA DO NORTE, GRANJEIRO, CROATÁ E IPUEIRAS

BARRAGEM MAMOEIRO

MÓDULO II - ESTUDOS BÁSICOS, ANTEPROJETOS E AVALIAÇÕES

VOLUME I - ESTUDOS BÁSICOS

TOMO 3A - ESTUDOS CARTOGRÁFICOS

ESTUDOS TOPOGRÁFICOS - EIXO BARRÁVEL E SANGRADOURO

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ESTUDOS TOPOGRÁFICOS – EIXO BARRÁVEL E SANGRADOURO

RELATÓRIO TÉCNICO

EDITADO EM MARÇO DE 2006

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APRESENTAÇÃO

O consórcio KL - Serviços de Engenharia S/S Ltda, MABE – Infra-Estrutura e Serviços Ltda e ENERCONSULT S/A, no âmbito do contrato Nº11/PROGERIRH/CE/SRH/2003 do Programa de Gerenciamento e Integração dos Recursos Hídricos do Estado do Ceará – PROGERIRH tem por finalidade a Elaboração dos Estudos de Viabilidades Técnicas, Ambientais, Econômicas, Eias - Rimas, Projetos Executivos, Levantamentos Cadastrais e Planos de Reassentamentos de Populações, Manuais de Operação e Manutenção e Avaliação Financeira e Econômica referentes às Barragens: Mamoeiro, Riacho do Meio, Melancia, Jucá e Jatobá e Adutoras de Antonina do Norte, Granjeiro, Croatá e Ipueiras.

Os estudos desenvolvidos, em atendimento aos Termos de Referência, são constituídos por atividades multidisciplinares que permitem a elaboração de relatórios específicos organizados em Módulos, Volumes e Tomos. As partes e tomos que compõem o acervo do contrato são apresentados na seqüência:

Módulo I: Estudos de Alternativas de Localização das Barragens e Adutoras

VOLUME I: Estudo de Alternativas e Opções para a Localização dos Eixos Barráveis e Adutoras

Módulo II: Estudos Básicos, Anteprojetos e Avaliações

VOLUME I: Estudos Básicos

TOMO 1 – Relatório Geral - Textos

TOMO 2 – Estudos Hidrológicos

TOMO 3 – Estudos Cartográficos

TOMO 4 – Estudos Geológicos e Geotécnicos

TOMO 5 – Estudos Pedológicos

VOLUME II: Anteprojetos

TOMO 1 – Relatório de Concepção Geral

TOMO 1A – Desenhos e Plantas

TOMO 1B – Memoria de Calculo

VOLUME III: Avaliações Financeiras e Econômicas

TOMO 1 – Relatório de Avaliações Financeira e Econômica

Módulo III: Estudos dos Impactos no Meio Ambiente (EIA/RIMA)

VOLUME I: EIA

VOLUME II: RIMA

Módulo IV: Detalhamento do Projeto Executivo das Barragens

VOLUME I: Detalhamento do Projeto Executivo

TOMO 1 – Memorial Descritivo do Projeto

TOMO 2 – Desenhos do Projeto

TOMO 3 – Memória de Cálculo

TOMO 4 – Especificações Técnicas

TOMO 5 – Quantitativos e Orçamentos

TOMO 6 – Síntese

Módulo V: Levantamento Cadastral e Plano de Reassentamento

VOLUME I: Levantamento Cadastral

TOMO 1 – Relatório Geral

TOMO 2 – Laudos Individuais de Avaliação

TOMO 3 – Levantamentos Topográficos

VOLUME II: Plano de Reassentamento

TOMO 1 – Relatório Final de Reassentamento

Módulo VI: Projeto Executivo das Adutoras

VOLUME I: Estudos Básicos

TOMO 1 – Levantamentos Topográficos

TOMO 2 – Investigações Geotécnicas

VOLUME II: Anteprojeto

VOLUME III: Detalhamento do Projeto Executivo

TOMO 1 – Memorial Descritivo

TOMO 2 – Memória de Cálculo

TOMO 3 – Quantitativos e Orçamentos

TOMO 4 – Especificações Técnicas e Normas de Medições

Módulo VII: Elaboração dos Manuais de Operação e Manutenção

VOLUME I: Manuais de Operação e Manutenção

O presente relatório que trata da **Barragem Mamoeiro**, aqui nomeado como Volume I – Estudos Básicos, Tomo 3A – Estudos Cartográficos (Estudos Topográficos – Eixo Barrável e Sangradouro), é parte integrante do Módulo II – Estudos Básicos, Anteprojetos e Avaliações.

1 – INTRODUÇÃO

O consórcio constituído pelas empresas KL – Serviços de Engenharia S/S Ltda, MABE – Infra-Estrutura e Serviços Ltda e ENERCONSULT S/A atendendo às atribuições do contrato N°11/PROGERIRH/SRH/2003 vem apresentar os Estudos Topográficos da Barragem Mamoeiro.

O relatório é desenvolvido a seguir abordando os seguintes tópicos:

- Levantamento do Eixo Barrável e do Sangradouro;
- Levantamento do Canal de Restituição;
- Coordenadas e Cotas;
- Serviços Executados;
- Anexos.

2 – LEVANTAMENTO DO EIXO BARRÁVEL E DO SANGRADOURO

Os levantamentos topográficos do eixo barrável e do sangradouro, foram executados através de locação de Estação Total, pelo método de coordenadas com identificação dos eixos: Este, Norte, elevação e descrição dos pontos identificados. Os serviços realizados foram: locação; implantação de marcos para futura relocação; nivelamento e levantamento de seções transversais.

A visualização destes serviços consta dos desenhos ilustrativos números 01 e 02 apresentados no Anexo 4 – Desenhos.

2.1 – LOCAÇÃO DOS EIXOS E IMPLANTAÇÃO DE MARCOS

Utilizando-se GPS e a Estação Total descrita anteriormente, locou-se o eixo da barragem e do sangradouro, o qual foi materializado a cada 20 metros por pontos estaqueados e numerados, sendo também indicados através de estacas inteiras ou fracionadas todos os pontos notáveis tais como: talvegues, estradas, afloramentos rochosos, rede elétrica, elevações, mudanças bruscas de inclinação do terreno entre outros.

Para locação do eixo barrável foi utilizado o marco MA-01 com referência no marco MA-02, com uma deflexão de $167^{\circ} 45' 25''$ e uma distância de 46,20 metros, locando-se assim a estaca-00, localizada na ombreira esquerda, para melhor locação do eixo se fez necessária uma deflexão de $11^{\circ} 21' 25''$, seguindo-se até a estaca 35+0,23, e no sentido oposto a partir da estaca -01 seguindo até o eixo do sangradouro, estaca ES13+6,15, coincidente com a estaca -27, totalizando uma extensão de 1.240,58 metros.

O eixo do sangradouro levantado inicialmente possui estaqueamento no mesmo sentido, isto é, o estaqueamento cresce da esquerda para a direita, partindo da estaca ES00 e finalizando na estaca ES13+6,15, e complementado posteriormente da estaca ES00 até a estaca ES-03, perfazendo um total de 326,15 metros de extensão.

O quadro a seguir apresenta a relação dos marcos implantados.

Marco	Estaca	Coordenadas UTM (m)	
		Este	Norte
MA-01	-	381909.806	9249443.228
MA-02	-	382478.569	9249536.267

2.2 – NIVELAMENTO

O levantamento altimétrico da barragem Mamoeiro e o seu respectivo sangradouro, foi realizado utilizando-se GPS e Estação Total, onde foram niveladas todas as estacas do eixo materializado. A partir deste levantamento, gerou-se o perfil longitudinal do terreno natural no eixo da barragem e do sangradouro (ver Desenho 05 no Anexo 4 – Desenhos).

2.3 – LEVANTAMENTO DE SEÇÕES TRANSVERSAIS

Foram levantadas seções transversais ao eixo da barragem e do sangradouro a cada 20 metros abrangendo uma faixa de domínio com largura de 150 metros à montante e à jusante, e se constituíram de pontos cotados a cada 10 metros, considerando também os pontos de destaque do relevo topográfico.

3 – LEVANTAMENTO DO CANAL DE RESTITUIÇÃO

Assim como o eixo barrável e o sangradouro, o canal de restituição da barragem Mamoeiro, foi levantado plani-altimetricamente através de Estação Total, pelo método de coordenadas com identificação dos eixos: Este, Norte, elevação e descrição dos pontos identificados. Os serviços topográficos executados no canal de restituição, foram os seguintes: locação; nivelamento e levantamento de seções transversais.

3.1 – LOCAÇÃO

Locou-se o canal de restituição utilizando-se Estação Total, o qual foi estaqueado e numerado a cada 50 metros, sendo também indicados através de estacas inteiras ou fracionadas todos os pontos notáveis do relevo.

A partir da estaca 02 do eixo do sangradouro, foi locada a poligonal do canal de restituição, partindo da estaca S0 até a estaca –S13+10,26 metros, à montante, e da estaca S0 a estaca S62+7,65 metros, acompanhando o talvegue à jusante que conduzirá o caudal de sangria até o Rio, totalizando 1.517,91 metros de extensão.

3.2 – NIVELAMENTO E LEVANTAMENTO DE SEÇÕES TRANSVERSAIS

Utilizando-se o mesmo equipamento citado no item anterior, realizou-se o levantamento altimétrico da poligonal do canal de restituição, através de seccionamento a cada 50 metros, com 100 metros de largura para cada lado, com pontos cotados a cada 10 metros. A partir desse levantamento foi elaborada uma planta baixa com curvas de nível do terreno natural a cada metro (ver Desenho 03 e 04 no Anexo 4 – Desenhos).

4 – COORDENADAS E COTAS

4.1 – COORDENADAS

Em relação às coordenadas utilizadas para o levantamento, estas foram fornecidas pela TOPOCART, empresa responsável pelos serviços cartográficos.

4.2 – COTAS

Também foram utilizadas cotas fornecidas pela TOPOCART, empresa responsável pelos serviços cartográficos.

5 – SERVIÇOS EXECUTADOS

Os serviços executados são descritos a seguir:

- ◆ Locação e Nivelamento do Eixo Barrável e do Sangradouro1,57Km;
- ◆ Locação e Nivelamento da Poligonal do Canal de Sangria e da Calha do Rio.....1,52 Km;
- ◆ Seccionamento do Eixo Barrável e do Sangradouro.....25,11Km;

As cadernetas de campo referente aos serviços acima citados estão apresentados nos Anexos 1, 2 e 3.

ANEXOS

ANEXO 1 – CADERNETAS DE CAMPO – LOCAÇÃO E NIVELAMENTO DO EIXO BARRÁVEL E DO SANGRADOURO

E00 | 381866.819 | 9249426.272 | 405.969

E1 | 381886.582 | 9249429.821 | 402.308

E10 | 382063.799 | 9249461.597 | 353.454

E11 | 382083.351 | 9249465.105 | 349.183

E12 | 382103.035 | 9249468.637 | 346.617

E13 | 382122.898 | 9249472.196 | 345.961

E14 | 382142.441 | 9249475.701 | 343.705

E15 | 382162.311 | 9249479.264 | 341.764

E16 | 382182.033 | 9249482.796 | 339.620

E17 | 382201.852 | 9249486.352 | 339.534

E18=BRC | 382221.586 | 9249489.890 | 339.085

E19 | 382241.269 | 9249493.416 | 336.619

E1 | 381886.566 | 9249429.815 | 402.292

E2 | 381906.256 | 9249433.348 | 397.334

E20=BRC | 382260.994 | 9249496.944 | 339.466

E21 | 382280.640 | 9249500.468 | 341.658

E22 | 382300.353 | 9249503.846 | 341.243

E23 | 382320.028 | 9249507.212 | 343.488

E24 | 382339.667 | 9249510.575 | 348.765

E25 | 382359.319 | 9249513.942 | 354.992

E26 | 382379.008 | 9249517.318 | 361.783

E27 | 382398.789 | 9249520.702 | 368.380

E28 | 382418.277 | 9249524.043 | 377.134

E29 | 382438.299 | 9249527.472 | 383.240

E3|381926.033|9249436.896|391.298
E30|382457.986|9249530.843|389.346
E31|382477.682|9249534.221|393.012
E32|382497.397|9249537.593|397.896
E33|382516.952|9249540.948|399.739
E34|382536.826|9249544.325|400.471
E4|381945.675|9249440.418|384.580
E5|381965.319|9249443.941|379.588
E6|381985.054|9249447.479|374.087
E7|382004.586|9249450.982|367.905
E8|382024.356|9249454.526|362.890
E9|382044.144|9249458.075|358.049
E35+0.23|382556.437|9249547.688|401.433
ES0|381227.052|9249407.601|371.974
ES0+18.66|381244.838|9249401.960|367.495
ES1|381246.107|9249401.558|367.689
ES2|381265.120|9249395.528|365.643
ES2+10.37|381275.002|9249392.394|361.624
ES3|381284.248|9249389.461|360.257
ES4|381303.335|9249383.408|355.760
ES4+12.45|381315.115|9249379.672|354.218
ES5|381322.386|9249377.366|355.521
ES6|381341.368|9249371.346|357.928
ES7|381360.545|9249365.265|361.942

ANEXO 2 – CADERNETAS DE CAMPO – LOCAÇÃO E NIVELAMENTO DA POLIGONAL DO CANAL DE SANGRIA E DA CALHA DO RIO

1EB|381279.541|9249507.959|372.489

2EB|381298.616|9249501.935|371.743

3EA|381317.858|9249495.861|370.066

4EA|381315.556|9249421.998|361.269

4EB|381337.004|9249489.765|367.775

5DA|381305.504|9249324.360|354.762

6DA|381321.065|9249307.852|355.242

7DA|381340.195|9249301.741|357.640

BAN|381418.333|9250050.411|348.812

BAN|381419.074|9250051.400|348.652

BAN|381419.484|9250050.518|348.712

BAN|381419.911|9250051.553|348.482

BAN|381420.487|9250048.924|348.364

BAN|381421.550|9250050.346|348.190

BE|381307.631|9250006.400|354.342

BE|381313.378|9250006.048|353.979

BE|381317.462|9250027.570|353.138

BE|381321.268|9250024.483|353.096

BE|381325.980|9250035.357|352.745

BE|381329.018|9250032.002|352.574

BE|381348.557|9250054.561|351.792

BE|381350.950|9250050.616|351.760

BE|381365.022|9250067.502|350.733

BE|381383.956|9250082.885|349.493

BE|381387.335|9250080.165|349.701
BE|381409.586|9250104.528|348.538
BE|381413.719|9250101.684|348.343
BE|381419.950|9250105.612|348.035
BE|381430.711|9250119.115|347.526
BE|381439.739|9250127.600|346.745
BE|381443.677|9250124.578|346.825
BE|381445.628|9250137.474|346.174
BE|381448.293|9250133.044|346.407
BE|381448.500|9250134.828|346.331
BE|381455.586|9250154.673|345.308
BE|381459.921|9250152.487|345.644
BE|381470.338|9250192.153|342.757
BE|381473.924|9250191.877|342.823
CA|381398.300|9250103.739|348.548
CA|381408.559|9250082.472|349.463
CA|381408.855|9250083.075|349.526
CA|381410.576|9250078.618|349.503
CA|381410.633|9250078.611|349.544
CA|381411.795|9250074.204|349.638
CA|381411.834|9250074.107|349.575
CA|381415.235|9250070.931|349.246
CA|381415.904|9250091.258|348.963
CA|381426.583|9250084.462|348.901
CA|381428.545|9250051.263|347.250
CA|381429.528|9250045.236|346.408

CA|381430.678|9250160.407|345.612
CA|381434.471|9250146.726|345.899
CA|381439.523|9250153.037|345.915
CA|381483.684|9250148.482|344.635
CA|381492.826|9250146.651|344.232
CA|381495.042|9250145.153|344.238
CA|381497.440|9250148.320|343.941
CACE|381396.498|9250099.645|349.019
CACE|381426.252|9250046.933|347.269
CACE|381488.308|9250154.906|344.523
CE|381237.200|9249664.295|362.831
CE|381260.914|9249611.754|360.877
CE|381292.430|9249544.418|369.134
CE|381304.063|9249519.595|370.790
CE|381307.894|9249530.422|369.731
CE|381311.608|9249541.967|368.168
CE|381316.625|9249489.522|370.146
CE|381328.270|9249461.610|365.973
CE|381334.528|9249413.561|357.366
CE|381340.092|9249367.409|358.085
CE|381342.186|9250014.032|354.422
CE|381344.108|9250016.573|354.532
CE|381345.983|9249319.358|358.990
CE|381347.449|9250019.602|353.261
CE|381382.106|9250062.138|350.960
CE|381383.470|9250084.317|349.698

CE|381394.697|9249997.271|350.848
CE|381397.553|9249988.628|354.123
CE|381402.791|9250087.115|349.519
CE|381406.161|9250132.071|346.899
CE|381408.595|9250082.460|349.452
CE|381411.088|9250134.364|346.794
CE|381418.459|9250033.937|347.805
CE|381424.871|9250120.142|347.762
CE|381426.656|9249974.826|353.939
CE|381431.747|9250162.042|344.780
CE|381432.782|9250128.467|347.116
CE|381447.099|9250182.906|343.484
CE|381454.085|9250013.641|347.189
CE|381456.472|9250195.836|342.440
CE|381463.127|9250207.708|341.412
CE|381472.930|9250125.399|344.913
CE|381480.916|9250192.220|343.305
CE|381481.871|9250052.625|346.340
CE|381498.085|9250165.073|344.244
CE|381506.124|9250123.701|341.354
CE|381509.509|9250090.002|343.078
CE|381521.668|9250106.805|341.128
CE|381522.828|9250141.893|341.620
CE|381548.098|9250127.755|340.570
CE|381564.781|9250149.589|339.914
CE|381564.838|9250145.180|339.987

CE|381594.486|9250299.003|340.739
CE|381606.946|9250289.184|338.658
CE|381623.886|9250131.164|342.864
CE|381628.600|9250271.033|340.465
CE|381665.960|9250240.989|341.086
CECA|381386.624|9250109.396|348.450
CECA|381490.083|9250143.906|344.599
CO|381181.190|9249264.691|358.739
CO|381184.355|9249274.465|359.804
CO|381188.263|9249286.644|360.262
CO|381193.367|9249302.446|361.708
CO|381197.058|9249252.473|356.057
CO|381197.529|9249315.234|363.897
CO|381200.088|9249323.236|364.672
CO|381201.153|9249260.830|356.006
CO|381203.525|9249333.914|364.192
CO|381204.719|9249270.887|356.564
CO|381205.207|9249269.723|356.378
CO|381205.548|9249339.815|366.308
CO|381206.755|9249343.620|366.372
CO|381207.058|9249279.593|357.814
CO|381210.280|9249289.012|358.117
CO|381213.348|9249298.075|358.863
CO|381213.474|9249364.803|366.826
CO|381215.828|9249307.058|359.403
CO|381216.064|9249372.954|368.860

CO|381216.508|9249252.386|353.068
CO|381218.838|9249316.372|359.851
CO|381219.142|9249382.658|368.959
CO|381220.828|9249326.549|360.380
CO|381222.517|9249265.291|351.861
CO|381223.203|9249395.464|370.792
CO|381223.791|9249334.851|361.559
CO|381225.760|9249342.936|362.560
CO|381227.033|9249276.624|352.683
CO|381228.087|9249664.849|363.736
CO|381228.179|9249350.893|364.087
CO|381230.823|9249419.494|372.702
CO|381231.028|9249359.527|365.272
CO|381231.656|9249621.669|361.583
CO|381231.770|9249289.660|352.467
CO|381232.175|9249244.216|352.589
CO|381233.453|9249368.043|366.588
CO|381234.920|9249249.366|350.283
CO|381235.382|9249377.544|367.253
CO|381235.531|9249434.344|373.873
CO|381237.264|9249304.218|353.803
CO|381237.729|9249620.127|360.344
CO|381237.883|9249387.127|368.330
CO|381238.873|9249444.880|374.768
CO|381239.079|9249314.449|352.982
CO|381240.074|9249256.954|348.982

CO|381240.208|9249393.751|368.267
CO|381242.860|9249457.459|375.346
CO|381243.685|9249326.760|357.046
CO|381244.266|9249266.368|349.512
CO|381244.278|9249266.366|349.520
CO|381245.637|9249334.823|358.703
CO|381247.214|9249661.216|361.313
CO|381247.547|9249275.023|349.898
CO|381248.223|9249343.266|358.526
CO|381248.717|9249408.791|369.636
CO|381249.548|9249283.257|349.928
CO|381250.551|9249481.692|374.243
CO|381250.956|9249352.078|359.944
CO|381251.943|9249417.273|370.399
CO|381252.304|9249291.021|349.925
CO|381252.813|9249614.893|358.809
CO|381253.322|9249300.061|350.886
CO|381253.333|9249360.143|360.043
CO|381253.734|9249491.563|373.596
CO|381254.623|9249308.188|352.565
CO|381255.165|9249425.158|370.837
CO|381255.680|9249366.655|361.357
CO|381256.831|9249501.332|372.665
CO|381257.329|9249238.323|348.329
CO|381257.674|9249318.097|353.096
CO|381258.333|9249374.149|363.296

CO|381258.368|9249433.236|370.847
CO|381259.054|9249657.328|359.463
CO|381260.253|9249512.124|371.579
CO|381260.852|9249382.084|362.792
CO|381261.702|9249441.183|371.551
CO|381262.120|9249251.952|347.073
CO|381262.381|9249327.242|354.641
CO|381262.569|9249387.492|364.213
CO|381263.433|9249522.153|371.035
CO|381264.823|9249449.095|372.945
CO|381265.462|9249469.934|374.862
CO|381266.416|9249336.912|353.477
CO|381266.558|9249610.462|361.579
CO|381266.565|9249270.270|347.821
CO|381266.769|9249532.675|370.169
CO|381267.460|9249456.993|373.241
CO|381267.965|9249479.499|374.445
CO|381268.480|9249407.078|367.203
CO|381268.697|9249345.778|353.867
CO|381269.458|9249281.878|348.222
CO|381270.049|9249653.816|357.654
CO|381270.360|9249543.998|369.146
CO|381270.474|9249355.566|355.986
CO|381271.605|9249463.741|373.280
CO|381271.613|9249417.371|368.036
CO|381271.695|9249488.538|373.426

CO|381273.047|9249292.232|349.174
CO|381274.218|9249556.167|367.849
CO|381274.635|9249607.547|361.803
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CO|381275.683|9249498.261|372.879
CO|381276.674|9249232.583|346.887
CO|381277.172|9249234.398|346.265
CO|381277.523|9249302.228|349.942
CO|381277.978|9249237.763|346.947
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CO|381281.754|9249249.639|347.718
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CO|381283.171|9249458.296|370.613
CO|381283.303|9249650.575|354.196
CO|381284.191|9249604.458|361.542
CO|381284.221|9249322.458|350.439
CO|381285.174|9249260.400|348.593
CO|381285.389|9249528.328|370.935
CO|381286.997|9249469.183|371.675
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CO|381287.652|9249398.793|361.858

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CO|381292.765|9249408.161|362.459
CO|381293.037|9249601.584|362.346
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CO|381297.434|9249418.010|363.847
CO|381297.459|9249234.286|347.284
CO|381297.842|9249363.452|353.338
CO|381298.616|9249501.935|371.743
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CO|381314.757|9249594.243|362.661
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CO|381315.061|9249354.902|355.329
CO|381317.439|9249233.059|347.758
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CO|381317.946|9249298.130|354.148
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CO|381324.471|9249450.105|364.292
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CO|381325.657|9249255.149|350.196
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CO|381335.037|9249351.787|357.870
CO|381335.158|9249285.593|355.257
CO|381337.671|9249423.987|358.232
CO|381337.926|9249295.129|356.655
CO|381338.045|9249585.649|361.159
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CO|381344.546|9249635.255|356.384
CO|381345.025|9249382.834|357.922
CO|381345.347|9249449.604|361.577
CO|381345.896|9249517.578|365.441
CO|381348.550|9249393.912|358.745
CO|381348.745|9249581.759|359.816
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CO|381349.441|9249460.900|362.777
CO|381349.491|9249330.321|359.927
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CO|381353.589|9249342.781|359.564
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CO|381380.692|9249358.704|366.031
CO|381381.195|9249498.280|366.921
CO|381383.293|9249437.050|365.987
CO|381383.383|9249994.898|354.437
CO|381383.881|9249506.457|366.503
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CO|381416.331|9249990.770|348.211
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CO|381421.514|9250104.093|348.056
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CO|381557.591|9250241.696|339.683
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CO|381566.010|9250236.810|340.002
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CO|381570.454|9250108.341|344.295
CO|381571.289|9250220.516|340.068
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CO|381573.901|9250172.693|339.435
CO|381576.178|9250231.075|340.023
CO|381577.023|9250100.674|345.922
CO|381579.753|9250290.311|340.137
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CS12|381598.798|9250276.311|339.035
CS13|381639.433|9250333.609|340.561
CS14|381633.318|9250361.685|339.143
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CS3|381327.898|9249639.573|356.905

CS4|381296.467|9249647.113|355.458
CS5|381409.384|9249982.166|354.025
CS6|381439.479|9250022.207|343.363
CS7|381462.188|9250067.184|341.781
CS8|381491.051|9250108.358|341.165
CS9|381525.299|9250145.414|341.603
CS9|381525.308|9250145.410|341.600
CURR|381449.890|9250121.598|346.679
CURR|381462.253|9250111.851|345.705
CURR|381470.230|9250147.928|345.378
CURR|381482.720|9250138.027|344.626
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G100|381479.700|9250169.855|344.459
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G4|381079.607|9249581.171|396.865
G5|381141.572|9249422.969|375.116
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GRO|381268.817|9249292.698|348.226
GRO|381280.517|9249315.775|349.394
GRO|381281.160|9249342.179|350.410
GRO|381292.289|9249356.897|351.544
GRO|381296.099|9249368.673|352.751
GRO|381305.487|9249375.239|353.229
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NA|381296.444|9249666.191|353.311
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NA|381316.671|9249803.446|353.332
NA|381326.491|9249825.838|353.204
NA|381329.764|9249665.524|353.268
NA|381330.463|9249834.104|353.300
NA|381331.428|9249668.824|353.230
NA|381332.387|9249926.034|353.187
NA|381338.288|9249861.342|353.228
NA|381343.984|9249915.222|353.243
NA|381345.840|9249876.833|353.218
NA|381348.162|9249887.573|353.248
NA|381354.020|9249961.049|353.241
NA|381354.279|9250000.182|353.240
NA|381357.795|9249975.773|353.258
NA|381359.290|9250000.930|353.248
NA|381361.751|9249990.576|353.273
NA|381363.987|9249999.980|353.220
NA|381367.803|9249793.080|353.256
NA|381393.340|9249820.098|353.169
NA|381415.408|9249833.599|353.295
NA|381445.039|9249833.407|353.260
NA|381455.284|9249817.286|353.289

NA|381462.473|9249952.788|353.212
NA|381465.284|9249934.336|353.286
NA|381466.286|9249947.928|353.235
NA|381471.567|9249919.437|353.290
NA|381475.378|9249829.528|353.235
NA|381479.217|9249902.124|353.306
NA|381504.567|9249835.460|353.248
NA|381521.948|9249840.298|353.279
PC|381357.842|9250055.778|351.612
PC|381454.315|9250132.022|346.363
PC|381456.077|9250143.549|346.065
POR|381481.442|9250176.085|344.397
POR|381481.513|9250179.308|344.287
POR|381500.904|9250167.451|344.067
POR|381502.135|9250169.917|344.009
RIO|381622.647|9250396.717|335.630
RIO|381623.094|9250419.098|335.841
RIO|381627.961|9250371.174|338.738
RIO|381638.598|9250355.138|339.131
RIO|381652.877|9250401.476|340.559
RIO|381666.644|9250390.152|340.424
S0A|381245.919|9249466.919|375.291
S2A|381284.369|9249456.192|370.806
SAN|381321.450|9250010.940|353.758
SAN|381321.856|9250011.861|353.686

ANEXO 3 – CADERNETAS DE CAMPO – SECCIONAMENTO DO EIXO BARRÁVEL E DO SANGRADOURO

A1J|381857.927|9249475.851|398.306

A1M|381870.365|9249406.610|403.825

A2J|381852.412|9249505.022|389.626

A2M|381879.686|9249353.641|386.351

AJ2|381852.412|9249505.022|389.626

CE|381994.277|9249300.897|341.957

CE|382010.041|9249313.092|342.098

CE|382026.929|9249329.143|342.102

CE|382032.378|9249334.149|342.181

CE|382044.165|9249344.736|341.668

CE|382136.156|9249508.111|346.835

CE|382139.232|9249630.160|341.374

CE|382157.717|9249614.807|341.812

CE|382169.538|9249558.337|343.284

CE|382177.733|9249333.447|341.880

CE|382182.979|9249592.779|341.751

CE|382187.823|9249585.458|341.564

CE|382188.674|9249587.630|341.615

CE|382202.230|9249368.292|342.229

CE|382220.876|9249603.283|340.051

CE|382231.949|9249607.790|339.927

CE|382252.364|9249426.972|339.396

CE|382324.485|9249639.317|342.039

CE|382325.480|9249635.693|341.466

CE|382335.013|9249639.727|341.089
CE|382336.812|9249641.300|340.979
CE|382355.918|9249658.497|340.454
CERCA|382061.371|9249361.456|341.331
CERCA|382079.129|9249375.594|341.066
CERCA|382107.790|9249441.802|343.317
CERCA|382114.565|9249470.703|345.456
CERCA|382120.976|9249483.050|346.753
CERCA|382152.615|9249533.747|345.373
CERCA|382185.035|9249580.773|341.493
CERCA|382219.068|9249390.634|341.661
CERCA|382236.030|9249409.308|339.895
CERCA|382289.835|9249451.953|341.514
CERCA|382301.036|9249499.867|341.549
CERCA|382302.483|9249504.208|341.492
CERCA|382314.283|9249540.792|342.069
CERCA|382328.156|9249578.058|340.765
CO|381839.702|9249574.904|363.796
CO|381841.353|9249566.233|366.198
CO|381862.264|9249579.236|364.562
CO|381863.107|9249566.938|368.624
CO|381865.570|9249547.134|376.665
CO|381867.172|9249538.866|379.552
CO|381879.665|9249581.739|365.259
CO|381881.197|9249572.854|368.527
CO|381885.557|9249549.567|377.271

CO|381886.314|9249543.359|379.625
CO|381900.128|9249585.206|366.599
CO|381901.905|9249573.373|370.512
CO|381905.070|9249555.800|376.303
CO|381906.868|9249548.388|378.338
CO|381909.340|9249300.846|360.101
CO|381910.747|9249291.999|357.011
CO|381912.422|9249281.630|353.150
CO|381916.288|9249588.336|366.722
CO|381919.802|9249576.678|370.134
CO|381925.408|9249559.006|374.454
CO|381926.517|9249323.354|361.251
CO|381927.838|9249548.933|376.269
CO|381929.478|9249305.428|355.608
CO|381930.897|9249294.507|351.787
CO|381933.006|9249284.746|349.161
CO|381939.567|9249593.238|366.211
CO|381940.933|9249582.022|368.928
CO|381944.705|9249560.700|372.402
CO|381946.003|9249551.803|372.729
CO|381946.207|9249327.642|356.596
CO|381949.182|9249307.906|351.042
CO|381951.965|9249296.161|347.787
CO|381953.748|9249288.729|345.195
CO|381956.252|9249595.158|365.890
CO|381959.504|9249584.532|367.200

CO|381964.785|9249332.278|353.539
CO|381964.858|9249565.383|368.650
CO|381967.946|9249555.820|367.687
CO|381969.378|9249309.985|347.276
CO|381970.710|9249303.742|345.119
CO|381974.059|9249292.925|342.805
CO|381979.188|9249599.780|362.559
CO|381980.065|9249590.996|363.487
CO|381980.784|9249586.735|363.012
CO|381983.090|9249568.720|364.161
CO|381983.609|9249334.690|351.353
CO|381984.180|9249559.875|362.714
CO|381990.455|9249313.356|344.816
CO|381992.555|9249306.912|342.938
CO|381995.613|9249296.601|341.761
CO|381996.874|9249602.149|359.279
CO|381999.441|9249592.449|359.635
CO|382001.899|9249577.943|358.965
CO|382003.223|9249337.704|347.584
CO|382004.275|9249569.894|362.138
CO|382005.606|9249563.582|363.586
CO|382009.005|9249317.186|342.668
CO|382011.188|9249308.490|341.782
CO|382013.291|9249299.719|341.947
CO|382013.417|9249605.514|355.954
CO|382014.655|9249602.343|355.026

CO|382018.634|9249593.117|354.554
CO|382022.967|9249576.373|360.002
CO|382023.032|9249342.867|344.936
CO|382024.740|9249567.700|362.388
CO|382029.003|9249319.876|341.597
CO|382030.299|9249311.030|341.557
CO|382032.809|9249302.449|341.633
CO|382039.746|9249612.143|350.006
CO|382040.186|9249607.293|351.561
CO|382040.653|9249599.128|353.668
CO|382041.960|9249578.741|358.609
CO|382043.484|9249570.014|359.959
CO|382046.386|9249327.438|341.438
CO|382048.484|9249316.257|341.773
CO|382049.989|9249305.644|341.091
CO|382055.130|9249612.920|349.572
CO|382057.419|9249604.729|351.870
CO|382062.555|9249312.627|340.041
CO|382063.670|9249581.328|355.792
CO|382064.082|9249348.664|341.366
CO|382066.534|9249570.834|355.852
CO|382066.697|9249331.188|341.806
CO|382067.723|9249323.851|341.164
CO|382068.434|9249318.196|339.472
CO|382069.485|9249312.397|340.016
CO|382077.476|9249616.465|348.597

CO|382077.985|9249610.119|349.352
CO|382080.792|9249576.681|352.557
CO|382081.236|9249585.712|351.837
CO|382083.628|9249350.766|341.824
CO|382086.634|9249334.466|341.441
CO|382087.681|9249326.632|340.545
CO|382096.816|9249620.631|345.703
CO|382098.082|9249611.829|346.246
CO|382103.185|9249588.261|348.360
CO|382103.748|9249334.790|340.381
CO|382103.800|9249580.321|349.126
CO|382104.028|9249354.145|340.965
CO|382114.149|9249622.644|343.510
CO|382116.422|9249614.556|344.047
CO|382121.961|9249591.711|344.999
CO|382122.582|9249586.173|345.168
CO|382123.801|9249359.038|340.426
CO|382124.908|9249574.411|345.901
CO|382126.982|9249562.220|346.607
CO|382129.028|9249549.933|346.725
CO|382131.706|9249622.971|341.810
CO|382133.342|9249524.088|346.419
CO|382135.136|9249513.899|346.715
CO|382136.753|9249615.395|342.077
CO|382137.567|9249500.096|346.984
CO|382139.061|9249491.609|347.530

CO|382140.198|9249484.765|348.111
CO|382140.273|9249450.992|340.425
CO|382140.654|9249436.249|339.904
CO|382141.476|9249459.509|341.319
CO|382143.619|9249598.226|343.383
CO|382143.855|9249410.937|340.382
CO|382145.308|9249388.231|340.693
CO|382145.943|9249368.420|340.002
CO|382146.294|9249375.158|340.286
CO|382146.882|9249589.761|343.854
CO|382154.416|9249630.054|341.117
CO|382156.540|9249621.103|341.367
CO|382160.815|9249600.489|342.685
CO|382162.045|9249588.530|343.172
CO|382166.033|9249571.934|343.522
CO|382170.726|9249549.526|344.748
CO|382173.143|9249631.712|341.616
CO|382173.413|9249535.029|346.364
CO|382175.388|9249525.606|348.427
CO|382175.455|9249350.989|339.803
CO|382175.525|9249343.404|340.569
CO|382176.437|9249622.335|341.655
CO|382181.035|9249604.886|341.713
CO|382182.129|9249596.043|341.771
CO|382193.792|9249638.381|341.088
CO|382195.856|9249629.937|341.191

CO|382199.981|9249606.653|342.041
CO|382200.829|9249378.721|340.253
CO|382201.077|9249598.593|342.201
CO|382205.086|9249355.498|344.814
CO|382206.507|9249347.575|347.304
CO|382208.739|9249337.867|348.887
CO|382209.981|9249331.890|349.989
CO|382215.202|9249638.387|339.370
CO|382217.071|9249630.543|339.276
CO|382219.257|9249611.458|339.956
CO|382220.864|9249376.373|343.625
CO|382223.109|9249590.242|340.285
CO|382224.095|9249358.313|349.406
CO|382224.383|9249582.512|339.798
CO|382225.300|9249349.596|351.875
CO|382225.560|9249574.350|340.579
CO|382226.212|9249565.960|340.347
CO|382226.595|9249337.645|352.440
CO|382228.132|9249557.637|339.723
CO|382231.812|9249626.448|336.433
CO|382232.505|9249613.539|336.789
CO|382240.919|9249630.380|335.430
CO|382242.368|9249381.158|345.654
CO|382245.003|9249360.245|350.846
CO|382246.796|9249352.483|352.453
CO|382248.587|9249646.522|336.764

CO|382249.088|9249635.938|336.185
CO|382249.296|9249341.983|356.268
CO|382249.744|9249435.620|341.716
CO|382253.842|9249419.912|339.774
CO|382254.222|9249651.315|337.358
CO|382256.833|9249405.774|342.746
CO|382259.678|9249392.885|344.967
CO|382261.320|9249381.827|348.188
CO|382263.527|9249650.822|338.016
CO|382264.024|9249363.508|352.431
CO|382265.843|9249355.445|354.494
CO|382267.788|9249343.605|357.949
CO|382267.923|9249645.852|337.999
CO|382274.243|9249651.070|341.484
CO|382274.863|9249646.089|341.654
CO|382275.839|9249639.744|341.669
CO|382279.902|9249621.146|340.145
CO|382281.464|9249387.795|351.021
CO|382282.817|9249373.120|351.478
CO|382284.174|9249364.415|354.966
CO|382285.445|9249356.829|357.181
CO|382286.887|9249347.404|359.037
CO|382293.969|9249656.022|342.575
CO|382295.598|9249643.422|342.261
CO|382299.005|9249622.796|341.780
CO|382299.355|9249616.922|341.627

CO|382301.185|9249390.831|352.614
CO|382301.841|9249380.644|353.599
CO|382302.232|9249373.225|354.731
CO|382303.401|9249364.574|356.206
CO|382303.937|9249350.556|359.507
CO|382311.620|9249659.833|343.524
CO|382314.204|9249648.744|343.276
CO|382318.515|9249625.260|341.569
CO|382319.749|9249618.844|340.663
CO|382320.382|9249393.958|356.486
CO|382321.962|9249372.000|359.587
CO|382322.683|9249363.525|359.659
CO|382322.777|9249353.680|358.005
CO|382335.649|9249661.435|344.275
CO|382336.762|9249649.962|342.186
CO|382339.131|9249629.012|339.792
CO|382339.370|9249398.546|361.548
CO|382340.752|9249620.760|339.508
CO|382342.620|9249374.398|363.109
CO|382343.757|9249362.922|361.315
CO|382344.192|9249357.379|362.517
CO|382355.366|9249632.787|339.948
CO|382355.805|9249663.987|341.266
CO|382355.912|9249622.150|339.950
CO|382359.392|9249356.865|365.052
CO|382359.679|9249363.913|365.106

CO|382360.075|9249372.734|363.946
CO|382361.946|9249400.610|365.713
CO|382371.204|9249366.724|366.584
CO|382374.376|9249667.386|339.780
CO|382375.493|9249655.501|340.658
CO|382376.647|9249383.995|368.638
CO|382376.916|9249630.403|342.085
CO|382377.612|9249622.553|344.089
CO|382380.704|9249407.960|368.793
CO|382392.526|9249670.961|341.633
CO|382394.136|9249662.135|342.055
CO|382397.597|9249640.040|346.628
CO|382398.325|9249408.942|372.276
CO|382399.413|9249629.303|349.058
CO|382400.930|9249621.365|351.079
CO|382402.225|9249382.528|374.849
CO|382402.809|9249610.568|353.460
CO|382403.270|9249374.350|376.150
CO|382403.910|9249370.090|376.486
CO|382405.030|9249601.975|355.727
CO|382406.658|9249594.085|357.643
CO|382409.009|9249673.426|343.466
CO|382409.443|9249580.154|360.664
CO|382410.997|9249572.436|363.400
CO|382412.591|9249563.291|364.971
CO|382413.232|9249662.082|346.555

CO|382413.996|9249555.830|367.023
CO|382415.731|9249546.659|369.670
CO|382417.386|9249538.414|371.644
CO|382418.427|9249412.658|378.390
CO|382418.776|9249642.638|351.858
CO|382419.655|9249514.204|379.898
CO|382421.341|9249633.550|354.033
CO|382421.394|9249392.903|380.128
CO|382421.594|9249502.167|382.783
CO|382424.324|9249487.234|382.479
CO|382425.202|9249377.947|380.591
CO|382425.384|9249481.390|382.128
CO|382426.352|9249372.592|380.198
CO|382426.378|9249475.996|381.171
CO|382427.422|9249469.668|379.079
CO|382429.127|9249461.612|378.639
CO|382431.190|9249678.045|347.804
CO|382431.712|9249449.225|379.898
CO|382431.986|9249668.938|350.034
CO|382433.302|9249440.299|379.794
CO|382434.934|9249432.517|381.129
CO|382435.693|9249429.766|380.540
CO|382437.296|9249419.821|381.214
CO|382438.755|9249647.937|355.983
CO|382439.936|9249398.842|383.692
CO|382440.924|9249641.085|357.958

CO|382441.160|9249391.770|383.312
CO|382441.759|9249386.005|382.142
CO|382443.033|9249376.256|380.560
CO|382451.414|9249681.186|352.035
CO|382453.635|9249670.141|354.474
CO|382455.894|9249421.775|386.847
CO|382456.502|9249649.351|360.220
CO|382459.301|9249639.086|362.020
CO|382460.653|9249629.973|365.757
CO|382460.950|9249398.671|384.038
CO|382461.617|9249625.883|367.246
CO|382463.152|9249618.681|369.356
CO|382463.699|9249389.556|381.753
CO|382466.023|9249379.878|379.560
CO|382466.064|9249605.108|373.024
CO|382468.692|9249586.552|378.460
CO|382470.451|9249685.142|355.479
CO|382472.801|9249674.029|359.183
CO|382476.330|9249422.324|387.720
CO|382476.923|9249654.532|364.674
CO|382478.068|9249644.554|367.264
CO|382481.117|9249400.181|382.434
CO|382482.846|9249389.687|380.205
CO|382485.047|9249379.884|377.546
CO|382491.315|9249688.668|361.557
CO|382492.882|9249679.277|363.328

CO|382495.482|9249426.478|385.883
CO|382496.381|9249657.335|368.466
CO|382497.747|9249649.104|371.226
CO|382501.479|9249405.286|381.259
CO|382504.893|9249396.113|379.297
CO|382508.236|9249387.179|376.276
CO|382512.735|9249690.397|365.870
CO|382513.984|9249681.776|368.653
CO|382515.940|9249661.133|375.426
CO|382517.795|9249653.051|378.873
CO|382517.912|9249429.749|384.170
CO|382518.336|9249406.433|377.604
CO|382519.665|9249398.212|378.306
CO|382521.016|9249389.288|379.667
CO|382527.278|9249694.839|369.482
CO|382530.537|9249685.836|373.410
CO|382535.978|9249664.670|382.374
CO|382536.301|9249432.973|380.731
CO|382538.525|9249656.743|384.299
CO|382540.027|9249411.550|381.610
CO|382541.134|9249406.474|383.103
CO|382543.308|9249393.788|385.188
CO|382556.621|9249436.407|380.198
CO|382558.171|9249417.621|386.049
CO|382559.402|9249408.620|388.109
CO|382561.365|9249396.126|389.772

CO|382576.902|9249439.488|384.972
CO|382578.754|9249416.880|390.055
CO|382581.097|9249403.774|392.107
CO|382582.699|9249396.898|393.502
CRI|382231.991|9249607.284|340.751
CRI|382235.993|9249603.570|340.847
CRI|382238.059|9249609.261|341.689
CRI|382239.321|9249608.225|341.708
E00/100D|381884.838|9249328.058|376.996
E00/100E|381848.913|9249523.922|380.692
E00/20D|381870.419|9249406.656|403.805
E00/20E|381863.229|9249445.845|402.498
E00/40D|381874.063|9249386.794|397.764
E00/40E|381859.635|9249465.436|399.265
E00/60D|381877.542|9249367.826|390.742
E00/60E|381855.992|9249485.306|395.583
E00/80D|381881.218|9249347.790|383.694
E00/80E|381852.397|9249504.917|389.585
E1/100D|381904.582|9249331.583|371.066
E1/100E|381868.596|9249528.279|383.196
E1/20D|381890.180|9249410.201|399.110
E1/20E|381883.048|9249449.497|400.732
E1/40D|381893.774|9249390.609|392.714
E1/40E|381879.452|9249469.102|394.654
E1/60D|381897.374|9249370.989|385.901
E1/60E|381875.786|9249489.079|392.311

E1/80D|381900.982|9249351.304|378.809
E1/80E|381872.228|9249508.481|389.483
E10/100D|382081.460|9249362.506|341.249
E10/100E|382046.419|9249560.114|354.209
E10/20D|382067.319|9249441.851|350.204
E10/20E|382060.284|9249481.381|357.510
E10/40D|382070.834|9249422.125|349.723
E10/40E|382056.773|9249501.139|359.562
E10/60D|382074.327|9249402.528|346.396
E10/60E|382053.267|9249520.879|360.458
E10/80D|382077.762|9249383.256|342.097
E10/80E|382049.798|9249540.402|361.739
E11/100D|382100.716|9249366.968|341.636
E11/100E|382066.294|9249563.155|357.353
E11/20D|382086.861|9249445.205|348.148
E11/20E|382079.911|9249484.727|353.044
E11/40D|382090.440|9249425.051|345.618
E11/40E|382076.483|9249504.271|354.902
E11/60D|382093.755|9249406.170|342.246
E11/60E|382073.028|9249523.968|356.324
E11/80E|382069.615|9249543.431|357.353
E11/80E|382097.344|9249386.019|340.622
E12/100D|382120.495|9249370.079|340.585
E12/100E|382085.412|9249566.844|353.052
E12/20D|382106.541|9249448.849|344.285
E12/20E|382099.486|9249488.414|349.396

E12/40D|382110.030|9249429.154|341.782
E12/40E|382095.931|9249508.228|350.776
E12/60D|382113.488|9249409.633|340.825
E12/60E|382092.426|9249527.764|352.446
E12/80D|382116.941|9249390.139|341.649
E12/80E|382088.908|9249547.358|353.284
E13/100E|382105.492|9249570.480|349.261
E13/100E|382140.424|9249374.029|340.566
E13/20D|382126.388|9249452.662|341.642
E13/20E|382119.365|9249492.147|347.466
E13/40D|382129.933|9249432.800|340.138
E13/40E|382115.895|9249511.734|348.342
E13/60D|382133.460|9249413.041|340.624
E13/60E|382112.434|9249531.279|348.770
E13/80D|382136.947|9249393.508|340.543
E13/80E|382108.978|9249550.794|349.747
E15/100D|382178.668|9249382.390|336.247
E15/100E|382144.677|9249577.593|344.314
E15/20D|382165.663|9249459.408|339.711
E15/20E|382158.747|9249499.094|346.831
E15/40.1E|382155.211|9249518.850|346.130
E15/40D|382169.017|9249439.550|340.478
E15/40E|382156.510|9249511.539|347.377
E15/60D|382172.315|9249420.020|340.914
E15/60E|382151.683|9249538.483|345.043
E15/80D|382175.622|9249400.433|339.481

E15/80E|382148.178|9249558.046|345.352
E16/100D|382199.752|9249383.992|339.381
E16/20D|382185.564|9249463.047|340.205
E16/20E|382178.504|9249502.489|343.258
E16/40D|382189.093|9249443.309|340.507
E16/60D|382192.612|9249423.628|339.680
E16/80D|382196.218|9249403.459|336.190
E17/100D|382219.583|9249387.766|341.868
E17/100E|382184.243|9249585.310|341.666
E17/20D|382205.412|9249466.559|340.047
E17/20E|382198.296|9249506.087|340.080
E17/40D|382208.942|9249446.934|338.527
E17/40E|382194.755|9249525.753|345.114
E17/60D|382212.465|9249427.345|336.573
E17/60E|382191.168|9249545.677|345.340
E17/80D|382215.982|9249407.792|338.230
E17/80E|382187.718|9249565.415|342.647
E18/100D|382239.111|9249392.126|343.429
E18/100E|382203.761|9249589.234|341.001
E18/20D|382225.016|9249470.726|337.540
E18/20E|382217.915|9249510.257|339.349
E18/40D|382228.507|9249451.255|336.667
E18/40E|382214.391|9249529.866|340.261
E18/60D|382232.037|9249431.577|336.899
E18/60E|382210.834|9249549.657|341.631
E18/80D|382235.615|9249411.625|339.857

E18/80E|382207.322|9249569.374|341.733
E19/20D|382244.798|9249473.730|336.449
E19/20E|382237.741|9249513.106|340.094
E19/40E|382234.211|9249532.792|341.717
E2/100D|381924.078|9249335.374|365.876
E2/100E|381888.370|9249532.169|383.430
E2/20D|381909.841|9249413.468|393.282
E2/20E|381902.676|9249453.148|396.983
E2/40D|381913.309|9249394.239|387.197
E2/40E|381899.157|9249472.604|393.480
E2/60D|381916.900|9249374.613|380.371
E2/60E|381895.622|9249492.129|388.290
E2/80D|381920.507|9249354.895|374.372
E2/80E|381891.982|9249512.221|386.218
E20/100D|382299.127|9249401.937|350.289
E20/100E|382263.066|9249598.934|337.714
E20/20D|382284.462|9249480.358|340.786
E20/20E|382277.170|9249519.818|337.020
E20/40E|382273.669|9249539.829|337.509
E20/40E|382288.164|9249460.677|341.781
E20/60D|382291.895|9249440.609|341.479
E20/60E|382270.132|9249559.678|339.240
E20/80D|382295.487|9249421.438|344.578
E20/80E|382266.598|9249579.522|338.204
E21/100D|382278.119|9249398.789|351.409
E21/100E|382243.883|9249595.723|336.596

E21/20D|382264.458|9249477.091|341.449
E21/20E|382257.573|9249516.694|340.612
E21/40D|382267.873|9249457.516|342.941
E21/40E|382254.151|9249536.442|338.385
E21/60D|382271.282|9249437.970|346.256
E21/60E|382250.745|9249556.109|337.124
E21/80D|382274.719|9249418.279|348.670
E21/80E|382247.301|9249575.987|336.161
E22/100D|382317.286|9249405.211|355.411
E22/100E|382283.568|9249602.317|338.847
E22/20D|382303.740|9249484.112|343.140
E22/20E|382296.989|9249523.588|340.450
E22/40D|382307.127|9249464.388|347.341
E22/40E|382293.614|9249543.383|341.208
E22/60D|382310.513|9249444.664|351.726
E22/60E|382290.275|9249562.976|340.646
E22/80D|382313.916|9249424.842|354.083
E22/80E|382286.895|9249582.804|340.378
E23/100D|382337.096|9249408.893|358.698
E23/100E|382303.194|9249605.591|341.436
E23/20D|382323.379|9249487.615|347.386
E23/20E|382316.628|9249527.086|341.932
E23/40D|382326.749|9249467.896|352.264
E23/40E|382313.293|9249546.580|341.849
E23/60D|382330.150|9249448.000|356.811
E23/60E|382309.896|9249566.430|341.391

E23/80D|382333.509|9249428.363|357.770
E23/80E|382306.539|9249586.054|339.901
E24/100D|382357.784|9249412.141|364.142
E24/100E|382322.860|9249609.112|339.954
E24/20D|382343.353|9249490.885|353.878
E24/20E|382336.282|9249530.424|345.723
E24/40D|382347.030|9249471.247|356.958
E24/40E|382332.939|9249550.020|344.047
E24/60D|382350.685|9249451.719|361.455
E24/60E|382329.551|9249569.880|340.956
E24/80D|382354.403|9249431.848|360.941
E24/80E|382326.206|9249589.488|340.547
E25/100D|382376.136|9249415.685|366.922
E25/100E|382342.600|9249612.316|339.685
E25/20D|382362.685|9249494.236|358.545
E25/20E|382355.948|9249533.749|351.508
E25/40D|382366.063|9249474.470|361.380
E25/40E|382352.655|9249553.086|347.508
E25/60D|382369.415|9249454.847|363.684
E25/60E|382349.266|9249572.993|342.795
E25/80D|382372.840|9249435.033|365.581
E25/80E|382345.907|9249592.719|340.890
E26/100D|382396.726|9249419.036|371.351
E26/100E|382362.297|9249616.051|340.853
E26/20D|382382.351|9249497.571|366.773
E26/20E|382375.731|9249536.681|353.270

E26/40D|382385.646|9249478.105|369.478
E26/40E|382372.361|9249556.596|353.228
E26/60D|382389.332|9249458.454|367.711
E26/60E|382369.008|9249576.400|348.005
E26/80D|382393.045|9249438.661|370.580
E26/80E|382365.650|9249596.243|344.508
E27/100D|382415.426|9249422.220|376.210
E27/100E|382383.115|9249619.432|346.022
E27/20D|382402.050|9249500.958|374.160
E27/20E|382395.634|9249540.552|363.732
E27/40D|382405.288|9249481.356|376.867
E27/40E|382392.522|9249560.135|357.853
E27/60D|382408.666|9249461.641|373.114
E27/60E|382389.374|9249579.934|354.372
E27/80D|382412.048|9249441.935|372.795
E27/80E|382386.242|9249599.650|349.027
E28/100D|382435.177|9249425.490|381.172
E29/100D|382456.809|9249429.063|387.329
E29/100E|382421.185|9249624.846|355.181
E29/20D|382441.677|9249507.661|388.262
E29/20E|382434.913|9249547.094|376.803
E29/40D|382445.479|9249487.910|388.175
E29/40E|382431.509|9249566.827|370.250
E29/60D|382449.228|9249468.434|385.250
E29/60E|382428.117|9249586.476|364.609
E29/80D|382453.119|9249448.232|387.327

E29/80E|382424.497|9249605.942|361.063
E3/100D|381943.477|9249338.923|361.286
E3/100E|381908.156|9249535.297|381.306
E3/20D|381929.575|9249417.047|386.483
E3/20E|381922.506|9249456.506|392.603
E3/40D|381933.041|9249397.624|382.631
E3/40E|381918.896|9249476.324|390.739
E3/60D|381936.541|9249378.023|376.333
E3/60E|381915.342|9249495.835|386.245
E3/80D|381940.015|9249358.441|368.709
E3/80E|381911.783|9249515.388|383.179
E30/100D|382474.580|9249432.074|387.277
E30/100E|382441.309|9249628.891|359.218
E30/20D|382461.286|9249511.142|391.168
E30/20E|382454.647|9249550.452|383.225
E30/40D|382464.585|9249491.452|391.075
E30/40E|382451.292|9249570.027|376.074
E30/60D|382467.876|9249471.801|390.540
E30/60E|382447.880|9249590.011|369.868
E30/80D|382471.203|9249451.788|390.302
E30/80E|382444.529|9249609.621|364.664
E31/100D|382495.144|9249436.524|388.104
E31/20D|382480.996|9249514.504|393.880
E31/20E|382474.303|9249554.264|390.075
E31/40D|382484.297|9249494.851|394.822
E31/40E|382471.037|9249573.716|381.605

E31/60D|382487.573|9249475.352|394.258
E31/80D|382491.366|9249455.900|391.752
E32/100D|382512.861|9249441.552|385.312
E32/100E|382481.057|9249635.823|368.857
E32/20D|382500.630|9249517.790|397.068
E32/20E|382494.100|9249557.262|393.821
E32/40D|382503.812|9249498.297|397.005
E32/40E|382490.859|9249576.599|389.468
E32/60D|382507.058|9249478.404|394.871
E32/60E|382487.566|9249596.482|381.548
E32/80D|382510.095|9249458.891|390.991
E32/80E|382484.365|9249615.833|375.930
E33/100D|382533.694|9249442.286|383.613
E33/100E|382500.251|9249637.752|373.726
E33/20D|382520.324|9249521.052|399.073
E33/20E|382513.543|9249560.747|397.528
E33/40D|382523.624|9249501.575|397.443
E33/40E|382510.150|9249580.457|393.369
E33/60D|382526.976|9249481.794|394.475
E33/60E|382506.749|9249600.218|388.962
E33/80D|382530.340|9249462.017|388.794
E33/80E|382503.353|9249619.800|382.162
E34/100D|382553.017|9249445.687|381.237
E34/100E|382520.056|9249642.925|381.245
E34/20D|382540.053|9249524.509|399.603
E34/20E|382533.457|9249564.227|399.534

E34/40D|382543.236|9249504.974|396.337

E34/40E|382530.114|9249583.823|397.566

E34/60D|382546.455|9249485.571|392.196

E34/60E|382526.756|9249603.536|392.185

E34/80D|382549.751|9249465.318|385.984

E34/80E|382523.347|9249623.547|387.210

E4/100D|381963.124|9249342.134|358.981

E4/100E|381926.151|9249538.967|378.017

E4/20D|381949.213|9249420.652|380.868

E4/20E|381942.106|9249460.093|387.984

E4/40D|381952.702|9249401.166|377.100

E4/40E|381936.946|9249479.712|387.415

E4/60D|381956.256|9249381.312|370.543

E4/60E|381933.348|9249499.464|384.013

E4/80D|381959.742|9249361.840|365.591

E4/80E|381929.826|9249518.790|377.651

E5/100D|381983.006|9249346.010|354.907

E5/100E|381947.515|9249542.249|372.812

E5/20D|381968.879|9249424.234|375.551

E5/20E|381961.753|9249463.589|381.541

E5/40D|381972.427|9249404.591|370.357

E5/40E|381958.208|9249483.128|382.236

E5/60D|381975.974|9249384.950|366.311

E5/60E|381954.649|9249502.756|380.832

E5/80D|381979.535|9249365.235|360.855

E5/80E|381951.130|9249522.227|374.262

E6/100D|382002.759|9249349.065|351.535

E6/100E|381967.380|9249545.651|366.111

E6/20D|381988.625|9249427.629|369.837

E6/20E|381981.515|9249467.207|376.230

E6/40D|381992.156|9249408.001|365.299

E6/40E|381978.021|9249486.685|378.082

E6/60D|381995.715|9249388.221|361.445

E6/60E|381974.457|9249506.545|377.568

E6/80D|381999.220|9249368.738|358.112

E6/80E|381970.949|9249525.926|374.136

E7/100D|382021.430|9249351.364|349.021

E7/100E|381987.132|9249550.136|366.704

E7/20D|382007.887|9249431.383|364.227

E7/20E|382001.111|9249470.719|370.733

E7/40D|382011.161|9249411.947|360.829

E7/40E|381997.669|9249490.263|372.266

E7/60D|382014.532|9249391.938|357.192

E7/60E|381994.212|9249509.896|373.509

E7/80D|382018.048|9249371.069|354.177

E7/80E|381990.733|9249529.673|372.503

E8/100D|382041.764|9249356.408|345.924

E8/100E|382006.782|9249552.742|366.679

E8/20D|382027.909|9249434.969|358.782

E8/20E|382020.811|9249474.118|366.278

E8/40D|382031.406|9249415.115|355.991

E8/40E|382017.226|9249493.940|368.156

E8/60D|382034.905|9249395.556|354.227
E8/60E|382013.706|9249513.403|369.987
E8/80D|382038.382|9249376.113|348.534
E8/80E|382010.158|9249533.022|369.544
E9/100D|382061.700|9249359.616|341.263
E9/100E|382026.894|9249556.426|365.772
E9/20D|382047.632|9249438.448|354.307
E9/20E|382040.695|9249477.627|361.749
E9/40D|382051.170|9249418.537|352.813
E9/40E|382037.188|9249497.511|363.713
E9/60D|382054.653|9249398.938|351.505
E9/60E|382033.735|9249517.079|365.509
E9/80D|382058.162|9249379.359|345.297
E9/80E|382030.272|9249536.711|364.752
G1|381827.207|9249417.849|411.492
G2|381775.818|9249416.731|415.553
MA-01-TOPOCART|381909.806|9249443.220|396.920
MA-02-TOPOCART|382478.973|9249536.340|393.040
MARCO/100D|382573.807|9249448.340|380.686
MARCO/100E|382539.773|9249646.767|386.371
MARCO/20D|382559.848|9249528.069|397.884
MARCO/20E|382552.978|9249567.708|402.066
MARCO/40D|382563.258|9249508.448|394.109
MARCO/40E|382549.584|9249587.343|400.882
MARCO/60D|382566.727|9249488.492|389.298
MARCO/60E|382546.155|9249607.187|397.261

MARCO/80D|382570.274|9249468.078|384.023

MARCO/80E|382542.894|9249627.326|391.896

NA|382090.417|9249319.565|339.015

NA|382105.728|9249330.551|339.266

NA|382121.783|9249341.030|339.865

NA|382132.012|9249302.795|339.239

NA|382141.637|9249312.368|339.236

NA|382146.405|9249366.822|339.003

NA|382153.003|9249325.512|339.300

NA|382176.204|9249358.524|339.358

NA|382228.241|9249628.936|336.793

NA|382228.532|9249645.295|336.729

NA|382228.966|9249621.258|336.758

NA|382230.589|9249548.076|339.149

NA|382240.229|9249652.338|336.203

NA|382246.534|9249452.585|340.296

NA|382260.322|9249640.385|336.726

NA|382271.074|9249630.188|339.094

NA|382280.562|9249616.047|339.090

P1|381847.375|9249422.705|409.435

RC|382227.044|9249490.867|337.731

RC|382252.830|9249495.485|337.380

RIO|382114.639|9249323.954|337.663

RIO|382117.712|9249328.816|337.486

RIO|382144.007|9249337.287|337.231

RIO|382144.094|9249352.789|337.194

ROCHA|382271.170|9249642.893|341.915
ROCHA|382272.046|9249639.795|341.996
ROCHA|382272.854|9249638.547|341.965
S1|381893.344|9249277.060|357.766
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SJ10|382041.025|9249589.520|356.473
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SJ14A|382130.920|9249537.845|346.417
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SJ16|382159.145|9249610.085|342.164
SJ16A|382168.903|9249560.315|343.246
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SJ17|382178.984|9249613.552|341.575
SJ18|382198.519|9249616.906|341.446
SJ19|382218.244|9249620.348|340.024
SJ19A|382221.640|9249597.994|341.230
SJ1A|381845.157|9249545.357|373.031
SJ2|381882.929|9249561.871|373.142
SJ22|382277.269|9249630.765|339.644
SJ23|382296.874|9249633.735|342.224
SJ24|382316.527|9249637.172|342.125
SJ25|382337.512|9249640.719|340.670
SJ26|382356.219|9249643.787|339.722
SJ27|382375.883|9249647.334|340.674
SJ28|382395.657|9249650.890|343.339
SJ29|382415.244|9249654.369|348.579
SJ3|381903.060|9249565.308|373.016
SJ30|382435.554|9249658.054|352.231
SJ31|382455.271|9249661.506|357.270
SJ32|382474.996|9249664.897|361.716
SJ33|382494.380|9249668.423|365.414
SJ34|382514.450|9249671.990|371.821
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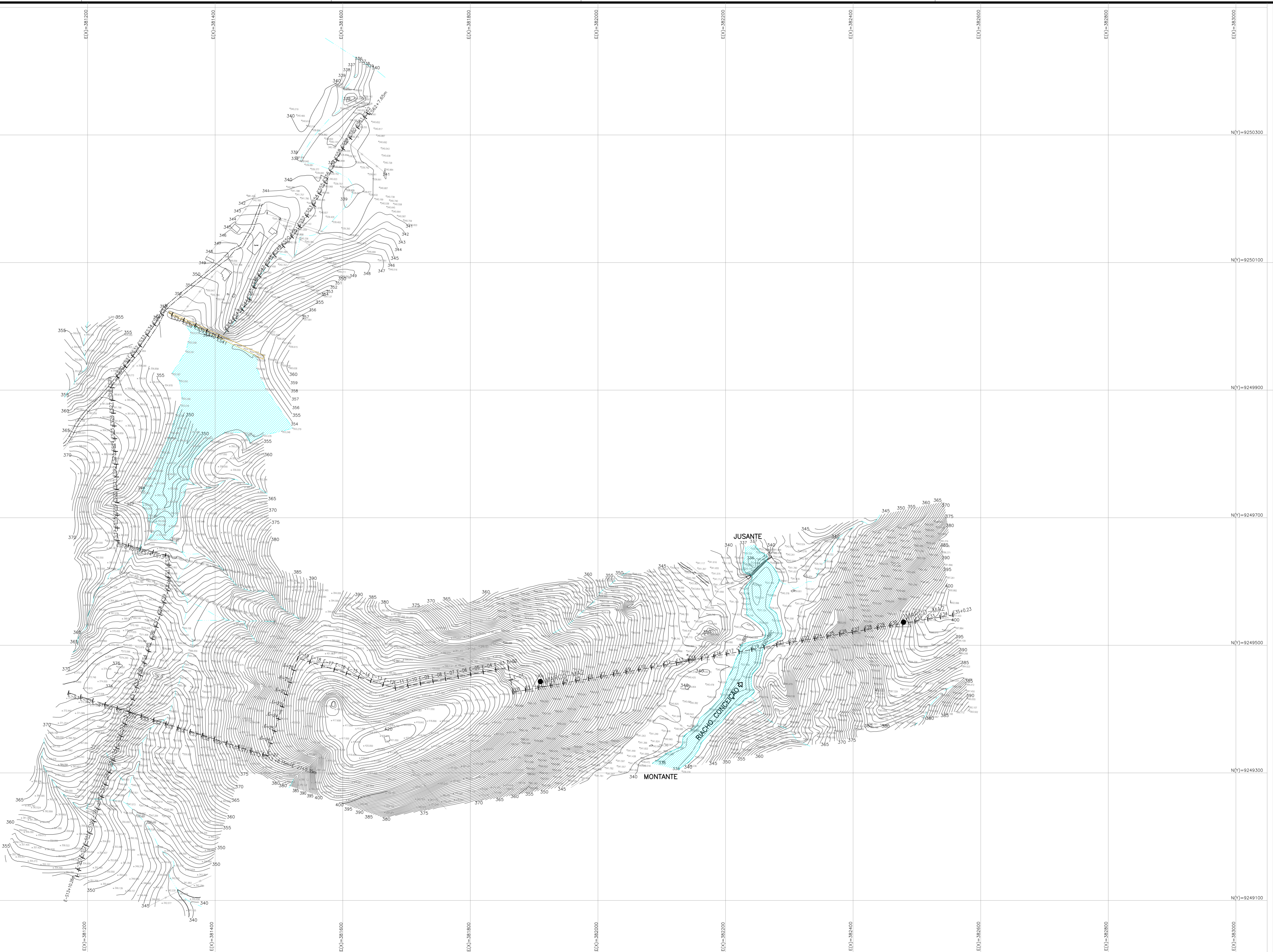
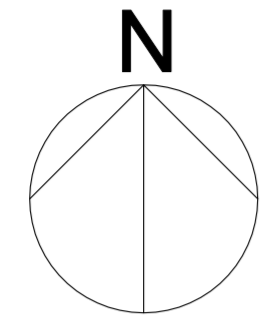
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SM20 | 382282.131 | 9249377.175 | 351.640
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SM22 | 382321.470 | 9249384.096 | 357.955
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SM25A | 382380.219 | 9249396.344 | 368.874
SM26 | 382399.339 | 9249399.607 | 373.542
SM26A | 382400.387 | 9249393.586 | 375.829
SM27 | 382419.631 | 9249402.954 | 380.214

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SM3 | 381927.521 | 9249314.763 | 358.885
SM30 | 382478.617 | 9249412.957 | 385.221
SM31 | 382498.572 | 9249416.262 | 383.170
SM32 | 382518.216 | 9249419.640 | 381.016
SM33 | 382537.993 | 9249422.872 | 378.035
SM34 | 382557.665 | 9249426.169 | 383.866
SM35 | 382577.482 | 9249429.192 | 387.450
SM4 | 381947.183 | 9249318.493 | 353.747
SM5 | 381967.148 | 9249322.070 | 350.670
SM6 | 381986.829 | 9249325.596 | 347.890
SM7 | 382006.146 | 9249328.994 | 345.165
SM8 | 382026.094 | 9249332.529 | 342.658
SM9 | 382045.698 | 9249335.979 | 341.449
TAL | 382258.825 | 9249627.409 | 338.014
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ANEXO 4 – DESENHOS

RELAÇÃO DE DESENHOS – BARRAGEM MAMOEIRO

Nº DE ORDEM	DESCRIÇÃO	ARQUIVO
01	Planta Baixa do Boqueirão e do Canal de Sangria – Arranjo Geral	I-3-MA-01/07-000
02	Planta Baixa do Boqueirão – Estaca ES34 a ES62+7,65m	I-3-MA-02/07-000
03	Planta Baixa do Boqueirão – Estaca ES5 a ES33	I-3-MA-03/07-000
04	Planta Baixa do Boqueirão – Estaca ES3 a E-06 e Estaca ES13+10,26 a ES4	I-3-MA-04/07-000
05	Planta Baixa do Boqueirão – Estaca E-05 a E35+0,23m	I-3-MA-05/07-000
06	Perfil Longitudinal do Eixo do Boqueirão – Estaca ES-3 a E-5	I-3-MA-06/07-000
07	Perfil Longitudinal do Eixo do Boqueirão – Estaca ES-5 a E35	I-3-MA-07/07-000



LEGENDA

- EIXO ESTADUEADO A CADA 20m
- EIXO DO CANAL DE RESTITUIÇÃO
- ESTRADA EXISTENTE
- CERCA EXISTENTE
- ~ CURVA MESTRA A CADA 5m
- ~ CURVA INTERMEDIÁRIA A CADA 1m
- RIO / RIACHO
- REDE ELÉTRICA
- CASA
- ▲ MARCOS IMPLANTADOS

NOTAS

ARTICULAÇÃO:

REVISÕES

Nº	NATUREZA DA REVISÃO	DATA	APROVO

GOVERNO DO ESTADO DO CEARÁ
SECRETARIA DOS RECURSOS HÍDRICOS - SRH

PROGRAMA DE GERENCIAMENTO E INTEGRAÇÃO DOS RECURSOS HÍDRICOS
DO ESTADO DO CEARÁ - PROGERIRH

ESTUDOS TOPOGRÁFICOS

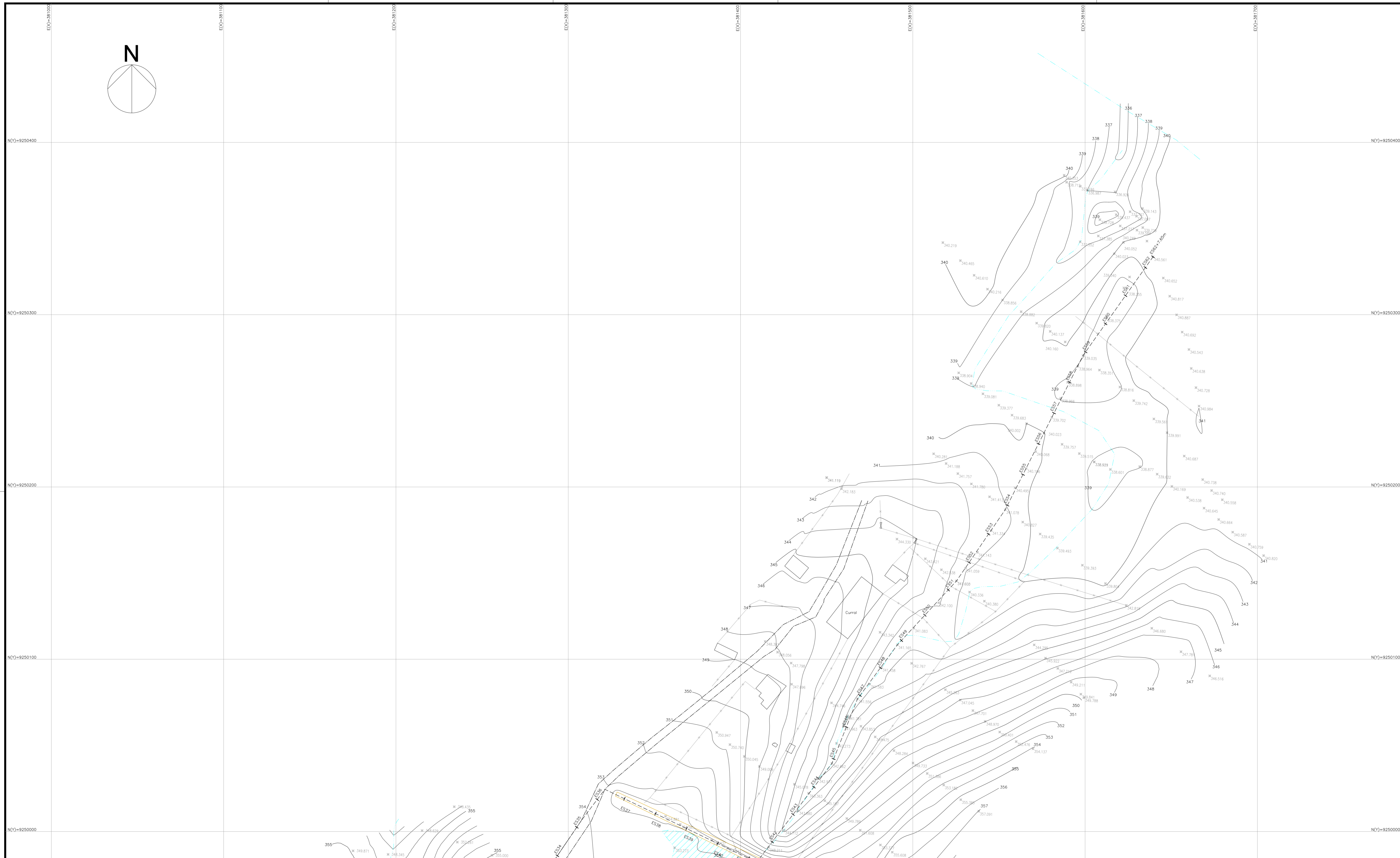
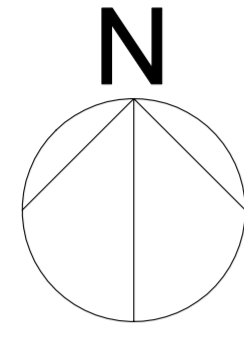
BARRAGEM MAMOIEIRO
PLANTA BAIXA DO BOQUEIRÃO
E DO CANAL DE SANGRIA - ARRANJO GERAL

ELABORADO POR:

EDITADO EM: MARÇO/2006

ESCALA: HOR. = 1/3.000

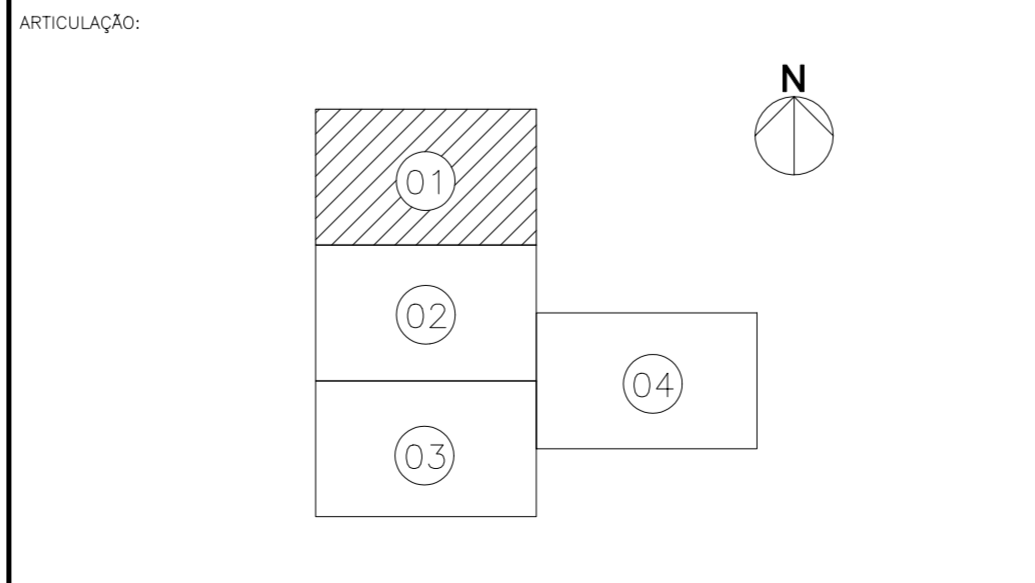
ARQUIVO: I-3-M-01/07-001



LEGENDA

- EIXO ESTAGUADO A CADA 20m
- EIXO DO CANAL DE RESTITUIÇÃO
- ESTRADA EXISTENTE
- CERCA EXISTENTE
- CURVA MESTRA A CADA 5m
- CURVA INTERMEDIÁRIA A CADA 1m
- RIO / RIACHO
- REDE ELÉTRICA
- CASA
- MARCOS IMPLANTADOS

NOTAS



REVISÕES

Nº	NATUREZA DA REVISÃO	DATA	APROVO



GOVERNO DO ESTADO DO CEARÁ
SECRETARIA DOS RECURSOS HÍDRICOS - SRH

PROGRAMA DE GERENCIAMENTO E INTEGRAÇÃO DOS RECURSOS HÍDRICOS DO ESTADO DO CEARÁ - PROGERIRH

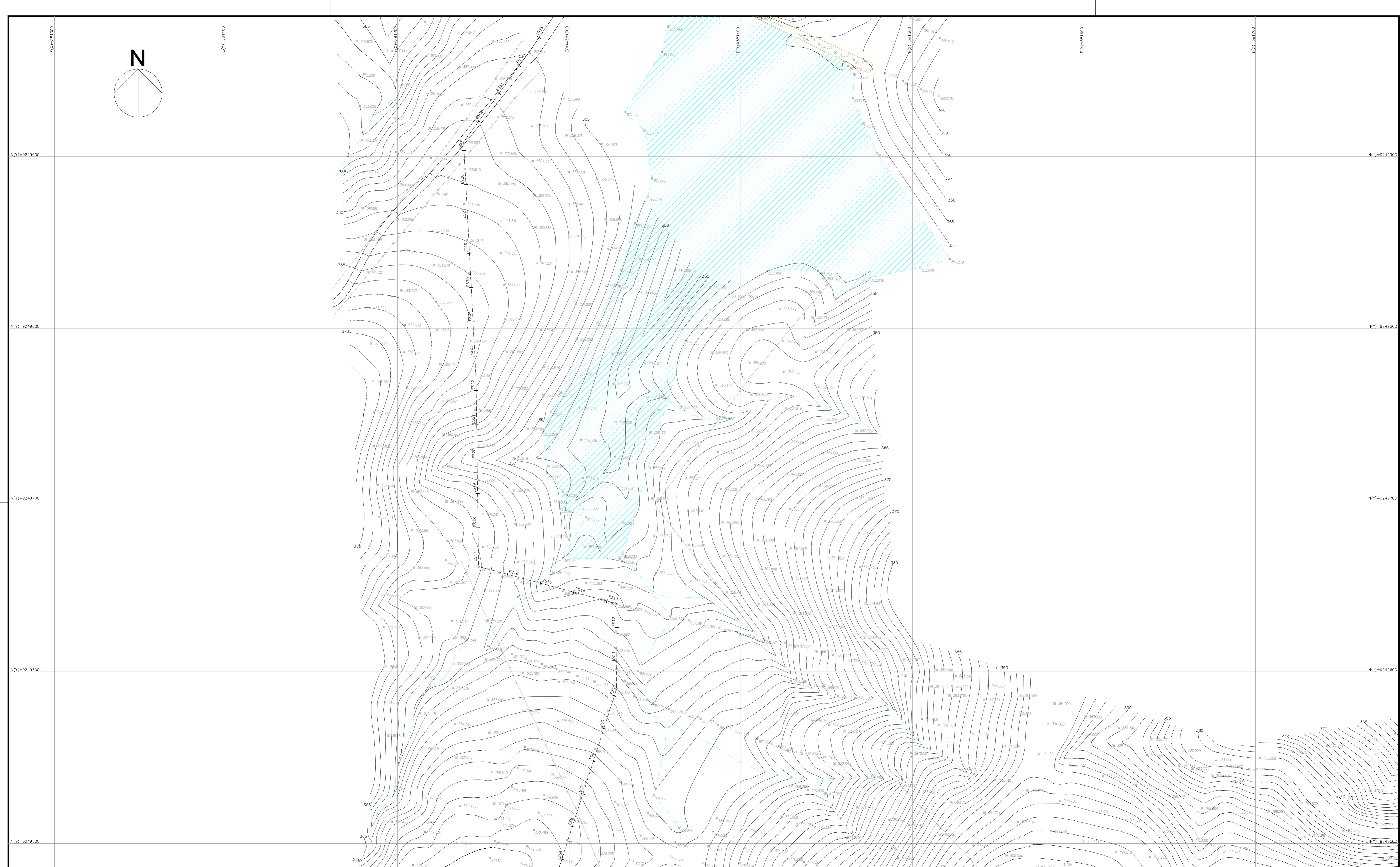
ESTUDOS TOPOGRÁFICOS

BARRAGEM MAMOIEIRO
PLANTA BAIXA DO BOQUEIRÃO
ESTACA ES34 a ES62+7,65m

ELABORADO POR:

KL ENGENHARIA **MAIBE** **enerconsult s.a.**

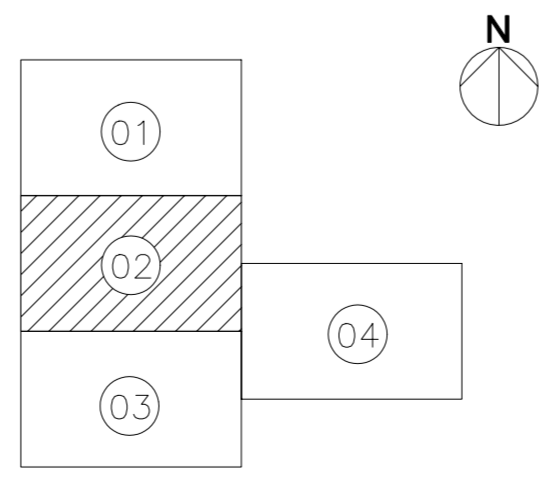
EDITADO EM: MARÇO/2006
ESCALA: HOR. = 1/1.000
ARQUIVO: I-3-M-02/07-001




- LEGENDA
- EXO ESTAQUEADO A CADA 20m
 - EXO DO CANAL DE RESTITUIÇÃO
 - ESTRADA EXISTENTE
 - CERCA EXISTENTE
 - CURVA MESTRA A CADA 5m
 - CURVA INTERMEDIÁRIA A CADA 1m
 - RIO / RIACHO
 - REDE ELÉTRICA
 - CASA
 - MARCOS IMPLANTADOS

NOTAS

ARTICULAÇÃO:



REVISÕES			
Nº	NATUREZA DA REVISÃO	DATA	APROVO



SRH

GOVERNO DO ESTADO DO CEARÁ
SECRETARIA DOS RECURSOS HÍDRICOS - SRH

PROGRAMA DE GERENCIAMENTO E INTEGRAÇÃO DOS RECURSOS HÍDRICOS DO ESTADO DO CEARÁ - PROGERIRH

ESTUDOS TOPOGRÁFICOS

BARRAGEM MAMOIEIRO
PLANTA BAIXA DO BOQUEIRO
ESTACA ES5 a ES33

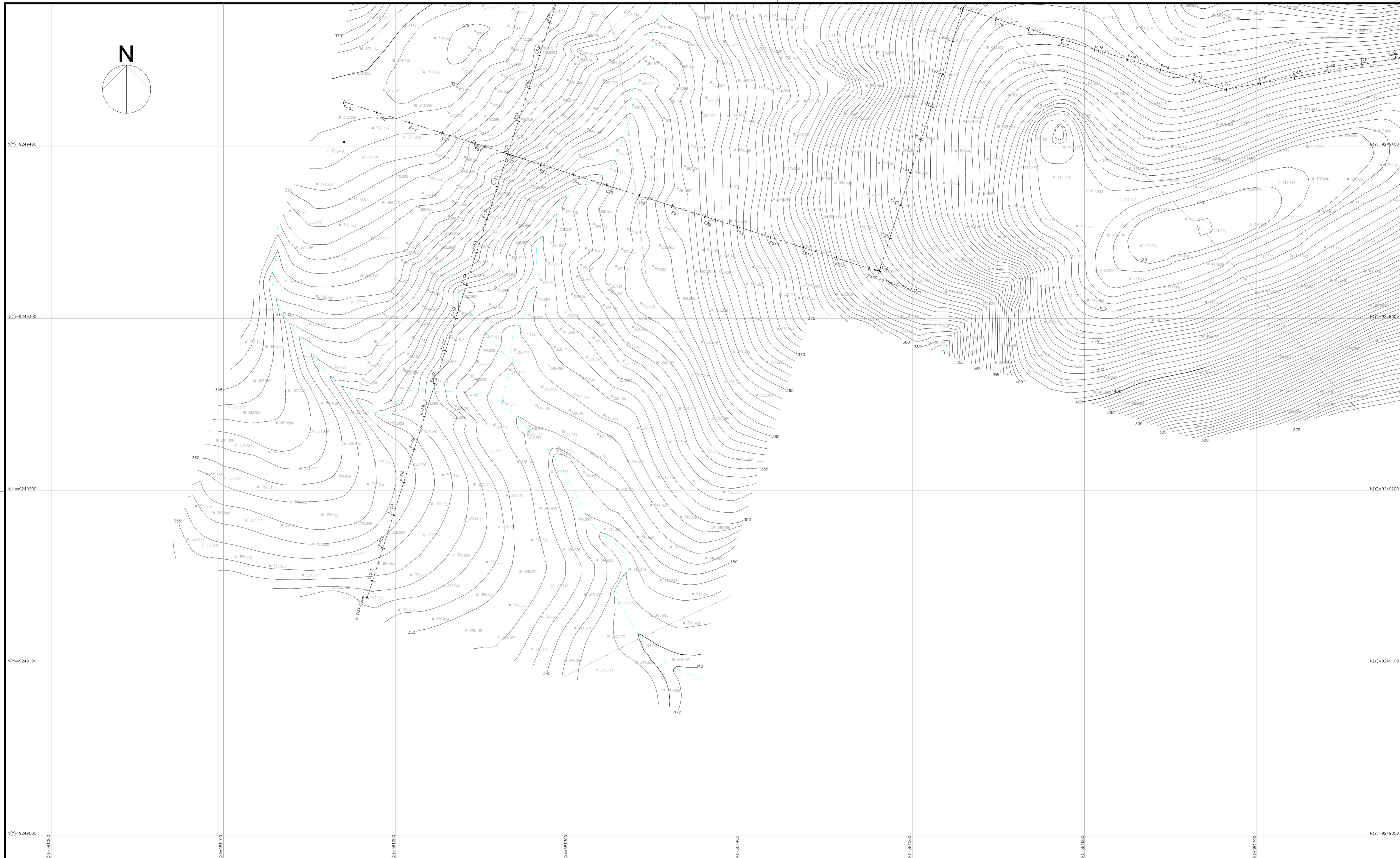
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EDITADO EM: MARÇO/2006

ESCALA: HOR. = 1/1.000

ARQUIVO: I-3-MA-03/07-001

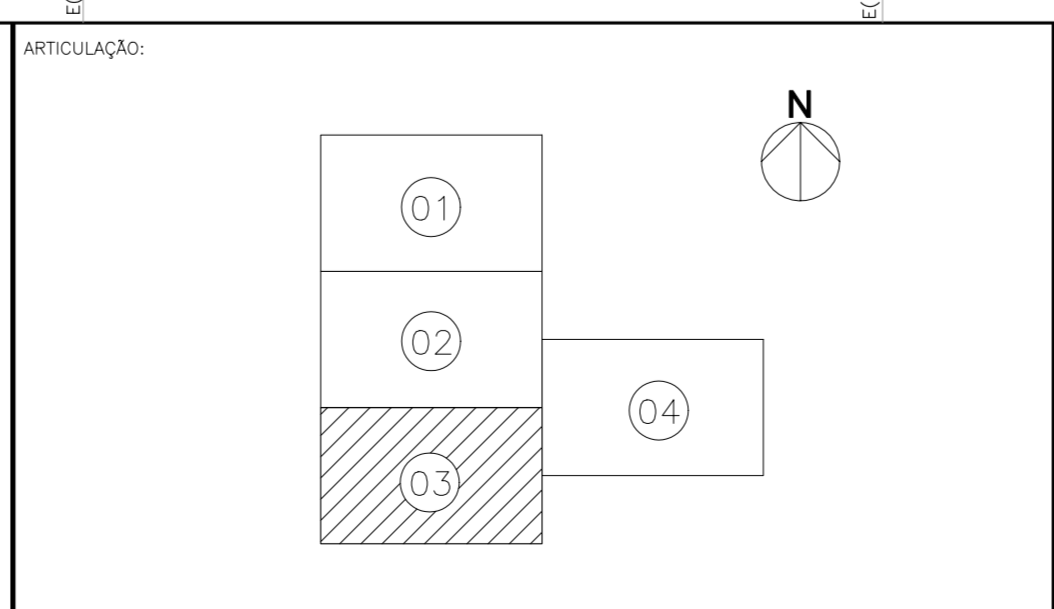


LEGENDA

- EIXO ESTAQUEADO A CADA 20m
- - - EIXO DO CANAL DE RESTITUIÇÃO
- == ESTRADA EXISTENTE
- - - CERCA EXISTENTE
- ~ CURVA MESTRA A CADA 5m
- ~ CURVA INTERMEDIÁRIA A CADA 1m
- ~ RIO / RACHO
- REDE ELÉTRICA
- CASA
- ▲ MARCOS IMPLANTADOS


NOTAS

ARTICULAÇÃO:



REVISÕES

Nº	NATUREZA DA REVISÃO	DATA	APROVO



SRH

GOVERNO DO ESTADO DO CEARÁ
SECRETARIA DOS RECURSOS HÍDRICOS - SRH

PROGRAMA DE GERENCIAMENTO E INTEGRAÇÃO DOS RECURSOS HÍDRICOS DO ESTADO DO CEARÁ - PROGERIRH

ESTUDOS TOPOGRÁFICOS

BARRAGEM MAMOIRO
PLANTA BAIXA DO BOQUEIRÃO
ESTACA E-S3 a E-06 e
ESTACA E-S13+10,26m a E-S4

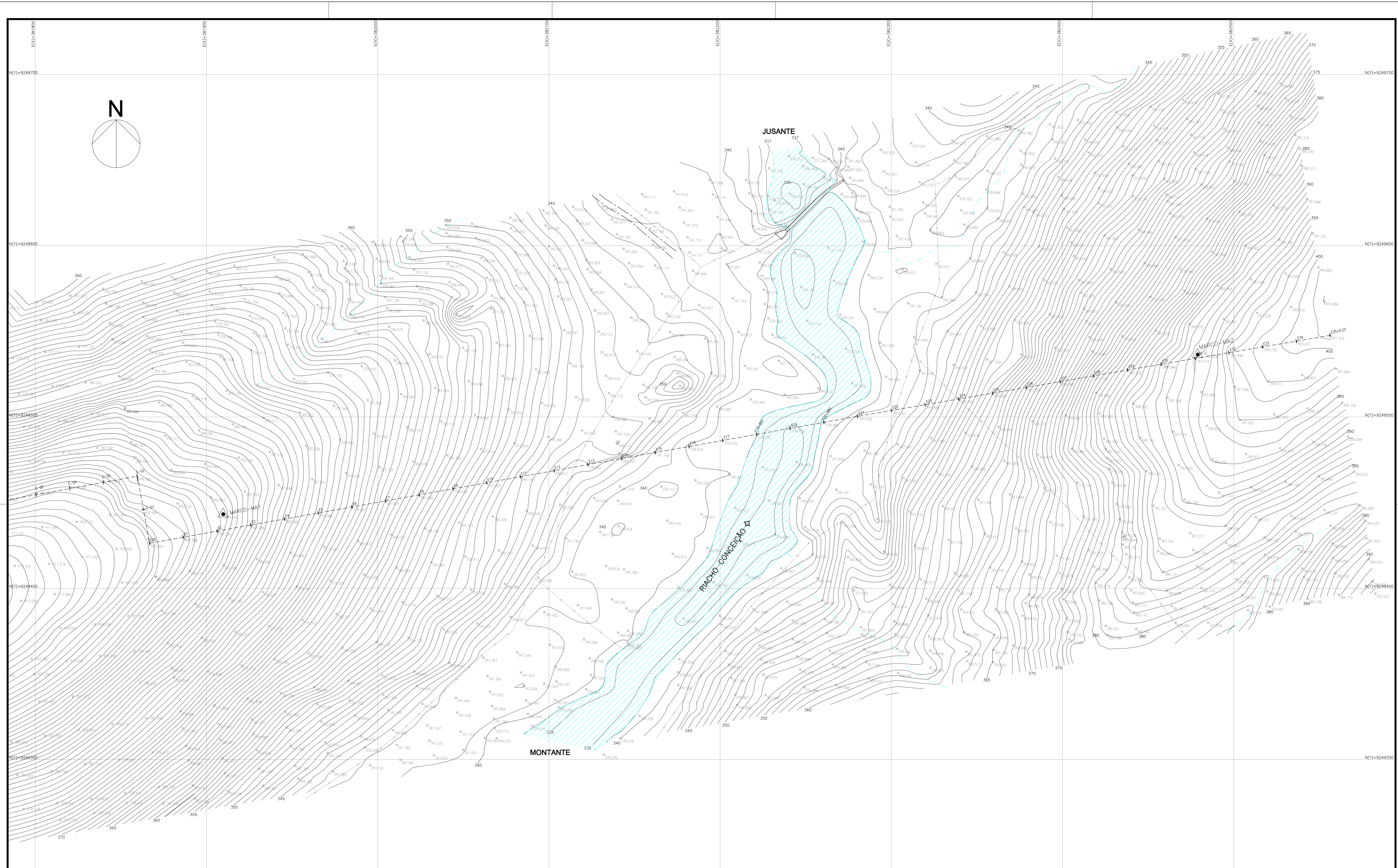
ELABORADO POR:

KLINGENHARIA **MAIBE** **enerconsult s.a.**

EDITADO EM: MARÇO/2006

ESCALA: HOR = 1/1.000

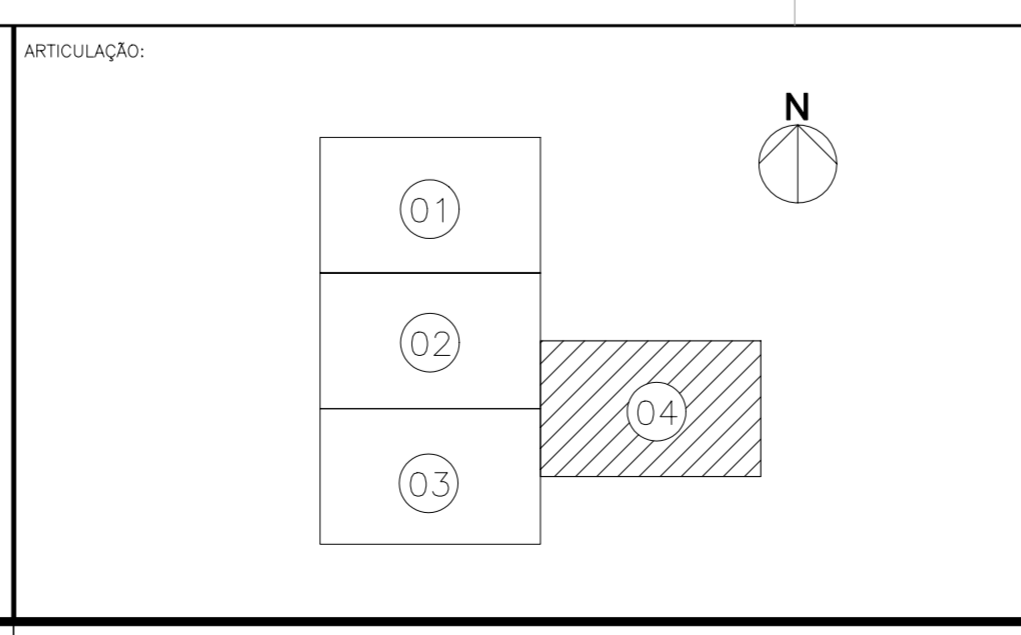
ARQUIVO: I-3-M-04/07-001



LEGENDA


- EIXO ESTAQUEADO A CADA 20m
- - - EIXO DO CANAL DE RESTITUIÇÃO
- ==== ESTRADA EXISTENTE
- CERCA EXISTENTE
- ~ CURVA MESTRA A CADA 5m
- ~ CURVA INTERMEDIÁRIA A CADA 1m
- RIO / RIACHO
- REDE ELÉTRICA
- CASA
- ▲ MARCOS IMPLANTADOS

NOTAS






REVISÕES

Nº	NATUREZA DA REVISÃO	DATA	APROVO



ELABORADO POR:

GOVERNO DO ESTADO DO CEARÁ
SECRETARIA DOS RECURSOS HÍDRICOS-SRH

PROGRAMA DE GERENCIAMENTO E INTEGRAÇÃO DOS RECURSOS HÍDRICOS DO ESTADO DO CEARÁ - PROGERIRH

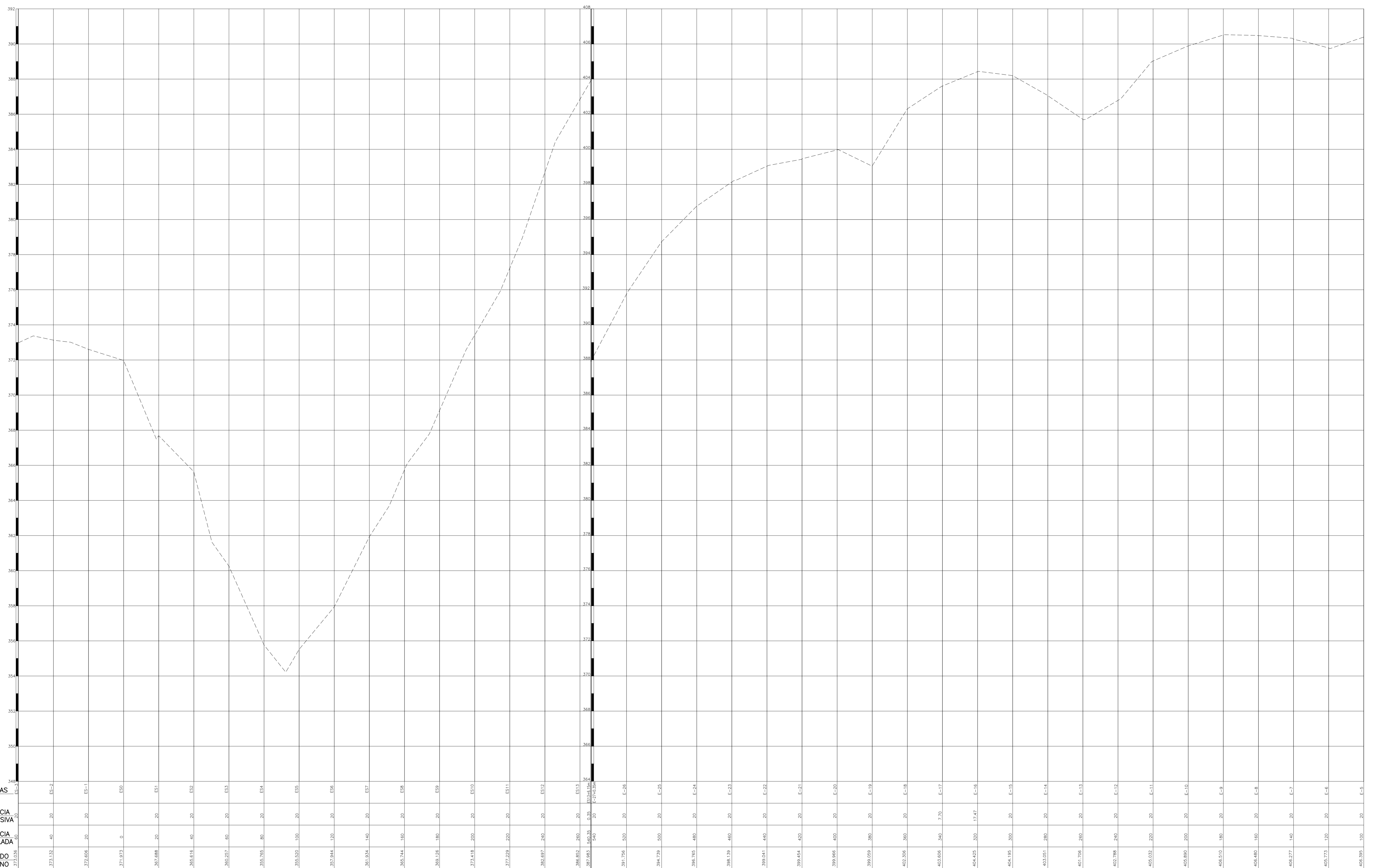
ESTUDOS TOPOGRÁFICOS

BARRAGEM MAMOEIRO
PLANTA BAIXA DO BOQUEIRÃO
ESTACA E-05 a E35+0,23m

ESTADO EM: MARÇO/2006

ESCALA: HOR. = 1/1.000

ARQUIVO: I-3-MA-05-07-001



LEGENDA

--- TERRENO NATURAL

NOTAS

ARTICULAÇÃO:

REVISÕES			
Nº	NATUREZA DA REVISÃO	DATA	APROVO

GOVERNO DO ESTADO DO CEARÁ
SECRETARIA DOS RECURSOS HÍDRICOS - SRH

PROGRAMA DE GERENCIAMENTO E INTEGRAÇÃO DOS RECURSOS HÍDRICOS DO ESTADO DO CEARÁ - PROGERIRH

ESTUDOS TOPOGRÁFICOS

BARRAGEM MAMOIRO
PERFIL LONGITUDINAL DO EIXO DO BOQUEIRÃO
ESTACA ES-3 A E-5

ELABORADO POR:

EDITADO EM: MARÇO/2006
ESCALA: HOR. = 1/1.000
VERT. = 1/100
DESENHO: T-3-MA-06/07-001

