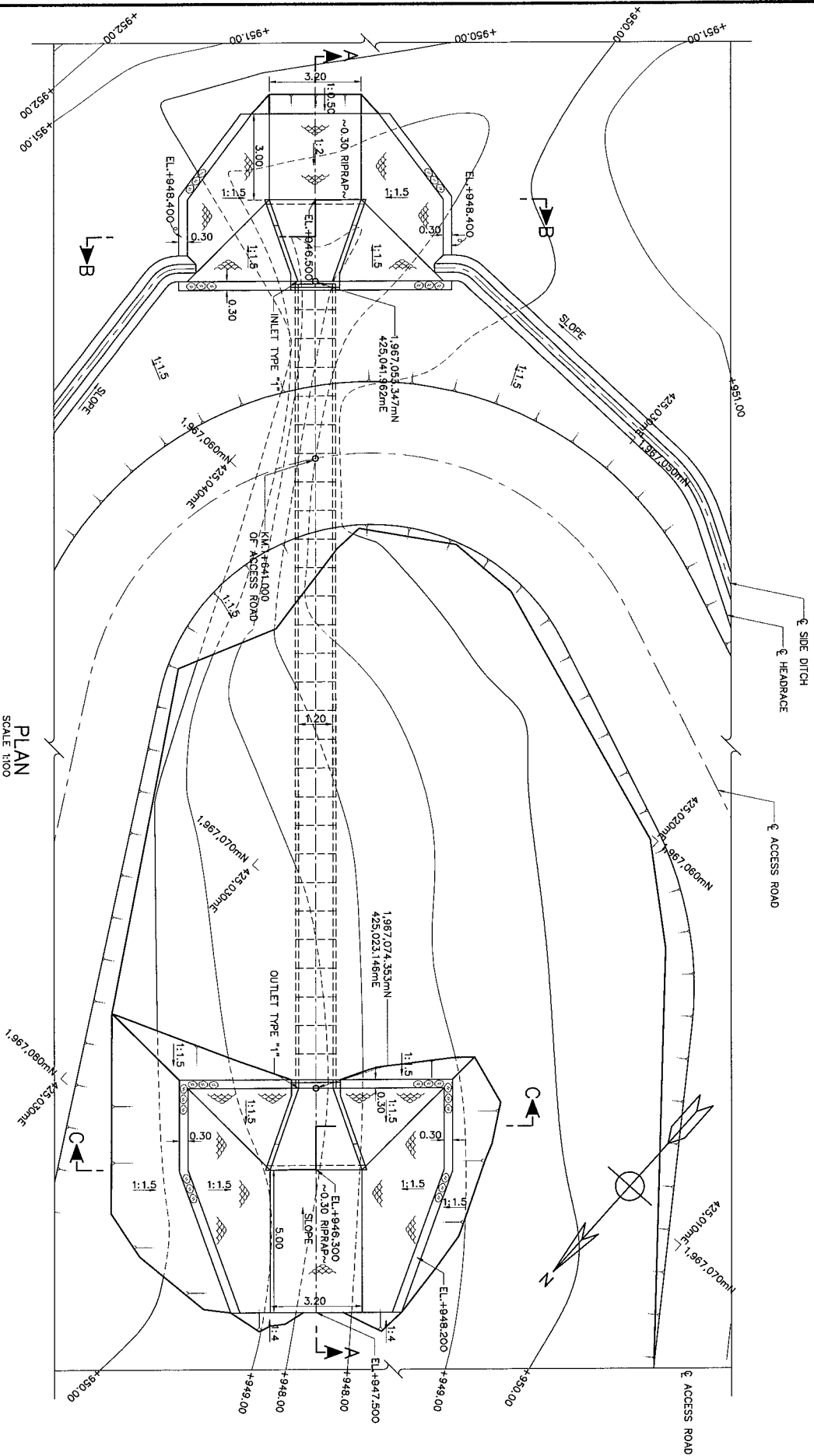
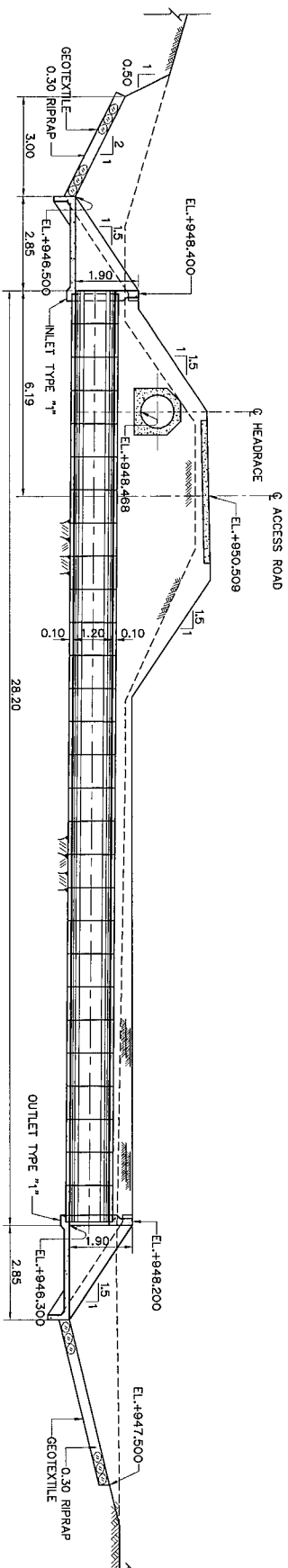
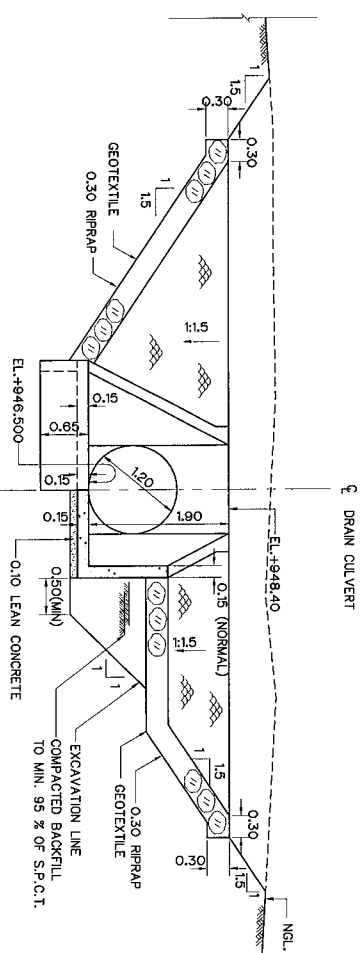




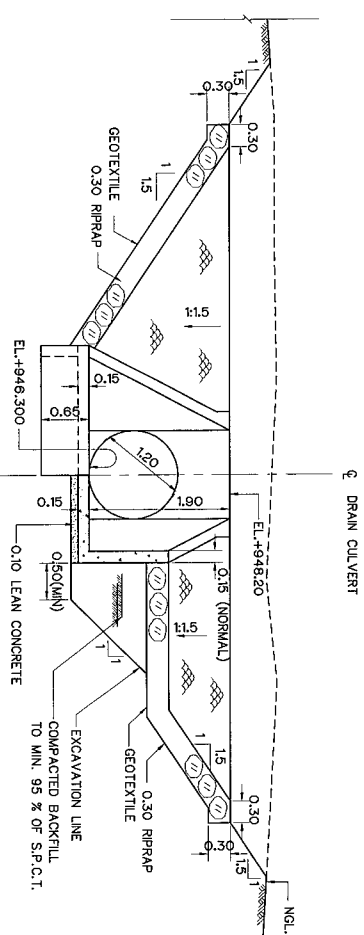
PLAN  
SCALE 1:100



SECTION A-A  
SCALE 1:100



SECTION B-B  
SCALE 1:50



SECTION C-C  
SCALE 1:50

NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-GN-01
3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M<sup>2</sup>.
4. CLASS 3 TOLUOL AND GROOVE TYPE OF R.C. PIPE WILL BE USED.
5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
6. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.

REFERENCE DRAWINGS :-

1. HEADRACE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
2. HEADRACE, TYPICAL SECTIONS
3. HEADRACE, STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
4. HEADRACE, MANHOLE DETAILS
5. HEADRACE, INLET AND OUTLET TRANSITIONS

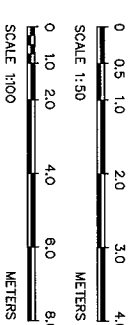
MT-HR-01 TO MT-HR-05

MT-HR-19

MT-HR-40

MT-HR-41

MT-HR-42



DEPARTMENT OF ALTERNATIVE ENERGY  
DEVELOPMENT AND EFFICIENCY

MAE TUEN HYDROPOWER PROJECT

CIVIL WORKS  
HEADRACE

DRAIN CULVERT, KM. 1+641.000

PAVIA CONSULTANTS CO., LTD.

DESIGNED BY: MT/22314

DRAWN BY: MT/22314

CHECKED BY: MT/22314

PROJECT MANAGER: MT/22314

DATE: 22/06/13

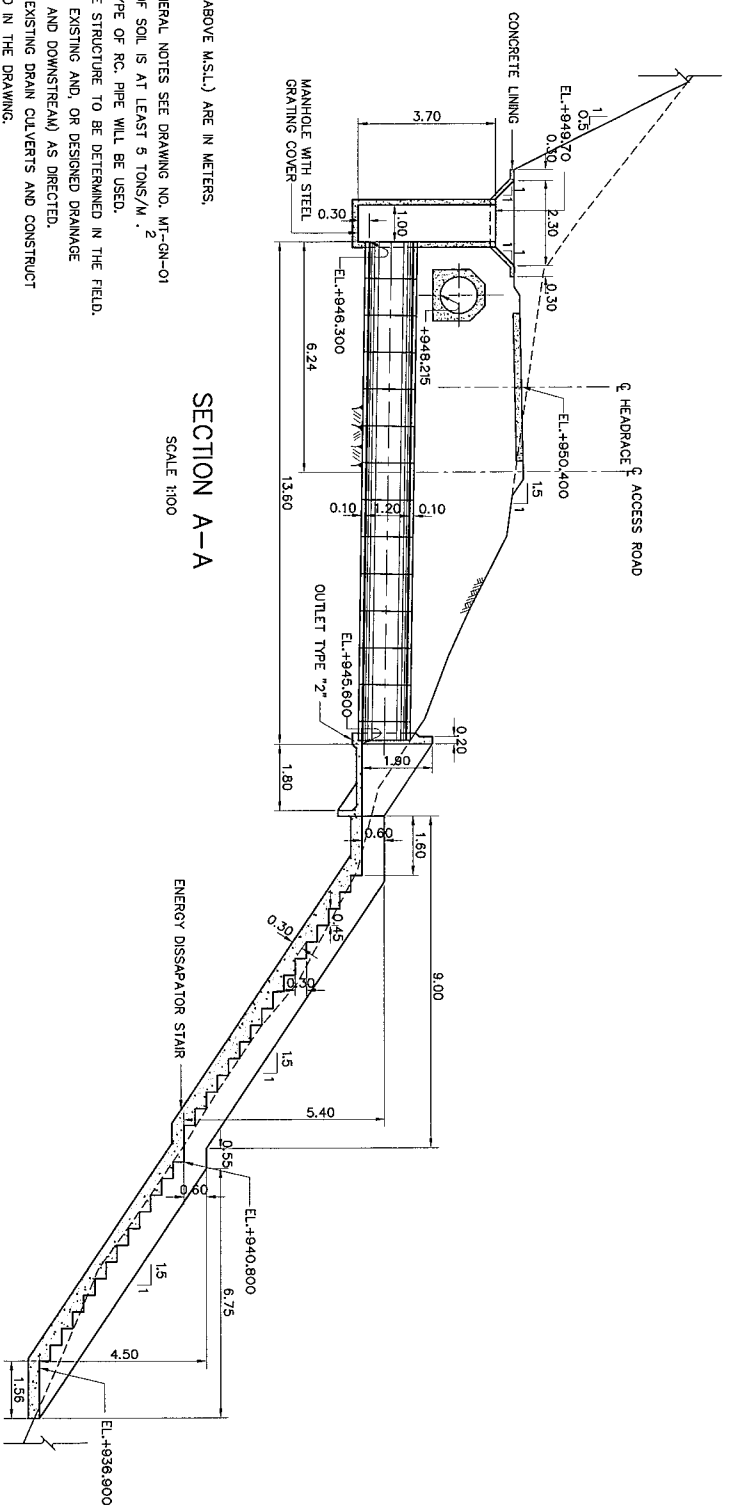
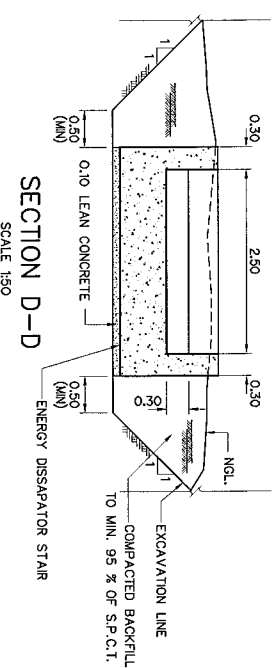
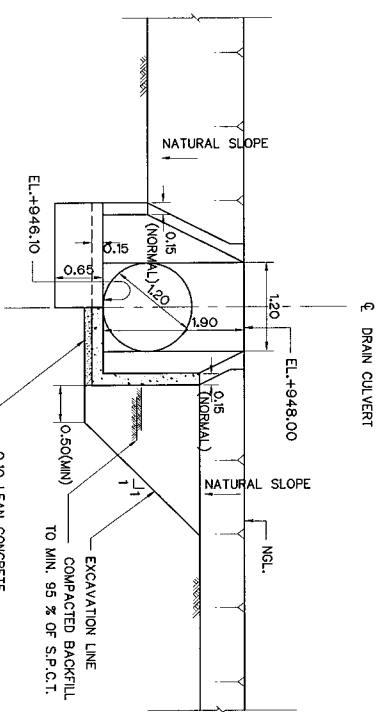
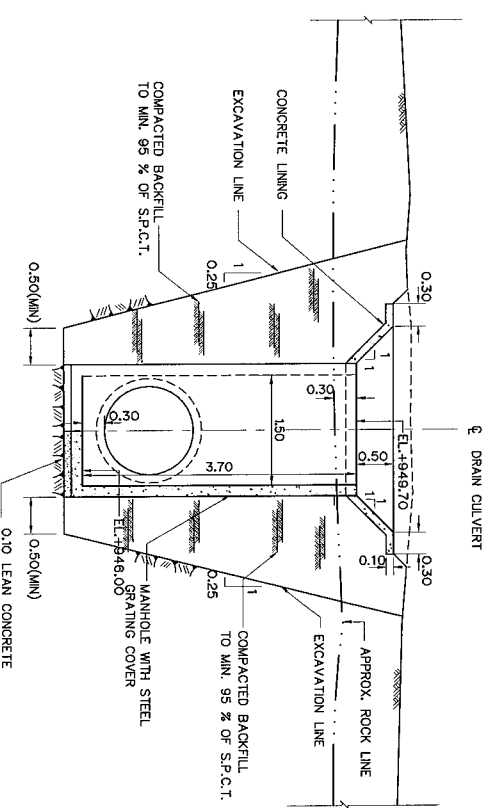
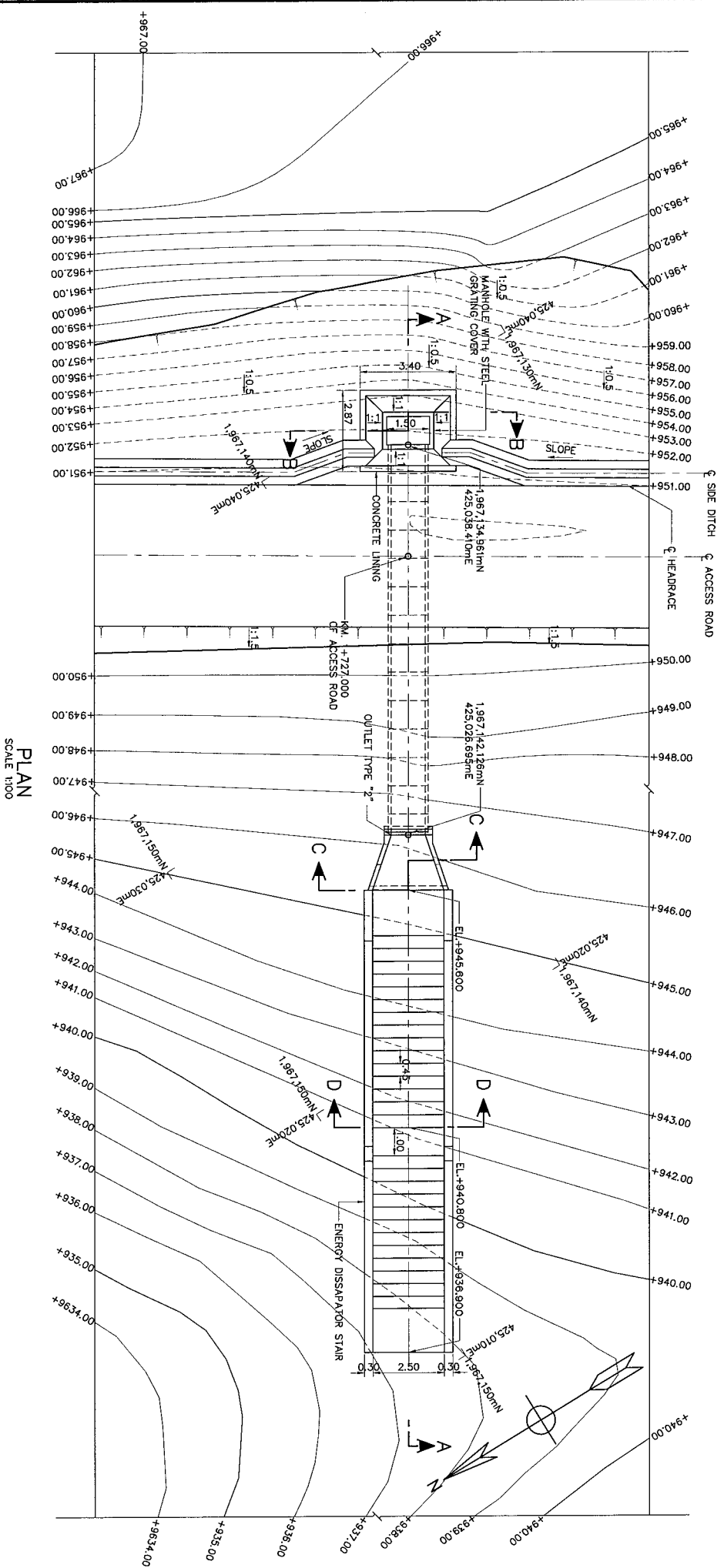
DATE: 22/06/13

DATE: 22/06/13

DATE: 22/06/13

DATE: 22/06/13

DATE: 22/06/13



- NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-CN-01
3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M.<sup>2</sup>
4. CLASS 3 TOLUOL AND GROOVE TYPE OF RC. PIPE WILL BE USED.
5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
6. STRUCTURE TO BE CONNECTED TO EXISTING AND, OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.

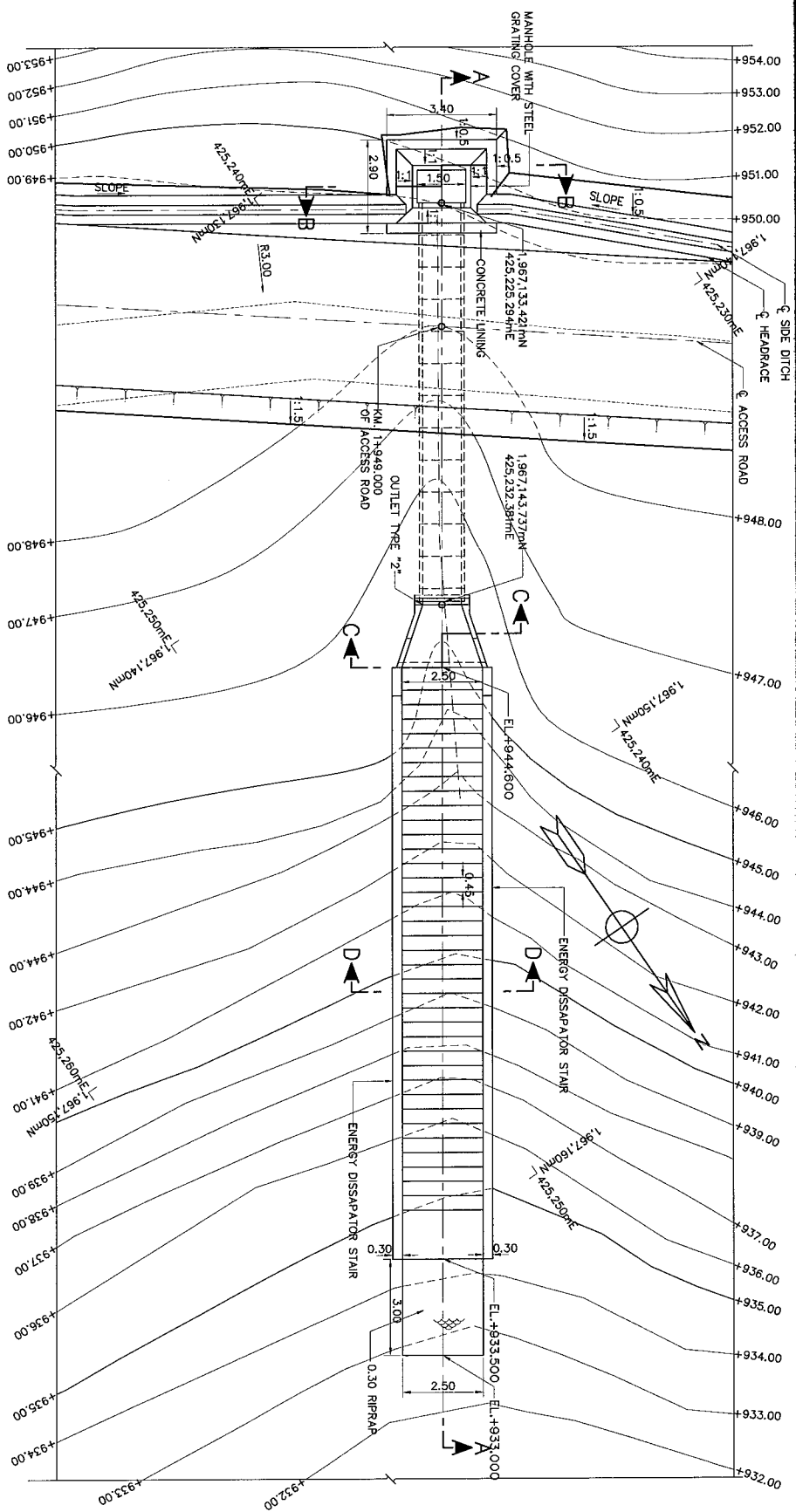
- REFERENCE DRAWINGS :-**

1. HEADRACE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
2. HEADRACE, TYPICAL SECTIONS
3. HEADRACE, STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
4. HEADRACE, MANHOLE DETAILS
5. HEADRACE, INLET AND OUTLET TRANSITIONS

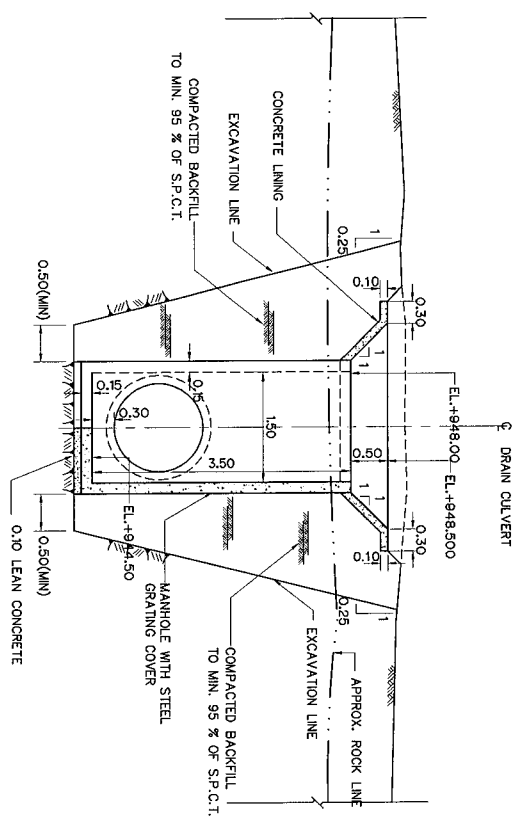
- MT-HR-01 TO MT-HR-05  
MT-HR-19  
MT-HR-40  
MT-HR-41  
MT-HR-42

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| CONSULTANTS |      |           |         |          |
| DEDE        |      |           |         |          |

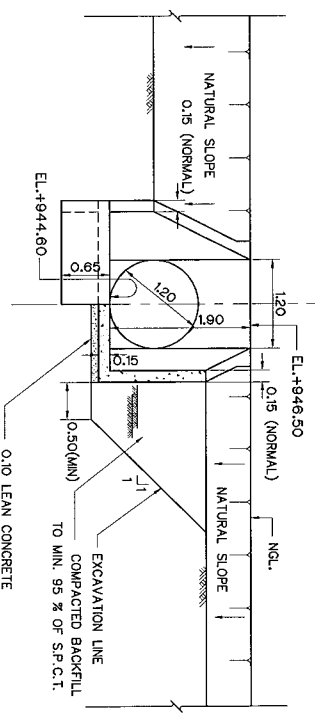
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|----------------------------------------------------------------------------------------------------------|---------------------------------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |                                 |
| MAE TUEN HYDROPOWER PROJECT                                                                              |                                 |
| CIVIL WORKS<br>HEADRACE                                                                                  |                                 |
| DRAIN CULVERT, KM. 1+727.000                                                                             |                                 |
| DESIGNED <i>DR</i> RUJ22514 <i>ayun</i> RU.8405                                                          | SUBMITTED <i>[Signature]</i>    |
| DRAWN <i>[Signature]</i>                                                                                 | RECOMMENDED <i>P. Hongsakul</i> |
| CHECKED <i>[Signature]</i>                                                                               | APPROVED <i>[Signature]</i>     |
| PROJECT MANAGER <i>[Signature]</i>                                                                       | SHEET NO. 40 OF 98              |
| DATE 27/06/13                                                                                            | DRAINING NO. MT-HR-29           |



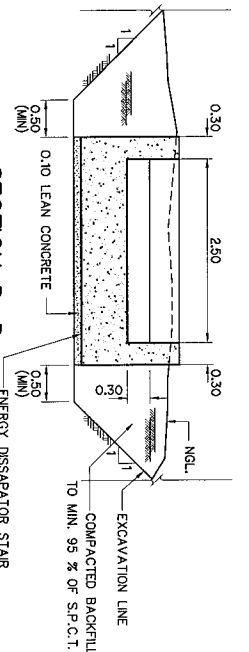
PLAN  
SCALE 1:100



SECTION B-B  
SCALE 1:50



SECTION C-C  
SCALE 1:50

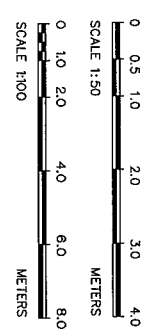


SECTION D-D  
SCALE 1:50

- NOTES :-
1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
  2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-QN-01
  3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M<sup>2</sup>
  4. CLASS 3 TONGUE AND GROOVE TYPE OF RC. PIPE WILL BE USED.
  5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
  6. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
  7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.

- REFERENCE DRAWINGS :-
1. HEADRACE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
  2. HEADRACE TYPICAL SECTIONS
  3. HEADRACE STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
  4. HEADRACE MANHOLE DETAILS
  5. HEADRACE INLET AND OUTLET TRANSITIONS

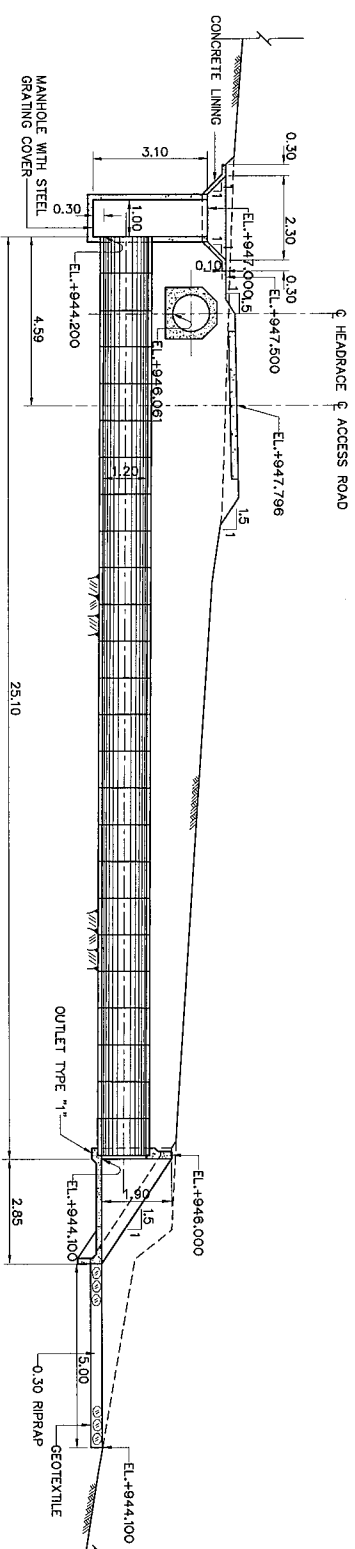
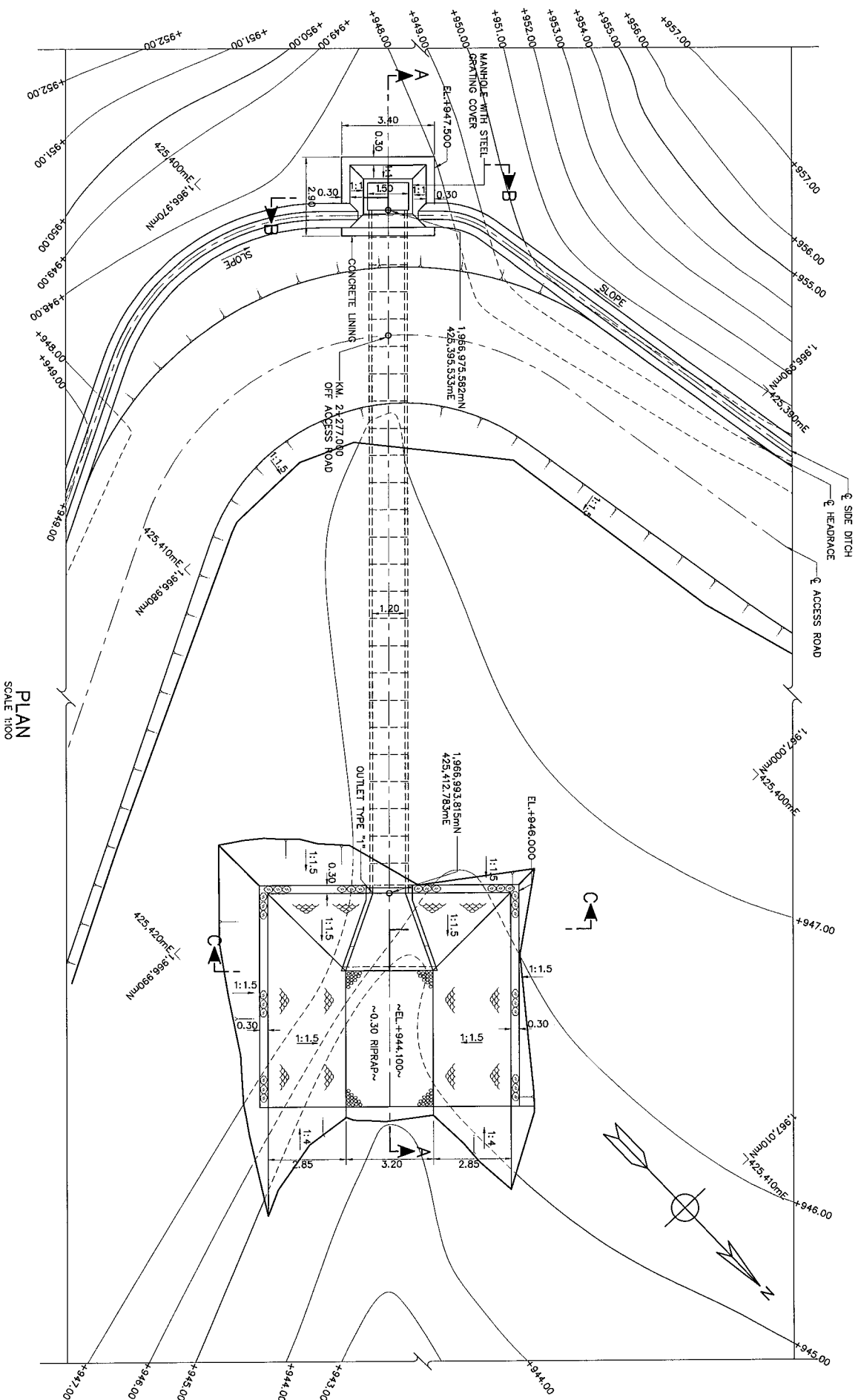
- MT-HR-01 TO MT-HR-05  
MT-HR-19  
MT-HR-40  
MT-HR-41  
MT-HR-42



|     |      |           |         |          |             |
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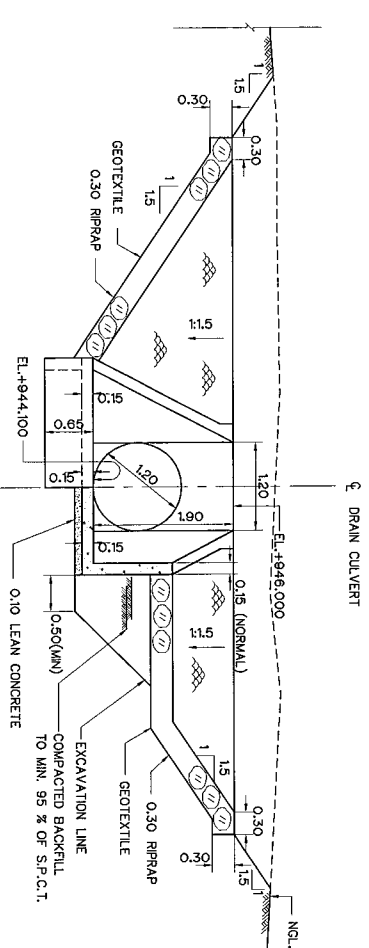
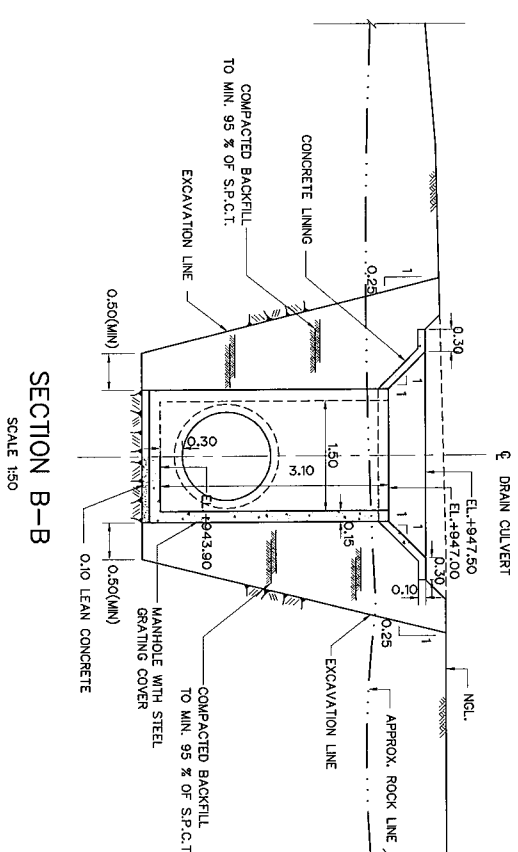
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| KINGDOM OF THAILAND                                         |             |
| MINISTRY OF ENERGY                                          |             |
| DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |             |
| MAE TUEH HYDROPOWER PROJECT                                 |             |
| CIVIL WORKS                                                 |             |
| HEADRACE                                                    |             |
| DRAIN CULVERT, KM. 1+949.000                                |             |
| PANYA CONSULTANTS CO., LTD.                                 |             |
| DESIGNED                                                    | REVIEWED    |
| DRAWN                                                       | SUBMITTED   |
| CHECKED                                                     | RECOMMENDED |
| APPROVED                                                    | APPROVED    |
| DATE                                                        | DATE        |
| PROJECT MANAGER                                             | SHEET NO.   |





- NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-CN-01
3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M.<sup>2</sup>
4. CLASS 3 TONGUE AND GROOVE TYPE OF R.C. PIPE WILL BE USED.
5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
6. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.



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| CONSULTANTS |      | DEDC      |                       |

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|-----------------|--|--------|-------------|--------------|--|-----------|
| DESIGNED        |  | DATE   | APPROVED    | DRAWING NO.  |  | SHEET NO. |
| DRAWN           |  | 2/1/22 | RECOMMENDED | M1-HR-32     |  | 43 OF 98  |
| CHECKED         |  | 2/1/22 | APPROVED    | PROJECT NO.  |  |           |
| PROJECT MANAGER |  | 2/1/22 | DATE        | PROJECT NAME |  |           |

DRAIN CULVERT, KM. 2+277.000

CIVIL WORKS  
HEADRACE

MAE TUEN HYDROPOWER PROJECT

KINGDOM OF THAILAND  
MINISTRY OF ENERGY  
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY

MT-HR-01 TO MT-HR-05

MT-HR-01

MT-HR-01

MT-HR-01

MT-HR-01

**CD PANYA CONSULTANTS CO.,LTD**

DEPARTMENT OF ALTERNATIVE ENERGY  
DEVELOPMENT AND EFFICIENCYREVIEWED 

DESIGNED BY:  DATE: 2/25/14 2075

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|---|-----------|-------------------------------------------------------------------------------------|
| 5 | SUBMITTED |  |
|---|-----------|-------------------------------------------------------------------------------------|

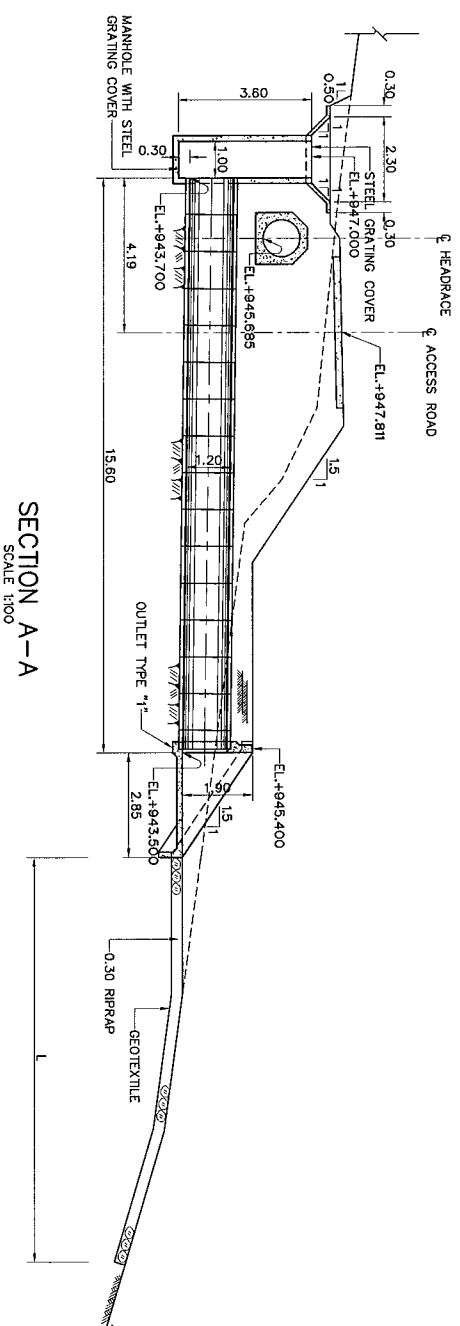
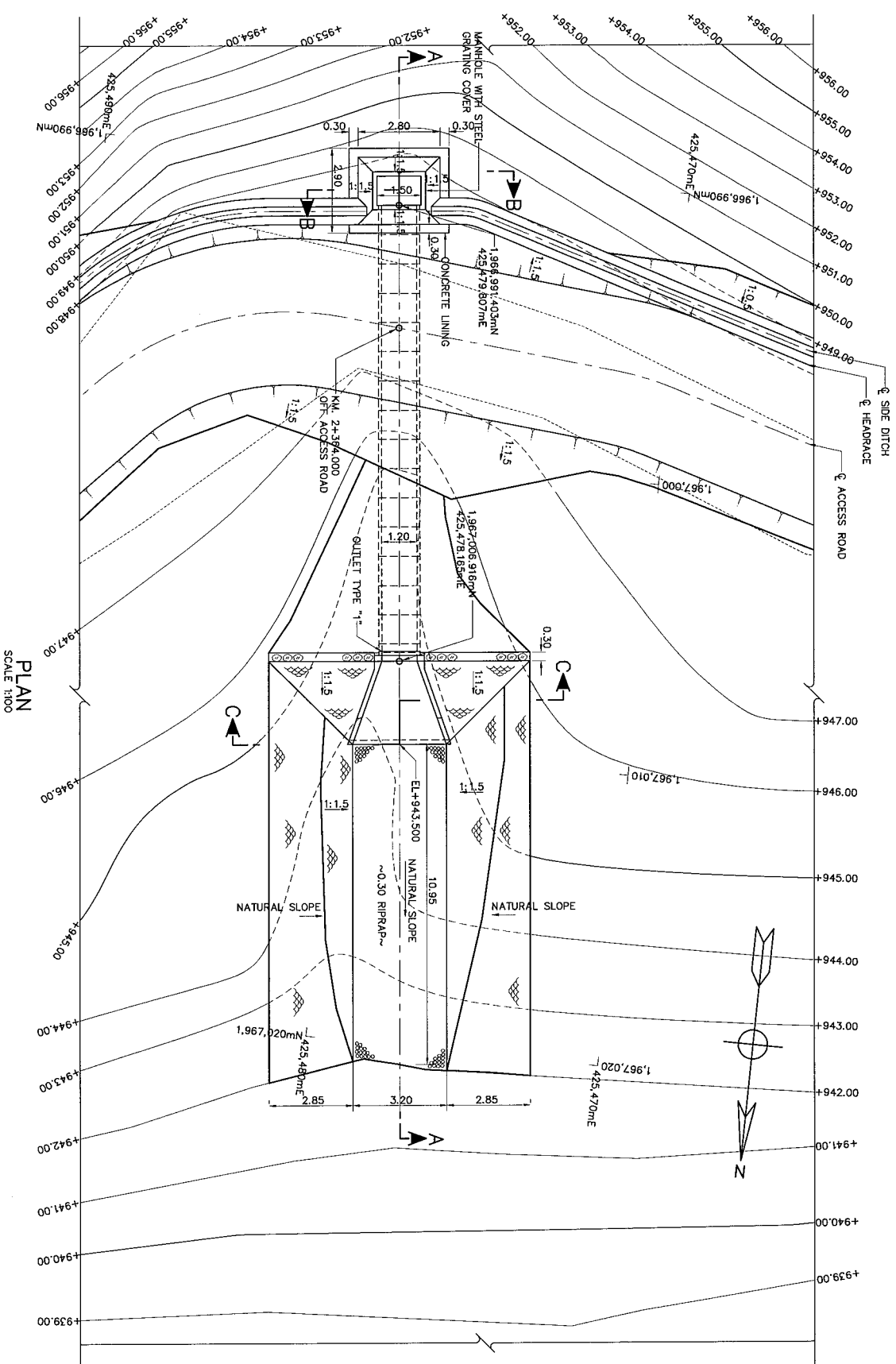
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RECORDED 11

44

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| RECOMMENDED | P. 240-68, 1/78 |
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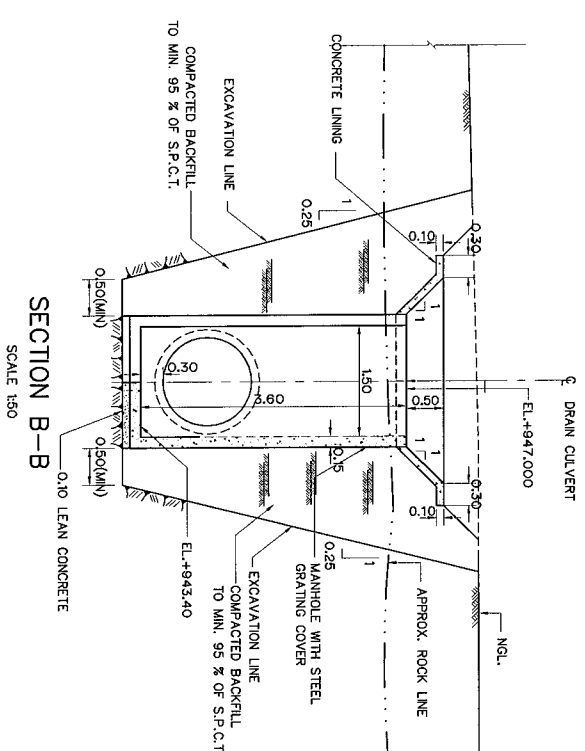
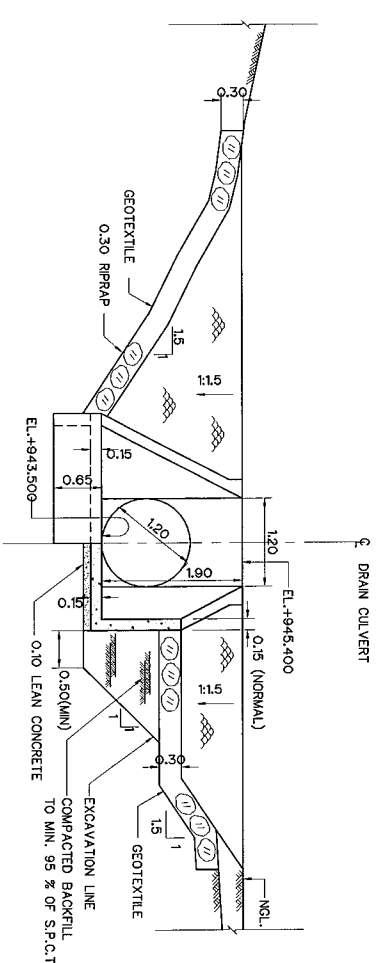
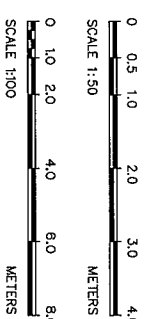
2



- REFERENCE DRAWINGS :-
1. HEADRAGE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
  2. HEADRAGE, TYPICAL SECTIONS
  3. HEADRAGE, STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
  4. HEADRAGE, MANHOLE DETAILS
  5. HEADRAGE, INLET AND OUTLET TRANSITIONS

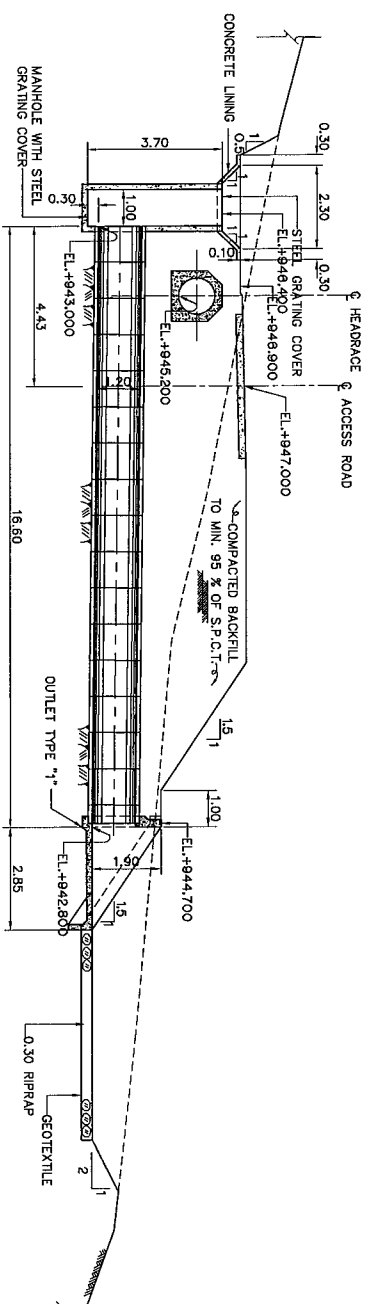
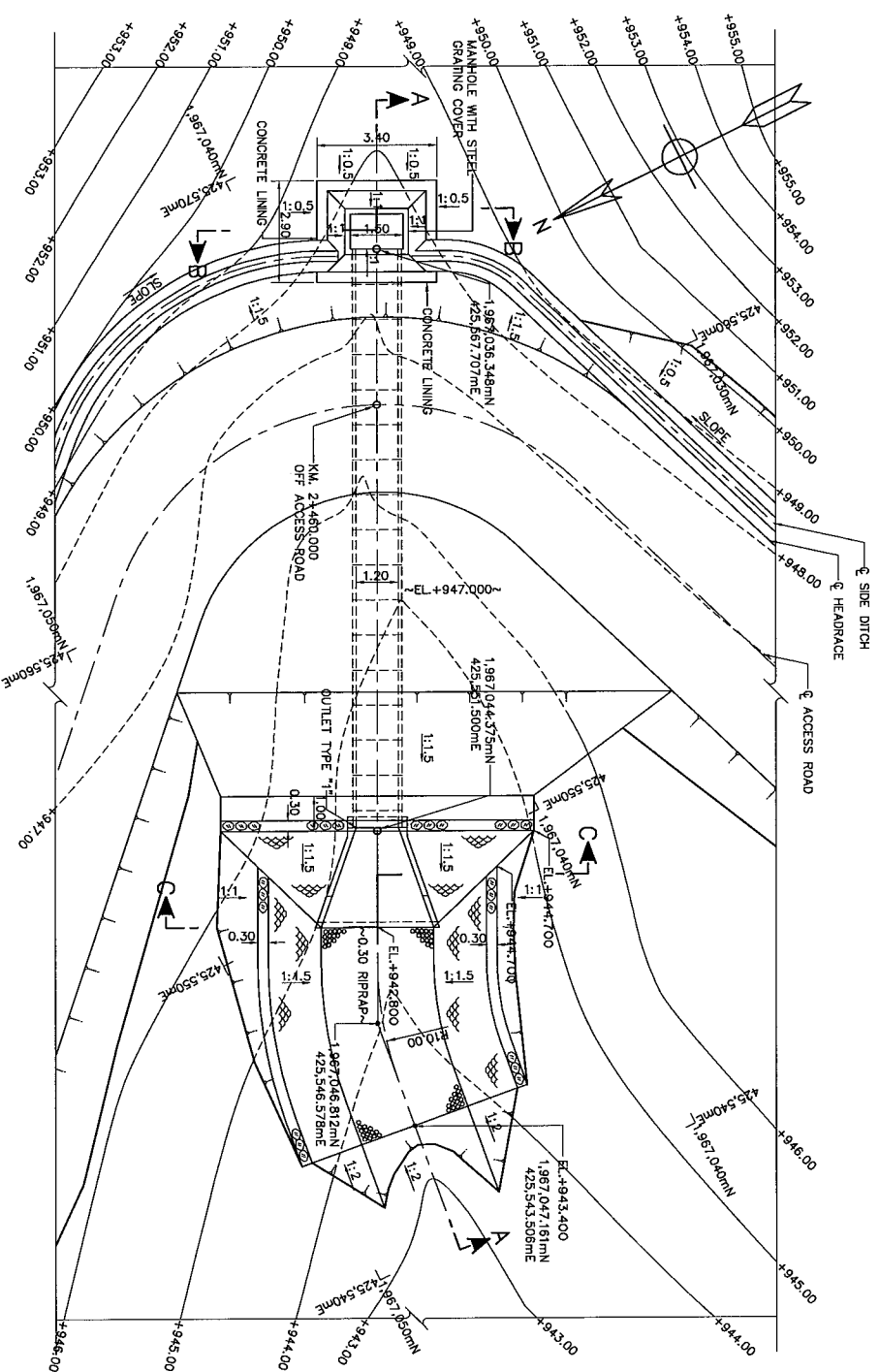
NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-QN-01
3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M<sup>2</sup>
4. CLASS 3 TONGUE AND GROOVE TYPE OF RC. PIPE WILL BE USED.
5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
6. STRUCTURE TO BE CONNECTED TO EXISTING AND, OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.



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| NO. | DATE | REVISIONS | CHECKED | APPROVED | CONSULTANTS |

|                                                                                                          |  |  |  |  |  |
|----------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |  |  |  |  |  |
| MAE TUEN HYDROPOWER PROJECT                                                                              |  |  |  |  |  |
| CIVIL WORKS                                                                                              |  |  |  |  |  |
| HEADRAGE                                                                                                 |  |  |  |  |  |
| DRAIN CULVERT KM. 2+364.000                                                                              |  |  |  |  |  |
| PANYA CONSULTANTS CO., LTD.                                                                              |  |  |  |  |  |
| DESIGNED BY: PANYA CONSULTANTS CO., LTD.                                                                 |  |  |  |  |  |
| CHECKED BY: PANYA CONSULTANTS CO., LTD.                                                                  |  |  |  |  |  |
| APPROVED BY: PANYA CONSULTANTS CO., LTD.                                                                 |  |  |  |  |  |
| PROJECT MANAGER: PANYA CONSULTANTS CO., LTD.                                                             |  |  |  |  |  |
| DATE: 27/08/13                                                                                           |  |  |  |  |  |
| DRAWING NO. MT-HR-33                                                                                     |  |  |  |  |  |
| SHEET NO. 44 OF 98                                                                                       |  |  |  |  |  |



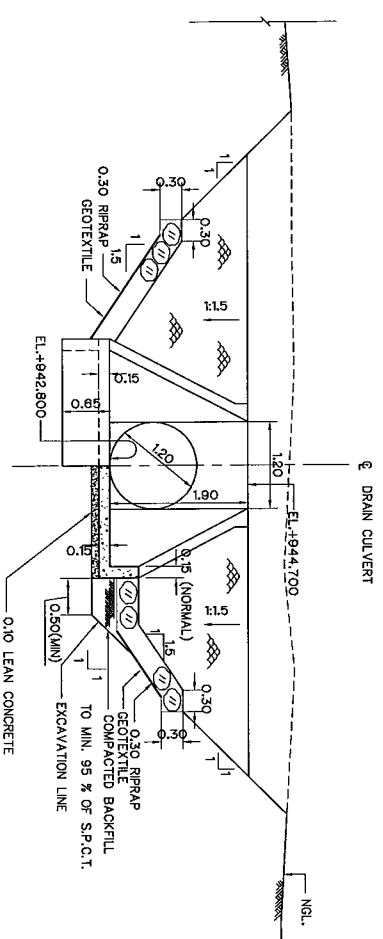
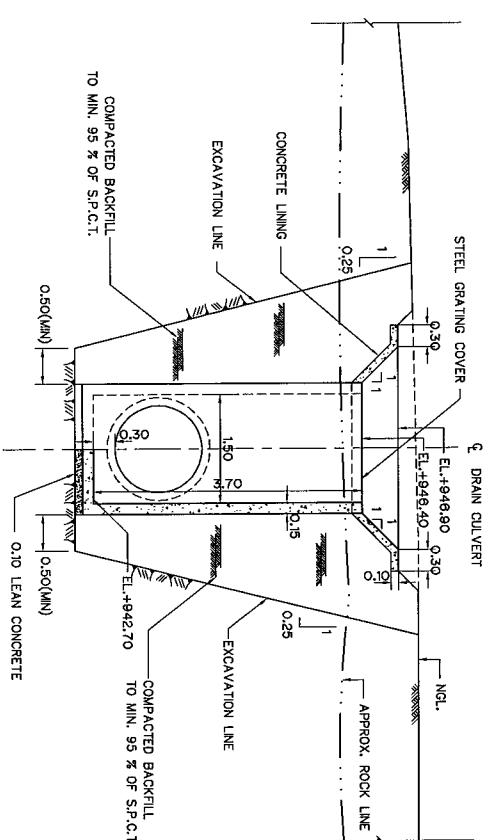
**NOTES :-**

1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. M7-CR-01
3. ALLOWABLE BEARING CAPACITY OF SOIL IS AT LEAST 5 TONS/M<sup>2</sup>
4. CLASS 3 TOLUENE AND GROOVE TYPE OF RC PIPE WILL BE USED.
5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
6. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.

**REFERENCE DRAWINGS :-**

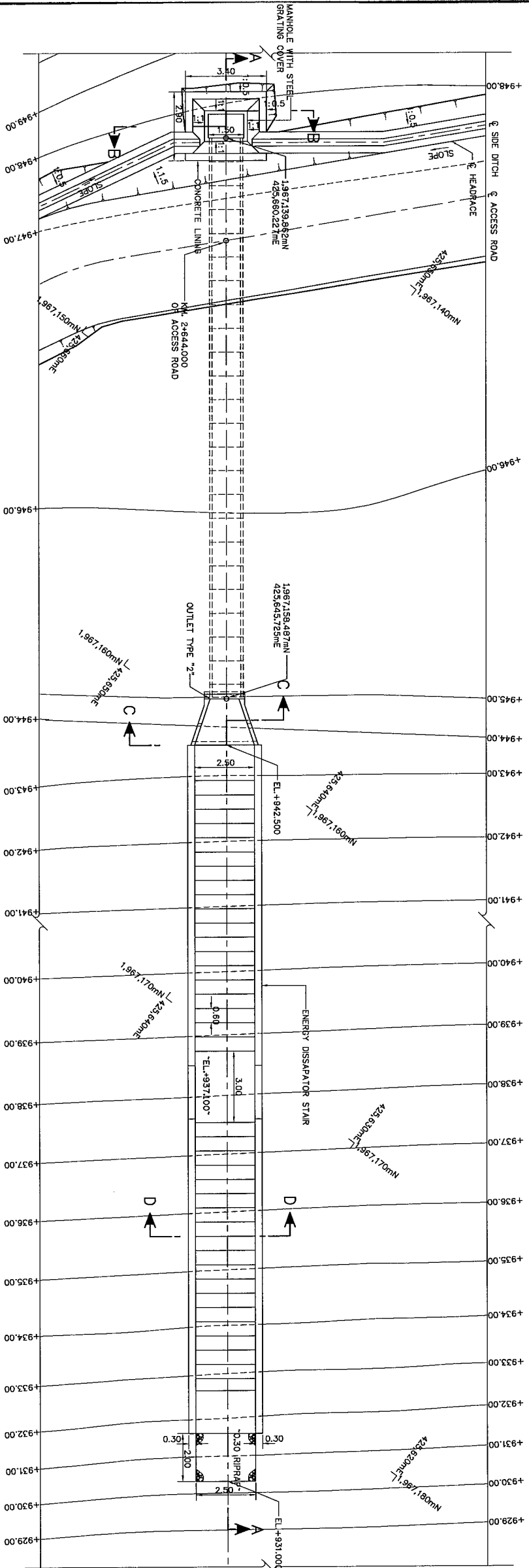
1. HEADRACE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
2. HEADRACE, TYPICAL SECTIONS
3. HEADRACE, STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
4. HEADRACE, MANHOLE DETAILS
5. HEADRACE, INLET AND OUTLET TRANSITIONS

MT-HR-01 TO MT-HR-05  
MT-HR-19  
MT-HR-40  
MT-HR-41  
MT-HR-42

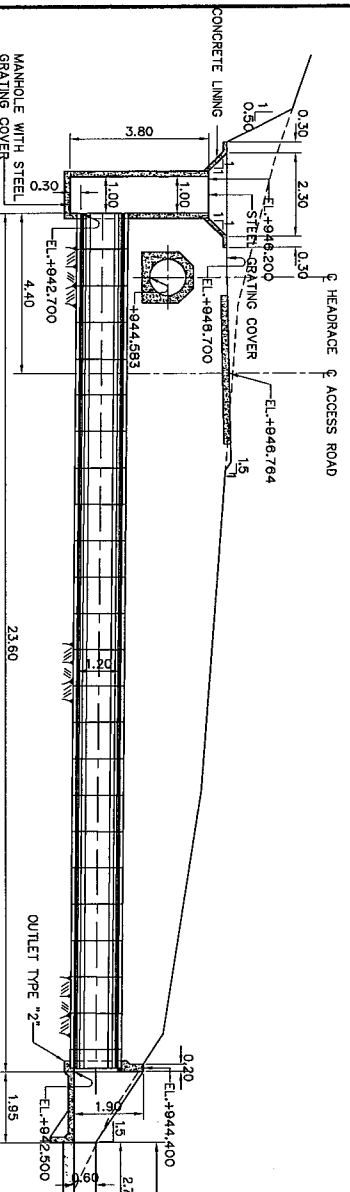


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| NO.         | DATE | REVISIONS | CHECKED | APPROVED |
| CONSULTANTS |      |           |         |          |
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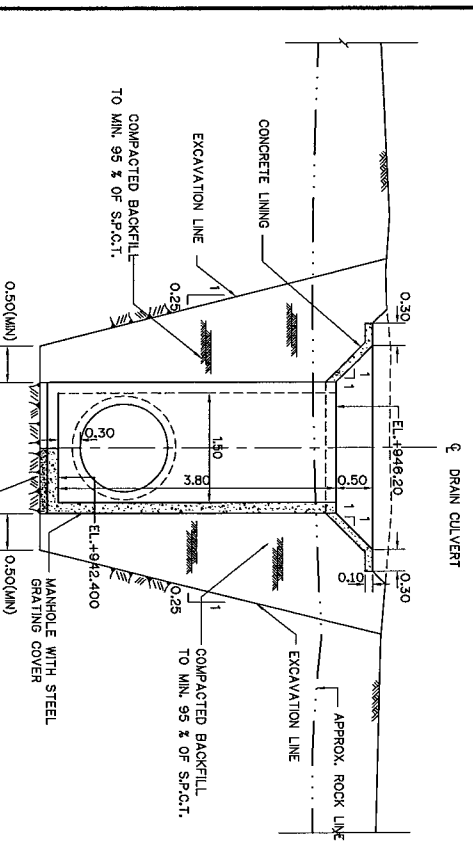
|                                                                                                          |                                                                                     |                                         |                                                                                        |
|----------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |                                                                                     | MAE TUEN HYDROPOWER PROJECT             |                                                                                        |
| CIVIL WORKS                                                                                              |                                                                                     | HEADRACE                                |                                                                                        |
| DRAIN CULVERT KM. 2+460.000                                                                              |                                                                                     | DESIGNED BY PANYA CONSULTANTS CO., LTD. |                                                                                        |
| RECEIVED                                                                                                 | DEPARTMENT OF ALTERNATIVE ENERGY<br>DEVELOPMENT AND EFFICIENCY                      | DESIGNED                                | OK ML22514 WSN RM4403                                                                  |
| SUBMITTED                                                                                                |  | DRAWN                                   | OK  |
| RECOMMENDED                                                                                              | P. HANNUA                                                                           | CHECKED                                 | OK  |
| APPROVED                                                                                                 | P. HANNUA                                                                           | PROJECT MANAGER                         | OK  |
| DRAWING NO.                                                                                              | MT-HR-34                                                                            | DATE                                    | 27/06/13                                                                               |
| SHEET NO.                                                                                                | 45 OF 98                                                                            |                                         |                                                                                        |



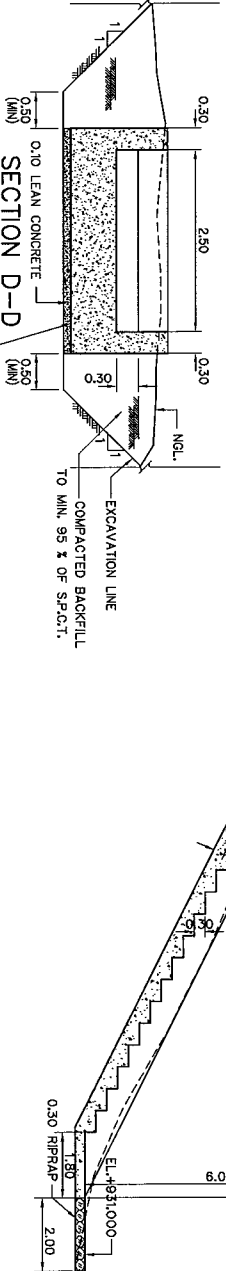
PLAN  
SCALE 1:100



SECTION A-A  
SCALE 1:100



SECTION B-B  
SCALE 1:50

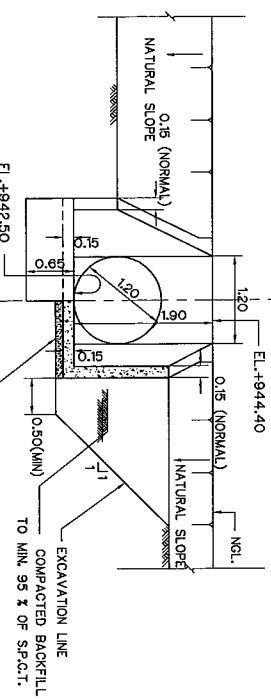


SECTION D-D  
SCALE 1:50

REFERENCE DRAWINGS :-

1. HEADRAGE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
2. HEADRAGE, TYPICAL SECTIONS
3. HEADRAGE, STANDARD REINFORCED AND INSTALLATION CONCRETE PRE
4. HEADRAGE, MANHOLE DETAILS
5. HEADRAGE, INLET AND OUTLET TRANSITIONS

- MT-HR-01 TO MT-HR-05  
MT-HR-19  
MT-HR-40  
MT-HR-41  
MT-HR-42



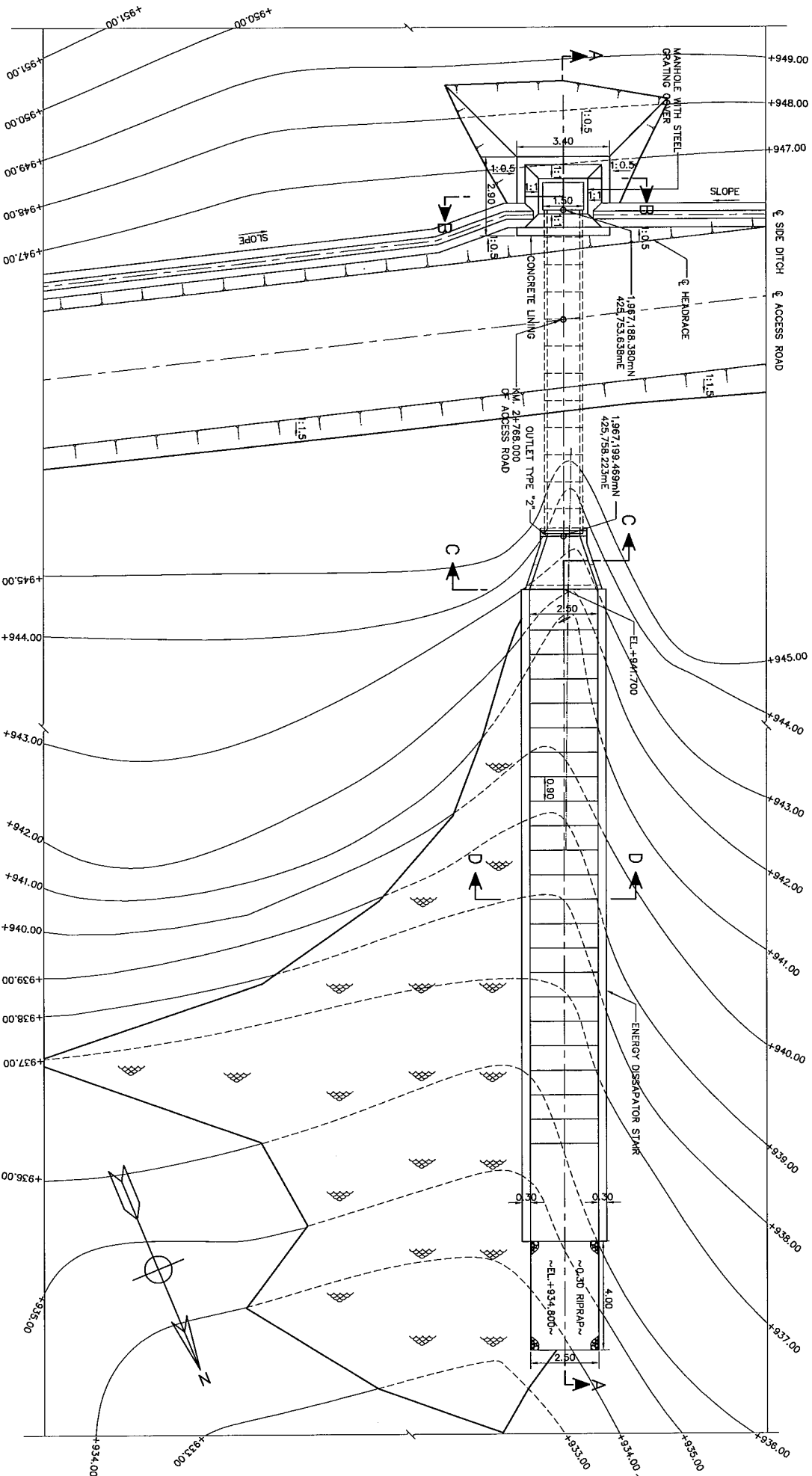
SECTION C-C  
SCALE 1:50

NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-CN-01
3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M<sup>2</sup>.
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5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
6. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.

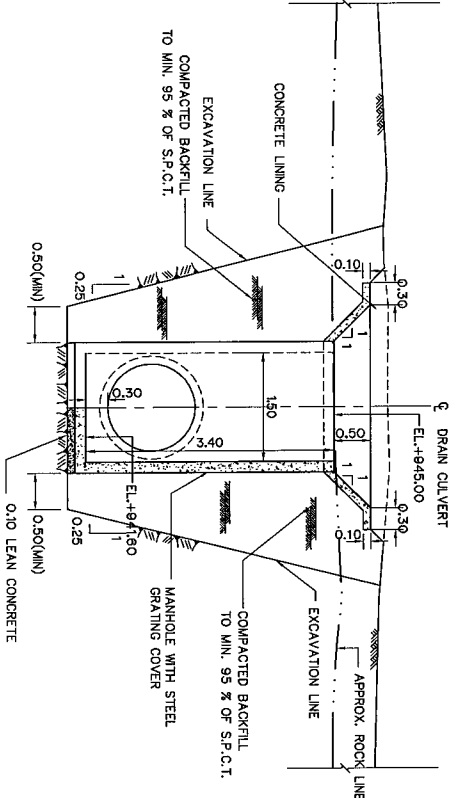
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|------------|-----|-----|-----|-----|-----|
| 0          | 0.5 | 1.0 | 2.0 | 3.0 | 4.0 |
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| SCALE 1:50 |     |     |     |     |     |
| METERS     |     |     |     |     |     |

|                                                                                                          |                                     |
|----------------------------------------------------------------------------------------------------------|-------------------------------------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |                                     |
| MAE TUN HYDROPOWER PROJECT                                                                               |                                     |
| CIVIL WORKS<br>HEADRAGE                                                                                  |                                     |
| DRAIN CULVERT KM. 2+644.000                                                                              |                                     |
| DESIGNED BY<br>P. HANSA<br>27/06/13                                                                      | REVIEWED BY<br>P. HANSA<br>27/06/13 |
| CHECKED BY<br>P. HANSA<br>27/06/13                                                                       | APPROVED BY<br>P. HANSA<br>27/06/13 |
| PROJECT MANAGER<br>P. HANSA<br>27/06/13                                                                  | SHEET NO.<br>46 OF 98               |

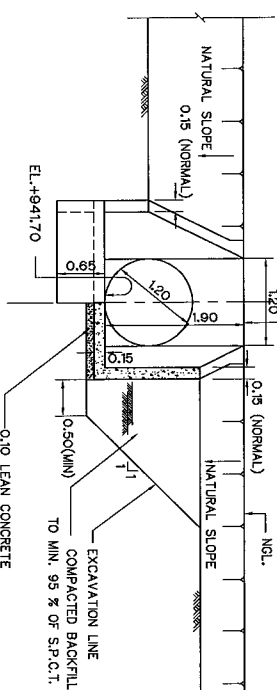


PLAN  
SCALE 1:100

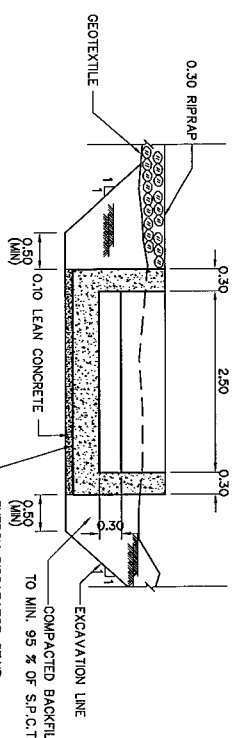
SECTION B-B  
SCALE 1:50



SECTION C-C  
SCALE 1:50



SECTION D-D  
SCALE 1:50

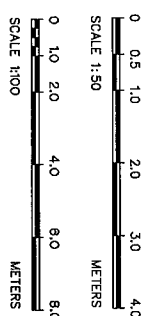


SECTION A-A  
SCALE 1:100

NOTES :-  
1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.  
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-GH-01  
3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 9 TONS/M<sup>2</sup>  
4. CLASS 3 TONGUE AND GROOVE TYPE OF RC. PIPE WILL BE USED.  
5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.  
6. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.  
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.

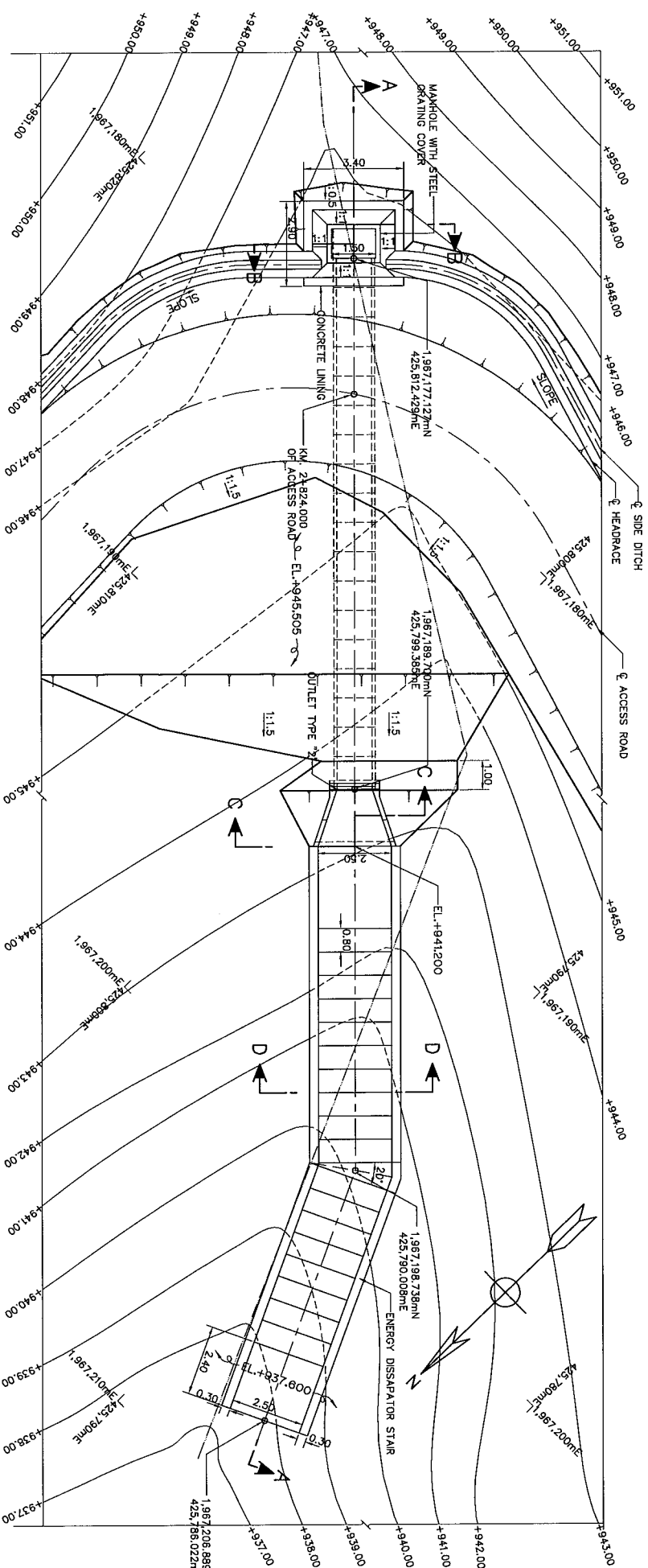
REFERENCE DRAWINGS :-  
1. HEADRACE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)  
2. HEADRACE, TYPICAL SECTIONS  
3. HEADRACE, STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE  
4. CLASS 3 TONGUE AND GROOVE TYPE OF RC. PIPE WILL BE USED.  
5. HEADRACE, INLET AND OUTLET TRANSITIONS

MT-HR-01 TO MT-HR-05  
MT-HR-19  
MT-HR-40  
MT-HR-41  
MT-HR-42

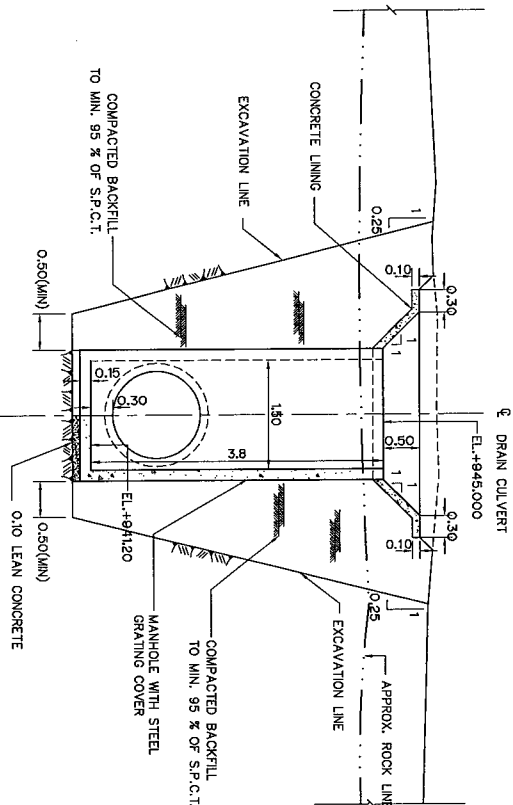


| NO. | DATE | REVISIONS | CHECKED | APPROVED |
|-----|------|-----------|---------|----------|
| 1   |      |           |         |          |
| 2   |      |           |         |          |
| 3   |      |           |         |          |

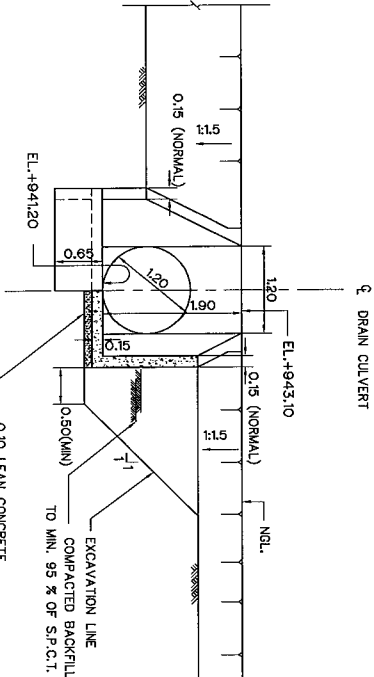
|                                                                                                                                                                                                    |  |  |  |                                                                                                                      |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|----------------------------------------------------------------------------------------------------------------------|--|--|--|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY<br>MAE TUEH HYDROPOWER PROJECT<br>CIVIL WORKS<br>HEADRACE<br>DRAIN CULVERT, KM. 2+768.000 |  |  |  | DESIGNED BY P. J. 22/11/14<br>DRAWN BY P. J. 22/11/14<br>CHECKED BY P. J. 22/11/14<br>PROJECT MANAGER P. J. 22/11/14 |  |  |  |
| PAVIA CONSULTANTS CO., LTD.                                                                                                                                                                        |  |  |  | DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY                                                          |  |  |  |
| REVIEWED BY P. J. 22/11/14                                                                                                                                                                         |  |  |  | RECOMMENDED BY P. J. 22/11/14                                                                                        |  |  |  |
| APPROVED BY P. J. 22/11/14                                                                                                                                                                         |  |  |  | APPROVED BY P. J. 22/11/14                                                                                           |  |  |  |
| DATE 22/06/13                                                                                                                                                                                      |  |  |  | DRAWING NO. MT-HR-36                                                                                                 |  |  |  |
|                                                                                                                                                                                                    |  |  |  | SHEET NO. 47 OF 98                                                                                                   |  |  |  |



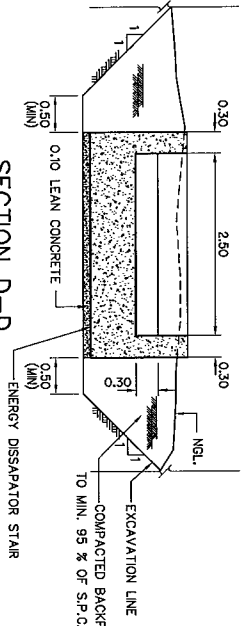
PLAN  
SCALE 1:100



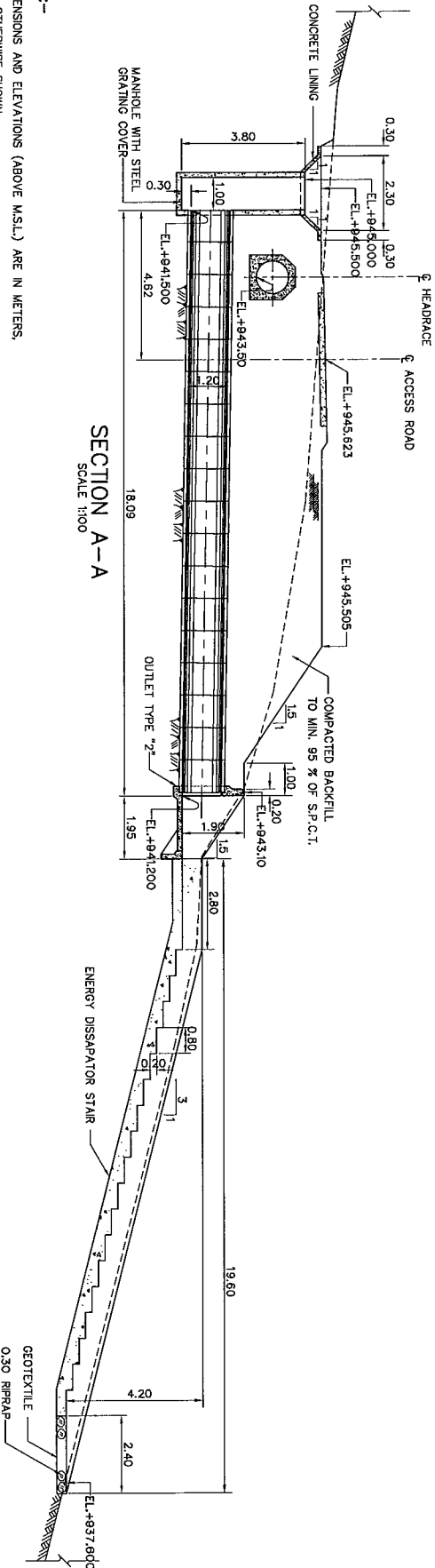
SECTION B-B  
SCALE 1:50



SECTION C-C  
SCALE 1:50



SECTION D-D  
SCALE 1:50



SECTION A-A  
SCALE 1:100

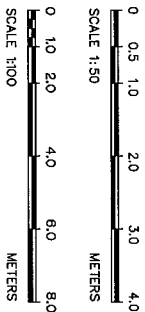
NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-GN-01
3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M<sup>2</sup>.
4. CLASS 3 TOLUENE AND GROOVE TYPE OF R.C. PIPE WILL BE USED.
5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
6. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAIL IN THE DRAWING.

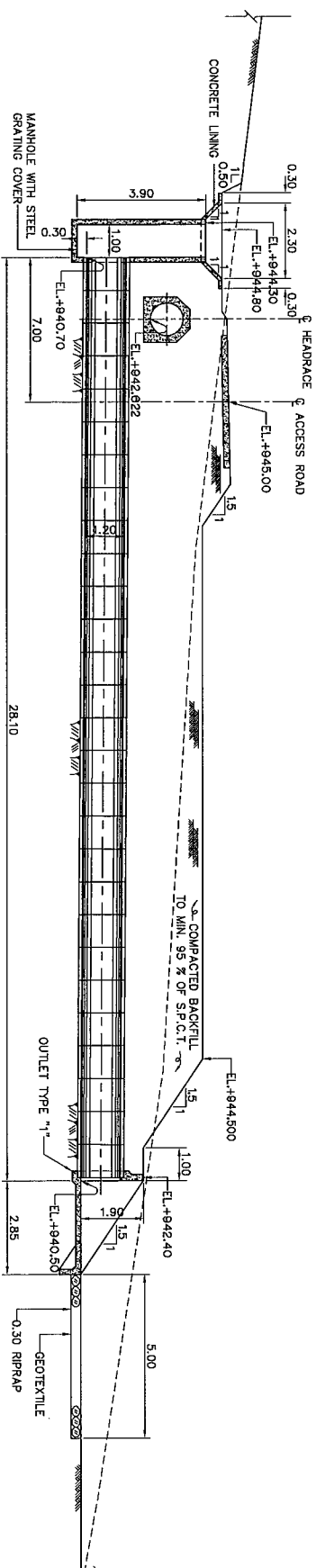
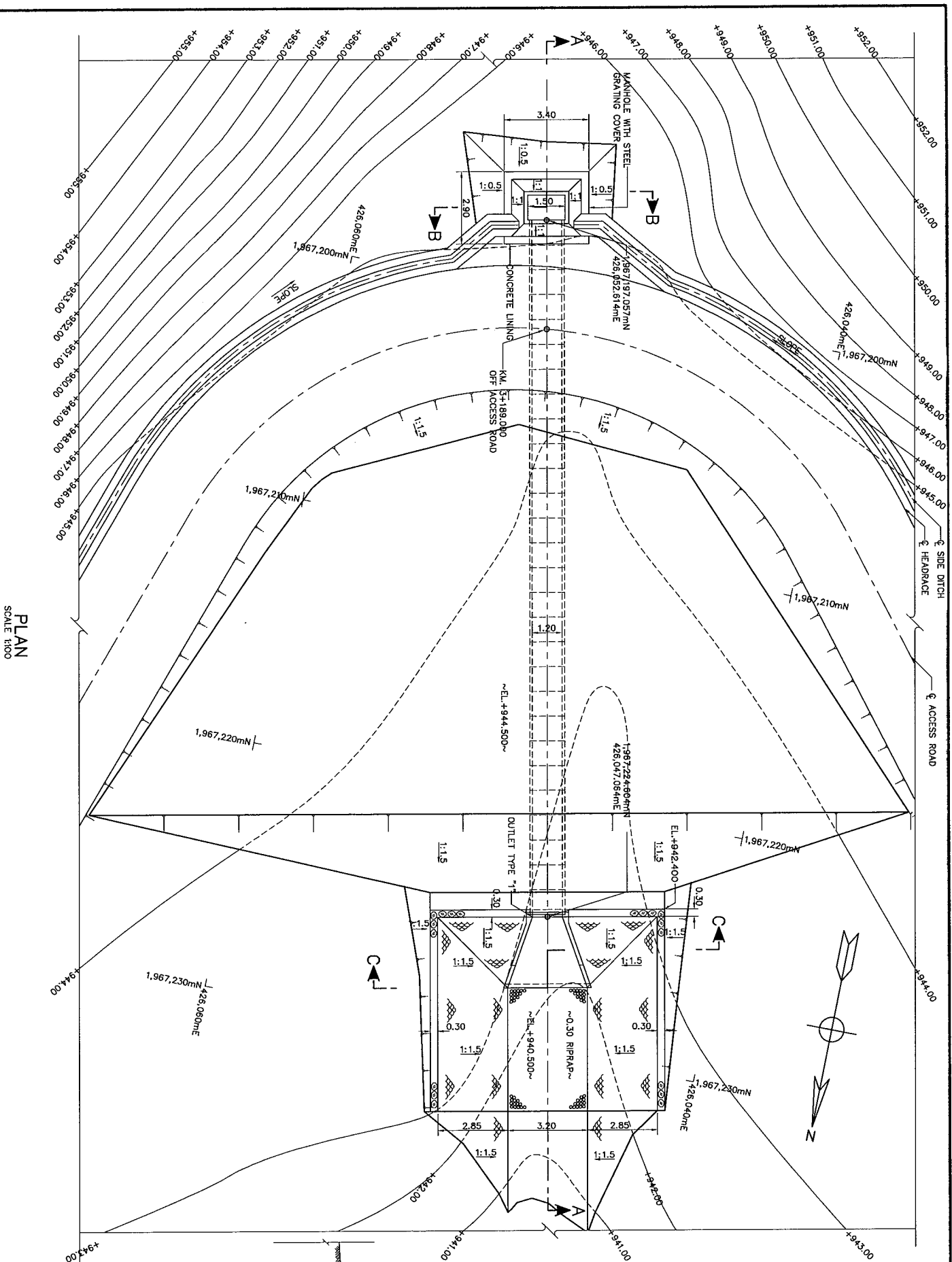
REFERENCE DRAWINGS :-

1. HEADRAGE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
  2. HEADRAGE, TYPICAL SECTIONS
  3. HEADRAGE, STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
  4. HEADRAGE, MANHOLE DETAILS
  5. HEADRAGE, INLET AND OUTLET TRANSITIONS
- MT-HR-01 TO MT-HR-05  
MT-HR-19  
MT-HR-40  
MT-HR-41  
MT-HR-42

| NO. | DATE | REVISIONS | CHECKED | APPROVED | CONSULTANTS | DEDE |
|-----|------|-----------|---------|----------|-------------|------|
| 1   |      |           |         |          |             |      |
| 2   |      |           |         |          |             |      |
| 3   |      |           |         |          |             |      |

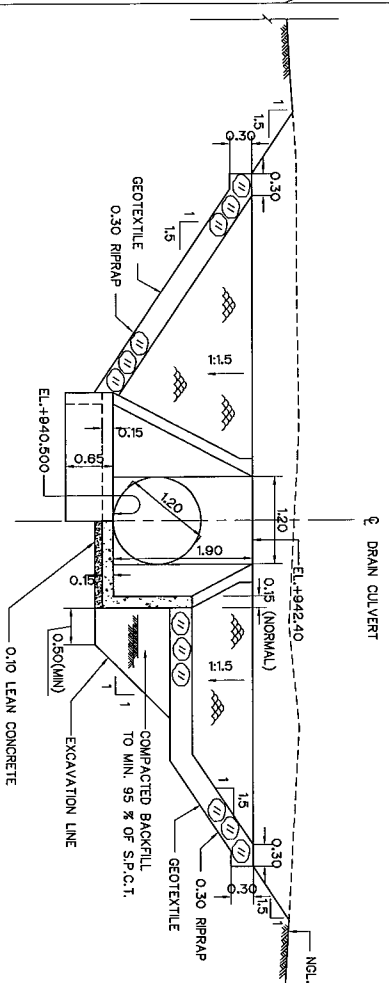
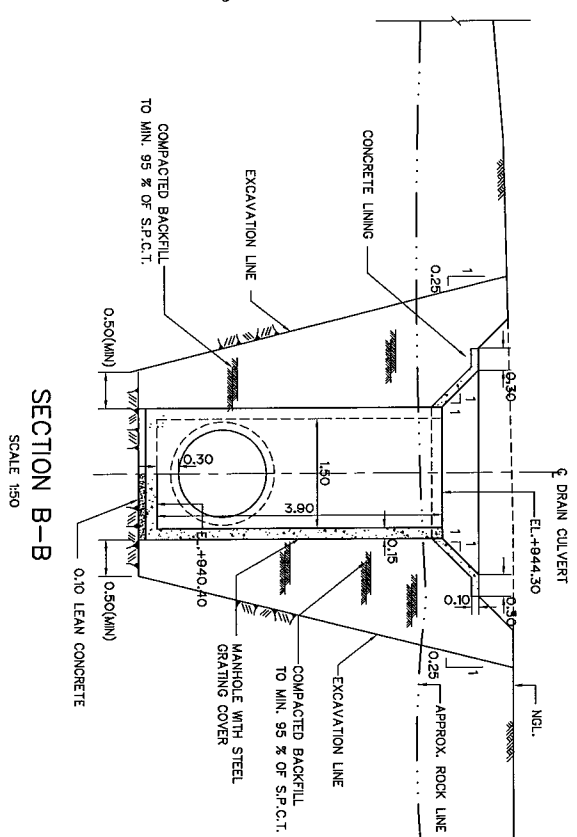


|                                                                                                          |                                       |
|----------------------------------------------------------------------------------------------------------|---------------------------------------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |                                       |
| MAE TUN HYDROPOWER PROJECT                                                                               |                                       |
| CIVIL WORKS<br>HEADRAGE<br>DRAIN CULVERT, KM. 2+824.000                                                  |                                       |
| PANYA CONSULTANTS CO., LTD.                                                                              |                                       |
| DESIGNED<br>7/11/2561<br>7/11/2561                                                                       | SUBMITTED<br>7/11/2561<br>7/11/2561   |
| DRAWN<br>7/11/2561<br>7/11/2561                                                                          | RECOMMENDED<br>7/11/2561<br>7/11/2561 |
| CHECKED<br>7/11/2561<br>7/11/2561                                                                        | APPROVED<br>7/11/2561<br>7/11/2561    |
| PROJECT MANAGER<br>7/11/2561<br>7/11/2561                                                                | DATE<br>7/11/2561<br>7/11/2561        |
| SHEET NO. 48 OF 98                                                                                       |                                       |



- REFERENCE DRAWINGS :-**
1. HEADRAGE PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
  2. HEADRAGE TYPICAL SECTIONS
  3. HEADRAGE STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
  4. HEADRAGE MANHOLE DETAILS
  5. HEADRAGE INLET AND OUTLET TRANSITIONS

- MT-HR-01 TO MT-HR-05  
MT-HR-19  
MT-HR-40  
MT-HR-41  
MT-HR-42



- NOTES :-**
1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS.
  2. UNLESS OTHERWISE SHOWN.
  3. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-CR-01
  4. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M. <sup>2</sup>
  5. CLASS 3 TOLUENE AND GROOVE TYPE OF RC. PIPE WILL BE USED.
  6. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
  7. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
  8. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.

|             |      |           |         |          |          |        |   |        |   |                 |   |        |   |        |      |        |   |        |    |             |    |        |    |        |          |        |    |        |    |           |    |        |    |        |          |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |     |        |
|-------------|------|-----------|---------|----------|----------|--------|---|--------|---|-----------------|---|--------|---|--------|------|--------|---|--------|----|-------------|----|--------|----|--------|----------|--------|----|--------|----|-----------|----|--------|----|--------|----------|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|----|--------|-----|--------|
| 3           |      |           |         |          | DESIGNED | 7/6/23 | 4 | 7/6/23 | 5 | 7/6/23          | 6 | 7/6/23 | 7 | 7/6/23 | 8    | 7/6/23 | 9 | 7/6/23 | 10 | 7/6/23      | 11 | 7/6/23 | 12 | 7/6/23 | 13       | 7/6/23 | 14 | 7/6/23 | 15 | 7/6/23    | 16 | 7/6/23 | 17 | 7/6/23 | 18       | 7/6/23 | 19 | 7/6/23 | 20 | 7/6/23 | 21 | 7/6/23 | 22 | 7/6/23 | 23 | 7/6/23 | 24 | 7/6/23 | 25 | 7/6/23 | 26 | 7/6/23 | 27 | 7/6/23 | 28 | 7/6/23 | 29 | 7/6/23 | 30 | 7/6/23 | 31 | 7/6/23 | 32 | 7/6/23 | 33 | 7/6/23 | 34 | 7/6/23 | 35 | 7/6/23 | 36 | 7/6/23 | 37 | 7/6/23 | 38 | 7/6/23 | 39 | 7/6/23 | 40 | 7/6/23 | 41 | 7/6/23 | 42 | 7/6/23 | 43 | 7/6/23 | 44 | 7/6/23 | 45 | 7/6/23 | 46 | 7/6/23 | 47 | 7/6/23 | 48 | 7/6/23 | 49 | 7/6/23 | 50 | 7/6/23 | 51 | 7/6/23 | 52 | 7/6/23 | 53 | 7/6/23 | 54 | 7/6/23 | 55 | 7/6/23 | 56 | 7/6/23 | 57 | 7/6/23 | 58 | 7/6/23 | 59 | 7/6/23 | 60 | 7/6/23 | 61 | 7/6/23 | 62 | 7/6/23 | 63 | 7/6/23 | 64 | 7/6/23 | 65 | 7/6/23 | 66 | 7/6/23 | 67 | 7/6/23 | 68 | 7/6/23 | 69 | 7/6/23 | 70 | 7/6/23 | 71 | 7/6/23 | 72 | 7/6/23 | 73 | 7/6/23 | 74 | 7/6/23 | 75 | 7/6/23 | 76 | 7/6/23 | 77 | 7/6/23 | 78 | 7/6/23 | 79 | 7/6/23 | 80 | 7/6/23 | 81 | 7/6/23 | 82 | 7/6/23 | 83 | 7/6/23 | 84 | 7/6/23 | 85 | 7/6/23 | 86 | 7/6/23 | 87 | 7/6/23 | 88 | 7/6/23 | 89 | 7/6/23 | 90 | 7/6/23 | 91 | 7/6/23 | 92 | 7/6/23 | 93 | 7/6/23 | 94 | 7/6/23 | 95 | 7/6/23 | 96 | 7/6/23 | 97 | 7/6/23 | 98 | 7/6/23 | 99 | 7/6/23 | 100 | 7/6/23 |
| 2           |      |           |         |          | DRAWN    | 7/6/23 | 4 | 7/6/23 | 5 | 7/6/23          | 6 | 7/6/23 | 7 | 7/6/23 | 8    | 7/6/23 | 9 | 7/6/23 | 10 | 7/6/23      | 11 | 7/6/23 | 12 | 7/6/23 | 13       | 7/6/23 | 14 | 7/6/23 | 15 | 7/6/23    | 16 | 7/6/23 | 17 | 7/6/23 | 18       | 7/6/23 | 19 | 7/6/23 | 20 | 7/6/23 | 21 | 7/6/23 | 22 | 7/6/23 | 23 | 7/6/23 | 24 | 7/6/23 | 25 | 7/6/23 | 26 | 7/6/23 | 27 | 7/6/23 | 28 | 7/6/23 | 29 | 7/6/23 | 30 | 7/6/23 | 31 | 7/6/23 | 32 | 7/6/23 | 33 | 7/6/23 | 34 | 7/6/23 | 35 | 7/6/23 | 36 | 7/6/23 | 37 | 7/6/23 | 38 | 7/6/23 | 39 | 7/6/23 | 40 | 7/6/23 | 41 | 7/6/23 | 42 | 7/6/23 | 43 | 7/6/23 | 44 | 7/6/23 | 45 | 7/6/23 | 46 | 7/6/23 | 47 | 7/6/23 | 48 | 7/6/23 | 49 | 7/6/23 | 50 | 7/6/23 | 51 | 7/6/23 | 52 | 7/6/23 | 53 | 7/6/23 | 54 | 7/6/23 | 55 | 7/6/23 | 56 | 7/6/23 | 57 | 7/6/23 | 58 | 7/6/23 | 59 | 7/6/23 | 60 | 7/6/23 | 61 | 7/6/23 | 62 | 7/6/23 | 63 | 7/6/23 | 64 | 7/6/23 | 65 | 7/6/23 | 66 | 7/6/23 | 67 | 7/6/23 | 68 | 7/6/23 | 69 | 7/6/23 | 70 | 7/6/23 | 71 | 7/6/23 | 72 | 7/6/23 | 73 | 7/6/23 | 74 | 7/6/23 | 75 | 7/6/23 | 76 | 7/6/23 | 77 | 7/6/23 | 78 | 7/6/23 | 79 | 7/6/23 | 80 | 7/6/23 | 81 | 7/6/23 | 82 | 7/6/23 | 83 | 7/6/23 | 84 | 7/6/23 | 85 | 7/6/23 | 86 | 7/6/23 | 87 | 7/6/23 | 88 | 7/6/23 | 89 | 7/6/23 | 90 | 7/6/23 | 91 | 7/6/23 | 92 | 7/6/23 | 93 | 7/6/23 | 94 | 7/6/23 | 95 | 7/6/23 | 96 | 7/6/23 | 97 | 7/6/23 | 98 | 7/6/23 | 99 | 7/6/23 | 100 | 7/6/23 |
| 1           |      |           |         |          | CHECKED  | 7/6/23 | 4 | 7/6/23 | 5 | 7/6/23          | 6 | 7/6/23 | 7 | 7/6/23 | 8    | 7/6/23 | 9 | 7/6/23 | 10 | 7/6/23      | 11 | 7/6/23 | 12 | 7/6/23 | 13       | 7/6/23 | 14 | 7/6/23 | 15 | 7/6/23    | 16 | 7/6/23 | 17 | 7/6/23 | 18       | 7/6/23 | 19 | 7/6/23 | 20 | 7/6/23 | 21 | 7/6/23 | 22 | 7/6/23 | 23 | 7/6/23 | 24 | 7/6/23 | 25 | 7/6/23 | 26 | 7/6/23 | 27 | 7/6/23 | 28 | 7/6/23 | 29 | 7/6/23 | 30 | 7/6/23 | 31 | 7/6/23 | 32 | 7/6/23 | 33 | 7/6/23 | 34 | 7/6/23 | 35 | 7/6/23 | 36 | 7/6/23 | 37 | 7/6/23 | 38 | 7/6/23 | 39 | 7/6/23 | 40 | 7/6/23 | 41 | 7/6/23 | 42 | 7/6/23 | 43 | 7/6/23 | 44 | 7/6/23 | 45 | 7/6/23 | 46 | 7/6/23 | 47 | 7/6/23 | 48 | 7/6/23 | 49 | 7/6/23 | 50 | 7/6/23 | 51 | 7/6/23 | 52 | 7/6/23 | 53 | 7/6/23 | 54 | 7/6/23 | 55 | 7/6/23 | 56 | 7/6/23 | 57 | 7/6/23 | 58 | 7/6/23 | 59 | 7/6/23 | 60 | 7/6/23 | 61 | 7/6/23 | 62 | 7/6/23 | 63 | 7/6/23 | 64 | 7/6/23 | 65 | 7/6/23 | 66 | 7/6/23 | 67 | 7/6/23 | 68 | 7/6/23 | 69 | 7/6/23 | 70 | 7/6/23 | 71 | 7/6/23 | 72 | 7/6/23 | 73 | 7/6/23 | 74 | 7/6/23 | 75 | 7/6/23 | 76 | 7/6/23 | 77 | 7/6/23 | 78 | 7/6/23 | 79 | 7/6/23 | 80 | 7/6/23 | 81 | 7/6/23 | 82 | 7/6/23 | 83 | 7/6/23 | 84 | 7/6/23 | 85 | 7/6/23 | 86 | 7/6/23 | 87 | 7/6/23 | 88 | 7/6/23 | 89 | 7/6/23 | 90 | 7/6/23 | 91 | 7/6/23 | 92 | 7/6/23 | 93 | 7/6/23 | 94 | 7/6/23 | 95 | 7/6/23 | 96 | 7/6/23 | 97 | 7/6/23 | 98 | 7/6/23 | 99 | 7/6/23 | 100 | 7/6/23 |
| NO.         | DATE | REVISIONS | CHECKED | APPROVED | CHECKED  | 7/6/23 | 4 | 7/6/23 | 5 | 7/6/23          | 6 | 7/6/23 | 7 | 7/6/23 | 8    | 7/6/23 | 9 | 7/6/23 | 10 | 7/6/23      | 11 | 7/6/23 | 12 | 7/6/23 | 13       | 7/6/23 | 14 | 7/6/23 | 15 | 7/6/23    | 16 | 7/6/23 | 17 | 7/6/23 | 18       | 7/6/23 | 19 | 7/6/23 | 20 | 7/6/23 | 21 | 7/6/23 | 22 | 7/6/23 | 23 | 7/6/23 | 24 | 7/6/23 | 25 | 7/6/23 | 26 | 7/6/23 | 27 | 7/6/23 | 28 | 7/6/23 | 29 | 7/6/23 | 30 | 7/6/23 | 31 | 7/6/23 | 32 | 7/6/23 | 33 | 7/6/23 | 34 | 7/6/23 | 35 | 7/6/23 | 36 | 7/6/23 | 37 | 7/6/23 | 38 | 7/6/23 | 39 | 7/6/23 | 40 | 7/6/23 | 41 | 7/6/23 | 42 | 7/6/23 | 43 | 7/6/23 | 44 | 7/6/23 | 45 | 7/6/23 | 46 | 7/6/23 | 47 | 7/6/23 | 48 | 7/6/23 | 49 | 7/6/23 | 50 | 7/6/23 | 51 | 7/6/23 | 52 | 7/6/23 | 53 | 7/6/23 | 54 | 7/6/23 | 55 | 7/6/23 | 56 | 7/6/23 | 57 | 7/6/23 | 58 | 7/6/23 | 59 | 7/6/23 | 60 | 7/6/23 | 61 | 7/6/23 | 62 | 7/6/23 | 63 | 7/6/23 | 64 | 7/6/23 | 65 | 7/6/23 | 66 | 7/6/23 | 67 | 7/6/23 | 68 | 7/6/23 | 69 | 7/6/23 | 70 | 7/6/23 | 71 | 7/6/23 | 72 | 7/6/23 | 73 | 7/6/23 | 74 | 7/6/23 | 75 | 7/6/23 | 76 | 7/6/23 | 77 | 7/6/23 | 78 | 7/6/23 | 79 | 7/6/23 | 80 | 7/6/23 | 81 | 7/6/23 | 82 | 7/6/23 | 83 | 7/6/23 | 84 | 7/6/23 | 85 | 7/6/23 | 86 | 7/6/23 | 87 | 7/6/23 | 88 | 7/6/23 | 89 | 7/6/23 | 90 | 7/6/23 | 91 | 7/6/23 | 92 | 7/6/23 | 93 | 7/6/23 | 94 | 7/6/23 | 95 | 7/6/23 | 96 | 7/6/23 | 97 | 7/6/23 | 98 | 7/6/23 | 99 | 7/6/23 | 100 | 7/6/23 |
| CONSULTANTS |      |           |         |          | DEDE     |        |   |        |   | PROJECT MANAGER |   |        |   |        | DATE |        |   |        |    | DRAWING NO. |    |        |    |        | M1-HR-35 |        |    |        |    | SHEET NO. |    |        |    |        | 49 OF 98 |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |    |        |     |        |

DRAIN CULVERT KM. 3+189.000

CIVIL WORKS  
HEADRACE

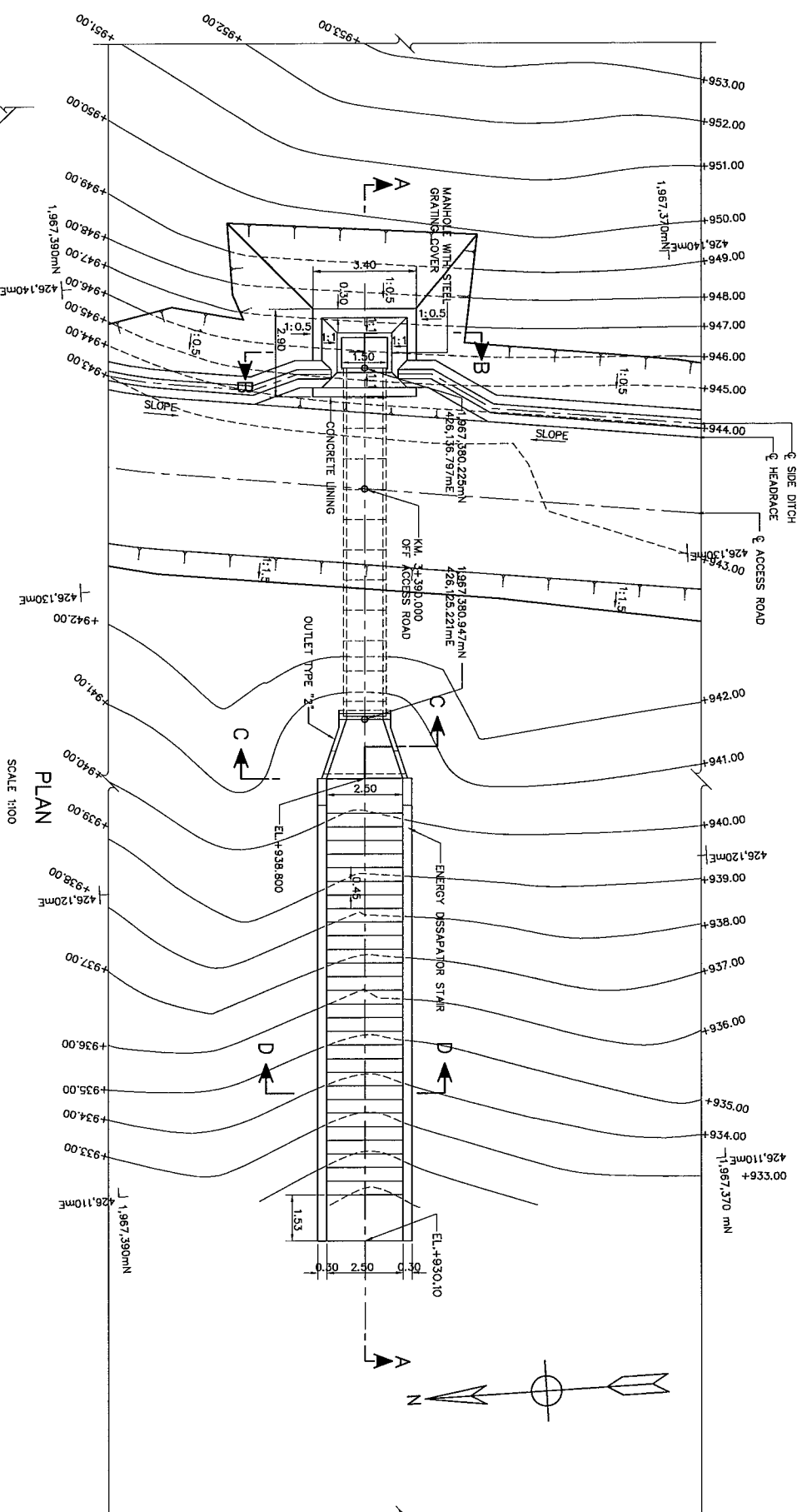
MAE TUEN HYDROPOWER PROJECT

DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY

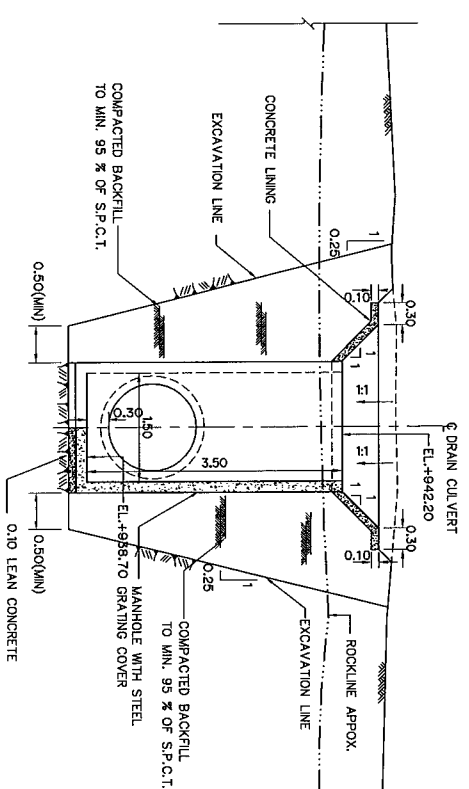
KINGDOM OF THAILAND

DEVELOPMENT AND EFFICIENCY

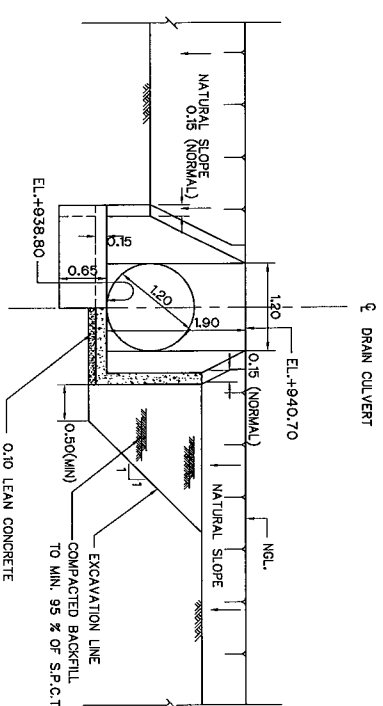
DEPARTMENT OF ALTERNATIVE ENERGY  
DEVELOPMENT AND EFFICIENCY



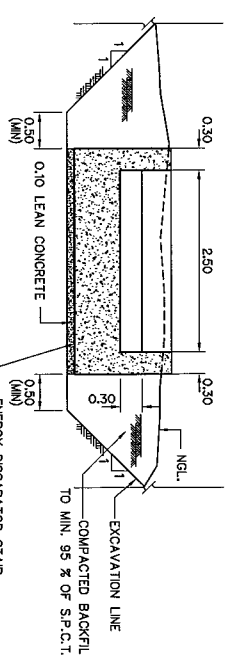
SECTION B-B  
SCALE 1:50



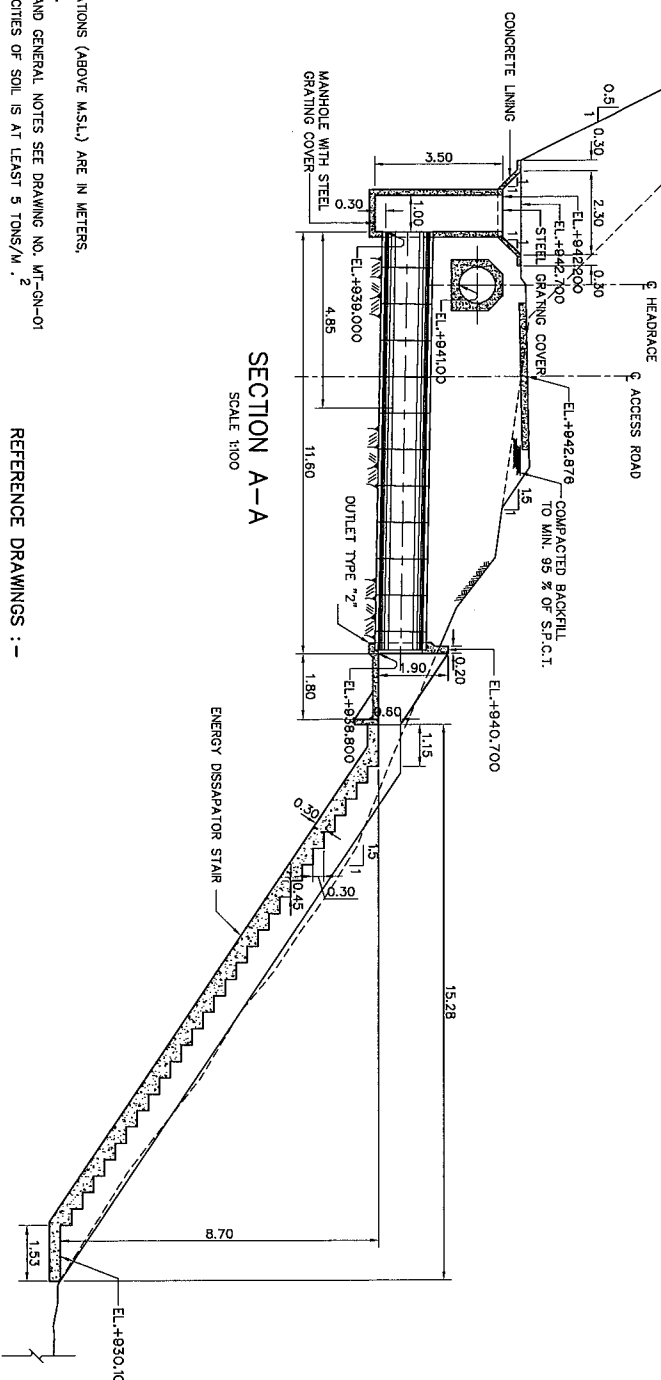
SECTION C-C  
SCALE 1:50



SECTION D-D  
SCALE 1:50



SECTION A-A  
SCALE 1:100



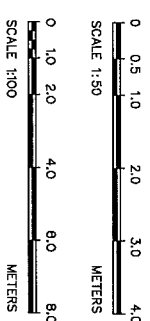
NOTES :-

1. ALL DIMENSIONS AND ELEVATIONS (ABOVE M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DRAWING NO. MT-SN-01
3. ALLOWABLE BEARING CAPACITIES OF SOIL IS AT LEAST 5 TONS/M<sup>2</sup>
4. CLASS 3 TONGUE AND GROOVE TYPE OF RC. PIPE WILL BE USED.
5. DRESSING OF GROUND TO SUIT THE STRUCTURE TO BE DETERMINED IN THE FIELD.
6. STRUCTURE TO BE CONNECTED TO EXISTING AND/OR DESIGNED DRAINAGE CHANNELS OR DITCHES (UPSTREAM AND DOWNSTREAM) AS DIRECTED.
7. THE CONTRACTOR SHALL REMOVE EXISTING DRAIN CULVERTS AND CONSTRUCT NEW DRAIN CULVERTS AS DETAILED IN THE DRAWING.

REFERENCE DRAWINGS :-

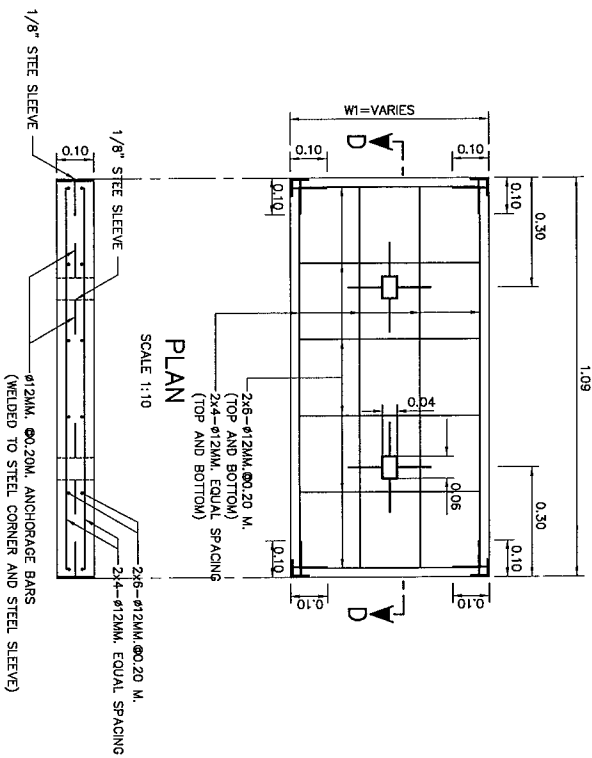
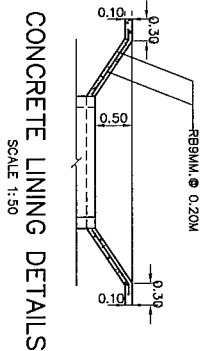
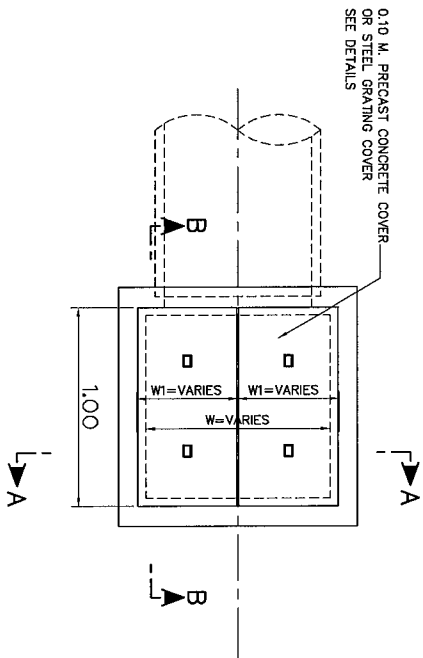
1. HEADRACE, PLAN & PROFILE (SHEET 1/5) TO (SHEET 5/5)
2. HEADRACE, TYPICAL SECTIONS
3. HEADRACE, STANDARD REINFORCED AND INSTALLATION CONCRETE PIPE
4. HEADRACE, MANHOLE DETAILS
5. HEADRACE, INLET AND OUTLET TRANSITIONS

- MT-HR-01 TO MT-HR-05  
MT-HR-19  
MT-HR-40  
MT-HR-41  
MT-HR-42



|                                                                                                          |          |          |                                                             |
|----------------------------------------------------------------------------------------------------------|----------|----------|-------------------------------------------------------------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |          |          |                                                             |
| MAE TUN HYDROPOWER PROJECT                                                                               |          |          |                                                             |
| CIVIL WORKS                                                                                              |          |          |                                                             |
| HEADRACE                                                                                                 |          |          |                                                             |
| DRAIN CULVERT KM. 3+390.000                                                                              |          |          |                                                             |
| PANYA CONSULTANTS CO., LTD.                                                                              |          |          |                                                             |
| DESIGNED                                                                                                 | MT-22514 | MT-4005  | DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |
| DRAWN                                                                                                    | MT-22514 | MT-4005  | RECOMMENDED                                                 |
| CHECKED                                                                                                  | MT-22514 | MT-4005  | APPROVED                                                    |
| PROJECT MANAGER                                                                                          | DATE     | 27/06/13 | DRAWING NO. MT-HR-39                                        |
|                                                                                                          |          |          | SHEET NO. 50 OF 98                                          |



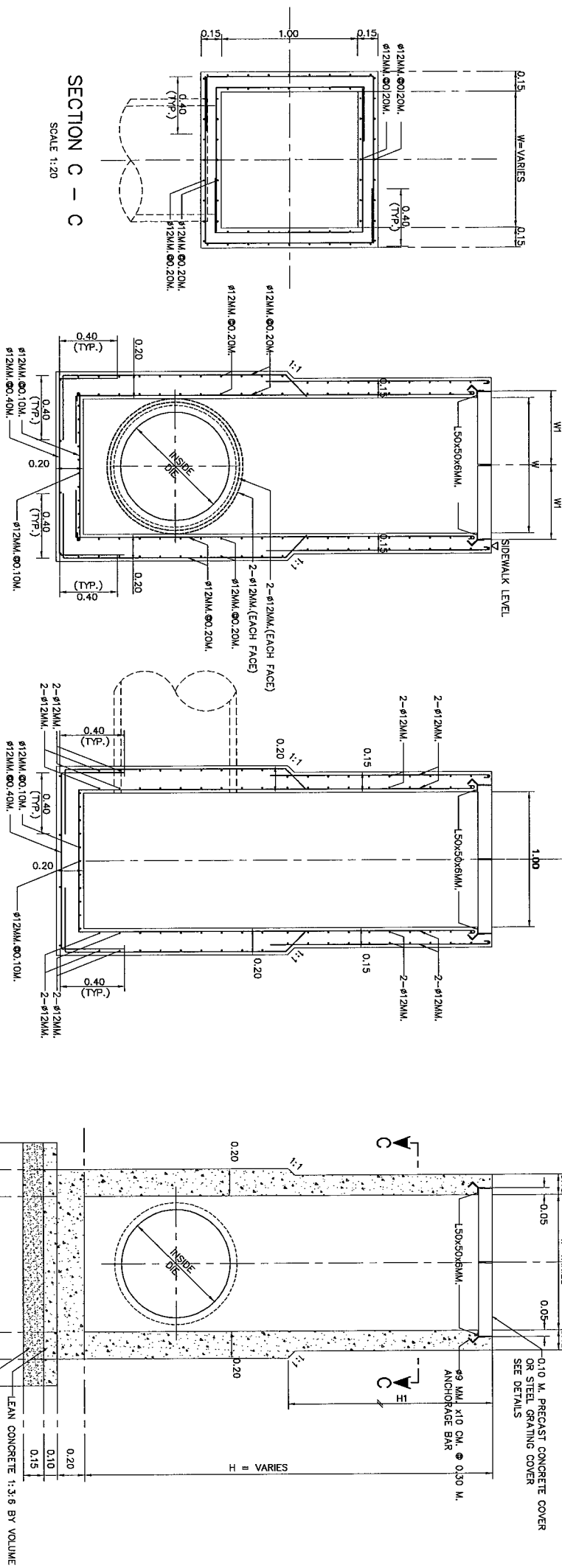
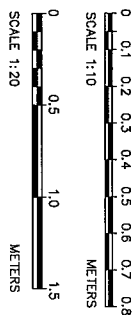
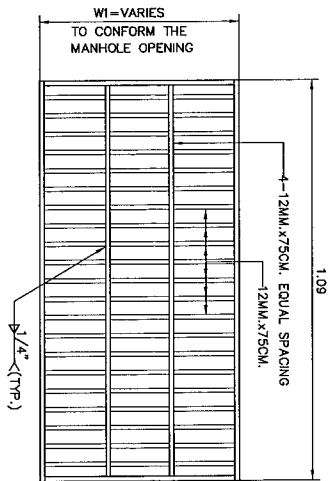


PLAN OF MANHOLE  
SCALE 1:20

SECTION D - D  
SCALE 1:20  
PRECAST CONCRETE COVER

- NOTES :
1. ALL DIMENSIONS ARE IN METERS UNLESS OTHERWISE INDICATED.
  2. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 KSC. FOR 15x15x15 CM. CUBE AT 28 DAYS AN APPROXIMATE MIX DESIGN PER CUBIC METER IS SUGGESTED AS FOLLOWS :  
PORTLAND CEMENT TYPE 1 350 KG.(MN.)  
SAND 0.43 M<sup>3</sup>  
CRUSHED ROCK OR GRAVEL 0.86 M<sup>3</sup>  
CONCRETE SLUMP 10 CM.(MAX.)
  3. STRUCTURAL STEEL SHALL CONFORM TO TIS, 116 GRADE Fy. 30
  4. FLAT PLATE STEEL SHALL CONFORM TO TIS, 55 GRADE SR 24
  5. STRUCTURAL STEEL AND FLAT PLATE STEEL SHALL BE PAINTED WITH RUST-OILEUM PAINT OR EQUIVALENT TWICE AND WITH OIL PAINT ONCE.
  6. CLEAR CONCRETE COVER SHALL BE 3 CM.
  7. MANHOLE SHALL VARY ACCORDING TO THE SIZE OF R.C. PIPE CULVERT (SEE TABLE I)

| INSIDE DIA. OF R.C. PIPE CULVERT | DIMENSIONS |       |        |
|----------------------------------|------------|-------|--------|
|                                  | W          | H     | H1     |
| ø 0.80                           | 0.80       | 0.440 | VARIES |
| ø 0.80                           | 1.00       | 0.540 | VARIES |
| ø 1.00                           | 1.25       | 0.665 | VARIES |
| ø 1.20                           | 1.50       | 0.790 | VARIES |



SECTION A - A  
SCALE 1:20

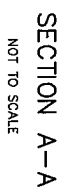
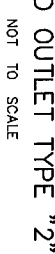
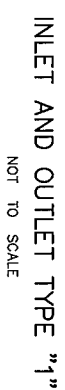
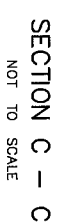
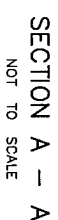
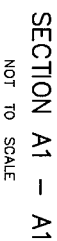
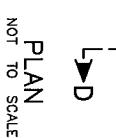
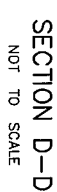
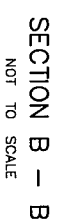
SECTION B - B  
SCALE 1:20

SECTION A - A  
SCALE 1:20

| NO. | DATE | REVISIONS | CHECKED | APPROVED |
|-----|------|-----------|---------|----------|
| 1   |      |           |         |          |
| 2   |      |           |         |          |
| 3   |      |           |         |          |

|                                     |  |                                 |  |
|-------------------------------------|--|---------------------------------|--|
| DESIGNED BY: <i>M. R. S. S. S.</i>  |  | CHECKED BY: <i>P. H. S. S.</i>  |  |
| DRAWN BY: <i>P. H. S. S.</i>        |  | APPROVED BY: <i>P. H. S. S.</i> |  |
| DATE: 27/06/13                      |  | SHEET NO: 52 OF 98              |  |
| PROJECT MANAGER: <i>P. H. S. S.</i> |  |                                 |  |

|                                                                                                          |  |
|----------------------------------------------------------------------------------------------------------|--|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |  |
| MAE TUEH HYDROPOWER PROJECT                                                                              |  |
| CIVIL WORKS<br>HEADRACE<br>MANHOLE DETAILS                                                               |  |
| DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY                                              |  |

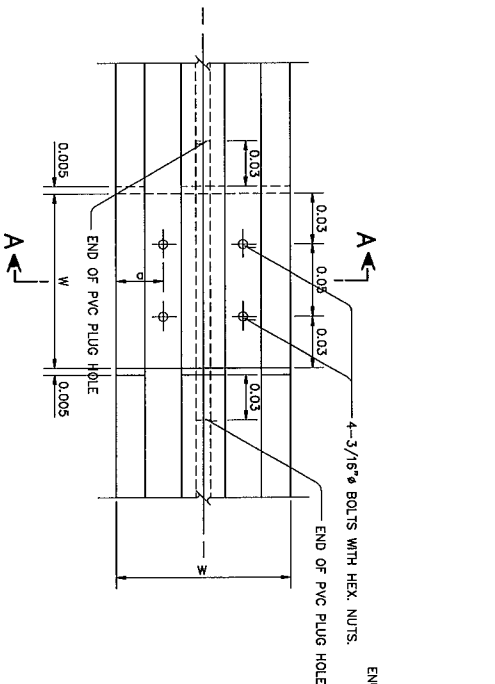
TABLE

**NOTES :**

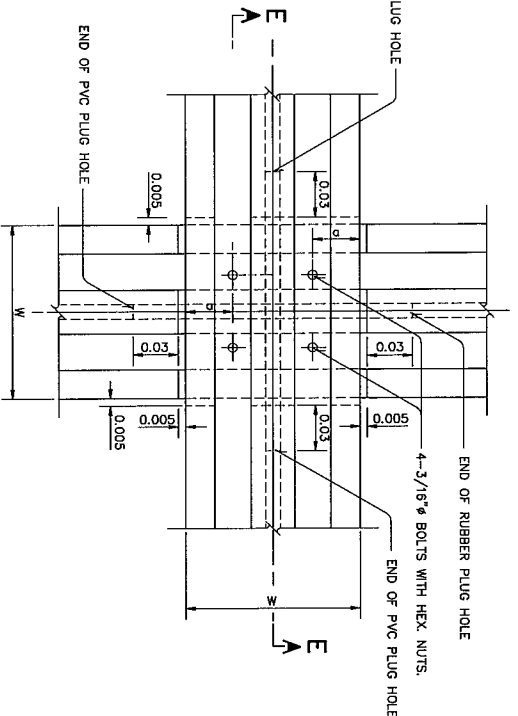
1. ALL DIMENSIONS AND ELEVATIONS (W.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-CN-01
3. INLET AND OUTLET SHALL VARY ACCORDING TO THE SIZE OF R.C. PIPE CULVERT (SEE TABLE )

|             |      |           |         |          |
|-------------|------|-----------|---------|----------|
| 3           |      |           |         |          |
| 2           |      |           |         |          |
| 1           |      |           |         |          |
| NO          | DATE | REVISIONS | CHECKED | APPROVED |
| CONSULTANTS |      |           | DEDE    |          |

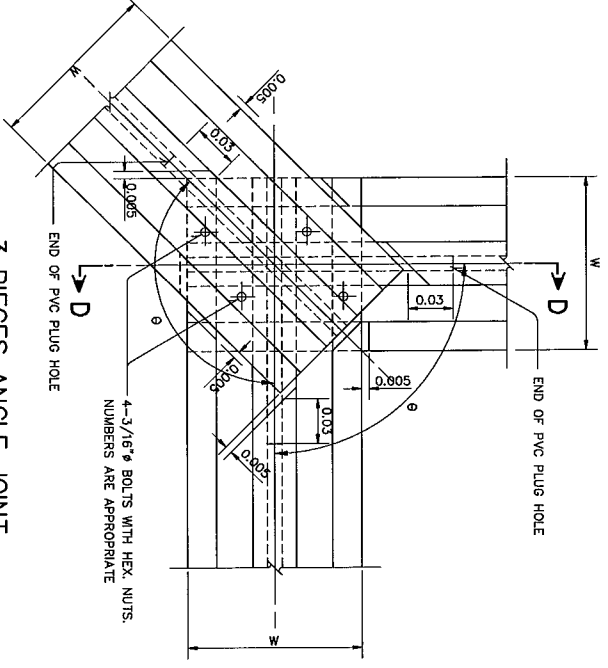
|                                                                                                          |                                      |
|----------------------------------------------------------------------------------------------------------|--------------------------------------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |                                      |
| MAE TUEN HYDROPOWER PROJECT                                                                              |                                      |
| CIVIL WORKS<br>HEADRACE<br>INLET AND OUTLET TRANSITIONS                                                  |                                      |
| DESIGNED<br>BY <i>[Signature]</i><br>DATE JUL/25/14<br>BY <i>[Signature]</i>                             | RECOMMENDED<br>BY <i>[Signature]</i> |
| DRAWN<br>BY <i>[Signature]</i>                                                                           | RECOMMENDED<br>BY <i>[Signature]</i> |
| CHECKED<br>BY <i>[Signature]</i>                                                                         | APPROVED<br>BY <i>[Signature]</i>    |
| PROJECT MANAGER<br>DATE 7/27/08/13                                                                       | DRAWING NO.<br>MT-HR-42              |
|                                                                                                          | SHEET NO.<br>53 OF 98                |



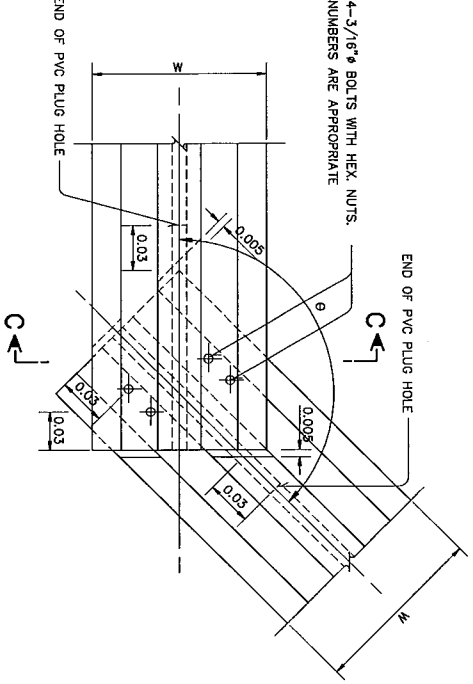
STRAIGHT JOINT  
NOT TO SCALE



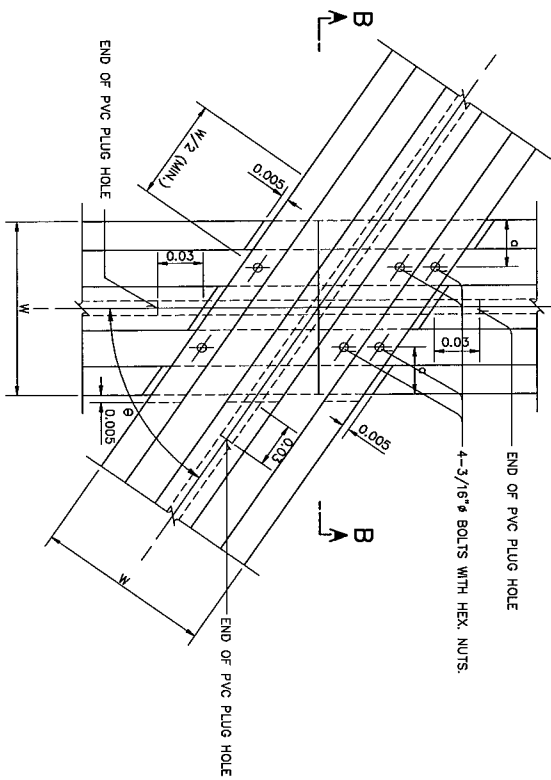
NORMAL LEAN JOINT  
NOT TO SCALE



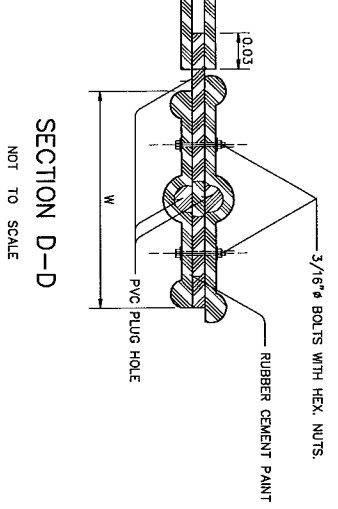
3 PIECES ANGLE JOINT  
NOT TO SCALE



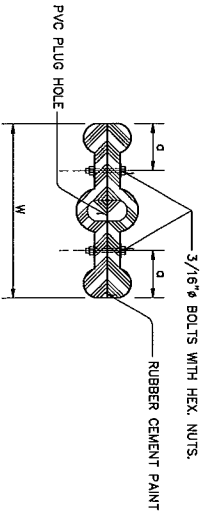
ANGLE JOINT  
NOT TO SCALE



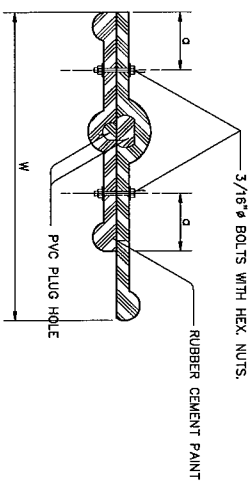
ANGLE LEAN JOINT  
NOT TO SCALE



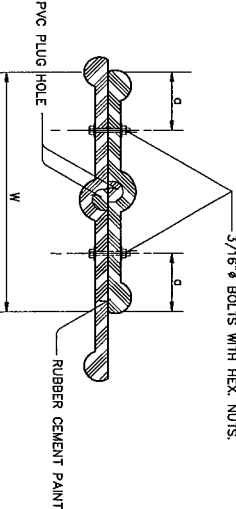
SECTION D-D  
NOT TO SCALE



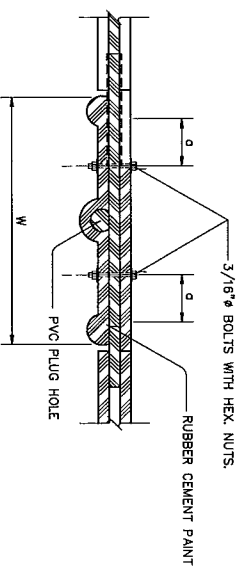
SECTION A-A  
NOT TO SCALE



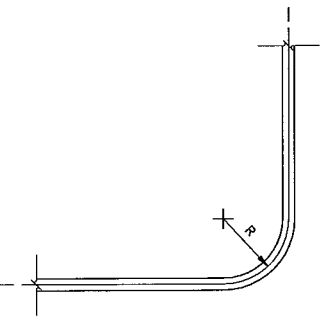
SECTION B-B  
NOT TO SCALE



SECTION C-C  
NOT TO SCALE

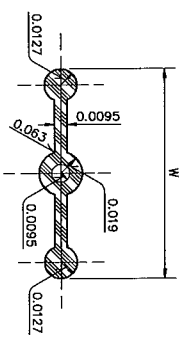


SECTION E-E  
NOT TO SCALE

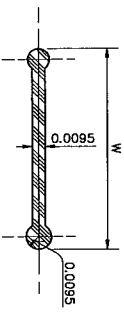


STANDARD CURVE  
NOT TO SCALE

| PVC WATERSTOP |        |      |      |
|---------------|--------|------|------|
| TYPE          | W      | o    | R    |
| A             | 0.2288 | 0.04 | 0.20 |
| B             | 0.1524 | 0.04 | 0.15 |
| C             | 0.1524 | 0.04 | 0.10 |



PVC WATERSTOP  
(TYPE "A" & TYPE "B")  
NOT TO SCALE

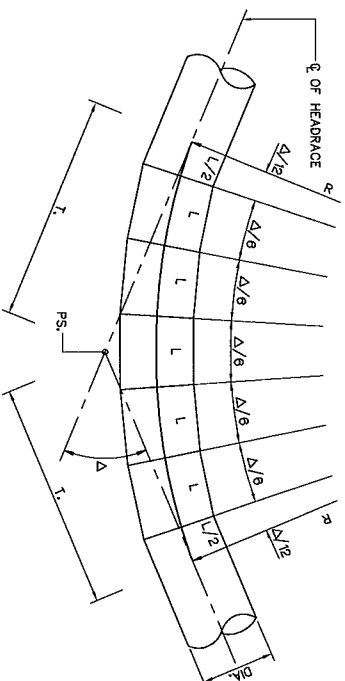
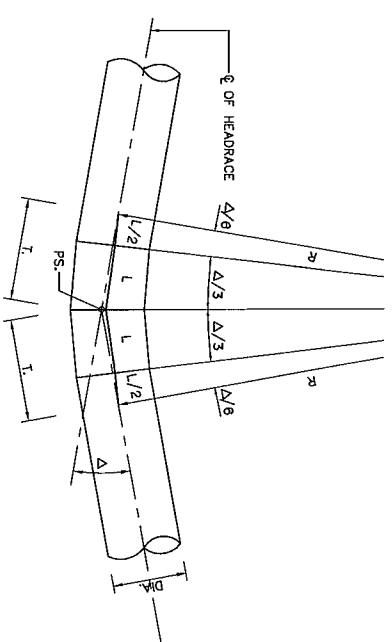
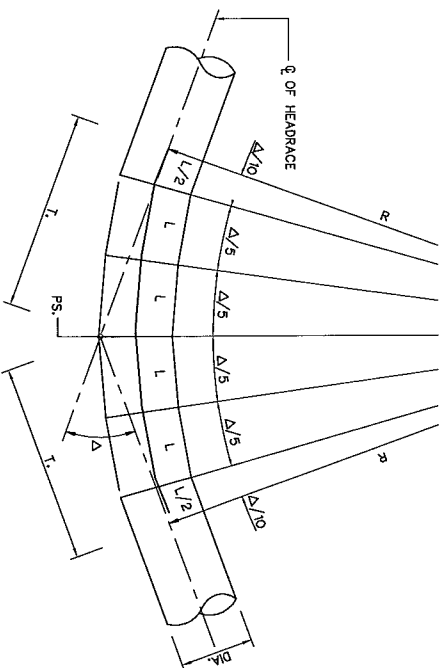
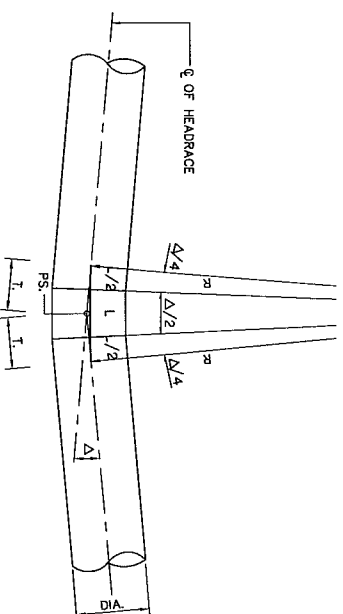
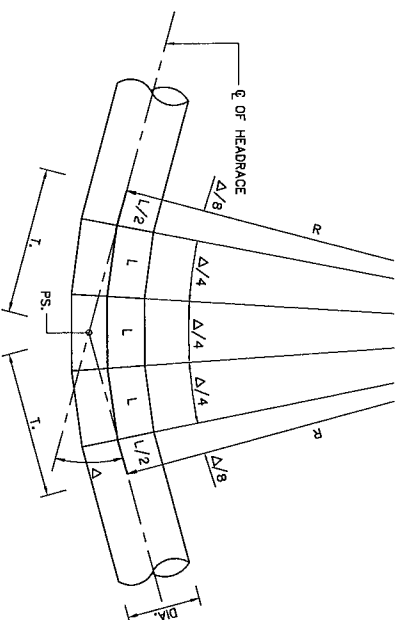
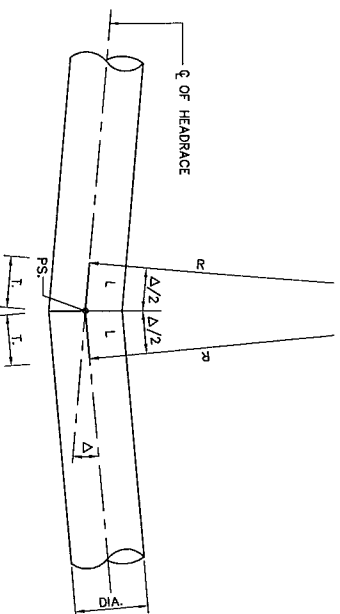


PVC WATERSTOP  
(TYPE "C")  
NOT TO SCALE

- NOTES:
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN
  2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01
  3. PVC PLUG HOLES TIGHT AND STOCK WITH PVC WATERSTOP.
  4. BOLTS WITH HEX. NUTS ARE BRASS OR STAINLESS.

| NO. | DATE | REVISIONS | CHECKED | APPROVED |
|-----|------|-----------|---------|----------|
| 1   |      |           |         |          |
| 2   |      |           |         |          |
| 3   |      |           |         |          |

|                                                                                                          |  |                                                            |  |
|----------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------|--|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |  |                                                            |  |
| MAE TUEN HYDROPOWER PROJECT                                                                              |  |                                                            |  |
| CIVIL WORKS<br>HEADRACE<br>STANDARD PVC WATERSTOP SECTION AND DETAILS                                    |  |                                                            |  |
| DESIGNED<br>PANYA CONSULTANTS CO., LTD.<br>20/25/14                                                      |  | REVIEWED<br>PANYA CONSULTANTS CO., LTD.<br>20/25/14        |  |
| DRAWN<br>PANYA CONSULTANTS CO., LTD.<br>20/25/14                                                         |  | APPROVED<br>PANYA CONSULTANTS CO., LTD.<br>20/25/14        |  |
| CHECKED<br>PANYA CONSULTANTS CO., LTD.<br>20/25/14                                                       |  | PROJECT MANAGER<br>PANYA CONSULTANTS CO., LTD.<br>20/25/14 |  |
| DATE<br>27/05/15                                                                                         |  | SHEET NO.<br>54 OF 98                                      |  |



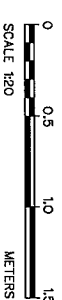
### BEND DETAILS TABLE

| BEND NO. | PS          |            | DELTA(Δ) | T      | R       | L      | TYPE   |
|----------|-------------|------------|----------|--------|---------|--------|--------|
|          | N           | E          |          |        |         |        |        |
| 1        | 1967210.970 | 423963.410 | 17.39-58 | 3.100  | 19.949  | 2.050  | TYPE 3 |
| 2        | 1967241.872 | 424008.460 | 6-54-04  | 3.020  | 50.087  | 3.017  | TYPE 2 |
| 3        | 1967271.670 | 424078.383 | 22-54-31 | 2.028  | 10.000  | 1.333  | TYPE 3 |
| 4        | 1967279.287 | 424098.503 | 16-33-16 | 3.207  | 22.500  | 2.123  | TYPE 3 |
| 5        | 1967277.773 | 424121.803 | 18-56-31 | 3.754  | 22.500  | 2.480  | TYPE 3 |
| 6        | 1967266.334 | 424138.616 | 9-56-37  | 1.957  | 22.500  | 1.953  | TYPE 2 |
| 7        | 1967247.506 | 424160.576 | 15-01-00 | 2.866  | 22.500  | 2.949  | TYPE 2 |
| 8        | 1967190.824 | 424199.304 | 20-47-37 | 5.046  | 27.500  | 3.267  | TYPE 3 |
| 9        | 1967166.155 | 424230.408 | 16-37-34 | 4.018  | 27.500  | 2.380  | TYPE 3 |
| 10       | 1967162.538 | 424250.488 | 5-38-02  | 12.489 | 0.615   | TYPE 1 | TYPE 1 |
| 11       | 1967156.335 | 424278.190 | 40-29-45 | 4.611  | 12.500  | 1.787  | TYPE 5 |
| 12       | 1967161.487 | 424281.906 | 54-05-53 | 6.383  | 12.500  | 1.967  | TYPE 6 |
| 13       | 1967176.711 | 424290.330 | 54-36-03 | 6.411  | 12.412  | 1.973  | TYPE 6 |
| 14       | 1967202.977 | 424337.230 | 13-15-01 | 1.435  | 12.354  | 1.429  | TYPE 2 |
| 15       | 1967216.931 | 424353.506 | 16-48-30 | 2.009  | 13.589  | 1.330  | TYPE 3 |
| 16       | 1967243.460 | 424370.462 | 24-05-56 | 7.908  | 37.022  | 5.191  | TYPE 3 |
| 17       | 1967237.433 | 424391.721 | 8-09-20  | 7.503  | 102.500 | 7.286  | TYPE 2 |
| 18       | 1967264.913 | 424400.184 | 4-27-20  | 3.987  | 102.492 | 3.985  | TYPE 2 |
| 19       | 1967293.584 | 424428.010 | 50-28-34 | 3.535  | 7.500   | 1.101  | TYPE 6 |
| 20       | 1967293.139 | 424447.081 | 7-42-35  | 0.505  | 7.500   | 0.505  | TYPE 2 |
| 21       | 1967284.725 | 424485.805 | 11-18-49 | 9.583  | 96.750  | 9.582  | TYPE 2 |
| 22       | 1967271.745 | 424515.553 | 11-08-16 | 0.731  | 7.500   | 0.729  | TYPE 2 |
| 23       | 1967256.334 | 424537.802 | 15-44-22 | 1.728  | 12.500  | 1.717  | TYPE 2 |
| 24       | 1967244.591 | 424564.862 | 45-41-45 | 7.374  | 17.500  | 2.781  | TYPE 2 |
| 25       | 1967255.706 | 424594.038 | 7-42-51  | 0.843  | 12.500  | 0.842  | TYPE 2 |
| 26       | 1967285.197 | 424637.044 | 31-34-17 | 2.120  | 7.500   | 1.033  | TYPE 2 |
| 27       | 1967301.436 | 424664.270 | 19-49-34 | 2.185  | 12.500  | 1.442  | TYPE 2 |
| 28       | 1967348.883 | 424688.793 | 3-43-42  | 6.591  | 202.497 | 6.589  | TYPE 2 |
| 29       | 1967444.105 | 424799.938 | 15-24-59 | 0.659  | 4.867   | 0.655  | TYPE 2 |
| 30       | 1967461.279 | 424794.929 | 12-37-42 | 1.383  | 12.501  | 1.378  | TYPE 2 |
| 31       | 1967479.089 | 424839.232 | 11-41-33 | 1.280  | 12.500  | 1.276  | TYPE 2 |
| 32       | 1967484.789 | 424871.118 | 90-45-05 | 12.685 | 12.500  | 3.300  | TYPE 2 |
| 33       | 1967425.713 | 424880.825 | 22-46-08 | 1.510  | 7.500   | 0.933  | TYPE 2 |
| 34       | 1967352.743 | 424863.617 | 12-44-08 | 10.861 | 97.500  | 10.856 | TYPE 2 |
| 35       | 1967311.697 | 424843.327 | 52-02-20 | 5.153  | 10.556  | 1.588  | TYPE 2 |
| 36       | 1967303.979 | 424848.989 | 69-30-44 | 7.035  | 10.556  | 2.135  | TYPE 2 |
| 37       | 1967303.994 | 424885.685 | 71-56-43 | 9.128  | 12.500  | 2.617  | TYPE 2 |
| 38       | 1967283.536 | 424884.447 | 3-13-54  | 0.635  | 92.500  | 0.635  | TYPE 2 |
| 39       | 1967280.995 | 424910.983 | 9-28-52  | 1.037  | 12.500  | 1.034  | TYPE 2 |
| 40       | 1967215.181 | 424922.099 | 27-06-33 | 3.014  | 12.500  | 1.479  | TYPE 2 |
| 41       | 1967162.294 | 424973.805 | 39-11-20 | 8.010  | 22.500  | 3.078  | TYPE 2 |
| 42       | 1967111.826 | 424977.824 | 16-15-14 | 3.927  | 27.500  | 2.690  | TYPE 2 |
| 43       | 1967094.992 | 424986.888 | 13-58-39 | 3.371  | 27.500  | 3.355  | TYPE 2 |
| 44       | 1967068.940 | 425013.723 | 32-58-56 | 5.181  | 17.500  | 2.919  | TYPE 2 |
| 45       | 1967048.499 | 425035.017 | 80-02-33 | 10.487 | 12.500  | 2.811  | TYPE 2 |
| 46       | 1967057.473 | 425040.534 | 0-20-32  | 0.037  | 12.487  | 0.038  | TYPE 2 |
| 47       | 1967063.793 | 425044.366 | 60-56-00 | 7.353  | 12.500  | 2.216  | TYPE 2 |
| 48       | 1967107.312 | 425019.547 | 61-33-25 | 22.335 | 37.500  | 6.715  | TYPE 2 |
| 49       | 1967163.085 | 425064.208 | 68-23-47 | 11.882 | 17.500  | 3.482  | TYPE 2 |
| 50       | 1967154.504 | 425099.420 | 40-50-26 | 4.654  | 12.500  | 1.782  | TYPE 2 |
| 51       | 1967134.488 | 425115.895 | 52-48-51 | 6.207  | 12.500  | 1.920  | TYPE 2 |
| 52       | 1967135.550 | 425153.550 | 22-47-01 | 2.501  | 12.500  | 1.646  | TYPE 2 |
| 53       | 1967148.551 | 425163.461 | 23-41-01 | 2.621  | 12.500  | 1.722  | TYPE 2 |
| 54       | 1967149.080 | 425207.446 | 38-38-37 | 4.730  | 13.489  | 1.820  | TYPE 2 |
| 55       | 1967122.319 | 425241.697 | 33-38-51 | 2.893  | 22.500  | 2.680  | TYPE 2 |

BEND DETAILS TABLE

| BEND NO. | PS           |             | DELTA(Δ)     | T      | R      | L      | TYPE   |
|----------|--------------|-------------|--------------|--------|--------|--------|--------|
|          | N            | E           |              |        |        |        |        |
| 56       | 1967090.044  | 425313.067  | 117°-16'-19" | 25.429 | 15.500 | 5.288  | TYPE E |
| 57       | 1967046.888  | 425268.733  | 61°-10'-44"  | 10.345 | 17.500 | 3.114  | TYPE E |
| 58       | 1967028.871  | 424281.772  | 11°-08'-46"  | 1.708  | 17.489 | 1.702  | TYPE E |
| 59       | 1967016.506  | 423268.486  | 67°-09'-10"  | 11.617 | 17.500 | 3.419  | TYPE E |
| 60       | 1967072.001  | 423587.806  | 77°-36'-00"  | 18.090 | 22.500 | 5.079  | TYPE E |
| 61       | 19668979.831 | 423530.636  | 40°-18'-51"  | 4.589  | 12.500 | 1.759  | TYPE E |
| 62       | 19668971.556 | 423403.584  | 67°-03'-17"  | 8.287  | 12.500 | 2.439  | TYPE E |
| 63       | 19668998.551 | 423464.887  | 44°-24'-48"  | 5.103  | 12.500 | 1.939  | TYPE E |
| 64       | 1966893.891  | 423470.360  | 11°-26'-18"  | 1.252  | 12.500 | 1.248  | TYPE E |
| 65       | 19668992.338 | 423487.103  | 52°-13'-02"  | 6.126  | 12.500 | 1.889  | TYPE E |
| 66       | 1967013.323  | 423506.729  | 28°-40'-10"  | 3.078  | 12.984 | 1.511  | TYPE E |
| 67       | 1967034.100  | 423563.057  | 46°-54'-41"  | 4.566  | 10.500 | 1.433  | TYPE E |
| 68       | 1967044.529  | 423587.576  | 68°-01'-31"  | 7.086  | 10.500 | 2.078  | TYPE E |
| 69       | 1967074.586  | 423537.648  | 94°-50'-01"  | 13.602 | 12.500 | 3.448  | TYPE E |
| 70       | 1967095.876  | 423562.731  | 22°-06'-00"  | 13.038 | 86.763 | 8.564  | TYPE E |
| 71       | 1967121.754  | 423641.208  | 29°-08'-13"  | 4.551  | 17.500 | 2.226  | TYPE E |
| 72       | 1967146.402  | 423663.870  | 13°-49'-46"  | 1.738  | 12.500 | 1.727  | TYPE E |
| 73       | 1967170.784  | 423678.169  | 31°-56'-59"  | 3.578  | 12.500 | 1.743  | TYPE E |
| 74       | 1967198.888  | 423722.424  | 47°-17'-02"  | 7.661  | 17.500 | 2.407  | TYPE E |
| 75       | 1967185.244  | 423504.882  | 43°-34'-02"  | 4.996  | 12.500 | 1.901  | TYPE E |
| 76       | 1967181.284  | 423618.414  | 65°-19'-57"  | 8.519  | 12.489 | 2.375  | TYPE E |
| 77       | 1967245.049  | 423613.184  | 63°-46'-19"  | 47.265 | 76.976 | 14.094 | TYPE E |
| 78       | 1967290.051  | 423583.945  | 4°-30'-00"   | 0.888  | 22.998 | 0.888  | TYPE E |
| 79       | 1967314.372  | 423630.513  | 60°-01'-17"  | 15.884 | 27.500 | 4.801  | TYPE E |
| 80       | 1967288.651  | 423662.190  | 25°-04'-58"  | 8.342  | 37.500 | 5.472  | TYPE E |
| 81       | 1967198.544  | 423604.885  | 52°-58'-45"  | 8.774  | 17.500 | 2.898  | TYPE E |
| 82       | 1967199.098  | 423662.770  | 89°-37'-10"  | 12.167 | 17.500 | 3.544  | TYPE E |
| 83       | 1967230.793  | 423673.598  | 4°-00'-03"   | 0.437  | 12.500 | 0.437  | TYPE E |
| 84       | 1967251.816  | 4236079.176 | 21°-24'-31"  | 1.418  | 7.500  | 0.934  | TYPE E |
| 85       | 1967273.861  | 4236095.352 | 24°-41'-37"  | 3.831  | 17.500 | 2.514  | TYPE E |
| 86       | 1967263.520  | 4236099.378 | 18°-36'-31"  | 12.840 | 78.155 | 8.464  | TYPE E |
| 87       | 1967308.816  | 4236108.878 | 2°-03'-44"   | 0.315  | 17.497 | 0.315  | TYPE E |
| 88       | 1967351.873  | 4236131.281 | 20°-09'-55"  | 15.465 | 86.673 | 10.203 | TYPE E |
| 89       | 1967402.930  | 423138.502  | 89°-12'-47"  | 16.460 | 16.688 | 4.331  | TYPE E |
| 90       | 1967400.002  | 4236161.647 | 22°-24'-01"  | 3.465  | 17.500 | 2.281  | TYPE E |
| 91       | 1967394.053  | 4236172.111 | 59°-49'-49"  | 5.754  | 10.000 | 1.740  | TYPE E |

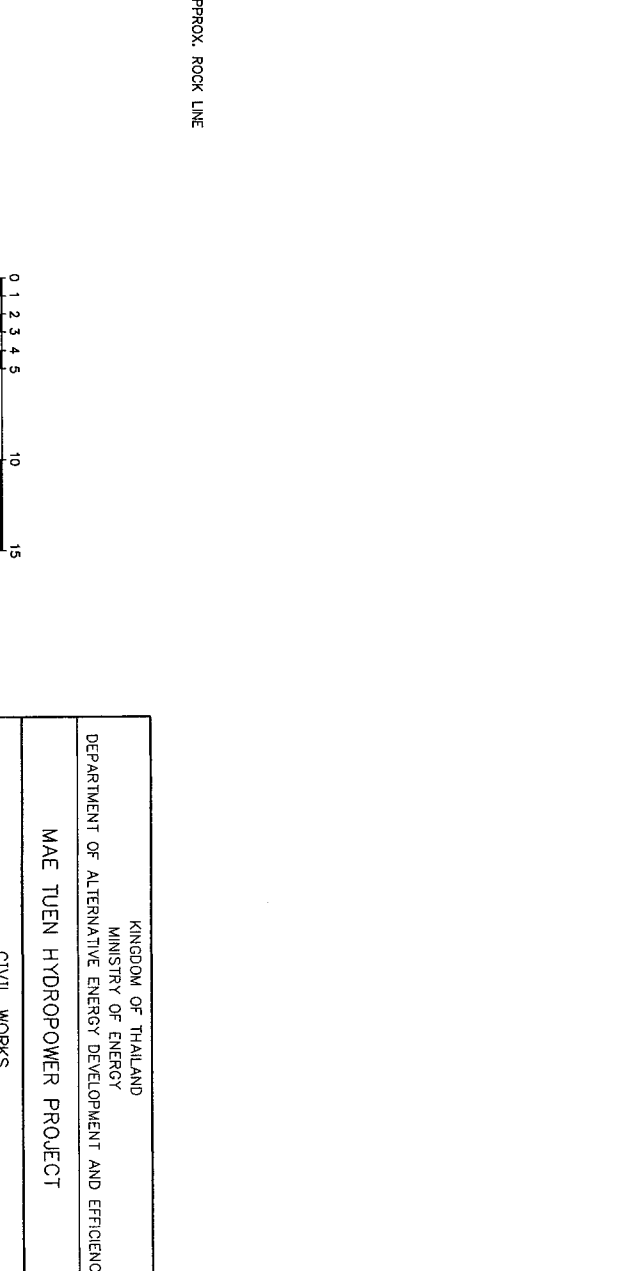
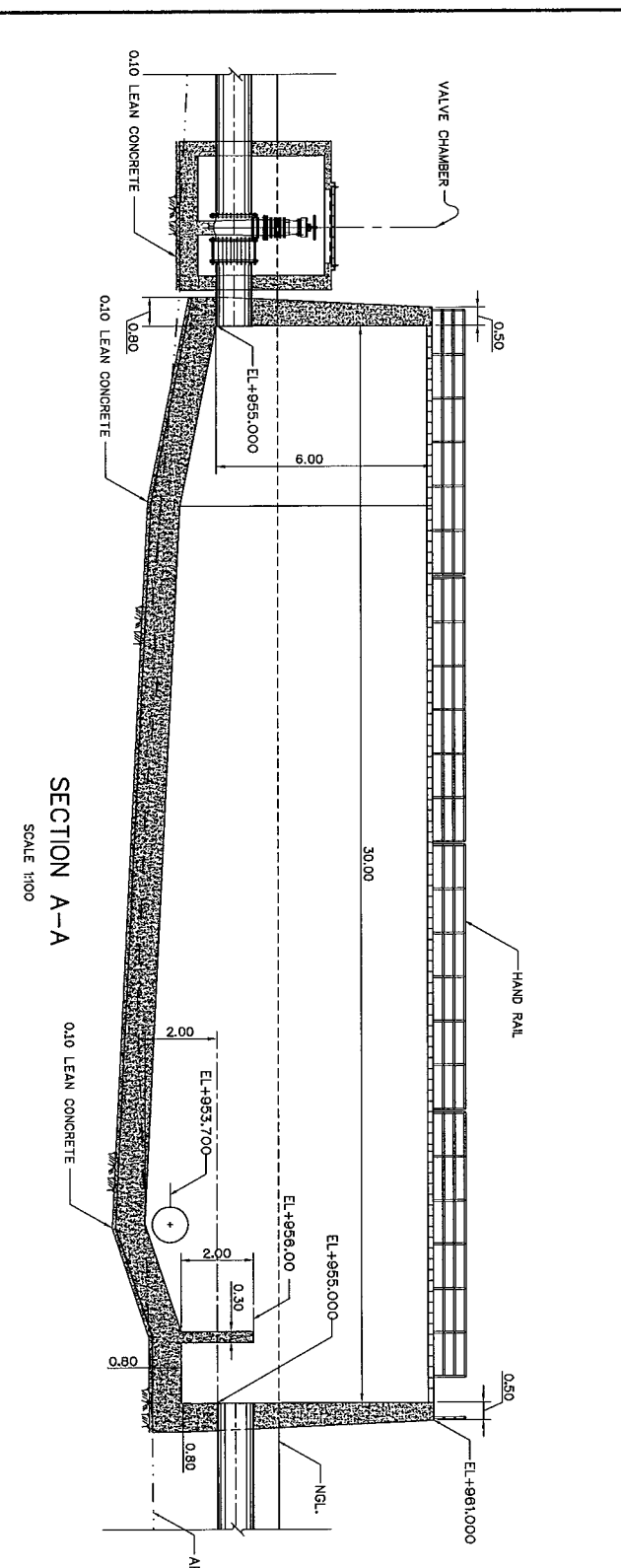
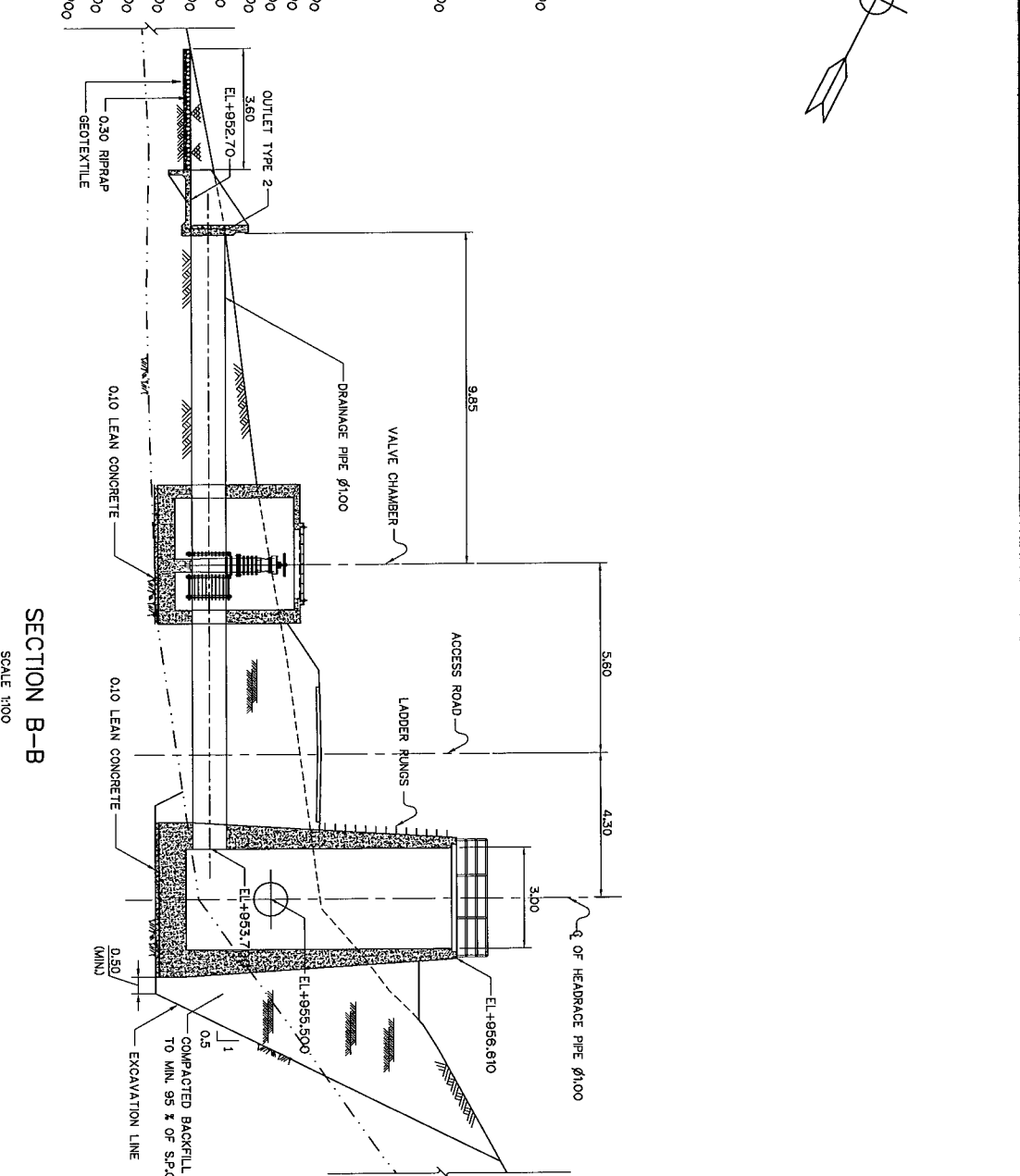
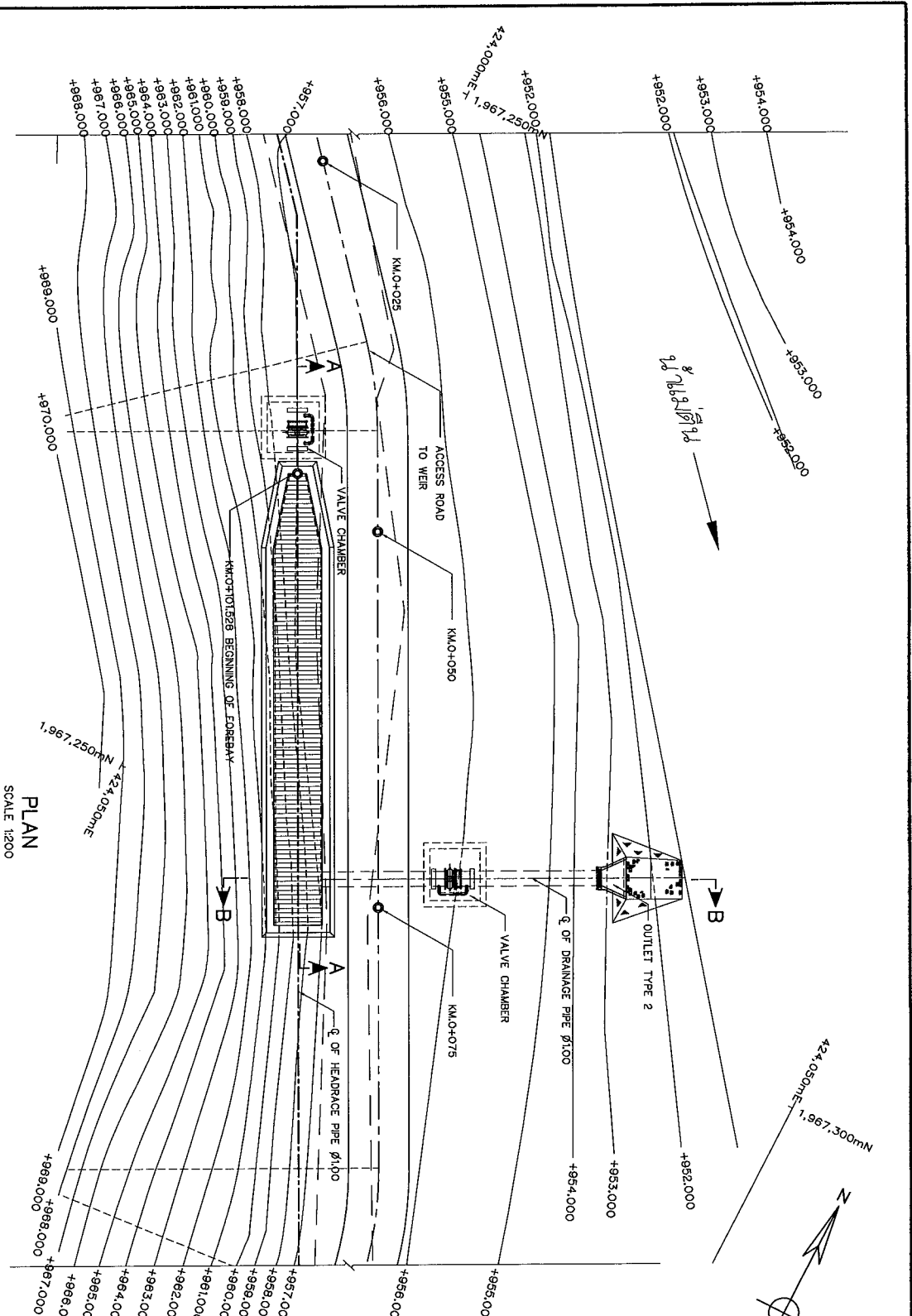
NOTE :  
1. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-07



KINGDOM OF THAILAND  
MINISTRY OF ENERGY  
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY  
MAE TUEN HYDROPOWER PROJECT

CIVIL WORKS  
HEADRACE  
BEND DETAILS

|                             |      |           |         |          |         |                                                             |                    |             |           |
|-----------------------------|------|-----------|---------|----------|---------|-------------------------------------------------------------|--------------------|-------------|-----------|
| PANYA CONSULTANTS CO., LTD. |      |           |         |          |         | DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |                    |             |           |
|                             |      |           |         |          |         | REMOVED                                                     | <i>[Signature]</i> |             |           |
| 3                           |      |           |         |          |         | SUBMITTED                                                   | <i>[Signature]</i> | DRAWING NO. | SHEET NO. |
| 2                           |      |           |         |          |         | DRAWN                                                       | <i>[Signature]</i> | M-1-HR-44   | 55 OF 98  |
| 1                           |      |           |         |          |         | RECOMMENDED                                                 | P. Hunk            |             |           |
| NO.                         | DATE | REVISIONS | CHECKED | APPROVED | CHECKED |                                                             |                    |             |           |
| CONSULTANTS                 |      |           |         |          |         | DDBE                                                        |                    |             |           |
|                             |      |           |         |          |         | PROJECT MANAGER DATE 27/09/13                               |                    |             |           |



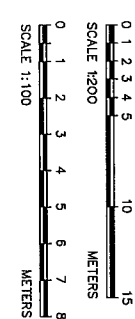
NOTES:

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN

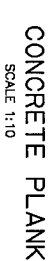
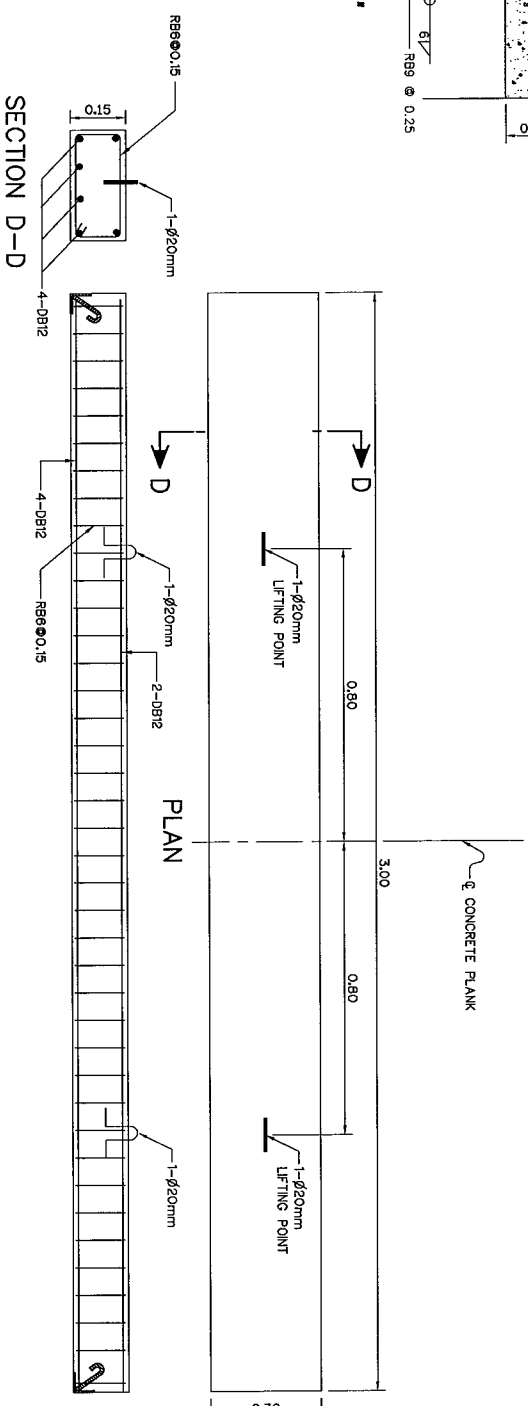
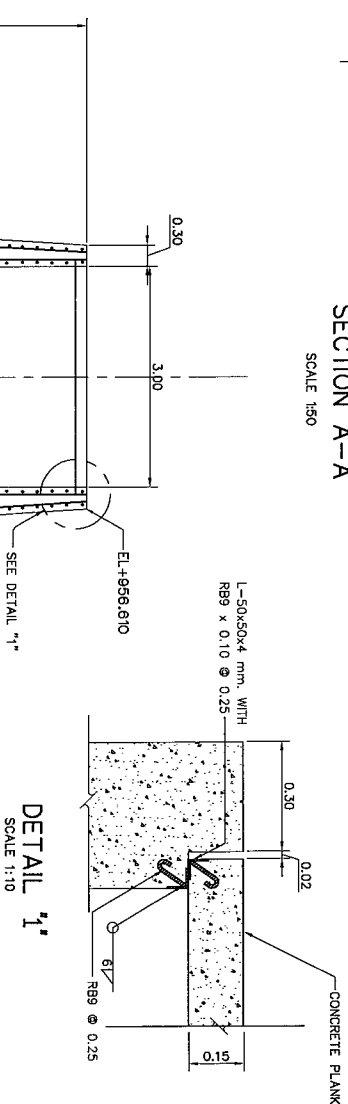
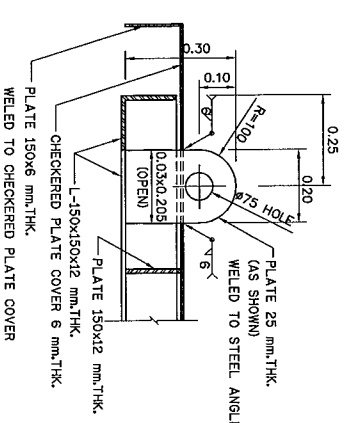
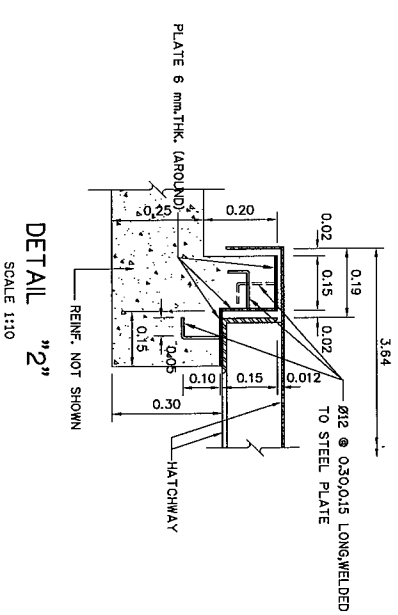
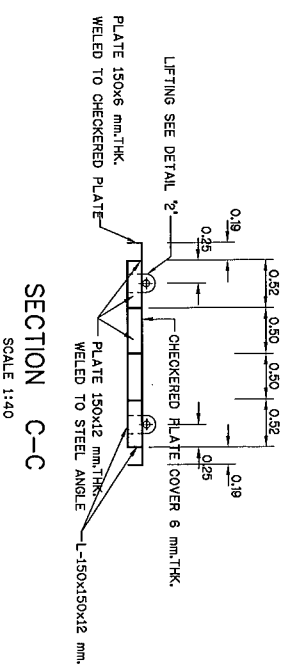
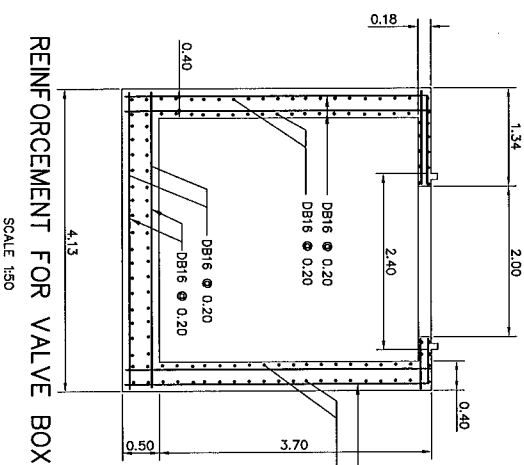
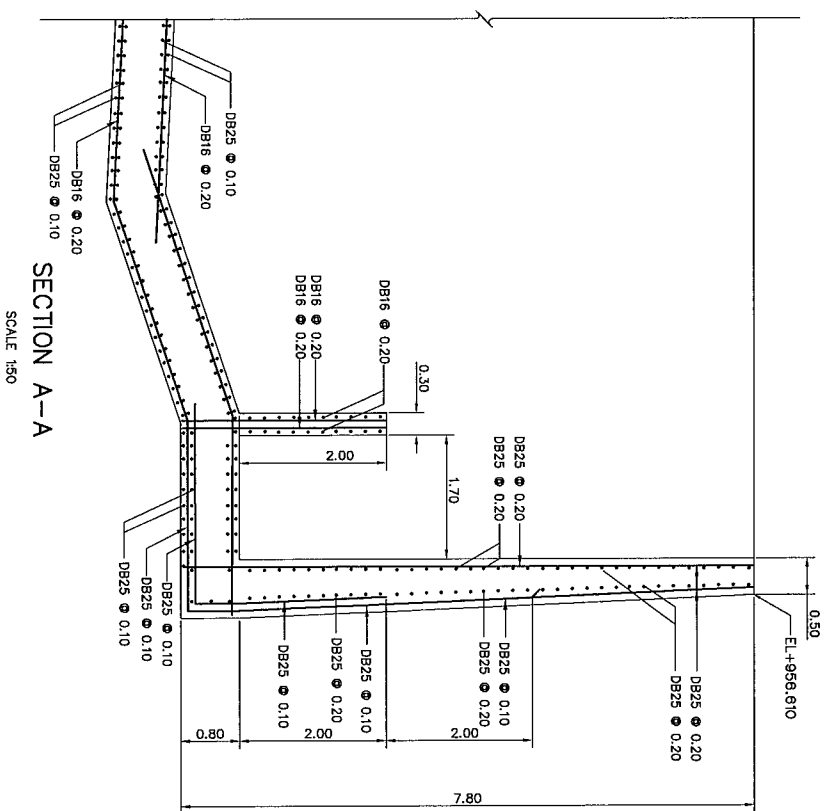
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01

REFERENCE DRAWINGS :-

- 1. HEADRAGE, PLAN & PROFILE, KM1+200 TO KM2+400 MT-HR-02
- 2. HEADRAGE, INTAKE, PLAN SECTIONS AND DETAILS MT-HR-04
- 3. HEADRAGE, TYPICAL SECTION, INSTALLATION DATA MT-HR-05
- 4. HEADRAGE, VALVE CHAMBER, PLAN AND SECTIONS MT-HR-06



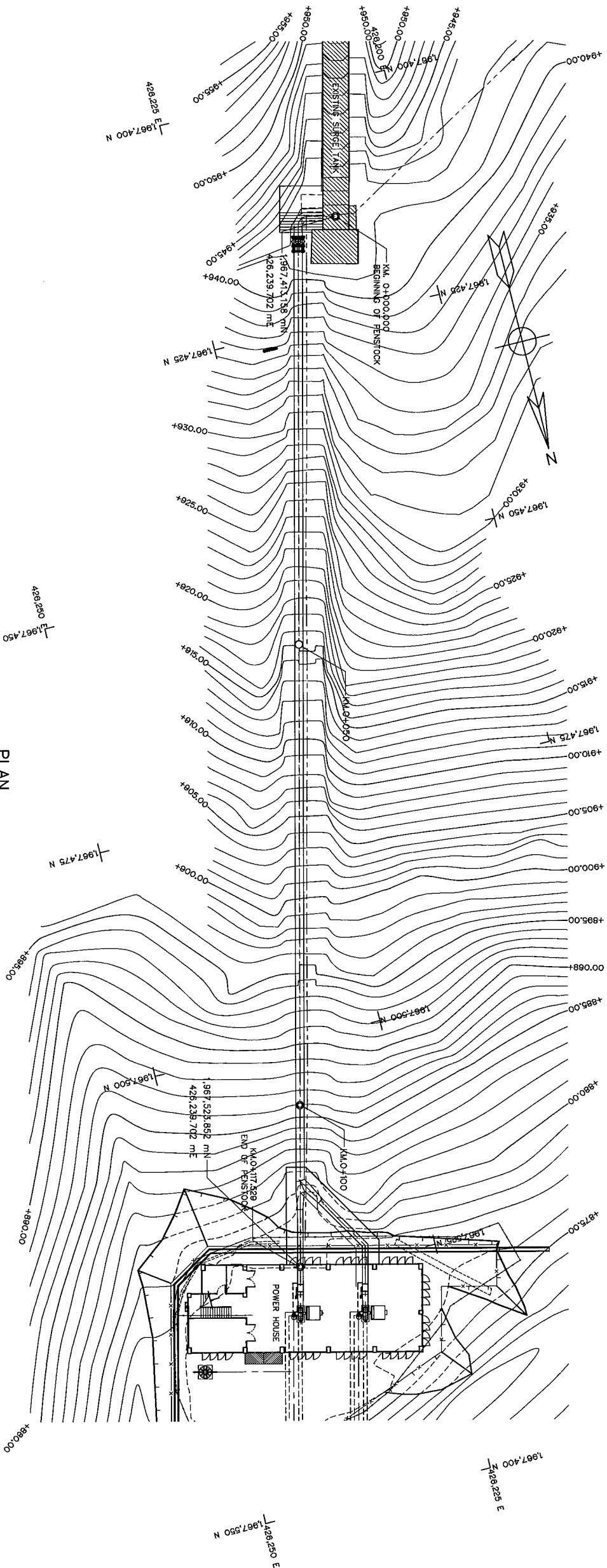
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|----------------------------------------|--|--|--|-------------------------------------------------------------|--|--|--|
| KINGDOM OF THAILAND                    |  |  |  | DEPARTMENT OF THAILAND                                      |  |  |  |
| MINISTRY OF ENERGY                     |  |  |  | DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |  |  |  |
| MAE TUEN HYDROPOWER PROJECT            |  |  |  | CIVIL WORKS                                                 |  |  |  |
| FOREBAY                                |  |  |  | PLAN & SECTION                                              |  |  |  |
| PANA CONSULTANTS CO., LTD.             |  |  |  | DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |  |  |  |
| DESIGNED BY PANA CONSULTANTS CO., LTD. |  |  |  | REVIEWED BY PANA CONSULTANTS CO., LTD.                      |  |  |  |
| DRAWN BY PANA CONSULTANTS CO., LTD.    |  |  |  | RECOMMENDED BY PANA CONSULTANTS CO., LTD.                   |  |  |  |
| CHECKED BY PANA CONSULTANTS CO., LTD.  |  |  |  | APPROVED BY PANA CONSULTANTS CO., LTD.                      |  |  |  |
| PROJECT MANAGER                        |  |  |  | DRAWING NO. MT-FB-01                                        |  |  |  |
| DATE                                   |  |  |  | SHEET NO. 56 OF 98                                          |  |  |  |



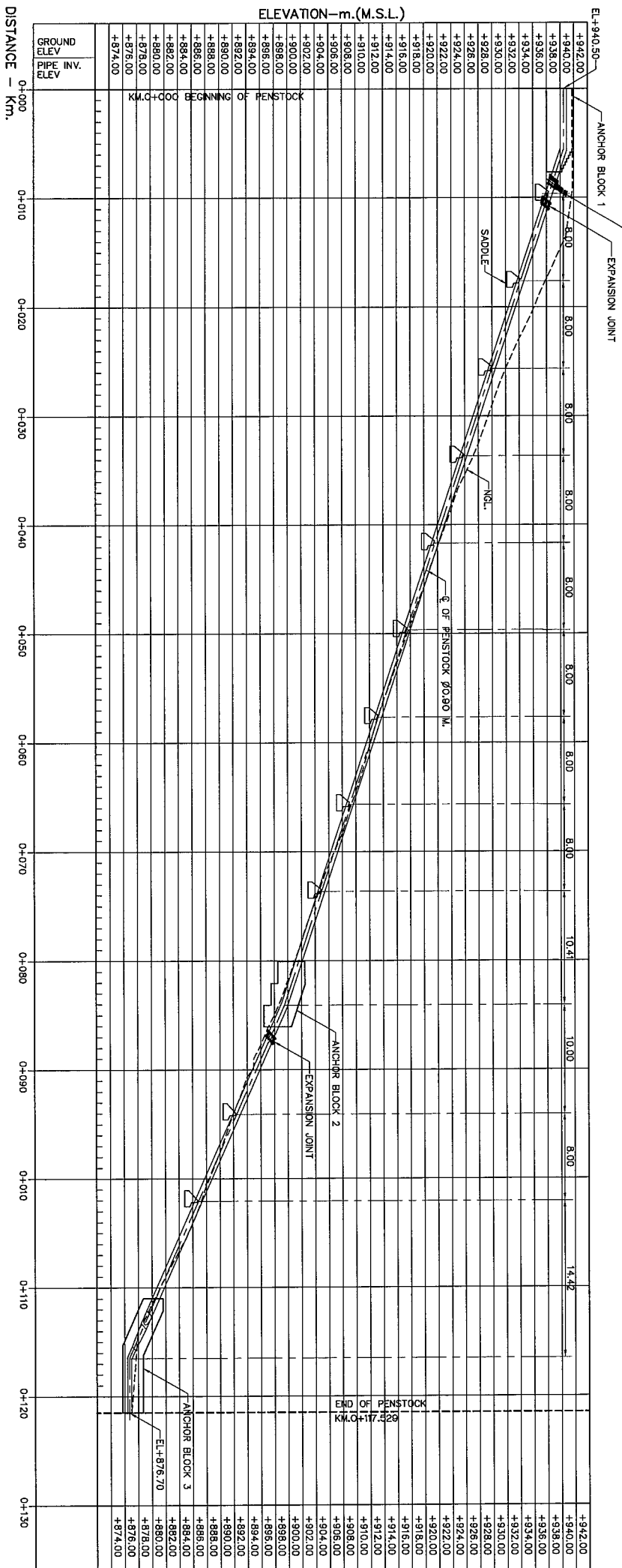
- NOTES :**

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METRES UNLESS OTHERWISE SHOWN.
2. ALLOWABLE BEARING CAPACITY NOT LESS THAN 28 TONS/sq.m.
3. REINFORCEMENT BARS ARE IN MILLIMETRES, UNLESS OTHERWISE SHOWN.
4. CONCRETE SHALL HAVE A MINIMUM ULTIMATE COMPRESSIVE STRENGTH OF 210 ksc. FOR A STANDARD CYLINDER AT 28 DAYS.
5. THE CONTRACTOR SHALL PERFORM GEOTECHNICAL AND SOIL INVESTIGATION IN ORDER TO CONFIRM UNDERGROUND CONDUIT/UT DESIGN SHAKE & REVIEWED AND CONFIRMED BY THE CONTRACTOR.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|--|--|--|--|
| <p style="text-align: center;"> <b>KINGDOM OF THAILAND</b><br/> <b>MINISTRY OF ENERGY</b><br/> <b>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY</b> </p> <p style="text-align: center;"><b>MAE TUEN HYDROPOWER PROJECT</b></p> <p style="text-align: center;"><b>CIVIL WORKS</b></p> <p style="text-align: center;"><b>HEADRACE</b></p> <p style="text-align: center;"><b>REINFORCEMENT DETAILS</b></p>                                                                                   |  |  |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  |  |  |  |  |  |  |  |  |
| <p> <b>NO.</b> PANYA CONSULTANTS CO., LTD.<br/> <b>REVIEWED</b> <i>[Signature]</i><br/> <b>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY</b><br/> <b>SUBMITTED</b> <i>[Signature]</i><br/> <b>RECOMMENDED</b> <i>[Signature]</i><br/> <b>APPROVED</b> <i>[Signature]</i><br/> <b>DRAWING NO.</b> <i>[Blank]</i><br/> <b>DATE</b> <i>[Blank]</i><br/> <b>PROJECT MANAGER</b> <i>[Signature]</i><br/> <b>DATE</b> 27/06/13<br/> <b>WT-FB-02</b><br/> <b>SHEET NO.</b> 57 OF 98         </p> |  |  |  |  |  |  |  |  |  |



PLAN  
SCALE 1:250



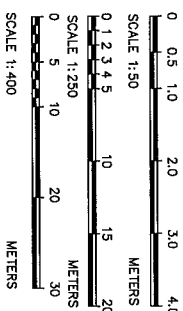
PROFILE  
HORIZONTAL SCALE 1:250  
VERTICAL SCALE 1:400

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-ON-01
3. ALLOWABLE BEARING CAPACITY NOT LESS THAN 20 TON/M<sup>2</sup>

REFERENCE DRAWINGS :

1. PENSTOCK, ANCHOR BLOCK AND PIPE SUPPORT MT-PS-02
2. PENSTOCK, WYE, PLAN, SECTIONS AND DETAILS MT-PS-03



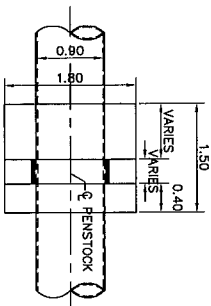
KINGDOM OF THAILAND  
MINISTRY OF ENERGY  
DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY  
MAE TUEN HYDROPOWER PROJECT

CIVIL WORKS  
PENSTOCK  
PLAN AND PROFILE

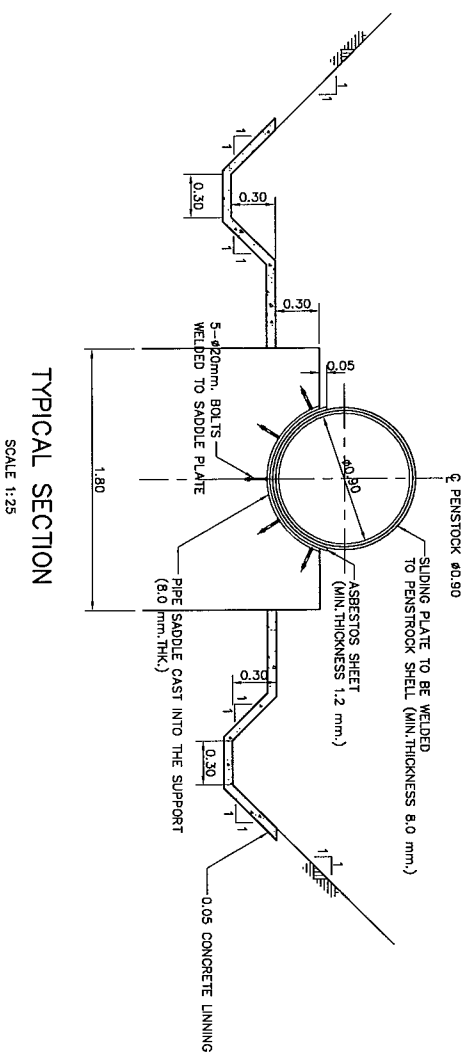
DESIGNED BY PANYA CONSULTANTS CO., LTD.  
SUBMITTED BY PANYA CONSULTANTS CO., LTD.  
RECOMMENDED BY PANYA CONSULTANTS CO., LTD.

|     |          |           |         |          |
|-----|----------|-----------|---------|----------|
| NO. | DATE     | REVISIONS | CHECKED | APPROVED |
| 1   | 27/06/13 |           |         |          |
| 2   |          |           |         |          |
| 3   |          |           |         |          |

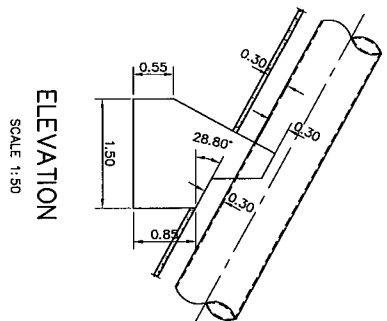
PROJECT MANAGER DATE MT-PS-01 SHEET NO. 58 OF 58



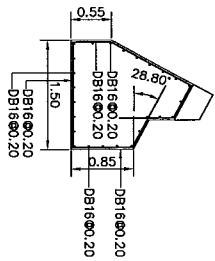
PLAN OF SADDLE  
SCALE 1:50



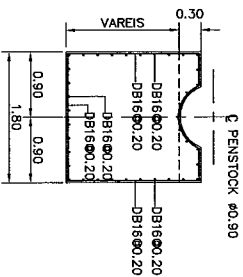
TYPICAL SECTION  
SCALE 1:25



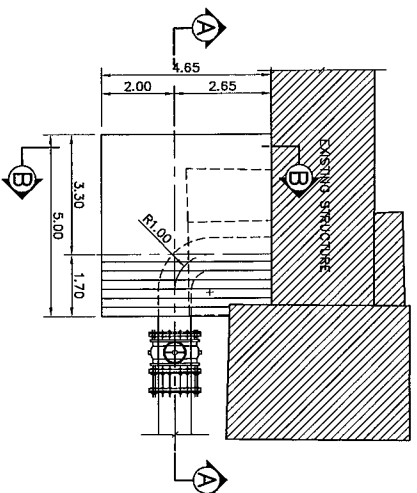
ELEVATION  
SCALE 1:50



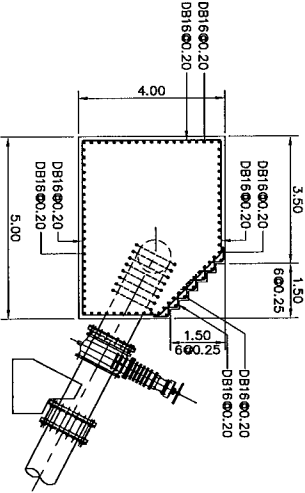
SECTION A-A  
SCALE 1:50



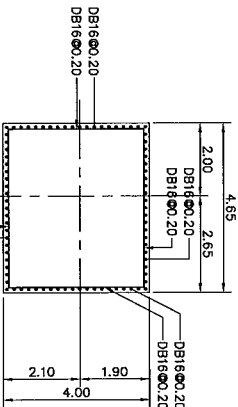
SECTION B-B  
SCALE 1:50



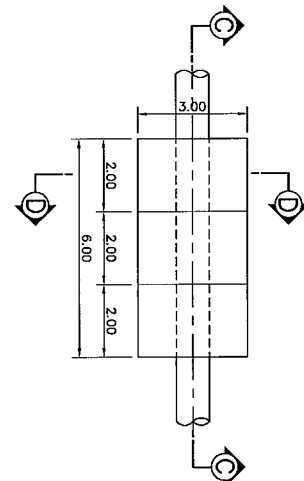
PLAN OF ANCHOR 1  
SCALE 1:100



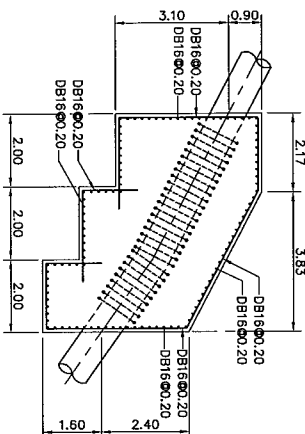
SECTION A-A  
SCALE 1:100



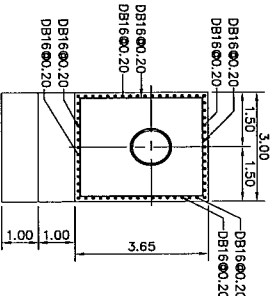
SECTION B-B  
SCALE 1:100



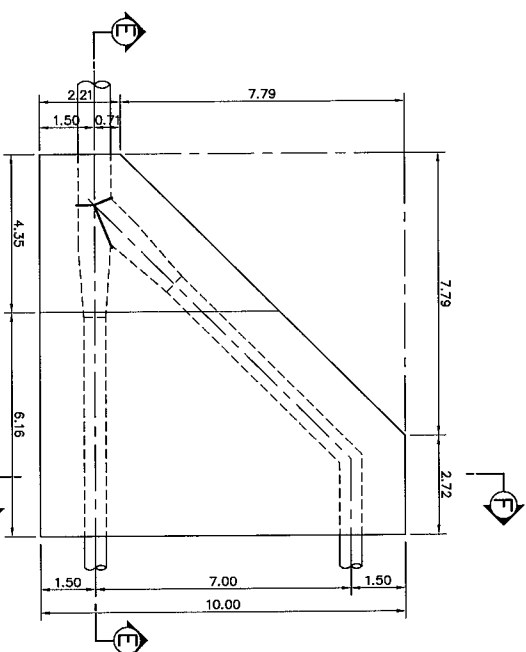
PLAN OF ANCHOR 2  
SCALE 1:100



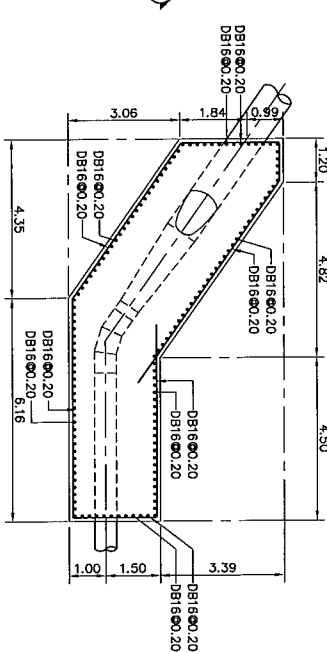
SECTION C-C  
SCALE 1:100



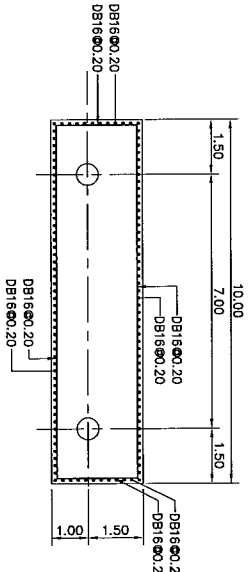
SECTION D-D  
SCALE 1:100



PLAN OF ANCHOR 3  
SCALE 1:100



SECTION E-E  
SCALE 1:100



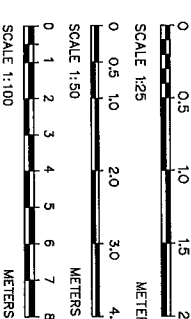
SECTION F-F  
SCALE 1:100

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-ON-01
3. ALLOWABLE BEARING CAPACITY NOT LESS THAN 10 TON/M<sup>2</sup>

REFERENCE DRAWINGS :

1. PENSTOCK, PLAN AND PROFILE MT-PS-01
2. PENSTOCK, WELD, PLAN, SECTIONS AND DETAILS MT-PS-03
3. PENSTOCK, WELDING DETAILS MT-PS-04



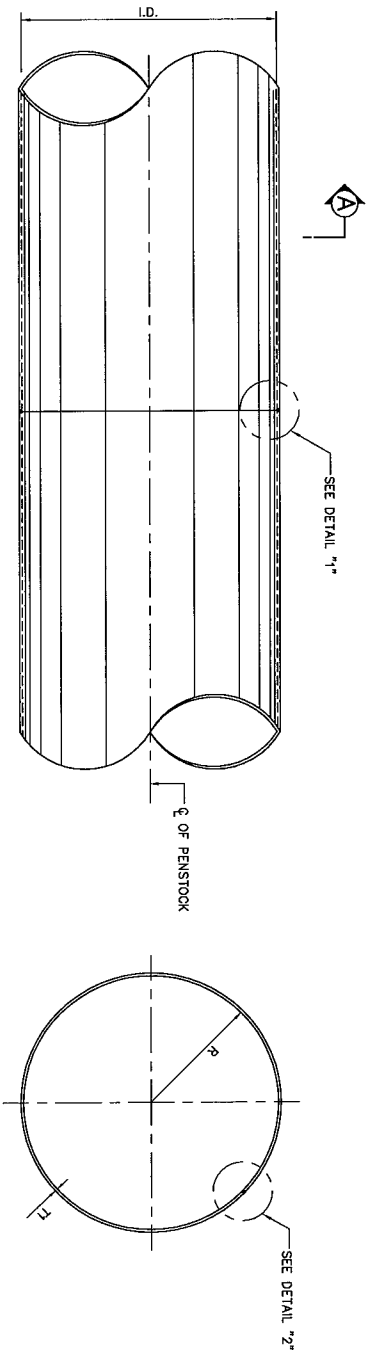
|   |      |           |         |          |
|---|------|-----------|---------|----------|
| 1 | DATE | REVISIONS | CHECKED | APPROVED |
| 2 | DATE | REVISIONS | CHECKED | APPROVED |
| 3 | DATE | REVISIONS | CHECKED | APPROVED |

|                                                                                                          |                                    |
|----------------------------------------------------------------------------------------------------------|------------------------------------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |                                    |
| MAE TUEN HYDROPOWER PROJECT                                                                              |                                    |
| CIVIL WORKS                                                                                              |                                    |
| ANCHOR BLOCK AND PIPE SUPPORT                                                                            |                                    |
| DESIGNED BY<br>DRAWN BY<br>CHECKED BY<br>PROJECT MANAGER                                                 | REVIEWED BY<br>APPROVED BY<br>DATE |
| 27/06/13                                                                                                 | MT-PS-02                           |
| 59                                                                                                       | 98                                 |



TABLE OF TYPE "A" SINGLE-V-GROOVE WELD, BUTT JOINT

| WELDING PROCESS | JOINT DESIGNATION | BASE METAL THICKNESS<br>(t= UNLIMITED) |    | GROOVE PREPARATION |                     | ALLOWED WELDING POSITIONS | GAS SHIELDING FOR FCAW | REMARK         | TOLERANCES                                                        |           |
|-----------------|-------------------|----------------------------------------|----|--------------------|---------------------|---------------------------|------------------------|----------------|-------------------------------------------------------------------|-----------|
|                 |                   |                                        |    | ROOT OPENING       | GROOVE ANGLE        |                           |                        |                | AS DETAILED                                                       | AS FIT-UP |
|                 |                   | T1                                     | T3 |                    |                     |                           |                        |                |                                                                   |           |
| SMAW            | B-U2a             | U                                      | 10 | R = 6              | $\alpha = 45^\circ$ | ALL                       | -                      | e <sub>j</sub> | R = +2,-0<br>$\alpha = +10^\circ,-0^\circ$<br><br>+6,-2<br>+10,-5 |           |
|                 |                   |                                        |    | R = 10             | $\alpha = 30^\circ$ | F.V.OH                    | -                      | e <sub>j</sub> |                                                                   |           |
|                 |                   |                                        |    | R = 12             | $\alpha = 20^\circ$ | F.V.OH                    | -                      | e <sub>j</sub> |                                                                   |           |
| GMAW FCAW       | B-U2a-GF          | U                                      | 10 | R = 5              | $\alpha = 30^\circ$ | F.V.OH                    | REQUIRED               | o <sub>j</sub> |                                                                   |           |
|                 |                   |                                        |    | R = 10             | $\alpha = 30^\circ$ | F.V.OH                    | NOT REQ.               | o <sub>j</sub> |                                                                   |           |
|                 |                   |                                        |    | R = 6              | $\alpha = 45^\circ$ | F.V.OH                    | NOT REQ.               | o <sub>j</sub> |                                                                   |           |
| GMAW            | B-L2a-S           | 50 MAX.                                | 10 | R = 6              | $\alpha = 30^\circ$ | F                         | -                      | j              |                                                                   |           |
| GMAW            | B-L2-S            | U                                      | 10 | R = 16             | $\alpha = 20^\circ$ | F                         | -                      | j              |                                                                   |           |



ELEVATION

NOT TO SCALE

SECTION A-A

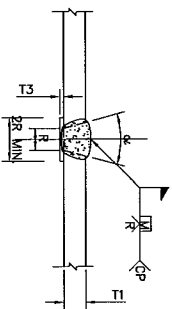
NOT TO SCALE

TABLE OF TYPE "B" SINGLE-V-GROOVE WELD, BUTT JOINT

| WELDING PROCESS | JOINT DESIGNATION | BASE METAL THICKNESS<br>(U= UNLIMITED) | GROOVE PREPARATION                        |                                  |                                       |                                 | ALLOWED WELDING POSITIONS | GAS SHIELDING FOR FCAW | REMARK |
|-----------------|-------------------|----------------------------------------|-------------------------------------------|----------------------------------|---------------------------------------|---------------------------------|---------------------------|------------------------|--------|
|                 |                   |                                        | ROOT OPENING<br>ROOT FACE<br>GROOVE ANGLE | TOLERANCES                       |                                       |                                 |                           |                        |        |
|                 |                   |                                        |                                           | AS DETAILED                      | AS FIT-UP                             |                                 |                           |                        |        |
| SAW             | B-U2              | U                                      | 10                                        | R = 0-3<br>f = 0 TO 3<br>α = 60° | +2,-0<br>+2,-0<br>+10,-0°             | +2,-3<br>NOT LIMITED<br>+10,-5° | ALL                       | -                      | d.e.j  |
| GMAW FCAW       | B-U2-OF           | U                                      | 10                                        | R = 0-3<br>f = 0 TO 3<br>α = 60° | +2,-0<br>+2,-0<br>+10,-0°             | +2,-3<br>NOT LIMITED<br>+10,-5° | ALL                       | NOT REQ.               | d.d.j  |
| SAW             | B-L2c-s           | OVER 12 TO 25                          | 10                                        | R = 0<br>f = 6 MAX.<br>α = 60°   |                                       |                                 |                           |                        |        |
|                 |                   | OVER 12 TO 38                          | 10                                        | R = 0<br>f = 6 MAX.<br>α = 60°   | R = +0,-0<br>f = +0,-f<br>α = +10,-0° | +2,-0<br>+2,-2<br>+10,-5°       | F                         | -                      | d.j    |
|                 |                   | OVER 38 TO 50                          | 10                                        | R = 0<br>f = 6 MAX.<br>α = 60°   |                                       |                                 |                           |                        |        |

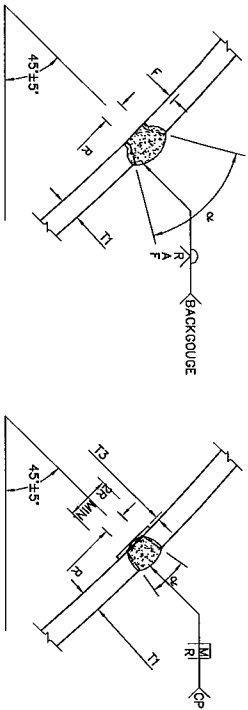
CIRCULAR BUTT JOINT  
TYPE "A"

NOT TO SCALE



DETAIL "1"

NOT TO SCALE



## LONGITUDINAL BUTT JOINT

### LONGITUDINAL BUTT JOINT (ALTERNATIVE)

DETAIL "2"

NOT TO SCALE

## WELDING SYMBOLS

|                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                     |                                                                                         |                                                                                     |                                                                                     |                                                                                     |                                                                                     |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |  |  |      |  |  |  |  |
| FIELD WELD SYMBOL                                                                 | WELD - ALL - AROUND SYMBOL                                                        | SQUARE GROOVE WELDING SYMBOL<br>R=ROOT OPENING                                    | V-GROOVE WELDING SYMBOL<br>R=ROOT OPENING<br>A=GROOVE ANGLE<br>F=ROOT FACE        | BACKING SYMBOL<br>(MATERIAL OF BACKING THE SAME AS OF PIPE)                       | COMPLETE JOINT PENETRATION                                                          | FILLET WELD<br>S=WELDING SIZE<br>L=LENGTH OF WELD<br>P=PITCH (CENTER TO CENTER OF WELD) | BACK OR BACKING WELD SYMBOL                                                         | COMBINED WELDS,<br>BACKING WELD ON FAR SIDE AND V-GROOVE WELD ON NEAR SIDE          | BEVEL GROOVE WELDING SYMBOL                                                         | FLARE-BEVEL GROOVE WELDING SYMBOL                                                   |

## REMARKS :

- c : NOT PREQUALIFIED FOR GMAW-S NOR GTAW.  
d : BACKGOUGE ROOT TO SOUND METAL BEFORE WELDING SECOND SIDE.  
e : SMAW DETAILED JOINTS MAY BE USED FOR PREQUALIFIED GMAW (EXCEPT GMAW-S) AND FCAM.  
f : THE ORIENTATION OF THE TWO MEMBERS IN THE JOINTS MAY VARY FROM 135° TO 180° FOR BUTT JOINTS,  
OR 45° TO 135° FOR CORNER JOINTS, OR 45° TO 90° FOR T-JOINTS.

## LEGENDS :

- | WELDING PROCESSES              | WELDING POSITIONS |
|--------------------------------|-------------------|
| SAW = SHIELD METAL ARC WELDING | F = FLAT          |
| GMAW = GAS METAL ARC WELDING   | H = HORIZONTAL    |
| FCAW = FLUX CORED ARC WELDING  | V = VERTICAL      |
| SAW = SUBMERGED ARC WELDING    | OH = OVERHEAD     |

**NOTES :**

1. ALL DIMENSION ARE IN MILLIMETER, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. GP-01.
3. GROOVE WELD MADE AFTER WELDING OTHER SIDE.
4. USE WELDING ELECTRODE TYPE "E" 70XX.
5. MATERIAL OF BACKING IS THE SAME AS OF PIPE.
6. WELDED JOINT SHALL CONFORM TO AWS D11.

**REFERENCE DRAWINGS :**

- |                                            |          |
|--------------------------------------------|----------|
| 1. PENSTOCK, ANCHOR BLOCK AND PIPE SUPPORT | MT-PS-02 |
| 2. PENSTOCK, WELDING DETAILS               | MT-PS-03 |

|                                                                |  |  |  |  |  |
|----------------------------------------------------------------|--|--|--|--|--|
| KINGDOM OF THAILAND                                            |  |  |  |  |  |
| MINISTRY OF ENERGY                                             |  |  |  |  |  |
| DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY    |  |  |  |  |  |
| MAE TUEN HYDROPOWER PROJECT                                    |  |  |  |  |  |
| CIVIL WORKS                                                    |  |  |  |  |  |
| PENSTOCK                                                       |  |  |  |  |  |
| WELDING DETAILS                                                |  |  |  |  |  |
| DEPARTMENT OF ALTERNATIVE ENERGY<br>DEVELOPMENT AND EFFICIENCY |  |  |  |  |  |
| REVIEWED                                                       |  |  |  |  |  |
| SUBMITTED                                                      |  |  |  |  |  |
| RECOMMENDED                                                    |  |  |  |  |  |
| APPROVED                                                       |  |  |  |  |  |
| DRAWING NO.                                                    |  |  |  |  |  |
| SHEET NO.                                                      |  |  |  |  |  |
| DATE                                                           |  |  |  |  |  |
| PROJECT MANAGER                                                |  |  |  |  |  |
| CONSULTANTS                                                    |  |  |  |  |  |
| CHECKED                                                        |  |  |  |  |  |
| APPROVED                                                       |  |  |  |  |  |
| DUPLICATE                                                      |  |  |  |  |  |
| NO.                                                            |  |  |  |  |  |
| DATE                                                           |  |  |  |  |  |
| CONSULTANTS                                                    |  |  |  |  |  |

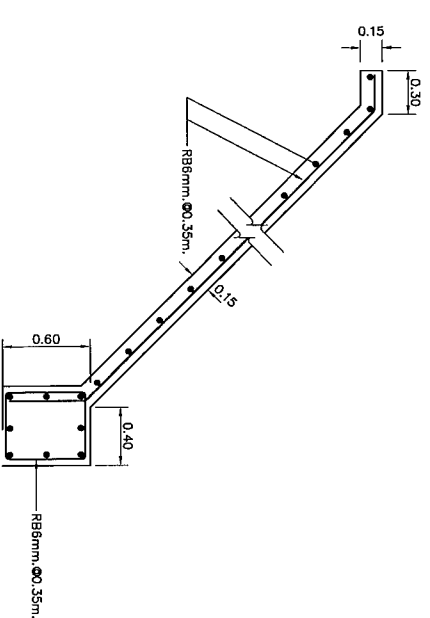
NOTES:  
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.  
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.

REFERENCE DRAWINGS :

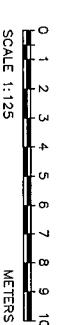
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2. POWERHOUSE, SECTIONS (SHEET 1/2) MT-PH-04
3. POWERHOUSE, SECTIONS (SHEET 2/2) MT-PH-05
4. POWERHOUSE, MISCELLANEOUS DETAILS MT-PH-13
5. POWERHOUSE, CHAIN LINK FENCE AND GATE WIDTH 1.00 M. MT-PH-14
6. POWERHOUSE, WATER SUPPLY PIPELINE SYSTEM LAY-OUT AND DETAILS MT-PH-16
7. POWERHOUSE, LIGHTING SYSTEM MT-PH-23

LEGENDS :

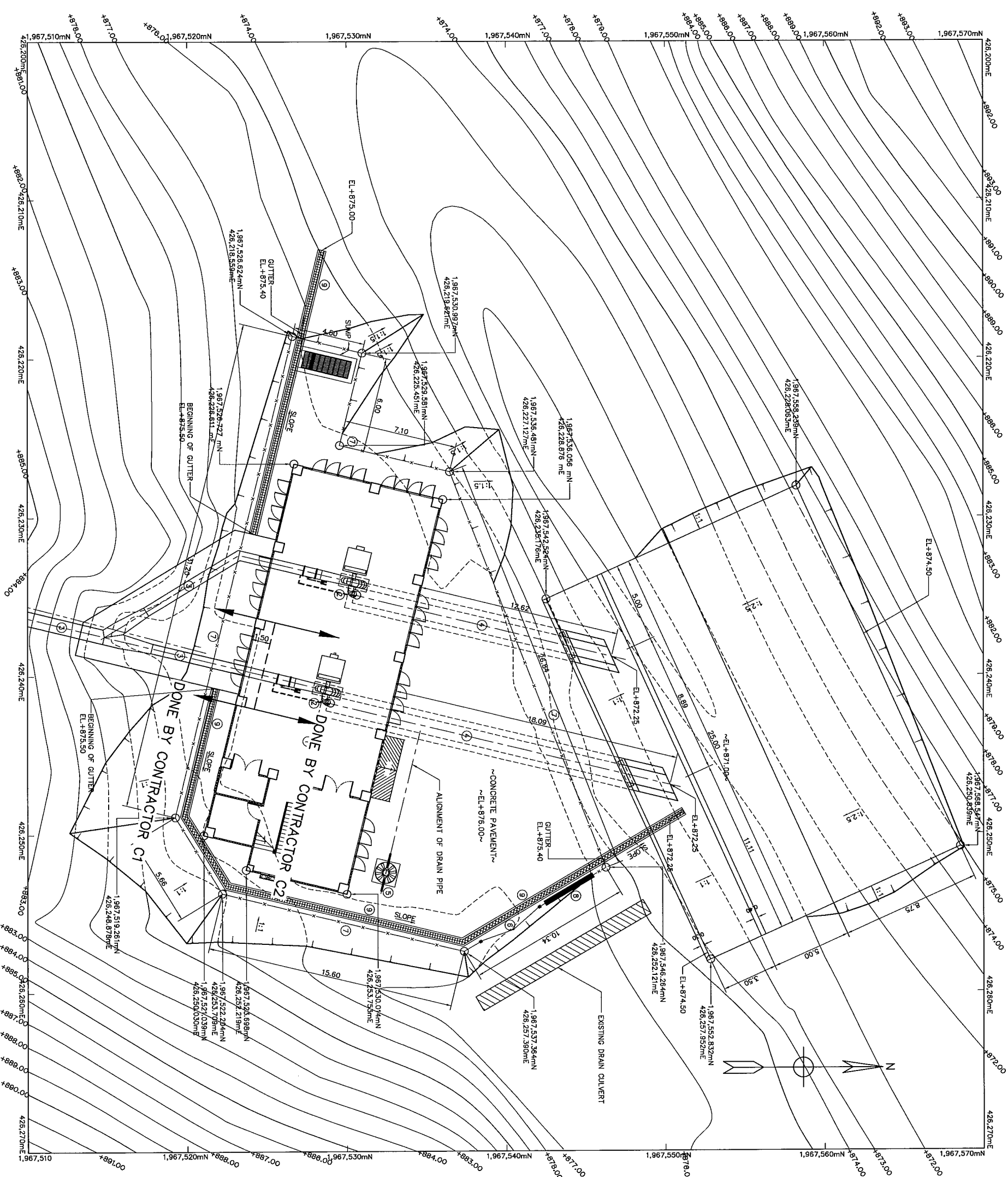
- ① POWERHOUSE
  - ② FRANCIS TURBINE
  - ③ PENSTOCK
  - ④ TAILRACE
  - ⑤ SEEPAGE TANK
  - ⑥ GATE
  - ⑦ CHAIN LINK FENCE
  - ⑧ SIGNBOARD
  - ⑨ GUTTER
- EXISTING STRUCTURE



SECTION A-A  
SCALE 1:25

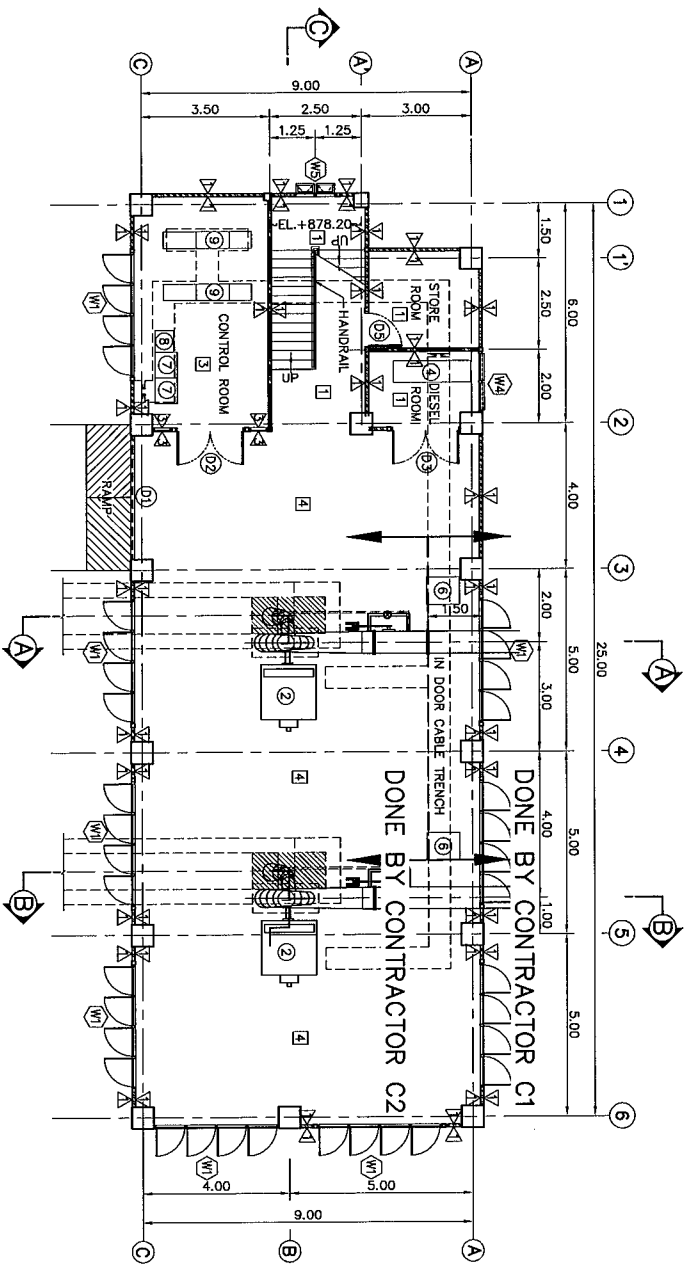


LAY-OUT  
SCALE 1:125



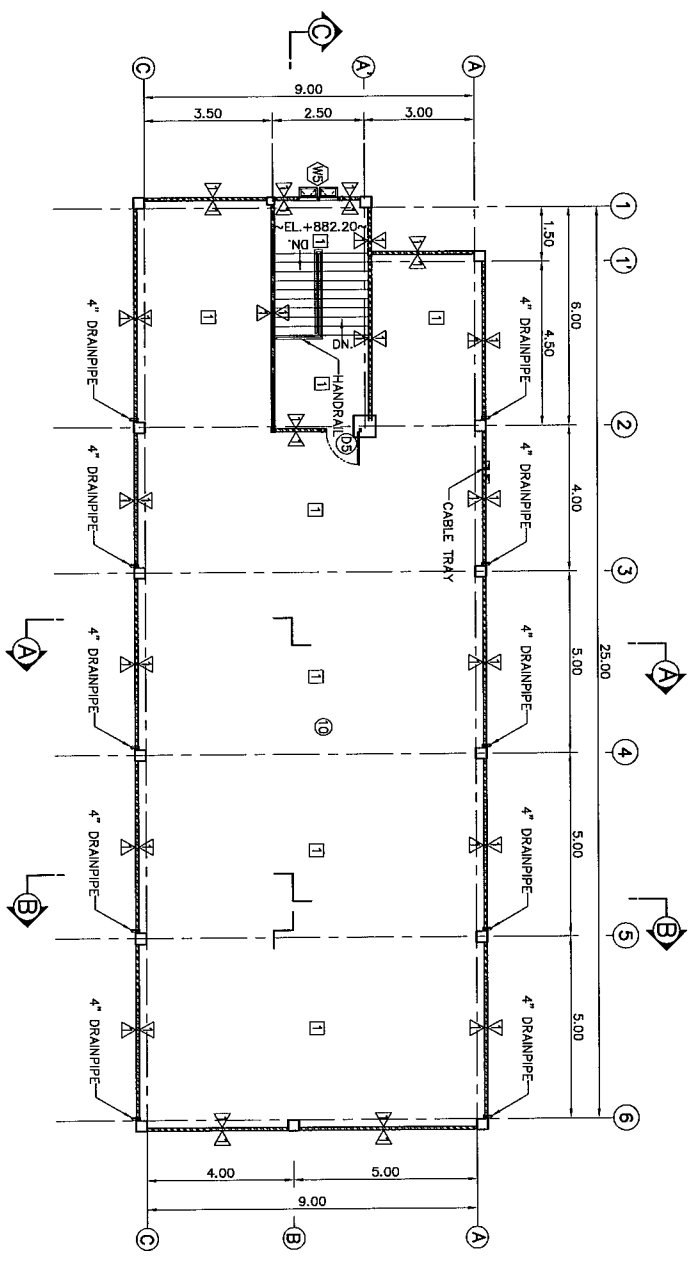
| 3 | 2 | 1 | NO | DATE | REVISIONS | CHECKED | APPROVED | CONSULTANTS | OFFICE |
|---|---|---|----|------|-----------|---------|----------|-------------|--------|
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|   |   |   |    |      |           |         |          |             |        |

|                                                                                                          |          |           |          |                                                             |             |           |  |
|----------------------------------------------------------------------------------------------------------|----------|-----------|----------|-------------------------------------------------------------|-------------|-----------|--|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |          |           |          | MAE TUEN HYDROPOWER PROJECT                                 |             |           |  |
| CIVIL WORKS<br>POWERHOUSE                                                                                |          |           |          | LAY-OUT                                                     |             |           |  |
| PANYA CONSULTANTS CO., LTD.                                                                              |          |           |          | DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |             |           |  |
| DESIGNED                                                                                                 | REVIEWED | SUBMITTED | RECEIVED | DATE                                                        | DRAWING NO. | SHEET NO. |  |
| 27/06/73                                                                                                 | 27/06/73 | 27/06/73  | 27/06/73 | 27/06/73                                                    | MT-PH-01    | 62 OF 98  |  |



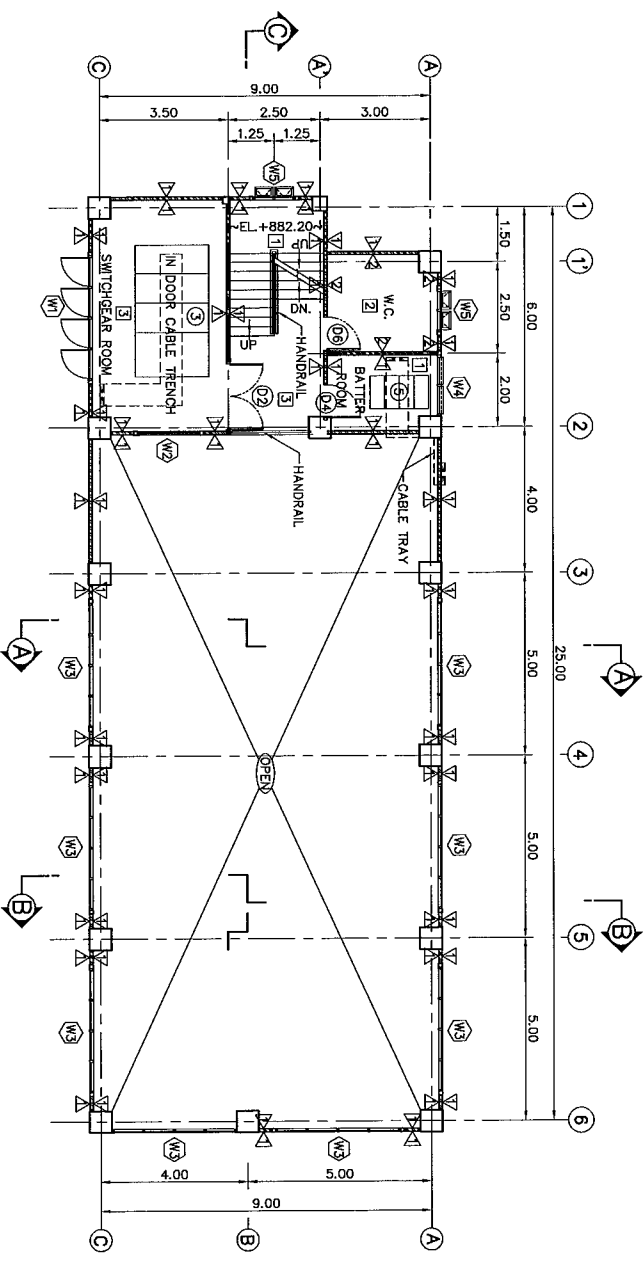
GROUND FLOOR PLAN (EL.+876.20)

SCALE 1:100



ROOF DECK PLAN (EL.+884.20)

SCALE 1:100

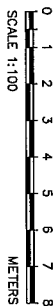


SECOND FLOOR PLAN (EL.+880.20)

SCALE 1:100

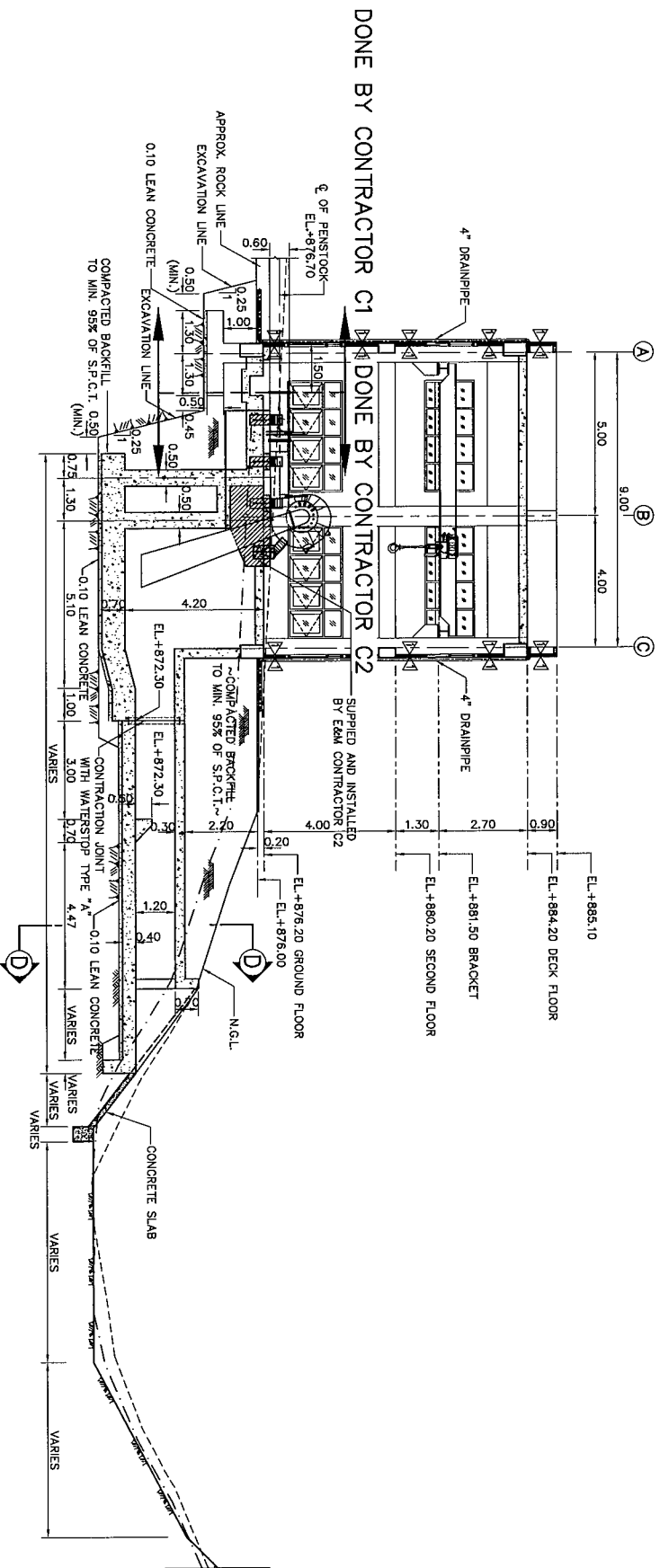
- DESCRIPTIONS :
- 1 VERTICAL SHAFT KAPLAN TURBINE
  - 2 GENERATOR
  - 3 SWITCH GEAR CUBICLES
  - 4 DIESEL GENERATOR SET
  - 5 BATTERY AND TANK
  - 6 OIL PRESSURE RACK
  - 7 AC AND DC SWITCHBOARD AND
  - 8 TURBINE-GOVERNOR BOARD
  - 9 MAIN CONTROL SWITCHBOARD
  - 10 BATTERY CHARGER CUBICLE
  - 11 SWITCHYARD
- WALL FINISH SYMBOLS :
- 1 PLASTERING W/PAINT
  - 2 8"x8" NON SLIP CERAMIC TILES
  - 3 GLASS W/ALUMINIUM FRAME
- FLOOR FINISH SYMBOLS :
- 1 COARSE FINISHED
  - 2 8"x8" NON SLIP CERAMIC FLOOR TILES
  - 3 8"x8" CERAMIC FLOOR TILES
  - 4 ACID PROOF EPOXY
- CELLINGS :
- 1 OFFICE, CONTROL ROOM, DIESEL ROOM, SWITCHGEAR ROOM, BATTERY ROOM AND STORE ROOM
  - 2 PLASTERING W/PAINT
  - 3 - 9 mm THK. GYPSUM BOARD WITH T-BAR STUD 0.60X0.60
- NOTES :
- 1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
  - 2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.

- REFERENCE DRAWINGS :
- 1. POWERHOUSE, LAY-OUT
  - 2. POWERHOUSE, ELEVATIONS
  - 3. POWERHOUSE, SECTIONS (SHEET 1/2)
  - 4. POWERHOUSE, SECTIONS (SHEET 2/2)
  - 5. POWERHOUSE, DETAILS OF TOILET, SEPTIC AND SEEPAGE TANK
  - 6. POWERHOUSE, DETAILS OF DOORS, WINDOWS AND NAME PLATE
  - 7. POWERHOUSE, KEY PLAN AND REINFORCEMENT DETAILS
  - 8. POWERHOUSE, CABLE TRENCH DETAILS
  - 9. POWERHOUSE, MISCELLANEOUS DETAILS
  - 10. POWERHOUSE, REINFORCEMENT DETAILS (SHEET 1/3)
  - 11. POWERHOUSE, REINFORCEMENT DETAILS (SHEET 2/3)
  - 12. POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 1/3)
  - 13. POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 2/3)
  - 14. POWERHOUSE, POWER ELECTRIC AND LIGHTING SYSTEM (SHEET 3/3)
  - 15. POWERHOUSE, GROUNDING SYSTEM AND LOAD SCHEDULE
- MT-PH-01  
MT-PH-03  
MT-PH-04  
MT-PH-05  
MT-PH-06  
MT-PH-07  
MT-PH-08  
MT-PH-12  
MT-PH-13  
MT-PH-15  
MT-PH-16  
MT-PH-19  
MT-PH-20  
MT-PH-21  
MT-PH-22

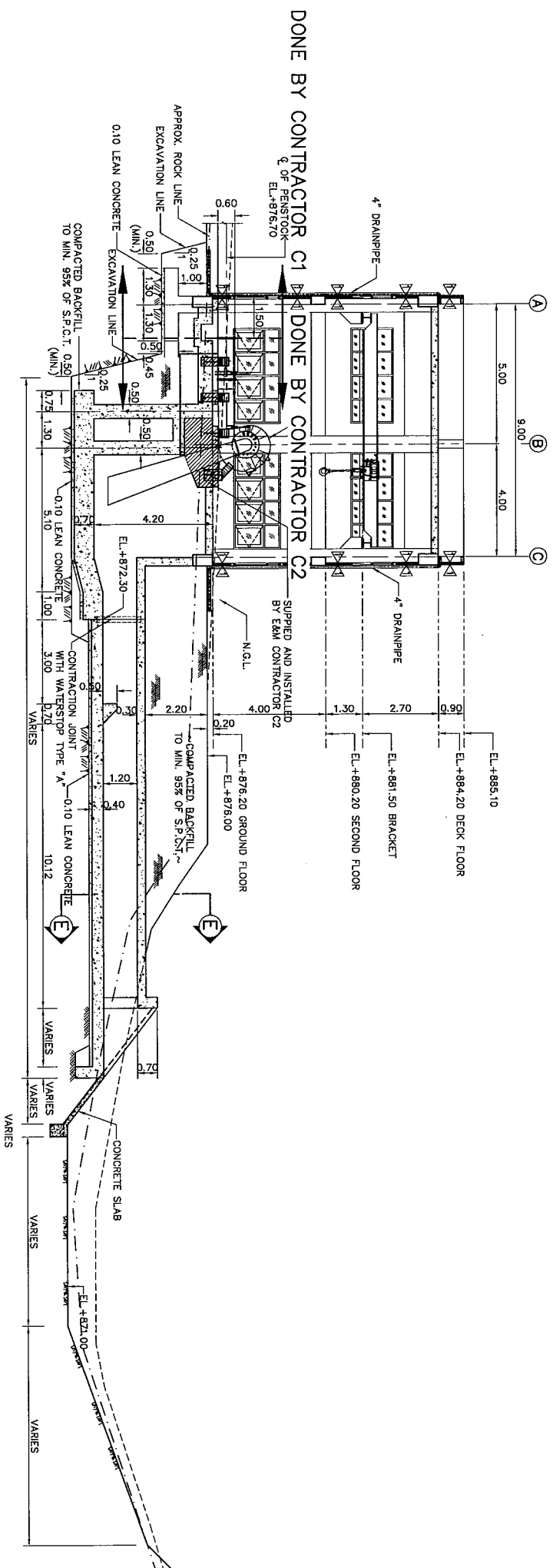


|                                                                                                          |      |                                                             |         |
|----------------------------------------------------------------------------------------------------------|------|-------------------------------------------------------------|---------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |      |                                                             |         |
| MAE TUEN HYDROPOWER PROJECT                                                                              |      |                                                             |         |
| CIVIL WORKS<br>POWERHOUSE<br>PLANS                                                                       |      |                                                             |         |
| PANYA CONSULTANTS CO., LTD.                                                                              |      | DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |         |
| NO.                                                                                                      | DATE | REVISIONS                                                   | CHECKED |
| 1                                                                                                        |      |                                                             |         |
| 2                                                                                                        |      |                                                             |         |
| 3                                                                                                        |      |                                                             |         |
| CONSULTANTS                                                                                              |      | DEVELOPER                                                   |         |
| PROJECT MANAGER                                                                                          |      | DATE                                                        |         |
| 27/06/15                                                                                                 |      | DRAWING NO.                                                 |         |
| MT-PH-02                                                                                                 |      | SHEET NO.                                                   |         |
| 63                                                                                                       |      | OF 98                                                       |         |





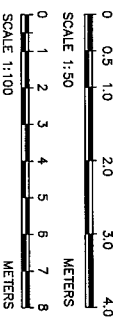
SECTION A-A  
SCALE 1:100



SECTION B-B  
SCALE 1:100

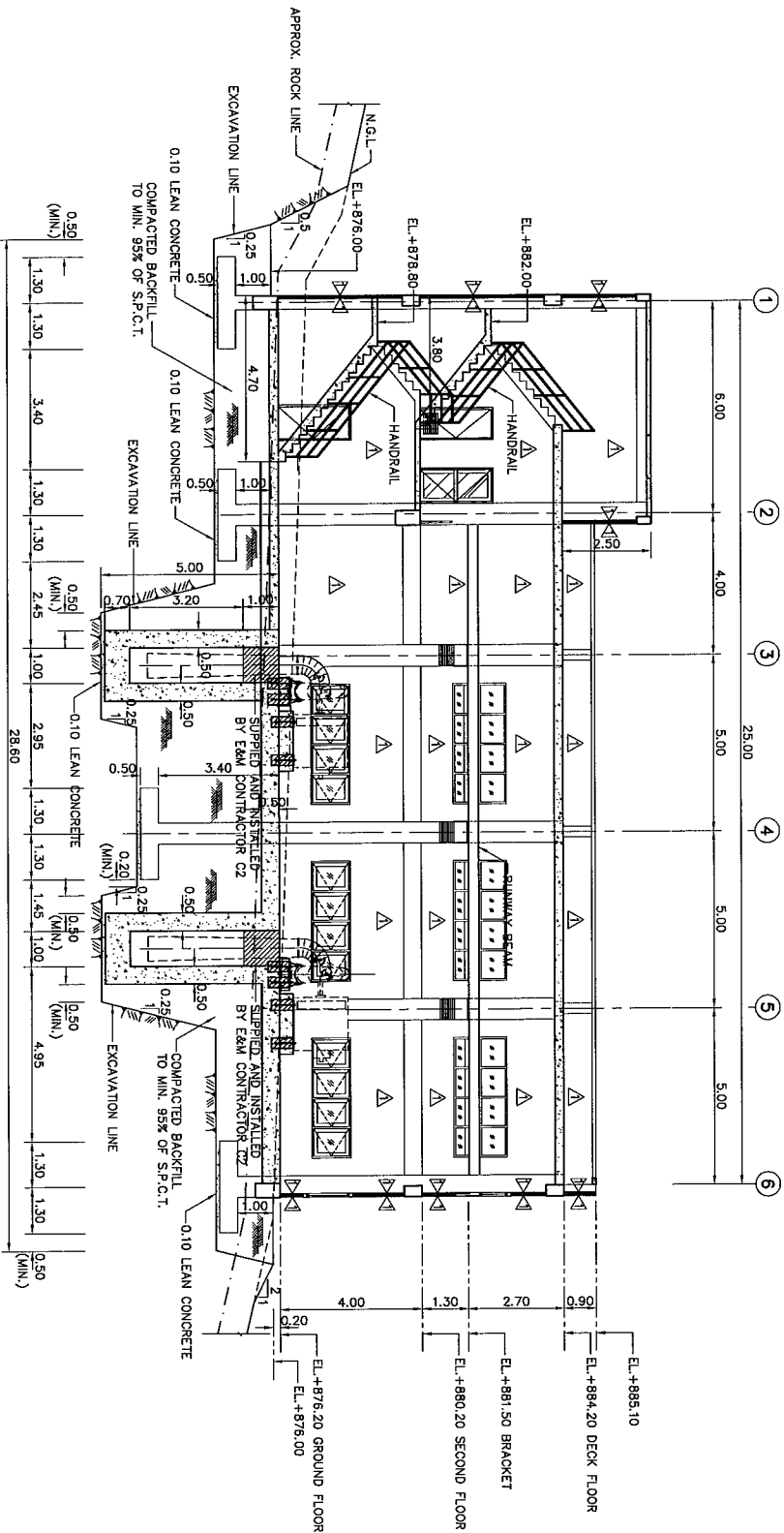
- NOTES :
1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
  2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-PH-01.
  3. ALLOWABLE BEARING CAPACITY NOT LESS THAN 30 TON/M<sup>2</sup>

- REFERENCE DRAWINGS :
1. POWERHOUSE, LAY-OUT
  2. POWERHOUSE, PLANS
  3. POWERHOUSE, SECTIONS (SHEET 2/2)
  4. POWERHOUSE, DETAILS OF DOORS, WINDOWS AND NAME PLATE
  5. POWERHOUSE, REINFORCEMENT DETAILS

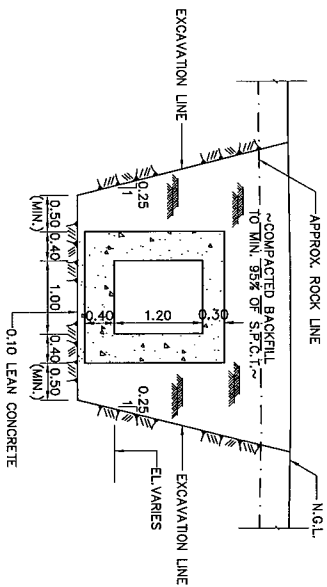


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| 3  |      |           |         |          |  |
| 2  |      |           |         |          |  |
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| NO | DATE | REVISIONS | CHECKED | APPROVED |  |
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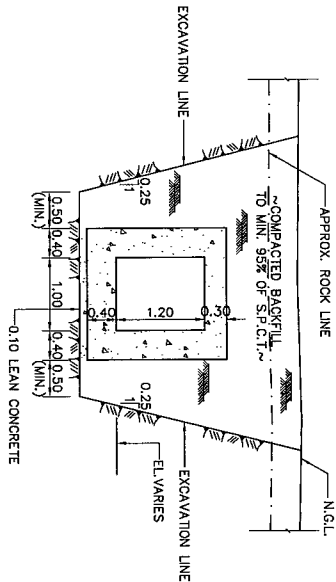
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|----------------------------------------------------------------------------------------------------------|----------|----------|-------------------------------------------------------------|----------|--------------------|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |          |          |                                                             |          |                    |
| MAE TUEN HYDROPOWER PROJECT                                                                              |          |          |                                                             |          |                    |
| CIVIL WORKS<br>POWERHOUSE                                                                                |          |          |                                                             |          |                    |
| SECTIONS                                                                                                 |          |          |                                                             |          |                    |
| PANYA CONSULTANTS CO., LTD.                                                                              |          |          | DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |          |                    |
| DESIGNED                                                                                                 | 20.04.05 | 20.04.05 | REVIEWED                                                    | 20.04.05 | 20.04.05           |
| DRAWN                                                                                                    | 27.08.15 | 27.08.15 | RECOMMENDED                                                 | 27.08.15 | 27.08.15           |
| CHECKED                                                                                                  |          |          | APPROVED                                                    |          |                    |
| PROJECT MANAGER                                                                                          |          |          | DRAWING NO.                                                 | MT-PH-04 | SHEET NO. 65 OF 98 |
|                                                                                                          |          |          |                                                             |          | (SHEET 1/2)        |



SECTION C-C  
SCALE 1:100



SECTION D-D  
SCALE 1:50



SECTION E-E  
SCALE 1:50

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.
3. ALLOWABLE BEARING CAPACITY NOT LESS THAN 30 TON/M<sup>2</sup>

REFERENCE DRAWINGS :

1. POWERHOUSE, LAY-OUT
2. POWERHOUSE, PLANS
3. POWERHOUSE, SECTIONS (SHEET 1/2)
4. POWERHOUSE, DETAILS OF DOORS, WINDOWS AND NAME PLATE
5. POWERHOUSE, REINFORCEMENT DETAILS

MT-PH-01

MT-PH-02

MT-PH-04

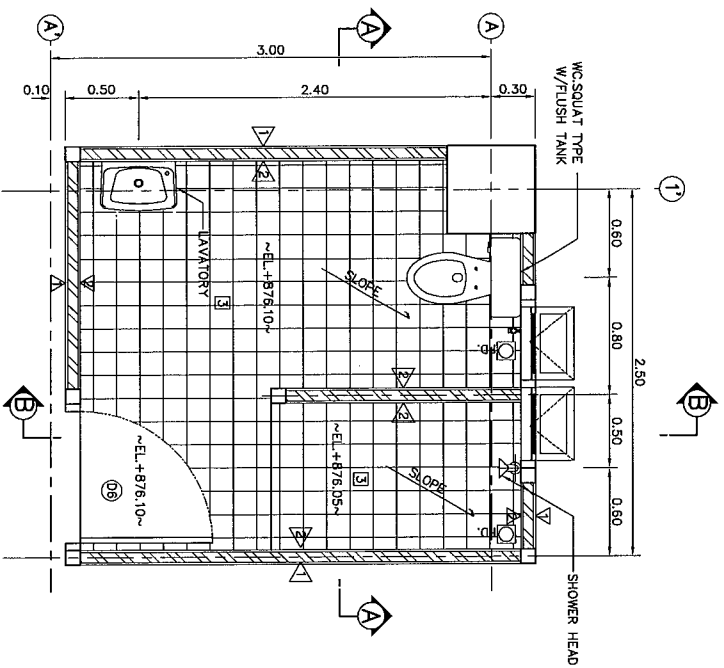
MT-PH-07

MT-PH-15

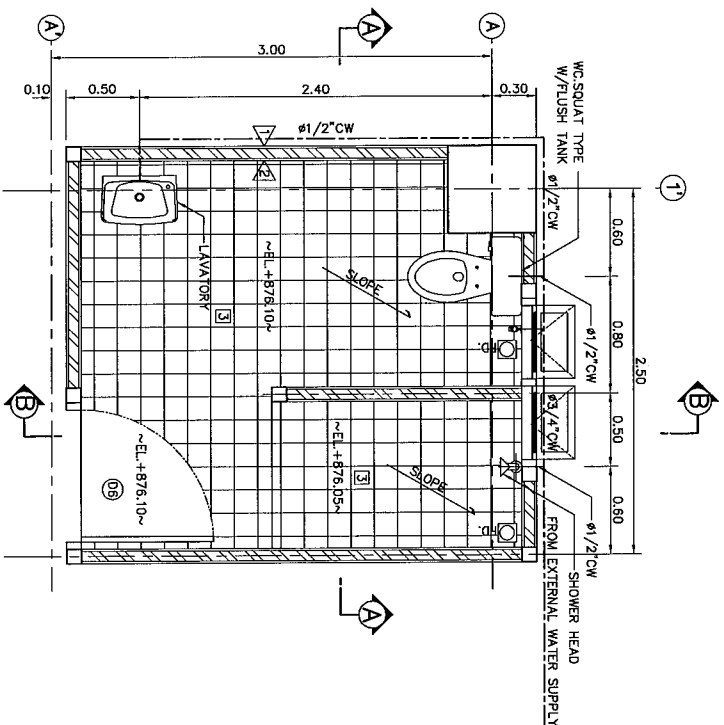


| NO. | DATE | REVISIONS | CHECKED | APPROVED |
|-----|------|-----------|---------|----------|
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| 2   |      |           |         |          |
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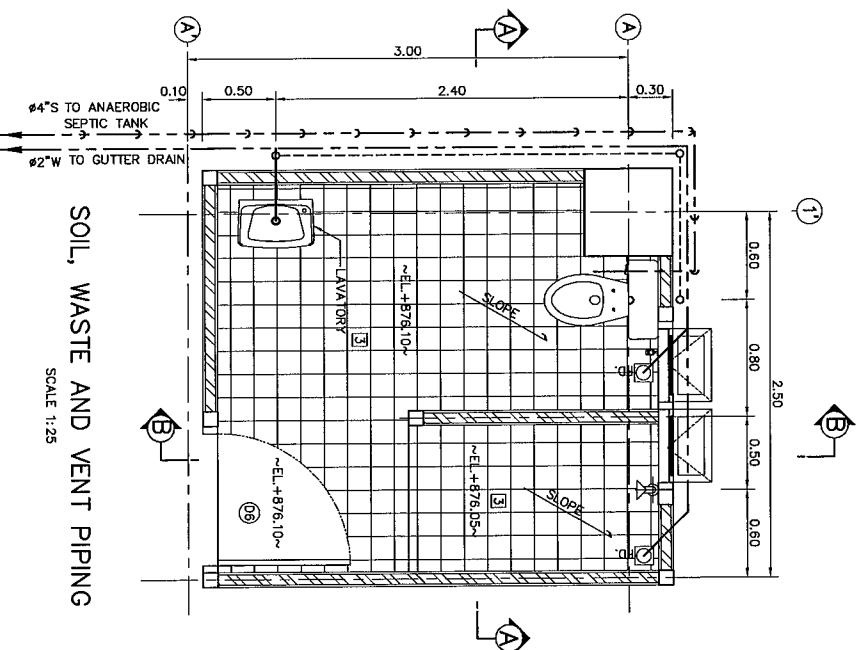
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| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |  |                                                                |  |
| MAE TUEN HYDROPOWER PROJECT                                                                              |  |                                                                |  |
| CIVIL WORKS<br>POWERHOUSE                                                                                |  |                                                                |  |
| SECTIONS                                                                                                 |  |                                                                |  |
| DESIGNED<br>PANKA CONSULTANTS CO., LTD.<br>2014/05/05                                                    |  | DEPARTMENT OF ALTERNATIVE ENERGY<br>DEVELOPMENT AND EFFICIENCY |  |
| DRAWN<br>PANKA CONSULTANTS CO., LTD.<br>2014/05/05                                                       |  | REVIEWED<br>PANKA CONSULTANTS CO., LTD.<br>2014/05/05          |  |
| CHECKED<br>PANKA CONSULTANTS CO., LTD.<br>2014/05/05                                                     |  | APPROVED<br>PANKA CONSULTANTS CO., LTD.<br>2014/05/05          |  |
| PROJECT MANAGER<br>PANKA CONSULTANTS CO., LTD.<br>2014/05/05                                             |  | DRAWING NO.<br>MT-PH-05                                        |  |
| DATE<br>27/05/13                                                                                         |  | SHEET NO.<br>66 OF 98                                          |  |



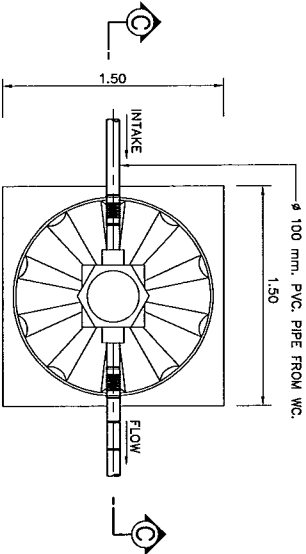
PLAN OF TOILET  
SCALE 1:25



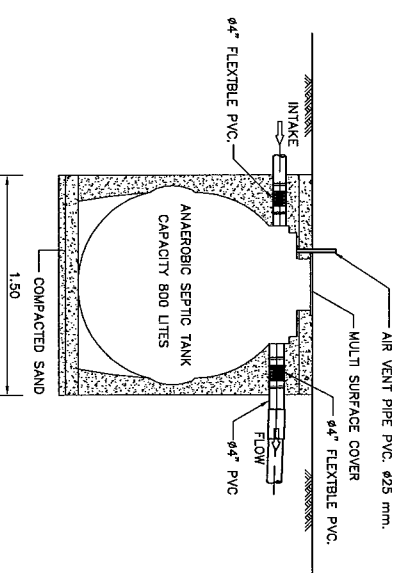
COLD WATER PIPING  
SCALE 1:25



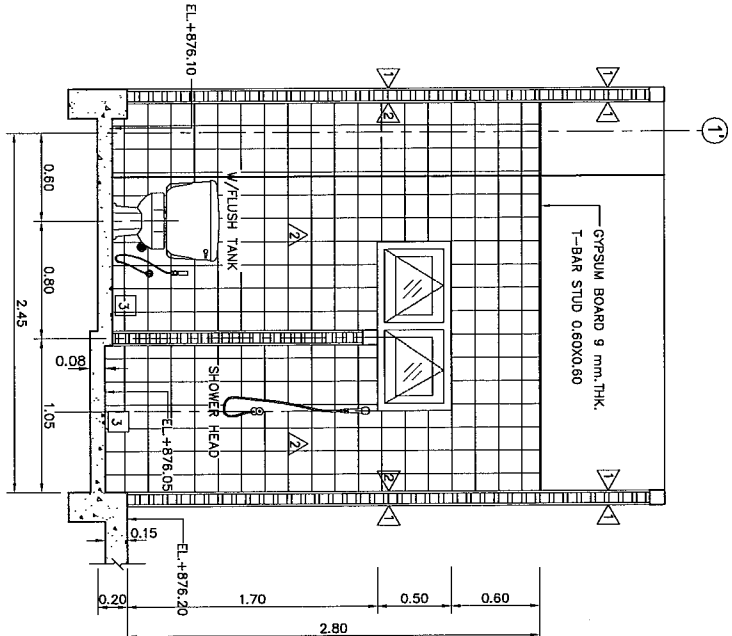
SOIL, WASTE AND VENT PIPING  
SCALE 1:25



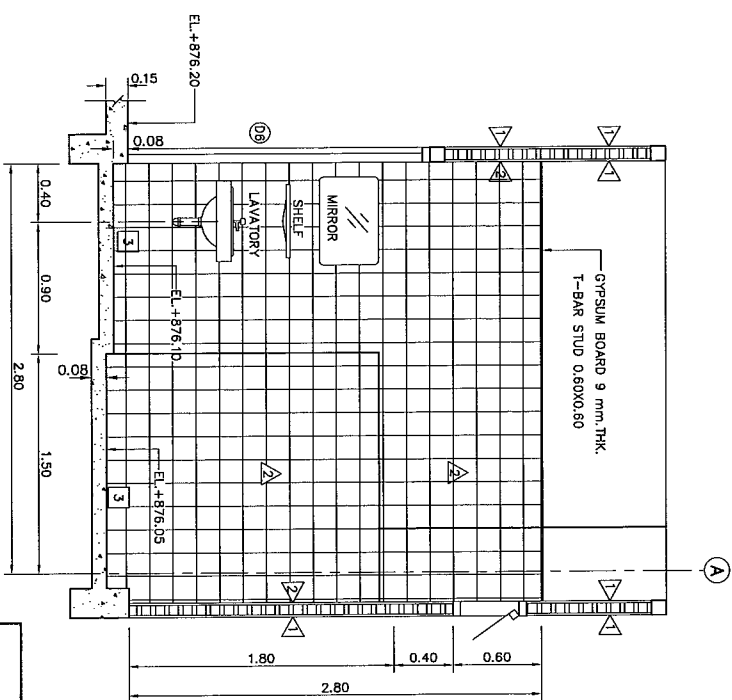
SEEPAGE TANK  
SCALE 1:25



SECTION C-C  
SCALE 1:25



SECTION A-A  
SCALE 1:25



SECTION B-B  
SCALE 1:25

NOTES :

1. ALL DIMENSIONS AND ELEVATIONS (M.S.L.) ARE IN METERS. REINFORCEMENT BARS ARE IN MILLIMETERS, UNLESS OTHERWISE SHOWN.
2. SYMBOLS, ABBREVIATIONS AND GENERAL NOTES SEE DWG. NO. MT-GN-01.

REFERENCE DRAWINGS :

1. POWERHOUSE, PLANS MT-PH-02
2. POWERHOUSE, DETAILS OF DOORS, WINDOWS AND NAME PLATE MT-PH-07

|             |      |           |         |          |  |
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| 3           |      |           |         |          |  |
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| 1           |      |           |         |          |  |
| NO          | DATE | REVISIONS | CHECKED | APPROVED |  |
| CONSULTANTS |      |           |         |          |  |
| J&E         |      |           |         |          |  |

|                                                                                                          |  |                                            |  |
|----------------------------------------------------------------------------------------------------------|--|--------------------------------------------|--|
| KINGDOM OF THAILAND<br>MINISTRY OF ENERGY<br>DEPARTMENT OF ALTERNATIVE ENERGY DEVELOPMENT AND EFFICIENCY |  |                                            |  |
| MAE TUN HYDROPOWER PROJECT                                                                               |  |                                            |  |
| CIVIL WORKS<br>POWERHOUSE                                                                                |  |                                            |  |
| DETAILS OF TOILET, SEPTIC AND SEEPAGE TANK                                                               |  |                                            |  |
| DESIGNED BY PANYA CONSULTANTS CO., LTD.                                                                  |  | REVIEWED BY PANYA CONSULTANTS CO., LTD.    |  |
| DRAWN BY PANYA CONSULTANTS CO., LTD.                                                                     |  | RECOMMENDED BY PANYA CONSULTANTS CO., LTD. |  |
| CHECKED BY PANYA CONSULTANTS CO., LTD.                                                                   |  | APPROVED BY PANYA CONSULTANTS CO., LTD.    |  |
| DATE 27/06/13                                                                                            |  | DRAWING NO. MT-PH-06                       |  |
| PROJECT MANAGER                                                                                          |  | SHEET NO. 67 OF 98                         |  |

