



MEMORANDUM

FOR/TO : All Regional Directors
All Regional Technical Directors for Forest Management Service
All PENROs and CENROs

FROM : The Director

SUBJECT : **TECHNICAL BULLETIN NO. 15 SUPPLEMENTAL
STANDARD COST AND DESIGN FOR SMALL WATER
IMPOUNDING PROJECT (SWIP)**

DATE :

1. The Technical Bulletin

This Technical Bulletin provides supplemental guidelines for the standard cost and design of Small Water Impounding Project (SWIP) consistent to the FMB Technical Bulletin No. 13 entitled "Standard Cost and Design for Forest Protection and Soil and Water Conservation Measures". The SWIP is one of the small scale irrigation technologies developed by the Bureau of Soils and Water Management (BSWM) to address the problems on supply and allocation of water in certain watershed community. The functions of the SWIP are the following: (a) it can restrain water during rain events and functions as a reservoir; (b) flood control; (c) ground water recharge; (d) aquaculture; (e) domestic water use; (f) water for livestock; and (g) recreation/eco-tourism. This will serve as guide to all regions and field offices for their formulation of annual Work and Financial Plan.

2. Scope and Coverage

This Supplemental Technical Bulletin shall apply to all components of all forestland development programs and projects.

3. Users of this Technical Bulletin

The intended users of this technical bulletin are personnel of DENR field offices who are involved in planning, implementing and managing of forest resources and forestlands.

4. Selection Criteria and Requirements for the Establishment of SWIP

- 4.1 The pond area should be atleast 0.75 hectares;
- 4.2 Secure ECC prior to the establishment of SWIP as it require cutting of trees for access road and reservoir/dam (for compliance kindly refer to EMB Memorandum Circular 005 dated July 2014 entitled " *Revised guidelines for the Coverage Screening and Standardized Requirements under the Philippine EIS System*");
- 4.3 Should be established in open or grassland areas;
- 4.4 The site should be outside any ancestral claims; and
- 4.5 Total Cost divided by the service area must be less than or equal to 300,000 pesos per hectare

5. Procedure for establishment of SWIP

- 5.1 Validation of the area (based on the selection criteria identified);
- 5.2 Survey, Mapping and Planning (based on topographic survey);
- 5.3 Design;
- 5.4 Cost Estimate; and
- 5.5 Implementation.

6 Small Water Impounding Project: Soil and Water Conservation Measure

SOIL AND WATER CONSERVATION MEASURE	
<p>Small Water Impounding Project isa small scale earth dam structures with height of 5 to 15 meters, constructed across a narrow depression or valley to collect and store rainfall and runoff during rainy season for immediate and future use.</p>	
Uses of SWIP	
1	Collect and store surface run-off water during the rainy season for immediate and future use
2	Conserve soil and water
3	Irrigate crops
4	Source of water for livestock
5	Minimize flooding
6	Minimize soil erosion and siltation of fertile bottom lands
7	Use as a community recreational area
8	Groundwater recharge
Major Components of Water Impounding System	
1	Watershed
2	Dam and Reservoir Area
3	Distribution Facilities (Irrigation, Domestic Water etc.)
Beneficiaries of SWIP	
1	Peoples' Organizations(POs)/Farmers' Association (FA)
2	Areas with no "rights of way" and other social problems
3	PO/FA that is capable and willing to shoulder full cost of operations and maintenance

7 Standard Cost for Small Water Impounding Project (SWIP)

The following activities are computed based on the guidelines of Bureau of Soils and Water Management (BSWM) for the construction of SWIP. Thus, the establishment and identification of areas for SWIP must be done in close coordination with BSWM.

Activities	Unit of Work Measure	Unit Cost (Php)
1. Construction of Camp , other temporary facilities and movement of equipment	L.S	98,900.40
2. Construction of Access Road	Meter	495.99
3. Reservoir and Borrow Area		
a. Clearing and Grubbing	Square Meter	8.20
4. Construction of Dam		
4.1 Excavation		
4.1.1 Stripping	Cubic Meter	52.00
4.1.2 Core Trench	Cubic Meter	85.22

4.2 Embankment Fill		
4.2.1 Side Borrow	Cubic Meter	114.88
4.2.2 Borrow Haul	Cubic Meter	201.99
4.2.3 From Core Trench & Spillway Excavation	Cubic Meter	62.88
4.3 Gravel Blanket	Cubic Meter	740.92
4.4 Handlaid Riprap	Cubic Meter	1,996.80
4.5 Sprigging and sodding	Square Meter	63.16
4.6 Gravel Surfacing	Cubic Meter	645.41
4.7 Toe Drain		
5.7.1 Rock Toe (Boulders)	Cubic Meter	1,540.07
5.7.2 Gravel and Sand Transition	Cubic Meter	653.70
5.7.3 Fine Sand Transition	Cubic Meter	653.70
5. Spillway		
5.1 Excavation	Cubic Meter	85.22
5.2 Structural Backfill	Cubic Meter	233.12
5.3 Concrete Class "A"	Cubic Meter	7,093.40
5.4 Reinforcing Steel	Cubic Meter	73.56
5.5 Levelling Course	Cubic Meter	740.92
5.6 Grouted Riprap	Cubic Meter	3,722.13
5.7 Handlaid Riprap	Cubic Meter	1,996.80
6. Outlet Works		
6.1 Excavation	Cubic Meter	194.28
6.2 Structural Backfill	Cubic Meter	233.13
6.3 Concrete Class "A"	Cubic Meter	7,039.40
6.4 Reinforcing Steel	Cubic Meter	73.56
6.5 Levelling Course	Cubic Meter	740.92
6.6 Steel Pipe (20 cm dia. x 6m)	Per piece	70,748.08
6.7 Gate Valve (20 cm)	Assembled	65,650.00
6.8 Trashrack, fishscreen and flashboard	L.S.	13,650.00
7. Irrigation Works		
7.1 Excavation	Cubic Meter	194.28
7.2 Fill	Cubic Meter	233.13
7.3 Concrete Class "A"	Cubic Meter	7,093.40
7.4 Reinforcing Steel	Kilograms	73.56
7.5 Levelling Course	Cubic Meter	2,122.82
7.6 Grouted Riprap	Cubic Meter	4,349.31
7.7 RCP (610 mm diameter)	L.M.	3,469.57
a. 0.46 m. Diam.	Meter	
b. 0.61 m. Diam.	Meter	
c. 0.91 m. Diam.	Meter	
7.6 Grouted Riprap	Cubic Meter	286,065.30

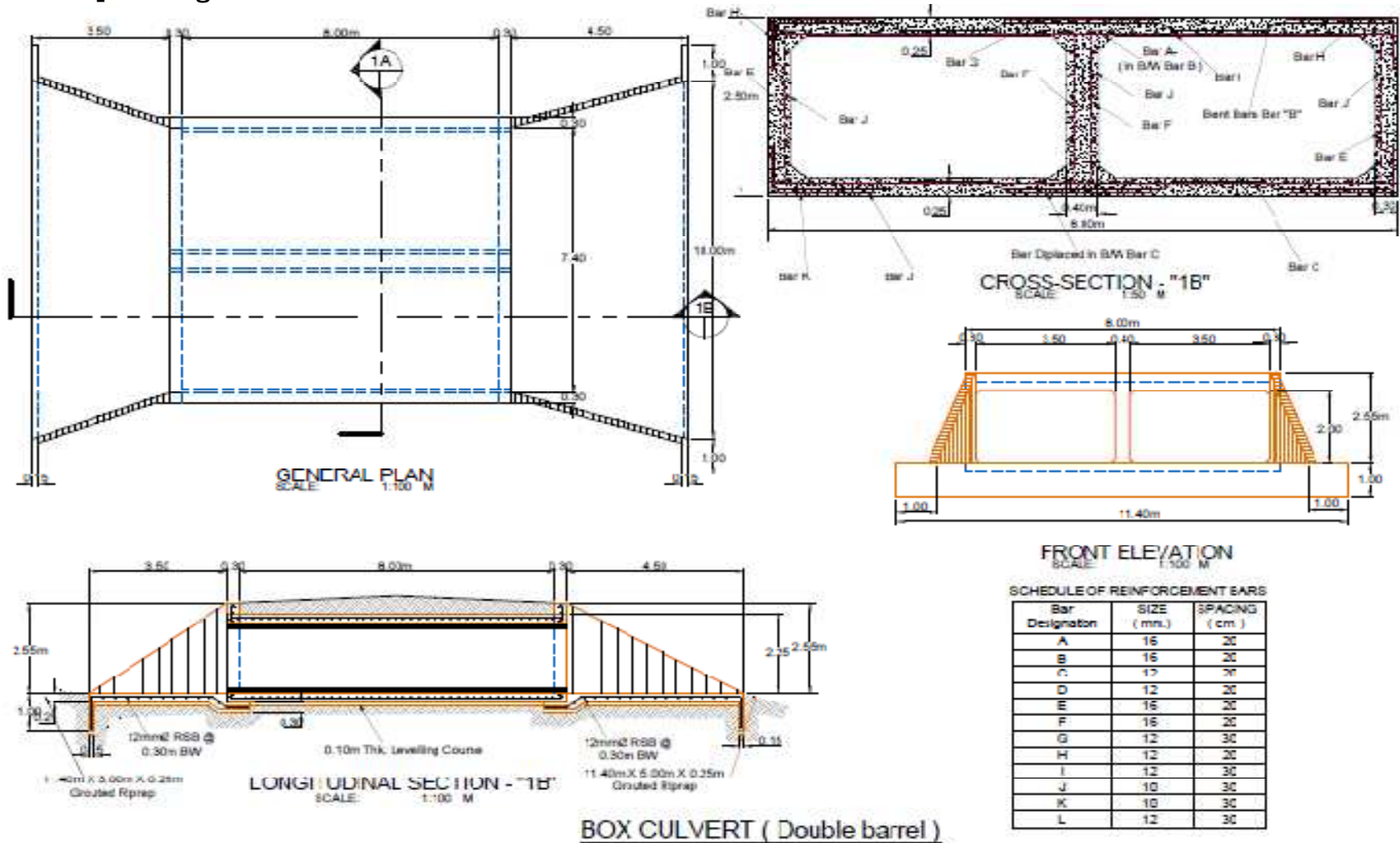
Reference: Department of Agriculture - Bureau of Soil and Water Management (BSWM)

Refer to FMB Technical Bulletin No.10 *Standard Seedling Cost and Unit Cost of Activities of the National Greening Program* for reference on the costing of preparatory activities such as site preparation and site validation, assessment and planning.

FOR INFORMATION AND GUIDANCE.

RICARDO L. CALDERON, CESO III

Sample Design



BOX CULVERT (Double barrel)

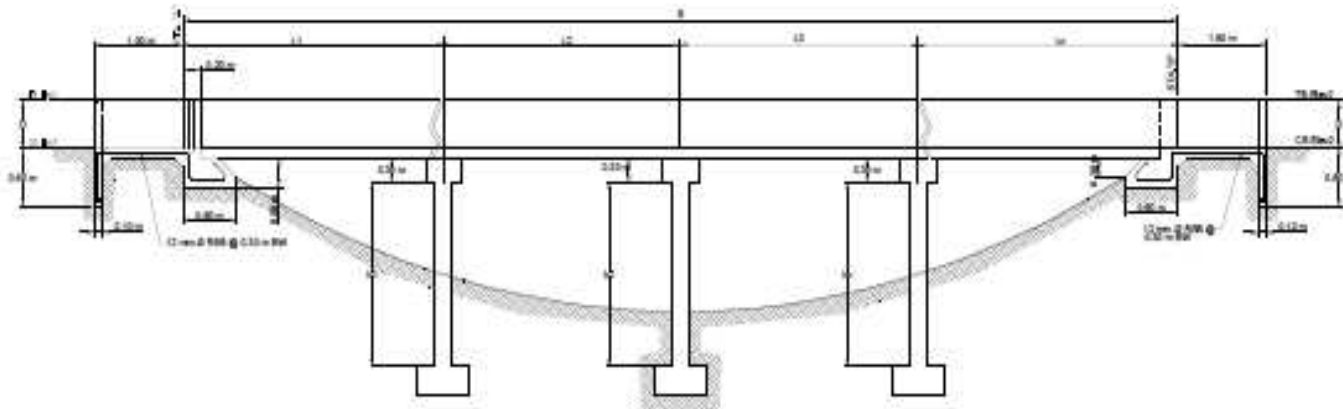
Reference: Department of Agriculture- Bureau of Soils and Water Management

“Annex B”

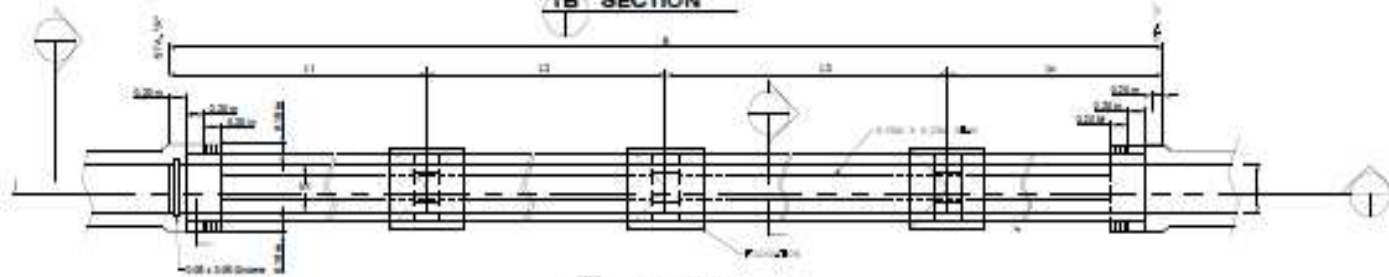
Sample Design

SCHEDULE OF ELEVATIONS AND DIMENSIONS

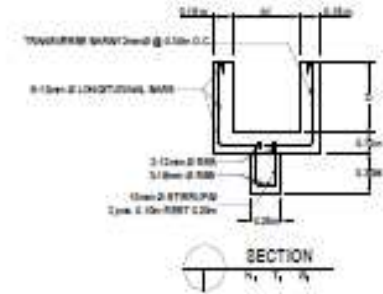
STATION		ELEVATION (m)					DIMENSIONS (m)															
From	To	TS	CB	TD	OS		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	



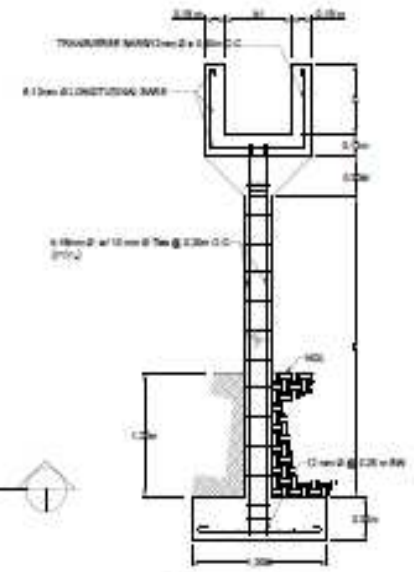
1B SECTION



1A PLAN



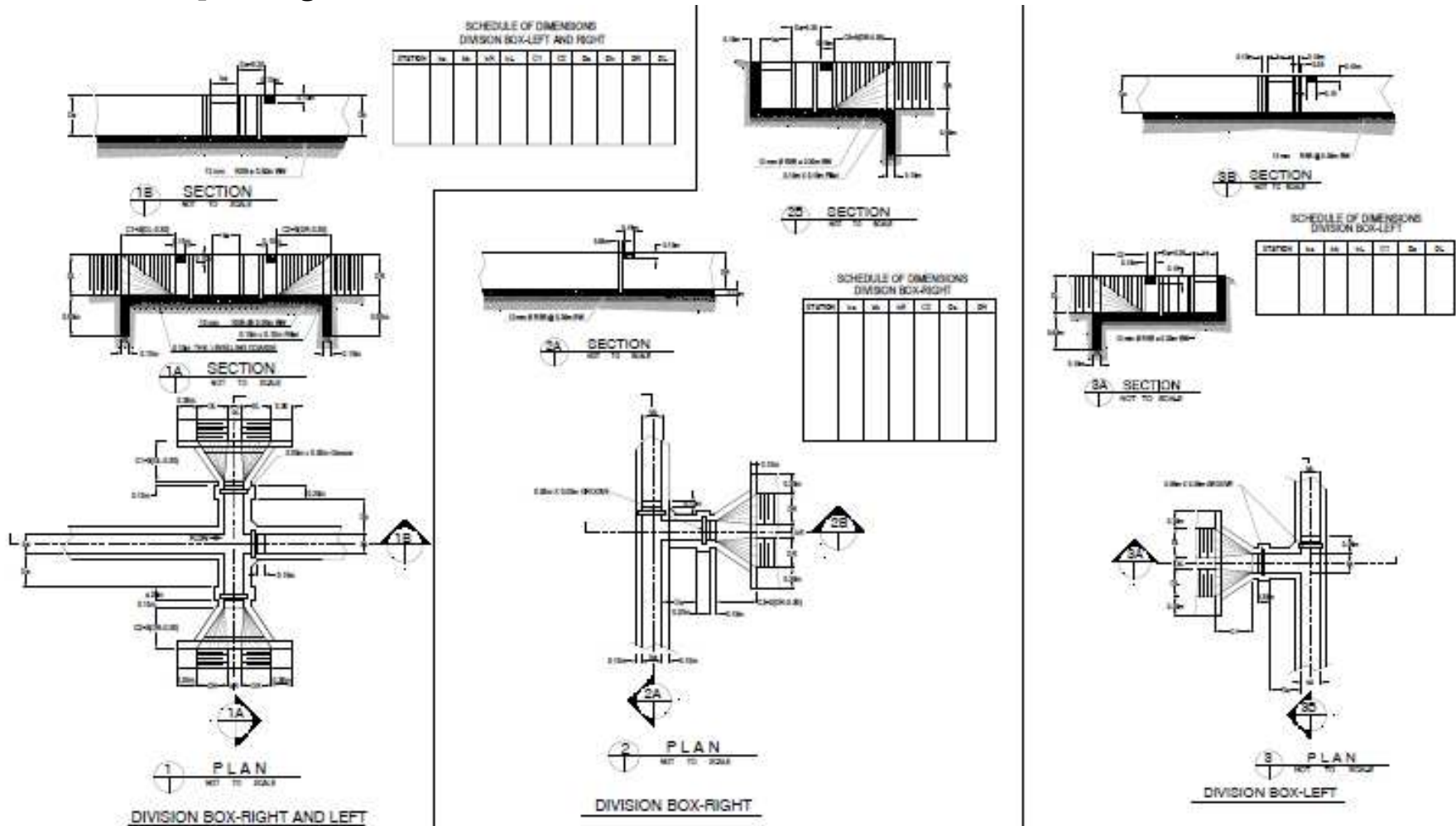
SECTION



10 SECTION

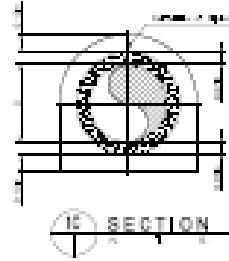
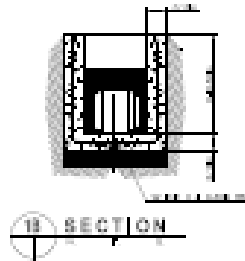
Reference: Department of Agriculture- Bureau of Soils and Water Management

Sample Design



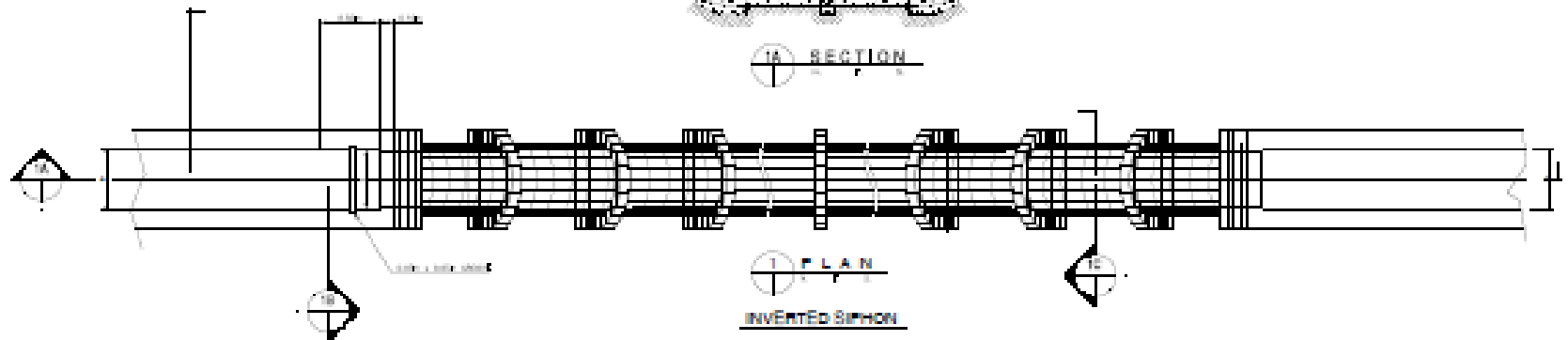
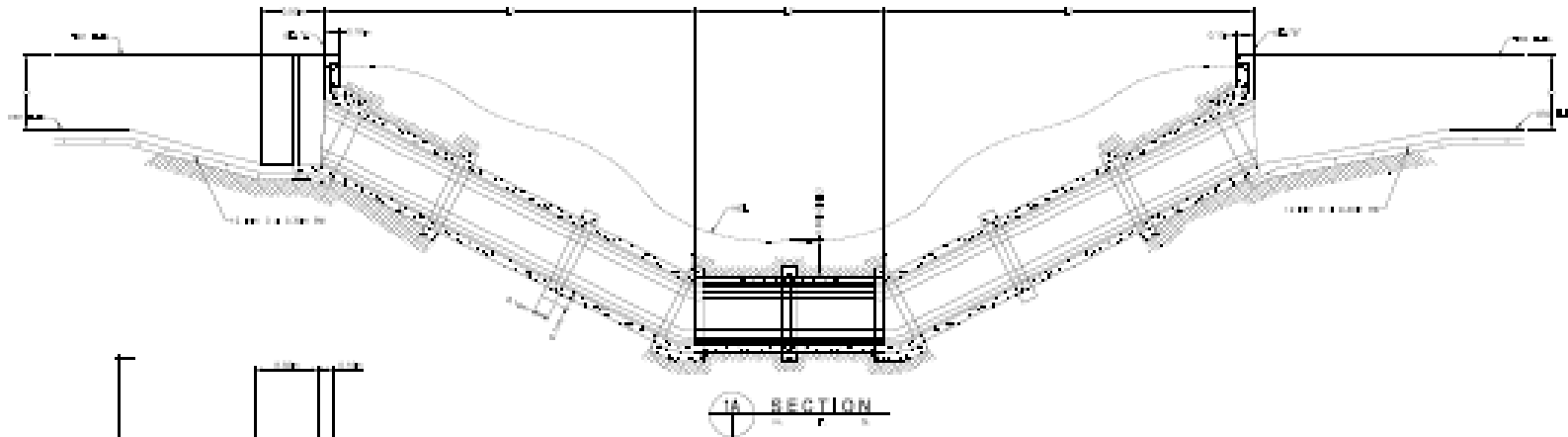
Reference: Department of Agriculture- Bureau of Soils and Water Management

Sample Design



SCHEDULE OF ELEVATIONS AND DIMENSIONS

SPRINK NO.	SECTION		ELEVATIONS						DIMENSIONS					
	A	B	T ₁	T ₂	T ₃	T ₄	D	a	b	c	d	e	f	g



Reference: Department of Agriculture- Bureau of Soils and Water Management

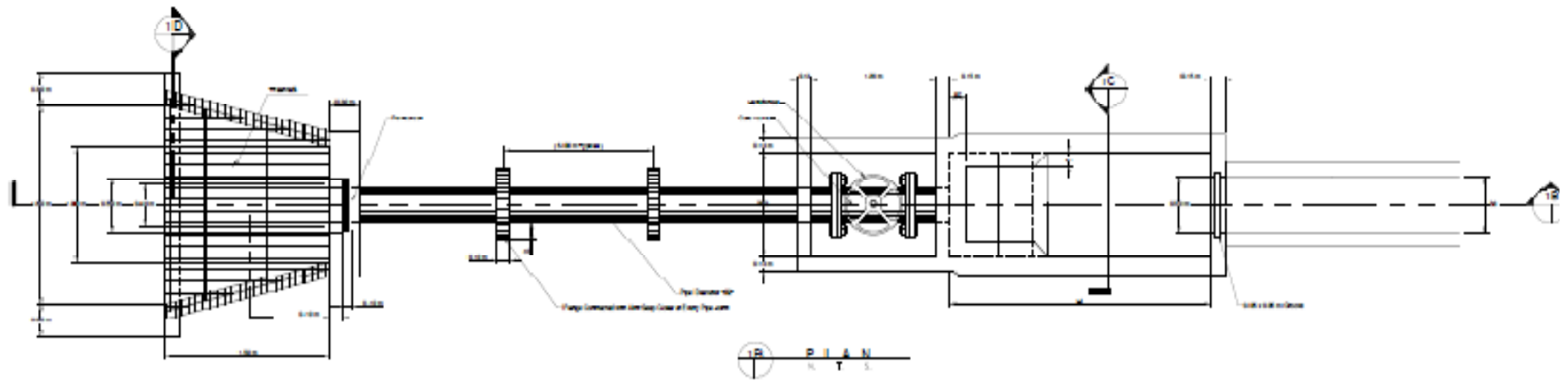
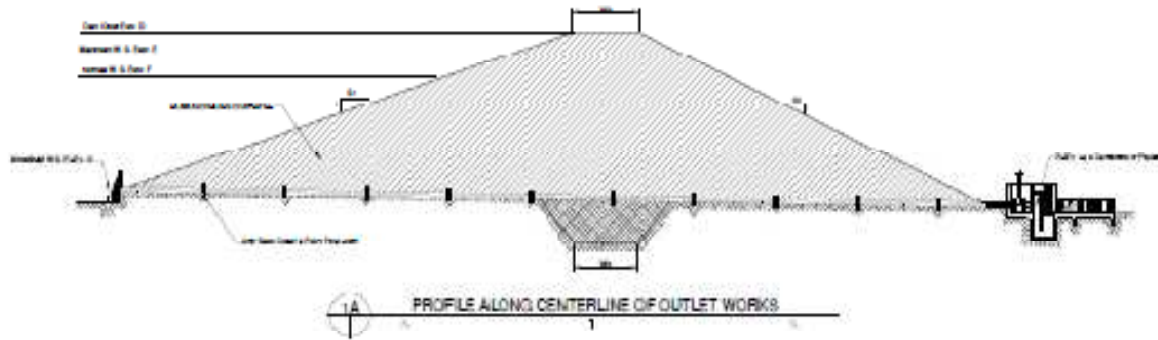
“Annex E”

Sample Design

All dimensions shall be in meters.

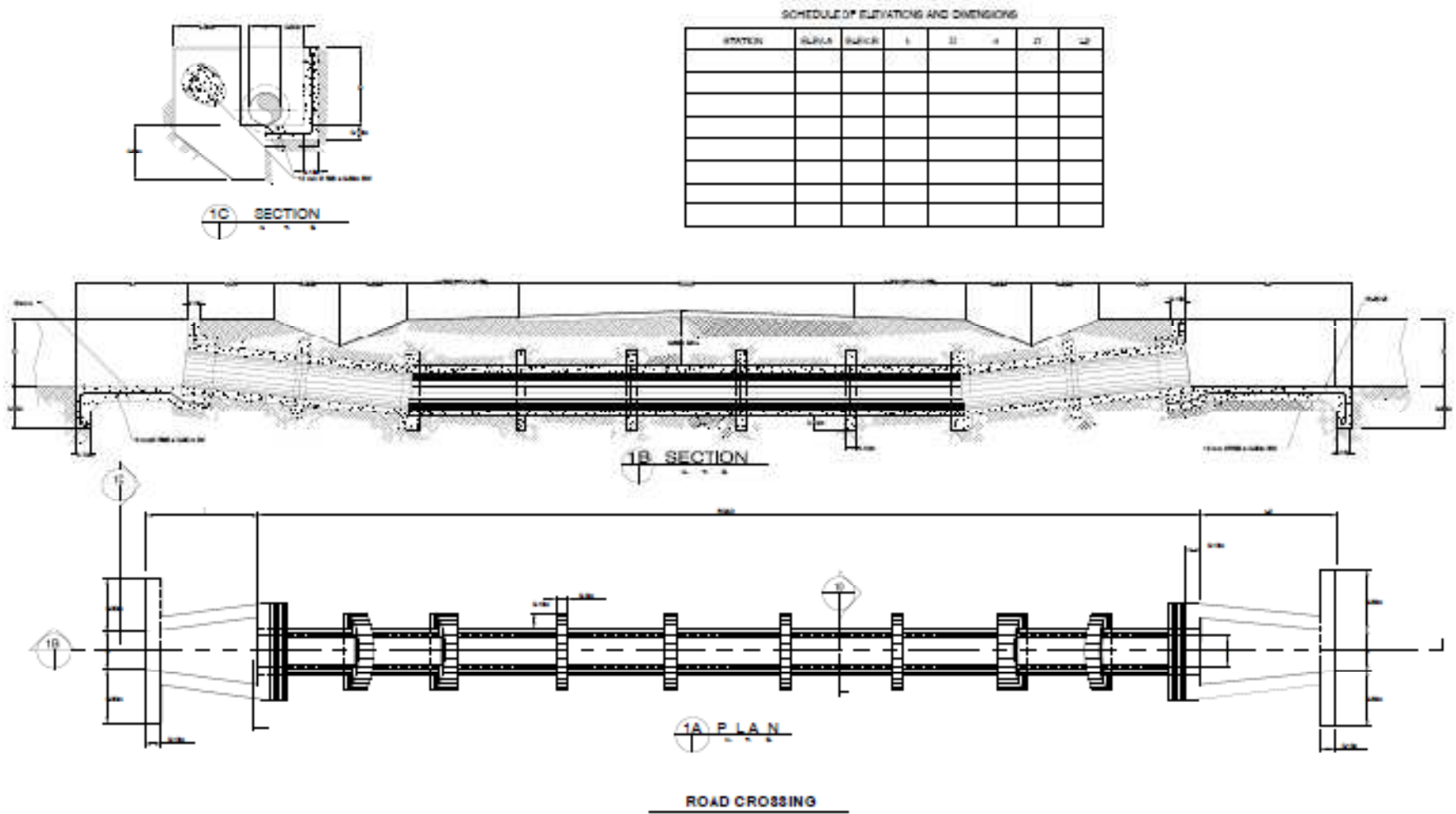
SCHEDULE OF ELEVATIONS AND DIMENSIONS

ELEV. 0.0
ELEV. 0.5
ELEV. 1.0
ELEV. 1.5
ELEV. 2.0
ELEV. 2.5
ELEV. 3.0
ELEV. 3.5
ELEV. 4.0
ELEV. 4.5
ELEV. 5.0
ELEV. 5.5
ELEV. 6.0
ELEV. 6.5
ELEV. 7.0
ELEV. 7.5
ELEV. 8.0
ELEV. 8.5
ELEV. 9.0
ELEV. 9.5
ELEV. 10.0



Reference: Department of Agriculture- Bureau of Soils and Water Management

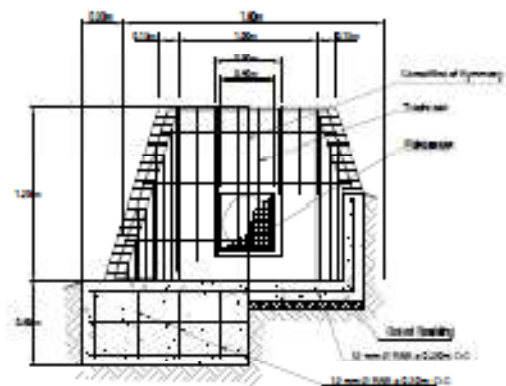
Sample Design



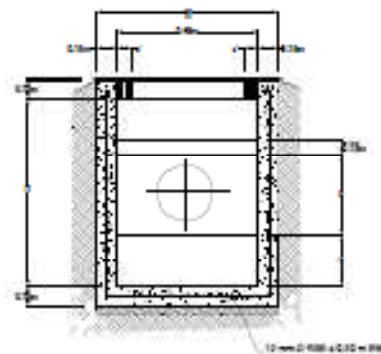
Reference: Department of Agriculture- Bureau of Soils and Water Management

“Annex G”

Sample Design



1D SECTION

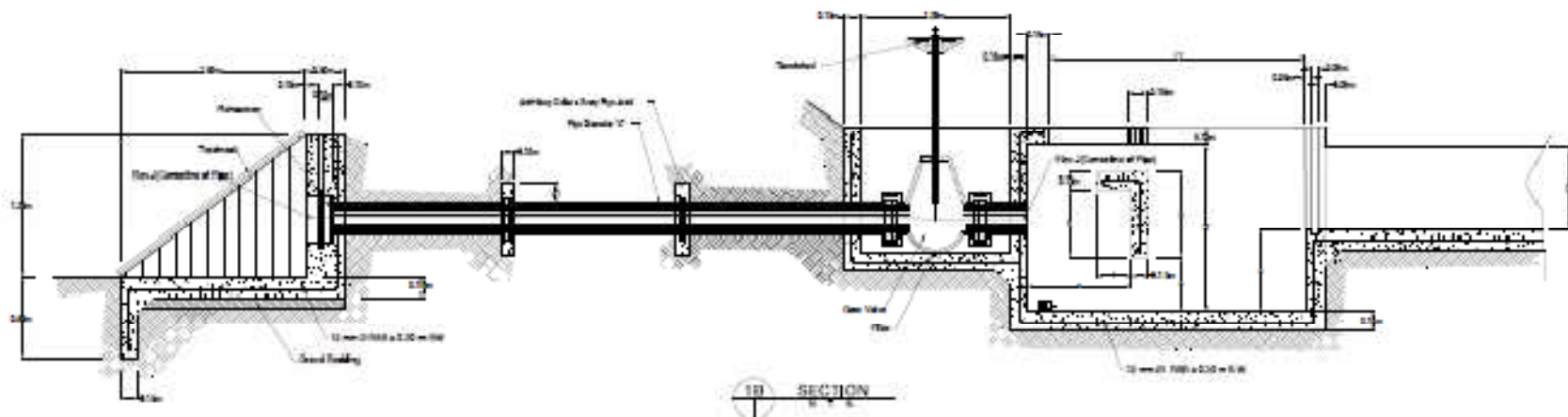


1C SECTION

NOTES :
All dimensions shall be in meters.

SCHEDULE OF DIMENSIONS

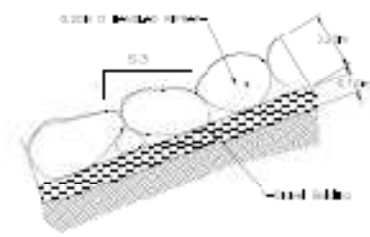
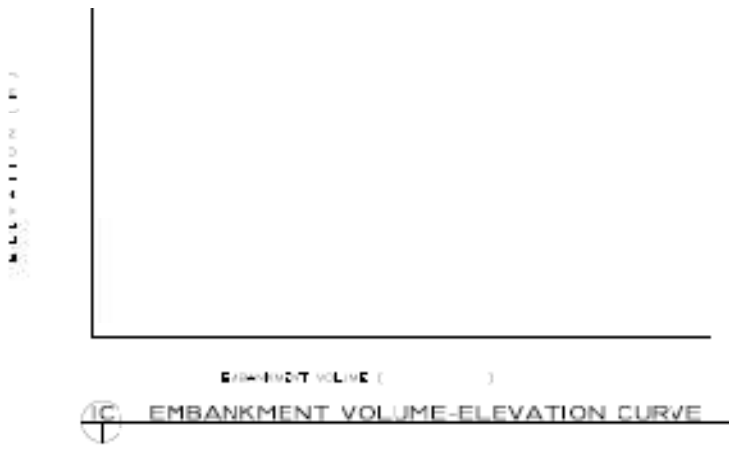
Sl. No.	Dimensions
1	0.30m
2	0.15m
3	0.15m
4	0.15m
5	0.15m
6	0.15m
7	0.15m
8	0.15m
9	0.15m
10	0.15m
11	0.15m
12	0.15m
13	0.15m
14	0.15m
15	0.15m
16	0.15m
17	0.15m
18	0.15m
19	0.15m
20	0.15m
21	0.15m
22	0.15m
23	0.15m
24	0.15m
25	0.15m
26	0.15m
27	0.15m
28	0.15m
29	0.15m
30	0.15m
31	0.15m
32	0.15m
33	0.15m
34	0.15m
35	0.15m
36	0.15m
37	0.15m
38	0.15m
39	0.15m
40	0.15m
41	0.15m
42	0.15m
43	0.15m
44	0.15m
45	0.15m
46	0.15m
47	0.15m
48	0.15m
49	0.15m
50	0.15m



1B SECTION

Reference: Department of Agriculture- Bureau of Soils and Water Management

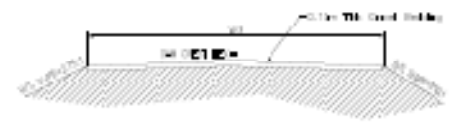
Sample Design



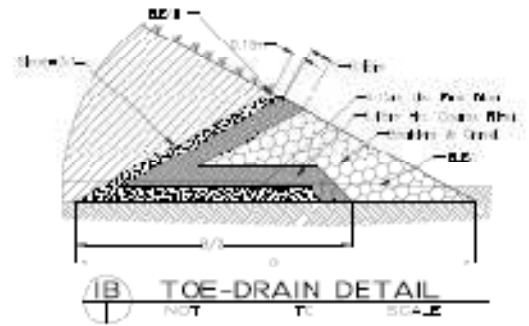
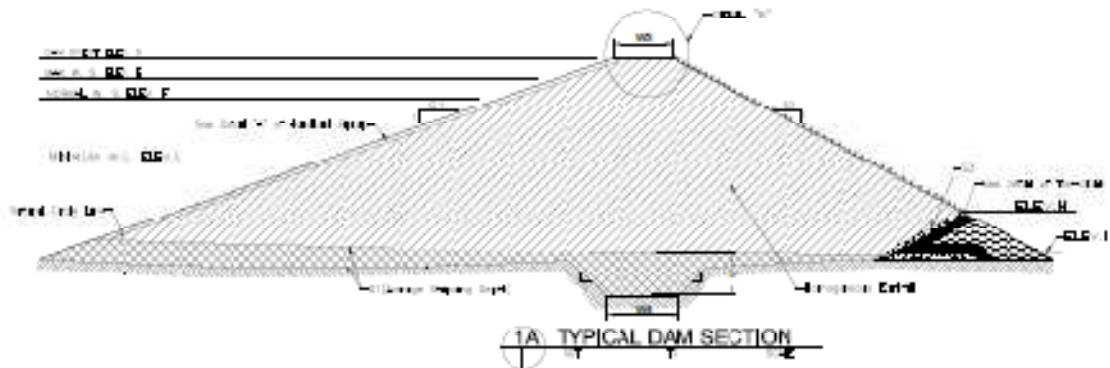
DETAIL "A"
NOT TO SCALE

SCHEDULE OF ELEVATED AND BENCHMARKS

BE 1 =
BE 2 =
BE 3 =
BE 4 =
BE 5 =
BE 6 =
BE 7 =
BE 8 =
BE 9 =
BE 10 =
BE 11 =
BE 12 =
BE 13 =
BE 14 =
BE 15 =
BE 16 =
BE 17 =
BE 18 =
BE 19 =
BE 20 =



DETAIL "B"
NOT TO SCALE



Reference: Department of Agriculture- Bureau of Soils and Water Management