



**GOVERNMENT OF TAMILNADU
WATER RESOURCES ORGANISATION
PUBLIC WORKS DEPARTMENT**

**TAMILNADU IRRIGATED AGRICULTURE MODERNISATION AND
WATER RESOURCES MANAGEMENT PROJECT**

**REHABILITATION OF LEFT OUT COMPONENTS IN IAMWARM SUB BASINS
UTILISING THE SAVINGS – PHASE –II**

**UPPER GUNDAR SUB BASIN
DETAILED PROJECT REPORT**

ESTIMATE AMOUNT: - 232.00 LAKHS

**GUNDAR BASIN DIVISION, MADURAI
VAIPPAR BASIN CIRCLE, VIRUDHUNAGAR
MADURAI REGION, MADURAI**

DETAILED PROJECT REPORT ON REHABILITATION OF (LEFT OUT COMPONENTS) IN NON SYSTEM TANKS & ANICUTS IN PHASE II OF UPPER GUNDAR SUB BASIN IN MADURAI DISTRICT.

ESTIMATE Rs.232.00 Lakhs.

GENERAL

The river **Gundar** originates at an altitude of 1008 m in Saptur Reserve forest on the eastern slopes of Western Ghats in Madurai District and runs eastward for a distance of 150 km and finally empties into Bay of Bengal. The **Gundar** river basin is located between latitude 9° 05' N to 10° 03' N and longitude 78° 35' E to 78° 35' E having an area of 5690 Sq.Km and is surrounded by Vaippar Basin on the South Western Ghats and Upper Vaigai Basin on the west, Vaigai Basin on the north and Bay of Bengal on the east.

The Gundar Basin has been divided into 9 sub basins and Upper Gundar is one of the sub basins. Varattar and Gownda Nathi are the worth mentioning tributaries of Upper Gundar Sub Basin. It has no reservoir.

Upper Gundar Sub basin area is 1099.99 Sq. Km with a hilly area of 45 Sq. Km. The taluks covered in the sub basin are Usilampatti, Peraiyur, Thirumangalam of Madurai District . It receives an annual average rainfall of 818.83 mm, with its major share of 434.83 mm during North-East Monsoon.

Under Phase II of IAMWARM Project for Upper Gundar Sub basin the estimates prepared for the schedule of rates for the year 2008-2009 has been cleared by the world bank and subsequently the Government has administratively sanctioned the proposals for Rs.185.8828 crores in G.O.NO.205/Public Works(WRI) Department dated 13.06.2008. Among the Upper Gundar sub basins Rs.865.00 lakhs has been provided for the rehabilitation of Works in Upper Gundar sub basin comprising 3 packages. Non system tanks and anicuts in Usilampatti, Peraiyur and Thirumangalam Taluk in Madurai District sub basin comprising three packages ie totally 27 tanks and 21 anicuts.

REHABILITATION TAKEN UP UNDER PHASE II AND COMPLETED:

In the original proposals rehabilitation to infrastructures in Upper Gundar sub basin have been taken up vide Phase II. Out of the 27 tanks, 21 anicuts and supply channels with the length of 43 Km rehabilitation works were carried out in 22 tanks, 20 anicuts and supply channels length of 37.09 Km. 5 tanks does not require any improvement at that time. The following infrastructures have been contemplated in the Phase II works.

TANKS:

- Raising and strengthening the tank bund by using Machineries for 45264m in 22 tanks out of 27 tanks.
- Desilting the supply channels by earthwork excavation using Machineries for 37.09 Km out of 43.00 Km supply channels in the sub basin.
- Repairs to 4 Nos. of weirs out of 37 Nos. weirs in the sub basin.
- Reconstruction of 11 Nos. of Collapsed Sluices out of 57 Nos. in the sub basin.
- Retaining walls in selective area of the tanks
- Providing S.G. Shutter / Plug arrangements to Sluices, Head sluices, Scour vents etc.,
- Fixing Boundary Stones in the tank bund and water spread area

ANICUTS:

- Repairs to anicuts body wall with skin wall, aprons, reconstruction of damaged abutment, wings, renewal of shutters of scour vents and head sluices.

LEFT OUT COMPONENTS:-

Out of the 27 tanks in the sub basin only 22 tanks have been rehabilitated. Still in these tanks certain components have been left out. But during the WRO officials visit in the sub basin need for rehabilitation of certain components in the infrastructures which have been left out was emphasized and WUA people also requested to carry out the left out components to make up the system in functional condition.

Hence this estimate is prepared to carry out the left out components by using the overall savings amount available and based on the agreed actions in the wrap up meeting chaired by the Finance secretary on 17.09.2012, which was communicated in the Engineer in Chief WRD Letter No. Tech cell / 57252/WB Mission/ 2009/Dated: 05.10.2012 and also the World Bank Implementation support mission draft aide memoir.

LEFT OUT COMPONENTS NOW PROPOSED TO BE TAKEN UP IN LEFT OUT TANKS:

Out of 5 tanks left out, since two tanks have been taken up in other schemes recently for rehabilitation and three tanks are now proposed in this estimate for rehabilitation viz. Sowdarpatti Karisalkulam, Chennampatti puliyankulam and K. Senkulam

- Raising and strengthening the tank bund for 5329 m in 3 tanks in which tank bund strengthening has not been taken up in the Phase II IAMWARM works including Turfing the D/S slope of bund for entire length.
- Reconstruction of 6 Nos. sluices in the above 3 tanks where tank bund strengthening is proposed now.
- Repairs to 2 nos of weirs.
- Lining of Irrigation channels under 6 sluices .
- Construction of cart track pipe culvert in the surplus course.
- Desilting supply channels for 1850 m & providing retaining wall at vulnerable points for a total length of 40 m.
- Providing flow measuring devices

LEFT OUT COMPONENTS IN THE 5 TANKS OUT OF 22 TANKS ALREADY TAKEN UP NOW PROPOSED TO BE TAKEN UP IN LEFT OUT TANKS:

Alappalacheri tank ,

Kuppammal Samudhiram tank ,

Saptur Periyakanmoi ,

Kudiseri tank &

Poolankulam tank

- Raising and strengthening the tank bund for 1993 m in Poolankulam tank which was not taken up in the Phase II IAMWARM works including Turfing the D/S slope of bund for entire length.
- Repairs to 9 nos of sluices.
- Repairs to 5 nos of weirs.
- Renewal of 22 shutters.

LEFT OUT COMPONENTS NOW PROPOSED TO BE TAKEN UP IN LEFT OUT ANICUT:

- Repairs to anicut.
- Repairs to 15 nos of shutters.
- Regrading of supply channel for 4325 m in LMC & RMC & providing retaining wall at vulnerable points for a total length of 72.00 m.

1.	01 / IAMWARM / WRD / UGR / LEFT OUT / 2012-13.	Rehabilitation and Modernisation of left out components in the Non System tanks, anicut and their supply channels under Upper Gundar Sub Basin in Periyur and Thirumangalam Taluks of Madurai District.	232.00 Lakhs
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**AssistantEngineer,PWD/WRO
Gundar Basin section,
Peraiyur.**

**Nodal Officer,
Executive Engineer, PWD., WRO.,
Gundar Basin Division, Madurai.**

**Superintending Engineer, PWD., WRO.,
Vaippar Basin Circle, Virudhunagar.**

**Chief Engineer, PWD., WRO.,
Madurai Region, Madurai.**

Statement - I

**Rehabilitation of Left Out works in UPPER GUNDAR Sub Basin
Abstract showing the details of Rehabilitation works proposed**

Region : Madurai

**Circle : Vaippar Basin circle Virudhunagar
Nodal Officer: Executive Engineer,
PWD,WRO,**

Gundar Basin Division, Madurai.

Sl.No	Description	Tanks (Nos.)	Anicut (Nos)	Supply Channel Km.	Remarks
1	Available Infrastructure in the Sub Basin	27	21	43.00	
2	Rehabilitation works taken up under IAMWARM Project	22	20	37.09	
	a) Infrastructure in which all the components are in good condition and does not require rehabilitation now	17	20	37.09	
	b) Infrastructures taken up under IAMWARM but certain components not taken up then, but require rehabilitation now.	5	-	-	
3	Tanks not taken up for rehabilitation since 2005 under any other schemes.	5	1	5.91	
	a) Infrastructure in which all the components are in good condition and does not require rehabilitation now	2	-	-	
	b) Infrastructures in which certain components not taken up since 2005 but require rehabilitation now.	3	1	5.91	
4	Total No of infrastructures requiring rehabilitation now.	8	1	5.91	

- 1 Certified that the works are proposed in the selected IAMWARM Sub Basin area
- 2 Certified that the Panchayat Union tanks are not considered in this project
- 3 Certified that for item 2 b, the components of the infrastructures now proposed were not taken up under IAMWARM Project.
- 4 For Item No: 3 - Certified that the works were not executed under various schemes (Viz., NABARD, Part II Schemes, etc.,) and IAMWARM since 2005.

**Assistant Engineer, PWD/WRO
Gundar Basin section,
Peraiyur.**

**Assistant Executive Engineer, PWD,
Gundar Basin Subdivision,
Thirumangalam.**

**Executive Engineer, PWD,
Gundar Basin Division,
Madurai.**

**Superintending Engineer, PWD,
Vaippar Basin Circle,
Virudhunagar.**

STATEMENT II – B
PUBLIC WORKS DEPARTMENT
WATER RESOURCES ORGANISATION
TN IAMWARM Project

Sub Basin

UPPER GUNDAR

Package No: I

REHABILITATION OF IRRIGATION CHANNELS

SI No	Name of tanks	Components of works proposed										Total amount in Lakhs
		Desilting of Irrigation Channel		Lining of Irrigation Channel		Repairs to Drops, Syphon, Cistern		Repairs to Culterts, Aqueducts		Shutter Renewal		
		No	Amount	No	Amount	No	Amount	Nos	Amount	Nos	Amount	
1	Sowdarpatti Karisalkulam			4	8.08							8.08
2	Chennampatti Puliyankulam			2	4.38			1	4.14			8.52
	Total	0	0.00	6	12.46	0	0.00	1	4.14	0	0.00	16.60

Assistant Engineer, PWD/WRO
Gundar Basin section,
Peraiyur.

Assistant Executive Engineer, PWD,
Gundar Basin Subdivision,
Thirumangalam.

Executive Engineer, PWD,
Gundar Basin Division,
Madurai.

Superintending Engineer, PWD,
Vaippar Basin Circle,
Virudhunagar.

STATEMENT II – C
PUBLIC WORKS DEPARTMENT
WATER RESOURCES ORGANISATION
TN IAMWARM Project

Sub Basin

UPPER GUNDAR

Package No: II

REHABILITATION OF ANICUTS AND SUPPLY CHANNELS

SI No	Name of Anicut / Supply Channel	Components of works proposed										Total amount in Lakhs
		Reconstruction of anicut		Repairs to anicut		Repairs to Head Sluice		Shutter Renewal		Supply channel		
		No	Amt	No	Amount	No	Amount	Nos	Amount	Length in M	Amount	
1	Chennampatti Anicut	0	0.00	1	16.00	0	0.00	15	4.50	4325	15.15	35.65
2	Chennampatti Puliyankulam Surplus course									950	2.39	2.39
3	K.Senkulam supply channel									900	8.34	8.34
4	Kudiseri tank supply channel							3	0.84		12.40	13.24
	Total	0	0.00	1	16.00	0	0.00	15	5.34	6175	38.28	59.62

Assistant Engineer, PWD/WRO
Gundar Basin section,
Peraiyur.

Assistant Executive Engineer, PWD,
Gundar Basin Subdivision,
Thirumangalam.

Executive Engineer, PWD,
Gundar Basin Division,
Madurai.

Superintending Engineer, PWD,
Vaippar Basin Circle,
Virudhunagar.

PACKAGE STATEMENT

**PUBLIC WORKS DEPARTMENT
WATER RESOURCES ORGANISATION**

**UPPER
GUNDAR** **TN IAMWARM
Project**

Details of Works in leftout Tank Component

Rehabilitation works for Left Out Infrastructure in IAMWARM Project Sub Basin - UPPER GUNDAR

SI No	Package No	Components of works proposed																										Total amount in Lakhs
		Tank Bund Improvements		Repairs to Sluices		Reconstruc tion of Sluices		Repairs to Weirs		Reconstruc tion of Weirs		Shutter Renewal		Desilting of Irrigation Channel		Lining of Irrigation Channel		Repairs to Culverts, Aqueducts		Shutter Renewal		Repairs to anicut		Shutter Renewal		Supply channel		
		Length in M	Amt	N o s	Amt	N o s	Amt	No s	Amt	No s	Amt	No s	Amt	N o	Amou nt	N o	Amt	N o s	Amou nt	No s	Amou nt	N o	Amt	No s	Amt	Length in M	Amt	
1	Package No.1	7322	60.92	9	24.09	6	23.97	7	20.24	0	0.00	19	20.55	0	0.00	6	12.46	1	4.14	0	0.0	1	16.00	15	5.34	6175	38.28	225.99
	TOTAL	7322	60.92	9	24.09	6	23.97	7	20.24	0	0.00	19	20.55	0	0.00	6	12.46	1	4.14	0	0.0	1	16.00	15	5.34	6175	38.28	225.99

**Assistant Engineer, PWD/WRO
Gundar Basin section,
Peraiyur.**

**Assistant Executive Engineer, PWD,
Gundar Basin Subdivision,
Thirumangalam.**

**Executive Engineer, PWD,
Gundar Basin Division,
Madurai.**

**Superintending Engineer, PWD,
Vaippar Basin Circle,
Virudhunagar.**

WRO COST TABLE

Cost Table for the components of work now proposed for which Left out infrastructures and components in IAWARM - Phase II.

Sl. No	Description of Component	Quantity	Unit	Amount in Lakhs
	TANKS			
1	Tank Bund	7322	RM	60.92
2	Repairs to sluices	9	Nos	24.09
3	Reconstruction of sluices	6	Nos	23.97
4	Repairs to weirs	7	Nos	20.24
5	Reconstruction of weirs	0	Nos	0.00
	Shutters Renewal	19	Nos	20.55
	IRRIGATION CHANNELS			
1	Desilting of Irrigation channel	0	Nos	0.00
2	Lining of Irrigation Channel	6	Nos	12.46
3	Repairs to Drops, Syphons, Cisterns	0	Nos	0.00
4	Repairs to Culverts, Aqueducts	1	Nos	4.14
5	Shutters Renewal	0	Nos	0.00
	ANICUTS			
1	Reconstruction of anicut	0	Nos	0.00
2	Repairs to anicuts	1	Nos	16.00
3	Repairs to Head Sluice	0	Nos	0.00
4	Shutters Renewal	15	Nos	5.34
5	Supply channel	6175	RM	38.28
	Sub total			225.99
1	Provision for Advertisement charges, Documentation charges, Photographic Charges, Name board Charges, PS Charges and contingences charges @ 2.5%	LS	--	5.32
	Provision for Labour welfare @ 0.3%	LS	--	0.69
	Total			232.00

[Rupees Two hundred and Thirty Two Lakhs]

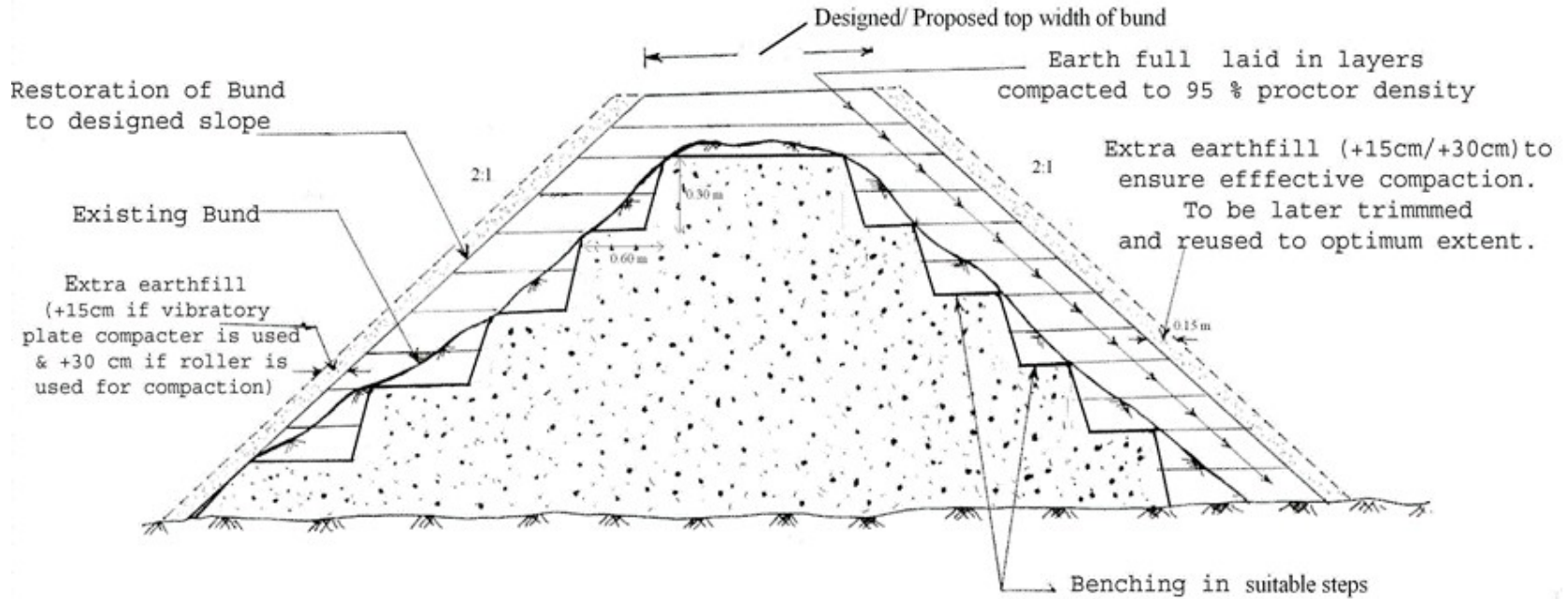
Assistant Engineer, PWD/WRO
Gundar Basin section,
Peraiyur.

Assistant Executive Engineer, PWD,
Gundar Basin Subdivision,
Thirumangalam.

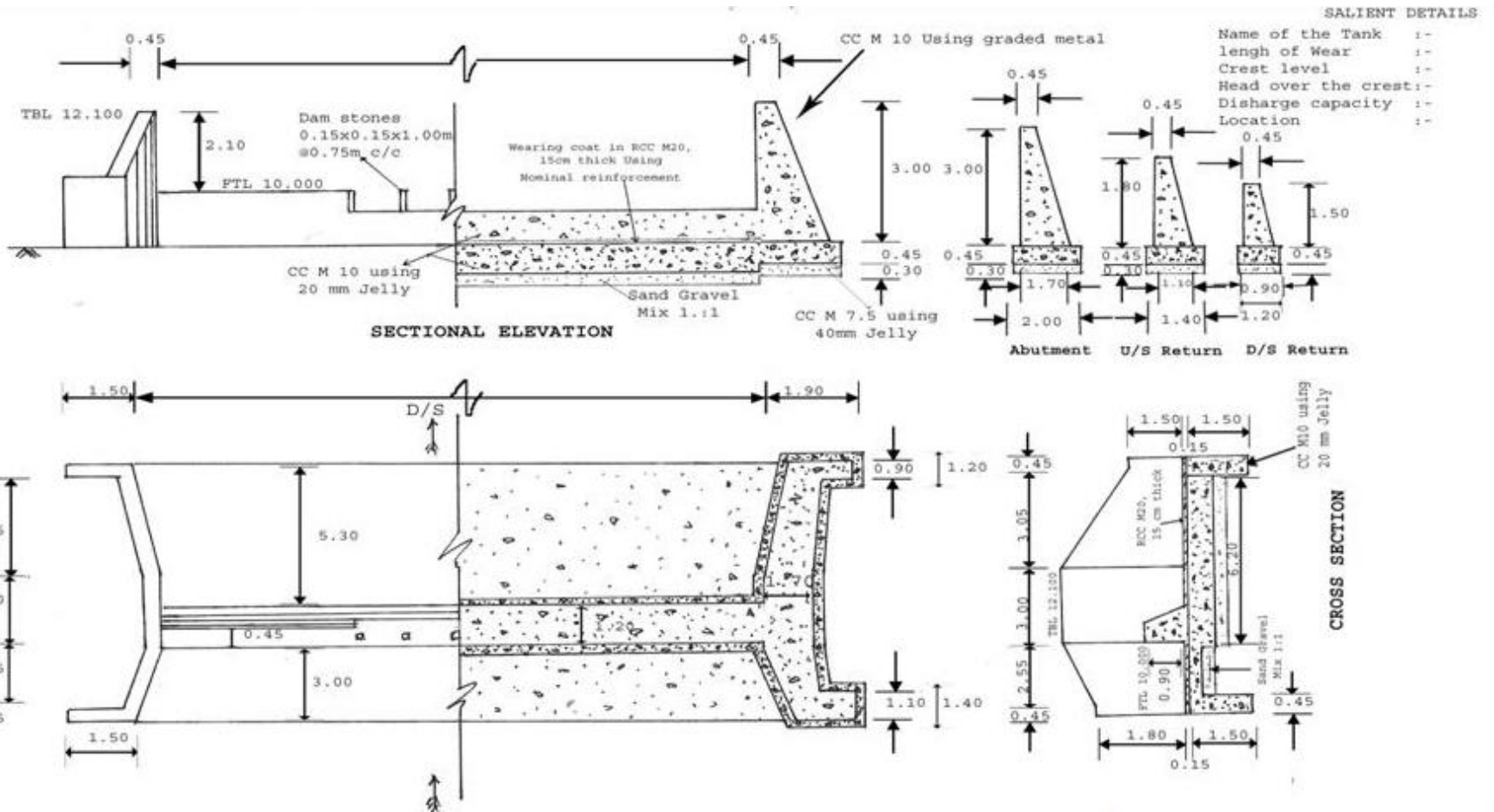
Executive Engineer, PWD,
Gundar Basin Division,
Madurai.

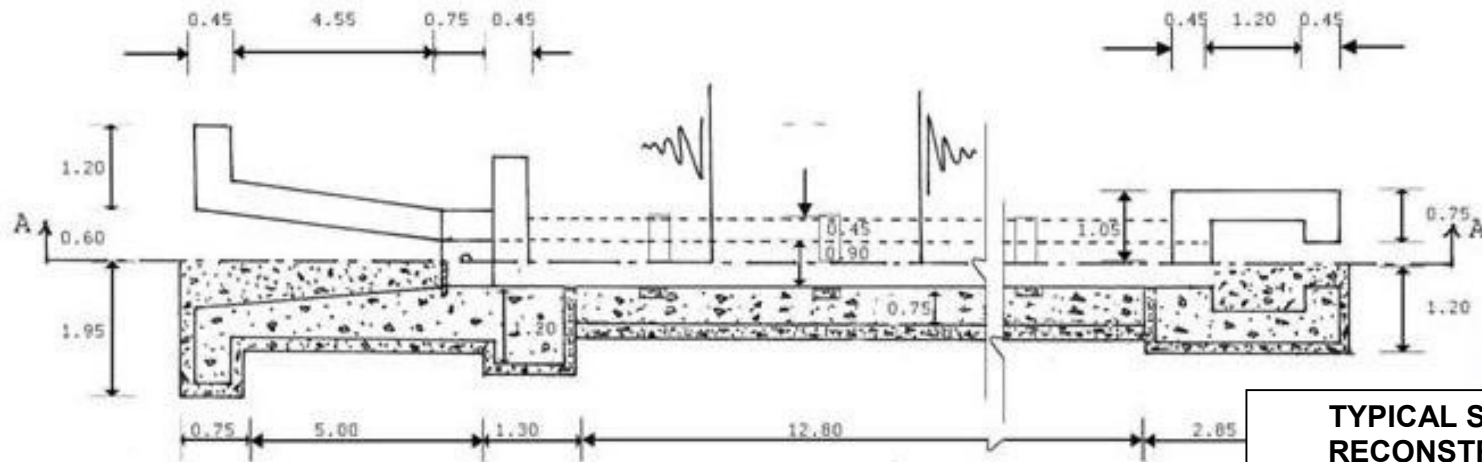
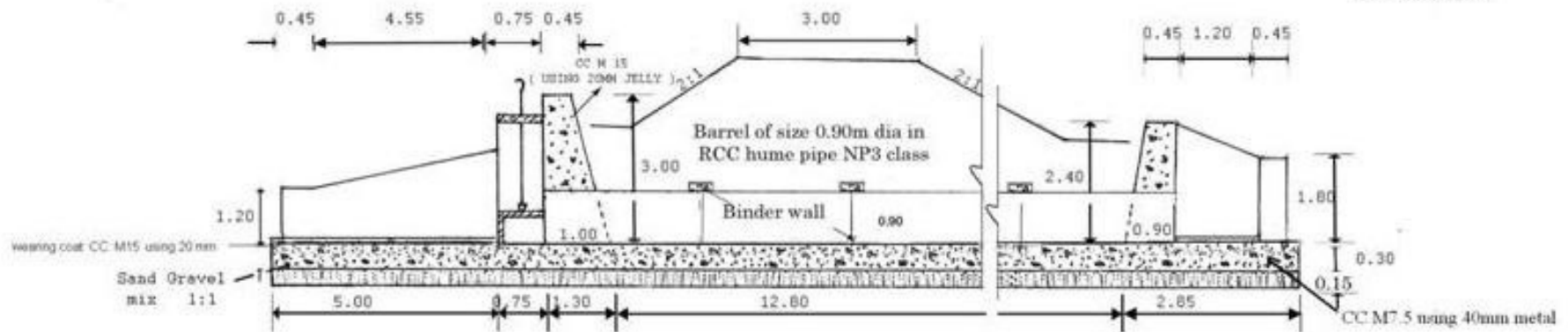
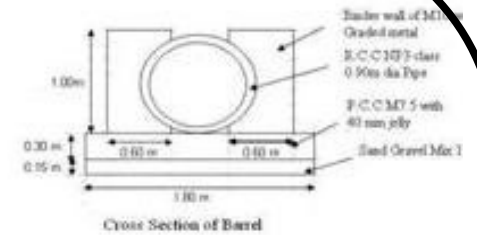
Superintending Engineer, PWD,
Vaippar Basin Circle,
Virudhunagar.

TYPICAL SKETCH FOR TANK BUND

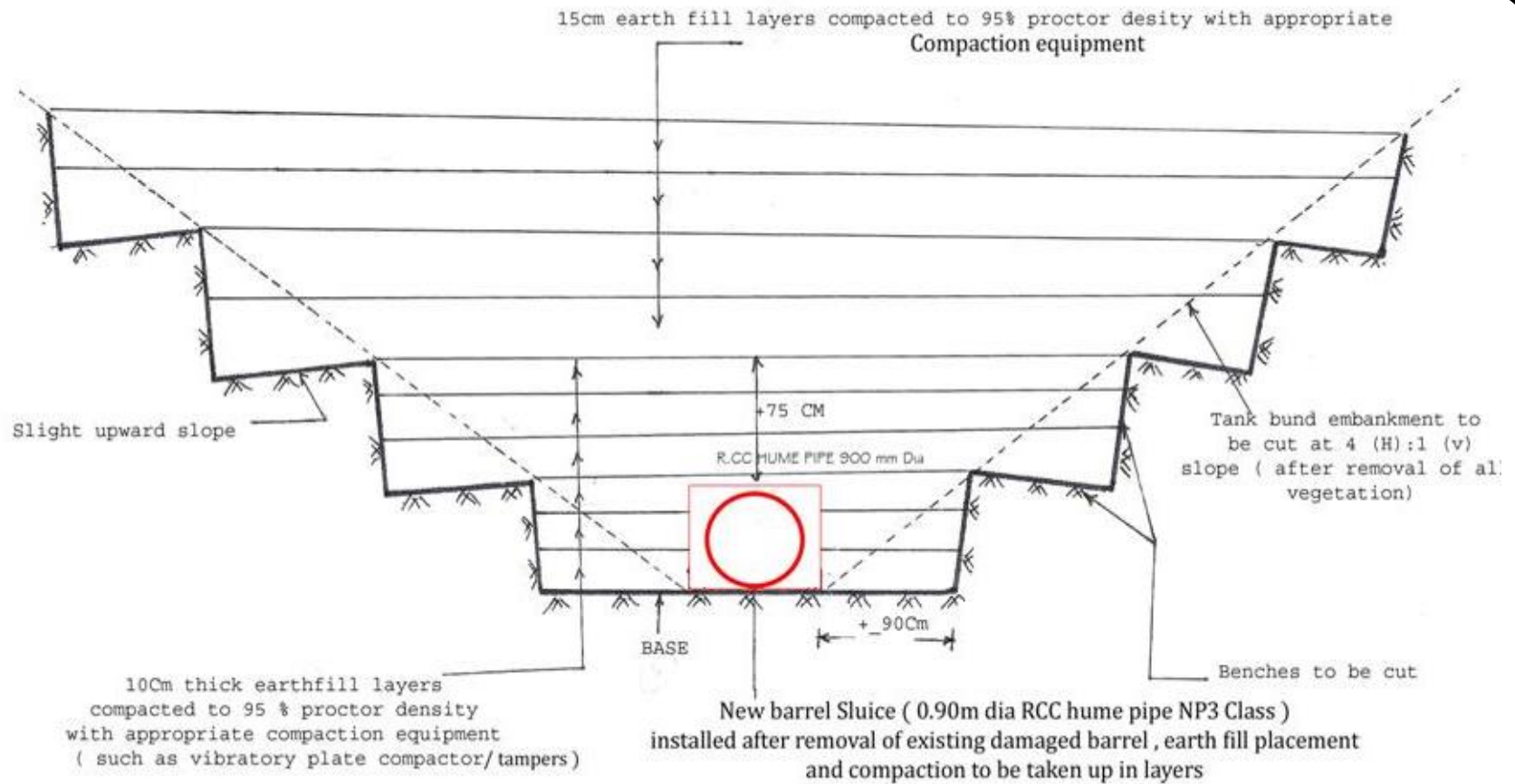


TYPICAL SKETCH FOR REPAIRS TO WEIR



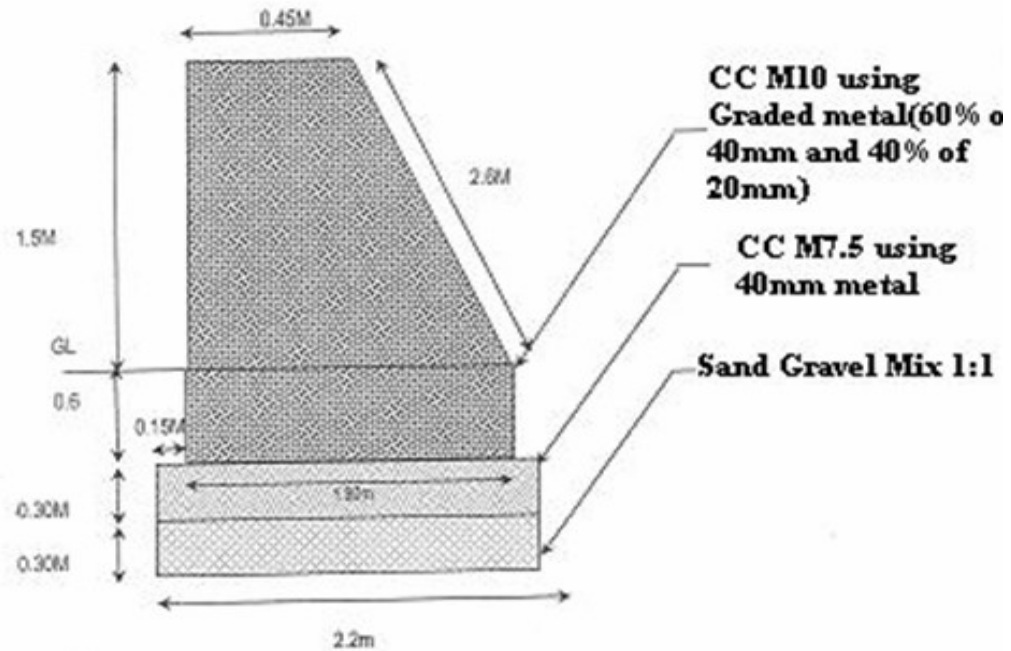


TYPICAL SKETCH FOR RECONSTRUCTION OF WING WALL TYPE SLUICE
ALL DIMENTIONS ARE IN METERE



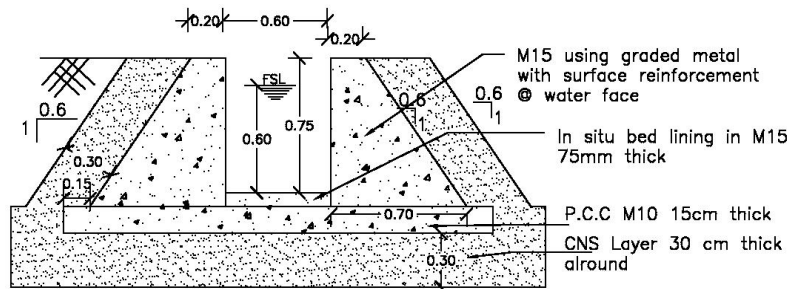
TYPICAL SKETCH FOR CUT OPEN TO TANK BUND FOR RECONSTRUCTION OF SLUICE

TYPICAL SKETCH FOR PROTECTION WALL

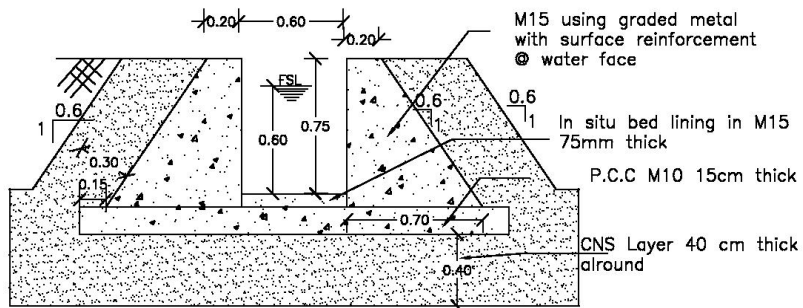


CROSS SECTION OF PROTECTION WALL

RETAINING WALL DESIGN AS PER INSTRUCTION OF E IN C, WRC
C.E (GENERAL) PWD, CHENNAI, LR.NO. S7(4) / 40351 / 2006 /
CELL DATED : 24.04.2007



Typical Section for channels in soils
with swell pressure ranging from
50kn/m² to 150 kn/m²



Typical Section for channels in soils
with swell pressure above 150 kn/m²

All dimensions are in metres
unless otherwise specified.

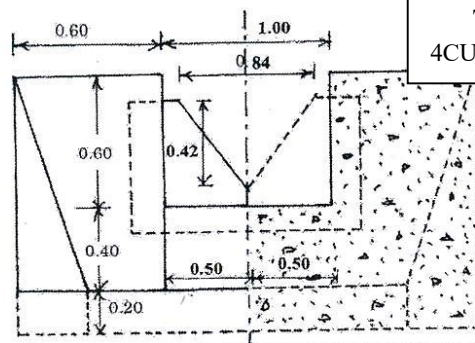
NOTES

- The adequacy of the canal section provided in Engineer-in-Chief, WRD, Chennai, Ir.No.Tech. Cell / Additional proposal/ Phase-I and II/2011/ dated 24.04.2012 has been checked and found that the provided section of the canal can discharge upto 0.30cumecs.
- As the channel is running on swelling type of soil (Black cotton soil), a Cohesive Non-Swelling (CNS) Layer of thickness as specified below are to be provided around the canal section as specified in IS 9451-1994

Swell pressure	Thickness of CNS layer
50-150 kN/m ²	30cm
above 150 kN/m ²	40cm
- The parameters of backfill material such as angle of internal friction and saturated unit weight have been assumed as 10degree and 1.8 tonnes/m³ respectively, the average properties of soft clay. However during execution, the properties of backfill material should be tested, if the tested values are less than the adopted value, the backfill should be replaced with CNS material.
- The CNS material shall be non swelling with a max. swelling pressure of 10kn/m² as specified in Cl.4.2.3 of IS 9451-1994
- The soil having the following properties can be used as CNS layer:

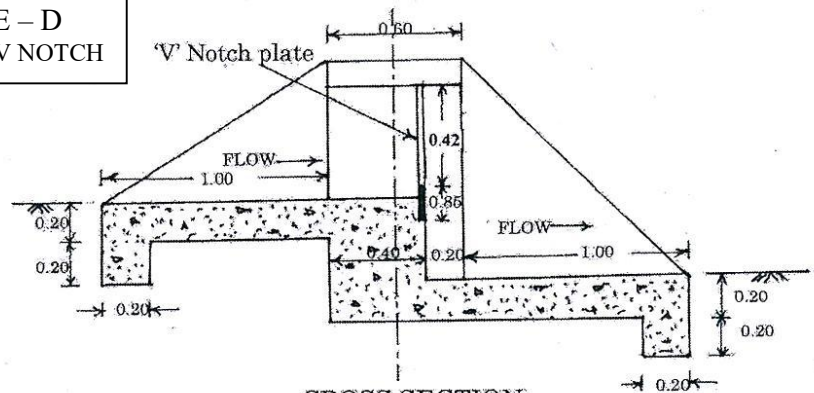
Clay (less than 2 microns)	15% to 20%
Silt(0.06mm - .002mm)	30% to 40%
Sand(2mm - 0.06mm)	30% to 40%
Gravel(Greater than 2mm)	0% to 10%
Liquid limit - Greater than 30 , but less than 50	
Plasticity Index - Greater than 15 but less than 30	
- The construction procedure for the CNS layer shall be in accordance with Clause 6 of IS 9451-1994.
- Under Drainage arrangements of channel shall be provided in accordance with Clause 8.2 of IS 9451-1994.
- The side walls of the canal are designed for levelled backfill material only.
- The retaining wall is designed only for lateral earth pressure and hence vehicular traffic shall not be allowed over the back fill adjacent to the wall.
- Surface reinforcement at the rate of 2.5 kg/m² shall be provided in the wall, both horizontally and vertically and the spacing of the bars shall not exceed 200mm.

IAMWARM PROJECT
UPPER GUNDAR SUB BASIN
IRRIGATION CHANNEL LINING
Scale:- 1:1000
All Dimention are in Metre

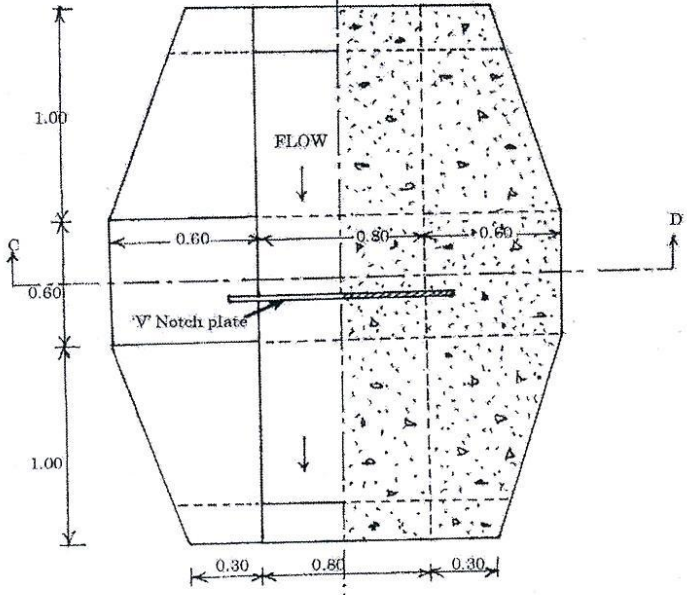


HALF FRONT ELEVATION AND HALF SECTIONAL ELEVATION AT 'CD'

TYPE - D
4CUSEC V NOTCH



CROSS SECTION



HALF PLAN AT TOP AND HALF PLAN AT BOTTOM

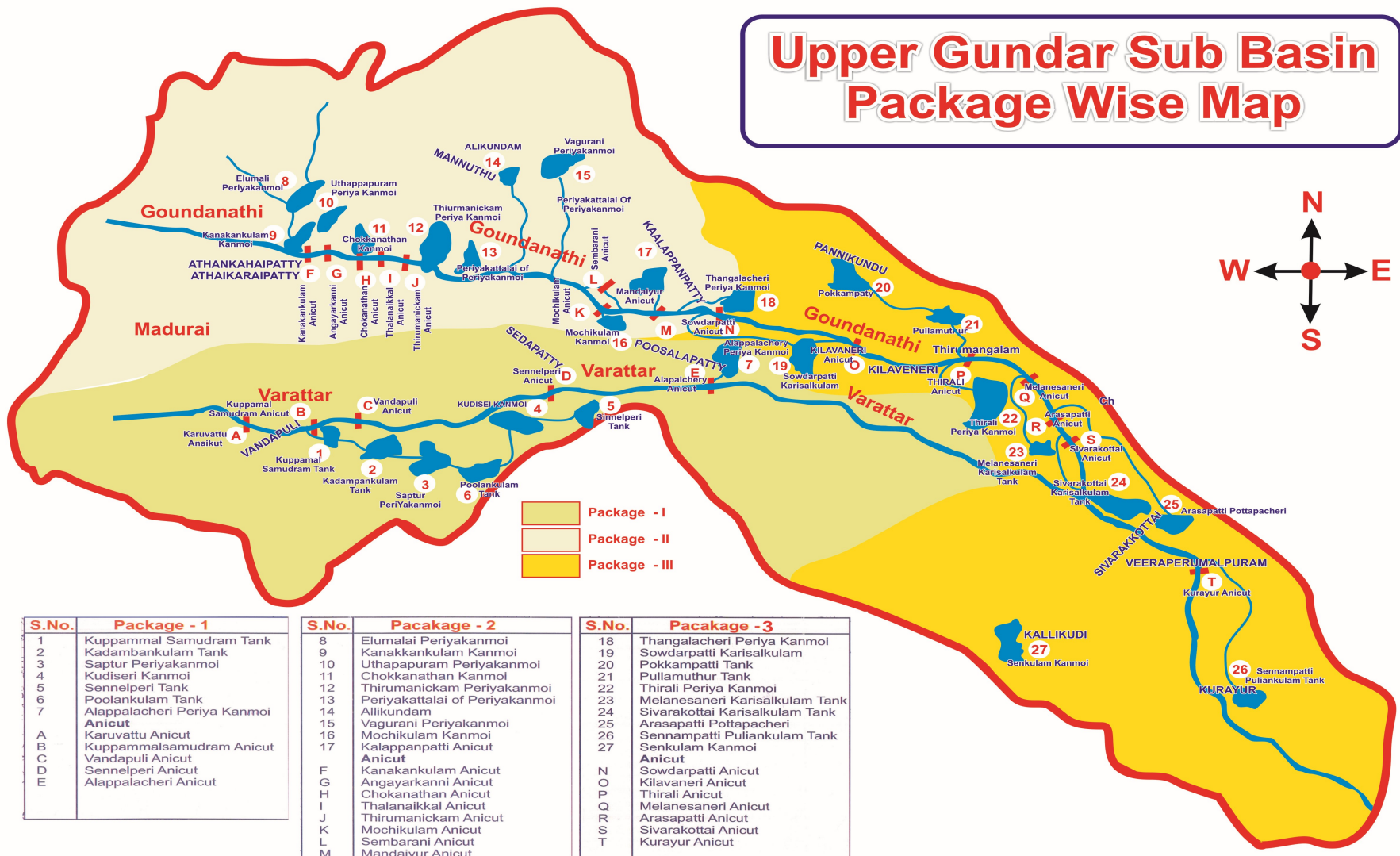
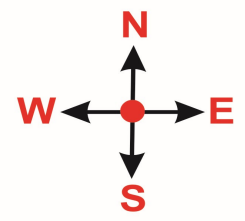
'V' NOTCH - SALIENT DETAILS (For 1 to 4 C/s)

Discharge		Head Over Crest Cm	V' Notch size Cm	Overall size Cm
Cusec	Litre / sec			
1	28.3	20.5	25 x 50	50 x 65
2	56.6	27	30 x 60	50 x 75
3	85	32	35 x 70	55 x 90
4	113.27	36	42 x 84	60 x 100

IAMWARM PROJECT
UPPER GUNDAR SUB BASIN
PROVIDING FLOW MEASURING
DEVICE('V') NOTCH) IN THE FIELD
CHANNEL OF TANK SLUICE Scale
1cm=0.25m All dimation are in Metre

Executive Engineer PWD
Gundar Basin Division
Madurai

Upper Gundar Sub Basin Package Wise Map



- Package - I
- Package - II
- Package - III

S.No.	Package - 1
1	Kuppammal Samudram Tank
2	Kadambankulam Tank
3	Saptur Periyakanmoi
4	Kudiseri Kanmoi
5	Sennelperi Tank
6	Poolankulam Tank
7	Alappalacheri Periya Kanmoi Anicut
A	Karuvattu Anicut
B	Kuppammalsamudram Anicut
C	Vandapuli Anicut
D	Sennelperi Anicut
E	Alappalacheri Anicut

S.No.	Pacakege - 2
8	Elumalai Periyakanmoi
9	Kanakankulam Kanmoi
10	Uthappapuram Periyakanmoi
11	Chokkanathan Kanmoi
12	Thirumanickam Periyakanmoi
13	Periyakattalai of Periyakanmoi
14	Alilikundam
15	Vagurani Periyakanmoi
16	Mochikulam Kanmoi
17	Kalappanpatti Anicut
F	Kanakankulam Anicut
G	Angayarkanni Anicut
H	Chokkanathan Anicut
I	Thalanaikkal Anicut
J	Thirumanickam Anicut
K	Mochikulam Anicut
L	Sembarani Anicut
M	Mandaiyur Anicut

S.No.	Pacakege - 3
18	Thangalacheri Periya Kanmoi
19	Sowdarpatti Karisalkulam
20	Pokkampatti Tank
21	Pullamuthur Tank
22	Thirali Periya Kanmoi
23	Melanesaneri Karisalkulam Tank
24	Sivarakottai Karisalkulam Tank
25	Arasapatti Pottapacheri
26	Sennampatti Puliankulam Tank
27	Senkulam Kanmoi
N	Sowdarpatti Anicut
O	Kilavaneri Anicut
P	Thirali Anicut
Q	Melanesaneri Anicut
R	Arasapatti Anicut
S	Sivarakottai Anicut
T	Kurayur Anicut

