PUBLIC WORKS DEPARTMENT

WATER RESOURCES DEPARTMENT

MADURAI REGION

TAMILNADU IRRIGATED AGRICULTURE MODERNIZATION PROJECT (TNIAMP)

PHASE– III

NAMBIYAR SUB BASIN

Detailed Project Report - Volume II

REVISED ESTIMATE AMOUNT Rs. 808.61 LAKH.
AYACUT 1312.83 Ha.

MADURAI REGION, MADURAI,
TAMIRABARANI BASIN CIRCLE, TIRUNELVELI,
CHITTAR BASIN DIVISION, TENKASI@KUDIYIRUPPU.

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	Cross section of Tanks are attached in separate Booklet Volume 1/2 and 2/2	

TNIAMP- Phase III

NAMBIYAR SUB BASIN

Reply and Action taken report for the Technical Review comments pointed out by Mr.R.K Malhotra, Consultant, World Bank

S. No	Review Comments/ Observation	Reply
1	Presently, cross-sections of none of the 40 Tank Bunds are appended. In order to be sure and check that correct quantities of earthwork are calculated and adopted in the estimate, it is essential that cross-sections of all 40 Tank Bunds at the spacing, at which actually observed, depicting the actual profile duly super-imposed with design section and showing benches cut in existing side slopes, should be appended in a separate Volume-DPR-Vol.II. Relevant features, such as, FTL, MWL, TBL & side slopes should be shown in the cross sections	Cross-sections of the 40 Tank Bunds with cut benches/ serrations are appended in a separate Volume-DPR-Vol.II, Volume 1/2 and 2/2. Relevant features, such as, FTL, MWL, TBL & side slopes are shown in the cross sections and the cost is increased due to benching quantity. (Initial earthwork quantity = 346535.00 m^3 Revised earthwork quantity = 479699.00 m^3 Revised cost = 359.05 lakhs)
2	Maximum height of Kallikulam Tank Bund (tabulated at Sl. No. 29 on page 91) is 3.04 m.The height being only 0.04 m more than 3.0 m, the free board for this Tank Bund may be kept as 1.25 m instead of 1.50 m.	In Section 6.4 of the DPR, Free board for Kallikulam Tank Bund is kept as 1.25 m instead of 1.50 m.
3	Page 105 of DPR indicates that provision for “Turfing” is made. However, the extent of “surface area” of only 5797. 60 M2 assumed for putting turfing on the rear side slopes of as many as 40 tank bunds, seems to be abnormally less / inadequate. This aspect should be examined and correct surface area be provided and the cost of this item be accordingly revised.	In Section 6.8.2, for item No.24, the extent of “surface area” to be provided for Turfing is increased and adequate and accordingly cost revision is done and the cost is increased. (initial turfing = 5797.60 m2 Revised turfing = 202129.00 m2 Revised cost = 80.245 lakhs)
4	It is suggested that the proposed repairs should be clearly indicated on the drawings / sketches with brief self explanatory notes on such repairs.	Drawings for proposed repair works to sluices is appended in Chapter 9 of the DPR with brief self explanatory notes on such repairs.

S. No	Review Comments/ Observation	Reply
5	Names of the concerned Weirs are not indicated in the Sketches. It should be done. Correctness of the provision of Rs 12.60 lakhs for the construction of concrete skin walls in 8 Weirs should also be checked. Following be included in the Note under the respective Sketch of the Weir:· Drill holes of 50 mm diameter to be drilled at downward inclination of 5 degree to ensure easy filling of mortar.· Horizontal spacing of Drill holes (along the Weir length) to be 1.0 m or as decided by the Engineer-in-Charge. Consistency of mortar, presently indicated as (1:2:5) in the Sketches, be corrected to (1:2) – cement sand mortar. The indicated consistency (1:2:5) implies coarse aggregate in the mortar, which is not correct. This aspect be examined.	(i) In Chapter 9 of the DPR, names of the concerned weirs (8 Nos.) are indicated in the sketches. (ii) The cost is been revised to Rs 12.44 lakhs for the construction of concrete skin walls in 8 Weirs. (iii) Following is included in the Note under the respective Sketch of the Weir: (a)Drill holes of 50 mm diameter to be drilled at downward inclination of 5 degree to ensure easy filling of mortar. (b) Horizontal spacing of Drill holes (along the Weir length) to be 1.0 m or as decided by the Engineer-in-Charge. (iv) Consistency of mortar, presently indicated as (1:2:5) in the Sketches, is corrected to (1:2) – cement sand mortar.
6	It is accordingly suggested that Central Design Organization (C.D.O.)should undertake this task. Initially, such exercise should be taken up for 8 Weirs which areproposed to be repaired in this sub basin. The cost of modifications of the Weirs, based on thedrawings of modifications issued by C.D.O., should be included in the cost estimate.	Maximum Design flood calculations sent to SE/ Design Circle and observation of SE/ Design Circle is enclosed wherein it is observed that the existing length of the weir for the 8 tanks is found sufficient to carry the discharge based on the rainfall intensity. Enclosed in page no 6 of the Detailed Project Report Volume II. The report on Maximum Flood Discharge occurred is enclosed in the page no 8 of this DPR vol II
7	This Item envisages “cut opening tank bund” involving 4493.00 m3 earthwork excavation. It should be checked whether this item relates to the re-construction of Sluices. If so, the sentence: “… for cut opening tank bund…” be re-worded to read as: “…..for cut opening tank bund in 4(H):1(V) slope…”. Also,correctness of the quantity of 4493.00 m3 should be ascertained based on cut opening the tank bunds for the reconstruction of 10 Sluices.	In Section 6.8.2 of the DPR (item No.2) (i) This item relates to the re-construction of Sluices and the sentence: is changed from “… for cut opening tank bund…”to re-worded to read as: “…..for cut opening tank bund in 4(H):1(V) slope…”. (iii) correctness of the quantity is ascertained based on cut opening the tank bunds for the reconstruction of 10 Sluices and the quantity is revised to 5908 m3

S. No	Review Comments/ Observation	Reply
8	The sentence: " 0.90 m width drum" should be re-worded to read as: "± 0.90 m width drum". Also, in Sl No. 21, the words "breaking clods" in the 9 th line should be changed to read as: "breaking clods of size more than 75 mm	In Section 6.8.2 of the DPR, in (i) Sl.No.16, the sentence: " 0.90 m width drum" is re-worded to read as:"± 0.90 m width drum". (ii) in Sl No. 21, the words "breaking clods" in the 9 th line is changed to read as: "breaking clods of size more than 75 mm
9	Spacing of holes of 50 mm dia is indicated as 80 cm in this Item. However, the spacing is shown to be 70 cm in some sketches of Weirs and spacing of 30 cm is shown in some Sketches of other Weirs in Section 9: Drawings. In this context, correct spacing be indicated.	Correct spacing of holes in the weir body wall is indicated in Sl.No. 20. (6.8.2 BOQ) of the DPR which is in par with the drawings in Chapter 9
10	Also, this Item stipulates „fixing anchor rods of 16 mm dia of 1 m length in such a way that 60 cm length is embedded into the masonry wall …….. and 40 cm length projected and ent outside the wall…….. „. In this connection, reference be made of the Sketches of Weirs appended in the Section 9: Drawings. These Sketches indicate the depth of 50 mm dia holes drilled in the masonry body wall as 30 cm. Then, how 60 cm length of anchors will get embedded in these holes of 30 cm length ?. Furthermore, thickness of „skin concrete" being 15 cm to 20 cm, how it is stipulated that the anchor rods after bending will get appropriately accommodated in the skin wall ? It is accordingly suggested that the concerned engineers should carefully read this Item and correctly formulate this important item duly conforming to the relevant Sketch / Sketches of Skin Wall	Description of work in Item No.. 20 (6.8.2 BOQ) of the DPR is corrected and relevant with the sketches appended in Chapter 9 of the DPR.

Assistant Engineer, PWD/WRD.,
Irrigation Section,
Vallioor

Assistant Executive Engineer,
PWD/WRD.,
Nambiyar Basin Sub Division,
Nanguneri

Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

Superintending Engineer, PWD/WRD.,
Tamirabarani Basin Circle,
Tirunelveli

Chief Engineer, PWD/WRD.,
Madurai Region,
Madurai.

PUBLIC WORKS DEPARTMENT
WATER RESOURCES DEPARTMENT

From

Er.S.Shanthi M.E.,
Superintending Engineer, PWD
Designs Circle, WRD
Chennai 600 005.

To

The Chief Engineer, PWD,
Madurai Region,
Madurai

Lr.No: / SE(D)/AEE 1/T 1 /F.1437/2020/ dated : 28.12.2020

Sir,

Sub: TNIAM Project – Phase III DPR – Nambiyar Sub basin - Technical Review Comments given by Mr.R.K. Malhotra, Consultant, World Bank – Revised Design Flood – Adequacy of length of weir for 8 Tanks checked – Communicated - reg.

Ref: 1. Engineer-in-Chief, WRD& Chief Engineer (GI), PWD, Chennai Lr.No. TNIAMP/F142/Phase III/2019/Dt. 10.11.2020
2. Chief Engineer, Madurai Region, PWD., WRD., Madurai Lr. No. OT3 / AE5 / TNIAMP Phase III / 2020 / dated dt.24.12.2020

In the reference 2nd cited the Chief Engineer, Madurai Region has sent the Hydraulic particulars of the following 8 Nos. of tanks under Nambiyar Sub Basin along with the calculations for the Maximum flood discharge based on rainfall intensity, for checking the adequacy of the existing weirs.

1. Nadukkamparaikulam Tank
2. Nambikurichikulam Tank
3. Kannankulam Tank
4. Palathikulam Tank
5. Sinnammalpuram & PudukulamTank
6. Veetrithankulam Tank
7. Achampadukulam Tank
8. Panisakulam Tank

On scrutiny of the details furnished by the Chief Engineer, Madurai Region it is observed that the length of the weirs for the above 8 Tanks under Nambiyar Sub Basin is found to be sufficient to dispose the discharge based on the rainfall intensity as furnished in Annexure 1.

Encl.: Annexure 1

Sd/-
Superintending Engineer, PWD
Designs Circle, WRD., Chennai - 5.

Copy submitted to the Engineer-in-Chief, WRD & Chief Engineer (GI), PWD., Chepauk Chennai – 5 for information.

Copy submitted to the Chief Engineer, PWD., DR & CS, WRD., Chepauk Chennai – 5 for information.

Copy to the Superintending Engineer, PWD., Thambiraparani Basin Circle, Tirunelveli for information and further action.

Copy to the Executive Engineer, PWD., Chittar Basin Division., WRD., Tenkasi @ Kudiyiruppu for further action.

28/12/2020

For Superintending Engineer, PWD
Designs Circle, WRD., Chennai - 5.

28/12/2020

TN IAMP - PHASE III

ADEQUACY CHECK OF LENGTH OF WEIRS FOR THE TANKS UNDER NAMBIYAR SUB BASIN

S. No.	Name of Tank	FTL in m	MWL in m	Head over crest in m	Discharge based on rainfall intensity in cusecs (as furnished by the Chief Engineer, PWD Madurai Region)	Existing		Remarks
						Length of weir in m	Discharging capacity in cusecs	
1	Nadukkamparaikulam Tank	121.790	122.390	0.600	33.54	3.10	87.93	Existing length of surplus weir is sufficient to carry the discharge based on Rainfall intensity
2	Nambikurichikulam Tank	43.440	43.740	0.300	103.11	11.45	114.77	Existing length of surplus weir is sufficient to carry the discharge based on Rainfall intensity
3	Kannankulam Tank	30.650	31.250	0.600	56.85	8.20	232.01	Existing length of surplus weir is sufficient to carry the discharge based on Rainfall intensity
4	Palathikulam Tank	23.525	23.825	0.300	94.64	17.80	178.34	Existing length of surplus weir is sufficient to carry the discharge based on Rainfall intensity

5	Sinnammalpuram & PudukulamTank	75.930	76.430	0.500	102.41	9.30	200.23	Existing length of surplus weir is sufficient to carry the discharge based on Rainfall intensity
6	Veetrithankulam Tank	65.200	65.500	0.300	49.08	7.00	69.92	Existing length of surplus weir is sufficient to carry the discharge based on Rainfall intensity
7	Achampadukulam Tank	83.605	83.905	0.300	107.35	11.00	110.18	Existing length of surplus weir is sufficient to carry the discharge based on Rainfall intensity
8	Panisakulam Tank	67.400	68.000	0.600	117.24	7.45	210.83	Existing length of surplus weir is sufficient to carry the discharge based on Rainfall intensity

28/12/2020

for Superintending Engineer, P.W.D.,
Designs Circle, W.R.D.,
Chepauk, Chennai-600 005.

Report on Maximum Flood Discharge Occurred

S.No	Name of Tank	Designed Discharge (cusecs)	Observed Maximum Flood Discharge (cusecs)	No of past Years Accounted for	Remark
1	Nadukkamparaikulam	87.93	70.81	13	The observed maximum discharge passed safely through weir.
2	Nambikurichikulam	114.77	92.47	11	The observed maximum discharge passed safely through weir.
3	Kannankulam	232.01	192.74	11	The observed maximum discharge passed safely through weir.
4	Palathikulam	178.34	152.13	11	The observed maximum discharge passed safely through weir.
5	Sinnammalpuram and Pudukulam	200.23	159.74	13	The observed maximum discharge passed safely through weir.
6	Veetrithankulam	69.92	56.53	13	The observed maximum discharge passed safely through weir.
7	Achampadukulam	110.18	94.01	13	The observed maximum discharge passed safely through weir.
8	Panisakulam	210.83	170.18	13	The observed maximum discharge passed safely through weir.

23/11/24
Assistant Engineer, PWD/WRD.,
Irrigation Section,
Vallioor

Assistant Executive Engineer, PWD/WRD.,
Nambiyar Basin Sub Division,
Nanguneri

23/11/24
Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

TAMILNADU IRRIGATED AGRICULTURE MODERNIZATION PROJECT

Phase – III Sub Basin Nambiyar Sub Basin

Comments on DPR offered by Mr. R.K. Malhotra, Consultant World Bank

Certificate for Adequacy of weir length for flood discharge and Earth fill Quantities

1. Certified that weir adequacy for 8 weirs in the Nadukkamparaikulam, Nambikurichikulam, Kannankulam, Palathikulam, Sinnammalpuram and Pudukulam, Veetrithankulam, Achampadukulam and Panisakulam are adequate to safely evacuate the design discharge during flood.
2. Certified that the earth fill quantities provided in the cost estimate are worked by superimposing the proposed profile on the existing cross section and with cut benches/ serrations as provided in the L.S and C.S drawings enclosed in Plan Volume 1/2 and Plan Volume 2/2 of Nambiyar Sub basin.

Assistant Engineer, PWD/WRD.,
Irrigation Section,
Vallioor

Assistant Executive Engineer,
PWD/WRD.,
Nambiyar Basin Sub Division,
Nanguneri

Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

Superintending Engineer, PWD/WRD.,
Tamirabarani Basin Circle,
Tirunelveli

Chief Engineer, PWD/WRD.,
Madurai Region,
Madurai.

3. HYDRAULIC PARTICULARS OF THE COMPONENTS

3.1 Hydraulic Particulars Of Tanks (System & Non System) Including Supply Channels

Sl.No.	District	Taluk	Block	Name of Tank	System Tank / Non System Tank	Tank Unicode	Ayacut (ha)	Capacity (Mcft)	Number of Fillings	Free Catchment (sqkm)	Combined Catchment (sqkm)	Water Spread Area (sqkm)	No.of Sluices	Deepest Sluice Sill level (m)	FTL (m)	MWL (m)	TBL (m)	Storage Depth (m)	Free Board	Nos and Length of Weir		Dischage (Cusecs)	Length of Bund (m)	Height of Bund (m)	Length of Supply Channel (m)	Bed Width (m)	Upper Tank	Lower Tank	Remarks
																				Nos	Length (m)								
1	2	3	4	5	6	6A	7	8	9	10	11	12	13	13A	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Cluster I																													
1	Tirunelveli	Nanguneri	Kalakkad	Nadukkamparaikulam	System Tank	TNNM-02-T0137	14.340	2.110	2	0.268	1.338	0.00058	2	118.705	121.790	122.390	123.390	3.085	1.00	1	3.1	87.93	663	4.685	300	4.00	Channel	River	
2	Tirunelveli	Nanguneri	Kalakkad	Kesavaneri Kulam	System Tank	TNNM-02-T0148	108.490	5.950	1	0.172	0.686	0.00078	1	113.500	119.960	120.560	121.560	6.46	1.00	1	39	30.1197	650	8.06	1000	6.00	Padalayar kulam	ponnakurichi kulam	
3	Tirunelveli	Nanguneri	Kalakkad	Padalayar Tank	System Tank	TNNM-02-T0138	203.840	27.130	1.5	1.833	6.546	0.00449	2	115.900	121.055	121.655	122.655	5.155	1.00	1	34.4	23.09	2650	6.755	5000	3.00	Karisal kulam	Kesavaneri kulam	
4	Tirunelveli	Nanguneri	Kalakkad	Karisalkulam	System Tank	TNNM-02-T0139	83.500	13.730	2.5	1.308	4.671	0.00035	2	113.715	119.745	120.745	121.745	6.03	1.00	1	3.6	5.579	1310	8.03	400	2.00	Channel	River	
Cluster II																													
5	Tirunelveli	Radhapuram	Vallioor	Vallioor Puthukulam	System Tank	TNNM-02-T0186	262.300	11.660	2	0.700	0.700	0.00274	1	100.965	103.440	104.140	105.140	2.475	1.00	1	3.3	3.21	1710	4.175	500	6.00	Vallioor Big tank	Ganapathiyar kulam	
6	Tirunelveli	Radhapuram	Vallioor	Devarkulam	System Tank	TNNM-02-T0188	10.030	0.640	3	0.299	0.533	0.00017	1	89.160	89.850	90.150	91.150	0.69	1.00	1	4	1.883	500	1.99	2000	2.00	Vallioor puthukulam	Ganapathiyar kulam	
7	Tirunelveli	Radhapuram	Vallioor	Ganapathiyarkulam	System Tank	TNNM-02-T0187	4.450	0.250	3	0.393	0.626	8.4E-05	1	87.930	89.770	90.370	91.370	1.84	1.00	1	3.2	2.609	380	3.44	1000	2.00	Dever kulam	pothayadi kulam	
8	Tirunelveli	Radhapuram	Vallioor	Alankulam	System Tank	TNNM-02-T0183	12.020	5.750	1	2.864	11.215	0.00138	1	66.650	69.795	70.395	71.395	3.145	1.00	1	5.85	16.1	1560	4.745	3500	9.00	Vattakulam	Nedunkulam	

Sl.No.	District	Taluk	Block	Name of Tank	System Tank / Non System Tank	Tank Unicode	Ayacut (ha)	Capacity (Mcft)	Number of Fillings	Free Catchment (sqkm)	Combined Catchment (sqkm)	Water Spread Area (sqkm)	No.of Sluices	Deepest Sluice Sill level (m)	FTL (m)	MWL (m)	TBL (m)	Storage Depth (m)	Free Board	Nos and Length of Weir		Dischage (Cusecs)	Length of Bund (m)	Height of Bund (m)	Length of Supply Channel (m)	Bed Width (m)	Upper Tank	Lower Tank	Remarks
																				Nos	Length (m)								
1	2	3	4	5	6	6A	7	8	9	10	11	12	13	13A	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
9	Tirunelveli	Radhapuram	Vallioor	Vattakulam	System Tank	TNNM-02-T0178	17.610	5.130	1.5	0.119	0.119	0.00141	1	81.435	84.525	84.825	85.825	3.09	1.00	1	4.55	1.1695	1100	4.39	500	4.00	Pandrakulam	Alankulam	
Cluster III																													
10	Tirunelveli	Radhapuram	Radhapuram	Kattayanerikulam	System Tank	TNNM-02-T0196	27.020	12.910	1	0.375	5.640	0.00474	1	53.225	54.950	55.550	56.550	1.725	1.00	1	27.3	20.9072	1500	3.325	5000	5.00	Kallikulam	Eluvar kulam	
11	Tirunelveli	Radhapuram	Radhapuram	Eluvarkulam	System Tank	TNNM-02-T0197	18.620	8.400	1	2.426	8.532	0.00263	1	47.665	50.165	50.765	51.765	2.50	1.00	1	22.6	15.6105	1010	4.10	4000	5.00	Kattayaneri kulam	Kuravar kulam	
12	Tirunelveli	Radhapuram	Radhapuram	Valatharvalavaith ankulam	System Tank	TNNM-02-T0213	42.610	13.200	2	4.000	18.326	0.00339	2	49.105	52.095	52.995	53.995	2.99	1.00	1	20	86.6555	1750	4.89	3500	7.00	Kallikulam	Kurinchi kulam	
13	Tirunelveli	Radhapuram	Radhapuram	Mannarkulam	System Tank	TNNM-02-T0228	12.730	13.020	1.5	2.785	4.004	0.00339	1	48.985	52.045	52.545	53.545	3.06	1.00	1	35.4	14.2642	1500	4.56	2000	7.00	Valathurvalavaithan kulam	Seelathi kulam	
14	Tirunelveli	Radhapuram	Radhapuram	Kurunchikulam	System Tank	TNNM-02-T0214	8.760	5.380	1	0.205	17.270	0.0018	1	48.510	51.050	51.650	52.650	2.54	1.00	1	17	80.4152	1160	4.14	500	10.00	Valathurvalavaithan kulam	Lingam klam	
Cluster IV																													
15	Tirunelveli	Thisayanvilai	Radhapuram	Nambikurichi kulam	System Tank	TNNM-02-T0104	17.120	11.660	1.2	1.503	2.356	0.00274	1	40.965	43.440	43.740	44.740	2.475	1.00	1	11.45	114.77	1710	3.775	3000	3.00	Channel	Peeli kulam	
16	Tirunelveli	Thisayanvilai	Radhapuram	Kannankulam	System Tank	TNNM-02-T0203	9.130	5.920	1	0.671	1.911	0.0019	1	27.600	30.650	31.250	32.250	3.05	1.00	1	8.2	232.01	1200	4.65	2000	6.00	Thuthi kulam	River	
17	Tirunelveli	Thisayanvilai	Radhapuram	Vilimankulam	System Tank	TNNM-02-T0257	13.780	8.260	1.2	1.312	1.566	0.00188	1	10.975	14.500	15.000	15.500	3.525	0.5	1	16.8	8.4	1470	4.525	700	7.00	Uruman kulam	Puliman kulam	

Sl.No.	District	Taluk	Block	Name of Tank	System Tank / Non System Tank	Tank Unicode	Ayacut (ha)	Capacity (Mcft)	Number of Fillings	Free Catchment (sqkm)	Combined Catchment (sqkm)	Water Spread Area (sqkm)	No.of Sluices	Deepest Sluice Sill level (m)	FTL (m)	MWL (m)	TBL (m)	Storage Depth (m)	Free Board	Nos and Length of Weir		Dischage (Cusecs)	Length of Bund (m)	Height of Bund (m)	Length of Supply Channel (m)	Bed Width (m)	Upper Tank	Lower Tank	Remarks
																				Nos	Length (m)								
1	2	3	4	5	6	6A	7	8	9	10	11	12	13	13A	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
18	Tirunelveli	Thisayanvilai	Radhapuram	Aimudi kulam	System Tank	TNNM-02-T0210	7.290	4.530	1	1.884	1.884	0.00253	1	27.810	28.620	29.220	30.220	0.81	1.00	1	5.6	7.457	1540	2.41	3500	2.00	Channel	Kannan kulam	
19	Tirunelveli	Thisayanvilai	Radhapuram	Palathikulam	System Tank	TNNM-02-T0248	5.660	13.140	1	1.141	3.11	0.00401	1	21.055	23.525	23.825	24.825	2.47	1.00	1	17.8	178.34	1200	3.77	1000	2.00	Channel	Kailasaperi kulam	
20	Tirunelveli	Thisayanvilai	Radhapuram	Pappankulam	System Tank	TNNM-02-T0249	8.440	10.200	1	0.612	1.359	0.00488	1	20.165	21.695	22.695	23.695	1.53	1.00	1	2	115.33	1705	3.53	1500	3.00	Channel	Sithalan kulam	
21	Tirunelveli	Thisayanvilai	Radhapuram	Periyalankulam	System Tank	TNNM-02-T0256	1.870	2.580	1	0.761	0.761	0.00073	1	23.865	26.095	26.545	27.545	2.23	1.00	1	10.2	8.39	849	3.68	2250	3.00	Sithalan kulam	River	
22	Tirunelveli	Thisayanvilai	Radhapuram	Kailasaperikulam	System Tank	TNNM-02-T0263	4.490	7.560	1	1.102	2.899	0.00199	1	18.230	20.685	20.985	21.985	2.455	1.00	1	15.7	21.3896	1025	3.755	4000	3.00	Palathi kulam	River	
23	Tirunelveli	Thisayanvilai	Radhapuram	Ponathikulam	System Tank	TNNM-02-T0244	24.780	2.970	1.5	0.484	1.242	0.00135	1	28.945	30.675	31.125	32.125	1.73	1.00	1	6.2	2.432	400	3.18	800	3.00	Pudhukurichi kulam	Palathi kulam	
Cluster V																													
24	Tirunelveli	Nanguneri	Nanguneri	Karuthanerikulam	System Tank	TNNM-02-T0145	17.760	4.370	1.5	0.421	0.689	0.00129	1	83.200	86.000	86.300	87.300	2.80	1.00	1	11.1	2.432	1400	4.10	300	4.00	Channel	Illayanainar kulam	
25	Tirunelveli	Radhapuram	Vallioor	Sinammalpuram and pudukulam	System Tank	TNNM-02-T0134	62.410	15.240	1	1.471	1.471	0.00385	3	73.405	75.930	76.430	77.430	2.525	1.00	1	9.3	200.23	1650	4.025	5000	5.00	Thiruvenkadanathapuram periya kulam	Chinnamal puram puthu kulam	
26	Tirunelveli	Nanguneri	Nanguneri	Nallapethankulam	System Tank	TNNM-02-T0152	12.160	2.810	1	1.700	25.408	0.00082	1	83.855	86.035	87.285	88.285	2.18	1.00	1	25.2	104.872	626	4.430	1000	5.00	Kanchirankondan kulam	Kandiyaperi kulam	
27	Tirunelveli	Nanguneri	Vallioor	Kandiaperikulam	System Tank	TNNM-02-T0161	42.460	11.300	1.5	1.697	1.697	0.00325	1	81.830	84.780	85.180	86.180	2.95	1.00	1	2.6	5.985	1450	4.350	800	5.00	Channel	Achampadu kulam	

Sl.No.	District	Taluk	Block	Name of Tank	System Tank / Non System Tank	Tank Unicode	Ayacut (ha)	Capacity (Mcft)	Number of Fillings	Free Catchment (sqkm)	Combined Catchment (sqkm)	Water Spread Area (sqkm)	No.of Sluices	Deepest Sluice Sill level (m)	FTL (m)	MWL (m)	TBL (m)	Storage Depth (m)	Free Board	Nos and Length of Weir		Dischage (Cusecs)	Length of Bund (m)	Height of Bund (m)	Length of Supply Channel (m)	Bed Width (m)	Upper Tank	Lower Tank	Remarks
																				Nos	Length (m)								
1	2	3	4	5	6	6A	7	8	9	10	11	12	13	13A	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
28	Tirunelveli	Radhapuram	Vallioor	Kovanerikulam	System Tank	TNNM-02-T0130	26.530	3.610	1.5	0.268	0.268	0.00168	1	83.975	85.800	86.400	87.400	1.825	1.00	1	0.9	0.9462	1380	3.425	200	3.00	Channel	Soochikulam	
Cluster VI																													
29	Tirunelveli	Radhapuram	Radhapuram	Kallikulam	System Tank	TNNM-02-T0180	10.860	2.480	1	0.176	0.176	0.0009	1	67.020	68.610	69.060	70.060	1.59	1.00	1	1.91	3.357	1574	3.040	3400	6.00	Pandrakulam	Pettai kulam	
30	Tirunelveli	Radhapuram	Vallioor	Karuppukalkulam	Non system Tank	TNNM-02-T0156	4.650	4.950	1	2.875	5.776	0.00132	1	64.150	67.355	67.655	68.655	3.205	1.00	1	6.5	20.372	1120	4.505	500	9.00	Anaikulam	Thankaiyan kulam	
31	Tirunelveli	Radhapuram	Vallioor	Veetrithankulam	Non system Tank	TNNM-02-T0160	4.360	0.410	1	0.174	2.834	0.00015	1	62.750	65.200	65.500	66.500	2.45	1.00	1	7.0	69.92	1400	3.750	1500	6.00	Karrupukal kulam	Sithoor keel kulam	
32	Tirunelveli	Thisayanvilai	Vallioor	Thankaiyankulam	Non system Tank	TNNM-02-T0162	4.160	0.920	1	0.701	5.184	0.0014	1	65.050	66.355	66.655	67.905	1.305	1.25	1	9.3	23.11	663	2.855	800	6.00	Karupukal kulam	Iyappaneri kulam	
33	Tirunelveli	Thisayanvilai	Vallioor	Vilvarayankulam	Non System Tank	TNNM-02-T0169	27.520	23.200	1	2.720	6.801	0.00657	1	78.915	79.720	80.320	81.320	0.805	1.00	1	7.9	10.202	1715	2.405	500	6.00	Iyappaneri kulam	Thamba kulam	
34	Tirunelveli	Radhapuram	Vallioor	Achampadukulam	System Tank	TNNM-02-T0164	22.240	12.300	1	1.204	2.901	0.00384	1	80.945	83.605	83.905	84.905	2.66	1.00	1	11.0	110.18	2010	3.960	3000	4.00	Kandiyaperi kulam	Thanuvan kulam	
35	Tirunelveli	Radhapuram	Vallioor	Thanuvankulam	System Tank	TNNM-02-T0174	3.260	29.280	1	0.453	2.338	0.00384	1	80.945	83.605	83.905	84.905	2.66	1.00	1	19.3	19.924	754	3.960	200	4.00	Achampadu kulam	Poopillai kulam	
36	Tirunelveli	Radhapuram	Vallioor	Poopillaikulam	System Tank	TNNM-02-T0171	3.940	29.280	1	0.822	3.160	0.00384	1	80.945	83.605	83.905	84.905	2.66	1.00	1	19.3	19.924	987	3.960	2000	4.00	Thanuvan kulam	Kannavaraya n kulam	
37	Tirunelveli	Thisayanvilai	Vallioor	Panisakulam	Non system Tank	TNNM-01-T0250	33.050	4.930	1.5	1.561	2.207	0.00737	2	65.550	67.400	68.000	69.000	1.85	1.00	1	7.45	210.83	1800	3.450	6000	6.00	Channel	Vijayanaraya nam kulam	

Sl.No.	District	Taluk	Block	Name of Tank	System Tank / Non System Tank	Tank Unicode	Ayacut (ha)	Capacity (Mcft)	Number of Fillings	Free Catchment (sqkm)	Combined Catchment (sqkm)	Water Spread Area (sqkm)	No.of Sluices	Deepest Sluice Sill level (m)	FTL (m)	MWL (m)	TBL (m)	Storage Depth (m)	Free Board	Nos and Length of Weir		Dischage (Cusecs)	Length of Bund (m)	Height of Bund (m)	Length of Supply Channel (m)	Bed Width (m)	Upper Tank	Lower Tank	Remarks
																				Nos	Length (m)								
1	2	3	4	5	6	6A	7	8	9	10	11	12	13	13A	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
38	Tirunelveli	Thisayanvilai	Vallioor	Thambakulam	Non system Tank	TNNM-02-T0175	6.370	10.340	2	0.000	0.000	0.00241	1	80.240	82.865	83.465	84.465	2.625	1.00	1	10	8.56	1345	4.225	2000	5.00	Vilvarayan kulam	River	
39	Tirunelveli	Thisayanvilai	Vallioor	Sittur Keelkulam	Non system Tank	TNNM-02-T0154	23.390	10.160	1	1.063	5.779	0.00372	1	55.360	57.360	57.710	58.710	2	1.00	1	5.6	5.3991	2160	3.350	3500	6.00	Sithoor kulam	River	
40	Tirunelveli	Thisayanvilai	Vallioor	Iyyapanerikulam	Non system Tank	TNNM-02-T0167	4.160	3.740	1.5	0.937	6.121	0.00119	2	59.940	62.050	62.500	63.500	2.11	1.00	1	8.5	21.6929	1185	3.560	2000	4.00	Thangiyan kulam	Vilvarayan kulam	
Total Ayacut							**1228.16 ha**																						

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6. REHABILITATION OF IRRIGATION INFRASTRUCTURES

6.4 Tank Details with Free Board Provided

Sl .No	Name of the Tank	Maximum Height of Bund in m	Free Board		Length of Bund in m	Remarks
			Provided previously in m	Provided now in		
1	Nadukkamparaikulam	4.685	1.00	1.50	663	Proposed to raise the Bund as per standards
2	Kesavaneri Kulam	8.06	1.00	1.50	650	Proposed to raise the Bund as per standards
3	Padalayar Tank	6.755	1.00	1.50	2650	Proposed to raise the Bund as per standards
4	Karisalkulam	8.03	1.00	1.50	1310	Proposed to raise the Bund as per standards
5	Vallioor Puthukulam	4.175	1.00	1.50	1710	Proposed to raise the Bund as per standards
6	Devarkulam	1.99	1.00	1.25	500	Proposed to raise the Bund as per standards
7	Ganapathiyarkulam	3.44	1.00	1.50	380	Proposed to raise the Bund as per standards
8	Alankulam	4.745	1.00	1.50	1560	Proposed to raise the Bund as per standards
9	Vattakulam	4.39	1.00	1.50	1100	Proposed to raise the Bund as per standards
10	Kattayanerikulam	3.325	1.00	1.50	1500	Proposed to raise the Bund as per standards
11	Eluvarkulam	4.10	1.00	1.50	1010	Proposed to raise the Bund as per standards
12	Valatharvalavaithankulam	4.89	1.00	1.50	1750	Proposed to raise the Bund as per standards
13	Mannarkulam	4.56	1.00	1.50	1500	Proposed to raise the Bund as per standards
14	Kurunchikulam	4.14	1.00	1.50	1160	Proposed to raise the Bund as per standards
15	Nambikurichikulam	3.775	1.00	1.50	1710	Proposed to raise the Bund as per standards
16	Kannankulam	4.65	1.00	1.50	1200	Proposed to raise the Bund as per standards
17	Vilimankulam	4.525	0.50	1.50	1470	Proposed to raise the Bund as per standards
18	Aimudi kulam	2.41	1.00	1.25	1540	Proposed to raise the Bund as per standards
19	Palathikulam	3.77	1.00	1.50	1200	Proposed to raise the Bund as per standards
20	Pappankulam	3.53	1.00	1.50	1705	Proposed to raise the Bund as per standards
21	Periyalankulam	3.68	1.00	1.50	849	Proposed to raise the Bund as per standards
22	Kailasaperikulam	3.755	1.00	1.50	1025	Proposed to raise the Bund as per standards

Sl .No	Name of the Tank	Maximum Height of Bund in m	Free Board		Length of Bund in m	Remarks
			Provided previously in m	Provided now in		
23	Ponathikulam	3.18	1.00	1.50	400	Proposed to raise the Bund as per standards
24	Karuthanerikulam	4.10	1.00	1.50	1400	Proposed to raise the Bund as per standards
25	Sinammalpuram and pudukulam	4.025	1.00	1.50	1650	Proposed to raise the Bund as per standards
26	Nallapethankulam	4.430	1.00	1.50	626	Proposed to raise the Bund as per standards
27	Kandiaperikulam	4.350	1.00	1.50	1450	Proposed to raise the Bund as per standards
28	Kovanerikulam	3.425	1.00	1.50	1380	Proposed to raise the Bund as per standards
29	Kallikulam	3.040	1.00	1.25	1574	Proposed to raise the Bund as per standards
30	Karuppukalkulam	4.505	1.00	1.50	1120	Proposed to raise the Bund as per standards
31	Veetrithankulam	3.750	1.00	1.50	1400	Proposed to raise the Bund as per standards
32	Thankaiyankulam	2.855	1.25	1.25	663	Bund Top is BT road existing Free board is maintained.
33	Vilvarayankulam	2.405	1.00	1.25	1715	Proposed to raise the Bund as per standards
34	Achampadukulam	3.960	1.00	1.50	2010	Proposed to raise the Bund as per standards
35	Thanuvankulam	3.960	1.00	1.50	754	Proposed to raise the Bund as per standards
36	Poopillaikulam	3.960	1.00	1.50	987	Proposed to raise the Bund as per standards
37	Panisakulam	3.450	1.00	1.50	1800	Proposed to raise the Bund as per standards
38	Thambakulam	4.225	1.00	1.50	1345	Proposed to raise the Bund as per standards
39	Sittur Keelkulam	3.350	1.00	1.50	2160	Proposed to raise the Bund as per standards
40	Iyyapanerikulam	3.560	1.00	1.50	1185	Proposed to raise the Bund as per standards

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6.5 Details of proposals in each Infrastructure of the sub basin Package No. I

Sl. No	Name of tank/ Anicut/ Reservoir	Bund				Sluice					Weir						Total
		Rehabilitation to Bund		Model Section		Total No. sluices	Repairs to sluice		Reconstruction of sluice		Total No. weirs	Length of weir	Reconstruction to weir		Repairs to weir		
		Length (m)	Amt in Lakhs	No	Amt in Lakhs		No	Amt in Lakhs	No	Amt in Lakhs			No	Amt in Lakhs	No	Amt in Lakhs	Amt in Lakhs
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
A	TANKS																
1	Nadukkamparaikulam	663	7.26	1	0.85	2					1	3.1			1	0.58	8.69
2	Kesavaneri Kulam	650	8.06	1	0.87	1					1	39					8.93
3	Padalayar Tank	2650	29.83	1	0.86	2			1	13.24	1	34.4					43.93
4	Padalayar Kal (Anicut Supply Channel)					4	1	3.23									3.23
5	Karisalkulam	1310	13.84	1	0.85	2					1	3.6					14.69
6	Vallioor Puthukulam	1710	18.19	1	0.86	1			1	10.52	1	3.3					29.57
7	Devarkulam	500	4.42	1	0.86	1					1	4					5.28
8	Ganapathiyarkulam	380	3.52	1	0.86	1					1	3.2					4.38
9	Alankulam	1560	15.65	1	0.87	1					1	5.85					16.52
10	Vattakulam	1100	11.15	1	0.86	1					1	4.55					12.01
11	Kattayanerikulam	1500	14.46	1	0.86	1					1	27.3					15.32
12	Eluvarkulam	1010	9.87	1	0.86	1					1	22.6					10.73
13	Valatharvalavaithankulam	1750	17.69	1	0.86	2					1	20					18.55
14	Mannarkulam	1500	15.09	1	0.86	1					1	35.4					15.95
15	Kurunchikulam	1160	11.63	1	0.86	1					1	17					12.49
16	Nambikurichikulam	1710	16.98	1	0.86	1			1	10.38	1	11.45			1	1.72	29.94

Sl. No	Name of tank/ Anicut/ Reservoir	Bund				Sluice					Weir						Total
		Rehabilitation to Bund		Model Section		Total No. sluices	Repairs to sluice		Reconstruction of sluice		Total No. weirs	Length of weir	Reconstruction to weir		Repairs to weir		
		Length (m)	Amt in Lakhs	No	Amt in Lakhs		No	Amt in Lakhs	No	Amt in Lakhs			No	Amt in Lakhs	No	Amt in Lakhs	Amt in Lakhs
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
17	Kannankulam	1200	12.02	1	1.03	1					1	8.2			1	1.25	14.3
18	Vilimankulam	1470	16.31	1	1.04	1					1	16.8					17.35
19	Aimudi kulam	1540	13.02	1	0.86	1					1	5.6					13.88
20	Palathikulam	1200	11.51	1	0.86	1					1	17.8			1	3.05	15.42
21	Pappankulam	1705	16.09	1	0.86	1					1	2					16.95
22	Periyalankulam	849	8.59	1	0.86	1					1	10.2					9.45
23	Kailasaperikulam	1025	10.36	1	0.85	1	1	5.18			1	15.7					16.39
24	Ponathikulam	400	3.92	1	0.86	1			1	7.02	1	6.2					11.8
25	Karuthanerikulam	1400	13.62	1	0.86	1					1	11.1					14.48
26	Sinammalpuram and pudukulam	1650	16.17	1	0.86	3			1	10.18	1	9.3			1	1.41	28.62
27	Nallapethankulam	626	6.48	1	0.86	1			1	10.91	1	25.2					18.25
28	Kandiaperikulam	1450	14.46	1	0.87	1					1	2.6					15.33
29	Kovanerikulam	1380	13.24	1	0.86	1			1	8.12	1	0.9					22.22
30	Kallikulam	1574	13.63	1	0.87	1					1	1.91					14.5
31	Karuppukalkulam	1120	11.51	1	0.86	1					1	6.5					12.37
32	Veetrithankulam	1400	13.68	1	0.86	1					1	7			1	1.23	15.77
33	Thankaiyankulam	663	2.45	1	1.04	1			1	8.83	1	9.3					12.32
34	Vilvarayankulam	1715	14.69	1	0.86	1					1	7.9					15.55

Sl. No	Name of tank/ Anicut/ Reservoir	Bund				Sluice					Weir						Total
		Rehabilitation to Bund		Model Section		Total No. sluices	Repairs to sluice		Reconstruction of sluice		Total No. weirs	Length of weir	Reconstruction to weir		Repairs to weir		
		Length (m)	Amt in Lakhs	No	Amt in Lakhs		No	Amt in Lakhs	No	Amt in Lakhs			No	Amt in Lakhs	No	Amt in Lakhs	Amt in Lakhs
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
35	Achampadukulam	2010	19.98	1	0.86	1					1	11			1	1.9	22.74
36	Thanuvankulam	754	7.64	1	0.85	1					1	19.3					8.49
37	Poopillaikulam	987	10.17	1	1.04	1	1	5.18			1	19.3					16.39
38	Panisakulam	1800	17.31	1	0.85	2			1	7.7	1	7.45			1	1.3	27.16
39	Thambakulam	1345	13.63	1	0.86	1					1	10					14.49
40	Sittur Keelkulam	2160	20.08	1	0.86	1			1	8.07	1	5.6					29.01
41	Iyyapanerikulam	1185	12.15	1	0.86	2					1	8.5					13.01
	Tanks Total	**51761**	**510.35**	**40**	**35.1**	**52**	**3**	**13.59**	**10**	**94.97**	**40**	**480.11**	**0**	**0**	**8**	**12.44**	**666.45**
		TANKS TOTAL															**666.45**
		TOTAL															666.45
		Provision for GST (12%)															79.97
		Provision for Unforeseen items, advertisement charges, Photographic Charge, documentation (2.5%)															18.66
		Provision for Labour Welfare Fund (1%)															7.65
		Provision for OFD works including field channel lining,measuring devices (2200/Ha).															28.88
		WRD Component Total															**801.61**
		Environment Component Total															7
		Grand Total															**808.61**

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6.6 DETAILS OF PROPOSAL IN EACH INFRASTRUCTURE OF SUB BASIN – TANKS AND ANICUT ABSTRACT

Sl. No	For Rehabilitation Package No	Ayacut in Ha	No of tanks	Bund		Sluice Repair		Sluice Reconstruction		Weir		Rehabilitation of Anicut Supply channel (Repair to sluice)		Total Amt in Lakhs
				Length (m)	Amt in Lakhs	No	Amt in Lakhs	No	Amt in Lakhs	No	Amt in Lakhs	Length (km)	Amt in Lakhs	
1	Package No 01	1312.83	40	51761	545.45	3	10.36	10	94.97	8	12.44	4.00	3.23	666.45
2	Provision for GST @ 12%													79.97
3	Provision for Unforeseen items, advertisement charges, Photographic Charge, documentation (2.5%)													18.66
4	Provision for Labour Welfare Fund (1%)													7.65
5	Provision for OFD works including field channel lining,measuring devices(Rs2200/Ha)													28.88
6	Provision for Environmental component													7.00
														808.61

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6.7 WRD - COST TABLE

Ayacut : 1312.83 Ha

Sl.No	Description Of Work	Qty Proposed	Amount in Lakhs
1	Bund Standardisation (m)	51761	545.45
2	Repairs to Sluice (No)	3	13.59
3	Reconstruction of Sluices (Nos)	10	94.97
4	Repairs to Weirs (Nos)	8	12.44
	Sub Total 1		**666.45**
5	**Add GST @ 12 %**		**79.97**
6	Provision for Unforeseen items, Advertisement Charges, Photographic Charges	2.50%	18.66
7	Provision for Labour Welfare Fund	1%	7.65
8	OFD Works:		28.88
9	Provision for Environmental Component		7.00
10	Provision for Ground Water Component		--
	GRAND TOTAL		**808.61**

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6.8 Details of Packages

6.8.1 Package Details

Sl. No.	Name of Tank/Anicut	Amount in Lakh
	Package – I	
1.	Rehabilitation and Modernisation of 4 Tanks in Kalakad Block of Nanguneri Taluk, 2 Tanks in Nanguneri Block &Taluk, 12 Tanks in Vallioor Block of Radhapuram Taluk, 6 Tanks in Radhapuram Block & Taluk, 9 Tanks in Radhapuram Block of Thisaiyanvillai Taluk, 6 Tanks in Vallioor Block of Thisaiyanvillai Taluk and 1 Tank in Vallioor Block of Nanguneri Taluk and 1 Anicut supply channel in Kalakkad Block of Nanguneri Taluk in Tirunelveli District of Nambiyar Sub basin.	666.45
	ADD GST @ 12%	79.97
	Provision for P.S Charges, Contingencies& Unforeseen items, advertisement charges, Photographic Charge, documentation (2.5%)	18.66
	Provision for Labour Welfare Fund (1%)	7.65
	Provision for OFD works including field channel lining,measuring devices (Rs2200/Ha)	28.88
	Total	**801.61**

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NAME OF WORK: - Rehabilitation and Modernisation of 4 Tanks in Kalakad Block of Nanguneri Taluk, 2 Tanks in Nanguneri Block &Taluk, 12 Tanks in Vallioor Block of Radhapuram Taluk, 6 Tanks in Radhapuram Block & Taluk, 9 Tanks in Radhapuram Block of Thisaiyanvillai Taluk, 6 Tanks in Vallioor Block of Thisaiyanvillai Taluk and 1 Tank in Vallioor Block of Nanguneri Taluk and 1 Anicut supply channel in Kalakkad Block of Nanguneri Taluk in Tirunelveli District of Nambiyar Sub basin.

6.8.2.Bill of Quantites

Sl. No	Description of work	Quantity	Unit	Rate in Figures and Words	Amount
1	Clearing light jungle and disposing of the same as directed by the Engineer in charge of the works and as per technical specification. (Specification No. 3.2.1 to 3.2.4)	**926010.00** (Nine Lakh Twenty six Thousand and Ten Square Metre only)	1 M^2 (One Square Metre)	4.40 (Rupees Four and Paise Forty only)	**4074444**
2	Earthwork excavation for cut opening tank bund in 4(H): 1(V) excavation with initial lead of 10m and lift of 2m in hard stiff clay , stiff black cotton soil, hard red earth, shale"s, murams, stony earth and earth mixed with small size boulders and hard gravelly soil etc, complete as directed by the Engineer in charge of works and as per the technical specifications.	**5908.00** (Five Thousand Nine Hundred and Eight Cubic Metre only)	1 M^3 (One Cubic Metre)	83.80 (Rupees Eighty three and Paise Eighty only)	**495090**
3	Dismantling, clearing away and carefully stacking material and without disturbing nearby structure useful for reuse for any thickness of brick or stone masonry in Cement Mortar walls under 3 (Three) meters high etc, complete as directed by the Engineer in charge of works and as per the technical specifications [specification 5.4C)	**266.04** (Two Hundred and Sixty Six point Zero Four Cubic Metre only)	1 M^3 (One Cubic Metre)	193.00 (Rupees One Hundred Ninety Three only)	**51346**
4	Dismantling, clearing away and carefully stacking material and without damaging the near by structures if any ,clearing away plain cement concrete as directed by the Engineer in charge of the works as per technical Specification [specification 4.6.G] cement concrete	**140.00** (One Hundred Fourty Cubic Metre only)	1 M^3 (One Cubic Metre)	332.00 (Rupees Three Hundred Thirty Two only)	**46480**

Sl. No	Description of work	Quantity	Unit	Rate in Figures and Words	Amount
5	Earth work excavation for foundation in all kinds of soils and sub soils except hard rock requiring blasting full depth as may be directed and depositing the surplus earth in places shown by the Engineer in - charge of work and leveling the same with all leads and lifts including shoring, strutting, shuttering, baling out water wherever necessary and refilling the sides of foundation with excavated earth in layers of 15cm thick well rammed and consolidated etc. complete, complying with technical specifications and drawings as directed by the Engineer in - charge of work. (Specification No.4.2.2.)	**1673.81** (One thousand six hundred and Seventy three point eight one Cubic Metre only)	1 M^3 (One Cubic Metre)	177.37 (Rupees One Hundred Seventy Seven and paise thirty seven only)	**296884**
6	Random Rubble masonry in Cement mortar 1:4 (One cement and four sand by volume mixed mechanically in approved mixer) using new hard granite stones and bond stones from approved sources including simultaneous pointing of the exposed surface with same mortar and all incidental charges such as bailing out water, watering, curing, finishing etc, complete as directed by the Engineer in charge of works and as per the technical specifications	**440.00** (four hundred and forty Cubic Metre only)	1 M^3 (One Cubic Metre)	4547.70 (Rupees four thousand five hundred and forty-seven and paise seventy only)	**2000988**
7	Providing and placing in Position of Plain cement concrete of grade M10 using hard broken stone aggregate of maximum nominal size of 40mm to IS specified grading mixing by mixer machine including dewatering the placement site,laying the concrete in layers and in bays ,compacting and finishing the surface with all leads and lifts watering curing to attain the profile and strength as specified for various depth and height and above ground level etc complete as directed by the Engineer in charge of work complying with the standard specification	**352.65** (Three hundred and fifty two point six five Cubic Metre only)	1 M^3 (One Cubic Metre)	4577.70 (Rupees four thousand five hundred and seventy-seven and paise seventy only)	**1614326**
8	Providing and placing in Position of Plain cement concrete of grade M15 using hard broken stone aggregate of maximum nominal size of 20mm to IS specified grading mixing by mixer machine including dewatering the placement site, laying the concrete in layers and in bays vibrating, compacting and finishing the surface with all leads and lifts watering curing to attain the profile and strength as specified in the drawing for various depth and height below and above ground level etc	**17.53** (Seventeen point five three Cubic Metre only)	1 M^3 (One Cubic Metre)	5402.10 (Rupees five thousand four hundred and two and paise ten only)	**94699**

Sl. No	Description of work	Quantity	Unit	Rate in Figures and Words	Amount
	complete as directed by the Engineer in charge of work complying with the standard specification				
9	Providing and placing in position of plain Cement concrete of grade M15usinghard well graded aggregates with the nominal maximum size of coarse aggregate of 40mm (60%) and 20mm (40%); weigh batching the ingredients and mixing in approved mixers/batching plant (to produce concrete of the specified characteristic strength of 15 N/mm2 at 28days) including dewatering the placement site by bailing/pumping and by diverting wherever necessary; laying the concrete in layers of not exceeding 15 cm thick and in bays; vibrating, compacting and finishing the surface with all leads and lifts; watering curing complete so as to attain the profile and strength specified in the approved drawing & specifications and Including the cost component of providing rigid and smooth centering for soffits of concrete slab or plain surface wherever necessary for various depths below ground level and various heights above ground level etc., complete as directed by the Engineer in charge of works and as per the technical specifications.				
a	Centering with strutting	**644.33** (Six hundred and Fourty four point three three Cubic Metre only)	1 M^3 (One Cubic Metre)	7093.38 (Rupees Seven thousand and ninety three and paise thirty eight only)	**4570477**
b	Centering without strutting	**429.54** (Four hundred and twenty nine point five four Cubic Metre only)	1 M^3 (One Cubic Metre)	6119.09 (Rupees Six thousand one hundred and nineteen and paise nine only)	**2628394**
10	Providing and placing in Position of Plain cement concrete of grade M20 using hard broken stone aggregate of maximum nominal size of 20mm to IS specified grading mixing by mixer machine including dewatering the placement site, laying the concrete in layers and in bays vibrating, compacting and finishing the surface with all leads and lifts watering curing to attain the profile and strength as specified in the	**31.23** (thirty-one point two three Cubic Metre only)	1 M^3 (One Cubic Metre)	5906.03 (Rupees five thousand nine hundred and six and paise three only)	**184445**

Sl. No	Description of work	Quantity	Unit	Rate in Figures and Words	Amount
	drawing for various depth and height below and above ground level etc complete as directed by the Engineer in charge of work complying with the standard specification				
11	Providing and placing in position of Reinforced cement concrete of grade M 25 using hard well gradedaggregates with the nominal maximum size of coarse aggregate of 20mm weigh batching the ingredients and mixing in approved mixers/batching plant (to produce concrete of the specified characteristic strength of 25N/mm2 at 28 days) including dewatering the placement site by bailing/pumping and by diverting wherever necessary laying the concrete in layers of not exceeding 15cm thick and in bays vibrating, compacting and finishing the surface with all leads and lifts, watering curing complete so as to attain the profile and strength specified in the approved drawing & specifications and Including the cost component of providing rigid and smooth centering for soffits of reinforced cement concrete slab or plain surface wherever necessary for various depths below ground level and various heights above ground level etc., complete as directed by the Engineer in charge of works and as per the technical specifications.	**113.05** (One hundred and Thirteen point zero five Cubic Metre only)	1 M^3 (One Cubic Metre)	7571.14 (Rupees seven thousand five hundred and seventy one and paise fourteen only)	**855917**
12	Plastering in Cement mortar 1:4 (One cement four sand by volume) 20 mm thick including finishing, curing using mixer machine for mixing mortar etc, complete as directed by the Engineer incharge of works and as per the technical specifications	**573.17** (five hundred and seventy-three point one seven Square Metre only)	1 M^2 (One Square Metre)	406.44 (Rupees four hundred and six and paise forty four only)	**232959**
13	Supplying, fabricating and placing in position of HSD (high Yield Strength) bars for all reinforced cement concrete works including cost of binding wire, steel rods, conveyance charges and labour charges etc., complete, complying with standard specifications and as directed by the Engineer in - charge of work.. (Specification No.9.1 to 9.12.1)	**67.63** (Sixty seven point six three Quintal only)	1 Qtl (One Quintal)	6937.40 (Rupees six thousand nine hundred and thirty-seven and Paise Forty only)	**469176**
14	Supplying and fixing new cut stone fully dressed to size all faces and set in cement mortar 1:3 (One cement and three sand by volume) mixed mechanically in approved	**6.00** (Six Cubic Metre only)	1 M^3 (One Cubic Metre)	7514.36 (Rupees seven thousand five hundred	**45086**

Sl. No	Description of work	Quantity	Unit	Rate in Figures and Words	Amount
	mixer) including all incidental charges such as finishing, curing etc., complete as directed by the Engineer in charge of works and as per technical specifications.			and fourteen and Paise thirty six only)	
15	Fabrication, Supply and erection of Screw Gearing Steel Shutter of size 0.50x0.50, made out of 8mm thick Mild Steel plates and 65 x 65 x 6mm Mild Steel Channels for outer frame with each 1 No of vertical and horizontal stiffeners at equal spacing made out of same section and 8mm Mild Steel plate for Gusset plate 2 Nos. of size 0.30 x 0.23m with required bolts and nuts and shutter Groove Angle made out of 100 x 100 x 10mm Mild Steel angle with required height including welding of Holdfast of size 40x40x6mm Mild Steel angle 3 Nos and Screw Rod 50mm dia Mild Steel Round Rod duly machined and fully threaded to suit the Capstan Head Assembly with required bolt and nut and Top beam made out of 150x75mm (ISMB 150) duly drilled to suit the Head Set Assembly with required bed bolt made out of 25mm Mild Steel Round Rod duly threaded with suitable anchorage arrangements to a height of 0.9m with necessary Fish Plate made out of 12mm Mild Steel plate of size 0.23 x 0.30m, 2 Nos and the Cast Iron Head Set Assembly medium duty with hexagonal nut (approximate 50Kg) duly machined with nut, threading to suit the Screw rod with including cost of ball bearings for smooth operation cost of grease, one coat of Anticorrosive black paint over the one coat Red Oxide primer etc., The cost shall include required handle for shutter operation and conveying loading and unloading charges including petty civil work and trail operation etc., complete.	**13.00** (Thirteen Numbers only)	1 Nos (One Number)	65000.00 (Rupees Sixty five thousand only)	**845000**
16	Refilling the excavated earth in layers not exceeding 23cm thickness and watering to OMC (Optimum Moisture content) and compaction of each layer to 95% of proctor Density through deployment of appropriate compaction equipment (8-10T power roller) vibratory power roller of short width (± 0.90m width drum) power roller or vibratory power roller/fuel operated or electrically operated, vibratory plate compactors, ensuring compaction of	**5609.03** (five thousand six hundred and nine point zero three Cubic Metre only)	1 M^3 (One Cubic Metre)	58.60 (Rupees Fifty eight and Paise sixty only)	**328689**

Sl. No	Description of work	Quantity	Unit	Rate in Figures and Words	Amount
	designed bund section including side slopes etc., complete as directed by the Engineer in charge of works and as per the technical specifications.				
17	Rough stone dry packing for revetment and apron using new hard granite stones obtained from approved sources including the cost of new wedges for filling the gaps etc, complete as directed by the Engineer in charge of works and as per the technical specifications	**129.69** (one hundred and twenty-nine point six nine Cubic Metre only)	1 M^3 (One Cubic Metre)	1626.69 (Rupees one thousand six hundred twenty-six and paise sixty nine only)	**210965**
18	Gravel packing 15cm thick for cement concrete block revetment or apron including stacking watering and consolidation etc, complete as directed by the Engineer in charge of works and as per the technical specifications.	**100.37** (one hundred point three seven Cubic Metre only)	1 M^3 (One Cubic Metre)	768.35 (Rupees seven hundred and sixty-eight and paise thirty five only)	**77119**
19	Drilling holes 50mm dia in existing body wall of weir for placing anchor rods etc.	**83.60** (eighty-three point six zero Running Metre only)	1 RM (One Running Metre)	267.00 (Rupees two hundred and sixty-seven only)	**22321**
20	Grouting the holes of 50mm dia with w/c ratio of 0.33 in the existing weir body wall provided at a spacing of 80 cm c/c in a staggered manner in the vertical surface for fixing anchor rod of 16 mm dia RTS of 1m length in a such position that 60 cm length embeded into the masonry wall at a downward inclinations of 5 degree to horizontal and 40 cm length projected and bend out side the wall including cleaning the drilled hole fixing the rod and other incidential charges etc.	**142.00** (One hundred and forty two Running Metre only)	1 RM (One Running Metre)	100.00 (Rupees One hundred only)	**14200**
21	Earthwork in all soils except hard rock requiring blasting and conveying with a lead of 0 to 100M by deploying earth moving machineries and tippers for formation of bund in layers of suitable thickness, depending upon type of compaction equipment deployed and not exceeding 23cm thickness, benching of slopes prior to placement of earth fill, breaking clods of size more than 75 mm, formation of bund, sectioning extra watering to OMC and compaction of each layers to 95% of proctor density through deployment of appropriate compaction equipment (8-10 ton vibratory power roller/short width (±0.90M width drum) power roller or vibratory power roller/fuel-	**479699.00** (Four Lakh Seventy Nine Thousand Six Hundred And Ninety Nine Cubic Metre only)	1 M^3 (One Cubic Metre)	74.85 (Rupees seventy four and paise eighty five only)	**35905470**

Sl. No	Description of work	Quantity	Unit	Rate in Figures and Words	Amount
	operated or electrical operated vibratory plate compactors ensuring compaction of designed bund section including side slopes compaction complete as per specifications etc., complete as directed by the Engineer-in-charge (Specification No.4.2.1 to 4.2.4)				
22	Supplying demarcation R.C.C. pre cast posts in Cement concrete of grade M20 with well graded aggregates and the nominal maximum size of coarse aggregate of size 20 mm of size 0.20 x 0.20 x 1.45 M and fixing the post 40 Cm depth below ground level, the post includes using 4 numbers of 10 mm RTS main rod to a length of 1.325 M, using 8 mm MS 10 numbers as strips with steel centering and painting the post with enamel paint to a height of 0.80 M around the post etc. complete and conveying the post to the site of demarcation boundary such as tank bund and foreshore including earth work excavation for foundation in HSC having the base plain cement concrete of 10 cm of gradeM15 concrete using hard blue granite broken stone of graded metal 1/3 Part of 40mm & 2/3 Part of 20 mm size, and the post embedded by using Cement concrete of grade M25 with well graded aggregates and the nominal maximum size of coarse aggregate of 20 mm etc, complete as directed by the Engineer in charge of works and as per the technical specifications.	**695.00** (six hundred and ninety five Numbers only)	1 Nos (One Number)	876.70 (Rupees eight hundred and seventy-six and paise seventy only)	**609306**
23	Compaction of earth fill on the tank bund and side slopes to specified density through deployment of hydraulic excavators with steel plate fixtures attached to their booms / heavy power rollers or vibratory power roller / fuel operated or electrically operated, vibratory plate compactors, complete as directed by the Engineer in charge of works and as per the technical specifications	**485046.00** (Four Lakh Eighty Five Thousand and Fourty Six Square Metre only)	1 M^2 (One Square Metre)	5.00 (Rupees five only)	**2425230**
24	Turfing on downstream side(rear) slope of bund including watering and fixing with initial lead of up to 50 m including cost of turf and labour charges etc complete as directed by the Engineer in charge of works and as per the technical specifications(4.1.3)	**202129.00** (Two lakh Two thousand and One hundred twenty nine square metre only)	M^2 (One Square Metre)	39.70 (Rupees thirty nine and paise seventy only)	**8024521**

Sl. No	Description of work	Quantity	Unit	Rate in Figures and Words	Amount
25	Supplying, hoisting, laying and fixing in position of RCC Hume pipe NP3 class of 900mm dia with suitable collars for sluices including labour and jointing materials as directed by the departmental officers and complying with standard specification.	**147.50** (one hundred forty-seven point five zero Running Metre only)	RM (Running Metre)	3540.00 (Rupees three thousand five hundred and forty only)	**522150**
	Total				**66645682**

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6.8.3 Calculation of machineries Requirement

Hydraulic excavators =	3	Nos
Tippers =	4	Nos
Working hour=	8	Hours / Day
	3	loads/ hour
1 trip of quantity=	5.66	m3/ trip
For 1 day=	1630.1	m3 /Day
For 1 month=	25	Working days
	40752.5	m^3

Total quantity of earth work = 493396.25 $\frac{493396.25}{40752.5}$ 12 Months

Working period for earth work= 5 working months + 6 Months rainy season& irrigation+6 working months + 6 Months rainy season& irrigation + 1 working months

= 12 months working period & 12 months rainy season and irrigation period

Machineries required for earth work:

1	Hydraulic excavator	=	**3**	Nos
2	Tippers / Lorries	=	**4**	Nos
3	Power roller	=	**1**	Nos
4	Vibrated compactor	=	**1**	Nos
5	Water lorries	=	**1**	Nos

Mixer machine

working hour=	7	hours / Day
	4	m^3/ hour
For 1 day=	28	m3 /Day
For 1 month=	10	working days
For 10 days=	280	m3/ month
Total quantity of concrete	3302.50	m^3

Qty of concrete/mixer machine/month $\frac{3302.50}{280}$ 11.79

Mixer machine required=	**2**	**Nos for 10 days / month**
Months required to complete Concrete works=	**12**	months
Mixer machine required=	**2**	
Concrete Vibrator required=	**4**	

RR masonry in CM 1:4 = 53.86 MT

Cement concrete M.10 using 40mm	=	73.00	MT
Cement concrete M.15 using 20 mm	=	5.05	MT
Cement concrete M.15 using 60% 40mm &40%20mm	=	296.71	MT
P.C.C M 20 using 20mm	=	11.43	MT
R.C.C M 25 using 20mm	=	39.57	MT
Plastering in CM 1:4 20mm thick	=	4.54	MT
Supplying and fixing boundary stone in RCC M20	=	6.57	MT
Cut stone roughly dressed	=	0.24	MT
Total quantity of Cement required	=	**490.95**	MT
Total quantity of Steel required	=	**6.76**	MT
Total quantity of Sand required	=	**1054.42**	m^3
Total quantity of 40mm Metal required	=	**897.00**	m^3
Total quantity of 20mm Metal required	=	**549.00**	m^3
Total quantity of R.R Stone required	=	**492.80**	m^3
Total quantity of cut stone required	=	**6.00**	m^3
Total quantity of RCC Hume pipe required	=	**147.50**	RM

Material conveyance Tippers / Lorries

Cement = 10 mt / Trip	1 trip / day	10 mt / day
Sand = 5.66 m^3 / Trip	3 trips / day	16.98 m^3 /day
Metal / stone = 5.66 m^3 / Trip	4 trips / day	22.64 m^3 /day

Lorry required for conveying cement = 50 lorries

Lorry required for conveying sand = $\frac{1054.42}{16.98}$ = 63 Lorries

Lorry required for conveying metal & stone = $\frac{1944.80}{22.64}$ = 86 Lorries

Total Lorries required for conveyance = 199 Lorries

Total Lorries required for conveyance assuming 17 days per month = $\frac{199}{17}$

= 12 Lorries/month

Lorries required per month = $\frac{12}{12}$ = 1 Lorries per 17 days for 12 months

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6.8.4 REQUIREMENT OF EQUIPMENTS AND MATERIALS

PACKAGE NUMBER	EQUIPMENTS REQUIRED IN NUMBERS							MATERIAL REQUIRED							
	HYDRAULIC EXCAVATOR	TIPPER / LORRY	POWER ROLLER	VIBRATED COMPACTOR	WATER LORRIES	CONCRETE MIXER MACHINE	CONCRETE VIBRATOR	CEMENT IN M.T.	SAND IN m^3	STEEL IN M.T.	METAL 40MM IN m^3	METAL 20MM IN m^3	R.R.STONE IN m^3	CUT STONE IN m^3	RCC HUME PIPE IN RM
PACKAGE I	3	4	1	1	1	2	4	491	1054	7	897	549	493	6	147.5

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6.8.5 PHYSICAL AND FINANCIAL PROGRAM

Sl. No	Description	I st Milestone-20		II nd Milestone-60		III rd Milestone-20		Total	
		Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
1	Bund	97470	7331881.56	292409	21995644.68	97470	7331881.56	487348.25	36659407.80
2	Foundation	1210	108314.08	3629	324942.24	1210	108314.08	6048.00	541570.40
3	Clearing light jungle	185202	814888.80	555606	2444666.40	185202	814888.80	926010.00	4074444.00
4	Compacting the side slope	97009	485046.00	291028	1455138.00	97009	485046.00	485046.00	2425230.00
5	Turfing	40426	1604904.26	121277	4814712.78	40426	1604904.26	202129.00	8024521.30
	Concrete								
6	Cement concrete M.10 using 40mm	71	322865.18	212	968595.54	71	322865.18	352.65	1614325.91
7	Cement concrete M.15 using 20 mm	4	18939.76	11	56819.29	4	18939.76	17.53	94698.81
8	Cement concrete M.15 using 60% 40mm &40%20mm	215	1439774.20	644	4319322.60	215	1439774.20	1073.87	7198870.00
9	P.C.C M 20 using 20mm	6	36889.06	19	110667.19	6	36889.06	31.23	184445.32
10	R.C.C M 25 using 20mm	23	171183.40	68	513550.20	23	171183.40	113.05	855916.37
11	Reinforcement	14	93840.13	41	281520.39	14	93840.13	67.63	469176.00
12	Cut stone roughly dressed	1	9017.23	4	27051.70	1	9017.23	6.00	45086.16
13	Supplying and fixing boundary stone in RCC M20	139	121861.30	417	365583.90	139	121861.30	695.00	609306.50
14	Plastering in CM 1:4 20mm thick	115	46591.84	344	139775.53	115	46591.84	573.17	232959.21
15	RR masonry in CM 1:4	88	400197.60	264	1200592.80	88	400197.60	440.00	2000988.00
16	Drilling & Grouting	46	7304.24	137	21912.72	46	7304.24	227.60	36521.20

Sl. No	Description	I st Milestone-20		II nd Milestone-60		III rd Milestone-20		Total	
		Quantity	Amount	Quantity	Amount	Quantity	Amount	Quantity	Amount
17	Rough stone dry backing for revetment	26	42193.09	78	126579.26	26	42193.09	129.69	210965.43
18	Supplying and fixing S.G. Shutter	3	169000.00	8	507000.00	3	169000.00	13.00	845000.00
19	RCC Hume pipe of NP3 class	29.5	104430.00	88.5	313290.00	29.5	104430.00	147.50	522150.00
	Total		**13329136.47**		**39987409.45**		**13329136.47**		**66645682.41**

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6.8.6 Construction Methodology

Sl. No	Description	WORKING MOTNHS					RAINY SEASON & WATER REGULATION						WORKING MOTNH						RAINY SEASON & WATER REGULATION						WORKING MOTNH	Total Quantity	Amount
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
	Earth work																										
1	Bund	24367.4	48734.8	48734.8	48734.82	24367.4							24367.4	48734.8	48734.8	48734.8	48734.8	24367.4							48734.8	487348	36659407.8
2	Foundation	302.4	604.8	604.8	604.8	302.4							302.4	604.8	604.8	604.8	604.8	302.4							604.8	6048	541570.40
3	Clearing light jungle	46300.5	92601.0	92601.0	92601	46300.5							46300.5	92601.0	92601.0	92601.0	92601.0	46300.5							92601.0	926010	4074444.00
4	Compacting the side slope	24252.3	48504.6	48504.6	48504.6	24252.3							24252.3	48504.6	48504.6	48504.6	48504.6	24252.3							48504.6	485046	2425230.00
5	Turfing	10106.5	20212.9	20212.9	20212.9	10106.5							10106.5	20212.9	20212.9	20212.9	20212.9	10106.5							20212.9	202129	8024521.30
	Concrete																										
6	Cement concrete M.10 using 40mm	17.6325	35.3	35.3	35.265	17.6325							17.6	35.3	35.3	35.3	35.3	17.6							35.3	352.65	1614325.91
7	Cement concrete M.15 using 20 mm	0.8765	1.8	1.8	1.753	0.8765							0.9	1.8	1.8	1.8	1.8	0.9							1.8	17.53	94698.81
8	Cement concrete M.15 using 60% 40mm &40%20mm	53.6933	107.4	107.4	107.3866	53.6933							53.7	107.4	107.4	107.4	107.4	53.7							107.4	1073.87	7198870.00
9	P.C.C M 20 using 20mm	1.5615	3.1	3.1	3.123	1.5615							1.6	3.1	3.1	3.1	3.1	1.6							3.1	31.23	184445.32
10	R.C.C M 25 using 20mm	5.6525	11.3	11.3	11.305	5.6525							5.7	11.3	11.3	11.3	11.3	5.7							11.3	113.05	855916.37
11	Reinforcement	3.38168	6.8	6.8	6.76335	3.38168							3.4	6.8	6.8	6.8	6.8	3.4							6.8	67.63	469176.00
12	Cut stone roughly dressed	0.3	0.6	0.6	0.6	0.3							0.3	0.6	0.6	0.6	0.6	0.3							0.6	6.00	45086.16
13	Supplying and fixing boundary stone in RCC M20	34.75	69.5	69.5	69.5	34.75							34.8	69.5	69.5	69.5	69.5	34.8							69.5	695.00	609306.50
14	Plastering in CM 1:4 20mm thick	28.6585	57.3	57.3	57.317	28.6585							28.7	57.3	57.3	57.3	57.3	28.7							57.3	573.17	232959.21
15	RR masonry in CM 1:4	22	44.0	44.0	44	22							22.0	44.0	44.0	44.0	44.0	22.0							44.0	440.00	2000988.00
16	Drilling & Grouting	11.38	22.8	22.8	22.76	11.38							11.4	22.8	22.8	22.8	22.8	11.4							22.8	227.60	36521.20
17	Rough stone dry backing for revetment	6.4845	13.0	13.0	12.969	6.4845							6.5	13.0	13.0	13.0	13.0	6.5							13.0	129.69	210965.43

Sl. No	Description	WORKING MOTNHS					RAINY SEASON & WATER REGULATION						WORKING MOTNH						RAINY SEASON & WATER REGULATION						WORKING MOTNH	Total Quantity	Amount
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3		
18	Supplying and fixing S.G. Shutter	1.0	1.0	1.0	1.0	1.0							1.0	1.0	2.0	1.0	1.0	1.0							1.0	13.00	845000.00
19	RCC Hume pipe of NP3 class	7.5	14.5	14.5	14.5	8.0							8.0	14.5	14.5	14.5	14.5	8.0							14.5	147.50	522150.00
																											6664568200

Assistant Engineer, PWD/WRD.,
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Nanguneri

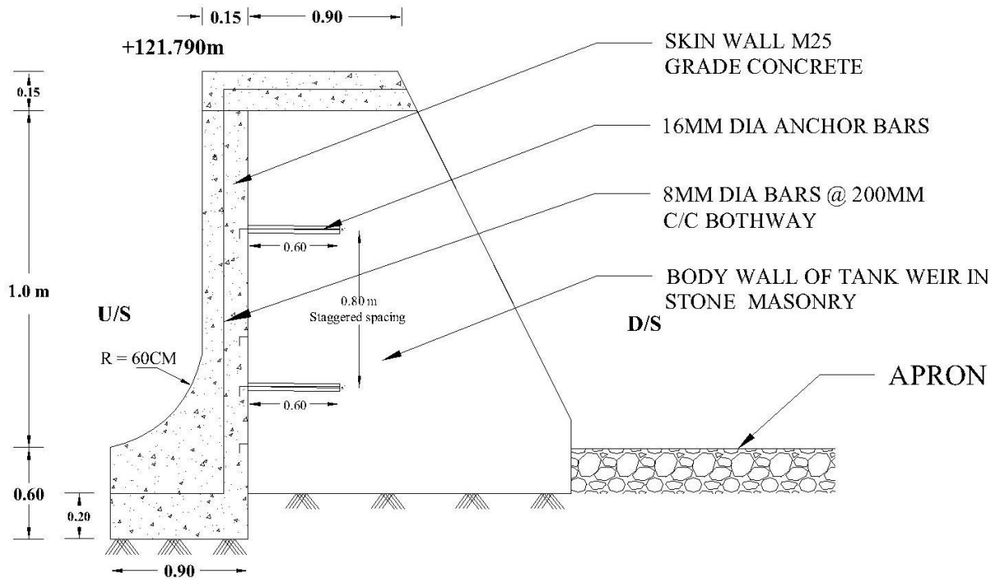
Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

9. DRAWINGS

Proposed Repair to weir in Tanks

Sl. No	Name of tank	Weir No
1.	Nadukkamparaikulam	1
2.	Nambikurichikulam	1
3.	Kannankulam	1
4.	Palathikulam	1
5.	Sinammalpuram Bigtank	1
6.	Veetrithankulam	1
7.	Achampadukulam	1
8.	Panisakulam	1
	Total	**8 Nos**

TYPICAL CROSS SECTION OF SKIN WALL (Weir Repair)



1) Joints on u/s surface to be raked to 25mm depth & surface roughened by chipping.
2) Drill- holes of 50mm to be filled with 1:2 mortar and 16mm Anchor bars to be pushed in. The roughened surface to be kept wet for 72 hours & cement slurry (1:2) of 0.70 water - cement ratio be applied over the surface prior to placement of skin concrete.
   a) Drill holes of 50 mm diameter to be drilled at downward inclination of 5 degree to ensure easy filling of mortar
   b) Horizontal spacing of Drill holes (along the weir length) to be 1.0m or as decided by the Engineer in Charge. (The staggered spacing is kept as 80 cm centre to centre)
3) Cement concrete of M25 Grade concrete is to be used with 20mm maximum aggregate size.
4) Curing is to be done for 21.days
   * Thickness of skin concrete : 15cm @ top & 20cm at bottom for weir of height upto 1.50m and 20cm at top & 30cm at bottom for weir of height more than 1.50m

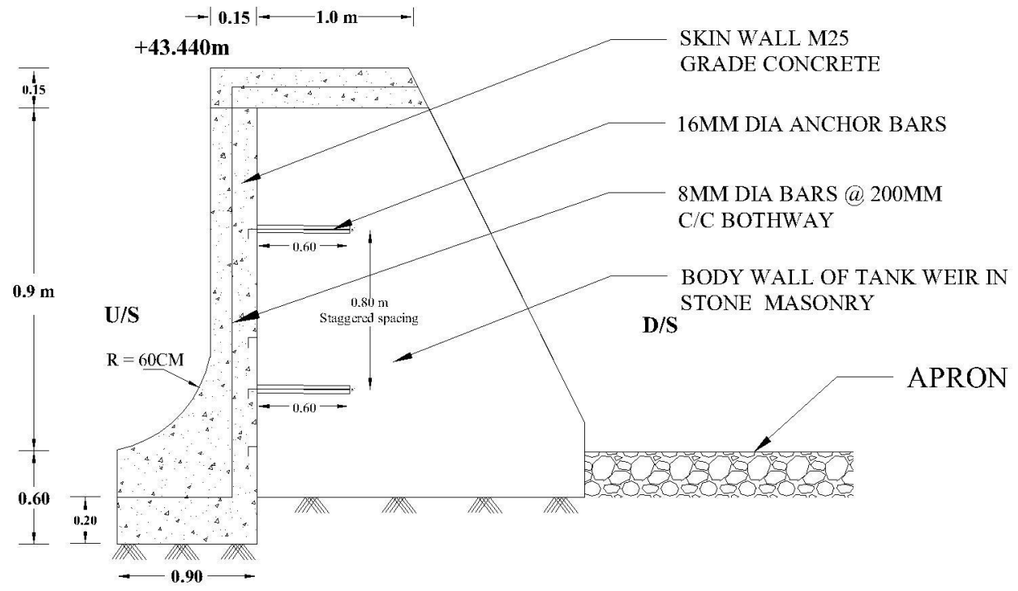
ALL DIMENSIONS ARE IN METRE NOT TO SCALE	**NADUKKAMPARAIKULAM**

23/1/24
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23/1/24
Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

TYPICAL CROSS SECTION OF SKIN WALL (Weir Repair)



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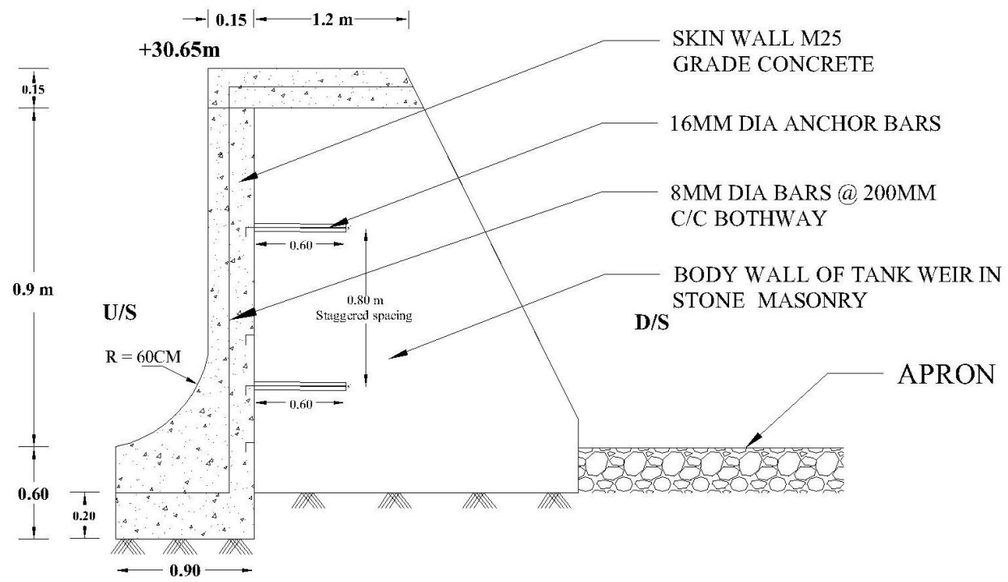
ALL DIMENSIONS ARE IN METRE NOT TO SCALE	**NAMBIKURICHUKULAM**

Assistant Engineer, PWD/WRD.,
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Assistant Executive Engineer, PWD/WRD.,
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Nanguneri

Executive Engineer, PWD/WRD.,
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Tenkasi.

TYPICAL CROSS SECTION OF SKIN WALL (Weir Repair)



1) Joints on u/s surface to be raked to 25mm depth & surface roughened by chipping.
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   * Thickness of skin concrete : 15cm @ top & 20cm at bottom for weir of height upto 1.50m and 20cm at top & 30cm at bottom for weir of height more than 1.50m

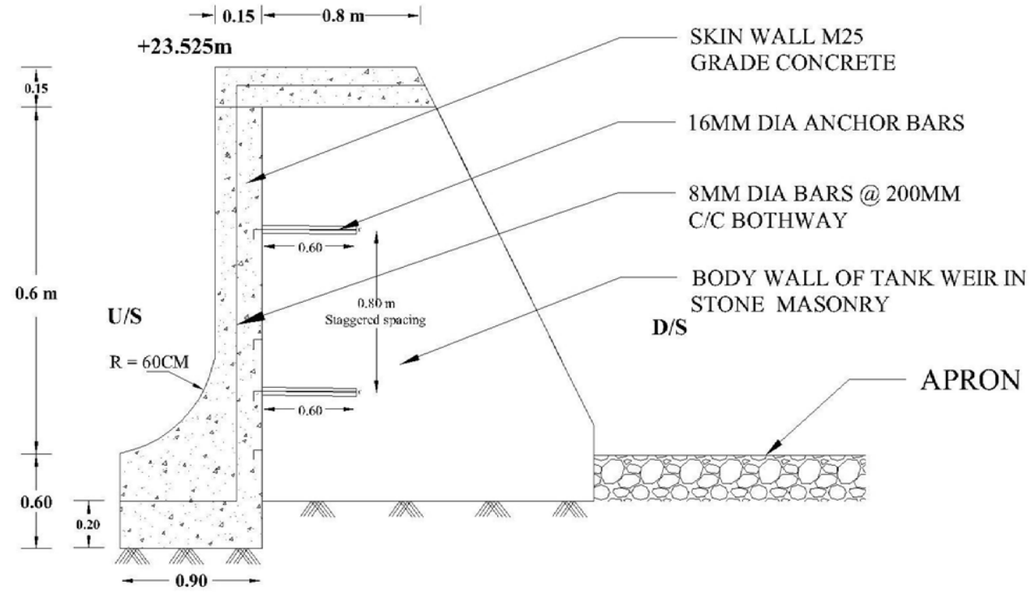
ALL DIMENSIONS ARE IN METRE NOT TO SCALE	**KANNANKULAM**

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Nanguneri

Executive Engineer, PWD/WRD.,
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TYPICAL CROSS SECTION OF SKIN WALL (Weir Repair)



1) Joints on u/s surface to be raked to 25mm depth & surface roughened by chipping.
2) Drill- holes of 50mm to be filled with 1:2 mortar and 16mm Anchor bars to be pushed in. The roughened surface to be kept wet for 72 hours & cement slurry (1:2) of 0.70 water - cement ratio be applied over the surface prior to placement of skin concrete.
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   * Thickness of skin concrete : 15cm @ top & 20cm at bottom for weir of height upto 1.50m and 20cm at top & 30cm at bottom for weir of height more than 1.50m

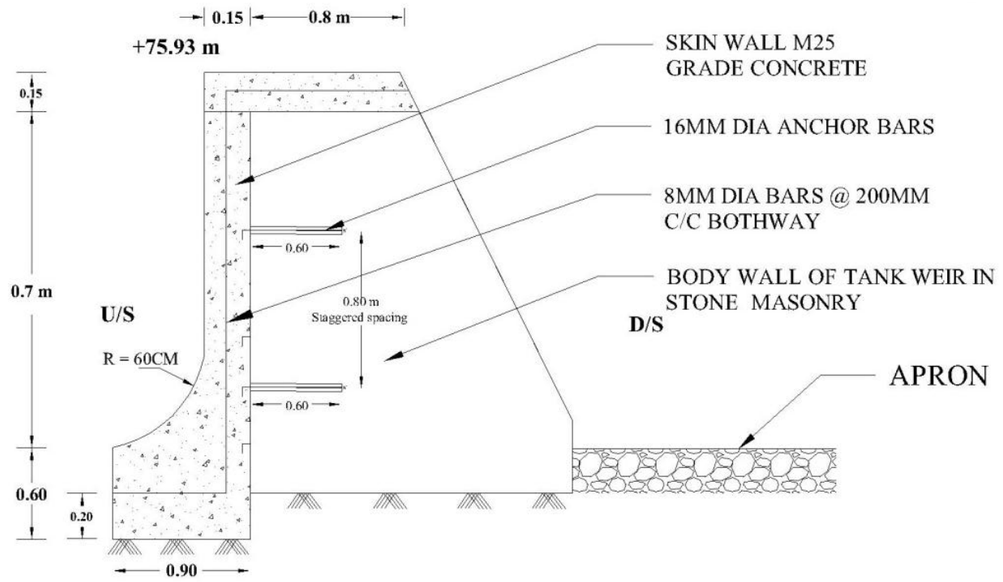
ALL DIMENSIONS ARE IN METRE NOT TO SCALE	**PALATHIKULAM**

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23/1/24
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Tenkasi.

TYPICAL CROSS SECTION OF SKIN WALL (Weir Repair)



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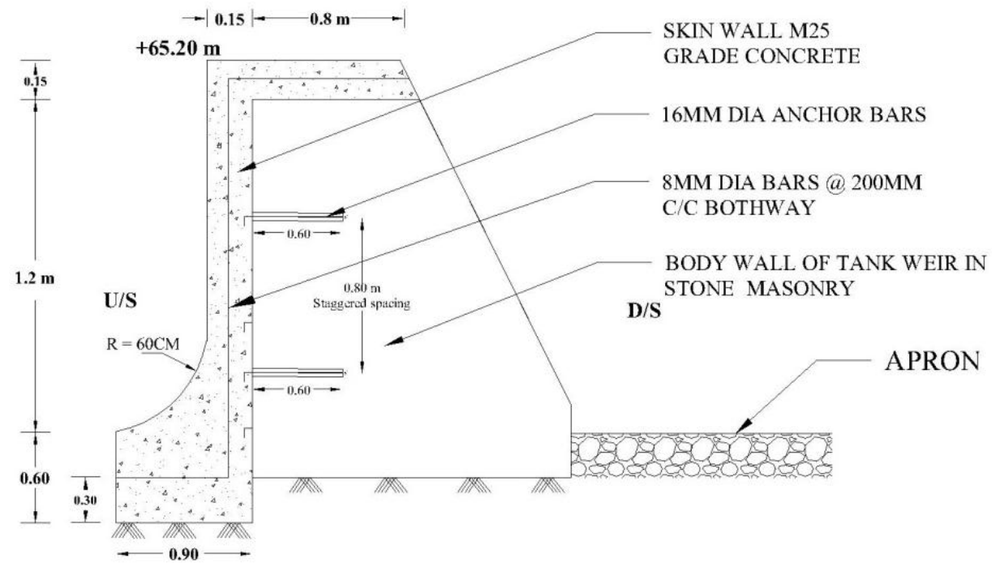
ALL DIMENSIONS ARE IN METRE NOT TO SCALE	**SINNAMALPURAM AND PUDUKULAM**

Assistant Engineer, PWD/WRD.,
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Nanguneri

Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

TYPICAL CROSS SECTION OF SKIN WALL (Weir Repair)



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   * Thickness of skin concrete : 15cm @ top & 20cm at bottom for weir of height upto 1.50m and 20cm at top & 30cm at bottom for weir of height more than 1.50m

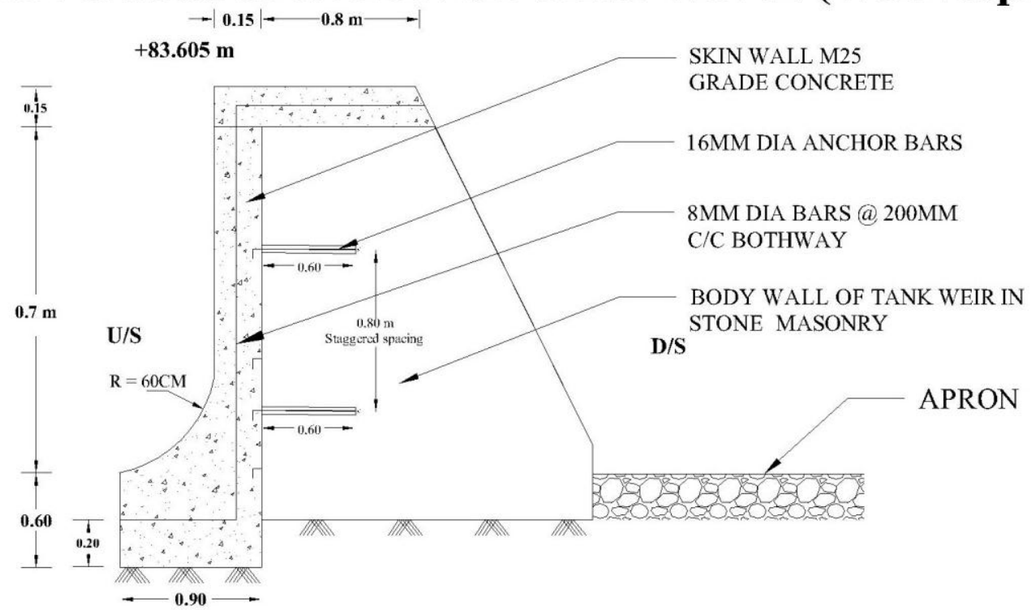
ALL DIMENSIONS ARE IN METRE NOT TO SCALE	**VEETRITHANKULAM**

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23/1/24
Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

TYPICAL CROSS SECTION OF SKIN WALL (Weir Repair)



1) Joints on u/s surface to be raked to 25mm depth & surface roughened by chipping.
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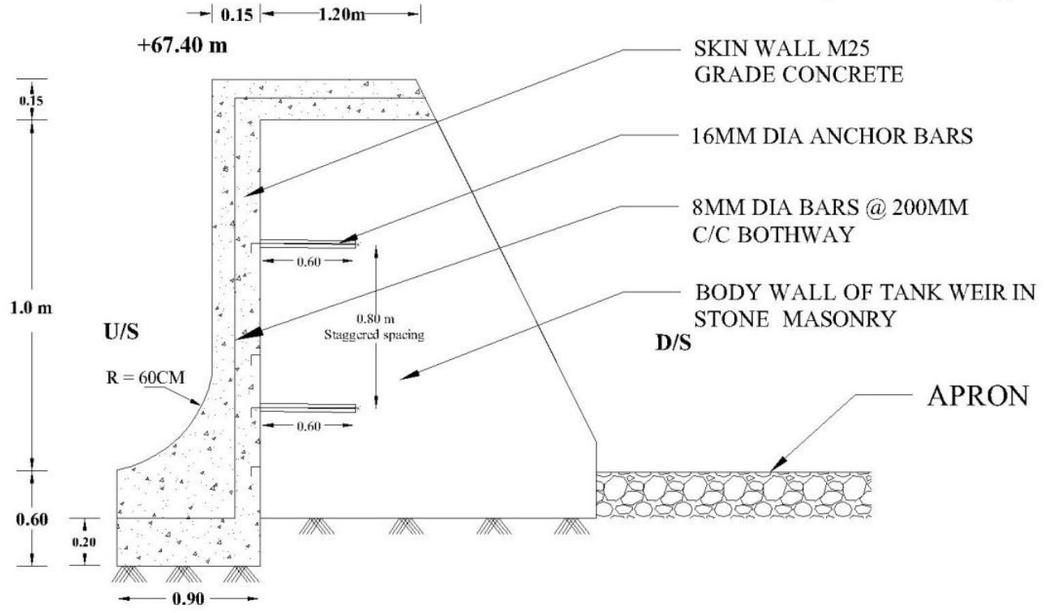
ALL DIMENSIONS ARE IN METRE NOT TO SCALE	**ACHAMPADUKULAM**

23/1/24
Assistant Engineer, PWD/WRD.,
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Assistant Executive Engineer, PWD/WRD.,
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Nanguneri

23/1/24
Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

TYPICAL CROSS SECTION OF SKIN WALL (Weir Repair)



1) Joints on u/s surface to be raked to 25mm depth & surface roughened by chipping.
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ALL DIMENSIONS ARE IN METRE NOT TO SCALE	**PANISALKULAM**

23/1/24
Assistant Engineer, PWD/WRD.,
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Vallioor

Assistant Executive Engineer, PWD/WRD.,
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Nanguneri

23/1/24
Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

Proposed Repair to sluice in Tanks		
Sl. No	Name of tank	Sluice No.
1.	Kailasaperikulam	1
2.	Poopilaikulam	1
Proposed Repair to sluice in Anicut Supply Channel		
1.	Padalayarkal Direct Sluice	1
	Total	**3 Nos**

Proposed Repair to sluice in Tanks

Repair of Kailasaperikulam Sluice:

In the Kailaperikulam, the sluice is old and made of RR masonry and requires rehabilitation, hence it is proposed to repair the headwall, wing wall, and guide wall by dismantling and constructing with concrete as per the standard sluice drawing attached in page no 52 and also to provide Shutter.

Repair of Poopilaikulam Sluice:

In the Poopilaikulam, the sluice is old and made of RR masonry and requires rehabilitation, hence it is proposed to repair the headwall, wing wall, and guide wall by dismantling and constructing with concrete as per the standard sluice drawing attached in page no 53 and also to provide Shutter.

Repair of Sluice in Padalayarkal (Anicut Supply Channel)

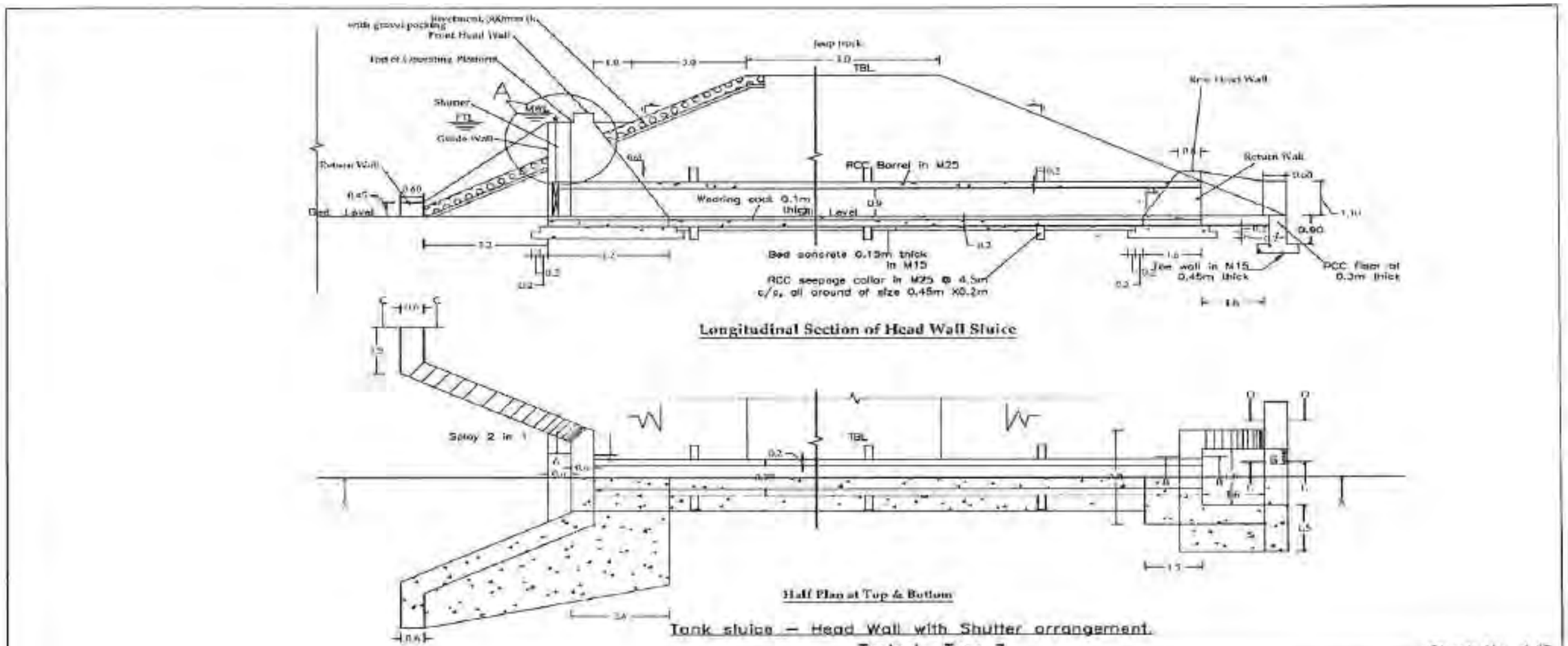
The Padalayarkal has 4 direct sluice, among that Direct Sluice (2nd) available at LS 1950m is planned to be repaired. The masonry is planned to be dismantled and concrete sluice is planned to be constructed with PCC of grade M15 (60% of 40mm and 40% of 20 mm) and the shutter is also planned to be replaced. The protection wall is planned to be constructed near the sides of sluice as per the drawing in page no 54.

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REPAIR TO KAILASAPERIKULAM SLUICE



Longitudinal Section of Head Wall Sluice

Half Plan at Top & Bottom

Tank sluice – Head Wall with Shutter arrangement.
Typical– Type 3

Sheet No. 4/6

PUBLIC WORKS DEPARTMENT
OFFICE OF THE SUPERINTENDING ENGINEER, PWD.
DESIGNS CIRCLE, WRO, CHENNAI – 600 005

Designed & Drawn by Er. V.VENKATESH PRABU, AE II/I		NAME OF WORK:
Checked by Er. M.NIRANJATHY, AEE-I (SDO)		IAMWARM TYPICAL DRAWING FOR TANK SLUICE
Verified by Tr.ANTHA BALRAJ, TT(SDO)		
Recommended by Er. K. BALAIYA, SE(D)		DESIGNED DRAWING OF TANK SLUICE Head Wall with Shutter arrangement Typical Type – 3
Approved by Er. S.THANAKARAN, CE(PP)		
DeC.NO. / 2016	SCALE 1 : 100	

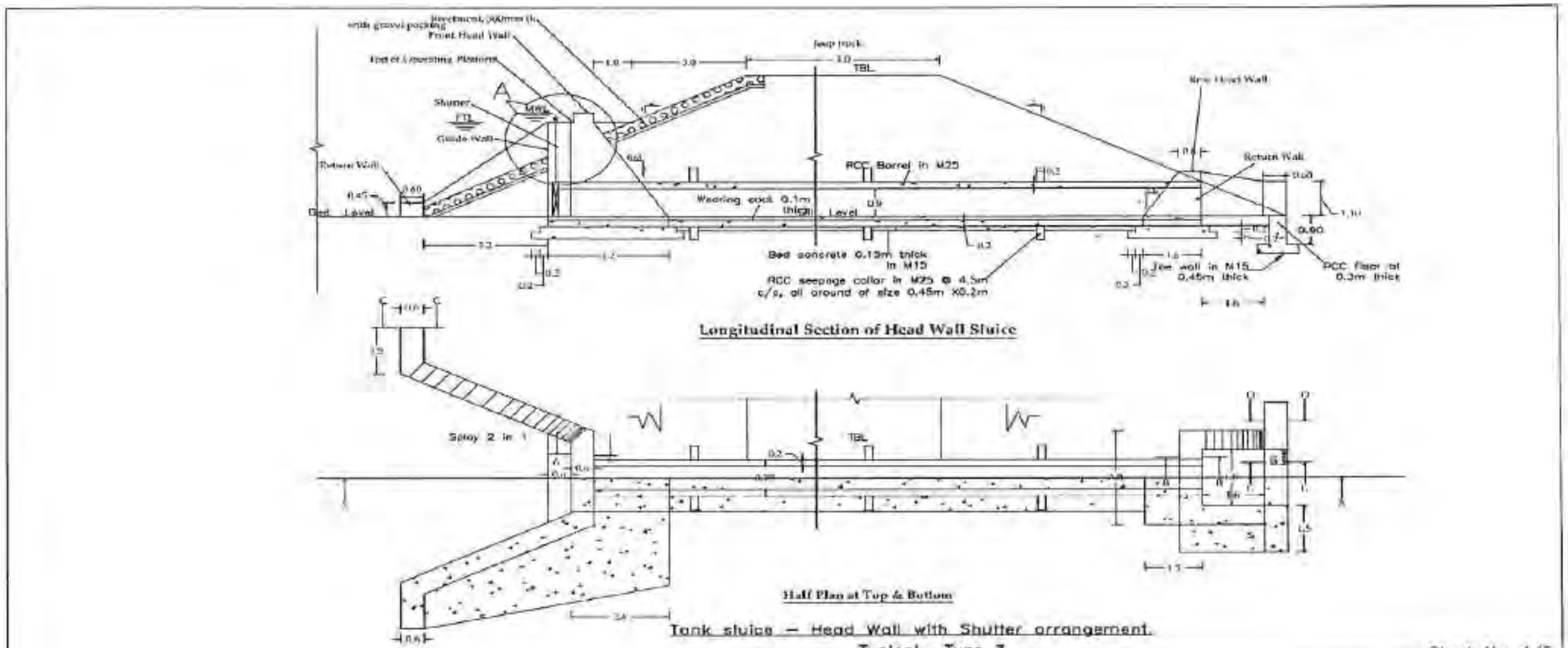
Notes:
1. All dimensions are in metres unless otherwise specified.
2. This drawing should be read along with Dwg.No. / 2016 to Dwg.No. 6/16

Assistant Engineer, PWD/WRD.,
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REPAIR TO POOPILAIKULAM SLUICE



Longitudinal Section of Head Wall Sluice

Half Plan at Top & Bottom

Tank sluice – Head Wall with Shutter arrangement.
Typical– Type 3

Sheet No. 4/6

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OFFICE OF THE SUPERINTENDING ENGINEER, PWD.
DESIGNS CIRCLE, WRO, CHENNAI – 600 005

Designed & Drawn by Er. V.VENKATESH PRABU, AE II/I	NAME OF WORK: IAMWARM TYPICAL DRAWING FOR TANK SLUICE
Checked by Er. M.NIRANJANY, AEE-I (SDO)	
Verified by Er.ANFILA BALRAJ, IT(SDO)	
Recommended by Er. K. BALAIYA, SE(D)	DESIGNED DRAWING OF TANK SLUICE Head Wall with Shutter arrangement Typical Type – 3
Approved by Er. S.THANAPAAN, CE(PP)	
DeC.NO. / 2016	SCALE 1 : 100

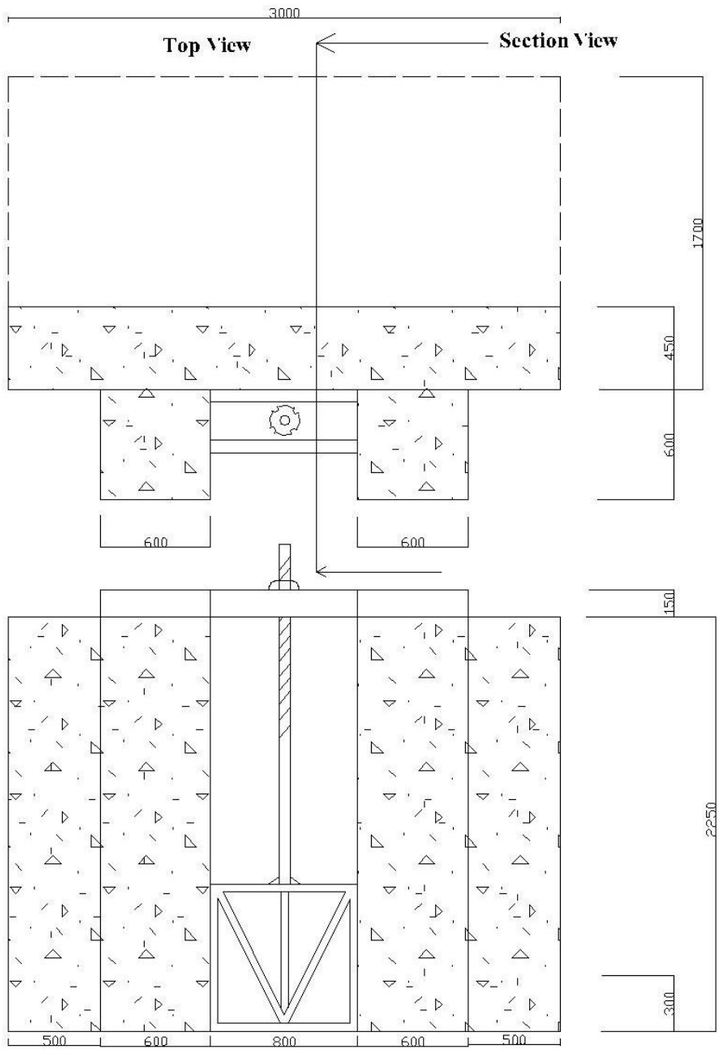
Notes:
1. All dimensions are in metres unless otherwise specified.
2. This drawing should be read along with Dwg.No. / 2016 to Dwg.No. /2016

Assistant Engineer, PWD/WRD.,
Irrigation Section,
Vallioor

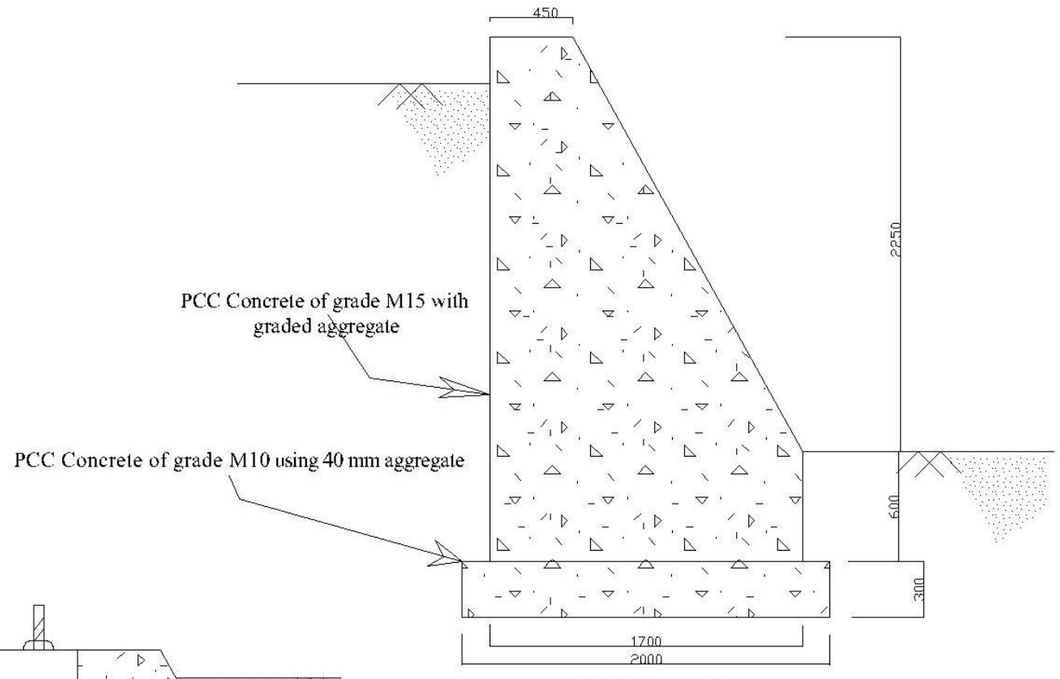
Assistant Executive Engineer, PWD/WRD.,
Nambiyar Basin Sub Division,
Nanguneri

Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.

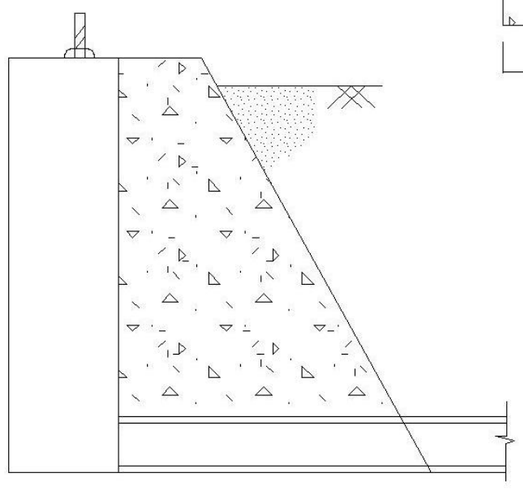
REPAIR TO PADALAYARKAL (ANICUT SUPPLY CHANNEL) DIRECT SLUICE



Front View



Protection wall



Section View

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Nanguneri

Executive Engineer, PWD/WRD.,
Chittar Basin Division,
Tenkasi.