



सत्यमेव जयते

**GOVERNMENT OF ASSAM  
WATER RESOURCES DEPARTMENT  
GUWAHATI, ASSAM**

**DETAILED PROJECT REPORT**

**INTEGRATED FLOOD AND EROSION  
MANAGEMENT OF MANAS AND BEKI RIVER IN  
THE DISTRICT OF BAKSA AND BARPETA IN  
BRAHMAPUTRA VALLEY WITHIN ASSAM  
(REVIEW)**

**Estimated Amount = Rs. 400,21,95,000.00**

**Submitted by:**

**Executive Engineer  
Barpeta Water Resources Division  
Barpeta**

**Name of scheme : INTEGRATED FLOOD AND EROSION MANAGEMENT OF MANAS AND BEKI RIVER IN THE DISTRICT OF BAKSA AND BARPETA IN BRAHMAPUTRA VALLEY WITHIN ASSAM (REVIEW)**

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CHAPTER-1

FOREWORD



OFFICE OF THE CHIEF ENGINEER  
WATER RESOURCES DEPARTMENT  
CHANDMARI, GUWAHATI

FOREWORD

**Name of the Project:** Integrated Flood and Erosion Management of Manas and Beki River in the district of Baksa and Barpeta in Brahmaputra Valley within Assam (Review).

The Manas River is a trans-boundary river in the Himalayan foothills between southern Bhutan and India. It originates from Bhutan and when enters into Assam it forms two other channels namely Beki & Hakuwa. But in later stage the original course of Manas was silted up and also the Hakuwa choked up, thereby almost all the flood discharge flows through Beki for which river Beki becomes like the main river flowing from Bhutan.

The Beki river valley has a major reserve forest areas, namely the Manas National Park approximately 95,000 hectares encompassing Project Tiger Reserve, an Elephant Reserve and a Biosphere Reserve, which constitutes a UNESCO World Heritage Site declared. Under subtropical climatic conditions (with 30 millimeters (1.2 in) of annual rainfall and temperature varying from a maximum of 30 °C (86 °F) and a minimum of 5 °C (41 °F), the forest consists of the semi-evergreen forest vegetation with mixed deciduous, littorals and swamps, and interspersed with bamboo and cane. Flooding occurs in large part of the Bio Reserve.

Flood affect of both the Manas & Beki rivers were observed from Mothanguri to Tinkuni Part-III area and severe bank erosions were observed almost all along the banks of the river. Since the Beki river is carrying almost all the discharge of a huge catchment area so the flood hazard of it was seen too severe day by day. During flowing through a meandering path of Barpeta and Baksa District the bank of the Beki river is being eroded away and damages of huge agricultural product including houses, school building, Govt. institutions etc. had been witnessed. The existing embankment along the river was also seen in damaged stage. Nos of devastating flood starting from 2004 and due to release of excess water of Kurishu dam, Bhutan creates severe flood havoc including erosion problem almost all the reaches. Though the original course of river Beki was west ward at upstream and east ward at downstream but year by year it's route has been changed and it erodes huge area of Manas National Park and Agricultural land in downstream and becomes a major threat to the riparian area.

In view of the present scenario of the river Beki's course of flow it is becoming utmost necessity to push the river towards west ward in upstream reach and towards east ward in downstream reach. In this way the river could be trained to maintain its course of flow in the defined path. Moreover, to prevent the unprecedented flash flood the existing embankment should be raised & strengthened.

So, considering suggestion and provision of Master plan of Manas-Beki sub-basin as well as experiencing the present problem the DPR was prepared by the Executive Engineer, Barpeta W.R Division, Barpeta for an amounting to Rs.20093.90 L. after getting due recommendation of the memo from TAC on 7/03/2020(80<sup>th</sup> special TAC meeting). The scheme was again reviewed by the TAC in the special TAC meeting held on 18<sup>th</sup> May/2021 for amounting to Rs.288.4310 Cr. due to re-arrangement existing erosion reaches and for incorporation of some new erosion locations. Observing all the technical feasibility the TAC Committee has recommended the memo suggesting some modification in technical specifications. After doing the necessary modification as per suggestion of TAC, the DPR was prepared by the Barpeta W.R Division and cost of the project

raised upto Rs.400.2195 Cr. Benefit cost ratio is calculated as 1.51:1. Due to strong restriction of Forest and Environment Department in executing the anti-erosion work, raising and strengthening work of embankment etc. the provision for the same in the Manas National Park area was not incorporated in this DPR.

The major provisions that included in this project are as follows.

- (1) Erosion protection by construction of Apron with Geo-bag of size 1.03m x 0.70m in cage along with bank revetment with Geo bag of size 1.03m x 0.70m in loose for a length of 43178m in different locations along the banks of river Beki where erosion is too severe.
- (2) Single layer porcupine screens & bars at different locations to close some incoming channels as well as to push the river away from bank.
- (3) Raising & strengthening of the existing embankment in Right as well as Left bank for a total length of 11.271Km.

The project is very much essential to implement for future permanent solution to combat against erosion of river Beki.

Socio-economic viability of the scheme is examined and therefore recommended for Clearance.

After successful implementation of the project approx. 800 Sqkm .area & 3.00 Lakh people will be benefited.

The scheme fits in overall requirement of Master Plan for development of the basin and flood control measures therefore strongly recommended for clearance.



**Chief Engineer**  
**Water Resources Department.**  
**Chandmari, Guwahati-3**

## CHAPTER-2

### Salient features of the project:

- 1) **Name of the Project :**  
Integrated flood and erosion management of Manas and Beki river in district of Baksa and Barpeta in Brahmaputra valley within Assam (Review).
- 2) **Estimated cost & price level:** Cost of the project is Rs. 400.2195 Cr. The price level for the rate considered from the SOR of WRD for the year 2021-22.
- 3) **Reference of State TAC clearance:** The last memo of the project was recommended by the TAC on 82<sup>nd</sup> special TAC meeting held on 18/05/2021 in Guwahati for Rs.288.4310 Cr. with some observations in technical specification.
- 4) **Master Plan for the basin, fitment of the project and priority:** This project is prepared on the basis of requirement and fitment of the Master Plan to save the life and property of the greater area.
- 5) **Name of State:** Assam
- 6) **Name of District:** Baksa and Barpeta
- 7) **Name of Basin/ Sub-basin:** The project is under Manas-Beki Sub-Basin
- 8) **Name of the river:** Beki
- 9) **Longitude and Latitude of the Project:**
  - i) Longitude = from 90°58'47"E to 90°46'30"E
  - ii) Latitude = from 26°14'0"N to 26°42'0"N
- 10) **Nearest GD site and its Latitude and Longitude:** Nearest GD site is located just D/S of NH-31 bridge over Beki bearing Longitude 90°54'58"E and Latitude 26°29'39"
- 11) **Distance along with direction from nearby major district(HQ)/town :** The project location is situated in North-West and South-West direction at a distance about 12 KM(nearest) from Barpeta town.
- 12) **B.C Ratio:** B.C ratio is calculated as 1.51:1
- 13) **Population benefited:** 3,00,000.00
- 14) **Benefited area:** 80,000 Hectare
- 15) **Flood affected area in the Assam State:** Flood affected area of the state is found to be 3.82 mha
- 16) **Flood protected area in Assam State:** Flood protected area of the state found to be 2.35 mha

17) Details of proposed works along with reach length:

a) Embankments:

Raising & Strengthening works:

- i) Left bank embankment = 9420m.
- ii) Right bank embankment = 1851m.

b) Revetment:

Erosion protection work with Geo-textile bags proposed at 37 different locations for a total length of 43178m.

- Thickness of pitching for negative head criteria = 0.3m
- Size of Launching Apron = 9.00m x 0.90 m (using 2 layers of cages of geo-bag, size 1.03m\*0.70m\* thickness of 0.45m of 1 layer of cage)
- Toe-key of size 1.50\*1.50\*0.45m (2 layer)

Erosion protection work with Geo-textile bag

Sl.No.	Location	Length in m.
1	Raghabill(L/B)	300
2	Elengbari(L/B)	1600
3	Chunbari(L/B)	1500
4	Khagrabari(L/B)	2500
5	Gobardhana(L/B)	900
6	Udalguri(R/B)	600
7	Barapeta(R/B)	500
8	Tilabori(R/B)	800
9	Dumunighat(L/B)	1300
10	Safakamr(L/B)	750
11	Katajar(L/B)	1870
12	Nichuka(L/B)	1450
13	Chantabari(R/B)	1250
14	Ketekibari(R/B)	1500
15	Hajipur- Deuliapara(L/B)	1350
16	Kurobaha(R/B)	700
17	Salsalia(R/B)	900
18	Bordonga(R/B)	1300
19	Guileza(R/B)	1000
20	Mowamari(R/B)	500
21	Kaurjahi(R/B)	1000
22	Kharbali-Sutirpathar(R/B)	1500
23	Daukmari(L/B)	1000
24	Sawpur(R/B)	1500
25	Alipur-Rasulpur(R/B)	1400
26	Jaurimari(R/B)	1400

27	Pub Moinbari(R/B)	500
28	Takakata(R/B)	700
29	Hatchara(R/B)	1000
30	Joypur(R/B)	900
31	Tarakandi(R/B)	1920
32	Chotola(R/B)	1530
33	Kismat Moinbori(R/B)	930
34	Puran Chikatari(R/B)	250
35	Bheragaon (L/B)	1000
36	Satrankanara(L/B)	2037
37	Marabhaj(L/B)	2041
	Total =	43178

**c) PSC Porcupine works:**

- Total nos. of Screen/Bar = 160 nos in single layer at 25 different locations.
- All bars/screen consists of 5 rows at channels, river bed and bank slopes and each screen will be placed at a spacing of 1times of the width of oblique channel.

**16) Completion schedule:** A tentative work schedule was prepared for the project showing the different phases of work starting in the month of Jan/2022and to be completed in the month of Jan/2024.Detailed work programme is enclosed in the DPR.

**17) Details of already executed works:** At Safakamar area total 4(four) nos. of anti-erosion work was taken up for a reach length of 2278m with geo-bag apron and PCC slab revetment which were completed in the year 2015-16. A total of Rs.16.00 Cr. was incurred to complete the said works.

  
 Executive Engineer  
 Barpreta WR Division  
 Barpeta



## CHAPTER-3

### EXECUTIVE SUMMARY

#### **Introduction:**

The river Manas is a trans-boundary river in the Himalyan foot hills between southern Bhutan and India. The river got its name after the Serpent God in Hindu mythology. The river after debouching from the foot hills, flows in two channels namely Beki and Manas itself. The high intensity rainfall in the hilly areas of Bhutan contributes a high order discharge to the river. The landslides in Bhutan hills and soil erosion in the region contributes large amount of silt load that is carried to the foot hills. From the foot hills of Bhutan up to the confluence these two rivers Beki and Manas drain low lying areas of flood plain. The spatial and temporal distribution of rain in the area, sometimes give rise to huge flood in the downstream plain. In 2004 such an occurrence change the river scenario in which the original course of Manas was silted up and nearly 80% of flood discharge flow through the river Beki. In addition, the flood of river Buradia (which after drains a huge area joins the river Beki) in 2004 accelerated the problem further on downstream. After this flood, the river Beki created a lot of problems by eroding the banks to get the river regime and still continuing. During the process the river has eroded numbers of villages and large tracks of cultivable lands.

**Location of the Project:** The present proposal starts from Narayanguri(at L/B of Beki river)which is 16.20 km D/S of Mothanguri(where the river Beki enters into Assam) and uptoTinkunia part-III (at R/B of Beki river) covering the reaches of Baksa and Barpeta District.It is situated in within location from Longitude  $90^{\circ}58'47''\text{E}$  to  $90^{\circ}46'30''\text{E}$  and Latitude  $26^{\circ}14'0''\text{N}$  to  $26^{\circ}42'0''\text{N}$ .

**Problem:**The high flood water in Beki river, exerts heavy thrust on bank from Mothanguri to Safakamar. This portion is affected by heavy erosion of Beki. After crossing Raghabil, the river erodes at many places on its left bank. Due to continuous erosion during flood time the most affected places between Raghabil and NH.31 on left bank of the river Beki are Raghabil,Elengbari, Chunbari,Khagrabari,Gobardhana,Udalguri,Barapeta,Safakamar,Katajar, Dumunighat, Tilabori, Nichuka. After crossing the NH31 erosion on right bank the intensive and heavy erosion creates problem at Chantabari,Kurobaha,Salsalia,Bordonga,Guileza,Mowamari,Kaurjahi,Kharbali-Sutirpathar,Daukmari,Sawpur,Alipur-Rasulpur,Bheragaon,Satrankanara,Morabhaj,Jaurimari,Takakata, Pub-Moinbori,Hatchara,Joypur, Kismat Moinbori,Tarakandi, PuranChikartari. Chotala, Apart from the erosions of river bank in different reaches the flood wave through incoming channels in many locations are causing instant flood havoc destroying nos. of buildings, schools etc. and eating up huge cultivable/homestead land immediately making lakhs of people homeless as well as paddy loss of a huge area.

Though there is erosion problem inside the Manas National Park, but due to major restriction in execution of such work by other organization, so provision of anti-erosion work including raising and strengthening work has not incorporated in this DPR.

**Details of earlier executed project/ongoing works:** At Safakamar area total 4 (four) nos. of anti-erosion work was taken up for a reach length of 2278m with geo-bag apron and PCC slab revetment which were completed in the year 2015-16. A total of Rs.16.00 Cr. was incurred to complete the said works.

The above mentioned existing work at Safakamar area is just upstream of the proposed work incorporated in this DPR and it is not overlapped with the earlier works.

**Master Plan of the basin, fitment of the Project:** In the Master Plan of Beki-Aai-Manas basin prepared by the Brahmaputra Board, the losses due to erosion and flood inundation was accessed in details and suggested various scope of protection work to protect the bank from repeated migration year by year. Accordingly this project is prepared on the basis of recommendation of the Master Plan to save the life and property of the greater area.

**Non-structural measures:** Earlier the flood havoc of Beki river occurred suddenly because the Kurichu dam of Bhutan had released excess water without any advance warning to the concern department/Govt. for necessary preparedness. But after making the understanding with the Govt. of India, the Bhutan Govt. gives information to the Assam Govt. prior to release of the excess discharge from the dam and thereby people are informed regarding the flood discharge through the local body. The District administration along with Water Resources Department arranges some awareness programme among the people residing near the river bank/embankment. Disaster response team is also taking most initiative to keep alert the local people and tell them the consequences of flood havoc etc.

**Survey and Investigation:** A detailed Bathymetric survey to access the river bed profile along with water depth of the river was done using Echo-Sounder. The highest flood level was computed by flood frequency analysis. A detailed topographic survey was done using DGPS in Kinematic mode to get the elevations of the entire area as well as the elevation profiles of the existing embankment. Present bank line survey was done and the previous years' satellite imageries were collected to analyse the migration of the river bank. Velocity of the river was observed through velocity meter and the soil investigation was carried out to get the silt factor of the river bed material.

From the hydrological survey data the river cross sections were generated using AutoCAD and taking the Design Discharge given by the Hydrology (NE) Dte, CWC, New Delhi, the flood hazard map was prepared using ArcGIS & GeoHECRAS. While preparing the Flood Hazard map the satellite imageries of earlier years' and the DEM file were also used.

**Various alternatives, cost effective practices and present proposal:** Beki river is braided in nature and changes its gradient from 1:600 to 1:6500. Some practices like construction of spur, bull head etc. is not feasible due to its local affect in U/S and D/S and due to incoming channels pointed toward banks do not allow such structures for proper functioning.. In the Brahmaputra river some major projects at Palasbari and Dibrugarh was executed for bank protection funded by Asian Development Bank with geo-bag and was successful in protecting the reach sustaining well. Though there is some cost effective measures like vegetation cover, deep root plant etc. but observing the nature of flow, erosive properties, nature of soil, flow velocity, meandering pattern etc. the geo-bag material is considered in this project.

As the Beki river carries maximum discharge with heavy silt load, it develops many sand chars on river bed. As a result flood water directly hits the bank creating erosion problem in most of the reaches. Moreover due to meandering nature of the river, the flow direction changes repeatedly and hence flood wave starts to erode the bank. So, anti-erosion works are proposed to stabilize the bank.

As the existing flood embankments are in very poor condition with insufficient freeboard, it is not able to withstand the thrust of flood water. So, raising and strengthening of the existing embankments are proposed in this DPR.

Due to some oblique channels and flow through it, creates inward thrust on the bank to erode bank slope, porcupine screens are incorporated in this project to choke up these oblique channels and also to induce silt near bank in some locations.

**Scope of the Project:** To protect the community and land erosion from the flood of the river Beki raising and strengthening of existing embankment system as well as bank revetment is being utmost necessary. Erosion protection by construction of apron with Geo-bag of size 1.03m x 0.70m in cage along with bank revetment with Geo bag of size 1.03m x 0.70m in loose for a length of 43178m at 37 different locations is proposed where erosion is too severe. Single layer PSC porcupine screens & bars at 25 different locations to close some incoming channels as well as to push the river away from bank is considered in the project. Raising & strengthening of the existing embankment in Right as well as Left bank for a total length of 11.271Km is proposed to avoid flood inundation problem.

**Design features:** Design H.F.L. of Beki at NH31 Bridge has been calculated by Log Pearson Type-III for 25, 50 & 100 years flood frequency and required HFL has been collected from CWC gauge site situated near NH31 Beki bridge and the DHFL has been assessed as 46.25m. Design HFL of other locations are calculated with respect to observed flood gradient followed by the Beki river which from CH.0m at Mothaguri IB upto CH.12000m downstream is 1:500, from CH.12000m to CH.20000m downstream is 1:600, from CH.20000m to CH.30000m is 1:1000, from CH.30000m to CH.31000m is 1:2500 and from CH.31000m to CH. 36000m is 1:4500, from CH.36000m to CH. 59000m is 1: 5000, from CH.59000m to CH. 76000m is 1: 5500, and from CH.76000m to outfall near D/S of Tinkunia Part-III it is 1:6500.

Initially the design discharge was calculated on the basis of observed data collected by WRD, Govt. of Assam which was found to be 5500 Cumec and 46.25m for 50

years return period respectively. These values were finalised by Hyd(NE)Dte,CWC vide no CWC U.O No 4/265/2016-Hyd(NE)/310 Dt. 29/11/2016.

Later on an expert team from CWC,Adabari,Gwahati,Assam visited the site to observe the proposed flooded and eroded area on the instruction of FMP Dte. CWC. Based on the report submitted by the expert team,it was advised to revise/recheck the discharge value since it was found that the discharge value observed at CWC G&D site exceeded the design discharge of 5500cumec on many occasions.

Based on the discharge data of CWC gauge site at NH-31 for 16 years(2003-2018),the flood frequency analysis has been carried by Hyd(NE) Dte,CWC by fitting the Log Pearson Type-III and Gumble Distribution,it was estimated that 25,50& 100yr. return period flood after accounting for Skewness correction for small data length as 9390,10450 and 11500cumec respectively.In this project the design discharge is considered as 10450cumec for 50 years of return period.As per suggestion of State Technical Advisory Committee(meeting held on 18<sup>th</sup> May/2021) provision of apron was made with Geo-bag in cage of size 1.50m x 1.50m x 0.45m considering for adequate and sustainable protection measure.

The size of the apron which was calculated as 16.50m x 0.45m has been adopted as 9m x 0.90m keeping the volume of apron as same and to place the geo bags (size 1.03mx0.7m) in cage(size 1.50mx1.50mx0.45m) for apron in more stable manner in 2 layers.

Toe Key has been provided to support the pitching work and in view of the IS code 14262-1995 (Para 5.1) and considering the thickness of pitching (0.3m.) as well as the thickness of apron (minimum required 0.45m.) (i.e. thickness of toe key =thickness of pitching + thickness of apron = 0.3+0.45 = 0.75m).Adjusting, toe key in gabion has been proposed in 2 layers which will come as 0.9m (0.45m+0.45m). The width of the toe key (=1.50m.) has been decided in view of the size of one wire netting cage which is 1.50mx1.50mx0.45m.Top anchorage will be done with geo-bag by placing in a trench along the bank and geo-fabric sheet will be wrapped up in silt filled geo-bag.

As the flow depth is 6m to 7m, considering the 50% of flow depth,a single layer of RCC porcupine of length 3.00m is provided as pro-siltation measures in the form of screen/bar. Porcupine screens in single layer will be placed in the oblique channels to chock up and to push the flow to the main course. The porcupine bars will be placed in the bank, slope of bank and at river bed to induce silt and thereby protect the firm bank from directly hitting of flood wave. Each bar/screen is consisting of 5 rows in channels, river bed, bank slope.

In the previous DPR a total length of 16.551km was proposed for raising and strengthening work,but a length of 2.50km(R/B) was taken up by APWD(R) Department and a length of 2.78km(L/B) inside Manas National Park.Hence a total length of 11.271 km is incorporated for raising and strengthening of embankment in this DPR.For Raising and strengthening of embankment the formation level of the crest of embankment has been calculated by adding the Free Board (=1.8m.) with the DHFL at the concerned chainages. Thus the height of embankment has been calculated by deducting the embankment's toe level from the embankment's proposed crest level. The calculation of height of embankment at every kilometre of embankment has been shown below:

CHAINAGE (in m.)	Formation Level (In m.)	Toe Level (in m.)	Height of embankment (in m.)
1	2	3	4=2-3
Left bank embankment			
(start at 2780)3000	68.65	64.87	3.78
4000	67.01	63.15	3.86
5000	65.38	61.42	3.96
6000	63.77	58.44	5.33
7000	62.17	57.47	4.7
8000	50.56	45.93	4.63
9000	59.12	54.96	4.16
10000	58.08	53.85	4.23
11000	57.04	53.35	3.69
12000	56.01	52.15	3.86
12200	55.8	51.9	3.9
Right bank embankment			
2500	46.73	43.31	3.32
3500	46.53	43.18	3.35
4351	46.36	42.9	3.46

**Basis of rates and cost estimate:** The total cost of the project with the provision as mentioned above is worked out and stands at Rs. 400,21,95,000.00 only. The price level for the rates considered from SOR of WRD is 2021-22. For preparing the DPR necessary topography and bathymetry survey work was done by M/S B.C Engineering & Consultancy, Survey, Beltola Guwahati and work order was issued vide no BWRD/GEN-18/pt-II/14/5 Dt. 18/2/2015 for Rs.17,70,000.00 which was considered during preparation of estimate.


**Benefit Cost Ratio:** Calculating the cost of damages due to flood and erosion in the entire reaches, the benefit cost ratio has been found as 1.51:1. While assessing the BC Ratio, the damage certified by the concerned Administration have been considered. Furthermore, the residual costs of the earlier executed project have also been taken into account while calculating the Cost of Project.

**Construction programme:** As the proposed work site aligns along the river bank and the reach is actively erosion-prone, the apron work have to be implemented in the dry seasons only. So a period of 24 months has been considered for construction. The raising & strengthening of the existing embankments will also be done in the dry season. Just after allocation of the work, the work sites could be handed over to the contractor for necessary preparation to execute the project. For protection work A-Type geo-bag of size 1.03mx0.70m will be used both in apron and revetment. As pro-siltation measures PSC porcupine members are considered both in river bed and bank. Construction of embankment will be done by locally available ordinary soil.

**Socio –economic aspect:** The flood inundation and erosion problem of Beki river affect the socio-economic development of the people residing in the adjoining areas and villages. The people becomes landless and homeless and fighting hard for their livelihood due to losses of huge cultivable as well as homestead land. After implementation of the project large area will be protected and land reclamation will give benefit to the people for their cultivation. By this project many school buildings, Govt. institutions, hospitals, public utility buildings will be safe from the grip of erosion of Beki river. Hence, it will be a great help for maintaining the socio-economic development of the people living nearby the Beki river. If the road communication get protected from erosion problem, then people of the locality can only go for different opportunity for their livelihood and then only their socio-economic development can be expected. Furthermore the most important communication to the Manas National Sanctuary which gets interrupted every year will be safe in future after implementing this project. So, this project has a great socio-economic aspect and may be considered for early implementation to get the benefit.

**Environmental aspect:** By implementing this project no any adverse impact on environment is accessed. As no any major structure on the bed of the river will be laid down or will be blocked its natural flow which may be harmful for aquatic life, so environment will not hamper by any means. By stabilizing the bank with Geo-bag, it will not harm the balance of the environment. Providing pro-siltation measures, land will be reclaimed and will get positive impact on environment by starting cultivation by the people again. Raising and strengthening of the existing embankment will not harm the environment as it does not require any de-forestation or does not require to destroy any natural resources. Plantation along the bank which is incorporated in the project will help to balance the environment in addition. No any work in Manas National Park area is included in the project considering the environmental impact.

**Recommendations:** In the 80th special TAC meeting that was held on 07/03/2020 at Guwahati the final memo of the project has been recommended by the Hon'ble TAC committee amounting to Rs.20325.00 lakh. The scheme was again reviewed by the 82<sup>nd</sup> special TAC on 18<sup>th</sup> May/2021 for amounting to Rs.288.4310 Cr. due to re-arrangement existing erosion reaches considering the present site condition and for incorporation of some new erosion locations. Observing all the technical feasibility the TAC Committee has recommended the memo suggesting some technical modification. After doing the necessary modification as per suggestion of TAC, the DPR was prepared for amounting to Rs.400.2195Cr.

  
Executive Engineer  
Barpeta W.R Division  
Barpeta

## BRIEF HISTORY OF PAST FLOODS AND EROSION OF RIVER BEKI

**Name of the Project:-** Integrated Flood and Erosion Management of Manas and Beki River in the district of Baksa and Barpeta in Brahmaputra Valley within Assam (Review).

The river Manas is a trans-boundary river in the Himalyan foot hills between southern Bhutan and India. It originates from Bhutan and when enters into Assam it falls to other channels namely Beki and Hakua. In the later stage the original course of Manas was silted up. Also due to heavy landslides and other natural phenomena the Hakua channel also choked up allowing 80% of flow discharge through Beki. As a result the Beki is the main river flowing from Bhutan carrying huge discharge with silt load to the downstream with high velocity and create flood hazard in a long reach to the outfall at mighty river Brahmaputra.

**Year 2004:** In the year 2004 unprecedented flood as well as release of excess water from the Kurishu dam of Bhutan created flood havoc to the downstream reach. Due to heavy rush of water the tie bundh at Narayanguri breached on 12<sup>th</sup> July, 2004 and river Beki avulsed through this breach diverting 80% of its discharge through the avulsed channel. The avulsed channel breached the embankment of Beki near Narayanguri and fell out in the Kalpani river. The river water rush through Kalpani river and then Pallah river caused devastation in major parts of Barpeta and Baksa district including N.H.31. The P.W.D. road from Barpeta road to Manas Wildlife Sanctuary breached at five locations disrupting the communication to the sanctuary as well as to the adjacent villages. The cultivated and homestead land in all the villages at downstrea had been badly affected. The NH31 was under knee-deep water for number of days. The more than 500years old religious and cultural heritage, the Barpeta Xatriya Kirtan Ghar (a temple) which never been flooded had been affected by this flood. The earlier flood protection works like boulder spur, boulder revetment works were completely damaged. The discharge during the peak flood was 9733cumec (as per CWC gauge station). The closing of breach of embankment at Narayanguri was executed by Barpeta W.R. Division in 2005. Due to this heavy flood, bank erosion at different locations was occurred and changed the river configuration.

**Year 2007:** Similar situation was occurred in the year 2007 also, within 14 hours the level of Beki rose to height of 8feet. More than 100 villages were under deep submergence including cultivated land comprising 40 to 50 Km in length and 7 to 8 Km in width for the entire flood season and there after rendering destruction and possibilities of late cultivation and crippling the entire economy of the area. Many road bridges wooden/RCC and culverts were badly damaged or washed away. Thousands of people were rendered homeless and had to live in relief camps for a long time. There had been a number of losses of human life and livestock. The Manas National Park suffered immeasurably and its link to the main land remained cutoff. The discharge and maximum water level during the peak flood was 5520cumec and 45.80m respectively (as per CWC gauge station). That year also breach occurred at Narayanguri and also damaged the earlier anti-erosion works including the tie bund. Due to meandering pattern of the river huge sand char had been formed pushing the flood wave directly to the banks creating severe erosion at many locations.

**Year 2009:** Again in the year 2009 similar devastation along with incessant rainfall rendered more than 1.5 lakh of people belonging to 300 villages to suffer under flood water for several days. Flash floods entered the northern and western part of

Barpeta district and also Baksa district which swept one village after another. Flood waters washed away a portion of the Barpeta Road- Basbari road leading to Manas National Park-cum-tiger Project at Safakamar besides considerably affecting ongoing erosion-control work there. The famous park had remained cut off from the rest over the last 48 hours. During this period flood discharge & water level recorded at CWC gauge station as 6722 cumec and 45.14 m respectively.

**Year 2015:** In the year 2015, flood discharge of Beki recorded at CWC gauge station was 3260 cumec which create severe erosion problem at Gamariguri and Uttar Safakamar area. During this period the water level recorded as 45.80 m and the existing embankment for a length of about 800 m had been washed away. After this flood four anti-erosion works had been executed from 2016 to 2019 with geo-bag apron and P.C.C slab revetment. These protection works resulted to make stream line the flow to resist the thrust of flood wave and thereby to save further bank migration in that area.

**Year 2016:** In the year 2016, due to severe erosion on R/B embankment at Bordanga breach occurred for a length of 50 m and inundated a vast area under Kalgachia revenue circle, nos of school buildings, houses, PWD roads and other public utility had been eroded away. Still the erosion is continuing at Bordanga area and some palliative measures were taken time to time without any fruitful result to arrest the erosion. The breach portion was closed and till now it is existing to save the area from flood inundation.

Due to heavy discharge with silt load during flood period the erosion problem in the un-embankment reaches has also been continuing since last 10 years and some pro-siltation measures like bamboo screen is being taken to solve the problem. But until doing some permanent nature of protection work, the erosion problem can hardly be solved and then only further bank migration will stop.

This flood havoc phenomenon is happening every year due to carriage of huge flow of water by river Beki beyond its capacity. It is observed that the river Beki has a tendency of shifting towards L/B from Mothanguri to the bridge at NH31 and after that it shows tendency of shifting towards R/B from the NH31 Bridge to the outfall at Tinkunia Pt-III. In this purview the proposed works in the modified DPR are located mainly along the L/B of Beki river in the upstream from the RCC bridge at NH31 and similarly along the R/B of river Beki in the downstream from the RCC bridge at NH31.

Year after year this shifting of river course rendering huge loss in the economy from the agricultural point of view as well as the habitation point of view. To protect further shifting of the river Beki and to push the river to the original course the closing of incoming channels as well as bank revetment to arrest further erosion are utmost necessary.

  
Executive Engineer  
Barpeta W.R.Division  
Barpeta



## CHAPTER-4

### PRIORITIZATION OF SCHEME

Name of scheme: Integrated Flood and Erosion Management of Manas and Beki River in the district of Baksa and Barpeta in Brahmaputra Valley within Assam (Review).

4.1 Location and problem: The river Beki originates from the foot hill of Bhutan and enters in India at Mathanguri of Assam State. The present proposal starts from Narayanguri (at L/B of Beki river) which is 16.20 km D/S of Mothanguri (where the river Beki enters into Assam) and upto Tinkunia part-III (at R/B of Beki river) covering the reaches of Baksa and Barpeta District. It is situated in within location from Longitude  $90^{\circ}58'47''\text{E}$  to  $90^{\circ}46'30''\text{E}$  and Latitude  $26^{\circ}14'0''\text{N}$  to  $26^{\circ}42'0''\text{N}$ .

Near the project site, a Major District PWD road connecting NH 31 and Manas National Park is under serious threat due to erosion of the Beki river. A State Highway connecting Barpeta town to Abhayapuri town crossing Beki river is also under threat of Beki erosion. Major towns like Barpeta Road, Barpeta and Kalgachia etc are situated very close to the project location.

Along the banks of the river Beki, nos of family are residing to earn their livelihood by cultivating seasonal crops. In the project location huge cultivable and homestead land is eroded away by the flood wave of the Beki river.

4.2 Necessity of the Scheme: As per the recommendation and suggestion of the Master Plan prepared by the Brahmaputra Board, this project is prepared for the benefit of nearby habitant incorporating the anti-erosion works, raising and strengthening work of existing embankment and pro-siltation measures. After protecting the entire reach of the Beki river, the scope of developing the adjacent areas will be fruitful to implement any type of project for agricultural product, small industry etc.

After implementation of the project, large area will be protected and land reclamation will give benefit to the people for their cultivation. By this project many school buildings, Govt. institutions, hospitals and public utility buildings will be protected from the grip of erosion of the Beki river. Hence, it will be a great help for maintaining the socio-economic development of the people living nearby the Beki river. If the road communication gets protected from erosion problem, the people of the locality can go for different opportunity for their livelihood and their socio-economic development can be expected.

Furthermore the most important communication to the Manas National Sanctuary which gets interrupted every year will be safe in future after implementation of this project.

It may be noted that a total area of 800Sqkm and 3,00,000 people will be benefited So, this project has a great socio-economic aspect and may be considered for early implementation to get the benefit.

4.3 Sustainability, Operation & Maintenance of Assets after completion of the project: Water Resources Department, Govt. of Assam bears the responsibility for maintenance and repairing of the project after completion. Separate provision of fund is made by the state Govt. for this purpose. The Executive Engineers of the Divisions under W.R Department will be the nodal agency for maintenance of the scheme.



Executive Engineer  
Barpeta W.R Division  
Barpeta

**CHAPTER-5**  
**HYDROLOGY**

**5.1 Design Discharge:**

5.1.1 For the design of various works of R/S of embankment and anti-erosion works in this project, the design flood is kept as 50 years considering the location of the project area in predominantly rural areas.

5.1.2 The design discharge at Beki Road bridge G&D site is estimated to be 9390,10450 and 11500 cumec respectively for 25,50 & 100 years return period based on the recommendation of Hydrology(NE) Directorate, CWC, New Delhi vide letter no 4/265/2016-Hyd(NE)/267 Dt. 19/11/2018 (copy enclosed herewith).

5.1.3 A design discharge of 10450 cumecs for a return period of 50 yrs is considered in this project for design purposes.

**5.2 Design H.F.L:**

5.2.1 The Design period for HFL calculation is taken as 25 Yrs as the proposed locations are at rural area.

5.2.2 Peak Flood data for last 22 years (From 1998 to 2019) which was collected at CWC G&D site at Beki Road bridge is considered for calculating the design H.F.L for this project.

5.2.3 The design HFL is calculated for frequency analysis by Log Pearson type -III method.

5.2.4 The design H.F.L calculated for 25 years return period is 46.24m whereas observed H.F.L in 1998 was 46.25m. Hence the observed H.F.L of 46.25m is considered for design purposes.

  
Executive Engineer  
Barpeta W.R Division  
Barpeta

Integrated flood and erosion management of Manas and Beki river in district of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

**CALCULATION OF DESIGN HFL  
FREQUENCY ANALYSIS BY LOG PEARSON TYPE -III METHOD**

Sl. No.	Year	X	Z=log10(X)	Z-Zm	(Z-Zm) <sup>2</sup>	(Z-Zm) <sup>3</sup>
1	1998	46.25	1.66511	0.005148	2.650E-05	1.364E-07
2	1999	46.20	1.66464	0.004678	2.189E-05	1.024E-07
3	2000	46.12	1.66389	0.003928	1.543E-05	6.061E-08
4	2001	45.24	1.65552	-0.004442	1.973E-05	-8.764E-08
5	2002	45.63	1.65925	-0.000712	5.067E-07	-3.607E-10
6	2003	45.53	1.6583	-0.001662	2.762E-06	-4.589E-09
7	2004	45.80	1.66087	0.000908	8.248E-07	7.491E-10
8	2005	45.90	1.66181	0.001848	3.418E-06	6.313E-09
9	2006	45.19	1.65504	-0.004922	2.422E-05	-1.192E-07
10	2007	45.79	1.66077	0.000808	6.532E-07	5.279E-10
11	2008	45.76	1.66049	0.000528	2.790E-07	1.474E-10
12	2009	45.17	1.65485	-0.005112	2.613E-05	-1.336E-07
13	2010	45.80	1.66087	0.000908	8.248E-07	7.491E-10
14	2011	45.36	1.65667	-0.003292	1.084E-05	-3.567E-08
15	2012	45.85	1.66134	0.001378	1.899E-06	2.618E-09
16	2013	45.36	1.65667	-0.003292	1.084E-05	-3.567E-08
17	2014	45.78	1.66068	0.000716	5.158E-07	3.704E-10
18	2015	45.84	1.66124	0.001276	1.634E-06	2.088E-09
19	2016	45.92	1.662	0.002038	4.164E-06	8.467E-09
20	2017	45.97	1.66247	0.002508	6.291E-06	1.578E-08
21	2018	45.32	1.65629	-0.003672	1.348E-05	-4.950E-08
22	2019	45.75	1.66039	0.000428	1.833E-07	7.850E-11
		1005.63	38.51916	7.3275E-15	1.930E-04	-1.289E-07

**Result of flood frequency analysis**

No. of Data Point	22
Average HFL ( $\mu$ ) =	45.705909
Mean of log of Data value (Zm)	1.659962
Standard deviation (S)	0.003032
Coefficient of Skewness (Cs)	-0.242338 (Skewed to left)

Return period (t)	Frequency factor Kt	Zt = log10(Xt) Zm+Kt*S	Xt antilog(Zt)
25	1.678435	1.665050	46.240
50	1.830870	1.665512	46.293

Therefore, HFL at RCC bridge at NH31 = 46.240 m  
 But the Observed HFL in the year 1998 is 46.25m.  
 So, the Designed HFL considered is at NH31 bridge at Sorbhog = 46.25m

  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta

TABLE FOR FREQUENCY FACTOR IN LOG PEARSON'S TYPE III METHOD

Coefficient of Skewness	Recurrence interval in years					
	2	10	25	50	100	
3	-0.396	1.18	2.278	3.152	4.051	
2.5	-0.36	1.25	2.262	3.048	3.845	
2.2	-0.33	1.284	2.24	2.97	3.705	
2	-0.307	1.302	2.219	2.912	3.605	
1.8	-0.282	1.318	2.193	2.848	3.499	
1.6	-0.254	1.329	2.163	2.78	3.388	
1.4	-0.225	1.337	2.128	2.706	3.271	
1.2	-0.195	1.34	2.087	2.626	3.149	
1	-0.164	1.34	2.043	2.542	3.022	
0.9	-0.148	1.339	2.018	2.498	2.957	
0.8	-0.132	1.336	1.998	2.453	2.891	
0.7	-0.116	1.333	1.967	2.407	2.824	
0.6	-0.099	1.328	1.939	2.359	2.755	
0.5	-0.083	1.323	1.91	2.311	2.686	
0.4	-0.066	1.317	1.88	2.261	2.615	
0.3	-0.05	1.309	1.849	2.211	2.544	
0.2	-0.033	1.301	1.818	2.159	2.472	
0.1	-0.017	1.292	1.785	2.107	2.4	
0	0	1.282	1.751	2.054	2.326	
-0.1	0.017	1.27	1.716	2	2.252	
-0.2	0.033	1.258	1.68	1.945	2.178	
-0.3	0.05	1.245	1.643	1.89	2.104	
-0.4	0.066	1.231	1.606	1.834	2.029	
-0.5	0.083	1.216	1.567	1.777	1.955	
-0.6	0.099	1.2	1.528	1.72	1.88	
-0.7	0.116	1.183	1.488	1.663	1.806	
-0.8	0.132	1.166	1.448	1.606	1.733	
-0.9	0.148	1.147	1.407	1.549	1.66	
-1	0.164	1.128	1.366	1.492	1.588	
-1.4	0.225	1.041	1.198	1.27	1.318	
-1.8	0.282	0.945	1.035	1.069	1.087	
-2.2	0.33	0.844	0.888	0.9	0.905	
-3	0.396	0.66	0.666	0.666	0.667	

  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

**Design for thickness of pitching and launching apron at NH31 gauge site according to IS Code 8408**

Designed Discharge, Q	=	10450.00 cumecs	
Flow depth at bank full stage, d	=	7.5 m	
Discharge Intensity $q = d \times V$	=	17 m <sup>3</sup> /sec/m	
Gravitational Acceleration g	=	9.81 m/sec <sup>2</sup>	
Designed HFL	=	46.25 m	
Observed LWL	=	41.17 m	
Stream Velocity V	=	2.29 m/sec	
Mean Dia of river bed material d	=	0.260 mm	
Silt Factor $f = 1.76 \times (d)^{1/2}$	=	0.9	
Angle of sloping bank (2H:1V) $\theta$	=	26.57 °	
Angle of repose $\Phi$	=	30 °	
Value of $K = [1 - \sin^2 \theta / \sin^2 \Phi]^{1/2}$	=	0.447	
Specific gravity of sand $S_s$ ( wet and packed) inside	=	1.90	
Weight of saturated sand in geobags (Min reqd)	=	19.524 kg	
$W = 0.02323 \times S_s \times V^6 / (K \times (S_s - 1)^3)$	=		
Thickness of pitching (T) for negative head criterion = $V^2 / 2g(S_s - 1)$	=	0.30 m	

**Design of Launching Apron (to be laid at LWL)**

Scour Depth below HFL, $D = 0.473 \times (Q/f)^{1/3}$	=	10.721 m	
Max. Scour Depth below HFL due to bends etc ( $D_{max}$ ) =			
1.5 * D	=	16.08	m
Width of Launching Apron = $1.5 \times [D_{max} - (HFL - LWL)]$	=	16.50	m
Say =	=	16.50	m
Thickness of Launching Apron (crates) = $1.5 \times 0.30$	=	0.45	m
Adopting 2 layers of Geo bag (size 1.03m x 0.70m) in cage of size 1.50m x 1.50m x 0.45m (filled thickness 0.45m of one layer) thickness of apron =	=	0.90	m
So, Width of apron = $(16.5 \times 0.45) / 0.6 =$	=	8.25	m
Adjusting for width of 1.50m cage, adopted apron width	=	9.00	m
So, Size of Apron = 9.00m x 0.90m			

  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta

## CHAPTER-6

### DESIGN OF WORKS

#### **6.1 Design of Embankment (As per BIS code 12094:2000)**

6.1.1 25 years of return period HFL data is considered for raising and strengthening of existing embankments and 50 years of return period design discharge data is considered for design of anti-erosion works.

6.1.2 R/S of embankments:

- Left Bank embankment: 9420m
- Right Bank embankment: 1851 m
  
- Design HFL for R/S of embankment is considered as 46.25m by doing flood frequency analysis.
- Crest width is taken as 6.00m
- River side slope is taken as 2:1
- Country side slope is taken as 3:1
- Free board is taken as 1.80m since discharge is more than 3000cumecs.
- H.G line is provided as 6:1

#### **6.2: Design of revetment: ( As per BIS: 14262:1995)**

6.2.1 Protection of banks is a part and parcel of river training works because bank caving is one of the causes of deterioration of river conditions. River passes through populated/agricultural areas necessitates protection of adjacent land and properties threatened by the erosion.

6.2.2 The design flood for pitching/revetment is calculated for 50 years return period using the flood frequency analysis. The design HFL is obtained from G&D site.

6.2.3 Erosion protection work with Geo-textile bags is proposed at 37 locations for a total length of 44678 m.

6.2.4 The design of revetment and launching apron is done as per provision of IS 14262:1995 and values are found as per calculations are

- Thickness of pitching for negative head criteria = 0.3m
- Size of Launching Apron = 9.00\* 0.90 m ( using 2 layers of cages(size 1.50mx1.50mx0.45m) of geo-bag of size 1.03m\*0.70m\* thickness of 0.45m of 1 layer of cage)
- Toe-key of size 1.50.0\*1.50\*0.9m

6.2.5 Top anchorage will be done with geo-bag by placing in a trench along the bank and geo-fabric sheet will be wrapped up in silt filled geo-bag.

### **6.3 Design of PSC porcupine bars/screens**

- 6.3.1 Protection of banks is a part and parcel of river training works. This protection comes under anti erosion works.
- 6.3.2 Permeable structures envisaging construction of PSC porcupine screens and bars are a cost effective alternative to the impermeable bank protection works as the Beki River carries considerable amount of silt. PSC porcupine is a prismatic type permeable structure, comprises six members of PSC, which are joined with the help of iron nuts and bolts.
- 6.3.3 During laying of PSC porcupine bar, it is considered that the length of bar does not block more than 20% of flow width of river.
- 6.3.4 PSC porcupine screen are laid at the oblique channels to chock up and thereby to divert the flow to the flow to the main stream.
- 6.3.5 PSC bars are laid at the slope of bank and at the river bed to induce silt along the bank and thereby pushing the flow towards the river to avoid any damages in the firm bank.
- 6.3.6 Since submergence of PSC porcupine screens & bars may be kept up to 50% of depth of flow, single layer of porcupine bar/screen of length 3.0m is provided to induce siltation as average depth of flow in the river is 6-7m.
- 6.3.7 A total of 160 nos of screens/ Bars are proposed at 25 different locations throughout the river.
- 6.3.8 All bars/screen consists of 5 rows at channels, river bed and bank slopes and each screen will be placed at a spacing of 1times of the width of oblique channel.

  
Executive Engineer  
Barpeta W.R Division  
Barpeta



### RAISING AND STRENGTHENING OF EMBANKMENT

For Raising and strengthening of embankment the formation level of the crest of embankment has been calculated by adding the Free Board (=1.8m.) with the DHFL at the concerned chainages. Thus the height of embankment has been calculated by deducting the embankment's toe level from the embankment's proposed crest level. The calculation of height of embankment at every kilometre of embankment has been shown below:

CHAINAGE (in m.)	Formation Level (in m.)	Toe Level (in m.)	Height of embankment (in m.)
1	2	3	4=2-3
<b>Left bank embankment</b>			
(Start at 2780)3000	68.65	64.87	3.78
4000	67.01	63.15	3.86
5000	65.38	61.42	3.96
6000	63.77	58.44	5.33
7000	62.17	57.47	4.7
8000	50.56	45.93	4.63
9000	59.12	54.96	4.16
10000	58.08	53.85	4.23
11000	57.04	53.35	3.69
12000	56.01	52.15	3.86
12200	55.8	51.9	3.9
<b>Right bank embankment</b>			
2500	46.73	43.31	3.32
3500	46.53	43.18	3.35
4351	46.36	42.9	3.46

  
Executive Engineer  
Barpeta W.R Division  
Barpeta

### REVETMENT LOCATIONS

Erosion protection work with Geo-textile bag

Sl.No.	Location	Length in m.
1	Raghabili(L/B)	300
2	Elengbari(L/B)	1600
3	Chunbari(L/B)	1500
4	Khagrabari(L/B)	2500
5	Gobardhana(L/B)	900
6	Udalguri(R/B)	600
7	Barapeta(R/B)	500
8	Tilabori(R/B)	800
9	Dumunighat(L/B)	1300
10	Safakamr(L/B)	750
11	Katajar(L/B)	1870
12	Nichuka(L/B)	1450
13	Chantabari(R/B)	1250
14	Ketekibari(R/B)	1500
15	Hajipur- Deuliapara(L/B)	1350
16	Kurobaha(R/B)	700
17	Salsalia(R/B)	900
18	Bordonga(R/B)	1300
19	Guileza(R/B)	1000
20	Mowamari(R/B)	500
21	Kaurjahi(R/B)	1000
22	Kharbali-Sutirpathar(R/B)	1500
23	Daukmari(L/B)	1000
24	Sawpur(R/B)	1500
25	Alipur-Rasulpur(R/B)	1400
26	Jaurimari(R/B)	1400
27	Pub Moinbari(R/B)	500
28	Takakata(R/B)	700
29	Hatchara(R/B)	1000
30	Joypur(R/B)	900
31	Tarakandi(R/B)	1920
32	Chotola(R/B)	1530
33	Kismat Moinbori(R/B)	930
34	Puran Chikatari(R/B)	250
35	Bheragaon (L/B)	1000
36	Satrankanara(L/B)	2037
37	Marabhaj(L/B)	2041
	Total =	43178



Executive Engineer  
Barpeta W.R Division, Barpeta

GOVT OF ASSAM  
OFFICE OF THE EXECUTIVE ENGINEER - LOWER ASSAM INVESTIGATION  
DIVISION WATER RESOURCES DEPARTMENT; BARPETA ROAD

To LAID/S-1/

Date

To,

The Assistant Executive Engineer  
Sorbhog W.R. Sub-Division  
Sorbhog

Sub: Regarding the data of maximum velocity of river Beki at N.H.31 Bridge site.

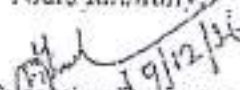
Ref: Your letter No. SWRS/W-28/Pt-vijj/2015-16/38 dated.08-12-2016

In response to your letter on the subject cited above the maximum velocity of river Beki at N.H.31 Bridge location as observed and taken in this office's record has been provided as below:

The maximum velocity of river Beki at NH31 bridge site = 2.29m/sec (observed on 12-07-2007)

Thanking you.

Yours faithfully,

  
19/12/16  
Executive Engineer  
Lower Assam Investigation Division  
Water Resources Department  
Barpeta Road

File No.T-320144/2020-FMP DTE

**No.9/1/PR-40/2020-FMP**  
**भारत सरकार/ GOVERNMENT OF INDIA**  
**केंद्रीय जल आयोग/ CENTRAL WATER COMMISSION**  
**बाढ़ प्रबंधन आयोजना निदेशालय/ FLOOD MANAGEMENT PLANNING Dte.**

906 JIS, Sewa Bhawan  
 R. K. Puram, New Delhi - 66  
 Date: 07.07.2020

To  
 The Chief Engineer  
 Water Resource Department  
 Govt. of Assam  
 Guwahati

Subj: Submission of DPR for scheme "Integrated Flood and Erosion Management of Manas and Boid River in the District of Baksa and Barapeta in Brahmaputra Valley within Assam (Review)" - (Estimated Cost: Rs 203.25 Crores) - 105


Ref: Your mail dated 15.06.2020.

Sir,

Reference is invited to the above mentioned mail vide which DPR of the above mentioned scheme was submitted to this office for detailed techno-economical appraisal. Subsequently the DPR was forwarded to Hydrology (NE) Dte for fixing the hydrological aspects of the scheme vide letter dated 24.06.2020.

In relation to this, the comments received from Hydrology (NE) Dte are enclosed here for your kind information and further necessary action.

Yours faithfully,

  
 Piyush Kumar  
 Director

Encl: As Above

Copy for kind information to:

SE (HOC), B&BDO, CWC, Guwahati

Subject: Examination of the Flood Management Scheme "Integrated Flood and Flood Management of Manu and Beki Rivers in District of Lakhimpur, Assam in Brahmaputra Valley" (Review) situated post C1206/2016.

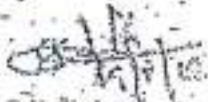
Ref: CWC LHO No. 54/FRC-10/2016/FAC-145/1456 dated 17/07/2016

Kindly refer to this office letter of even number dated 08/10/2018, vide which, the HOC, Guwahati was requested to coordinate with the State Government officials to identify and resolve the discrepancies in discharge data observed by CWC and Government of Assam near NH-31 Beki road bridge site. Consequently, vide SL, HOC, Guwahati letter no. 3/08/F&E Management/2016-HOC/1528-30 dated 11.10.2018, it has been suggested to use the discharge data observed at CWC site (2003 onwards), as it may be measured in Beki road bridge by the State Government does not appear to be consistent with the observed rainfall in the catchment. Subsequently, the annual flood peak data at Beki road bridge G&D site of CWC for 16 years (2003-18) was received through email dated 31.10.2018 from SL, HOC, CWC, Guwahati.

The 25, 50 and 100 year return period floods at proposed project site were earlier worked out as 4960, 5415 and 5867 cumec respectively communicated vide this office letter no. 4/265/2016-Hyd(NE)/318 dated 29.11.2016 based on observed discharge data provided by the State Government for the period 1974-2010. However, the observed discharge at Beki road bridge site has exceeded even 100 year return period flood in a number of years since 2003 as seen from the discharge data provided by the HOC, CWC, Guwahati. In quite a few years, the discharge has exceeded the 100 year flood earlier recommended by this office quite substantially. Accordingly, based on this 16 year data, the design flood has been reassessed, and the results are as follows;

The 16 years discharge data of Beki Road bridge G&D site (2003-18), has been checked for randomness as well as trend and the flood frequency analysis has been carried out in this Directorate by fitting the Log Pearson Type III and Gumbel distribution on the annual flood peak data.

The estimated 25, 50 and 100 year return period flood after accounting for skewness correction for small data length is 9390, 10450 and 11500 cumec respectively which may be adopted for planning and design purpose.

  
S K Sanjay  
Director

Director, Flood Management Planning Div, CWC, New Delhi  
No 4/265/2016-Hyd(NE)/267 Dated: 19/11/2018

Copy for:  
Superintending Engineer, HOC, B&BDO, Guwahati

भारत सरकार  
जल शक्ति मंत्रालय  
जल संसाधन नदी विकास एवं जंगल संरक्षण विभाग  
केंद्रीय जल आयोग  
जल विकास (उत्तर-पूर्व) निदेशालय



Government of India  
Ministry of Jal Shakti  
Dept. of Water Resources, RD&GR  
Central Water Commission  
Hydrology (North-East) Directorate

**Subject:** Examination of the Flood Management Scheme "Integrated Flood and Erosion Management of Manas and Bold Rivers in districts of Baksa and Borapeta in Brahmaputra Valley within Assam (Review)-Estimated cost ₹203.25 crores.

**Ref:** Letter No. 9/9/PR-40/2020-FMP dated 24.06.2020

Kindly refer to above mentioned letter on the subject requesting therein for the examination of hydrological aspects of the scheme mentioned above has been requested.

In this connection, on examination of the DPR forwarded through email dated 24.6.2020, it is found that there is no changes in the location of proposed work under above mentioned flood protection scheme, whose DPR was earlier sent to this office vide your letter No. 9/1/PR-40/2016-FMP-480 dated 20.06.2016. Accordingly, there is no change in the 25, 50 and 100 year return period flood conveyed vide this office letter no. 4/265/2016-Hyd/NE/267 dated 19.11.2018 (copy enclosed). There are no further comments to offer in this regard.

This issues with the approval of Chief Engineer (HSO).

Encl: As above

Signature Not Verified  
Digitally signed by SUYASH  
KAMAL SINHA  
Date: 2020.07.02 14:25:38 IST

(S K Sinha)  
Director, Hydrology (NE)

**Director, Flood Management Planning Dte, CWC, Delhi**  
No. 4/263/2016-Hyd (NE) Dated: 10/7/2020

CHAPTER-7





## ABSTRACT OF COST

**GENERAL ABSTRACT OF COST**

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

<b>(A) Direct Charges</b>			
I-Works	=	Rs.	3952879875.49
II-Establishment	=	Rs.	0.00
III-Tools & Plant	=	Rs.	2500000.00
IV-Suspense	=	Rs.	0.00
V-Reciepts & Recoveries	=	Rs.	2076000.00
<b>Total Direct Charges( I+II+III+IV-V)</b>	=	Rs.	<b>3953303875.49</b>
<b>(B) Indirect Charges</b>			
(a) Capitalized value of abatement of land revenue(5% of cost of culturable land or 20 times of annual revenue)	=	Rs.	0.00
(b) Audit & Account Charges(0.25% of I-Works)	=	Rs.	9882199.69
<b>Total Indirect Charges</b>	=	Rs.	<b>9882199.69</b>
<b>Total Cost (A+B)</b>	=	Rs.	<b>3963186075.18</b>
<b>(C) Add 1% contingency on C-works</b>	=	Rs.	<b>39008961.13</b>
<b>Total (A+B+C)</b>	=	Rs.	<b>4002195036.31</b>
	Say	Rs.	<b>4002195000.00</b>

**(Rupees Four hundred crore twenty one lakh ninety five thousand ) only**

Counter signature		
		
Superintending Engineer Mukalmua Protection W.R. Circle Mukalmua	Chief Engineer Water Resources Deptt. Chandmari, Ghy-3	Executive Engineer Barpeta W.R. Division Barpeta
Recommended by		
		
Addl. Chief Engineer Lower Assam Zone WR Department, Chandmari, Ghy-3		

A.C.




Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

**I-Works**

Details			Amount
A-Preliminary (As per Sub-estimate No-1)	=	Rs.	2670000.00
B-Land	=	Rs.	0.00
C-Works	=	Rs.	3900896112.77
K-Building (As per Sub-estimate No-2)	=	Rs.	13838748.00
M-Plantation (As per Sub-estimate No-3)	=	Rs.	6576486.72
O-Miscellaneous (As per Sub-estimate No-4)	=	Rs.	2861672.00
P-Maintenance	=	Rs.	0.00
Q-Spl T&P	=	Rs.	0.00
R-Communication (As per Sub-estimate No-5)	=	Rs.	26036856.00
X-Env &Ecology	=	Rs.	0.00
Y-losses	=	Rs.	0.00
Total(I-Works)	=	Rs.	3952879875.49

3952879875.49


  
Executive Engineer  
Barpeta W.R. Division  
Barpeta



### ABSTRACT OF 'C' WORKS

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

Sl No	ITEM OF WORKS	Amount	
1	Clearing medium jungles and trees up to 50cm. girth	Rs.	894753.43
2	Cutting bamboo , uprooting roots & stumps	Rs.	6263384.40
3	Felling trees including uprooting roots and stumps	Rs.	403166.16
4	Earthwork in grabbing the seat of the embankment.	Rs.	9979239.14
5	Earth work in embankment by truck carriage in ordinary/normal soil	Rs.	226850771.21
6	Turfing with grass sods of largest possible rectangles of	Rs.	7523765.10
7	Earthwork in bank trimming to the designed	Rs.	161151051.19
8	Supply of Geo-textile bags of type-A (size 1.03X0.70M)	Rs.	1579205490.00
9	Supply of Wire -netting box of size 1.50mx 1.50mx 0.45m	Rs.	967188000.00
10	Supply of non-woven Geo-textile fabric sheets of 300 GSM	Rs.	69756670.00
11	Supply of Sewing Thread/Yarn PPMF Stitching Thread	Rs.	10488308.16
12	Carriage of Geo bags of size 1.03 x 0.70 m	Rs.	17162686.08
13	Carriage of 300gsm Geo-Sheet including	Rs.	1318401.06
14	Filling and laying in cage with silt filled Geo bags of size 1.03m X 0.70m a) Without Boat	Rs.	33589224.24
	b) with boat		287345802.94
15	Filling and laying of Geo bags of size 1.03m X 0.70m a) Without boat	Rs.	109372798.62
16	Labour charge for laying Geo fabric sheet	Rs.	26082018.91
17	Collection and supply of River silt by truck carriage	Rs.	231040265.39
18	Earth work in excavation of drainage channel	Rs.	8593717.34
19	Supply of P.S.C Porcupine member of size 0.10m x 0.10m x 3.00m	Rs.	123106874.22
20	Labour charge for launching of PSC		
	a) without boat	Rs.	3109132.18
	b) with boat	Rs.	20470593.00
	G.Total	Rs.	3900896112.77

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

**C. WORKS**  
**DETAILED ESTIMATE**

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

Sl No	ITEM OF WORKS	UNIT	QUANTITY	RATE	AMOUNT (in Rs.)	SOR
1	Clearing medium jungles and trees up to 50cm. girth including cutting, uprooting roots and stumps, removing them from the site of the work, etc. complete as directed. (when 30% to 60% of the area is cover by shrubs trees etc) (Quantity as per Statement No.1)	Sqm	68197.67	13.12	894,753.43	SOR OF WR 2021-22 Item No 1.02
2	Cutting bamboo , uprooting roots & stumps including removing them from the site of work, etc. complete as directed. (Qty as per statement No-2)	Sqm	12285.00	509.84	6,263,384.40	SOR OF WR 2021-22 Item No-1.5
3	Felling trees including uprooting roots and stumps upto 50 cm. below ground, cutting into pieces and removing the same from the site of work as directed. Trees above 0.50m and up to 1m girth: (Quantity as per Statement No.2)	Each	972	414.78	403,166.16	SOR OF WR 2021-22 Item No-1.04.1
4	Earthwork in grabbing the seat of the embankment upto 0.3 m depth and depositing the soils outside the country side toe of the proposed structures , etc. complete as directed.(Quantity as per Statement No.3)	Cum	61771.83	161.55	9,979,239.14	SOR OF WR 2021-22 Item No-2.10
5	Item: Earth. work in embankment by truck carriage in ordinary/normal soil excluding sandy and rocky soil free from roots & vegetation and filling in uniform layers not exceeding 25cm. Thick including ploughing or roughening or benching the seats, removing all debries, breaking clods up to 4cm. cube, dressing as per design section including payment of forest royalty if any, etc. complete as directed. (10% deduction will be made from the section measured quantities of the completed and compacted on account of shrinkage) For initial lead beyond ½ Km and up to 4.00 Km and for all lifts(Quantity as per Statement No.9)	Cum	675432.54	335.86	226,850,771.21	SOR OF WR 2021-22 Item No-2.05.1
6	Item: Turfing with grass sods of largest possible rectangles of 12cm. Minimum thickness placed closely including dressing earth pagging with Jati bamboo split, watering till the grass grows for a lead up to 90m and all lifts. (Quantity as per Statement No.9)	Sqm	260970.00	28.83	7523765.10	SOR OF WR 2021-22 Item No-2.13
7	Earthwork in bank trimming to the designed section/ slope including removing the soils at a minimum distance of 30m completed as directed. (Quantity as per Statement No.4)	Cum	960719.28	167.74	161151051.19	SOR OF WR 2021-22 Item No-2.09

Sl No	ITEM OF WORKS	UNIT	QUANTITY	RATE	AMOUNT (In Rs.)	SOR
8	<p>Supply of Geo-textile bags of type-A (size 1.03X0.70M), inner dimension made of Geo-textile non-woven fabric sheets of 400 GSM manufactured from 100% virgin Polypropylene (PP) fibre having thickness not less than 3.00 mm with minimum properties as (i) Tensile strength (CD) <math>\geq</math> 24 KN/m (ii) Tensile strength (MD) <math>\geq</math> 22 KN/m (iii) Mass <math>\geq</math> 400.00 Gm/m<sup>2</sup> (iv) CBR Puncture strength <math>\geq</math> 4100 N/m<sup>2</sup> (v) Elongation @ break (Warp) <math>\geq</math> 54% (vi) Elongation @ break (Weft) <math>\geq</math> 52% (vii) Abrasion <math>\geq</math> 70 % (viii) UV Resistance @ 500 hours <math>\geq</math> 70% (ix) AOS <math>\leq</math> 75 micron (x) Permittivity <math>\geq</math> 1.25, (xi) Trapezoidal Tear Strength <math>\leq</math> 520 N (xii) Permeability = 45lt/m<sup>2</sup>/sec (xiii) Seam strength = 80 % of geotextiles strength. Stitching of Bags should be Ring Spun Yarn stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge @ minimum 15 stitches per 100 mm.</p> <p>(Bags are to be supplied of 100 numbers or part in a bundle, properly packed with name of Manufacturer and Batch Number is to be marked on each bag with "WRD Govt of ASSAM" to be printed on each bag and mentioning properly the GSM and type of Geo bag polymer. Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material). FOR GUWAHATI(Quantity as per Statement No.5)</p>	Nos.	7945688	198.75	1579205490.00	SOR OF W.R 2021-22 Item no-11.1
9	<p>Supply of Wire -netting box of size 1.50mx 1.50mx 0.45m made with mechanically woven, double twisted , hexagonal shaped wire mesh with wire made of low carbon, high ductile MS wire with heavy class of galvanization with an additional layer of PVC coating with mesh type of 10x12 as per EN 10223 &amp; ASTM A975 , mesh wire of 2.70mm (I.D)/3.70mm(OD)tensile strength of 450-500/mm<sup>2</sup>,edge wire/selvedge around it at least 2.5 times, lacing wire (zink P.V.C. coated) of 2.20mm (I.D.) /3.20mm (O.D) P.V.C. coating thickness of 0.50mm nominal, 0.38mm minimum and with average weight per unit being 12 kg with additional 3% of the weight of box for lacing wire supplied separately, supporting the facing of the box with Zink coated steel wire of required length as directed, complying with A.S.T.M and European norms, including payment of all duties,sale tax, any other taxes as applicable loading, unloading and staking them at the site of work in measurable stacks, complete as directed</p> <p>(As per statement No.-5)</p>	Each	402995	2400.00	967188000.00	SOR OF W.R 2021-22 Item no-11.1

Sl No	ITEM OF WORKS	UNIT	QUANTITY	RATE	AMOUNT (In Rs.)	SOR
10	Supply of non-woven Geo-textile fabric sheets of 300 GSM manufactured from 100% virgin Polypropylene (PP) fibre with minimum properties as (i) Tensile strength $\geq 1.2$ KN/m (ii) Mass $\geq 300.00$ Gm/m <sup>2</sup> (iii) CBR Puncture strength $\geq 3.5$ KN (iv) Elongation at break $\geq 60\%$ (v) Abrasion $\geq 70\%$ (vi) UV Resistance @ 500 hours $\geq 70\%$ (vii) AOS $\leq 75$ micron (ix) Permittivity $\geq 1.25$ , (x) Trapezoidal Tear Strength $\leq 340$ N (xi) Permeability = $2.00 \times 10^{-3}$ m/sec (xii) Seam strength = 80 % of geotextiles strength. Stitching of Bags should be Ring Spun Yarn stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge @ minimum 15 stitches per 100 mm. (Each Roll of Geo Fabric Sheet should be supplied in properly packed Bundles and should be marked with the Name of Manufacturer & Batch Number clearly on each bundle with "WRD Govt of ASSAM" to be printed on it and mentioning properly the GSM and type of polymer and Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material FOR GUWAHATI	Sqm	697566.70	100.00	69756670.00	SOR OF W,R 2021-22 Item no-11.3
11	Supply of Sewing Thread/Yarn PPMF Stitching Thread (2000 Den. Kaplon) i/c payment of taxes. (Quantity as per Statement No.10)	RM	87402568	0.12	10488308.16	SOR OF WR 2021-22 Item no- 11.07
12	Carriage of Geo bags of size 1.03 x 0.70 m including loading & unloading, stacking etc. complete and including hire charge of truck with driver and handyman cost of P.O.L etc complete as directed. (Distance from Guwahati to Sorbhog = 135Km.) (Quantity as per Statement No.5)	Bag/Km	7945688	0.016	17162686.08	SOR OF WR 2021-22 Item No-3.08
13	Carriage of 300gsm Geo-Sheet including loading & unloading, stacking cost of P.O.L etc. complete and including hire charge of truck with driver and handyman complete as directed. (Distance from Guwahati to Sorbhog = 135Km.) (Quantity as per Statement No.7)	Sqm/Km	697566.70	0.014	1318401.05	SOR OF WR 2021-22 Item No-3.09

Sl No	ITEM OF WORKS	UNIT	QUANTITY	RATE	AMOUNT (in Rs.)	SOR
14	Filling and laying in cage with silt filled Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chars within a distance of 90m of the work site, filling geo bags with silt having minimum weighing 126.00 Kg and minimum volume 0.084 cum after filling ,double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly. in cages made of wire netting sheets of size 2.57x1.66m of 8G galvanized wire making the cage from 2 nos. of wire netting sheet by tying the projected wires complete as directed. (Silt, Geo Bag, Wire Netting Sheets and Polypropylene thread will be supplied by the department free of cost). a)Without Boat (Quantity as per Statement No.5)	Bag	690852	48.62	33589224.24	SOR OF WR 2021-22 Item No- 8.02.C.1
	b) With boat (Quantity as per Statement No.5)	Bag	4559597	63.02	287345802.94	SOR OF WR 2021-22 Item No- 8.02C.2
15	Filling and laying of Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chars within a distance of 90m of the work site, filling geo bags with silt having minimum weighing 126.00 Kg and minimum volume 0.084 cum after filling ,double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle double stitched machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly as directed. (Silt, Geo Bag and Polypropylene thread will be supplied by the department free of cost) a)without boat (Quantity as per Statement No.5)	Bag	2695239	40.58	109372798.62	SOR OF WR 2021-22 Item No- 8.01.C.1
16	Labour charge for laying Geo fabric sheet as filter belowpitching including anchoring and complete as directed (Quantity as per Statement No.7)	Sqm	697566.70	37.39	26082018.91	SOR OF WR 2021-22 Item No-8.06
17	Collection and supply of River silt by truck carriage free from debries and other foreign material payment of forest royalty if any, etc.(For Initial Lead beyond 1/2 Km and upto 4.00 km for all lifts.) (Quantity as per Statement No.5)	Cum	667437.79	346.16	231040265.39	SOR OF WR 2021-22 Item No-4.1
18	Earth work in excavation of drainage channel to the proper grade and slopes as required including desposing the excavated debries/soil to a safe distance of minimum 50 m distance as directed. Normal Soil. (Quantity as per Statement No.5)	m <sup>3</sup>	43178.00	199.03	8593717.34	SOR OF WR 2021-22 Item No-2.08

SI No	ITEM OF WORKS	UNIT	QUANTITY	RATE	AMOUNT (in Rs.)	SOR
19	Item : Supply of Pre stressed Cement Concrete (PSC) Porcupine members of size 0.10m X 0.10mX 3.00m with M-30 grade of cement concrete conforming to IS 1343:2012 using super -plasticizer @ 1.2lit /bag of cement with graded brocken course aggregate upto 20mm size down conforming to IS 10262:2009 & IS 456:2000 and reinforced with 4 Nos. of 4 mm dia high tensile steel wire cable with necessary cover and 4mm high tensile stirrups at 250mm C/C, in conformity with IS-6403:R2002 and stressed to required strength not exceeding 9.18 N/mm, holes of 16 mm dia at 50 cm inside from both ends in the same face and in either face of post another 2 Nos. of holes of size 16 mm dia at 65mm inside from both ends including properly curing for 21 (twenty one ) days and carriage of porcupine members from factory to the stack yard within a distance up to 20 Km including loading, unloading& stacking complete as directed. ( Including forest royalty and all taxes as admissble). (As per statement No.-8)	Each	156882	784.71	123106874.22	SOR OF WR 2021-22 Item No-7.07
20	Item : Labour charge for launching of PSC Porcupine including carriage of PSC porcupine members of size 0.10m x 0.10m x 3.00m from the stack yard to the place of launching ,erection of the Porcupine with 6 (six) members properly, supply & fitting/fixing with 12 mm dia 25 Cm long M.S. Nuts and bolts and launching the porcupine properly as directed. (Lead up to 150 m)				0.00	SOR OF WR 2021-22 Item No-7.04
	Launching without boat. (Quantity as per Statement No.8)	Each	4697	661.94	3109132.18	SOR OF WR 2021-22 Item No-
	Launching by boat: (Quantity as per Statement No.8)	Each	21450	954.34	20470593.00	SOR OF WR 2021-22 Item No- 7.04.2
Total 'C' works = Rs.					3900896112.77	


  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta



**SUB-ESTIMATE NO-1**  
**A-Preliminary**

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

a	Detailed Topographic survey	=	Rs.	950000.00
b	Bathymetric survey	=	Rs.	820000.00
c	Preparation and printing of project reports including purchase of Satellite Imagery, maps etc.	=	Rs.	350000.00
d	Hire charge for Vehicles, boats etc. for inspecting officers for site investigations	=	Rs.	100000.00
e	Camp equipment	=	Rs.	300000.00
f	Preliminary soil tests	=	Rs.	150000.00
	<b>Total</b>	<b>=</b>	<b>Rs.</b>	<b>2670000.00</b>


  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

## SUB-ESTIMATE NO-2

## K- Building


Name of Scheme:- Integrated flood and erosion management of Manas and Bekl river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

Sl. No.	Item	Qty.	Unit	Rate (Rs.)	Amount (Rs.)
1	Construction of temporary shed of two roof with mud plinth of minimum height with Bhaluka bamboo post 1.5 m apart driven at atleast 0.75 m below ground and height above plinth 2.5m, Split Jatti bamboo/tarza wall, 10 cm thick thatched roofing over bamboo rua frame placing at 0.15 m clear apart fitted with bamboo kamies from binding doors and windows with Bamboo Chattal strengthening with Bamboo frame binding with wire etc complete as directed. (Using Bhaluka Bamboo at the rate of 6.00 nos/ Rm & Jati Bamboo at the rate of 61.00nos / Rm)		sqm	1797.24	13838748.00
	a)With whole jati bamboo rua frame				
	Area: - 1) For store = 56x15.00x5.00	4200.00			
	site office at 35 locations =35x5x10	1750.00			
	4) For police picket = 35 x 10.00 x5.00	1750.00			
	Total	7700.00			
	Rate as per SoR 2021-22 of WRD item no-6.34				
				Total = Rs.	13,838,748.00

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta





SUB-ESTIMATE NO-5					
R-COMMUNICATION					
Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)					
Sl.No.	Description of Item	Unit	Quantity	Rate (in Rs.)	Amount (in Rs.)
A)	Total length of approach road to stackyard	KM	8		
	Total	KM	8		
<b>DETAIL OF WORK</b>					
1	<b>EARTHWORK</b>				
	Earth work in embankment by truck carriage in ordinary/normal soil excluding sandy and rocky soil free from roots & vegetation and stacking in regular measurable stacks at suitable places including clearing debris, , breaking clods up to 4 cm cube, payment of forest royalty if any, etc. ( 12.50 % deduction will be made from measured quantities on account of shrinkage) For initial lead beyond 1/2 Km and up to 4.00 Km and for all lifts				
	Qty = 8000X4.00X0.45 Rate as per SoR 2021-22 of WRD,Item 2.05.1	CUM	14400.00	363.58	5235552.00
2	Spreading of earth stack over the crest and side slope of the embankment and place as directed in uniform layer of 22. cm thick including breaking clods, dressing , ramming etc. complete where necessary including dressing the embankment before complete as directed				
	Qty = 8000X4.00X0.45 Rate as per SoR2021-22 of WRD,Item 2.11				
	Total	CUM	14400.00	102.80	1480320.00
3	Collection and supply of brick bats 20-40mm size to work site including loading, unloading transportation and stacking in measurable stacks including sale tax, compensation if any, etc. complete as directed				
	Qty = 8000X3.00X0.30 Rate as per SoR2021-22 of WRD( Item No-9.09)	CUM	7200.00	2523.73	18170856.00
4	Labour charge for laying of soling stone, brick bats, broken stone metal, sand gravel etc. on approach road including ramming dressing the seat and local carriage of materials up to a distance of 60 m complete as directed				
	Qty = 8000X3.00X0.30 Rate as per SoR2021-22of WRD( Item No-9.03)	CUM	7200.00	159.74	1150128.00
				<b>TOTAL = Rs.</b>	<b>26036856.00</b>
Note:- Needed in stretches for 35 nos of A/E locations and 25 nos of pro-siltation locations for approach road exceelsibility to smooth progress of te work.					
					
				Executive Engineer	
				Barpeta W.R. Division	
				Barpeta	

**SUB-ESTIMATE NO-6**

**V-Receipts & Recoveries**

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the

District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

1 Recovery 15% of Temporary Bulidings	= Rs.	2075812.20
Total	= Rs.	<u>2075812.20</u>
Say	= Rs.	<u>2076000.00</u>

(Rupees Twenty Lakh Seventy Six thousand )only

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

**STATEMENT No.1**

Name of Work : Integrated flood and erosion management of Manas and  
Beki river in the District of Baksa and Barpeta in Brahmaputra valley  
within Assam (Review).

Clearing medium jungles and trees up to 50cm. girth including cutting,  
uprooting roots and stumps, removing them from the site of the work, etc.  
complete as directed.

**LEFT BANK**

Chainage	C/S slope	R/S slope	Total(M)	Average(M)	Dist.(M)	Qty.(Sqm)
2780	0.00	0.00	0.00			
2785	2.85	0.00	2.85	1.43	5.00	7.15
2800	2.86	0.00	2.86	2.86	15.00	42.90
2900	2.86	0.00	2.86	2.86	100.00	286.00
3000	2.87	0.00	2.87	2.87	100.00	287.00
3100	2.88	0.00	2.88	2.88	100.00	288.00
3200	2.89	0.00	2.89	2.89	100.00	289.00
3300	2.90	0.00	2.90	2.90	100.00	290.00
3400	2.90	2.46	5.36	4.13	100.00	413.00
3500	2.91	2.45	5.36	5.36	100.00	536.00
3600	2.92	2.44	5.36	5.36	100.00	536.00
3700	2.93	2.43	5.36	5.36	100.00	536.00
3800	2.94	2.42	5.36	5.36	100.00	536.00
3900	2.95	2.41	5.36	5.36	100.00	536.00
4000	3.24	2.68	5.92	5.64	100.00	564.00
4100	2.96	2.39	5.35	5.64	100.00	564.00
4200	2.97	2.39	5.36	5.36	100.00	536.00
4300	2.98	2.38	5.36	5.36	100.00	536.00
4400	2.99	2.37	5.36	5.36	100.00	536.00
4500	3.21	2.46	5.67	5.52	100.00	552.00
4600	3.42	2.56	5.98	5.83	100.00	583.00
4700	3.64	2.67	6.31	6.15	100.00	615.00
4800	3.86	2.77	6.63	6.47	100.00	647.00
4900	4.07	2.88	6.95	6.79	100.00	679.00
5000	4.29	2.99	7.28	7.12	100.00	712.00
5100	4.14	2.79	6.93	7.11	100.00	711.00
5200	3.77	2.40	6.17	6.55	100.00	655.00
5300	3.52	2.10	5.62	5.90	100.00	590.00
5400	3.26	1.80	5.06	5.34	100.00	534.00
5500	3.00	5.26	8.26	6.66	100.00	666.00
5600	2.74	2.61	5.35	6.81	100.00	681.00
5700	2.48	5.24	7.72	6.54	100.00	654.00
5800	1.37	5.23	6.60	7.16	100.00	716.00
5900	1.54	5.22	6.76	6.68	100.00	668.00
6000	1.71	5.20	6.91	6.84	100.00	684.00
6100	1.50	5.19	6.69	6.80	100.00	680.00
6200	1.37	5.17	6.54	6.62	100.00	662.00
6300	2.15	5.16	7.31	6.93	100.00	693.00
6400	2.30	5.15	7.45	7.38	100.00	738.00
6500	2.46	5.13	7.59	7.52	100.00	752.00

6600	2.62	5.12	7.74	7.67	100.00	767.00
6700	2.79	4.24	7.03	7.39	100.00	739.00
6800	2.96	2.37	5.32	6.18	100.00	618.00
6900	3.12	2.37	5.49	5.41	100.00	541.00
7000	3.29	2.37	5.66	5.58	100.00	558.00
7100	3.76	2.03	5.79	5.73	100.00	573.00
7200	2.35	3.13	5.48	5.64	100.00	564.00
7300	3.28	3.53	6.81	6.15	100.00	615.00
7400	3.28	3.92	7.20	7.01	100.00	701.00
7500	3.27	4.31	7.58	7.39	100.00	739.00
7600	3.27	4.71	7.98	7.78	100.00	778.00
7700	3.27	5.11	8.38	8.18	100.00	818.00
7800	3.31	4.97	8.28	8.33	100.00	833.00
7900	3.35	4.83	8.18	8.23	100.00	823.00
8000	3.39	4.69	8.08	8.13	100.00	813.00
8100	3.44	4.56	8.00	8.04	100.00	804.00
8200	3.48	4.42	7.90	7.95	100.00	795.00
8300	3.53	4.29	7.82	7.86	100.00	786.00
8400	3.58	3.31	6.89	7.36	100.00	736.00
8500	2.99	3.46	6.45	6.67	100.00	667.00
8600	3.36	3.61	6.97	6.71	100.00	671.00
8700	3.74	3.76	7.50	7.24	100.00	724.00
8800	3.97	3.89	7.86	7.68	100.00	768.00
8900	4.23	4.02	8.25	8.06	100.00	806.00
9000	4.50	4.15	8.65	8.45	100.00	845.00
9100	4.31	4.07	8.38	8.52	100.00	852.00
9200	4.13	3.99	8.12	8.25	100.00	825.00
9300	3.94	3.92	7.86	7.99	100.00	799.00
9400	4.12	4.00	8.12	7.99	100.00	799.00
9500	4.32	4.10	8.42	8.27	100.00	827.00
9600	4.51	4.20	8.71	8.57	100.00	857.00
9700	4.52	4.17	8.69	8.70	100.00	870.00
9800	4.52	4.14	8.66	8.68	100.00	868.00
9900	4.53	4.12	8.65	8.66	100.00	866.00
10000	4.49	4.09	8.58	8.62	100.00	862.00
10100	4.42	4.08	8.50	8.54	100.00	854.00
10200	4.41	4.06	8.47	8.49	100.00	849.00
10300	4.42	4.02	8.44	8.46	100.00	846.00
10400	4.44	3.99	8.43	8.44	100.00	844.00
10500	4.46	3.96	8.42	8.43	100.00	843.00
10600	3.56	4.36	7.92	8.17	100.00	817.00
10700	4.39	3.87	8.26	8.09	100.00	809.00
10800	4.35	3.83	8.18	8.22	100.00	822.00
10900	4.33	3.78	8.11	8.15	100.00	815.00
11000	4.30	3.75	8.05	8.08	100.00	808.00
11100	4.17	3.52	7.69	7.87	100.00	787.00
11200	4.05	3.31	7.36	7.53	100.00	753.00
11300	4.04	3.29	7.33	7.35	100.00	735.00
11400	3.43	2.80	6.23	6.78	100.00	678.00
11500	4.02	3.26	7.28	6.76	100.00	676.00



11600	4.01	3.25	7.26	7.27	100.00	727.00
11700	4.00	3.23	7.23	7.25	100.00	725.00
11800	3.99	3.22	7.21	7.22	100.00	722.00
11900	3.99	3.20	7.19	7.20	100.00	720.00
12000	3.98	3.19	7.17	7.18	100.00	718.00
12100	3.97	3.18	7.15	7.16	100.00	716.00
12195	3.81	3.12	6.93	7.04	95.00	668.80
12200	0.00	0.00	0.00	3.47	5.00	17.35

TOTAL= 64648.20

RIGHT BANK

2500	0.00	0.00	0.00			
2505	4.56	4.30	8.86	4.43	5.00	22.15
2600	4.33	4.10	8.43	8.65	95.00	821.75
2700	4.46	4.17	8.63	8.53	100.00	853.00
2800	4.33	4.11	8.44	8.54	100.00	854.00
2900	4.46	4.17	8.63	8.54	100.00	854.00
3000	4.31	4.11	8.42	8.53	100.00	853.00
3100	4.43	4.14	8.57	8.50	100.00	850.00
3200	4.31	4.12	8.43	8.50	100.00	850.00
3300	4.43	4.14	8.57	8.50	100.00	850.00
3400	4.34	4.12	8.46	8.52	100.00	852.00
3500	4.55	4.30	8.85	8.66	100.00	866.00
3600	4.40	4.14	8.54	8.70	100.00	870.00
3700	4.45	4.15	8.60	8.57	100.00	857.00
3800	4.31	4.09	8.40	8.50	100.00	850.00
3900	4.55	4.31	8.86	8.63	100.00	863.00
4000	4.36	4.12	8.48	8.67	100.00	867.00
4100	4.56	4.30	8.86	8.67	100.00	867.00
4200	4.31	4.07	8.38	8.62	100.00	862.00
4300	4.55	4.29	8.84	8.61	100.00	861.00
4345	4.36	3.98	8.34	8.59	45.00	386.55
4351	0.00	0.00	0.00	4.17	6.00	25.02

TOTAL= 15834.47

TOTAL=  
Deduct cutting & uprooting bamboo  
Net qty.=

80482.67 Sqm.  
12285 Sqm.  
68197.67 Sqm.

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

**STATEMENT No. 2**

Name of Work : Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

**STATEMENT FOR CUTTING TREES AND BAMBOO CLUMP**

LOCATION	NOS OF TREES	BAMBOOS(Sqm)
LEFT BANK		
2780-4000M	82	340
4000-5000M	166	720
5000-6000M	77	1775
6000-7000M	74	1390
7000-8000M	39	1650
8000-9000M	103	2400
9000-10000M	107	950
10000-11000	72	225
11000-12000M	21	590
12000-12200M	38	1420
TOTAL=	779	11460
RIGHT BANK		
25000-4351M	193	825
TOTAL=		
GRAND TOTAL=	972	12285

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

**STATEMENT No. 3**

Name of Work : Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

Earthwork in grabbing the seat of the embankment, upto 0.3 m depth and depositing the soils outside the country side toe of the proposed structures , etc. complete as directed.

**LEFT BANK**

Chainage	C/S	R/S	Total(M)	Average(M)	Dist.(M)	Qty.(Sqm)	Thickness(m)	Volume(cum)
2780	0.00	0.00	0.00					
2785	19.82	0.00	19.82	9.91	5.00	49.55	0.30	14.87
2800	19.04	0.00	19.04	19.43	15.00	291.45	0.30	87.44
2900	18.91	0.00	18.91	18.98	100.00	1898.00	0.30	569.40
3000	18.86	0.00	18.86	18.89	100.00	1889.00	0.30	566.70
3100	18.93	0.00	18.93	18.90	100.00	1890.00	0.30	567.00
3200	19.25	0.00	19.25	19.09	100.00	1909.00	0.30	572.70
3300	19.44	0.00	19.44	19.35	100.00	1935.00	0.30	580.50
3400	12.60	7.36	19.96	19.70	100.00	1970.00	0.30	591.00
3500	12.59	7.38	19.97	19.97	100.00	1997.00	0.30	599.10
3600	12.58	7.40	19.98	19.98	100.00	1998.00	0.30	599.40
3700	12.57	7.41	19.98	19.98	100.00	1998.00	0.30	599.40
3800	12.57	7.43	20.00	19.99	100.00	1999.00	0.30	599.70
3900	12.56	7.45	20.01	20.01	100.00	2001.00	0.30	600.30
4000	12.56	7.46	20.02	20.02	100.00	2002.00	0.30	600.60
4100	12.55	7.48	20.03	20.03	100.00	2003.00	0.30	600.90
4200	12.54	7.50	20.04	20.04	100.00	2004.00	0.30	601.20
4300	12.53	7.51	20.04	20.04	100.00	2004.00	0.30	601.20
4400	12.52	7.55	20.07	20.06	100.00	2006.00	0.30	601.80
4500	12.81	7.56	20.37	20.22	100.00	2022.00	0.30	606.60
4600	13.11	7.58	20.69	20.53	100.00	2053.00	0.30	615.90
4700	13.40	7.59	20.99	20.84	100.00	2084.00	0.30	625.20
4800	13.71	7.61	21.32	21.16	100.00	2116.00	0.30	634.80
4900	14.00	7.62	21.62	21.47	100.00	2147.00	0.30	644.10
5000	14.28	7.68	21.96	21.79	100.00	2179.00	0.30	653.70
5100	14.25	8.09	22.33	22.15	100.00	2215.00	0.30	664.50
5200	14.22	8.54	22.76	22.55	100.00	2255.00	0.30	676.50
5300	14.19	9.00	23.19	22.98	100.00	2298.00	0.30	689.40
5400	14.16	9.45	23.61	23.40	100.00	2340.00	0.30	702.00
5500	14.13	6.29	20.42	22.02	100.00	2202.00	0.30	660.60
5600	14.10	9.27	23.37	21.90	100.00	2190.00	0.30	657.00
5700	14.07	6.85	20.92	22.15	100.00	2215.00	0.30	664.50
5800	14.65	7.13	21.78	21.35	100.00	2135.00	0.30	640.50
5900	14.27	7.40	21.67	21.73	100.00	2173.00	0.30	651.90
6000	13.97	7.68	21.65	21.66	100.00	2166.00	0.30	649.80
6100	13.90	7.53	21.43	21.54	100.00	2154.00	0.30	646.20
6200	13.83	7.39	21.22	21.33	100.00	2133.00	0.30	639.90
6300	12.84	7.28	20.10	20.66	100.00	2066.00	0.30	619.80
6400	12.47	7.14	19.61	19.86	100.00	1986.00	0.30	595.80
6500	12.10	7.01	19.11	19.36	100.00	1936.00	0.30	580.80

6600	11.72	6.89	18.61	18.86	100.00	1886.00	0.30	565.80
6700	11.34	7.57	18.91	18.76	100.00	1876.00	0.30	562.80
6800	10.95	9.34	20.29	19.60	100.00	1960.00	0.30	588.00
6900	10.56	9.21	19.77	20.03	100.00	2003.00	0.30	600.90
7000	10.18	9.08	19.26	19.52	100.00	1952.00	0.30	585.60
7100	9.87	9.41	19.28	19.27	100.00	1927.00	0.30	578.10
7200	11.38	8.57	19.95	19.62	100.00	1962.00	0.30	588.60
7300	10.72	8.22	18.94	19.45	100.00	1945.00	0.30	583.50
7400	10.98	3.18	14.16	16.55	100.00	1655.00	0.30	496.50
7500	11.23	7.53	18.76	16.46	100.00	1646.00	0.30	493.80
7600	11.49	7.18	18.67	18.72	100.00	1872.00	0.30	561.60
7700	11.75	6.83	18.58	18.63	100.00	1863.00	0.30	558.90
7800	11.78	6.80	18.58	18.58	100.00	1858.00	0.30	557.40
7900	11.89	6.80	18.69	18.64	100.00	1864.00	0.30	559.20
8000	11.96	6.78	18.74	18.72	100.00	1872.00	0.30	561.60
8100	12.01	6.77	18.78	18.76	100.00	1876.00	0.30	562.80
8200	12.05	6.75	18.80	18.79	100.00	1879.00	0.30	563.70
8300	12.09	6.75	18.84	18.82	100.00	1882.00	0.30	564.60
8400	12.12	7.55	19.67	19.26	100.00	1926.00	0.30	577.80
8500	12.76	7.28	20.04	19.86	100.00	1986.00	0.30	595.80
8600	12.50	7.00	19.50	19.77	100.00	1977.00	0.30	593.10
8700	12.24	6.73	18.97	19.24	100.00	1924.00	0.30	577.20
8800	12.26	6.72	18.98	18.98	100.00	1898.00	0.30	569.40
8900	12.23	6.76	18.99	18.99	100.00	1899.00	0.30	569.70
9000	12.23	6.77	19.00	19.00	100.00	1900.00	0.30	570.00
9100	12.39	6.78	19.17	19.09	100.00	1909.00	0.30	572.70
9200	12.41	6.90	19.31	19.24	100.00	1924.00	0.30	577.20
9300	12.69	6.79	19.48	19.40	100.00	1940.00	0.30	582.00
9400	12.38	6.96	19.34	19.41	100.00	1941.00	0.30	582.30
9500	12.43	6.79	19.22	19.28	100.00	1928.00	0.30	578.40
9600	12.29	6.79	19.08	19.15	100.00	1915.00	0.30	574.50
9700	12.46	6.98	19.44	19.26	100.00	1926.00	0.30	577.80
9800	12.47	7.14	19.61	19.53	100.00	1953.00	0.30	585.90
9900	12.47	7.18	19.65	19.63	100.00	1963.00	0.30	588.90
10000	12.43	7.00	19.43	19.54	100.00	1954.00	0.30	586.20
10100	12.38	6.77	19.15	19.29	100.00	1929.00	0.30	578.70
10200	12.25	6.53	18.78	18.97	100.00	1897.00	0.30	569.10
10300	12.26	6.72	18.98	18.88	100.00	1888.00	0.30	566.40
10400	12.35	6.90	19.25	19.12	100.00	1912.00	0.30	573.60
10500	12.45	7.08	19.53	19.39	100.00	1939.00	0.30	581.70
10600	12.91	6.34	19.25	19.39	100.00	1939.00	0.30	581.70
10700	12.02	6.83	18.85	19.05	100.00	1905.00	0.30	571.50
10800	11.75	6.69	18.44	18.65	100.00	1865.00	0.30	559.50
10900	11.48	6.53	18.01	18.23	100.00	1823.00	0.30	546.90
11000	11.21	6.40	17.61	17.81	100.00	1781.00	0.30	534.30
11100	11.40	6.77	18.17	17.89	100.00	1789.00	0.30	536.70
11200	11.59	7.11	18.70	18.44	100.00	1844.00	0.30	553.20
11300	11.58	7.11	18.69	18.70	100.00	1870.00	0.30	561.00
11400	12.03	7.44	19.47	19.08	100.00	1908.00	0.30	572.40
11500	11.56	7.10	18.66	19.07	100.00	1907.00	0.30	572.10

11600	11.56	7.10	18.66	18.66	100.00	1866.00	0.30	559.80
11700	11.55	7.09	18.64	18.65	100.00	1865.00	0.30	559.50
11800	11.54	7.09	18.63	18.64	100.00	1864.00	0.30	559.20
11900	11.53	7.09	18.62	18.63	100.00	1863.00	0.30	558.90
12000	11.52	7.08	18.60	18.61	100.00	1861.00	0.30	558.30
12100	11.51	7.08	18.59	18.60	100.00	1860.00	0.30	558.00
12195	11.50	7.07	18.57	18.58	95.00	1765.10	0.30	529.53
12200	0.00	0.00	0.00	9.29	5.00	46.45	0.30	13.94
							TOTAL=	55420.98

RIGTH BANK								
2500	0	0	0.00					
2505	6.72	4.51	11.23	5.62	5.00	28.10	0.30	8.43
2600	6.96	4.70	11.66	11.45	95.00	1087.75	0.30	326.33
2700	6.78	4.51	11.29	11.48	100.00	1148.00	0.30	344.40
2800	7.11	4.84	11.95	11.62	100.00	1162.00	0.30	348.60
2900	6.66	4.43	11.09	11.52	100.00	1152.00	0.30	345.60
3000	7.02	4.78	11.80	11.45	100.00	1145.00	0.30	343.50
3100	6.66	4.44	11.10	11.45	100.00	1145.00	0.30	343.50
3200	7.02	4.78	11.80	11.45	100.00	1145.00	0.30	343.50
3300	6.66	4.44	11.10	11.45	100.00	1145.00	0.30	343.50
3400	6.96	4.74	11.70	11.40	100.00	1140.00	0.30	342.00
3500	6.72	4.51	11.23	11.47	100.00	1147.00	0.30	344.10
3600	7.37	4.55	11.92	11.58	100.00	1158.00	0.30	347.40
3700	6.66	4.43	11.09	11.51	100.00	1151.00	0.30	345.30
3800	6.96	4.74	11.70	11.40	100.00	1140.00	0.30	342.00
3900	6.72	4.51	11.23	11.47	100.00	1147.00	0.30	344.10
4000	6.96	4.74	11.70	11.47	100.00	1147.00	0.30	344.10
4100	6.71	4.43	11.14	11.42	100.00	1142.00	0.30	342.60
4200	6.96	4.74	11.70	11.42	100.00	1142.00	0.30	342.60
4300	6.71	4.43	11.14	11.42	100.00	1142.00	0.30	342.60
4345	6.96	5.00	11.96	11.55	45.00	519.75	0.30	155.93
4351	0.00	0.00	0.00	5.98	6.00	35.88	0.30	10.76
							TOTAL=	6350.85

TOTAL= 61771.83 cum

  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta


**STATEMENT No. 4**

Name of Work : Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

Earthwork in bank trimming to the designed section/ slope including removing the soils at a safe distance completed as directed. (Quantity as per Statement No.4)

Mark	Location	Length in m.	Area of bank trimming in Sqm	Volume of bank trimming in Cum.
a	Raghabill	300	21.01	6303.75
b	Elengabari	1600	20.22	32352.00
c	Chunbari	1500	21.35	32025.00
d	Khagrabari	2500	23.11	57781.25
e	Gobardhana	900	21.28	19152.00
e1	Udalguri	600	18.35	11010.00
e2	Barapeta	500	19.44	9720.00
e3	Tilabori	800	21.50	17200.00
e4	Safakamr	750	13.50	10125.00
e5	Katajar	1870	18.35	34314.50
f	Dumunighat	1300	20.58	26754.00
g	Nichuka	1450	21.09	30580.50
h	Chantabari	1250	19.98	24975.00
h1	Ketekibari	1500	18.35	27525.00
h2	Hajipur-Deolipara	1350	18.50	24975.00
i	Kurobaha	700	18.38	12866.00
j	Salsalia	900	20.19	18171.00
k	Bordonga	1300	19.20	24960.00
l	Guileza	1000	23.72	23720.00
m	Mowamari	500	20.01	10005.00
n	Kaurjahi	1000	22.00	22000.00
o	Kharbali-Sutirpathar	1500	19.01	28518.75
o1	Daukmeri	1000	19.20	19200.00
o2	Sawpur	1500	24.00	36000.00
o3	Alipur/ Rasulpur	1400	26.46	37044.00
p	Jaurimari	1400	23.68	33152.00
q	Pub Moinbari	500	23.52	11760.00
r	Takakata	700	24.10	16870.00
s	Hatchara	1000	24.35	24350.00
t	Joypur	900	23.74	21366.00
u	Tarakandi	1920	23.95	45984.00
v	Chotala	1530	22.55	34501.50
w	Kismat Moinbari	930	24.57	22850.10
x	Puran Chikatari	250	16.51	4127.50

y	Bheragaon	1000		21.66	21660.00
z	Satrankanara	2037		22.50	45832.50
z1	Marabhaj	2041		22.80	46534.80
		43178.00		Total =	926266.15
For Porcupine Bar					
		125	15.00	18.38	34453.13
				G. Total =	960719.28

  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta

**STATEMENT No.5**

Name of Work : Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

Supply of Geo-textile bags of type A ( 1.03 X 0.70 m) made of Geo-textile non woven fabric sheets manufactured from poly propylene conforming to relevant ISO standard and conforming to technical specification of fill - materials, F.O.R destination Barpeta.


Mar	Location	Length in m.	Av. Slope length (in m.)	Thickness of pitching (in m.)	Volume of pitching (in cum.)	Nos. of Geo bag = Vol. of pitching / 0.084
a	Raghabill	300	12.20	0.30	1098.00	13072
b	Elengabari	1600	12.40	0.30	5952.00	70858
c	Chunbari	1500	12.50	0.30	5625.00	66965
d	Khagrabari	2500	12.50	0.30	9375.00	111608
e	Gobardhana	900	12.40	0.30	3348.00	39858
e1	Udalguri	600	13.50	0.30	2430.00	28929
e2	Barapeta	500	13.50	0.30	2025.00	24108
e3	Tilabori	800	13.50	0.30	3240.00	38572
e4	Safakamr	750	12.50	0.30	2812.50	33483
e5	Katajar	1870	13.50	0.30	7573.50	90161
f	Dumunighat	1300	12.65	0.30	4933.50	58733
g	Nichuka	1450	12.50	0.30	5437.50	64733
h	Chantabari	1250	12.60	0.30	4725.00	56250
h1	Ketekibari	1500	12.40	0.30	5580.00	66429
h2	Hajipur-Deoliapara	1350	12.50	0.30	5103.00	60750
i	Kurobaha	700	12.60	0.30	2646.00	31500
j	Salsalia	900	12.50	0.30	3375.00	40179
k	Bordonga	1300	12.50	0.30	4875.00	58036
l	Guileza	1000	12.60	0.30	3780.00	45000
m	Mowamari	500	12.45	0.30	1867.50	22233
n	Kaurjahi	1000	12.50	0.30	3750.00	44643
o	Kharbali-Sutirpathar	1500	12.40	0.30	5580.00	66429
o1	Daukmari	1000	12.40	0.30	3720.00	44286
o2	Sawpur	1500	13.00	0.30	5850.00	69643
o3	Allipur/Rasulpur	1400	12.80	0.30	5376.00	64000
p	Jaurimari	1400	12.50	0.30	5250.00	62500
q	Pub Moinbari	500	12.40	0.30	1860.00	22143



r	Takakata	700	13.50	0.30	2835.00	33750
s	Hatchara	1000	13.40	0.30	4020.00	47858
t	Joypur	900	13.05	0.30	3523.50	41947
u	Tarakandi	1920	13.00	0.30	7488.00	89143
v	Chotala	1530	12.50	0.30	5737.50	68304
w	Kismat Moinbari	930	13.11	0.30	3657.69	43544
x	Puran Chikatari	250	12.50	0.30	937.50	11161
y	Bheragaon	1000	13.50	0.30	4050.00	48215
z	Satrankanara	2037	14.00	0.30	8555.40	101850
z1	Marabhaj	2041	14.00	0.30	8572.20	102050
		43178.00			Sub Total =	1982923
	10% for reserve stock=					198292
	Total =					2181215
<b>For Anchorage of Geo-fabric sheet</b>						
		Reach length (in m.)	Width (in m.)	depth (in m.)	Volume (in cum.)	Nos. of Geo bag
		43178.00	1.00	1.00	43178.00	514024
					Total =	2695239
					Geo bag reqd. for Apron=	4559597
					Geo bag in toe key (1.5m x 1.5mx 0.45m in double layer)=	690852
					G.Total =	7945688

Cage reqd. for toe key = 57571 nos.

Filling of Geo bag in without boat =	2695239 Nos.
Filling of Geo bag with cage and without boat =	690852 Nos.
Filling of Geo bag in cage with boat =	4559597 Nos.
No of Geo-bag in one cage = $(1.50 \times 1.50 \times 0.45) / 0.084$	12 Nos.
No of cage required Apron =	345424 Nos.
Total cage require=	402995 Nos.
Geo-Bag for cage	4835940 Nos.
Qty of silt for Geo-bag=	667437.79 Cum.
Earthwork in excavation for anchorage trench =	43178.00 Cum.

  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta

**STATEMENT No. 6**

Name of Work : Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

**Statement of Geo bag required in Apron**


Supply of Geo-textile bags of type A ( 1.03 X 0.70 m) made of Geo-textile non woven fabric sheets manufactured from poly propylene conforming to relevant ISO standard and conforming to technical specification of fill – materials, F.O.R destination Barpeta.

Mark	Location	Length in m.	Width of Apron (in m.)	Thickness of apron (in m.)	Total Volume of Apron (in cum.)	Nos. of Geo bag in cage
a	Raghabill	300.00	9.00	0.90	2430.00	28800
b	Elengabari	1600.00	9.00	0.90	12960.00	153600
c	Chunbari	1500.00	9.00	0.90	12150.00	144000
d	Khagrabari	2500.00	9.00	0.90	20250.00	240000
e	Gobardhana	900.00	9.00	0.90	7290.00	86400
e1	Udalguri	600.00	9.00	0.90	4860.00	57600
e2	Barapeta	500.00	9.00	0.90	4050.00	48000
e3	Tilabori	800.00	9.00	0.90	6480.00	76800
e4	Safakamr	750.00	9.00	0.90	6075.00	72000
e5	Katajar	1870.00	9.00	0.90	15147.00	179520
f	Dumunighat	1300.00	9.00	0.90	10530.00	124800
g	Nichuka	1450.00	9.00	0.90	11745.00	139200
h	Chentabari	1250.00	9.00	0.90	10125.00	120000
h1	Ketekibari	1500.00	9.00	0.90	12150.00	144000
h2	Hajipur-Deollapara	1350.00	9.00	0.90	10935.00	129600
i	Kurobaha	700.00	9.00	0.90	5670.00	67200
j	Salsalia	900.00	9.00	0.90	7290.00	86400
k	Bordonga	1300.00	9.00	0.90	10530.00	124800
l	Gulleza	1000.00	9.00	0.90	8100.00	96000
m	Mowamari	500.00	9.00	0.90	4050.00	48000
n	Kaurjahi	1000.00	9.00	0.90	8100.00	96000
o	Kharballi-Sutirpathar	1500.00	9.00	0.90	12150.00	144000
o1	Daukmari	1000.00	9.00	0.90	8100.00	96000
o2	Sawpur	1500.00	9.00	0.90	12150.00	144000
o3	Alipur/Rasulpur	1400.00	9.00	0.90	11340.00	134400
p	Jaurimari	1400.00	9.00	0.90	11340.00	134400
q	Pub Moinbari	500.00	9.00	0.90	4050.00	48000
r	Takakata	700.00	9.00	0.90	5670.00	67200
s	Hatchara	1000.00	9.00	0.90	8100.00	96000
t	Joypur	900.00	9.00	0.90	7290.00	86400
u	Tarakandi	1920.00	9.00	0.90	15552.00	184320
v	Chotala	1530.00	9.00	0.90	12393.00	146880
w	Kismat Moinbari	930.00	9.00	0.90	7533.00	89280

x	Puran Chikatari	250.00	9.00	0.90	2025.00	24000
y	Bheragaon	1000.00	9.00	0.90	8100.00	96000
z	Satrankanara	2037.00	9.00	0.90	18499.70	195552
z1	Marabhaj	2041.00	9.00	0.90	18532.10	195936
		43178.00				4145088
					Total =	4145088

10% for reserve stock= 414509

G.Total= 4559597

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

**STATEMENT No. 7**

Name of Work : Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

**Supply of Non-woven Geo-textile fabric sheet of 300 gsm**

Mark	Location	Length in m.	Av. Slope length (in m.)	Length for anchoring in m	length of Geo-textile fabric in m.	Area of Geo-textile fabric In Sqm
a	Raghabill	300	12.20	3.30	15.50	4650.00
b	Elengabari	1600	12.40	3.30	15.70	25120.00
c	Chunbari	1500	12.50	3.30	15.80	23700.00
d	Khagrabari	2500	12.50	3.30	15.80	39500.00
e	Gobardhana	900	12.40	3.30	15.70	14130.00
e1	Udalguri	800	13.50	3.30	16.80	10080.00
e2	Barapeta	500	13.50	3.30	16.80	8400.00
e3	Tilabori	800	13.50	3.30	16.80	13440.00
e4	Safakamr	750	12.50	3.30	15.80	11850.00
e5	Katajar	1870	13.50	3.30	16.80	31416.00
f	Dumunighat	1300	12.65	3.30	15.95	20735.00
g	Nichuka	1450	12.50	3.30	15.80	22910.00
h	Chantabari	1250	12.60	3.30	15.90	19875.00
h1	Ketekibari	1500	12.40	3.30	15.70	23550.00
h2	Hajipur-Deoliapara	1350	12.50	3.30	15.80	21330.00
i	Kurobaha	700	12.60	3.30	15.90	11130.00
j	Salsalia	900	12.50	3.30	15.80	14220.00
k	Bordonga	1300	12.50	3.30	15.80	20540.00
l	Guileza	1000	12.60	3.30	15.90	15900.00
m	Mowamari	500	12.45	3.30	15.75	7875.00
n	Kaurjahi	1000	12.50	3.30	15.80	15800.00
o	Kharbali-Sutirpathar	1500	12.40	3.30	15.70	23550.00
o1	Daukmari	1000	12.40	3.30	15.70	15700.00
o2	Sawpur	1500	13.00	3.30	16.30	24450.00
o3	Alipur/Rasulpur	1400	12.80	3.30	16.10	22540.00
p	Jaurimari	1400	12.50	3.30	15.80	22120.00
q	Pub Moinbari	500	12.40	3.30	15.70	7850.00
r	Takakata	700	13.50	3.30	16.80	11760.00
s	Hatchara	1000	13.40	3.30	16.70	16700.00
t	Joypur	900	13.05	3.30	16.35	14715.00
u	Tarakandi	1920	13.00	3.30	16.30	31296.00
v	Chotala	1530	12.50	3.30	15.80	24174.00
w	Kismat Moinbari	930	13.11	3.30	16.41	15261.30

x	Puran Chikadari	250	12.50	3.30	15.80	3950.00
y	Bheragaon	1000	13.50	3.30	16.80	16800.00
z	Satrankanara	2037	14.00	3.30	17.30	35240.10
z1	Marabhaj	2041	14.00	3.30	17.30	35309.30
		43178.00				
				Total =		697566.70

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

**STATEMENT No. -8**

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

**STATEMENT OF RCC PORCUPINE**

Data:

- i) Nos. of layers in river bed for bar = 1
- ii) Nos. of layers in slope of bank = 1
- iii) Nos. of layers in bank = 1
- iv) Nos. of layers in channel for screen = 1
- v) Nos. of rows in river bed = 5
- vi) Nos. of rows in slope of bank = 5
- vii) Nos. of rows in bank = 5
- viii) Nos. of rows in channel bed = 5

Requirement of P.S.C Porcupine per 3m. length:

- a) in river bed = 5nos.
- b) in slope of bank = 5nos.
- c) in bank = 5nos.
- d) in channel bed = 5 nos.

Screen /bar No.	Locatio	Nos. of Screen / bar	Length at river bed (in m.)	Length of bank (in m.)	Length a bank slope (in m.)	Length at channel (in m.)	RCC Porcupine in river bed	RCC Porcupine in bank	RCC Porcupine in slope of bank	RCC Porcupine in channel	Total Without boat	Total With boat
1 (Screen)	Narayanguri	4		6	12	153	0	10	20	255	120	1020
2 (Screen)	Chunbari	4		6	12	132	0	10	20	220	120	880
3 (Screen)	Khagrabari	4		6	12	153	0	10	20	255	120	1020
4 (Screen)	Gameriguri	4		6	12	111	0	10	20	185	120	740
5 (Screen)	Safakamar	4		6	12	153	0	10	20	255	120	1020
6 (bar)	Niz Damaka	3	108	6	12		180	10	20	0	90	540
7 (Screen)	Chantabari	4		6	12	102	0	10	20	170	120	680
8 (bar)	Aisarpar	4	78	6	9		130	10	15	0	100	520
9 (bar)	Kamarpara	4	93	6	12		155	10	20	0	120	620
10 (bar)	Beniarpara	20	48	6	9		80	10	15	0	500	1600
11 (Screen)	Daukmarit	4		6	12	183	0	10	20	305	120	1220

Screen /bar No.	Locatio	Nos. of Screen / bar	Length at river bed (in m.)	Length of bank (in m.)	Length a bank slope (in m.)	Length at channel (in m.)	RCC Porcupine in river bed	RCC Porcupine in bank	RCC Porcupine in slope of bank	RCC Porcupine in channel	Total Without boat	Total With boat
12 (bar)	Choudhury bazar	12	48	6	12		80	10	20	0	360	960
13 (bar)	Sawpur	3	93	6	9		155	10	15	0	75	465
14 (bar)	Balkuri	3	93	6	9		155	10	15	0	75	465
15 (bar)	Sonapur	20	48	6	9		80	10	15	0	500	1600
16 (bar)	Chikni	3	63	6	9		105	10	15	0	75	315
17 (Screen)	Jaurimari	3		6	12	183	0	10	20	305	90	915
18 (bar)	Bheragaon	4	48	6	9		80	10	15	0	100	320
19 (Screen)	Satrankanara	4		6	12	102	0	10	20	170	120	680
20 (bar)	Pub Moinbori	4	48	6	9		80	10	15	0	100	320
21 (bar)	Solmari	5	48	6	9		80	10	15	0	125	400
22 (bar)	kishmat moinbori	10	48	6	9		80	10	15	0	250	800
23 (bar)	dakhin tarakandi	6	48	6	9		80	10	15	0	150	480
24 (bar)	gobindipur	20	48	6	9		80	10	15	0	500	1600
25 (bar)	Tinkuni Part-iii	4	48	6	9		80	10	15	0	100	320

160

No of Bar =

125 nos

No of Screen =

35 nos

Total Without Boat =

4270

Total with Boat =

19500

Add 10% stock as reserve, so a) Without boat =

4697 nos.

b) With boat =

21450 nos.

Total nos. RCC Porcupine members reqd. = (4697 + 21450) x 6 =

156882 nos.

Executive Engineer  
Barpeta W.R. Division  
Barpeta

## STATEMENT No. 9

Name of Work : Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

Earth work in embankment by truck carriage in locally available ordinary soil excluding rocky soil free from roots and vegetations and filling in uniform layers not exceeding 22cm thick including cutting & clearing light jungles trees upto 50cm girth ploughing or roughening or benching the seats, removing all debris, breaking clods up to 2.5cm. cube, dressing as per design section including payment of compensation for borrowing earth from private land or forest royalty if any, etc. complete as directed. (10% deduction will be made from the section measured quantities of the completed and compacted section earth work on account of shrinkage) (For lead beyond 4 Km and upto 6.00 km and for all lifts)

Chainage in M.	Turfing Length (in m.)	Earthwork area (in Sqm.)	Vol. of Earth work (in Cum.)	Area of Turfing (in Sqm.)
2780	0.00	0.00		
2785	15.00	63.62	159.05	37.50
2800	15.00	61.09	935.33	225.00
2900	15.00	60.76	6092.50	1500.00
3000	15.00	60.84	6080.00	1500.00
3100	15.00	61.18	6101.00	1500.00
3200	15.00	61.99	6158.50	1500.00
3300	15.00	62.48	6223.50	1500.00
3400	24.50	58.98	6073.00	1975.00
3500	24.00	59.12	5905.00	2425.00
3600	24.00	59.26	5919.00	2400.00
3700	24.00	59.40	5933.00	2400.00
3800	24.00	59.53	5946.50	2400.00
3900	24.00	59.66	5959.50	2400.00
4000	24.00	57.71	5868.50	2400.00
4100	24.00	59.91	5881.00	2400.00
4200	24.00	60.02	5996.50	2400.00
4300	24.00	60.14	6008.00	2400.00
4400	24.00	60.28	6021.00	2400.00
4500	24.50	59.76	6002.00	2425.00
4600	24.50	60.59	6017.50	2450.00
4700	25.00	60.96	6077.50	2475.00
4800	25.00	61.48	6122.00	2500.00
4900	26.00	62.10	6179.00	2550.00
5000	26.00	62.99	6254.50	2600.00
5100	26.00	64.03	6351.00	2600.00



Chainage in M.	Turfing Length (in m.)	Earthwork area (in Sqm.)	Vol. of Earth work (in Cum.)	Area of Turfing (in Sqm.)
5200	26.00	64.32	6417.50	2600.00
5300	26.50	65.26	6479.00	2625.00
5400	26.50	66.86	6606.00	2650.00
5500	27.00	68.06	6746.00	2675.00
5600	27.00	69.63	6884.50	2700.00
5700	27.00	71.18	7040.50	2700.00
5800	27.00	70.64	7091.00	2700.00
5900	27.00	72.94	7179.00	2700.00
6000	27.00	75.50	7422.00	2700.00
6100	27.00	73.14	7432.00	2700.00
6200	26.00	70.78	7196.00	2650.00
6300	26.00	69.28	7003.00	2600.00
6400	26.00	67.18	6823.00	2600.00
6500	25.00	65.21	6619.50	2550.00
6600	25.00	63.27	6424.00	2500.00
6700	25.00	60.93	6210.00	2500.00
6800	25.00	59.32	6012.50	2500.00
6900	24.00	57.67	5849.50	2450.00
7000	24.00	55.94	5680.50	2400.00
7100	24.00	57.12	5653.00	2400.00
7200	24.00	58.64	5788.00	2400.00
7300	24.00	60.08	5936.00	2400.00
7400	24.00	61.67	6087.50	2400.00
7500	25.00	62.82	6224.50	2450.00
7600	25.00	64.36	6359.00	2500.00
7700	25.00	65.82	6509.00	2500.00
7800	25.00	64.16	6499.00	2500.00
7900	25.00	63.29	6372.50	2500.00
8000	25.00	62.34	6281.50	2500.00
8100	25.00	61.55	6194.50	2500.00
8200	25.00	60.38	6096.50	2500.00
8300	25.00	59.16	5977.00	2500.00
8400	25.00	57.36	5826.00	2500.00
8500	24.00	56.12	5674.00	2450.00
8600	24.00	54.78	5545.00	2400.00

Chainage in M.	Turfing Length (in m.)	Earthwork area (in Sqm.)	Vol. of Earth work (in Cum.)	Area of Turfing (in Sqm.)
8700	24.00	53.85	5431.50	2400.00
8800	24.00	53.98	5391.50	2400.00
8900	24.00	53.93	5395.50	2400.00
9000	24.00	53.72	5382.50	2400.00
9100	24.00	54.80	5426.00	2400.00
9200	24.00	55.97	5538.50	2400.00
9300	24.00	57.41	5669.00	2400.00
9400	24.00	56.59	5700.00	2400.00
9500	24.00	55.80	5619.50	2400.00
9600	24.00	54.78	5529.00	2400.00
9700	25.00	56.33	5555.50	2450.00
9800	25.00	57.96	5714.50	2500.00
9900	25.00	59.52	5874.00	2500.00
10000	25.00	59.11	5931.50	2500.00
10100	25.00	58.16	5863.50	2500.00
10200	25.00	56.53	5734.50	2500.00
10300	24.00	56.19	5636.00	2450.00
10400	24.00	55.66	5592.50	2400.00
10500	24.00	54.72	5519.00	2400.00
10600	24.00	53.00	5386.00	2400.00
10700	24.00	53.92	5346.00	2400.00
10800	23.00	53.22	5357.00	2350.00
10900	23.00	52.32	5277.00	2300.00
11000	23.00	51.21	5176.50	2300.00
11100	23.00	52.35	5178.00	2300.00
11200	23.00	52.57	5246.00	2300.00
11300	23.00	52.75	5266.00	2300.00
11400	23.00	51.40	5207.50	2300.00
11500	23.00	53.07	5223.50	2300.00
11600	23.00	53.22	5314.50	2300.00
11700	23.00	53.35	5328.50	2300.00
11800	23.00	53.48	5341.50	2300.00
11900	23.00	53.59	5353.50	2300.00
12000	23.00	53.69	5364.00	2300.00
12100	23.00	53.78	5373.50	2300.00
12195	23.00	53.73	5106.73	2185.00
12200	0.00	0.00	134.33	57.50

Total (A) =

560886.93

225755.00

Chainage in M.	Turfing Length (in m.)	Earthwork area (in Sqm.)	Vol. of Earth work (in Cum.)	Area of Turfing (in Sqm.)
----------------	------------------------	--------------------------	------------------------------	---------------------------

Right Bank Embankment

2500	0.00	0.00	0.00	0.00
2505	18.00	27.89	69.73	45.00
2600	18.00	28.42	2674.73	1710.00
2700	18.00	29.75	2908.50	1800.00
2800	18.00	29.52	2963.50	1800.00
2900	18.00	28.88	2920.00	1800.00
3000	18.00	28.79	2883.50	1800.00
3100	18.00	29.46	2912.50	1800.00
3200	18.00	28.90	2918.00	1800.00
3300	18.00	29.50	2920.00	1800.00
3400	20.00	28.55	2902.50	1900.00
3500	20.00	27.76	2815.50	2000.00
3600	20.00	28.84	2830.00	2000.00
3700	20.00	29.12	2898.00	2000.00
3800	20.00	28.25	2868.50	2000.00
3900	20.00	27.94	2809.50	2000.00
4000	20.00	28.43	2818.50	2000.00
4100	20.00	27.47	2795.00	2000.00
4200	20.00	27.84	2765.50	2000.00
4300	20.00	27.61	2772.50	2000.00
4345	20.00	27.71	1244.70	900.00
4351	0.00	0.00	83.13	60.00


Total (B) = 52773.78 35215.00

Total = Total (A) + Total (B) = 613660.71 260970.00

Grubbing Qty. = 61771.83

Grand total E/W qty = 675432.54 cum

Total length = 14051.00

  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta

STATEMENT No. - 10

Name of Work : Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

Supply of polypropelene sewing thread, F.O.R. Destination Barpeta.

Geo bag size	Total Nos. of Geo bag	Length of sewing thread for 1 no. geo bag (in m.)	Total length of sewing thread required (in m.)
1.03m x 0.7m	7945688	11.00	87402568
		Total =	87402568

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

CHAPTER-8

**B.C RATIO**

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

### Benefit cost Ratio

<b>A.Capital Cost of the Scheme</b>	=	Rs	40021.95 lakhs
Residual Value of Rs. 1600L of already executed project. (considering 2% depreciation per year from 2016-17 to 2019-2020)			1472.00 lakhs
<b>Total Cost</b>	=	Rs.	<b>41493.95 lakhs</b>
I.Interest Charges @10% of cost of scheme	=	Rs	4149.4 lakhs
II.Maintenance @5% of cost of scheme	=	Rs	2074.7 lakhs
III.Depreciation @2% of cost of scheme	=	Rs	829.88 lakhs
<b>Total</b>	=	Rs	<b>7053.98 lakhs</b>
<b>B.Annual Benefit of the Scheme</b>			
Average annual benefit from the statement	=	Rs	10546.28 lakhs
<b>B. C. Ratio= Annual Benefit/Annual Cost</b>	=		<b>1.51 : 1</b>

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)

### Statement of loss assessment

As per Circle Officers of Revenue Department, Govt. of Assam

Name of the Circle Officer			Total Loss (in Rs.) in last ten years.
Kalgachia Revenue Circle	=	Rs.	2585400000.00
Barnagar Revenue Circle	=	Rs.	2562170000.00
Jalah Revenue Circle	=	Rs.	2304450000.00
Baghbar Revenue Circle	=	Rs.	1812121560.00
Barpeta Revenue Circle	=	Rs.	1382137800.00
Total (in 10 years)	=	Rs.	10846279160.00
Average loss per year	=	Rs.	1084627916.00

So, the Annual benefit from the scheme = Rs. 10846.28 Lakhs

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

OFFICE OF THE CIRCLE OFFICER, BARNAGAR REVENUE CIRCLE, SOBKHOG

No. BNC (MIS) - 01/2617/4130

Dt. 12/02/2020

The Executive Engineer  
Barpeta W.R Division, Barpeta

Sub: Flood Loss assessment of Barnagar Revenue Circle due to Flooding of River Baki for preparation of scheme "Integrated flood and erosion management of Manu and Baki river in the District of Bakm and Barpeta in Brahmaputra valley within Assam (Review)

Sr. With reference to subject cited above I would like to furnish the following information in respect of loss of crops, fisheries, building, roads and public institutions etc. Due to flooding of river Baki during the year 2018-2019 along with affected area and value as follows:

Loss of Crops:

Cultivable Land ~ 21000 Hectr = 156975.00 Bigha  
Production of paddy @ 18 Q/higa in two crops in Atm and Sali  
Hence loss in crops  
Considering Rs. 1400/Quintal in monetary term = Rs. 1758120000.00

Loss of Fisheries:

Fisheries Affected = 156 nos  
Avg. Loss of fishery productivity due to flooding  
Considering Rs. 150000/ha = Rs. 23,400,000.00

Road/building damages caused by flood:

- 1. Assam Tyne building 126 nos @ Rs 5,00,000/ha = Rs. 9,90,00,000.00
- 2. Tinched House 47 nos @ Rs 20,000/ha = Rs. 28,5,00,000.00
- 3. PWD road damages 60 km @ Rs 600000/km = Rs. 36,00,00,000.00

Loss of Land due to Erosion:

- 1. Cultivable land 3400 Bigha @ Rs. 65,000/Bigha = Rs. 22,10,00,000 .00
  - 2. Homestead  
Institutional 685 Bigha @ Rs. 92,000/Bigha = Rs. 6,16,50,000.00
  - 3. Fallow land 300 Bigha @ Rs. 35,000/Bigha = Rs. 1,05,00,000.00
- Total Rs. 256,21,70,000.00

Yours faithfully

Circle officer  
Barnagar Revenue circle  
Sobkhog Office  
Barnagar Revenue Circle  
Sobkhog



## OFFICE OF THE CIRCLE OFFICER, KALGACHIA REVENUE CIRCLE, KALGACHIA

No: 3825

DL 21/11/2020

To,  
The Executive Engineer  
Deputy W.R. Division, Burpeta

Sub- Flood Loss assessment of Kalgachia Revenue Circle due to Flooding of River Beldi for preparation of scheme "Integrated flood and erosion management of Monas and Beldi river in the District of Buxa and Burpeta in Brahmaputra valley within Assam (Review)

Sir,

With reference to subject cited above I would like to furnish the following information in respect of loss of crops, fisheries, building, roads, and public institutions etc. Due to flooding of river Beldi during the year 2019-2020 along with affected area and value as follows

## Loss of Crops:

Cultivable Land = 22000 Hectare = 1,64,450.00 Bighas  
Production of paddy @ 8 Qyabha in two crops in Aha and Bala  
Hence loss in crops.  
Considering Rs.1400/Quintal in monetary term = Rs.184,18,40,000.00

## Loss of Fisheries:

Fisheries Affected = 150 nos  
Avg. Loss of fishery productivity due to flooding  
Considering Rs.1,50,000/ha. = Rs. 22,500,000.00

## Road/building damages caused by floods:

1. Assam Type building 180 nos @ Rs 5,00,000/ha = Rs. 9,00,00,000.00  
2. Thatched House 500 nos @ Rs 60,000/ha = Rs. 30,00,000.00  
3. PWD road damages 34 km @ Rs 60,00,000/km = Rs. 20,40,00,000.00

## Loss of Land due to Erosion:

1. Cultivable land 3200 Bigha @ Rs.65,000/Bigha = Rs.20,80,00,000.00  
2. Homestead & Institutional 690 Bigha @ Rs.90,000/Bigha = Rs. 6,21,00,000.00  
3. Fallow land 200 Bigha @ Rs.35,000/Bigha = Rs. 7,00,000.00  
Total Rs.258,54,40,000.00



Yours faithfully

Circle Officer  
Kalgachia Revenue Circle  
Kalgachia

GOVT. OF ASSAM  
OFFICE OF THE CIRCUIT OFFICER, BASHAR REVENUE CIRCLE, MANDIA

No. BORE-23/2019/156

Date: 2/11/2019

The Executive Engineer

Barpetta W.P. Division

Barpetta

Re: Road loss and damage of Bashara Revenue Circle due to flooding of River Borajoke in part of the Shree Integrated flood and erosion management of Masas and Bekhiva in the District of Bakasani, Barak valley, within Assam (Review)

With reference to the subject cited above, I would like to furnish the following information in respect of loss of crops, fisheries, buildings, roads and public institutions etc. due to flooding of river Bakajoke in the year 2018-2019 along with affected area and value as follows:

**Loss of Crops**

Cultivable area	2557.00 ha	2557.00 ha
Production of paddy (at 8000 kg/ha)	20456000 kg	20456000 kg
Value of paddy crop	Rs. 163648000	Rs. 163648000
considering 100% (100%) crop loss		Rs. 163648000

**Loss of Fisheries**

Extent affected	25 nos	25 nos
Average of fisher productivity due to flood	Rs. 70000/ha	Rs. 1750000.00
considering 100% (100%) loss		Rs. 1750000.00

**Road Building Damages caused by flood**

1. Assam type Building	10 nos @ Rs. 50000	Rs. 500000.00
2. Bached House	10 nos @ Rs. 60000	Rs. 600000.00
3. Road damage	34 nos @ Rs. 60000	Rs. 2040000.00

**Loss of Land due to Erosion**

1. Cultivable land	200 sq. m @ Rs. 25000/ha	Rs. 500000.00
2. House	10 nos @ Rs. 25000/ha	Rs. 250000.00
3. Road	200 sq. m @ Rs. 25000/ha	Rs. 500000.00

  
 Circuit Officer  
 Bashara Revenue Circle  
 Mandia

GOVT. OF ASSAM  
OFFICE OF THE CIRCLE OFFICER: BARPETA REVENUE CIRCLE, BARPETA

Dated: 16-7-2021

No. SRC-34/Misc/2017/59

To,  
The Executive Engineer,  
Barpeta W.R. Division,  
Barpeta

Sub. Flood loss assessment of Barpeta Revenue Circle due to flooding of River Beki for preparation of the scheme of integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

Sir,  
With reference to the subject cited above, I would like to furnish the following information in respect of loss of crops, fisheries, building, roads and public institutions etc. due to flooding of river Beki during the year 2011-2020 along with affected area and value as follows.

<b>Loss of Crops:</b>			
Cultivable land =	12080 Hectr.	=	90298.00 Bighas.
Production of paddy @	8 Q/bigha in two crops in Ahu and Sali		
Hence loss in crops considering Rs	1400 /Quintal in monetary term		₹ 1,01,13,37,600.00
<b>Loss of Fisheries:</b>			
Fisheries Affected =	120 nos.		
Avg. loss of fishery productivity due to flooding considering Rs.150000/no.			₹ 1,80,00,000.00
<b>Road/building damages caused by flood:</b>			
1 Assam Type-Building	80 nos. @ Rs.	500000 /no.	= ₹ 4,00,00,000.00
2 Thatched House	280 nos. @ Rs.	60000 /no.	= ₹ 1,68,00,000.00
3 PWD road-damages	24 km. @Rs.	6000000 /Km.	= ₹ 14,40,00,000.00
<b>Loss of Land due to Erosion:</b>			
1 Cultivable land =	1800 Bigha @ Rs.	65000 /Bigha.	= ₹ 11,70,00,000.00
2 Homestead & =	350 Bigha @ Rs.	90000 /Bigha	= ₹ 3,15,00,000.00
3 Fellow-land =	100 Bigha @ Rs.	35000 /Bigha	= ₹ 35,00,000.00
			₹ 1,38,21,37,600.00

Yours faithfully

Circle Officer  
Barpeta Revenue Circle  
Barpeta

**GOVT. OF ASSAM**  
**OFFICE OF THE CIRCLE OFFICER : JALAH REVENUE CIRCLE; JALAH**

Date: 02-08-2021

No. JLR-27/2021/205

To,  
The Executive Engineer,  
Chirang W.R. Division, Kajalgaon.

Sub:- Flood loss assessment of Jalah Revenue Circle due, Jalah to flooding of river Beki for preparation of the DPR "Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)".

Sir,

With reference to the subject cited above, I would like to furnish the following information in respect of loss of crops, fisheries, building, roads and public institutions etc. Due to flooding of river Beki during the year 2011-2020 along with affected area and value as follows. (However the estimated data provided below is only provisional)

**Loss of Crops :**

Cultivable Land=	=	20000 Hectr.	=	149500.00 Bighas
Production of paddy @		8 Q/bigha in two crops in Ahu and Sali		
Hence loss in crops .				
considering Rs		1400 /Quintal in monetary term	=	₹ 1,67,44,00,000.00

**Loss of Fisheries:**

Fisheries Affected	=	135 Nos.		
Avg. loss of Fishery productivity due to flooding				
considering Rs.150000/No.			=	₹ 2,02,50,000.00

**Road/building damages caused by flood:**

1 Assam Type Building	150 Nos. @ Rs.	500000	/no.	=	₹ 7,50,00,000.00
2 Thached House	350 Nos. @ Rs.	60000	/no.	=	₹ 2,10,00,000.00
3 PWD road damages	45 km. @Rs.	6000000	/Km.	=	₹ 27,00,00,000.00

**Loss of Land due to Erosion:**

1 Cultivable land	=	3000 Bigha @ Rs.	65000 /Bigha	=	₹ 19,50,00,000.00
2 Homestead &	=	480 Bigha @ Rs.	90000 /Bigha	=	₹ 4,32,00,000.00
3 Fellow land	=	160 Bigha @ Rs.	35000 /Bigha	=	₹ 56,00,000.00
				=	₹ 2,30,44,50,000.00

Yours faithfully

*P. Ram*  
Circle Officer  
Jalah Revenue Circle  
Jalah Revenue Circle  
Jalah

BREAK UP OF DAMAGES DUE TO EROSION AND FLOOD

On the basis of flood loss assessment submitted by the concern revenue circle the breakup of losses due to erosion and flood has shown below.

Sl. No	Name of Revenue circle	Damage due to erosion	Damage due to flood
1	Barnagar revenue circle	293150000.00	2269020000.00
2	Kalgachia revenue circle	277100000.00	2308340000.00
3	Barpeta revenue circle	152000000.00	1230137600.00
4	Baghbor revenue circle	210950000.00	1601171560.00
5	Jalah revenue circle	243800000.00	2060650000.00

  
Executive Engineer  
Barpeta W.R Division  
Barpeta

CHAPTER-9

## CONSTRUCTION PLAN

**PROJECT ACTION PLAN**

**NAME OF WORK : Integrated Flood and Erosion Management of Manas and Bekl River in the districts of Baksa and Barpeta in Brahmaputra Valley within Assam (Review). (Phase-I)**

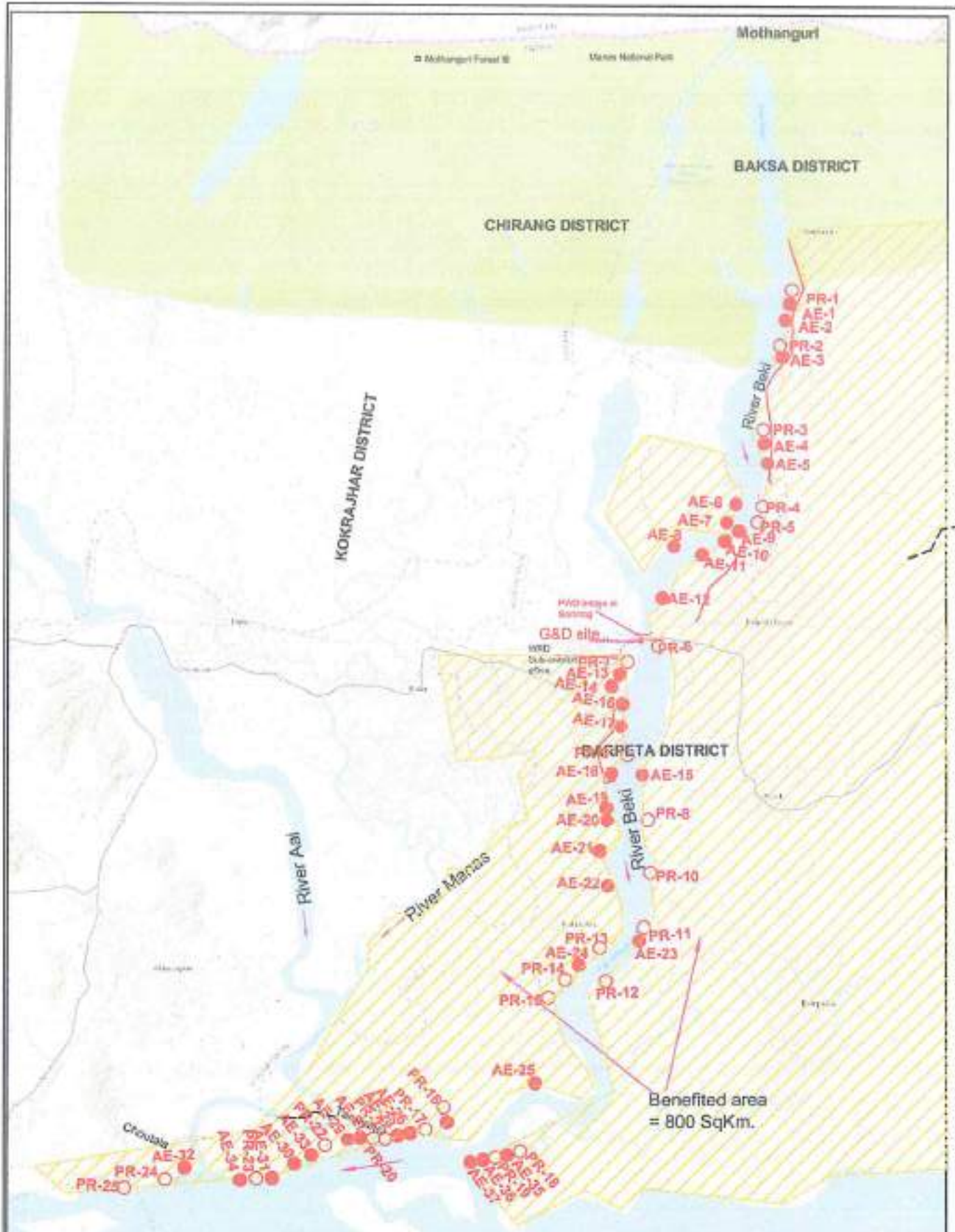
SL No	ACTIVITIES	2022												2023												2024		
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan		
1	PRELIMINARY	█																										
2	FLOATING OF TENDER AND ALLOTMENT OF		█																									
3	MOBILISATION OF MACHINERIES			█	█																							
4	COLLECTION OF MATERIALS			█	█				█																			
5	RAISING AND STRENGTHENING WORKS			█	█	█			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█			
6	CONSTRUCTION OF APRON WITH GEO-BAG				█	█			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█			
7	REVTMENT OF BANK WITH GEO-BAG				█	█			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█			
8	SUPPLY AND LAUNCHING OF RCC PORCUPINE IN SCREEN/BAR				█	█			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█			
9	SUBHEADED WORK				█	█			█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█	█			

  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta.

CHAPTER-10

INDEX MAP





Name of the Project: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)  
 Benefited area = 800 SqKm.

LEGEND	
1. Stone/Bed Area	
2. Pier	
3. N.H.-31	
4. P.W.D. Road	
5. Railway	
6. River	
7. W.D work of embankment	
8. Piers, Pier-abutment works	
9. Piers, Spillway protection works with Gating	

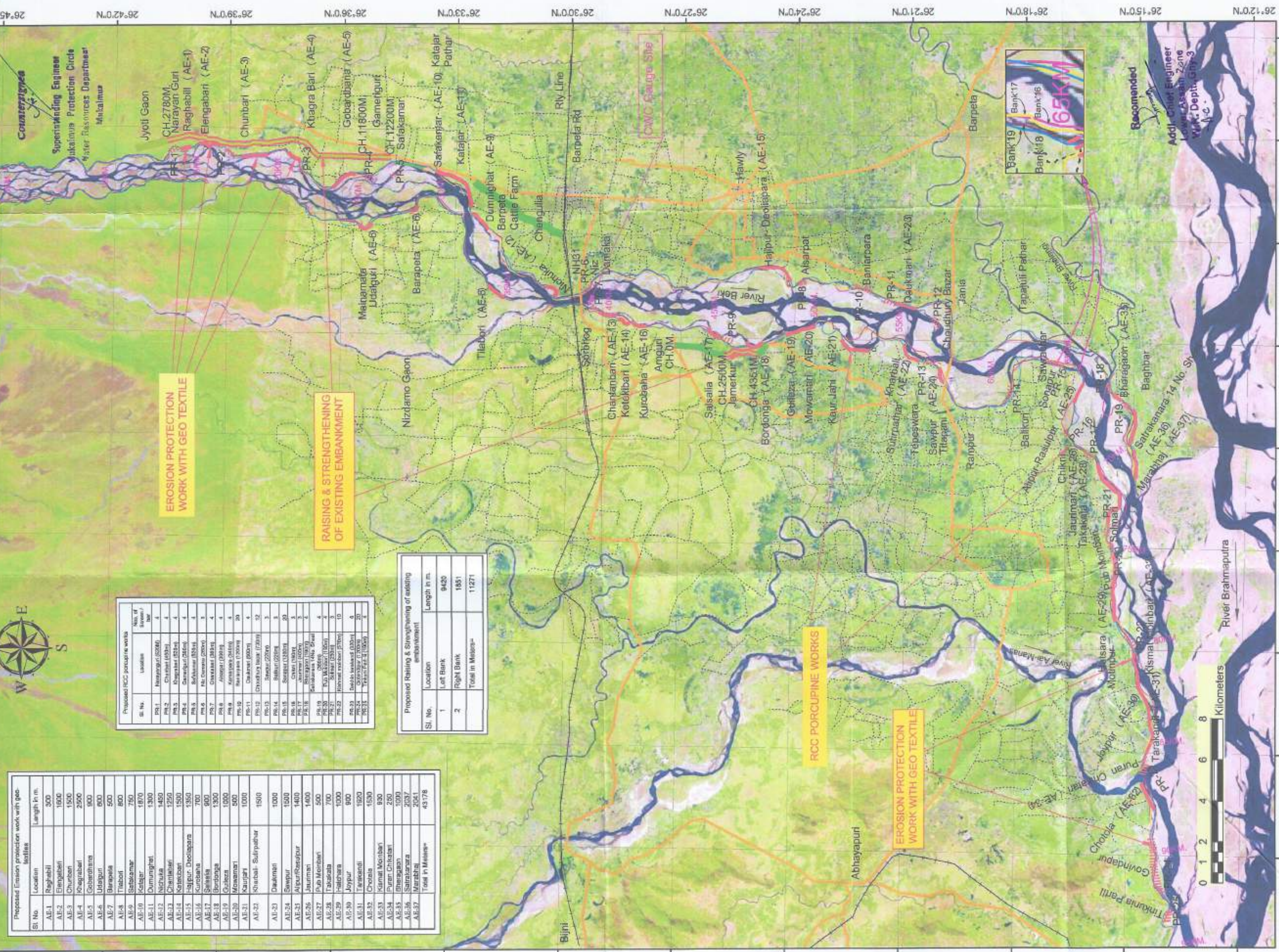


GOVT. OF ASSAM  
 W.R. DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WR DIVISION, BARPETA  
**INDEX MAP**  
 Executive Engineer  
 Barpeta W.R. Division, Barpeta

Sl. No.	Location	Length in m.
AE-1	Raghobli	300
AE-2	Elangabari	1000
AE-3	Chunbari	1500
AE-4	Khagrabari	2500
AE-5	Gobarhatia	900
AE-6	Udayuri	600
AE-7	Barapeta	500
AE-8	Tilaboti	800
AE-9	Sabbarbar	750
AE-10	Scholar	1070
AE-11	Chumunghat	1300
AE-12	Sekaria	1400
AE-13	Chengulla	1250
AE-14	Sahapur	1500
AE-15	Sahapur Dooitpara	1350
AE-16	Scholar	700
AE-17	Saisalia	900
AE-18	Bordonga	1300
AE-19	Chakra	1000
AE-20	Musamari	500
AE-21	Kaur Jati	1000
AE-22	Kaurbari Sulpanthar	1500
AE-23	Dakamail	1000
AE-24	Sawpur	1500
AE-25	Ajpur-Rasulpur	1400
AE-26	Jauman	1400
AE-27	Pub Morbari	500
AE-28	Tasabara	700
AE-29	Sahapara	1000
AE-30	Jaypur	900
AE-31	Tarandil	1000
AE-32	Chorala	1000
AE-33	Kamal Morbari	900
AE-34	Puran Chikalan	200
AE-35	Bheragan	1000
AE-36	Saibazar	200
AE-37	Morbari	200
Total in Meters*		43178

Sl. No.	Location	No. of Trees/100m
PR-1	Muzangul (S/M)	4
PR-2	Chakra (S/M)	4
PR-3	Khagrabari (S/M)	4
PR-4	Gobarhatia (S/M)	4
PR-5	Barapeta (S/M)	4
PR-6	Udayuri (S/M)	4
PR-7	Chakra (S/M)	4
PR-8	Chakra (S/M)	4
PR-9	Chakra (S/M)	4
PR-10	Chakra (S/M)	4
PR-11	Chakra (S/M)	4
PR-12	Chakra (S/M)	4
PR-13	Chakra (S/M)	4
PR-14	Chakra (S/M)	4
PR-15	Chakra (S/M)	4
PR-16	Chakra (S/M)	4
PR-17	Chakra (S/M)	4
PR-18	Chakra (S/M)	4
PR-19	Chakra (S/M)	4
PR-20	Chakra (S/M)	4
PR-21	Chakra (S/M)	4
PR-22	Chakra (S/M)	4
PR-23	Chakra (S/M)	4
PR-24	Chakra (S/M)	4
PR-25	Chakra (S/M)	4
PR-26	Chakra (S/M)	4
PR-27	Chakra (S/M)	4
PR-28	Chakra (S/M)	4
PR-29	Chakra (S/M)	4
PR-30	Chakra (S/M)	4
PR-31	Chakra (S/M)	4
PR-32	Chakra (S/M)	4
PR-33	Chakra (S/M)	4
PR-34	Chakra (S/M)	4
PR-35	Chakra (S/M)	4
PR-36	Chakra (S/M)	4
PR-37	Chakra (S/M)	4
PR-38	Chakra (S/M)	4
PR-39	Chakra (S/M)	4
PR-40	Chakra (S/M)	4
PR-41	Chakra (S/M)	4
PR-42	Chakra (S/M)	4
PR-43	Chakra (S/M)	4
PR-44	Chakra (S/M)	4
PR-45	Chakra (S/M)	4
PR-46	Chakra (S/M)	4
PR-47	Chakra (S/M)	4
PR-48	Chakra (S/M)	4
PR-49	Chakra (S/M)	4
PR-50	Chakra (S/M)	4
PR-51	Chakra (S/M)	4
PR-52	Chakra (S/M)	4
PR-53	Chakra (S/M)	4
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PR-63	Chakra (S/M)	4
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PR-91	Chakra (S/M)	4
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PR-93	Chakra (S/M)	4
PR-94	Chakra (S/M)	4
PR-95	Chakra (S/M)	4
PR-96	Chakra (S/M)	4
PR-97	Chakra (S/M)	4
PR-98	Chakra (S/M)	4
PR-99	Chakra (S/M)	4
PR-100	Chakra (S/M)	4

Sl. No.	Location	Length in m.
1	Left Bank	9420
2	Right Bank	1851
Total in Meters*		11271



EROSION PROTECTION WORK WITH GEO TEXTILE

RAISING & STRENGTHENING OF EXISTING EMBANKMENT

RCC PORCUPINE WORKS

EROSION PROTECTION WORK WITH GEO TEXTILE

Manas National Park  
Conservation  
Superintending Engineer  
Jabakuma Protection Circle  
Water Resources Department  
Mitalma

Jyoti Gaon  
CH-2780M, Narayan Guri  
Raghobli (AE-1)  
Elangabari (AE-2)  
Chunbari (AE-3)  
Ktiagra Bari (AE-4)  
Gobarhatia (AE-5)  
Gobarhatia (AE-5)  
Gamarhatia  
CH-11800M  
CH-12200M  
Safakantari (AE-10)  
Katajar (AE-13)  
Dumunghat (AE-9)  
Barpeta Cattle Farm  
Chengulla  
Riv Line  
Barpeta R/I  
Barpeta  
Barpeta (AE-8)  
Maitamala Udayuri (AE-6)  
Tilaboti (AE-8)  
Sohollog  
Nizjamo Gaon  
Chandambari (AE-13)  
Kelokbari (AE-14)  
Kuroaha (AE-16)  
Anguri CH.OM.  
Saisalia (AE-17)  
CH-2510M Jamerkur  
PR-9  
Bordonga (AE-18)  
CH-4355M  
Golliza (AE-19)  
Mowantari (AE-20)  
Kaur Jati (AE-21)  
PR-10  
Banjarpara  
PR-11  
Daukmarl (AE-23)  
Sairpather (AE-22)  
Tejosewara (AE-24)  
Sawpur (AE-24)  
Tilajam  
Chaudhuri Bazar  
Tanis  
Raijpur  
Balikur  
Sawrajar  
Sogpur  
Anapur-Rasulpur (AE-25)  
Chikli  
Jauamari (AE-28)  
Taksabari (AE-28)  
PR-12  
PR-13  
PR-14  
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PR-99  
PR-100



Recommended  
Addl. Chief Engineer  
Lower Assam Zone  
Work Depth: Ghy-3  
J.C.



LEGEND

- Prop. Works:-
- Prop. Works:- (sub-soared)
- Exist. Works:-
- Ongoing Works:-
- Bank/2016
- Bank/2017
- Bank/2018
- Bank/2019

GOVERNMENT OF ASSAM  
WATER RESOURCES DEPARTMENT  
OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA WATER RESOURCES DIVISION, BARPETA

COMPASS PLAN

EXECUTIVE ENGINEER  
BARPETA WATER RESOURCES DIVISION, BARPETA

Certified that the survey was done by me and correct to the best of my knowledge.

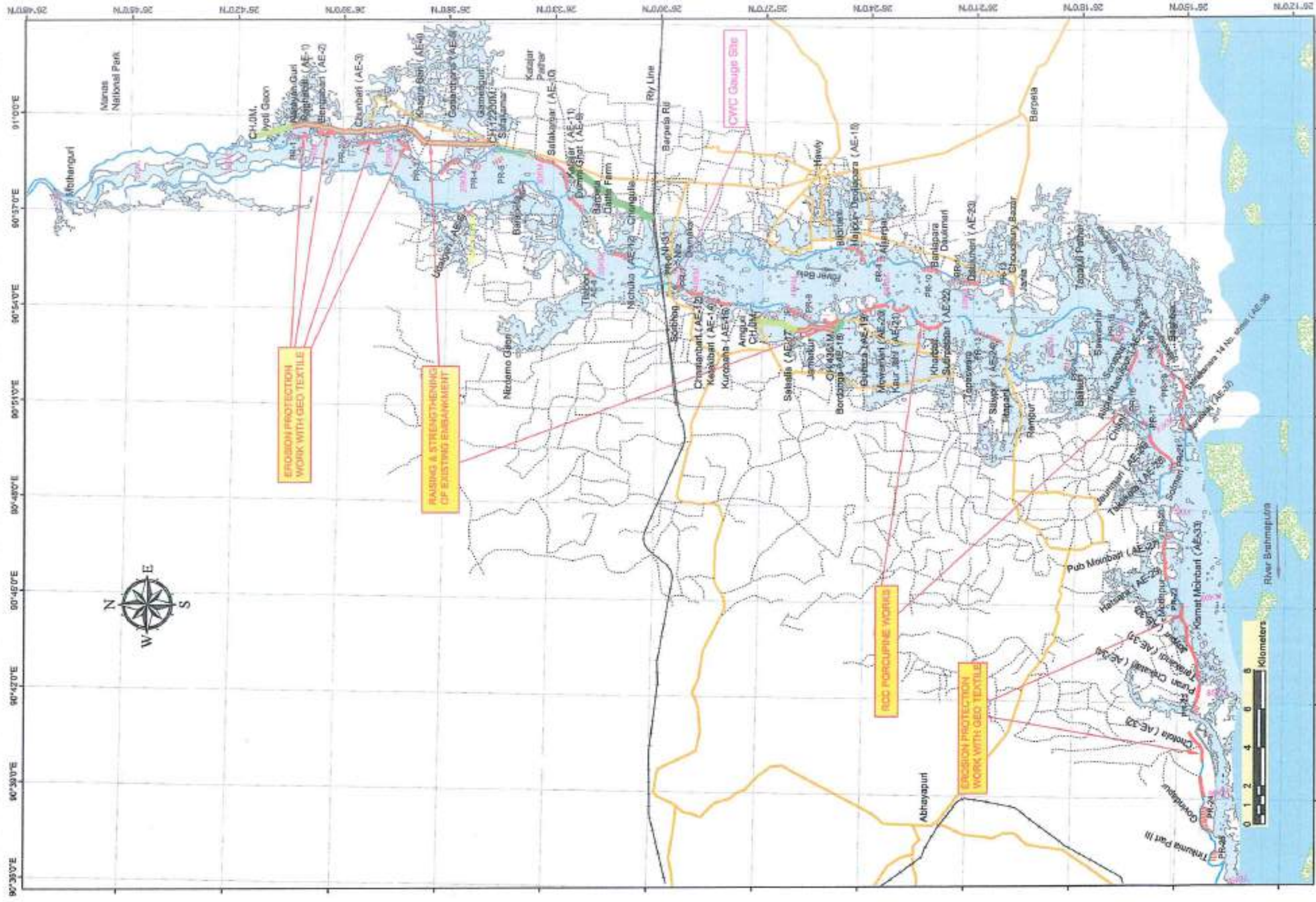
A.E./J.E.

Checked by me and found correct

A.E.E.  
Sorbhog W.R. Sub-Division

Name of Scheme:- Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam ( Review )

Background of the Compass Plan has been taken from satellite imagery on 30.03.2020



LEGEND	
Prop. Works	
Prop. Works (Done/Under)	
Exist. Works	
Ongoing Works	
Mark 2018	
Flood of Back	

Name of Scheme:- Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Berpeta in Brahmaputra valley within Assam ( Review )

Certified that the survey was done by me and correct to the best of my knowledge.

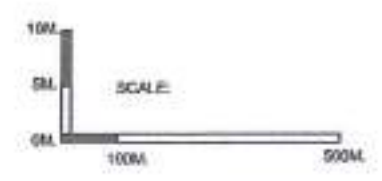
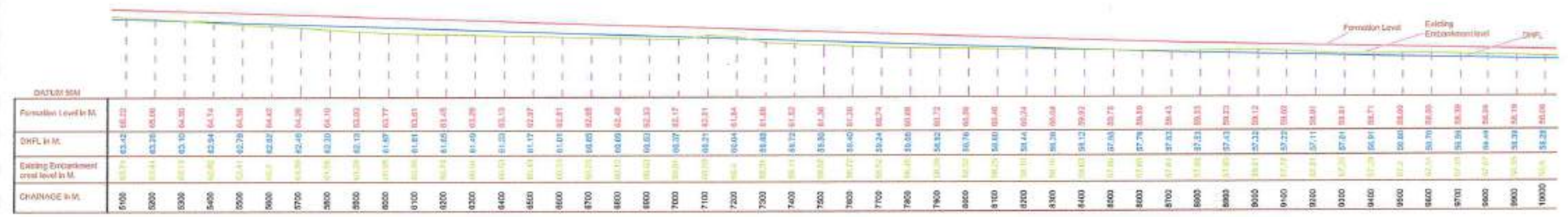
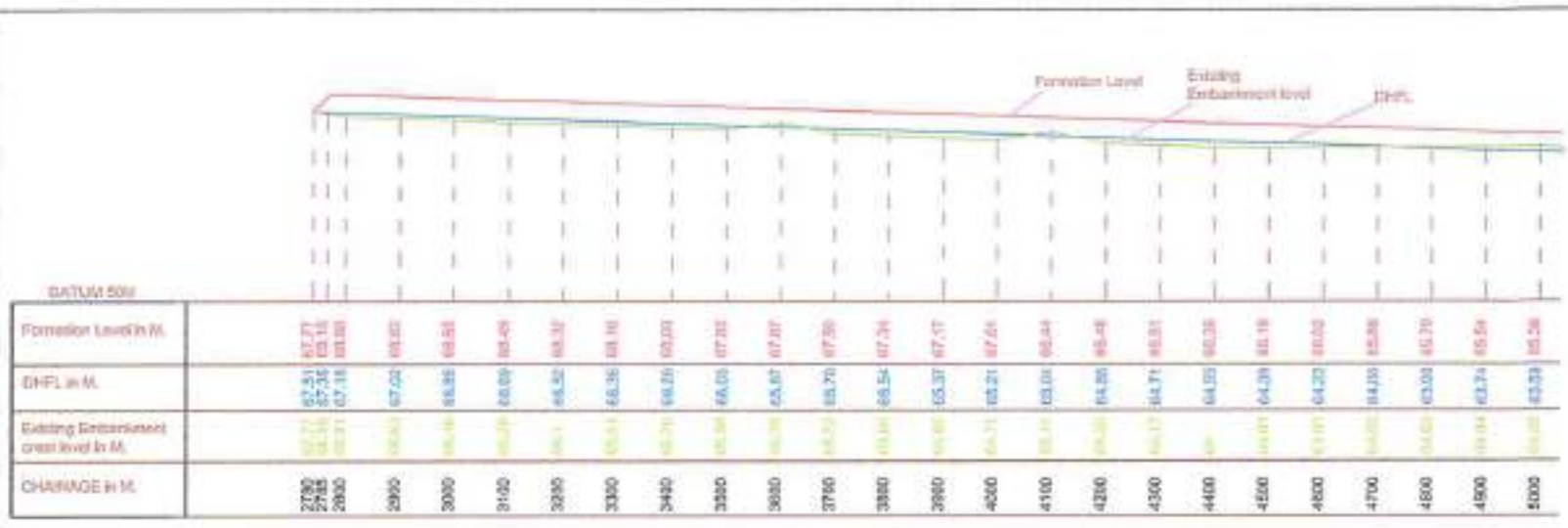
A.E./J.E.

Checked by me and found correct

Senthil W.R. Sub-Division

GOVERNMENT OF ASSAM
WATER RESOURCES DEPARTMENT
OFFICE OF THE EXECUTIVE ENGINEER
BARPETA WATER RESOURCES DIVISION, BARPETA
FLOOD HAZARD MAP
EXECUTIVE ENGINEER
BARPETA WATER RESOURCES DIVISION, BARPETA

CHAPTER-11  
DRAWINGS



CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

*[Signature]*  
A.E./E.

CHECKED AT RANDOM AND FOUND CORRECT

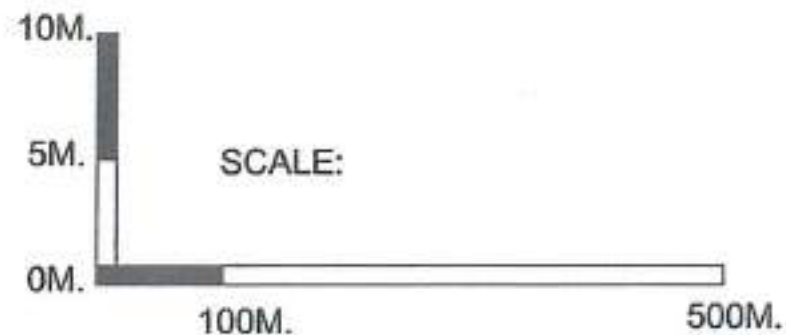
*[Signature]*  
A.E.E.  
SORBHOG WR SUB-DIV.

GOVT. OF ASSAM W.R. DEPARTMENT
OFFICE OF THE EXECUTIVE ENGINEER BARPETA WR DIVISION, BARPETA
Long Section of embankment (Left Bank)
Name of Scheme - Integrated flood and erosion management of Manas (ing) Bcdh div in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)
<i>[Signature]</i> EXECUTIVE ENGINEER BARPETA WR DIVISION, BARPETA



DATUM 40M

Formation Level in M.	46.73	46.71	46.69	46.67	46.65	46.63	46.61	46.59	46.57	46.55	46.53	46.51	46.49	46.47	46.45	46.43	46.41	46.39	46.37	46.36
DHFL in M.	44.83	44.91	44.89	44.87	44.85	44.83	44.81	44.79	44.77	44.75	44.73	44.71	44.69	44.67	44.65	44.63	44.61	44.59	44.57	44.56
Existing Embankment crest level in M.	46.73	45.66	45.64	45.61	45.6	45.58	45.56	45.55	45.52	45.50	45.47	45.45	45.43	45.41	45.40	45.38	45.35	45.34	45.32	45.31
CHAINAGE in M.	2500	2600	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100	4200	4300	4350



CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

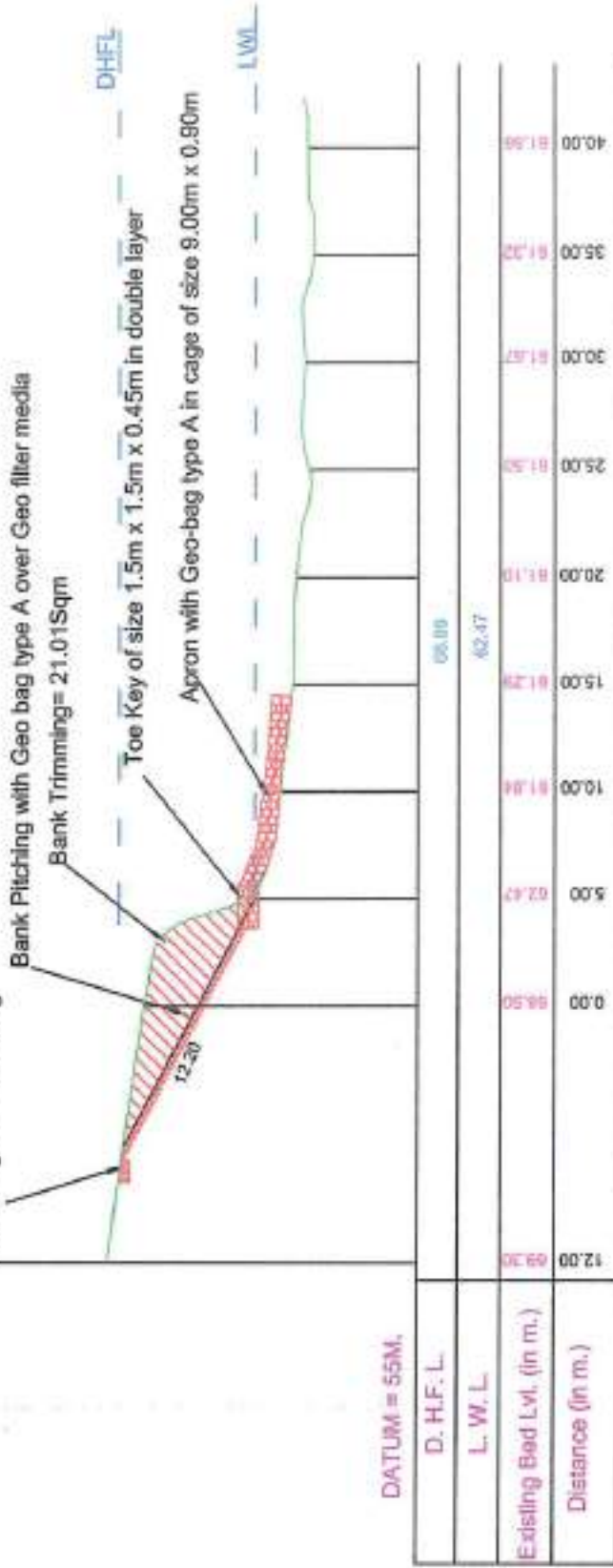
*[Signature]*  
A.E./E.

CHECKED AT RANDOM AND FOUND CORRECT

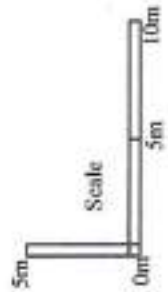
*[Signature]*  
A.E.E.  
SORBHOG W.R. SUB-DIV.

GOVT. OF ASSAM W.R. DEPARTMENT
OFFICE OF THE EXECUTIVE ENGINEER BARPETA WR DIVISION, BARPETA
<b>Long Section of embankment (Right Bank)</b>
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)
<i>[Signature]</i> EXECUTIVE ENGINEER BARPETA WR DIVISION, BARPETA

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Raghabil



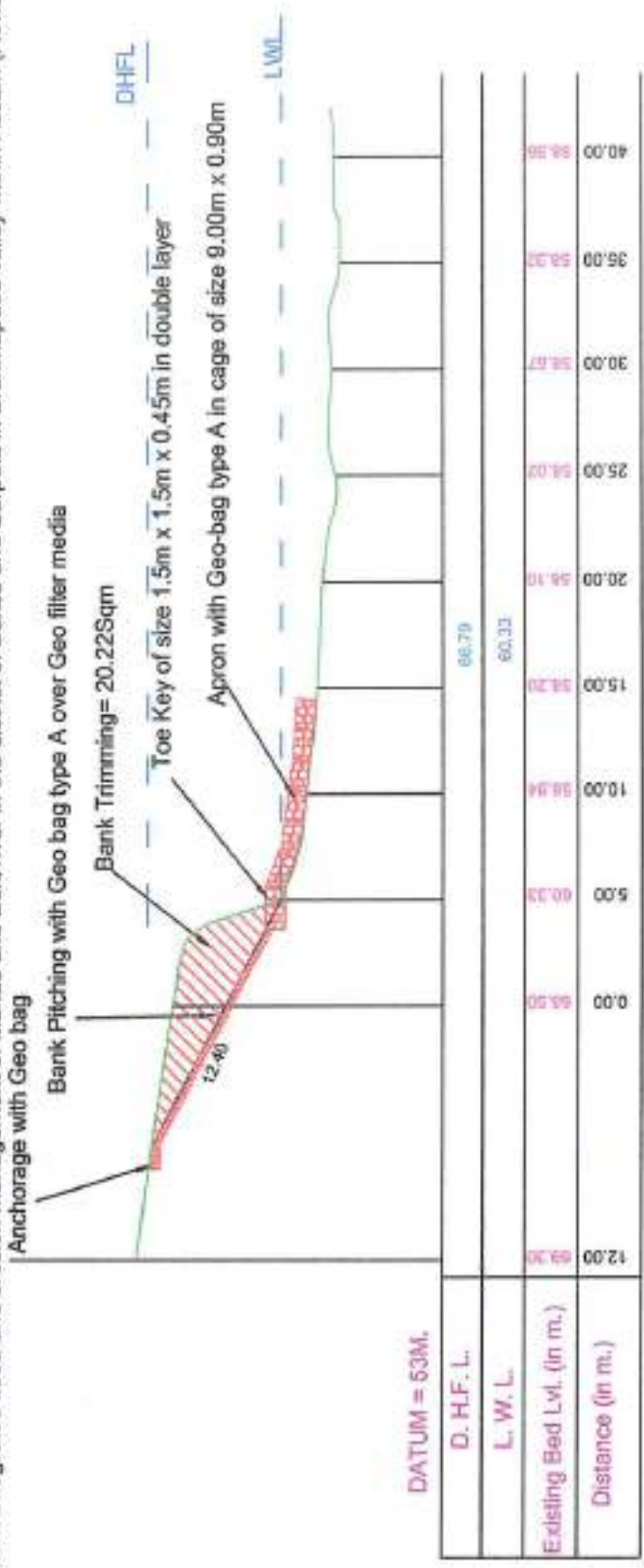
Certified that the survey was done by me and correct and correct to the best of my knowledge

A. E. / J. E.  
 Sorbhog W. R. Sub-Division

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF APRON & BANK PITCHING

Executive Engineer  
 Barpeta W. R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Elengabari



Certified that the survey was done by me and correct and correct to the best of my knowledge

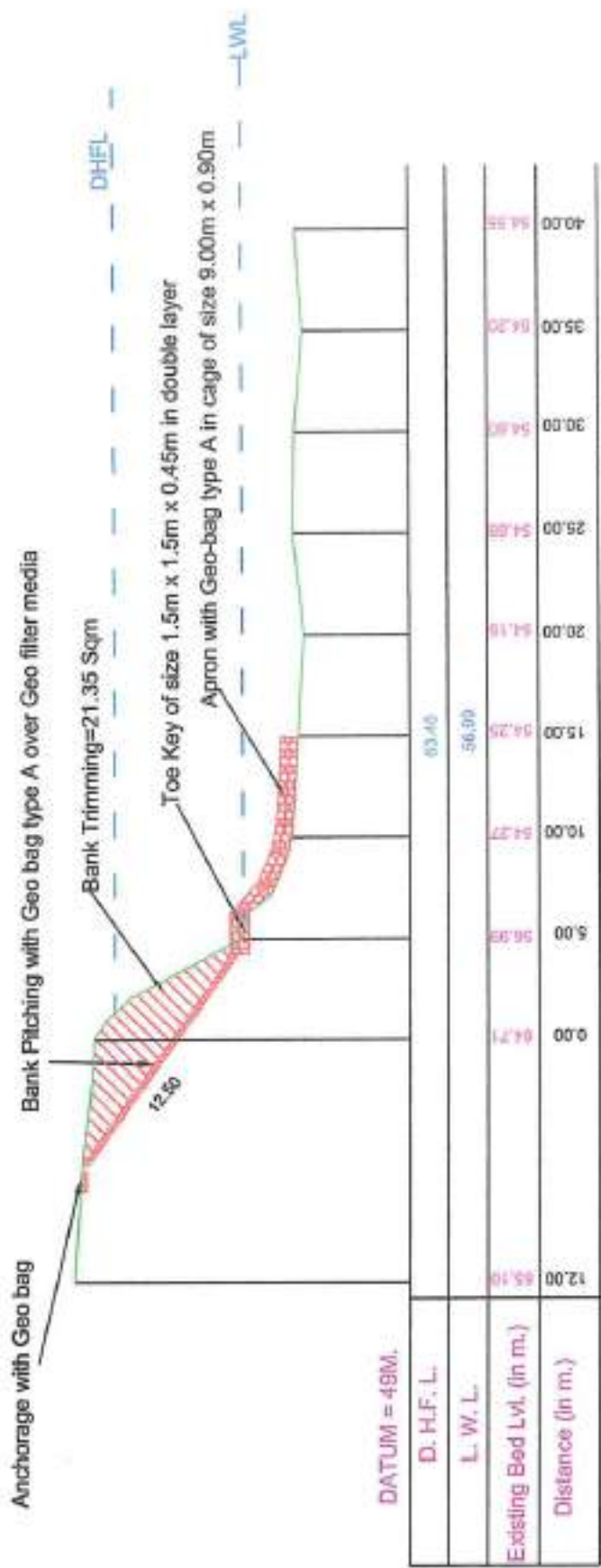
*[Signature]*  
A. E. / J. E.  
Sorbhog W.R. Sub-Division

**GOVT. OF ASSAM**  
**WATER RESOURCES DEPARTMENT**  
OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA WATER RESOURCES DIVISION, BARPETA  
TYPICAL SECTION OF APRON & BANK PITCHING

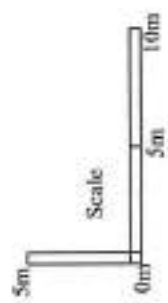
*[Signature]*  
Executive Engineer  
Barpeta W.R. Division, Barpeta



Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Chunbari



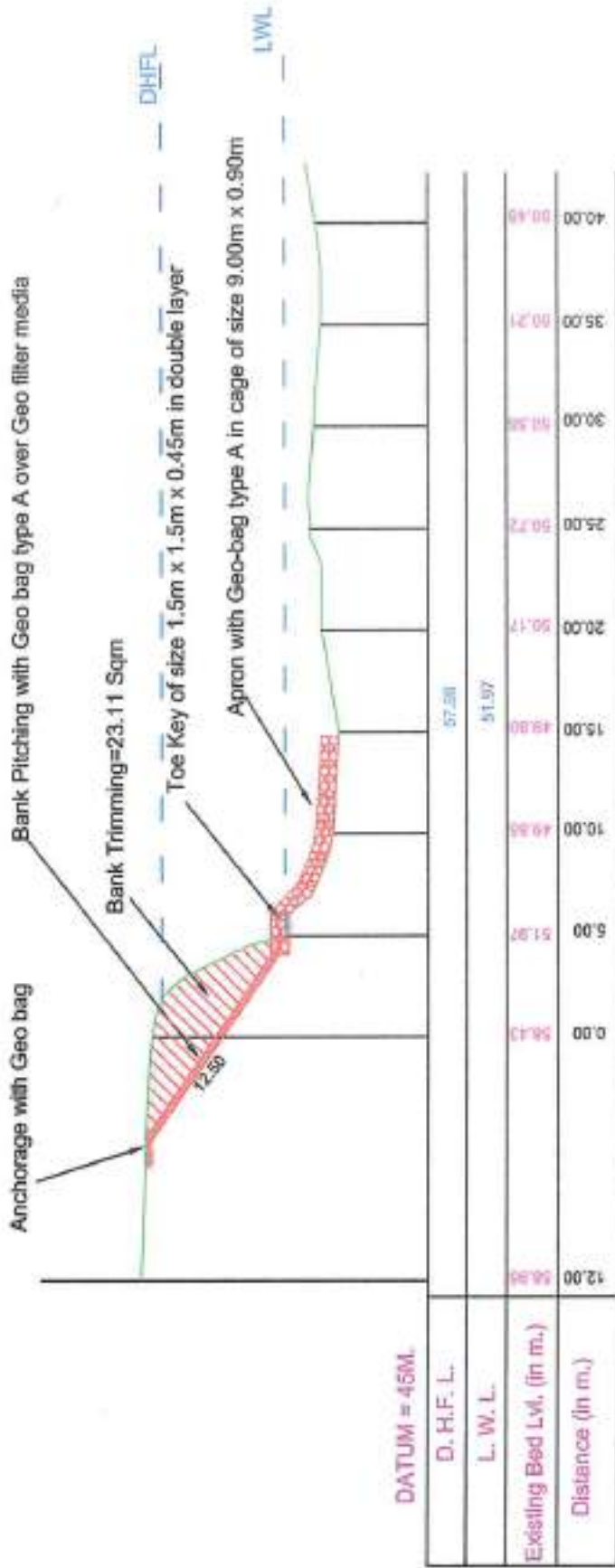
Certified that the survey was done by me and found correct and correct to the best of my knowledge

*(Signature)*  
A.E./J.E.  
Sorbhog W.R. Sub-Division

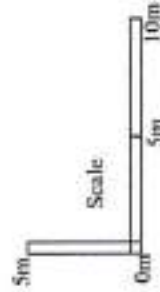
**GOVT. OF ASSAM**  
**WATER RESOURCES DEPARTMENT**  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF APRON & BANK PITCHING

*(Signature)*  
Executive Engineer  
Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Khagrabari



Certified that the survey was done by me and found correct and correct to the best of my knowledge

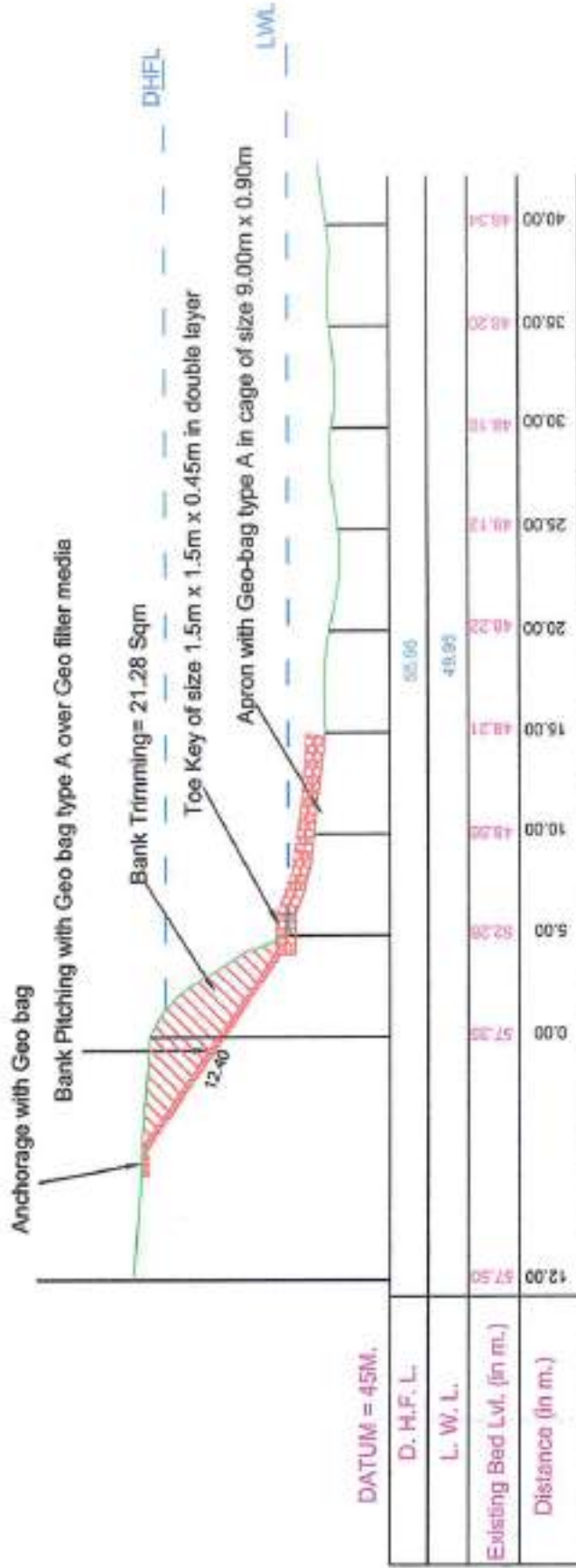
*[Signature]*  
A.E.E.  
Sorbibag W.R. Sub-Division

*[Signature]*  
A.E./J.E.

GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT  
OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA WATER RESOURCES DIVISION, BARPETA  
TYPICAL SECTION OF APRON & BANK PITCHING

*[Signature]*  
Executive Engineer  
Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beldi river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Gobardhana



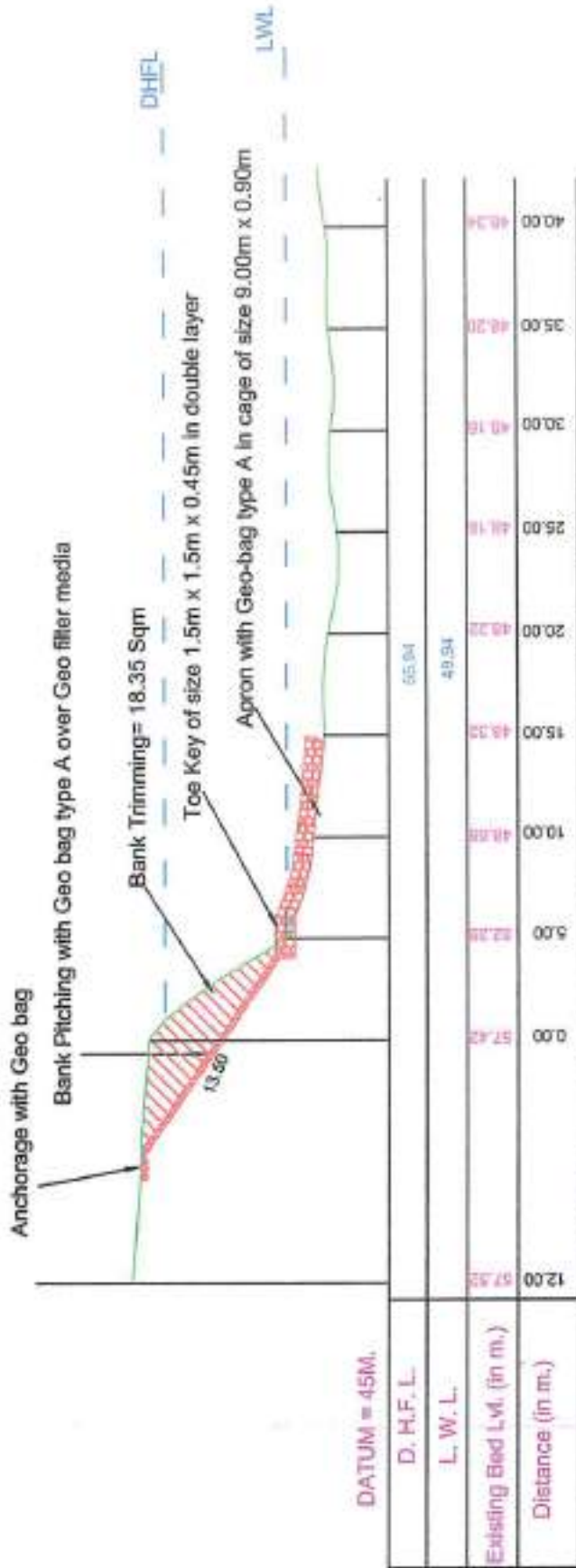
Certified that the survey was done by me and found correct and correct to the best of my knowledge

A.E./J.E.  
 Sorbhog W.R. Sub-Division

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF APRON & BANK PITCHING

Executive Engineer  
 Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Udalguri



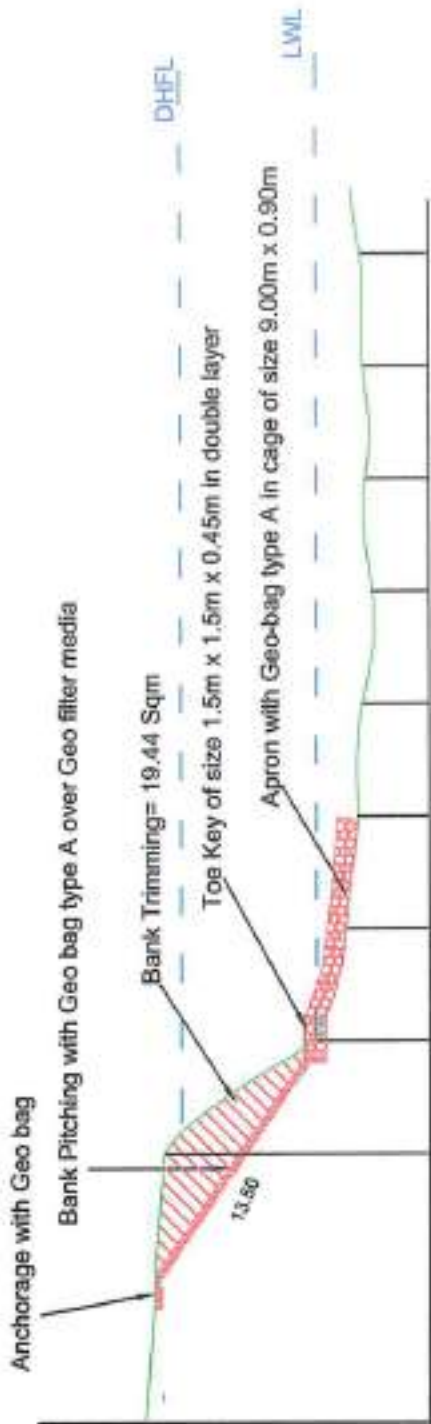
Certified that the survey was done by me and found correct and correct to the best of my knowledge

A.E./J.E.  
 Sorbhog W.R. Sub-Division

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF APRON & BANK PITCHING

Executive Engineer  
 Barpeta W.R. Division, Barpeta

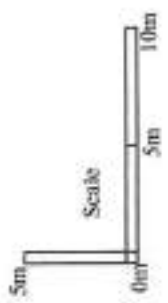
Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



DATUM = 45M.

D. H.F. L.	65.10	60.00	55.00	50.00	45.00	40.00	35.00	30.00	25.00	20.00	15.00	10.00	5.00	0.00	12.00
L. W. L.	49.10	48.75	48.30	47.85	47.40	46.95	46.50	46.05	45.60	45.15	44.70	44.25	43.80	43.35	42.90
Existing Bed Lvl. (In m.)															
Distance (In m.)															

Typical Cross section of proposed measures for erosion protection at Barapeta



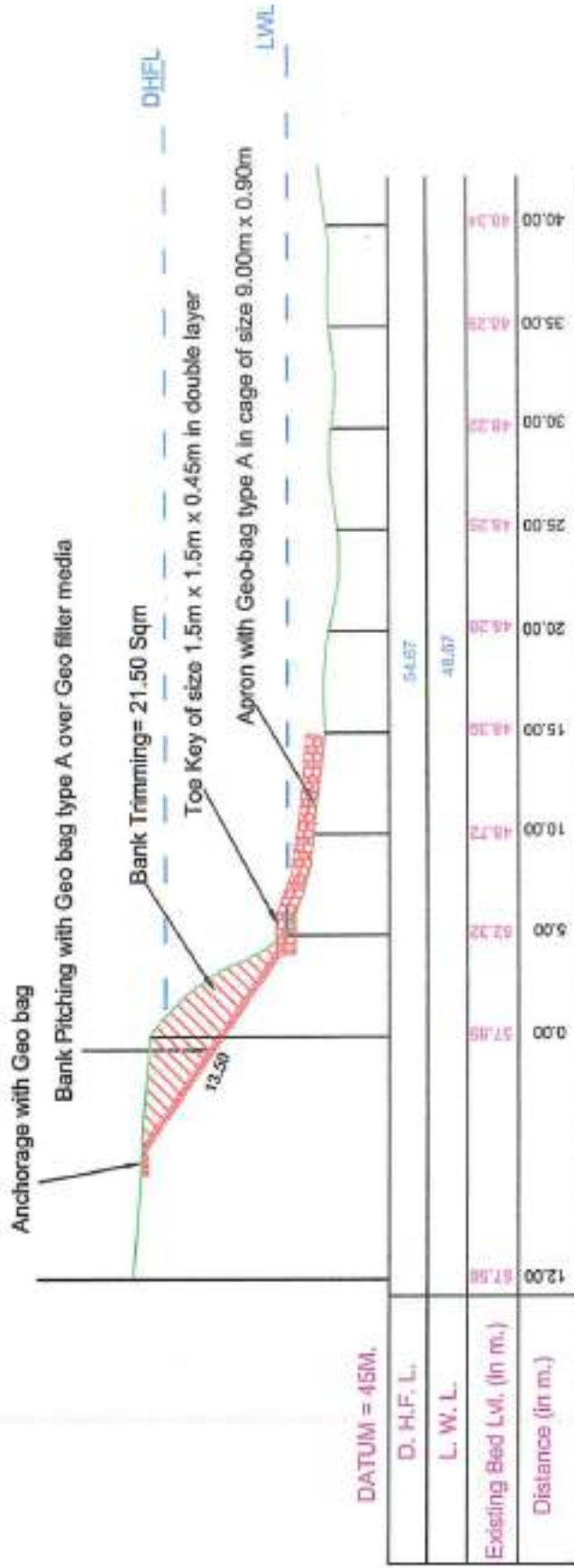
Certified that the survey was done by me and found correct and correct to the best of my knowledge.

  
 A.E.J.E.  
 Sorbhog W.R. Sub-Division

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF APRON & BANK PITCHING

  
 Executive Engineer  
 Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Tilabari



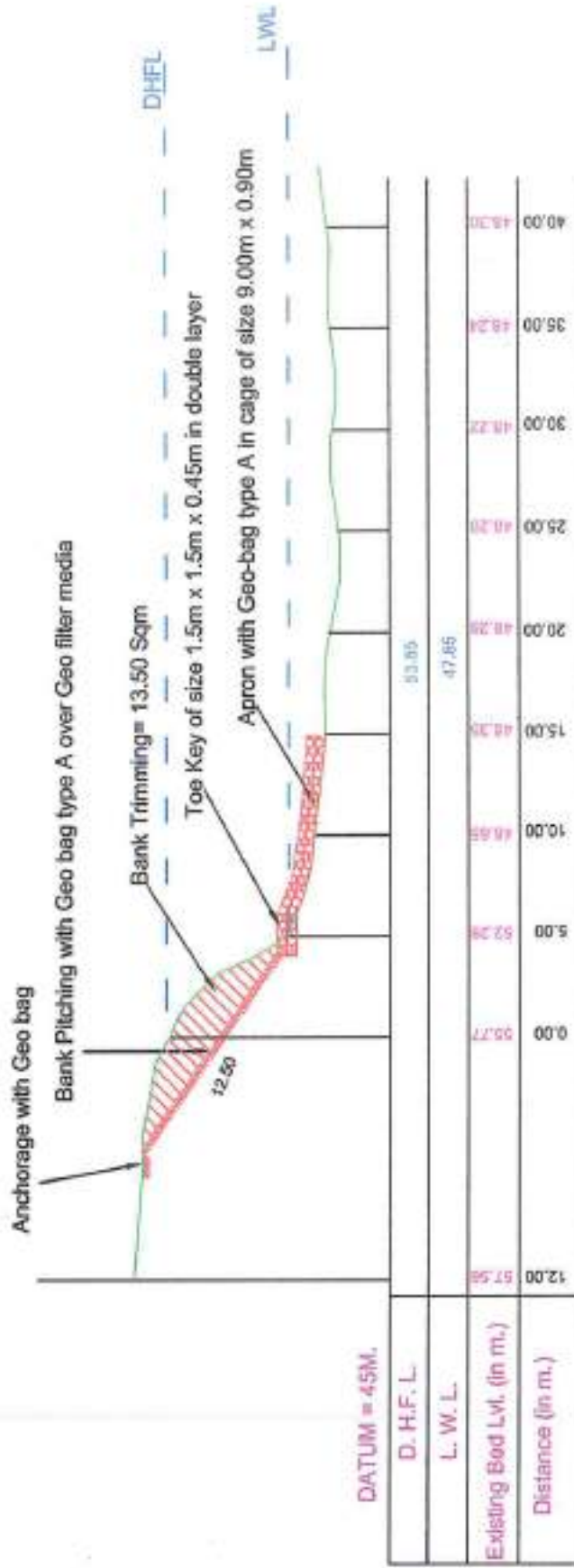
Certified that the survey was done by me and found correct and correct to the best of my knowledge

*[Signature]*  
A.E./J.E.  
Soebhog W.R. Sub-Division

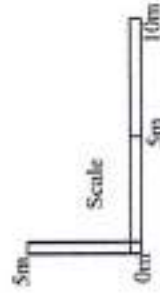
GOVT. OF ASSAM  
**WATER RESOURCES DEPARTMENT**  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF APRON & BANK PITCHING

*[Signature]*  
 Executive Engineer  
 Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Safakamar



Certified that the survey was done by me and found correct and correct to the best of my knowledge

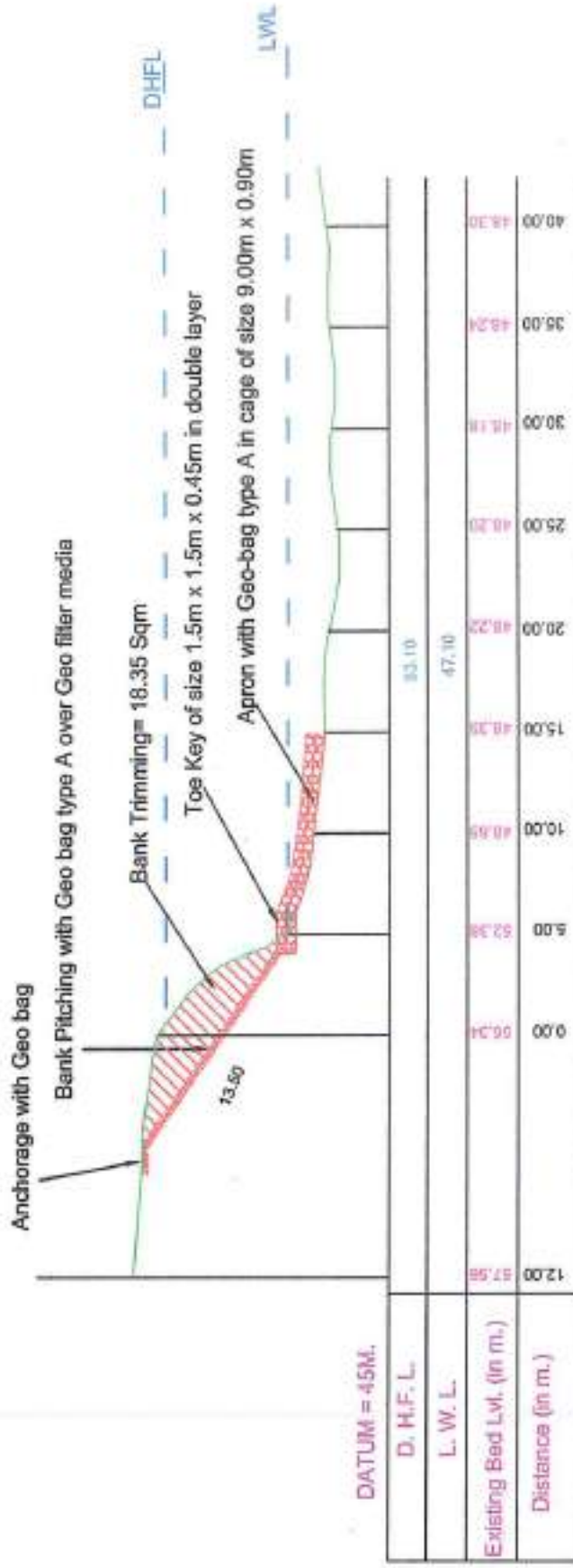
*(Signature)*  
A. E. E.

Sorbhog W. R. Sub-Division

A. E. / J. E.

<b>GOVT. OF ASSAM</b>
<b>WATER RESOURCES DEPARTMENT</b>
OFFICE OF THE EXECUTIVE ENGINEER
BARPETA WATER RESOURCES DIVISION, BARPETA
TYPICAL SECTION OF APRON & BANK PITCHING
<i>(Signature)</i> Executive Engineer Barpeta W. R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Katalajar



Certified that the survey was done by me and found correct and correct to the best of my knowledge

*(Signature)*  
A.E.E.

Sorbhag W.R. Sub-Division

A.E./J.E.

GOVT. OF ASSAM

WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER

BARPETA WATER RESOURCES DIVISION, BARPETA

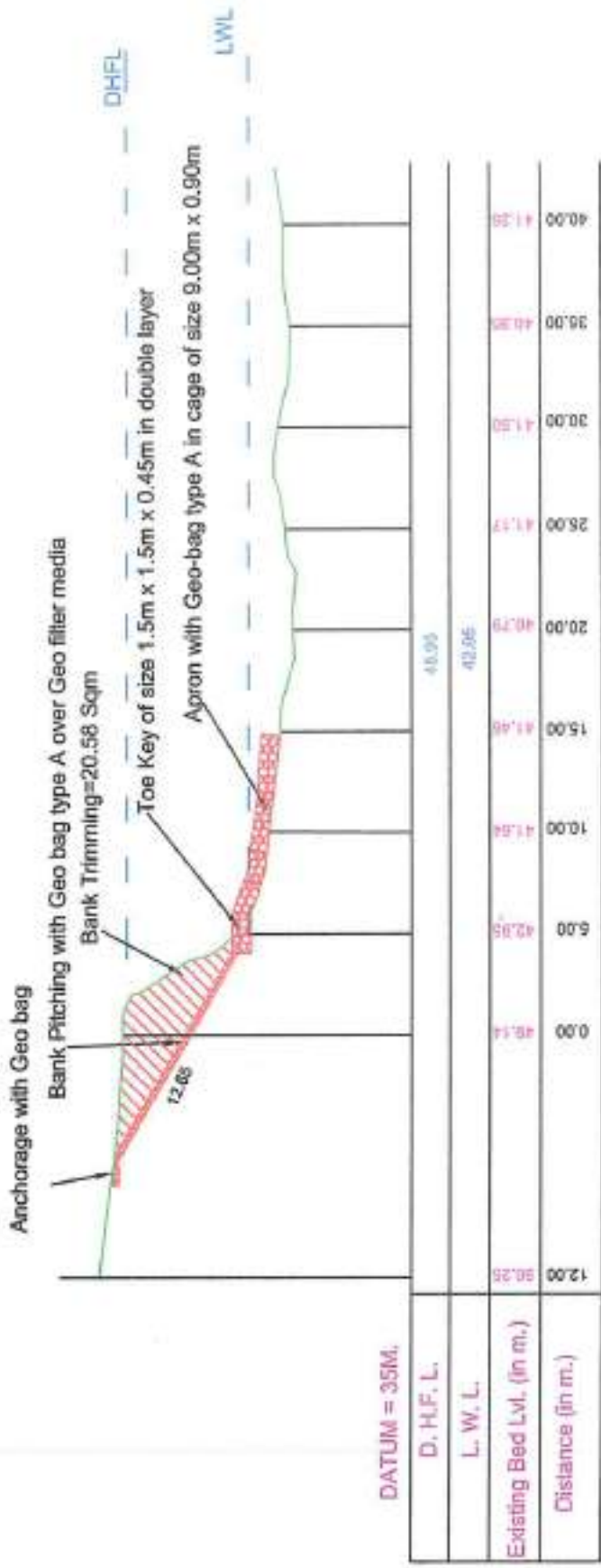
TYPICAL SECTION OF APRON & BANK PITCHING

*(Signature)*  
Executive Engineer

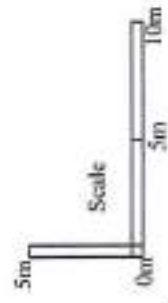
Barpeta W.R. Division, Barpeta



Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Dumunighat



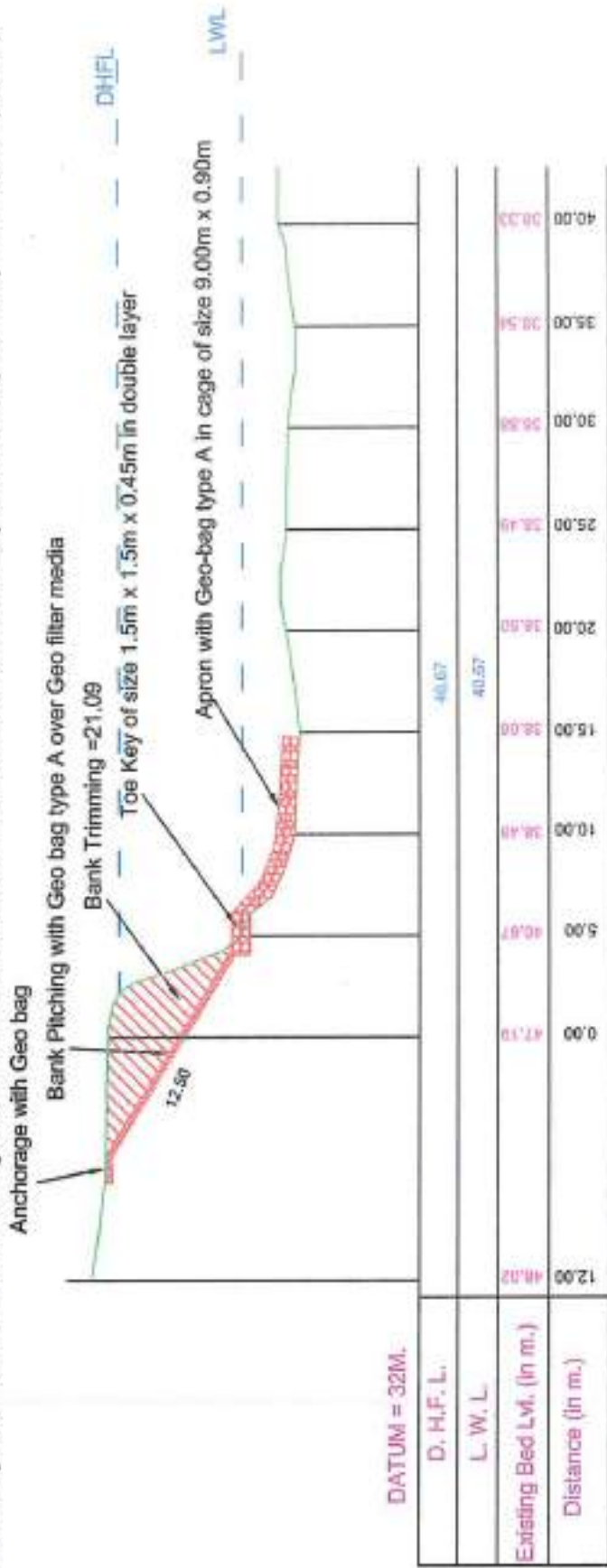
Certified that the survey was done by me and found correct and correct to the best of my knowledge

A. E./J.E.  
 Sorlibog W.R. Sub-Division

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF APRON & BANK PITCHING

Executive Engineer  
 Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection Nichuka



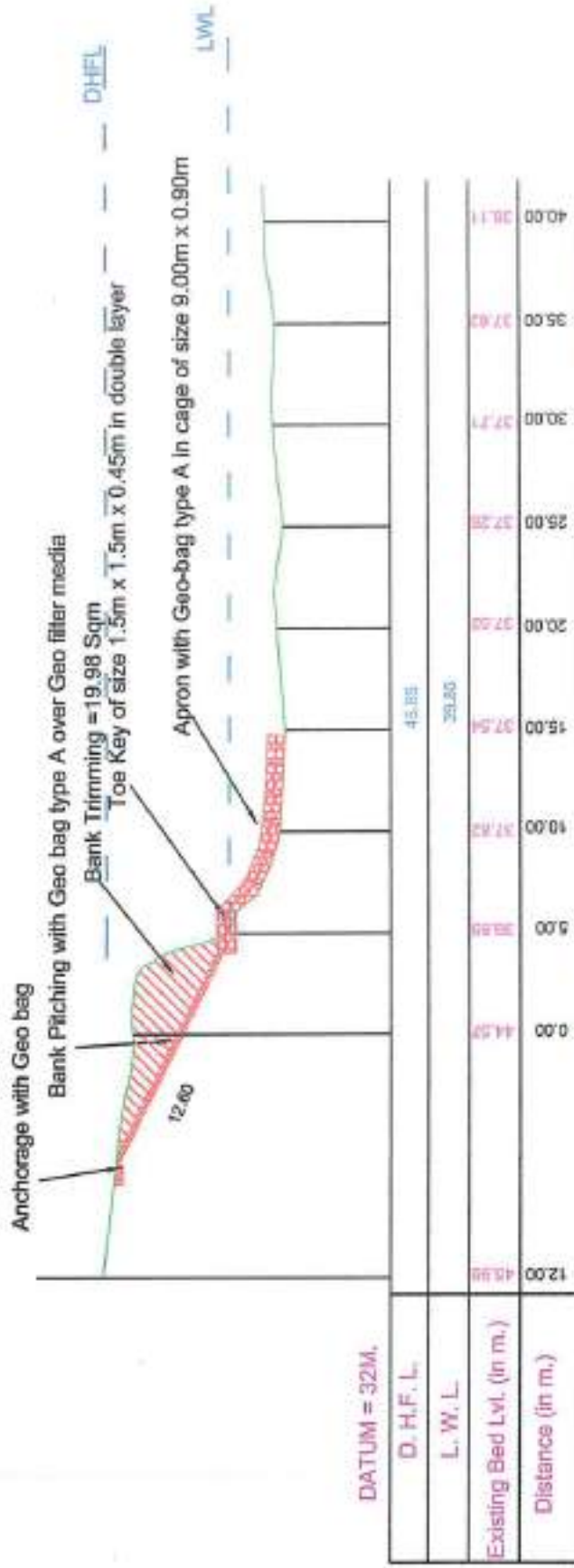
Certified that the survey was done by me and found correct and correct to the best of my knowledge

A.E./J.E.  
  
 Sorbhog W.R. Sub-Division

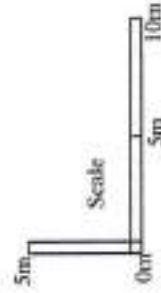
GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF APRON & BANK PITCHING

Executive Engineer  
 Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Chantabari



Certified that the survey was done by me and correct to the best of my knowledge  
Checked by me and found correct

*(Signature)*  
A.E.E.

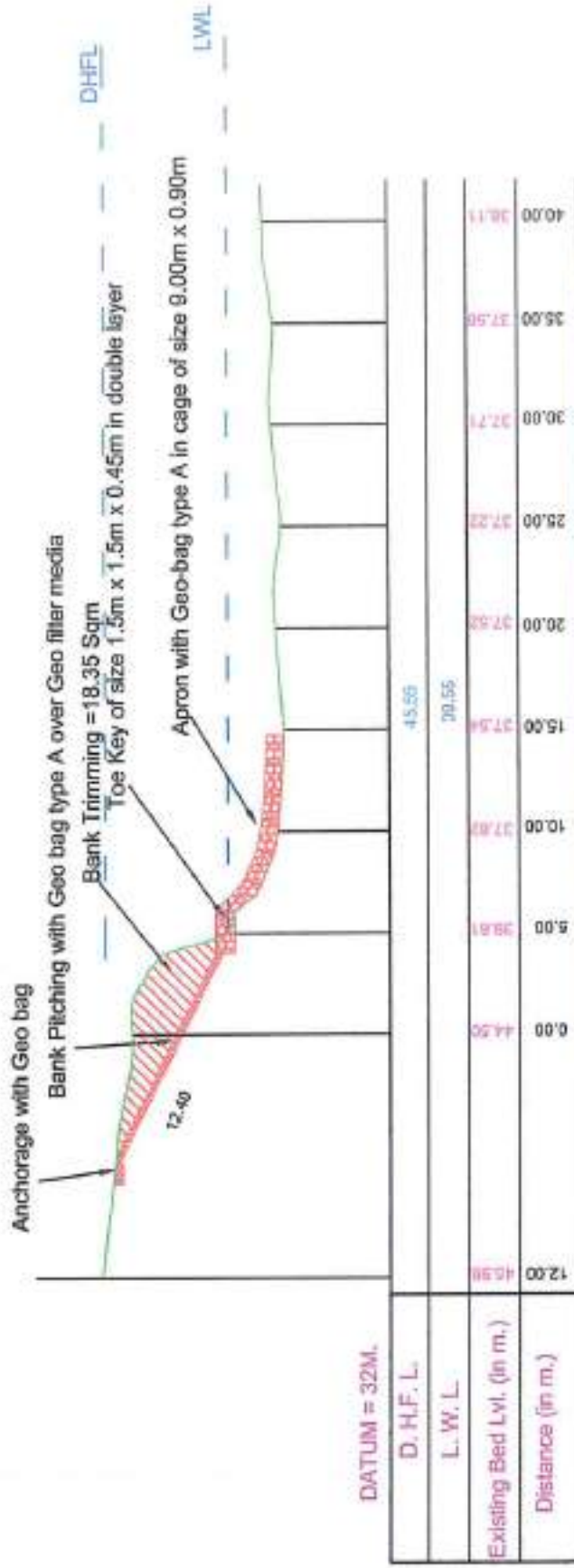
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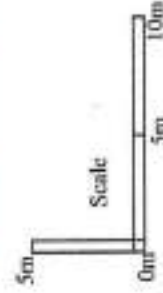
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TYPICAL SECTION OF APRON & BANK PITCHING

*(Signature)*  
Executive Engineer  
Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Ketelbari



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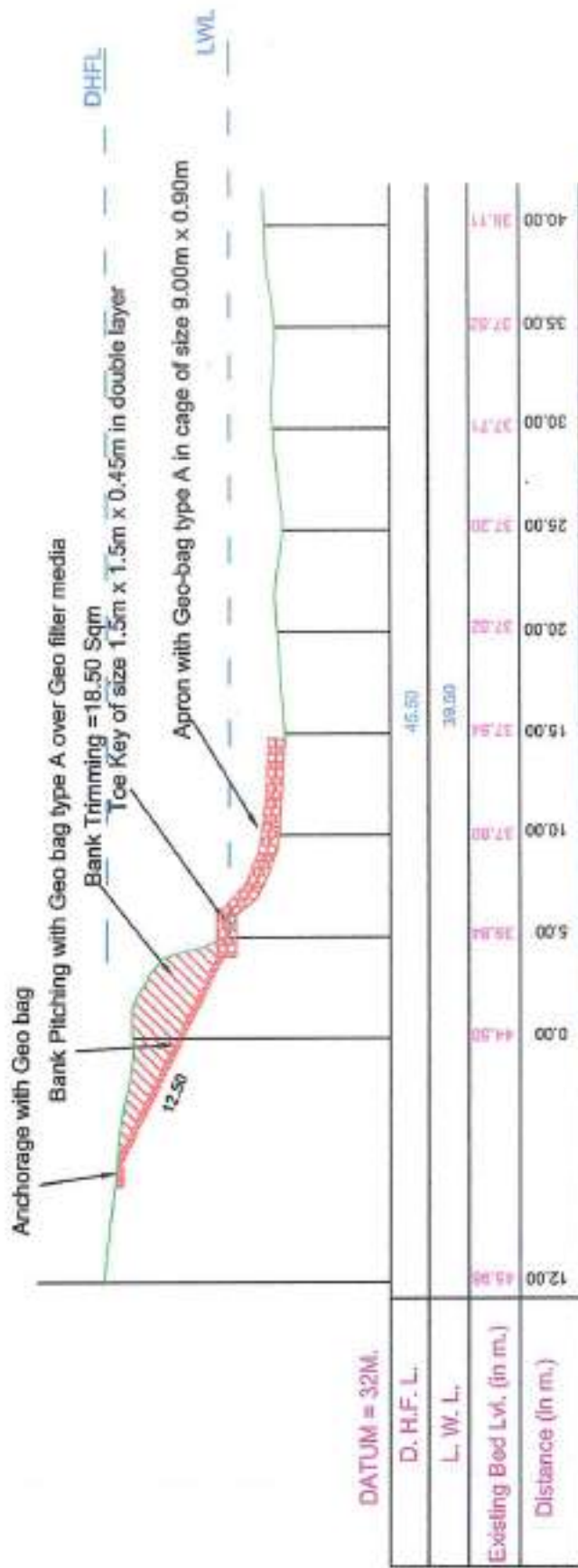
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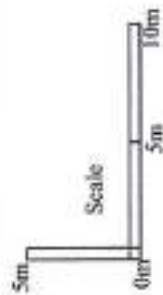
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Executive Engineer Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Hajipur-Deolapara



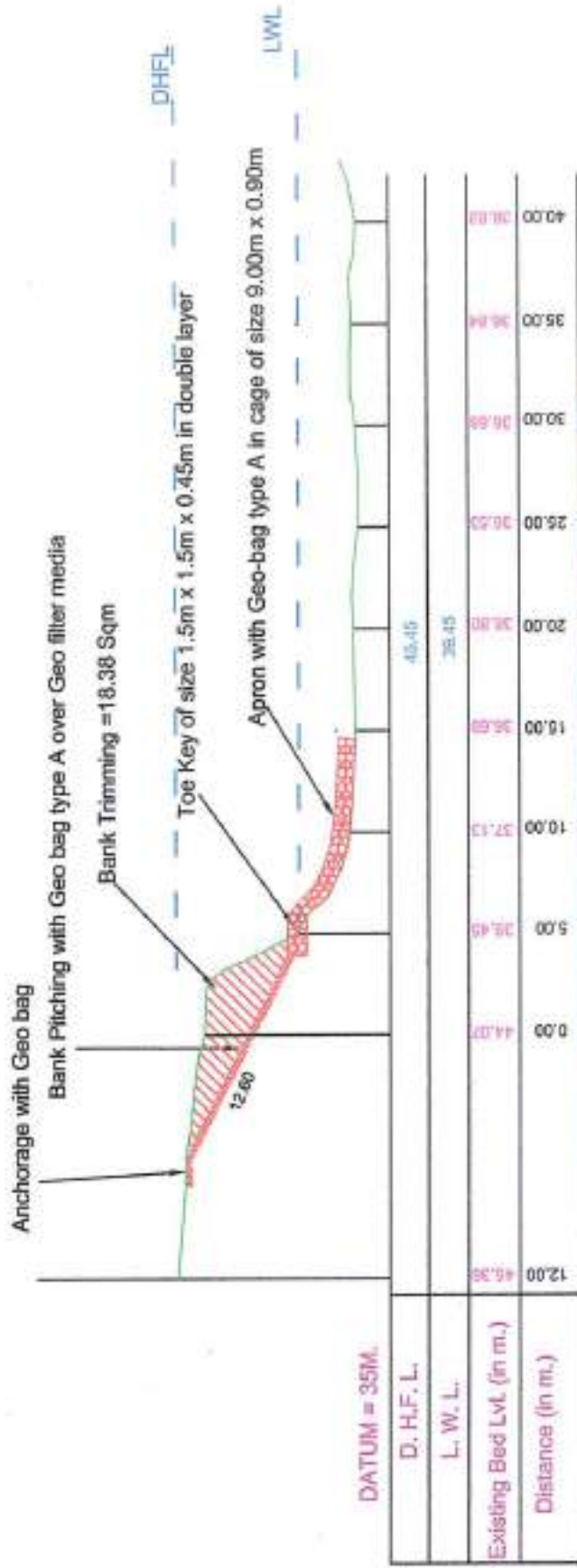
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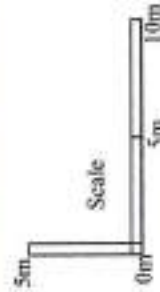
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Executive Engineer  
 Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Kurobaha



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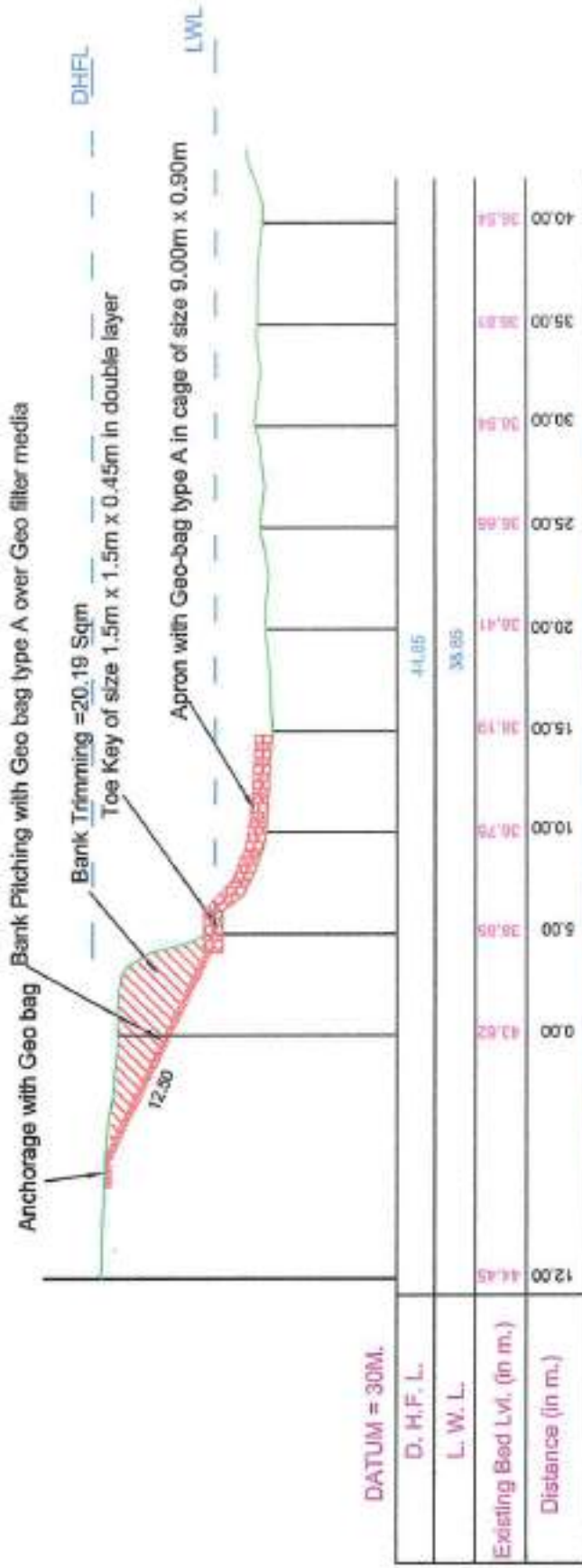
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A.E.E.  
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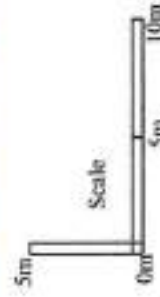
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Executive Engineer  
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Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Salsalia



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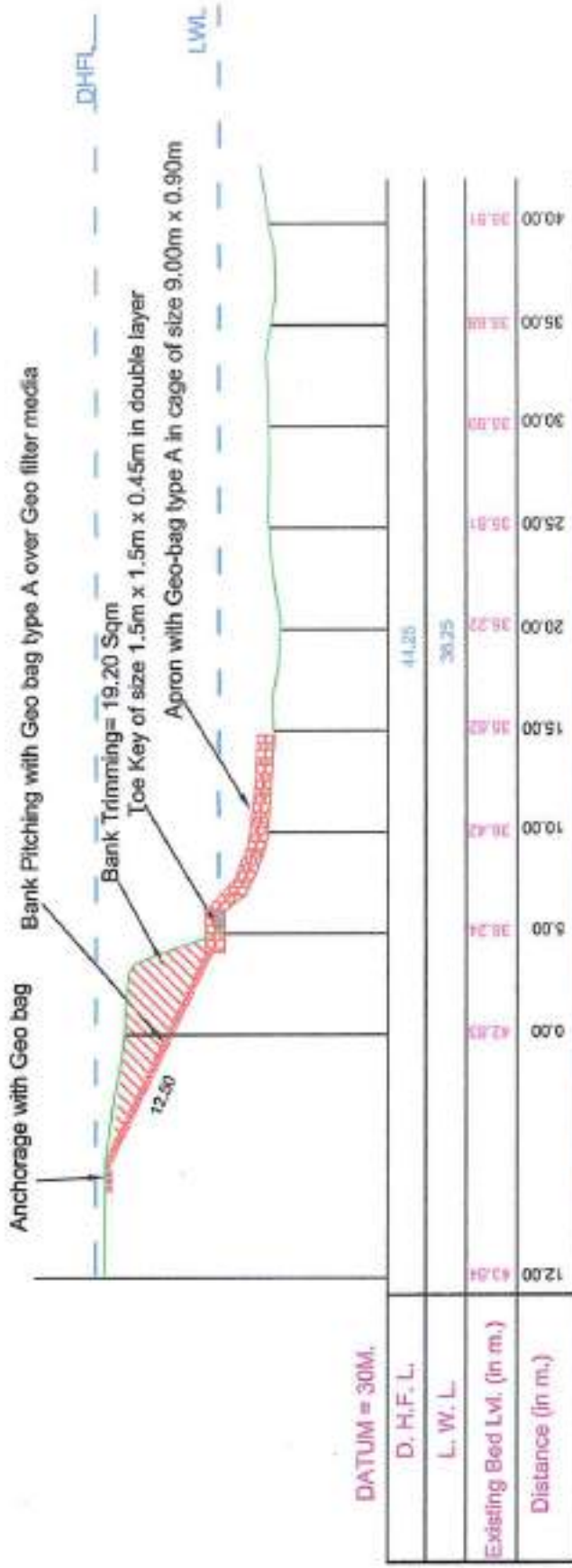
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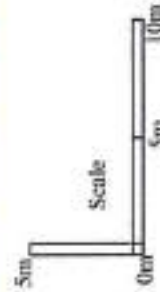
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Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Bordenga



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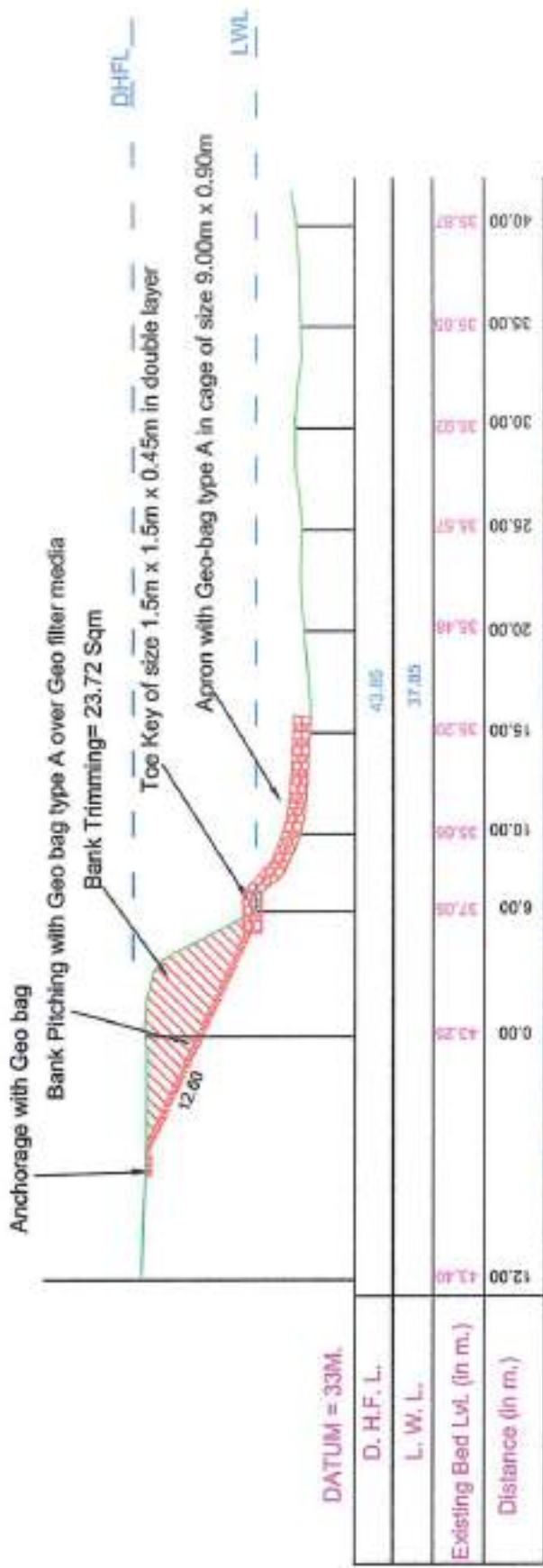
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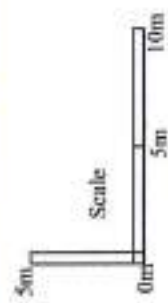
*(Signature)*  
Executive Engineer  
Barpeta W.R. Division, Barpeta



Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Gulleiza



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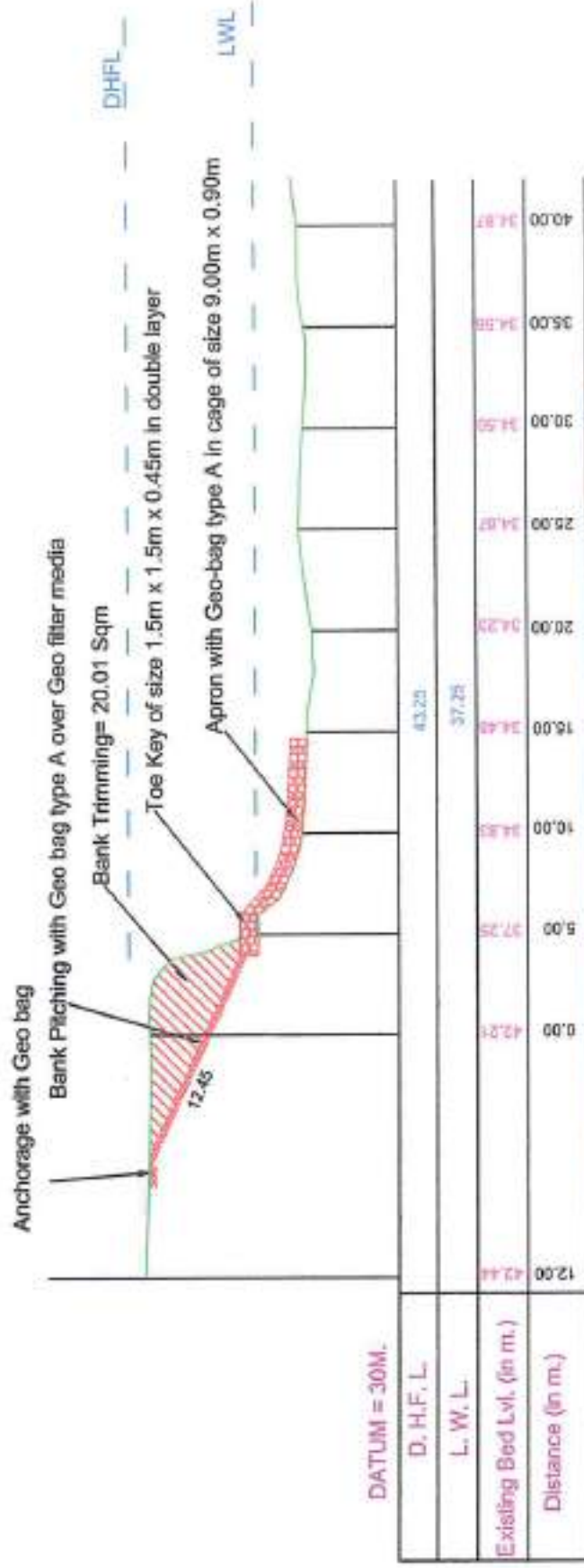
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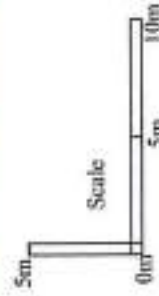
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Executive Engineer  
 Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Mowamarh



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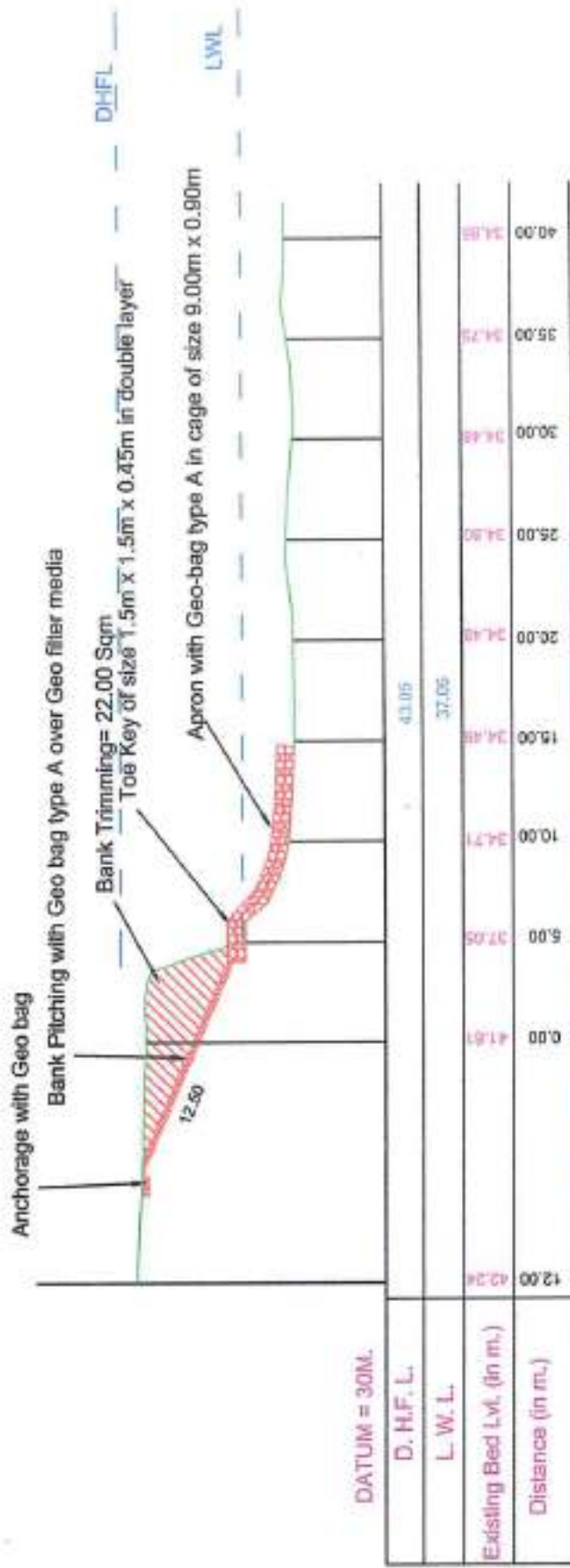
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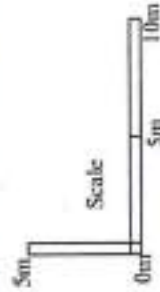
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Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Bekh river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Kaurjahi



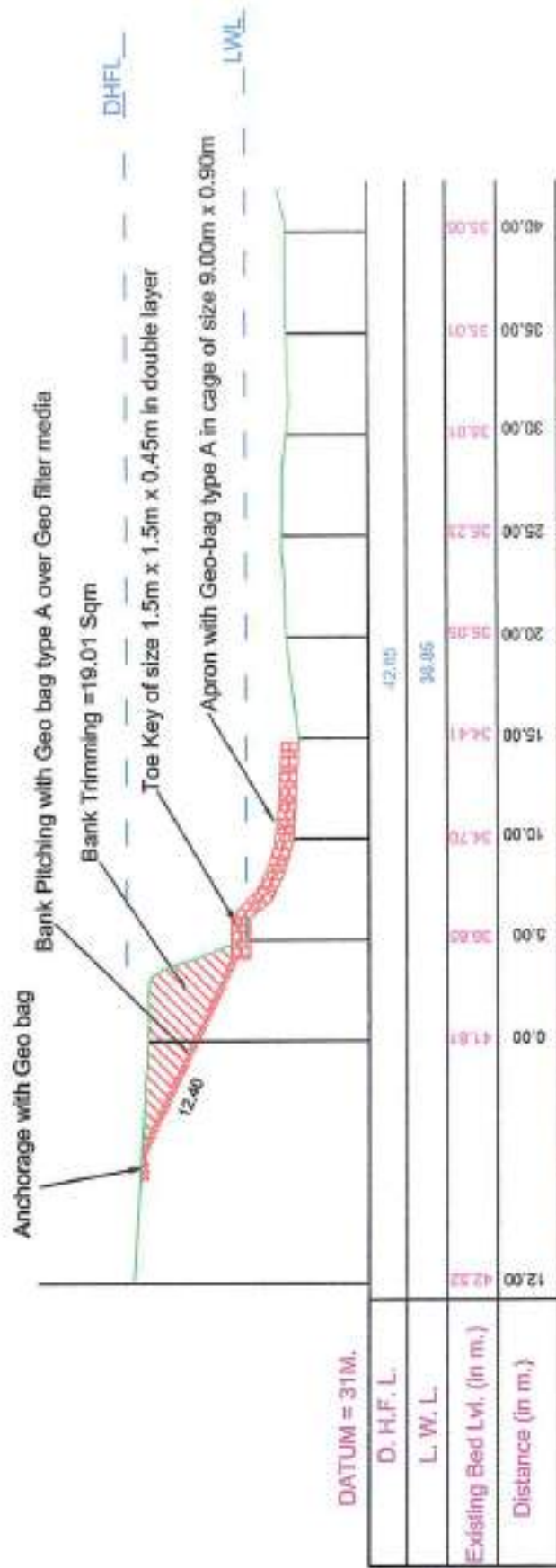
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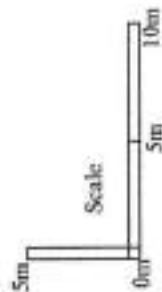
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TYPICAL SECTION OF APRON & BANK PITCHING
<i>[Signature]</i> Executive Engineer Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Kharball Sullipathar



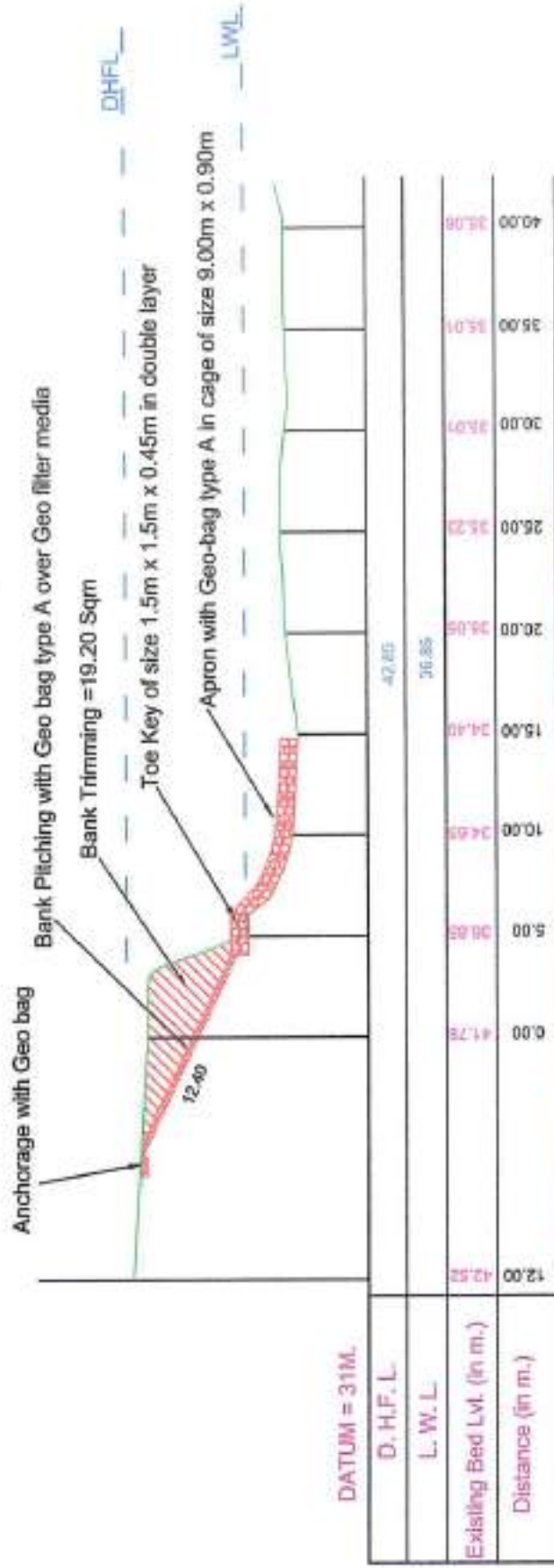
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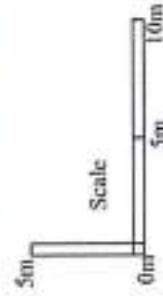
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 Barpeta W.R. Division, Barpeta

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Typical Cross section of proposed measures for erosion protection at Daukmarit



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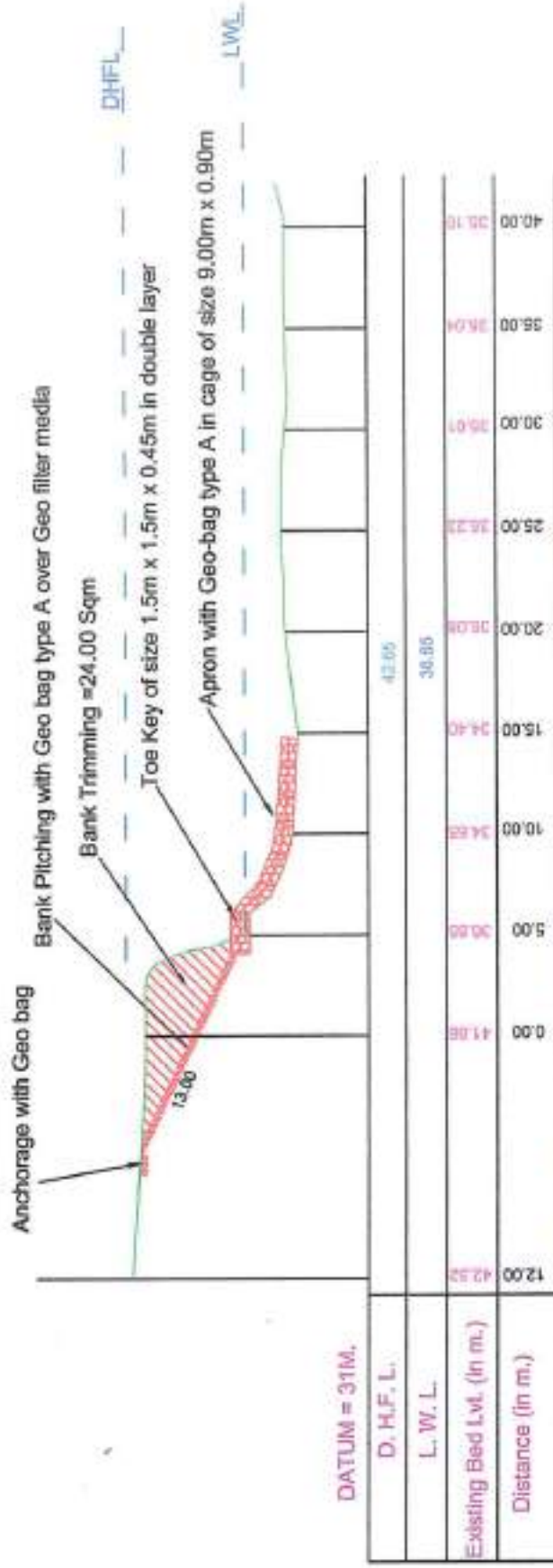
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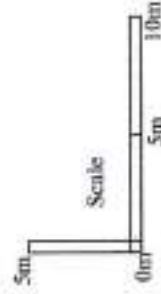
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Barpeta W.R. Division, Barpeta

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Typical Cross section of proposed measures for erosion protection at Sawpur



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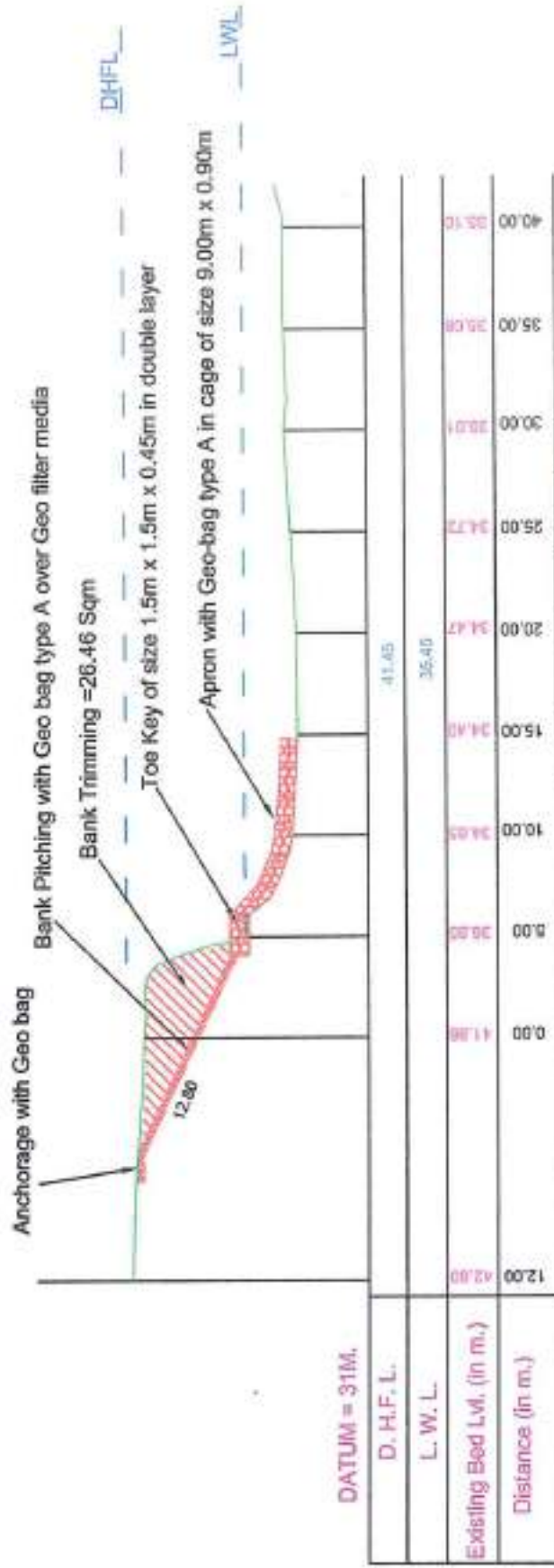
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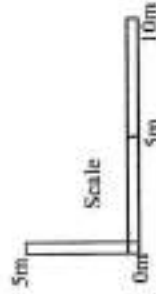
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Typical Cross section of proposed measures for erosion protection at Ailpur/ Rasulpur



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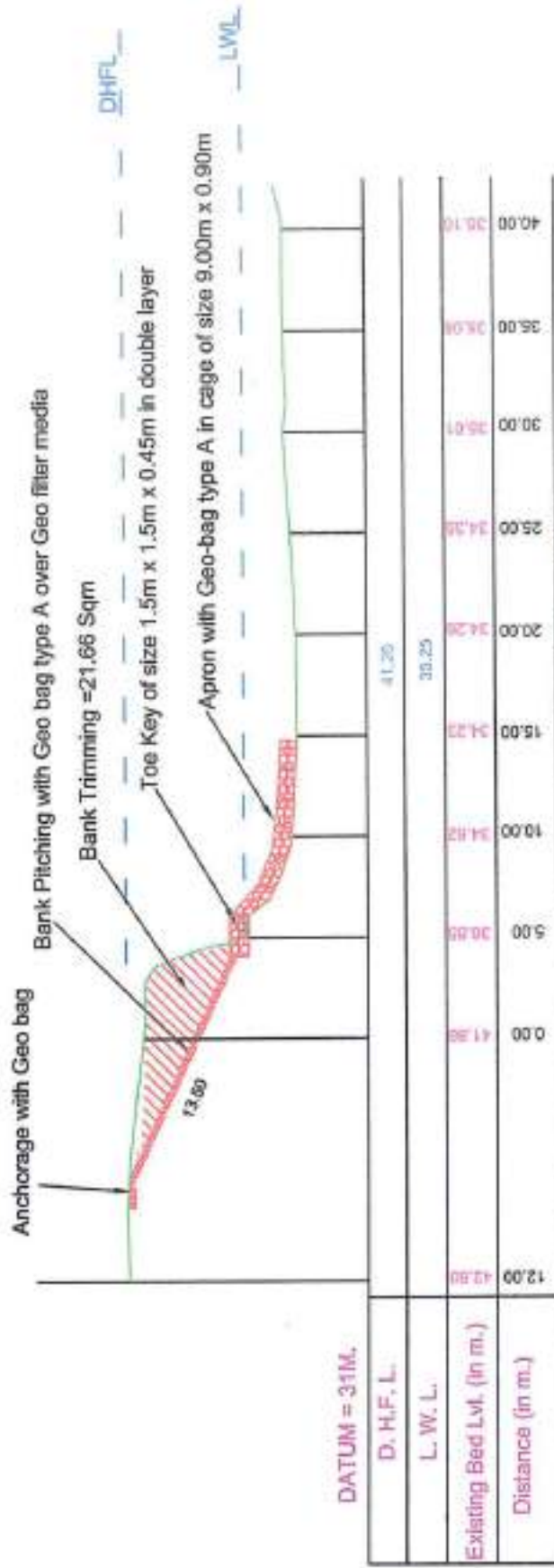
A.E.E.

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Executive Engineer  
Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Bheragaon



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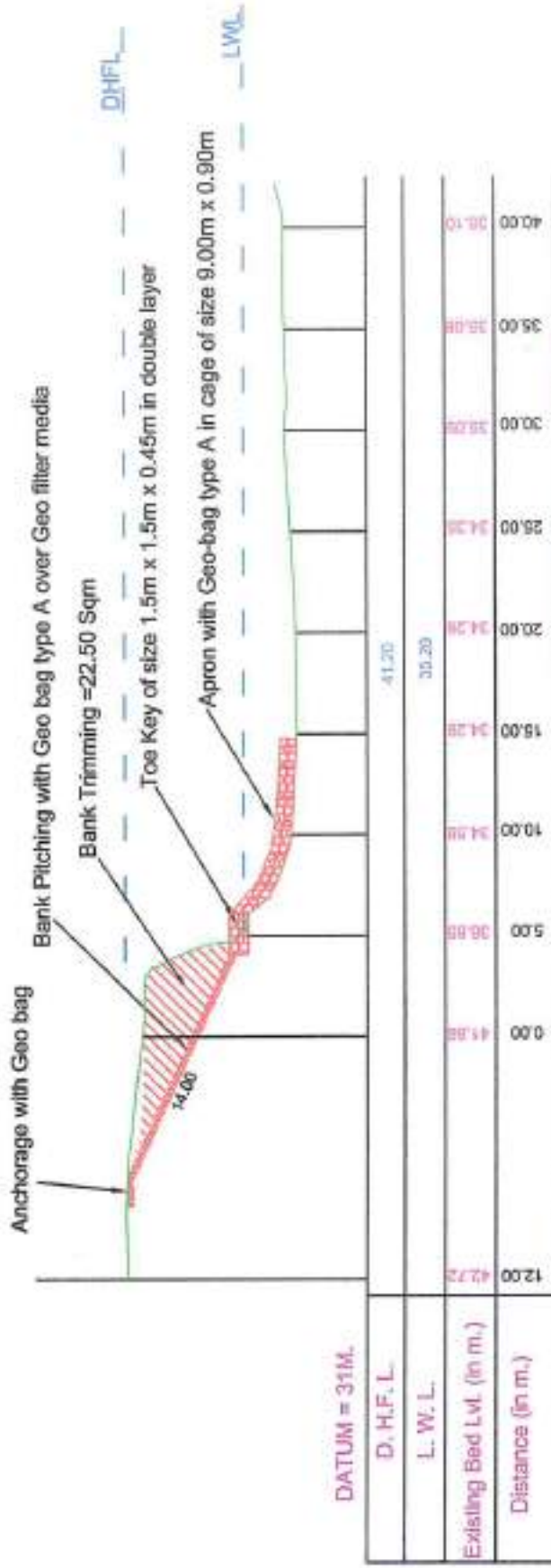
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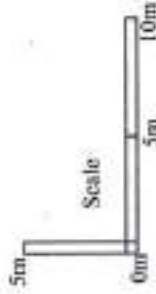
Executive Engineer  
 Barpeta W.R. Division, Barpeta



Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Satraknara -19No. Sheet



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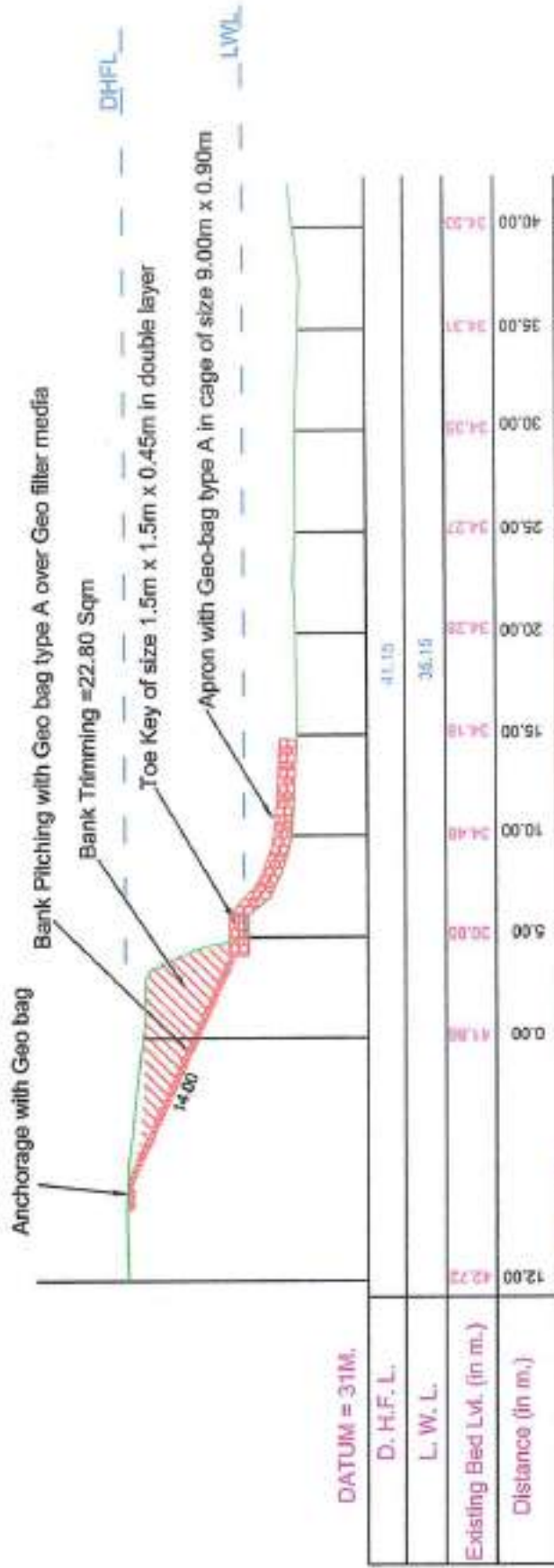
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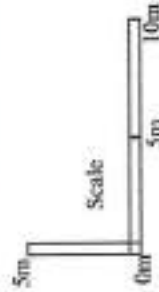
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Typical Cross section of proposed measures for erosion protection at Marabhaj



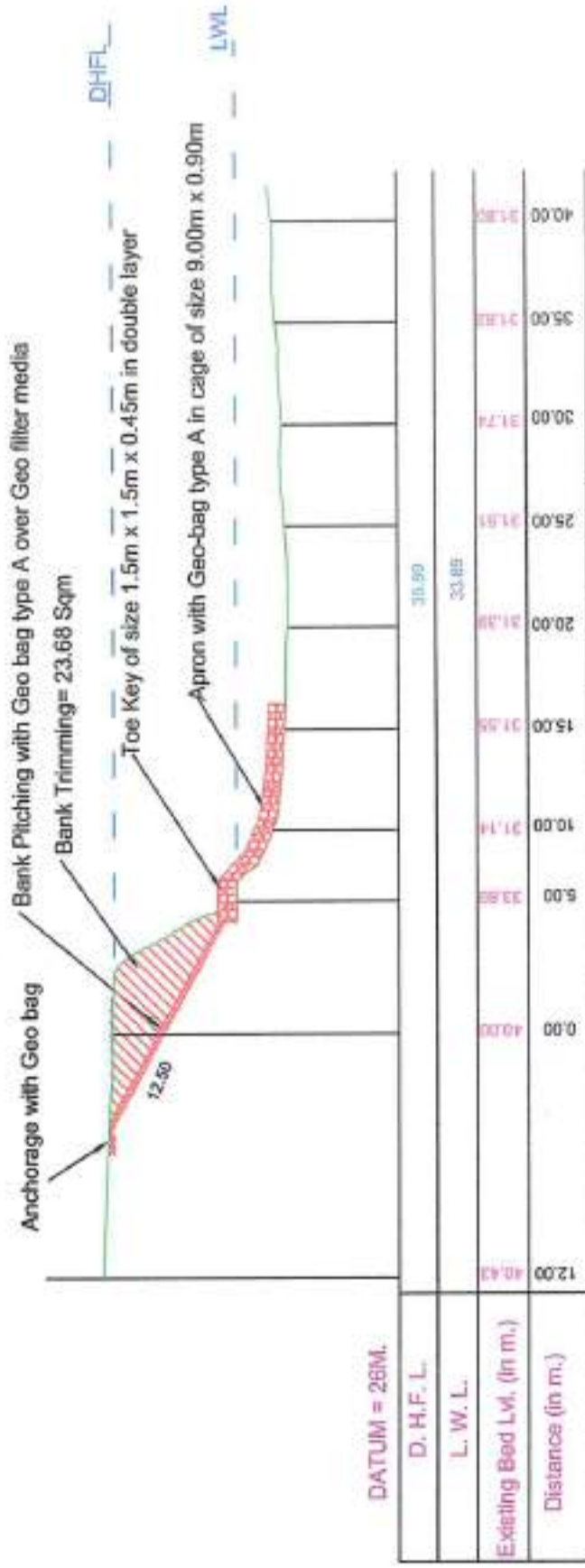
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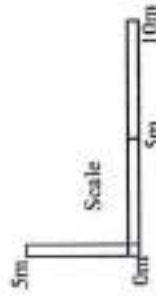
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Typical Cross section of proposed measures for erosion protection at Jaurimari



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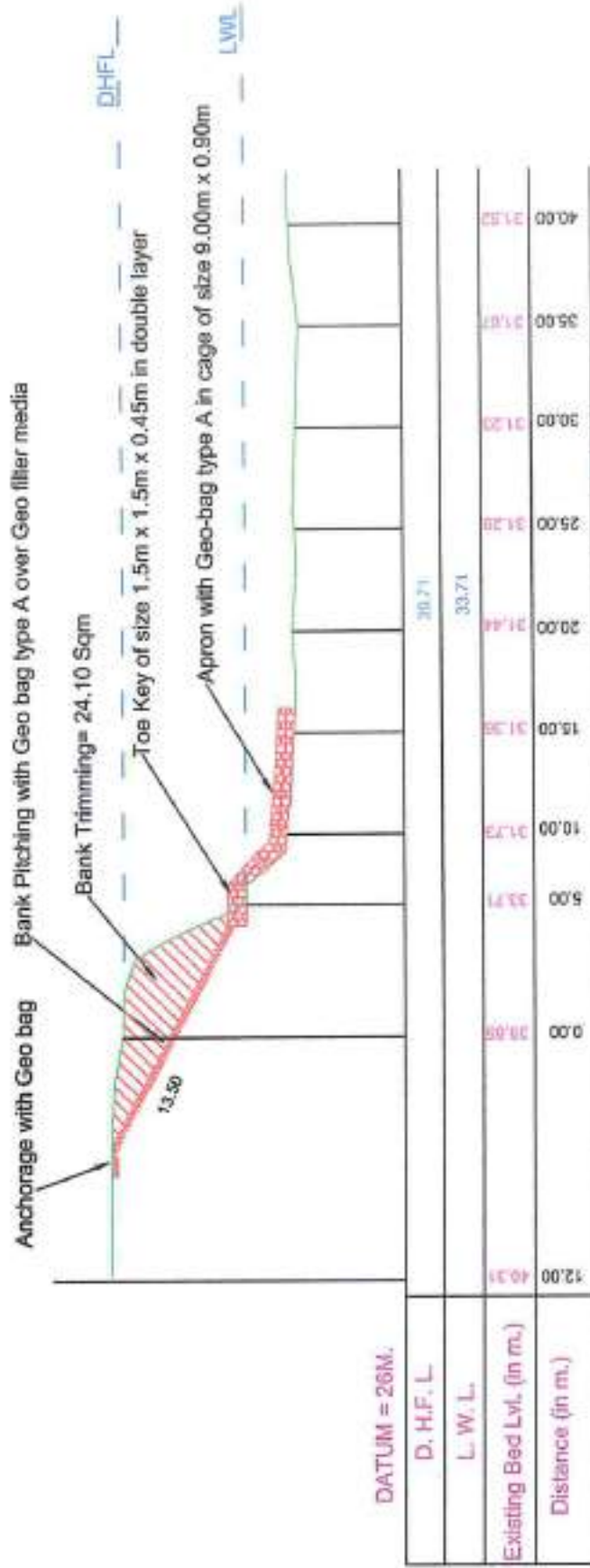
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*(Signature)*  
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Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Takakata



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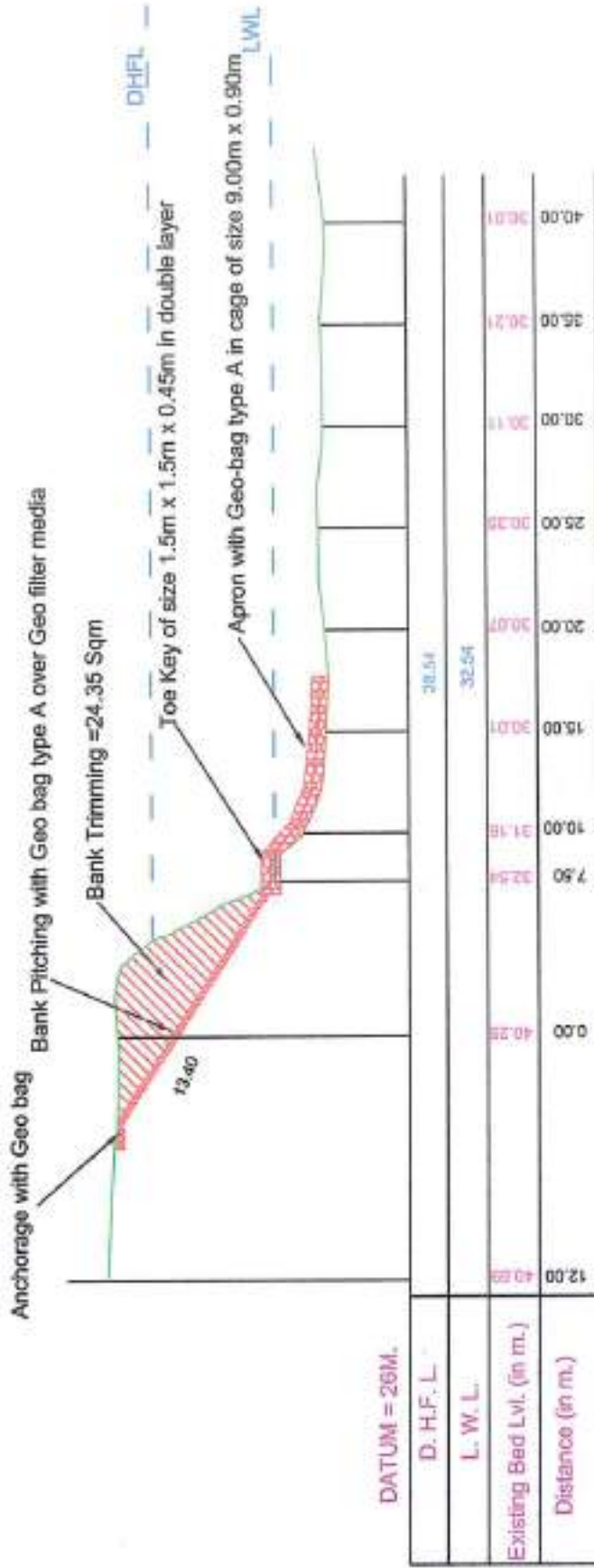
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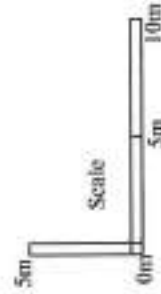
Executive Engineer  
 Barpeta W.R. Division, Barpeta



Name of Scheme: Integrated flood and erosion management of Manas and Belai river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Hachaira



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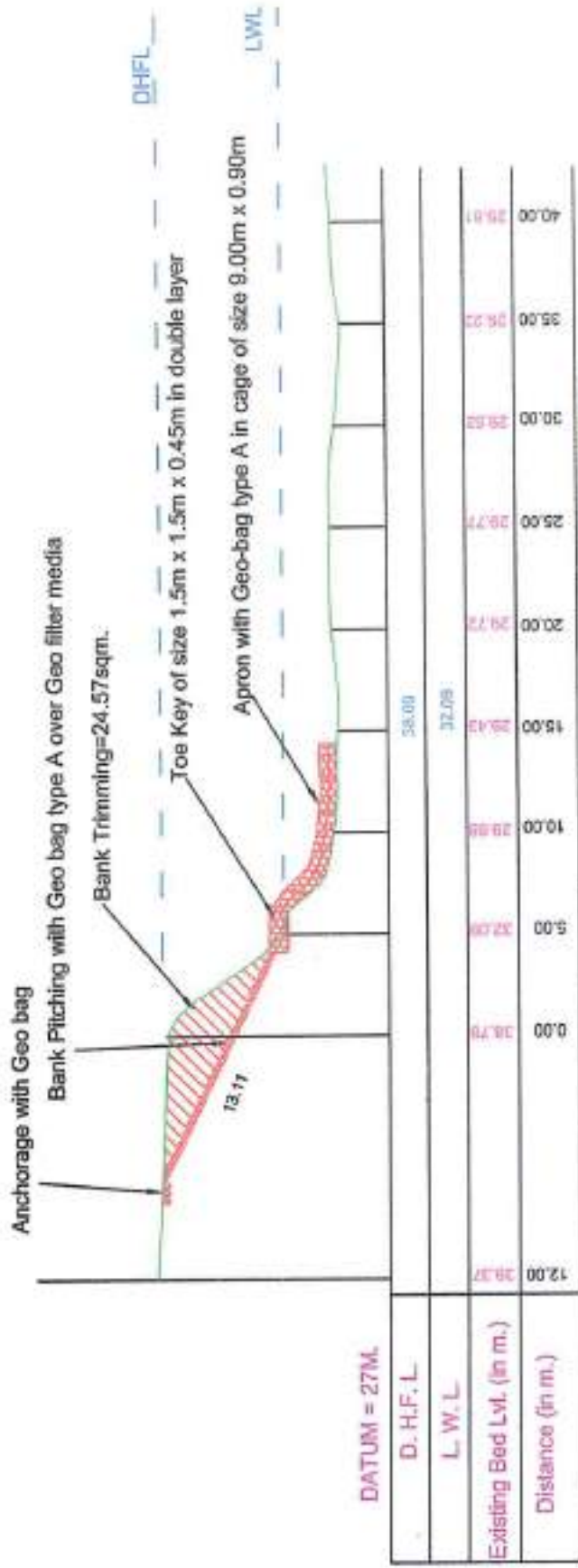
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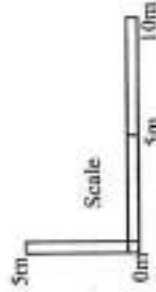
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Name of Scheme: Integrated flood and erosion management of Manas and Beti river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Kismat Moibant



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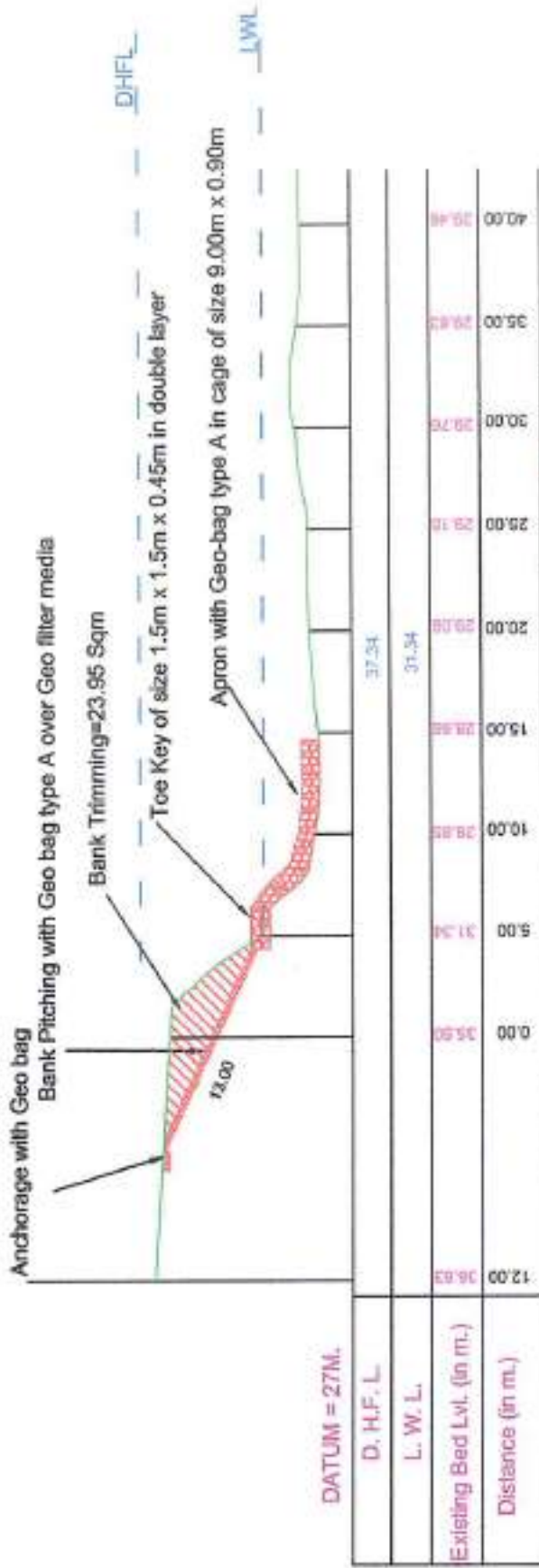
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Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



Typical Cross section of proposed measures for erosion protection at Tarakandi



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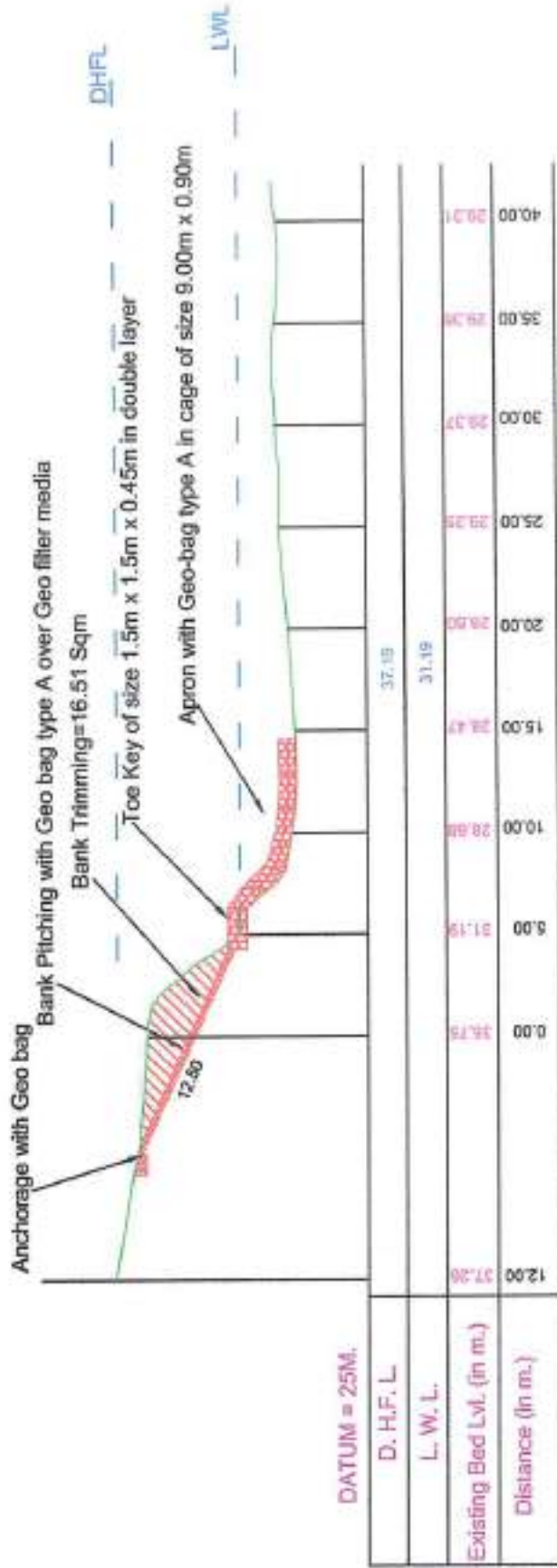
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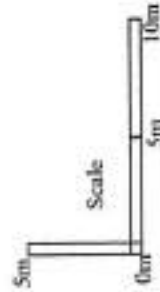
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Typical Cross section of proposed measures for erosion protection at Pura Chikatarl



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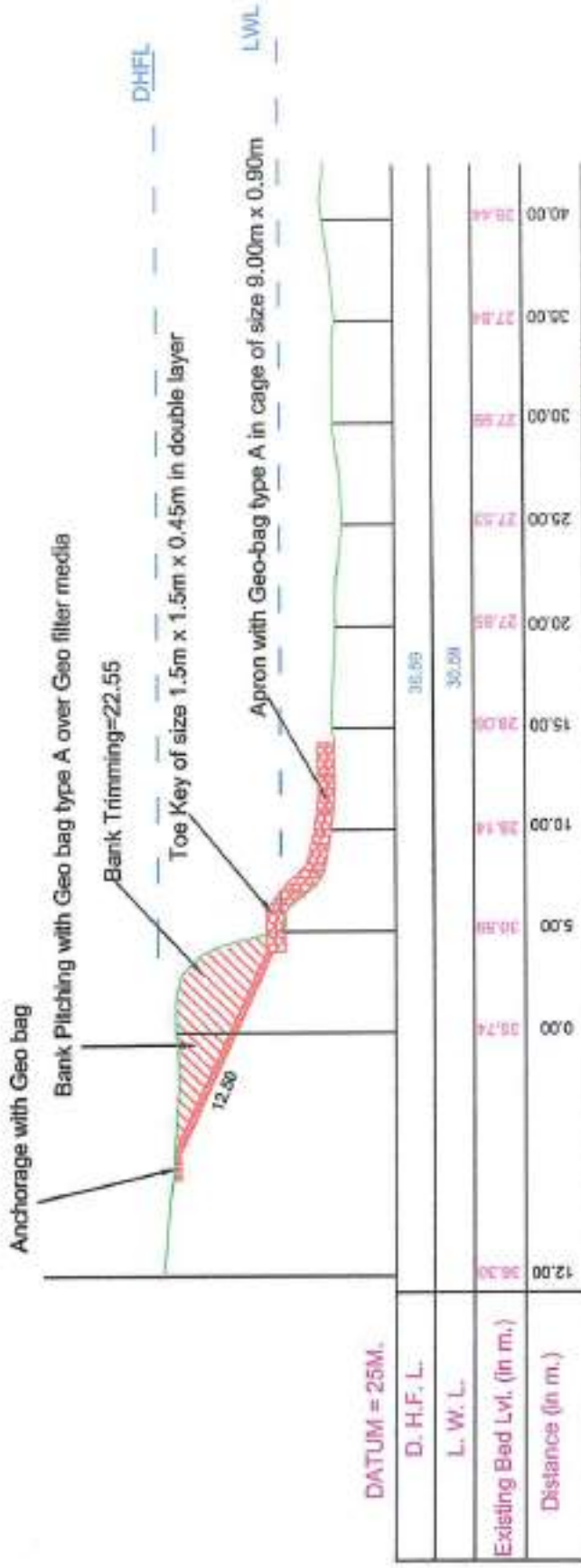
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A.E./J.E.

*[Signature]*  
A.E.E.  
Sorbhog W.R. Sub-Division

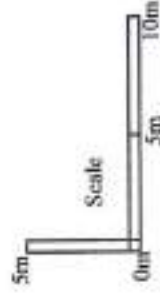
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*[Signature]*  
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Barpeta W.R. Division, Barpeta

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Typical Cross section of proposed measures for erosion protection at Chotala



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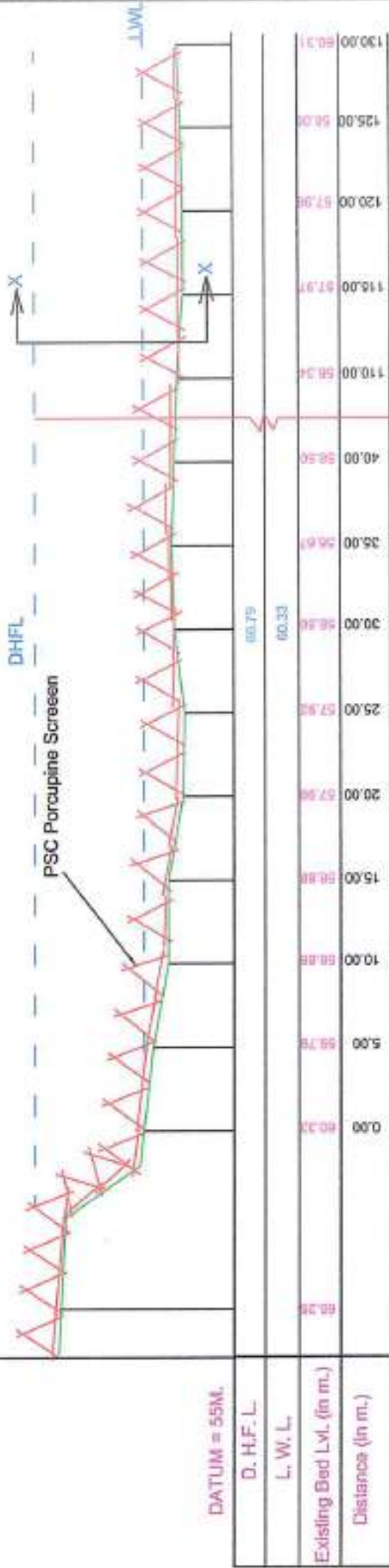
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Barpeta W.R. Division, Barpeta



Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



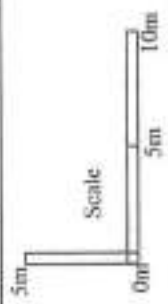
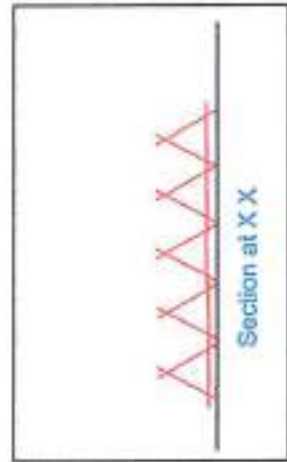
Typical PSC Porcupine works at Chumbani

Certified that the survey was done by me and correct to the best of my knowledge

*[Signature]*  
A.E./I.E.

Checked by me and found correct

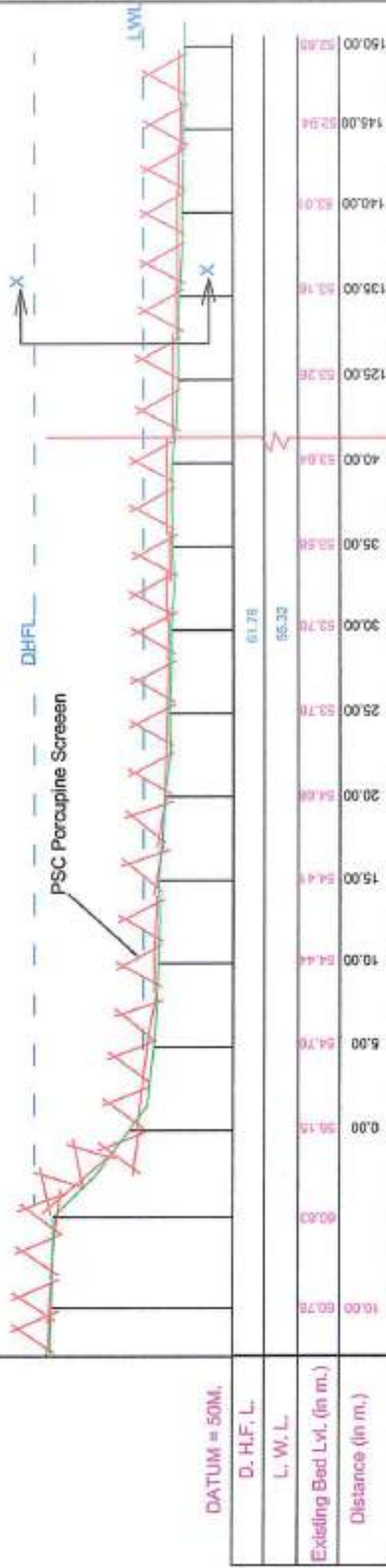
*[Signature]*  
A.E./E.  
Sorbhog W.R. Sub-Division



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*[Signature]*  
Executive Engineer  
Barpeta W.R. Division, Barpeta

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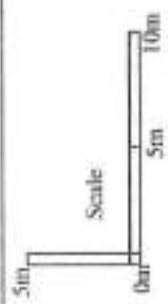
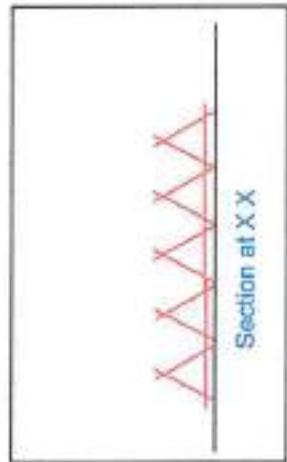
Typical PSC Porcupine works at Khagrabari

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A.E./J.E.

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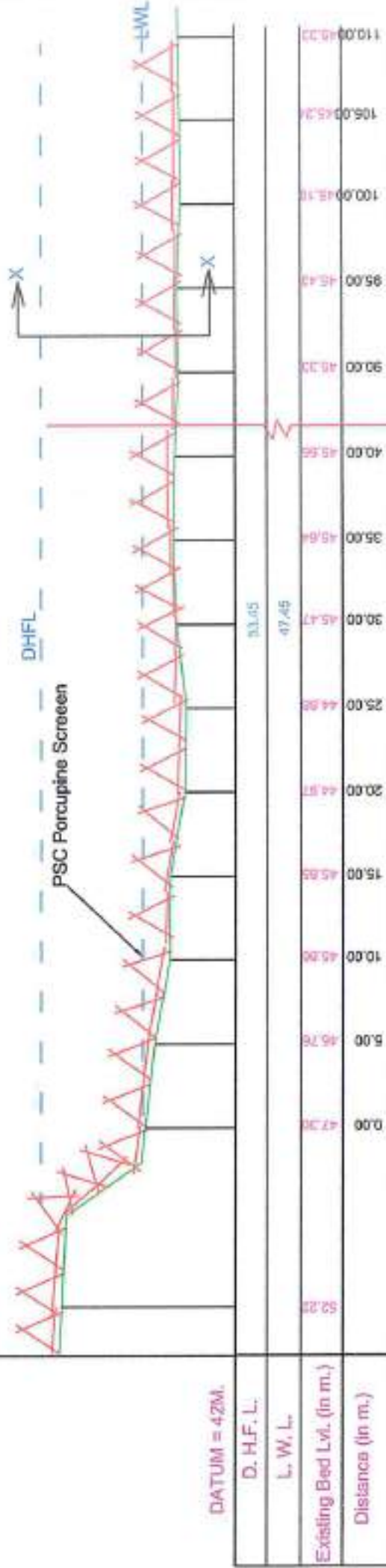
  
A.E.E.  
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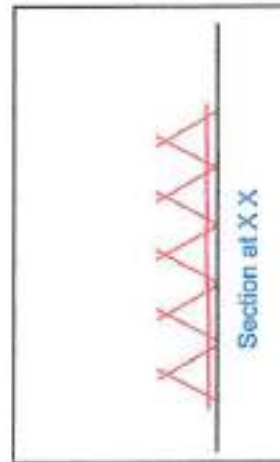
Typical PSC Porcupine works at Garmertguri

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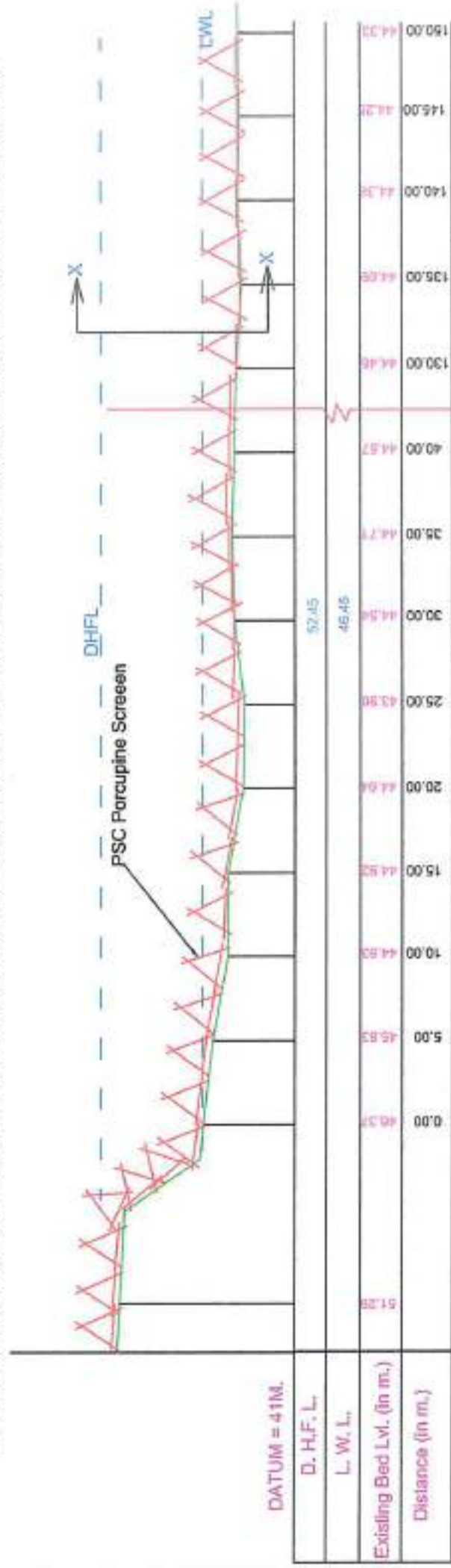
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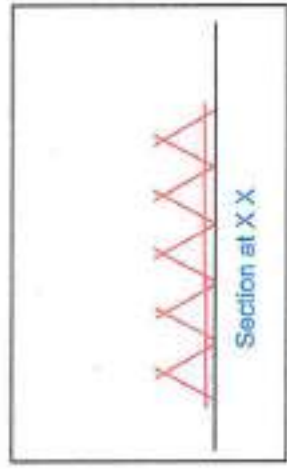
Typical PSC Porcupine works at Safakamar

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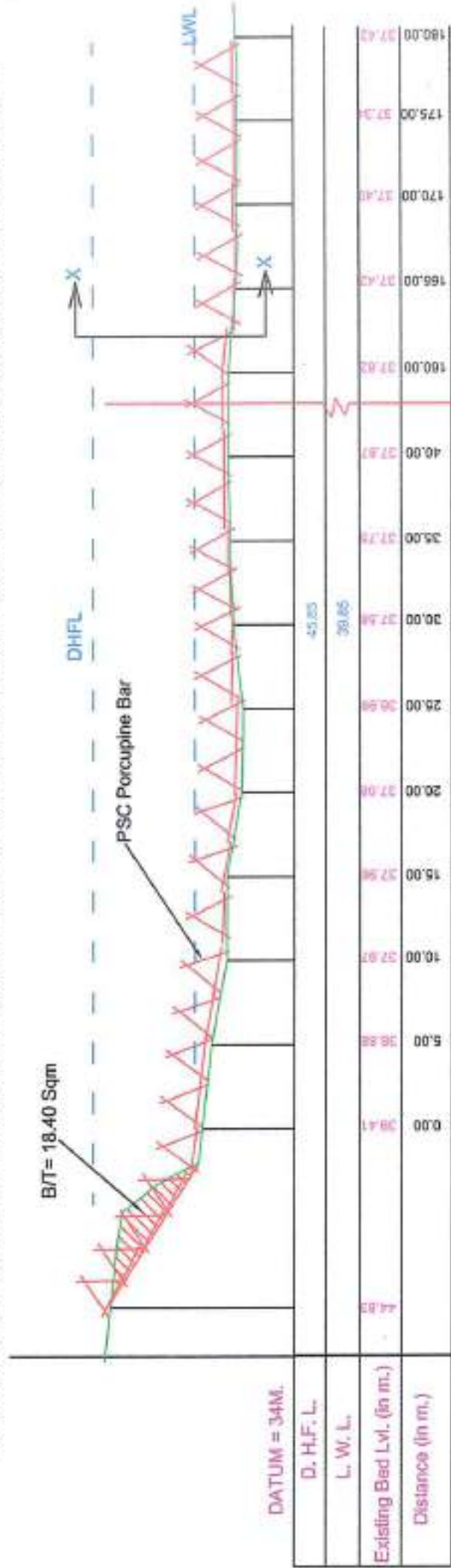


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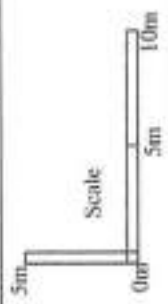
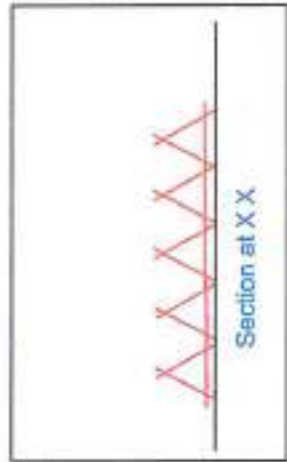
Typical PSC Porcupine works at Niz Damakha

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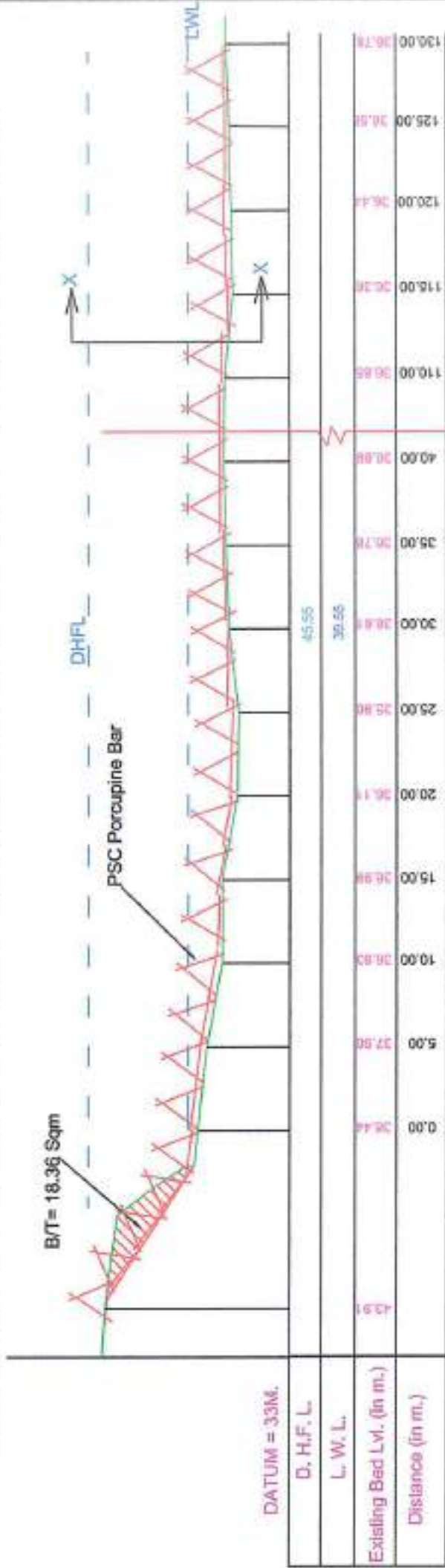
*[Signature]*  
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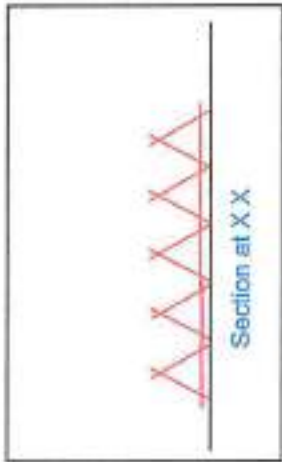
Typical PSC Porcupine works at Asairpar

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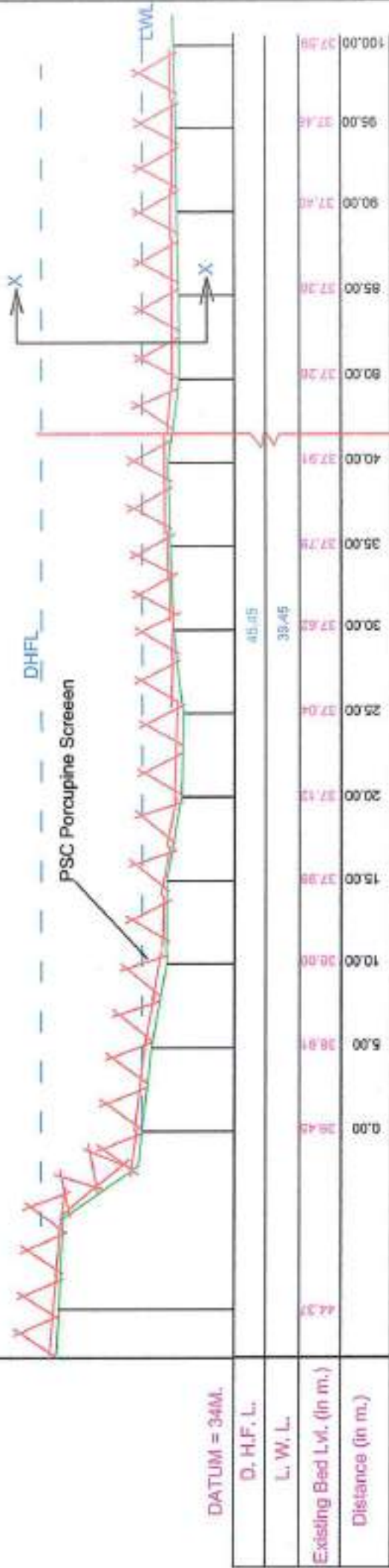
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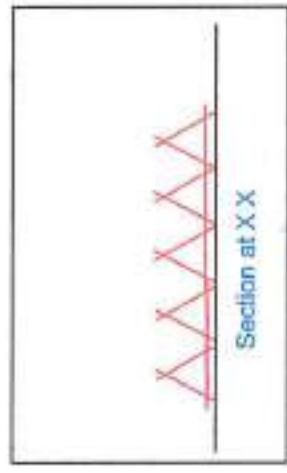
Typical PSC Porcupine works at Chantabari

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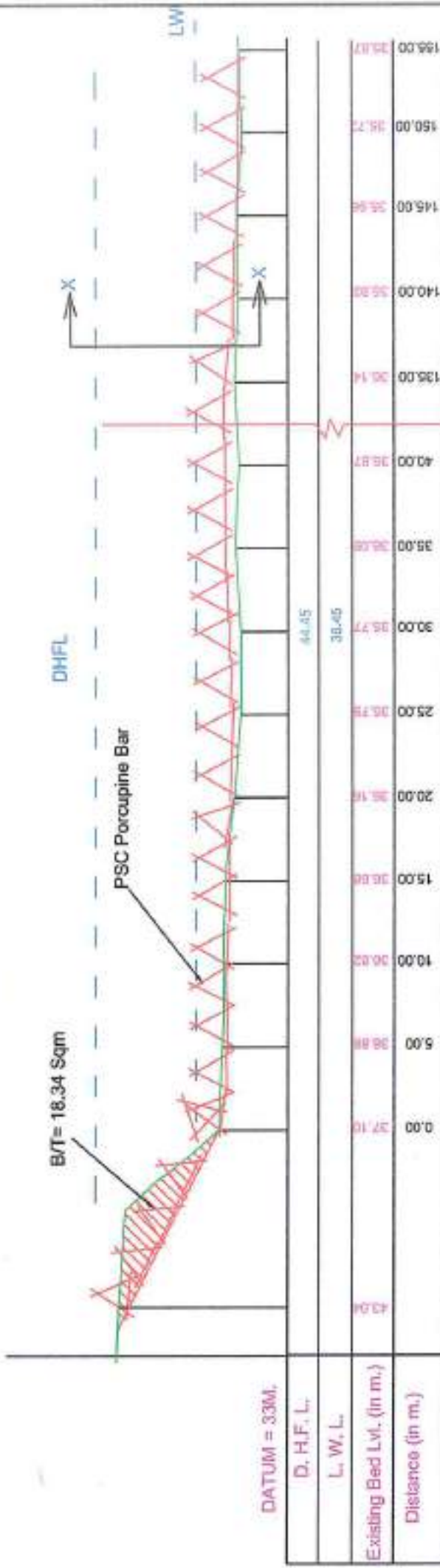
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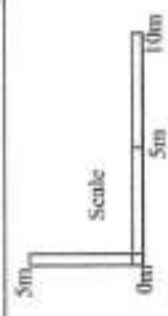
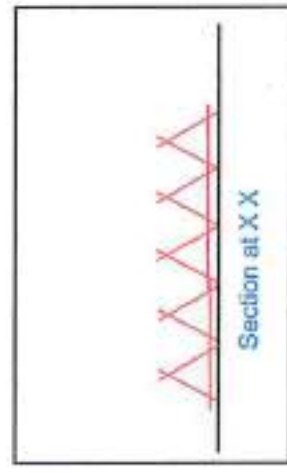
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Typical PSC Porcupine works at Kamarpara

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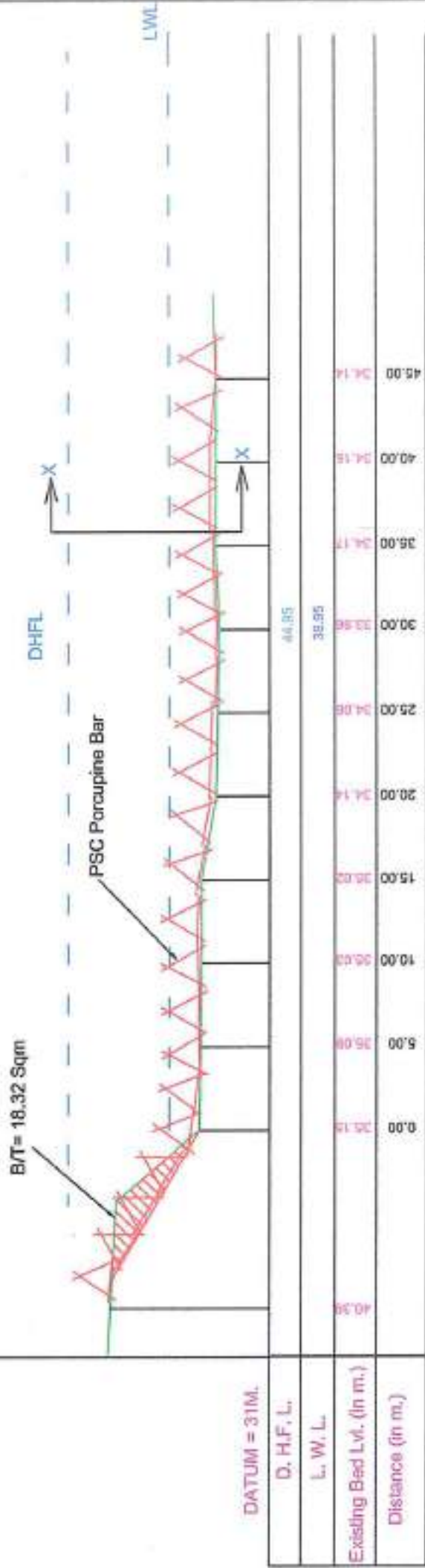
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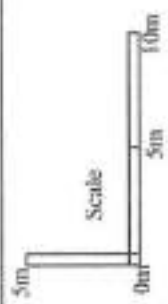
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Typical PSC Porcupine works at Beniapara

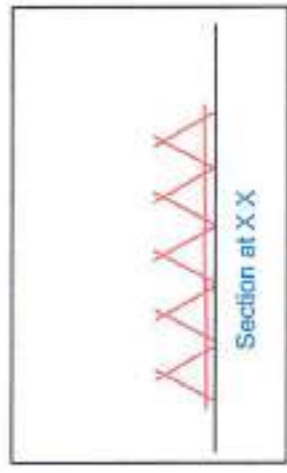


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A.E./J.E.

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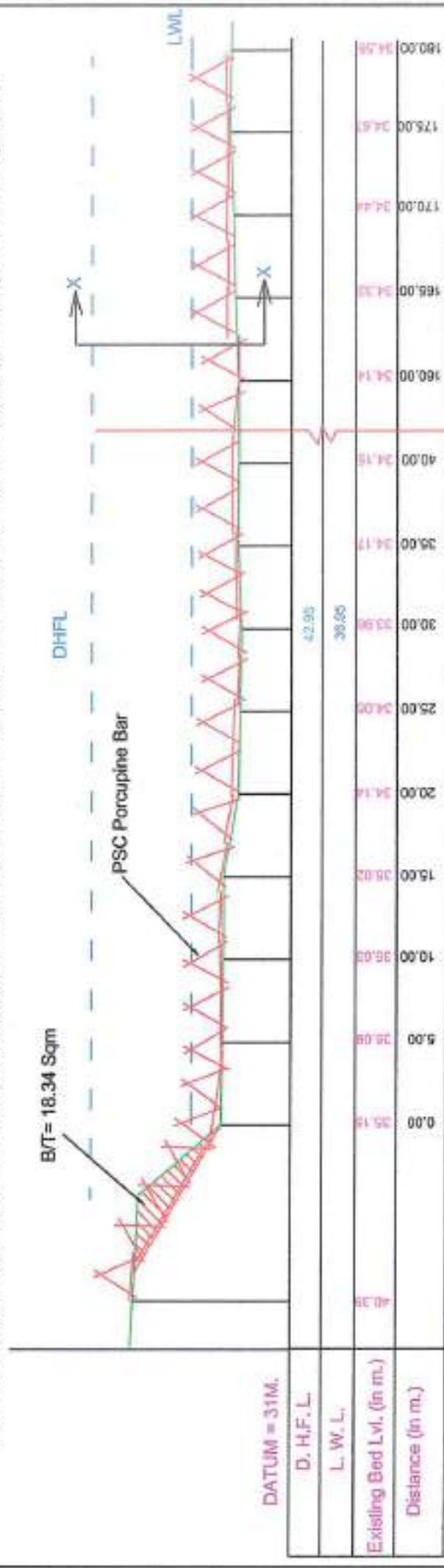
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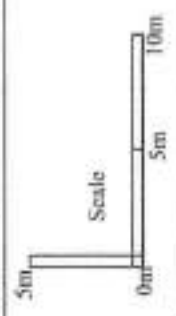
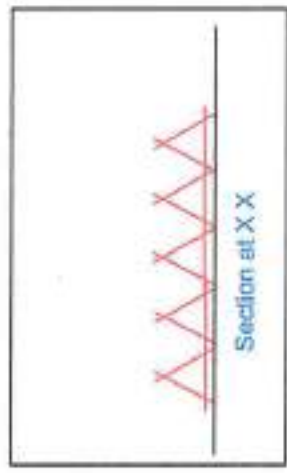
Typical PSC Porcupine works at Daukmarit

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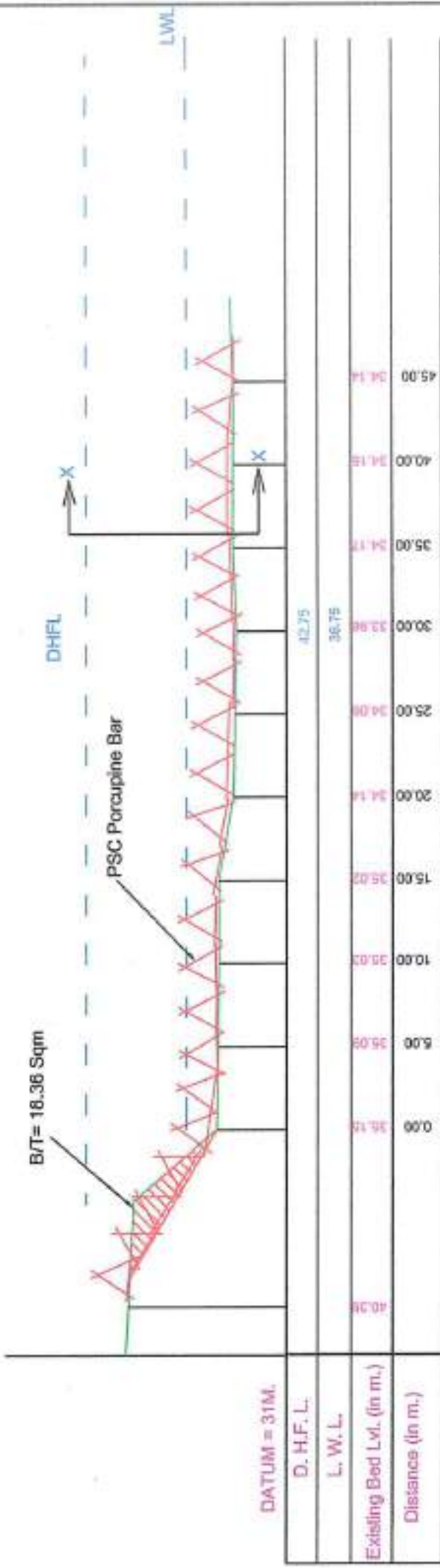
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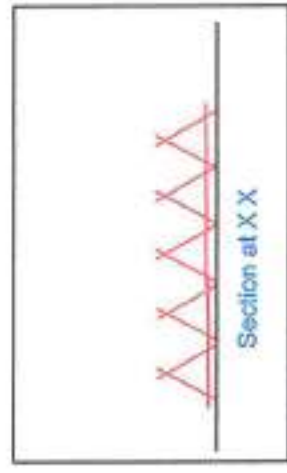
Typical PSC Porcupine works at Choudhury Bazar

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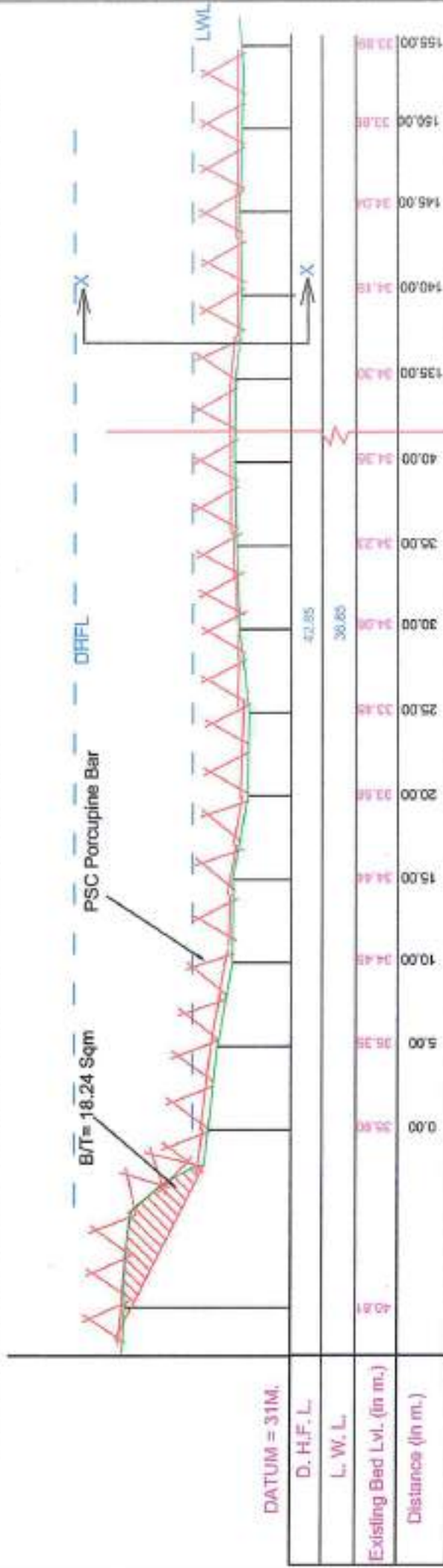
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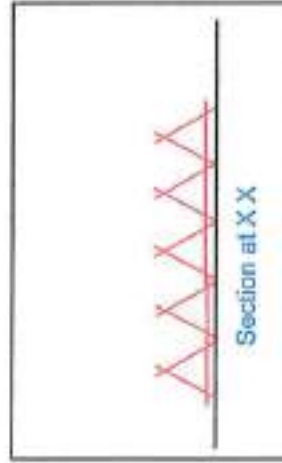
Typical PSC Porcupine works at Sawpur

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Sorbhog W.R. Sub-Division

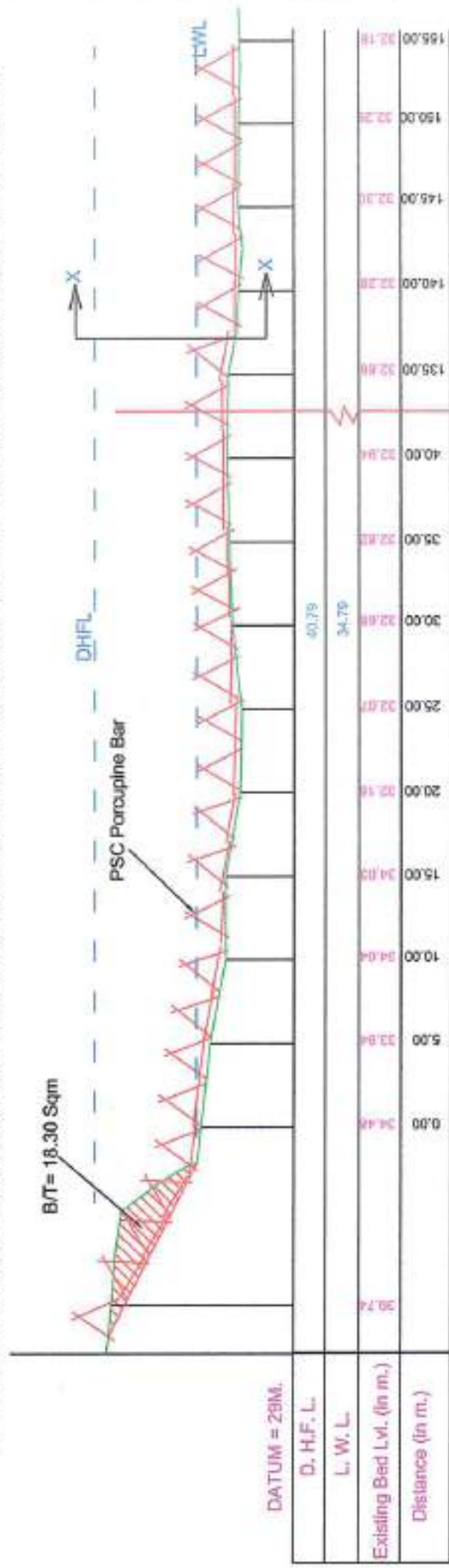


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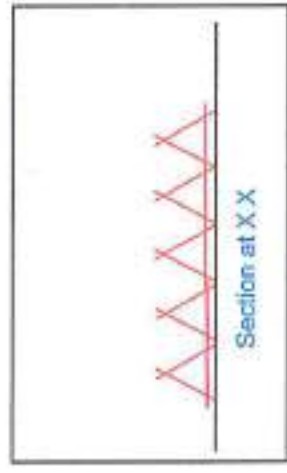
Typical PSC Porcupine works at Ballikurt

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*[Signature]*  
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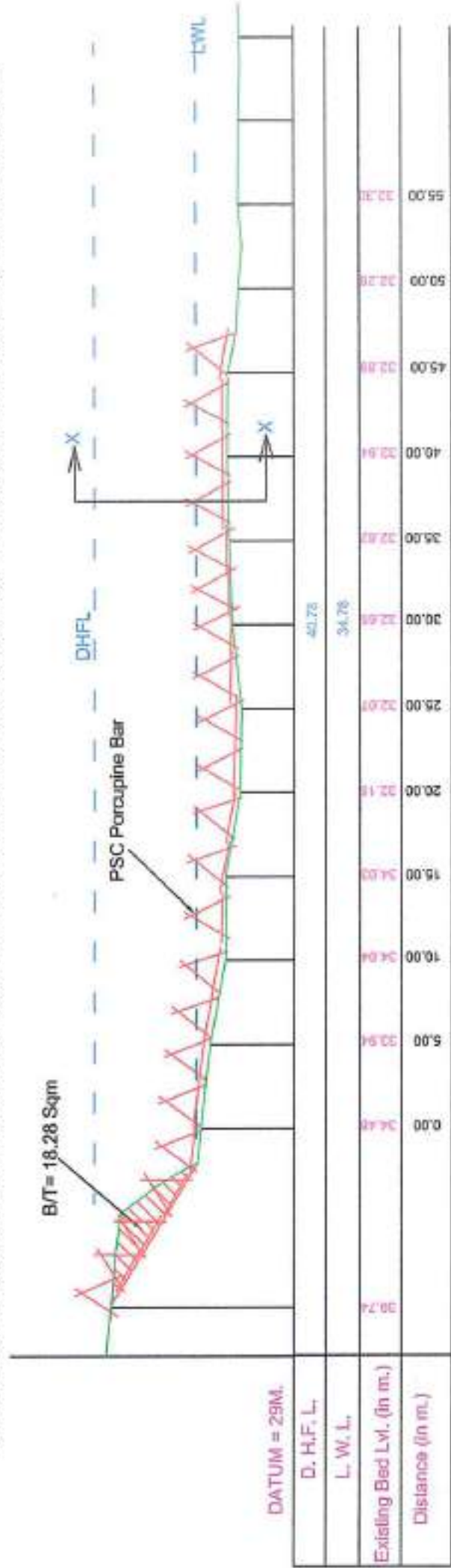
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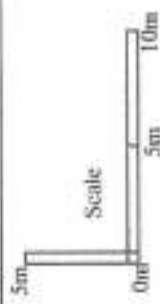
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Typical PSC Porcupine works at Sonapur

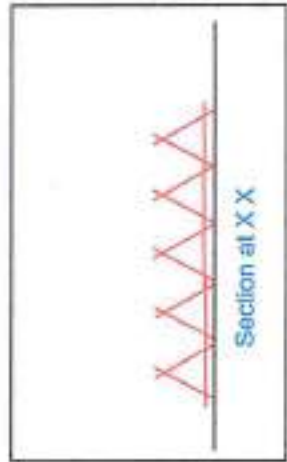


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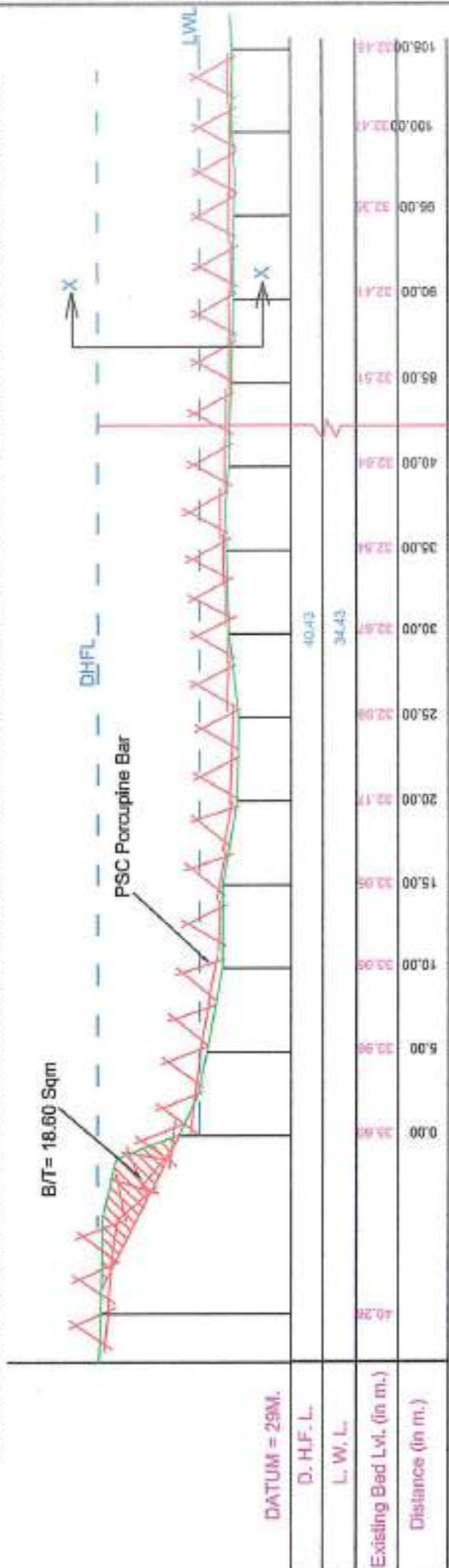
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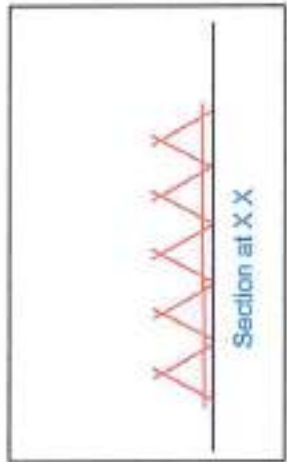
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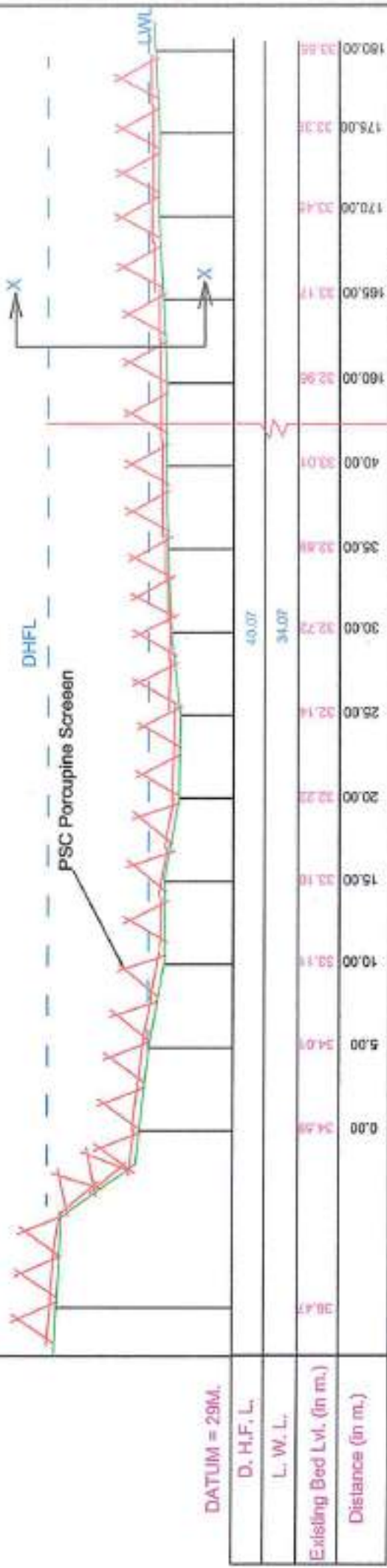
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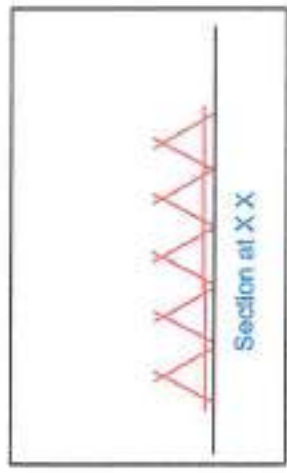
Typical PSC Porcupine works at Jaurimari

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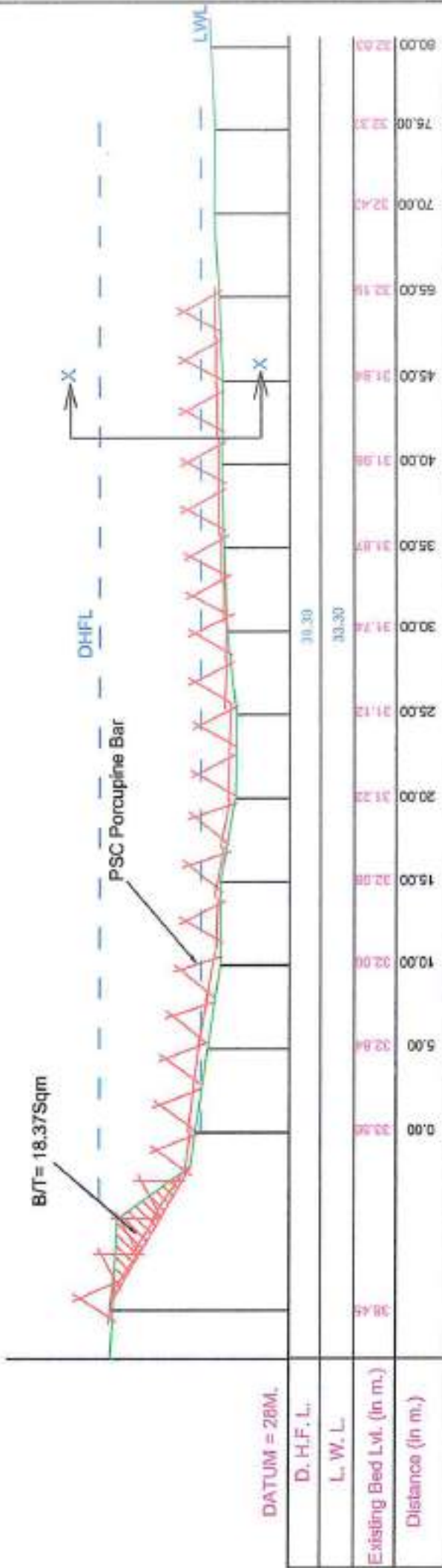
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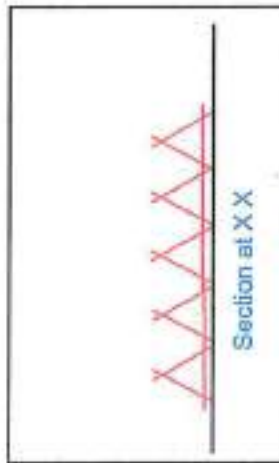
Typical PSC Porcupine works at Bheraogon

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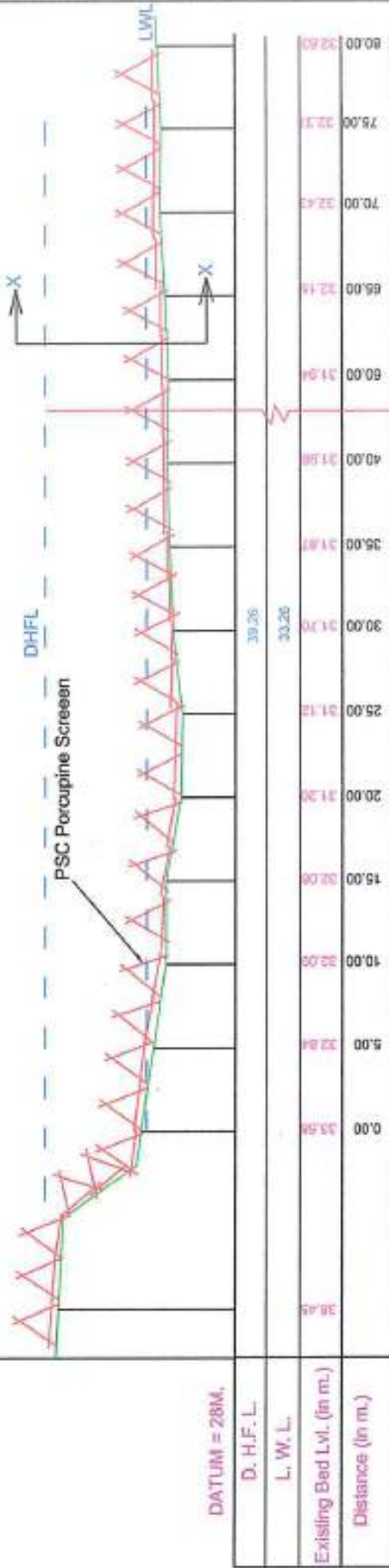
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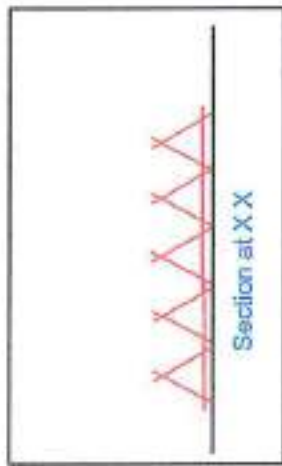
Typical PSC Porcupine works at Sattrakanara 14 No. sheet

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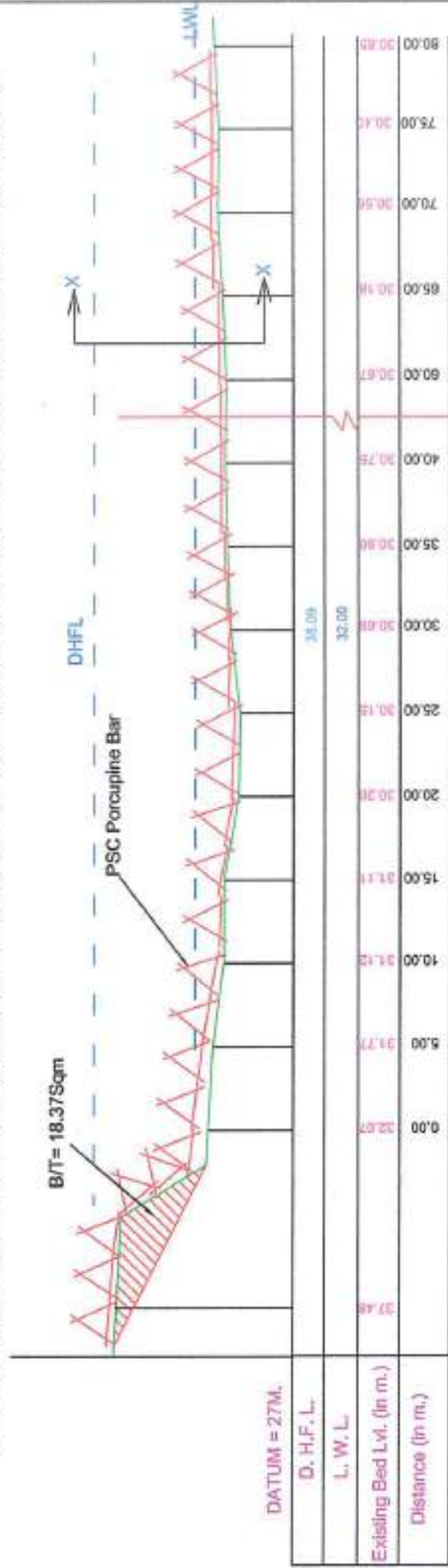
*[Signature]*  
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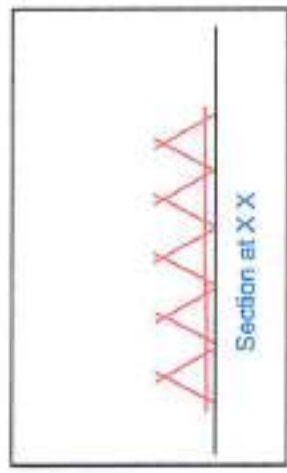
Typical PSC Porcupine works at Kismat Moibari

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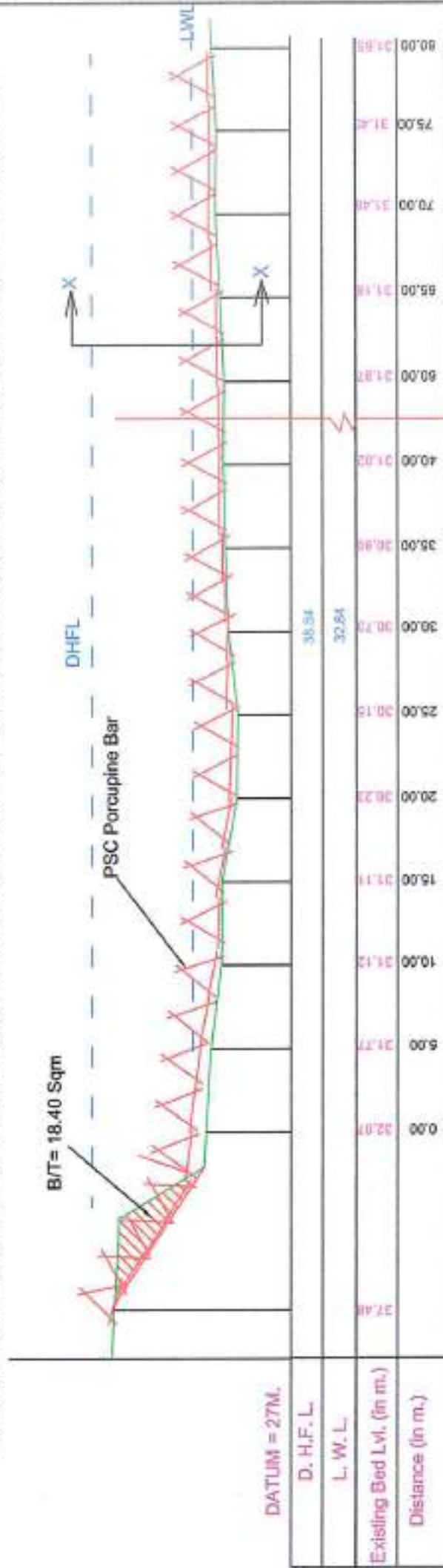
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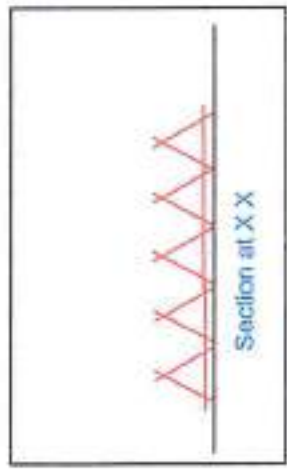
Typical PSC Porcupine works at Pub Mainbari

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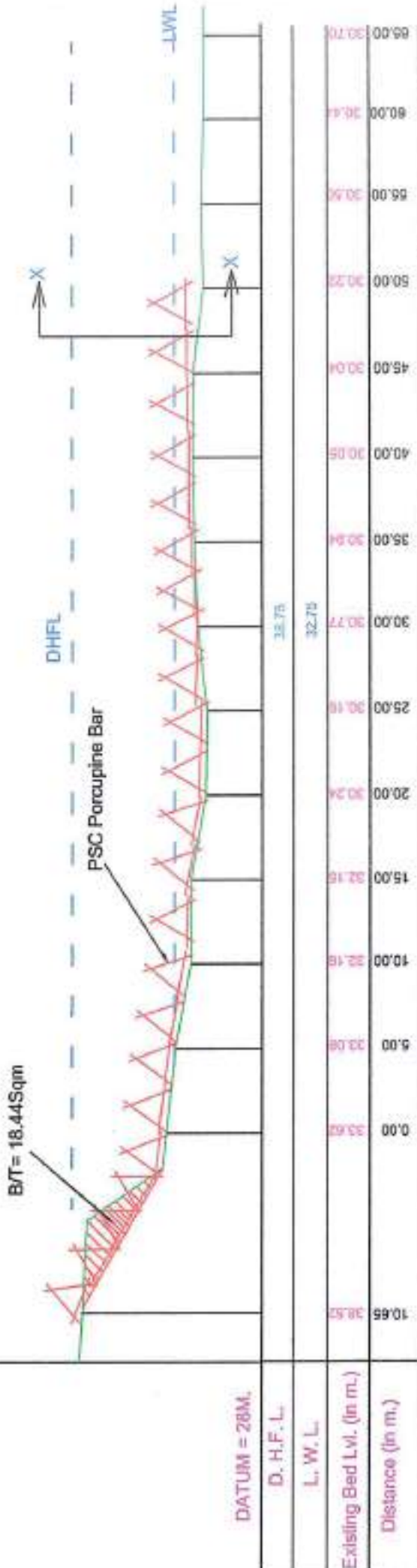


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 Barpeta W.R. Division, Barpeta



Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



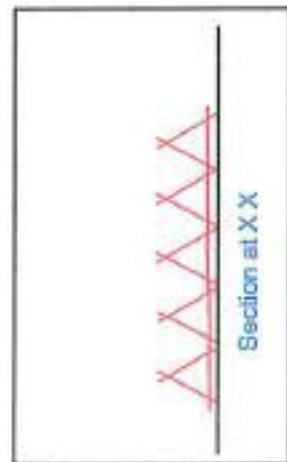
Typical PSC Porcupine works at Solman

Certified that the survey was done by me and correct to the best of my knowledge

*[Signature]*  
A.E./J.E.

Checked by me and found correct

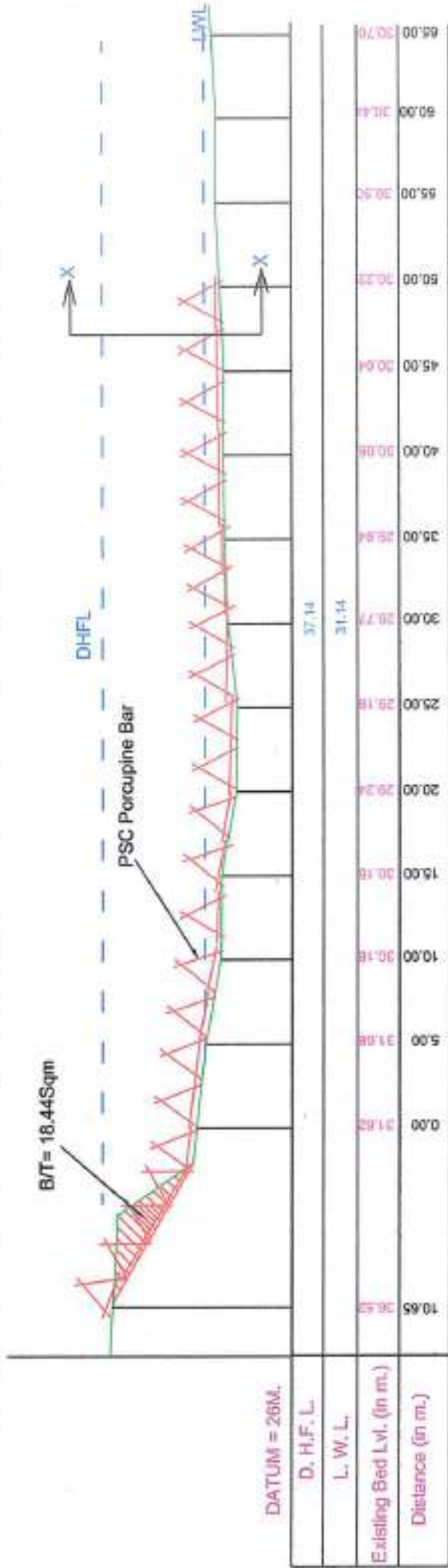
*[Signature]*  
A.E.E.  
Sorbhog W.R. Sub-Division



GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION, BARPETA  
 TYPICAL SECTION OF PORCUPINE WORKS

*[Signature]*  
 Executive Engineer  
 Barpeta W.R. Division, Barpeta

Name of Scheme: Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



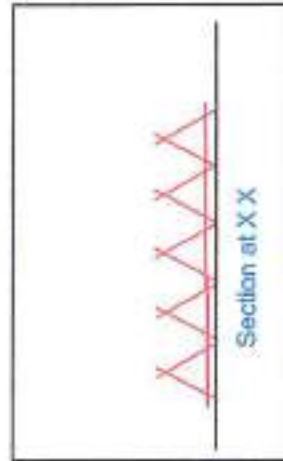
Typical PSC Porcupine works at Dakhin Tarakandi

Certified that the survey was done by me and correct to the best of my knowledge

A.E./J.E.

Checked by me and found correct

A.E.E.  
Sorbhog W.R. Sub-Division

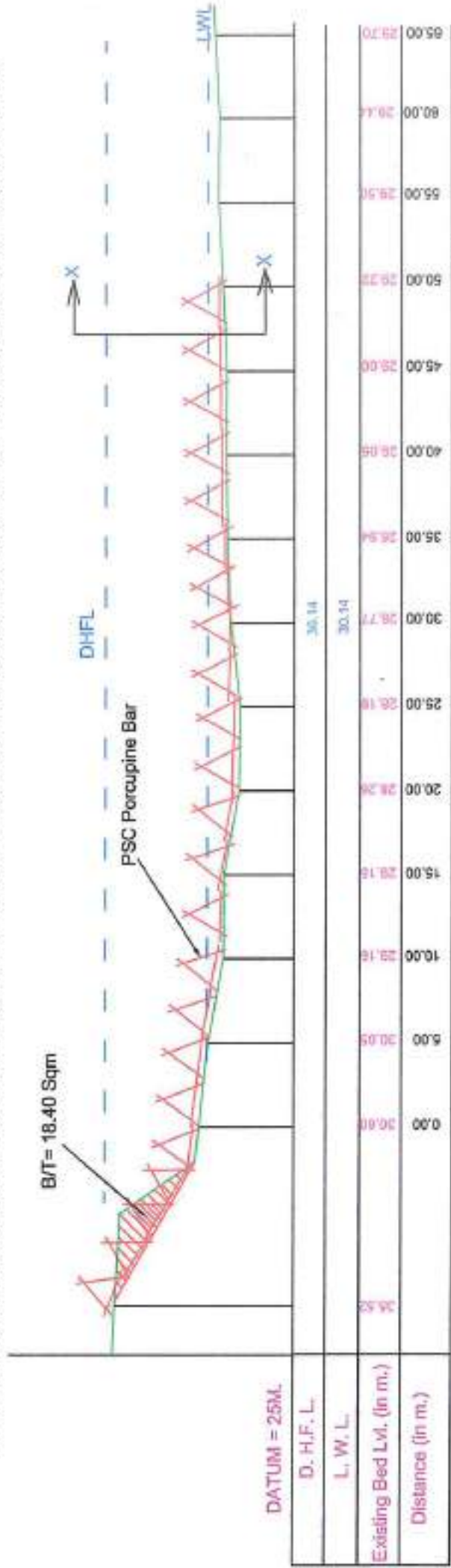


GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT  
OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA WATER RESOURCES DIVISION, BARPETA  
TYPICAL SECTION OF PORCUPINE WORKS

Executive Engineer  
Barpeta W.R. Division, Barpeta



Name of Scheme: Integrated flood and erosion management of Manas and Belki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)



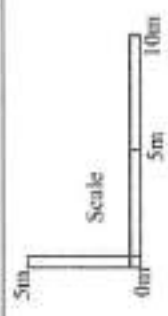
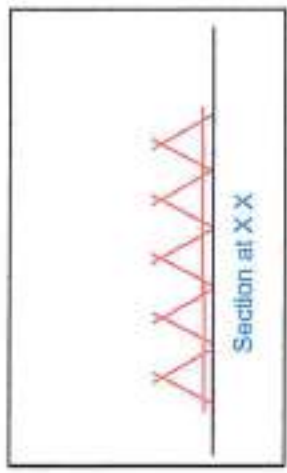
Typical PSC Porcupine works at Tinkuni Part-III

Certified that the survey was done by me and correct to the best of my knowledge

*[Signature]*  
A.E./J.E.

Checked by me and found correct

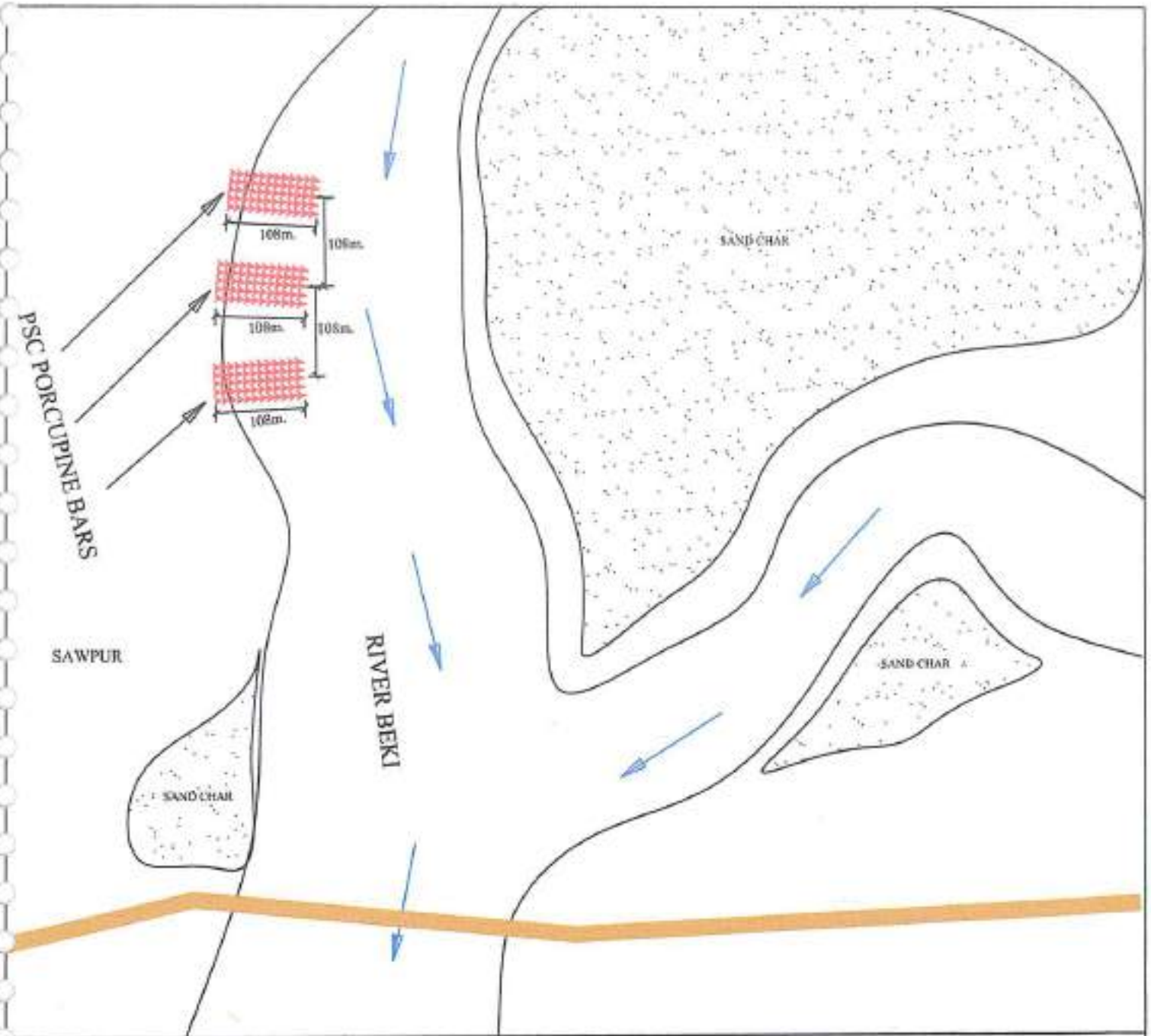
*[Signature]*  
A.E.E.  
Sorbhog W.R. Sub-Division



GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT  
OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA WATER RESOURCES DIVISION, BARPETA  
TYPICAL SECTION OF PORCUPINE WORKS

*[Signature]*  
Executive Engineer  
Barpeta W.R. Division, Barpeta






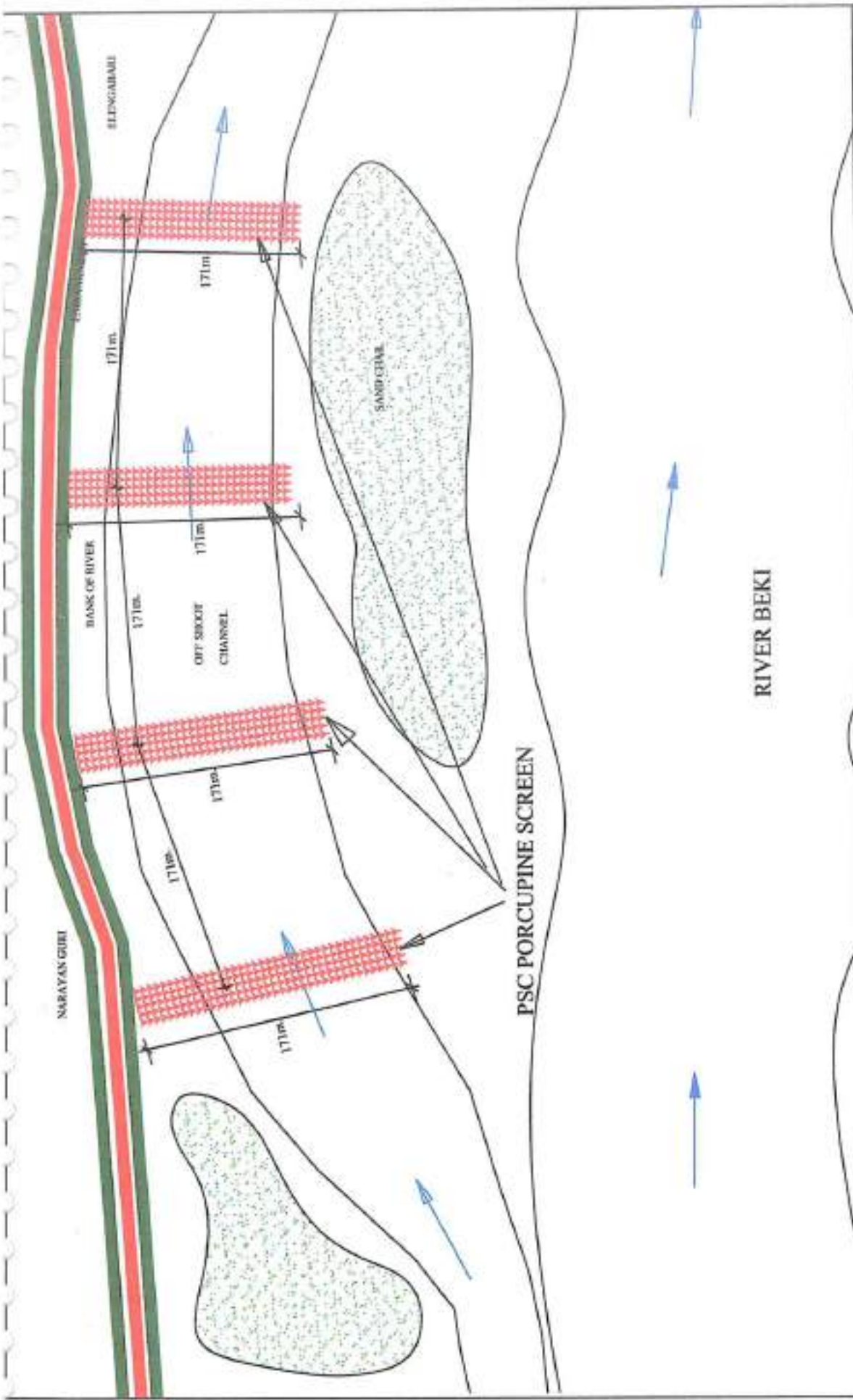
Name Of Scheme: Integrated flood and erosion management of Manas and Beki river in the District of Baska and Barpeta in Brahmaputra valley within Assam(Review).

NOT IN SCALE

  
 Jyoti/Asst. Engineer  
 Sorbhog W.R. Sub-Division, Sorbhog

  
 Asst. Executive Engineer  
 Sorbhog W.R. Sub-Division, Sorbhog

<b>GOVT. OF ASSAM</b> <b>WATER RESOURCES DEPARTMENT</b> OFFICE OF THE EXECUTIVE ENGINEER BARPETA WATER RESOURCES DIVISION, BARPETA <b>LAYOUT PLAN OF PORCUPINE BARS</b>
 Executive Engineer Barpeta W.R. Division, Barpeta



**Name Of Scheme:** Integrated flood and erosion management of Manas and Beki river in the District of Baska and Barpeta in Brahmaputra valley within Assam (Review).

WFS/2024

GOVT. OF ASSAM
WATER RESOURCES DEPARTMENT
OFFICE OF THE EXECUTIVE ENGINEER
BARPETA WATER RESOURCES DIVISION, BARPETA
LAYOUT PLAN OF PORCUPINE SCREEN

*[Signature]*

Asst. Executive Engineer  
Sorbeg W. R. Sub-Division, Sorbhog

*[Signature]*

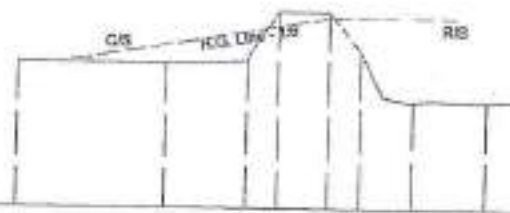
Junior/Asst. Engineer  
Sorbeg W. R. Sub-Division, Sorbhog

*[Signature]*

Executive Engineer  
Barpeta W. R. Division, Barpeta

**RIVER BEKI**

Earthwork area = 0.00 sq.m  
 Turfing Length = 0.00 m



Datum = 57.0m

EMBANMENT HEIGHT	3.76								
	67.51								
EXISTING R.L.	64.97	64.98	65.27	67.77	67.77	65.62	62.94	62.92	
OFFSET DISTANCES	15.70	7.58	3.12	1.40	0.00	1.40	3.12	6.00	10.02

X-Section at Ch.2780.00m

SCALE - 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

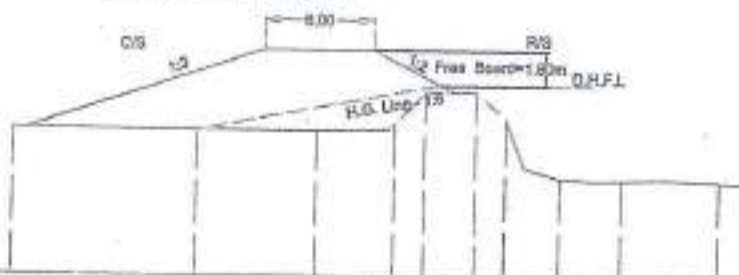
A.E.E.

E.E.  
BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Bokss and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION



Earthwork area = 63.62 sq.m  
 Turfing Length = 15 m

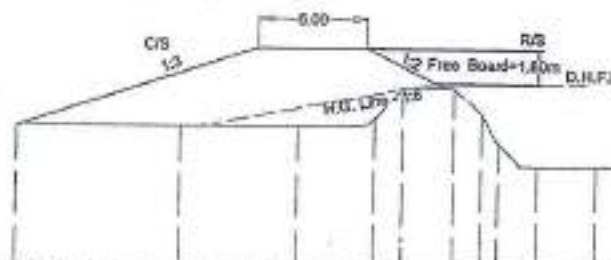


Datum = 57.0m

PROPOSED F.L.	69.15										
EMBANKMENT HEIGHT	3.75										
	67.35										
EXISTING R.L.	64.80	64.81	64.82	65.20	66.98	66.98	66.98	65.53	62.38	62.29	
OFFSET DISTANCES	24.00	13.95	7.36	3.03	1.40	0.00	1.40	3.03	6.00	9.40	15.00

X-Section at Ch. 2785.00m

Earthwork area = 61.09 sq.m  
 Turfing Length = 15 m



Datum = 57.0m

PROPOSED F.L.	68.98											
EMBANKMENT HEIGHT	3.76											
	67.18											
EXISTING R.L.	64.63	64.64	64.66	65.13	66.81	66.81	66.81	65.44	63.85	62.58	62.59	62.73
OFFSET DISTANCES	22.50	13.60	7.15	2.94	1.40	0.00	1.40	2.94	3.84	6.00	9.22	15.02

X-Section at Ch. 2800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

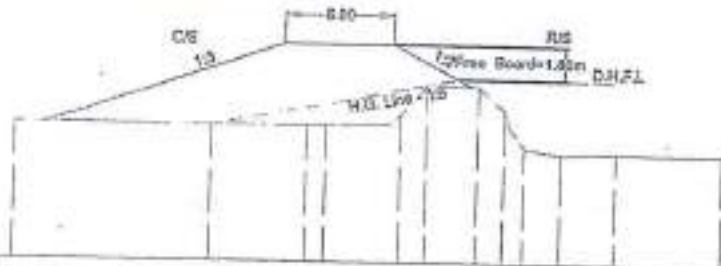
A.E.E.

E.E.  
 BARPETA

SCALE: 1:400

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY AEE (TC)	 EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 60.76 sq.m  
 Turfing Length = 15 m

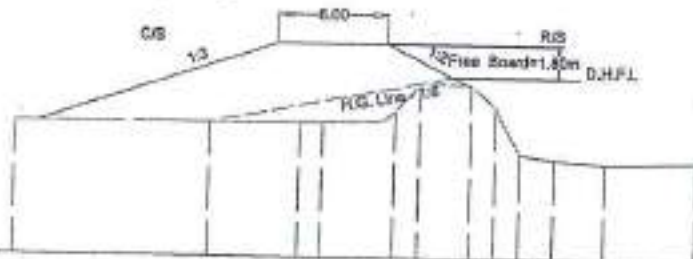


Datum = 57.0m

PROPOSED F.L.	68.82										
EMBANMENTK HIGHT	3.77										
	67.02										
EXISTING R.L.	64.46	64.47	64.47	65.06	65.63	66.63	66.63	65.35	62.97	63.07	62.99
OFFSET DISTANCES	24.05	13.25	8.00	2.85	1.40	0.00	1.40	2.85	6.00	9.02	15.02

X-Section at Ch.2900.00m

Earthwork area = 60.84 sq.m  
 Turfing Length = 15 m



Datum = 57.0m

PROPOSED F.L.	68.65												
EMBANMENTK HIGHT	3.78												
	66.85												
EXISTING R.L.	64.29	64.30	64.33	64.30	64.99	66.45	66.46	66.45	65.26	62.78	62.48	62.25	62.39
OFFSET DISTANCES	24.00	12.90	6.73	8.90	2.76	1.40	0.00	1.40	2.75	4.10	6.00	8.80	14.00

X-Section at Ch.3000.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.E.

CHECKED AT RANDOM AND FOUND CORRECT

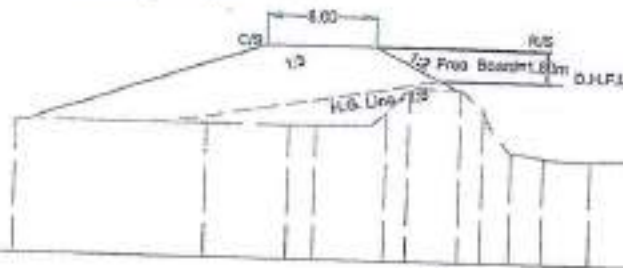
A.E.E.

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Boksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK (EMBKT.))	
CHECKED BY A.E.E. (TC)	 EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 61.18 sq.m  
Turfing Length = 15 m

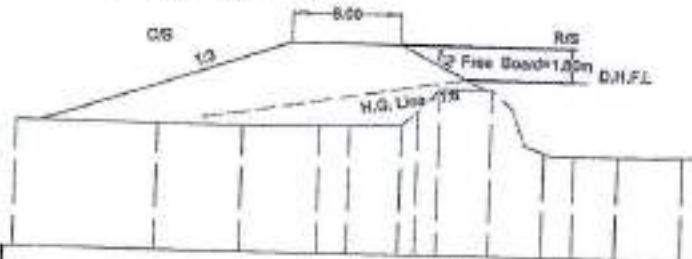


Datum = 57.0m

PROPOSED F.L.	68.49												
EMBANMENTK HIGHT	3.79												
	68.69												
EXISTING R.L.	64.12	64.13	64.17	64.13	64.92	66.28	66.28	66.28	65.17	62.88	62.59	62.51	62.68
OFFSET DISTANCES	22.90	12.55	6.52	8.00	2.67	1.40	0.00	1.40	2.67	4.24	6.00	8.61	15.02

X-Section at Ch.3100.00m

Earthwork area = 61.99 sq.m  
Turfing Length = 15 m



Datum = 57.0m

PROPOSED F.L.	68.32													
EMBANMENTK HIGHT	3.79													
	66.52													
EXISTING R.L.	63.97	63.89	63.96	63.87	64.00	64.07	64.85	66.10	66.10	66.10	62.73	62.58	62.59	62.66
OFFSET DISTANCES	24.50	16.00	12.20	8.00	6.31	3.49	2.58	1.44	0.00	1.44	4.38	6.00	8.41	12.02

X-Section at Ch.3200.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W. R. DIVISION  
BARPETA

Name of Scheme : Integrated flood and erosion  
management of Manas and Boidi river in the district of  
Baksa and Barpeta in Brahmaputra valley within Assam  
(Review)

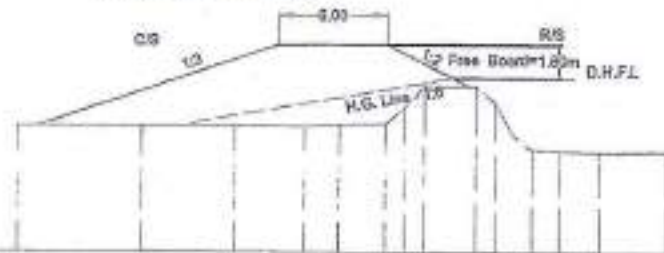
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

ASEE (TC)

EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION

Earthwork area = 62.48 sq.m  
 Turfing Length = 15 m

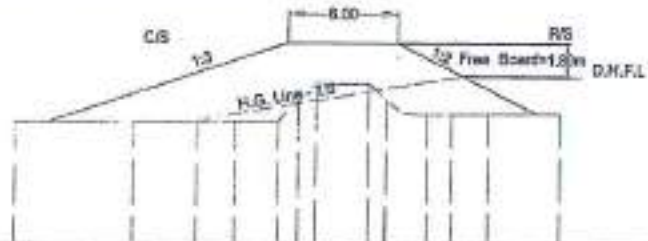


Datum = 57.0m

PROPOSED F.L.	68.16														
EMBANMENTK HIGHT	3.81														
	66.36														
EXISTING R.L.	63.75	63.78	63.79	63.70	63.84	64.90	64.78	65.93	65.93	65.93	62.50	62.42	62.38	62.43	
OFFSET DISTANCES	23.70	16.90	11.85	8.00	6.09	3.51	2.49	1.44	0.00	1.44	2.49	4.51	6.00	8.21	12.02

X-Section at Ch.3300.00m

Earthwork area = 58.98 sq.m  
 Turfing Length = 24.50 m



Datum = 57.0m

PROPOSED F.L.	68.00													
EMBANMENTK HIGHT	3.81													
	66.20													
EXISTING R.L.	63.62	63.64	63.63	63.69	63.74	64.71	65.76	65.76	65.76	64.91	64.09	64.11	63.26	64.19
OFFSET DISTANCES	17.95	11.50	8.00	5.88	3.53	2.40	1.45	0.00	1.45	2.40	4.85	6.00	8.01	12.02

X-Section at Ch.3400.00m

SCALE - 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.U.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

B.E.  
 BARPETA

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and BARPETA in Brahmaputra valley within Assam  
 (Review)

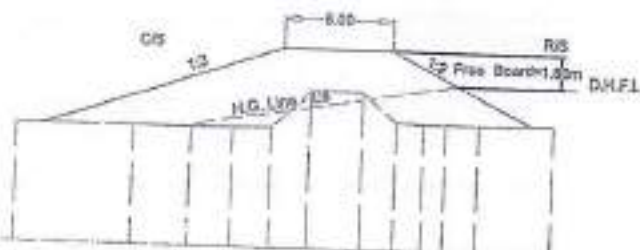
CROSS SECTION (LEFT BANK EMERT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 59.12 sq.m  
 Turfing Length = 24 m

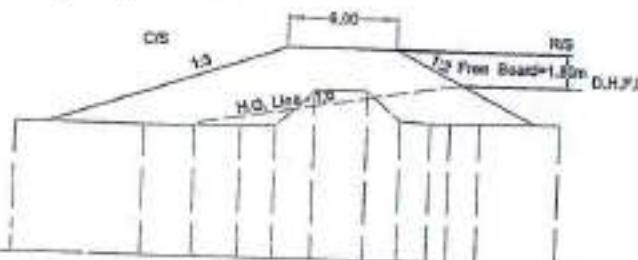


Datum = 57.0m

PROPOSED F.L.	67.83												
EMBANMENTK HIGHT	3.82												
	66.03												
EXISTING R.L.	63.44	63.46	63.45	63.51	63.56	65.58	65.58	65.58	63.96	63.90	63.92	63.95	64.01
OFFSET DISTANCES	17.55	11.15	8.00	5.87	3.56	1.46	0.00	1.46	3.30	4.78	6.00	7.81	12.02

X-Section at Ch.3500.00m

Earthwork area = 59.26 sq.m  
 Turfing Length = 24m



Datum = 57.0m

PROPOSED F.L.	67.87												
EMBANMENTK HIGHT	2.95												
	65.87												
EXISTING R.L.	64.16	64.18	64.18	64.24	64.28	66.29	66.29	66.29	64.68	64.62	64.64	64.66	64.72
OFFSET DISTANCES	17.80	10.80	8.00	5.46	3.58	1.46	0.00	1.46	3.30	4.92	6.00	7.61	12.02

X-Section at Ch.3600.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./J.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and BARPETA in Brahmaputra valley within Assam  
 (Review)

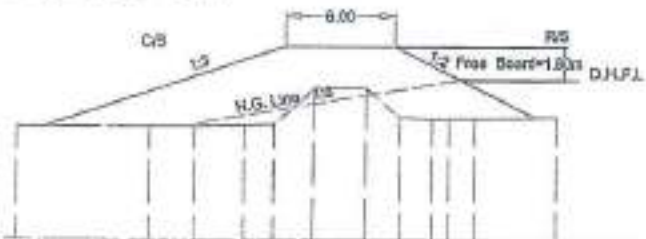
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 69.40 sq.m  
 Turfing Length = 24 m

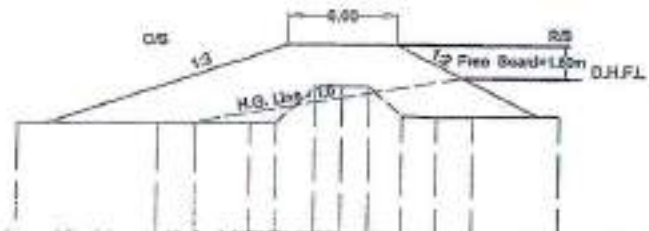


Datum = 57.0m

PROPOSED F.L.	67.50												
EMBANMENTK HIGHT	3.84												
	65.70												
EXISTING R.L.	63.10	63.12	63.12	63.19	63.22	63.22	65.22	65.22	63.63	63.56	63.57	63.59	63.66
OFFSET DISTANCES	17.75	10.45	8.00	5.25	3.60	1.46	0.00	1.46	3.30	5.05	6.00	7.41	12.02

X-Section at Ch.3700.00m

Earthwork area = 59.53 sq.m  
 Turfing Length = 24m



Datum = 57.0m

PROPOSED F.L.	67.34												
EMBANMENTK HIGHT	3.84												
	65.54												
EXISTING R.L.	62.94	62.96	62.96	63.03	63.06	65.06	65.06	65.06	63.47	63.39	63.42	63.50	63.50
OFFSET DISTANCES	17.80	10.10	8.00	5.04	3.63	1.47	0.00	1.47	3.30	5.19	7.21	12.02	12.02

X-Section at Ch.3800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./J.E.

CHECKED AT RANDOM AND FOUND CORRECT

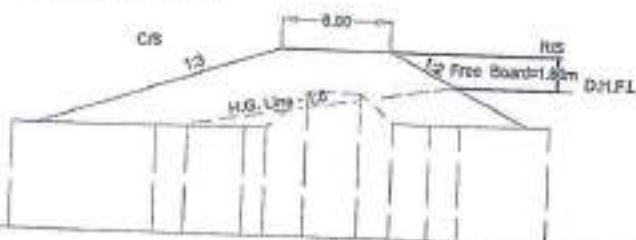
A.E.E.

E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Bekriver in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 59.66 sq.m  
 Turfing Length = 24m

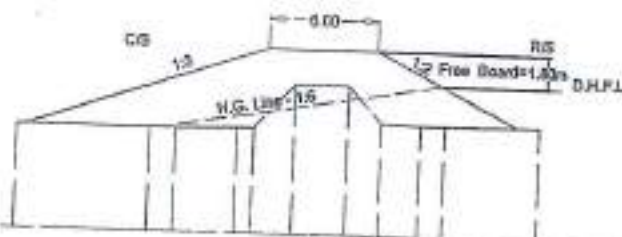


Datum = 57.0m

PROPOSED F.L.	67.17											
EMBANMENTK HIGHT	3.86											
	65.37											
EXISTING R.L.	62.76	62.87	62.78	62.86	62.88	64.87	64.87	63.29	63.21	63.24	63.31	
OFFSET DISTANCES	17.55	9.75	8.00	4.82	3.65	1.48	0.00	1.48	3.30	5.32	7.01	12.02

X-Section at Ch.3900.00m

Earthwork area = 57.71 sq.m  
 Turfing Length = 24m



Datum = 57.0m

PROPOSED F.L.	67.01											
EMBANMENTK HIGHT	3.86											
	65.21											
EXISTING R.L.	62.60	62.62	60.62	62.70	62.73	65.21	65.21	65.21	63.13	63.50	63.07	63.15
OFFSET DISTANCES	16.65	9.40	8.00	4.61	3.67	1.48	0.00	1.48	3.30	5.46	6.80	12.02

X-Section at Ch.4000.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E. [Signature]

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E. [Signature]

E.E.  
 BARPETA [Signature]

SCALE - 1:450

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

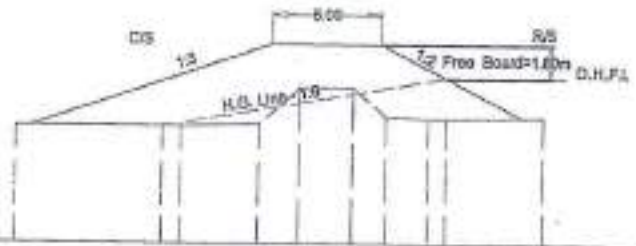
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

[Signature]  
 EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 59.91 sq.m  
Turving Length = 24m

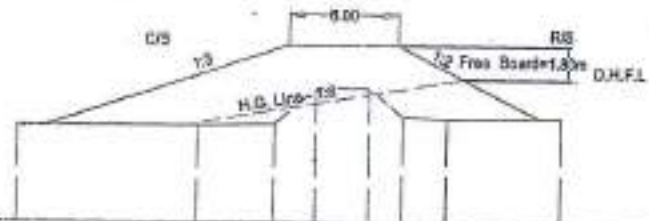


Datum = 57.0m

PROPOSED F.L.	66.44						
EMBANMENTK HIGHT	2.58						
	65.04						
EXISTING R.L.	63.31	63.33	63.44	65.41	65.41	65.41	63.86
OFFSET DISTANCES	17.05	9.05	3.70	1.48	0.00	1.48	12.02

X-Section at Ch.4100.00m

Earthwork area = 60.02 sq.m  
Turving Length = 24m



Datum = 57.0m

PROPOSED F.L.	66.48						
EMBANMENTK HIGHT	3.67						
	64.88						
EXISTING R.L.	62.26	62.28	62.39	64.35	64.36	64.35	62.81
OFFSET DISTANCES	17.90	8.00	3.72	1.49	0.00	1.49	12.02

X-Section at Ch.4200.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W. R. DIVISION  
BARPETA

Name of Scheme : Integrated flood and erosion  
management of Manas and Beki river in the district of  
Baksa and Barpeta in Brahmaputra valley within Assam  
(Review)

CROSS SECTION (LEFT BANK EMBKT.)

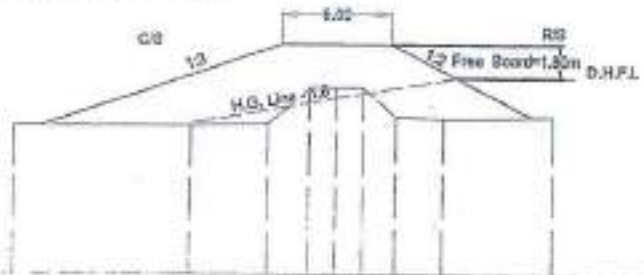
CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION



Earthwork area = 80.14 sq.m  
 Turfing Length = 24m

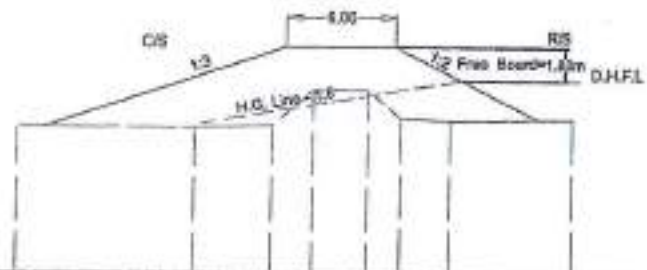


Datum = 57.0m

PROPOSED F.L.	66.51								
EMBANMENTK HIGHT	3.89								
	64.71								
EXISTING R.L.	62.08	62.10	62.21	64.17	64.17	62.62	62.52	62.62	
OFFSET DISTANCES	17.80	8.00	3.74	1.50	0.00	1.50	3.30	5.86	12.02

X-Section at Ch.4300.00m

Earthwork area = 80.26 sq.m  
 Turfing Length = 24m



Datum = 54.0m

PROPOSED F.L.	66.35								
EMBANMENTK HIGHT	3.89								
	64.55								
EXISTING R.L.	61.92	61.95	62.05	64.00	64.00	64.00	62.46	62.35	62.46
OFFSET DISTANCES	17.80	8.00	3.77	1.50	0.00	1.50	3.30	6.00	12.85

X-Section at Ch.4400.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.U.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

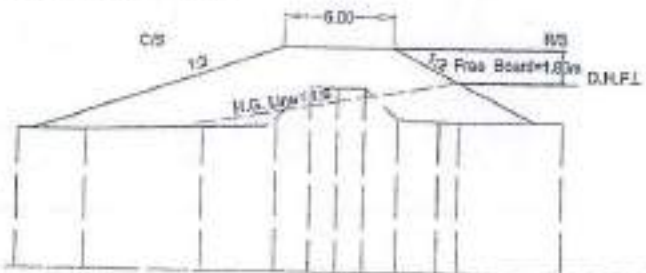
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =59.76 sq.m  
 Turfing Length =24.50m

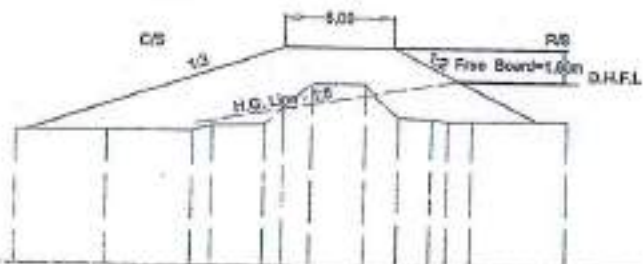


Datum =54.0m

PROPOSED F.L.	66.19																					
EMBANMENTK HIGHT	3.90																					
	64.39																					
EXISTING R.L.	17.55	61.61	13.83	61.63	7.44	61.82	3.38	62.38	1.49	64.01	0.00	64.01	1.49	64.01	3.30	62.34	5.55	62.24	6.67	62.20	12.45	62.29
OFFSET DISTANCES	17.55	61.61	13.83	61.63	7.44	61.82	3.38	62.38	1.49	64.01	0.00	64.01	1.49	64.01	3.30	62.34	5.55	62.24	6.67	62.20	12.45	62.29

X-Section at Ch.4500.00m

Earthwork area =60.59 sq.m  
 Turfing Length =24.50 m



Datum =54.0m

PROPOSED F.L.	66.02																											
EMBANMENTK HIGHT	3.92																											
	64.22																											
EXISTING R.L.	17.60	61.29	12.67	61.33	8.00	61.35	6.87	61.68	4.05	61.75	2.99	62.71	1.48	64.01	0.00	64.01	1.48	64.10	3.30	61.31	5.10	62.13	6.00	61.99	7.34	62.04	12.70	62.10
OFFSET DISTANCES	17.60	61.29	12.67	61.33	8.00	61.35	6.87	61.68	4.05	61.75	2.99	62.71	1.48	64.01	0.00	64.01	1.48	64.10	3.30	61.31	5.10	62.13	6.00	61.99	7.34	62.04	12.70	62.10

X-Section at Ch.4600.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Schema : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

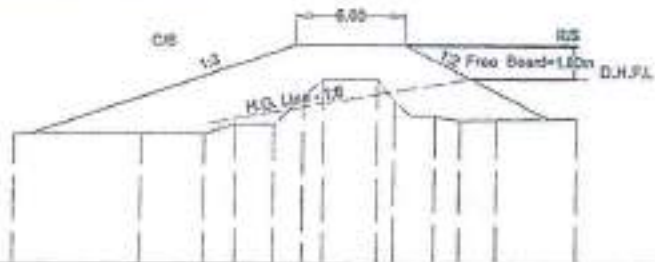
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

A.E.E. (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =60.96 sq.m  
 Turfing Length =25 m

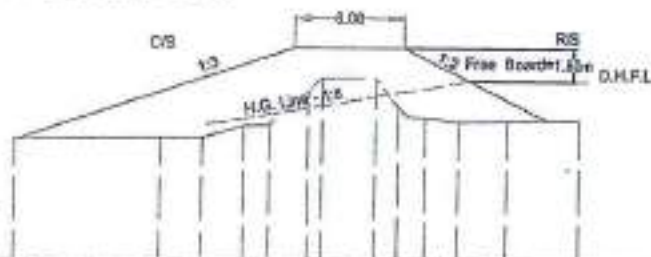


Datum =54.0m

PROPOSED F.L.	65.88													
EMBANMENTK HIGHT	3.93													
	64.06													
EXISTING R.L.	60.99	61.04	61.06	61.55	61.60	63.04	64.02	64.02	64.02	62.85	62.02	61.82	61.88	61.93
OFFSET DISTANCES	18.50	11.50	8.00	6.31	4.19	2.61	1.48	0.00	1.48	2.40	4.65	6.00	8.01	12.80

X-Section at Ch.4700.00m

Earthwork area =61.48 sq.m  
 Turfing Length =25 m



Datum =54.0m

PROPOSED F.L.	65.70														
EMBANMENTK HIGHT	3.94														
	63.90														
EXISTING R.L.	60.68	60.75	61.45	60.76	60.76	63.38	61.42	64.03	64.03	64.03	62.46	61.91	61.64	61.73	61.76
OFFSET DISTANCES	18.33	10.33	4.34	8.00	5.22	5.75	1.47	0.00	1.47	2.70	4.20	6.00	8.68	12.80	

X-Section at Ch.4800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./[Signature]

CHECKED AT RANDOM AND FOUND CORRECT

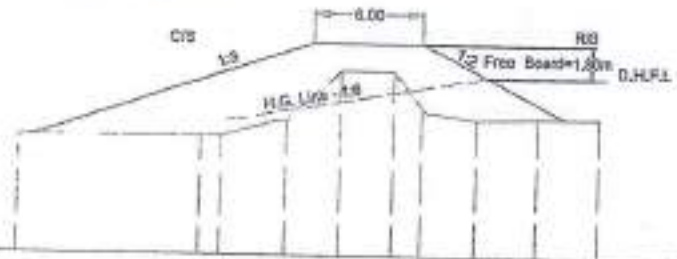
A.E.E.

E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Menas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK ENBKT.)	
CHECKED BY	[Signature]
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 62.10 sq.m  
 Turfing Length = 26m

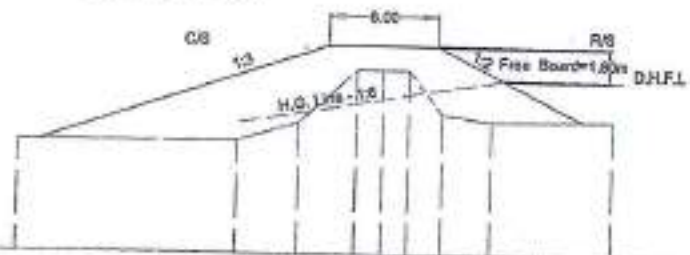


Datum = 54.0m

PROPOSED F.L.	65.54										
EMBANMENTK HIGHT	3.95										
	63.74										
EXISTING R.L.	60.37	60.47	60.47	61.30	64.04	64.04	64.04	62.07	61.47	61.57	61.59
OFFSET DISTANCES	19.17	9.17	8.00	4.48	1.45	0.00	1.45	3.00	6.00	9.35	12.80

X-Section at Ch.4900.00m

Earthwork area = 62.99 sq.m  
 Turfing Length = 26m



Datum = 54.0m

PROPOSED F.L.	65.38										
EMBANMENTK HIGHT	3.96										
	63.58										
EXISTING R.L.	60.06	60.16	60.16	61.16	64.04	64.05	64.04	61.69	61.29	61.42	61.42
OFFSET DISTANCES	20.00	8.00	4.62	1.45	0.00	1.45	3.30	6.00	12.02	12.02	61.42

X-Section at Ch.5000.00m

SCALE - 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.U.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Bakli river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 64.03 sq.m  
 Turfing Length = 26 m

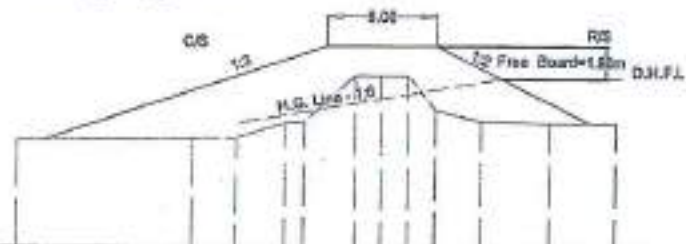


Datum = 54.0m

PROPOSED F.L.	65.22										
EMBANMENTK HIGHT	4.10										
	63.42										
EXISTING R.L.	59.97	60.07	60.09	61.02	63.74	63.74	63.74	61.10	61.11	61.12	
OFFSET DISTANCES	20.00	9.20	8.00	4.44	1.30	0.00	1.30	3.12	5.73	9.62	12.52

X-Section at Ch.5100.00m

Earthwork area = 64.32 sq.m  
 Turfing Length = 26 m



Datum = 54.0m

PROPOSED F.L.	65.06											
EMBANMENTK HIGHT	4.23											
	63.26											
EXISTING R.L.	59.89	59.98	60.01	60.79	63.44	63.44	63.44	61.55	60.93	60.81	60.83	
OFFSET DISTANCES	20.00	10.40	8.00	5.30	4.25	1.46	0.00	1.46	2.94	5.46	9.22	11.02

X-Section at Ch.5200.00m

SCALE - 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

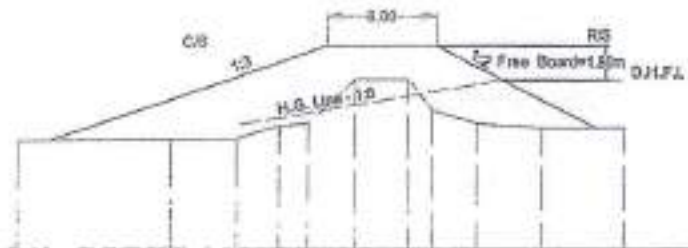
CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Bekri river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 65.25 sq.m  
 Turfing Length = 26.50m

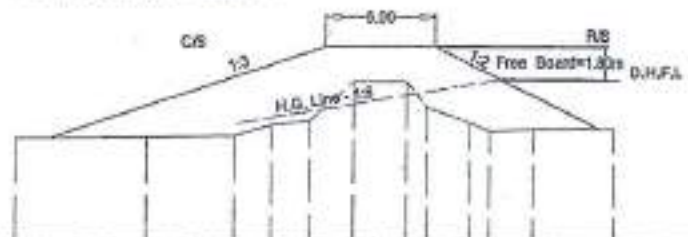


Datum = 54.0m

PROPOSED F.L.	64.90											
EMBANMENTK HIGHT	4.37											
	63.10											
EXISTING R.L.	59.80	59.88	59.92	60.60	60.76	63.13	63.13	61.48	60.74	60.50	60.53	
OFFSET DISTANCES	20.00	11.60	8.00	5.64	4.07	1.46	0.00	1.46	2.76	5.19	8.81	13.52

X-Section at Ch.5300.00m

Earthwork area = 06.88 sq.m  
 Turfing Length = 26.50m



Datum = 54.0m

PROPOSED F.L.	64.74												
EMBANMENTK HIGHT	4.50												
	62.94												
EXISTING R.L.	59.71	59.78	59.83	60.42	60.63	62.82	62.82	62.82	61.40	60.55	60.12	60.20	60.24
OFFSET DISTANCES	20.00	12.80	8.00	5.97	3.88	1.47	0.00	1.47	2.58	4.92	6.00	8.41	13.02

X-Section at Ch.5400.00m

SCALE - 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.

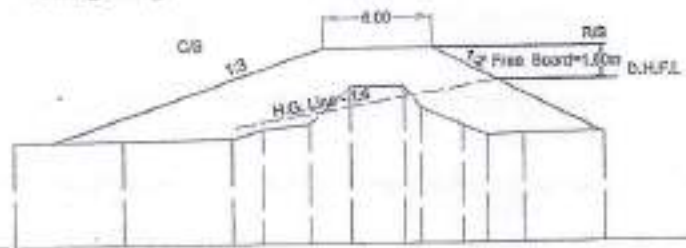
CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Schema : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 69.06 sq.m  
 Turfing Length = 27m



Datum = 54.0m

PROPOSED F.L.	64.58										
EMBANMENTK HIGHT	4.64										
	62.78										
EXISTING R.L.	59.62	59.67	59.74	60.23	60.49	62.41	62.41	62.41	61.33	61.96	59.83
OFFSET DISTANCES	20.00	14.00	8.00	6.31	3.70	1.48	0.00	1.48	2.40	4.65	6.00
											8.01
											12.52

X-Section at Ch.5500.00m

Earthwork area = 69.63 sq.m  
 Turfing Length = 27m



Datum = 54.0m

PROPOSED F.L.	64.42										
EMBANMENTK HIGHT	4.78										
	62.62										
EXISTING R.L.	59.53	59.57	59.65	60.04	60.36	62.20	62.20	62.20	60.33	60.17	59.53
OFFSET DISTANCES	20.00	15.20	8.00	6.65	3.51	1.48	0.00	1.48	3.30	4.38	6.00
											7.61
											13.02

X-Section at Ch.5600.00m

SCALE - 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.E.

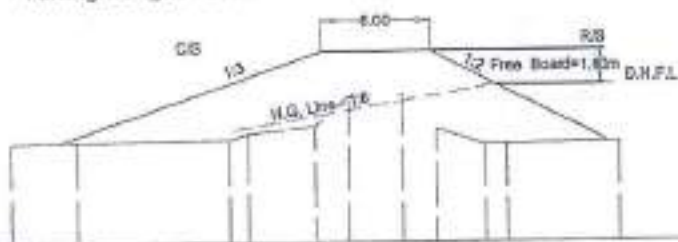
CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area =71.18 sq.m  
 Turfing Length =27m

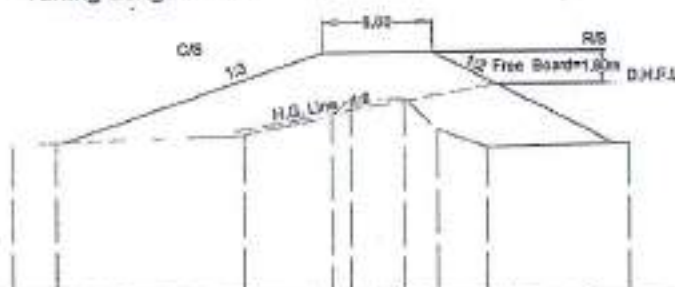


Datum =54.0m

PROPOSED F.L.	64.26						
EMBANMENTK HIGHT	4.91						
	62.46						
EXISTING R.L.	59.44	59.47	59.56	60.23	61.89	61.89	59.24
			59.86		61.89		59.27
OFFSET DISTANCES	20.00	16.40	8.00	3.33	1.48	0.00	1.48
			6.96		3.30		6.00
							7.21
							13.52

X-Section at Ch.5700.00m

Earthwork area =70.64 sq.m  
 Turfing Length =27m



Datum =51.0m

PROPOSED F.L.	64.10						
EMBANMENTK HIGHT	5.05						
	62.30						
EXISTING R.L.	59.34	59.37	59.67	60.67	61.58	61.58	58.94
				61.58			59.87
OFFSET DISTANCES	20.00	17.60	7.32	2.51	1.49	0.00	1.49
				1.49			3.30
							6.00
							14.02

X-Section at Ch.5800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

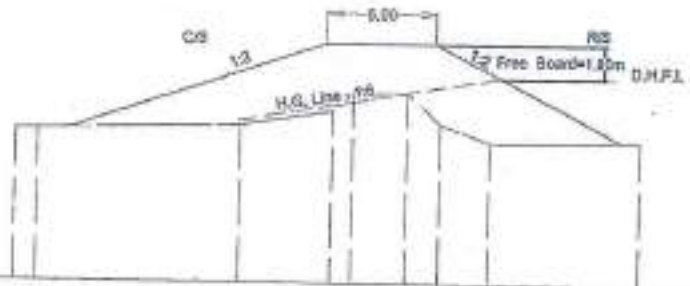
E.E.  
 BARPETA

SCALE - 1:500

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme ; Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION



Earthwork area = 72.34 sq.m  
 Turfing Length = 27m

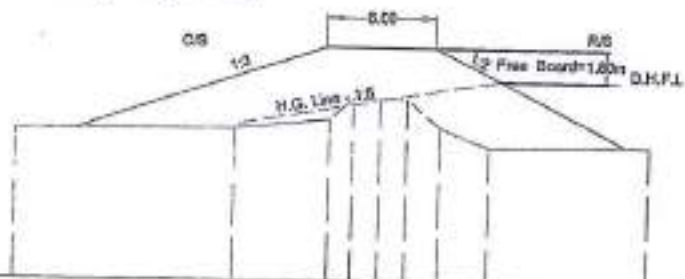


Datum = 51.0m

PROPOSED F.L.	63.93									
EMBANMENTK HIGHT	5.19									
	62.13									
EXISTING R.L.	59.24	59.26	59.47	60.24	61.26	61.26	58.64	58.74		
OFFSET DISTANCES	20.00	18.80	7.68	2.64	1.50	0.00	1.50	3.30	6.00	14.52

X-Section at Ch.5900.00m

Earthwork area = 75.50 sq.m  
 Turfing Length = 27m



Datum = 51.0m

PROPOSED F.L.	63.77								
EMBANMENTK HIGHT	5.33								
	61.97								
EXISTING R.L.	59.15	59.26	59.81	60.95	60.95	60.95	59.40	58.34	58.44
OFFSET DISTANCES	20.00	6.00	2.78	1.50	0.00	1.50	3.30	6.00	15.02

X-Section at Ch.6000.00m

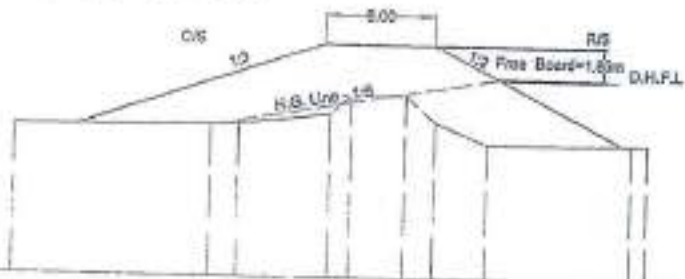
CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE  
 A.E./E. *[Signature]*

CHECKED AT RANDOM AND FOUND CORRECT  
 A.E.E. *[Signature]*  
 E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Bokri river in the district of Bakas and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	<i>[Signature]</i>
AEE (TC)	EXECUTIVE ENGINEER BARPETA W. R. DIVISION

Earthwork area = 73.14 sq.m  
 Turfing Length = 27m



Datum = 51.0m

PROPOSED F.L.	63.61										
EMBANMENTK HIGHT	5.26										
	61.81										
EXISTING R.L.	59.06	59.17	59.23	59.82	60.85	60.85	59.45	58.26	58.35	58.35	
OFFSET DISTANCES	20.00	9.20	7.66	2.65	1.50	0.00	1.50	3.12	6.00	14.12	15.02

X-Section at Ch.6100.00m

Earthwork area = 70.78 sq.m  
 Turfing Length = 26 m



Datum = 51.0m

PROPOSED F.L.	63.45										
EMBANMENTK HIGHT	5.20										
	61.65										
EXISTING R.L.	58.95	59.07	59.17	59.83	60.74	60.74	59.50	58.17	58.25	58.25	
OFFSET DISTANCES	20.00	10.40	7.32	2.53	1.51	0.00	1.51	2.95	6.00	13.22	15.02

X-Section at Ch.6200.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE.

A.E./E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Mense and Beki river in the district of  
 Baka and Barpeta in Brahmaputra valley within Assam  
 (Review)

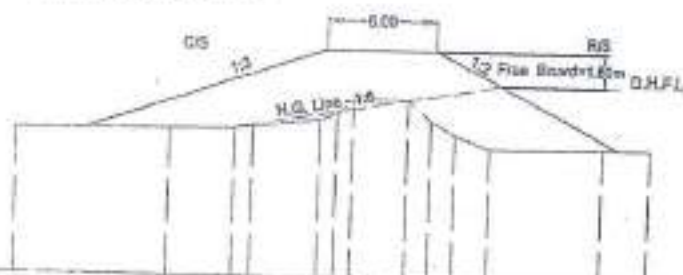
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 69.28 sq.m  
 Turfing Length = 20m

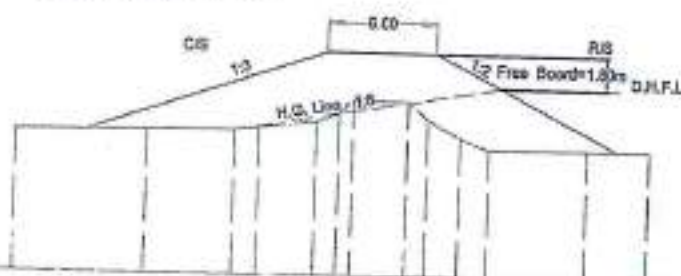


Datum = 51.0m

PROPOSED F.L.	63.29													
EMBANMENTK HIGHT	5.13													
	61.49													
EXISTING R.L.	58.85	58.95	59.12	59.06	59.49	59.84	60.64	60.64	60.64	59.55	58.83	58.10	58.16	58.015
OFFSET DISTANCES	20.00	11.60	6.99	8.00	3.33	2.41	1.51	0.00	1.51	2.77	4.11	6.00	12.31	15.02

X-Section at Ch.6300.00m

Earthwork area = 67.18 sq.m  
 Turfing Length = 20 m



Datum = 51.0m

PROPOSED F.L.	63.13													
EMBANMENTK HIGHT	5.07													
	61.33													
EXISTING R.L.	58.75	58.83	59.06	59.90	59.38	59.85	60.53	60.53	60.53	59.60	58.64	58.00	58.06	58.05
OFFSET DISTANCES	20.00	12.80	6.65	8.00	3.51	2.29	1.52	0.00	1.52	2.60	4.38	6.00	11.41	15.02

X-Section at Ch.6400.00m

SCALE - 1:100

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

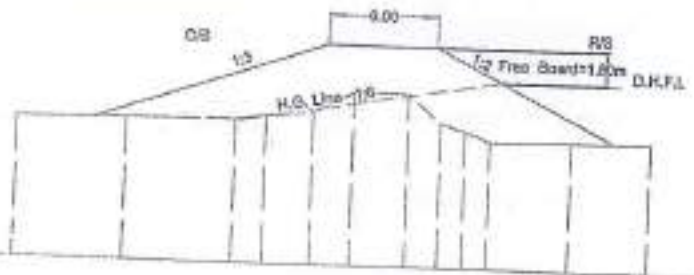
CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Bakas and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 65.21 sq.m  
 Turfing Length = 25 m

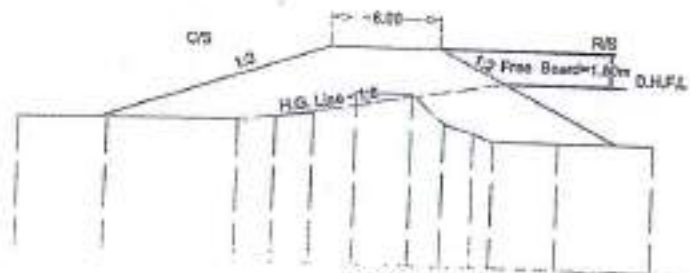


Datum = 51.0m

PROPOSED F.L.	62.97												
EMBANMENTK HIGHT	5.00												
	61.17												
EXISTING R.L.	58.65	58.72	58.80	59.01	59.27	60.43	60.43	60.43	58.85	58.45	57.97	57.95	
OFFSET DISTANCES	20.00	14.00	8.00	6.31	3.70	1.52	0.00	1.52	3.30	4.85	6.00	10.51	15.02

X-Section at Ch.6500.00m

Earthwork area = 63.27 sq.m  
 Turfing Length = 25 m



Datum = 51.0m

PROPOSED F.L.	62.81												
EMBANMENTK HIGHT	4.92												
	60.01												
EXISTING R.L.	58.56	58.62	58.72	58.96	59.18	60.33	60.33	60.33	58.75	58.27	57.89	57.86	
OFFSET DISTANCES	20.00	15.20	8.00	5.97	3.88	1.53	0.00	1.53	3.30	4.92	6.00	9.61	15.02

X-Section at Ch.6600.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E. *[Signature]*

CHECKED AT RANDOM AND FOUND CORRECT

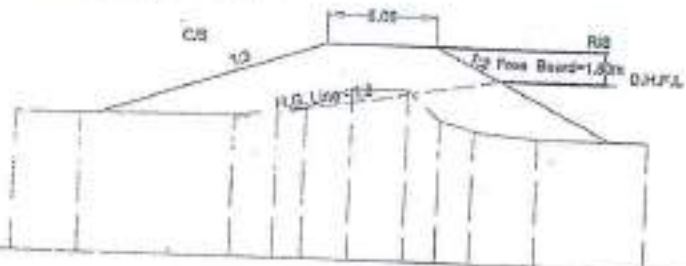
A.E.E. *[Signature]*

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY AEE (TC)	<i>[Signature]</i> EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 80.93 sq.m  
 Turfing Length = 25 m



Datum = 51.0m

PROPOSED F.L.	62.65											
EMBANMENTK HIGHT	4.88											
	60.85											
EXISTING R.L.	58.46	58.50	58.62	58.91	59.07	60.23	60.23	60.23	58.64	58.08	57.79	57.77
OFFSET DISTANCES	20.00	16.40	8.00	5.64	4.07	1.54	0.00	1.54	3.30	5.19	8.71	15.02

X-Section at Ch.6700.00m

Earthwork area = 59.32 sq.m  
 Turfing Length = 25 m



Datum = 51.0m

PROPOSED F.L.	62.49											
EMBANMENTK HIGHT	3.94											
	60.69											
EXISTING R.L.	58.37	58.39	58.53	58.86	58.96	60.12	60.12	60.12	58.53	57.89	57.70	58.55
OFFSET DISTANCES	20.00	17.60	8.00	5.30	4.25	1.54	0.00	1.54	3.30	5.46	7.80	15.02

X-Section at Ch.6800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

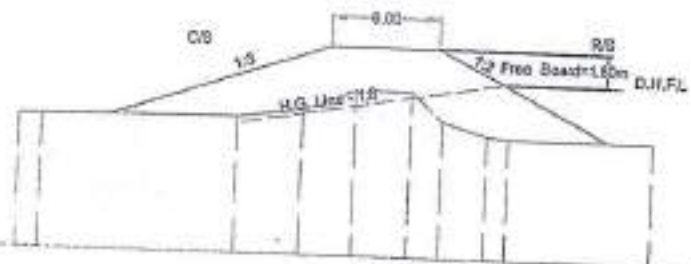
A.E.E.

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY  AEE (TC)	 EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 57.67 sq.m  
 Turfing Length = 24 m

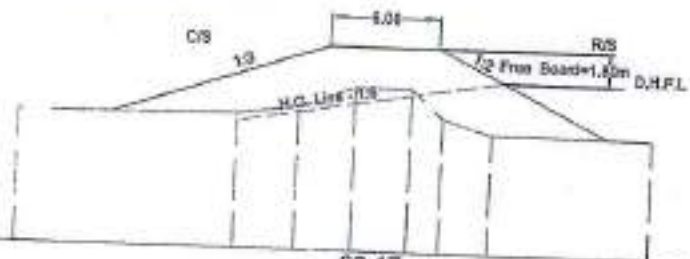


Datum = 51.0m

PROPOSED F.L.	62.33										
EMBANMENTK HIGHT	4.76										
	60.53										
EXISTING R.L.	58.27	58.28	58.43	58.85	60.02	60.02	60.02	58.42	57.70	57.60	57.57
OFFSET DISTANCES	20.00	18.80	8.00	4.44	1.54	0.00	1.54	3.30	5.73	6.90	15.02

X-Section at Ch.6900.00m

Earthwork area = 55.94 sq.m  
 Turfing Length = 24 m



Datum = 51.0m

PROPOSED F.L.	62.17										
EMBANMENTK HIGHT	4.70										
	60.37										
EXISTING R.L.	58.17		58.34	58.75	59.91	59.91	59.91	58.31	57.51		57.47
OFFSET DISTANCES	20.00		8.00	4.62	1.55	0.00	1.55	3.30	6.00		15.02

X-Section at Ch.7000.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.U. *[Signature]*

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E. *[Signature]*

E.E.  
 BARPETA *[Signature]*

SCALE - 1:500

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme ; Integrated flood and erosion management of Manas and Beki river in the district of Dokse and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK (EMBKT.))	
CHECKED BY  AEE (TC)	<i>[Signature]</i> EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 57.12 sq.m  
 Turfing Length = 24 m

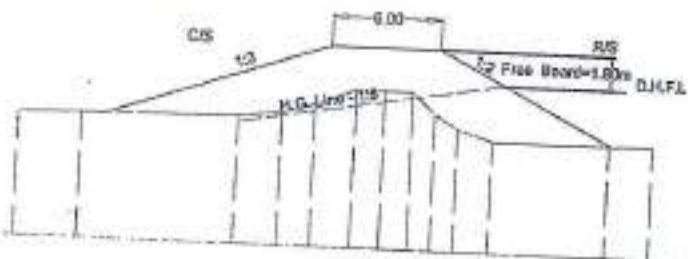


Datum = 51.0m

PROPOSED F.L.	62.01											
EMBANMENTK HIGHT	3.88											
	60.21											
EXISTING R.L.	57.93	58.85	59.00	59.35	59.59	60.59	60.59	59.22	58.16	58.13	56.17	
OFFSET DISTANCES	20.00	18.29	8.00	5.10	4.19	1.56	0.00	1.56	3.06	6.00	13.73	15.02

X-Section at Ch.7100.00m

Earthwork area = 58.64 sq.m  
 Turfing Length = 24 m



Datum = 51.0m

PROPOSED F.L.	61.84												
EMBANMENTK HIGHT	3.94												
	60.04												
EXISTING R.L.	58.57	58.66	58.78	59.08	59.56	60.40	60.40	59.25	58.50	57.93	57.90	57.99	
OFFSET DISTANCES	20.00	16.57	8.00	5.59	3.76	1.57	0.00	1.57	2.82	4.07	6.00	12.44	15.02

X-Section at Ch.7200.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.   
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

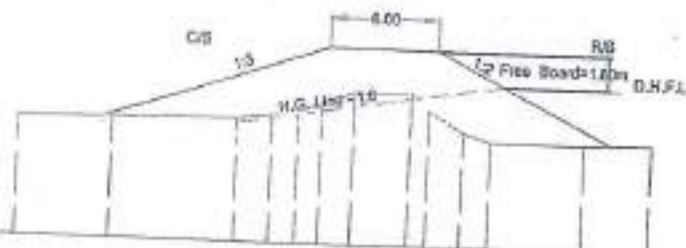
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

A.E.E. (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 60.08 sq.m  
 Turfing Length = 24 m

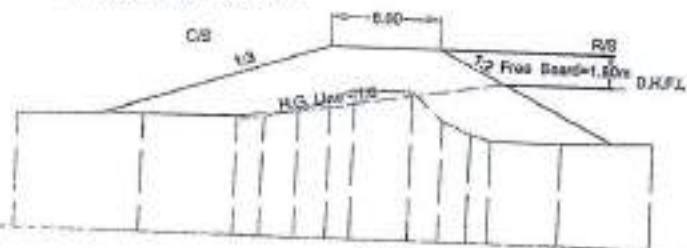


Datum = 51.0m

PROPOSED F.L.	61.68										
EMBANKMENT HEIGHT	4.89										
	59.88										
EXISTING R.L.	57.44	57.58	57.91	57.68	58.09	58.64	59.31	59.31	59.31	58.40	57.27
OFFSET DISTANCES	20.00	14.86	6.07	8.00	4.62	3.34	1.58	0.00	1.58	2.58	4.46
											6.00
											11.15
											15.02

X-Section at Ch. 7300.00m

Earthwork area = 61.67 sq.m  
 Turfing Length = 24 m



Datum = 51.0m

PROPOSED F.L.	61.52										
EMBANKMENT HEIGHT	4.78										
	59.72										
EXISTING R.L.	57.20	57.39	57.46	57.64	57.87	58.61	59.11	59.11	59.11	57.57	56.57
OFFSET DISTANCES	20.00	13.14	8.00	6.55	4.62	2.91	1.59	0.00	1.59	3.30	4.84
											6.00
											9.87
											15.02

X-Section at Ch. 7400.00m

SCALE - 1:100

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

CROSS SECTION (LEFT BANK EMBKT.)

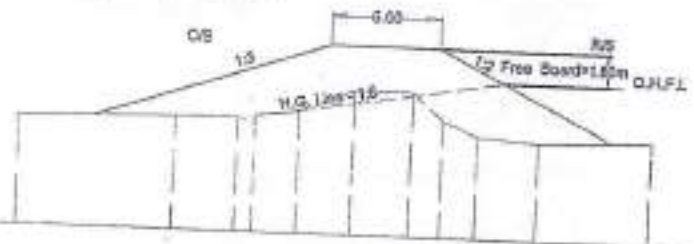
CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION



Earthwork area = 62.82 sq.m  
 Turfing Length = 25 m

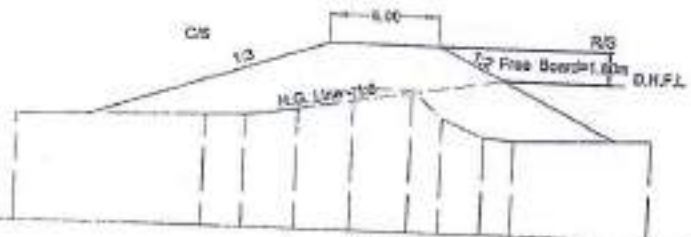


Datum = 51.0m

PROPOSED F.L.	61.36											
EMBANMENTK HIGHT	4.80											
	59.56											
EXISTING R.L.	56.96	57.20	57.24	57.36	57.65	58.91	58.92	58.91	57.39	56.58	56.34	56.56
OFFSET DISTANCES	20.00	11.43	8.00	7.03	4.62	1.60	0.00	1.60	3.30	5.23	8.58	15.02

X-Section at Ch.7500.00m

Earthwork area = 84.36 sq.m  
 Turfing Length = 25 m



Datum = 51.0m

PROPOSED F.L.	61.20											
EMBANMENTK HIGHT	4.82											
	59.40											
EXISTING R.L.	56.72	57.00	57.09	57.44	58.72	58.72	58.72	57.21	56.24	56.12		56.38
OFFSET DISTANCES	20.00	9.71	7.52	4.62	1.61	0.00	1.61	3.30	5.61	7.29		15.02

X-Section at Ch.7600.00m

CERTIFIED THAT THE SURVRY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

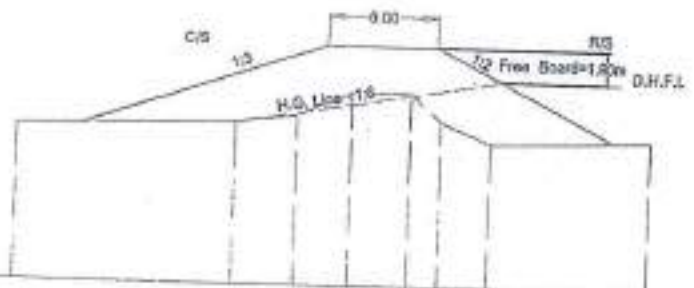
A.E.E.

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	EXECUTIVE ENGINEER BARPETA W.R. DIVISION
AIE (TC)	

Earthwork area = 65.82 sq.m  
 Turfing Length = 25m

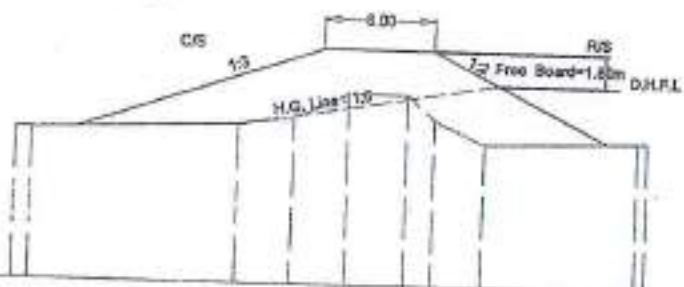


Datum = 48.0m

PROPOSED F.L.	61.04								
EMBANMENTK HIGHT	4.85								
	59.24								
EXISTING R.L.	56.48	56.81	57.22	58.52	58.52	56.52	55.89	56.19	
OFFSET DISTANCES	20.00	8.00	4.62	1.62	0.00	1.62	3.30	6.00	15.02

X-Section at Ch.7700.00m

Earthwork area = 64.16 sq.m  
 Turfing Length = 25 m



Datum = 48.0m

PROPOSED F.L.	60.88										
EMBANMENTK HIGHT	4.78										
	59.08										
EXISTING R.L.	56.31	56.33	56.69	57.06	58.45	58.45	58.45	57.10	55.85	56.10	56.11
OFFSET DISTANCES	19.87	18.99	7.66	4.62	1.62	0.00	1.62	3.13	5.85	14.43	15.02

X-Section at Ch.7800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.M.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.   
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

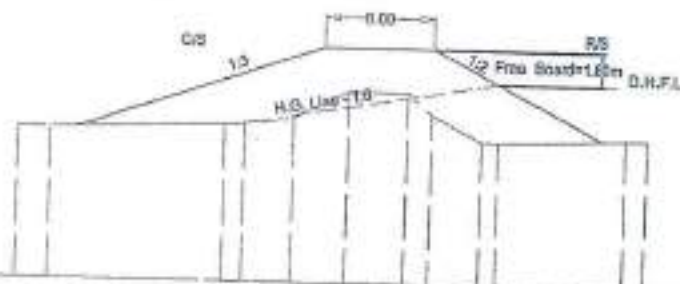
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 63.29 sq.m  
 Turfing Length = 25 m

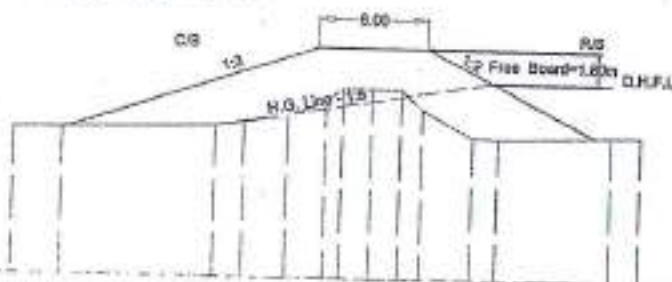


Datum = 48.0m

PROPOSED F.L.	60.72												
EMBANMENTK HIGHT	4.71												
	58.92												
EXISTING R.L.	56.14	56.17	56.44	56.57	56.90	58.38	58.38	58.38	57.18	55.80	55.77	56.01	56.03
OFFSET DISTANCES	19.74	17.99	8.39	7.32	4.62	1.62	0.00	1.82	2.96	5.70	6.63	13.85	15.02

X-Section at Ch.7900.00m

Earthwork area = 62.34 sq.m  
 Turfing Length = 25 m



Datum = 48.0m

PROPOSED F.L.	60.56													
EMBANMENTK HIGHT	4.63													
	58.76													
EXISTING R.L.	55.98	56.03	56.26	56.46	56.75	57.66	58.32	58.32	58.32	57.27	55.73	55.72	55.93	55.96
OFFSET DISTANCES	19.61	16.98	8.58	6.99	4.62	2.52	1.61	0.00	1.81	2.79	5.55	6.94	13.26	15.02

X-Section at Ch.8000.00m

SCALE: 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE.

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 61.55 sq.m  
 Turfing Length = 25 m

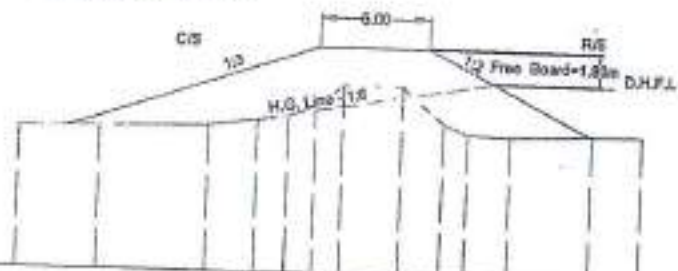


Datum = 48.0m

PROPOSED F.L.	60.40														
EMBANKMENTK HIGHT	4.56														
	58.60														
EXISTING R.L.	55.81	55.87	56.07	56.34	56.59	57.37	58.25	58.25	58.35	57.35	56.39	55.71	55.66	55.84	55.88
OFFSET DISTANCES	19.48	15.98	8.78	6.55	4.62	2.82	1.61	0.00	1.61	3.92	3.78	5.40	7.28	12.67	15.02

X-Section at Ch.8100.00m

Earthwork area = 60.38 sq.m  
 Turfing Length = 25 m



Datum = 48.0m

PROPOSED F.L.	60.24														
EMBANKMENTK HIGHT	4.50														
	58.44														
EXISTING R.L.	55.64	55.72	55.88	56.22	56.43	57.08	58.17	58.18	58.17	56.23	55.67	55.59	55.74	55.80	
OFFSET DISTANCES	19.35	14.97	8.97	6.31	4.82	3.12	1.61	0.00	1.61	3.90	5.25	7.57	12.08	15.02	

X-Section at Ch.8200.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E. [Signature]

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E. [Signature]

E.E.  
 BARPETA [Signature]

SCALE - 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Boki river in the district of  
 Bakas and Barpeta in Brahmaputra valley within Assam  
 (Review)

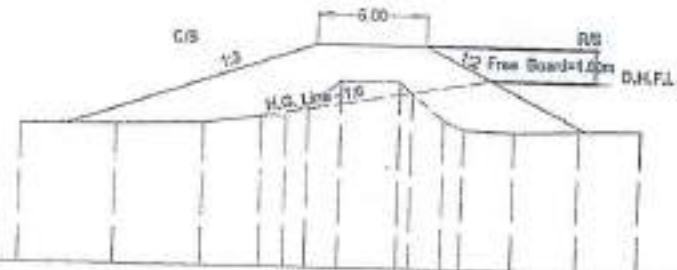
CROSS SECTION (LEFT BANK ENBKT.)

CHECKED BY

[Signature]  
 EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

A.E.E. (TC)

Earthwork area = 59.16 sq.m  
 Turfing Length = 25 m

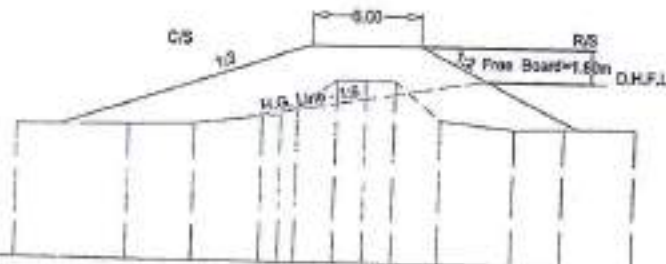


Datum = 48.0m

PROPOSED F.L.	60.08														
EMBANMENTK HIGHT	2.67														
	58.28														
EXISTING R.L.	55.47	55.56	55.70	56.10	56.27	56.54	59.86	59.86	59.27	57.83	57.38	57.29	57.41	57.48	
OFFSET DISTANCES	19.22	13.97	9.17	5.97	4.62	3.42	2.61	0.00	2.61	3.28	4.02	5.10	7.89	11.50	15.02

X-Section at Ch. 8300.00m

Earthwork area = 57.36 sq.m  
 Turfing Length = 25 m



Datum = 48.0m

PROPOSED F.L.	59.92												
EMBANMENTK HIGHT	4.36												
	58.12												
EXISTING R.L.	55.30	55.41	55.51	55.98	56.10	56.49	56.03	58.03	58.03	55.91	55.47	55.56	55.64
OFFSET DISTANCES	19.09	12.96	9.36	5.64	4.62	3.72	1.61	0.00	1.61	4.14	8.20	10.91	15.02

X-Section at Ch. 8400.00m

SCALE - 1:500

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Schema : Integrated flood and erosion management of Manas and Baki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 56.12 sq.m  
 Turfing Length = 24 m



Datum = 48.0m

PROPOSED F.L.	59.75											
EMBANMENTK HIGHT	4.29											
	57.95											
EXISTING R.L.	55.12	55.24	55.31	55.85	56.19	57.95	57.95	57.95	55.74	55.40	55.46	55.55
OFFSET DISTANCES	18.96	11.96	9.56	5.30	4.02	1.60	0.00	1.60	4.26	8.52	10.32	15.02

X-Section at Ch.8500.00m

Earthwork area = 54.78 sq.m  
 Turfing Length = 24 m



Datum = 48.0m

PROPOSED F.L.	59.59											
EMBANMENTK HIGHT	4.22											
	57.79											
EXISTING R.L.	54.95	55.09	55.12	55.90	57.88	57.88	57.88	55.58	55.34	55.37	55.47	55.47
OFFSET DISTANCES	18.83	10.95	9.75	4.32	1.60	0.00	1.60	4.38	8.83	9.73	15.02	15.02

X-Section at Ch.8600.00m

SCALE = 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Deki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

CROSS SECTION (LEFT BANK (EMBKT.))

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 53.85 sq.m  
 Turfing Length = 24 m

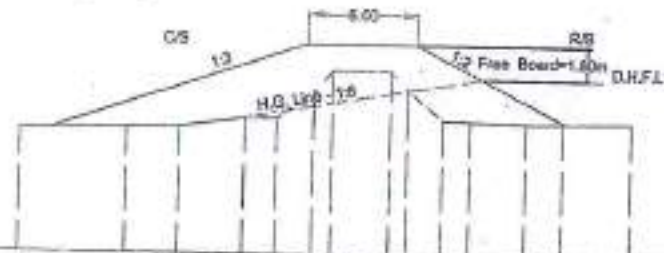


Datum = 48.0m

PROPOSED F.L.	59.43								
EMBANKMENTK HIGHT	4.16								
	57.63								
EXISTING R.L.	54.78	54.94	55.61	57.81	57.81	57.81	55.42	55.27	55.39
OFFSET DISTANCES	18.70	9.95	4.62	1.60	0.00	1.60	4.50	9.14	15.02

X-Section at Ch.6700.00m

Earthwork area = 53.93 sq.m  
 Turfing Length = 24 m



Datum = 48.0m

PROPOSED F.L.	59.33														
EMBANKMENTK HIGHT	4.12														
	57.53														
EXISTING R.L.	54.67	54.78	54.83	55.28	56.77	55.31	57.87	57.88	57.87	56.88	55.28	55.27	55.17	55.21	55.28
OFFSET DISTANCES	18.70	12.87	9.95	6.49	4.62	1.56	0.00	1.59	2.55	4.49	5.99	9.08	11.10	15.02	

X-Section at Ch.8800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.   
 BARPETA

SCALE = 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and areolen  
 management of Manas and Bakl river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

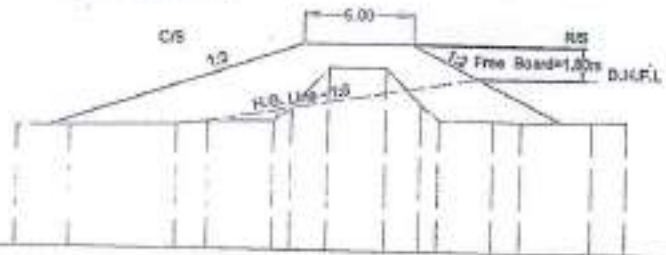
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 53.93 sq.m  
 Turfing Length = 24m

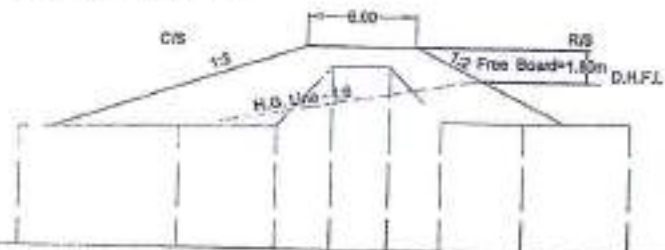


Datum = 48.0m

PROPOSED F.L.	59.23														
EMBANKMENTK HIGHT	4.16														
	57.43														
EXISTING R.L.	54.58	54.83	54.74	54.96	55.01	55.74	57.95	57.95	57.95	55.95	55.15	55.12	55.08	55.15	55.19
OFFSET DISTANCES	18.70	15.78	9.95	8.17	4.62	3.61	1.58	0.00	1.58	3.50	4.47	7.48	9.02	13.06	15.02

X-Section at Ch.8900.00m

Earthwork area = 53.72 sq.m  
 Turfing Length = 24 m



Datum = 48.0m

PROPOSED F.L.	59.12														
EMBANKMENTK HIGHT	4.16														
	57.32														
EXISTING R.L.	54.47	54.63	54.70	54.70	58.01	58.01	58.01	58.01	55.01	54.96	55.08	55.08	55.08	55.08	55.08
OFFSET DISTANCES	18.70	9.95	4.62	1.58	0.00	1.58	4.45	8.96	15.02						

X-Section at Ch.9000.00m

SCALE = 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.

CHECKED AT RANDOM AND FOUND CORRECT

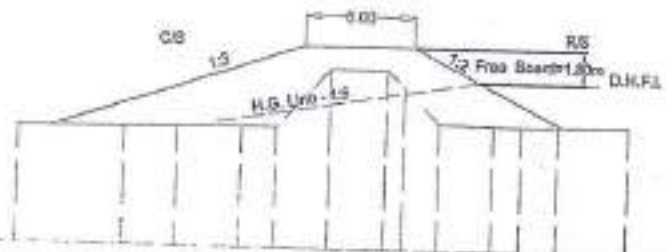
A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Mores and Beki river in the district of Baksa and BARPETA in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY AEE (TC)	 EXECUTIVE ENGINEER BARPETA W.R. DIVISION



Earthwork area = 54.80 sq.m  
 Turfing Length = 24m

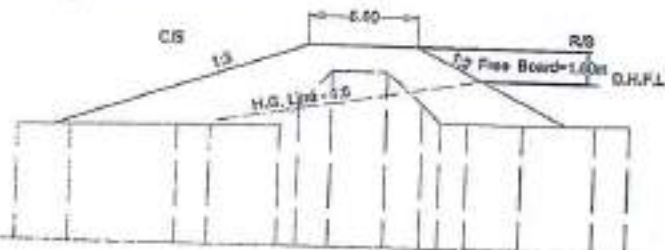


Datum = 48.0m

PROPOSED F.L.	59.02									
EMBANMENTK HIGHT	4.11									
	67.22									
EXISTING R.L.	54.37	54.48	54.53	54.58	54.60	57.77	57.77	56.91	54.91	54.98
OFFSET DISTANCES	18.70	12.87	9.95	6.40	4.48	1.55	0.00	1.55	2.54	15.02

X-Section at Ch.9100.00m

Earthwork area = 65.97 sq.m  
 Turfing Length = 24 m



Datum = 48.0m

PROPOSED F.L.	58.91									
EMBANMENTK HIGHT	4.16									
	57.11									
EXISTING R.L.	54.25	54.31	54.41	54.44	54.48	57.51	57.51	54.78	54.75	54.86
OFFSET DISTANCES	18.70	15.78	9.95	8.17	4.33	1.53	0.00	1.53	8.96	15.02

X-Section at Ch.9200.00m

SCALE - 1:400

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E. *[Signature]*

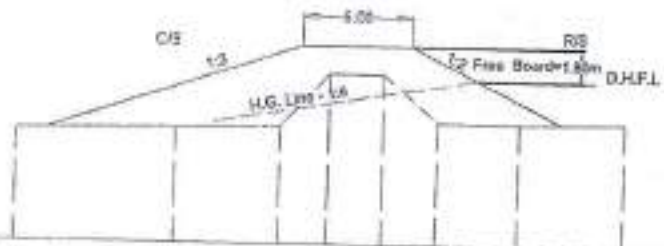
CHECKED AT RANDOM AND FOUND CORRECT

A.E.E. *[Signature]*

E.E.  
 BARPETA *[Signature]*

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	<i>[Signature]</i>
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 57.41 sq.m  
 Turfing Length = 24m

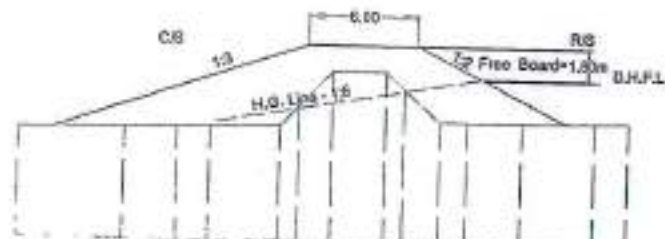


Datum = 48.0m

PROPOSED F.L.	58.81								
EMBANKMENTK HIGHT	4.17								
	57.01								
EXISTING R.L.	54.15	54.31	54.38	57.26	57.26	57.26	54.69	54.64	54.76
OFFSET DISTANCES	18.70	9.95	4.19	1.50	0.00	1.50	4.45	8.96	15.02

X-Section at Ch.9300.00m

Earthwork area = 56.59 sq.m  
 Turfing Length = 24 m



Datum = 48.0m

PROPOSED F.L.	58.71								
EMBANKMENTK HIGHT	4.16								
	56.91								
EXISTING R.L.	54.05	54.16	54.21	54.24	54.28	57.29	57.29	54.59	54.63
OFFSET DISTANCES	18.70	12.87	9.95	8.16	3.27	1.48	0.00	5.95	13.00

X-Section at Ch.9400.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

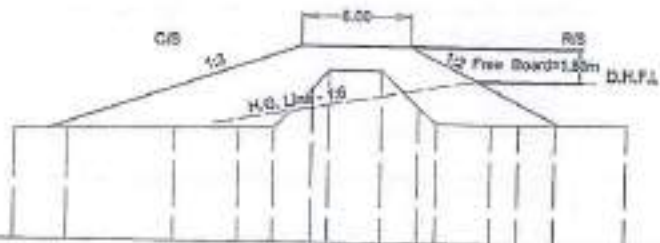
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

A.E.E. (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 55.80 sq.m  
 Turfing Length = 24 m

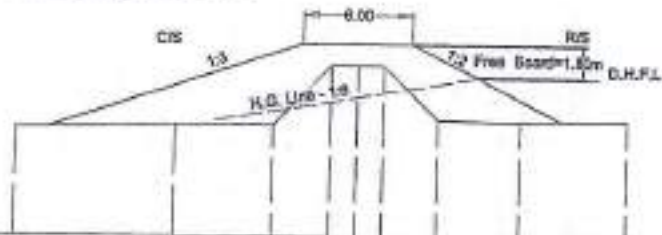


Datum = 48.0m

PROPOSED F.L.	58.60													
EMBANMENTK HIGHT	4.12													
	56.80													
EXISTING R.L.	53.94	53.99	54.10	54.15	54.17	56.33	57.30	57.30	55.34	54.48	54.45	54.44	54.48	54.55
OFFSET DISTANCES	18.70	15.78	9.95	6.37	4.45	2.36	1.50	0.00	1.50	3.47	4.45	7.46	8.96	15.02

X-Section at Ch.9500.00m

Earthwork area = 54.78 sq.m  
 Turfing Length = 24 m



Datum = 48.0m

PROPOSED F.L.	58.50													
EMBANMENTK HIGHT	4.17													
	56.70													
EXISTING R.L.	53.84	54.00	54.07	57.31	57.31	57.31	54.38	54.33	54.45	54.45	54.45	54.45	54.45	54.45
OFFSET DISTANCES	18.70	9.95	4.58	1.45	0.00	1.45	4.45	8.96	15.02	15.02	15.02	15.02	15.02	15.02

X-Section at Ch.9600.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

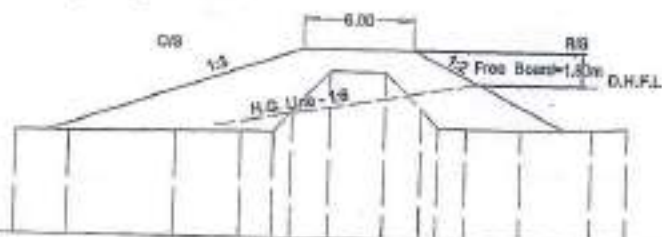
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

A.E.E. (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 56.33 sq.m  
Turfling Length = 25 m

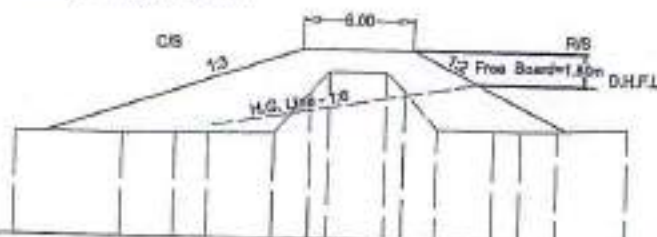


Datum = 48.0m

PROPOSED F.L.	58.39													
EMBANMENTK HIGHT	4.24													
	56.59													
EXISTING R.L.	53.73	53.70	53.81	53.85	53.88	55.03	57.19	57.19	55.23	54.20	54.18	54.15	54.23	54.34
OFFSET DISTANCES	18.70	15.78	9.95	6.37	4.57	3.59	1.50	0.00	1.50	3.50	4.40	5.95	8.96	13.00

X-Section at Ch.9700.00m

Earthwork area = 57.96 sq.m  
Turfling Length = 25 m



Datum = 48.0m

PROPOSED F.L.	58.29													
EMBANMENTK HIGHT	4.28													
	56.49													
EXISTING R.L.	53.63	53.57	53.62	53.64	53.69	55.98	57.07	57.07	56.09	54.02	53.99	53.97	54.01	54.24
OFFSET DISTANCES	18.70	12.87	9.96	8.16	4.56	2.59	1.55	0.00	1.55	2.55	4.36	7.46	8.96	10.98

X-Section at Ch.9800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

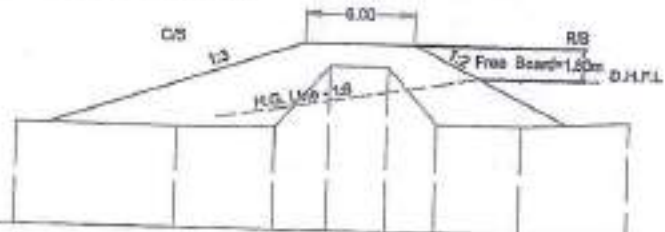
A.E.E.

E.E.  
BARPETA

SCALE - 1:100

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 59.52 sq.m  
Turfling Length = 25 m

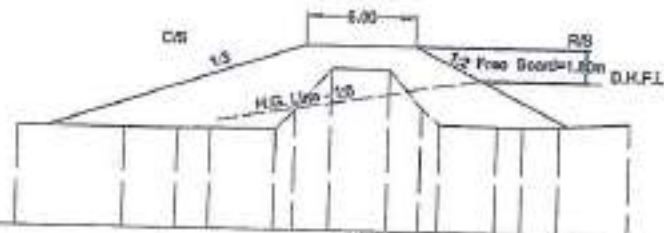


Datum = 48.0m

PROPOSED F.L.	58.19													
EMBANMENTK HIGHT	4.39													
	56.39													
EXISTING R.L.	53.54		53.44		53.51		56.95	56.95	56.95	53.85		53.80		54.15
OFFSET DISTANCES	18.70		9.95		4.55		1.60	0.00	1.60	4.31		6.96		15.02

X-Section at Ch.9900.00m

Earthwork area = 59.11 sq.m  
Turfling Length = 25 m



Datum = 48.0m

PROPOSED F.L.	58.08																			
EMBANMENTK HIGHT	4.23																			
	56.28																			
EXISTING R.L.	53.42		53.36	53.38	53.40		53.45	56.78	56.80	56.78	54.71	53.61		53.78		53.77		53.85		54.08
OFFSET DISTANCES	18.70		12.87		9.95	8.20		4.60	3.55	1.58	0.00	1.58	3.39	4.41		7.51	8.96	10.98		15.02

X-Section at Ch.10000.00m

SCALE - 1:100

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E. *[Signature]*

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E. *[Signature]*

E.E.  
BARPETA *[Signature]*

GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W. R. DIVISION  
BARPETA

Name of Scheme : Integrated flood and erosion  
management of Manas and Beki river in the district of  
Baksa and Barpeta in Brahmaputra valley within Assam  
(Review)

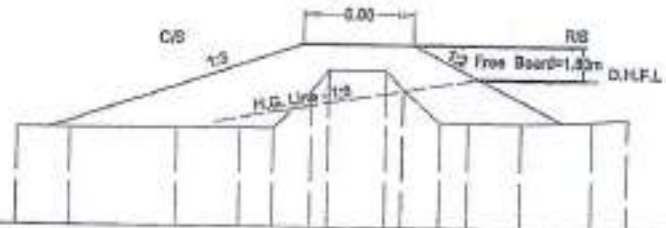
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

*[Signature]*  
EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION

Earthwork area =58.16 sq.m  
 Turfing Length =25 m

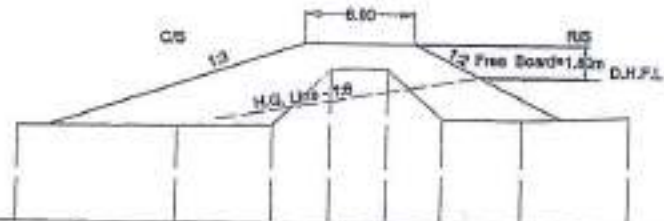


Datum =48.0m

PROPOSED F.L.	57.98														
EMBANMENTK HIGHT	4.24														
	56.18														
EXISTING R.L.	53.32	53.29	53.32	53.37	53.39	55.46	58.01	58.62	55.58	53.79	53.77	53.74	53.91	54.03	
OFFSET DISTANCES	18.70	15.78	9.95	6.44	4.64	2.55	1.57	0.00	1.57	2.47	4.50	6.05	8.96	13.00	15.02

X-Section at Ch.10100.00m

Earthwork area =56.53 sq.m  
 Turfing Length =25 m



Datum =48.0m

PROPOSED F.L.	57.88													
EMBANMENTK HIGHT	4.15													
	56.08													
EXISTING R.L.	53.23	53.28	53.35	56.45	56.51	56.46	53.77	53.73	53.98					
OFFSET DISTANCES	18.70		9.95	4.69	1.55	0.00	1.55	4.59	8.96	15.02				

X-Section at Ch.10200.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Mansa and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

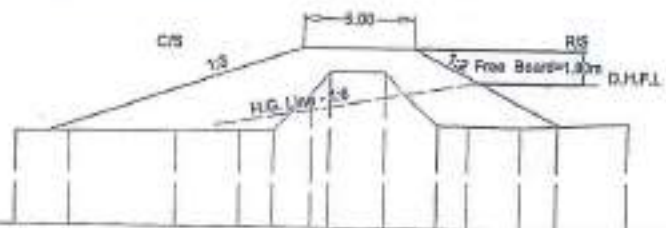
CROSS SECTION (LEFT BANK ENDKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =56.19 sq.m  
 Turfing Length =24m

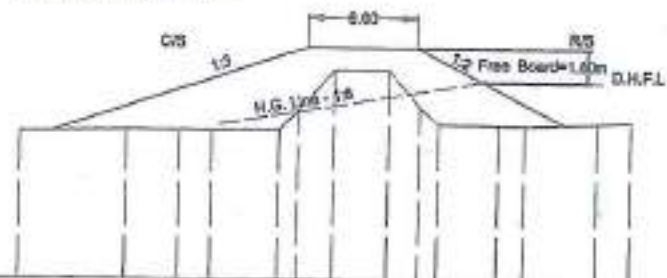


Datum =48.0m

PROPOSED F.L.	57.77													
EMBANMENTK HIGHT	4.07													
	55.97													
EXISTING R.L.	53.11	53.17	53.20	53.25	53.27	55.34	56.46	56.51	56.46	53.66	53.64	53.61	53.70	53.87
OFFSET DISTANCES	18.70	15.78	9.95	6.44	4.60	2.50	1.52	0.00	1.52	4.41	6.05	8.96	10.98	15.02

X-Section at Ch.10300.00m

Earthwork area =55.66 sq.m  
 Turfing Length =24m



Datum =45.0m

PROPOSED F.L.	57.67														
EMBANMENTK HIGHT	4.15														
	55.87														
EXISTING R.L.	53.02	53.13	53.15	53.17	53.22	54.25	56.50	56.53	56.49	54.46	53.56	53.54	53.52	53.69	53.78
OFFSET DISTANCES	18.70	12.87	9.95	8.20	4.50	3.46	1.50	0.00	1.50	3.21	4.23	7.51	8.96	13.00	15.02

X-Section at Ch.10400.00m

SCALE - 1:100

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.V.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

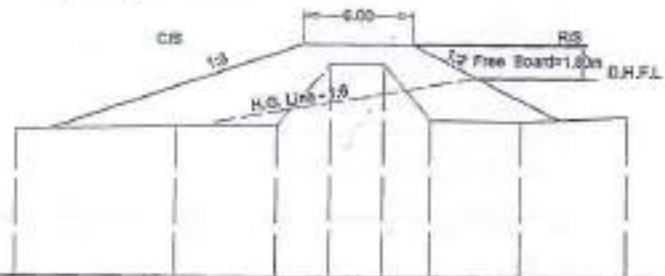
CROSS SECTION (LEFT BANK EMSKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =54.72 sq.m  
Turfling Length =24 m

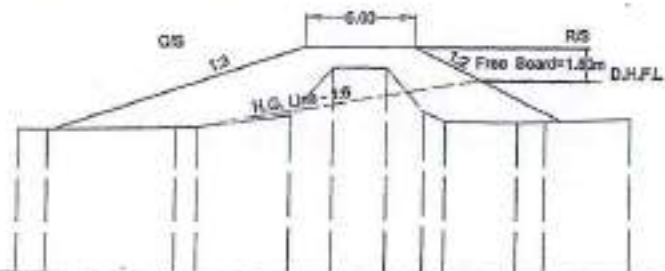


Datum =45.0m

PROPOSED F.L.	57.56								
EMBANMENTK HIGHT	4.15								
	55.76								
EXISTING R.L.	52.91	53.07	53.14	56.94	56.52	56.47	53.45	53.41	53.66
OFFSET DISTANCES	18.70	9.95	4.41	1.47	0.00	1.47	4.04	8.96	15.02

X-Section at Ch.10500.00m

Earthwork area =53.00 sq.m  
Turfling Length =24 m



Datum =45.0m

PROPOSED F.L.	57.46												
EMBANMENTK HIGHT	4.06												
	55.66												
EXISTING R.L.	52.87	52.87	53.00	53.01	53.64	56.33	56.35	56.33	53.89	53.36	53.34	53.40	53.60
OFFSET DISTANCES	18.70	17.08	10.08	8.90	3.83	1.48	0.00	1.48	3.53	4.71	8.65	10.17	15.02

X-Section at Ch.10600.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

S.E.  
BARPETA

SCALE - 1:500

GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W. R. DIVISION  
BARPETA

Name of Scheme : Integrated flood and erosion  
management of Manas and Beki river in the district of  
Baksa and Barpeta in Brahmaputra valley within Assam  
(Review)

CROSS SECTION (LEFT BANK EMBKT.)

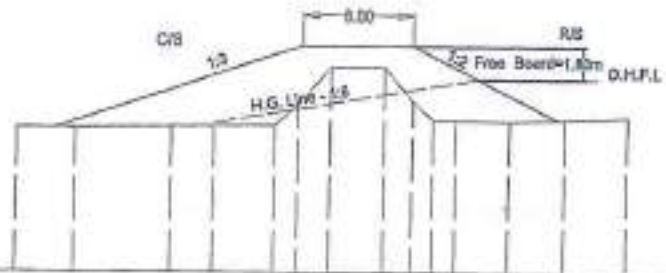
CHECKED BY

A.E.E. (TC)

EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION



Earthwork area =53.92 sq.m  
 Turfing Length =24 m

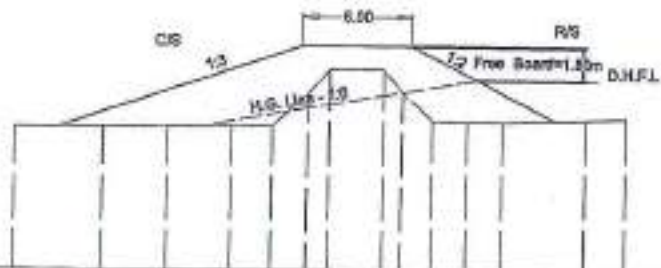


Datum =45.0m

PROPOSED F.L.	57.36														
EMBANMENTK HIGHT	3.97														
	55.58														
EXISTING R.L.	52.85	52.84	52.94	52.97	53.01	54.15	56.16	56.19	56.15	54.34	53.34	53.32	53.29	53.39	53.55
OFFSET DISTANCES	18.70	15.47	10.22	7.86	4.53	3.25	1.48	0.00	1.48	3.02	4.13	5.38	8.34	11.39	15.02

X-Section at Ch.10700.00m

Earthwork area =53.22 sq.m  
 Turfing Length =23 m



Datum =45.0m

PROPOSED F.L.	57.25														
EMBANMENTK HIGHT	3.88														
	55.45														
EXISTING R.L.	52.81	52.79	52.86	52.90	52.93	54.84	55.98	56.02	55.98	54.77	53.26	53.24	53.22	53.37	53.47
OFFSET DISTANCES	18.70	13.85	10.35	6.81	4.60	2.66	1.49	0.00	1.48	2.52	4.18	6.06	8.02	12.60	15.02

X-Section at Ch.10800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.J.E.

CHECKED AT RANDOM AND FOUND CORRECT

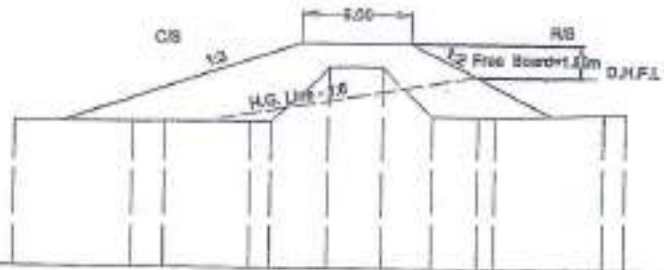
A.E.E.

E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY AEE (TC)	 EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area =52.32 sq.m  
Turfling Length =23m



PROPOSED F.L.	57.15							
EMBANMENTK HIGHT	3.79							
	55.35							
EXISTING R.L.	52.77	52.76	52.79	52.85	55.81	53.2	53.17	53.36
OFFSET DISTANCES	18.70	12.23	10.48	5.76	1.49	4.23	6.73	13.81
				4.86	0.00			15.02
				52.88	55.85	55.82	53.16	53.41

X-Section at Ch.10900.00m

Earthwork area =51.21 sq.m  
Turfling Length =23m



PROPOSED F.L.	57.04							
EMBANMENTK HIGHT	3.69							
	55.24							
EXISTING R.L.	52.74	52.72	52.79	55.64	53.14	53.09	53.35	53.35
OFFSET DISTANCES	18.70	10.62	4.72	1.50	4.27	7.40	15.02	15.02
				0.00				
				55.68	55.66			

X-Section at Ch.11000.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W. R. DIVISION  
BARPETA

Name of Schema : Integrated flood and erosion  
management of Manas and Beki river in the district of  
Baksa and Barpeta in Brahmaputra valley within Assam  
(Review)

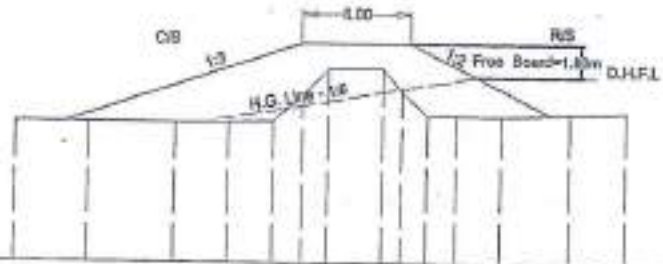
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

A.E.E. (TC)

EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION

Earthwork area =52.35 sq.m  
 Turfing Length =23m



Datum =45.0m

PROPOSED F.L.	56.94														
EMBANMENTK HIGHT	3.82														
	55.14														
EXISTING R.L.	52.63	52.62	52.61	52.65	52.68	54.11	55.56	55.60	55.56	54.29	53.03	53.01	52.99	53.12	53.24
OFFSET DISTANCES	18.70	14.66	9.93	6.98	4.53	2.92	1.50	0.00	1.50	2.96	3.95	5.51	7.97	11.78	15.02

X-Section at Ch.11100.00m

Earthwork area =52.57 sq.m  
 Turfing Length =23m



Datum =45.0m

PROPOSED F.L.	56.84														
EMBANMENTK HIGHT	3.95														
	55.04														
EXISTING R.L.	52.54	52.51	52.59	55.48	55.53	55.48	51.94	52.89	53.15						
OFFSET DISTANCES	18.70	9.25	4.34	1.50	0.00	1.50	3.62	8.54	15.02						

X-Section at Ch.11200.00m

SCALE: 1:100

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

F.S.  
 BARPETA

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

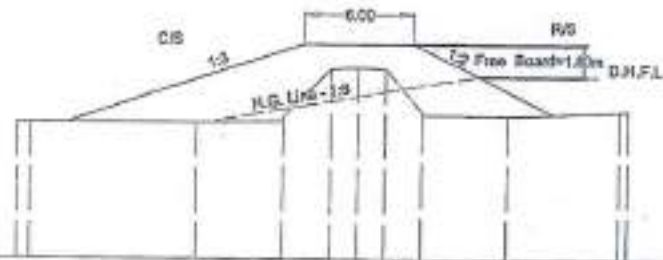
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =52.75 sq.m  
 Turfing Length =23 m

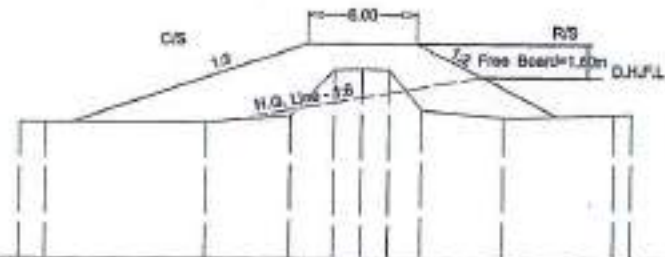


Datum =45.0m

PROPOSED F.L.	56.73										
EMBANMENTK HIGHT	3.95										
	54.93										
EXISTING R.L.	52.43	52.42	52.41	52.68	55.34	55.39	55.34	53.00	52.78	53.02	53.04
OFFSET DISTANCES	18.70	18.00	8.88	4.12	1.50	0.00	1.50	3.45	8.17	14.53	15.02

X-Section at Ch.11300.00m

Earthwork area =51.40 sq.m  
 Turfing Length =23 m



Datum =45.0m

PROPOSED F.L.	56.83										
EMBANMENTK HIGHT	3.95										
	54.83										
EXISTING R.L.	52.32	52.32	52.31	52.77	55.22	55.26	55.22	53.06	52.68	52.69	52.93
OFFSET DISTANCES	18.70	17.29	8.51	3.90	1.50	0.00	1.50	3.29	7.79	14.03	15.02

X-Section at Ch.11400.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.   
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Bakas and Barpeta in Brahmaputra valley within Assam  
 (Review)

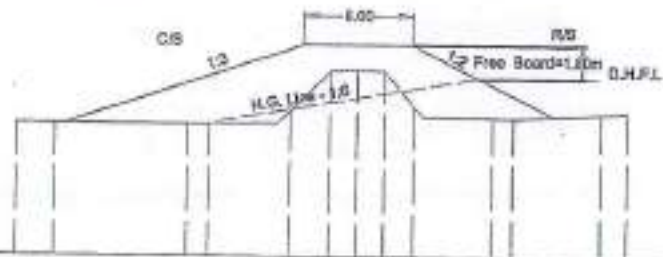
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

A.E.E. (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =53.07 sq.m  
 Turfing Length =23m



Datum =45.0m

PROPOSED F.L.	56.53												
EMBANMENTK HIGHT	3.95												
	54.73												
EXISTING R.L.	18.70	52.23	52.22	52.21	52.22	52.88	55.10	55.14	55.10	53.14	52.58	52.78	52.84
OFFSET DISTANCES	18.70	16.59	9.32	8.14	3.68	1.50	0.00	1.50	3.13	7.42	8.55	13.54	15.02

X-Section at Ch.11500.00m

Earthwork area =53.22 sq.m  
 Turfing Length =23m



Datum =45.0m

PROPOSED F.L.	56.42														
EMBANMENTK HIGHT	3.95														
	54.62														
EXISTING R.L.	18.70	52.11	52.11	52.09	52.11	52.16	52.96	54.96	55.00	54.96	53.20	52.48	52.47	52.85	52.72
OFFSET DISTANCES	18.70	15.88	9.34	7.77	4.38	3.47	1.50	0.00	1.50	2.97	7.04	8.56	13.04	15.02	

X-Section at Ch.11600.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE: 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

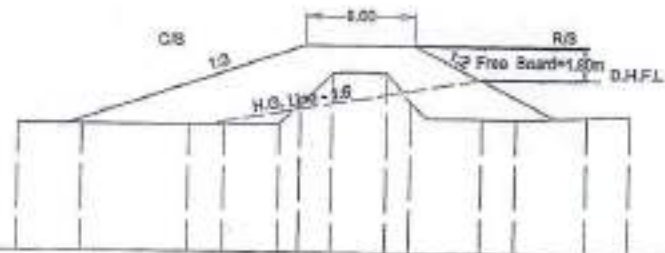
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =53.35 sq.m  
 Turfing Length =23m

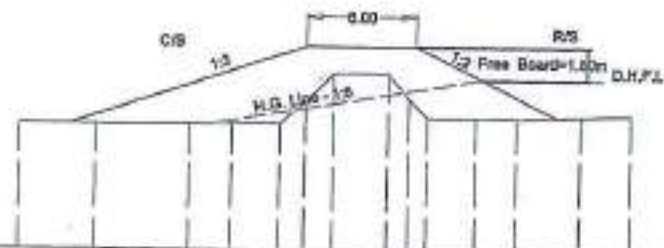


Datum =45.0m

PROPOSED F.L.	56.32													
EMBANMENTK HIGHT	3.95													
	54.12													
EXISTING R.L.	52.02	52.01	52.00	52.03	52.07	53.07	54.85	54.88	54.85	53.28	52.39	52.37	52.53	52.63
OFFSET DISTANCES	18.70	15.18	9.36	7.41	4.39	3.25	1.50	0.00	1.50	2.80	6.67	8.56	12.55	15.02

X-Section at Ch.11700.00m

Earthwork area =53.48 sq.m  
 Turfing Length =23m



Datum =45.0m

PROPOSED F.L.	58.21														
EMBANMENTK HIGHT	3.95														
	54.41														
EXISTING R.L.	51.91	51.90	51.89	51.92	51.96	53.15	54.71	54.74	54.71	53.34	52.30	52.28	52.26	52.40	52.52
OFFSET DISTANCES	18.70	14.48	9.39	7.04	4.40	3.03	1.50	0.00	1.50	2.84	3.64	6.29	8.56	12.05	15.02

X-Section at Ch.11800.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E. [Signature]

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E. [Signature]

E.E.  
 BARPETA [Signature]

SCALE - 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

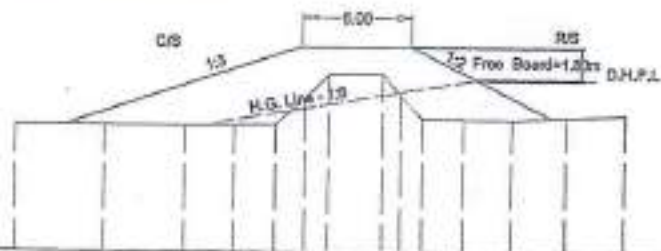
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

[Signature]  
 EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =53.59 sq.m  
Turfling Length =23m

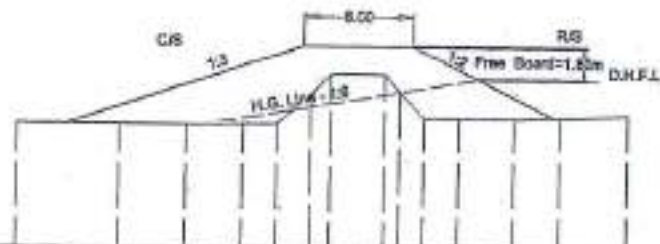


Datum =45.0m

PROPOSED F.L.	56.11														
EMBANMENTK HIGHT	3.84														
	54.31														
EXISTING R.L.	51.80	51.79	51.78	51.82	51.85	53.25	54.58	54.61	54.58	53.41	52.20	52.18	52.16	52.27	52.41
OFFSET DISTANCES	18.70	13.77	9.41	6.87	4.41	2.81	1.50	0.00	1.50	2.48	3.64	5.92	8.57	11.56	15.02

X-Section at Ch.11900.00m

Earthwork area =53.69 sq.m  
Turfling Length =23 m



Datum =45.0m

PROPOSED F.L.	56.01														
EMBANMENTK HIGHT	3.86														
	54.21														
EXISTING R.L.	51.71	51.70	51.69	51.73	51.76	52.46	53.59	54.48	54.47	53.48	52.10	52.08	52.05	52.15	52.31
OFFSET DISTANCES	18.70	13.07	9.43	6.30	4.41	2.59	1.50	0.00	1.50	2.31	3.65	5.54	8.57	11.06	15.02

X-Section at Ch.12000.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W. R. DIVISION  
BARPETA

Name of Scheme : Integrated flood and erosion  
management of Manas and Bekher in the district of  
Baksa and Barpeta in Brahmaputra valley within Assam  
(Review)

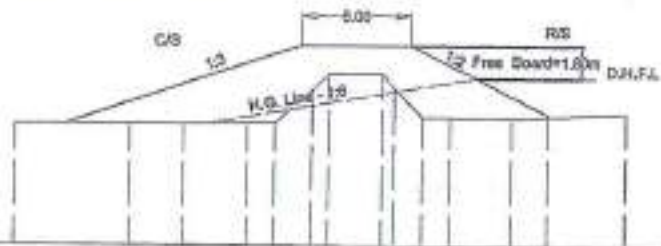
CROSS SECTION (LEFT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION

Earthwork area =53.78 sq.m  
 Turfing Length =23m

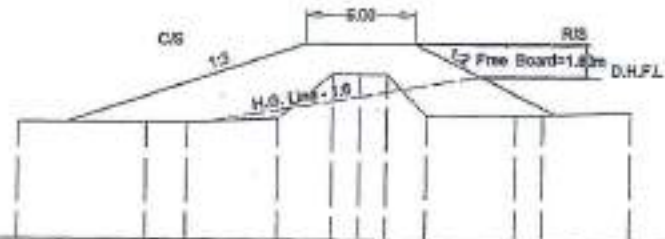


Datum =45.0m

PROPOSED F.L.	55.90														
EMBANMENTK HIGHT	3.87														
	54.10														
EXISTING R.L.	51.59	51.58	51.57	51.62	51.65	53.44	54.34	54.36	54.34	51.99	51.98				
OFFSET DISTANCES	18.70	12.37	9.46	5.93	4.42	2.37	1.50	0.00	1.50	2.15	3.65	5.17	8.57	10.57	15.02

X-Section at Ch.12100.00m

Earthwork area =53.73 sq.m  
 Turfing Length =23m



Datum =45.0m

PROPOSED F.L.	55.80										
EMBANMENTK HIGHT	3.90										
	54.00										
EXISTING R.L.	51.49	51.47	51.47	51.69	54.13	54.11	54.11	51.85	51.85	51.90	52.10
OFFSET DISTANCES	18.70	11.66	9.48	4.43	1.50	0.00	1.50	3.66	8.58	10.07	15.02

X-Section at Ch.12195.00m

SCALE - 1:100

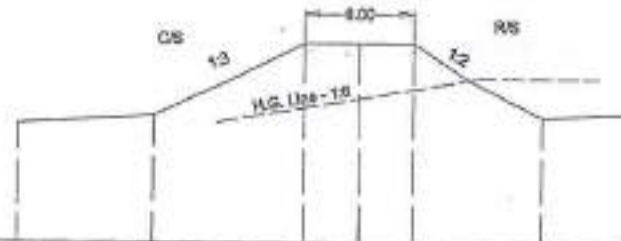
CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE  
 A.E./E.

CHECKED AT RANDOM AND FOUND CORRECT  
 A.E.E.  
 E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION



Earthwork area =0.00 sq.m  
 Turfing Length =0.00m



Datum =45.0m

PROPOSED F.L.	55.80						
EMBANMENTK HIGHT	3.90						
	54.00						
EXISTING R.L.	51.49	51.95	55.80	55.80	55.80	51.90	52.10
OFFSET DISTANCES	18.70	11.25	3.00	0.00	3.00	10.07	15.02

X-Section at Ch.12200.00m

SCALE - 1:100

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.J.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (LEFT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area = 0.00 sq.m  
 Turfing Length = 0.00m

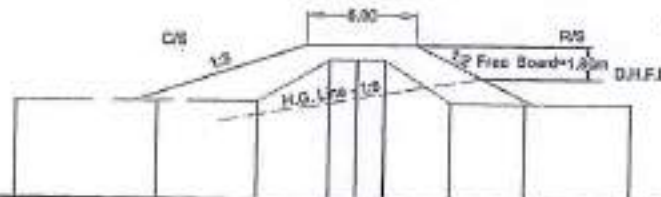


Datum = 38.0m

PROPOSED F.L.	46.73					
EMBANMENTK HIGHT	3.38					
	44.93					
EXISTING R.L.	43.43	43.45	46.73	46.73	46.73	43.37 43.36
OFFSET DISTANCES	18.70	12.40	3.00	0.00	3.00	9.40 10.29

X-Section at Ch.2500.00m

Earthwork area = 27.86 sq.m  
 Turfing Length = 19m



Datum = 38.0m

PROPOSED F.L.	46.73								
EMBANMENTK HIGHT	3.42								
	44.93								
EXISTING R.L.	43.48	43.41	43.44	45.70	45.70	45.70	43.37	43.31	43.35
OFFSET DISTANCES	18.70	10.98	5.46	1.50	0.00	1.50	5.12	9.25	15.02

X-Section at Ch.2505.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1/400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

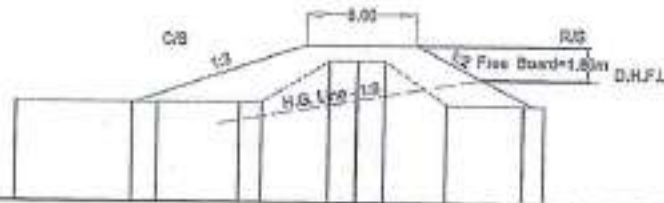
CROSS SECTION (RIGHT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 28.42 sq.m  
 Turfing Length = 18m

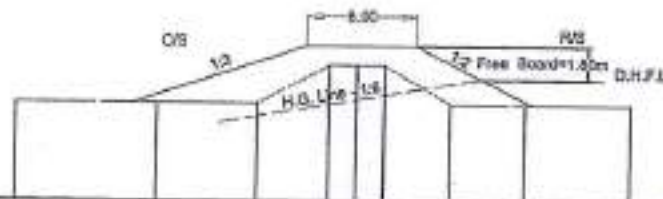


Datum = 38.0m

PROPOSED F.L.	46.71						
EMBANMENTK HIGHT	3.40						
	44.91						
EXISTING R.L.	43.37	43.38	43.38	43.41	45.66	43.36	43.31
		10.95		43.46	45.66		43.30
OFFSET DISTANCES	18.70	12.33	10.95	6.45	5.22	1.50	0.00
				43.46	45.66	1.50	4.90
							9.15
							10.29

X-Section at Ch.2600.00m

Earthwork area = 29.75 sq.m  
 Turfing Length = 18m



Datum = 38.0m

PROPOSED F.L.	46.69						
EMBANMENTK HIGHT	3.38						
	44.89						
EXISTING R.L.	43.38	43.39	43.40	45.64	45.64	43.38	43.31
		10.98	5.46	43.40	45.64		43.35
OFFSET DISTANCES	18.70	10.98	5.46	1.50	0.00	1.50	5.12
				43.40	45.64	1.50	9.25
							15.02

X-Section at Ch.2700.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Bakas and Barpeta in Brahmaputra valley within Assam  
 (Review)

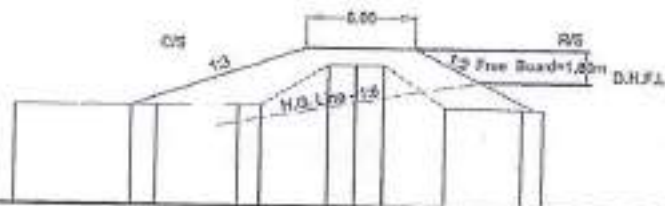
CROSS SECTION (RIGHT BANK (EMBKT.))

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =29.52 sq.m  
 Turfing Length =18m

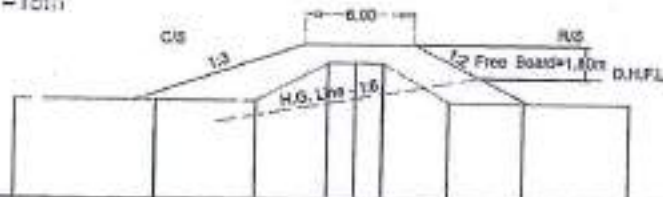


Datum =38.0m

PROPOSED F.L.	46.67						
EMBANMENTK HIGHT	3.41						
	44.87						
EXISTING R.L.	43.32	43.33	43.33	43.36	45.61	43.31	43.25
OFFSET DISTANCES	18.70	12.33	10.95	6.45	1.50	4.90	9.15
				5.22	0.00		10.29
				43.41	45.61		43.25
				43.41	45.61		43.25

X-Section at Ch.2800.00m

Earthwork area =28.88 sq.m  
 Turfing Length =18m



Datum =38.0m

PROPOSED F.L.	46.65						
EMBANMENTK HIGHT	3.34						
	44.85						
EXISTING R.L.	43.38	43.39	43.40	45.60	45.60	43.38	43.35
OFFSET DISTANCES	18.70	10.98	5.46	1.50	0.00	5.12	9.25
				1.50	1.50		15.02
				43.38	45.60		43.35
				43.38	45.60		43.35

X-Section at Ch.2900.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.

BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

CROSS SECTION (RIGHT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =20.79 sq.m  
Turfig Length =10m



Datum =38.0m

PROPOSED F.L.	46.63											
EMBANMENTK HIGHT	3.37											
	44.83											
EXISTING R.L.	18.70	43.32	43.33	43.33	43.36	43.44	45.58	45.58	45.58	43.31	43.26	43.25
OFFSET DISTANCES	18.70	12.33	10.95	10.95	6.45	5.22	1.50	0.00	1.50	4.90	9.15	10.29

X-Section at Ch.3000.00m

Earthwork area =29.46 sq.m  
Turfig Length =16m



Datum =38.0m

PROPOSED F.L.	46.61											
EMBANMENTK HIGHT	3.30											
	44.81											
EXISTING R.L.	18.70	43.38	43.39	43.39	43.40	45.56	45.56	45.56	43.34	43.31	43.30	43.30
OFFSET DISTANCES	18.70	10.98	10.98	10.98	5.46	1.50	0.00	1.50	5.12	9.25	15.02	15.02

X-Section at Ch.3100.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
BARPETA

SCALE : 1:400

GOVT. OF ASSAM  
WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W. R. DIVISION  
BARPETA

Name of Scheme : Integrated flood and erosion  
management of Manas and Baki river in the district of  
Bakse and Barpeta in Brahmaputra valley within Assam  
(Review)

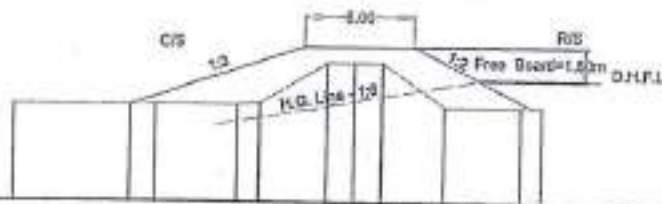
CROSS SECTION (RIGHT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION

Earthwork area = 28.50 sq.m  
 Turfing Length = 10m

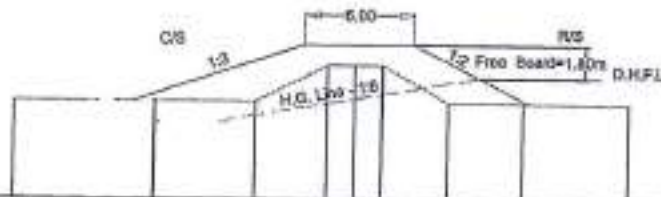


Datum = 38.0m

PROPOSED F.L.	46.59						
EMBANMENTK HIGHT	3.36						
	44.79						
EXISTING R.L.	43.29	43.30	43.30	43.33	45.55	43.26	43.22
OFFSET DISTANCES	18.70	12.33	10.95	6.45	1.50	4.90	9.15
				5.22	0.00		10.29
					1.50		

X-Section at Ch.3200.00m

Earthwork area = 29.50 sq.m  
 Turfing Length = 18m



Datum = 38.0m

PROPOSED F.L.	46.57						
EMBANMENTK HIGHT	3.30						
	44.77						
EXISTING R.L.	43.34	43.35	43.36	45.52	43.32	43.27	43.26
OFFSET DISTANCES	18.70	10.98	5.46	1.50	5.12	9.25	15.02
				0.00			
				1.50			

X-Section at Ch.3300.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E. *[Signature]*

CHECKED AT RANDOM AND FOUND CORRECT

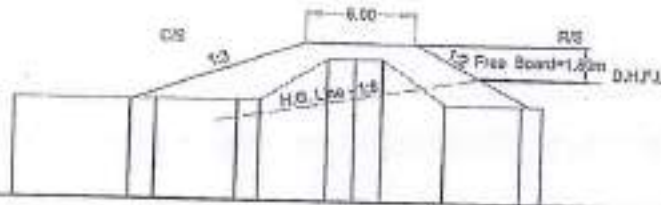
A.E.E. *[Signature]*

E.E.  
 BARPETA *[Signature]*

SCALE - 1:100

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DMSION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (RIGHT BANK EMBKT.)	
CHECKED BY	<i>[Signature]</i>
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DMSION

Earthwork area = 28.55 sq.m  
 Turfing Length = 20m

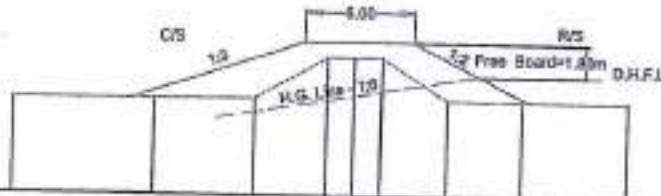


Datum = 38.0m

PROPOSED F.L.	46.55						
EMBANMENTK HIGHT	3.30						
	44.75						
EXISTING R.L.	43.31	43.32	43.32	43.35	43.38	45.50	43.28
						45.50	
						45.50	
OFFSET DISTANCES	18.70	12.33	10.95	6.45	5.22	1.60	4.90
						0.00	
						1.50	
							9.15
							10.28

X-Section at Ch.3400.00m

Earthwork area = 27.76 sq.m  
 Turfing Length = 20m



Datum = 38.0m

PROPOSED F.L.	46.53						
EMBANMENTK HIGHT	3.35						
	44.73						
EXISTING R.L.	43.35	43.28	43.33	45.47	45.47	45.47	43.25
							43.18
							43.22
OFFSET DISTANCES	18.70	10.98	5.46	1.50	0.00	1.50	5.12
							9.25
							15.02

X-Section at Ch.3500.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E. ✓

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:100

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Monas and Beki river in the district of  
 Baksa and Barpeta in Brahmaputra valley within Assam  
 (Review)

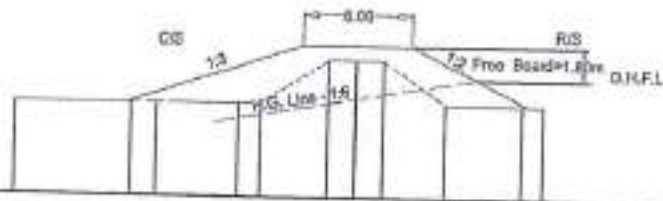
CROSS SECTION (RIGHT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area =28.84 sq.m  
Turfing Length =20m



Datum =38.0m

PROPOSED F.L.	46.51						
EMBANMENTK HIGHT	2.47						
	44.71						
EXISTING R.L.	43.03	43.03	43.03	43.06	45.45	43.08	44.04
		43.03		43.10	45.45		43.05
OFFSET DISTANCES	18.70	12.33	10.95	6.45	1.50	4.90	9.15
				5.22	0.00		10.29
					1.90		

X-Section at Ch.3600.00m

Earthwork area =29.12 sq.m  
Turfing Length =20m



Datum =38.0m

PROPOSED F.L.	46.49						
EMBANMENTK HIGHT	3.18						
	44.69						
EXISTING R.L.	43.38	43.39	43.40	45.43	43.38	43.31	43.35
		43.39		45.43			
OFFSET DISTANCES	18.70	10.98	5.46	1.50	5.12	9.25	15.02
				0.00			
				1.50			

X-Section at Ch.3700.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

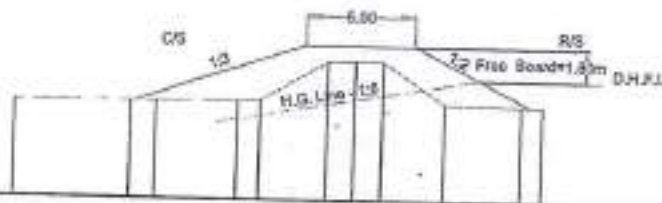
E.E.  
BARPETA

SCALE - 1:100

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Bakas and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (RIGHT BANK EMBKT.)	
CHECKED BY	
A.E.E. (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION



Earthwork area =26.25 sq.m  
 Turfing Length =20m

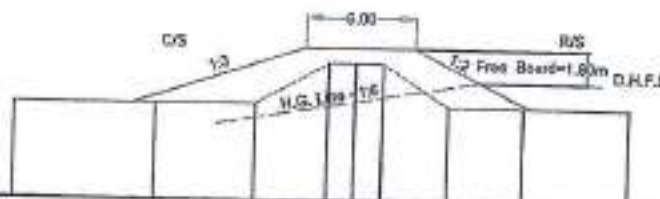


Datum =38.0m

PROPOSED F.L.	46.47								
EMBANMENTK HIGHT	3.31								
	44.67								
EXISTING R.L.	43.22	43.23	43.23	43.26	43.35	45.41	45.41	43.23	43.16
OFFSET DISTANCES	18.70	12.33	10.95	6.45	5.22	1.50	0.00	1.50	4.90
									9.15
									10.29

X-Section at Ch.3800.00m

Earthwork area =27.94 eq.m  
 Turfing Length =20m



Datum =38.0m

PROPOSED F.L.	46.45								
EMBANMENTK HIGHT	3.27								
	44.65								
EXISTING R.L.	43.35	43.28	43.33	45.40	45.40	45.40	43.22	43.18	43.22
OFFSET DISTANCES	18.70	10.98	5.46	1.50	0.00	1.50	5.12	9.25	15.02

X-Section at Ch.3900.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.

CHECKED AT RANDOM AND FOUND CORRECT

A.E.E.

E.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W. R. DIVISION  
 BARPETA

Name of Scheme : Integrated flood and erosion  
 management of Manas and Baki river in the district of  
 Baksa and Borpeta in Brahmaputra valley within Assam  
 (Review)

CROSS SECTION (RIGHT BANK EMBKT.)

CHECKED BY

AEE (TC)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION

Earthwork area = 26.43 sq.m  
Turving Length = 20m

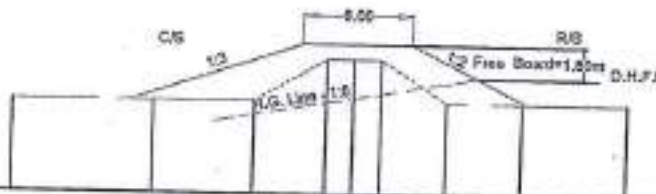


Datum = 38.0m

PROPOSED F.L.	46.43										
EMBANMENTK HIGHT	3.42										
	44.63										
EXISTING R.L.	43.07	43.08	43.08	43.11	43.12	45.38	45.38	45.38	43.05	43.01	43.00
OFFSET DISTANCES	18.70	12.33	10.95	6.45	5.22	1.50	0.00	1.50	4.90	9.15	10.29

X-Section at Ch.4000.00m

Earthwork area = 27.47 sq.m  
Turving Length = 20m



Datum = 38.0m

PROPOSED F.L.	46.41										
EMBANMENTK HIGHT	3.45										
	44.61										
EXISTING R.L.	43.13	43.06	43.06	43.09	43.09	45.35	45.35	45.35	43.02	42.96	43.00
OFFSET DISTANCES	18.70	10.98	10.98	5.46	5.46	1.50	0.00	1.50	5.12	9.25	15.02

X-Section at Ch.4100.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.J.E.

CHECKED AT RANDOM AND FOUND CORRECT

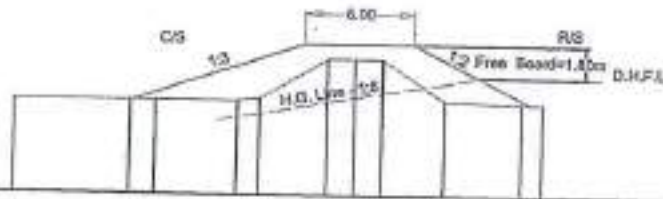
A.E.E.

E.E.  
BARPETA

SCALE - 1:400

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (RIGHT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area =27.84 sq.m  
 Turfing Length =20m

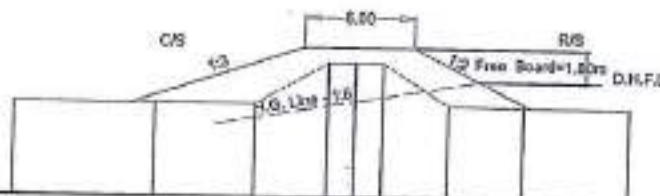


Datum =38.0m

PROPOSED F.L.	46.39						
EMBANMENTK HIGHT	3.42						
	44.59						
EXISTING R.L.	43.03	43.04	43.04	43.07	43.18	45.34	43.10
		43.04		43.18		45.34	42.97
OFFSET DISTANCES	18.70	12.33	10.95	6.45	5.22	1.50	4.90
						0.00	9.15
						1.50	10.29

X-Section at Ch.4200.00m

Earthwork area =27.61 sq.m  
 Turfing Length =20m



Datum =38.0m

PROPOSED F.L.	46.37						
EMBANMENTK HIGHT	3.41						
	44.57						
EXISTING R.L.	43.13	43.06	43.09	45.32	45.32	45.32	43.02
				45.32	45.32	45.32	42.96
OFFSET DISTANCES	18.70	10.98	5.46	1.50	0.00	1.50	5.12
							9.25
							15.02

X-Section at Ch.4300.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

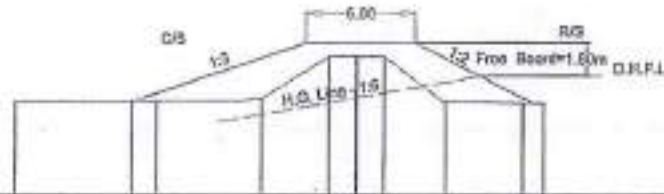
A.E.E.

S.E.  
 BARPETA

SCALE - 1:400

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (RIGHT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Earthwork area =27.71 sq.m  
 Turfing Length =20m



Datum =38.0m

PROPOSED F.L.	46.36									
EMBANMENTK HIGHT	3.46									
	44.56									
EXISTING R.L.	42.99	43.00	43.00	43.14	45.40	45.40	45.39	43.01	42.90	42.88
OFFSET DISTANCES	18.70	12.33	10.95	5.22	1.50	0.00	1.50	4.90	9.15	10.29

X-Section at Ch.4345.00m

Earthwork area =0.00 sq.m  
 Turfing Length =0.00m



Datum =38.0m

PROPOSED F.L.	46.36							
EMBANMENTK HIGHT	3.46							
	44.56							
EXISTING R.L.	42.99	43.00	46.36	46.36	46.36		43.16	42.88
OFFSET DISTANCES	18.70	12.40	3.00	0.00	3.00		9.15	10.29

X-Section at Ch.4351.00m

CERTIFIED THAT THE SURVEY WAS DONE BY ME  
 AND CORRECT TO THE BEST OF MY KNOWLEDGE

A.E./E.E.

CHECKED AT RANDOM AND FOUND CORRECT

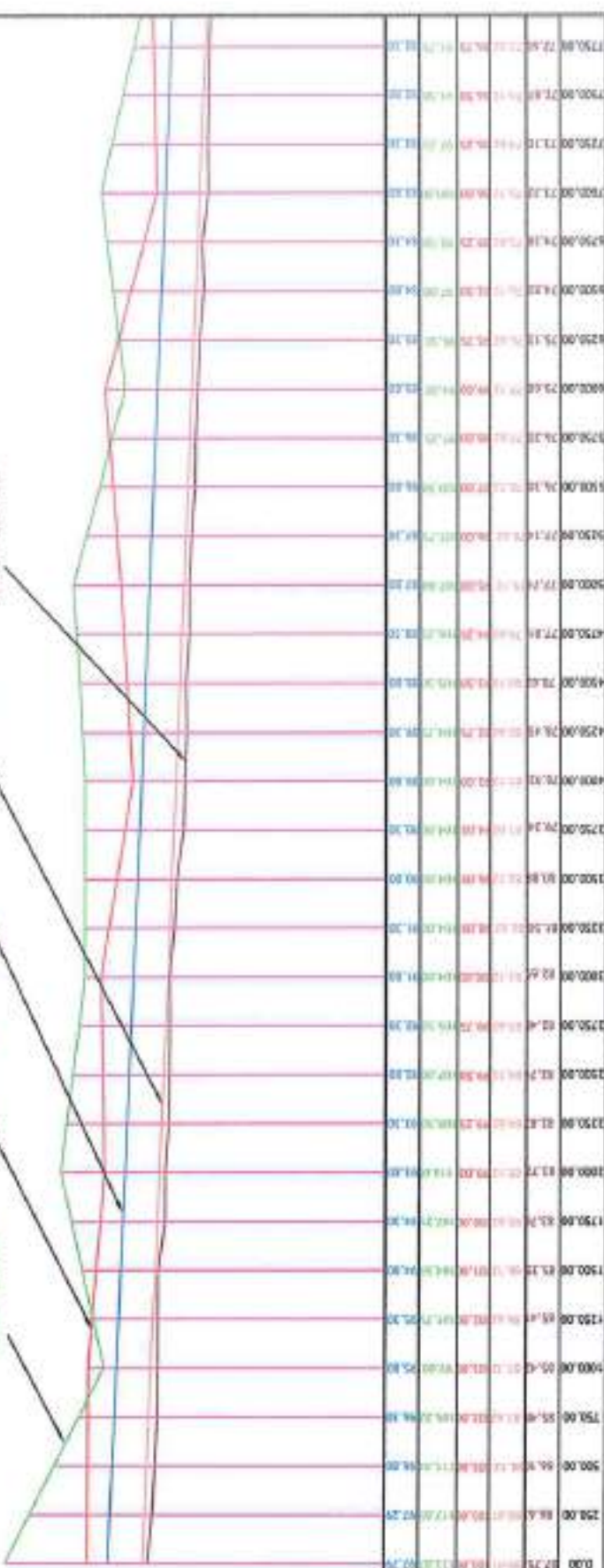
A.E.E.

E.E.  
 BARPETA

SCALE - 1:500

GOVT. OF ASSAM WATER RESOURCES DEPARTMENT	
OFFICE OF THE EXECUTIVE ENGINEER BARPETA W. R. DIVISION BARPETA	
Name of Scheme : Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)	
CROSS SECTION (RIGHT BANK EMBKT.)	
CHECKED BY	
AEE (TC)	EXECUTIVE ENGINEER BARPETA W.R. DIVISION

Left Bank  
 Right Bank  
 HFL  
 L.W.L.  
 BED LEVEL



Datum: 26.0	0.00	07.25	99.41	63.88	113.07	29.79
H.F.L.	1750.00	55.46	63.42	68.00	69.00	69.00
Left Bank	1500.00	64.34	64.00	64.00	64.00	64.00
Right Bank	1350.00	63.75	63.75	63.75	63.75	63.75
L.W.L.	1200.00	62.25	62.25	62.25	62.25	62.25
Bed Level	1050.00	61.75	61.75	61.75	61.75	61.75
Distance	750.00	55.46	63.42	68.00	69.00	69.00

CHECKED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

CHECKED AT RANDOM AND FOUND CORRECT



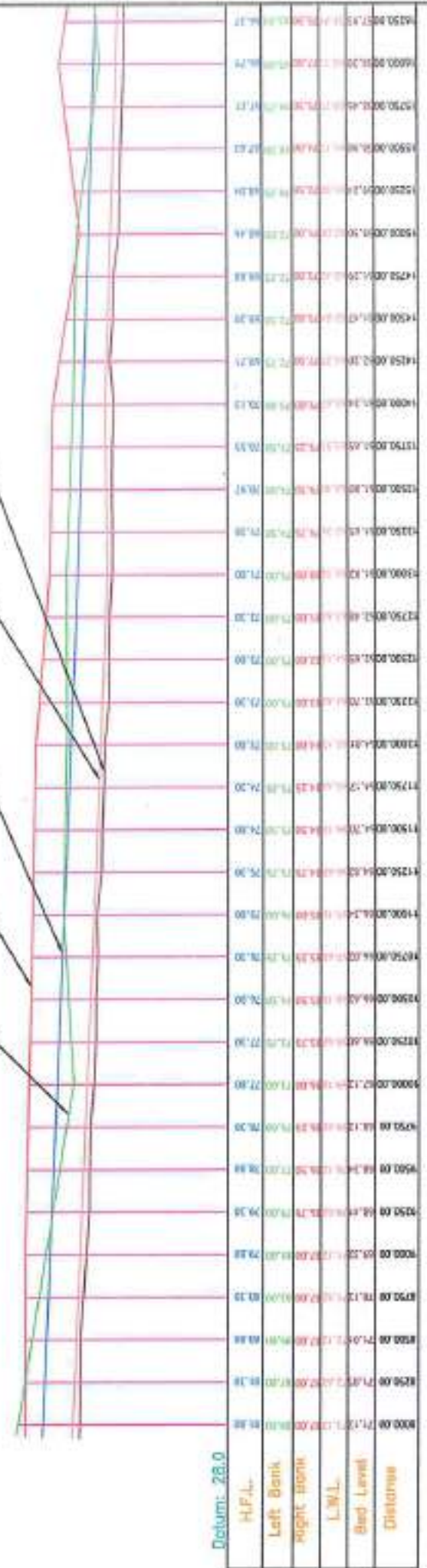
*[Signature]*  
 A.E. SUB-DIVISION

*[Signature]*  
 A.E. U.E.

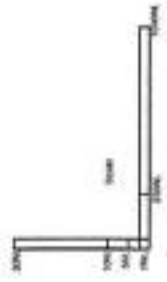
GOVT OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA  
 LONG SECTION SHOWING RIVER BANKS  
 Name of Scheme: Integrated flood and erosion management of Nand and Sill river in the district of Baksa and Barpeta in Brahmaputra valley within Assam. (Flood)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA

Left Bank  
 Right Bank  
 HFL  
 L.W.L.  
 BED LEVEL



Datum: 28.0



CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

*[Signature]*  
 A.E.E.

CHECKED AT RANDOM AND FOUND CORRECT

*[Signature]*  
 A.E.E.  
 BARPETA W.R. SUB-DIVISION

GOVT OF ASSAM  
 WATER RESOURCES DEPARTMENT

OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA

LONG SECTION SHOWING RIVER BANKS  
 Name of Scheme- Integrated flood and erosion management of Manas and Bhalanar in the district of Baksa and Barpeta in Bodhupatna valley within Assam ( Ranked )

*[Signature]*  
 EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA

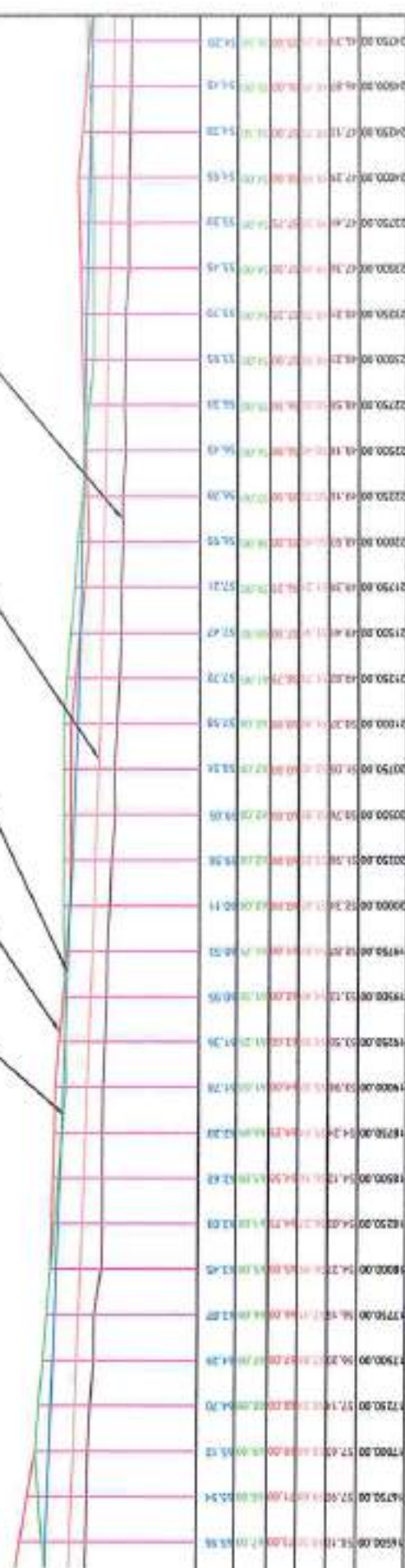
BED LEVEL

L.W.L.

HFL

Right Bank

Left Bank



Datum: 25.0

Distance	Bed Level	L.W.L.	Right Bank	Left Bank	H.F.L.
0.00	18.10	17.00	17.00	17.00	17.00
10.00	18.10	17.00	17.00	17.00	17.00
20.00	18.10	17.00	17.00	17.00	17.00
30.00	18.10	17.00	17.00	17.00	17.00
40.00	18.10	17.00	17.00	17.00	17.00
50.00	18.10	17.00	17.00	17.00	17.00
60.00	18.10	17.00	17.00	17.00	17.00
70.00	18.10	17.00	17.00	17.00	17.00
80.00	18.10	17.00	17.00	17.00	17.00
90.00	18.10	17.00	17.00	17.00	17.00
100.00	18.10	17.00	17.00	17.00	17.00
110.00	18.10	17.00	17.00	17.00	17.00
120.00	18.10	17.00	17.00	17.00	17.00
130.00	18.10	17.00	17.00	17.00	17.00
140.00	18.10	17.00	17.00	17.00	17.00
150.00	18.10	17.00	17.00	17.00	17.00
160.00	18.10	17.00	17.00	17.00	17.00
170.00	18.10	17.00	17.00	17.00	17.00
180.00	18.10	17.00	17.00	17.00	17.00
190.00	18.10	17.00	17.00	17.00	17.00
200.00	18.10	17.00	17.00	17.00	17.00
210.00	18.10	17.00	17.00	17.00	17.00
220.00	18.10	17.00	17.00	17.00	17.00
230.00	18.10	17.00	17.00	17.00	17.00
240.00	18.10	17.00	17.00	17.00	17.00
250.00	18.10	17.00	17.00	17.00	17.00



CERTIFIED THAT THE SURVEYING DONE BY ME AND CONDUCTED TO THE BEST OF MY KNOWLEDGE

CHECKED AT NUMBER AND FOUND CORRECT

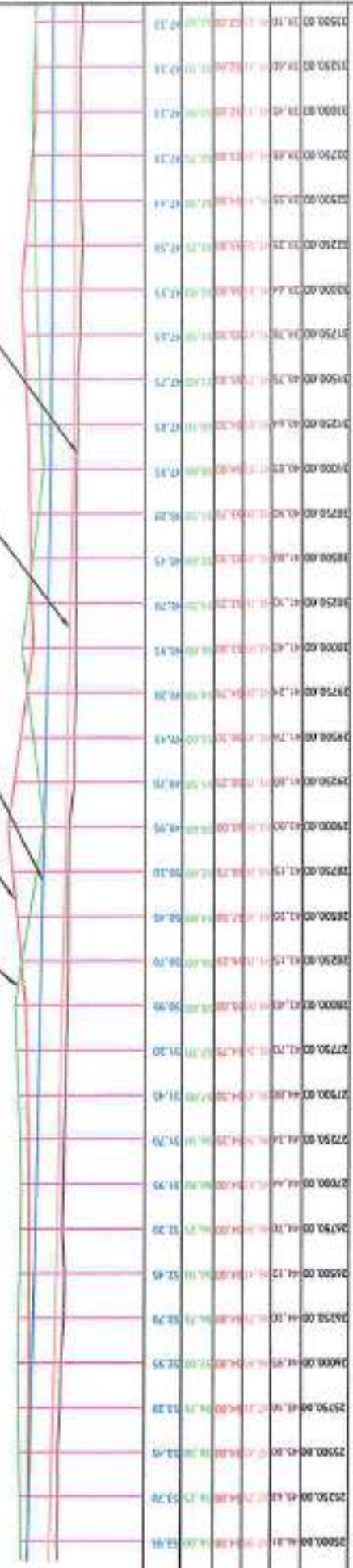
A.C. O.E.

SORBHOGUJ, SUB-DIVISION

GOVT OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W.P. DIVISION, BARPETA  
 LONG SECTION SHOWING RIVER BANKS  
 Name of Scheme: Integrated flood and erosion management of Namas and Baidher in the district of Itanagar and Barpeta in Imphalpur valley within Assam (Rohini)

EXECUTIVE ENGINEER  
 BARPETA W.P. DIVISION, BARPETA

Left Bank  
Right Bank  
HFL  
L.W.L.  
BED LEVEL



Dotum: 22.0

Left Bank	Right Bank	H.F.L.	L.W.L.	Bed Level	Distance
-----------	------------	--------	--------	-----------	----------

CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

*[Signature]*  
A.E. J.L.

CHECKED AT RANDOM AND FOUND CORRECT

*[Signature]*  
A.E. J.L.  
SUPERVISOR W.P. DIVISION

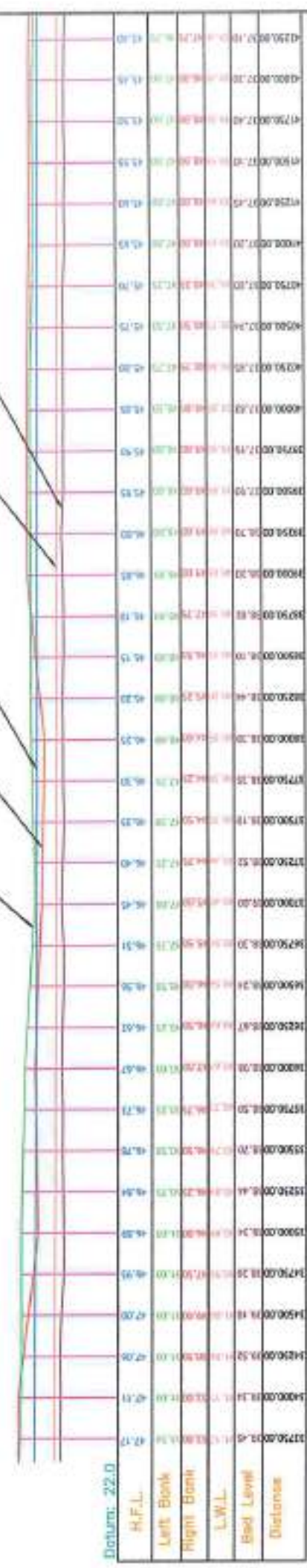


GOVT OF ASSAM  
WATER RESOURCES DEPARTMENT  
OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W.P. DIVISION, BARPETA  
LONG SECTION SHOWING RIVER BANKS  
Name of Scheme: Integrated flood and erosion management of Manas and Bokai river in the district of Baksa and Bajpeta in Bishnupur valley within Assam. ( Revised )

*[Signature]*  
EXECUTIVE ENGINEER  
BARPETA W.P. DIVISION, BARPETA



Left Bank  
Right Bank  
H.F.L.  
L.W.L.  
BED LEVEL



CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE.

*[Signature]*  
A.C. H.L.

CHECKED & AT RANDOM AND FOUND CORRECT

*[Signature]*  
A.S.L.  
SUPERVISOR W.R. DIVISION

GOVT OF ASSAM  
WATER RESOURCES DEPARTMENT  
OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION, BARPETA  
LONG SECTION SHOWING RIVER BANKS  
Name of Scheme- Integrated flood and erosion management of Marua and flood over in the district of Bakhar and Barpeta in Brahmaputra valley within Assam. ( Roadal )

EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION, BARPETA

Right Bank

L.W.L.

HFL

Left Bank

BED LEVEL



Datum: 20.0

CHECKED AT RANDOM AND FOUND CORRECT

CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

  
A.E. Sub-Engineer

  
A.E. J.L.



GOVT OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA  
 LONG SECTION SHOWING RIVER BANKS  
 Name of Scheme: Integrated flood and erosion management of Manas and Sankar in the district of Barpeta and Barpeta in Bakaspara valley within Assam. (Floods)

  
EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION, BARPETA

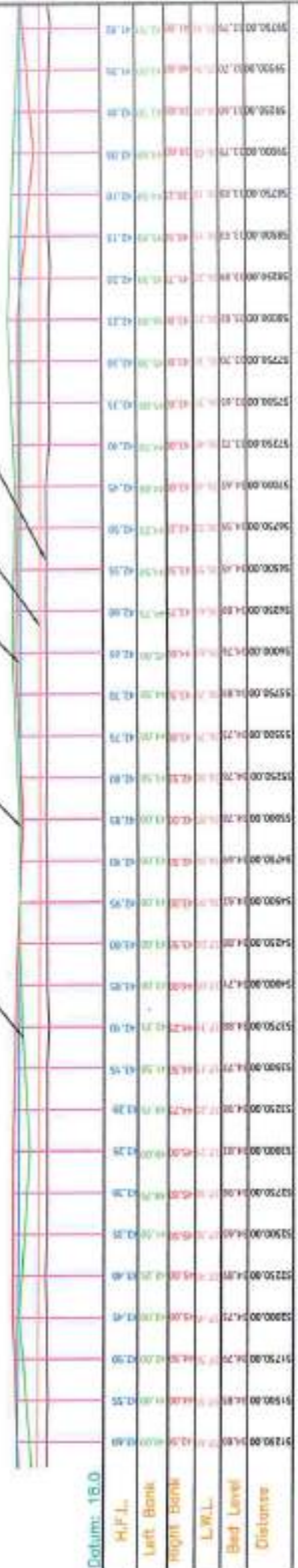
Left Bank

Right Bank

HFL

L.W.L.

BED LEVEL



Datum: 16.0



CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

CHECKED AT RANDOM AND FOUND CORRECT

*[Signature]*  
A.R. JUI

*[Signature]*  
A.R. SUBRASSON  
ENGINEER IN CHARGE

GOVT OF ASSAM  
WATER RESOURCES DEPARTMENT  
OFFICE OF THE EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION, BARPETA  
LONG SECTION SHOWING RIVER BANKS  
Name of Scheme: Integrator food and erosion management of Mousa and Nalanda in the district of Baksa and Barpeta in Assam valley within Assam (Revised)

EXECUTIVE ENGINEER  
BARPETA W.R. DIVISION, BARPETA

Datum: 18.0

M.F.L.	Left Bank	Right Bank	L.W.L.	Bed Level	Distance
4600.00	11.70	11.55	11.48	11.38	41.87
4610.00	11.70	11.55	11.48	11.38	41.83
4620.00	11.70	11.55	11.48	11.38	41.79
4630.00	11.70	11.55	11.48	11.38	41.74
4640.00	11.70	11.55	11.48	11.38	41.70
4650.00	11.70	11.55	11.48	11.38	41.65
4660.00	11.70	11.55	11.48	11.38	41.60
4670.00	11.70	11.55	11.48	11.38	41.55
4680.00	11.70	11.55	11.48	11.38	41.50
4690.00	11.70	11.55	11.48	11.38	41.45
4700.00	11.70	11.55	11.48	11.38	41.40
4710.00	11.70	11.55	11.48	11.38	41.35
4720.00	11.70	11.55	11.48	11.38	41.30
4730.00	11.70	11.55	11.48	11.38	41.25
4740.00	11.70	11.55	11.48	11.38	41.20
4750.00	11.70	11.55	11.48	11.38	41.15
4760.00	11.70	11.55	11.48	11.38	41.10
4770.00	11.70	11.55	11.48	11.38	41.05
4780.00	11.70	11.55	11.48	11.38	41.00
4790.00	11.70	11.55	11.48	11.38	40.95
4800.00	11.70	11.55	11.48	11.38	40.90
4810.00	11.70	11.55	11.48	11.38	40.85
4820.00	11.70	11.55	11.48	11.38	40.80
4830.00	11.70	11.55	11.48	11.38	40.75
4840.00	11.70	11.55	11.48	11.38	40.70
4850.00	11.70	11.55	11.48	11.38	40.65
4860.00	11.70	11.55	11.48	11.38	40.60
4870.00	11.70	11.55	11.48	11.38	40.55
4880.00	11.70	11.55	11.48	11.38	40.50
4890.00	11.70	11.55	11.48	11.38	40.45
4900.00	11.70	11.55	11.48	11.38	40.40
4910.00	11.70	11.55	11.48	11.38	40.35
4920.00	11.70	11.55	11.48	11.38	40.30
4930.00	11.70	11.55	11.48	11.38	40.25
4940.00	11.70	11.55	11.48	11.38	40.20
4950.00	11.70	11.55	11.48	11.38	40.15
4960.00	11.70	11.55	11.48	11.38	40.10
4970.00	11.70	11.55	11.48	11.38	40.05
4980.00	11.70	11.55	11.48	11.38	40.00
4990.00	11.70	11.55	11.48	11.38	39.95
5000.00	11.70	11.55	11.48	11.38	39.90
5010.00	11.70	11.55	11.48	11.38	39.85
5020.00	11.70	11.55	11.48	11.38	39.80
5030.00	11.70	11.55	11.48	11.38	39.75
5040.00	11.70	11.55	11.48	11.38	39.70
5050.00	11.70	11.55	11.48	11.38	39.65
5060.00	11.70	11.55	11.48	11.38	39.60
5070.00	11.70	11.55	11.48	11.38	39.55
5080.00	11.70	11.55	11.48	11.38	39.50
5090.00	11.70	11.55	11.48	11.38	39.45
5100.00	11.70	11.55	11.48	11.38	39.40
5110.00	11.70	11.55	11.48	11.38	39.35
5120.00	11.70	11.55	11.48	11.38	39.30
5130.00	11.70	11.55	11.48	11.38	39.25
5140.00	11.70	11.55	11.48	11.38	39.20
5150.00	11.70	11.55	11.48	11.38	39.15
5160.00	11.70	11.55	11.48	11.38	39.10
5170.00	11.70	11.55	11.48	11.38	39.05
5180.00	11.70	11.55	11.48	11.38	39.00
5190.00	11.70	11.55	11.48	11.38	38.95
5200.00	11.70	11.55	11.48	11.38	38.90
5210.00	11.70	11.55	11.48	11.38	38.85
5220.00	11.70	11.55	11.48	11.38	38.80
5230.00	11.70	11.55	11.48	11.38	38.75
5240.00	11.70	11.55	11.48	11.38	38.70
5250.00	11.70	11.55	11.48	11.38	38.65
5260.00	11.70	11.55	11.48	11.38	38.60
5270.00	11.70	11.55	11.48	11.38	38.55
5280.00	11.70	11.55	11.48	11.38	38.50
5290.00	11.70	11.55	11.48	11.38	38.45
5300.00	11.70	11.55	11.48	11.38	38.40
5310.00	11.70	11.55	11.48	11.38	38.35
5320.00	11.70	11.55	11.48	11.38	38.30
5330.00	11.70	11.55	11.48	11.38	38.25
5340.00	11.70	11.55	11.48	11.38	38.20
5350.00	11.70	11.55	11.48	11.38	38.15
5360.00	11.70	11.55	11.48	11.38	38.10
5370.00	11.70	11.55	11.48	11.38	38.05
5380.00	11.70	11.55	11.48	11.38	38.00
5390.00	11.70	11.55	11.48	11.38	37.95
5400.00	11.70	11.55	11.48	11.38	37.90
5410.00	11.70	11.55	11.48	11.38	37.85
5420.00	11.70	11.55	11.48	11.38	37.80
5430.00	11.70	11.55	11.48	11.38	37.75
5440.00	11.70	11.55	11.48	11.38	37.70
5450.00	11.70	11.55	11.48	11.38	37.65
5460.00	11.70	11.55	11.48	11.38	37.60
5470.00	11.70	11.55	11.48	11.38	37.55
5480.00	11.70	11.55	11.48	11.38	37.50
5490.00	11.70	11.55	11.48	11.38	37.45
5500.00	11.70	11.55	11.48	11.38	37.40
5510.00	11.70	11.55	11.48	11.38	37.35
5520.00	11.70	11.55	11.48	11.38	37.30
5530.00	11.70	11.55	11.48	11.38	37.25
5540.00	11.70	11.55	11.48	11.38	37.20
5550.00	11.70	11.55	11.48	11.38	37.15
5560.00	11.70	11.55	11.48	11.38	37.10
5570.00	11.70	11.55	11.48	11.38	37.05
5580.00	11.70	11.55	11.48	11.38	37.00
5590.00	11.70	11.55	11.48	11.38	36.95
5600.00	11.70	11.55	11.48	11.38	36.90
5610.00	11.70	11.55	11.48	11.38	36.85
5620.00	11.70	11.55	11.48	11.38	36.80
5630.00	11.70	11.55	11.48	11.38	36.75
5640.00	11.70	11.55	11.48	11.38	36.70
5650.00	11.70	11.55	11.48	11.38	36.65
5660.00	11.70	11.55	11.48	11.38	36.60
5670.00	11.70	11.55	11.48	11.38	36.55
5680.00	11.70	11.55	11.48	11.38	36.50
5690.00	11.70	11.55	11.48	11.38	36.45
5700.00	11.70	11.55	11.48	11.38	36.40
5710.00	11.70	11.55	11.48	11.38	36.35
5720.00	11.70	11.55	11.48	11.38	36.30
5730.00	11.70	11.55	11.48	11.38	36.25
5740.00	11.70	11.55	11.48	11.38	36.20
5750.00	11.70	11.55	11.48	11.38	36.15
5760.00	11.70	11.55	11.48	11.38	36.10
5770.00	11.70	11.55	11.48	11.38	36.05
5780.00	11.70	11.55	11.48	11.38	36.00
5790.00	11.70	11.55	11.48	11.38	35.95
5800.00	11.70	11.55	11.48	11.38	35.90
5810.00	11.70	11.55	11.48	11.38	35.85
5820.00	11.70	11.55	11.48	11.38	35.80
5830.00	11.70	11.55	11.48	11.38	35.75
5840.00	11.70	11.55	11.48	11.38	35.70
5850.00	11.70	11.55	11.48	11.38	35.65
5860.00	11.70	11.55	11.48	11.38	35.60
5870.00	11.70	11.55	11.48	11.38	35.55
5880.00	11.70	11.55	11.48	11.38	35.50
5890.00	11.70	11.55	11.48	11.38	35.45
5900.00	11.70	11.55	11.48	11.38	35.40
5910.00	11.70	11.55	11.48	11.38	35.35
5920.00	11.70	11.55	11.48	11.38	35.30
5930.00	11.70	11.55	11.48	11.38	35.25
5940.00	11.70	11.55	11.48	11.38	35.20
5950.00	11.70	11.55	11.48	11.38	35.15
5960.00	11.70	11.55	11.48	11.38	35.10
5970.00	11.70	11.55	11.48	11.38	35.05
5980.00	11.70	11.55	11.48	11.38	35.00
5990.00	11.70	11.55	11.48	11.38	34.95
6000.00	11.70	11.55	11.48	11.38	34.90

Left Bank

Right Bank

H.F.L.

L.W.L.

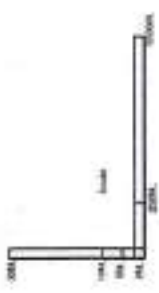
BED LEVEL

CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

CHECKED AT RANDOM AND FOUND CORRECT

A.E. J.U.E.

SUBDIVISION



GOVT OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA  
 LONG SECTION SHOWING RIVER BANKS  
 (Name of Scheme- Integrated flood risk reduction management of Manas and Sankar river in the district of Baksa and Barpeta in Guwahati valley within Assam. (Revised) )

EXECUTIVE ENGINEER,  
 BARPETA W.R. DIVISION, BARPETA



BED LEVEL

L.W.L.

H.F.L.

Right Bank

Left Bank

Datum: 15.0

H.F.L.	Left Bank	Right Bank	L.W.L.	Bed Level	Distance
7750.00	78.00	77.40	77.40	77.40	00
7755.00	78.00	77.40	77.40	77.40	10
7760.00	78.00	77.40	77.40	77.40	20
7765.00	78.00	77.40	77.40	77.40	30
7770.00	78.00	77.40	77.40	77.40	40
7775.00	78.00	77.40	77.40	77.40	50
7780.00	78.00	77.40	77.40	77.40	60
7785.00	78.00	77.40	77.40	77.40	70
7790.00	78.00	77.40	77.40	77.40	80
7795.00	78.00	77.40	77.40	77.40	90
7800.00	78.00	77.40	77.40	77.40	100
7805.00	78.00	77.40	77.40	77.40	110
7810.00	78.00	77.40	77.40	77.40	120
7815.00	78.00	77.40	77.40	77.40	130
7820.00	78.00	77.40	77.40	77.40	140
7825.00	78.00	77.40	77.40	77.40	150
7830.00	78.00	77.40	77.40	77.40	160
7835.00	78.00	77.40	77.40	77.40	170
7840.00	78.00	77.40	77.40	77.40	180
7845.00	78.00	77.40	77.40	77.40	190
7850.00	78.00	77.40	77.40	77.40	200
7855.00	78.00	77.40	77.40	77.40	210
7860.00	78.00	77.40	77.40	77.40	220
7865.00	78.00	77.40	77.40	77.40	230
7870.00	78.00	77.40	77.40	77.40	240
7875.00	78.00	77.40	77.40	77.40	250
7880.00	78.00	77.40	77.40	77.40	260
7885.00	78.00	77.40	77.40	77.40	270
7890.00	78.00	77.40	77.40	77.40	280
7895.00	78.00	77.40	77.40	77.40	290
7900.00	78.00	77.40	77.40	77.40	300
7905.00	78.00	77.40	77.40	77.40	310
7910.00	78.00	77.40	77.40	77.40	320
7915.00	78.00	77.40	77.40	77.40	330
7920.00	78.00	77.40	77.40	77.40	340
7925.00	78.00	77.40	77.40	77.40	350
7930.00	78.00	77.40	77.40	77.40	360
7935.00	78.00	77.40	77.40	77.40	370
7940.00	78.00	77.40	77.40	77.40	380
7945.00	78.00	77.40	77.40	77.40	390
7950.00	78.00	77.40	77.40	77.40	400
7955.00	78.00	77.40	77.40	77.40	410
7960.00	78.00	77.40	77.40	77.40	420
7965.00	78.00	77.40	77.40	77.40	430
7970.00	78.00	77.40	77.40	77.40	440
7975.00	78.00	77.40	77.40	77.40	450
7980.00	78.00	77.40	77.40	77.40	460
7985.00	78.00	77.40	77.40	77.40	470
7990.00	78.00	77.40	77.40	77.40	480
7995.00	78.00	77.40	77.40	77.40	490
8000.00	78.00	77.40	77.40	77.40	500
8005.00	78.00	77.40	77.40	77.40	510
8010.00	78.00	77.40	77.40	77.40	520
8015.00	78.00	77.40	77.40	77.40	530
8020.00	78.00	77.40	77.40	77.40	540
8025.00	78.00	77.40	77.40	77.40	550
8030.00	78.00	77.40	77.40	77.40	560
8035.00	78.00	77.40	77.40	77.40	570
8040.00	78.00	77.40	77.40	77.40	580
8045.00	78.00	77.40	77.40	77.40	590
8050.00	78.00	77.40	77.40	77.40	600
8055.00	78.00	77.40	77.40	77.40	610
8060.00	78.00	77.40	77.40	77.40	620
8065.00	78.00	77.40	77.40	77.40	630
8070.00	78.00	77.40	77.40	77.40	640
8075.00	78.00	77.40	77.40	77.40	650
8080.00	78.00	77.40	77.40	77.40	660
8085.00	78.00	77.40	77.40	77.40	670
8090.00	78.00	77.40	77.40	77.40	680
8095.00	78.00	77.40	77.40	77.40	690
8100.00	78.00	77.40	77.40	77.40	700
8105.00	78.00	77.40	77.40	77.40	710
8110.00	78.00	77.40	77.40	77.40	720
8115.00	78.00	77.40	77.40	77.40	730
8120.00	78.00	77.40	77.40	77.40	740
8125.00	78.00	77.40	77.40	77.40	750
8130.00	78.00	77.40	77.40	77.40	760
8135.00	78.00	77.40	77.40	77.40	770
8140.00	78.00	77.40	77.40	77.40	780
8145.00	78.00	77.40	77.40	77.40	790
8150.00	78.00	77.40	77.40	77.40	800
8155.00	78.00	77.40	77.40	77.40	810
8160.00	78.00	77.40	77.40	77.40	820
8165.00	78.00	77.40	77.40	77.40	830
8170.00	78.00	77.40	77.40	77.40	840
8175.00	78.00	77.40	77.40	77.40	850
8180.00	78.00	77.40	77.40	77.40	860
8185.00	78.00	77.40	77.40	77.40	870
8190.00	78.00	77.40	77.40	77.40	880
8195.00	78.00	77.40	77.40	77.40	890
8200.00	78.00	77.40	77.40	77.40	900
8205.00	78.00	77.40	77.40	77.40	910
8210.00	78.00	77.40	77.40	77.40	920
8215.00	78.00	77.40	77.40	77.40	930
8220.00	78.00	77.40	77.40	77.40	940
8225.00	78.00	77.40	77.40	77.40	950
8230.00	78.00	77.40	77.40	77.40	960
8235.00	78.00	77.40	77.40	77.40	970
8240.00	78.00	77.40	77.40	77.40	980
8245.00	78.00	77.40	77.40	77.40	990
8250.00	78.00	77.40	77.40	77.40	1000

CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

CHECKED AT RANDOM AND FOUND CORRECT



A.E. J.E.

9359466 V.R. SUB-DIVISION

GOVT OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA  
 LONG SECTION SHOWING RIVER BANKS  
 Name of Scheme: Integrated flood and erosion management of Baras and Subas in the district of Baksa and Barpeta in Assam's valley within Assam. (Rakha)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA

Right Bank

L.W.L.

HFL

Left Bank

BED LEVEL



Datum: 15.0  
 H.F.L.  
 Left Bank  
 Right Bank  
 L.W.L.  
 Bed Level  
 Distances



CERTIFIED THAT THE SURVEY WAS DONE BY ME AND CORRECT TO THE BEST OF MY KNOWLEDGE

*[Signature]*  
A.E. J.E.

CHECKED AT BARSOON AND FOUND CORRECT

*[Signature]*  
SORSRICE S.R. SUB-DIVISION

GOVT OF ASSAM  
 WATER RESOURCES DEPARTMENT  
 OFFICE OF THE EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA  
 LONG SECTION SHOWING RIVER BANKS  
 Name of Scheme- Integrated flood and erosion management of Jorhat and Boli river in the District of Baksa and Barpeta in Inhabitant valley within Assam (Barsooi)

EXECUTIVE ENGINEER  
 BARPETA W.R. DIVISION, BARPETA

CHAPTER-12

**ANNEXURES & CERTIFICATES**





OFFICE OF THE CHIEF ENGINEER  
WATER RESOURCES DEPARTMENT  
CHANDMARI, GUWAHATI

CERTIFICATE REGARDING PROPOSED FUNDING FROM WORLD BANK

The scheme "Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam(Review)" is proposed under AIRBMP(Ph-I) for funding of the World Bank. After receiving the PPR from the Govt. of Assam, the Dy. Secretary(FB),DEA,Ministry of Finance,GOI requested the Country Director,India the World Bank seeking financial assistance of 500 million USD from World Bank vide no 3/8/2015-FB-II dt. 04-06-2020(copy enclosed) where this scheme is also included.

( Er. Borsing Rongpi )  
Chief Engineer  
Water Resources Department  
Chandmari,Guwahati-03



OFFICE OF THE CHIEF ENGINEER  
WATER RESOURCES DEPARTMENT  
CHANDMARI, GUWAHATI

CERTIFICATE REGARDING CORRECTNESS OF QUANTITIES

Certified that the quantities calculated for various item of works have been worked out on the basis of design and drawing adopted for the scheme and that is justified and correct for the project "Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam(Review)"

A handwritten signature in blue ink, appearing to read 'Borsing Rongpi'.

( Er. Borsing Rongpi )  
Chief Engineer  
Water Resources Department  
Chandmari, Guwahati-03



OFFICE OF THE CHIEF ENGINEER  
WATER RESOURCES DEPARTMENT  
CHANDMARI, GUWAHATI

Certificate for ensuring e-flow, longitudinal & latitudinal connectivity

Name of Project:- Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra Valley within Assam(Review).

The implementation of proposed PSC porcupine screen in the above mentioned project will close only some offshoot channels which are causing erosion in the bank but the flow in main channel will remain unaffected i.e. the longitudinal connectivity will not get obstructed due to the implementation of the proposed works. Also there is neither any propose work for blocking the tributaries or any incoming channel to the river Beki nor the obstruction in the main channel. So, the existing lateral connectivity as well as e-flow will also remain unhindered.

So, it may be ensured that e-flow as well as longitudinal & latitudinal connectivity will remain unaffected after implementation of the above mentioned project.

( Er. Borsing Rongpi )  
Chief Engineer  
Water Resources Department  
Chandmari, Guwahati-03

CERTIFICATE

Certified that the cost of the project will remain firm for the proposed reach and for the provisions with specifications that is incorporated in the DPR.

  
Executive Engineer  
Barpeta W.R Division  
Barpeta

NON DUPLICACY CERTIFICATE

Certified that the works proposed in the project "Integrated flood and erosion management of Manas and Beki river in District of Baksa and Barpeta in Brahmaputra valley within Assam(Review)" do not overlap with any works undertaken in the other projects in the river Beki.

  
Executive Engineer  
Barpeta W.R Division  
Barpeta

63/2020

**GOVERNMENT OF ASSAM**  
**DECLASSIFIED RIVER BASIN MANAGEMENT AGENCY (FREMA)**

Address: Nagartani Supermarket, 8<sup>th</sup> floor, Bhowali, Guwahati-22, Pincode: 781025, Assam.  
Email: [frema@assam.gov.in](mailto:frema@assam.gov.in), [frema@frema.gov.in](mailto:frema@frema.gov.in)

No. FREMA/WRD/2019/2020/1757 Dated: 12-08-2020

To  
The Director,  
Food Management Planning Directorate  
Central Water Commission  
905 J/S, Bawa Brawan  
P.K. Farm, New Delhi, 58

SUB: re: Examination of the scheme "Integrated Water Resources Management of Boringing Basin" (Esti Cost: Rs. 603.20 cr) & "Integrated food and ecosystem management of Manas and Boki in the district of Baksa and Barpeta in Brahmaputra valley within Assam".

- Ref:
1. Your letter No. 211PR-41/2019/FMF dated 30.12.19
  2. G.E(WRO) Goa's letter No. WR(ED)Tech/640/2009/4
  3. S.E. CWC, Hydrological Observations Circle, Guwahati letter No. T-220/4/2020-HOC-Guwahati dated 01.05.2020

Sr  
Reference is invited to the above mentioned letters vide which CWC requested necessary documents certifying the inclusion of the "Integrated Water Resources Management of Boringing Basin" and "Integrated food and ecosystem management of Manas and Boki in the district of Baksa and Barpeta in Brahmaputra valley within Assam". In the funding from World Bank. In this regard we would like to draw your attention to the concept note which was sent to CWC vide letter No. WR(G) 57/2019/H-1409 dated 01/10/2019 from the Secy, WRD Goa wherein inclusion of Boringing and Boki along with other tributaries are mentioned in the concept note.

The World bank aided "Assam Integrated River Basin Management Project (AIRBMP)" has received clearances from the line Ministries of Goa such as Water Resources, Finance, Transformation and Development, etc. AIRBMP has also received clearances from NITI Aayog, MoDNER, CWC, Ministry of External Affairs, Ministry of Home Affairs as well as from Dept. of Economic Affairs. Presently we are anticipating approval from Ministry of Jal Shakti for the project to be posed to the Department of Water Resource, Govt. of Assam.

Considering the above we would like to request you to provide your concurrence to the DPR of Boringing and Boki which are placed at your end.

Yours faithfully,

*Rajay Baitan*  
21/5/2020  
Rajay Baitan  
EO-T, FREMA

- Encl:
- 1) Concept note.
  - 2) Letters mentioned under reference.

GOVERNMENT OF ASSAMOFFICE OF THE CIRCLE OFFICER BARNAGAR REVENUE CIRCLE - SORBHOG

No. BRC(Misc)-01/PAL/14, 8 2020

Date: 05/06/2020

To,

The Executive Engineer, Barpeta W R Division,  
Barpeta

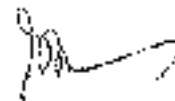
Sub: Issue of Certificate regarding flood damaged assessment:

Sub: No. BWARD/GFN-7/PT-1/14/193 Dtd. 05/06/2020

Sir,

With reference to the above, I am to submit herewith the certificate of the damage assessment for the scheme "Integrated flood and erosion management of Manas and Barak river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)".

Submitted for information &amp; necessary action.



Addl. Deputy Commissioner

&amp;

i/c Circle Office,  
Barnagar Rev. Circle,  
Sorbhog



CERTIFICATE

Certified that the flood damage assessment for the scheme "Integrated flood and erosion management of Manas and Boki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Rowiew)" is based on the actual flood affected area of Boki river under this revenue circle.

Circle Officer  
Barnagar Revenue Circle  
Srimangal





GOVERNMENT OF ASSAM  
OFFICE OF THE CIRCLE OFFICER, KALGACHIA REVENUE CIRCLE, KALGACHIA

No. KGC- 04/20 (8) 5961

Dated- 27/06/2020

To,

✓ The Executive Engineer, Barpeta W. R. Division,  
Barpeta.

Subj:- Issue of certificate regarding flood damaged assessment.

Ref:- No. BWRD/GEN-7/PT-1/14/199 dtd. 05/06/2020.

Sir,

With reference to the subject cited above, I would like to enclose herewith the certificate regarding flood damaged assessment for favour of your kind information and necessary action.

Encls:- As stated above.

Yours faithfully

*[Signature]*  
Circle Officer  
Kalgachia Revenue Circle  
Kalgachia

CERTIFICATE

Certified that the flood damage assessment for the scheme "Integrated flood and erosion management of Manas and Beki river in the District of Baksa and Barpeta in Brahmaputra valley within Assam (Review)" is based on the actual flood affected area of Beki river under this revenue circle.



21.04.23  
Circle Officer  
Kalgachia Revenue Circle  
Kalgachia (C. 31.6.12)

**GOVERNMENT OF ASSAM**  
**OFFICE OF THE CIRCLE OFFICER IN BARNAGAR REVENUE CIRCLE**  
**SORBMOG**

NO BNC OF 2019 3664

Date: 29/11/2019

The Executive Engineer  
 Assam Water Development, Barpeta

Regarding Land availability certificate for the scheme "Integrated Hydro and Land use management of Manas and Beki in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review).  
 BWSR/EST/MP/II/2017/55 Dated 27/11/2019

With reference to the subject cited above I would like to inform you that, the protection work which is to be carried out on the "River land" of Manas and Beki river is at present available at the work site both in the form of Sarkari land and Patta land.

This is for favour of your kind information and necessary action

Yours faithfully

(S)  
 Circle Officer  
 Barnagar Revenue Circle  
 Barnagar, Sorbmoog

GOVERNMENT OF ASSAM  
OFFICE OF THE CIRCLE OFFICER, KALGACHIA REVENUE CIRCLE,  
KALGACHIA

No: 3930

Dt. 05/06/2020

To, ✓  
 The Executive Engineer,  
 Barpeta W.R. Division,  
 Barpeta

Sub: Regarding Land availability Certificate for the scheme "Integrated flood and erosion management of Aitana and Beki in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review).

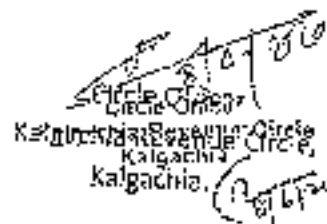
Ref NO: 20YRD/GEN-7/PYH/14/289      date: 05.06.2020

Sir,

With reference to the subject cited above, I would like to inform you that, the protection work which is to be carried out on the "river land" of Beki River is at present available at the work site. The proposed embankment works will be carried out on the existing embankment hence, required land is available for execution of the work.

This is for favour of your kind information and necessary action.

Yours faithfully

  
 Circle Officer  
 Kalgachia Revenue Circle  
 Kalgachia.



GOVERNMENT OF ASSAM  
OFFICE OF THE DIVISIONAL FOREST OFFICER, NORTH KAMRUJ DIVISION, RANGIA

Letter No: WFMD/ROCF/5043-1/17

Date: 17.03.2017

To: The Executive Engineer,  
Barpeta WR Division, Barpeta

Sub: No Objection Certificate (general integrated flood erosion management) of Bokri River in the Barpeta District.

Ref: Your letter no: SWRD/Gen-7/2013/481 dt-15-03-2017.

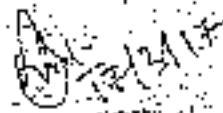
Sr,

With reference to the letter cited above, I would like to inform you that the site of proposed project under Barpeta District does not fall in any protected area as reported by the Range Officer, Barpeta Road Range.

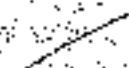
As such this forest Division does not have any objection on execution of the proposed project under Barpeta District as the area falls outside the forest area subject to fulfillment of compliance and all other existing laws/Acts/Rules what so ever is in force. No objection for the remaining part of the project related to River Bekri & Manes may be obtained from the concerning Division i.e. Field Director, Manes Tiger Reserve, Barpeta Sector or from the DFO, Beksa Division, Mithalpur which falls under Baksa District.

This is for favour of your kind information and necessary action.

Yours faithfully

  
Divisional Forest Officer,  
North Kamrup Division, Rangia.

\*Copy to the Range Officer, Barpeta Road Range for information with reference to his letter no. BRD/Misc/841-12 dt-16-03-2017.

  
Divisional Forest Officer,  
North Kamrup Division, Rangia.

GOVERNMENT OF ASSAM  
OFFICE OF THE DIVISIONAL FOREST OFFICER, BAKSA EAST DIVISION,  
BARSALOUJEETI.

Memorandum No. 17/2014/63

Date: 24.03.2017

To

The Executive Engineer,  
Baksa W.C. Borewell Division,  
Bakasa.

Subj

No objection Certificate for the scheme Integrated flood and erosion management of Baxsa and Bezi river in the district of Baksa and Borewell in Brahmaputra valley within areas.

Ref:-

Your No. WRO/GEN/7/Pt.1/2014/63, Dtd. 24.03.2017.

Sir,

With reference to the letter No. cited above, I am to inform you that, the identified area proposed to be undertaken integrated flood and erosion management scheme from Bargaoli to down ward river stretch upto NH-35 does not fall in Reserve Forest under Bonga Division. Hence the undersigned does not have any objection in implementation of the aforesaid scheme provided prescribed Environmental Guidelines is not violated.

This is for favour of your kind information and necessary action.

Yours faithfully,

Divisional Forest Officer,  
Baksa Forest Division,  
Bakasa.

1949, OF 19201

LETTER FROM RANGE OFFICER TO DISTRICT FOREST OFFICER

1949/10/10

1949/10/10

The District Forest Officer,  
North Range Division, Mysore.

Mysore, M.C.C.

1949/10/10/1949/10/10/1949/10/10/1949/10/10

With reference to the letter No. cited above which is received  
from the District Forest Officer, Mysore, I have the honor to inform you that  
the area known as the above named 'Integrated Field and Cattle Range'  
of Mysore, and which is situated in Mysore in Mysore Valley  
is not to be treated as a forest area in any protected forest area.

This regard necessary steps to the Department to cause the same  
to be issued as per procedure.

This is for favour of your kind useful action.

Yours faithfully,

Range Forest Officer,  
Mysore Range,  
Mysore Road.

Copy to the District Engineer, Mysore Division, Mysore for  
information.

Range Forest Officer,  
Mysore Range,  
Mysore Road.

GOVT OF ASSAM

WATER RESOURCES DEPARTMENT  
GUWAHATI

Ref: WRR/CP/MS/CP/MS/016/023

Dt: 10/11/2017

The Executive Engineer,  
Brihaddhara Water Resources Division,  
Dibrugarh

Regarding the project 'Integrated Flood and erosion management in places and  
belt in the districts of Nalae and Sonoma in Brahmaputra valley, Assam  
(Rocks)'

No. BWR/CP/MS/CP/MS/016/023 Dated 03-07-2017


In view of the fact that you are hereby called to the post bag in  
the name of the project for work pertaining to the scheme under subject name and modify the  
DPR accordingly. The modified DPR may be submitted at an early date for onward submission  
to the CWC, Sahibganj.

  
Chief Engineer  
Water Resources Department  
Guwahati-3

Memo No. WRR(ED) Eek/016/023/17  
Copy to:-

21

1. The Additional Chief Engineer, Lower Assam Water Zone, Chandernagore, Guwahati-3 for information.
2. The Superintending Engineer, Mishra's Protection Water Resources Circle, Guwahati-3 for information and necessary action.

  
Chief Engineer  
Water Resources Department  
Guwahati-3



RESPECTED  
DIRECTOR GENERAL

GOVERNMENT OF INDIA

# BRAHMAPUTRA BOARD

(MINISTRY OF WATER RESOURCES)



सत्यमेव जयते

BRAHMAPUTRA BOARD  
100, RAJABAZAR  
GUWAHATI

## MASTER PLAN OF BEKI-MANAS-AIE SUB-BASIN

(A MASTER PLAN UNDER PART-IB)

REPORT VOLUME  
VOLUME - I

AUGUST, 2010.

VI-11-(3)

Table No. 10  
 Page No. 11

ANNUAL FLOOD DAMAGE IN BERUMBAH AND SUGUSSIM

Year	Barepe District (Area 2677.33 sokm <sup>2</sup> )		Nalban District (Area 1069.57 sokm <sup>2</sup> )		Average Damage per sokm <sup>2</sup> at 2006-10 price level	Average Damage per sokm <sup>2</sup> at 2006-10 price level
	At Current Price	Damage per sokm <sup>2</sup> at 2000-10 price level	At Current Price	Damage per sokm <sup>2</sup> at 2006-10 price level		
2007	105.57	0.12	738.90	121.15	1.11	1.11
2008	39.57	432.54	0.05	0.90	0.99	0.99
2009	145.57	25153.09	1450.00	1906.31	1.33	1.33
2009	11,35.14	1251.43	14.53	11.73	0.61	0.63
2009	32.00	211.72	1.95	1.25	0.66	0.66
2007	145.57	1578.26	2494.21	3257.32	0.18	0.18
2009	10572.59	11017.27	5066.14	6153.82	0.51	0.51
2009	2000.87	20709.35			1.04	1.04
					1.18	1.18

Registered Office: Bhid Road, Manikgollan, P.O. Gauhati, Dist. Chirang (Assam), 781031  
 Guwahati Office: B-12, Ring Road, Jalandhar, (Assam), Contact no: 89540 9954  
 Offices in All parts of Assam: Survey, Design, Est. Control, Operation, Scientific Instrument  
 Sales, Services & General Office: Guwahati  
 E.P. No. 101371/0331/087 No. 101/003103

TO:  
 THE EXECUTIVE ENGINEER  
 BARPETA WATER RESOURCES DIVISION,  
 BARPETA, ASSAM (INDIA)

DATED: 06/08/2018

SUBJECT: QUOTATION

Sl. No.	ITEM DESCRIPTION	RATE
1.	Total Station Along with all standard accessories in the box/packing	Rs.3,50,000.00
2.	Auto Levels Along with all standard accessories in the box/packing	Rs.28,500.00
3.	Current Meter Along with all standard accessories in the box/packing	Rs.43,000.00
4.	Echo Sounder Along with all standard accessories in the box/packing	Rs.42,500.00
5.	Calculator	Rs.500.00
6.	Measuring tape	Rs.500.00
8.	Protractor (42")	Rs.2,46,000.00
9.	Duplicating Machine	Rs.75,000.00

TERMS & CONDITIONS:-

- 01. SALE TAX : As shown above.
- 02. PAYMENT : 100% against delivery.
- 03. DELIVERY : 15 days after receiving your confirm order.
- 04. FREIGHT : inclusive FOB Destination, Barpeta.

Thanking You,  
 For any clarification please feel free to contact us.



(Authorized Signature)

# Ahmed tour & travels

Sachin, Dist - Jaisalmer  
Mobile: 9804114884

To Executive Engineer

General M.R. Division

Jaisalmer.

Sir,

We are submitting herewith the quotation for the hire charge of Vehicle (Bulwer) including P.O.L.

Hire Charge/month = Rs 30,000.00

Above charge includes the remuneration of the driver.

This is for your information and necessary action.

Regards,

*Ahmed*  
3/4/2014

Ahmed Ahmed

Proprietor

Ahmed Tour & Travels

GOVERNMENT OF INDIA

MINISTRY OF WATER RESOURCES

CENTRAL WATER COMMISSION

NEW DELHI

100, (S), Sanshodhan

100, (S), Sanshodhan

100, (S), Sanshodhan

100, (S), Sanshodhan

100, (S), Sanshodhan

100, (S), Sanshodhan

The Chief Engineer,  
Cantt. Executive Department,  
Gurgaon, Haryana,  
Gurgaon.

Subject: Re-examination of the Flood Management Scheme (Integrating Flood and  
Drainage Management at HUDA and Bafra Sides in the District of Haryana)  
Submitted in Gurgaon (Gurgaon) under contract No. (Gurgaon) Contract No. 123/2015-16.

Reference: (Gurgaon) (Gurgaon) (Gurgaon) dated 14.06.2016

Letter No. 01/1/PR-40/2015/173-79 dated 15.06.2016

Letter No. 01/1/PR-40/2015/173-79 dated 26.06.2016

Letter No. 01/1/PR-40/2015/173-79 dated 08.06.2016

Reference is invited to the above mentioned letter, vide which it was  
intimated that discharge data considered for design is different from what was  
submitted. In this regard, HUDA has reassessed the design  
and based on the annual flow peak data at Bafra road bridge (S.D. side of CWC) for  
the years 2002-2012 and lowest significant discharge in design flood as used in the  
scheme. The details of HUDA are also enclosed.

No.	Return Period (Years)	Design Flood based on S.D. (Govt. data scheme)	Design Flood based on CWC data (revised)
1	25	3960	3960
2	50	5415	4450
3	100	6420	4150

It is requested that the revised design data may be used for the  
scheme. The details of HUDA are also enclosed at the office for further  
reference.

Yours faithfully,

Yours faithfully,

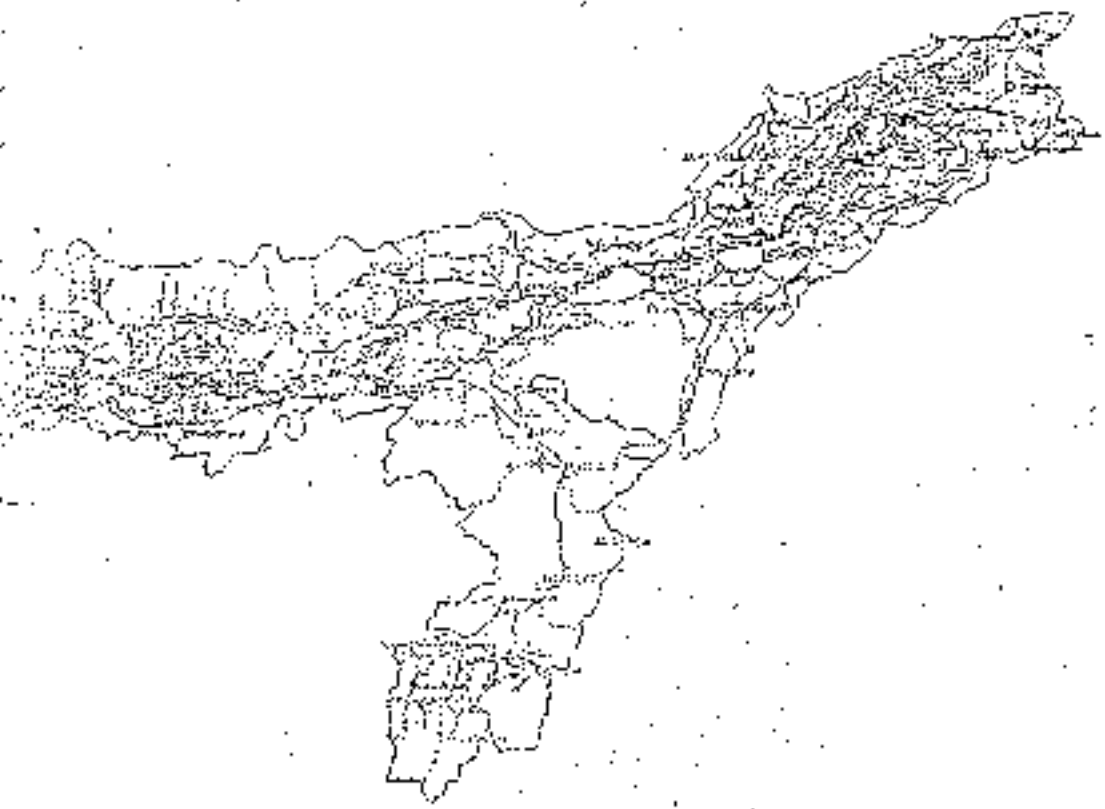
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GOVERNMENT OF ASSAM

WATER RESOURCES DEPARTMENT,  
CHANDMARI, GUWAHATI-3.



MINUTES OF THE  
56<sup>th</sup> TECHNICAL ADVISORY COMMITTEE  
MEETING  
10<sup>th</sup> & 11<sup>th</sup> Oct 2012

ANNOUNCEMENT  
MEMBERSHIP OF THE TECHNICAL ADVISORY COMMITTEE FOR THE  
RECONSTRUCTION OF GUWAHATI

Date: 19.10.2012

- 1. Mr. Jibon Kumar Saha, Dy. Commr. Assam  
Water Resources Department. Member, TAC
- 2. Mr. H. C. W. Chel, Engineer in Charge, Assam  
Water Resources Department, Assam. Member
- 3. Mr. J. B. Chel, Dy. Commr. Assam, Assam. Member
- 4. Mr. J. B. Chel, Dy. Commr. Assam, Assam. Member
- 5. Mr. J. B. Chel, Dy. Commr. Assam, Assam. Member
- 6. Mr. J. B. Chel, Dy. Commr. Assam, Assam. Member
- 7. Mr. J. B. Chel, Dy. Commr. Assam, Assam. Member
- 8. Mr. J. B. Chel, Dy. Commr. Assam, Assam. Member
- 9. Mr. J. B. Chel, Dy. Commr. Assam, Assam. Member
- 10. Mr. J. B. Chel, Dy. Commr. Assam, Assam. Member

MEMBERSHIP OF THE TAC HELD AT W.R. DEPT'S CONFERENCE ROOM, CHANDMARI, GUWAHATI ON 10<sup>th</sup> & 11<sup>th</sup> October 2012

With reference to the above, I am directed to forward herewith the minutes of the 5<sup>th</sup> meeting of TAC held at W.R. Dept's Conference Room, Chandmari, Guwahati on 10<sup>th</sup> & 11<sup>th</sup> October 2012.

Documents enclosed, if any, may kindly be sent to this office in due order.

Yours faithfully,

*(Signature)*  
Secretary

A. S. S. U. F. C. Board  
(Chandmari, Guwahati-3)

Page No. 100/1001

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- 1. Chief Engineer, WR Deptt. Guwahati-3
- 2. Chief Engineer, WR Deptt. Guwahati-3
- 3. Chief Engineer, WR Deptt. Guwahati-3
- 4. Chief Engineer, WR Deptt. Guwahati-3
- 5. Chief Engineer, WR Deptt. Guwahati-3
- 6. Chief Engineer, WR Deptt. Guwahati-3
- 7. Chief Engineer, WR Deptt. Guwahati-3
- 8. Chief Engineer, WR Deptt. Guwahati-3
- 9. Chief Engineer, WR Deptt. Guwahati-3
- 10. Chief Engineer, WR Deptt. Guwahati-3
- 11. Chief Engineer, WR Deptt. Guwahati-3
- 12. Chief Engineer, WR Deptt. Guwahati-3
- 13. Chief Engineer, WR Deptt. Guwahati-3
- 14. Chief Engineer, WR Deptt. Guwahati-3
- 15. Chief Engineer, WR Deptt. Guwahati-3
- 16. Chief Engineer, WR Deptt. Guwahati-3
- 17. Chief Engineer, WR Deptt. Guwahati-3
- 18. Chief Engineer, WR Deptt. Guwahati-3
- 19. Chief Engineer, WR Deptt. Guwahati-3
- 20. Chief Engineer, WR Deptt. Guwahati-3

*(Signature)*  
 (M. Sheikh)  
 Secretary,  
 A. S. B. V. P. C. Board  
 Chandernagore, Guwahati-3





As per the 45<sup>th</sup> FAC, the project is to be taken up in the next financial year.

**SHARATI EAST W.R. DIVISION**

36. Protection of village of Bani and other adjoining area from erosion of (through bridge) transverse road of near Bani village. 136.00

The proposal has been discussed by the distinguished members.  
The protection scheme is recommended.

37. All measures to protect village Bhandari Chandrapur from the erosion of river Pranhara. 553.07

The proposal has been discussed by the distinguished members.  
The protection scheme is recommended.

38. Protection of Bhandari and Garat area D/S of Dhaptola Bazar from the erosion of river Pranhara. Ck. 5200m to Ck. 6100m. 539.39

The proposal has been discussed by the distinguished members.  
The protection scheme is recommended.

**SHARATI WEST W.R. DIVISION**

39. All measures to protect village Mullaipara from the erosion of river Bhairabnadi. 587.28

The proposal has been discussed by the distinguished members.  
The protection scheme is recommended.

**SHIRDI W.R. DIVISION**

40. All measures for Rajghati Reinforcement on R/B of river S/S from Ck. 2500m to 8500.00m along with A/E measures. 1213.41

The proposal has been discussed by the distinguished members.  
It was opined by the FAC that this scheme is to be tagged with the scheme already recommended in the minutes of the 44<sup>th</sup> FAC vide 21.11.1997.

**BARPETA W.R. DIVISION**

41. Integrated flood and erosion management of Manes and Beki in the District of Barpeta and Barpeta in Goalaparvata Valley within Assam (Review). 5508.50

The project is a review project. The original project costing Rs. 11.15 Crores was recommended by the 45<sup>th</sup> FAC.

The provision in the earlier project was number of geo-anchors.

*(Handwritten signature)*

72 is linked

quarry collection. The following strategy will be adopted in the field and implementation of these measures. It may not give the desired results. The proposal of the Department and company is clarified and so through pre-arranged measures and bank protection to be according to the affected reaches with PSC/CCU part to be secured and border reinforcement to be the implementation. After dated discussion it was opined that protection of affected reaches through PSC/CCU part to be secured after field inspection. Additional Chief Engineer concerned should inspect the embankment and finalize the protective measures judiciously for better results.

DPR may be modified accordingly.

**WILPURA-W.R. DIVISION**

Channelization of river Karamnaptara and regularization of eroded land from Pancharatna to Charan.

1246.00

The proposal has been discussed by the distinguished members.

The scheme was recommended by the TAC with the observation that the provisions of PSC/CCU part to be reviewed by the Additional Chief Engineer, Lower Assam Zone after field inspection and finalize the same judiciously for better results.

Anti-erosion measures to protect Kishanpur Bazar and its adjoining area from the erosion of river Karamnaptara.

865.00

The proposal has been discussed by the distinguished members.

The proposal is recommended with the provisions provided.

Anti-erosion measures to protect Kishanpur - Chinaraita area from the erosion of river Karamnaptara. (Review)

1476.85

Additional Chief Engineer, Lower Assam Zone opined that no work is not required for discussion as the work proposed to be executed under this scheme is covered in the scheme in SI. 45 which is recommended.

*[Signature]*  
Secretary

ASB/FEC Board, Guwahati-3

ASBWF Board, Bhubaneswar

Summary of Proceedings

The proposal for the construction of a dam on the right bank of the river Brahmaputra at the confluence of the river into the Bay of Bengal was presented to the ASBWF Board during the meeting held on 17th March 2005. The Board discussed the proposal and decided to refer the same to the Additional Chief Engineer, Lower Assam Zone for his review and report. The Board also decided that the proposal should be reviewed after one year from the date of the meeting. The Board also decided to refer the proposal to the ASBWF Board for its review and report. The Board also decided to refer the proposal to the ASBWF Board for its review and report.

DPR may be considered accordingly.

DATA WITH DIVISION

<p>Construction of river Brahmaputra and reclamation of eroded land from Paschimputra to Chandrai.</p> <p>The proposal has been discussed by the distinguished members.</p> <p>The scheme was recommended by the TAC with the observation that the project of PSORFC protective systems to be reviewed by the Additional Chief Engineer, Lower Assam Zone after field inspection and to take the same judiciously for better results.</p>	<p>1246.33</p>
<p>Anti erosion measures to protect Krishna Bazar and its adjoining area from the erosion of river Krishna.</p> <p>The proposal has been discussed by the distinguished members.</p> <p>The proposal is recommended with the provisions provided.</p>	<p>865.00</p>
<p>Anti erosion measures to protect Kachua- Chhara area from the erosion of river Hoshangpur. (Review)</p> <p>The Additional Chief Engineer, Lower Assam Zone opined that the scheme is not important for discussion as the reach proposed to be maintained under this scheme is covered by the scheme in SI. 45 which is recommended.</p>	<p>1475.85</p>

*(Signature)*

Secretary


ASBWF Board, Bhubaneswar

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MEMORANDUM OF THE 10TH MEETING OF TECHNICAL MEMBERS' OFFICE  
CONFERENCE BOARD, CHANDMARI, GUWAHATI-3  
ON 27<sup>th</sup> AND 28<sup>th</sup> Nov, 2010

Members present:

1	The Senior Engineer, Co-Secretary to the Govt. of Assam, Water Resources Department, Guwahati-3.	Chairman/TAC
	The Secretary, to the Govt. of Assam, Water Resources Department, Dym, Guwahati-6.	Member
	The Chief Engineer, Water Resources Department, Guwahati-3	Member
1	The Additional Chief Engineer, Lower Assam Zone, Water Resources Department, Guwahati.	Member
2	The Superintending Engineer, I&W, Bakhrapara Road represented the Chairman, Bakhrapara Board, Basietha, Guwahati-28	Member
3	The Additional Chief Engineer, Upper Assam Zone, Water Resources Department, Dibrugarh.	Member
4	The Chief Engineer Irrigation Department, Guwahati-3.	Member
5	Smt. B. G. Pathak DDGM represented the Dy. Director General, R.F.C., Bongaigaon	Member
6	The Chief Engineer, P.W.D. (E)	Member
10	The H.O.D. (Civil), Assam Engineering College.	Member
11	Smt. C.R. Das, P.O. represented the Director, Soil Conservation, Assam, Ghy-6	Member

  
(D.K. Datta)  
Secretary

Assam State Bakhrapara Valley Flood Control Board  
Chandmari, Guwahati-3

MINUTES OF 10<sup>th</sup> MEETING OF THE T.A.C. OF PUNJAB RIVER BOARD  
HELD ON 19<sup>th</sup> AND 20<sup>th</sup> NOV, 2010 AT THE CONFERENCE ROOM OF THE  
P.W. DEPARTMENT, CHANDIGARH, GUWAHATI - 781005.

Before starting the formal meeting as per Agenda, a Power Point Presentation was made by Shri. Preet Singh, E.I. Quality Control, W & Dept on the following two subjects.

A) Channelisation of river Brahmaputra

In this concept of channelisation of the Brahmaputra, it is proposed to regularise the width of river Brahmaputra within 3 to 4 Km in a predetermined course thereby solving the erosion problem in its erosion prone reaches as well as to reclaim an area of more than 3.0 Lakh Hectare of land which was already eroded away by the river.

The methodology proposed to be adopted for the channelisation is as follows:

1. Channeling of all inclined channels of river Brahmaputra, flowing towards bank, by inducing siltation by using R.C.C. Porcupine screens.
2. Development of the main channel of river Brahmaputra along a predetermined course of width within 3 to 4 Km.
3. Dredging of low sand bars (outside the path of the pre determined course) by using silt inducing device like R.C.C. Porcupine etc.

The technical details of the process of siltation by R.C.C. Porcupines and some of the success stories of siltation by R.C.C. Porcupine screens, executed in different reaches of river Brahmaputra were also presented. The Committee appreciated the proposal.

The committee after detailed deliberations, felt that the concept is based on practical approach and is feasible. As the river Brahmaputra has already eroded away about 4.0 Lakh Hectare and bank erosion is still continuing at several reaches, so channelisation of the river may be considered as the need of the hour. The river carries heavy sediment load and so the methods suggested for achieving the object may give fruitful result provided the screens are executed properly at proper locations, at proper time and with proper replenishment as and where necessary. The department may take up a pilot project at an independent reach as a prototype study. For the pilot project, the reach at the down stream of Saraihat Bridge up to Pateshbari area may be considered. A proposal to this effect may be placed in the next meeting of the T.A.C. by the Department.

B) Performance of flood walls of river Bharalu during monsoon of 2010

A power point presentation was made on the performance of flood walls of both banks of river Bharalu in the reach from R.G. Barua Road crossing and G.S. Barua crossing during the monsoon of 2010. It was observed that the flood walls successfully prevented bank sliding by river Bharalu. It was also observed that though the flood walls prevent the entry of flood water from the river to the country side, the areas like East Barua, Barua Nagar, part of Lachit Nagar and areas around R.G. Barua Road

the river water has not been kept off away from the societies and villages of the area. It has also caused the tolls to be raised for the same. The river has been affected by the Bhatnagar Dam which causes floods in the area during high water discharge. The water is diverted towards the R.G. Barua Road.

High discharge causes the river to rise, which causes floods in the surrounding area.

The run off through the closed sluice drain along Rajgan Road from the Charanpur area and adjoining hills of Krishna Nagar flows directly to river Bhatnagar. Anil Nagar area by the storm drain along the Rajgan Road. When the river Bhatnagar is in high state, the sluice gate at the exit point of the storm drain is closed for preventing back flow of river water. This discharge causes partial flood of the country side of the flood walls in the area.

Though two pumps have been installed in the Anil Nagar area to pump out the accumulated discharge to the river Bhatnagar along with a few sluice gates, considering the quantity of accumulated water it will not be possible to pump out the same within a short time. So to ease the waterlogging problem in these areas up to manageable limit, the committee suggests the following:-

1. Diversion of refinery drain from Noonmati towards Bonda area through the existing drain near the railway line. Also diversion of the drain near Guvahati College gate (which carries the run off from Jyotinagar area) towards Noonmati and to connect the same with diverted refinery drain. These measures will reduce the flood discharge of river Bhatnagar as well as in the R.G. Barua Road area, relieving the Anil Nagar- Nabra Nagar area.
2. Diversion of river Bahini at the downstream of the Rukminiggon Bridge towards Saisake Beel, which will reduce flood discharge of river Bhatnagar as well as floods in the Suddapur area near R.G. Barua Road.
3. Possibility of diverting the Charanpur drain by connecting the same with the drain along the railway line towards Goresa Beel is to be explored. This will reduce flood inundation of the Anil Nagar area during high state of river Bhatnagar.

The W.R. Deptt. may take up the above proposal with the concerned authorities for consideration.

#### Part A

Para No. 15a. Confirmation of the minutes of the 45<sup>th</sup> (special) TAC meeting held at Guwahati on 18<sup>th</sup> June, 2010.

The Chairman confirms the minutes of the 48<sup>th</sup> (special) TAC meeting held at Guwahati on 18<sup>th</sup> June, 2010.

Part-B

1) Status of the various schemes recommended by the 45th TAC. The Chief Engineer, W.R. Department submitted the status of the head schemes recommended by TASS (G.O.P. up to Oct. 2010). A number of schemes under ADD loan are under NCC. Large is not completed. Location of 82 nos. DPR are as below -  
 100% physically completed schemes: 24 Nos.  
 Above 50% to 50% physically completed schemes: 64 Nos.  
 Below 50% physically completed schemes: 14 Nos.  
 Status of progress is about 51% only.  
 The committee noted the status as given and suggested the department to complete the incomplete schemes within this year.

2) Status of the various schemes recommended by the 47th and 48th TAC. The Chief Engineer, W.R. Department submitted the status report of various schemes recommended by the 47th and 48th TAC. It appears out of 6 Nos. of schemes considered by the 48th committee, 1 Nos. completed, DPR of 1 No. is with CWC and 1 No. is cleared by the General TAC & DPR for the rest 3 nos. are yet to be processed further. Similarly, out of 11 Nos. of schemes considered by the 47th committee, 3 nos. are under different stages of process, 10 nos. are under observations and nothing is done in respect of the rest 75 nos. of schemes. The committee noted the status report.

Part-C

Item No.156: To examine and recommend the schemes to be taken up by the W.R. Department.

The Committee after going through the memos of the schemes observed that the memos were not at all checked by the Chief Engineer / Additional Chief Engineer of the Department before placing to the TAC. Hence, the Committee reiterates that the memos should be properly examined by the Chief Engineer / Additional Chief Engineer of the Department before placing to the TAC.

The Committee also stressed upon the Power Point presentation for each and every memos of schemes from the next TAC.

The Committee examined the following schemes on the basis of priorities as indicated by the Chief Engineer, WRD. The recommendation / comments of the committee are given against each scheme below:

Sl. No.	Ref. of Agenda	Name of Division	Names of schemes with recommendations	Est. No. or P.S. or L.A. No.
1	1	Dibrugarh	Emergency protection measures for protection of Beharoria areas in Dibrugarh District (Review).	5991-29
2	2	Dibrugarh	Strengthening of Dibrugarh town protection works from Majan to Mohanagarh including boulder retaining works at Ch. 500 M to Ch. 550 M and Ch. 1800 M to Ch. 2300 M (Review).	2914-85

1. The Committee after going through the memos of the schemes observed that the memos were not at all checked by the Chief Engineer / Additional Chief Engineer of the Department before placing to the TAC. Hence, the Committee reiterates that the memos should be properly examined by the Chief Engineer / Additional Chief Engineer of the Department before placing to the TAC.



			<p>vi) Reversion of retained work proposed may arise.</p> <p>The estimate may be modified accordingly showing expected completion time.</p>	
17	8	Budget	<p>Construction of reinforcement from at Budget from Ballkuchi to Doldubi from Ch. 23.94 km (at Jaleswar) connecting DEBA land at Nainpur including A/R measures.</p> <p>The committee recommended the scheme with the following suggestions:</p> <ul style="list-style-type: none"> <li>i) 6 Nos. porcupine screens in increasing length to be provided as shown in the plan.</li> <li>ii) Screen no. 1 to be placed across the channel. (Chart is attached)</li> <li>iii) 3 Nos. porcupine screens to be provided at the entry point to check the channel along the bank.</li> <li>iv) Between screen no. 3 &amp; 4, 4 &amp; 5 2 nos. porcupine screens to be provided.</li> <li>v) 1 D/S. 1 nos. porcupine screens to be provided across the channel between low sand.</li> <li>vi) Reversion &amp; Retention proposal may arise. <p>The estimate may be modified accordingly showing expected completion time.</p> </li></ul>	3526.60
18	35	Budget	<p>A/R along B/S of Zalmara from Kachhighat to Bly Line (R/S &amp; A/R measures at different reaches of L/B embankment)</p>	1497.12
19	36	Budget	<p>A/R along B/S of Faliwara from Kachhighat to Bly Line (R/S &amp; A/R measures at different reaches of R/S embankment).</p> <p>The committee recommended the scheme with the following suggestions:</p> <ul style="list-style-type: none"> <li>i) A/R measures may be restricted to the critical points only.</li> <li>ii) Long Geo bags in place of boulders may be examined for A/R work.</li> <li>iii) R/S work may stand. However A/R to be provided for 25 years flood frequency.</li> </ul> <p>The schemes of sl. 35 and 60 to be clubbed together.</p> <p>The estimate may be modified accordingly showing expected completion time.</p>	3428.15



		<p>Construction of dyke from ch. 61.50 to ch. 61.50 km of Balyta including 400 metres at Chera and Mandapur area to protect from the erosion of river Brahmaputra.</p> <p>The committee recommended the scheme with the suggestion to change the nomenclature of the scheme "Construction of revetment from 61.50km to 67.00km of Balyta from Baman to Balyta including 400 metres at Chera and Mandapur area to protect from the erosion of river Brahmaputra".</p>	218.14
63	Barpeta	<p>Protection of both bank of river Koldia (Bank Protection in 4 Forest reaches of river Koldia) (Review).</p> <p>After detailed discussions the committee recommended the scheme.</p>	164.12
64	Barpeta	<p>Protection of Bahari, Fulbari, Bhagerpar, Parabhang and its adjoining area from the erosion of river Brahmaputra.</p> <p>The committee recommended the scheme with the following suggestions:</p> <ul style="list-style-type: none"> <li>i) Revetment from ch. 38km to 41.5km including Bell-Head at ch. 41.30 km may stand.</li> <li>ii) In the remaining portion porcupine screens at an interval of 2km of screen length to be provided up to 5km instead of the revetment work as proposed.</li> <li>iii) Strengthening work in Parabhang bend may stand.</li> <li>iv) 3 rows porcupine screens to be provided at channel no. 1 as proposed.</li> <li>v) In the remaining 3 channels 2 rows porcupine screens to be provided instead of one row.</li> <li>vi) Porcupine screens at channel no. 2 &amp; 3 are to be provided in continuation.</li> <li>vii) At channel no. 4, 2 rows of porcupine screens to be provided as shown on the plan.</li> <li>viii) Pricing of works and expected time for completion to be indicated.</li> </ul> <p>The estimate may be modified accordingly.</p>	21800.00
65	Barpeta	<p>Integrated flood and erosion management of rivers Alanas and Baki in the Dist. of Baska and Barpeta, in Brahmaputra valley within Assam.</p> <p>The committee recommended the scheme with the following suggestions:</p> <ul style="list-style-type: none"> <li>i) Additional 4 nos. deflectors are to be provided from ch. 36km to 34.5km at Mal'waguni.</li> <li>ii) At 125, alternative porcupine lines are to be extended up to end east.</li> </ul>	21499.50

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

|    |    |        |   |        |
|----|----|--------|---|--------|
|    |    |        | <p>to suit a few pumping schemes to be considered in the event of a future increase in water.</p> <p>3. Provision for at least 1% of works for maintenance to be made.</p> <p>4. Fixing of works and expected time for completion to be indicated.</p> <p>The estimate may be modified accordingly.</p>   |        |
| 38 | 65 | Nakhas | <p>W/S to M/E along B/B of river Noona from 'O' Point of existing embankment to its outlet (From 'O' Point to Rly. Line or R/B).</p> <p>The committee recommended the scheme with the suggestion to furnish River C/S showing B/B embankments in the DPT, and examine affec. on the other bank.</p>   | 619.85 |
| 39 | 67 | Nakhas | <p>M/E along B/B of river Pongadia from G.I. Ab to N.T. Road, Pt. I fabricron (LSD &amp; 300) installation (ASHAKASEI GEO-TECHNOLOGIES) for protection at 5<sup>th</sup> km LAD near village, Pab-Bardol.</p> <p>The committee recommended the scheme as a pilot project using 'ASHAKASEI GEO-TECHNOLOGIES'. Dr. M.R. Arower representative of ASHAKASEI gave a Power Point Presentation of the technologies applied at various countries of the world successfully. The same technology was applied at (a) Rani under Irrigation Dept. Assam, (b) Near Rajbansan (Assam) A.P.W. sponsored project also.</p> <p>Performance report of the scheme after one riged is to be placed on file at subsequent meeting.</p> | 292.85 |
| 40 | 68 | Nakhas | <p>M/E for the scheme of immediate measure to protect B/dyke on R/B from Adagari to Kakarjan at Mukhlanua from Ch. 15600m to Ch. 16600m for 2008-09 under C.R.D.</p> <p>The committee recommended the scheme.</p>   | 42.18  |
| 41 | 69 | LAD    | <p>Collection of Hydro-meteorological Data for 2010-2011.</p> <p>The committee recommended the scheme.</p>  | 11.00  |
| 42 | 70 | LAD    | <p>Hydrographic Survey of river Beangapaten from Dhubri to Panita (S/Ns No.1 to S/Ns No.22) for 2010-2010.</p> <p>The committee recommended the scheme.</p>   | 81.81  |
| 43 | 71 | Varan  | <p>Measures to protect Jhabara R/B from Dhubri to Karmachari.</p> <p>The Committee suggested to place the scheme in the next TAC with proper design using Gabions instead of boulders and expected time of completion.</p>  | 252.65 |

MINUTES OF THE 29<sup>TH</sup> MEETING OF THE TECHNICAL ADVISORY COMMITTEE  
 HEADQUARTERS, DEPARTMENT'S CONFERENCE ROOM, GUWAHATI-3, ON 23<sup>RD</sup>  
 NOVEMBER 2019.

To examine and recommend the new Schemes to be taken up by the W.R. Department. The Committee examined the schemes and observed against each scheme as indicated below:-

| Sl. No.                         | Name of scheme  | Estimated amount (Rs.) in lakhs |
|---------------------------------|---|---------------------------------|
| 1                               | 2   | 3                               |
| <b>SIVASAGAR W. R. DIVISION</b> |   |                                 |
| 1                               | <p>A/E measures to protect B/dyke from Desangmukh to Dikhowmukh (in between 5<sup>th</sup> Km to 10<sup>th</sup> Km) from the river Brahmaputra.</p> <p>The committee observed that the proposal should be reframed after taking up geo-technical examination. Provision of porcupine screens may be deleted, instead of it sustainable measures to be adopted.</p> | 900.00                          |
| 2                               | <p>R/S to B/dyke from Laibesi to Desangmukh at Mifonko and Samukjan area.</p> <p>The scheme is recommended</p>  | 645.08                          |
| 3                               | <p>R/S to Debung bund L/B from Laibesi to Desangmukh.</p> <p>The scheme is recommended</p>  | 443.68                          |
| 4                               | <p>Protection to Jharji bund R/B from A.T. Road to Yamulibhiga PWD Road at Banurgaon from the erosion of river Jharji (including R/S from Ch.3000m to ch. 3750m).</p> <p>The committee recommended the scheme with the observation that the apron should be properly designed and to be made of Geo-bag in loose.</p>   | 211.51                          |
| 5                               | <p>A/E measures to protect Sorani town from the erosion of river Towkak at ward No.8.</p>   | 325.00                          |
| 6                               | <p>A/E measures of Desang bund L/B from Akhoipatia to Desangmukh at Lepaigaon and Jailgaon from the erosion of river Desang.</p>  | 475.75                          |
| 7                               | <p>Protection of Dikhow bund L/B from upper Nazira to Sundorpukhuri at Chanbosa from the erosion of river Dikhow in between ch. 4<sup>th</sup> and 5<sup>th</sup> Km.</p>   | 550.00                          |
| 8                               | <p>A/E measures for restoration of breach like damages at Cherekaper on the dyke Dikhow bund R/B from Monipuribesi to A.T. Road of Sivsagar town.</p>   | 427.92                          |

## BARPEETA W. R. DIVISION


|                                |  |          |
|--------------------------------|--|----------|
| 22                             | Assam Integrated flood and river bank erosion risk management project for Chhenhari, Bahari, Bhangerper and its adjoining areas (including protection of Bahari Satra & Dakreswar Devslaya).   | 29843.00 |
|                                | The scheme is Recommended.   |          |
| 23                             | Construction of L/B embkts. of river Burahia from Thru Lakhanz PWD road to Dr. Maham path including protection work on D/B at different reaches.   | 2873.28  |
|                                | The committee recommended the scheme with observations as below: -<br>A) The nomenclature of the scheme should be changed as, "Construction of embankment on L/B of river Burahia from Kalutoli to Katin including protection works at different reaches." |          |
| 24                             | Protection of Bhowkaman area from the erosion of river Bokhara on its R/B.   | 240.23   |
|                                | The scheme is Recommended.   |          |
| 25                             | Integrated flood and erosion management of Manas and Beki river in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review).  | 15152.66 |
|                                | The scheme is Reviewed and recommended.  |          |
| 26                             | Protection of Barpeta Cattle Farm and its adjoining area from the erosion of river Beki on its L/B.  | 513.24   |
| 27                             | Protection of Gujraza area from the erosion of river Beki on its R/B.  | 517.75   |
|                                | The committee recommended the scheme at Sl. No. 26 and 27 with the following observations: -<br>A. Apron is to be designed properly and to be in loose Geo bag.<br>B. Cavity filling is to be deleted.   |          |
| 28                             | Protection of Khudrakhwa, Issapur and Manikpur area from the erosion of river Manas on its R/B.  | 599.60   |
|                                | The scheme is Recommended.   |          |
| NORTH LAKHEMPUR W. R. DIVISION |  |          |
| 29                             | Construction of short retirement at 36 <sup>th</sup> km of Subansiri R/B embkt. at Ghanchari including Pro-Siltation measures.   | 592.22   |
|                                | The scheme is Recommended.   |          |
| NHPC LIMITED                   |  |          |
| 30                             | Left & Right Bank of River Subansiri for Identified Stretches from RD 23Km. to 30 Km D/S of dam.   |          |
|                                | The Committee is Recommended. The proposal of protection work on L/B and R/B Subansiri.  |          |

Technical session / discussion during 79<sup>th</sup> TAC meeting

- A power point presentation by Director (Strategy & Development), DFI (India) 206, Okhla Industrial Estate, Ph- III, Okhla Industrial Area, New Delhi, Delhi-110020 for Develop and Verify the Pilot Embankment Breach Risk Assessment and Prediction Model along with associated surveys.

The Technical Advisory Committee advised the Department to implement a pilot Breach Prediction and Risk Assessment in Majuli Water Resources Division in the Dyke as mentioned below: -

Erakmapatra Dyke from Bessamara to Dakshinpat (Starting point Niskinkhawa  $26^{\circ}59'59.65''$  N,  $94^{\circ}19'56.75''$  E) to Ending point (Solmara  $26^{\circ}55'58.54''$  N,  $94^{\circ}17'32.18''$  E). Total length = 9.70 Km

  
 25/04/2019  
 Secretary  
 ASBVFC Board  
 Chandmari, Guwahati-3

GOVERNMENT OF ASSAM  
OFFICE OF THE SECRETARY  
ASSAM STATE BRAHMAPUTRA VALLEY FLOOD CONTROL BOARD  
WATER RESOURCES DEPARTMENT  
GUWAHATI-3

NO.BVFCB.303/2020/04

Date: 07.03.2020

To,

|    |  |                        |
|----|--|------------------------|
| 1  | Shri A.K. Mitra, Retd. Secretary to the Govt. of Assam, W.R. Department                                | Chairman TAC           |
| 2  | Member (RM) , CWC/Chief Engineer or his representative   | Member                 |
| 3  | The Chairman / Vice Chairman, Brahmaputra Board or his representative                                  | Member                 |
| 4  | The Secretary to the Govt. of Assam, W.R. Department, Dispur, Guwahati-5                               | Member                 |
| 5  | The Chief Engineer W.R. Department, Guwahati-3   | Member                 |
| 6  | The Chief Engineer, Quality Control, W.R. Department, Guwahati-3                                       | Invitee                |
| 7  | The Addl. Chief Engineer, I.A.Zone, W.R. Department, Guwahati-3  | Member                 |
| 8  | The Head of the Department of Civil Engineering, Assam Engineering College, Guwahati-13                | Member                 |
| 9  | The Chief Engineer, PWD (Roads), Guwahati-3  | Member                 |
| 10 | The Addl. Chief Engineer, Upper Assam Zone, W.R. Department, Dispur-Ghat                               | Member                 |
| 11 | The Chief Bridge Engineer, N.E. Rly. Maligaon, Guwahati  | Member                 |
| 12 | The Director Inland Water Transport, Guwahati-7  | Member                 |
| 13 | Shri Ratul Ch. Sarma, Retd. Commissioner and Special Secretary To the Govt. of Assam, W.R. Department. | Special Invitee Member |
| 14 | Shri Haran Kakoti, Retd. Secretary to the Govt. of Assam, W.R. Department                              | Spec of Invitee Member |

Subj:- 80<sup>th</sup> Special Meeting of the TAC held at Chief Engineer Conference Room, Chandmari, Guwahati-3 on 07<sup>th</sup> March/2020.

Ref:- BVFCB.303/2020/03

dated-06.03.2020.

Sir,

In continuation to the earlier letter under reference, I am directed to forward herewith the list of approved schemes under 80<sup>th</sup> Special Meeting of the TAC held at Chief Engineer Conference Room, Chandmari, Guwahati-3 on 07<sup>th</sup> March/2020.

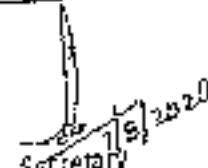
This is for favour of your kind information and necessary action.

Yours faithfully

Secretary  
ASBVFC Board,  
Guwahati-3

Minutes of the 80<sup>th</sup> (Special) Meeting of the Technical Advisory Committee held at W.R. Departments Conference Room, Guwahati-3 on 07<sup>th</sup> March/2020.  
 To examine and recommended the Schemes to be taken up by the W.R. Department. Name of schemes for placing in the 80<sup>th</sup> (Special) TAC meeting

| Sl No   | Name of scheme | Estimated amount (Rs.) in lakhs |
|---|----------------|---------------------------------|
| 2   |                | 3                               |
| <b>SIVASAGAR W.R. DIVISION</b>  |                |                                 |
| Protection of South bank of river Brahmaputra from Dikhowmukh to Rupahmukh (Review).  | 17162.51       |                                 |
| <p>A/E measures to protect E/dyke from Desengmukh to Dikhowmukh (in between 5<sup>th</sup> km to 10<sup>th</sup> km.) from the river Brahmaputra.</p> <p><b>Sl 1 &amp; 2 the committee suggested that for some important investigation to evolve a lasting and sustainable solution of the problem. Accordingly the department has instructed to survey the bank line at effected and identified that the vulnerable reaches, soil profiling be made for designing the particular solution.</b></p> <p><b>In the mean time however the department may take up one or two pilot project of the vulnerable reaches with the articulated grouted filled mattress. The technology is already available with the department from the consultant (TERRE ARMEE).</b></p> | 500.00         |                                 |
| <b>BARPETA W.R. DIVISION</b>  |                |                                 |
| <p>Protection of Krishnaguru Sewashram and its adjoining area from the erosion of river Alpa-Jaan.</p> <p><b>The Committee discussed the scheme and suggested that apron is not necessary and recommended the scheme as proposed.</b></p>   | 544.27         |                                 |
| <p>Integrated flood and erosion management of Manas and Beki river in the districts of Baksa and Barpeta in Brahmaputra Valley within Assam (Review).</p> <p><b>The committee has reviewed the scheme and recommended as per report submitted by the Chief Engineer W.R. vide his letter No. WR(ED)Tech/6154/2011/73, date-04.03.2020.</b></p>  | 20525.00       |                                 |

  
 Secretary  
 ASEVFC Board, Guwahati-3.



**MINUTES OF THE 82<sup>ND</sup> SPECIAL TECHNICAL ADVISORY COMMITTEE**  
**MEETING HELD ON 18<sup>TH</sup> MAY 2021 IN VIRTUAL PLATFORM AS**  
**APPROVED BY GOVT**

The list of members of TAC, Invited & Spl. invitees participated in the Webinar Organized by W. R. Dept. on 18<sup>th</sup> of May 2021 at 1:00 PM is annexed.

At the very outset Chairman accorded warm welcome to all the participants and requested Chief Engineer, Water Resources Department, to start the proceedings as per Agenda Circulated.

**AGENDA NO. 1:-**

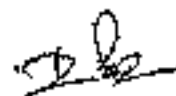
**Integrated Water Resources management of Burdighing basin.**

**Estimated cost:- Rs. 1195.523 Crore**

Addl. C. E. (UAZ) briefed and explained the reason for preparation of revised DPR of the Burdighing project and stated the main contributing factors leading the revised cost estimate. The major reason for revision of the DPR are addition of locations of erosion points as per present site conditions, incorporation of interlocking paver blocks on the top of the embankment to increase the sustainability and durability of the upgraded embankment structure and increase in quantity of earthwork due to the increase in crest width of embankment to accommodate the road provision on embankment. Due to incorporation of these provisions the cost of the revised DPR has increased from Rs. 635.223 Crores to Rs. 1195.523 Crore. However, Addl. Chief Engineer (UAZ) has stated that the design provision is kept same as earlier proposal. Director Design has also explained the reason for preparing of revised DPR and a detailed power point presentation was made to highlight the requirement and justification of the provisions made in the revised DPR.

The department also informed TAC that this project is likely to be implemented through world bank funding and representative of world bank along with officials of both Water Resources Department and PREMAA visited the site to understand the ground reality suggesting updating of the DPR.

During the discussion Dr. Shivash Sharma, Associate Professor, Assam Engineering College, Sri Ankit Dasoja, Deputy Director, Central Water Commission and Mr. M. P. Scott, Vice Chairman, Brahmaputra Board, has also participated in the discussion and made some valuable suggestion.



After threadbare discussion the committee has recommended the revised DPR with all the provisions with the suggestion to forward the revised DPR to appropriate authority of Govt. of India, for necessary approval.

AGENDA NO. 2:-

Integrated Flood and Erosion Management of Mamuk & Beki in the District of Baksa and Karbi in Brahmaputra Valley in Assam.

Estimated cost - Rs. 211.167 Crore

Asst. Chief Engineer (LAZ), has explained the new proposals adopted in the revised estimate and stated that due to incorporation of new erosion affected location and inclusion of paver blocks surfacing on the top of the embankment, the cost of the DPR increased from Rs. 203.25 Crore to Rs. 211.167 Crore. During the discussion, Hon'ble Chairman has suggested that the department may explore the possibility of utilizing river boulders in the apron and revetment at the vulnerable points of upper reaches where considerable velocity is generated during flood, Beki being a flashy river carries considerable discharge, adequate and sustainable protection measure is necessary. However, after detail discussion on the provisions made in the proposal, the Committee strongly felt that at proposed vulnerable reaches for safety and sustainability, Geo Bags (in apron) should be placed in gabion/ suitable crates in case of non-availability of specified river boulders.

The department also informed TAC that this project is likely to be implemented through world bank funding and representative of world bank along with officials of both Water Resources Department and FRDMAA visited the site to understand the ground reality suggesting updating of the DPR.

Committee members Dr. Bivash Barua, Associate Professor, Assam Engineering College, Sri Ankit Dadeja, Deputy Director, Central Water Commission and Mr. M. P. Scott, Vice Chairman, Brahmaputra Board, have also participated in the discussion and opined the same views. After threadbare discussion the committee has recommended the scheme with suggestions to forward the revised DPR to appropriate authorities of Govt. of India for approval.

The meeting ended with vote of thanks from chair.



Secretary  
ASBVP Board  
Water Resources Department  
Chandmari Guwahati - 3

GOVERNMENT OF ASSAM  
OFFICE OF THE SECRETARY  
ASSAM STATE BRAHMAPUTRA VALLEY FLOOD CONTROL BOARD  
WATER RESOURCES DEPARTMENT  
GUWAHATI-3

No. BVFCB.264/2019/A0

Dated: 15.05.2020

To,

The Chief Engineer  
Water Resources Department  
Guwahati-3

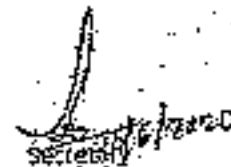
Subj: Approval of scheme under emergency procedure.

Sir,

With reference to the subject cited above I have the honour to inform you that the Vice-Chairman, ASBVFC Board, (M.W.B.) has approved the following schemes under emergency procedure.

| <u>Sl no.</u> | <u>Name of scheme</u>  | <u>Amount</u>  |
|---------------|--|----------------|
| 1.            | Integrated flood and erosion management of Amanas and Boli river in the district of Baksa and Darrpeta in Brahmaputra valley within Assam (Review) | Rs. 20125.00 L |

Years faithfuly


Secretary  
ASBVFC Board, Guwahati-3

Dated: 15/05/2020

Memo No. BVFCB.264/2019/A0-A.

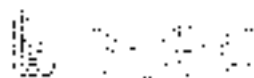
Copy to,

The Deputy Secretary (II) to the Govt. of Assam Water Resources Department, Dispur,  
Guwahati-6, for information.

SAF

Secretary

ASBVFC Board, Guwahati-3

  
B.C. Engineering & Consultancy  
Email: [bc2005@gmail.com](mailto:bc2005@gmail.com)

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To,  
The Executive Engineer,  
Projects & S.D. Division  
Bardoli

Sub: Soil Test Report

Ref: Your letter for conducting Soil Test for determination of Silt Factor.

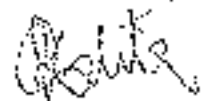
Sir,

I would like to submit herewith the soil test report for the river Bardoli conducted on the samples you submitted. Kindly get the report as in the following.

I request you kindly to pay the bill for conducting the Soil Test.

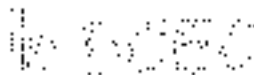
Thanking you,

Sincerely yours



CEO,

B.C. Engineering & Consultancy



GOVERNMENT OF ASSAM

Public Engineering & Consultancy  
 Email: [cei@cei.gov.in](mailto:cei@cei.gov.in)

Name of Work: Laboratory analysis of Disturbed & Undisturbed Soil samples for grain size analysis for determination of soil factor

Name of Division: Barpeta W.R. Division

Name of Sub-Division: Sorbhog W.R. Sub-Division

Name of the Scheme: INTEGRATED FLOOD AND EROSION MANAGEMENT OF MAJAS AND BEKI RIVER IN THE DISTRICT OF BAKSA AND BARPETA IN BRAHMAPUTRA VALLEY WITHIN ASSAM (ICMIFW)

Laboratory Investigation:

Soil sample supplied from Barpeta W.R. Division, Sorbhog W.R. Sub-Division under examination were carefully analysed in the laboratory as per IS Code Specification.

Soil Sample No./Description of Soil samples:

Soil-1/SS/CH: 42000 Ghugubari, river Beki

Light ash to yellowish in colour poorly graded fine sand with silt, traces, vegetable roots, inorganic alluvial soil.

Soil-2/SS/CH: 51000 Kargachia, river Beki

Light ash to whitish in colour poorly graded fine sand with silt, traces, vegetable roots, inorganic alluvial soil.

Soil-3/SS/CH: 74500 Poo Memberi, river Beki

Light ash in colour poorly graded fine sand with silt, traces, vegetable roots, inorganic alluvial soil.

Office:

5B, Palace Export, Dr. B.N. Sarma Road, Survey, Bokoia,  
 Goalpara, Assam - 781028  
 Phone: 9850979003, 9856076467, Landline: 0361-2725680

**BCEC**

Bharat Engineering & Consultancy

B.C. Engineering & Consultancy  
 Email: bceec2000@gmail.com

### Grain Size Analysis in %

Table -1

| Soil Sample No. | Depth (ft) | Clay less than 0.075mm | Silt between 0.075 to 0.002mm | Sand between 0.075 to 4.75mm | Gravel greater than 4.75mm | IS-1498 | Specific Gravity |
|-----------------|------------|------------------------|-------------------------------|------------------------------|----------------------------|---------|------------------|
| Soil-1          | 0.50       | --                     | 10.03                         | 90.00                        | --                         | SP      | 2.35             |
| Soil-2          | 0.50       | --                     | 9.69                          | 91.00                        | --                         | SP      | 2.35             |
| Soil-3          | 0.50       | --                     | 9.69                          | 91.00                        | --                         | SP      | 2.35             |

### Silt Factor

Table -2

| Soil sample No. | Depth (ft) | D20   | D50   | D80   | Mean Dia (mm) | Silt Factor (F) |
|-----------------|------------|-------|-------|-------|---------------|-----------------|
| Soil-1          | 0.50       | 0.125 | 0.270 | 0.373 | 0.256         | 0.891           |
| Soil-2          | 0.50       | 0.133 | 0.293 | 0.364 | 0.264         | 0.904           |
| Soil-3          | 0.50       | 0.160 | 0.280 | 0.360 | 0.257         | 0.905           |

From the laboratory analysis of soil samples supplied by the Berpeta W.R. Division, Sarsing W.R. Sub-Division, the average Silt Factor for soil sample found as 0.90. The above Silt Factor result has been worked out as per Levey's equation

C.E.O.  
 B.C. Engineering & Consultancy

Office:  
 B3, Patna Ch. Road, 2nd & 3rd, Galle Road, Survey, Belhara  
 Comaba, Aizawl - 781018

Compliance of the observations raised by the CWC, New Delhi vide letter no: T-22314/3/2020  
FMP DTP Dated 24.09.2021

| Sl. No.                 | Observations of CWC.   | Compliance.  |
|-------------------------|--|--|
| (j) General Observation |  |  |
| 1                       | The Scheme was cleared by the State TAC in June,2018 for an estimate cost of Rs.203.25Cr and was in advance stage of techno-economic appraisal at CWC HQ with modified cost of Rs.300.93Cr. However as per State TAC held in May 2021, the scope of the project has been enhanced. The need of revision of scope of project duly supported by technical study/ drawing /imaginary etc may be please furnished.   | The DPR was last recommended by the SOI/TAC held on 07.05.2020. However, in the meantime, severe bank erosion activated in some of the locations which required immediate attention. Therefore, on priority some immediate measures were taken up at some previously identified locations of most vulnerable reaches. Accordingly, it was felt that some new reaches of Anti-erosion and Pro-siltation measures are required to be included in the project. As such, it was placed in the State TAC again for reviewing the scope of the project.<br>The imagery showing the migration of bank line is shown and is appended in the DPR. |
| 2                       | As per the Minutes of Meeting (MoM) of State TAC held on 18 <sup>th</sup> May 2021, the cost of the revised DPR has been revised from Rs.203.25Cr. to Rs 288.43)Cr. However, the DPR submitted has estimated cost of Rs.420.833Cr. Reason of this variation may be clarified.  | In the memo of work there was no provision of cage in the apron. The TAC advised to provide cage in apron. Crest width of the embankment in the memo was 4.5m, which was later increased to 6.6m to provide Road cum embankment with paver block. Further, some minor changes occurred due to adoption of the SOR of APWD (RR)2020-21 for most of the items in the DPR. Hence variation occurred.  |
| 3                       | As per the (MoM) of State TAC, reason for revision of the DPR is due to incorporation of new erosion affected location and inclusion of paver blocks surfacing on the top of the embankment. In this regard, it is to mention that pavement designs for the roads and flood embankment designs are dealt with separate BIS/IRC codes and the aspect of road provision on embankment is not covered under flood management schemes hence cost of incorporation of interlocking paver blocks on the top of the embankment may be shown separately from the flood management works and design of pavement work may done using appropriate BIS code. | As suggested, the revised DPR is being separately prepared showing A. Flood Management Work & B. Road Component in Abstract of Cost. The road will be constructed as per MORD Specifications for Rural Roads 2014  |
| 4                       | As per the salient features of the project, the benefitted area and benefitted population has increased. Justification for the same may be supported with providing bank lines of last 3-4years showing reach wise affected areas.   | As some new reaches have been incorporated in the project as per site condition, the benefitted area and population benefitted have increased. Necessary certificates in respect of new benefitted area is obtained from Revenue Authority, which is considered for calculating the B.C Ratio. Moreover, the bank line is shown in the compass plan.   |
| 5                       | Head wise percentage variation statement for all works with respect to previously submitted DPR may be appended in the   | Appended in the DPR.   |

| Sl. No.                        | Observations of CWC   | Compliance   |
|--------------------------------|---|--|
| <b>DPR</b>                     |   |  |
| 5                              | The content of DPR may be page numbered   | Done accordingly.  |
| 7                              | Recent site visit report by the regional office of CWC may be appended.   | CWC, BBO, Gawaihat, has already been requested for the site visit and the report will be submitted immediately after receiving the same from the CWC end.  |
| 8                              | Soft copy of the DPR in MS-word and MS-excel format may be provided.  | Will be provided accordingly.  |
| 9                              | Power point presentation on the proposal may be provided.   | Will be provided accordingly.  |
| <b>2) Design</b>               |   |  |
| 1                              | Chapter on Design of work may be revised as per approved design in previous DPR following provisions of relevant BIS codes. | The design of revetment has been done as per the provisions of IS 14262:1995 while the launching apron has been designed by adopting the provisions of IS 8408:1994 & 14262:1995. Design discharge of 50 years return period as provided by the Hydrology N.E. Dte of CWC has been adopted for consideration of design discharges. |
| 7                              | The details of work as envisaged in the scheme provided as per the Preference attached.                                     | Appended in the DPR as per the given Preference.   |
| 2                              | Typical cross-section of embankment indicating key parameters such as free board, datum, HGL, etc. may be provided.         | Provided accordingly.  |
| 4                              | Typical cross-section for revetment work may be provided.   | Provided accordingly.  |
| 5                              | Comments on hydrological aspects by Hydrology (NE),CWC will be conveyed to your good office in due course of time.          | Any observation made by the Hydrology (NE),CWC will be met up in due course of time.   |
| <b>3) Stationary Clearance</b> |   |  |
| 1                              | Certificate from the State Finance concurrence may also be appended.  | In process & will be submitted as received   |

  
 Executive Engineer  
 Barpeta W.R Division  
 Barpeta



Name of the Project: Integrated Flood and Erosion Management of Manas and Baki River in the district of Baksa and Barpeta in Brahmputra Valley within Assam (Review).

1. Embankment Works

A. Main River

| S.No. | Name of River/Stream | Location        | Newly proposed Embankment |            |       | Raising & Strengthening of embankment |            |       | Final Total |
|-------|----------------------|-----------------|---------------------------|------------|-------|---------------------------------------|------------|-------|-------------|
|       |                      |                 | Left Bank                 | Right Bank | Total | Left Bank                             | Right Bank | Total |             |
| 1     | Beki                 | Ch.2780m-12200m | Nil                       | Nil        | Nil   | 9420m                                 | Nil        | 9420m | 9420m       |
| 2     |                      | Ch.2500m-4357m  | Nil                       | Nil        | Nil   | Nil                                   | 1851m      | 1851m | 1851m       |

B. Tributaries

| S.No. | Name of River/Stream | Location | Newly proposed Embankment |            |       | Raising & Strengthening of embankment |            |       | Final Total |
|-------|----------------------|----------|---------------------------|------------|-------|---------------------------------------|------------|-------|-------------|
|       |                      |          | Left Bank                 | Right Bank | Total | Left Bank                             | Right Bank | Total |             |
| Nil   | Nil                  | Nil      | Nil                       | Nil        | Nil   | Nil                                   | Nil        | Nil   | Nil         |

2. Anti-Erosion Works

A. Main river

| S.No. | Name of River/Stream | Location   | Anti Erosion Works |            | Total Length(m) |
|-------|----------------------|------------|--------------------|------------|-----------------|
|       |                      |            | Left Bank          | Right Bank |                 |
| 1     | Baki                 | Raghabill  | 300                | Nil        | 300             |
| 2     |                      | Elengbari  | 1500               | Nil        | 1600            |
| 3     |                      | Chunbari   | 1500               | Nil        | 1500            |
| 4     |                      | Khagrabari | 2500               | Nil        | 2500            |
| 5     |                      | Gobardhana | 900                | Nil        | 900             |
| 6     |                      | Udalguri   | Nil                | 600        | 600             |
| 7     |                      | Barapeta   | Nil                | 500        | 500             |
| 8     |                      | Tilabori   | Nil                | 800        | 800             |
| 9     |                      | Damunighat | 1300               | Nil        | 1300            |
| 10    |                      | Safakamr   | 750                | Nil        | 750             |
| 11    |                      | Ketajar    | 1870               | Nil        | 1870            |

|    |                          |      |      |      |
|----|--------------------------|------|------|------|
| 12 | Nichuka                  | 1450 | Nil  | 1450 |
| 13 | Chantabari               | Nil  | 1250 | 1250 |
| 14 | Kotekbari                | Nil  | 1500 | 1500 |
| 15 | Hijipur-<br>Deulipara    | 1350 | Nil  | 1350 |
| 16 | Kurobaha                 | Nil  | 700  | 700  |
| 17 | Salsaha                  | Nil  | 900  | 900  |
| 18 | Bordanga                 | Nil  | 1300 | 1300 |
| 19 | Gulleza                  | Nil  | 1000 | 1000 |
| 20 | Mowanzari                | Nil  | 500  | 500  |
| 21 | Kaurfahi                 | Nil  | 1000 | 1000 |
| 22 | Kharbala-<br>Sulirpathar | Nil  | 1500 | 1500 |
| 23 | Daukmar                  | Nil  | 1000 | 1000 |
| 24 | Sawpur                   | Nil  | 1500 | 1500 |
| 25 | Aipur-Basupur            | Nil  | 1400 | 1400 |
| 26 | Jacrimar                 | Nil  | 1400 | 1400 |
| 27 | Pub Moimbari             | Nil  | 500  | 500  |
| 28 | Takakata                 | Nil  | 700  | 700  |
| 29 | Hatchara                 | Nil  | 1000 | 1000 |
| 30 | Joyour                   | Nil  | 900  | 900  |
| 31 | Tarakandi                | Nil  | 1920 | 1920 |
| 32 | Chotoa                   | Nil  | 1530 | 1530 |
| 33 | Kismat Molnbari          | Nil  | 930  | 930  |
| 34 | Puran Chikatari          | Nil  | 250  | 250  |
| 35 | Bheragaon                | 1000 | Nil  | 1000 |
| 36 | Satrankanara             | 2037 | Nil  | 2037 |
| 37 | Marachaj                 | 2041 | Nil  | 2041 |

### B. Tributaries

| S.No. | Name of River/Stream | Location | Anti Erosion Works |            | Total Length |
|-------|----------------------|----------|--------------------|------------|--------------|
|       |                      |          | Left Bank          | Right Bank |              |
| Nil   | Nil                  | Nil      | Nil                | Nil        | Nil          |

### 3. Porcupine work

#### A. Main river

| S.No. | Name of River/Stream | Location    | Porcupine Works |            | Total Length(m) |
|-------|----------------------|-------------|-----------------|------------|-----------------|
|       |                      |             | Left Bank       | Right Bank |                 |
| 1     |                      | Narayanguri | 520m            | nil        | 520m            |
| 2     |                      | Chanbari    | 450m            | nil        | 450m            |
| 3     |                      | Khagrabari  | 520m            | nil        | 520m            |
| 4     |                      | Gaerigari   | 390m            | nil        | 390m            |
| 5     |                      | Safakatur   | 520m            | nil        | 520m            |
| 6     |                      | Niz Darnake | 260m            | nil        | 260m            |
| 7     |                      | Chanbari    | nil             | 360m       | 360m            |

|    |     |                  |       |       |       |
|----|-----|------------------|-------|-------|-------|
| 8  |     | Asanpur          | 300m  | nil   | 300m  |
| 9  |     | Kamrupera        | nil   | 340m  | 340m  |
| 10 |     | Baraispeta       | 1200m | nil   | 1200m |
| 11 |     | Daskhari         | nil   | 600m  | 600m  |
| 12 | BKJ | Chandury Bazar   | 710m  | nil   | 710m  |
| 13 |     | Sawpur           | nil   | 220m  | 220m  |
| 14 |     | Balikuri         | nil   | 220m  | 220m  |
| 15 |     | Somban           | nil   | 1200m | 1200m |
| 16 |     | Chikni           | nil   | 160m  | 160m  |
| 17 |     | Jaurimari        | nil   | 400m  | 400m  |
| 18 |     | Bhuzogon         | 190m  | nil   | 190m  |
| 19 |     | Satrukandan      | 360m  | nil   | 360m  |
| 20 |     | Pub Masbari      | nil   | 190m  | 190m  |
| 21 |     | Solmari          | nil   | 250m  | 250m  |
| 22 |     | Kishnat          | nil   | 570m  | 570m  |
| 23 |     | Meinbori         |       |       |       |
| 23 |     | Dukhin Sikartary | nil   | 320m  | 320m  |
| 24 |     | Gobindapur       | nil   | 1200m | 1200m |
| 25 |     | Tankuni part-iii | nil   | 190m  | 190m  |

#### B. Tributaries

| S.No. | Name of River/Stream | Location | Porcupine Works |            | Total Length |
|-------|----------------------|----------|-----------------|------------|--------------|
|       |                      |          | Left Bank       | Right Bank |              |
| Nil   | Nil                  | Nil      | Nil             | Nil        | Nil          |


#### 4. Sluice Work

##### A. Main river

| S.No. | Name of River/Stream | Location | Newly proposed work |            | Repair/maintenance work |            |
|-------|----------------------|----------|---------------------|------------|-------------------------|------------|
|       |                      |          | Left Bank           | Right bank | Left Bank               | Right Bank |
| Nil   | Nil                  | Nil      | Nil                 | Nil        | Nil                     | Nil        |

##### B. Tributaries


| S.No. | Name of River/Stream | Location | Newly proposed work |     | Repair/maintenance work |     |
|-------|----------------------|----------|---------------------|-----|-------------------------|-----|
|       |                      |          |                     |     |                         |     |
| Nil   | Nil                  | Nil      | Nil                 | Nil | Nil                     | Nil |


  
 Executive Engineer  
 Barpeta W.R. Division  
 Barpeta

list of observations from CWC, New Delhi vide Letter No. 9/1/PR-49/2020-FMP dated 13.10.2020 and the replies from WRD, Govt. of Assam.

| Sl. No.                      | Comments / Observations of CWC   | Compliance furnished by WRD, Assam  | Status  | Replies from the WRD, Govt. of Assam. |
|------------------------------|--|---|---|---------------------------------------|
| <b>General Observations:</b> |  |   |   |                                       |
| (1)                          | <p>Earlier one DPR 'Integrated Flood and erosion management of Menas and Beldi rivers in districts of Sakas and Borphat' costing Rs 90 Cr was submitted to CWC on 16.06.2016. The DPR was examined in detail in CWC and cost was modified to Rs 126.606 on 19.02.2018. However, during site visit by officials from regional office of CWC, State Govt inconsistency was found in HPL and therefore design discharge needed a review. Thereafter, State Govt was requested for revision/checking of Design Discharge vide letter dated 18.06.18. Replies from State Govt were received on 14.09.2018, which were sent to Hyd(NE), CWC on 17.09.2018. Comments from Hyd(NE) Dte was received on 19.11.2018 &amp; State Govt was requested to modify the DPR based on Hyd(NE) comments on 20.11.2018.</p> <p>Reminder was also sent on 01.02.2019 to submit modified DPR. Finally DPR was deleted/ Returned vide letter dated 13.03.2019 due to non response from the State Govt. Works envisaged under earlier DPR were Raising and Strengthening of the existing dyke in both banks for a total length of 25.00 Km(R/B- 20.549km and R/LB- 4.351 km), Revetment with sand-filled geo-bags (length- 14000m at 14 locations) &amp; R.C. C. Perceptic works. In the instant proposal works costing Rs 203.25 Cr envisaged are Raising &amp; strengthening of the existing embankment in Right as well as Left bank for a total length of 16.551km (Left Bank embankment = 12200m, Right bank embankment = 4351m) Erosion protection by construction of Agron with Geo-bag along with bank revetment for a length of 28330m in different locations &amp; R.C. C. Perceptic works. It has been found that there considerable changes in the proposed works in earlier &amp; proposed DPR. These changes need detailed justification. It is suggested to append a comparison statement for various features/works with cost of both schemes along with remarks column in tabular form to compare both the schemes.</p> | <p>The justifications of changes along with comparison statement have been appended with modified DPR</p> | <p>No further comments</p>  | <p>No. Received.</p>                  |
| (2)                          | <p>DPR may be prepared as per CWC guidelines 2016 with all requisite details of the project.</p>   | <p>Done accordingly</p>   | <p>Please refer Page-4 of Guidelines for preparation of DPR for flood management works-2016 for Index-Guideline of DPR. Also provide index with Associated page number.</p> | <p>Done Accordingly.</p>              |

|     |  |                                     |  |  |
|-----|--|-------------------------------------|--|--|
| (2) | A certificate regarding correctness of quantities from the competent authority i.e. Chief Engineer or equivalent (with stamp and date) may be provided.  | Enclosed DPR                        | No further comments  | Not required.  |
| (3) | As the scheme is a part of concept used Assam Integrated River Basin Management Project (AIRBMP-Phase-II) funded by World Bank. A certificate regarding the proposal funding from the World Bank may be given. | Enclosed in the DPR                 | No further comments  | Not required.  |
| (4) | As the project is externally funded (through World Bank), the same should be routed through EA Wing of DoWR, RD&GR, MGS.   | Routed through the concerned WDGPA. | Reference documents for the same has to be attached with DPR. Further, copy of the certificate/EP from DoWR, RD&GR in which the instant scheme has been proposed should be appended. | After getting clearance from CWC, proposal for funding from World Bank will be filed. A letter from EO-T, PRIMA to PMSP, CWC vide no. PRIMA/PM/ADMIN/199/2017/part-1/376/1956 dt. 14/5/2018 enclosed in the DPR for reference, where this scheme is also included. |
| (5) | A certificate regarding the cost of the project shall remain final may be attached with the DPR  | Attached in the DPR.                | No further comments  | Not required.  |
| (6) | The compliance with respect to the longitudinal and latitudinal connectivity and e-flow as per the CWC guideline should also be submitted.   | Certificate enclosed in the DPR.    | No further comments  | Not required.  |
| (7) | Land acquisition certificate may be provided if any.   | No land acquisition is required.    | No further comments  | Not required.  |
| (8) | A Certificate that separate schemes are not being proposed/planned on the same reach of the river may be added to the DPR.   | Appended in the DPR.                | No further comments  | Not required.  |

  
Executive Engineer  
Barpeta W.R Division  
Barpeta

  
Chief Engineer  
Water Resources Department,  
Charaninari, Guwahati-03

**NO. 07/PR-08/2019-RMP/**  
**सर्वभारत / GOVERNMENT OF INDIA**  
**केन्द्रीय जल आयोग / CENTRAL WATER COMMISSION**  
**सांख्यिकीय योजना विभाग / FLOOD MANAGEMENT PLANNING Div.**

पत्रांक/संख्या- 91/6 JIS) नवा मुम्बई  
 एम/कृष्णा मुरम, नई दिल्ली  
 दिनांक- 01.07.2020

Chief Engineer,  
 Water Resources Department  
 Guwahati, Assam

Sub: Submission of DPR for scheme 'Integrated Flood and Erosion Management of Manas and Deo, River in the District of Baksa and Barpeta in Echamputra Valley, Assam (Review)' (Estimated Cost: Rs 202.25 Crores) etc.

Ref: Your letter dated 15.06.2020

Reference is invited to the above mentioned letter vide which DPR was submitted to this office. The DPR has been examined and the observations/comments are as follows:

**A. General Observations:**

1. Earlier one DPR 'Integrated Flood and erosion management of Manas and Sakti rivers in districts of Baksa and Dibrugarh' costing Rs 96 Cr was submitted to CWC on 10.06.2018. The DPR was examined in detail in CWC and cost was modified to Rs 128.60 Cr on 19.02.2018. However, during site visit by officials from regional offices of CWC, State Government (any) was found in HPS and therefore design discharge needed a review. Thereafter, State Govt was requested for revision checking of Design Discharge vide letter dated 18.05.18. Replies from State Govt were received on 14.09.2018, which were sent to Hyd(N)S, CWC on 17.09.2018. Comments from Hyd(N)S/Dt. was received on 19.11.2018 & State Govt was requested to modify its DPR based on Hyd(N)S comment on 20.11.2018. Reminder was also sent on 04.02.2019 to submit modified DPR. Finally DPR was received returned vide letter dated 11.03.2019 due to non response from the State Govt. Works envisaged under revised DPR were: Raising and Strengthening of the existing dyke in both banks for a total length of 25.00 Km (R/R- 20.6400 m and R/R- # 152 Km), Revetment with local filled gab-bags (Length- 1.4000 m at 14 locations) & R. C. C. Porepines works. In the instant proposal works costing Rs 202.25 Cr envisaged are Raising & strengthening of the existing embankment in Right as well as Left bank for a total length of 16.55 Km (Left Bank embankment

12. Old Right Bank embankment (425 m) has been totally constructed in April with Gap 567 m long with bank in breach for a length of 2335 m in different locations & R.C.C. Pile pile work. It has been found that there is considerable change in the proposed works in earlier & proposed DPR. These changes need detailed justification. It is suggested to submit a comparison statement for various features/works with cost of both schemes. Details with criteria calculation should form to compare both the schemes.
13. DPRs may be prepared as per CWC guidelines 2013 with all requisite details of the project.
14. A brief history of the past floods and erosion in the affected area indicating duration of floods, flood discharges and corresponding water levels, stage of the river at which damage was most pronounced, extent of damage and their effect on river regime, damages of house, shops, public utilities, measures adopted earlier for the protection against floods and their effect on the river courses, river siltation, bed levels etc. as well as present condition of the existing flood control works, if any, should be mentioned in the DPR. This information may support the need of submission of revised DPR.
15. Salient features of the project should be given with proper indexing of DPR containing the details like name of sub-area, name of river / tributary / basin, location, block / taluk / district, Design flood and FRR, Catchment Area, location of G&D site, design specifications of the proposed works, estimated cost, work price level, construction schedule and financial phasing, status of various clearances/permissions, benefited area, benefited population, B.C. fund, etc. may be appended with the project report.
16. Executive summary of the project describing the location of the project, description of the problems, scope of the project, construction program and materials, socio-economic aspects and environmental aspects may be added in the DPR.
17. The reach-wise details of works may be appended in the DPR.
18. Minutes of main TAC in which scheme was accepted may be enclosed.
19. A clear water map and flood hazard map in A2 and A3 size paper, as per scale in Arc-GIS/AUTOCAD format as well as on google map on the basis of latest satellite imagery indicating the all existing/proposed works on all stream/reaches in different colors along with reach length/numbers, benefited area, nearby G&D site, annual bank line for recent 3-4 years, nearby important locations, habitation etc. may be appended in the DPR.
20. Master Plan for the basin, if any, as per scale in Arc-GIS/AUTOCAD format as well as on google map showing different works at various locations along with reach length/numbers, benefited area, nearby important locations may be shown. Further description about the master plan may also be appended.
21. The basis for assessing the benefited area as 400 Sq. km may be given and shown in the map.

**B. Hydrology:**

OFFICE OF THE SECRETARY  
ASSAM STATE BRAHMAPUTRA VALLEY FLOOD CONTROL BOARD  
WATER RESOURCES DEPARTMENT  
GUWAHATI-3

Date: 23.12.2019

ASB/FVCB. 278/2019/07

|  |                        |
|--|------------------------|
| Shri A.K. Mitra, Retd. Secretary to the Govt. of Assam, W.R. Department                                | Chairman TAC           |
| Member (RMA), EWC/Chief Engineer or his representative   | Member                 |
| The Chairman / Vice Chairman, Brahmaputra Board or his representative                                  | Member                 |
| The Secretary to the Govt. of Assam, W.R. Department, Dispur, Guwahati-6                               | Member                 |
| The Chief Engineer, W.R. Department, Guwahati-3  | Member                 |
| The Chief Engineer, Quality Control, W.R. Department, Guwahati-3                                       | Invitee                |
| The Addl. Chief Engineer, S.A. Zone, W.R. Department, Guwahati-3                                       | Member                 |
| The Head of the Department of Civil Engineering, Assam Engineering College, Guwahati-13                | Member                 |
| The Chief Engineer, PWD (Roads), Guwahati-3  | Member                 |
| The Addl. Chief Engineer, Upper Assam Zone, W.R. Department, Dibrugarh                                 | Member                 |
| The Chief Bridge Engineer, A.F. Fly, Maligaon, Guwahati  | Member                 |
| The Director Inland Water Transport, Guwahati-7  | Member                 |
| Shri Ratul Ch. Sarma, Retd. Commissioner and Special Secretary to the Govt. of Assam, W.R. Department. | Special Invitee Member |
| Shri Naren Kakoti, Retd. Secretary to the Govt. of Assam, W.R. Department                              | Special Invitee Member |

73<sup>rd</sup> Meeting of the TAC held at Chief Engineer Conference Room, Chandimari, Guwahati-3 on 25<sup>th</sup> November/2019.


ASB/FVCB.258/2019/05

dated-13.11.2019

In continuation to the earlier letter under reference, I am directed to forward herewith the list of approved schemes under 73<sup>rd</sup> meeting of the TAC held at Chief Engineers Conference Room, Chandimari, Guwahati-3 on 25<sup>th</sup> November/2019.

This is for favour of your kind information and necessary action.

Yours faithfully

  
23/12/2019  
Secretary

ASB/FVC Board,  
Guwahati-3



22820(1)

1. The observations of Hydrology (NH), CWC will be reiterated, and when these are received. Clips for hydrological aspects should be appended as per observations of Hydrology (NH), CWC.

#### 2. Design

1. The height of embankment for raising strengthens should be clearly indicated at various stretches in the earliest features.
2. Design of Launching apron with bank revetment may be carried out as per RRS codes and CBS of the same may be added in the DPR.
3. Details layout and cross sections of CC for different stretches at different locations should be given.
4. Specifications of can like revetments, wall size and various other parameters used should be mentioned in the DPR.
5. Detailed design diagrams with detailed description, sections, long sections as proposed works should be appended in the DPR.

#### 3. B.C. Ratio

1. Residual cost of earlier executed works, if any, may also be considered while calculating the B.C. Ratio.
2. The basis for assessment of benefited area including cultivated land, houses and land etc and population affected should be given in detail in the project report. Benefited area should be clearly demarcated on the map. Further the annual benefits/losses like crops, land, buildings etc should be assessed based on the past 3-5 year annual losses and/or anticipated annual losses in the absence of the proposed project. The losses/benefits may also be verified by the competent Authority of Revenue Dept.
3. Break up of losses due to erosion and subsidence may be given and B. C. Ratio calculations to be revised accordingly.

#### 4. Statutory Clearance

1. A No-Objection certificate from the concerned Forest Department, Flood Control Board and State Finance Commission may be submitted.
2. A certificate regarding correctness of entitlements from the competent authority i.e. Chief Engineer or equivalent (with name and date) may be provided.
3. As the project is a part of collection of Asian Integrated River Basin Management Project (AIRBMP phase I) funded by World Bank, a certificate regarding the proposed funding from the World Bank may be given.
4. As the project is externally funded (through World Bank), the same should be routed through SA Wing of DWR, BILASPUR, M.S.
5. A certificate regarding the cost of the project shall learn, if any, may be attached with the DPR.
6. The compliance with respect to the Longitudinal and Lateral connectivity and e-

02/20/21

How ever the CWC guideline shall also be submitted

Land acquisition certificate may be provided if any

8. A Certificate that separate scheme is not being proposed on the same tract of the river may be added to the DPR.

Concluding Remarks:

DPR was scrutiny done in various files and some files are not open in this office & various details are also missing. Above comments are filed on the basis of documents regarding DPR sent to this office. It is requested that 5 hard copies of DPR may be submitted & soft copy of complete DPR preferably in PDF format along with various chapters in MS word/MS excel format may be sent via email.

(Signature)  
Ajay Kumar / Piyush Kumar  
Joint Director

Chief Executive Officer  
SPTOC, E&ED, CWC, Ghazipur

Compliance of the observations raised by the Director, CWC (Hyd. Div.), Govt. of India vide letter no. 92/FR-40/2019-FMC D. 01/07/2020

Obs.A.1. Earlier one DPR "Integrated Flood and erosion management of Manas and Beki rivers in districts of Balesar and Bargarh" costing Rs. 90Cr. was submitted to CWC on 10.06.2016. The DPR was examined in detail in CWC and cost was modified to Rs 128.636 Cr. on 19.02.2018. However, during site visit by officials from regional design discharge needed a review. Thereafter, State Govt was requested for revision/checking of Design Discharge vide letter dated 18.06.18. Replies from State Govt. was requested to modify the DPR based on Hyd(NB), CWC on 17.09.2018. Comments from Hyd (NE) Div was received on 19.11.2018 & State Govt was requested to modify the DPR based on Hyd(NB) comments on 20.11.2018. Reminder was also sent on 04.02.2019 to submit modified DPR. Finally DPR was deleted/Returned vide letter dated 12.03.2019 due to non response from the State Govt. Works envisaged under earlier DPR were Raising and Strengthening of the existing dyke in both banks for a total Length of 25.00Km (L/B -20.649 km and R/B - 4.35) km). Revetment with sand-filled geo-bags (Length - 14000m at 14 locations) & R.C.C. Porcupine works. In the instant proposal works costing Rs. 201.25 Cr envisaged are Raising & strengthening of the existing embankment in Right as well as Left bank for a total length of 16.551 Km (Left Bank embankment = 1200m, Right bank embankment = 4351m.). Erosion protection by construction of Apron with Geo-bag along with bank revetment for a length of 28230m in different locations & R.C.C. Porcupine works. It has been found that there considerable changes in the proposed works in earlier & proposed DPR. These changes need detailed justification. It is suggested to append a comparison statement for various features/works with cost of both schemes along with remarks column in tabular form to compare both the schemes.

Reply: The justification of the changes along with comparison statement have been appended with the modified DPR.

Obs.A.2. DPR may be prepared as per CWC guidelines 2018 with all requisite details of the project.

Reply: Done accordingly.

Obs.A.3. A brief history of the past floods and erosion in the affected area indicating duration of floods, flood discharges and corresponding water levels, stage of the river at which damage was most pronounced, extent of damage and their effect on river regime, damages of house, crops, public utilities, measures adopted earlier for the protection against floods and their effect on the river courses, river sections, bed levels etc as well as present condition of the existing flood control work, if any, should be mentioned in the DPR. This information may support the need of submission of revised DPR.

Reply: Brief history of the past floods and other relevant information has been compiled separately and submitted with this revised DPR.

Obs.A.4. Sufficient features of the project should be given with proper indexing of DPR containing the details like name of scheme, name of river/ tributary/ basin, location block/ taluk/ district. Design flood and HFL, Catchment area, location of G&D sites, design specifications of the proposed works, estimated cost with price level, construction schedule

and financial phasing, status of various clearances/certificates, benefited area, benefited population, B.C. Ratio, etc may be appended with the project report.

Reply: Appended in the DPR.

Obs.A.5. Executive summary of the project describing the location of the project, description of the problems, scope of the project, construction program and materials, socio-economic aspects and environmental aspects may be added in the DPR.

Reply: Done accordingly

Obs.A.6. The task-wise details of works may be appended in the DPR.

Reply: Appended in the DPR

Obs.A.7. Minutes of state TAC in which scheme was accepted may be enclosed.

Reply: Enclosed in the DPR

Obs.A.8. A clear index map and flood hazard map in A2 and A3 size paper, as per scale in Arc-GIS/ AUTOCAD format as well as on google map on the basis of latest satellite imagery indicating the all existing /proposed works on all streams/rivers in different colours along with reach length/numbers, benefited area, nearest G&D site, annual bank lines for recent 3-4 years, nearby important locations, habitation etc may be appended in the DPR.

Reply: Shown accordingly and appended in the DPR

Obs.A.9. Master Plan for the basin, if any, as per scale in Arc-GIS/ AUTOCAD format as well as on Google map showing different works at various locations along with reach length/ numbers, benefited area, nearby important locations may be shown. Further descriptions about the master plan may also be appended.

Reply: Done as recommendation of Master Plan and appended in the DPR

Obs.A.10. The basis for assessing the benefited area as 440 Sq km may be given and shown in the map.

Reply: On the basis of the assessment done by the concern Circle Officer(Barnagar and Kugachia revenue Circle) the benefited area is calculated as 440 Sq. Km and shown in the map.

Obs.B.1. The observations of Hydrology (NE), CWC will be intimated as and when those are received. Chapter for hydrological aspects should be appended as per observations of Hydrology (NE), CWC.

Reply: Comments of Hydrology(NE),CWC received vide no 9/14r-40/2020-FMF Dt.07.07.2020 (a copy enclosed in the DPR)

Obs.C.1. The height of embankment for raising / strengthening should be clearly indicated at various stretches in the salient features.

Reply: Shown in the cross sections.

Obs.C.2. Design of Launching apron with bank revetment may be carried out as per BIS codes and C/S of the same may be added in the DPR.

Reply: Done as per BIS Code and added in the DPR

Obs.C.3. Detailed layout and cross sections of RCC Porcupines works at different locations should be given.

Reply: Done accordingly

Obs.C.4. Source/Basis of data like velocities, silt size and various other parameters used should be mentioned in the DPR.

Reply: Mentioned in the design features of Executive summary.

Obs.C.5. Detailed design chapter with detailed design, cross sections, long sections of proposed works should be appended in the DPR.

Reply: Appended in the DPR.

Obs.D.1. Residual cost of earlier executed works, if any, may also be considered while calculating the B.C. Ratio.

Reply: Considered in the calculation of B.C. ratio.

Obs.D.2. The basis for assessment of benefited area including cultivated land, homestead land etc and population effected should be given in detail in the project report. Benefited area should be clearly demarcated on the index map. Further the annual benefits/losses like crops, land, buildings etc should be assessed based on the past actual annual losses and the anticipated annual losses in the absence of the proposed project. The losses/benefits may also be vetted by the Competent Authority of Revenue Dept.

Reply: Done accordingly.

Obs.D.3. Break up of losses due to erosion and submergence may be given and B.C. Ratio calculation may be revised accordingly.

Reply: Shown the break up and done accordingly.

Obs.E.1. A No-Objection certificate/Clearance from the concerned Forest Department, Flood Control Board and State Finance concurrence may be submitted.

Reply: Appended in the DPR.

Obs.E.2. A certificate regarding correctness of quantities from the competent authority i.e. Chief Engineer or equivalent (with name and date) may be provided.

Reply: Enclosed in the DPR.

Obs.E.3. As the scheme is a part of concept note "Assam Integrated River Basin Management Project (AIRBMP-phase-3) funded by World Bank". A certificate regarding the proposed funding from the World Bank may be given.

Reply: Enclosed in the DPR.

Obs.E.4. As the project is externally funded (through World Bank), the same should be routed through F.A Wing of DoWR, RD&GR, MIS.

Reply: Routed through the concern wings.

Obs.E.5. A certificate regarding the cost of the project shall remain firm may be attached with the DPR.

Reply: Attached in the DPR.

Obs.E.6. The compliance with respect to the Longitudinal and latitudinal connectivity and e-flow as per the CWC guideline should also be submitted.


Reply: Certificate enclosed in the DPR.

Obs.E.7. Land acquisition certificate may be provided if any.

Reply: No land requisition is required.

Obs.E.8. A Certificate that separate schemes are not being proposed / planned on the same reach of the river may be added to the DPR.

Reply: Appended in the DPR.

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

  
Chief Engineer  
Water Resources Department  
Chandmari, Guwahati-3



Director, General Secretariat  
Ministry of Foreign Affairs  
Nairobi, Kenya  
Dear Sir,

Subject: Project proposal 2004/0-0014 Integrated Water and Land Management Project  
and its sub-projects (2004/0-0014/001-005) under Grant 04/01-0014.

Enclosure: Annex 30

I am pleased to refer to the project proposal of Govt. of Kenya under the above-mentioned  
Integrated Water and Land Management Project with total estimated cost of USD 240 million which  
is being financed by the World Bank under Grant 04/01-0014.

The Ministry of Agriculture and Livestock Development has received a copy of the  
proposal and has forwarded it to the relevant departments for their comments. The  
Ministry of Water and Power is also involved in the project and will be providing technical assistance  
to the project. The Ministry of Environment and Natural Resources is also involved in the project  
and will be providing technical assistance to the project. The Ministry of Health is also  
involved in the project and will be providing technical assistance to the project.

In view of the above, the Government of Kenya is pleased to inform you that it has  
agreed to provide technical assistance to the project. The Government of Kenya is pleased  
to inform you that it has agreed to provide technical assistance to the project. The  
Government of Kenya is pleased to inform you that it has agreed to provide technical  
assistance to the project.

Yours faithfully,  
Director, General Secretariat

Yours sincerely,  
[Signature]

Deputy Secretary  
[Signature]



Government of Assam  
Ministry of Jal Shakti  
Dept. of Water Resources, H.O. No. 318  
Central Water Commission Bldg  
Hydrology & Operation Circle,  
Guwahati-781014

সংস্কৃত  
কেন্দ্রীয় কার্যালয়  
জল সম্পদ বিভাগ, হ.ও. নং ৩১৮  
কেন্দ্রীয় জল কমিশন ভবন  
হাইড্রোলজি ও পরিচালনা সার্কেল,  
গুৱাহাটী-৭৮১০১৪

No. 318/FEM/2016-HOCC/25-27

Dated 13/1/2020

সেৱাৰ্থে / To

Chief Engineer,  
Water Resources Department  
Govt. of Assam  
Chandmari, Guwahati

বিষয় / Sub. Submission of DPR for the scheme 'Integrated flood And erosion management of Manas and Beki River in the District of Baksa and Barpeta in Brahmaputra Valley within Assam (Review)' amounting to Rs.23154.79 Lakh - reg

সংসর্গে / Ref: C.E. (WRD), Assam letter No.WR(ED)/Tech/5154/2011/71 dated 21/01/2020  
2.B&BEO, CWC Shillong letter No.8(22)/2013-BBB/Baksa & Barpeta/257-61 dated 31/01/2020.

সহোদৰ / Sir,

The DPR submitted through CE, B&BEO, CWC, Shillong has been examined. Interactive meeting has also been held with AE and JE concerned of Water Resources Department Assam in the chamber of SE, HOC, CWC, Guwahati on 12/02/2020. The scheme, being a major scheme, will be appraised in detail by expert Directorates in New Delhi. Regional office of Central Water Commission at Guwahati will submit the DPR after preliminary examination of the same to ensure that the DPR is as per the latest guidelines and contains all relevant documents. The proposed works in the DPR consists of:

1. Construction of Apron with Geo-bag of size 1.03m x 0.75m along with bank revetment with Geo bag of size 1.03m x 0.75m for a length of 28330m in different locations along the banks of river Beki.
2. Single layer RCC porcupine screens & bars at different locations.
3. Raising & strengthening of the existing embankment in Right as well as Left bank for a total length of 10.55 Km (Left bank embankment = 12200 m, Right bank embankment = 4351m)

To protect the area of 440 Sq.km and population of 2,53,000 in Barpeta and Baksa districts of Assam. The BC ratio is 1.31:1. Estimate cost of the Scheme is Rs 231.55 Crore at 2018-19 price level.

After preliminary examination of the DPR the following observations are made for compliance at the earliest.

Continue in next page

কম নং ৩১৮, সী. ডব্লিউ. সী. কাম্প্লেক্স,  
অদাভাৰী, গুৱাহাটী-৭৮১০১৪.  
ফোন-৩৩৫১-২৬৭২২৫৩/২৬৭২১৩১/২৬৭২৭৯৭



Room No. 318, CWC, Complex Behind  
Adabari Bus Terminus, Adabari,  
Guwahati-781014  
Tel: 0361-2672253/2672131/2672797





State of Assam  
Water Resource Dept.  
Office of Chief Engineer, FMS  
CWC, Guwahati Complex  
Behind Aashir, Sus Terminus, Adabari,  
Guwahati-781014

সংখ্যা: ১৬  
৩০ মার্চ ২০১৫ খ্রিঃ  
৩১/৩/১৫  
৩১/৩/১৫  
৩১/৩/১৫

1. The DPR is to be recognised as per the guidelines for "Preparation of DPR for Flood Management Works, Flood Management Organisation April, 2015".
2. It appears that the scheme was submitted earlier also. Some observations were made by CWC. A note on compliance of all those observations should also be made part of the DPR.
3. The certified copy of damage assessment from revenue/agriculture Deptt. is not enclosed. The same may be enclosed.
4. The cost of the DPR as recommended by TAC of State Flood Control Board is Rs.101.32 crore, Whereas the estimated cost of submitted DPR is Rs.201.55 crore. The deviation needs to be clarified.
5. Certificate of the State Financial concurrence should also be incorporated in the revised DPR.
6. The design discharge is more than 10000 cumecs for which free board is recommended as 1.8 meter. However, the free board provided is 1.5 meter only. The design of embankment needs to be revised accordingly.
7. The index map showing existing, ongoing works and proposed works in different colours duly indexed along with location of hydrological observation stations on GIS map, preferably on A4 size paper should be enclosed with DPR.
8. 'L' Section of the river, preferably on A4 size paper should also be enclosed with the DPR.
9. The revised DPR in soft copy as well as hard copy should be submitted to the office at the earliest for further appraisal.
10. Presentation in Power Point may be made while submitting of the revised DPR.

স্বাক্ষর  
বিজ্ঞান  
(সি.ই. কে.এ.স.)  
অতিরিক্ত পরিচালক

Copy to:

1. Chief Engineer, FMS, CWC, New Delhi
2. Superintending Engineer(C) H&BDO, CWC, Shillong for information please.
3. Director, M&A, Dte, CWC, Guwahati
4. Executive Engineer, Water Resource Department, Barak Govt. of Assam.

সংখ্যা: ১৬, পি. ডব্লিউ. সী. লাম্পেলস,  
অদাবারী, গুৱাহাটী-৭৮১০১৪.  
ফোন: ০৩৬১-২৬৭৪২৬৮/২৬৭৪১৯১/২৬৭৪২৯৭  
ই. মেল: [sa.hoghy-cwc@gov.in](mailto:sa.hoghy-cwc@gov.in)  
Assam Water Resource Department



Room No. 318, CWC, Complex Behind  
Aashir, Sus Terminus, Adabari,  
Guwahati-781014  
Tel: 0361-2674268/2674191/2674297  
E-mail: [sa.hoghy-cwc@gov.in](mailto:sa.hoghy-cwc@gov.in)



Compliance of the observations raised by the CWC Hydrological Observation  
Circle, Guwahati, vide letter no. 302/HEP/2019-HOO/23-27, Dt. 14/02/2020

| Sl. No. | Observations of CWC, HOO, Guwahati-44  | Compliance  |
|---------|--|---|
| 1       | The DPR is to be reorganised as per the guidelines for "Preparation of DPR for Flood Management works, Flood Management Organization April 2018"   | DPR is reorganised as per guidelines  |
| 2       | It appears that the scheme was submitted earlier also. Some observations were made by CWC. A note on compliance of all these observations should also be made part of the DPR.   | A note on compliance was made and appended.   |
| 3       | The certified copy of damage assessment from revenue/agriculture Dept. is not enclosed. The same may be enclosed.  | Enclosed damage statement from revenue Dept.  |
| 4       | The cost of the DPR as recommended by TAC of State Flood Control Board is Rs. 161.52 Crore. Whereas the estimated cost of submitted DPR is Rs. 231.55 Crore. The deviation needs to be clarified.                                | The Hon'ble TAC committee had reviewed the DPR and recommended a memo for Rs. 203.25 Cr on 30 <sup>th</sup> special TAC on 7 <sup>th</sup> March/2020. Accordingly a DPR was prepared amounting to Rs. 203.25 Cr. for onward submission to CWC. |
| 5       | Certificate of the State Financial concurrence should also be incorporated in the revised DPR.   | Certificate is not yet received. It is under process. The scheme is proposed to be incorporated in Assam Integrated River Basin Management Project (AIRBMP) Tranche-I to be funded by World Bank.   |
| 6       | The design discharge is more than 10000 cumec for which free board provided is 1.50m only. The design of embankment needs to be revised accordingly.   | As per design the free board is provided 1.80m.   |
| 7       | The Index map showing existing, ongoing works and proposed works in different colours duly indexed along with location of Hydrological observation stations on GIS map, preferably on A0 size paper should be enclosed with DPR. | Indicated the existing, ongoing works and proposed works in different colours with hydrological station on GIS map.   |
| 8       | 'L' Section of the river, preferably on A0 size paper should also be enclosed with the DPR.  | Due to varying steep gradient from starting point to end point, it is not possible to show on A0 size paper.  |
| 9       | The revised DPR in soft copy as well as hard copy should be submitted to this office at the earliest for further appraisal.  | Submitted hard copy and soft copy of DPR.   |
| 10      | Presentation in power point may be made while submitting of the revised DPR.   | Power point of DPR was made and submitted accordingly.  |

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta

  
Chief Engineer  
Water Resources Department  
Chandernati, Guwahati-65

GOVT. OF ASSAM  
OFFICE OF THE CHIEF ENGINEER - WATER RESOURCES DEPARTMENT  
GUWAHATI-3

156  
15/3/2018

No. WR(ED)Tech/6154/2018/76

Date: 13.03.2018

To:  
The Secretary to the Govt. of Assam  
W.R. Department, Dispur  
Guwahati-06

Subj: - State Financial concurrence for the scheme "Integrated flood and erosion management of Manas and Soti in the district of Baksa and Dimpur in Brahmaputra valley within Assam (Review)".

Ref: No. WR(ED)Tech/6154/11/44 Dated 07.04.2018

Sir,

In inviting a reference to the above, I have the honour to inform you that the scheme under reference above was submitted to the CWC, HCC, Guwahati at a cost of Rs. 20325.00 Lakh for necessary techno-economic clearance. Now, the CWC has raised some observations, one of which includes furnishing certificate of the State Financial Concurrence for the scheme. In this context, I would like to request you kindly to take necessary steps for obtaining the same from the Finance Department, Assam.

This is for favour of your kind needful action.

Yours faithfully,

  
Chief Engineer  
Water Resources Department  
Chandimari, Guwahati-3

REC-3  
30/06/13



DD  
21-9

AG-170  
31/5  
Date

भारत सरकार

संघीय जल उपमंत्रालय

ब्रह्मपुत्र एवं बसिन्दा बेसिन संगठन, शिसोनी

सं. 8(21)/2013-BBDB/Baksa-Barpeta

दस्तावेज संख्या: 0564-220558, 2220489

कैम्पस: 2220644

दिनांक: 05.08.2013

सेवा में,

Chief Engineer,  
Water Resources Department,  
Government of Assam, Guwahati

विषय- Integrated Flood and Erosion management of Manas and Beki River in district of Baksa & Barpeta in Brahmaputra Valley, Assam - regd.

संदर्भ: i) सं. BB/CS-DFM/22/P-I-2012/39 दिनांक: 15.01.2013

ii) सं. WR(EDY)Tech/6154/11/8 दिनांक: 29.01.2013

गहोदय,

The project report of "Integrated Flood and Erosion management of Manas and Beki River in district of Baksa & Barpeta in Brahmaputra Valley" was received vide above referred letter no. i) from Brahmaputra Board. The estimated cost of the scheme was Rs 179.50 Crore. Brahmaputra Board, after making the site visit, sent the observations on project report to WRD, Govt. of Assam vide their letter dated 5<sup>th</sup> June 2012. However, WRD, Govt. of Assam reviewed the project proposal and sent the modified report vide letter at ref no. ii), costing Rs 96.00 Crore. However, replies to comments of Brahmaputra Board were not furnished by State Government.

In the earlier report, following works were proposed:

- i) Raising & strengthening of existing embankment from Narayanguri to Barpeta Road,
- ii) Submersible Geo-tube spurs (26 nos) on both banks of river Beki,
- iii) Bank reversion with Geo-textile matress and Geo-bags aprons on both banks of river Beki, and
- iv) Multi-layer porcupine screens rows in between the Geo-tube spurs.

However, following works are now proposed in the present scheme:

- i) Raising & strengthening of existing embankment from Narayanguri to Barpeta Road,
- ii) Multi-layer porcupine bar and screens at different locations, and
- iii) Boulder pitching in reversion and boulder apron in the form of cage.

No. 22021  
31/8/13

WRD, Govt. of Assam  
Water Resources Department  
Guwahati-781005

Member of the Brahmaputra Board

The machine report has been examined briefly and following comments are given below for compliance:

- 1) The para-wise replies to comments given by Brahmaputra Board may be furnished and it may also be stated whether all the comments/observations raised by Brahmaputra Board have been complied. All the documents, as asked in the comments of Brahmaputra Board, may be provided along with the replies.
- 2) It is stated that the scheme was first recommended by the 49<sup>th</sup> Technical Advisory Committee of WRD, Assam for an amount of Rs 414.99 Crore. The modified proposal was recommended by 56<sup>th</sup> TAC for an amount of Rs 95.32 Crore. It is, further, stated that the scheme was modified after observing the recent river configuration and its effect. The change in river configuration since earlier proposal which prompted State Government to modify the proposal may be clearly mentioned in the report.
- 3) It may be stated whether the present proposal is the most comprehensive and appropriate scheme to tackle the flood and erosion problems of Baki river.
- 4) While discussing the modified proposal in the 56<sup>th</sup> TAC meeting, Committee asked Additional Chief Engineer to review the provision of PSOROC porcupine for protection of affected reaches after making field visit and accordingly DPR to be modified. Action taken in the matter and report of Additional Chief Engineer after making the field visit may be provided.
- 5) In the report of Executive Engineer, it is stated that a scheme "Training of river Baki on L/R and siltation of river Manas and Hakas at Mothenguri", costing Rs 14.815 Crore, was approved in 2011. The status of implementation and efficacy of this scheme in achieving the desired result may be stated. It may, also, be certified that there is no overlap of works between this scheme and scheme, now, proposed.
- 6) It may be confirmed whether benefits, as mentioned in the present scheme, are exclusive to this scheme. However, if benefits from the scheme are shared with any other scheme, the cost of that scheme should also be considered while calculating the B.C. Ratio of the scheme.
- 7) Under proposed scheme, R/S of 25.6 km of existing embankment is proposed. In this regard, the existing level of embankment and corresponding maximum water level at suitable interval (1 km) along the embankment for the last 10 years may be provided.
- 8) It is mentioned in the report that the lead distance for availability of boulder is in the range of 65-80 m, which is very high. This high lead may impact the cost substantially. In this regard, it is suggested to make judicious decision with regard to use of geo-bags or boulders in bank protection. Here, it is worth remembering that use of boulder is being discouraged now-a-days due to its negative environmental impact.
- 9) It seems two layers of RCC porcupines of varying length and rows have been adopted for screens as well as bars. The basis for adopting different lengths and rows above five rows in case of screens may be stated. The spacing of screens and bars may be mentioned in the Design section as well as in Salient features.
- 10) Provision of Scientific & Mathematical equipment and Office equipment has been made under Q-Special T&P. These provisions should be made under Ordinary T&P.
- 11) Salient features of the project may be given in the report.
- 12) The cost of each component of works as per the proposal may be calculated separately based upon quantities of items of works pertaining to that particular works and unit.

|     |  |  |  |  |
|-----|--|--|--|--|
| 13) | A brief history of the past floods and erosion in the affected area indicating duration of floods, flood discharges and corresponding water levels, stage of the river at which damage was most pronounced, extent of damage and their effect on river regime, damages of houses, crops, public utilities, measures adopted earlier for the protection against floods and their effect on the river course, river sections, bed levels etc as well as present condition of the existing flood control works, if any, should be mentioned in the DPR. This information may support the need of submission of revised DPR. | Brief history of the past floods and other relevant information has been compiled separately and submitted with the revised DPR.   | No further comments  | Not required                                     |
| 14) | Salient features of the project should be given with proper indexing of DPR concerning the details like name of scheme, name of river / tributary / basin, location block / taluk / district, Design flood and HFL, Catchment area, location of Q&D site, design specifications of the proposed works, estimated cost with price level, construction schedule and financial phasing status of various clearance/certificates, benefited area, benefited population, B.C. Ratio, etc may be appended with the project report.   | Appended in the DPR.   | Flood affected area of the State in (state) and Protected area of the State so far in (state) may also be provided in salient features   | Provided accordingly                             |
| 15) | The reach-wise details of works may be appended in the DPR.  | Appended in the DPR.   | No further comments  | Not required.                                    |
| 17) | Minutes of state SAC in which scheme was accepted may be enclosed.   | Enclosed in the DPR.   | No further comments  | Not required.                                    |
| 18) | A clear index map and flood hazard map in A2 and A3 size paper, as per scale in Arc-GIS/AUTOCAD format as well as on google map on the basis of latest satellite imagery indicating the all existing/proposed works on all streams/streams in different colours along with reach length/numbers, benefited area, nearest Q&D site, annual bank lines for recent 3-4 years, nearby important locations, habitation etc may be appended in the DPR.  | Shown accordingly and appended in the DPR.   | Index map showing "ongoing works" need to be elaborated as at some stretches "Proposed works" and "ongoing works" are in close vicinity. | Elaborated accordingly in the Executive summary. |
| 19) | Master Plan for the basin, if any, as per scale in Arc-GIS/AUTOCAD format as well as on google map showing different works at various locations along with reach length/numbers, benefited area, nearby important locations may be shown. Further description about the master plan may also be appended.  | Done as per recommendation of the master plan and appended in the DPR.   | No further comments  | Not required                                     |
| 16) | The basis for assessing the benefited area as 440 Sq km may be given and shown in the map.   | On the basis of the assessment done by the concern circle officer (Kargahar and Kargah revenue circle) the benefited area is calculated as 440 sq.km and shown in the map. | No further comments  | Not required                                     |

| Hydrology |   |  |   |  |
|-----------|---|--|---|--|
| (1)       | The observations of Hydrology (NFI, CWC will be indicated as and when those are received. Chapter for hydrological aspects should be appended as per observations of Hydrology (NFI, CWC. | Comments of hydrology (NFI) received vide letter no 971/40/2020-FMP dated 07.07.2020 | No further comments   | As required.   |
| Design    |   |  |   |  |
| (1)       | The height of embankment for raising/strengthening should be clearly indicated at various stretches in the various sections.  | Shown in the cross sections.   | Embankment Height calculations may be elaborated.   | Elaborated in the Executive Summary  |
| (2)       | Design of Launching apron with bank revetment may be carried out as per BIS codes and C/S of the same may be added in the DPR.  | Done as per BIS and added in the DPR   | <p>1.As per design, size of apron is 16.5m x 0.45m. However, the adopted value is 12.50m x 0.60m. Please provide the justification for the above.</p> <p>2.Size adopted for toe key is 2m x 0.45m in double toe key or. Please provide the justification for the above. Also toe key has to be designed as per IS code 14252:1995.</p> <p>Further, size of apron, pitching, toe key should be adopted as per dimensions of Geo-bags</p> <p>4. Typical cross-section of embankment along with proposed Revetment works should be provided.</p> | Justifications of all the 3 points have been provided in the Executive Summary in the DPR. The typical cross section of embankment along with proposed Revetment works has been provided with the DPR. |



|                      |   |  |  |   |
|----------------------|---|--|--|---|
| (3)                  | Detailed layout and cross sections RCC Percolation works at different locations should be given.  | Done accordingly   | Detailed layout of RCC Percolation works should be provided.   | Provided with the DPR.  |
| (4)                  | Source/Levels of data like velocities silt etc and various other parameters used should be mentioned in the DPR.  | Mentioned in the Design features of the executive summary. | DFFL in the Desgr. Features ) as per executive summary is based on 25 year return period whereas it should be based on 50 year return period | Since the observed HFL is more than the DFFL of 50 years Return Period in the observed HFL has been considered. Executive Summary has been corrected accordingly. |
| (5)                  | Detailed Design chapter with detailed design, cross sections, long sections of proposed works should be appended in the DPR.  | Appended DPR.  | Modification required as per changes suggested   | Done accordingly.   |
| B.C. Ratio:          |   |  |  |   |
| (1)                  | Residual cost of earlier executed works, if any, may also be considered while calculating the B. C. Ratio.  | Considered calculation B.C.Ratio                           | No further comments  | Not required.   |
| (2)                  | The basis for assessment of benefited area including cultivated land/homestead land etc and population affected should be given in detail in the project report. Benefited area should be clearly demarcated on the index map. Further the annual benefits/losses like crops, land, buildings etc should be assessed based on the past actual annual losses and/or anticipated annual losses in the absence of the proposed project. The losses/benefits may also be vetted by the Competent Authority of Revenue Dept. | Done accordingly   | No further comments  | Not required.   |
| (3)                  | Break up of losses due to erosion and submergence may be given and B. C. Ratio calculation can be revised accordingly.  | Shown the break up and done accordingly.                   | No further comments  | Not required.   |
| Statutory Clearance: |   |  |  |   |
| (1)                  | A No- Objection certificate/Clearance from the concerned Forest Department, Flood Control Board and State Finance concurrence may be submitted.   | Appended DPR.  | No further comments  | Not required.   |

- 13) Hereafter cost of sub-head C-Works may be worked out reading cost of such items of works.
- 14) The price level of the scheme may be clearly mentioned in the report.
- 14) A copy of Schedule of Rates on which the scheme is based, may be appended with the report.
- 15) The relevant pages of AFWD EOR may also be appended from which unit rates of building have been taken.
- 16) Completion period of the scheme along with phasing of expenditure and construction schedule may be incorporated in the report.
- 17) An index map of the project area depicting the various sites, quarry sites, major towns/villages etc may be appended in the DPR marking therein the distances involved in each case.
- 18) A certificate from competent authority may be submitted stating that "quantities calculated for various items of works have been worked out on the basis of design and drawing adopted for the scheme and that is just & correct".

It is requested to furnish point-wise reply to above observations and re-submit the modified report, if required, for further examination or otherwise.

अधीक्षक

(दीपक कुमार)

अधीक्षक अभियंता (समानक)

Conclusions of the observations raised by the Regulatory Board vide letter No. 18/2019/PR/57/2017/455, dated 07 June 2012:

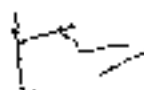
| Sl.No. | Observation of Regulatory Board   | Reply  |
|--------|---|--|
|        | The Index Plan annexed with the report may be modified. It may be prepared in A3/A4 paper size showing the locations of the proposed works (with their reach length and RD of starting and end point), locations of already executed works, annual erosion lines, affected area, benefited area, existing communication network and other important benchmarks to be shown in different colours for each feature. | Index Plan has been modified showing the locations of the proposed works, benefited area and existing communication network and reach length RD of starting & end point have been shown in Compass plan. Erosion lines have been shown in Baki River Configuration map.                          |
| 2.     | The Compass Plan annexed with the drawing volume needs modifications. Compass Plan should have indication of current bank-line. The L-section of the river should be prepared showing both the banks. Shifting of bank line at least for last 5 years may also be indicated.  | Modifications have been done in the Compass plan. L-section has been submitted separately. Shifting of bank line has been shown in Baki River Configuration map.   |
| 3.     | A vicinity map showing the location of the scheme in the state map to be attached with the report.  | Attached accordingly   |
| 4.     | The satellite imagery of the river should be modified, showing the scheme area and locations of the proposed structures.  | The satellite imagery has been modified showing the scheme area and locations of the proposed measures.  |
| 5.     | A map of borrow-pit areas, map showing existing roads near the project area including village roads, proposed approach roads under R-Communication etc. are to be shown.  | Accordingly shown in Compass Plan.   |
| 6.     | For proper quantification of volume of earth work in raising and strengthening of the embankment, cross section drawings at an interval of 25m may be provided. Presently, the cross section drawings are provided at 250m interval. Also, long section/profile of the embankment is also not appended with the DPR. The same may be incorporated with the DPR.   | The cross sections drawing for raising & strengthening work of embankment at an interval of 100m have been provided. Cross sections at an interval of 25m will be prepared just before the tendering of the work for the project. Long section of the embankment has been appended with the DPR. |

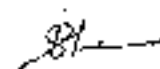
|    |   |   |
|----|---|---|
| 7  | Check list may be prepared in proper format as per CWC guidelines and appended with the DPR.  | Prepared & appended accordingly.  |
| 8  | Salient features of the project like proposed works and their specifications, name of scheme, name of river, location block/revenue circle/district design flood and HFL, design discharge, location of G&D site, length of river, B.C. ratio, estimated cost with price level, construction schedule and financial charging, status of various clearance/certificate, beneficiaries, benefited population etc. may be appended with the project report. Also, details of Spurs and SCC occupancies may be given separately along with their locations in the salient features of the scheme. | Appended accordingly.   |
| 9  | The drainage of the proposed works may be given with reference to some standard benchmark like origin of the river etc. The drainage should remain standard reference for all future works proposed to be undertaken.   | The Drainages of the proposed works have been marked in the Compass plan with reference to the Atulnaguri Forest IB which has been taken as Chaiage B.C.O.M.  |
| 10 | It is suggested to give the details of proposed works in tabular form mentioning the type of works, locations, start and end chainages of each work (location wise as well as total length), cost of each work etc. The G&D site has been shown as NH-34 Road Bridge. Its location with respect to the initial chainage of work may be given.   | Details of proposed works in tabular form have been mentioned in the Compass Plan. The location of G&D site has been mentioned in the Report of the Executive Engineer.   |
| 11 | The DPR should contain a separate section describing all surveys and investigations viz. topographical, hydro-meteorological, construction materials, geological etc., carried out for planning the scheme.   | Appended accordingly.   |
| 12 | It has been observed that some of the items of works are being analysed, though such items of works are available in the current schedule of rates of Govt. of Assam. Hence, it is suggested to recast the estimate with the current schedule of rates of state Water Resources   | Since the Schedule of Rate of the Water Resources Department was under process at the time of preparation of the DPR so the Rates of Analysis were made. Now the SCR has been published and accordingly the estimate has been |

|    |   |  |
|----|---|--|
|    | Department/AYUB The schedule of rates considered in preparation of the estimate may be appended with the report and no  | prepared incorporating the rates which are available from the W&P and 2003-04 & AYUB SOA 2013-14.                              |
| 13 | There are discrepancies in the length to 2 no. of four etc. at various pages of DPR. These discrepancies need rectification.  | Does not arise in the modified DPR.  |
| 14 | The work of raising and strengthening of the embankment needs to be supported by data of flood inundation, breaching of embankment etc. in the last 20 years in the identified reach.   | Justification of work of raising and strengthening of the embankment has been illustrated in the Report of Executive Engineer. |
| 15 | Market rates and lump sum provisions of materials/equipments provided in the estimate under G-Miscellaneous, III T&P (shown as special T&P), etc. may be supported with supporting documents/quotations from at least two suppliers.  | Attached the quotations accordingly.   |
| 16 | The analysis of rates presented in the estimate has not been provided with corresponding cross reference in the abstract of the estimate. Proper cross reference may be given in the estimate for its examination.  | Does not arise in the modified DPR.  |
| 17 | Details of estimated provisions under the sub-head R-Communication of Rs. 1,63,41,712 and M-Plantation of Rs. 33982937.00 have not been shown. Details may please be shown with supporting documents.   | Details of estimated provisions under sub-estimates have been shown in the modified DPR.                                       |
| 18 | Chief Engineer's report should contain inspection details of the area to be benefitted and the project site, general discussion of various alternatives, Master Plan for overall development of the river basin and stages of basin development as per guidelines of CWC.                   | Incorporated accordingly.  |
| 19 | The SE's report is short of indications regarding past approach towards alleviation of existing problem, inspection details of benefitted area, lead for construction materials, rates adopted for working out benefit from the scheme etc. The same may be modified as per CWC guidelines. | Incorporated accordingly.  |

|    |   |   |
|----|---|---|
| 20 | The EE's report's short of indications regarding schemes in vicinity, availability and lead for suitable construction materials, inclusion or provision of vendor schedules, description of design features, surveys conducted before formulation of the scheme, construction programme and completion dates, recommendation etc. as per CWC guidelines.  | Incorporated accordingly  |
| 21 | The estimated provision under the sub-head A-Preliminary of Rs. 3,27,92,000.00 are on higher side. Also, in the estimate, provisions of camp equipment, Computer and telecommunication facilities, training of engineers, environmental ecological studies, inspection vehicles, hire charge of boat etc. made under the sub-head A-Preliminary are not as per CWC guideline. Moreover, the provision of Rs. 3,00,00,000.00 for consultancy and project management and supervision charges is on higher side. Hence, estimated provision under the sub-head A-Preliminary may please be reviewed. | The provision for Consultancy & Project Management & Supervision charges has been deleted and accordingly the A-Preliminary has been modified and attached with the DPR.  |
| 22 | For flood management scheme, provisions are generally made for site-offices, quarters for staff and labour huts etc. only on temporary basis. But in the estimate, provision of construction of office building for Sub-Divisional Officer at Sorbhog is made with total estimated provision of Rs. 37,79,976.00. Hence, the provision may be reviewed.   | The provision of construction of office building for Sub-Divisional Officer at Sorbhog has been deleted and the provisions for temporary shed, sweeping machang, fencing etc. left with bar bed) have been kept in the DPR. |
| 23 | A statement may be incorporated with the estimate showing the detail calculation of quantities of jungle clearance.   | incorporated accordingly  |
| 24 | Relevant hydrological data, like observed LWL, velocity of flow at different sections for which designs have been carried out, gauge/S&D data, available at/near project site to be incorporated with the DPR.  | All these data have been incorporated in the Salient features of the Project.   |
| 25 | Return period considered for assessing design flood and other parameters of construction should be as per relevant BIS code   | Return period for assessing design flood and other parameters, has been considered as per relevant BIS code   |

|    |  |  |
|----|--|--|
|    | (17/094/2001).   | (12/094/2001) but since the years corresponding to these return periods have been found lesser than the observed maximum flood so for the design of embankment as well as other erosion measures the observed maximum flood has been considered. |
| 25 | The flood frequency analysis may be carried out using Gumbel's E.V. distribution and Log-Pearson Type-III distribution method and to use the best distribution by carrying out "D-Index" test for "Goodness of fit". The calculation carried out using Gumbel's E.V. distribution may please be rechecked.   | Incorporated accordingly in the Design Chapter of the DPR.   |
| 27 | As per CWC guidelines, the annual losses/damages in the last 10 years may be assessed and quantified. The anticipated losses after completion of the proposed scheme may also be ascertained. Both these needs to be certified by the Revenue Authority. The difference of these annual losses will be net benefit from the project, which may be used for evaluation of B.C. Ratio. Further, value of land crops/prosperities may be verified/certified by the concerned authority. | For damage assessment the data considered from the Master Plan of Baki-Manes-Ale prepared by the Orissa Rajya Board, Govt. of India.   |

  
 Chief Engineer  
 Water Resources Deptt.  
 Chandernagore, Gau-9

  
 Executive Engineer  
 Bargaon W.R. Division  
 Bargaon

GOVT OF ASSAM  
OFFICE OF THE CHIEF ENGINEER, WATER RESOURCES DEPARTMENT  
GUWAHATI-3

dated - 24-12-2013

No. WR(ED)Tech/6154/2013/ 16

To  
The Chief Engineer  
Brahmaputra & Barak Basin Organisation  
Central Water Commission  
Rebeka Maid, Near Bark Point,  
Temple Road, Lower Lachumiere  
Shillong - 783001

Subj: Submission of Detailed Project Report of the scheme "Integrated flood and erosion management of Manas and Jekti in the district of Baksa and Barak in Brahmaputra valley within Assam (Review)"  
Estd. Cost = Rs. 9600.00 Lakh

Ref- No.8(22)/2013-BBE/Bakra-Barpeta/120 dated 05-08-2013

Sr.

In view of a reference to the above subject I have the honour to submit, herewith a set of modified Detailed Project Report of the scheme after compliance of the observations for favour of necessary action at an early date. The scheme is proposed to be taken up under Flood Management Programme (FMP).

The scheme was recommended by the 65<sup>th</sup> TAC meeting held on 10<sup>th</sup> & 11<sup>th</sup> Oct, 2012

Enclos: i) Detailed Estimate - 1 (one) sets  
ii) Parawise reply - DWC, Shillong - 3 pages.  
Brahmaputra Board - 5 pages.

Yours faithfully

Chief Engineer  
Water Resources Department  
Guwahati-3

dated - 24-12-2013

Memo No. WR(ED)Tech/6154/2013/ 16 - A  
Copy to:

- i) The Superintending Engineer, Mukamius Protection W.R. Circle, Mukamius for information and necessary action.
- ii) The Executive Engineer, Barpeta W.R. Division, Barpeta for information and necessary action.

O/c

Chief Engineer  
Water Resources Department  
Guwahati-3



Reply of the observations of CWC, Amritsar.

- 1) Observation: The para-wise replies to comments given by Brahmaputra Board may be furnished and it may also be stated whether all the comments/observations raised by Brahmaputra Board have been complied. All the comments, as asked in the comments of Brahmaputra Board, may be provided along with the replies.  
Reply: All the comments have been provided with the modified DPR.
  
- 2) Observation: It is stated that the scheme was first recommended by the 49<sup>th</sup> Technical Advisory Committee of WRD, Assam for an amount of Rs. 413.98 Crore. The modified proposal was recommended by 55<sup>th</sup> TAC for an amount of 95.80 Crore. It is further stated that the scheme was modified after observing the recent river configuration and its effect. The change in river configuration since earlier proposal which prompted State Government to modify the proposal may be clearly mentioned in the report.  
Reply: After the proposal submitted in the 45<sup>th</sup> TAC the river configuration was so changed that numerous sand bars were developed and the river was flowing in more braided configuration which compels to change the planning from taking measures via impermeable deflecting geo-tube spurs to permeable RCC porcupine screens. Accordingly 55<sup>th</sup> TAC had recommended to take measures for proper channelization through pro-siltation measures through porcupine screen and bar and bank protection through boulder works. This has been clearly mentioned in the Report of the Executive Engineer in the modified DPR.
  
- 3) Observation: It may be stated whether the present proposal is the most comprehensive and appropriate scheme to tackle the flood and erosion problem of Baki river.  
Reply: After nos. of rectifications with various suggestions the present proposal has been framed out. So, it may be mentioned here that the present proposal is the most comprehensive and appropriate scheme to tackle the flood and erosion problem of Baki river.
  
- 4) Observation: While discussing the modified proposal in the 56<sup>th</sup> TAC meeting, Committee asked Additional Chief Engineer to review the provision of PSC/RCC porcupine for protection of affected reaches after making field visit and accordingly DPR to be modified. Action taken in the matter and report of Additional Chief Engineer after making the field visit may be provided.  
Reply: The above said report of the Additional Chief Engineer has not been found out in the concerned office.
  
- 5) Observation: In the report of Executive Engineer, it is stated that a scheme "Training of river Baki on L/B and activation of river Manas and Bakus at Mothanguri", costing Rs 14,815 Crore, was approved in 2011. The status of implementation and efficacy of this scheme in achieving the desired result may be stated. It may, also, be verified that there is no overlap of works between this scheme and scheme, now proposed.

Reply: The implementation of the above mentioned scheme is not complete yet, so the efficacy of the scheme could not be explained right now. Also a certified plan overlapping has been appended with this reply sheet.

- 6) Observation: It may be confirmed whether benefits as mentioned in the present scheme, are exclusive to this scheme. However, if benefits from the scheme are shared with any other scheme, the cost of that scheme should also be considered while calculating the B.C. Ratio of the scheme.

Reply: The benefited area shown in the index map is exclusively for this scheme and accordingly the B.C. Ratio has been calculated.

- 7) Observation: Under proposed scheme, R/S of 250 km of existing embankment is proposed. In this regard, the existing level of embankment and corresponding maximum water level at suitable interval (5Km) along the embankment for the last 10 years may be provided.

Reply: Attached in tabular form with this reply sheet.

- 8) Observation: It is mentioned in the report that the lead distance for availability of boulder is in the range of 65-80 km, which is very high. This high lead may impact the cost substantially. In this regard, it is suggested to make judicious decision with regard to use of geo-bags or boulders in bank protection. Here, it is worth remembering that use of boulder is being discouraged now-a-days due to its negative environmental impact.

Reply: Following this suggestion the boulder has been replaced with the Geo-bag.

- 9) Observation: It seems two layers of RCC porcupines of varying length and rows have been adopted for screens as well as bars. The basis for adopting different lengths and four rows above five rows in case of screens may be stated. The spacing of screens and bars may be mentioned in the Design section as well as in Salient features.

Reply: The length and height of the screens have been provided according to CWC Guidelines. The length of porcupine has been taken as 20% of the width of the channel and the height of the screen/bar has been considered as the 1/2 of the average flow depth at the time of flood. The spacing of screens and bars has been mentioned in the Salient features in the modified DPR.

- 10) Observation: Provision of Scientific & Mathematical equipment and Office equipment has been made under Q-Special T&P. These provisions should be made under Ordinary T&P.

Reply: Done accordingly.

- 11) Observation: Salient features of the project may be given in the report.

Reply: Salient features of the project have been attached in the modified DPR.

- 12) Observation: The cost of each component of works as per the proposal may be calculated separately based upon quantities of items of works pertaining to that

particular works and unit rates. The better cost of sub-head of works may be worked adding cost of each item of works.  
Reply: Done accordingly.

13) Observation: The price level of the scheme may be clearly mentioned in the report.  
Reply: The price level for the items taken from Water Resources Department's SoR is 2011-12 and for the items taken from Public Works Department's SoR is 2013-14.


14) Observation: A copy of Schedule of Rates on which the scheme is based, may be appended with the report.  
Reply: A copy of SoR of WRD has been annexed with this reply sheet.

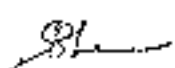
15) Observation: The relevant pages of APWD SoR may also be appended from which unit rates of building have been taken.  
Reply: Accordingly appended the relevant pages with this reply sheet.

16) Observation: Completion period of the scheme along with passing of expenditure and construction schedule may be incorporated in the report.  
Reply: The Action plan for the execution of the project has been attached in the modified DPR.

17) Observation: An index map of the project area depicting the various sites, quarry sites, major towns/villages etc may be appended in the DPR marking therein the distances involved in each case.  
Reply: Done accordingly.

18) Observation: A certificate from competent authority may be submitted stating that quantities calculated for various items of works have been worked out on the basis of design and drawing adopted for the scheme and that is just & correct.  
Reply: The certificate has been attached with the modified DPR.

  
Chief Engineer  
Water Resources Dept.  
Gandhinagar, Ghy-3

  
Executive Engineer  
Barpeta W.R. Division  
Barpeta.

Government of India  
Central Water Commission  
Hydrology (NE) Directorate

507(S), Sawa Bhowan,  
R.K. Puram, New Delhi-66


Sub: Examination of hydrological aspects of the Flood Management Scheme "Integrated Flood and Erosion Management of Manas and Baki River in the district of Baksa and Barpeta in Brahmaputra Valley within Assam (Review)"

Ref: CWC letter No. 511/PR-43/2016-FMP/483, dated 20.06.2016


This is with reference to above letter of FMP Dts. CWC with which the DPR of the above cited flood management scheme was sent to this Directorate for technical examination of hydrological aspects. The hydrological aspects of the above flood management scheme have been examined.

For estimating the design flood, hydrological analysis has been carried out in Hydrology(NE) Directorate by fitting the Log Pearson Type III, Gumbel, Log normal and Pearson type II distributions on the annual flood peak data of Baki river observed at NH-31 bridge site for the period 1971-2010. This data was collected by Water Resources Department, Government of Assam.

The estimated 25, 50 and 100 year return period flood at proposed project site is 4950, 5415 and 5857 cumec respectively by Gumbel Distribution. Accordingly, the 50 year return period flood of 5500 cumec may be adopted as design flood for the proposed scheme.

  
N.N. Rai  
Director, Hyd (NE)

Director, FMP Dts, CWC  
CWC U.O. No. 4/265/2315-Hyd(NE)/ 21.2 dated: 29/1/2016

  
29/1/2016

आवक संख्या: 534  
LIBRY No. 534  
दिनांक: 30-11-16  
DATE 30-11-16  
DIRECTORATE

No. S/11PR-10/2016-FMP - 8/33  
 NEW STATE GOVERNMENT OF INDIA  
 WATER RESOURCES / CENTRAL WATER COMMISSION  
 नदी नदी नदी / FLOOD MANAGEMENT DIVISION D.C.

आ. क्र. १०५/२०१६ (S) डी.डी. सं. १०५ (S) Sewa Bhawan  
 आ. क्र. १०५, नई दिल्ली-६६  
 M. K. Puram, New Delhi - 66  
 तिथि:.....  
 Date 20/12/2016

To,  
 The Chief Engineer  
 Water Resources Department  
 Govt. of Assam,  
 Gauhati

विषय : Examination of the Flood Management scheme "Integrated Flood and Erosion Management of Manas and Baki River in the District of Baksa and Barapeta in Brahmaputra Valley within Assam (Review)" (Estimated Cost Rs 96.00 Crores)

संदर्भ : 8(22)/2013-EEB/Baksa-Barapeta/134-35 dated 25.04.2016.

Sir,

This has a reference to above captioned letter dated 25.04.2016 vide which DPR of the above mentioned project with estimated cost of Rs. 96.00 crore was submitted to this office.

The DPR has been examined and comments of CWC thereon are as under:-

1. Hydrology (NE) Directorate of CWC has examined the DPR and issued hydrological aspects viz design discharge of the scheme has been called vide letter dated 29.11.2016 (Copy enclosed).
2. There is proposal for bank revetment at different locations for a length of 14 km. It has of RCC porcupine screen along with R/S of embankment for 25 km length on both banks of river Baki. Flood and erosion problem of the area like actual erosion data, incidence of breaches/overlapping of the embankment etc along with earlier executed works may be elaborated in the report of the executive engineer to justify the quantum and suitability of the proposed

- works to check the flood and erosion problem of the area in integrated manner.
3. As the scheme was re-examined in 500 State TAC meeting held in Oct. 2012, reason for late submission of the DPR in year 2016 may be explained. It may also be ensured that the works proposed in the project are individually approved by the State TAC.
  4. Cost estimate of DPR has been framed on the basis of Soil of WRD 2011-12 and SoR of APWD 2013-14. The estimate may be framed as per latest SoR of WRD/APWD.
  5. River gradient has been adopted as 1:5000, source/basis of the same may be mentioned in the DPR.
  6. River velocity has been adopted as 2.8 m/sec. Details of the same may be appended in the DPR.
  7. Silt factor has been adopted as 0.30. Details of the same may be appended in the DPR.
  8. Design discharge has been estimated as 8500 cumecs and same may be utilized in working out the width of launching apron may as per BIS 14252:1995. As sand filled gun bags are being used in place of boulders, angle of repose and specific gravity of the material may be used accordingly. In finalisation of thickness of pitching as well as size of launching apron.
  9. Details and layout of the RCC corrugate screens at different locations along with salient features of the R/S of embankment may be given in design chapter.
  10. In the calculation of B.C. Ratio, basis for assessment of benefited area including cultivated land/homestead land etc and population affected should be given in detail in the project report. Further annual benefits/losses like crops, land, buildings etc should be assessed based on the past actual annual losses and/or anticipated annual losses in the absence of the proposed project. The losses/benefits may also be vetted by the Competent Authority of Revenue Dept.
  11. Further proposed works, if any, along with change in different colours, annual bank lines, benefited area, nearby G&D site, important installations may be mentioned on the index map.
  12. Program of construction and period of completion of the scheme and staff required may also be appended in the DPR.
  13. The compliance with respect to the Longitudinal and latitudinal connectivity and e-flow may also be submitted.
  14. No-objection certificate from the concerned Forest Department may be submitted.

15. A certificate pertaining to the facts that separate channels are not being proposed/planned on the same reach of the river, may be appended.

16. The clearance from State Flood Control Board may be annexed.

The modified DPR after compliances of the above comments may be submitted at the earliest for further necessary action in this regard.

Back As above

Yours faithfully,

*[Handwritten signature]*  
22/12/2016

शिव कुमार / Piyush Kumar  
निदेशक / Director

CCO  
2/13

URGENT

Dt: 12/12/2016  
22887

No. S/3/PR-40/2016-SMF-181-22

भारत सरकार / GOVERNMENT OF INDIA

केन्द्रीय जल आयोग / CENTRAL WATER COMMISSION

कठ संघर्ष आयोग / FLOOD MANAGEMENT PLANNING Dts.

\*\*\*\*\*

कार्य संख्या: 906 J(S) सेवा श्रवण  
906 J(S) Sewa Shrawan  
अर. के. पुरम, नई दिल्ली- 66  
R. K. Puram, New Delhi - 66  
दिनांक.....  
Date: 12/12/2016

*Copy to be submitted to the Chief Engineer, Water Resources Department, Govt. of Assam, Guwahati for compliance.*

The Chief Engineer  
Water Resources Department  
Govt. of Assam,  
Guwahati

विषय : Examination of the Flood Management scheme "Integrated Flood and Erosion Management of Manas and Beki River in the District of Baksa and Darapeta in Brahmaputra Valley within Assam. (Review)- (Estimated Cost: Rs 96.00 Crores).

संदर्भ : No.S/3/PR-40/2016-SMF-833 dated 20.12.2015. (copy enclosed)

Sir,  
This has a reference to above mentioned letter dated 20.12.2015 vide which detailed comments were submitted for compliance. However no compliance has been received in this regard. It is intimated that as per new rules if compliance is not received within a period of three months, the project may be deleted from the list of pending schemes. Therefore the modified DPR after compliances of the comments may be submitted at the earliest for further necessary action in this regard.

Encl: As above

Yours faithfully,

*(Signature)*  
14/12/2016

(शिवूष कुमार / Shivush Kumar  
निदेशक / Director

820  
3/2/17  
4548  
1.2.17

Copy to:

1. Chief Engineer, BARDO, N.C.W.C, Guwahati

22887  
14/12/16



GOVT OF ASSAM  
DIRECTOR DESIGN & WATER RESOURCES DEPARTMENT  
GUWAHATI-3

Date: 1-02-2017

WR(D)Tech/6154/11/18

The Executive Engineer  
District Water Resources Division  
Guwahati

Subject: Rehabilitation of the Flood Management Scheme "Integrated flood and erosion management of Manas and Jalki in the district of Baksa and Bongaigaon in Brahmaputra valley within Assam (Review)" E/A:-Rs.96.00 Crore

Ref: No.5/WR-40/2015-FMP-835 dated 20-12-2016

Enclosed please find herewith a letter received from the Director, Central Water Commission, New Delhi enclosing another letter from the Director, Hydrology (NE), CWC, New Delhi which are self explain.

In this context, I am directed to requested you to meet up observations raised by the CWC, New Delhi within a short period of time. Please treat this as URGENT.

Encls:- As above.

*(S.U. Ahmed)*  
Director Design  
Water Resources Department  
Guwahati-3

Dated: 08-02-2017

Memo No. WR(D)Tech/6154/11/18-A  
Copy to:- The Superintending Engineer, Mulkajua Protection WR Circle, Mulkajua for  
favor of kind information and necessary action.

e/c

*(S.U. Ahmed)*  
Director Design  
Water Resources Department  
Guwahati-3

GOVT OF ASSAM  
OFFICE OF THE CHIEF ENGINEER, WATER RESOURCES DEPARTMENT  
GUWAHATI-3

No. WR(ED)Tech/ 5154/11 / 20

Dated:- 13-03-2012

To

The Director (FMP Div)  
Central Water Commission  
Flood Management Planning Directorate  
Room No-606 (I), Sewa Shiksha  
R.K. Puram, New Delhi -110 606

Subj- Submission of Detailed Project Report of the scheme "Integrated flood and erosion management of Manas and Beki in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)"  
Estid. Cost = Rs.130.746 Crore

Ref- No.57/PR-40/2016-FMP-533 dated.20-12-2016

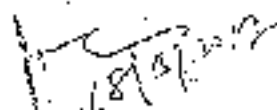
Sir,

In inviting a reference to the above subject, I have the honour to submit herewith 2 (two) sets of modified Detailed Project Report of the scheme for favour of necessary action at an early date. The scheme is proposed to be taken up under Flood Management Programme (FMP).

The scheme was recommended by the 55<sup>th</sup> TAC meeting held on 10<sup>th</sup> & 11<sup>th</sup> October, 2012.

Encls:- Detailed Estimate with perswise reply --2 (two) sets

Yours faithfully



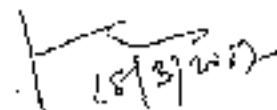
Chief Engineer  
Water Resources Department  
Guwahati-3

Dated:- 13-03-2012

Memo No. WR(ED)Tech/ 5154/11 / 20 - 2

Copy to:

- 1) The Superintending Engineer, Mulkarna Protection Circle, Water Resources Department, Mulkarna for information and necessary action.
- 2) The Executive Engineer, Barpeta W.R. Division, Barpeta for information and necessary action.



Chief Engineer  
Water Resources Department  
Guwahati-3

B/c.

State of Project: Integrated Flood and Erosion Management of Manas and Beki River in the district of Dibrugarh and Sivasagar in Brahmaputra Valley within Assam (Review)

Compliances of the comments sent from CWC, New Delhi.

Comment No. 1 of CWC (New Delhi): Hydrology (NE) Directorate of CWC has examined the DPR and issued hydrological aspects via design discharge of the scheme has been visited vide letter dated 29.11.2018.

Compliance: The Design Discharge has been adopted according to the Hydrology (NE) Directorate of CWC.

Comment No. 2 of CWC (New Delhi): There is proposal for Lank revetment at different locations for a length of 14Km. 18 nos. of RCC porcupine screen along with R/S of embankment for 25 Km. length on both banks of river Beki. Flood and erosion problem of the area like annual erosion data, incidence of breaches/ overtopping of the embankment etc along with earlier executed works may be elaborated in the report of the executive engineer to justify the quantum and suitability of the proposed works to check the flood and erosion problem of the area in integrated manner.

Compliance: The heavy flash flood of river Beki had breached the embankment many times at different locations as follows:

- In 2004 - at Raghadih
- In 2015 - at Safokamar
- In 2015 - at Bordonga

Furthermore, though the flood has not ever topped the embankment yet but the FWD which goes from Bapeta Road to Manas Reserved Forest which has a big importance is running just along the vicinity of the Left Bank embankment. Similarly there is a huge village area being protected only by the Right Bank embankment of the river Beki. Erosion is becoming obvious problem in the river Beki causing lakhs of people homeless, landless and huge loss in the cultivation & economy. So R/S of embankment as well as checking of flood erosion problem is very much important to make the area safe from flood hazards.

Comment No. 3 of CWC (New Delhi): As the scheme was recommended in 66<sup>th</sup> State TAC meeting held in Oct.2012, reason for late submission of the DPR in year 2018 may be explained. It may also be ensured that the works proposed in the project are individually approved by the State TAC.

Compliance: Due to revision of DPR so many times it becomes late for the submission of the DPR in the CWC, New Delhi. The proposed works are approved by the state TAC and the consideration of geo-textile instead of boulder has been approved by the Chief Engineer, Water Resources Department, Govt. of Assam.

Comment No. 4 of CWC (New Delhi): Cost estimate of DPR has been framed on the basis of SoR of WRD 2011-12 and SoR of APWD 2013-14. The estimate may be framed as per latest SoR of WRD/APWD.

Compliance: This modified cost estimate of DPR has been prepared as per latest SoR of WRD & APWD. But due to not publishing yet some rates in the K-building sub-estimate have been taken from the SoR of APWD (building) 2013-14.

Comment No. 5 of CWC (New Delhi): River gradient has been adopted as 1 in 5000, source basis of the same may be mentioned in the DPR.

Compliance: The river gradients in the DPR taken from the observed data in the river Beki.

Comment No. 6 of CWC (New Delhi): Filter velocity has been adopted as 2.0m/sec. Details of the same may be appended in the DPR.

Compliance: The filter velocity adopted in the DPR from the observed data in the river Baki.

Comment No. 7 of CWC (New Delhi): Silt factor has been adopted as 0.50. Details of the same may be appended in the DPR.

Compliance: The silt factor in the DPR has been adopted from the soil testing report. The soil testing report has been included in this modified DPR.

Comment No. 8 of CWC (New Delhi): Design discharge has been estimated as 5500 cumecs and same may be utilized in working out the width of launching apron may as per BIS 14202:1995. As sand filled geo bags are being used in place of boulders, angle of repose and specific gravity of the material may be used accordingly in finalization of thickness of pitching as well as size of launching apron.

Compliance: Accordingly the launching apron & pitching thickness have been calculated and the modified Apron Design has been appended in this DPR.

Comment No. 9 of CWC (New Delhi): Details and layout of the RCC porcupine screens at different locations along with salient features of the R/S of embankment may be given in design chapter.

Compliance: Done accordingly.

Comment No. 10 of CWC (New Delhi): In the calculation of B.C. Ratio, basis for assessment of benefited area including cultivated land/mestead land etc. and population affected should be given in the project report. Further annual benefits/losses like crops, land, buildings etc. should be assessed based on the past actual annual losses and/or anticipated annual losses in the absence of the proposed project. The losses/benefits may also be vetted by the Competent Authority of Revenue Dept.

Compliance: The whole proposed reaches fall under two Revenue Circles name'y Kaigachia Revenue Circle & Barnagar Revenue Circle. The B.C. Ratio in this modified DPR has been calculated on the basis of the above two Revenue Circle's loss assessment. The corresponding certificates have been appended with this DPR.

Comment No. 11 of CWC (New Delhi): Earlier proposed works, if any, along with change in different colours, annual bank lines, benefited area, nearby G&D site, important installations may be mentioned on the index map.

Compliance: There are no any works in the proposed reach since last 10 years. Benefited area, G&D site and important roads, locations etc. have been marked in the index map. The bank line has been marked in a separate drawing "Baki river configuration as on 2015" to depict the shifting of bank since the year 2005.

Comment No. 12 of CWC (New Delhi): Program of construction and period of completion of the scheme and staff required may also be appended in the DPR.

Compliance: The Program of construction has been appended with this DPR. The staff required for the proposed work is available in the Department.

Comment No. 13 of CWC (New Delhi): The compliance with respect to the Longitudinal and latitudinal connectivity and e-flow may also be submitted.

Compliance: The implementation of proposed RCC screen will close only some offshoot channels which are causing erosion in the bank but the flow in main channel will remain unaffected i.e. the longitudinal connectivity will not get obstructed due to the implementation of

The proposed works. Also there is neither any proposed work for blocking the tributaries or any existing channel to the river Barpa nor the construction in the main channel. So, the existing lateral connectivity as well as of flow will also remain unimpeded.

Comment No. 14 of CWC (New Delhi): No objection certificate from the concerned Forest Department may be submitted.  
Compliance: Submitted accordingly.

Comment No. 15 of CWC (New Delhi): A certificate pertaining to the issue that separate schemes are not being proposed/planned on the same reach of the river, may be appended.  
Compliance: The non-duplication certificate has been appended with the DPR.

Comment No. 16 of CWC (New Delhi): The clearance from State Flood Control Board may be attached.  
Compliance: The clearance from State Flood Control Board will be done just after the concurrence of the CWC, New Delhi.

*[Handwritten Signature]*  
18/5/2012  
Chief Engineer  
Water Resources Deptt.  
Chausaran, Ghy-3

*[Handwritten Signature]*  
Executive Engineer  
Barpara WR Division  
Barpara



429

GOVERNMENT OF INDIA  
 CENTRAL WATER COMMISSION  
 FLOOD MANAGEMENT PLANNING DIV.

उत्तर संख्या-908 J(S) सेवा मन्त्र  
 908 J(S) Sewa Bhawan  
 मंत्र. के. भवन, नई दिल्ली- 66  
 R. K. Puram, New Delhi - 66  
 दिनांक.....  
 Date 30.06.2017

The Chief Engineer  
 Water Resources Department  
 Govt. of Assam,  
 Gauhati

Examination of the Flood Management scheme "Integrated Flood and  
 Erosion Management of Manas and Beki River in the District of Baksa  
 and Barapeta in Brahmaputra Valley within Assam (Review)"-  
 (Estimated Cost: Rs 130,746.00 Crores).  
 No. WR(ED)/Tech/6154/11/27 dated 23.06.2017.

This has a reference to above mentioned letter dated 30.03.2017 vide  
 in compliance of the observations raised by this office were submitted.  
 ever following observations have not been complied with:

1. The report of site visit by team comprising of officials of State  
 Government, field office of CWC and Brahmaputra Board may be  
 submitted.
2. Draft background note and Power Point presentation of the above  
 project in detail may be mailed at [fnps@rediffmail.com](mailto:fnps@rediffmail.com) and [fnps@nic.in](mailto:fnps@nic.in).
3. State Financial concurrence and concurrence of State Flood  
 Control Board may also be submitted.

Therefore the above two observations may also be complied with at the  
 earliest for further necessary action in this regard.

R(E) Tech/6154/11/27 dt. 06.07.2017

Yours faithfully,

*Copy forwarded to the EL, Barpeta  
 for information and immediate  
 compliance of the observations.*

*(पियूष कुमार) Piyush Kumar*  
 30/06/2017

Compliances of Comments of CWC, New Delhi (vide letter No. CWC/ER/02/2018-FA/0000-000  
 dt. 20.03.2017):

Comment No. 1 of CWC (New Delhi): Complied with.

Comment No. 2 of CWC (New Delhi): Complied with.

Comment No. 3 of CWC (New Delhi): Not complied properly. Minutes of 53<sup>rd</sup> TAC pages are missing. It may be appended in DPR with clarity of works proposed matching with the design being undertaken.

Compliance: Appended accordingly with this DPR.

Comment No. 4 of CWC (New Delhi): Complied with.

Comment No. 5 of CWC (New Delhi): Not complied properly. Source of data for river gradient may be provided.

Compliance: The river gradients in the DPR taken from the surveyed data of river Bed. This data may be seen in the drawing "Long Section showing river banks". The river gradient for design purpose has been calculated from the LWL data from the drawing "Long Section showing river banks" within CH/35500m. to CH/50500m.

Comment No. 6 of CWC (New Delhi): Not complied properly. Source of data for river velocity may be provided.

Compliance: The river velocity data has been collected from the office of the Executive Engineer, Lower Assam Investigation Division, Water Resources Department, Barsoi Road. A copy of the letter has been attached with the DPR. This velocity has been incorporated in the design of pitching and launching apron in the modified DPR.

Comment No. 7 of CWC (New Delhi): Complied with.

Comment No. 8 of CWC (New Delhi): Complied with.

Comment No. 9 of CWC (New Delhi): Complied with.

Comment No. 10 of CWC (New Delhi): Not complied properly. Certificate from Barsoi Revenue Circle may be appended in the submitted DPR.

Compliance: Appended accordingly.

Comment No. 11 of CWC (New Delhi): Complied with.

Comment No. 12 of CWC (New Delhi): Complied with.

Comment No. 13 of CWC (New Delhi): Not complied properly. A certificate signed by concerned Chief Engineer of the State Government for ensuring e-flow, longitudinal & latitudinal connectivity may be provided.

Compliance: The Certificate from Chief Engineer, Water Resources Department, Govt. of Assam has been attached with this DPR.

Comment No. 14 of CWC (New Delhi): Complied with.

Comment No. 15 of CWC (New Delhi): Complied with.

Comment No. 16 of CWC (New Delhi): The clearance from State Flood Control Board may be attached.

Compliance: The clearance from State Flood Control Board is under process. The clearance letter will be submitted to CWC, New Delhi as soon as it comes from the SFDB.

In addition to the above, other observation along with the compliances are as follows:

1). Observation from CWC, New Delhi: Specific gravity (adopted as 2.35) of the sand filled geo bag appears to be on the higher side. Generally, specific gravity of compacted wet sand is approx 1.8:2.1. Therefore, justification for adopted specific gravity of 2.35 may be given and design may be modified, if required. Accordingly, with change in specific gravity, design calculation and cost estimate may be revised.

Compliance: The design calculation has been revised considering the specific gravity of sand filled geobag as 1.9 and the same has been incorporated in this modified DPR.



247

GOVT OF ASSAM  
OFFICE OF THE CHIEF ENGINEER - WATER RESOURCES DEPARTMENT  
GUWAHATI-3

Ac. No. WR(ED)Tech/64/14 / 37.

Dated: 13-08-2017

The Director (FMP Div)  
Central Water Commission  
Flood Management Planning Directorate  
Room No-906 (3), Sewa Bhawan  
R.K. Puram, New Delhi-110 606

Sub - Examination of the Flood Management scheme 'Integrated flood and erosion management of Manas and Beki in the district of Sivasagar and Dibrugarh in Brahmaputra valley within Assam (Review)'.  
Estid. Cost = Rs. 133,740 Crore

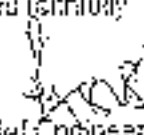
Ref:- No.91/FR-43/2016-FMP-492 dated.03-07-2017

Sir,

In inviting a reference to the above subject I have the honour to submit herewith para wise compliance of the observations raised by the Director, CWC, Cost Appraisal (HWF) Directorate, New Delhi along with a Certificate of correctness of quantities, SCR (WR)2016-17 and a soft copy of cost estimate in CD for favour of your kind further necessary action.

Encls:- Parawise reply - 1 (one) page.  
Certificate- 1 page  
CD- 1 piece

Yours faithfully

  
Chief Engineer  
Water Resources Department  
Guwahati-3

s/c

State of Project: Irrigation Flood and Erosion Management of Saras and Edla River in the Right of Banks and Barrets in Barpeta Valley within Assam (Rajmura)

*Instances of the observations / comments sent from Cost Appraisal Directorate, CWC, New Delhi.*

Observation No. 1 of Cost Appraisal Directorate, CWC (New Delhi): Establishment charges have not been included in the abstract of cost. If establishment charges are not required reason may be communicated.

Compliance: Since there are sufficient staff and resources available in the respective Water Resources Sub-Divisional office to look after the implementation of the project so a separate Establishment charge would not be required for the same. That is why Establishment charges have not been included in the abstract of cost.

Observation No. 2 of Cost Appraisal Directorate, CWC (New Delhi): A certificate regarding correctness of quantities from the competent authority i.e. Chief Engineer or equivalent (with name & date) may be provided.

Compliance: The certificate has been attached herewith.

Observation No. 3 of Cost Appraisal Directorate, CWC (New Delhi): Supporting documents in support of rates which items not included in the SOR may be provided.

Compliance: The quotations in support of rates for the items not included in the SOR have been attached with the DPR.

Observation No. 4 of Cost Appraisal Directorate, CWC (New Delhi): Detailed analysis of non-scheduled items may be provided.


Compliance: The quotations for non-scheduled items have been provided so detailed analysis does not arise.


Observation No. 5 of Cost Appraisal Directorate, CWC (New Delhi): A copy of schedule or rates applied in the above scheme may be provided.

Compliance: Attached herewith accordingly.

Observation No. 6 of Cost Appraisal Directorate, CWC (New Delhi): A soft copy in MS Excel format (Interlink all sheets) of the up dated cost estimate of the above scheme may be provided.

Compliance: Soft copy of the cost estimate in CD has been submitted herewith.

  
Chief Engineer  
Water Resources Dept.,  
Chandernagore, Assam

  
Executive Engineer  
Barpeta WR Division  
Barpeta

GOVT OF ASSAM  
OFFICE OF THE CHIEF ENGINEER & WATER RESOURCES DEPARTMENT  
GUWAHATI-3

No. WR(ED)/Tech/6154/2011/ 3A

dated: 30-01-2018

To  
The Director (FMR Dto)  
Central Water Commission  
Flood Management Planning Directorate  
Room No-608 (I) Sewa Bhava  
R.K. Puram New Delhi-110 003

Subj: Compliance of observations of the scheme "Integrated flood and erosion management of Manas and Heki in the district of Baksa and Barpeta in Brahmaputra valley within Assam (Review)"  
Estm. Cost = Rs. 130,745 Crore


Ref: No.8/1/73-40/2016-FMP-981-983 dated.04-12-2017

Sir,

In inviting a reference to the above subject, I have the honour to submit herewith the compliance of the observations of Cost Appraisal (FMR) Dto of CWC, New Delhi for favour of deposit.

Enclos: Compliance of observations- (12-pages)


Yours faithfully

  
Chief Engineer  
Water Resources Department  
Guwahati-3

dated:- 30-01-2018

Memo No. WR(ED)/Tech/6154/2011/ 3A - 2  
Copy to:

- 1) The Superintending Engineer, Mulkimua Protection Circle, Water Resources Department, Mulkimua for information and necessary action.
- 2) The Executive Engineer, Barpeta W.R. Division, Barpeta for information and necessary action.

  
Chief Engineer  
Water Resources Department  
Guwahati-3

o/c

Compliance of observations of CWC, New Delhi vide letter No. 3/1/PD-423916-1/2019-20, dt. 6.11.2017]

Observation of CWC (New Delhi) The project authority have been furnished the cost estimate on the basis of SoR WRD 2016-17 (C-Works Sub head), SoR PWD building 2013-14 (K building Sub head) & SoR APWRD (Rural) 2016-17 (M-Plantation Sub head), however, copy of SoR WRD 2016-17 has only been provided by the project authority. Hence, it is requested that copy of SoR PWD building 2013-14, SoR APWRD (Rural Roads) 2016-17 & Copy of award letter of Topographic survey of Rs. 950000.00 and Bathymetric survey of Rs. 820000.00 provisions kept in A-Preliminary sub-head shall be provided to this Directorate. Project authority may also be confirmed that SoR 2013-14 are workable in 2017.

**Compliance:**

The SoR WRD 2016-17, SoR PWD building 2013-14 & SoR APWRD (Rural) 2016-17 are the latest Schedule of Rates of the concerned department and after that no new edition has been published for those SoR till date. So, these SoRs had to be adopted for the rates of the relevant items.

The copy of the pages of the SoR of PWD building 2013-14 & SoR APWRD (Rural) 2016-17 containing the relevant items have been annexed herewith.

Copy of award letter of Topographic survey of Rs. 950000.00 and Bathymetric survey of Rs. 820000.00 has been annexed herewith.

Since the total amount of items for which rates have been taken from SoR PWD building 2013-14 is nominal (= Rs. 7,44,484.00) in respect to the whole project cost (= Rs. 190,746 Cr.) so in this context it may be assured that the SoR PWD building 2013-14 is workable in 2017.

  
Chief Engineer  
Water Resources Deptt.  
Chandernagar, Etry-3

  
Executive Engineer  
Barpeta WR Division  
Barpeta

10/20/2016 10:55 AM

ADDITIONAL INFORMATION

ADDITIONAL INFORMATION

ADDITIONAL INFORMATION

The Chief Engineer  
Water Resources Department  
Govt of Karnataka  
Bangalore

Subject: Request for design flood data for design flood peak  
data at bridge site of GND for  
design flood peak data at bridge site of GND for  
design flood peak data at bridge site of GND for

Reference: Letter No. 10/20/2016/10/20/2016 dated 15.08.2016

Letter No. 10/20/2016/10/20/2016 dated 15.08.2016

Letter No. 10/20/2016/10/20/2016 dated 15.08.2016

Letter No. 10/20/2016/10/20/2016 dated 15.08.2016

Reference is made to the above mentioned letter which it was  
intimated that the large data considered for design flood peak  
data at bridge site of GND for design flood peak data at  
bridge site of GND for design flood peak data at bridge site  
of GND for design flood peak data at bridge site of GND for

| No. | Return Period (Years) | Design Flood based on State Govt data (mm) | Design Flood based on GND data (mm) |
|-----|-----------------------|--|-------------------------------------|
| 1   | 5                     | 4060                                       | 9350                                |
| 2   | 10                    | 5415                                       | 10350                               |
| 3   | 20                    | 786  | 11500                               |


It is requested that the modified GND data may be based on the  
latest data available at GND; the same submitted to this office for further  
necessary action.

Respectfully

Respectfully

*[Handwritten Signature]*  
Chief Engineer  
Water Resources Department  
Govt of Karnataka  
Bangalore

ADDITIONAL INFORMATION

|  |   |   |
|--|---|---|
| भारत सरकार<br>जल संधि विभाग<br>जल संसाधन एवं सिंचन विभाग<br>केंद्रीय जल आयोग<br>जल संयोजन एवं आयोग विभाग |  | Government of India<br>Ministry of Jal Shakti<br>Dept. of Water Resources, RDO&CR<br>Central Water Commission<br>Flood Management Planning Div. |
|--|---|---|

दिनांक 07.01.2022

सेवा में,  
 The Chief Engineer  
 Water Resource Department  
 Govt. of Assam,  
 Guwahati

विषय: Examination of the Flood Management scheme "Integrated Flood and Erosion Management of Manas and Beki River in the District of Baksa and Barapeta in Brahmaputra Valley within Assam (Review)"-(Estimated Cost: Rs 400.22 Crores)

संदर्भ: File No.T-49014/2/2021-CA(HWF) DTE dated 06.01.2022

महोदय,

Please find enclosed herewith the cost estimate finalization letter of Cost Appraisal Directorate of CWC for kind information with a request to kindly arrange to submit the final DPR along with State Finance Concurrence to this Office at earliest for further needful action.


This issues with the approval of CE(FM), CWC.

भवदीय,

Encl: As Above

पियूष कुमार/Piyush Kumar

निदेशक/Director

|   |   |   |
|---|---|---|
| पश्चिमी ब्लॉक-2 नि.स.1(दिलीप नगर)<br>आर के पुरम नई दिल्ली<br>दूरभाष: 011-29583298<br>ईमेल: fmp-cwc@nic.in<br>जल संरक्षण - सुरक्षित जीवन |  | West Block-2, Wing-1 (2 <sup>nd</sup> floor),<br>R.K.Puram, New Delhi-110066<br>Tel: 011-29583298,<br>E-mail: fmp-cwc@nic.in<br>Conserve Water- Save Life |
|---|---|---|

By Email

Government of India

Ministry of Jal Shakti

Dept. of Water Resources, RD & GR

Central Water Commission

Cost Appraisal (HWF) Directorate

ভাৰত চৰকাৰ

জল শক্তি মন্ত্ৰালয়

জল সংৰক্ষণ নদী বিকাশ আৰু মৎস্য সংৰক্ষণ বিভাগ

কেন্দ্ৰীয় জল আয়োগ

স্বাৰ্ভাৱ সুলভাৰ্থ (এমপ্লয়মেন্ট) নিৰ্দেশালয়



सत्यमेव जयते

বিষয় : Examination of the Flood Management Scheme "Integrated Flood and Erosion Management of Manas and Beki River in the District of Baksa and Barapeta in Brahmaputra Valley within Assam (Review)"- reg.

সন্দৰ্ভ/Ref: i) FMP Dte. Letter No.9/1/PR-40/2016-FMP Dt. 11/30/2021

(i) This Directorate letter dated 31-11-2021 on the subject

(ii) WR (ED) Tech/ 6154/2011/104 Dated 21-12-2021

(iv) WR (ED) Tech/ 6154/2011/105 Dated 21-12-2021

(v) This Directorate letter dated 03-01-2022 on the subject

(vi) WR (ED) Tech/ 6154/2011/107 Dated 03-01-2022

Cost estimate of Examination of the Flood Management Scheme "Integrated Flood and Erosion Management of Manas and Beki River in the District of Baksa and Barapeta in Brahmaputra Valley within Assam" was forwarded by Flood Management Planning Dte. vide ref (i) for its cost appraisal. A preliminary examination was done and an observation letter was sent to the project authority vide ref (ii), compliance of which has been received vide reference (iii). Certificate as desired by this directorate is also received vide reference iv). After examinations an observation letter was sent vide ref (v) & in compliance of it project authority updated the rate of one item at latest price level vide ref (vi).

The rates and calculations have been checked with latest SoR made available by Project Authority. After the detailed examinations the final appraised estimate was corrected to Rs. 40021.95 lakh at Price Level of Nov 2021 as against Rs. 42080.33 lakh submitted by Project Authority. As per compliance/ reply submitted the finalized estimate with head wise details are at Annex-I.

The estimate is finalized subject to following conditions:-

- State Finance Concurrence may be obtained and enclosed at the time of submission of DPR/ cost estimate itself as per CWC guideline. Any past relaxation in this regard given due to time constraints may not be assumed as a rule and should not be repeated for other projects from the state. However, Civil Cost Estimate is hereby finalized subject to State Finance Concurrence from State.
- The provision for construction of Paver block on existing embankment for length of 11.2 KM has been removed as per FMP dte. letter dated 24/09/2021.
- Quantity, leads and rates in estimate are as certified by competent authority from State Government of Assam.
- GST may be reimbursed as per actual payment of works.

This issues with approval of Chief Engineer (PAO), CWC.

संलग्न/Back: उपरोक्तानुसार

(राजीव कुमार)  
निदेशक, का.सू. (एचडब्ल्यूएफ)

शेवा संकेत

निदेशक, बाढ़ प्रबंधन आयोजन निदेशालय, के.ज.भा. सेवा भवन, नई दिल्ली

|  |   |   |
|--|---|---|
| 601 तल (दक्षिण)सेवा भवन<br>एनए ब्लॉक पुरम 110065- नई दिल्ली,<br>फ़ोन: 011-29583427<br>ई मेल: cshwaf@nic.in |  | 5 <sup>th</sup> Floor (South), Sewa Bhawan<br>R.S.Puram, New Delhi-110066<br>Tel: 011-29583427<br>E-mail: cshwaf@nic.in<br>Conserve Water - Save Life |
| * जल संरक्षण - सुरक्षित भविष्य   |   |   |

Annexure-I

### GENERAL ABSTRACT OF COST

Name of Work:- Examination of the Flood Management Scheme  
 "Integrated Flood and Erosion Management of Manas and Beki River in the  
 District of Baksa and Barapeta in Brahmaputra Valley within Assam

Price Level  
 Nov-2021

| Sr. No   | Description of Works  | Appraised<br>(Amount in Lakh) |
|----------|-----------------------|-------------------------------|
| <b>A</b> | <b>DIRECT CHARGES</b> |                               |
| 1        | A- Preliminary        | 26.70                         |
| 2        | B- Land               | 0.00                          |
| 3        | C-Works               | 39008.96                      |
| 4        | K-Buildings           | 138.39                        |
| 5        | M-Plantation          | 65.76                         |
| 6        | Q-Miscellaneous       | 28.62                         |
| 7        | P-Maintenance         | 0.00                          |
| 8        | R-Communications      | 260.37                        |
| 9        | Y-Losses on Stock     | 0.00                          |



|     |   |          |
|-----|---|----------|
| I   | Works                                       | 38526.86 |
|     |   | 0.00     |
| II  | Establishment @ 10% of I works              | 25.00    |
| III | TRP   | 0.00     |
| IV  | Suspense                                    | 20.78    |
| V   | Receipt & Recoveries (-)                    | 30533.04 |
|     | <b>TOTAL DIRECT CHARGES</b>                 |          |
| B   | <b>INDIRECT CHARGES</b>                     |          |
| (a) | Audit & accounts charges @ 0.25% of I Works | 96.82    |
|     | <b>TOTAL INDIRECT CHARGES</b>               | 96.82    |
|     | <b>TOTAL (A + B )</b>                       | 30631.85 |
|     |   | 390.09   |
| C   | Add-1% contingency on C-works               | 40021.95 |
|     | <b>TOTAL (A +B+C)</b>                       |          |



Date: 08.11.2023

No. WR(EO)Tech/7720/2023/10

**CIRCULAR**

In pursuance of the meeting of the Committee for Revision of Schedule of Rate of Water Resources Department held on 28.10.2023 and in partial revision of the existing SoR of WRS for 2018-19, the rates of following items have been finalised for the year 2021-22. The rates shall be utilised in preparing the estimates under all Head of account with immediate effect and the following rates will be incorporated in the final SoR of WSD for 2021-22, which is under process of revision.

| Sl. No. | Item of work   | Unit | Rate   |
|---------|--|------|--------|
| 1.      | Medium jungles: Clearing medium jungles and trees upto 15 cm. girth including cutting, uprooting roots and stumps, removing them from the site of the work, etc. complete as directed. (When 30% to 60% of the area is covered by shrubs, trees etc.)  | Sqm  | 23.12  |
| 2.      | Felling trees including uprooting roots and stumps upto 50 cm. below ground, cutting into pieces and removing the same from the site of work as directed.<br>Trees above 0.50m and upto 1m girth:  | Each | 414.78 |
| 3.      | Cutting bamboo, uprooting roots & stumps including removing them from the site of work, etc. complete as directed.   | Sqm  | 509.94 |
| 4.      | Earth work in embankment by truck carriage in ordinary/normal soil excluding sandy and rocky soil free from roots & vegetation and filling in uniform layers not exceeding 25 cm thick including ploughing or roughening or benching the seats, removing all debris, breaking clods up to 4cm cube, dressing as per design section including payment of forest royalty if any, etc. complete as directed. (10% deduction will be made from the section measured quantities of the completed and compacted on account of shrinkage)<br>For initial lead beyond 1/2 Km and upto 4Km and for all lifts: | Cum  | 333.86 |
| 5.      | Earth work in embankment by truck carriage in ordinary/normal soil excluding sandy and rocky soil free from roots & vegetation and stacking in regular measurable stacks at suitable places including clearing debris, breaking clods up to 4 cm cube, payment of forest royalty if any, etc. [ 2.50 % deduction will be made from measured quantities on account of shrinkage)<br>For initial Lead beyond 1/2 Km and upto 4.00 km for all lifts.  | Cum  | 363.58 |
| 6.      | Earth work in excavation of drainage channel to the proper grade and slopes as required including depositing the excavated debris/soil to a safe distance of minimum 50 m distance as directed.<br>Normal Soil   | Cum  | 199.03 |
| 7.      | Earthwork in bank trimming to the designed section /slope including removing the soils at a minimum distance of 30 m, complete as directed.  | Cum  | 167.74 |
| 8.      | Earthwork in grabbing the seat of the embankment, upto 0.3 m depth and depositing the soils outside the country side toe of the proposed structures, etc. complete as directed.  | Cum  | 161.85 |

| Sl. No. | Name of work   | Unit   | Rate                 |
|---------|--|--------|----------------------|
| 9.      | Spreading of earth sods over the crest and slope of embankment and places as directed in uniform layer of 22 cm. thick including breaking clods, dressing, ramming etc. complete where necessary including dressing the embankment before complete as directed.  | Cum    | 102.80               |
| 10.     | Turfing with grass sods of largest possible rectangles of 12 cm minimum thickness placed closely including dressing earth pugging with jati bamboo split, watering till the grass grows for a bed up to 90m and all lifts.   | Sqm    | 22.83                |
| 11.     | Carriage of Geo Bags of size 1.03 x 0.70 m including loading & unloading, Stacking, etc. complete and including hire charge of truck with driver and handyman cost of P.O.I. etc. completed as directed.   | Bag/Km | 0.016                |
| 12.     | Carriage of 300 gsm Geo sheet of including loading & unloading, Stacking cost of P.O.I., etc. complete and including hire charge of truck with driver and handyman completed as directed.  | Sqm/Km | 0.014                |
| 13.     | Collection and supply of River silt by truck carriage free from debris and other foreign material payment of forest royalty if any, etc. (For initial Lead beyond 1/2 Km and upto 4.00 Km for all lifts.)  | Cum    | 146.16               |
| 14.     | Construction of temporary shed of two roof with mud plinth of minimum plinth height, with Bhaluka bamboo post 1.5 m apart driven at atleast 0.75 m below ground and height above plinth 2.5m. Split jetti bamboo/tarza wall, 10 cm thick thatched roofing over bamboo run frame placing at 0.15 m clear apart fitted with bamboo kamies for binding doors and windows with Bamboo Chattai strengthening with Bamboo frame binding with wire etc. complete as directed. (Using Bhaluka Bamboo at the rate of 6,00 nos/ Rm. & Jati Bamboo at the rate of 61,00 nos / Rm)   | Sqm    | 1797.24              |
| 15.     | Filling and laying of Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chers within a distance of 90m of the work site; filling geo bags with sand having minimum weighing 126.00 Kg and minimum volume 0.004 cum after filling, double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle double stitched machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly as directed. (sand, Geo Bag and Polypropylene thread will be supplied by the department free of cost) | Bag    | a) 40.58<br>b) 71.40 |
| 16.     | Filling and laying of Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chers within a distance of 90m of the work site; filling geo bags with silt having minimum weighing 126.00 Kg and minimum volume 0.004 cum after filling, double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle double stitched machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly as directed. (Geo Bag and Polypropylene thread will be  | Bag    |                      |

| Sl. No. | Item of work   | Unit           | Rates                |
|---------|--|----------------|----------------------|
|         | properly as directed. (Geo Bag and Polypropylene thread will be supplied by the department free of cost)<br>c) Without float<br>b) With float.   |                | a) 40.58<br>b) 71.40 |
| 17.     | Filling and laying in cage with silt filled Geo bags of size 1.03m X 0.70m excluding excavation of specified silt from flood plain or adjacent chas within a distance of 90m of the work site, filling geo bags with silt having minimum weighing 3.26.00 Kg and minimum volume 0.384 cum. after filling double locking chain stitching the mouth of the filled bags with polypropylene thread by power driven double needle machine, stacking the same in batches of 100, carrying the same to the dumping site including all handling charges and local carriage within a distance of 150m and laying properly. In cages made of wire netting sheets of size 2.37x1.66m of BG galvanized wire making the cage from 2 nos. of wire netting sheet by tying the projected wires complete as directed. (Geo Bag, Wire Netting Sheets and Polypropylene thread will be supplied by the department free of cost)<br>a) Without Boat<br>b) With Boat.   | Bag            | a) 40.62<br>b) 63.02 |
| 18.     | Labour charge for laying Geo fabric sheet as filter hollow pitching including anchoring and complete as directed.  | Sq.m           | 37.39                |
| 19.     | Labour charge for laying of selling stone, brick bats, broken stone metal, sand gravel etc on approach road including ramming dressing the seat and local carriage of materials up to a distance of 60 m complete as directed.   | Cum            | 159.74               |
| 20.     | Collection and supply of brick bats 20-40 mm size to work site including loading, unloading transportation and stacking in measurable stacks including sale tax, compensation if any, etc. complete as directed.   | Cum            | 2523.73              |
| 21.     | Supply of Pre stressed Cement Concrete (PSC) Porcupine members of size 0.10m X 0.10m X 3.00m with M-30 grade of cement concrete conforming to IS 1343 : 2012 using super-plasticizer @ 1.2 lit/bag of cement with graded broken coarse aggregates up to 20mm size down conforming to IS 10262:2009 & IS 456:2000 and reinforced with 4 Nos. of 6 mm dia high tensile steel wire cable with necessary cover and 4mm high tensile stirrups at 250mm C/C, in conformity with IS-6409:2002 and stressed to required strength not exceeding 9.18 N/mm, holes of 16 mm dia at 50 cm inside from both ends in the same face and in either face of post another 2 Nos. of holes of size 16 mm dia at 65mm inside from both ends including properly curing for 21 (twenty one) days and carriage of porcupine members from factory to the stack yard within a distance up to 20 Km including loading, unloading & stacking complete as directed. (Including forest royalty and all taxes as admissible) | Members        | 784.71               |
| 22.     | Local carriage of porcupine members by Diesel truck of 10MT capacity including loading at stack yard and unloading and stacking at river bank for all lift complete as directed.   | Members/<br>Km | 1.68                 |

| Sl. No. | Item of work   | Unit | Rate                   |
|---------|--|------|------------------------|
| 23.     | Labour charge for launching of PSC Percupine including carriage of PSC percupine members of size 0.10m x 0.10m x 3.00m from the stack yard to the place of launching, erection of the Percupine with 6 (six) members properly, supply & fitting/fixing with 12 mm dia 25 cm long M.S. Nuts and bolts and launching the percupine properly as directed. (Load up to 150 m)<br>a) Without Boat<br>b) With Boat |      | a) 661.94<br>b) 954.36 |

Sd/-  
Chief Engineer  
Water Resources Department,  
Chandmani, Guwahati-3

Memo No: WR(ED)Tech/7728/2021/10-A

Date: 08.11.2021

Copy to:

- 1) The PS to the Hon'ble Minister Water Resources Department, Govt. of Assam, for favour of kind information
- 2) The PA to the Additional Chief Secretary to the Govt. of Assam, Water Resources Department, Dispur, Ghy-6 for favour of kind information.
- 3) The Secretary to the Govt. of Assam, water Resources Department, Dispur, Ghy-6 for favour of kind information.
- 4) The Additional Chief Engineer, All W.R. Zone for information.
- 5) The Superintending Engineer, All W.R. Circle for information.
- 6) The Executive Engineer, All W.R. Division for information and necessary action.

  
 Director Design  
 Water Resources Department,  
 Chandmani, Guwahati-3  
 2/11

No. WR(EM)Tech/7728/2021/11

Date: 25.11.2021

**CIRCULAR**

The rates of the Geo-textile items and PVC coated gutting box have been finalized after evaluation of quotation for fixation of rates vide NIT - CE/CC/WR/NIT/2021 - 22/2030/1. Dated: 03/11/2021 and these approved rates as given below shall be utilized to prepare the estimates with immediate effect under all Heads of Accounts. These approved rates (inclusive of all taxes) will be incorporated in the final Schedule of Rate of Water Resources Department, Assam, for 2021 - 22, which is under process of revision.

| Sl no. | Item of work   | Unit | Rate     |
|--------|--|------|----------|
| 1.     | Supply of Geo-textile bags of type-A (1.03 x 0.70M) inner to inner made of Geo-textile non-woven fabric sheets of 400 GSM manufactured from 100% virgin Polypropylene (PP) fibre with minimum properties as per IS 16653 : 2017<br>(i) Wide Tensile strength(MD) $\geq 20$ KN/m & Wide Tensile strength(CD) $\geq 20$ KN/m<br>(ii) Elongation (MD) $\geq 50\%$ & Elongation (CD) $\geq 50\%$<br>(iii) Abrasion $\geq 95\%$<br>(iv) Trapezoidal Tear Strength (MD) $\geq 450$ N & Trapezoidal Tear Strength (CD) $\geq 450$ N<br>(v) CBR Puncture strength $\geq 4000$ N<br>(vi) Permittivity $\geq 1.10 \times 10^{-1}$<br>(vii) Permeability $\geq 40$ cm <sup>2</sup> /sec<br>(viii) AOS $\leq 75$ micron<br>(ix) UV Resistance @500 hours retained Tensile strength (MD) & (CD) $\geq 80\%$<br>(x) Mass $\geq 400$ gm/m <sup>2</sup><br>(xi) Thickness at 2 KP $\geq 3$ mm<br>(xii) Seam strength $\geq 80\%$ of actual fabric strength.<br>Stitching of Bags should be Ring Spun Yarn stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge @ minimum 15 stitches per 100mm. Bags are to be supplied of 100 numbers in a bundle, properly packed with each bag having proper tag with name of Manufacturer, Batch Number, the GSD and type of polymer encrypted and stitched on top corner and each bag is to be marked with "WRD Govt of ASSAM" to be printed distinctly. Test Certificate from approved NABL accredited and ISO (Certified Laboratory should invariably be submitted against each batch of material) | Each | ₹ 198.75 |
| 2.     | Supply of Geo-textile bags of type-A (1.03 x 0.70M) inner to inner made of Geo-textile non-woven fabric sheets of 300 GSM manufactured from 100% virgin Polypropylene (PP) fibre with minimum properties as per IS 16653 : 2017 (i) Wide Tensile strength(MD) $\geq 15$ KN/m & Wide Tensile strength (CD) $\geq 15$ KN/m (ii). Elongation (MD) $\geq 50\%$ & Elongation (CD)   | Each | ₹ 162.00 |



| Sl<br>no. | Item of work  | Unit | Rate       |
|-----------|---|------|------------|
|           | <p>≥30%(iii) Abrasion ≥95%(iv) Trapezoidal Tear Strength (MD) ≥340N &amp; Trapezoidal Tear Strength (CD) ≥340N(v) CBR Puncture strength: ≥300N(vi) Permeability ≥1.25s-1(vii) Permeability ≥60l/m<sup>2</sup>/sec(viii) AOS ≤75micron(ix) UV Resistance @ 500 hours retained Tensile strength (MD) &amp; (CD) ≥80%(x) Mass ≥300 gm/m<sup>2</sup>(xi) Thickness at 2 KPa ≥3 mm(xii) Seam strength ≥80 % of actual fabric strength.</p> <p><i>Knitting of Bags should be Ring Spun Yarn stitches with 2500-3000denier double line chain stitch with overlap with stitches along the edge of minimum 15stitches per 100 mm. Bags are to be supplied of 100 numbers in a bundle, properly packed with each bag having proper tag with name of Manufacturer, Batch Number, the GSM and type of polymer employed and stitched on top corner and each bag is to be marked with "BRD Govt of ASSAM" to be printed distinctly. Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material.</i></p>  |      |            |
| 3.        | <p>Supply of Geo Bags Type-B (Size 2.00m x 1.50m inner to inner) (Pillow Type) made of composite layers of Polypropylene (PP) Fibres as per IS 16653 : 2017 for Nonwoven and IS 16654 : 2017 for Woven.</p> <p><b>Woven Geo-textile for the outer cover (300gsm):</b> The woven geo textile is woven with multifilament woven fabric manufactured from ultra violet stabilized polypropylene. Geo-textile used to manufacture geo-textile bags should have high mechanical properties for enhanced durability along with enhanced puncture, abrasion and U.V. resistance characteristics. Geo-textile should be inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids</p> <p><b>Properties</b></p> <p>(i) Tensile strength (MD) ≥80 KN/m &amp; Tensile strength (CD) ≥70 KN/m</p> <p>(ii) Elongation (MD) ≤25% &amp; Elongation (CD) ≤25%</p> <p>(iii) Abrasion ≥75%</p> <p>(iv) Trapezoidal Tear Strength (MD) ≥1500N &amp; Trapezoidal Tear Strength (CD) ≥1300N</p> <p>(v) CBR/Puncture strength ≥900N</p> <p>(vi) Permeability ≥18 l/m<sup>2</sup>/sec</p> <p>(vii) AOS ≤250 micron</p> <p>(viii) UV Resistance @500 hours retained Tensile strength (MD) &amp; (CD) ≥80%</p> <p>(ix) Mass ≥300 gm/m<sup>2</sup></p> <p>(x) Seam strength ≥50 % of actual fabric strength.</p> <p><b>Non-Woven Geo-textile for the inner layer (300gsm):</b> It is needle punched non-woven geo-textile made of 100% polypropylene staple fibres which are formed into a random network for dimensional stability. It should resist UV degradation, rotting and alkalis.</p> <p><b>Properties</b></p> <p>(i) Wide Tensile strength (MD) ≥15 KN/m &amp; Wide Tensile strength (CD) ≥13 KN/m</p> | Each | ₹ 1,250.00 |

| Sl. No. | Item of work   | Unit | Rate     |
|---------|--|------|----------|
|         | <p>(ii) Elongation (MD) <math>\geq 50\%</math> &amp; Elongation (CD) <math>\geq 50\%</math><br/>           (iii) Abrasion <math>\geq 95\%</math><br/>           (iv) Trapezoidal Tear Strength (MD) <math>\geq 340</math> N &amp; Trapezoidal Tear Strength (CD) <math>\geq 340</math> N<br/>           (v) CBR Puncture strength <math>\geq 3000</math> N<br/>           (vi) Permeability <math>\geq 1.25</math> s<sup>-1</sup><br/>           (vii) Permeability <math>\geq 60</math> l/m<sup>2</sup>/sec<br/>           (viii) AOS <math>\geq 75</math> micron<br/>           (ix) UV Resistance @ 500 hours retained Tensile strength (MD) &amp; (CD) <math>\geq 80\%</math><br/>           (x) Mass <math>\geq 300</math> gm/m<sup>2</sup><br/>           (xi) Thickness at 2 KPa <math>\geq 3</math> mm<br/>           (xii) Seam strength <math>\geq 80\%</math> of actual fabric strength<br/>           Stitching of Bags should be Ring Spin Yarn, stitches with 2500-3000 denier double line chain stitch with overlap with stitches along the edge. Bags are to be supplied of 15 numbers in a bundle, properly packed with each bag, having proper tag with name of Manufacturer, Batch Number, the GSM and type of polymer encrypted and stitched on top corner and each bag is to be marked with "WRD Govt of ASSAM" to be printed distinctly. Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material]</p>  |      |          |
| c       | <p>Supply of Geo-textile Bags Pillow Type of Size 1.20m x 1.60m, inner dimension made of composite layers of geo-textile as per specifications below:<br/> <b>Woven Geo-textile for the outer cover.</b> The woven geo-textile is woven with UV resistant slit film tape fibre with MAWR values of the following properties. Geo-textile used to manufacture geo-textile bags should have high mechanical properties for enhanced durability along with enhanced puncture, abrasion and U.V. resistance characteristics. Geo-textile should be inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.</p> <ul style="list-style-type: none"> <li>• Weight (ISO-9864/ASTMD 5261) <math>\geq 250</math> Gms/Sqm</li> <li>• Tensile strength(MD) (ASTMD 4595) <math>\geq 33</math> kN/m</li> <li>• Tensile strength(CD) (ASTMD 4595) <math>\geq 35</math> kN/m</li> <li>• Tensile Elongation (ASTMD 4595) <math>\geq 5\%</math> &amp; <math>\leq 30\%</math></li> <li>• Grab Elongation (ASTMD 4632) <math>\geq 5\%</math> &amp; <math>\leq 30\%</math></li> <li>• Tensile strength (ASTMD 4632) = 3.5 kN</li> <li>• UV resistance (ASTMD 4355) = 70%/500 hrs</li> </ul> <p><b>Non woven Geo-textile for the inner layer.</b> It is needle punched non woven geo-textile made of 100% polypropylene staple fibers which are formed into a random network for dimensional stability. It should resist UV degradation, rotting and alkalis.</p> <ul style="list-style-type: none"> <li>• Weight (ISO-9864/ASTMD 5261) <math>\geq 300</math> Gms/Sqm</li> <li>• Tensile strength(MD) (ASTMD 4595) <math>\geq 12</math> kN/m</li> <li>• Tensile strength(CD) (ASTMD 4595) <math>\geq 12</math> kN/m</li> <li>• Tensile Elongation (ASTMD 4595) <math>\geq 5\%</math> &amp; <math>\leq 30\%</math></li> </ul> | Each | ₹ 504.00 |



| Sl no. | Item of work   | Unit | Rate       |
|--------|--|------|------------|
|        | <ul style="list-style-type: none"> <li>* Creep Elongation (ASTM D 4632) <math>\geq 5\%</math> &amp; <math>\leq 30\%</math></li> <li>* Tensile strength (ASTM D 4632) <math>\sim 1.5</math> KN</li> <li>* UV resistance (ASTM D 4355) = 70%/500 hrs</li> </ul> <p><i>(Bags are to be supplied of 100 numbers or part in a bundle, properly packed with name of Manufacturer and Batch Number is to be marked on each bag with "WRD Govt of ASSAM" to be printed on each bag and mentioning properly the GSI# and type of Geo bag polymer. Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material)</i></p>  |      |            |
| 5.     | <p>Supply of non-woven Geo-textile fabric sheets of 300 GSM manufactured from 100% virgin Polypropylene (PP) fibres with minimum properties as per IS 16653: 2017</p> <ul style="list-style-type: none"> <li>(i) Wide Tensile strength (MD) <math>\geq 15</math>KN/m &amp; Wide Tensile strength (CD) <math>\geq 15</math>KN/m</li> <li>(ii) Elongation (MD) <math>\geq 56\%</math> &amp; Elongation (CD) <math>\geq 50\%</math></li> <li>(iii) Abrasion <math>\geq 95\%</math></li> <li>(iv) Trapezoidal Tear Strength (MD) <math>\geq 340</math> N &amp; Trapezoidal Tear Strength (CD) <math>\geq 340</math> N</li> <li>(v) CBR Puncture strength <math>\geq 3000</math> N</li> <li>(vi) Permittivity <math>\geq 1.25</math> s<sup>-1</sup></li> <li>(vii) Permeability <math>&gt; 60</math> l/m<sup>2</sup>/sec</li> <li>(viii) AOS <math>\leq 75</math> micron</li> <li>(ix) UV Resistance @ 500 hours retained Tensile strength (MD) &amp; (CD) <math>\geq 80\%</math></li> <li>(x) Mass <math>\geq 300</math> gm/m<sup>2</sup></li> <li>(xi) Thickness at 2KPa <math>\geq 3</math>mm.</li> </ul> <p><i>(Each Roll of Geo Fabric Sheet should be supplied in properly packed Bundles and should be marked with the Name of Manufacturer, Batch Number &amp; its dimensions clearly on each roll with "WRD Govt of ASSAM" to be printed on it and mentioning properly the GSI# and type of polymer and Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material)</i></p> | Cum  | ₹ 196.00   |
| 6.     | <p>Supply of G-Mat in double layered composite Geo-textile fabricated to form a three dimensional mattresses, the upper layer of the mattress being heavily woven with polypropylene fabric needle-punched with a mixture of U.V. stabilized green fibres and cut lappo yarns with</p> <p><b>Upper Layer Properties as</b></p> <ul style="list-style-type: none"> <li>1) Mass per unit area <math>&gt; 650</math> GSM,</li> <li>2) Tensile Strength (MD) <math>\geq 70</math>KN/m,</li> <li>3) Tensile Strength (CD) <math>\geq 70</math>KN/m</li> <li>4) Tensile Elongation (MD) <math>\leq 25\%</math>,</li> <li>5) Tensile Elongation (CD) <math>\leq 25\%</math>, 6) Pore Size <math>&lt; 0.35</math> mm,</li> <li>7) Abrasion Resistance <math>\geq 35\%</math>,</li> <li>8) UV @ 500 hours <math>\geq 90\%</math></li> <li>9) Resistance to Oxidation @ 100°C for 28 days <math>\geq 80\%</math></li> </ul> <p><b>and Lower Layer Properties as</b></p> <ul style="list-style-type: none"> <li>1) Mass per unit area <math>&gt; 400</math> GSM,</li> </ul>   | Each | ₹ 1,350.00 |

| Sl. no. | Item of work   | Unit | Rate       |
|---------|--|------|------------|
|         | <p>2) Tensile Strength (MD) <math>\geq 110\text{ kN/m}</math><br/> 3) Tensile Strength (CD) <math>\geq 90\text{ kN/m}</math><br/> 4) Tensile Elongation (MD) <math>\leq 25\%</math><br/> 5) Tensile Elongation (CD) <math>\leq 25\%</math><br/> 6) Pore Size <math>&lt; 0.35\text{ mm}</math><br/> 7) Abrasion Resistance <math>\geq 60\%</math><br/> 8) UV @ 500 hours <math>\geq 90\%</math><br/> 9) Resistance to Oxidation @ <math>100^\circ\text{C}</math> (for 28 days) <math>\geq 80\%</math></p> <p>The sewing thread should be of high tenacity polyester and parallel stitches are to be continued positioned at 250 mm apart with a stitch length not exceeding 5 mm.</p> <p><i>(Each roll of G-Mat should be supplied in properly packed bundle and should be marked with the Name of Manufacturer &amp; Batch Number &amp; its dimensions clearly on each roll with "HFD Cost of ASSAM" to be printed on it and mentioning properly the GSM for both upper and lower layer) and types of polymer (for both upper and lower layer) and Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material, inclusive of Custom Duty)</i></p>  |      |            |
| 7.      | <p>Supply of G-Mat in double layered composite Geo-textile, fabricated to form a three dimensional mattresses, the upper layer of the mattress being heavily woven with polypropylene fabric needle-punched with a mixture of U.V. stabilized green fibres and cut rape yarns with</p> <p><b>Upper Layer Properties as</b></p> <p>1) Mass per unit area <math>&gt; 650\text{ GSM}</math>,<br/> 2) Tensile Strength (MD) <math>\geq 70\text{ kN/m}</math>,<br/> 3) Tensile Strength (CD) <math>\geq 70\text{ kN/m}</math><br/> 4) Tensile Elongation (MD) <math>\leq 25\%</math>,<br/> 5) Tensile Elongation (CD) <math>\leq 25\%</math>, 6) Pore Size <math>&lt; 0.35\text{ mm}</math>,<br/> 7) Abrasion Resistance <math>\geq 25\%</math>,<br/> 8) UV @ 500 hours <math>\geq 90\%</math><br/> 9) Resistance to Oxidation @ <math>100^\circ\text{C}</math> (for 28 days) <math>\geq 80\%</math>.</p> <p><b>and Lower Layer Properties as</b></p> <p>1) Mass per unit area <math>&gt; 400\text{ GSM}</math>,<br/> 2) Tensile Strength (MD) <math>\geq 110\text{ kN/m}</math>,<br/> 3) Tensile Strength (CD) <math>\geq 90\text{ kN/m}</math><br/> 4) Tensile Elongation (MD) <math>\leq 25\%</math>,<br/> 5) Tensile Elongation (CD) <math>\leq 25\%</math>,<br/> 6) Pore Size <math>&lt; 0.35\text{ mm}</math>,<br/> 7) Abrasion Resistance <math>\geq 60\%</math>,<br/> 8) UV @ 500 hours <math>\geq 90\%</math><br/> 9) Resistance to Oxidation @ <math>100^\circ\text{C}</math> (for 28 days) <math>\geq 80\%</math></p> <p>The sewing thread should be of high tenacity polyester and parallel stitches are to be continued positioned at 350 mm apart with a stitch length not exceeding 5 mm.</p> <p><i>(Each roll of G-Mat should be supplied in properly packed bundle and should be marked with the Name of Manufacturer &amp; Batch Number &amp; its dimensions clearly on each roll with "HFD Cost of</i></p> | Each | ₹ 1,290.00 |

| Sl No. | Item of work  | Unit | Rate         |
|--------|---|------|--------------|
|        | ASSAM to be printed on it and mentioning properly the GMAF for both upper and lower layer) and types of polymer (for both upper and lower layer) and Test Certificate from approved NABL accredited and ISO Certified Laboratory should invariably be submitted against each batch of material)<br><b>Without Custom duty</b>   |      |              |
| 8.     | Supply of geo-textile Tube (Mega containers) of 5m height of 2.5m and 25m length made of geo-textile with minimum properties as mentioned below:<br>i) Tensile strength of geo-textile materials > 700KN/m in both directions for woven geo-textiles<br>ii) O95 (pore size) of the geo-textile materials < 180 microns.<br>iii) Seam strength > 70% of the material tensile strength.<br>iv) Elongation of the material at the ultimate tensile strength should not be more than 20%<br>v) CBR Brust Strength > 10.5<br>vi) Abrasion resistance (BAW Rotating Drum) > 75% of strength retained.<br>vii) UV Resistance (ASTM D4355-500 hrs) > 80% of strength retained.<br>viii) The geo-textile mega containers must resist the pressure created by stacking the tubes in 3-2-1 manner. | Each | ₹ 138,294.60 |
| 9.     | Supply of woven Geo-textile Tube (Mega containers) of 5m height 0.9m made of geo-textile with minimum properties as mentioned below:<br>i) Tensile strength of geo-textile materials > 65KN/m in both directions<br>ii) O95 (Pore size) of the geo-textile materials < 180 microns.<br>iii) Seam strength > 70% of the materials tensile strength.<br>iv) Elongation of the material at the ultimate tensile strength should not be 65% for<br>v) CBR Brust strength > 10.5.<br>vi) Abrasion resistance (BAW Rotating Drum) > 75% of strength retained.<br>vii) UV Resistance (ASTM D 4355-500.Hrs) > 80% of strength retained. (Including all taxes)<br>(a) 10m Length   | Each | ₹ 17,579.24  |
| 10.    | Supply of geo-textile Tube (Mega containers) with minimum properties as mentioned below<br>• Polymer - PP<br>• Tube Circumference - 4.3 / 8.6 / 12.9 / 14.2 / 16 / 17.2 / 21.6 +5% (m)<br>• Fill Port (diameter) = 30 to 45 CM<br>• Tensile Strength (MD) ≥ 175 KN/m<br>• Tensile Strength (CD) ≥ 175 KN/m<br>• Elongation - MD ≤ 25%<br>• AOS ≤ 0.180 mm<br>• Permittivity ≥ 0.40 S-1<br>Length = 10/15/20/25/30 m   | Each |              |
| 10.1.  | Tube Circumference = 4.3 (m)  | Each | ₹ 29,561.29  |

| Sl. No. | Name of work  | Unit | Rate         |
|---------|---|------|--------------|
| 10.1.a  | Length = 10m  | Each | ₹ 43,689.32  |
| 10.1.b  | Length = 15m  | Each | ₹ 57,660.49  |
| 10.1.c  | Length = 20m  | Each | ₹ 75,304.19  |
| 10.1.d  | Length = 25m  | Each | ₹ 92,954.50  |
| 10.1.e  | Length = 30m  | Each | ₹ 112,857.62 |
| 10.2.   | Tube Circumference = 8.6 (m)  |      |              |
| 10.2.a  | Length = 10m  | Each | ₹ 79,402.54  |
| 10.2.b  | Length = 15m  | Each | ₹ 105,817.89 |
| 10.2.c  | Length = 20m  | Each | ₹ 131,937.28 |
| 10.2.d  | Length = 25m  | Each | ₹ 160,014.56 |
| 10.2.e  | Length = 30m  | Each | ₹ 183,362.97 |
| 10.3.   | Tube Circumference = 12.9 (m)   |      |              |
| 10.3.a  | Length = 10m  | Each | ₹ 115,705.15 |
| 10.3.b  | Length = 15m  | Each | ₹ 150,017.26 |
| 10.3.c  | Length = 20m  | Each | ₹ 187,587.86 |
| 10.3.d  | Length = 25m  | Each | ₹ 225,922.67 |
| 10.3.e  | Length = 30m  | Each | ₹ 261,617.17 |
| 10.4.   | Tube Circumference = 14.3 (m)   |      |              |
| 10.4.a  | Length = 10m  | Each | ₹ 129,574.62 |
| 10.4.b  | Length = 15m  | Each | ₹ 167,456.42 |
| 10.4.c  | Length = 20m  | Each | ₹ 208,797.44 |
| 10.4.d  | Length = 25m  | Each | ₹ 250,503.09 |
| 10.4.e  | Length = 30m  | Each | ₹ 294,956.28 |
| 10.5.   | Tube Circumference = 16.9 (m)   |      |              |
| 10.5.a  | Length = 10m  | Each | ₹ 147,350.40 |
| 10.5.b  | Length = 15m  | Each | ₹ 189,704.52 |
| 10.5.c  | Length = 20m  | Each | ₹ 235,744.28 |
| 10.5.d  | Length = 25m  | Each | ₹ 281,743.88 |
| 10.5.e  | Length = 30m  |      |              |
| 11.     | Supply of geo-textile Tube (Mega containers) with minimum properties as mentioned below<br><ul style="list-style-type: none"> <li>• Polymer = PP</li> <li>• Tube Circumference = 4.3/8.6/12.9/14.3/16/17.2/21.6 +5% (m)</li> <li>• Fill Port (diameter) = 30 to 45 CM</li> <li>• Tensile Strength (MD) ≥ 100 KN/m</li> <li>• Tensile Strength (CD) ≥ 100 KN/m</li> <li>• Elongation - MD ≤ 25%</li> <li>• AOS ≤ 0.180 mm</li> <li>• Permeability ≥ 0.40 S-1</li> <li>• Length = 10/15/20/25/30 m</li> </ul> | Each | ₹ 25,000.00  |
| 11.1.   | Tube Circumference = 4.3 (m)  |      |              |
| 11.1.a  | Length = 10m  | Each | ₹ 55,000.00  |
| 11.1.b  | Length = 15m  | Each | ₹ 45,000.00  |
| 11.1.c  | Length = 20m  | Each | ₹ 55,000.00  |
| 11.1.d  | Length = 25m  | Each | ₹ 65,000.00  |
| 11.1.e  | Length = 30m  | Each | ₹ 44,000.00  |
| 11.2.   | Tube Circumference = 8.6 (m)  |      |              |
| 11.2.a  | Length = 10m  | Each | ₹ 60,000.00  |
| 11.2.b  | Length = 15m  |      |              |

| Sl. no. | Item of work  | Unit | Rate         |
|---------|---|------|--------------|
| 11.2.c  | Length = 20m  | Each | ₹ 78,920.00  |
| 11.2.d  | Length = 25m  | Each | ₹ 97,000.00  |
| 11.2.e  | Length = 30m  | Each | ₹ 112,000.00 |
| 11.3.   | Tube Circumference = 12.9(m)  |      |              |
| 11.3.a  | Length = 10m  | Each | ₹ 39,000.00  |
| 11.3.b  | Length = 15m  | Each | ₹ 85,000.00  |
| 11.3.c  | Length = 20m  | Each | ₹ 110,000.00 |
| 11.3.d  | Length = 25m  | Each | ₹ 140,000.00 |
| 11.3.e  | Length = 30m  | Each | ₹ 165,000.00 |
| 11.4.   | Tube Circumference = 14.2(m)  |      |              |
| 11.4.a  | Length = 10m  | Each | ₹ 65,000.00  |
| 11.4.b  | Length = 15m  | Each | ₹ 95,000.00  |
| 11.4.c  | Length = 20m  | Each | ₹ 125,000.00 |
| 11.4.d  | Length = 25m  | Each | ₹ 155,000.00 |
| 11.4.e  | Length = 30m  | Each | ₹ 180,000.00 |
| 11.5.   | Tube Circumference = 16.0(m)  |      |              |
| 11.5.a  | Length = 10m  | Each | ₹ 74,000.00  |
| 11.5.b  | Length = 15m  | Each | ₹ 105,000.00 |
| 11.5.c  | Length = 20m  | Each | ₹ 135,000.00 |
| 11.5.d  | Length = 25m  | Each | ₹ 170,000.00 |
| 11.5.e  | Length = 30m  | Each | ₹ 205,000.00 |
| 12.     | Supply of geo-textile Tube (Mega containers) with minimum properties as mentioned below<br><ul style="list-style-type: none"> <li>• Polymer - Polyester</li> <li>• Tube Circumference = 4.3/8.6/12.9/14.2/16/17.2/21.6 +5% (m)</li> <li>• Fill Port (diameter) = 20 to 45 CM</li> <li>• Tensile Strength (MD) ≥ 175 KN/m</li> <li>• Tensile Strength (CD) ≥ 175 KN/m</li> <li>• Elongation - MD ≤ 15%</li> <li>• AOS ≤ 0.25mm</li> <li>• Permeability ≥ 1x10<sup>-3</sup> m/s</li> <li>• Length = 10/15/20/25/30 m</li> </ul> | Each | ₹ 29,905.04  |
| 12.1.   | Tube Circumference = 4.3 (m)  |      |              |
| 12.1.a  | Length = 10m  | Each | ₹ 44,106.05  |
| 12.1.b  | Length = 15m  | Each | ₹ 54,740.99  |
| 12.1.c  | Length = 20m  | Each | ₹ 76,092.64  |
| 12.1.d  | Length = 25m  | Each | ₹ 93,917.51  |
| 12.1.e  | Length = 30m  | Each | ₹ 115,362.58 |
| 12.2.   | Tube Circumference = 8.6 (m)  |      |              |
| 12.2.a  | Length = 10m  | Each | ₹ 80,151.50  |
| 12.2.b  | Length = 15m  | Each | ₹ 104,938.97 |
| 12.2.c  | Length = 20m  | Each | ₹ 130,230.56 |
| 12.2.d  | Length = 25m  | Each | ₹ 161,219.25 |
| 12.2.e  | Length = 30m  | Each | ₹ 183,764.27 |
| 12.3.   | Tube Circumference = 12.9(m)  |      |              |
| 12.3.a  | Length = 10m  | Each | ₹ 119,150.65 |
| 12.3.b  | Length = 15m  | Each | ₹ 154,535.55 |
| 12.3.c  | Length = 20m  | Each | ₹ 191,524.59 |
| 12.3.d  | Length = 25m  | Each |              |

D

| Sr. No. | Item of work  | Unit | Rate         |
|---------|---|------|--------------|
| 12.3.a  | Length = 30m  | Each | ₹ 233,552.38 |
| 12.4.   | Tube Circumference = 14.2(m)  | Each | ₹ 92,890.38  |
| 12.4.a  | Length = 10m  |      |              |
| 12.4.b  | Length = 15m  | Each | ₹ 231,575.38 |
| 12.4.c  | Length = 20m  | Each | ₹ 170,159.15 |
| 12.4.d  | Length = 25m  | Each | ₹ 212,352.80 |
| 12.4.e  | Length = 30m  | Each | ₹ 254,546.45 |
| 12.5.   | Tube Circumference = 16.0(m)  |      |              |
| 12.5.a  | Length = 10m  | Each | ₹ 149,321.43 |
| 12.5.b  | Length = 15m  | Each | ₹ 192,134.29 |
| 12.5.c  | Length = 20m  | Each | ₹ 238,764.15 |
| 12.5.d  | Length = 25m  | Each | ₹ 285,394.02 |
| 12.5.e  | Length = 30m  | Each | ₹ 334,000.00 |
| 13.     | Supply of Rope Polypropylene (PP) Gabion of size 2m x 2m x 0.45 m having the following properties<br>(i) Mesh opening size 150mmx150mm<br>(ii) Rope Diameter of 9.0mm<br>(iii) Linear Density of rope ≥ 65 tgm/m<br>(iv) Tensile Strength ≥ 1900kg<br>(v) Abrasion Resistance of rope after 1000-cycles ≥ 65%<br>(vi) CBR Puncture Strength ≥ 7000kg.   |      |              |
| 14.     | Construction and supply of Wire-netting box of size 1.50 m x 1.50 m x 0.45 m made with mechanically woven double twisted, hexagonal shaped wire mesh with wire made of low carbon, high ductile MS wire with heavy class of galvanization with an additional layer of PVC coating, with mesh type of 10 x 12 as per IS 10223 & ASTM A975, mesh wire of 2.70 mm (I.D) /3.20 mm (O.D) tensile strength of 450-500/mm <sup>2</sup> , edge wire sleeve around it at least 2.5 times, facing wire (zinc PVC coated) of 2.20mm (I.D) /3.20mm (O.D), VC coating thickness of 0.50mm nominal, 0.38 mm minimum, Mesh opening size 150mm x 150mm and with average weight per unit being 12 kg with additional 3% of the weight of box for facing wire supplied separately, supporting the facing of the box with zinc coated steel wire of required length as directed, complying with ASTM and European norms. | Nos. | ₹ 2,400.00   |

Sd/-  
Chief Engineer  
Water Resources Department,  
Chandernagore, Guwahati-7

Date: 28.11.2021

Memo No: WR(ED)Tech/7728/2021/1-A

Copy to,

- 1) The PS to the Hon'ble Minister, Water Resources Department, Govt. of Assam, for favour of kind information.
- 2) The PA to the Additional Chief Secretary to the Govt. of Assam, Water Resources Department, Dispur, Ghy-6 for favour of kind information.



- 3) The Secretary to the Govt. of Assam, Water Resources Department, Dispur, Ghy-6 for favour of kind information.
- 4) The Additional Chief Engineer, All W.R. Zone for information.
- 5) The Superintending Engineer, All W.R. Circle for information.
- 6) The Executive Engineer, All W.R. Division for information and necessary action.

  
Director  
Water Resources Department,  
Chandmari, Guwahati-2

*To/To The Chief Engineer  
Water Resources Department  
Chandmari, Guwahati-03  
(cewrdr.assam@yahoo.co.in)*



*মুখ্য জলসিঞ্চন কার্যালয়  
জলসঞ্চন বিভাগ  
চান্দমারী, গুৱাহাটী-০৩*

*Date: 03.01.2022*

*NO: WR(ED)Tech/7728/2021/12*

### CIRCULAR

The rates of the sewing thread as described below have been finalized after evaluation of the quotation for fixation of rates vide NIQ - CE/CC/WR/NIQ/2021-22/1030/03 dated 30.12.2021 and these approved rates as given below shall be utilized to prepare the estimates with immediate effect under all Heads of Accounts. These approved rates (inclusive of all taxes) will be incorporated in the final Schedule of Rate of Water Resources Department, Assam for 2021-22, which is under process of revision.

| Sl. No. | Item Specification  | Unit | Rate     |
|---------|---|------|----------|
| 1       | Supply of Sewing Thread/Yarn PPMF Stitching Thread (2000 Den. Kapton) i/c payment of taxes. | RM   | Rs. 8.12 |

*[Signature]*  
Chief Engineer  
Water Resources Department  
Chandmari, Guwahati-3

**Memo No:** WR(ED)Tech/7728/2021/12-A

*Date: 03.01.2022*

**Copy To:**

1. The PS to the Hon'ble Minister, Water Resources, Govt. of Assam, for favour of kind information.
2. The PS to the Additional Chief Secretary to the Govt. of Assam, Water Resources Department, for favour of kind information.
3. The Secretary to the Govt. of Assam, Water Resources Department, Dispur, Guwahati-D6 for favour of kind information.
4. The Additional Chief Engineer, All W.R. Zone, for information.
5. The Superintending Engineer, All W.R. Circle, for information.
6. The Executive Engineer, All W.R. Division, for information & necessary action.

*[Signature]*  
Chief Engineer  
Water Resources Department  
Chandmari, Guwahati-3