

**MINUTES OF 1st MEETING OF
COASTAL PROTECTION & DEVELOPMENT ADVISORY COMMITTEE
(CPDAC)**

**Date : 20-21/11/1995
(Kerala)**

Venue : Trivendrum

The first meeting of Coastal Protection and Development Advisory Committee was held at Trivandrum (Kerala) on 20-11-95, followed by site visits by the Members on 21-11-95. The Meeting started at 11 AM under the Chairmanship of Shri N. Sathyamurthy, Member (River Management), Central Water Commission. After observance of traditional silence prayer for two minutes by all the Members, Shri S.Sundareshan, Secretary, Irrigation Department, Govt. of Kerala, delivered the inaugural address. He welcomed all the Members and other officials and said that Kerala is honoured the Members and other officials and said that Kerala is honoured by conducting the First Meeting of the Committee at Trivandrum.

Shri N.Sathyamurthy, Chairman, also welcomed the Members and Invitees and emphasised the need to protect the entire coastal belt of the country in his Presidential Address. Chairman said that CWC has already initiated the action to deal with the coastal protection and has established a new Directorate called Beach Erosion Directorate at Cochin under the overall supervision of Chief Engineer (C&SR), Coimbatore. He requested all Maritime States to come forward and co-ordinate with the new Directorate at Cochin for the preparation of short-term /long term Master Plans to deal with the Coastal Erosion problems. The list of Participants is given at Annexure-I. With the permission of Chair, Director, Coastal Erosion Directorate, CWC, presented the agenda items for discussion.

1. CONFIRMATION OF THE 24TH MEETING

The committee decided to recommend the confirmation of the decisions of the 24th Meeting of erstwhile Beach Erosion Board held at Kakinada (Andhra Pradesh) on 5-6/1/95, as no comments were received from the Maritime States. It was also decided that the follow-up action in regard to the items of erstwhile Beach Erosion Board be taken up by this Committee.

1.1 To organize a coordinated programme of collection, compilation, evaluation and publication of data relating to various natural phenomena and coastal processes which affect the coastline

This item was discussed at length by the Members and it was noted that the feedback from various States about setting up of the Coastal Division as per guidelines circulated earlier has not been received. The collection of data relating to various natural phenomena which affect the coastline was also discussed and inter alia it was decided that instead of duplicating the work of data collection, it

would be appropriate to have a State Data Bank and nominate a nodal officer from each State to process the data and collect the available data from all other agencies and organizations who are engaged on this work. The data can be stored in one place for easy assessment. For this purpose, CW&PRS, Pune, will act as a National Coastal Data Centre and inter act with the State nodal officers of data relating matters. The CW&PRS, Pune, is connected to all maritime states through NIC Network and access to the data will not be difficult. The Govt. of Karnataka has a separate coastal division in their Research Station. It is not known whether their Research Station has the facilities for three-dimensional studies in shallow/wave basin as well as two-dimensional wave flume studies. The Govt. of West Bengal is also maintaining an eastern Circle under Waterways Department which is engaged in coastal area developmental works, they do not consider it necessary to create separate coastal division.

Shri Hamid Hussain, Engineer-in-Chief, A.P., Shri V.Palanichamy, Member-Secretary, State Planning Commission, Tamil Nadu, Shri Haridas Menon, Chief Engineer, Kerala, informed the Committee that they have gone ahead with the proposal and their States have established functioning units specially for data collection and compilation. Dr. Baba, CESS, narrated the details of data collected and compiled by their organization which will be submitted to the Govt. of Kerala sometimes in December, 1995. The Chairman of the Committee desired to get proposals on this item from other members not present in the meeting.

Action: Member States

1.2 To organize general investigations, studies and research with the help of Central and State Engineering Research Institutions.

1.2.1 Investigations for mud banks for the coast of Kerala

Dr. K.M.Nair, Director, CESS, Trivandrum, informed that studies regarding development of mathematical model is still in progress and the model for creating artificial mud banks of Kerala coast have been developed.

Research proposal for compilation and publication of a status report on the coastal erosion and related studies along Kerala coast prepared by CESS estimated to cost Rs. 3.23 lakhs circulated with the agenda items were discussed at length. Dr. Baba, Scientist from CESS explained the proposal, the necessity for detailed study about the mud banks in Kerala Coast and expressed that if the Committee support such programme, the same can be taken up. The Committee approved the proposal submitted by CESS, Trivandrum, and decided to recommend to the Ministry of Water Resources, New Delhi, for sanction.

Chief Engineer, A.P., and Member-Secretary, State Planning Commission, Tamil Nadu, also participated in the discussion. The Chairman desired that other States also may come up with similar proposals and send the same direct to Central Water Commission for consideration by the Committee (CPDAC).

Action: CWC, CESS

1.2.2 Satellite imageries to monitor shore line changes.

The States of Karnataka, Tamil Nadu, AP and West Bengal have initiated action for use of satellite imageries to monitor shore line changes and also fixing ground survey reference pillars to enable monitoring shore line changes for preparation of Coastal Atlas. Shri V.Palanichamy, Member-Secretary, State Planning Commission, Tamil Nadu, explained that satellite imageries have been arranged. Shri Hamid Hussain, Engineer-in-Chief, A.P., Shri T.K.Sasi, Chief Engineer, I&P, Kerala, also participated in the discussions. Dr. Baba, Scientist, CESS, informed that they are doing the work as a part of national programme and said that they will share the details available with them with Kerala Irrigation Department as and when required. The chairman desired that other Member States may also take up action for getting the satellite imageries duly interpreted to monitor shore line changes and intimate the Secretariat Office of the Committee.

Action: Member States

1.2.3 Coastal Atlas

The Secretariat of CPDAC (erstwhile Beach Erosion Board) has decided to prepare a Coastal Atlas depicting the erosion spots/eroded coastal areas in each maritime State. The Coastal map of each State was circulate with the request to update and include the recent changes which have occurred as a result of various natural phenomena. Karnataka Government has sent their own map showing the detailed information with erosion spots and eroded coastline of the State. The Member of Tamil Nadu state submitted the relevant map during the course of the meeting. Dr. K.M.Nair, CESS, informed that Kerala Irrigation Department, has collected data at KERI, Peechi, and CESS is co-ordinating in this respect. Dr. Baba, Scientist also informed that they are preparing the coastal maps in the scale 1:50,000 and about 16 maps are under preparation. The Report will be sent in due course. The Chairman requested the Members to furnish the detailed map to the Secretariat Office, so that preparation of Coastal Atlas can be initiated.

Action : Member States/CWC

1.2.4 Strengthening the facilities for coastal engineering research by the States.

This item was discussed at length. It was intimated to the Members that CW&PRS, Pune, has now evolved uniform guidelines for preparation of the research-oriented proposal. The guidelines have already been sent by CW&PRS, Pune, to all the Maritime States. Member states have been requested by the chairman to prepare the research-oriented proposal in accordance with the guidelines and submit the same to the Secretariate Office of the Advisory Committee where it could be examined from techno-economical point of view. After detailed examination and approval by the Committee, the proposals could be sent to the Ministry of Water Resources for sanctioning and providing funds. The members attending the meeting agreed to this new procedure.

Action : Member States

1.3 To lay down principles in construction techniques of coastal protection measures for the guidance of State Authorities.

1.3.1 Use of flat stone

As already decided in the previous meeting of erstwhile Beach Erosion Board the construction of sea wall using flat stone will not be taken up unless absolutely necessary. However, the maritime States were advised that before taking up the construction of sea wall with flat stones on large scale it would be appropriate to use flat stones on a small stretch as per the guidelines already circulated and watch the performance for a few years. For this experimental stretch, studies may be carried out by taking into account the construction costs and maintenance expenditure. Shri C.Siddaraju, Chief Engineer, Minor Irrigation (South), Bangalore, intimated that Karnataka state has used flat stones earlier in 1992 and after the cost analysis, it was found that the expenditure on construction of sea wall with flat stone is on higher side which is of the order of 1.20 crores per km and with cubical stone the cost is still higher and comes to Rs.1.70 crores per km. Chairman desired that a report showing the construction cost and maintenance expenditure for flat stone and recommended edge stone along with their performance may be made available by the Karnataka State, so that the same can be studied.

Action : Karnataka state

1.3.2 Use of Coir in Maritime Applications

The Kerala State Irrigation Department has done some experimental protection works using coir under Irrigation Division, Alapuzha at 4 stretches each of about 250 metre length. The details of various sections adopted in these reaches are given in the site inspection report. Member of the Committee after detailed examination of all the stretches felt that construction of sea wall in 4th stretch where conventional sea wall with high density monofilament plastic woven cloth filter was used is the more stable and can be used for future construction. Monofilament woven plastic cloth of high density has been used as a filter material with core material of 20 to 45 dm³ size granite stones. Armour Core is 200 dm³ granite stones.

Chairman also requested that Chief Engineer (I&A), Kerala, may furnish a cost comparative statement for the above reaches so as to consider the feasibility of adopting the type of design to be used in construction of sea wall in the next meeting. The Committee inspected these sites on 21-11-95. The site visit report is appended at Annexure-II.

Action : Kerala State

1.4 To Review the performance of the works carried out by States and evolve improved design techniques based on such experiences from time to time.

1.4.1 Modification in the design of seawall.

On the advice of members of erstwhile Beach Erosion Board, Kerala State has started an experimental work of construction of sea wall based on modified design provided by CW&PRS, Pune. In November, 1993, Chief Engineer, Irrigation, supplied the data regarding the cost of construction of existing as well as modified design of sea walls at the places under Irrigation Circle, Trivandrum and at Koolmuttom under Irrigation Circle, Trichur. In this regard, Chief Engineer (I&A), Trivandrum, informed that the experimental work have just started and the performance can be studied only after observing the same for a few seasons. Chairman observed that the details in respect of the above may be supplied for the benefit of other Member States. The section of typical design of sea wall adopted along the Kerala sea coast and the modified design suggested by CW&PRS, Pune, is appended at Annexure-III.

Action : Kerala State

OTHER POINTS :

1(a) Preparation of Indian Shore Protection Manual

In consonance with the decision taken in the previous meetings of the erstwhile Beach Erosion Board, a sub-committee for preparation of Indian Shore Protection Manual was constituted in February, 1994 with Director, CW&PRS, Pune as Convenor. So far no action in this regard has been taken by the sub-committee. However, Director, CW&PRS, Pune had informed in the previous meetings that the first meeting of sub-committee will be convened shortly to make the draft report ready by July, 1995. As the Beach Erosion Board has been renamed as Coastal Protection and development Advisory Committee, the Committee decided to reconstitute the sub-committee with the following composition :

| | |
|---|------------------|
| 1. Director, CW&PRS, Pune | Convenor |
| 2. Director, Coastal Erosion Dte. CWC, New Delhi | Member |
| 3. Chief Engineer, Irrigation, Govt. of Kerala | Member |
| 4. Chief Engineer & Director, KERS Krishna Rajasagar, Govt. of Karnataka | Member |
| 5. Dr. M.Baba, Head Marine Science, Centre for Earth Science Studies, Trivandrum | Member |
| 6. Director, Beach Erosion Dte., CWC, Cochin | Member-Secretary |

The sub-committee will carry out the following tasks:

- To prepare a comprehensive shore protection manual keeping in mind the specific problems experienced along the Indian Coast.
- The sub-committee shall hold its meeting at such places as may be determined by the Convenor. It may invite to the meeting such other person or persons as it may consider necessary.
- The work may be completed within a time frame of six months.

**Action : CW&PRS, Pune &
Director, Beach Erosion Dte.,
Cochin.**

1(b) Project proposal for seeking external assistance.

The National Coastal Protection Project for 5 years perspective plan is under preparation in CWC. In the meeting the Members representing different States agreed to prepare the proposal of their States and also agreed to participate in the discussions in CWC. So far the States of Kerala, Karnataka have responded and deputed their representatives for discussion in CWC. Representative of

Tamil Nadu State stated that the project proposal of their State is under preparation and will be sent in due course. The Chairman requested the other States to prepare the details for inclusion in the project and communicate their tentative dates for discussions during January, 1995, so that the Project can be posed for World Bank Aid.

Action : Member States

1.5 To inter act on the international agencies engaged in the work of coastal protection and technology transfer in the field of coastal protection.

The training activity in the field of coastal erosion protection has not been included in the functions of CPDAC. It is felt that training is an important activity for technology transfer and should be carried out by this Committee also. Members of the Committee agreed for inclusion of training activities in the functions of CPDAC. Members of the Committee also agreed that training courses on coastal erosion, protection, development and management of coastal zone for the in-service engineers of different maritime States should be conducted from time to time. It was also agreed by the members to plan of such courses in future in other countries like USA, Netherlands where coastal protection measures have been taken up successfully, for better inter-action and technology transfer. Chairman decided that CESS may also identify such courses for conducting in India/other countries. Secretariat office may also chalk out proposals for such training courses in India/other countries for the participation of in-service engineers of maritime States.

Action : CESS/CWC

1.6 To identify the coastal zone to be developed behind the coastal protection works with the help of State Govts.

1.6.1 Expert Committee for formation of guidelines for coastal zone management of Department of Coastal Development.

Department of Ocean Development has constituted an expert committee for formulation of guidelines for coastal zone management. Member-Secretary, CPDAC, is also the member on the above expert committee. The guidelines mostly include the ocean part. As per their terms of reference the activities for prohibition regulation are considered for the ocean part, that is, from the lowest water mark to 12 nautical miles in the sea.

CWC under the auspices of erstwhile Beach Erosion Board has prepared a draft model bill for constituting coastal land management authority in each maritime State. As per the terms of CLMA, the activities are subjected for the protection and prevention of the coastal erosion within a limit of 300 metres landwards of

mean high water level and limit of 1 km seawards of the mean low water level. The beach part is important from the tourism point of view and degradation due to erosion, discharge of effluent, disposal of solid waste, construction of buildings, industries, hotels and tourist resorts will affect the scenic value of the beach. Further, the activities like dredging, construction of break waters, harbours, ports and jetties, etc., should be carried out after detailed studies to ensure that the sea beach and the shore line are not adversely affected by accelerated erosion or accretion. The Members of the Committee during the deliberations agreed to above proposals sent by CWC to the Department of Ocean Development. Member of Tamil Nadu State said that his views in this regard will be sent in due course.

Action : CWC, Member States

1.6.2 Coastal Land Management Authority (CLMA)

The formation of Coastal Land Management Authority (CLMA) by the maritime States is a long pending issue. Member of the Committee of maritime States were requested by the Chairman for the follow-up in this regard. In view of this Member States were requested to set up a Committee, pending finalization of draft model bill on coastal land management authority. Such a multi-disciplinary Committee having specific jurisdiction to deal with the problems of management of coastal land will prepare a Master Plan for the optimum utilization of resources and monitor the coastal activities, so that these do not affect coastal environment. The Karnataka State has already formed a Committee comprising of technical experts to look into the problems of sea erosion. The State of West Bengal has also informed that CLMA is likely to be constituted under State Coastal Zone Management Plan. The State level multi-disciplinary Committee has already been formed in West Bengal. Members from the States of Kerala and Tamil Nadu said that Committee is being formed in their States and a Report will be sent early. Chairman requested other States to inform the action proposed by them in this regard.

Action : Member States

1.7 New Activities Assigned to the Coastal Protection and Development Advisory Committee.

In addition to the activities discussed above in the meeting, following new activities have also been assigned to the CPDAC for consideration. All the maritime States have been requested by the Chairman to take a note and highlight important issues item-wise falling in the new assigned activities.

- i) To identify the development potential in various techno-economic activities and advise the concerned State Governments to prepare programme for development.

- ii) To draw up long-term and short-term plans for coastal protection and development of the coast.
- iii) To appraise and recommend various coastal protection and development works for inclusion in the State Plans.
- iv) To arrange effective and timely monitoring of the coastal protection and development projects.
- v) To review the action plan for rehabilitation and resettlement of the coastal developed affected people and monitor the progress on rehabilitation and resettlement.

Action : Member States

1.8 NEW ITEMS

1.8.1 Composition of the Coastal Protection and Development Advisory Committee.

Among the standing members of the Committee it is also mentioned in the Resolution that three non-officials who are experts in the field of coastal protection and development can be co-opted for three years. Chairman requested maritime States to send the names of such officials along with their bio-data for consideration in the next meeting.

The Committee also decided to include C.E. (C&SR), CWC, Coimbatore, as one of the Members and approach Ministry of Water Resources for necessary amendment of the Constitution.

In partial modification to the Ministry of Water Resources Resolution No.15/2/91-BM dated 17-4-1995, an amendment in the composition of CPDAC has been issued by the Ministry. Copy of the amendment is given at Annexure-IV.

Action : CWC

1.8.2 Shri C. Siddaraju, Chief Engineer, Minor Irrigation (South) who represented the Karnataka State in the meeting invited the Committee to host its second meeting in Mangalore sometime in the month of April, 1996. The proposal was agreed by all the members of the Committee. Chairman, CPDAC, thanked the Govt. of Kerala for the excellent arrangements for the meeting.

Shri A.S. Bhatia, Director of the Secretariat office of CPDAC also thanked the Kerala State authorities, particularly Shri T. Haridas Menon, Chief Engineer, I&A, Mrs. Komalavally Amma, Executive Engineer, Shri S. Thomas, Executive Engineer and other staff members for their outstanding arrangements for the meeting and also for visits to critical sites of sea erosion.

The meeting ended with vote of thanks to the Chair.

Annexure-I

First Meeting of CPDAC (Officers Present)

Venue: Thiruvananthapuram

Dated 20th Nov., 1995

Sl.No. Name, Designation and
Office Address
S/Shri

- | | | |
|-----|---|---------------------|
| .1. | N. Sathyamurthy, Member (RM), CWC | Chairman |
| 2. | S. Sunderesan Secretary (Irr&WS), Kerala | Special Invitee |
| 3. | R.K. Prashar C.E.(SR),CWC, Coimbatore | Invitee |
| 4. | S.K. Agrawal Jt.Commissioner (Projects), MoWR, New Delhi | Representing Member |
| 5. | S.K. Hamid Hussain Eng-in-Chief (Irr& Admn), Kerala | Member |
| 6. | T. Haridas Menon, C.E.(Irr & Admn, Kerala | Member |
| 7. | C. Siddaraju, C.E.(M.I., South), Karnataka | Member |
| 8. | V. Palanichamy Member-Secretary, State Planning Commission, Tamil Nadu | Member |
| 9. | V.D. Vaiksey Dy.C.E.(Irr), Kerala | Invitee |
| 10. | T.K. Sasi C.E.(Irr), Kerala | Invitee |
| 11. | R. Balachandran Nair Dy.C.E., Kerala | Invitee |
| 12. | Dr.K.K. Menon Director, Beach Erosion, CWC, Cochin | Invitee |
| 13. | Dr.K.M. Nair, Director (CESS), Trivendrum (Kerala) | Invitee |
| 14. | R. Dharamarajan S.E., Trivandrum (Kerala) | Invitee |

- | | | |
|-----|--|-------------|
| 15. | P.J. Chacko S.E., Irr, Central Circle, Kerala | Invitee |
| 16. | P. Ummer S.E., Irr, North Circle, Kerala | Invitee |
| 17. | Dr.M.Baba, Head, Marine Sciences Div, CESS | invitee |
| 18. | A. Komalavalli Amma, E.E. Irr Div, Kerala | Invitee |
| 19. | S. Thomas, E.E., Irr Div, Kerala | Invitee |
| 20. | T.K. Shivarajan, EE CWC, Cochin | Invitee |
| 21. | K.B. Nataraj E.E.(MI), Karnataka | Invitee |
| 22. | P. Mohammad, E.E., Irr, Kerala | Invitee |
| 23. | M.M. Meeran Rawther, EE, Irr Div, Manjeri | Invitee |
| 24. | T. Rajagopal EE, Irr Div, Thalassery, Kerala | Invitee |
| 25. | T.S. Chellappan EE, Irr Div, Eranakuam | Invitee |
| 26. | A. Abdul Aalam EE(North), Thiruvananthapuram | Invitee |
| 27. | T.P. Pankajakshan Pillai EE,Irr, Allappuzha | Invitee |
| 28. | M.C. Anto Bai, EE, Irr, Thiruvananthapuram | Invitee |
| 29. | Geevargheese Daniel EE, Irr Div, Kolam | Invitee |
| 30. | A.S. Bhatia, Director, Coastal Erosion, CWC, New Delhi | Coordinator |
| 31. | K.R. Sharma, Deputy Director, Coastal Erosion Dte., CWC, New Delhi. | “ |

Annexure-II

Note on inspection of Kerala Coast by the CPDAC (21-11-1995)

Persuent to the decision taken by the erstwhile Beach Erosion Board in its 18th meeting held on 1-3rd August, 1990, at Rajkot, the Kerala State Irrigation Department has done some experimental protection works from sea erosion using coir as filter and also foam backed coir bags used in place of conventional stones. The experimental works were undertaken under Irrigation Division, Allappuzha on Vadaka / Beach Chittikadu in four stretches. The Members of the CPDAC inspected these beaches.

Details of Reaches

The entire length of 1 km of experimental work of sea wall construction was divided into 4 stretches of 250 metre each. Four types of design were proposed to be tried in 4 reaches as given below :

Reach-I *Chainage 0-250 from BLS 104 – towards north upto BLS 105*

Here a conventional type of sea wall as per latest design was constructed. Filter was 15 cm thick layer of 5 to 50 mm sifted silicions gravel as base over layed by another 15 cm thick layer of soiling stone of size 75 to 150 mm.

The core material was 20-45 dm³ size granite stones (60% 45 dm³, 30% 30-40 dm³ and 10% 20-30 dm³). The armour course was 90 cm thick layer of 200 dm³ granite stones which would measure at least 45 cm in any direction through its center of gravity.

Reach –II *Chainage 250 – 500 M from BLS 105 towards north upto BLS 106*

Here the conventional sea wall as per latest design is being constructed with a change only in the filter media. The conventional filter media is replaced by coir mat of Paravoor special yarn of runnage not more than 110 (scorage 5.5 and less) two shaft weaving with 20 ends and 20 picks in 10 cms in corresponding directions. The mat was spread with an overlap of 30 cm at all joints and overlaid with a sand cushion of 30 cm thick. The core and armour materials exactly resembled the previous one.

Reach – III Chainage 500-750, from BLS 106 towards north upto BLS 107

Here the complete design of sea wall was changed. Filter used was coir mat filter as used in Reach-II. The core used was foam backed coir matting bags of size 120 x 90 cm with Anjengo or better quality in strength weaving with 26 ends and 16 picks with foam backing rubber latex 600 gms per square meter. The bags were filled with sea sand to a maximum thickness of 25 cms and were laid in position at a slope of 1 in 20 towards land side taking care to break the joints while packing. The armour used was foam backed coir bags 180 x 120 cms with Anjengo or better in strength, weaving with 26 ends and 16 picks in 10 cms and foam backing rubber latex 600 gms per square meter. The bags were filled with sea sand to a maximum thickness of 30 cms and were laid at a slope of 1 in 20 towards land side breaking joints, to a thickness of 90 cms. The core and armour bags were made with open ends folded and sewn with double needle lock stitch using strong coir threads. Top layer of armour course was coated with a thick layer of industrial asphalt to safeguard the anticipated weathering.

Reach – IV Chainage 750- 1000 from BLS 107 towards north upto BLS 108

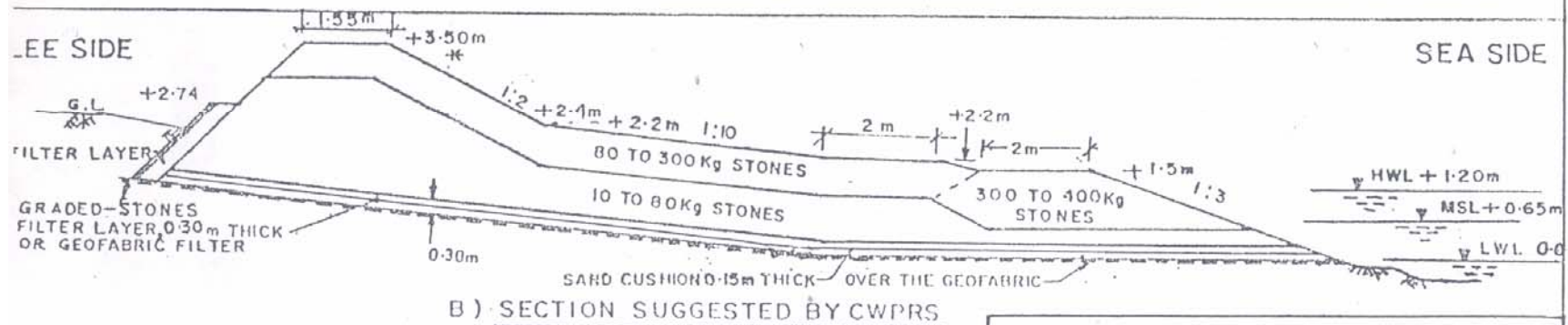
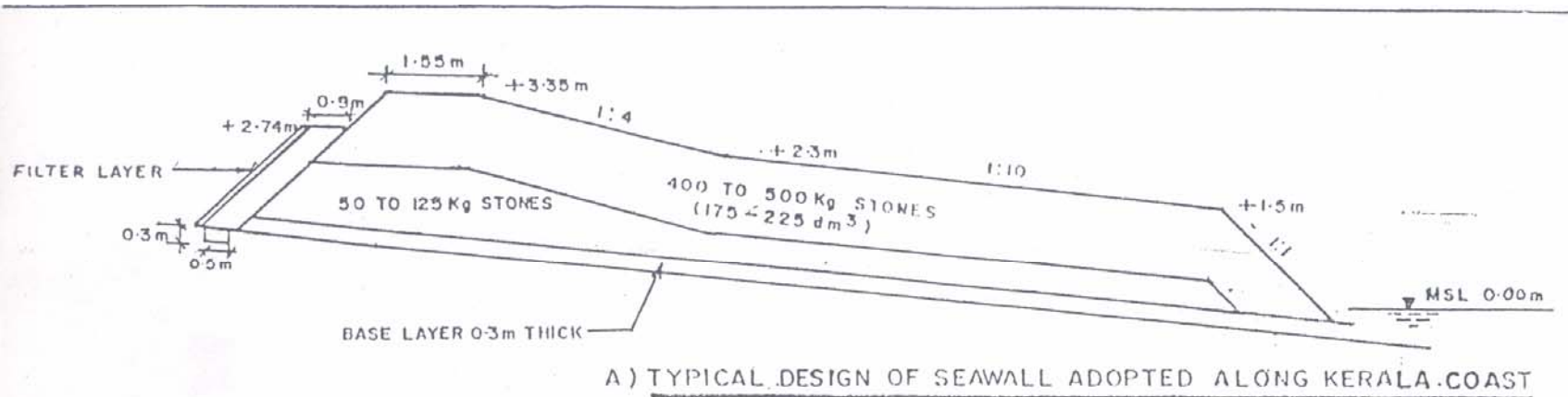
Here again the conventional core and armour stones were used as in Reach I & II changing the filter media only to high density monofilament woven plastic cloth. The monofilament plastic cloth was made with mesh of 36 per square inch and had a thickness of not less than 0.15 cm and had a weight of 100 gms per square meter. The mat was laid with an overlap of 30 cms at all joints and overlaid with a sand cushion of 30 cms.

OBSERVATIONS

Of all the above 4 experimental works the most stable one was found the fourth reach, i.e., between BLS 107-108 where conventional sea wall with high density monofilament plastic woven cloth filter was used. The experimental sea wall with coir mat filter and foam backed coir bags as core and armour course constructed between BLS 106-107 is a total failure, i.e., where the wave height was more than 1 metre, the use of foam backed coir bags have not been found successful. Reach-I where conventional sea wall was done experimentally showed the usual performance only. The performance of the experimental sea wall being done in reach-II using coir mat filter and conventional core and armour course is yet to be completed and observed by the State.

Though the performance of coir as a filter media is yet to be compared with the conventional filter using graded material, it can be seen that the

performance of coir in maritime conditions is poor as is evident from the performance of coir products used in Reach-III. However, the best results have been obtained where the monofilament plastic woven cloth was used as filter.



GRADATION OF STONES :

- (1) 300 TO 400Kg : 50 % MORE THAN 350Kg
(2) 80 TO 300Kg : 60 % 80 TO 150 Kg
40 % 150 TO 300 Kg
70 Kg : 75 % 10 TO 25 Kg
25 % 25 TO 80 Kg

NOTES:-

- 1) IN CWPRS DESIGN, ALL LEVELS ARE WITH RESPECT TO 0.00m AS CHART DATUM.
- 2) CREST LEVEL TO BE DECIDED FROM SITE CONDITIONS.
- 3) HWL, LVL TO BE VERIFIED FOR EACH SITE (HWL = +120m & LWL = 0.00, ARE ASSUMED LEVELS)

REF :- C.W.P.RS DRG.NO. 22/91

| | |
|--|----------------------|
| GOVERNMENT OF INDIA भारत सरकार | |
| CENTRAL WATER COMMISSION केन्द्रीय जल आयोग | |
| COASTAL EROSION DIRECTORATE तटीय अपरदन निदेशालय | |
| TYPICAL DESIGN OF SEAWALL ADOPTED ALONG KERALA STATE AND SECTION SUGGESTED BY CWPRS | |
| DRAWN. R. Singh | CHECKED. B. S. Rao |
| TRCD. R. Singh | SUB. |
| DRG. NO. 6(10)/87 CEC-10 | NEW DELHI - SEPT. 93 |

ANNEXURE – IV

(TO BE PUBLISHED IN THE GAZETTE OF INDIA IN PART – I, SECTION-I)

No. 15/2/91-B.M./1013
GOVERNMENT OF INDIA
Ministry of Water Resources

New Delhi, dated 6 October, 1995

AMENDMENT

In partial modification to this Ministry's resolution of even number dated 17.4.1995 wherein the erstwhile "Beach Erosion Board" has been renamed as "Coastal Protection and Development Advisory Committee, the following amendments in the composition of the said committee are made as here under: -

| Sl. No. | Status | As given in Resolution No 15/2/91-B.M. dt. 17.4.95 | Now read as |
|---------|--------|--|---|
| 8. | Member | Deputy Director General, Geological Survey of India (I/c of Coastal areas of Kerala & other Southern States), <u>Dehradun</u> , (U.P.) | Deputy Director General, O.M.E. & M.G. wing, GSI, Ratnakar Building, 4-Chowringhee Lane, <u>CALCUTTA</u> -7000016 |
| 9 | Member | Secretary, Roads & Bldg., Deptt., Government of Gujarat, <u>Gandhinagar</u> | Secretary, Ports & Fisheries Department, Block No.5, Sardar Bhawan, Sachivalaya, <u>GANDHINAGAR</u> – 382010 |
| 11. | Member | Member State Planning Board, Government of Maharashtra, <u>Bombay</u> | Commissioner, Water Transport, Maharashtra State, Indian Mercantile Chamber, 3 rd Floor, Ballard Estate, 14 Ramjibhai Kamani Marg, <u>BOMBAY</u> -400038 |

All other functions and Terms and Conditions will remain unchanged.

Sd/-
(M.S.REDDY)
SECRETARY TO THE GOVERNMENT OF INDIA

Copy to :-

1. P.S. to Minister (WR & PA)/MOS (WR) / Secretary (WR).

Copy also forwarded to:-

1. All Members (21 Nos.).
2. Chairman, Central Water Commission, R.K.Puram, New Delhi.
3. Member (RM), CWC, R.K.Puram, New Delhi.
4. Chairman, Ganga Flood Control Commission, Sinchai Bhawan, 3rd Floor, Patna-800015.
5. Secretary, Ministry of Surface Transport, New Delhi.
6. Director, National Institute of Oceanography, Goa.
7. Director, CWPRS, P.O. Khadakwasla, Pune.
8. Dy. Director-General, Geological Survey of India, O.M.E. & M.G. Wing, Ratnakar Building, 4, Chowringhee Lane, Calcutta-7000016
9. Secretary, Ports & Fisheries Department, Block No.5, Sardar Bhawan, Sachivalaya, Gandhinagar-382010
10. Commissioner, Water Transport, Maharashtra State Indian Mercantile Chamber, 3rd Floor, Ballard Estate, 14, Ramjibhai Kamani Marg, Bombay-400038
11. Secretary, Irrigation & PWD, Govt. of Goa, Panaji.
12. Secretary, PWD (Irrigation), Govt. of Karnataka, Bangalore.
13. Secretary, Irrigation Deptt, Govt. of Kerala, Trivandrum.
14. Secretary, P.W.D., Govt. of Tamil Nadu, Madras.
15. Secretary, Irrigation & Power Deptt. Govt. of Andhra Pradesh, Hyderabad.
16. Secretary, Irrigation & Power Deptt., Govt. of Orissa, Bhubaneswar.
17. Secretary, Irrigation & Waterways Deptt, Govt. of West Bengal, Writers Building, Calcutta.
18. Commissioner, (Projects), Min. of W.R.
19. Chief Engineer, (River Morphology), C.W.C., R.K.Puram, New Delhi.

Sd/-
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