PROPOSED HARBOUR AT H.DH KULHUDHUFUSHI

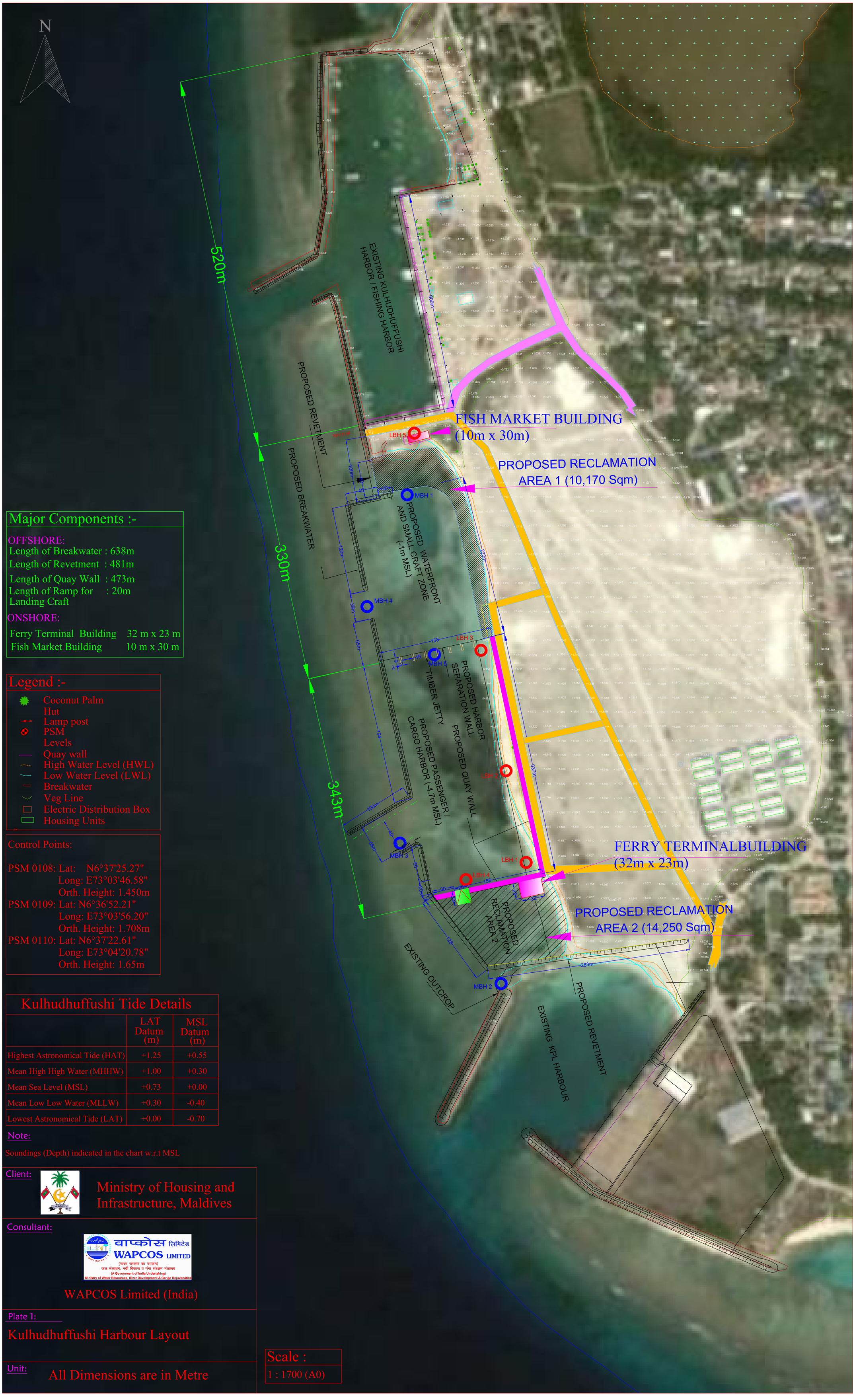
DRAWINGS

MARCH 2018

CLIENT : MINISTRY OF HOUSING AND INFRASTRUCTURE

DESIGN BY

वाप्कोस लिमिटेड
WAPCOS LIMITED
(भारत सरकार का उपक्रम)
जल संसाधन, नदी विकास व गंगा संरक्षण मंत्रालय
(A Government of India Undertaking)
Ministry of Water Resources, River Development & Ganga Rejuvenation



Major Components :-

OFFSHORE:

- Length of Breakwater : 638m
- Length of Revetment : 481m
- Length of Quay Wall : 473m
- Length of Ramp for Landing Craft : 20m

ONSHORE:

Ferry Terminal Building	32 m x 23 m
Fish Market Building	10 m x 30 m

Legend :-

- Coconut Palm
- Hut
- Lamp post
- PSM
- Levels
- Quay wall
- High Water Level (HWL)
- Low Water Level (LWL)
- Breakwater
- Veg Line
- Electric Distribution Box
- Housing Units

Control Points:

PSM 0108: Lat: N6°37'25.27"
Long: E73°03'46.58"
Orth. Height: 1.450m

PSM 0109: Lat: N6°36'52.21"
Long: E73°03'56.20"
Orth. Height: 1.708m

PSM 0110: Lat: N6°37'22.61"
Long: E73°04'20.78"
Orth. Height: 1.65m

Kulhudhuffushi Tide Details

	LAT Datum (m)	MSL Datum (m)
Highest Astronomical Tide (HAT)	+1.25	+0.55
Mean High High Water (MHHW)	+1.00	+0.30
Mean Sea Level (MSL)	+0.73	+0.00
Mean Low Low Water (MLLW)	+0.30	-0.40
Lowest Astronomical Tide (LAT)	+0.00	-0.70

Note:

Soundings (Depth) indicated in the chart w.r.t MSL

Client:

Ministry of Housing and Infrastructure, Maldives

Consultant:

वाप्कोस लिमिटेड
WAPCOS LIMITED
(भारत सरकार का उपक्रम)
जल संसाधन, नदी विकास व गंगा संरक्षण मंत्रालय
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Ministry of Water Resources, River Development & Ganga Rejuvenation

WAPCOS Limited (India)

Plate 1:

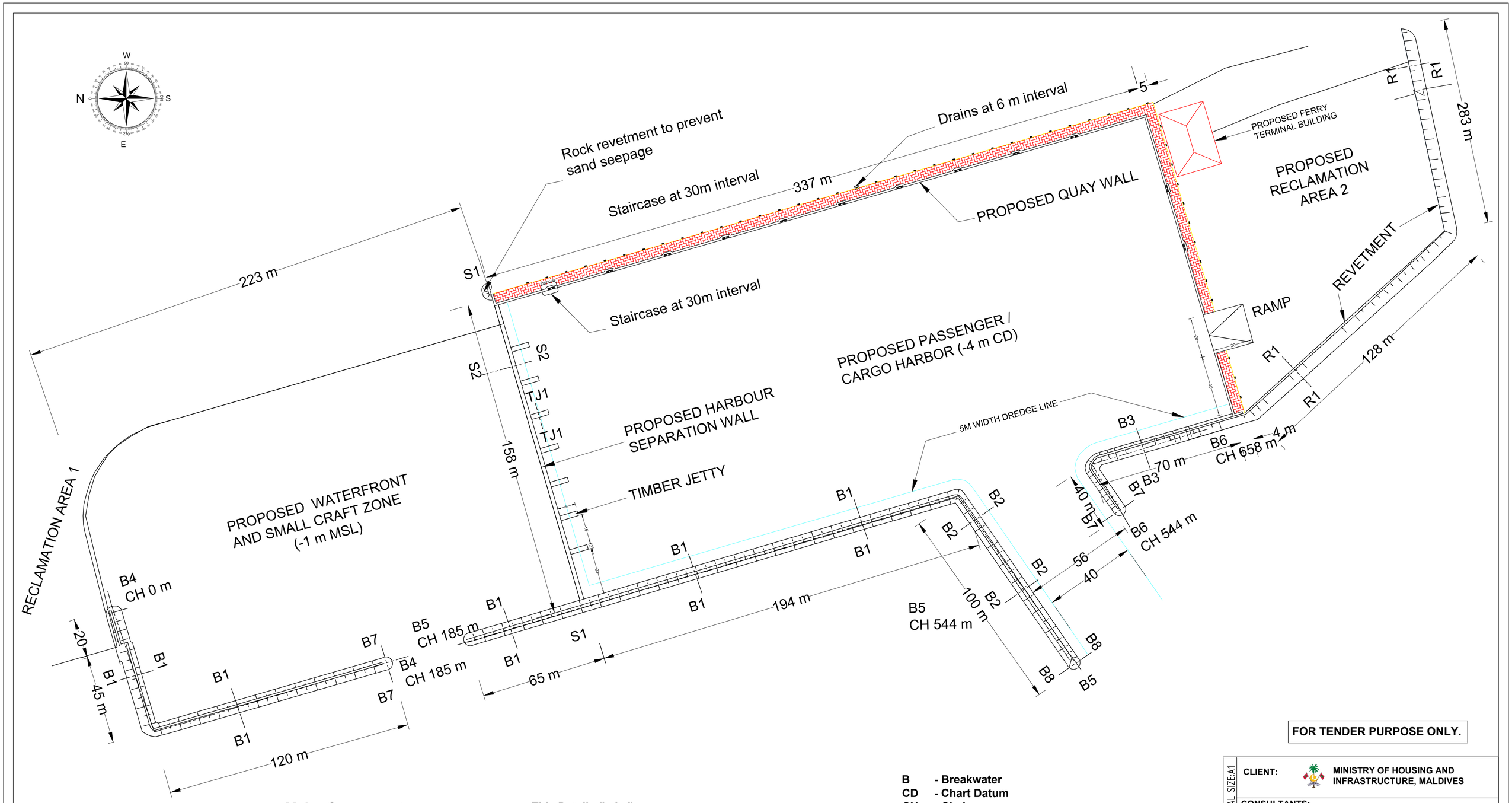
Kulhudhuffushi Harbour Layout

Unit:

All Dimensions are in Metre

Scale :

1 : 1700 (A0)



Major Components:-

Length of Breakwater	- 638 m
Length of Revetment	- 481 m
Length of Quay wall	- 473 m
Length of Ramp for landing craft	- 20 m

Tide Details (in 'm'):-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High WaterLevel	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

B	- Breakwater
CD	- Chart Datum
CH	- Chainage
MSL	- Mean Sea Level
Q	- Quay wall
R	- Revetment
S	- Separation Wall
TJ	- Timber Jetty

FOR TENDER PURPOSE ONLY.

ORIGINAL SIZE:A1

SCALE 1:900

CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

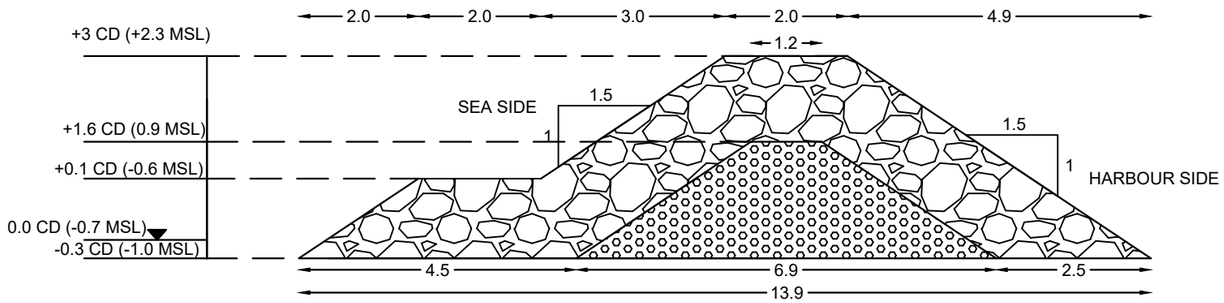
DEPARTMENT OF OCEAN ENGINEERING IIT MADRAS, INDIA.

PROJECT:

KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 2:

GENERAL ARRANGEMENT AND LOCATIONS OF LONGITUDINAL AND CROSS SECTIONS

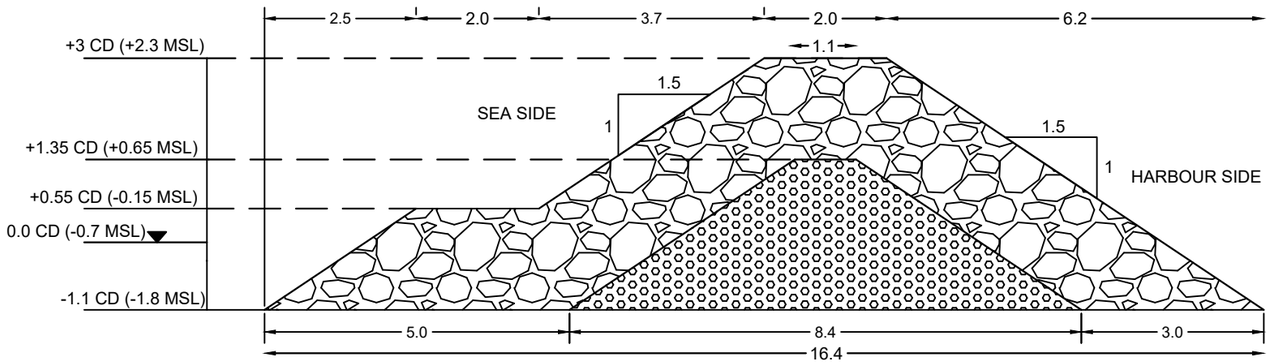


Armour layer with 700 kg - 1000 kg stones, of two layer thickness (1.4m)

Core Layer with 30 kg - 150 kg stones.

Water Depth -1 m MSL or -0.3 m CD

CROSS SECTION OF BREAKWATER AT B1 - B1

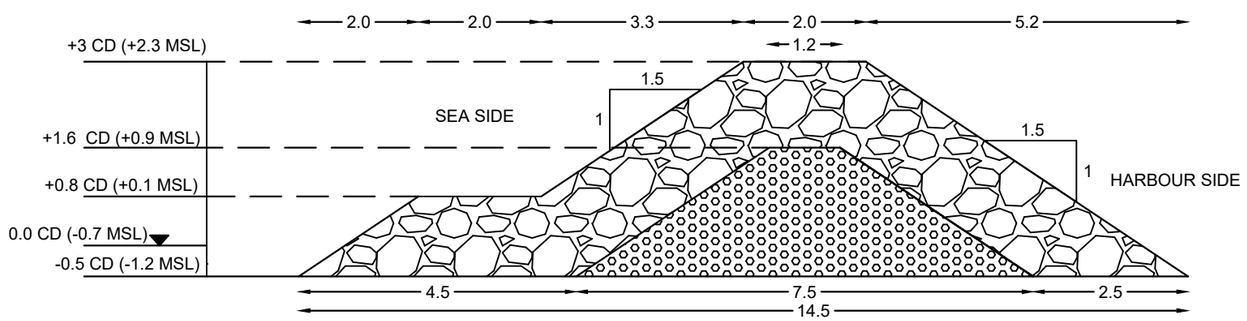


Armour layer with 1300 kg - 1500 kg stones, of two layer thickness (1.65m)

Core Layer with 30 kg - 150 kg stones.

Water Depth -1.8 m MSL or -1.1 m CD

CROSS SECTION OF BREAKWATER B2 - B2



Armour layer with 700 kg - 1000 kg stones,of two layer thickness.(1.4m)

Core Layer with 30 kg - 150 kg stones.

Water Depth -1.2 m MSL or -0.5 m CD

CROSS SECTION OF BREAKWATER B3 - B3

Notes:-
1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. The Quarry stones should be used.
4. The density of quarry stones should be 2.65 t/m^3.
5. Porosity should not be more than 30%.
6. Bed preparation should be taken care at site.
7. Armour units are placed randomly.

Tide Details (in 'm'):-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High Water	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

CD - Chart Datum
MSL - Mean Sea Level

FOR TENDER PURPOSE ONLY.

ORIGINAL SIZE:A3
SCALE 1:100

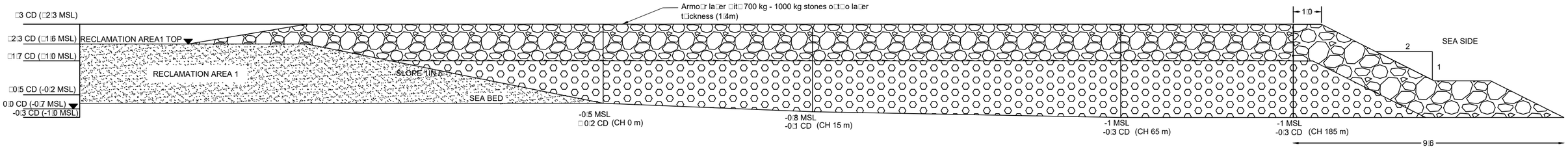
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

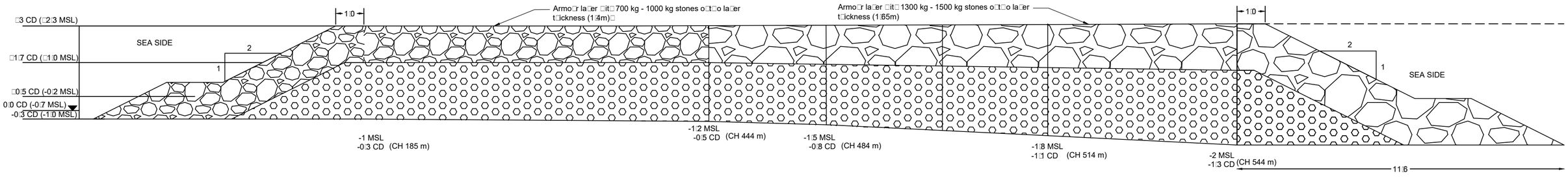
DEPARTMENT OF OCEAN ENGINEERING IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

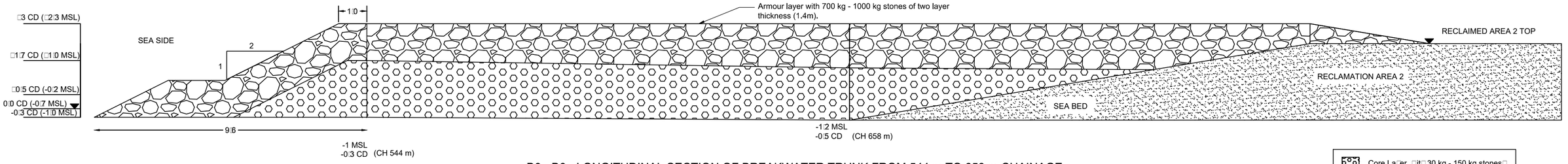
PLATE 3:
CROSS SECTIONS OF BREAKWATER



B4 - B4 - LONGITUDINAL SECTION OF BREAKWATER TRUNK UPTO 185 m CHAINAGE



B5 - B5 - LONGITUDINAL SECTION OF BREAKWATER TRUNK FROM 185 m TO 544 m CHAINAGE



B6 - B6 - LONGITUDINAL SECTION OF BREAKWATER TRUNK FROM 544 m TO 658 m CHAINAGE

Major Components:-

Length of Breakwater	- 658 m
Length of Revetment	- 481 m
Length of Quay wall	- 473 m
Length of Ramp for loading craft	- 20 m

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High WaterLevel	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

B	- Breakwater
CD	- Chart Datum
CH	- Chainage
MSL	- Mean Sea Level
Q	- Quay wall
R	- Revetment
S	- Separation Wall
TJ	- Timber Jetty

ORIGINAL SIZE:A2

SCALE 1:100

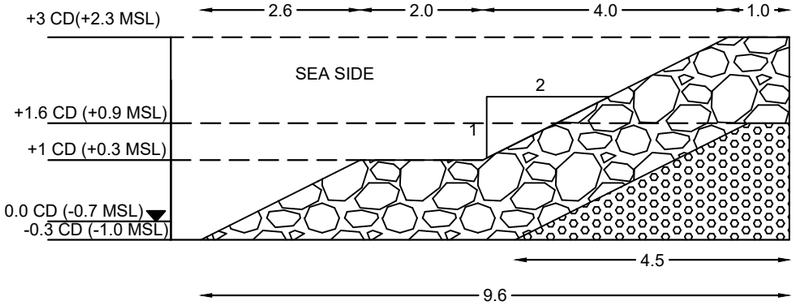
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING IIT MADRAS, INDIA.

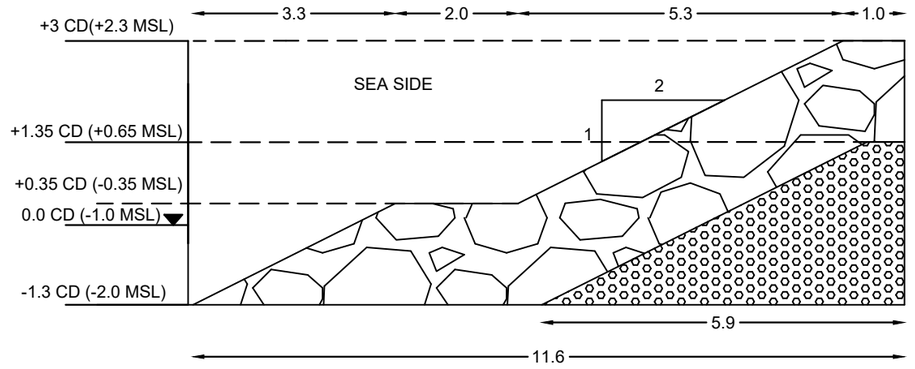
PROJECT: KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 4: LONGITUDINAL SECTIONS OF BREAKWATER



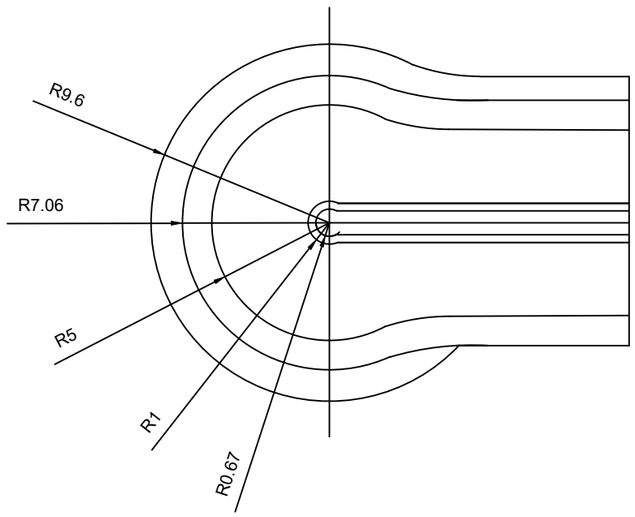
Water Depth -1 m MSL or -0.3 m CD

HEAD SECTION OF BREAKWATER AT B7 - B7

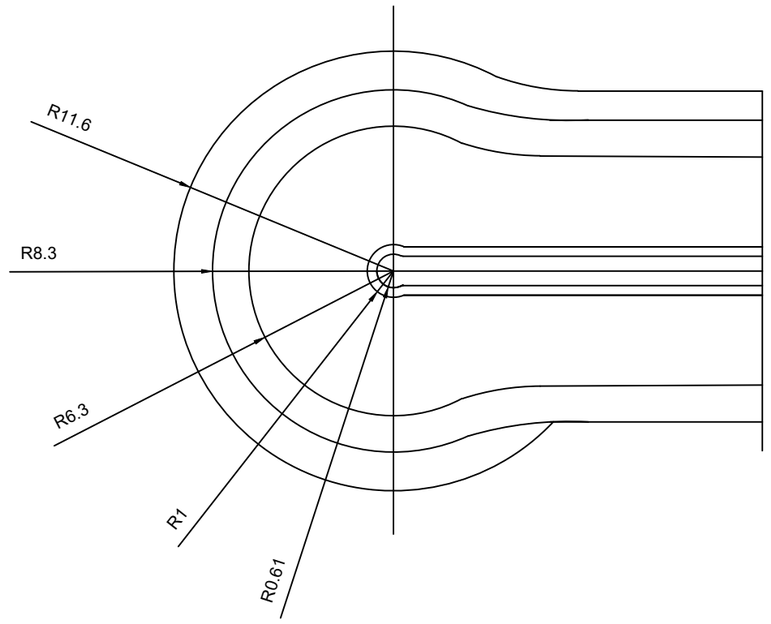


Water Depth -2 m MSL or -1.3 m CD

HEAD SECTION OF BREAKWATER AT B8 - B8.



PLAN VIEW OF THE HEAD SECTION B-7



PLAN VIEW OF THE HEAD SECTION B-8

Armour layer with 700kg - 1000 kg stonesof two layer thickness (1.4m)

Armour layer with 1300kg - 1500 kg stones of two layer thickness (1.65)

Core Layer with 30 kg - 150 kg stones.

Notes:-
1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. The Quarry stones should be used.
4. The density of quarry stones should be 2.65 t/m^3.
5. Porosity should not be more than 30%.
6. Bed preparation should be taken care at site.
7. Armour units are placed randomly.

Tide Details (in 'm'):-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High Water	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

CD - Chart Datum
MSL - Mean Sea Level

FOR TENDER PURPOSE ONLY

ORIGINAL SIZE:A3
SCALE 1:100

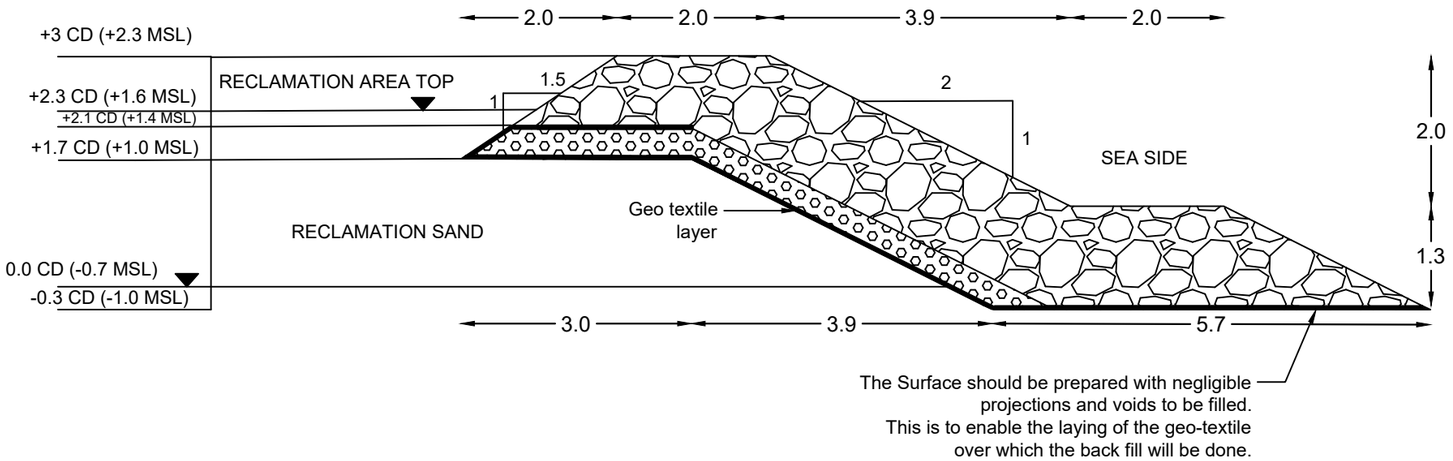
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 5:
PLAN AND CROSS SECTIONAL VIEW OF HEAD SECTION



CROSS SECTION OF THE REVETMENT AT R1 - R1

Armour layer with 700 kg - 1000 kg stones 2 layer thickness (1.4m)

Core Layer with 30 kg - 150 kg stones.

Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. The Quarry stones should be used.
4. The density of quarry stones should be 2.65 t/m^3.
5. Porosity should not be more than 30%.
6. Bed preparation should be taken care at site.
7. Armour units are placed randomly.

Tide Details (in 'm'):-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High Water	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

CD - Chart Datum
MSL - Mean Sea Level

FOR TENDER PURPOSE ONLY

B

ORIGINAL SIZE:A3

SCALE 1:80

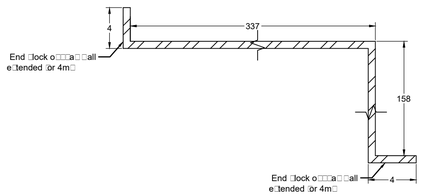
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

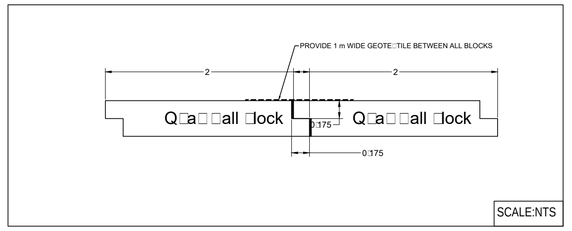
PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

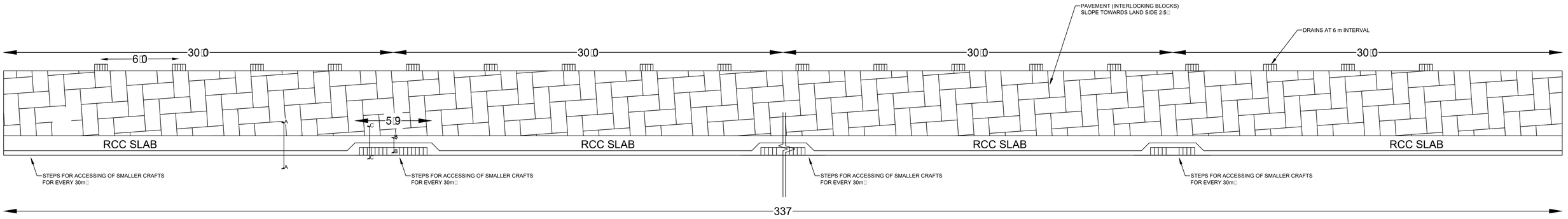
PLATE 6:
CROSS SECTIONS OF REVETMENTS



PROPOSED
RECLAMATION
AREA 2

END BLOCK LOCATIONS
SCALE:NTS

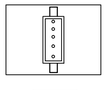




PLAN VIEW OF QUAY WALL

Notes:-

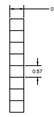
1. **All dimensions are in meters.**
2. **This Plate should be read along with Plate 2.**
3. **Net safe bearing capacity of soil = 100 kN/m^2 at the founding level.**
4. **N value at founding level is 12.**
5. **Grade of steel shall be of B500A conforming to BS 4449.**
6. **Grade of concrete shall be C40 conforming to BS 5328 PART 1 -1997.**
7. **Lap and development length for C40 shall be 40 times the diameter of bar.**
8. **Type of cement shall be of Port Land Cement confirming to BS 12**



3 n□m□ers o□Arc□
□ender MP 300 □or
ever□30m □ 10m
c/c□

4 n□m□ers o□15 ton
capacit□Single Bitt
□ollards □or ever□
30m □ 10m c/c□

STEPS FOR
ACCESSING
SMALLER CRAFTS
FOR EVERY 30M□



Rise □0□25m

Tread □0□3m

N□m□er o□steps □8

CD - Chart Datum
MSL - Mean Sea Level

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High water level	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70CD

ORIGINAL SIZE:A1
SCALE 1:150

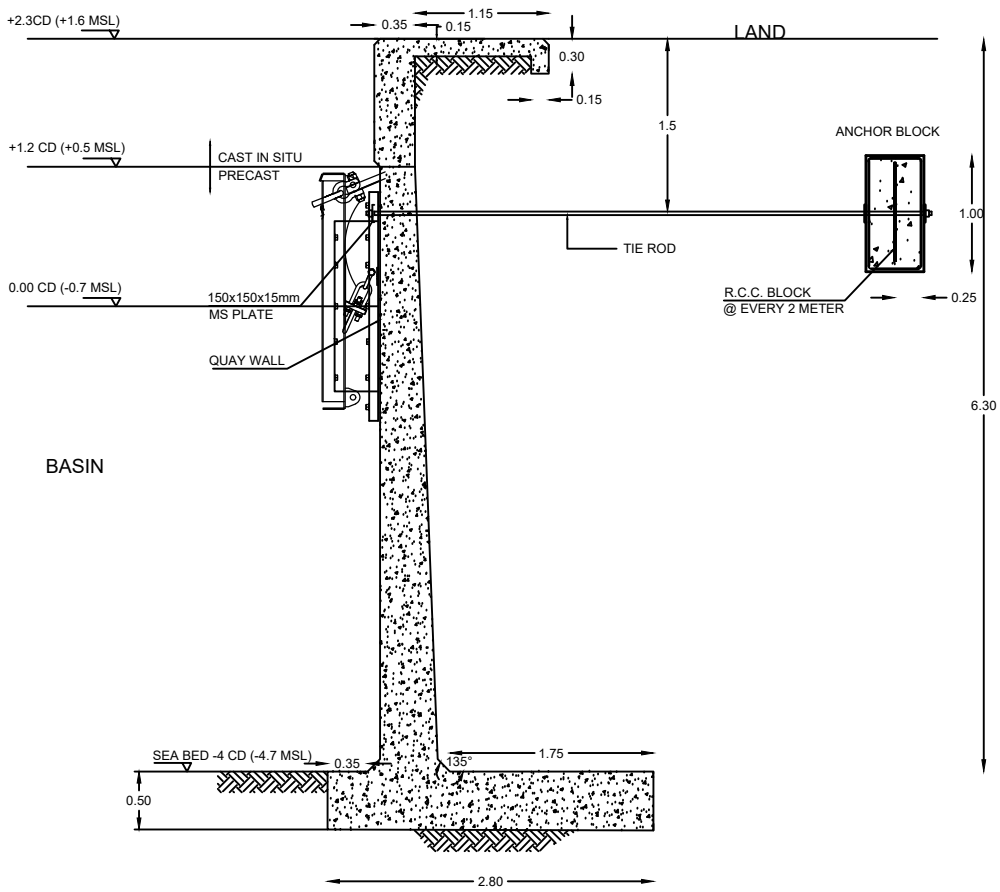
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

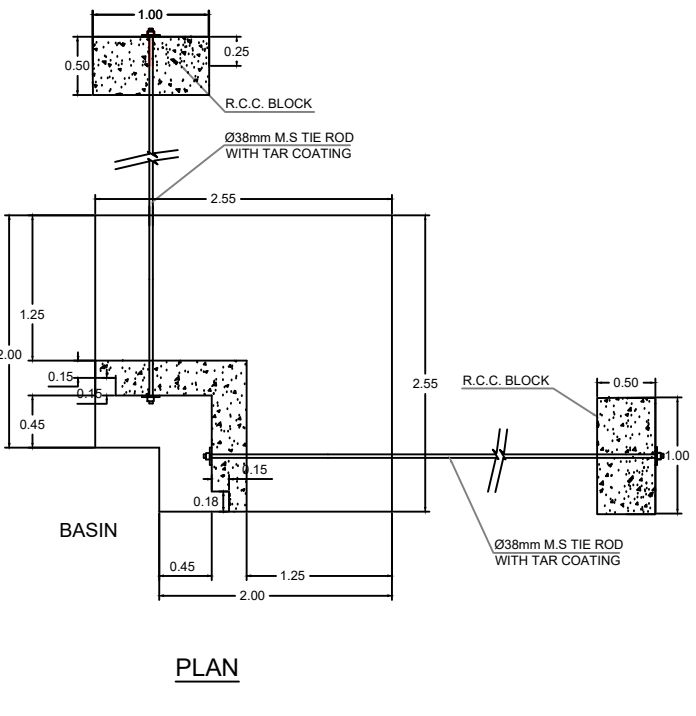
PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 7:
GENERAL VIEW OF QUAY WALL



CROSS SECTION OF QUAY WALL PANEL AT NON -STAIR CASE POSITION

SECTION A-A (REFER PLATE 7)

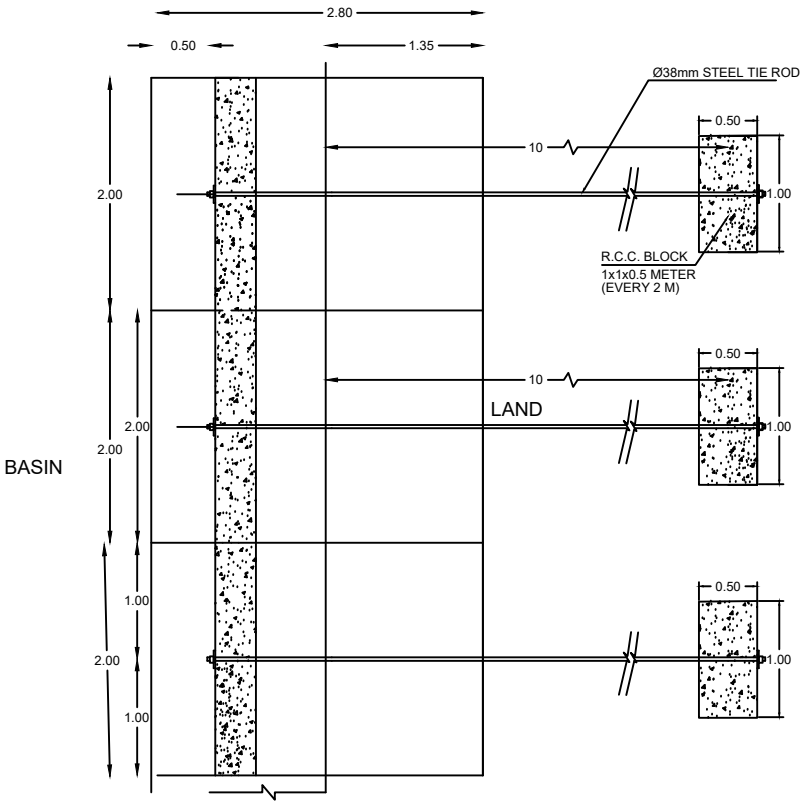


PLAN

CORNER QUAY WALL BLOCK

Notes:-

1. **All dimensions are in meters.**
2. **This Plate should be read along with Plate 2 AND 7.**
3. **Net safe bearing capacity of soil = 100 kN/m^2 at the founding level.**
4. **N value at founding level is 12.**
5. **Grade of steel shall be of B500A conforming to BS 4449.**
6. **Grade of concrete shall be C40 conforming to BS 5328 PART 1 -1997.**
7. **Lap and development length for C 40 shall be 40 times the diameter of bar.**
8. **Type of cement shall be of Port Land Cement confirming to BS 12**
9. **Water from drain pipe is drained into sea using PVC pipe as shown in cross section.**



PLAN VIEW OF QUAY WALL

Tide Details (In 'm'):-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High Water	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

CD - Chart Datum
MSL - Mean Sea Level

FOR TENDER PURPOSE ONLY

ORIGINAL SIZE:A3

SCALE 1:65

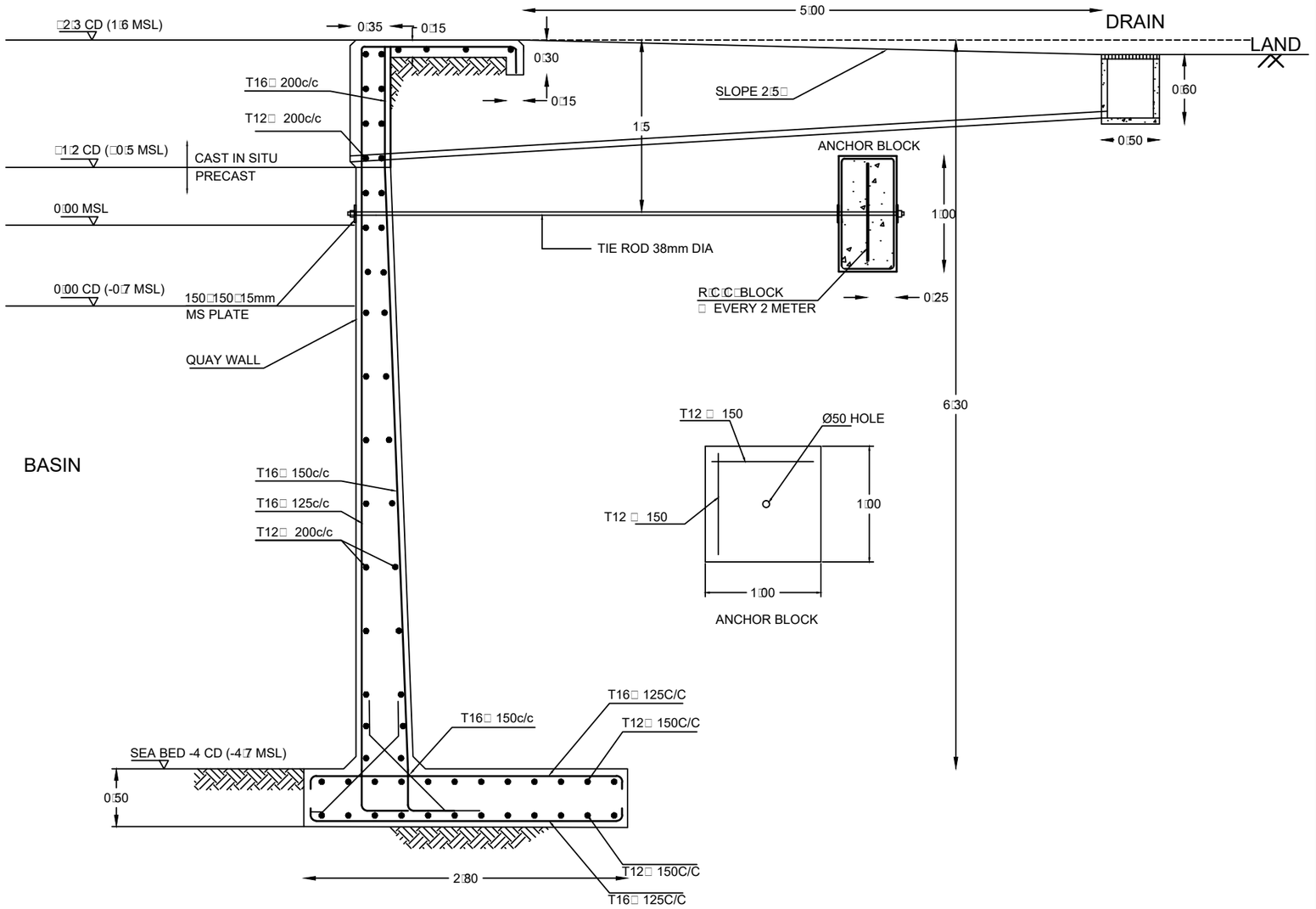
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 8:
PLAN AND CROSS SECTION OF QUAY WALL



REINFORCEMENT DETAILING OF QUAY WALL PANEL AT NON-STAIR CASE POSITION

RC DETAILS OF SECTION A-A (REFER PLATE 7)

Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2 AND 7.
3. Net safe bearing capacity of soil = 100 kN/m^2 at the founding level.
4. N value at founding level is 12.
5. Grade of steel shall be of B500A conforming to BS 4449.
6. Grade of concrete shall be C40 conforming to BS 5328 PART 1 -1997.
7. Lap and development length for C 40 shall be 40 times the diameter of bar.
8. Type of cement shall be of Port Land Cement confirming to BS 12
9. Water from drain pipe is drained into sea using PVC pipe as shown in cross section.

CD - Chart Datum
MSL - Mean Sea Level

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High water level	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

ORIGINAL SIZE:A3

SCALE 1:45

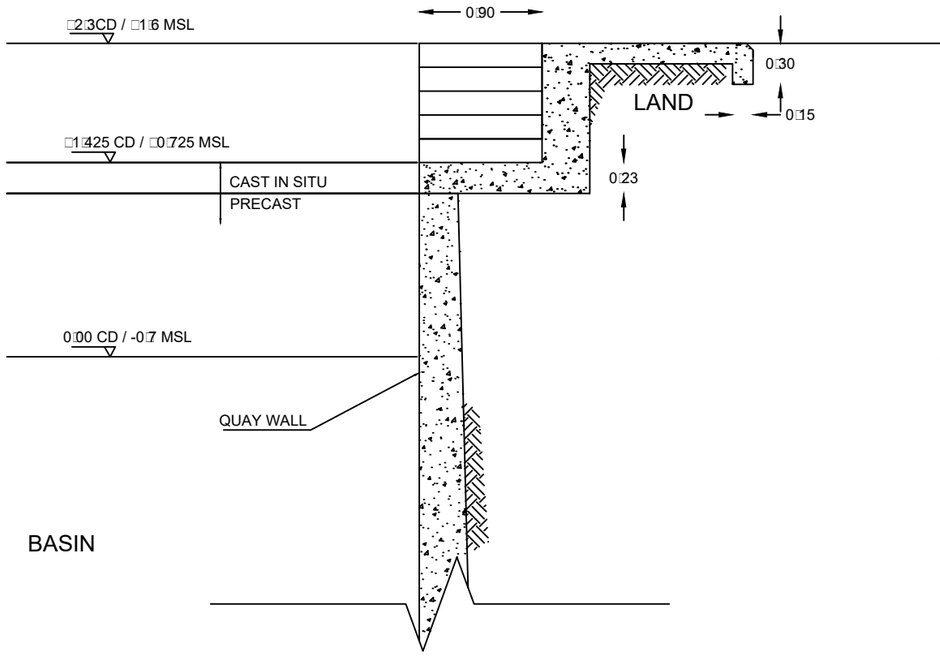
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

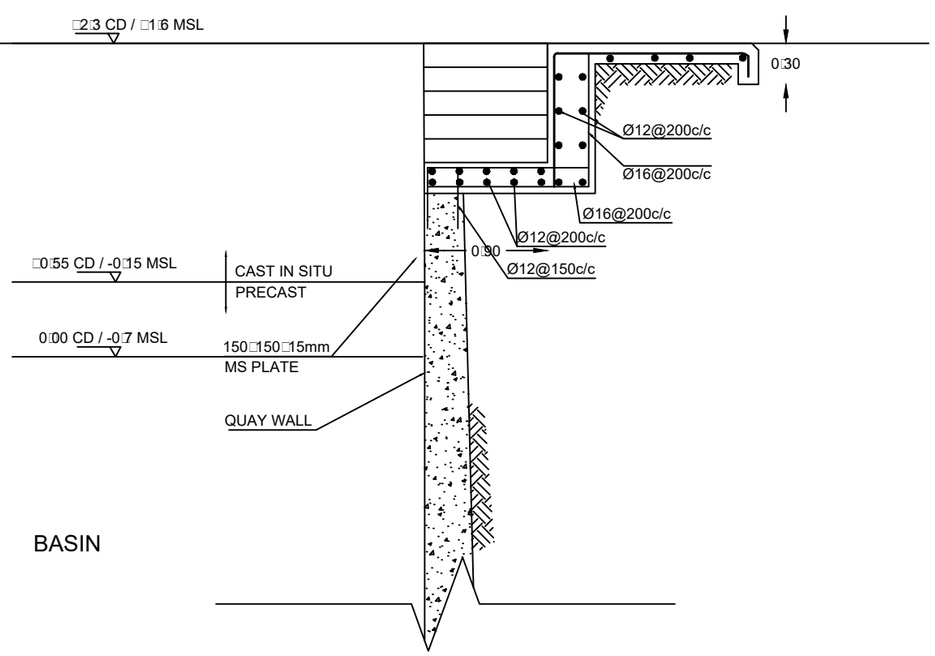
DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 9:
RC DETAILS OF QUAY WALL



SECTION C-C (REFER PLATE 7)



RC DETAILS OF SECTION C-C

Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2 AND 7.
3. Net safe bearing capacity of soil = 100 kN/m^2 at the founding level.
4. N value at founding level is 12.
5. Grade of steel shall be of B500A conforming to BS 4449.
6. Grade of concrete shall be C40 conforming to BS 5328 PART 1 -1997.
7. Lap and development length for C 40 shall be 40 times the diameter of bar.
8. Type of cement shall be of Port Land Cement confirming to BS 12
9. Water from drain pipe is drained into sea using PVC pipe as shown in cross section.

CD - Chart Datum
MSL - Mean Sea Level

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High water level	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

ORIGINAL SIZE:A3

SCALE 1:45

CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

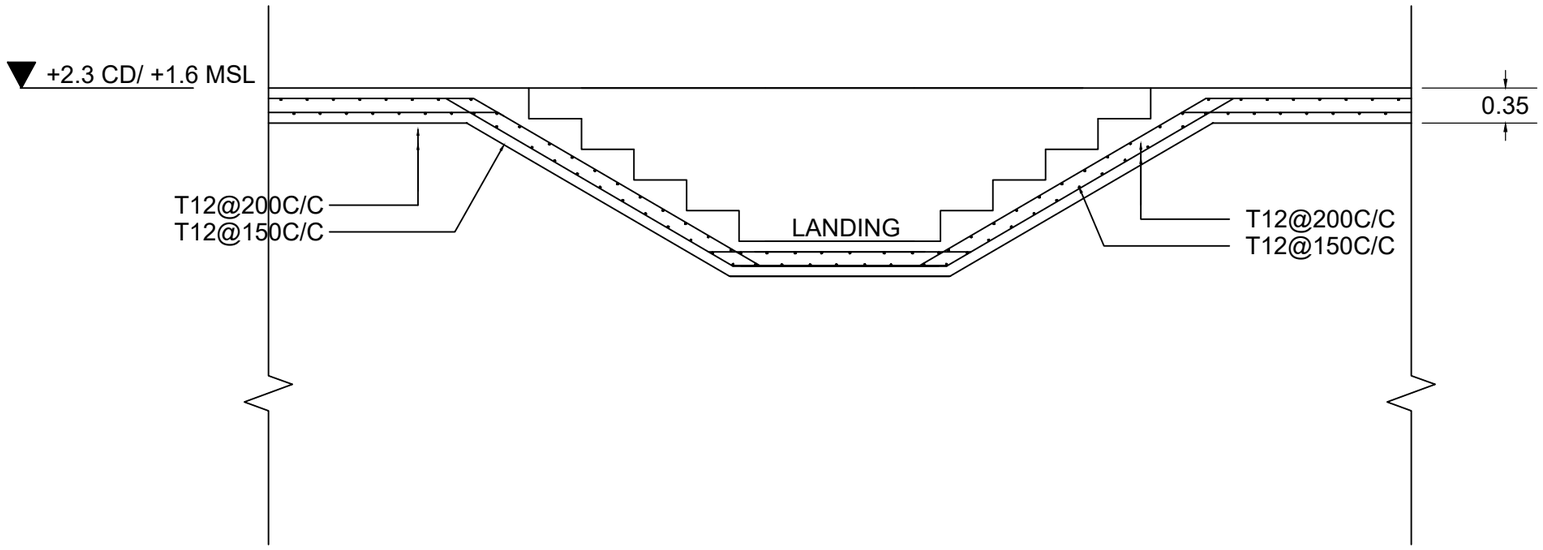
CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING IIT MADRAS, INDIA.

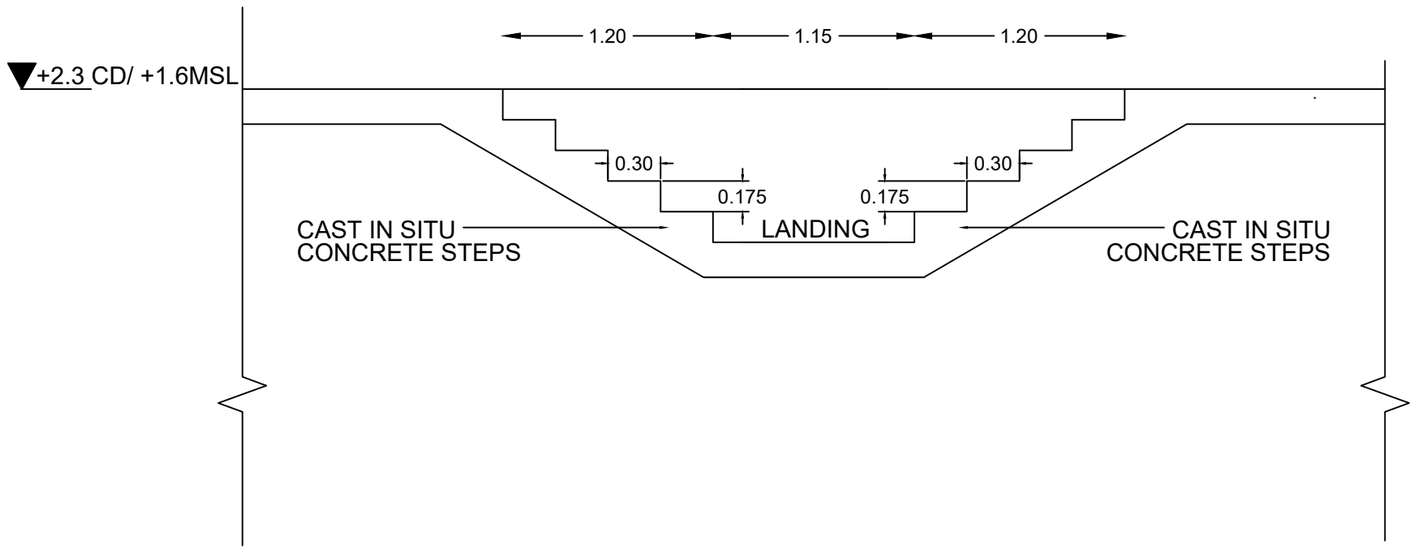
PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 10:

CROSS SECTION OF QUAY WALL AT STAIRCASE POSITION.



STAIRCASE REINFORCEMENT DETAILS



Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. The Quarry stones should be used.
4. The density of quarry stones should be 2.65 t/m^3.
5. Porosity should not be more than 30%.
6. Bed preparation should be taken care at site.
7. Armour units are placed randomly.

Tide Details (In 'm'):-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High Water	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

CD - Chart Datum
MSL - Mean Sea Level

FOR TENDER PURPOSE ONLY

ORIGINAL SIZE:A3

SCALE 1:35

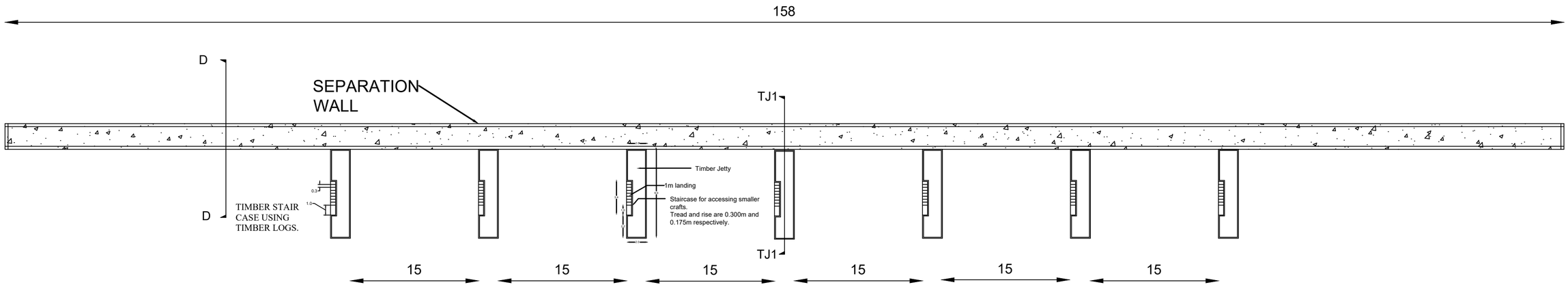
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 11:
DETAILS OF STAIR CASE IN QUAY WALL



PLAN VIEW OF SEPARATION WALL WITH TIMBER JETTY

Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. Net safe bearing capacity of soil = 100 kN/m^2 at the founding level.
4. N value at founding level is 12.
5. Grade of steel shall be of B500A conforming to BS 4449.
6. Grade of concrete shall be C40 conforming to BS 5328 PART 1 -1997.
7. Lap and development length for C40 shall be 40 times the diameter of bar.
8. Type of cement shall be of Port Land Cement confirming to BS 12

FOR TENDER PURPOSE ONLY

CD - Chart Datum
MSL - Mean Sea Level

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High Water	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70CD

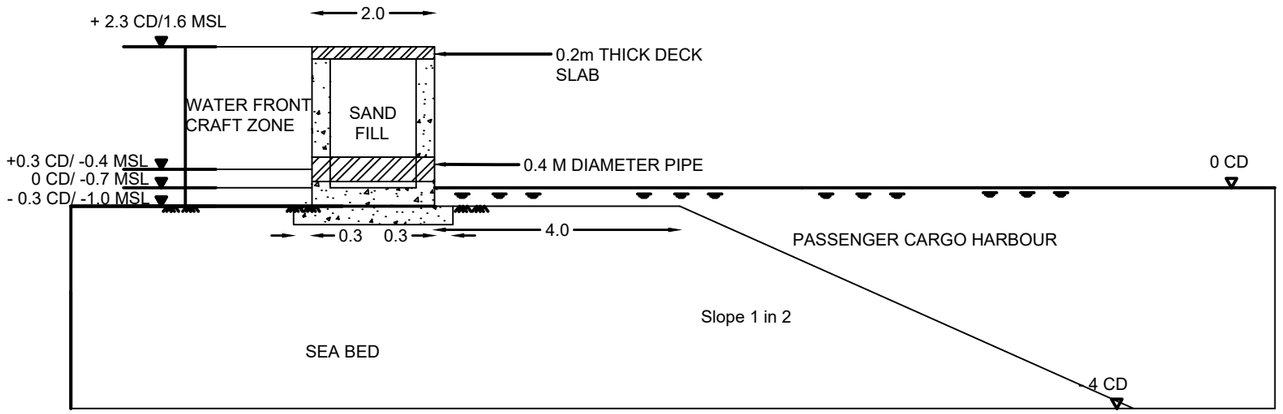
ORIGINAL SIZE:A2
SCALE 1:300

CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA
DEPARTMENT OF OCEAN ENGINEERING IIT MADRAS, INDIA.

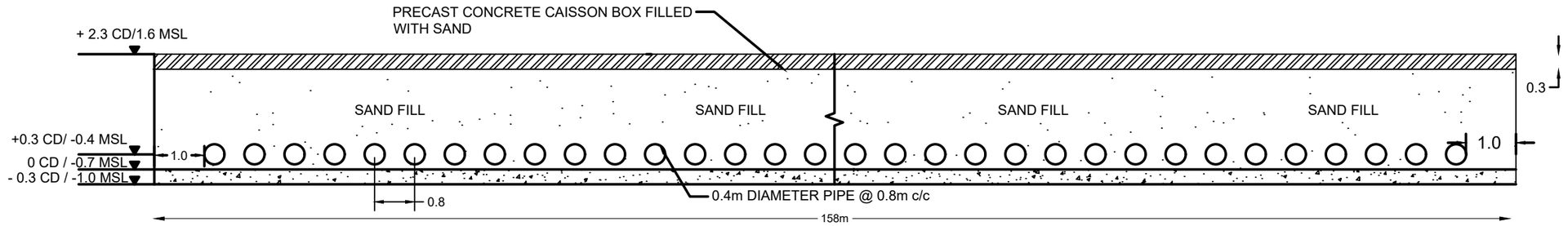
PROJECT: KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 12: PLAN VIEW OF SEPARATION WALL AND TIMBER JETTY



CROSS SECTION OF HARBOUR SEPERATION WALL S2-S2

PRECAST CONCRETE CAISSON BOX FILLED WITH SAND.



LONGITUDINAL SECTION OF HARBOUR SEPERATION WALL S1 - S1

PRECAST CONCRETE CAISSON BOX FILLED WITH SAND.

Notes:-

1. **All dimensions are in meters.**
2. **This Plate should be read along with Plate 2.**
3. **Net safe bearing capacity of soil = 100 kN/m^2 at the founding level.**
4. **N value at founding level is 32.**
5. **Grade of concrete shall be C40 conforming to BS 5328 PART 1-1997.**
6. **Blocks should be made of C40 concrete.**
7. **Blocks are connected by cement mortar.**
8. **Type of cement shall be of Portland Cement confirming to BS12.**
9. **Minimum cement content is 320 - 330kg/m^{3}conforming to BS 5328:1997.**
10. **400mm precast concrete pipe should be used.**
11. **Proper maintenance should be carried out to prevent clogging.**

FOR TENDER PURPOSE ONLY

CD - Chart Datum
MSL - Mean Sea Level

Tide Details:-

1. Highest Astronomical Tide	**+1.25 MSL**	**+0.55 CD**
2. Mean High High Water	**+1.00 MSL**	**+0.30 CD**
3. Mean Sea Level	**+0.73 MSL**	**+0.00 CD**
4. Mean Low Low Water	**+0.30 MSL**	**-0.40 CD**
5. Lowest Astronomical Tide	**+0.00 MSL**	**-0.70 CD**

ORIGINAL SIZE:A3

SCALE: 1:100

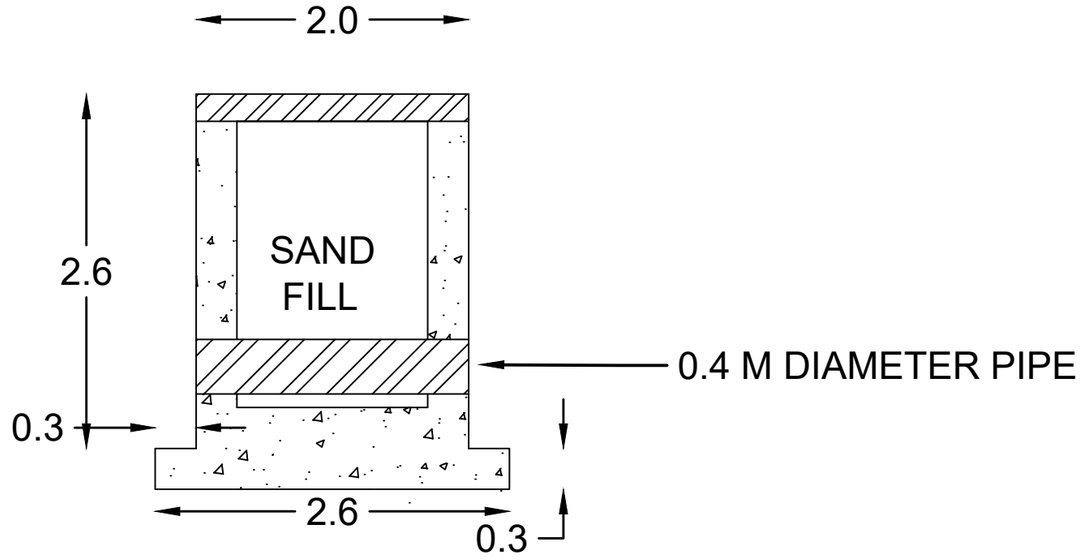
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

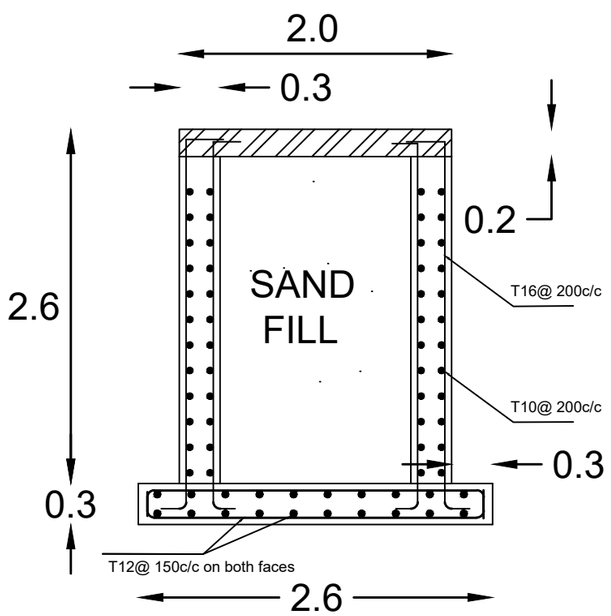
CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING IIT MADRAS, INDIA.

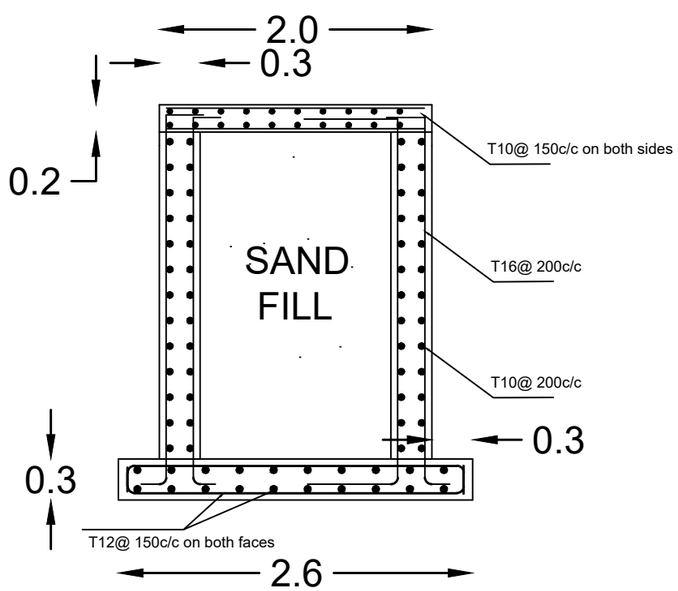
PROJECT: KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 13: SEPARATION WALL





PCC SLAB



REINFORCED SLAB

RC DETAILS OF PRECAST CONCRETE CAISSON BOX FILLED WITH SAND.

Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. Net safe bearing capacity of soil = 100 kN/m^2 at the founding level.
4. N value at founding level is 32.
5. Grade of concrete shall be C40 conforming to BS 5328 PART 1-1997.
6. Blocks should be made of C40 concrete.
7. Blocks are connected by cement mortar.
8. Type of cement shall be of Portland Cement confirming to BS12.
9. Minimum cement content is 320 - 330kg/m^3 conforming to BS 5328:1997.
10. 400mm precast concrete pipe should be used.
11. Proper maintenance should be carried out to prevent clogging.

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High water level	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

CD - Chart Datum
MSL - Mean Sea Level

FOR TENDER PURPOSE ONLY.

ORIGINAL SIZE:A3

SCALE 1:45

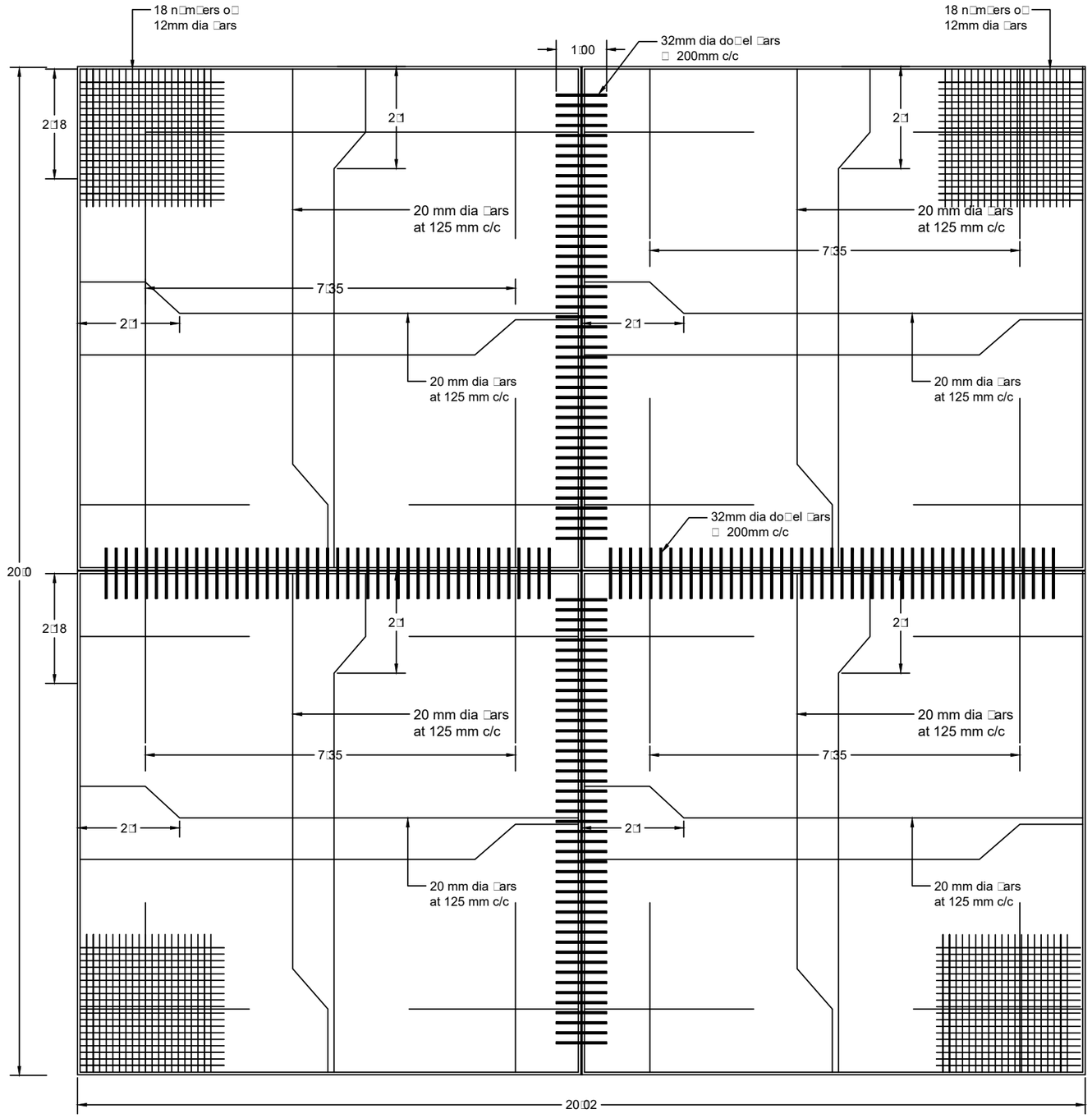
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 14:
SECTIONAL DETAILS OF SEPARATION WALL



REINFORCEMENT DETAILING OF RAMP FOR LOADING CARGO (TWO WAY SLAB FOR 20m □ 20m PLATFORM)

Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. Net safe bearing capacity of soil = 100 kN/m^2 at the founding level.
4. N value at founding level is 32.
5. Grade of concrete shall be C 40 conforming to BS 5328 PART 1-1997.
6. Type of cement shall be of Portland Cement confirming to BS12.
7. Minimum cement content is 320 - 330kg/m^3 conforming to BS 5328:1997
8. Grade of steel shall be of B500A conforming to BS 4449.
9. The depth of the slab is 0.3m.

CD - Chart Datum
MSL - Mean Sea Level

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High water level	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

ORIGINAL SIZE:A3

SCALE 1:100

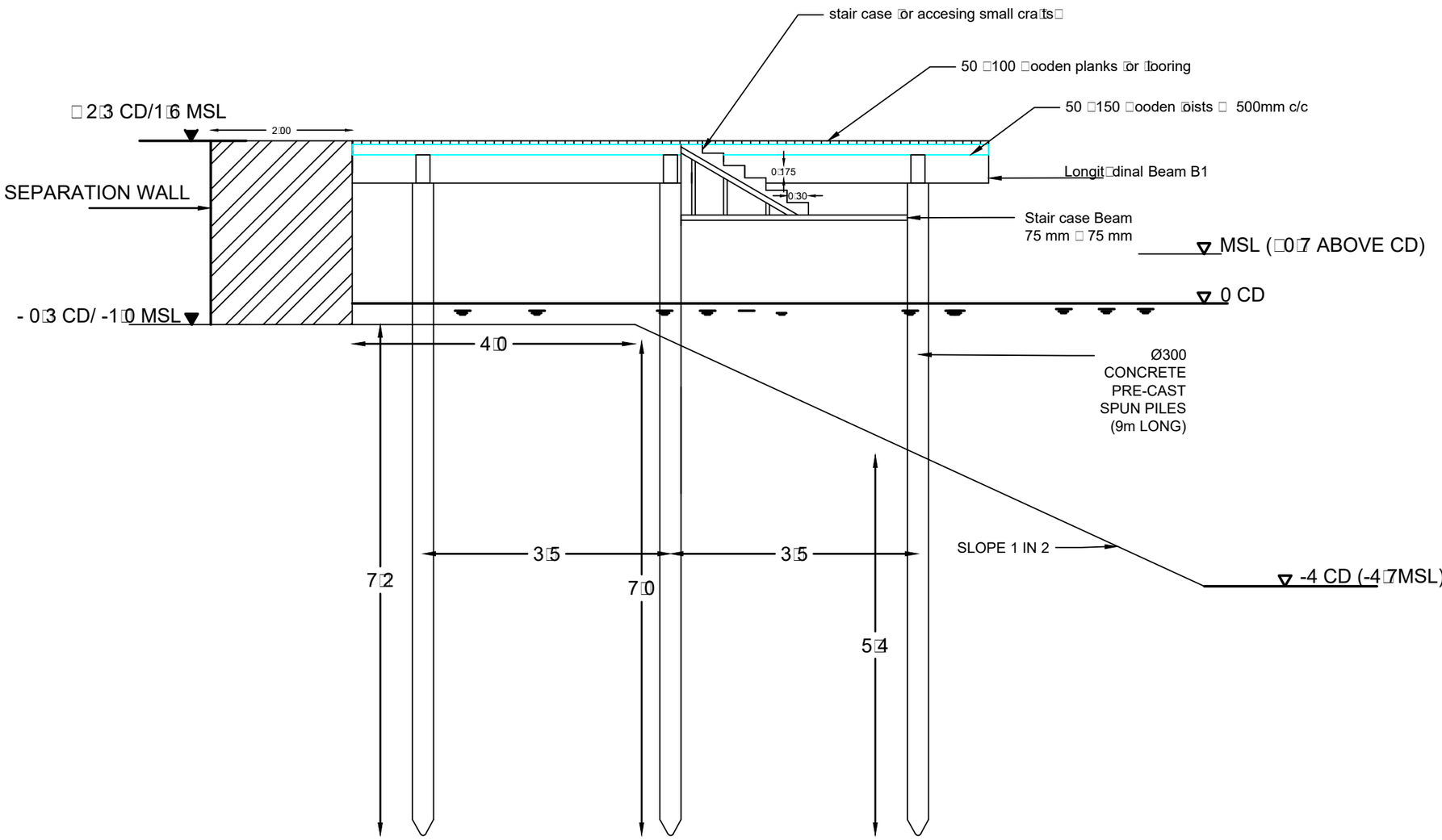
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 15:
RC DETAILING OF RAMP



CD - Chart Datum
MSL - Mean Sea Level

Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. Dredging should not be made much closer to pile location.
4. Founding level of pile must be 9m.
5. 7 number of timber jetty is placed at 15m center to center.
6. Staircase is made of timber planks with 7 steps.
7. Tread and rise are 0.3m and 0.175m respectively.
8. Precast spun piles of 300mm dia and 9m length are used
9. Stair case beams are made of timber 75mm x 75mm
10. Longitudinal and cross beams are made of concrete 250mm x 450mm @500mm c/c.
11. Southern Pine type of wood is preferred.
12. Piles are C40 pre-stressed concrete spun type.

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High Water Level	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

ORIGINAL SIZE:A3

SCALE 1:70

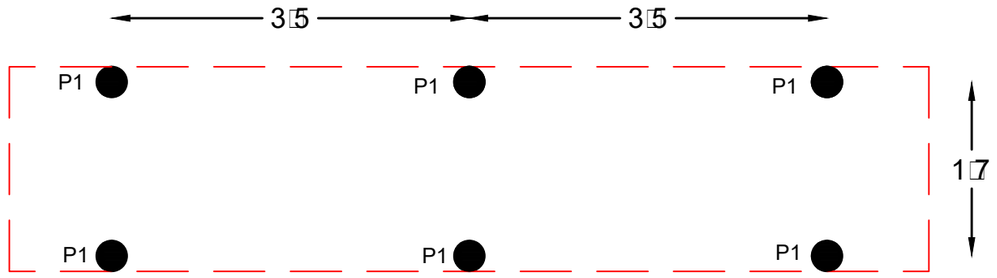
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

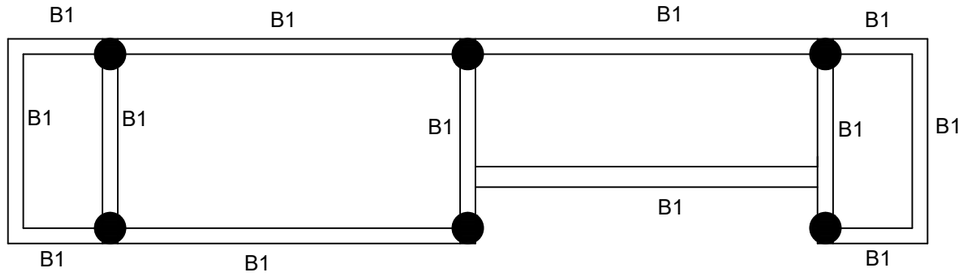
DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

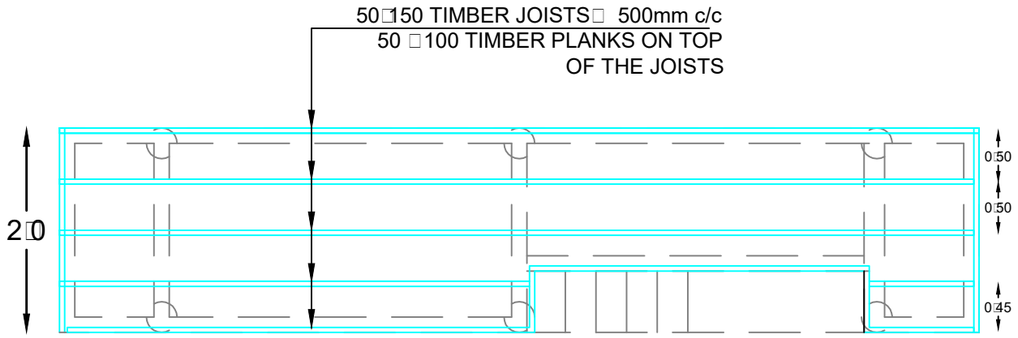
PLATE 16:
LONGITUDINAL SECTION OF TIMBER JETTY



FOUNDATION PLAN



BEAM PLAN



FLOOR STRUCTURE

CD - Chart Datum
MSL - Mean Sea Level

Notes:-

1. All dimensions are in meters.
2. This Plate should be read along with Plate 2.
3. Dredging should not be made much closer to pile location.
4. Founding level of pile must be 9m.
5. 7 number of timber jetty is placed at 15m center to center.
6. Staircase is made of timber planks with 7 steps.
7. Tread and rise are 0.3m and 0.175m respectively.
8. Precast spun piles of 300mm dia and 9m length are used
9. Stair case beams are made of timber 75mm x 75mm
10. Longitudinal and cross beams are made of concrete 250mm x 450mm @500mm c/c.

Tide Details:-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High Water Level	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

ORIGINAL SIZE:A3

SCALE 1:60

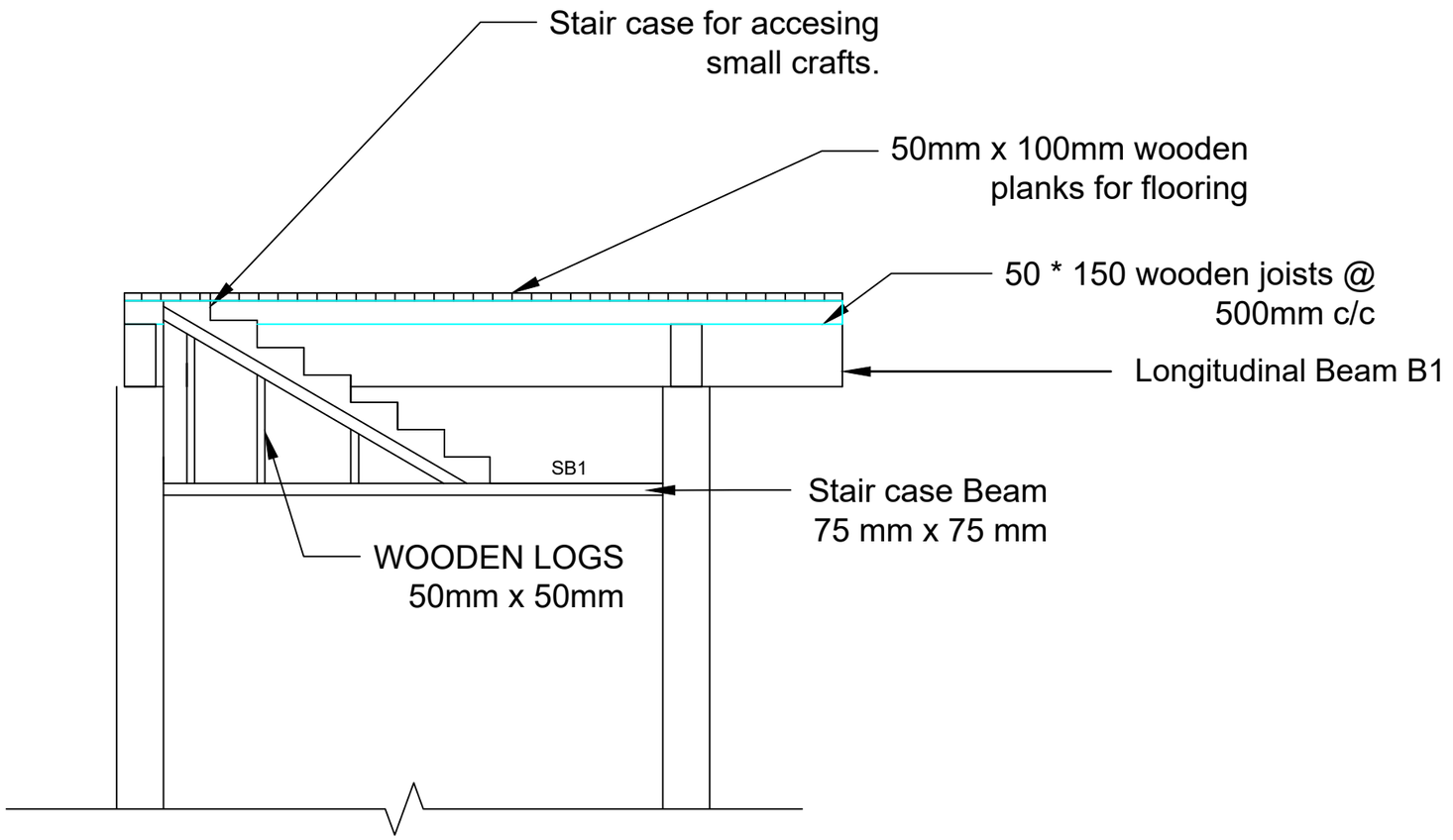
CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA

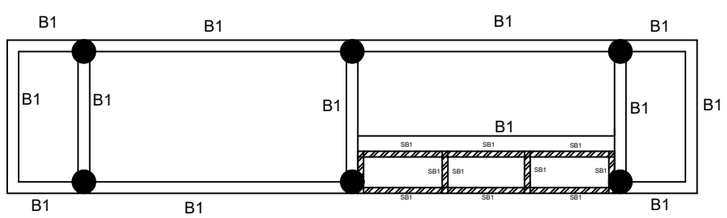
DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

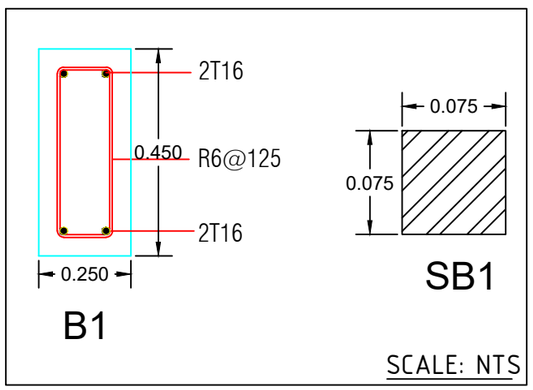
PLATE 17:
BEAM FLOOR AND FOUNDATION PLAN
OF TIMBER JETTY



STAIR CASE DETAILS
SCALE: NTS



STAIR CASE BEAM PLAN



SCALE: NTS

Notes:-

1. Dimensions as shown.
2. This Plate should be read along with Plate 2.
3. Dredging should not be done closer to pile location.
4. Founding level of pile must be 9m.
5. 7 number of timber jetty is placed at 15m center to center.
6. Staircase is made of timber planks with 7 steps.
7. Tread and rise are 0.3m and 0.175m respectively.
8. Precast spun piles of 300mm dia and 9m length are used
9. Stair case beams are made of timber 75mm x 75mm
10. Longitudinal and cross beams are made of concrete 250mm x 450mm @500mm c/c.

Tide Details (in 'm'):-

1. Highest Astronomical Tide	+1.25 MSL	+0.55 CD
2. Mean High High Water	+1.00 MSL	+0.30 CD
3. Mean Sea Level	+0.73 MSL	+0.00 CD
4. Mean Low Low Water	+0.30 MSL	-0.40 CD
5. Lowest Astronomical Tide	+0.00 MSL	-0.70 CD

CD - Chart Datum
MSL - Mean Sea Level

FOR TENDER PURPOSE ONLY

ORIGINAL SIZE:A3
SCALE 1:80

CLIENT: MINISTRY OF HOUSING AND INFRASTRUCTURE, MALDIVES

CONSULTANTS: WAPCOS LIMITED, INDIA
DEPARTMENT OF OCEAN ENGINEERING
IIT MADRAS, INDIA.

PROJECT:
KULHUDHUFFUSHI HARBOUR EXPANSION PROJECT

PLATE 18:
STAIR CASE DETAILS OF TIMBER JETTY