

HSCC (INDIA) LIMITED
(A Subsidiary of NBCC (India) Limited)
(A GOVERNMENT OF INDIA ENTERPRISE)

Dated: 05.12.2023

AMENDMENT No.- I

Project Name: Tender for “Construction of Tertiary Cancer Care Centre at Goa Medical College, Bambolim, Goa and their Maintenance during Defect Liability Period on Comprehensive Design, Engineering, Procurement and Construction (EPC) basis”

Tender No. HSCC/GMC/TCCC-GOA/EPC/2023/15, dated 24.11.2023

This has reference to subject work, the following Amendment may be noted, which shall be treated as a part of the contract to be uploaded along with tender/ bid:

(I). The Last date of submission & opening of bids has been extended as follows:

Last date to fill/upload the tender : **up to 15:00 hrs. on 21.12.2023**
through e-Tendering

Date of Opening of bids : on 21.12.2023 at 16:00 hrs.

(II). Reply to Pre-Bid Queries raised by bidders during pre -bid meeting held on 01.12.2023 at HSCC, Head Office, Noida

Sl. No.	Vol./ Cl. No. / Ref.	Bidder Queries / request	HSCC Reply / to be amended
1.	Vol.-I (NIT)- Cl. No. 2.0. Minimum Eligibility, A “Work Experience” Criteria: ii) (I)	We request hereby to accept any one work under the definition of the "Similar Work" & allow the other two works of similar nature except the condition of number of floors, to be eligible under the three similar works criteria. Moreover, we request you kindly consider 5 storey building instead of minimum five storeys including foundation & minimum one Basement.	No Change, Tender condition shall prevail.
2.	Vol.-I (NIT)- Cl.No. 2.0. Minimum Eligibility, A “Work Experience” Criteria: ii) (I)	We are a working contractor of HSCC and currently executing various Hospital projects for HSCC.	No Change, Tender condition shall prevail.

Sl. No.	Vol./ Cl. No. / Ref.	Bidder Queries / request	HSCC Reply / to be amended
		<p>Upon reviewing the work experience criteria as mentioned on page no. 3 of the tender document. We noted that the criteria are considerably restrictive and different compared to the standards set in earlier tenders for similar nature of projects issued by HSCC. We are enclosing herewith a few NITs of similar projects, issued by HSCC, for your kind reference. Due to this restrictive criterion as mentioned in the tender documents, we are unable to participate in the subject tender.</p> <p>Sir, we have been associated with your esteemed department since long and also, we are very keen to participate in this tender, therefore we request you that work experience criteria's may please be modified and be kept same as per earlier tenders issued/floated by HSCC for similar projects.</p> <p>We believe that aligning the work experience criteria with those set in earlier tenders for similar projects would promote fair competition and allow a broader range of qualified contractors, including ourselves, to participate effectively.</p>	
3.	General (Approvals)/BOQ	<p><u>Provisional Approvals:</u></p> <p>a) Have we received any provisional NOC for the project? As this tender was called in 2021.</p> <p>b) Whether the environmental file has been submitted or not, Kindly confirm the status of file.</p>	<p>No</p> <p>Yes, Environmental Clearance (EC) is under process through Third Party Consultant. However, all statutory approvals are to be taken by the successful bidders.</p>
4.		<p>Geotechnical Report: - Kindly provide us the geotechnical report it will be helpful to understand the ground conditions and strata on which construction has to be done</p>	<p>The Geotechnical Report is enclosed for reference only. However, the Geotechnical investigation, Hydraulic survey and other investigation(s) as required/desired is in the scope of the successful bidder.</p>
5.		<p>Waterproofing: - Considering as per whether condition in goa we require waterproofing kindly give clearance for new technology like membrane waterproofing, PU waterproofing etc.</p>	<p>Shall be as per tender conditions/ DBR</p>

Sl. No.	Vol./ Cl. No. / Ref.	Bidder Queries / request	HSCC Reply / to be amended
6.		Electrical load List. - We request you to provide the electrical load list for the project.	Electrical Load is as per DBR.
7.		BOQ Electrical: - Please confirm the rating of transformer as the DBR showing 3 Nos 1600 KVA (2W+IS) and as per drawing it is 2 Nos of 2500 kVA.	Rating of Transformer as per DBR and specification.
8.		BOQ Electrical: - Please confirm the rating of DG set as the DBR showing 3 Nos 750 KVA and as per drawing it is 2 Nos of 750 kVA and 1 Nos 250 kVA.	Rating of DG set as per DBR and specification.
9.		BOQ Electrical. Kindly Clarify, drawing it is showing the 1 Nos 180 kVA and 1 Nos 80 kVA while in the DBR it is 1 Nos 180 kVA and 25-30 Nos of 1kVA UPS.	Centralised UPS rating shall be as per DBR and specification and OT UPS shall be separate as per DBR/specification.
10.		BOQ Electrical. Lifts: - As per DBR the number of Lifts is not matching as per the drawing.	Lifts & dumb waiter sizes & numbers are correct as per Electrical DBR and the same will be complied in Arch. Drawings.
11.		BOQ HVAC. VRF System: - We request you to provide the area for which VRF system to be used.	As per DBR/contract.
12.		Clarification: - IF there is discrepancy in the technical specs, DBR and drawing then what will be Superseded?	Refer Clause no. 12 “Order of Precedence of Documents” of Vol.-III (SCC) of the tender document.
13.		Drawing Format: - We kindly request you to shear the AutoCAD Drawings.	Tender drawings in PDF are already available on HSCC e-tender portal.
14.		Final Fire NOC. Pl clarify regarding Final NOC required for this building or all project.	Fire NOC to be obtained for the complete scope of work by the successful bidder.
15.	Vol.-I (NIT)- Cl.No. 2.0. Minimum Eligibility, A “Work Experience” Criteria: ii) (I)	<p>We presume that in a project comprising LGF+UGF, 1st to 3rd floor, the lower Ground floor shall be considered as Basement to meet the criteria of Similar work.</p> <p>We request you to consider the experience of Basement & HVAC work executed in any one work out of Three Similar works shall be considered to meet the minimum eligibility criteria of Similar work.</p> <p>Kindly clarify.</p>	No Change, Tender condition shall prevail.

Sl. No.	Vol./ Cl. No. / Ref.	Bidder Queries / request	HSCC Reply / to be amended
16.	Vol.- I (NIT)- 19.0 q) on page 8 19.0 w) on Page 8 19.0 r) on Page 8	Kindly confirm whether bidder is required to upload only the amendment(s)/ addendum(s)/ Corrigendum(s)/pre-bid Clarification(s) and need not upload all Bid documents along with amendment(s)/ addendum(s)/ Corrigendum(s) Clarification(s) issued by you or.	Tender condition shall prevail.
17.	Vol.-II (GCC), Section -2 Annexure – IV on Page 22	<p>We would like to bring your kind notice that in the format for power of attorney does not provide space for filling the proposed project name. Therefore, the format needs to be modified as under;</p> <p>Know all men by these presents. We(Name of the Tenderer and address of y their registered office) do hereby constitute, appoint and authorize Mr / of Ms..... (name and residential address of Power of II Attorney holder) who is presently employed with us and holding the position of as our attorney, to do in our name and on our /behalf, all such acts, deeds and things necessary in connection with or incidental to our Bid for the Project i.e. _____ (Name of work) and submission of all documents and providing information / responses to *(HSCC) _____ representing us in all matters before (HSCC) _____ and generally dealing with *(HSCC) _____ in all matters in connection with our proposal for the said Project,</p> <p>Further we presume in the blank space marked as "*" bidder shall till the name of tender inviting Authority.</p>	Tender condition shall prevail.
18.	Vol.-II (GCC), Section -2 Form- G on Page 28	WORK EXPERIENCE CERTIFICATE - Generally, client has issue the completion certificate in their format at the time of project completion. They will not issue the separate completion for each tender. Therefore, we request you to allow us submit the completion certificates available with us containing all details requested in Form-G on page No. 28. Please Confirm	Tender condition shall prevail.
19.	Specs AC-Page 181 to 195	We presume that these technical details can to be submitted by successful bidder after award of work. Kindly confirm.	Yes, shall be per tender condition.

Sl. No.	Vol./ Cl. No. / Ref.	Bidder Queries / request	HSCC Reply / to be amended
20	B) on Page Specs- AC- Page -2	<p>Chiller Design Duty:</p> <p>The bidder shall submit printout of computerized selection of chillers duly stamped and signed by authorized representative of the chiller manufacturer along with the tender.</p> <p>We presume that these technical details can to be submitted by successful bidder after award of work. Kindly confirm.</p>	Yes, shall be per tender condition.
21.	on Page Specs- AC- Page -35	<p>Noise Control:</p> <p>Air Handling Units shall be selected for the lowest operating noise level of the equipment. Fan performance rating, power consumption, and sound power data with operating points clearly indicated shall be submitted by the tenders along with technical submittals for approval and verified at the time of testing and commissioning of the installation. The sound level within the AHU room shall be less than 60 dB at a distance of 1 meter from AHU</p> <p>We presume that these technical details can to be submitted by successful bidder after award of work. Kindly confirm.</p>	Yes, shall be per tender condition.
22.	IT Work : Firewall	<p>Authorization Original Manufacturer bidder after award Authorization Certificate to be submitted along with the bid.</p> <p>We reserve the right to reject in case deviation on the basis of technical compliance as submitted in the tender document</p> <p>We presume that these technical details can to be submitted by successful bidder after award of work. Kindly confirm.</p>	Yes, Authorization Certificate will be submitted by the successful bidder after award of work.
23.	Clause No. 5	<p>Instructions for online Bid submission: Submission of Bids, Clause No. 5:</p> <p>It is mentioned that "Bidders are requested to note that they should necessarily submit their financial bid in the format provided and no other format is acceptable." Bidders are required to download the BOQ file, open it and complete the white coloured cells with their respective financial quotes and other details.</p> <p>It is noted that above mentioned BOQ is not uploaded along with tender document. Please provide the same.</p>	Tender conditions shall prevail

Sl. No.	Vol./ Cl. No. / Ref.	Bidder Queries / request	HSCC Reply / to be amended
24.	Vol.-II (GCC)	Liquidated damages - Compensation for delay of work Maximum up to 10% of CV mentioned in the tender is somewhat on higher side. We request you to impose liquidated damages penalty up to 5% on balance work with respect to Mile stone.	Tender conditions shall prevail
25.	Vol.-II (GCC)	Mobilization advance -According to the clause, Mobilization advance will be paid in 3 equal instalments. Considering the nature of work and tight completion schedule. Contractor has to invest huge money for mobilising the site such as required plant and machinery, manpower etc. If the advance is paid in single instalments, it will help to the contractor to manage his cash flow smoothly. Hence, we request you to pay interest free 10% mobilisation advance in single instalment along with work order against the submission of bank guarantee.	Tender conditions shall prevail
26.	Vol.-II (GCC)	Machinery advance - We request you to pay 5% of contract value against the Bank Guarantee for smooth, progress of work and cash flow to enable us to deliver the project in time., interest free machinery advance along with Work Order.	Tender conditions shall prevail
27.		Defect Liability Period - We request you to change Defect Liability Period shall be one year instead of 2 years.	Tender conditions shall prevail
28.	Vol.-II (GCC)	Escalation - As per estimated cost given in tender major cost is Civil work, all other MEP related items, Labour rates are increasing day by day. As a matter of facts even the fuel prices are increase there will be impact on almost all the material as transport cost will go up. The stipulated construction period being of 20 months, operative part of contract execution will face two budgets. The rates of various input items such as Steel, Cement, aluminium, copper etc. are fluctuating day by day due to impact of global developments and Government policy, which are beyond anybody's prediction, estimation and control. We therefore earnestly request you to incorporate the Escalation clause to compensate the price fluctuations in labour index and other material to some extent.	Tender conditions shall prevail
29.	Vol.-II (GCC)	Water supply / Electrical supply We request you to provide the Water supply and Electrical connection at one point, this will reduce the time required for mobilisation of the same.	Tender conditions shall prevail

Sl. No.	Vol./ Cl. No. / Ref.	Bidder Queries / request	HSCC Reply / to be amended
30.		Contour Layout - We request you to furnish contour layout. We also presume that the site is clear from all the encumbrances and no need to take any approval/clearance from Forest Dept.	Tender conditions shall prevail
31.		New Taxes/increase in present taxes etc after award of work. We request you to reimburse new taxes / increase in present taxes if any enforced by Government/Semi GOVT/Local bodies after submission of the tender.	Tender conditions shall prevail
32.		Extra Item -We presume that the items which are not covered, shall be treated as extra item, and shall be paid as per the market rate of material labour equipment + 20% towards contractor overhead and profit + taxes.	Tender conditions shall prevail
33.		Mile Stone , we request you to allow contractor to submit the rescheduling of mile stone after award of work keeping overall completion period as per tender	Tender conditions shall prevail
34.		Land for Labour Camp & Temporary Structures We presume that land for labour camp, site offices, cement go down, stacking of materials, stores, batching plant, etc. shall be provided at free of cost up to defect liability period / maintenance period.	Shall be as per tender condition.
35.		Statutory Payment: -It is mentioned that the statutory payments or fees payable to Government / Local Body shall be reimbursed to the Contractor by HSCC. However, for E & M works all the statutory payments or fees payable to Government/local body / Electricity Board shall be paid by the Contractor and nothing extra shall be paid for same. In this context we request that since it is very difficult to work out payment charges of statutory fees for E&M work at the tender stage, the same shall be reimbursed to the contractor at actual on production of receipts/vouchers.	Tender conditions shall prevail
36.		Additional Points - Considering the voluminous work involved in the tender, we are studying tender document, specifications & drawings, we request you to kindly allow us to send additional queries, if any after Pre-bid meeting.	Tender conditions shall prevail
37.		Submission date Considering the voluminous works such as detailed soil investigation and surveys, preparation of structural design & drawings designing of Electromechanical services like Modula OT, MGMS, HVAC CSSD, PTS, UGT, OT, Lift, Kitchen & Laundry, Solar Hot Water System,	The Last date of submission & opening of bids has also been extended up to 15:00 hrs. on 21.12.2023.

Sl. No.	Vol./ Cl. No. / Ref.	Bidder Queries / request	HSCC Reply / to be amended
		Fire Fighting, PHE, STP, ETP, WTP Information Technology, Horticulture, Landscaping, Furniture, Signages, Substation, DG Set and External Development etc. and working out the quantities, preparation of Rate analysis, getting quotations from various specialized agencies for all MEP works. Therefore, we request you to extend the date of submission up to 20.01.2024, which will help us to submit most competitive tender. This will be in the best interest of the project and the client.	

- (III). The validity of Bid Security/ Earnest Money Deposit (EMD) to be submitted by the bidders with their bid in the form of Bank Guarantee (BG) shall be considered from the original due date of bid submission i.e., from 11.12.2023.
- (IV). SLD of Electrical Work mentioned in Tender drawings stands Deleted.
- (V). The ratio of the mortar mix to be used in the full brickwork masonry will be 1:6 (1 cement: 6 coarse sand), and for the half brick masonry, it will be 1: 4 (1 cement: 4 coarse sand). The half brickwork masonry will be also include providing and placing in position 2 Nos of 6mm dia. M.S. bars at every third course as per CPWD guidelines.

All other terms & Conditions of the Tender shall remain unchanged.

Prospective bidders are advised to regularly scan through HSCC e-tender portal <https://hsc.enivida.com> & HSCC website <http://www.hsccltd.co.in> as corrigendum/amendments etc., if any, will be notified on this portal only and separate advertisement will not be made for this.

(- Sd -)
GM (Engg.),
HSCC (India) Ltd.



Daftary Descon Engineering Pvt. Ltd.

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JOB NO G4.177: S.I. FOR PROPOSED MULTI STORIED BUILDING PROJECT AT GMC BAMBOLIM - GOA.

AUGUST'18

REPORT

SOIL INVESTIGATION FOR PROPOSED 7 STORIED BUILDING PROJECT (TERTIARY CANCER CARE CENTRE) IN PLOT BEARING SURVEY NO. 49 AT GMC BAMBOLIM - GOA.

CLIENT

GOA STATE INFRASTRUCTURE DEVELOPMENT
CORPORATION LTD.

1ST FLOOR, SPACES BUILDING,
PATTO CENTRE, PANJIM, GOA.

CONSULTANT

FRISCHMANN PRABHU (INDIA) PRIVATE LIMITED,
204/4/2 PACKLE COLONY, ALTO SANTA CRUZ,
TISWADI, GOA 403202



Daftary Descon Engineering Pvt. Ltd.

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JOB NO.G4.377: S.I. FOR PROPOSED MULTI STORIED BUILDING PROJECT AT GMC BAMBOLIM - GOA.

AUGUST'18

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REPORT

1. SCOPE OF WORK

Goa State Infrastructure Development Corporation (GSIDC) proposes to construct a 7 – Story Building designated as Tertiary Cancer Care centre at GMC, Bambolim, Goa. Frischmann Prabhu (India) Private limited; are the Project Management Consultant (PMC) for the same. Hence, it was decided to do the soil investigation in Plot bearing Survey No. 49 – Bambolim Village belonging to the Dean, Goa medical College & Hospital Bambolim, Goa to know the founding strata for designing foundations.

The soil investigation required 2 boreholes (20m depth and 30.00m depth) at the building location including sampling, conducting all the necessary field and laboratory tests, submitting a comprehensive engineering report along with recommendations for the type of foundations and safe bearing capacity.

The general site location plan is placed in fig No.1.

2. DRILLING AND FIELD TESTS

Drilling was done by power operated rotary drilling rig with tungsten carbide / diamond bits. Depths of boreholes were about 20-30m below existing GL. Water was circulated by pressure pump. HX / NX / BX size casing was used in the drilled hole to prevent collapse.

Standard penetration tests were conducted at regular intervals. Soil samples from the split spoon sampler were collected in plastic bags as representative disturbed samples for visual classification.

Site layout plan showing borehole locations is placed in Fig no. 2

Borehole log in standard proforma giving stratas metwith, samples collected, SPT-N values, etc. are placed in Fig No. 3 to 4.

Standard penetration test results in a standard tabular proforma are placed at Fig. No. 5.

Samples were tested in our soil laboratory at Panaji, Goa.

3. LABORATORY TESTS

Laboratory tests were conducted on the samples collected depending upon the nature of the soil. These include Sieve Analysis, Specific Gravity, Box Shear (Consolidated quick) and their results are placed at Fig.No.6. In addition to this chemical test were done on two water sample and the results are placed at Fig No. 8.



4. SOIL STRATA

The soil strata as revealed by the 2 boreholes BH1 to BH2 drilled shows the following sequences of stratas metwith:

- a) Reddish brownish very stiff laterite clayey silt with gravels. The thickness of this strata is varying from 4.0m (BH1) to 3.0m (BH2). SPT-N is > 50. This strata is met at surface for both boreholes.
- b) Reddish brownish boulder (rocky) laterite. The thickness of this strata is varying from 8.0m (BH1) to 10.0m (BH2). SPT-N is varying from 28 to 50. The depth from G.L at which this strata is met are 4.50m and 3.50m for BH1 and BH2 respectively
- c) Reddish brownish gravely (boulder) laterite with very stiff clayey silt with a pocket of yellowish brownish laterite clayey silt with occasional gravels. (Occasional gravels obtained between 10.5m - 11.50m depth). This strata is metwith in BH1 at a depth of 13.00m from G.L and having thickness of 4.0m and SPT-N is > 50. The same strata is met in BH2 at a depth of 18.00m having thickness as 3.00m and SPT-N varying from 31-21.
- d) Reddish brownish pinkish very stiff lateritic clayey silt with gravels is met in BH2 at a depth of 13.50m below G.L and having thickness of 1.50m. SPT-N is 40 - 29.
- e) **Pinkish grayish very stiff phyllitic clayey silt (Highly weathered variegated phyllite)**. This strata is metwith in BH2 at depth of 21.50m from G.L. The strata thickness in BH2 is not known due to termination of BH2 in this strata. SPT-N is > 50.



5. FOUNDATION RECOMMENDATION

Considering strata, type of structure, SPT-N and shear parameters the following types of foundation can be considered:-

1. Open Foundation
2. Raft Foundation

5.1 Safe Bearing Capacity:

- a) The strata metwith is bouldery laterite.
- b) Safe Bearing Capacity is worked out based on shear parameters and SPT-N values, which is as under:-

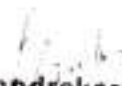
Depth below G.L (m)	Safe Bearing Capacity (MT/sqm)	
	Open	Raft
2.00	25	27
2.50	27	30
3.00	29	32

- c) Width of foundation is assumed to be 2.00m.
- d) For open foundation settlements maybe upto 25mm and differential settlement upto 20mm.
- e) For raft foundation settlements maybe upto 40mm and differential settlement upto 25mm.

For Daftary Descon Engg. Pvt. Ltd.


Aviraj Naik
Geotechnical Engineer

For Daftary Descon Engg. Pvt. Ltd.


R L Mandrekar
Senior Design Consultant



Daftary Descon Engineering Pvt. Ltd.

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JOB NO.G4 377: S.I. FOR PROPOSED MULTI STORIED BUILDING PROJECT AT GMC BAMBOLIM - GOA.

AUGUST'18

ANNEXURES



Daftary Descon Engineering Pvt. Ltd.

VELHO'S BUILDING, 2nd FLOOR
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AUGUST'18

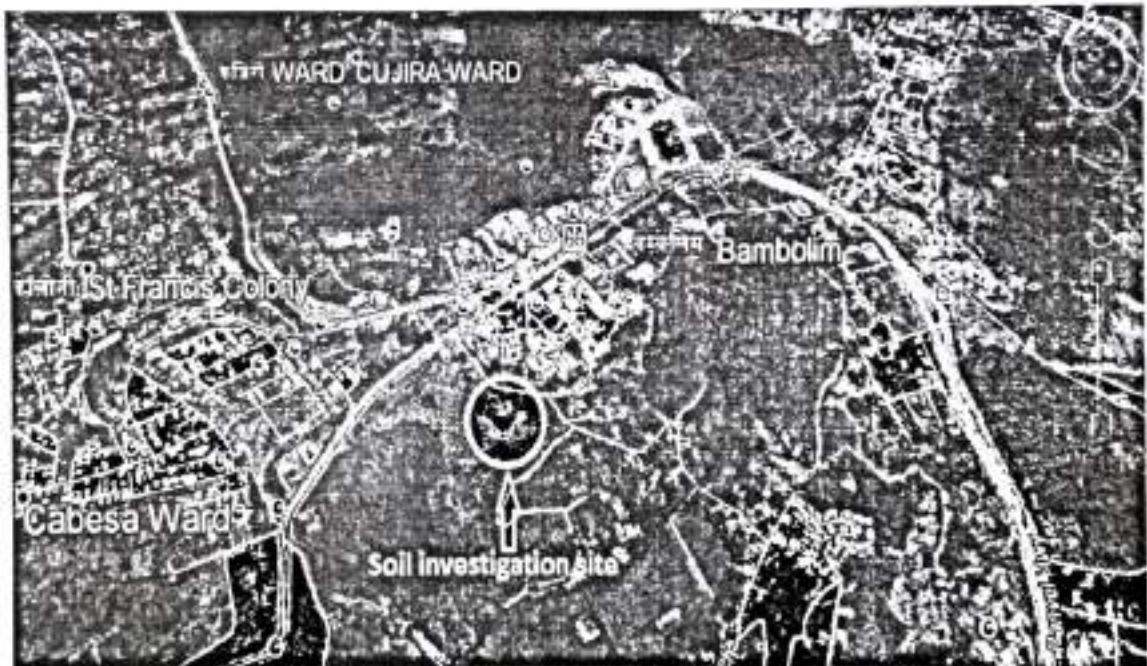


FIG NO. 1: GENERAL SITE LOCATION PLAN (NTS)

Regd. Office: Unique House, 2nd Floor, 25, S.A. Brelvi Road, Fort, Mumbai 400001.
Tel.: (022) 22663415 Fax: (o22) 22660284 Email : agdaftary@gmail.com

JOB NO.G4 377: S.I. FOR PROPOSED MULTI STORIED BLDG PROJECT AT GMC BAMBOLIM - GOA

AUGUST 11

FIG NO. 3: BOREHOLE LOG NO.1

Date Of Start : 24/08/2018 Rotary Drilling : TC
Date Of Completion : 04/08/2018 Dia. Of Casing : 100mm / NX
Borehole Coords : Refer site layout plan Dia. Of Core : NX
Ground level : --

Profile	Depth below GL (m)	Description	SPT N	Samples			Remarks		
				No.	Type	Depth (m)			
						From		To	
		Reddish brownish very stiff lateritic clayey silt with gravels.	>50	1	DP	1.00	1.45		
				2	CB	1.45	2.05		
	2.50		>50	3	DW	2.05	2.20	Hard to Penetrate	
				4	CB	2.10	3.00		
			>50	5	DP	3.00	3.07		
				6	CB	3.07	4.02		
			>50	7	DP	4.02	4.10	Hard to Penetrate	
	5.00	Redish brownish bouldery (Rocky) laterite	>50	8	CB	4.10	5.00		
				9	DP	5.00	5.13	Hard to Penetrate	
			>50	10	DP	6.05	6.10	Hard to Penetrate	
				11	CB	6.10	7.50		
	7.50		>50	12	DP	7.50	7.70		
				13	CB	7.70	9.02		
			>50	14	DP	9.02	9.10	Hard to Penetrate	
	10.00			15-16	CB	9.10	10.50		
			28	17	DP	10.50	10.95		
				18	UD	11.50	11.70		
			>50	19	DP	12.00	12.10	Hard to Penetrate	
	12.50								
		Reddish brownish gravelly (bouldery) laterite with very stiff clayey silt with a pocket of yellowish	44	20	DP	13.55	14.00		
	15.00	brownish lateritic clayey silt with occasional gravels 10.5m - 11.50m	>50	21	DP	15.05	15.13		
		BOREHOLE DEPTH BELOW EXISTING GL							

LEGEND

DP : Sample From SPT Tube
DW : Wash Sample

UD : Undisturbed Sample
CB : Core Barrel Sample

JOB NO.G4.377: S.I FOR PROPOSED MULTI STORIED BLDG PROJECT AT GMC BAMBOLIM - GOA

AUGUST'18

FIG NO. 3: BOREHOLE LOG NO. 01 CONTINUED

Date Of Start :
Date Of Completion :
Borehole Coords :
Ground level :
Rotary Drilling : TC
Dia. Of Casing : 100mm / NX
Dia. Of Core : NX
Refer site layout plan

Profile	Depth below GL (m)	Description	SPT N	Samples			Remarks	
				No.	Type	Depth (m)		
						From		To
		Redish brownish gravels (bouldery) laterite with very Stiff clayey sit.	>50	22	UD	16.05	16.30	
				23	DP	16.50	16.73	
	17.5		>50	24	DP	18.00	18.23	
	20.00		35	25	DP	19.64	20.09	
	22.5							
	25.00							
	27.5							
	30.00							
BOREHOLE DEPTH BELOW EXISTING GL = 20.09M								

LEGEND

DP : Sample From SPT Tube
DW : Wash Sample

UD : Undisturbed Sample
CB : Core Barrel Sample

JOB NO.G4.377: S.I. FOR PROPOSED MULTI STORIED BLDG PROJECT AT GMC BAMBOLIM - GOA

AUGUST'18

FIG NO. 4: BOREHOLE LOG NO.2

Date Of Start : 11/06/2018
Date Of Completion : 19/06/2018
Borehole Coords : Refer site layout plan
Ground level : ---

Rotary Drilling : TC
Dia. Of Casing : 100mm / NX
Dia. Of Core : NX

Profile	Depth below GL (m)	Description	SPT N	Samples			Remarks	
				No.	Type	Depth (m)		
						From		To
		Redish brownish very stiff lateritic clayey silt with gravels.	>50	1	DP	1.02	1.22	
				2-5	CB	1.22	2.03	
	2.50		>50	6	DP	2.03	2.08	Hard to penetrate
				7	CB	2.08	3.03	
			>50	8	DP	3.03	3.11	
		Redish brownish hard bouldery. (Rocky) laterite		9	CB	3.11	4.02	
	5.00		>50	10	DP	4.02	4.12	
				11	CB	4.12	5.02	
			>50	12	DP	5.02	5.12	
				13	CB	5.12	6.12	
			>50	14	DP	6.05	6.14	
	7.50			15	CB	6.14	7.55	
			>50	16	DW	7.55	7.60	
				17	CB	7.60	9.05	
			>50	18	DP	9.05	9.27	
	10.00			19	CB	9.27	10.52	
			>50	20	DP	10.52	10.76	
				21	CB	10.76	12.03	
			>50	22	DP	12.03	12.13	
	12.50			23	CB	12.13	13.54	
			40	24	DP	13.54	13.99	
		Redish brownish pinkish very stiff lateritic clayey silt with gravels.		25	UD	14.05	14.25	
	15.00		29	26	DP	15.00	15.45	
BOREHOLE DEPTH BELOW EXISTING GL								

LEGEND

DP : Sample From SPT Tube
DW : Wash Sample

UD : Undisturbed Sample
CB : Core Barrel Sample

FIG NO. 4: BOREHOLE LOG NO.2 CONTINUED

Date Of Start :
Date Of Completion :
Borehole Coords :
Ground level :
Rotary Drilling : TC
Dia. Of Casing : 100mm / NX
Dia. Of Core : NX
Refer site layout plan

Profile	Depth below GL (m)	Description	SPT N	Samples			Remarks	
				No.	Type	Depth (m)		
						From		To
17.5		Redish brownish very stiff lateritic clayey silt with gravels.	28	27	DP	16.55	17.00	
			31	28	DP	18.03	18.48	
20.00		Redish brownish yellowish very stiff lateritic clayey silt with occasional gravels.	21	29	UD	19.00	19.35	
			>50	30	DP	19.52	19.97	
22.5		Pinkish grayish very stiff phyllitic clayey silt (Highly weathered variegated phyllite.)	>50	31	DP	21.05	21.50	
			>50	32	DP	22.50	22.95	
			>50	33	DP	24.02	24.47	
25.00			>50	34	DW	25.50	25.95	SPT Sample Slipped.
			>50	35	DP	27.00	27.45	
27.5			>50	36	DP	28.55	29.00	
				37	CB	29.00	30.06	
30.00								
BOREHOLE DEPTH BELOW EXISTING GL = 30.06M								

LEGEND

DP : Sample From SPT Tube
DW : Wash Sample
UD : Undisturbed Sample
CB : Core Barrel Sample

FIG NO. 5 : STANDARD PENETRATION TEST RESULTS

SR. NO.	BH. NO.	DEPTH (M) BELOW BL		PENETRATION (CM)	CORRESPONDING NO. OF BLOWS	SPT N	REMARKS
		FROM	TO				
1	1	1.00	1.45	15	12		
				15	33		
				15	38		
2	1	2.05	2.20	15	50	>50	
						>50	RF 7 th B
3	1	3.00	3.07	07	50	>50	RF 4 th B
4	1	4.02	4.10	08	50	>50	
5	1	5.00	5.13	13	50	>50	
6	1	6.05	6.10	05	50	>50	
7	1	7.50	7.70	15	35		
				05	50	>50	
8	1	9.02	9.10	8	50	>50	RF 12 th B
9	1	10.50	10.95	15	12		
				15	13		
				15	15		
10	1	12.00	12.10	10	50	28	
						>50	
11	1	13.55	14.00	15	14		
				15	19		
				15	25		
				08	50	44	
12	1	15.05	15.13			>50	RF 12 th B
13	1	16.50	16.73	15	40		
				08	50	>50	RF 15 th B
14	1	18.00	18.23	15	35		
				08	50	>50	RF 15 th B

RF- Rebond From - Blows

FIG NO. 5 : STANDARD PENETRATION TEST RESULTS

SR. NO.	BH. NO.	DEPTH (M) BELOW BL		PENETRATION (CM)	CORRESPONDING NO. OF BLOWS	SPT N	REMARKS
		FROM	TO				
15	2	19.64	20.09	15	31		
				15	18		
				15	17	35	
16	2	1.02	1.22	15	16		
				05	50	>50	RF 2 nd B
17	2	2.03	2.08	05	50	>50	RF 5 th B
18	2	3.03	3.11	08	50	>50	RF 7 th B
19	2	4.02	4.12	10	50	>50	RF 15 th B
20	2	5.02	5.12	10	50	>50	RF 13 th B
21	2	6.05	6.14	09	50	>50	RF 6 th B
22	2	7.55	7.60	05	50	>50	RF 10 th B
23	2	9.05	9.27	15	40		
				07	50	>50	RF 2 nd B
24	2	10.52	10.76	15	28		
				09	50	>50	RF 15 th B
25	2	12.03	12.13	10	50	>50	RF 16 th B
26	2	13.54	13.99	15	15		
				15	15		
				15	25	40	
27	2	15.00	15.45	15	15		
				15	12		
				15	17	29	
28	2	16.55	17.00	15	11		
				15	13		
				15	15	28	

RF- Rebond From - Blows

FIG NO. 5 : STANDARD PENETRATION TEST RESULTS

SR. NO.	BH. NO.	DEPTH (M) BELOW BL		PENETRATION (CM)	CORRESPONDING NO. OF BLOWS	SPT N	REMARKS
		FROM	TO				
29	2	18.03	18.48	15	08		
				15	13		
				15	18		
30	2	19.52	19.97	15	08	31	
				15	10		
				15	11		
31	2	21.05	21.50	15	13	21	
				15	16		
				15	16		
32	2	22.50	22.95	15	10	32	
				15	21		
				15	30		
33	2	24.02	24.47	15	13	>50	
				15	30		
				15	35		
34	2	25.50	25.95	15	18	>50	
				15	24		
				15	34		
35	2	27.00	27.45	15	15	>50	
				15	26		
				15	35		
36	2	28.55	29.00	15	14	>50	
					27		
					36		
37						>50	
38							
39							
40							
41							

RF- Rebond From - Blows

FIG. NO. 6. TABLE OF LABORATORY TEST RESULTS

Sr. Borehole No	Depth		Field density & moisture content			Atterberg Limits			Mechanical analysis				Box shear (consolidated)		Unconfined compression		Consolidation		
	From	To	Bulk density	Dry density	Moisture content	LL	P.L	P.I	Gravel above	Sand	Silt	Clay	Specific gravity	C _u	C _c	q _u	Pressure range	Coeff. of compressibility	
	m	m	gm/cc	gm/cc	%	%	%	%	4.75mm	0.075mm to 4.75mm	0.075mm	below 0.075mm		kg/cm ²	kg/cm ²	kg/cm ²	kg/cm ²	cm ² /kg	
1	11.50	11.70	2.22	1.71	23.11	54.00	35.95	18.05	20.00	45.00	35.00	Combined	2.72	5250	25	15550	--	--	--
2	15.05	16.30	2.20	1.76	24.69	51.00	33.89	17.11	15.00	45.00	40.00	2.61	0	0	32	32010	--	--	--
3	14.05	14.25	2.20	1.74	26.25	48.00	33.11	14.89	24.00	56.00	20.00	2.52	0	0	32	6660	--	--	--
4	15	16.16	2.20	1.74	26.75	--	--	--	31.00	27.00	40.00	2.37	2000	20	7150	--	--	--	--



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JOB NO.G4.177: S.I. FOR PROPOSED MULTI STORED BLDG PROJECT AT GMC BAMBOLIM - GOA

AUGUST'18

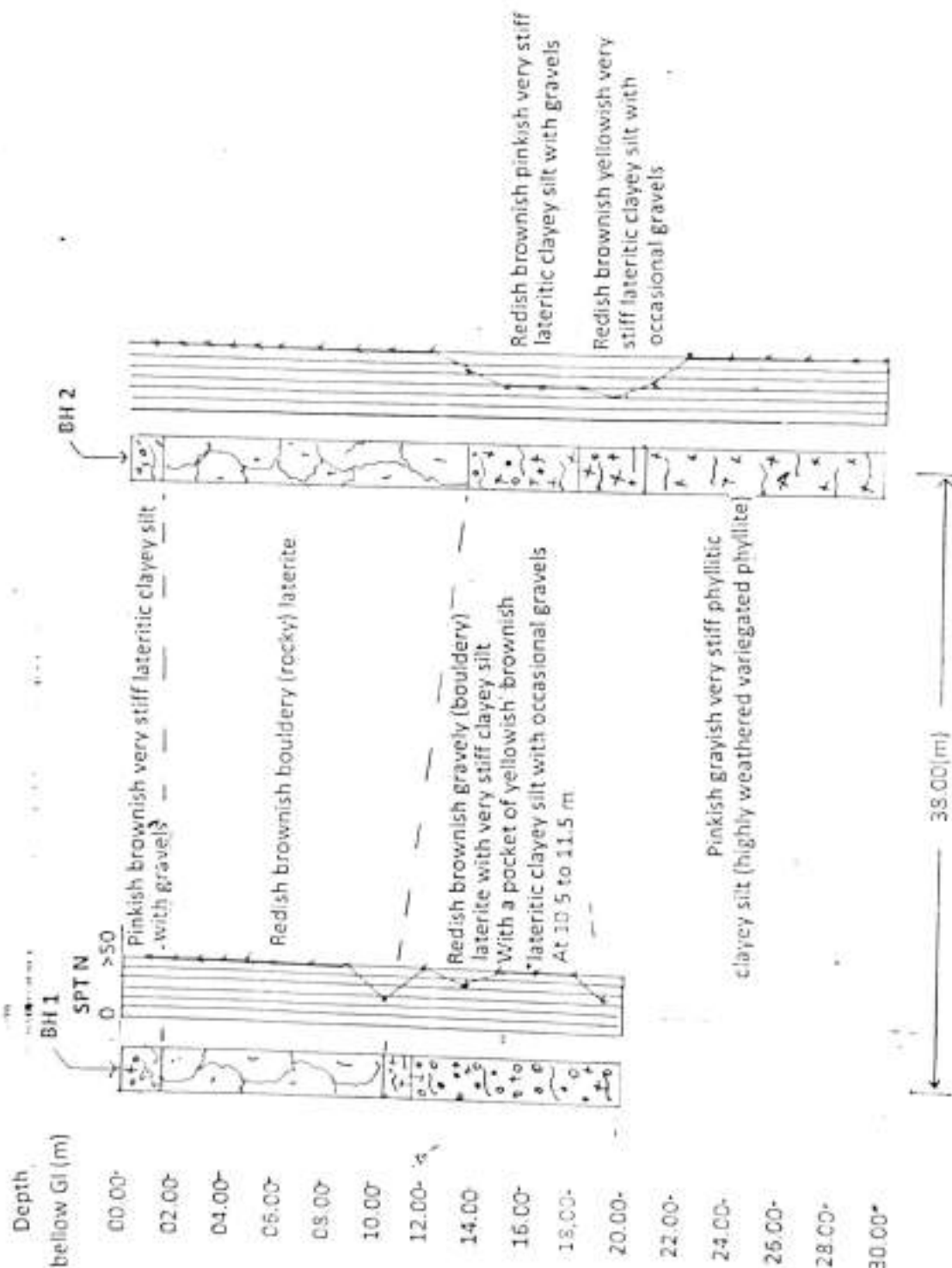


FIG NO. 7 : SOIL PROFILE ALONG BH1-BH2 (NTS)

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(A) CHEMICAL ANALYSIS RESULTS OF WATER SAMPLE

Sr. No.	BH No.	Sample No.	Depth below GL (m)	Chemical analysis results		
				pH	Chloride as Cl (mg/l)	Sulphate as SO ₄ (mg/l)
1	1	1	10.30	5.4	17.8	6.0
2	2	1	12.40	5.1	17.2	5.9

FIG. NO.: 8 CHEMICAL ANALYSIS RESULTS OF SOIL & WATER SAMPLE

