ASSAM ELECTRICITY GRID CORPORATION LIMITED
OFFICE OF THE MANAGING DIRECTOR
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CORRIGENDUM-VII

BID IDENTIFICATION NO: AEGCL/MD/TECH-1219/Thermal-Assam/2026/ BID Dated 23.08.2026
IFB No. : AEGCL/MD/TECH-1219/Thermal-Assam/2026/ IFB Dated 23.08.2026
NIT No. : AEGCL/MD/TECH-1219/Thermal-Assam/2026/ NIT Dated 23.08.2026
TENDER DETAILS/NAME OF WORK: "Implementation of Transmission Infrastructure to evacuate 3200MW thermal power from upcoming Generating Station at Chapor"

Part I: Turnkey construction of 400kV Chapor-I-Rangia Double Circuit Quad Moose Transmission Line with Associated 400kV bays and Reactor Works.

Part II: Turnkey Construction of 400/220kV Agia Substation with associated 400kV Chapor-II-Agia Transmission Line, including Bay Extension and Reactor Works

With reference to the above, please find herewith the replies and supporting documents against the queries received from the different bidders as enclosed at Table No:1

All other terms and conditions of the bid document shall remain same.

Sd/-

Chief General Manager (PP&D)
Assam Electricity Grid Corporation Limited

Memo No:AEGCL/MD/TECH-1219/Thermal-Assam/Tender/2026/ Part-1/2/32 Date: . 16.10..2026

Copy to:

1. IT Cell, O/o the MD, AEGCL, for publication of the corrigendum in AEGCL's Website

Sd/-

Chief General Manager (PP&D)

Table-1			
Name of Work: Implementation of transmission infrastructure to evacuate 3200 MW thermal power from upcoming generation station at Chapar.			
Serial Number	**Clause No./Drawing No./Description**	**Query**	**Reply**
1	GENERAL (VALIDITY OF TYPE TEST REPORT) -	We propose to offer Type tested euipment with type test validity as per CEA latest guidelines. Please confirm the acceptance	Confirmed
2	Reactor Type Tests BID Vol-II	Kindly confirm whether type test reports from the same manufacturing plant conducted within the last five years from NOA are mandatory.	As per Bid
3	Transformer specification -	The offered transformer should comply the requirement of similarity clause specified in IS 2026 (PART 5) / IEC 60076-5 with respect to short circuit tested transformer. Please confirm.	Confirmed
4	Scope/BPS -	We understand that in case of any discrepency between tender provided drawings / specifications/ section project and price schedule, the price schedule shall govern. Please confirm.	As per BoQ
5	Insulators BOQ1- 02	We are considering polymer insulator instead of disc insulator. Please comfirm.	As per BoQ
6	Control & Power Cable Control & Power Cable	Control & Power Cabling: Kindly Confirm the below Points:	During detail engineering
		i) Isolator, CT & CVT cabling will be provided in PVC pipe. No provision of RCC trench is envisaged. PVC pipes will be connected to nearest cable trench.	
		ii) We are not considering any cable tray for indoor / outdoor cable laying.	
		iii) Power & Control cables in switchyard shall be laid on cable support angles.	
		iv) Trench for present scope bays are exisitng. enough space is available in the same and cables shall be laid in the same trench.	
		v) We are not considere any HDPE pipe for cable laying.	
7	Clause 2.6.14 & Chapter 7	400 kV fault level is specified as 63 kA for 3 seconds in Clause 2.6.14, whereas Chapter 7 mentions 63 kA for 1 second. Kindly confirm the excat requirement for fault current for all voltage level.	63kA for 3 seconds
8	General Land Acquisition for Proposed 400/220kV Agia Substation	It is understood that the proposed land is already occupied by the client and encumbrance free land will be provided to the bidder. Please confirm.	yes
9	General Land Development for Proposed 400/220kV Agia Substation	Request you to share the contour of the proposed land along with the FGL to be considered for computing land development works.	Under EPC scope during detailed engineering

10	General FFL, plinth & road levels	Please provide FFL, plinth & road levels for our design engineering works.	Under EPC scope during detailed engineering

11	General Cutting of Trees in the proposed 400/220kV Agia Substation	It is understood that that the proposed land for sub stations does not consist of any trees. If the land consists of trees which are to be cut down, the required approvals/permissions and associated charges related will be borne by the client. Please confirm.	Confirmed
12	General Reference Standard Civil & Structure drawings for Tower/Gantry/LM/Equipments/Transformer/Reactor/DG Set	Request you to kindly share the civil & structure drawings for Tower/Gantry/LM/Equipments/Transformer/Reactor/DG Set for our reference and better understanding.	Under design scope of EPC
13	BoQ4 Sr no 12.01, 12.02, 12.03, and 12.04	Please confirm & clarify the following: 1) Whether the cable trench sections would be cast in situ type or Pre Cast Type ? 2) Longitudinal slope of 1:500 shall be maintained in the trenches. Please suggest if pre cast trench is adopted then whether precast trench will be laid in sloped PCC bed or whether section height will be increased and slope will be maintained by screeding.	As per Bid
14	General Drainage Requirement	Request you to kindly provide historical rainfall data and flood data for any drainage requirement (if) outside substation boundary. Also, Please confirm the outfall point where the storm water drain would be connected.	Under EPC scope during detailed engineering
15	General Civil Drawings	Kindly share the standard civil drawings of 500mva Power Transformer Foundation with Soak Pit on Pile Foundation, 80MVAR Bus Reactor Foundation with Soak pit on Pile Foundation, Common Burnt Oil Pit, Fire Protection Wall for Transformer and Reactor, Station Transformer Foundation, Main Gate and Switchyard Gate for our understanding and estimation purpose.	Under design scope of EPC and please refer corrigendum and revised BoQ issued earlier.
16	BoQ4 Sr no 12.10&12.11-RCC Box culvert	Kindly share the standard civil drawings of RCC Box culvert.	Under design scope of EPC
17	General Basic Site Information	Please furnish the following details for the Existing Substation:- 1. FGL of the proposed substation. 2. Soil investigation report. 3. High Flood Level. 4. Contour map. 5. Coordinates 6. Soil Bearing Capacity	Soil investigation report and soil bearing capacity is provided. FGL, HFL, Contour, Coordinates are under EPC scope during detailed engineering

18	General Space for Extension Work	We understand the adequate and encumbrance free land will be provided to the bidder for the bay extension work.	Confirmed
19	General Cutting of Trees in the exisitng 400kV Rangia Substation	It is understood that that the existing land for sub stations does not consist of any trees. If the land consists of trees which are to be cut down, the required approvals/permissions and associated charges related will be borne by the client. Please confirm.	Confirmed
20	General Drainage Requirement	Please confirm whether the newly constructed drains will be connected to the existing drainage system and that no new outfall point is proposed under the scope of work.	Under EPC scope during detailed engineering and outfall point to be decided during execution
21	BoQ BoQ13; Sr no 12	In accordance with the BoQ 13, Please confirm that bidder is not envisage for any other civil work except Concreting work in Extension of 400kV Rangia Substation.	Refer to the revised BOQ
22	General Reference Exisitng/Standard Civil & Structure drawings for Tower/Gantry/LM/Equipments	Request you to kindly share the civil & structure drawings for Tower/Gantry/LM/Equipments for our reference and better understanding.	Under design scope of EPC
23	BOQ_84456 Dismantling & Demolishing works	Kindly confirm that the scope includes only the dismantling of the RCC foundation and Brick Drain only. Any dismantling work beyond this will not be considered by us. Furthermore, please provide the designated disposal location for the dismantled debris.	As per Bid and as per corrigendum issued earlier.
24	Hard Rock Bid_Volume_II; Chapter 5; Cl no. 5.7-m	If the Hard Rock available in area, then Blasting may required and necessary approvals/permissions and the associated official charges will be borne by the Client. If the charges are to be borne by the bidder then the said charges will be reimbursed on submission of proofs for the same. Please confirm.	As per Bid and under EPC scope
25	General Dismantling & Demolishing works	We do not envisage any dismantling or demolition works at any of the substation. If any such work required, we request you to kindly provide a revised BOQ including the additional items related to this scope, along with details of the disposal point.	As per Bid and included in site clearance

26	General BOQ_84456	We understand that the quantity mentioned in "BOQ_84456" is tentative and for any changes in quantity or additional items during detailed engineering/execution, Bidder may ask for quantity amendment. Please confirm.	Confirmed
27	General Use of Alternate Constructional Material (M sand, Crush Sand, Stone Dust, PPC etc.)	Please confirm the usage of alternate construction materials like (M sand, Stone Dust, PPC etc.) due to location/availability/government orders constraints.	Only river sand shall be allowed
		Also, Please confirm that we can use M sand, Stone Dust, Crush Sand etc. over river sand for following construction works:	
		i. Concrete works	
		ii. Plastering and masonry	
		iii Any other specific applications as per project requirements	
28	General Stautory Clerances/Permission/Approvals/ ROW	The Bidder understands that any sort of statutory clearances/permissions/approvals activities w.r.t. a) Forest Clearances and Tree Cutting (as applicable) b) Right of Way c) Railway Clearance /Road Crossings/Bridge Crossings (if applicable) d) Unauthorized Construction e) Any civic authorities e) any other site access restrictions shall be in Customer's scope. Please confirm. Any cost incurred w.r.t. the same shall be to Customer's Scope. Suitable time extension shall be given to the bidder for such access restrictions / other restrictions.	All statutory clearance, approvals, permissions will be in the AEGCL scope. Also refer corrigendum issued earlier.
29	General Land Development	Please confirm that the scope of land development is limited to the current project requirements only and does not include any future expansion/extension or development.	As per BOQ
30	General Construction Power & Water Supply	It is understood that the water supply & power arrangement for construction purpose will be provided upto a single point adjoining the site by the client free of cost. Please confirm.	Under EPC scope
31	General Nallah Diversions	We do not envisage any Nallah diversion required neither for new sub station nor extension sub station. If Nallah diversion is needed then request you to please provide specific line item & quantity for the same in the amended BOQ.	Included in drain item
32	General Site Office/ Transit Camp/ Store Shed (Open & Close)	Employer's site office, Transit Camp, Store Shed (Open & Close) is not envisaged in any of the sub station. Please confirm.	Under EPC scope

33	CORRIGENDUM-III Sr No. 1 : Clause No.Vol-I, Section -VIII- Special Conditions of Contract, Clause no. 11: Price Variation allowed only for supply of Power Transformers, Reactors, Conductors, Cables and Tower Structures subject to ceiling of 10% of the quoted rate of individual item as per IEEMA Calculator.	As per the corrigendum issued PV is allowed subject to ceiling of 10%. We request you to kindly amend the following and allow no ceiling on the PV for Power Transformers, Reactors, Conductors, Cables and Tower Structures	As per earlier issued corrigendum
34	Details of Price Variation calculation will be provided along with Pre-Bid Minutes of the Meeting.		
35	CORRIGENDUM-III Sr No. 2 Clause No. Vol-I -Section - IX APPENDIX 1: TERMS AND PROCEDURES OF PAYMENT (A) Terms of Payment Clause No. 1:: Mobilization advance amounting Ten percent (10%) of the total Supply amount shall be released on submission of security in the form of Bank Guarantee for the equivalent amount made out in favour of the AEGCL. The Mobilization Advance will be provided on interest basis at the rate charged by the funding agency for the Project to AEGCL. The advance amount will be adjusted at the rate of 10% of the taxable invoice value from each subsequent supply bill till the complete amount of advance is adjusted. The advance payment security may be reduced in proportion to the value of the amount adjusted from the Invoices, as evidenced by delivery documents.	As per the corrigendum issued 10% Interest Bearing Advance is applicable. Kindly provide the rate of interest applicable on Advance.	As per earlier issued corrigendum

36	CORRIGENDUM-III Sr No. 5	As per the payment terms, "15% of the supply amount would be paid on completion of 50% of the total erection works of that individual item."	As per earlier issued corrigendum and pre bid MoM.
37	5) Clause No. Section - IX APPENDIX 1: TERMS AND PROCEDURES OF PAYMENT: (A) Terms of Payment Clause No. 2(a): 15% supply amount would be paid on completion of 50% of the total erection works of that individual item.	We understand that the above 15% payment shall become due upon completion of 50% of the erection works pertaining to the respective individual item, and shall not be linked to completion of the entire transmission line/substation or entire package. Please confirm.	
38	Pre-Bid Replies Sr No. 30 Pre-Bid Replies Sr No. 30	As per the pre-bid replies it was mentioned that MS, HT and Bolts and Nuts bifurcation would be given during detailed engineering. However, we once again want to reiterate that in Employer Designed tender invited by utilities including PGCIL, the bifurcation of MS, HT and bolts nuts for Tower and Stubs is provided in the BoQ, against which the bidders are required to quote their rates. Accordingly, combining these items without providing their respective quantities makes it difficult for bidders to accurately assess the material composition, estimate the associated cost, and quote the item on a realistic basis. We therefore once again request the Employer to kindly provide the bifurcated quantities of MS. HT and Bolts and Nuts for Tower and Stubs and suitably amend the BoQ before bid submission.	Kindly find the BOM for reference
39	Pre-Bid Replies Sr No. 28 Pre-Bid Replies Sr No. 28	As per the pre-bid replies, BOCW is applicable as per prevailing laws. We understand that BOCW is applicable 1% on service portion only. Please confirm.	As per earlier issued corrigendum and pre bid MoM.

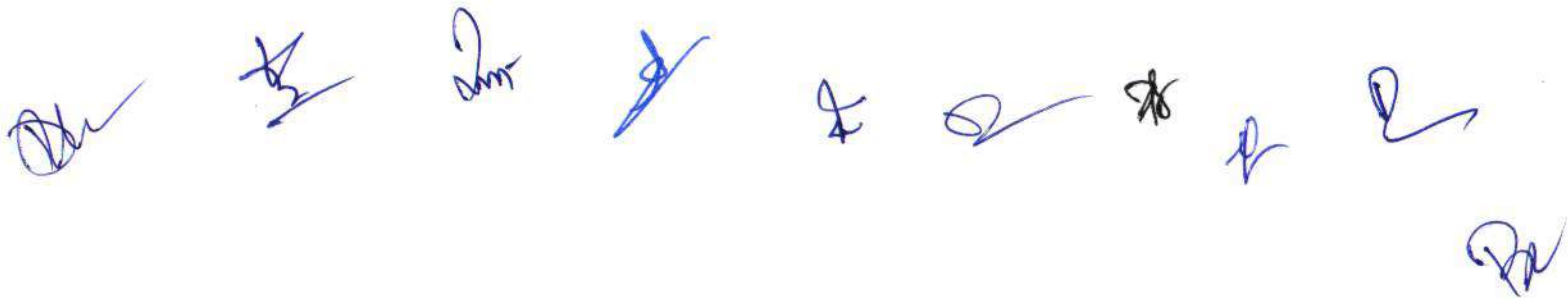
40	Pre-Bid Replies Sr No. 31 Pre-Bid Replies Sr No. 31	With reference to our earlier pre-bid query, we had specifically requested the Employer to provide the separate quantities of Excavation, M20 concrete, M10 concrete, and reinforcement steel (Rebar). However, we note that the same has not been incorporated in the revised BoQ. It is pertinent to highlight that, in Employer-designed tenders, utilities including PGCIL, the client generally specify the quantities of these major construction materials separately. Moreover, M20/M10 concrete and reinforcement steel have different units of measurement, i.e., excavation and concrete in m^3 and reinforcement steel in MT. Accordingly, combining these items without providing their respective quantities makes it difficult for bidders to accurately assess the material composition, estimate the associated cost, and quote the item on a realistic basis. We therefore once again request the Employer to kindly provide the bifurcated quantities of Excavation, M20, M10, and Rebar and suitably amend the BoQ before bid submission.	Refer to the foundation drawings provided
41	400kV Chapar - Agia & 400kV Chapar - Rangia TL 400kV Chapar - Agia & 400kV Chapar - Rangia TL	As per the pre-bid replies and tender document we understand that Design of Tower & its Foundation along with Pile foundation design will be in AEGCL's scope. Only Well foundation if envisaged during execution, the design of same will be in contractor's scope. Please confirm.	As per BOQ
42	400kV Chapar - Agia & 400kV Chapar - Rangia TL 400kV Chapar - Agia & 400kV Chapar - Rangia TL	We note from the Tower Schedule that, apart from normal open-cast foundations, certain tower locations are envisaged with raised chimney foundations. However, the ETC BoQ does not provide tower/location-wise quantities or the additional volume attributable to such raised chimney locations. The Employer is requested to confirm and provide the location-wise raised chiney quantities/volumes, so that the bidder can accurately assess the scope and quote accordingly.	Quantity as per BOQ and refer to foundation drawings provided

43	PRICE SCHEDULE 7: ETC_line_400kV Chapar - Agia Design of D/C special suspension tower for river crossing with Quad ACSR MOOSE conductor, 48 F (steel tube design) OPGW and sheild wire (7/3.66 mm) alongwith well foundation for D/C special suspension tower (AACSR Moose conductor) for river crossing including geotechnical investigation, hydrological and hydraulic study of the river, determination of HFL and vetting for complete job alongwith Design of D/C Anchor tower with Quad ACSR MOOSE conductor and 48 F (steel tube design) OPGW and sheild wire (7/3.66 mm) alongwith foundation for D/C Anchor tower (Design and vetting)	As per the revised BoQ we understand that Special Suspension tower for river crossing and Anchor tower design is in AEGCL's scope, while foundation of Special Suspension Tower for river crossing and Anchor Tower is in scope of Bidder. Please confirm. In the view of above, we request you to kindly provide foundation loads of special suspension tower for river crossing and anchor tower to enable us to carry out foundation design.	Design of tower under EPC scope as well
44	PRICE SCHEDULE 10: ETC_line_400kV Chapar - Rangia Design of D/C Line Gantry with foundation for Quad ACSR MOOSE conductor and 48 F (steel tube design) OPGW and sheild wire (7/3.66 mm)	We understand that Gantry Design is in AEGCL is in scope as weight has been given in the BoQ, while foundation design is in scope of bidder. In the view of above, we request you to kindly provide foundation loads of gantry to enable us to carry out foundation design.	Both under Design scope of EPC
45	PRICE SCHEDULE 8: Supply_line_400kV Chapar - Rangia S No. 16- INSULATOR (31mm /kV) PRICE SCHEDULE 5: Supply_line_400kV Chapar - Agia S No. 18 Anti Fog Disc Insulator Stack	We understand that bidder has to quote for Antifog Insulators with creepage for 120 KN and 160 KN insulator being 430 mm and 475 mm respectively We have noted from technical specification that creepage for 120 KN and 160 KN insulator is 430 mm and 475 mm respectively. Please confirm our understanding is correct. Please provide the technical specification of 210 KN insulator and also confirm the creepage of 210 KN insulator to be considered.	Confirmed. Technical specicification for210kN will be provided during detailed engineering
46	PRICE SCHEDULE 5: Supply_line_400kV Chapar - Agia S No. 7.2 AACSR Moose Conductor	We understand that PV is applicable on AACSR conductor also as per PV formula given in pre-bid replies. Please also provide technical specification of AACSR Moose conductor.	To be decided during detailed engineering
47	PRICE SCHEDULE 10 (BOQ-10): ETC_line_400kV Chapar - Rangia Stringing of power conductors including transportation from Stores and distribution of conductors and accessories to sites and laying, stringing, tensioning , clamping, jointing, jumpering and hoisting of insulators complete including cost of all fittings and accessories not specifically mentioned elsewhere per route Km (6 conductors for Double Circuit Line) of line.	As per the description mentioned in S No.. 10 bider to be carried out 24 conductors per phase for double circuit line. Please confirm and amend the BoQ accordingly.	24 conductors for a double circuit line (4 conductors per phase)

48	S No.. 10.2 PRICE SCHEDULE 5: Supply_line_400kV Chapar - Agia & S. No. 9.2 PRICE SCHEDULE 8: Supply_line_400kV Chapar - Rangia 50x6 mm GS flat as required	50x6 mm GS flat as required is to be supplied, we understand that it is counterpoise earthing, Please confirm.	During detail engineering
49	S No. 9 PRICE SCHEDULE 7: ETC_line_400kV Chapar - Agia, Sno. -18 & S No. 9 PRICE SCHEDULE 10: ETC_line_400kV Chapar - Rangia Grounding of towers (Pipe earthing / counterpoise earthing) with 3 metre long 50 mm dia G I pipe along with 50x6 mm GS flat, including cost of all materials, such as GI pipes, GI bolts & nuts and washer, salt, coke etc as per Specification.	We have to quote per tower rates for the said item, however, it may please be noted that there is a substantial difference between the unit rates of pipe type earting & counterpoise earting. Therefore, we request you to kindly bifurcate the pipe type earthing & counterpoise earthing quantities and amend the price schedule according.	As per BOQ
50	CHAPTER 40: TOWER FOUNDATION FOR 400kV TRANSMISSION LINE :- Clause - 40.14.4	The quantities for protection work of foundations are provisional only. The unit rates shall also be applicable for any quantity variations during execution. The same unit rates shall hold good for protection work carried out on down hills or up hills slopes applicable for the tower locations. As per the above mentioned clause, we understand that bidder has to quote unit rates for tower protection works like RRM (random rubble masonry), top sealing with M-15 concrete and back filling. Therefore, we sought you that, kindly arrange to provide the quantities for tower protection work and amend the price schedule accordingly.	As per BOQ

51	CHAPTER 40: TOWER FOUNDATION FOR 400kV TRANSMISSION LINE :- Clause - 40.13	As per the Technical specification clause it is mentioned that if the line passes through hilly/undulated terrain, levelling the ground may be required for casting of tower footings at no extra cost to the Employer. It may please be noted that there is huge financial impact in case benching is envisaged during execution as substantial quantity of benching is required to be carried out during foundation work. Therefore, we request you to please provide quantities for benching as per soil classification wise (For normal soil, FR and HR), and amend the price schedule accordingly.	As per BOQ
52	S No. 3 CORRIGENDUM-III &	We have noted from the corrigendum that Forest, RoW and all statutory clearances will be in the scope of AEGCL but necessary documents required for such approvals will have to be arranged by Contractor. Contractor personnel will liaison with District Administration and Land Owner at the time of execution for Site Clearance.	As per corrigendum and pre bid MoM issued earlier.
53	Clause No.Vol-I -Section - VII - General Conditions of Contract (GCC) & Vol-II: Information to Bidders (ITB) Clause -10.2 & 10.3 / Clause 2.7: RIGHT OF WAY:	As per the above mentioned clause we understand that crop compensation, tree compensation, expense towards tree cutting and trimming in forest and non forest area including stacking and transportation, land compensation for RoW corridor including access to locations will also be in client sope. Please confirm.	As per corrigendum and pre bid MoM issued earlier.
54	CHAPTER 38: SPECIFICATION FOR DESIGN AND FABRICATION OF TRAMSNISSION LINE TOWERS :- 38.1.16.0 STUB TEMPLATE	As per the clause, 38.1.16.0 STUB TEMPLATE bidder has to quote unit rate for stub template, while quantity of said item is not reflected in price schedule. Accordingly, we understand that bidder has to consider a suitable provision for this item in their estimate. Please confirm wheather our understanding is correct.	As per BOQ
55	38.1.16.1 Stub templates shall be designed, and the Bidder shall quote unit rate for each type of tower. These stub templates shall be painted with two coats of red-oxide zinc chromate primer as per relevant IS.		

56	CHAPTER 40: TOWER FOUNDATION FOR 400kV TRANSMISSION LINE :- 40.5 Soil Investigation page no.- 856 of volume-II of ODF file. Soil investigations shall be carried out by the Contractor. Rate shall quoted as one job for entire line except for well foundations. No extra payment shall be made by Employer.	As per the mentioned clause bider has to qoute their unit rate for soil investigation work as one job for entire line except for well foundations. However, provision to qoute the unit rate of said work is not mentioned in price schedule. Therefore, kindly request you to amend the price schedule accordingly.	As per BOQ
57	Bird guard Bird guard	Bird Guard quantities is not provided in the BoQ. We request you to kindly incorporate the same in respective price schedule.	As per BOQ
58	Price Schedule	We understand that the control and power cables required for the Fire Fighting and Illumination systems shall be considered under Price Schedules 21 and 22, respectively. Kindly confirm.	Confirmed
59	CHAPTER 12: TECHNICAL SPECIFICATIONS FOR SURGE ARRESTER	As per the Technical Specification, porcelain-type Lightning Arresters (LA) have been specified. We request you to kindly permit the use of polymer-housed Lightning Arresters as an approved alternative.	As per Bid
60	CHAPTER 31: TECHNICAL SPECIFICATION OF POST INSULATOR SAMAST METER	We request you to kindly consider the use of polymer-type Bus Post Insulators (BPI) in place of porcelain-type BPIs, except for applications involving isolators and wave traps. Due to supply constraints, porcelain-type BPIs are attracting significantly higher prices and longer delivery schedules. Furthermore, polymer-type BPIs (except for isolators and wave traps) are widely accepted and utilized by PGCIL. Therefore, we request your approval for the use of polymer-type BPIs.	As per Bid



61	Volume-I, SECTION IV, 4. Evaluation and Qualification Criteria, 4.2 Qualification Criteria, 4.2.1 (c) Manufacturers/ Subcontractor, Table Sl. No. 1,GIS, Point No. III	**Existing Clause:** "The Manufacturer shall furnish type test reports of SF6 Gas Insulated Substation equipment, duly designed, manufactured and tested as per relevant IEC Standards, which shall not be older than ten (10) years as on the date of tender opening." **Requested Amendment:** "The Manufacturer shall furnish type test reports of SF6 Gas Insulated Substation equipment, duly designed, manufactured and tested as per relevant IEC Standards, which shall not be older than fifteen (15) years as on the date of tender opening, in line with the latest applicable CEA guidelines." We kindly request amendment of the above requirement to allow submission of type test reports up to fifteen (15) years old. This will align the provision with the latest applicable CEA guidelines and promote wider participation without compromising technical compliance.	As per CEA " Guidliness for the Type Tests for Major Euipment of Power Sector" Jan 26
62	General	Kindly share the contour layout drawing.	Under EPC scope during detailed engineering
63	Corrigendum IV Prebid Reply Sl.No 58 Bidder Query: Please provide the Bank details for SFMS confirmation. Client Response: Enclosed with Pre-Bid MoM	There is no bank details available in the Prebid MOM. Kindly provide the same	Provided



64	Volume I, SECTION-VI 6. Bidding Forms 6.3 Bank Guarantee Format for Bid Security FORMAT-B3 Bid Security BG Format	Kindly provide the Place of Invocation and include the Notwithstanding Clause in the BG Format which is mandatory required by the bank for issuing Bank Guarantee.	As per bid
65	Corrigendum III Clause No 2 Clause No. Vol-I - Section - IX APPENDIX 1: TERMS AND PROCEDURES OF PAYMENT (A) Terms of Payment Clause No. 1:: Mobilization advance amounting Ten percent (10%) of the total Supply amount shall be released on submission of security in the form of Bank Guarantee for the equivalent amount made out in favour of the AEGCL. The Mobilization Advance will be provided on interest basis at the rate charged by the funding agency for the Project to AEGCL	Kindly Provide the Advance Bank Guarantee Format	Will be Provided during contract signing.

66	Volume I, Section IV - Evaluation and Qualification Criteria1 Clause No 4.2.1 (C) - Manufacturers / Subcontractor III. The Manufacturer shall have to furnish type test report of SF6 gas insulated sub-station equipment duly Designed, Manufactured, tested (as per IEC standard) which, shall not be older than 10 (Ten) years, as on date of tender opening.	Kindly Accept the Type Test Validity as per CEA Guidelines for GIS Equipment. The same has been accepted by all the Central / State Utilities.	Accepted
67	Volume II, CHAPTER 17: TECHNICAL SPECIFICATION OF TRANSFORMER (UPTO 400kV CLASS) Clause No 17.4.0. SPECIFIC REQUIREMENT: (i) Type Test: Clause No 17.12.1.4 Type test requirement & it's validity Test reports to be acceptable must be related directly to the materials offered. The Validity of type test report of Transformer shall be as per CEA's "Guidelines for the Type Tests for Major Equipment in Power Sector", January 2026 The offered transformer or the transformer, the design of which is similar to the offered transformer, should have been successfully type tested within last 5 years as on the last date of submission of bid.	Both the said clauses are contradictory. Kindly Accept the Type Test Validity as per CEA Guidelines for Power Transformer. The same has been accepted by all the Central / State Utilities.	Accepted

68	Volume II, CHAPTER 21: TECHNICAL SPECIFICATION FOR REACTOR Clause No 21.8.6 The validity of Type tests of Reactor shall be 5 years as on the date of NOA, provided that offered reactor is of same design as that of type tested reactor and active materials like – CRGO, copper conductor and insulation material are of same or better grade with respect to type tested unit. Failing which, type testing of reactor shall be carried out by the contractor at his own cost. Further, type test report of reactor from the same manufacturing plant shall only be acceptable.	Kindly Accept the Type Test Validity as per CEA Guidelines for Reactor. The same has been accepted by all the Central / State Utilities.	Accepted
69	Volume II, CHAPTER 16: GIS EQUIPMENTS Clause No 6.14 Mandatory Spares: Design, engineering, manufacture, testing, supply on FOR destination site basis including transportation & insurance, storage at site of Mandatory spares for the GIS. Standard list of Mandatory Spares shall be provided as per the BPS	Kindly provide the list of mandatory spares releated to GIS Equipments. However in the Bid Price Schedule there is no Mandatory spares. Please clarify the same.	As per BoQ
70	Volume II, CHAPTER 2: INFORMATION TO BIDDERS (ITB) Clause No 2.7.11 Tender Clause states that arranging access roads/RoW for transportation of materials from roadside to work sites, including compensation to property owners, shall be the Contractor's responsibility without reimbursement by AEGCL.	We request AEGCL to arrange the required access/RoW and bear the associated compensation costs, as these are owner-related statutory and land access issues. Kindly confirm.	As per earlier issued corrigendum and pre bid MoM.

71	BOQ/TS (TL) Sl. No. 2/Page No. 901 (17), Chapter 44 1). As per BOQ, Sl. No. 19.2, Double Suspension Pilot is required. However, as per practise, a Double Suspension Pilot has never been used till date. Also as per attached Technical Specification, Page No. 901 (17), Chapter 44, it clearly mentioned Single Suspension Pilot.	Kindly confrim which one to be considered.	Double suspension string required as per BOQ
72	BOQ/TS (TL) Sl. No. 3/Page No. 901 (17) & & 902 (18), Chapter 44 2). As per BOQ, Sl. No. 19.3, Double Tension is required. As per attached Technical Specification, Page No. 901 (17) & 902 (18), Chapter 44, it clearly mentioned Quad Tension.	Kindly confrim which one to be considered.	Quad tension string 160x4 kN to be considered.
73	BOQ/TS (TL) Sl. No. 2/Page No. 905 (21), Chapter 44 3). As per BOQ, Sl. No. 9.10, Vibration Damper is required. Normally Vibration Dampers are used in Single/Twin Bundle lines. Also as per attached Technical Specification, Page No. 905 (21), Chapter 44, it clearly mentioned Vibration Damper is used for Twin Bundle line only and not to Quad line.	Kindly confrim which one to be considered.	Vibration damper required as per BOQ
74	BOQ/TS (TL) Sl. No. 2/Page No. 907 (23), Chapter 44 4). As per BOQ, Sl. No. 9.5, Bundle Spacer is required. As per attached Technical Specification, Page No. 907 (23), Chapter 44, it clearly mentioned Quad Spacer Damper.	Kindly confrim which one to be considered.	As per BoQ

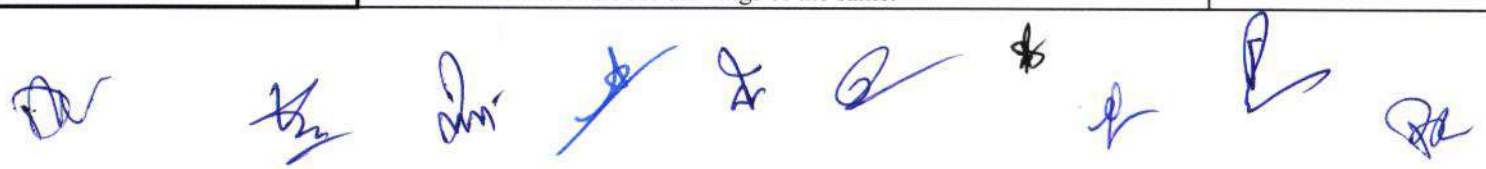
75	BOQ / BOQ-7 S.No 27.1 For Brahmaputra river crossing locations, the AACSR MOOSE conductor has been specified. The OPGW and Shield wire properties have been mentioned as 48F and 7/3.66 respectively.	We understand that for Brahmaputra river crossing locations, the span from Anchor tower to next Anchor Tower including river crossing suspension tower to be used with AACSR conductor. Further the earthwire properties also should be provided with increased UTS. So kindly confirm for the river crossing locations the earthwire properties to be proposed as 19/3.0 instead of 7/3.66.	To be decided during detail engineering
76	BOQ / BOQ-10 S.No 20 For 1500mm/1200mm diameter R.C.C. vertical bored pile, the pile length has been mentioned upto 30m from ground level.	We understand that the pile length has been restricted to 30m. Also, it is mentioned that the payment will be done as per the actual length of pile based upon the unit rate. However, during operation/execution stage, the minimum pile length may exceed 30m. So we request to add an additional item in the price schedule for the pile length above 30m.	Maximum depth of pile shall be 30m. Payment will be done as per actual length of pile.
77	BOQ / BOQ-7 S.No 28 Construction of well foundation for Special Suspension Tower in Brahmaputra river	As per our experience/feedback from the vendor, the construction of a 14m diameter well foundation in the Brahmaputra river is a very tedious task. The construction process has to be completed within the working season, otherwise the well foundation may be tilted/shifted during the flood time. Hence we request to consider the possibility of construction of other type of foundation (pile foundation) instead of well foundation.	As per BoQ, however any changes (if any) will be incorporated during detailed engineering.
78	General Accessibility of Navigation	Kindly confirm whether the Brahmaputra river is navigable or non-navigable	Navigable

79	General Approval from third party for Special Suspension Tower, Anchor Tower, Well/Pile foundation design	Please mention the list of agencies/parties to be approached for the Special Suspension Tower, Anchor Tower, well/pile foundation approval or contractor to decide the third party/agency.	Preferably IIT/CPRI
80	BOQ / BOQ-10 S.No 20 Reinforcement design for Pile foundation	As per the reference pile foundation drawing provided, we observed that 1% of the reinforcement in the pile drawings. However as per our experience, a minimum 2% of reinforcement may come for the pile foundation design. Hence we request to consider separate item for reinforcement quantity of the pile foundation OR it is considered that if the reinforcement quantity exceeds 1% during execution/operation stage, the additional reinforcement cost paid as per actual rate.	Provision of IS Code will be followed.
81	BID VOL-2 CHAPTER 4: PROJECT IMPLEMENTATION GENERAL Clause- 4.6	As per the referred clause, it is mentioned that "The general characteristics of the soil are given in the CHAPTER 3 OF "Volume III – BID PURPOSE DRAWINGS , SCHEDULE OF QUANTITIES AND MISCELLANEOUS DOCUMENTS".	Design will be as per soil investigation report provided.
82		The information furnished is for reference purpose only. The Contractor shall be required to carry out soil investigation and related design based on his findings. The same would prevail for designing of tower foundation of transmission lines also"	
		However the referred CHAPTER 3 OF Volume-III has not been attached with the tender documents. Kindly provide the CHAPTER 3 OF Volume-III and relevant soil investigation report (If available).	
83	BID VOL-2 Clause 5.3 SITE CLEARANCE, e)	As per the referred clause, dismantling and demolition activities are stated to be within the bidder's scope. However, no specific line item for demolition or dismantling is available in the Price Schedule.	All dismantling/demolition/excavation and disposal thereof included in the site clearance scope.
		Kindly confirm whether any demolition/dismantling works are envisaged under the present scope. If yes, please add separate line item in BPS and provide the detailed structure-wise/building-wise quantities and scope of demolition works for proper assessment and quantification of works.	



84	BID VOL-2 'CHAPTER: 5 LAND DEVELOPMENT AND ASSOCIATED CIVIL WORKS Clause b) & Clause 2.3 Climatic condition: Seismic Data	As per the referred clause, Seismic Zone -VI is mentioned to be considered. However as per Clause 2.3 Project Site information: Seismic Zone-V is mentioned. The above references appear to be contradictory and may impact the seismic design basis, loading criteria, and applicable design parameters for structures and foundations. Accordingly, we request AEGCL to clarify the correct seismic zone applicable to the project site and confirm the applicable seismic design codes/standards (including the relevant edition of IS 1893 and associated codes) to be adopted for the present scope of work.	Seismic Zone-V of IS 1893:2016
85	General -	Civil scope of work is not specifically mentioned in the tender documents. We understand that the Civil Works under the present scope shall be considered as listed in the Price Schedule and further, we presume that any additional Civil Works/items, if found necessary during detailed engineering, site conditions, or execution and which are not covered under the above-mentioned, shall be measured and paid on actual quantities executed at site on mutually agreed rates. Also we trust that quantities indicated in the price Schedule are tentative. Any change in the quantity during the execution will be paid on actual basis. Kindly confirm.	As per Bid and BoQ

86	Price schedule BOQ4 Sl. No.- 12.10	As per the referred line item, Storm water drains have been specified in running metres (Rm). However, the corresponding drain cross-sectional details, dimensions, and types of drains are not provided in the Bid Price Schedule (BPS). Further, the drawings furnished with the tender documents also do not indicate the required drain cross-sections details.	Sample drawing shall be provided for reference
		Since the construction cost of drains varies significantly based on the cross-sectional dimensions, it is not possible to accurately assess the scope based solely on the running length.	
		Accordingly, we request AEGCL to confirm the type of drain (i.e., cast-in-situ or precast type) and provide the drain cross-section drawings/details and incorporate separate section-wise line items in the BPS for each drain type/size to enable accurate estimation and bidding.	
		Kindly furnish the requisite details and amend the BPS accordingly.	
87	BID VOL-2 5.10 BUILDINGS & GENERAL REQUIREMENTS	As per the referred clause, it is mentioned that "The scope of work shall include the design, engineering and construction of the GIS building, Control Room	As per Bid & BOQ
		Building (CRB), Residential/Colony Buildings and all associated civil, architectural and structural works complete in all respects in accordance with these Specifications, the approved drawings and applicable Indian Standards".	
		However in the LAYOUT drawing of the 400/ 220kV Agia S/s provided along with tender documents, following buildings are shown and not mentioned in Price schedule-	
		ii. Residential/Colony Buildings	
		iii. FFPH	
		iv. Transit camp	
		v. Staff quarters	
		vi. Sentry post	
		Kindly clarify the requirement, if required please add separate line items in the Price schedule and share the drawings of the same.	



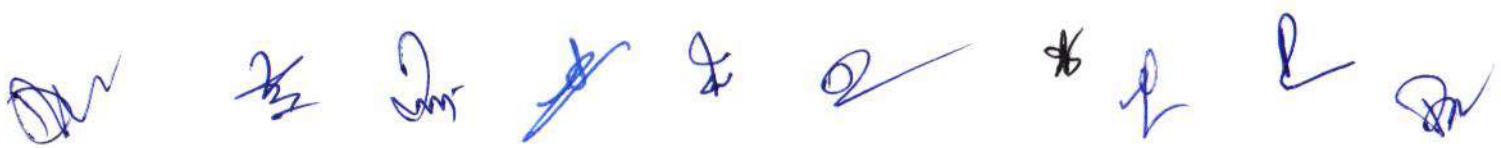
88	Price schedule BOQ3 Sl. No.- 27 and 28	It is mentioned in the line item no. 27, "Erection of lattice structures for incoming and outgoing gantries, etc., including construction of foundation and supply of all foundation materials, bolts, fasteners, etc., and labour."	Foundation shall be considered in item no. 28
		Further, Line Item No. 28 separately mentions:	
		"Concreting of gantry foundation including all labour, materials, equipment, excavation, shuttering, head loading, backfilling, handling, transportation, batching, mixing, placing, levelling, curing, etc., complete inclusive of cost of cement and reinforcement steel, including 300 mm boulder soling below the foundation."	
		We understand that Line Item No. 27 is intended to cover only the erection of lattice structures along with anchor bolts, fasteners and erection accessories, whereas all gantry foundation works including excavation, RCC, reinforcement steel, boulder soling, backfilling, and other associated civil works are covered and payable under Line Item No. 28.	
		Kindly confirm.	
89	Tender drawing Pile Foundation 400kV Drawing	In tender document pile foundation drawing for 400kV Tower is attached and the pile diameter of 1200 mm and pile length of 25000 mm have been indicated. We presume that these dimensions are indicative/reference values only.	Confirmed
		We understand that the pile details and parameters shall be determined based on the recommendations of the Geotechnical Investigation Report carried out by the Contractor for the proposed scope of works.	
		Kindly confirm whether our understanding is correct.	
90	Price schedule BOQ4 Sl. No.- 3	In the Price schedule quantity for of earthfilling of 90,000 cum. is given. We trust that filling is to be done with borrowed earth. Kindly confirm.	Earth filling shall be done by borrowed earth from outside. Boundary wall already in existence.
		Also there is no line item available for retaining wall, kindly add separate line item in the BPS if required.	
91	Price schedule BOQ4 Sl. No.- 3	Please furnish the contour drawing of proposed substation area(If available).	Under EPC scope
92	Price schedule BOQ4 Sl. No.- 4 and 13	As per the referred Price Schedule line items, kindly furnish the relevant drawings of the following-	Under design scope of EPC
		i. Gate and ii. Security fence.	

93	Price schedule BOQ4 BID Vol-II Sl. No.- 10 and Page no 102	As per the referred Price Schedule line item no 10 and BID Vol-II Page no. 102, two storied RCC (M-25) slow sand filter having sand filter at upper level with aeration arrangement and openable steel roof and reservoir at bottom needs to be considered. Also it is mentioned in BID VOl-II to consider pump house of (LXW=3mtrsX3mtrs) and 3 mtrs (height) and having RCC roof and brick walls with doors and overhead tank for each building as required by AEGCL. Kindly share the relevant details and drawings pertaining to the above items for quantification of works.	Under design scope of EPC
94	General -	We trust that for the bay extension work of the 400kV Rangia S/S followings works are to be envisaged as following- i. Equipment Structures and Foundations ii. Gantry Structures and Foundations iii. Bus duct And SF6 to air bushing structures and foundations Further, we presume that any additional Civil Works/items, if found necessary during detailed engineering, site conditions, or execution and which are not covered under the above-mentioned, shall be measured and paid on actual quantities executed at site on mutually agreed rates. Kindly confirm.	As per Bid & BOQ

95	BoQ 5. Sl. No. 1 SUPPLY OF LATTICE TOWERS	We understand that Design of Tower in AEGCL Scope as Tower in tonnage mentioned in BOQ. As the BOQ is quantified, we request you to provide the bifurcation of MS, HT & BNA	BOM will be attached for reference
96	BoQ 7. Sl. No. 18 Concreting of foundation including all Labour, materials, equipment, excavation shuttering, head loading, back filling etc complete for handling, transportation, batching, mixing, placing, levelling, curing etc complete inclusive of cost of cement and reinforcement steel.	Concreting CuM only provided in BoQ, bifurcation of M20 or M10 not given. Also, Excavation & Steel quantity is not mentioned. Further DA, DB, DC & DD drawings are provided in additional documents. We request you to kindly provide M20, M10, Excavation & Steel quantity for DD+18/25 m extn also.	Refer to foundation drawing for bifurcated quantity
97	BoQ 8. Sl. No. 1 SUPPLY OF LATTICE TOWERS	We understand that Design of Tower in AEGCL Scope as Tower in tonnage mentioned in BOQ. As the BOQ is quantified, we request you to provide the bifurcation of MS, HT & BNA	BOM will be attached for reference
98	BoQ 10. Sl. No. 18 Concreting of foundation including all Labour, materials, equipment, excavation shuttering, head loading, back filling etc complete for handling, transportation, batching, mixing, placing, levelling, curing etc complete inclusive of cost of cement and reinforcement steel.Also provide 300 mm thick boulder soiling below foundation	Concreting CuM only provided in BoQ, bifurcatiuon of M20 or M10 not given. Also, Excavation & Steel quantity is not mentioned We request you to kindly provide M20, M10, Excavation & Steel quantity	Refer to foundation drawing
99	BoQ 7. Sl. No. 26.1 & 26.2 Pile foundation	Quantified BOQ for Pile Foundation has been given, we understand that AEGCL has drawings & design for pile foundation. We request you to kindly provide the drawing for working and cost calculation.	Sample drawing shall be provided for reference
100	BoQ 7. Sl. No. 28 Well Foundation for Suspension Tower	Quantified BOQ for Pile Foundation has been given, we understand that AEGCL has drawings & design for pile foundation. We request you to kindly provide the drawing for working and cost calculation.	Sample drawing for pile foundation shall be provided however drawing for well foundation cannot be provided.
101	BoQ 5. Sl. No. 18 Anti Fog Disc Insulator Stack	As per BoQ, Anti fog Disc insulator has been mentioned We request you to kindly provide the technical specification.	As per BID volume 2
102	BoQ 8. Sl. No. 16 Disc Insulator Stack	As per BoQ, Disc insulator has been mentioned. We request you to kindly provide the technical specification.	As per BID volume 2

103	BoQ 5. Sl. No. 7.2 AACSR Moose conductor	As per BoQ 5, AACSR Moose conductor is mentioned which is required for river crossing spans. We request you to kindly provide the technical specification of AACSR Moose conductor.	To be decided during detail engineering and as per relevant IS/IEC/CEA standards and TTR of OEMs
104	BoQ 5. Sl. No. 8 7/3.66mm GI shield wire	As per BoQ 5, 7/3.66 mm GI shield wire mentioned for entire BOQ. Further for river crossing spans high strength earthwire may be used. Kindly confirm whether the same earthwire to be used for River crossing portion or High strength GS earthwire to be used and provide technical details.	To be decided during detail engineering
105	BoQ 5. Sl. No. 9.1 BoQ 8, Sl.No. 8.1 Stock bridge type Vibration Damper	As per BoQ 5 & BoQ8, Stock bridge type Vibration Damper mentioned in BoQ. Further for Quad ACSR Moose Quad spacer damper required, hence Stock bridge type VD is not required. Kindly confirm the same.	As per BOQ
	BoQ 5. Sl. No. 9.5 BoQ 8, Sl.No. 8.5 Bundle Spacer suitable for Quad ACSR Moose	As per BoQ 5 & BoQ8, Bundle spacer mentioned in BoQ. We undertsand that it is Quad Spacer Damper suitable for Quad ACSR Moose. Kindly confirm the same.	As per BOQ
106	BoQ 5. Sl. No. 11.1 48 Fibre (DWSM) OPGW fibre optic cable (Steel tube)	As per BoQ, 48 Fibre (DWSM) OPGW fibre optic cable (Steel tube) mentioned for entire BOQ. Further for river crossing spans high strength earthwire may be used. Kindly confirm whether the same OPGW 48F to be used for River crossing portion or High strength OPGW 48F to be used and provide technical details.	As Per BID volume 2 and BOQ
107	BoQ 7. Sl. No. 11 Detailed Survey and Check Survey as per Specification alongwith Geotechnical investigation for Tower locations for 400 kV Chapar -Agia Line	As per BOQ Detail and check survey to be done along with Geotechnical investigation. As per standard geo technical investigation to be carried out at every 7 to 8 km We request you to kindly confirm the same to consider the geo technical investigation at every 7 to 8 km.	For transmission line geotechnical investigation maybe carried out at a certain specified distance or at every angle tower which shall be decided during detailed engineering.
108	BoQ 5. Sl. No. 19.02 BoQ 8. Sl. No. 17.2 Hardware fittings for Quad ACSR Moose Conductor-Double Suspension String (Pilot) 120x2 kN	As per the provided BOQ Double Suspension String (Pilot) 120x2 kN is mentioned. But for Pilot Single Suspension String (Pilot) is required. Kindly confirm the same as Single Suspension String (Pilot).	Double suspension string required as per BOQ

109	BoQ 5. Sl. No. 19.03 BoQ 8. Sl. No. 17.3 Hardware fittings suitable for Quad ACSR Moose Conductor-Double Tension String 160X4 kN	As per the provided BOQ Double Tension string required with specified insulator of 4x160kN For 400KV Quad ACSR Moose. But in Double tension 2x160kN insulator will use. As per our line for Quad ACSR Moose, Quad Tension string 160x4kN is required. Kindly confirm the same as Quad Tension string 160x4kN	Confirmed. Quad tension string 160x4 kN to be considered.
110	BoQ 5. Sl. No. 19.04 Hardware fittings suitable for Quad AACSR Moose Conductor-Double V Suspension String 210X2 kN	As per the provided BOQ - Double V Suspension string required with specified insulator of 2x210kN. Kindly clarify the type of string , Because in Double V Suspension 2x2x210kN insulator will use.	Single V suspension string 2x210kN required.
		Additionally arrange to provide the required string angle and tower anchoring distance if any	String angle and anchoring distance to be decided during detail engineering.
111	BoQ 5. Sl. No. 17.1 BoQ 8. Sl. No. 15.1 Obstruction Lights (to be provided as per IS 5613)- 2 Medium Intensity + 2 Low Intensity	As per BOQ 2 Medium Intensity + 2 Low Intensity mentioned, while we are using 1 Medium intensity + 2 Low Intensity as per IS in PGCIL projects Kindly confirm the same	As per BOQ
112	BoQ 5. Sl. No. 18.1, 18.2, 18.3 Anti Fog Disc Insulator Stack:- Disc insulator suitable for Quad ACSR Moose 400 KV TL-120 KN Disc insulator suitable for Quad ACSR Moose 400 KV TL-160 KN Disc insulator suitable for Quad AACSR Moose (400 KV TL)-210 KN	i) The specification only provides the line-level values, from which the individual insulator values cannot be determined accurately. ii) While going through TS, the specification does not provide the specific requirements for the 210 kN insulator. Additionally, the individual GTP (Guaranteed Technical Particulars) value for the insulator has not been specified Therefore, kindly confirm the required GTP for the 120KN,160KN & 210 KN insulator and provide the details.	Technical parameteres of individual Anti fog disc insulators shall be decided during detail engineering and the same shall conform to relevant IS/IEC standards and TTR reports.
113	BoQ 8. Sl. No. 16.1, 16.2 INSULATOR (31mm /kV):- Disc insulator suitable for Quad ACSR Moose 400 KV TL-120 KN Disc insulator suitable for Quad ACSR Moose (400 KV TL)-160 KN	The specification only provides the line-level values, from which the individual insulator values cannot be determined accurately. Therefore, kindly confirm the required GTP for the 120KN,160KN insulator and provide the details.	Technical parameteres of individual Anti fog disc insulators shall be decided during detail engineering and the same shall conform to relevant IS/IEC standards and TTR reports.



114	(400kV Chapar - Agia TL) **Item No. 26.1: "Pile Foundation",** BOQ-7, Price Schedule **S.No. 45 & 51: *(SPECIAL ANCHOR TOWER - DD+25, Type of Foundation - PILE)***, Tower Schedule of Proposed 400 KV D/C line from ADANI CHAPAR THERMAL POWER PLANT to PROPOSED 400/220/132KV AGIA GRID SUB - STATION **Item No. 27.2: "Construction of foundation for D/C Anchor tower as per design",** BOQ-7, Price Schedule.	As per Item No. 26.1, we need to quote for **Pile foundation.** Also, As per Tower Schedule S.No. 45 & 51, the Type of Foundation for SPECIAL ANCHOR TOWER - DD+25 tower is **Pile Foundation.** However, Item No. 27.2 of BOQ-7 requires quoting for **D/C Anchor Tower foundations.** We understand that, SPECIAL ANCHOR TOWER - DD+25 require only Pile foundation & we needs to quote for the same only. Kindly Confirm. If Confirm, we request you to kindly remove the Item No.27.2 from the Price Schedule, as the type of foundation is contradictory with Tower Schedule S.No. 45 & 51.	As per soil report and tower design
115	Other:- **Allowable Wastage**	We request you to consider incorporating the following wastage allowances in the supplied quantities of the items listed below: 1. Condutor: 1% 2. OPGW: 5% 3. Earthwire: 1% 4. Disc Insulator: 1 %	As per BoQ
116	The Contractor agrees to supply spare parts for a period of years: Ten (10) Years.	a) As per the clause, contractor need to supply spare parts. However, Quantity of the spare parts has been inadvertently missing from the provided BOQ. We request you to kindly provide the same.	As per BoQ
		b) As per the clause, contractor need to supply spare parts for a period of 10 years. However, looking to the volatility in the raw material market & West Asia conflicts, it will be quite difficult to predict the raw material prices for the next 10 Years. We therefore request you to kindly amend the clause as mentioned below: **The Contractor agrees to supply spare parts (if Any) during the Contractual completion period.** Please Confirm.	As per Bid & BOQ

117	Soil Investigation report	We request you to provide soil investigation report for below mentioned river crossings: 1. Brahmaputra river 2. Beki river 3. Manas river 4. Champabati River 5. Pagladiya River	1. Brahmaputra river - Under the scope of EPC 2. Beki river - provided 3.. Champabati River - provided 4. Pagladiya River - provided
118	(400kV Chapar - Agia Line) Item No. 19.02: Double Suspension String (Pilot), BOQ-5, Price Schedule (400kV Chapar - Rangia Line) Item No. 17.2: Double Suspension String (Pilot), BOQ-8, Price Schedule Cl.44.27.0 STANDARDIZED TECHNICAL PARAMETERS, Page No. 901, Chapter 44, Vol-2, Technical Specification	As per BOQ, Item No. 19.02 of BOQ 5 & Item No. 17.2 of BOQ 8, Double Suspension Pilot is required. However, as per practise, a Double Suspension Pilot has never been used till date. Also as per attached Technical Specification, Page No. 901, Chapter 44, it clearly mentioned Single Suspension Pilot. Kindly Clarify	Double suspension string required as per BOQ
119	(400kV Chapar - Agia Line) Item No. 19.03: Double Tension, BOQ-5, Price Schedule (400kV Chapar - Rangia Line) Item No. 17.2: DoubleTension, BOQ-8, Price Schedule Cl.44.27.0 STANDARDIZED TECHNICAL PARAMETERS, Page No. 901 & 902, Chapter 44, Vol-2, Technical Specification	As per BOQ, Item No. 19.03 of BOQ 5 & Item No. 17.3 of BOQ 8, Double Tension is required. However, As per attached Technical Specification, Page No. 901 & 902, Chapter 44, it clearly mentioned Quad Tension. Kindly Clarify.	Confirmed. Quad tension string 160x4 kN to be considered.

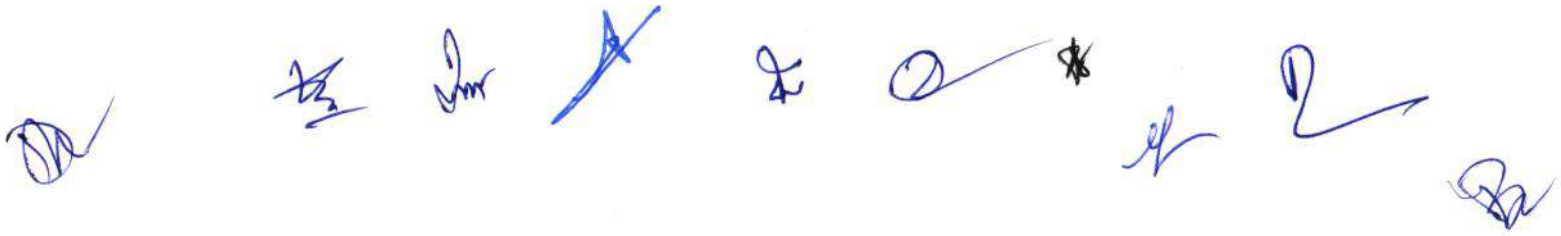
120	(400kV Chapar - Agia Line) Item No. 9.1: Stock bridge type Vibration Damper, BOQ-5, Price Schedule (400kV Chapar - Rangia Line) Item No. 8.1: Stock bridge type Vibration Damper, BOQ-8, Price Schedule Cl.44.27.0 STANDARDIZED TECHNICAL PARAMETERS, Page No. 901 & 902, Chapter 44, Vol-2, Technical Specification	As per BOQ, Item No. 9.1 of BOQ 5 & Item No. 8.1 of BOQ 8, Vibration Damper is required. Normally Vibration Dampers are used in Single/Twin Bundle lines. Also as per attached Technical Specification, Page No. 905, Chapter 44, it clearly mentioned Vibration Damper is used for Twin Bundle line only and not to Quad line. Kindly Clarify.	As per BoQ
121	(400kV Chapar - Agia Line) Item No. 9.5:Bundle Spacer suitable for Quad ACSR Moose, BOQ-5, Price Schedule (400kV Chapar - Rangia Line) Item No. 8.5: Bundle Spacer suitable for Quad ACSR Moose, BOQ-8, Price Schedule Cl.44.27.0 STANDARDIZED TECHNICAL PARAMETERS, Page No. 907, Chapter 44, Vol-2, Technical Specification	As per BOQ, Item No. 9.5 of BOQ 5 & Item No. 8.5 of BOQ 8, Bundle Spacer is required. However, As per attached Technical Specification, Page No. 907, Chapter 44, it clearly mentioned Quad Spacer Damper. Kindly Clarify.	As per BoQ

122	Bid_Volume_II Cl 5.10 - g - xix - PEB Building	Kindly furnish the following details for PEB Building.	Under design scope of EPC. Final parameters sahll be as per applicabale and Bid.
		1. Roof Colateral Load	
		2. Type of Bracing at Roof and Wall	
		3. Roof Slope	
		4. Canopy Slope, Canopy Specification, and Sofit Requirement	
		5. Future Expansion Requirement	
		6. Exterior Brick wall height & Wall Cladding height from FFL	
		7. Interior Brick wall height & Wall Cladding height from FFL	
		8. Numbers and Location of Cage Lader	
		9. Please confirm crane make, requirement of walkway, Handrail and ladder.	
		10.Roof line requirement, If yes please share specifications	
		11. As per technical specification, seperate staging OH tank will be constructed insted of installed at roof top. Please confirm?	
123	General Drain Drawing	Kindly provide the detailed drain section drawings, including clear depth, wall thickness, base dimensions, and reinforcement details for all types of drains.	Under design scope of EPC.
124	Civil Foundation Pile Foundation	In accordance with BoQ items and Soil Report, Pile foundation is adopted for Transformer Foundation, Reactor Foundation and GIS Building only, Rest equipment foundation and other foundation shall be considered as open foundation. Kindly confirm	For structures where pile foundation is not mentioned founation shall be as per soil report.
125	Civil Foundation Pile Foundation	The typical drawing provided in tender document is for the pile foundation is for the Transmission Line. Kindly Provide the typical pile section for the substation works also.	Under design scope of EPC.
126	BOQ_84456 Dismantling & Demolishing works	Kindly confirm that the scope related dismantling, demolition and tree cutting work. However, During our site visit, It was observed that few quarters and tree were there within the premises of proposed substation land. Kindly Confirm the Scope.	Under EPC scope and included in Site Clearance
		Moreover, If Dismantling and Demolition work is under the scope of bidder, then kindly confirm the location of dispoal of debris.	
127	Approved Vendor List Approved Vendor List	Kindly provide approved vendor list for all Eqipments.	AEGCL does not have an approved vendor/manufacturer's list
128	Item no. 12.07 BOQ	GIS Bus Duct & Bushing rating is not mentioned. Kindly confirm the current ratings.	Refer chapter 2 of Volume II "Information to bidders"



129	Item no. 3.02 BOQ	As separate item for Wave trap support/BPIs are not mentioned in the BOQ, kindly confirm in which line item we can claim for the same.	Included against normal BPI of BoQ
130	BOQ-3, Item No. 37.011, 37.012 & 38.001 Price Schedule	Reference: BOQ-3, Item No. 37.011, 37.012 & 38.001 We respectfully submit that HVAC/Ventilation-related items are included under BOQ-3, Item Nos. 37.011, 37.012 and 38.001. However, corresponding HVAC/Ventilation equipment supply items do not appear to be available under BOQ-1 (Supply Schedule). We kindly request clarification on whether the supply cost of HVAC and Ventilation equipment is included under BOQ-3 Item Nos. 37.011, 37.012 & 38.001, or if the corresponding supply items have been omitted from BOQ-1. Kindly confirm the appropriate BOQ for quoting these items.	As per BoQ
131	LT power cable and LT power cable Price Schedule	We observe that the supply of LT Power and Control Cables is provided under the Supply BOQ. Further, cable laying and termination are mentioned within certain ETC items of BOQ-3 and BOQ-13 for specific equipment only. Kindly clarify whether laying, dressing, glanding and termination of all LT Power and Control Cables supplied under the Supply BOQ are deemed included in the respective ETC items of BOQ-3 and BOQ-13, and that no separate payment shall be made for these activities. Alternatively, please specify the applicable BOQ item under which these works are to be quoted.	ETC of LT Power, control cables and accessories to be included with respective euipments
132	BOQ-1 Sr. No. 2.01 & 2.07 and BOQ-11 Sr. No. 1.01 Price Schedule	We observe that BOQ-1 Sr. No. 2.01 & 2.07 and BOQ-11 Sr. No. 1.01 specify Double Tension Insulator String with Hardware, whereas the configuration is mentioned as 4 × 160 kN. Kindly confirm whether the requirement is for a Double Tension String (2 × 160 kN) or a Quad Tension String (4 × 160 kN)	Quad Tension string (160x4kN)
133	BOQ-1 Sr. No. 2.02 and BOQ-11 Sr. No. 1.02 Price Schedule	We observe that BOQ-1 Sr. No. 2.02 and BOQ-11 Sr. No. 1.02 specify Suspension Insulator Strings with 210 kN UTS. Kindly confirm the specified 210 kN UTS for the 400 KV Suspension Insulator String.	Confirmed

134	CHAPTER 9: TECHNICAL SPECIFICATIONS OF CONTROL AND POWER CABLE POWER & CONTROL CABLES	We observe that separate technical requirements for power and control cables have been provided under Chapter 9 and Annexure-M, and certain requirements pertaining to cable construction and materials appear to differ between the two specifications. Kindly clarify which specification shall govern the design, manufacture, testing, and supply of power and control cables in case of any conflict between Chapter 9 and Annexure-M.	During detail engineering
135	CHAPTER 9: TECHNICAL SPECIFICATIONS OF CONTROL AND POWER CABLE & ANNEXURE - M 1.1 KV GRADE POWER & CONTROL CABLES POWER & CONTROL CABLES	Clause 9.3.2 of Chapter 9 stipulates supply on steel cable drums. Kindly confirm whether cables are required to be supplied exclusively on non-returnable steel drums or whether wooden drums shall also be acceptable.	As per Bid
136	CHAPTER 9: TECHNICAL SPECIFICATIONS OF CONTROL AND POWER CABLE & ANNEXURE - M 1.1 KV GRADE POWER & CONTROL CABLES POWER & CONTROL CABLES	Clause 9.15 of Chapter 9 specifies preferred make of XLPE compound as Dow/Borealis. Kindly confirm whether this requirement is applicable only for HT/EHV XLPE cables or whether the same shall also be applicable for LT power and control cables.	As per Bid
137	General POWER & CONTROL CABLES	We understand that the specification requires type testing on four randomly selected cable drums irrespective of the availability of valid type test certificates. Kindly confirm whether the mandatory type testing on four cable drums shall be carried out at the Contractor's cost. Further, please clarify whether any separate payment/reimbursement shall be made for testing, witnessing, and associated expenses.	As per BoQ
138	General POWER & CONTROL CABLES	The specification requires type testing on four randomly selected cable drums. Kindly confirm whether this requirement is applicable to all cable types and sizes covered under the contract or only to selected cable categories/sizes to be identified during detailed engineering.	During detail engineering



139	General Civil	We understand that our scope of work is limited to providing fencing around the proposed Agia (New) Substation, and that construction of the boundary wall is not included in our scope. Kindly confirm whether our above understanding is correct.	Confirmed
140	General Civil	We understand from the Master Plan drawing that the scope of work is limited to the following buildings: 400 kV GIS Building FFPH Building & Water Tank Store Room Building Kiosk Building Kindly confirm whether the above list covers all buildings included in the scope of work. If any additional buildings are to be considered, kindly provide the respective building names for assessment and BOQ estimation.	As per Bid & BOQ
141	General Civil	We understand from the Master Plan drawing that the following buildings are excluded from our scope of work: Officers' Quarters (2 Units × 3 Floors) Staff Quarters (4 Units × 3 Floors) Transit Camp Kindly confirm whether our above understanding is correct.	As per Bid & BOQ
142	General Civil	We observe that the tender BOQ includes line items only for the 400 kV GIS Building and Kiosk Building. In case any additional buildings are included in the scope of work, kindly provide the corresponding BOQ items for assessment and cost estimation.	As per Bid & BOQ
143	General Civil	We have received the Geotechnical Investigation Report for the proposed Agia (New) 400/220 kV Substation and understand that the same may be considered for execution purposes. Kindly confirm whether the existing geotechnical investigation report can be adopted for execution and whether any additional soil investigation is required.	Confirmed
144	General Civil	We understand that the Finished Ground Level (FGL) of the proposed Agia (New) 400/220 kV Substation shall be maintained at the same level as the existing Agia 220/132 kV Substation. Kindly confirm whether our above understanding is correct.	Will be determined during detailed engineering.



145	General Civil	We understand that the service road is not included in our scope of work and that our scope is limited to roads within the substation premises. Kindly confirm whether our above understanding is correct.	As per Bid & BOQ
146	General Commercial	Corrigendum III provides price variation only for selected items on Power Power Transformers, Reactors, Conductors, Cables and Tower Structures. Kindly clarify whether Price Variation shall also be applicable to major equipment such as GIS, SAS, Protection Panels, Control & Relay Panels, Station Auxiliaries, and commodity based items(Earthing , Al Tube, Cable , Trays) associated bought-out items having long manufacturing periods.	Please refer to corrigendum and pre bid MoM issued earlier.
147	General Commercial	The project execution is dependent upon availability of ROW, Forest Clearance, Railway Clearance, PTCC Approval and other statutory approvals. Kindly confirm that delays attributable to ROW, Forest Clearance, Railway approvals, PTCC approvals and other statutory approvals beyond Contractor's control shall entitle the Contractor to corresponding Extension of Time without levy of Liquidated Damages.	As per Bid and as per corrigendum issued earlier.
148	General Commercial	The conditions for issuance of Taking Over Certificate are not explicitly defined. Kindly confirm the timeline within which Taking Over Certificate shall be issued after successful completion and commissioning of works.	As per Bid
149	General Commercial	The bidding document provides for retention/security deduction from running bills. Kindly clarify the retention money percentage, maximum retention amount and the conditions for release of retention money. Further, confirm whether retention money can be replaced by a Bank Guarantee.	As per Bid
150	General Commercial	The bidding document stipulates that no interest shall be payable by the Employer in case of delayed payments beyond the prescribed payment period. Kindly review and confirm whether interest shall be payable for payments delayed beyond the stipulated 60-day payment period, particularly for delays not attributable to the Contractor.	As per Bid

151	General Commercial	Applicable rate for liquidated damages shall not exceed: ½% (half percent) per week. Maximum deduction for liquidated damages: 10 (ten) percent of contract price. Applicable rate for liquidated damages shall not exceed: ½% (half percent) per week. Maximum deduction for liquidated damages: 5 (five) percent of unexecuted portion of the contract.	As per Bid
152	General OEM	The bidding document does not explicitly clarify whether a GIS manufacturer can extend support to more than one bidder. Kindly confirm whether a GIS manufacturer/OEM is permitted to provide authorization and commercial offer to multiple bidders for this tender, or whether such authorization shall be on an exclusive basis to a single bidder only.	Multiple bidders
153	General OEM	We understand that during the bidding stage, the bidder shall propose a manufacturer/OEM meeting all technical specifications and qualification requirements of the bidding document. Kindly clarify whether, after award of contract, the Contractor shall be permitted to replace the proposed manufacturer/OEM with an alternate manufacturer/OEM meeting all the specified technical requirements and qualification criteria, subject to Employer's review and approval, in case the originally proposed manufacturer/OEM is unable to meet the project requirements, delivery schedule, or contractual obligations.	Confirmed subject to approval from AEGCL
		Existing Payment Terms Progressive payments for supply items: 1.Mobilization advance amounting Ten percent (10%) of the total Supply amount shall be released on submission of security in the form of Bank Guarantee for the equivalent amount made out in favour of the AEGCL. The Mobilization Advance	

154	General Payment terms	will be provided on interest basis at the rate charged by the funding agency for the Project to AEGCL 2. Within 60 (sixty) days from the date of submission of the invoice against supply, not more than 65% (seventy percent) payment of the total supply invoice value would be made, on receipt and acceptance of materials in full and good conditions (subject to availability of fund). However, GST amount on invoice would be paid 100% or as per Govt. Rules. 3. Remaining 25% (Twenty Five percent), retention amount of that item would be released subject to fulfillment of the following conditions – (a) 15% supply amount would be paid on completion of 50% of the total erection works of that individual item. (b) within 60 (sixty) days after receipt of invoice out of remaining 10% of the supply amount 5% would be paid upon issue of the Completion Certificate and balance 5% upon issue of the Operational Acceptance Certificate as per clause 25, 26 & 27 of GCC, which should be certified by the Project Authority In order to facilitate smooth project execution and improve cash flow during the manufacturing and procurement stage, we request consideration of the following payment terms: 10% Interest-Free Mobilization Advance against equivalent Bank Guarantee. 80% payment against submission of invoice and receipt of materials at site. 5% payment upon completion of erection of the respective item. 5% payment upon successful commissioning and Operational Acceptance.	As per Bid and as per corrigendum and pre bid MoM

ভাৰতীয় স্টেট বেংক
নিউ গুৱাহাটী
জিলা - কামৰূপ
গুৱাহাটী - ৭৮১০২১
অসম

भारतीय स्टेट बैंक
न्यू गुवाहाटी
जिला - कामरूप
गुवाहाटी - 781021
असम

State Bank of India
New Guwahati (0221)
Dist : Kamrup
Guwahati-781021
Assam

নং / क्रमांक / No

তাৰিখ / दिनांक/ Date :

Date. 10/05/2018

TO WHOM IT MAY CONCERN

This is to certify that Managing Director, ASSAM ELETRICITY GRID CORPORATION LIMITED (AEGCL) is operating its Principal Account with us in the name of "ASSAM ELETRICITY GRID PRIN AC"

The detail of Bank Account is as follows:

Name Of Bank	:	STATE BANK OF INDIA
Branch Name	:	NEW GUWAHATI BRANCH (BAMUNIMAIDAM)
Branch Code	:	00221
Account No	:	10566984188
Account Type	:	Current Account
IFSC Code	:	SBIN0000221
Name Of Account	:	ASSAM ELETRICITY GRID PRIN AC

STATE BANK OF INDIA NEW GUWAHATI

Assistant General Manager.
State Bank of India
New Guwahati Branch
Bamunimaidan,
Guwahati 781021

59

सत्यमेव जयते

Government of India

Form GST REG-06

[See Rule 10(1)]

Registration Certificate

Registration Number :18AAFCA4975J9Z3

1.	**Legal Name**	ASSAM ELECTRICITY GRID CORPORATION LIMITED			
2.	**Trade Name, if any**	ASSAM ELECTRICITY GRID CORPORATION LIMITED			
3.	**Constitution of Business**	Public Limited Company			
4.	**Address of Principal Place of Business**	1, BIJULEE BHAWAN, A.T. ROAD, PALTAN BAZAR, Kamrup Metropolitan, Assam, 781001			
5.	**Date of Liability**	04/03/2009			
6.	**Period of Validity**	From	29/08/2017	To	NA
7.	**Type of Registration**	Regular			
8.	**Particulars of Approving Authority**				
Signature					
Name					
Designation					
Jurisdictional Office					
9. Date of issue of Certificate		29/08/2017			
Note: The registration certificate is required to be prominently displayed at all places of business in the State.					

This is a system generated digitally signed Registration Certificate issued based on the deemed approval of the application for registration

Annexure A

सत्यमेव जयते

GSTIN	18AAFCA4973J9Z3
Legal Name	ASSAM ELECTRICITY GRID CORPORATION LIMITED
Trade Name, if any	ASSAM ELECTRICITY GRID CORPORATION LIMITED

Details of Additional Places of Business

Total Number of Additional Places of Business in the State	0

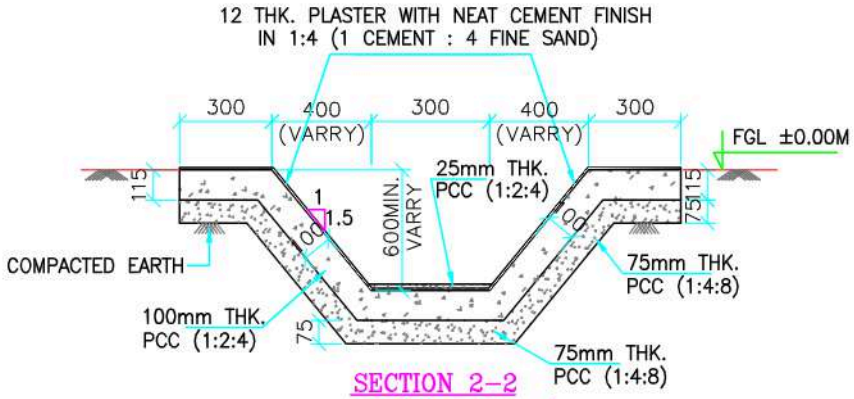
Annexure B

सत्यमेव-जयते

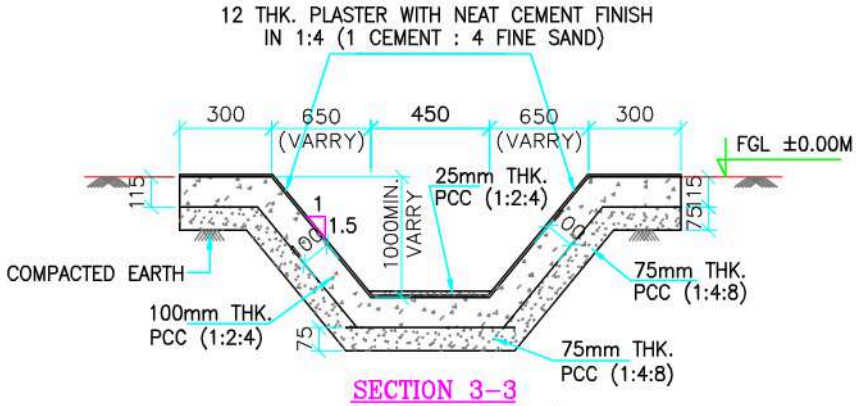
GSTIN	18AAFCA4973J9Z3
Legal Name	ASSAM ELECTRICITY GRID CORPORATION LIMITED
Trade Name, if any	ASSAM ELECTRICITY GRID CORPORATION LIMITED

Details of Managing / Whole-time Directors and Key Managerial Persons

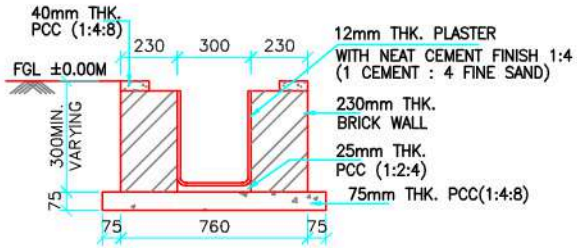
1	Name	SATYENDRA NATH KALITA
	Designation/Status	Maniging Director
	Resident of State	Assam



SECTION 2–2
DRAIN (500WX600D)
DRAIN LENGTH=2750
(SCALE–20:1)



SECTION 3–3
DRAIN (700WX1000D)
DRAIN LENGTH=1100
(SCALE–20:1)



SECTION 1–1
DRAIN (300WX300D)
DRAIN LENGTH=420
(SCALE–20:1)

NOTES:–

1. ALL DIMENSIONS ARE IN MM.
2. FINAL DRAWING BASED ON PROFILE AND DESIGN SHALL BE SUBMITTED DURING DETAILED ENGINEERING

CLIENT	ASSAM ELECTRICITY GRID CORP.LTD. BIJULEE BHAWAN,GUWAHATI,ASSAM			
TITLE	DETAIL OF DRAIN SECTION			
DRAWING NO.	DRAWING FOR TENDER PURPOSE ONLY			
		SCALE:	NTS	SHEET NO: 1 OF 1

ASSAM ELECTRICITY GRID CORPORATION LIMITED

Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.
(PILE LOCATION UP TO 40.00M)

Deputy Manager (C)
Design & Project
AEGCL, Kahilipara, Ghy-19

SUBMITTED BY:

Asstt. General Manager (C)
Design & Project
AEGCL, Kahilipara, Ghy-19

APPROVED BY

General Manager (C)
C/o The MD, AEGCL, Bijulee Bhawan

P.K.DUTTA & CO.
'SAI TOWER' BLOCK-A 1ST FLOOR,
NAIHATI, WEST BWNGAL-743165

A) BY WASH BORING METHOD

A.1.0 INTRODUCTION:

The Soil Investigation and laboratory tests for the proposed project for "Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant. Field Soil Exploration of bore holes have been completed during 31.08.2026 to 19.09.2026.

The objective of this soil investigation consisting of borings including conducting in-situ tests, collection of undisturbed & disturbed soil samples, conducting relevant laboratory tests, to study the soil stratifications, characteristics and engineering properties and suggesting safe approach to design and construction of foundation of proposed structure.

A.2.0 FIELD INVESTIGATION:

A.2.1 GENERAL:

For the design of the foundation for the proposed structure to be constructed at the site, this geotechnical investigation was done. In field work, the type of sub-soil profile and their characterization have been revealed. Laboratory test helps in determining relevant geotechnical properties of the sub-surface deposits leading to finalization of foundation depths and type of the structures and the bearing capacity with particular reference to the sub-surface types and their strength parameters and settlement potentials at the site.







Schedule of boreholes is tabulated form is given below:

Bore Hole No.	Terminating Depth (m)	GPS		Date of Commencement	Date of Completion
		LONGITUDE	LATITUDE		
AP-34	40.00 M	90°26'14.07"	26°20'38.79"	31.08.2026	04.09.2026
LOC-160/6	40.00 M	90°58'47.60"	26°35'50.1"	06.09.2026	10.09.2026
LOC-230/1	40.00 M	91°30'37.2"	26°37'36.1"	15.09.2026	19.09.2026

A.2.2 BORING/SAMPLING:

Of the different types of explorations, borings are the most practical and relatively correct method of obtaining sub-surface information. 3 (THREE) nos. bore holes of 150 mm diameter were sunk as per specifications and IS: 1892 and were extended up to specified depth 15.00m each for visualizing the stratification of soil. Casings as required were used to retain the borehole. Boring was carried out by Shell and Augur followed by Wash boring method in soil.

The details of these bore holes including field tests of Standard Penetration tests and also collection of disturbed and undisturbed soil samples are given in Bore Logs enclosed. Disturbed & SPT representative samples of sub-surface deposits were collected from bore holes, labeled depth wise and placed in polythene bags. Reference Numbers and depth of these samples are shown in Bore Log Data Sheets.

For proper evaluation of engineering properties of in-situ soils, including shear parameters and consolidation characteristics , representative undisturbed soil samples were collected at intervals along the boreholes, whenever clayey silt/silty clay or silty fine sand with clay binders were encountered.

Disturbed representative soil samples were collected during progress of boring, from shell and also from split-spoon sampler of Standard Penetration Tests conducted at different depth in boreholes. Such soil sample contains all the constituent materials of the respective stratum. Depth and details of the sample are shown in the borehole logs (Annexure).

A.2.3 STANDARD PENETRATION TEST (SPT):

The standard penetration tests were conducted as per IS 2131-1981. The split spoon sampler, connected with a string of drill rods, was lowered into the bottom of the bore hole. The sampler was driven into the soil stratum up to a maximum depth of 450mm. by making use of 63.5 kg. Weight falling freely from a height of 750mm on to an anvil fixed on the top of drill rod. The number of blows required to penetrate each of the successive 150mm. depths was counted to produce a total penetration of 450mm. To avoid seating errors, the blows required for the first 150mm. of penetration was not taken into account. Those required to increase the penetration from 150mm. to 450mm. constituted the N-number. On completion of the test, the sampler was lifted to the ground, opened, and the specimen of the soil sample was stored in polythene bags with the proper identification mark. N-value is noted in borehole log data sheets against the corresponding depth.

Followings are the corrections on SPT values in cohesion-less soil:

1. Due to overburden: N value for cohesion-less soil shall be corrected for overburden as per Fig. 1 of IS: 2131 (N').
2. Due to Dilatancy: The values corrected for overburden shall be corrected for dilatancy if the stratum consists of fine sand and silt below water table for values of N' greater than 15, as under (N"): N" = 15+0.5*(N'-15)

Typical calculation for N value correction:

BH No.-AP-1: 5.00m to 5.45m. Field N = 19. Water table: 1.20
Effective OVP at the average depth: = 0.56Kg/cm².
From Fig 1. of IS: 2131, correction factor = 1.15
So corrected SPT value for overburden, N' = 1.15x19 = 21.85
Dilatancy(N")=15+0.5(21.85-15) = 18.43
Corrected SPT value=18

Same calculation will be valid for other N values in sandy layer. All the correction in detail is presented in a tabular form below.

AVG. BULK DENSITY (gm/cc)		1.84	WATER TABLE (M)				1.20				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-34	2.00	2.45	2.23	10	0.41	0.31	0.31	1.32	13.20	-	13
	3.00	3.45	3.23	15	0.59	0.39	0.39	1.27	19.05	17.03	17
	5.00	5.45	5.23	19	0.96	0.56	0.56	1.15	21.85	18.43	18
	7.00	7.45	7.23	26	1.33	0.73	0.73	1.05	27.30	21.15	21
	10.00	10.45	10.23	39	1.88	0.98	0.98	1.00	39.00	27.00	27
	13.00	13.45	13.23	58	2.43	1.23	1.23	0.93	53.94	34.47	34
	16.00	16.45	16.23	83	2.99	1.48	1.48	0.85	70.55	42.78	43
	17.50	17.70	17.60	100	3.24	1.60	1.60	0.82	82.00	48.50	49
	19.00	19.07	19.04	100	3.50	1.72	1.72	0.81	81.00	48.00	48
	22.00	22.05	22.03	100	4.05	1.97	1.97	0.77	77.00	46.00	46
	40.00	40.05	40.03	100	7.36	3.48	3.48	0.59	59.00	37.00	37

AVG. BULK DENSITY (gm/cc)		1.85	WATER TABLE (M)				1.50				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
LOC-160/6	2.00	2.45	2.23	9	0.41	0.34	0.34	1.30	11.70	-	12
	3.00	3.45	3.23	14	0.60	0.42	0.42	1.25	17.50	16.25	16
	4.50	4.95	4.73	65	0.87	0.55	0.55	1.16	75.40	45.20	45
	6.00	6.19	6.10	100	1.13	0.67	0.67	1.08	108.00	61.50	62
	9.00	9.06	9.03	100	1.67	0.92	0.92	1.02	102.00	58.50	59
	40.00	40.08	40.04	100	7.41	3.55	3.55	0.59	59.00	37.00	37

AVG. BULK DENSITY (gm/cc)		1.84	WATER TABLE (M)				0.50				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
LOC- 230/1	2.00	2.45	2.23	5	0.41	0.24	0.24	1.37	6.85	-	7
	3.00	3.45	3.23	8	0.59	0.32	0.32	1.31	10.48	-	10
	5.00	5.45	5.23	17	0.96	0.49	0.49	1.20	20.40	17.70	18
	7.00	7.45	7.23	20	1.33	0.66	0.66	1.09	21.80	18.40	18
	10.00	10.45	10.23	9	1.88	0.91	0.91	1.02	9.18	-	9
	13.00	13.45	13.23	65	2.43	1.16	1.16	0.95	61.75	38.38	38
	14.50	14.70	14.60	100	2.69	1.28	1.28	0.92	92.00	53.50	54
	16.00	16.22	16.11	100	2.96	1.40	1.40	0.87	87.00	51.00	51
	19.00	19.08	19.04	100	3.50	1.65	1.65	0.82	82.00	48.50	49
	29.50	29.95	29.73	58	5.47	2.55	2.55	0.72	41.76	28.38	28
	31.00	31.45	31.23	61	5.75	2.67	2.67	0.70	42.70	28.85	29
	32.50	32.95	32.73	66	6.02	2.80	2.80	0.68	44.88	29.94	30
	34.00	34.45	34.23	71	6.30	2.92	2.92	0.67	47.57	31.29	31
	35.50	35.95	35.73	78	6.57	3.05	3.05	0.63	49.14	32.07	32
	37.00	37.45	37.23	81	6.85	3.18	3.18	0.60	48.60	31.80	32
	38.50	38.95	38.73	86	7.13	3.30	3.30	0.59	50.74	32.87	33
	40.00	40.45	40.23	90	7.40	3.43	3.43	0.57	51.30	33.15	33

A.2.4 MEASUREMENT OF WATER LEVEL:

Depth of level of water was noted when struck in. This is termed as depth of observed water level below existing ground level (EGL). Depth of ground water table (GWT) below EGL after 24 hours of removal of casing was also noted and shown in the profile. Standing water level was not encountered at any Borehole or Trail Pit. However ground water level is considered at ground level for design purpose.

BH No.	Depth (m)	Depth of GWT below EGL (m)	Commenced on	Completed on
AP-34	40.00	1.20	31.08.2026	04.09.2026
LOC-160/6	40.00	1.50	06.09.2026	10.09.2026
LOC-230/1	40.00	0.50	15.09.2026	19.09.2026

Note: SWL=Standing Water Level, EGL=Existing Ground Level

A.2.5 ROTARY CORE DRILLING:

Conventional diamond core drilling equipment was used for drilling vertical holes up to specified depth at each location. Rotary core drilling in rock was carried out according to IS 1892-1979. This drilling technique was regarded as the most satisfactory method of assessing the character of rock formations, which lie at depth below the ground surface. Specimens of rock in the form of cylindrical cores were recovered from the drill hole by means of a core barrel. Double barrel technique was adopted according to field condition. The core barrel was provided at its lower end with a detachable shoe or core bit, which is of diamond. All rotary core bits were of NX (75mm) size.

A.3.0 LABORATORY TESTING:

For proper identification and classification of the sub-surface and for deriving adequate information regarding its relevant physical and geotechnical properties at the site under investigation, the following laboratory tests were conducted on the soil and rock samples collected from the bore holes:

For Soil Samples:

1. Grain size analysis (Sieve as well as Hydrometer).
2. Liquid Limit & Plastic Limit.
3. Natural Moisture Content.
4. Specific Gravity.
5. Bulk & Dry Density.
6. Triaxial Shear Test (UU)
7. Unconfined Compressive Test (UC)
8. Direct Shear Test (DS)
9. Consolidation Test (**Oedometer test or a One-dimensional compression test.**)
10. Chemical Analysis

For Water Samples:

1. Chemical Analysis

The above mentioned laboratory tests were done following the testing procedure given in the relevant parts of IS: 2720 and other relevant IS codes. Results of all tests are furnished in Annexure of this report.

A.4.0 SUBSOIL PROFILE:

A.4.0 SUBSOIL PROFILE & ENGINEERING PROPERTIES:

4.1. AP-34:

STRATUM-I:-

The properties of the layer are as follows:

Description:

This layer is consists of "Loose to medium, dark grey silty fine sand with mica."Field "N" value of this layer is 10.This layer is laying after EGL and continues up to 3.00m.

Physical properties		
Gravel	%	0.00
Sand	%	68.00
Silt	%	28.00
Clay	%	4.00
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.82
Dry density	g/cc	1.54
NMC	%	18.26
Sp. Gr.		2.63

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0.00
Ø	°	18.00
Consolidation		
M_v	m^2/t	-----

STRATUM-II:-

The properties of the layer are as follows:

Description:

This layer is consists of "Medium, dark grey silty sand with mica." Average field N value of this layer is 20.This layer lies after 3.00m & continues up to 10.0m.

Physical properties		
Gravel	%	0.00
Sand	%	75.00
Silt	%	22.00
Clay	%	3.00
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.54
NMC	%	19.50
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0.00
Ø	°	26.00
Consolidation		
M_v	m^2/t	-----

STRATUM-III:-

The properties of the layer are as follows:

Description:

This layer is consists of "Dense, dark grey silty medium sand with mica & occasionally gravels observed." Average field "N" value of this layer is 60. layer lies after This 10.0m & continues up to 17.50m

Physical properties		
Gravel	%	2.00
Sand	%	77.00
Silt	%	19.00
Clay	%	2.00
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.54
NMC	%	20.45
Sp. Gr.		2.66

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0.00
Ø	°	34.00
Consolidation		
M_v	m^2/t	-----

STRATUM-IV:-

The properties of the layer are as follows:

Description:

This layer is consists of "Completely to highly, fractured, dark/white in coloured gravels & boulders with sand." Average field "N" value of this layer is more than 100. This layer lies after 17.50m & continues up to its termination depth (40.00m).

Range of TCR (%) 11% to 25%
Range of RQD (%) NIL

Note: *Since the RQD for this layer is nil, the rock samples Recovered are fractured and unsuitable for testing. Therefore, the compressive strength and shear capacity of this layer are estimated based on rock test results from samples collected from subsequent layers. This estimation is further supported by visual identification of the mineralogical structure and physical examinations, such as breakability, strength, and penetration (Ref. to Fig. 3 of IS 2911-1-2, Annex-B), performed on the fractured rock obtained from this layer.*

4.2. LOC-160/6:

STRATUM-I:-

The properties of the layer are as follows:

Description:

This layer is consists of "Medium stiff ,brownish grey clayey silt traces of sand" No SPT sample encountered in this layer. This layer is laying after EGL and continues up to 2.00m.

Physical properties		
Gravel	%	0
Sand	%	8
Silt	%	56
Clay	%	36
Classification		
IS Classification		ML

Liquid limit	%	31.31
Plastic limit	%	23.28
PI		8.03
Bulk density	g/cc	1.88
Dry density	g/cc	1.49
NMC	%	26.42
Sp. Gr.		2.67

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.23
Ø	°	0
Consolidation		
M_v	m^2/t	0.0017

STRATUM-II:-

The properties of the layer are as follows:

Description:

This layer is consists of "Loose to medium, dark grey silty sand with mica." Average field N value of this layer is 12.This layer lies after 2.00m & continues up to 3.50m.

Physical properties		
Gravel	%	0
Sand	%	73
Silt	%	23
Clay	%	4
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	---
NMC	%	---
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	25
Consolidation		
M_v	m^2/t	-----

STRATUM-III:-

The properties of the layer are as follows:

Description:

This layer is consists of "Medium dark grey, silty medium sand with gravels." Field "N" value of this layer is 65. This layer lies after This 3.50m & continues up to 6.00m

Physical properties		
Gravel	%	2
Sand	%	79
Silt	%	17
Clay	%	2
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	---
NMC	%	---
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	33
Consolidation		
M_v	m^2/t	-----

STRATUM-IV:-

The properties of the layer are as follows:

Description:

This layer is consists of "Completely to highly, fractured, dark/whitish grey coloured pebbles, cobbles, gravels etc. with sand." Average field "N" value of this layer is more than 100. This layer lies after 6.000m & continues up to 18.00m.

Range of TCR (%) 11% to 26%
Range of RQD (%) NIL

Note: *Since the RQD for this layer is nil, the rock samples Recovered are fractured and unsuitable for testing. Therefore, the compressive strength and shear capacity of this layer are estimated based on rock test results from samples collected from subsequent layers. This estimation is further supported by visual identification of the mineralogical structure and physical examinations, such as breakability, strength, and penetration (Ref. to Fig. 3 of IS 2911-1-2, Annex-B), performed on the fractured rock obtained from this layer.*

STRATUM-V:-

The properties of the layer are as follows:

Description:

This layer is consists of "Highly, to moderately, dark/whitish grey coloured gravels & boulders with sand." No SPT sample encountered in this layer. This layer lies after 18.00m & continues up to 33.00m.

Range of TCR (%)	25% to 37%
Range of RQD (%)	NIL

Note: *Since the RQD for this layer is nil, the rock samples Recovered are fractured and unsuitable for testing. Therefore, the compressive strength and shear capacity of this layer are estimated based on rock test results from samples collected from subsequent layers. This estimation is further supported by visual identification of the mineralogical structure and physical examinations, such as breakability, strength, and penetration (Ref. to Fig. 3 of IS 2911-1-2, Annex-B), performed on the fractured rock obtained from this layer.*

STRATUM-VI:-

The properties of the layer are as follows:

Description:

This layer is consists of "Completely to highly, dark grey colourd pebbles, cobbles, gravels with sand" Field SPT value of this layer is more than 100. This layer lies after 33.00m & continues up to its termination depth(40.00m).

Range of TCR (%)	10% to 23%
Range of RQD (%)	NIL

Note: *Since the RQD for this layer is nil, the rock samples Recovered are fractured and unsuitable for testing. Therefore, the compressive strength and shear capacity of this layer are estimated based on rock test results from samples collected from subsequent layers. This estimation is further supported by visual identification of the mineralogical structure and physical examinations, such as breakability, strength, and penetration (Ref. to Fig. 3 of IS 2911-1-2, Annex-B), performed on the fractured rock obtained from this layer.*

4.3. LOC-230/1:

STRATUM-I:-

The properties of the layer are as follows:

Description:

This layer is consists of "Loose, dark grey silty fine sand with mica." No SPT sample encountered in this layer. This layer is laying after EGL and continues up to 2.00m.

Physical properties		
Gravel	%	0
Sand	%	69
Silt	%	26
Clay	%	5
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	1.52
NMC	%	20.52
Sp. Gr.		2.63

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0.0
Ø	°	16
Consolidation		
M_v	m^2/t	-----

STRATUM-II:-

The properties of the layer are as follows:

Description:

This layer is consists of "Medium consistency, dark grey silty medium to coarses sand with mica." Average field N value of this layer is 13.This layer lies after 2.00m & continues up to 8.00m.

Physical properties		
Gravel	%	0
Sand	%	74
Silt	%	22
Clay	%	4
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.52
NMC	%	21.15
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	27
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:

This layer is consists of "Stiff consistency, dark grey clayey silt." Field "N" value of this layer is 9. This layer lies after This 8.00m & continues up to 11.50m

Physical properties		
Gravel	%	0
Sand	%	8
Silt	%	55
Clay	%	37
Classification		
IS Classification		ML

Liquid limit	%	32.31
Plastic limit	%	23.48
PI		8.83
Bulk density	g/cc	1.87
Dry density	g/cc	---
NMC	%	27.25
Sp. Gr.		2.67

Shear strength		
Type of Test		
Triaxial test		
C	kg/cm^2	0.22
Ø	°	5
Consolidation		
M_v	m^2/t	0.0018

STRATUM-IV:-

The properties of the layer are as follows:

Description:

This layer is consists of "Dense to very dense, dark grey silty medium to coarses sand with mica." Field "N" value of this layer is 65. This layer lies after 11.50m & continues up to 14.50m.

Physical properties		
Gravel	%	2
Sand	%	82
Silt	%	15
Clay	%	1
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	---
NMC	%	---
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	34
Consolidation		
M_v	m^2/t	---



STRATUM-V:-

The properties of the layer are as follows:

Description:

This layer is consists of "Pebbles, gravels infilling dark grey fine to medium coarses sand with mica." Average field "N" value of this layer is more than 100. This layer lies after 14.50m & continues up to 28.00m.

Range of TCR (%)	5% to 12%
Range of RQD (%)	NIL

Note: *Since the RQD for this layer is nil, the rock samples Recovered are fractured and unsuitable for testing. Therefore, the compressive strength and shear capacity of this layer are estimated based on rock test results from samples collected from subsequent layers. This estimation is further supported by visual identification of the mineralogical structure and physical examinations, such as breakability, strength, and penetration (Ref. to Fig. 3 of IS 2911-1-2, Annex-B), performed on the fractured rock obtained from this layer.*

STRATUM-VI:-

The properties of the layer are as follows:

Description:

This layer is consists of "Dense to very dense, dark grey fine to medium sand with mica & occasionally gravels and pea gravels." Average field SPT value of this layer is 74. This layer lies after 28.00m & continues up to its termination depth(40.00m).

Physical properties		
Gravel	%	12
Sand	%	75
Silt	%	12
Clay	%	1
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.82
Dry density	g/cc	---
NMC	%	17.68
Sp. Gr.		2.63

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	36
Consolidation		
M_v	m^2/t	---

Range of TCR (%)	NIL
Range of RQD (%)	NIL

Note: *Since the RQD for this layer is nil, the rock samples Recovered are fractured and unsuitable for testing. Therefore, the compressive strength and shear capacity of this layer are estimated based on rock test results from samples collected from subsequent layers. This estimation is further supported by visual identification of the mineralogical structure and physical examinations, such as breakability, strength, and penetration (Ref. to Fig. 3 of IS 2911-1-2, Annex-B), performed on the fractured rock obtained from this layer.*

A. 5.0 CALCULATION OF SCOUR LEVEL:

To provide for adequate margin of safety of the foundations for the proposed structure in river bed shall be designed for a larger discharge which should higher than the available data of river discharge during floods. Such additional percent of design discharge may be adopted at the discretion of the Foundation Designer to cover the possibility of floods of longer return period occurring during the life of the structure.

The following theoretical method may be adopted when dealing with natural channels flowing in non-coherent alluvium. The mean depth of scour d_{sm} in meters below the highest flood level may be calculated from the equation

$$d_{sm} = 1.34\left[\frac{D_b^{\,2}}{K_{sf}}\right]^{\frac{1}{3}}$$

Where, D_b = the discharge in cumecs per metre width of effective linear waterway.

K_{sf} = the representative silt factor for bed materials.

The designer is required to understand the scour phenomena at a particular site, and adopt moderated reasonable approximate design values of mean diameter of particles, design discharge, width of waterway for calculating the mean & maximum scour depth. It is also preferable to compare the estimated value of mean scour depth with the reported scour depths adopted in design of nearby bridge structures. Simple use of formula may not always help. Silt Factor plays a significant role in finalising the scour depth and also the

founding levels for the foundation of structures. Engineers often are confronted with a difficult job of choosing an appropriate value of silt factor. In the absence / identification of correct silt factor, there is a problem in the selection of this important parameter as the same is left to the judgment, discretion and experience of the designer. However, layer wise silt actor is given below.

BH NO. – AP-34

Stratum No.	Silt factor
I	0.557
II	1.154
III	2.198

BH NO. – LOC-160/6

Stratum No.	Silt factor
I	0.528
II	0.570
III	1.317

BH NO. – LOC-230/1

Stratum No.	Silt factor
I	0.568
II	0.584
III	2.254

5.1 SAMPLE CALCULATION:

BH NO. AP-34:

CHAMPABATI RIVER		
CALCULATION OF SCOUR DEPTH		
BH NO.	AP-34	
HFL (M)	40	AS per Survey Data (Profile)
DISCHARGE (CUMEC)	1737.000	Google did not provide any data, so we take tentative data for the calculation.
LINEAR WATER WAYS (M)	541.00	AS per Survey Data (Profile)

Layer No	FROM (RL) (AS per Survey Data (Profile)	To	Height (As per borelog data)	Type of soil	Ksf [f = 1.76Vd50]	Product
I	38.96	35.96	3	Silty fine sand	0.557	1.67
II	35.96	28.96	7	Silty sand	1.154	8.08
III	28.96	21.46	7.5	Silty medium sand with gravels.	2.198	16.49
			17.5		1.303	26.23

Linear Discharge (Cumec/M)	3.21	
Mean Scour Depth(M)	2.67	(Ref. Clause 703.2 IRC 78)
Maximum Scour Depth (M)	5.34	(Ref. Clause 703.2.1.1 IRC 78)
Maximum Scour Level (M)	34.66	
Scour Depth (M)	4.30	

Ground elevation = RL (+) 38.96 m.
Maximum scour level =34.66 m
Depth of soil to be washed away due to probable scour or Scour Depth = (38.96 - 34.66) = 4.30 ≈ 4.00 m

BH NO. - LOC- 160/6

BEKI RIVER		
CALCULATION OF SCOUR DEPTH		
BH NO.	LOC-160/6	
HFL (M)	54	AS per Survey Data (Profile)
DISCHARGE (CUMEC)	5520.000	As per google data
LINEAR WATER WAYS (M)	3230.00	AS per Survey Data (Profile)

Layer No	FROM (RL) (AS per Survey Data (Profile)	To	Height (As per borelog data)	Type of soil	Ksf [f = 1.76?d50]	Product
I	50.055	48.055	2	Clayey silt tracess of sand	0.528	1.06
II	48.055	46.555	1.5	Silty sand	0.57	0.86
III	46.555	44.055	2.5	Silty medium sand with gravels.	1.317	3.29
			6		0.805	5.20

Linear Discharge (Cumec/M)	1.71	
Mean Scour Depth (M)	2.06	(Ref. Clause 703.2 IRC 78)
Maximum Scour Depth(M)	4.12	(Ref. Clause 703.2.1.1 IRC 78)
Maximum Scour Level(M)	49.88	
Scour Depth (M)	0.17	

BH NO. - LOC- 230/1

PAGLADIYA RIVER		
CALCULATION OF SCOUR DEPTH		
BH NO.	LOC 230/1	
HFL (M)	70.10	AS per Survey Data (Profile)
DISCHARGE (CUMEC)	1737.000	As per google data
LINEAR WATER WAYS (M)	432.00	AS per Survey Data (Profile)

Layer No	FROM (RL) (AS per Survey Data (Profile)	To	Height (As per borelog data)	Type of soil	Ksf [f = 1.76Vd50]	Product
I	68.27	66.27	2	Silty fine sand	0.568	1.14
II	66.27	60.27	6	Silty Medium to coarses sand	0.584	3.50
III	60.27	57.27	3	Silty medium to coarses sand.	2.254	6.76
			11		1.14	11.40

Linear Discharge (Cumec/M)	4.02	
Mean Scour Depth (M)	3.25	(Ref. Clause 703.2 IRC 78)
Maximum Scour Depth (M)	6.50	(Ref. Clause 703.2.1.1 IRC 78)
Maximum Scour Level (M)	63.60	
Scour Depth (M)	4.67	

A.6.0 CHOICE OF FOUNDATION:

In views of the above sub-soil conditions in mind and the type of structure both the aspects regarding allowable bearing capacity for deep foundation have been discussed in the following paragraphs. Designer can choose the requirement depending upon the loading & geometry of the structure envisaged.

USE OF PILE FOUNDATION:

Bored cast in-situ piles are preferred due to typical geological formation, availability of construction agencies; ease of construction and less sound pollution.
While calculating the pile capacity, let us assume that,

a) Cut off level is at 2.0 m
b) Pile capacities shall be ascertained by approved method (IS 2911 (Part 1/Sec 2):2010).
c) Assumed Grade of Concrete = M25
d) Diameter of pile used = 1200mm.

A.6.0.1 **Sample Calculation of Safe Vertical Pile Capacity around AP- 34 [As per IS 2911 (Part 1/Sec 2) : 2010] s**

Pile embedment depth = 22 m.
Diameter of pile = 1200 mm.
Socket Length Considered in Calcualtion = 3m, [**Note:**Socket length can be provided shorter than the recommended value, depending on the design requirement for Pile capacity]
Sample vertical pile capacity has been estimated considering average layer stratification as per Sub- Soil Profile Clause 4.1 in the Report

Design Strength Parameters:

STRATUM-I

Considering the lab result and subsoil condition,
Use design c = 0 t/m^2 and $\Phi = 18^\circ$
Also use, Ki= 1; as $\Phi = 18^\circ$
Length of Shaft =3 m

STRATUM-II:

Considering the lab result and subsoil condition,
Use design c = 0 t/m^2 and $\Phi = 26^\circ$.
Also use, Ki= 1; as $\Phi = 26^\circ$
Length of Shaft = 7m

STRATUM-III:

Considering the lab result and subsoil condition,
Use design c = 0 t/m^2 and $\Phi = 34^\circ$.
Also use, Ki= 1.2; as $\Phi = 34^\circ$
Length of Shaft = 7.50m

STRATUM-IV:

Note:*Since the RQD for this layer is nil, the rock samples Recovered are fractured and unsuitable for testing. Therefore, the compressive strength and shear capacity of this layer are estimated based on rock test results from samples collected from subsequent layers. This estimation is further supported by visual identification of the mineralogical structure and physical examinations, such as breakability, strength, and penetration (Ref. to Fig. 3 of IS 2911-1-2, Annex-B), performed on the fractured rock obtained from this layer.*

Compressive strength of the Rock is assumed as, q_u = 160 tonne/m2,
Hence, c = 80 tonne/m^2
Nc= 9 (Recommended value)
α =0.9 (Recommended)

The ultimate vertical pile capacity of bored cast in situ RCC pile in soil may be estimated using the formula as given below:

$Q_u = [K_i \times P_{Di} \times \tan\delta_i \times A_{si}]/F_s + C_{ul} x N_c X \pi x B^2/4F_s + \alpha x C_{u2} x \pi x B x L/F_s$

$C_{ul} x N_c X \pi x B^2/4F_s$ is end bearing of Stratum-III (Ref. Cl 6.3.1.1 , and 6.3.2 Annex-B-8 page 13 of IS 2911 (Part-1/sec-2): 2010 (Pile in soft/ weathered rock)

$\alpha x C_{u2} x \pi x B x L/F_s$ is end bearing of Stratum-III (Ref. Cl 6.3.1.1 , and 6.3.2 Annex-B-8 page 13 of IS 2911 (Part-1/sec-2): 2010 (Pile in soft/ weathered rock)

where, Q_u = Ultimate vertical load carrying capacity of RCC bored pile,
K_i = Co-efficient of earth pressure in i^{th} layer.
P_{Di} = Mean effective overburden pressure of ith layer.
δ_i = Angle of wall friction between pile and soil for the ith layer.
A_{si} = Surface area of pile shaft in i^{th} layer = π x D x L
C_{ul} = Shear strength of rock below the base of pile
N_c = Bearing capacity factor taken as 9
D = Dia of pile in meter
F_s = Factor safety taken 3
α = 0.9 (recommended value)
C_{u2} = Average shear strength of rock in the socketed length pile
L = Length of pile in respective stratum,

Calculation of Safe Skin Frictional Resistance:

Stratum-I: (Layer 0 m depth to - 3.00 m depth)
(Note: Pile embedded 22m and cut off level 2.0m below the existing G.L)
Note: As the Cut-off, length is 2m from the existing ground level and as total length of scour depth is 4m in which 1m lies in this layer, So, Layer-I doesn't have any influence in the frictional resistance of the soil. Hence, it is ignored.
Stratum-II: (Layer - 3.00 m depth to - 10.00 m depth)
Note: As total length of scour depth is 4m in which 3m lies in this layer, So, in Layer-II first 3m doesn't have any influence in the frictional resistance of the soil. Hence, (7-3)=4m soil gives frictional resistance in this particular layer.
Ki= 1; as, $\Phi = 26^o$
Pdi=(0.5x0.84x4) = 1.68 t/m^2
Effective thickness= 4 m

As= π x 1.2 x 4 = 15.07 m^2
Ultimate Skin Frictional Resistance = (1.68x1xtan26°x15.07) = 12.35t.
Permissible skin friction resistance= 12.35/3= 4.12 t

Stratum-III: (Layer - 10.00 m depth to - 17.50 m depth)
Ki= 1.2; as, Φ = 34°
Pdi=(0.5x0.86x7.5+0.84x4) = 6.59 t/m^2
Effective thickness= 7.5 m
As= π x 1.2 x 7.5 = 28.26 m^2
Ultimate Skin Frictional Resistance = (6.59x1.2xtan34°x28.26) = 150.63 t.
Permissible skin friction resistance= 150.63/3= 50.21 t

Stratum-IV: (Layer - 17.50 m depth to - 22.00 m depth)
Adhesion factor, α=0.9 (Recommended by IS-2911-1-2)
Shear Strength Capacity along the socket length, c = 80 tonne/m^2
Dia. of the pile shaft, d= 1.2m
Length of the Socket, L = 3.0 m
As = (3.14x1.2x3.0) = 11.3 m^2
Ultimate Skin Frictional Resistance along the Socket Length = (0.9x80x11.3) tonne = 813.6 t
Safe Frictional Resistance =813.6/3 = 271 t

Calculation of Safe End Bearing Resistance:

A_p = 3.14 x $(1.2)^2/4$ = 1.1304 m^2.
D = Dia of pile 1.2 meter
F_s = Factor safety taken 3
Cu=Shear strength at the base of the foundation = 80 t/m^2
Nc= 9 [Taken from fig.1 of ANNEX-B of IS 2911-1-1(2010)]
Ultimate End Bearing Pressure = (80x9) = 720 t/m^2 (Restricted to 500 t/m^2)
Safe end bearing Pressure = 500/3 = 167 t/m^2
Hence, Safe End Bearing Resistance of the Pile = (167x1.1304) t/m2 =189 t
Safe vertical capacity of Pile = (4.12+50.21+271+167) t = 492 t
Recommended vertical capacity of the Pile = 480 t

Calculation of Uplift capacity of pile:
So, as per IS 2911(Part 1 /Sec 2):2010, Clause 6.3.2

Self weight of the pile (W_p) = A_pxLxϒ
= 1.130x22x25 = 621KN/9.81 (including cut off 2 m, ϒ=**25kN/m^3 as per IS 456)**
= 63.38 t
Safe uplift capacity of pile = Safe skin friction+ W_p /2
= (4.12+50.21+271+63.38)/2 = 194t

Recommended uplift capacity of pile = 189 t

Location	Pile Diameter (mm)	Pile Embedment Depth below existing Ground level with Cut-out level - 2.0 M (m)	Recommended Vertical Pile Capacity (t)	Recommended Uplift Pile Capacity (t)
AP-34	1000	22	420	144
	1200	22	480	189
LOC-160/6	1000	25	580	230
	1200	25	670	283
LOC-230/1	1000	22	400	126
	1200	22	450	157

A-6.0.2. ***Calculation of Lateral-Load Carrying Capacity and Moment-Resisting Capacity: Chapar-Rangia Transmission Line , AP- 34***

Diameter of Pile= 1200 mm

Refer to IS 2911 (Part-1/Section-2): 2010 Annex-c (Clause 6.5.2 page-14)

Stiffness Factor T= (EI/ηh)1/5 m (For pile in sand and normally loaded clay)

Here Ec= 5000√25 (fck = 25) =25000000 kN/ Sqm
I = π X 1.2^4/64 = 0.1017 m4
Taking, ηh = 11000 kN/m3 (from Table-3 of IS2911 (Part-1/Section-2) for Avg. Field N-value = 71 in fixity zone, considereing submerged condition)

Therefore, T = 2.970 m [Note: As, L>= 4T i.e. Long Pile, Calculation has been proceed with equivalent cantilever approach]

Here, e= 0 m (Considering, pile will be fully embedded) and

e/T= 0;

Refer to figure - 4 of Annex C of IS2911 (Part-1/Section-2) (Fixed head piles in sands and normally consolidated clays, Lf/T = 2.2

Therefore, Lf = 2.2 X 2.970 = 6.534 m and hence, e+Zf = 0+ 6.534 = 6.534 m

Permissible deflection of 1200mm dia. Pile = 12 mm (considering 1% of Pile dia)

For Fixed Head Pile

Refer to Clause c- 4.2 of IS 2911 y= H (e+Zf)3/12 EI

Here, y= 12mm or 0.012m

or H= 1312.5 kN= 131.25 ton

Moment MF = (Refer to Clause C-4.3 of IS 2911) = H (e+Zf)/2

MF = 131.25 x 6.534/2 = 428.78 t-M

Reduction Factor, m=0.82 [Ref. to Is 2911-part1-sec2, cl.C-4.3, 5B]

Hence, Actual Maximum moment, MA=351.60 ton-m

For Free Head Pile

Refer to Clause c- 4.2 of IS 2911 y= H (e+Zf)^3/3 EI

Here, y= 12mm or 0.012m

or H= 509.37 kN= 50.94 ton

Moment MF = (Refer to Clause C-4.3 of IS 2911) = Hx(e+Zf)

MF = 5.643X 50.94 = 287.45 t-M

Reduction Factor, m=0.4 [Ref. to Is 2911-part1-sec2, cl.C-4.3, 5A]

Hence, Actual Maximum moment, MA=114.98 t-M

BH NO	Pile Diameter (mm)	Recommended Lateral Load Carrying Capacity (t)		Recommended Moment Resisting Capacity (t-m)	
		Fixed-head Pile	Free-head Pile	Fixed-head Pile	Free-head Pile
AP-34	1000	81.71	31.73	189.26	61.90
	1200	131.25	50.94	351.60	114.98
LOC– 160/6	1000	74.84	29.04	178.48	58.36
	1200	120.16	46.65	331.52	108.42
LOC– 230/1	1000	77.20	29.96	182.22	59.59
	1200	123.94	48.09	338.42	110.66

A.7.0. CHEMICAL TESTS

Chemical tests were performed on soil and water samples for determining the pH value, Sulphate, Chloride content etc. The results are given in a tabular form below:

a. Chemical Test on Water Sample
Bore Hole No.- AP-34
Depth – 1.20M

Physical Test Findings:
1. Colour-Colourless 2.Odour-Agreeable

Chemical Test Findings:

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS: 3025(Part11):1983 Reaffirmed 2012	.....	6.9
2	conductivity at 25^0C	IS: 3025(Part14):2013 Reaffirmed 2006	µS/cm	235
3	Chloride as CL	IS:3025(Part-32):1988 Reaffirmed 2009	mg/l	29
4	Nitrate as NO_3	IS:3025(Part-34):1988 Reaffirmed 2009	mg/l	<1
5	Turbidity	IS:3025(Part-10):1984 Reaffirmed 2012	NTU	88.67
6	Organic matter	IS:3025(Part-47):1994	mg/l	185.1

Minimum detection limit: (i) Nitrate: 1.0mg/l

Bore Hole No.- LOC-160/6
Depth –1.50M

Physical Test Findings:
1.Colour-Colourless 2.Odour-Agreeable

Chemical Test Findings:

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS: 3025(Part11):1983 Reaffirmed 2012	.....	6.7
2	conductivity at 25^0C	IS: 3025(Part14):2013 Reaffirmed 2006	µS/cm	211
3	Chloride as CL	IS:3025(Part-32):1988 Reaffirmed 2009	mg/l	35
4	Nitrate as NO_3	IS:3025(Part-34):1988 Reaffirmed 2009	mg/l	<1
5	Turbidity	IS:3025(Part-10):1984 Reaffirmed 2012	NTU	90.15
6	Organic matter	IS:3025(Part-47):1994	mg/l	195.0

Minimum detection limit: (i) Nitrate: 1.0mg/l

Bore Hole No.- LOC-230/1
Depth –0.50M

Physical Test Findings:
1.Colour-Colourless 2.Odour-Agreeable

Chemical Test Findings:

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS: 3025(Part11):1983 Reaffirmed 2012	.....	6.89
2	conductivity at 25^0C	IS: 3025(Part14):2013 Reaffirmed 2006	µS/cm	213
3	Chloride as CL	IS:3025(Part-32):1988 Reaffirmed 2009	mg/l	37
4	Nitrate as NO_3	IS:3025(Part-34):1988 Reaffirmed 2009	mg/l	<1
5	Turbidity	IS:3025(Part-10):1984 Reaffirmed 2012	NTU	93.60
6	Organic matter	IS:3025(Part-47):1994	mg/l	189.0

Minimum detection limit: (i) Nitrate: 1.0mg/l

b. Chemical Test on Soil Sample
Bore Hole No.- AP-34

Depth –3.00-3.45 M

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS:2720(Part-26):1987	.....	3.20
2	Organic Matter(OM)	IS:2720(Part-22):1972	%	0.33
3	Calcium carbonate ($caco_3$)	IS:2720(Part-23):1976	%	19.52
4	Sulphate(SO_3)	IS:2720(Part-27):1977	mg/kg	5.76
5	Sulphate(SO_4)	IS:2720(Part-27):1977	mg/kg	8.00
6	Chloride	IS:3025(Part-32):1988	%	0.021
7	Salinity as Conductivity	IS:14767-2000	ms	1.63
8	Nitrate	SOP No: RVB/SOP/05/25 As per ICAR 2011 (Department of Agriculture & cooperation , Ministry of Agriculture, Govt. of India)	mg/kg	0.59

Bore Hole No- LOC-160/6

Depth –3.00-3.45 M

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS:2720(Part-26):1987	.....	2.83
2	Organic Matter (OM)	IS:2720(Part-22):1972	%	0.38
3	Calcium carbonate ($caco_3$)	IS:2720(Part-23):1976	%	21.15
4	Sulphate(SO_3)	IS:2720(Part-27):1977	mg/kg	6.13
5	Sulphate(SO_4)	IS:2720(Part-27):1977	mg/kg	8.09
6	Chloride	IS:3025(Part-32):1988	%	0.023
7	Salinity as Conductivity	IS:14767-2000	ms	1.71
8	Nitrate	SOP No: RVB/SOP/05/25 As per ICAR 2011 (Department of Agriculture & cooperation , Ministry of Agriculture, Govt. of India)	mg/kg	0.53

Bore Hole No- LOC-230/1

Depth –3.00-3.45 M

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS:2720(Part-26):1987	.....	3.05
2	Organic Matter (OM)	IS:2720(Part-22):1972	%	0.31
3	Calcium carbonate ($caco_3$)	IS:2720(Part-23):1976	%	20.66
4	Sulphate(SO_3)	IS:2720(Part-27):1977	mg/kg	6.05
5	Sulphate(SO_4)	IS:2720(Part-27):1977	mg/kg	7.69
6	Chloride	IS:3025(Part-32):1988	%	0.027
7	Salinity as Conductivity	IS:14767-2000	ms	1.68
8	Nitrate	SOP No: RVB/SOP/05/25 As per ICAR 2011 (Department of Agriculture & cooperation , Ministry of Agriculture, Govt. of India)	mg/kg	0.55

Chemical test was carried out on a soil and water samples to determine the pH value, Sulphate and Chloride. It is seen that the values are within permissible limits (as per IS: 456-2000) and so no special cement will be required for foundation concrete. **Either Ordinary Portland cement or Portland slag cement or Portland Pozzolana cement can be used for concreting.**

A8.0 CONCLUSION AND RECOMMENDATION :

From engineering properties of the deposit following recommendations for foundation are suggested:

Based on the field tests and the foregoing discussion the following are summarized:

a) The subsoil is characterized by silty clay in first layer & fine sand continues up to terminating depth of all the boreholes.

b) The present report deals with the geotechnical investigation findings at the location and the discussion on the aspects regarding allowable bearing capacity of open foundations. However, the Foundation Designer may modulate the type of foundations and other values regarding foundation geometry and soil design parameter to meet any specific design criteria.

c) Water level observations were made during the progress of boring. The depths at which ground water was encountered, was recorded in the respective borelog sheet as standing water level. Standing water level was measured after 24 hours of removal of casing. It was noticed that the standing water level was found within a depth of 1.50 m to 2.00 m below EGL.

d) Precaution in all respect should be taken for nearby existing structures, if any. The final decision regarding the foundation will depend on the judgment of the engineer concerned.

e) Any unsuitable expansive/decomposed if encountered should be replaced.

f) The foundation spacing should be chosen in such a way that there should not be any overlap of pressure bulb of 2 adjacent footings.

g) Determination of recommended allowable bearing capacity has been discussed in the section **5.1 (Summary of SBC) for Shallow Foundation.**

h) Concentration of chlorides, sulphates & pH value are under limit as per IS Code specification. So no special cement will be required for foundation concrete.

i) Pile Capacity shall be considered for Foundation design as per nearest bore hole data

Prepared By

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ANNEXURE

FIELD BORE LOG DATA

M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	AP-34	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type:-	Champabati River Bed	Northing :-	26°20'38.79"				
Commenced on:-	31.08.2026	Easting :-	90°26'14.07"	SPT	11	Undisturbed (U)	6
Completed on:-	04.09.2026	R.L. Value :-	38.96 M	Cone	-	Distubed (D)	7
Water Level :-1.20M		Termination Depth (m):-40.00		Vane	-	Core (C)	15

DEPTH (m)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D(%)	Remarks
0.00					Loose to medium, dark grey silty fine sand with mica.			D	1	0.50	---			
								D	2	1.00	---			
								U	1	1.50	1.95			
3.00	4	4	6	10			3.00	S	1	2.00	2.45			
3.00	5	7	8	15	Medium, dark grey silty sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	---			
	5	7	12	19				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	---			
	7	11	15	26				S	4	7.00	7.45			
								U	4	8.00	8.45			
10.00							7.00	D	5	8.50	---			
10.00	11	17	22	39	Dense, dark grey silty medium sand with mica & occasionally gravels observed.			S	5	10.00	10.45			
								U	5	11.00	11.45			
								D	6	11.50	---			
	16	25	33	58				S	6	13.00	13.45			
								U	6	14.00	14.45			
								D	7	14.50	---			
17.50	23	32	51	83			7.50	S	7	16.00	16.45			

"S" - 'SPT'	"C" - 'CORE'	"U" - 'UNDISTURBED SAMPLE'	"D" - 'DISTURBED SAMPLE'	"W" - 'WATER SAMPLE'	"BGL" - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-34	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type:-	Champabati River Bed	Northing :-	26°20'38.79"				
Commenced on:-	31.08.2026	Easting :-	90°26'14.07"	SPT	11	Undisturbed (U)	6
Completed on:-	04.09.2026	R.L. Value :-	38.96 M	Cone	-	Distubed (D)	7
Water Level :-1.20M		Termination Depth (m):-40.00		Vane	-	Core (C)	15

DEPTH (m)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D(%)	Remarks
17.50	48	55 blows for 5cm>100			Completely to highly, fractured, dark/white in coloured gravels & boulders with sand.			S	8	17.50	17.70			
								C	1	17.50	19.00	11%	NIL	
	65 blows for 7cm>100							S	9	19.00	19.07			Rebounded
								C	2	19.00	20.50	14%	NIL	
								C	3	20.50	22.00	15%	NIL	
	63 blows for 5cm>100							S	10	22.00	22.05			Rebounded
								C	4	22.00	23.50	19%	NIL	
								C	5	23.50	25.00	20%	NIL	
								C	6	25.00	26.50	18%	NIL	
								C	7	26.50	28.00	18%	NIL	
								C	8	28.00	29.50	20%	NIL	
								C	9	29.50	31.00	21%	NIL	
								C	10	31.00	32.50	23%	NIL	
								C	11	32.50	34.00	23%	NIL	
								C	12	34.00	35.50	21%	NIL	
								C	13	35.50	37.00	23%	NIL	
								C	14	37.00	38.50	22%	NIL	
								C	15	38.50	40.00	25%	NIL	
40.00	76 blows for 5cm>100						22.50	S	11	40.00	40.05			Rebounded

" S " - ' SPT '	" C " - 'CORE'	" U " - ' UNDISTURBED SAMPLE '	" D " - ' DISTURBED SAMPLE '	" W " - ' WATER SAMPLE '	" BGL " - 'BELOW GROUND LEVEL '

M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	LOC-160/6	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type:-	Beki river	Northing :-	26°35'50.1"				
Commenced on:-	06.09.2026	Easting :-	90°58'47.60"	SPT	6	Undisturbed (U)	2
Completed on:-	10.09.2026	R.L. Value :-	50.055 M	Cone	-	Distubed (D)	2
Water Level :-1.50M		Termination Depth (m):-40.00		Vane	-	Core (C)	23

DEPTH (m)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D(%)	Remarks
0.00					Medium stiff ,brownish grey clayey silt traces of sand.			D	1	0.50	---			
								D	2	1.00	---			
2.00							2.00	U	1	1.50	1.95			
2.00	3	4	5	9	Loose to medium, dark grey silty sand with mica.			S	1	2.00	2.45			
3.50	4	6	8	14			1.50	S	2	3.00	3.45			
3.50					Medium dark grey, silty medium sand with gravels.			U	2	4.00	4.20			
6.00	17	30	35	65			2.50	S	3	4.50	4.95			
6.00	55	50 blows for 4cm>100			Completely to highly, fractured, dark/whitish grey coloured pebbles, cobbles, gravels etc. with sand.			S	4	6.00	6.19			Rebounded
								C	1	6.00	7.50	13%	NIL	
								C	2	7.50	9.00	11%	NIL	
	64 blows for 6cm>100							S	5	9.00	9.06			
								C	3	9.00	10.50	14%	NIL	
								C	4	10.50	12.00	15%	NIL	
								C	5	12.00	13.50	17%	NIL	
								C	6	13.50	15.00	21%	NIL	
								C	7	15.00	16.50	24%	NIL	
18.00							18.00	C	8	16.50	18.00	26%	NIL	

"S" - 'SPT'	"C" - 'CORE'	"U" - 'UNDISTURBED SAMPLE'	"D" - 'DISTURBED SAMPLE'	"W" - 'WATER SAMPLE'	"BGL" - 'BELOW GROUND LEVEL'

P.K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	LOC-160/6	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type:-	Beki river	Northing :-	26°35'50.1"				
Commenced on:-	06.09.2026	Easting :-	90°58'47.60"	SPT	6	Undisturbed (U)	2
Completed on:-	10.09.2026	R.L. Value :-	50.055 M	Cone	-	Distubed (D)	2
Water Level :-1.50M		Termination Depth (m):-40.00		Vane	-	Core (C)	23

DEPTH (m)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D(%)	Remarks
18.00					Highly, to moderately, dark/whitish grey coloured gravels & boulders with sand			C	9	18.00	19.50	28%	NIL	
								C	10	19.50	21.00	30%	NIL	
								C	11	21.00	22.50	29%	NIL	
								C	12	22.50	24.00	30%	NIL	
								C	13	24.00	25.50	35%	NIL	
								C	14	25.50	27.00	37%	NIL	
								C	15	27.00	28.50	30%	NIL	
								C	16	28.50	30.00	29%	NIL	
								C	17	30.00	31.50	27%	NIL	
33.00							15.00	C	18	31.50	33.00	25%	NIL	
33.00					Completely to highly, dark grey colourd pebbles, cobbles, gravels with sand			C	19	33.00	34.50	23%	NIL	
								C	20	34.50	36.00	17%	NIL	
								C	21	36.00	37.50	16%	NIL	
								C	22	37.50	39.00	14%	NIL	
								C	23	39.00	40.00	10%	NIL	
40.00	69 blows for 8cm>100						7.00	S	6	40.00	40.08			

"S" - 'SPT' "C" -'CORE' "U" - 'UNDISTURBED SAMPLE' "D" - 'DISTURBED SAMPLE' "W" -'WATER SAMPLE' "BGL" - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	LOC-230/1	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type:-	Pagladiya River	Northing :-	26°37'36.1"				
Commenced on:-	15.09.2026	Easting :-	91°30'37.2"	SPT	17	Undisturbed (U)	5
Completed on:-	19.09.2026	R.L. Value :-	68.27 M	Cone	-	Distubed (D)	6
Water Level :-0.50M		Termination Depth (m):-40.00		Vane	-	Core (C)	10

DEPTH (m)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D (%)	Remarks
0.00					Loose, dark grey silty fine sand with mica.			D	1	0.50	---			
								D	2	1.00	---			
2.00							2.00	U	1	1.50	1.95			
2.00	2	2	3	5	Medium consistency, dark grey silty medium to coarses sand with mica.			S	1	2.00	2.45			
	3	4	4	8				S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	---			
	5	7	10	17				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	---			
8.00	7	9	11	20			6.00	S	4	7.00	7.45			
8.00					Stiff consistency, dark grey clayey silt			U	4	8.00	8.45			
								D	5	8.50	---			
	2	4	5	9				S	5	10.00	10.45			
								U	5	11.00	11.45			
11.50							3.50	D	6	11.50	---			
11.50					Dense to very dense, dark grey silty medium to coarses sand with mica									
	19	30	35	65				S	6	13.00	13.45			
14.50							3.00							

"S" - 'SPT'	"C" - 'CORE'	"U" - 'UNDISTURBED SAMPLE'	"D" - 'DISTURBED SAMPLE'	"W" - 'WATER SAMPLE'	"BGL" - 'BELOW GROUND LEVEL'

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M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	LOC-230/1	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type:-	Pagladiya River	Northing :-	26°37'36.1"				
Commenced on:-	15.09.2026	Easting :-	91°30'37.2"	SPT	17	Undisturbed (U)	5
Completed on:-	19.09.2026	R.L. Value :-	68.27 M	Cone	-	Distubed (D)	6
Water Level :-0.50M		Termination Depth (m):-40.00		Vane	-	Core (C)	10

DEPTH (m)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D (%)	Remarks
14.50	49	54 blows for 5cm>100			Pebbles, gravels infilling dark grey fine to medium coarses sand with mica.			S	7	14.50	14.70			Rebounded
								C	1	14.50	16.00	5%	NIL	
	48	56 blows for 7cm>100						S	8	16.00	16.22			Rebounded
								C	2	16.00	17.50	5%	NIL	
								C	3	17.50	19.00	6%	NIL	
	65 blows for 8cm>100							S	9	19.00	19.08			Rebounded
								C	4	19.00	20.50	8%	NIL	
								C	5	20.50	22.00	9%	NIL	
								C	6	22.00	23.50	11%	NIL	
								C	7	23.50	25.00	12%	NIL	
								C	8	25.00	26.50	7%	NIL	
28.00							13.50	C	9	26.50	28.00	5%	NIL	
28.00					Dense to very dense, dark grey fine to medium sand with mica & occasionally gravels and pea gravels.			C	10	28.00	29.50	NIL	NIL	
	14	22	36	58				S	10	29.50	29.95			
	14	23	38	61				S	11	31.00	31.45			
	16	27	39	66				S	12	32.50	32.95			
	19	26	45	71				S	13	34.00	34.45			
	20	30	48	78				S	14	35.50	35.95			
	21	36	45	81				S	15	37.00	37.45			
	25	40	46	86				S	16	38.50	38.95			
40.00	26	38	52	90			12.00	S	17	40.00	40.45			

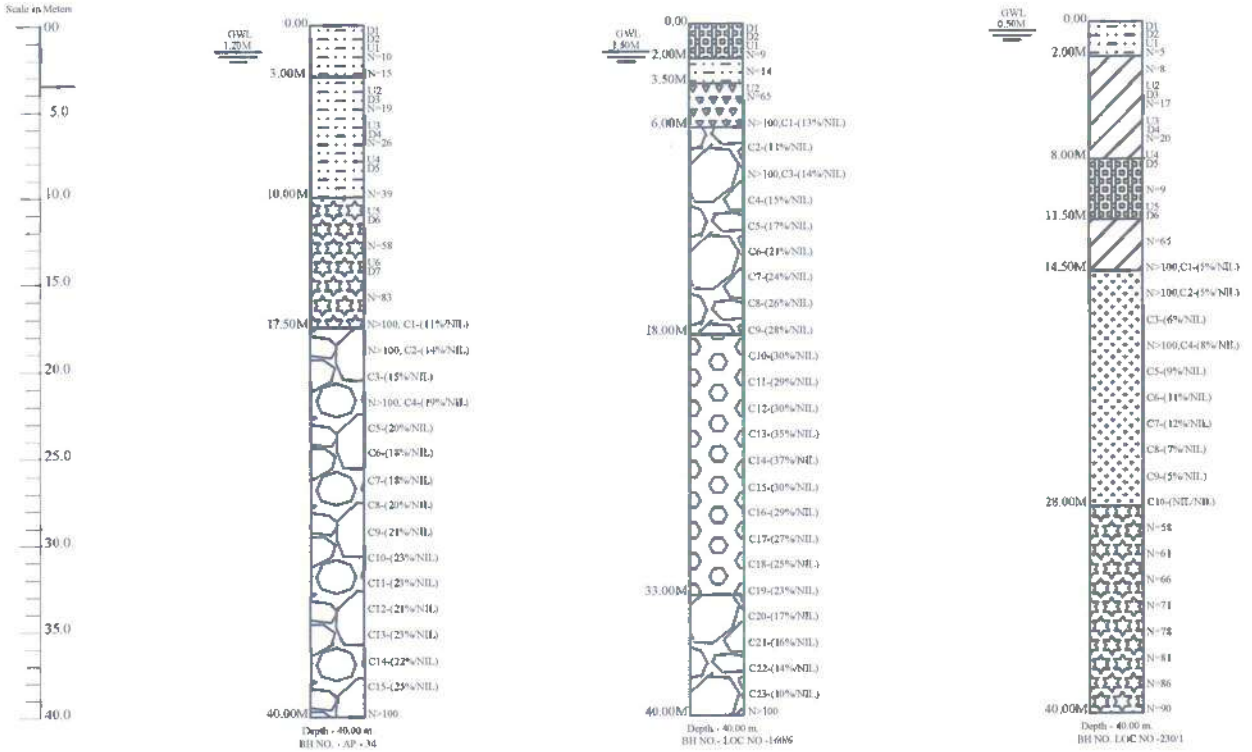
"S" - 'SPT' "C" - 'CORE' "U" - 'UNDISTURBED SAMPLE' "D" - 'DISTURBED SAMPLE' "W" - 'WATER SAMPLE' "BGL" - 'BELOW GROUND LEVEL'

P. K. DUTTA & CO. NAIHATI

SUBSOIL PROFILE

M/s. P. K. Dutta & Co.	Generalised Subsoil Profile	Client:-W.B.S.E.T.C.L

Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.



- Silty fine sand/Silty sand with mica.
- Silty medium sand with mica & occasionally gravels or pea gravels.
- Completely to highly, fractured gravels, pebbles, cobbles & boulders with sand etc.
- Clayey silt traces of sand./ Clayey silt
- Highly to moderately, gravels & boulders with sand
- silty medium to coarses sand with mica.
- Pebbles, gravels & infilling dark grey fine to medium coarses sand with mica.

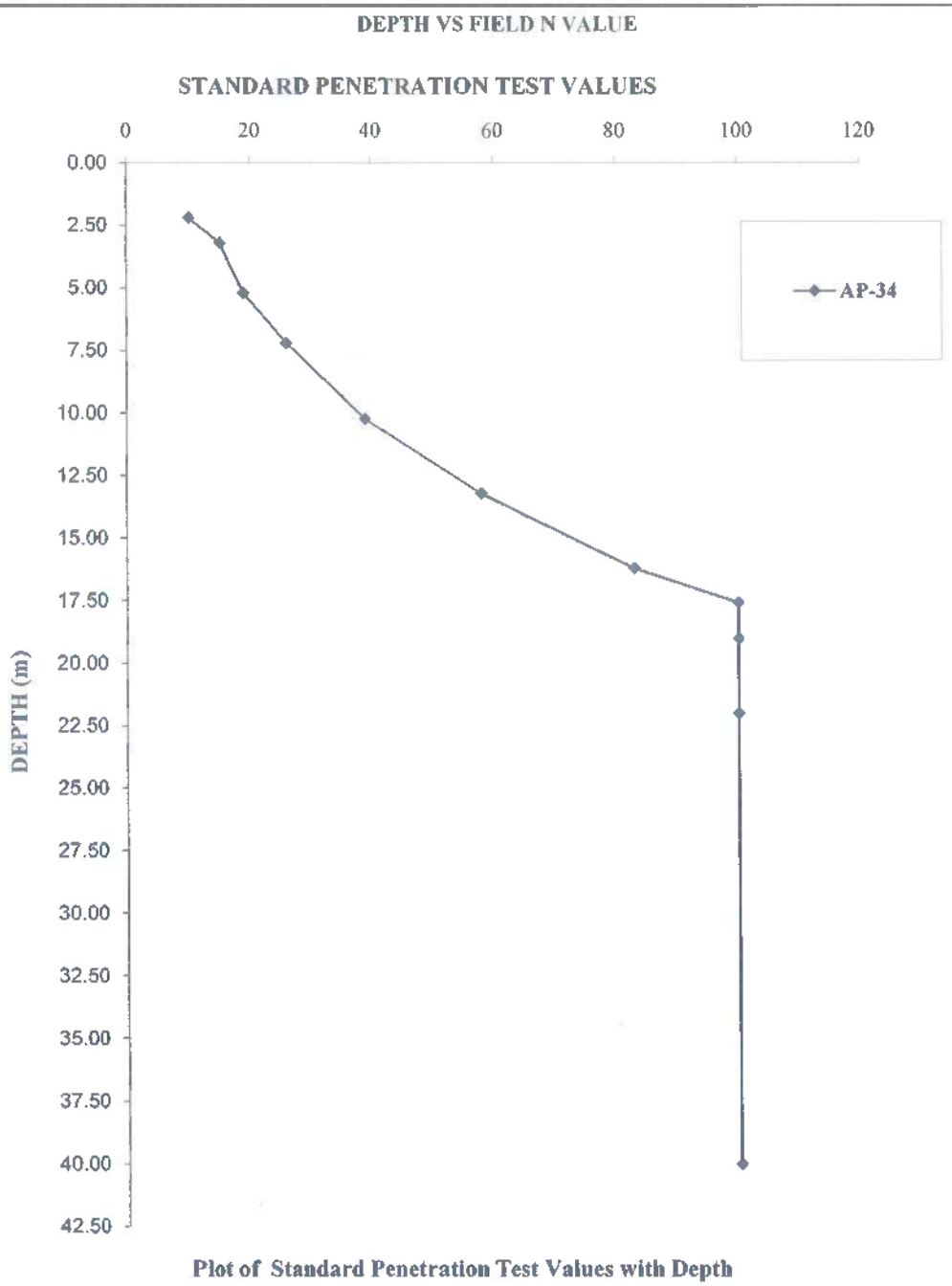
NOTE:
1) "N" means Standard Penetration Test value.
2) "U" means Undisturbed Soil Sample.
3) "D" means Disturbed Soil Sample.
4) "C" means Core.
5) "TCR" means Total Core Recovery.
6) "RQD" means Rock Quality Designation.
7) "SWL" means Standing water Level.
8) Thickness of each startum is shown in left side of each borehole.

P. K. DUTTA & CO. NAIHATI

PLOT OF SPT VALUES WITH DEPTH

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

Client :-	ASSAM ELECTRICITY GRID CORPORATION LIMITED.
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

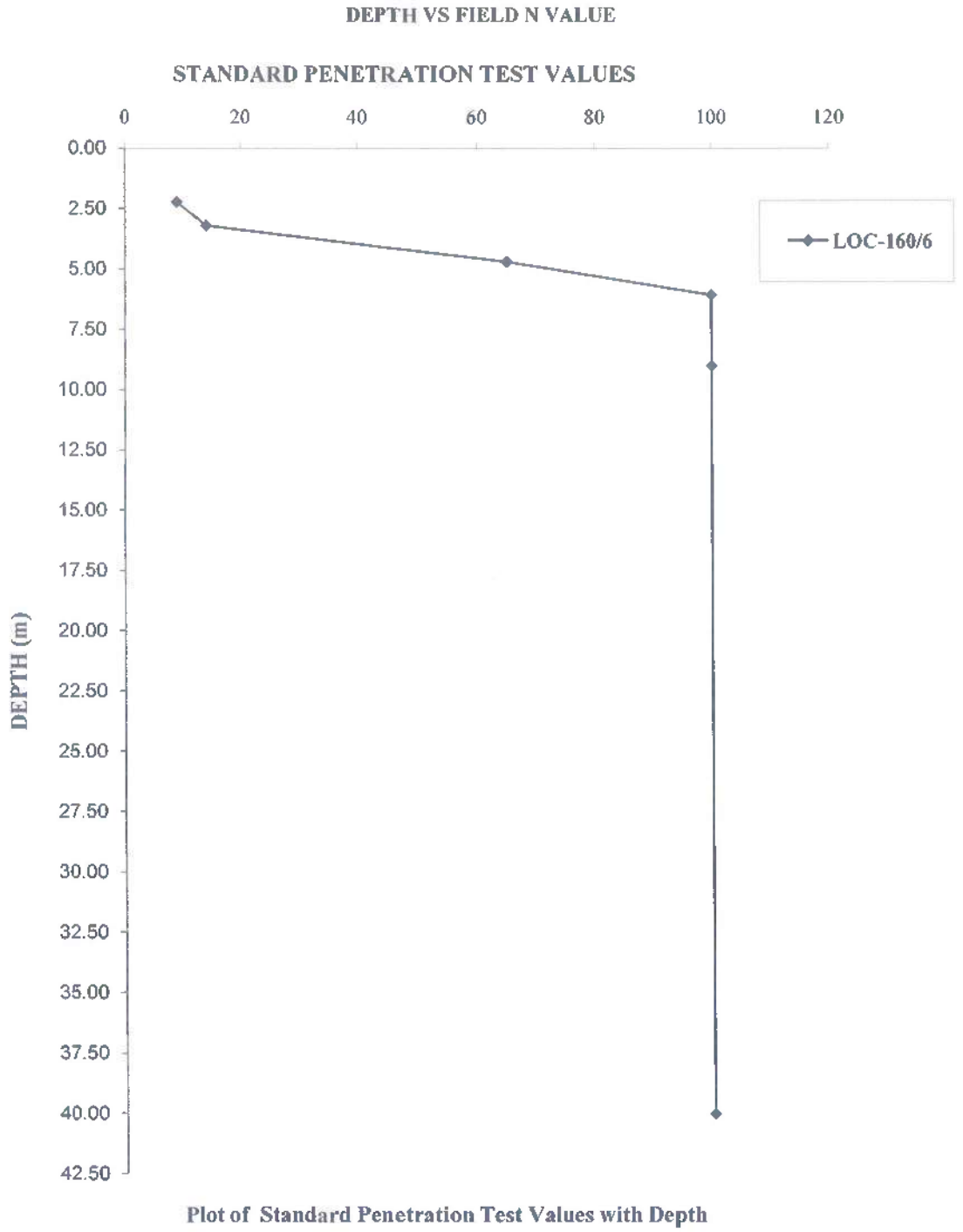


Plot of Standard Penetration Test Values with Depth



M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

Client :-	**ASSAM ELECTRICITY GRID CORPORATION LIMITED.**
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.



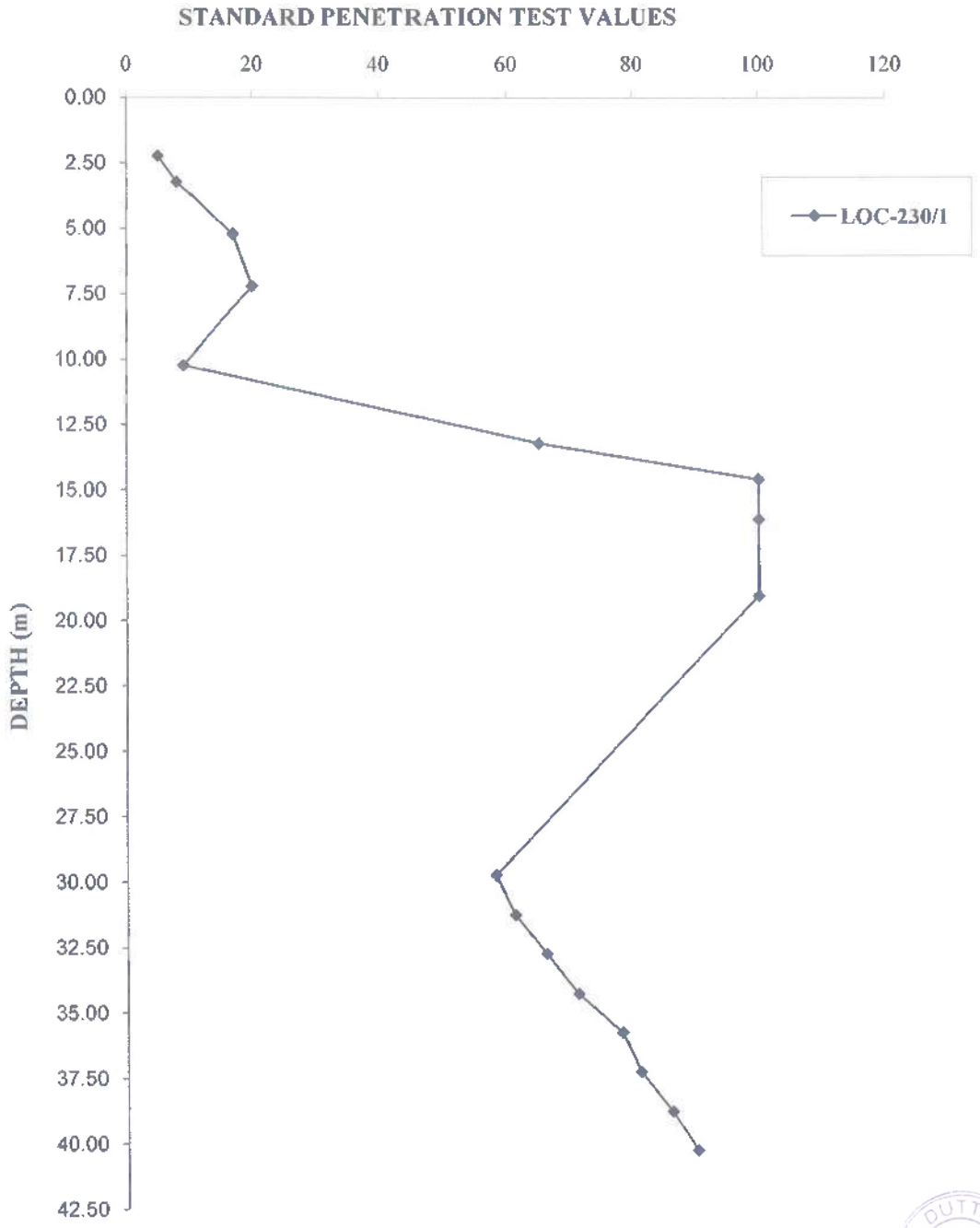
Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

Client :-	**ASSAM ELECTRICITY GRID CORPORATION LIMITED.**
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

DEPTH VS FIELD N VALUE



Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO. NAIHATI

LABORATORY TEST RESULTS OF SOIL

Client: Assam Electricity Grid Corporation Limited.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No	Sample Number	Depth (m)	Sample Description	Bulk Density	Dry Density	Sp. Gravity	Nat. Moisture	Mv	Shear Strength (kg/cm²)		Type of Test	Atter. Limits			IS Classification	Grain Size				Test Method
									Cohesion	Friction		LL	PL	PI		Gravel	Sand	Silt	Clay	
				gms/cc	gms/cc		%	t/sqm	kg/sqcm	Deg.		%	%	%		%	%	%	%	
AP-34	U1	1.50	Loose to medium dark grey silty fine sand with mica.	1.82	1.54	2.63	18.26	-	0.00	18.00	DS	NP	NP	NP	SM	0.00	68.00	28.00	4.00	*See the Note
	U3	6.00	Medium, dark grey silty sand with mica.	1.84	1.54	2.64	19.50	-	0.00	26.00	DS	NP	NP	NP	SM	0.00	75.00	22.00	3.00	*See the Note
	U5	11.00	Dense,dark grey silty medium sand with mica & occasionally gravels observed	1.86	1.54	2.66	20.45	-	0.00	34.00	DS	NP	NP	NP	SM	2.00	77.00	19.00	2.00	*See the Note
LOC-160/6	U1	1.50	Medium stiff, brownish grey clayey silt traces of sand.	1.88	1.49	2.67	26.42	0.0017	0.23	0.00	UC	31.31	23.28	8.03	ML	0.00	8.00	56.00	36.00	*See the Note
	*S2	3.00	Loose to medium, dark grey silty sand with mica.	1.84	-	2.64	-	-	0.00	25.00	DS	NP	NP	NP	SM	0.00	73.00	23.00	4.00	*See the Note
	*S3	4.50	Medium dark grey,silty medium sand with gravels.	1.83	-	2.65	-	-	0.00	33.00	DS	NP	NP	NP	SM	2.00	79.00	17.00	2.00	*See the Note
LOC-230/1	U1	1.50	Loose, dark grey silty fine sand with mica.	1.83	1.52	2.63	20.52		0.00	16.00	DS	NP	NP	NP	SM	0.00	69.00	26.00	5.00	*See the Note
	U3	6.00	Medium consistency, dark grey silty medium to coarses sand with mica.	1.84	1.52	2.64	21.15	-	0.00	27.00	DS	NP	NP	NP	SM	0.00	74.00	22.00	4.00	*See the Note
	U4	8.00	Stiff consistenct, dark grey clayey silt.	1.87	-	2.67	27.25	0.0018	0.22	5.00	UU	32.31	23.48	8.83	ML	0.00	8.00	55.00	37.00	*See the Note
	*S6	13.00	Dense ot very dense, dark grey silty medium to coarses sand with mica.	1.83	-	2.65	-	-	0.00	34.00	DS	NP	NP	NP	SM	2.00	82.00	15.00	1.00	*See the Note
	*S13	34.00	Dense to very dense, dark grey fine to medium sand with mica & occasionally gravels & pea gravels.	1.82	-	2.63	17.68	-	0.00	36.00	DS	NP	NP	NP	SM	12.00	75.00	12.00	1.00	*See the Note

Unconfined Compressive Strength Test:IS 2720 (Part 10) | Plastic Limit:IS 2720 (Part 5) | ConsolidationTest: IS 2720 (Part 15) | Liquid limit:IS 2720 (Part 5)

Specific Gravity: IS 2720 (Part 3) | Grain Size Analysis:IS 2720 (Part 4) | Direct Shear Test (DS) : IS 2720 (Part 13) | Triaxial Test (UU): IS 2720 (Part 11) | Natural Moisture Content: IS 2720 (Part 2) | *-Remould Sample

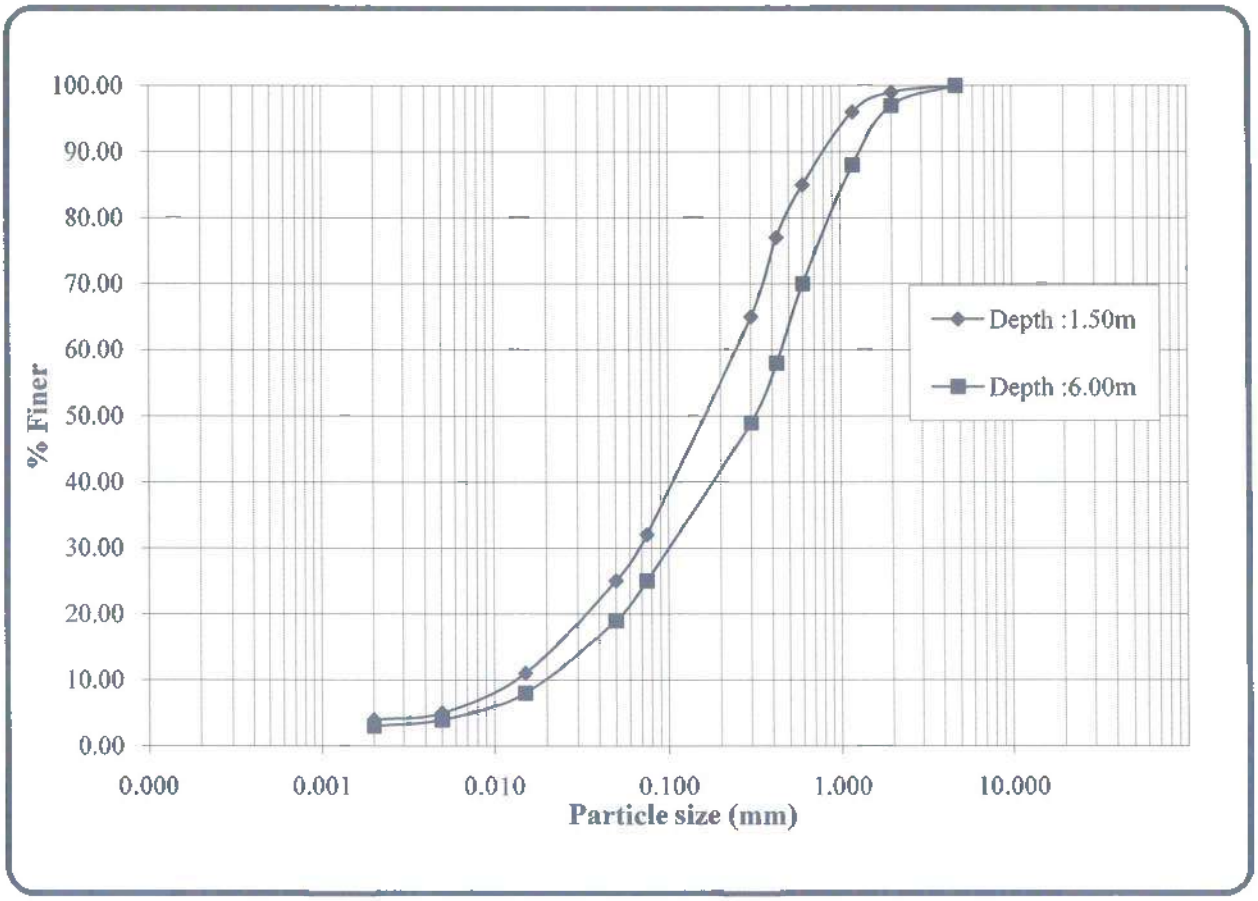


GRAIN SIZE DISTRIBUTION CURVES

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-34



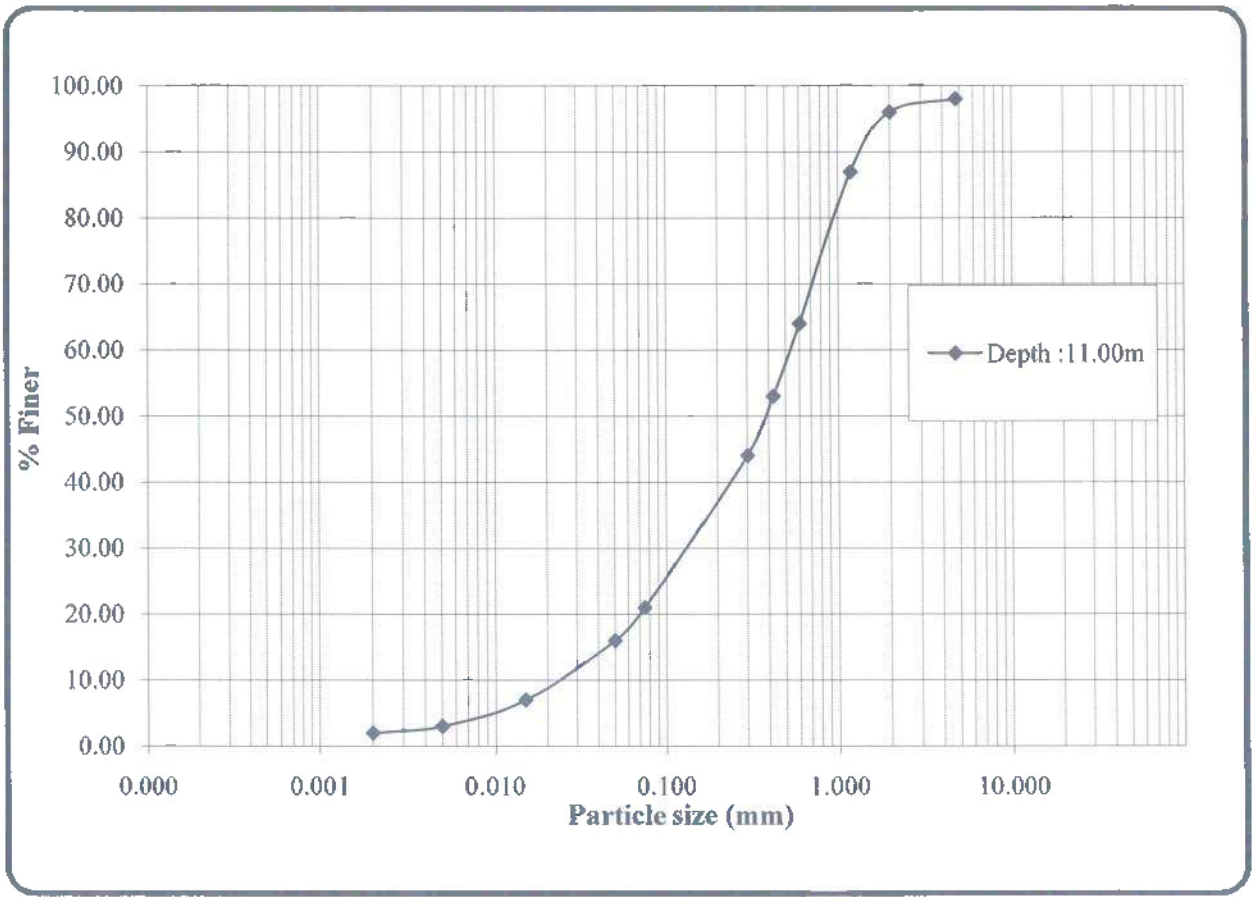
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-34, U-1, 1.50m	4.00	28.00	68.00	0.00
AP-34, U-3, 6.00m	3.00	22.00	75.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-34



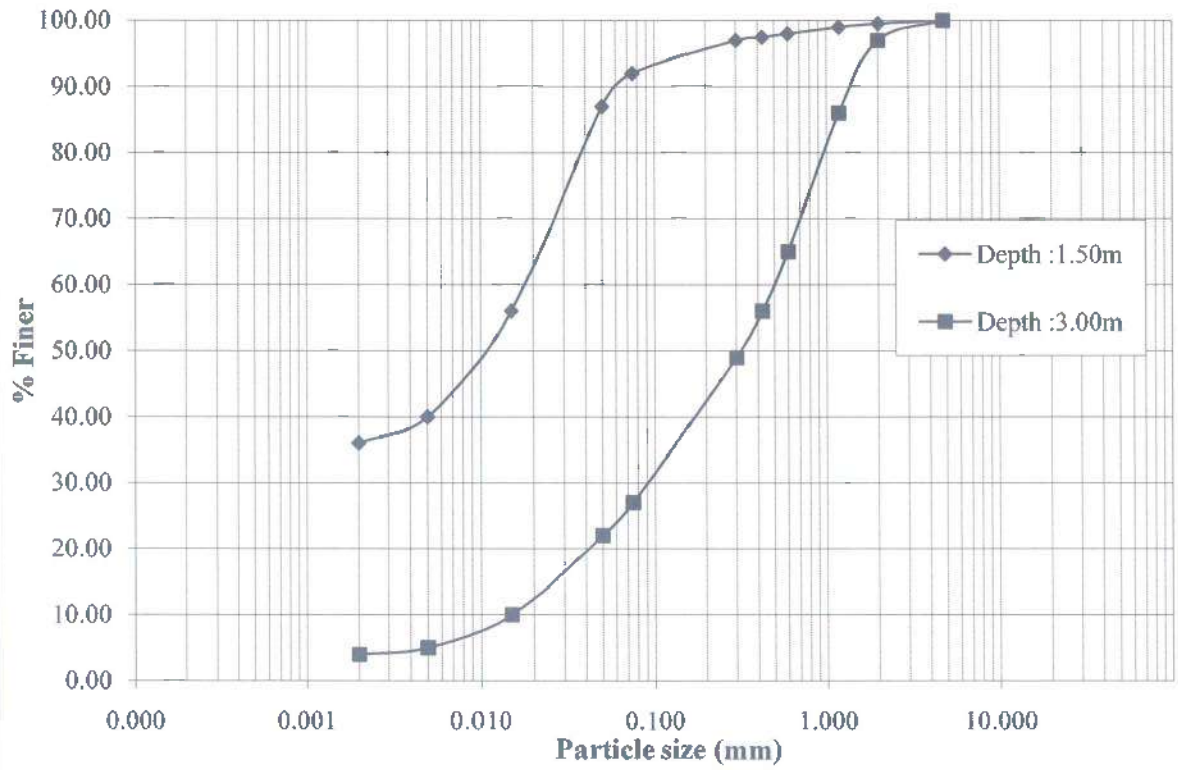
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-34, U-5, 11.00m	2.00	19.00	77.00	2.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-160/6



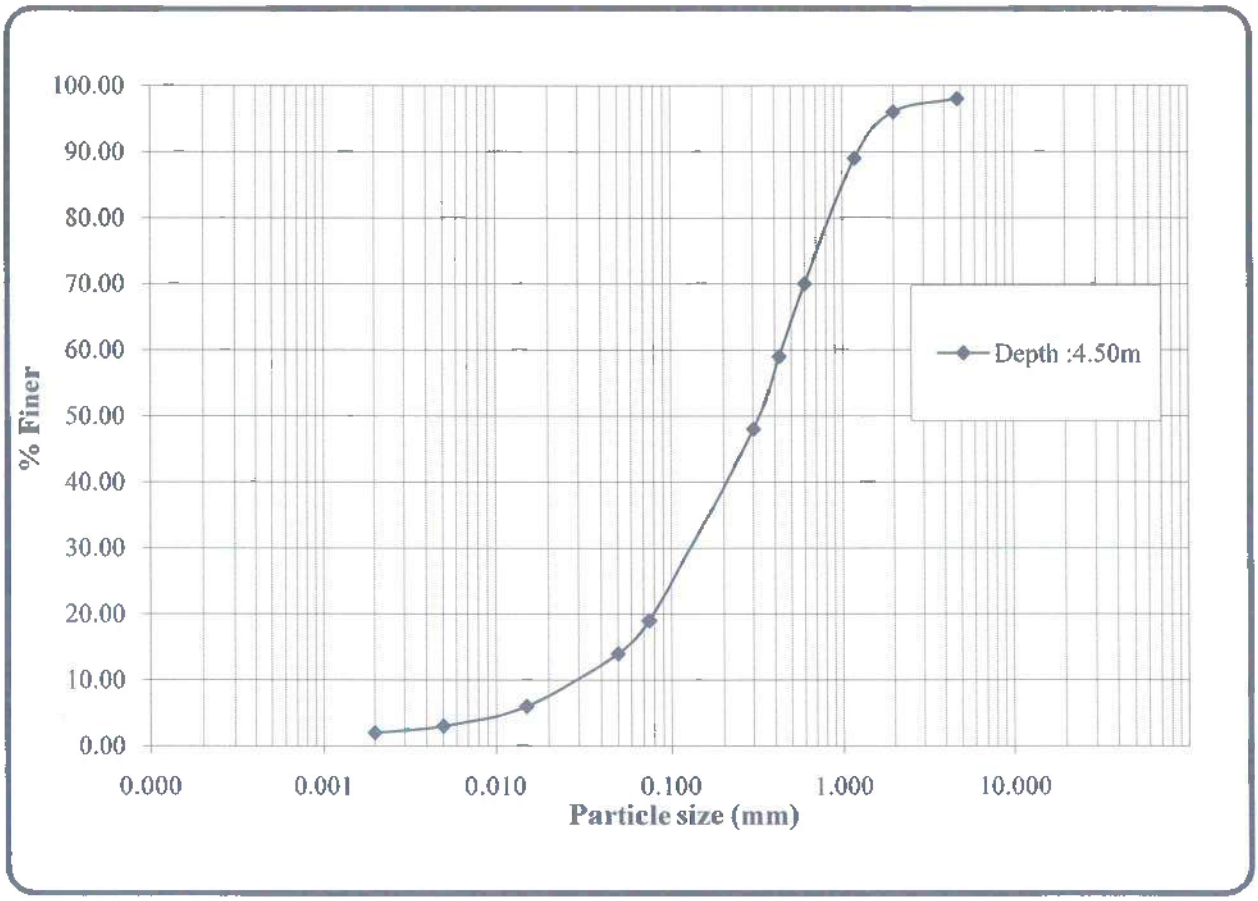
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-160-6, U-1, 1.50m	36.00	56.00	8.00	0.00
LOC-160-6, S-2, 3.00m	4.00	23.00	73.00	0.00

P. K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-160/6



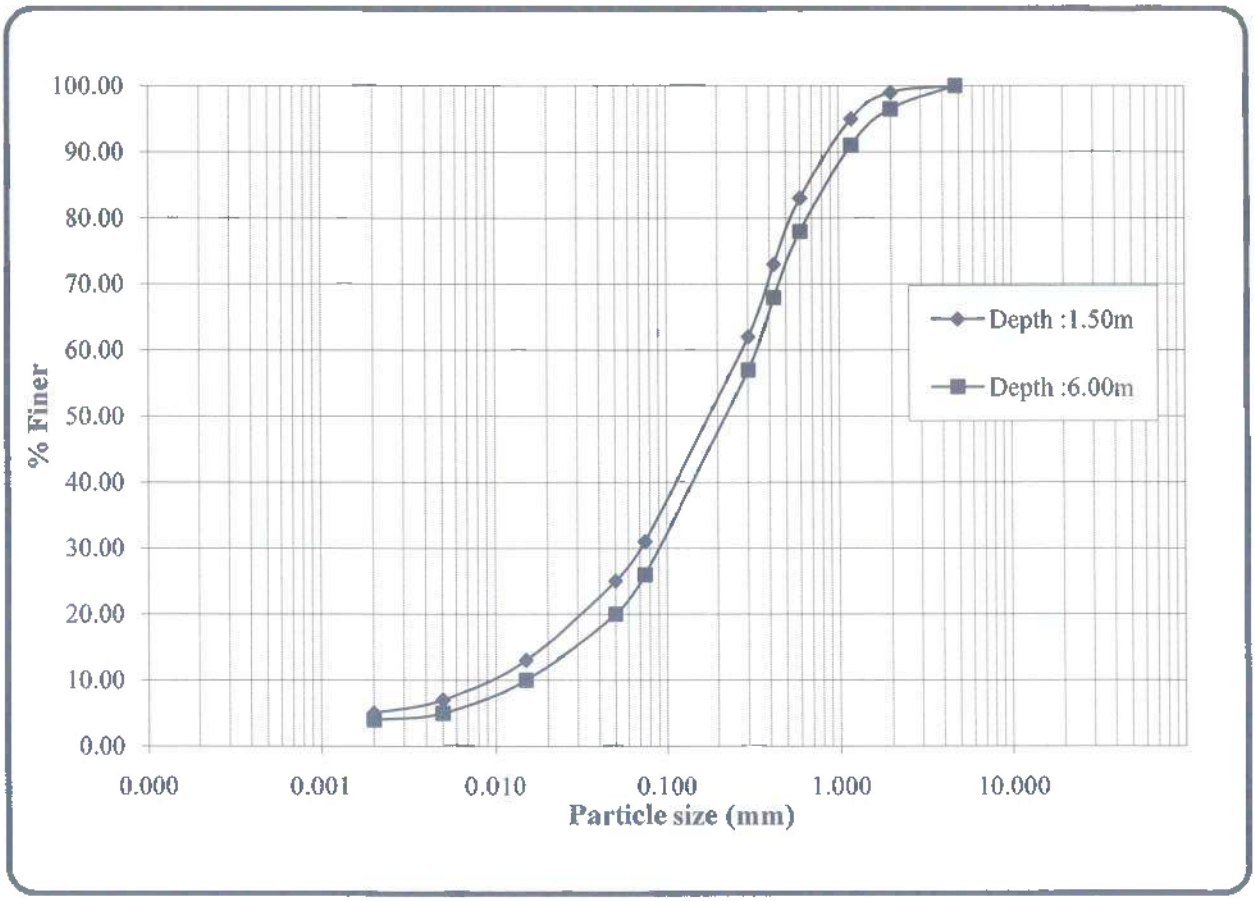
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-160/6, S-3, 4.50m	2.00	17.00	79.00	2.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-230/1



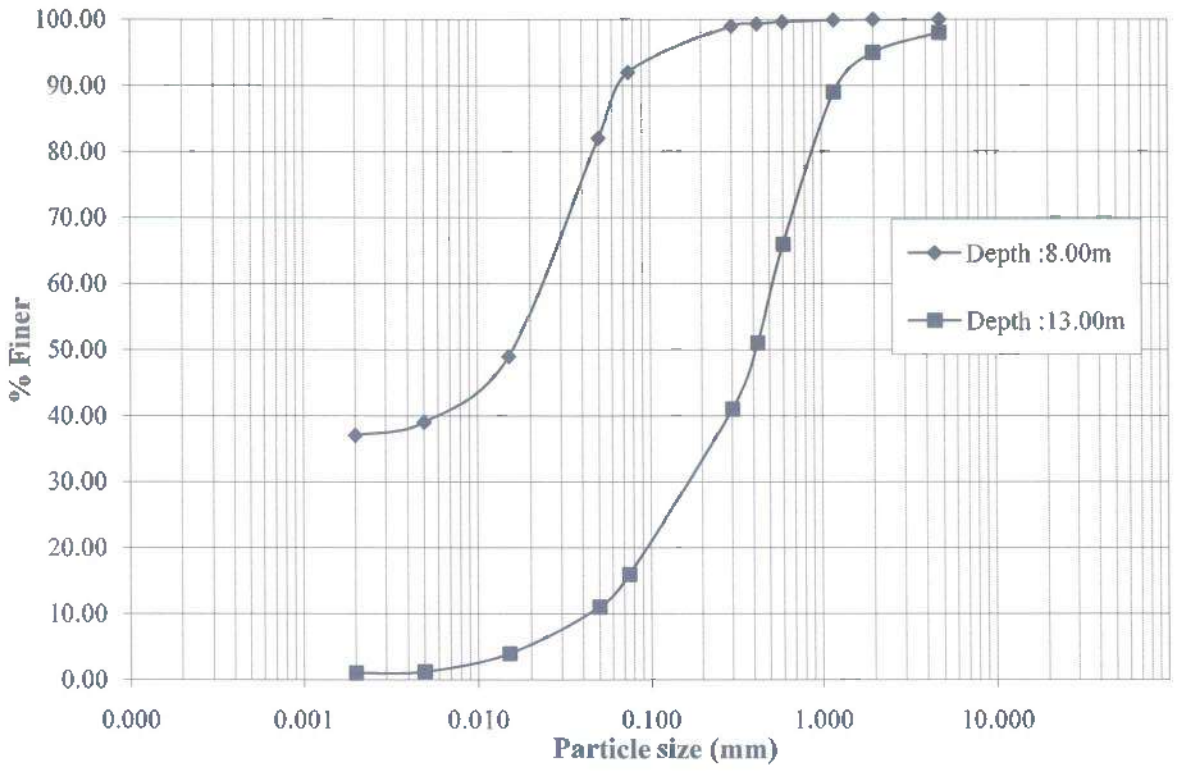
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-230/1, U-1, 1.50	5.00	26.00	69.00	0.00
LOC-230/1, U-3, 6.00	4.00	22.00	74.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-230/1



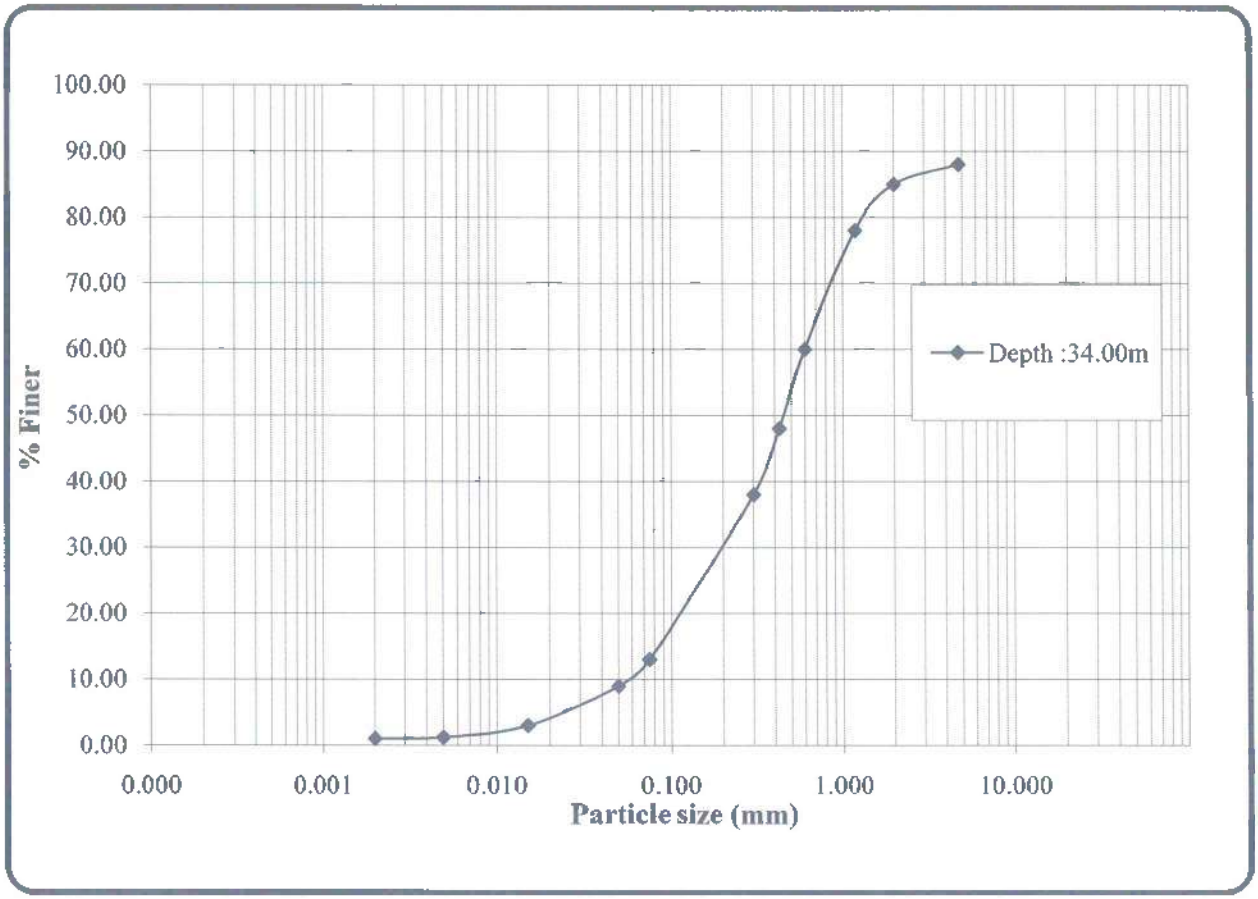
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-230/1, U-4, 8.00	37.00	55.00	8.00	0.00
LOC-230/1, S-6 13.00	1.00	15.00	82.00	2.00

P. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-230/1



Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-230/1, S-13,34.00m	1.00	12.00	75.00	12.00

P.K. DUTTA & CO. NAIHATI

SHEAR TEST CURVES

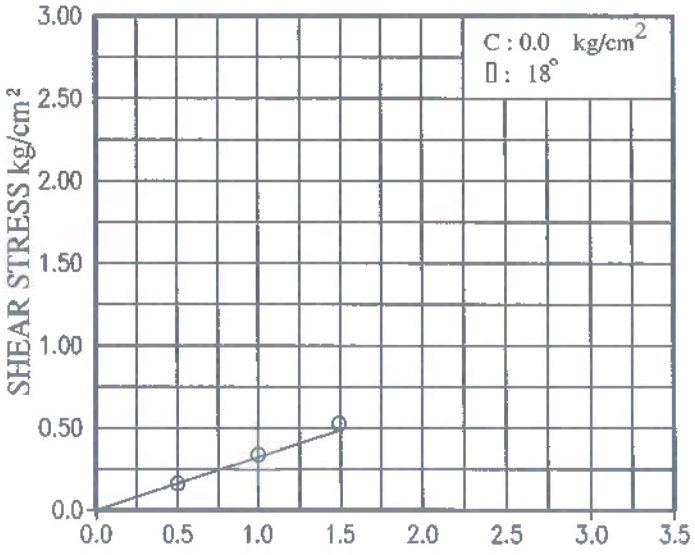
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

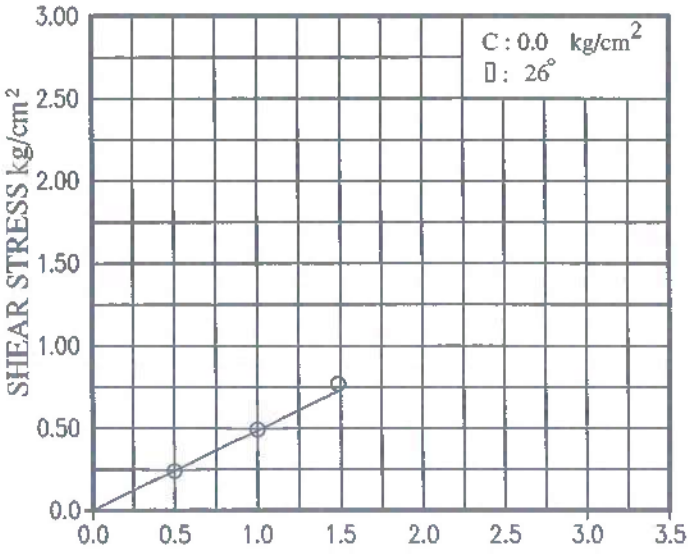
Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

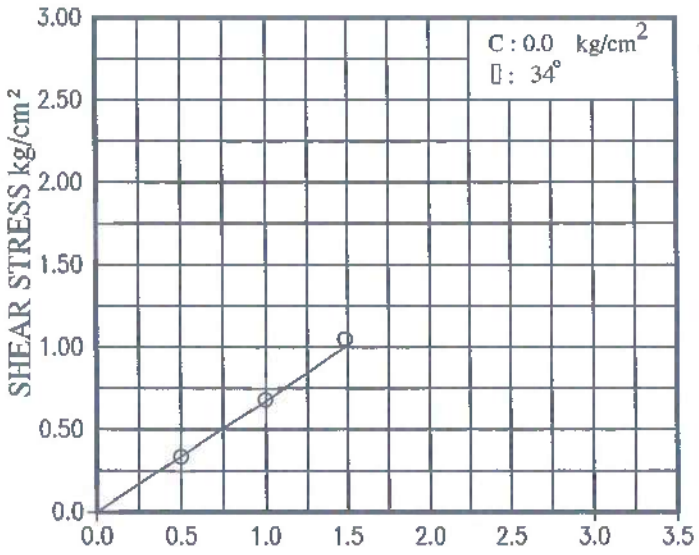
AP-34
DEPTH :- 1.50 m



AP-34
DEPTH :- 6.00 m



AP-34
DEPTH :- 11.00 m



DUTTA & CO. NAIHATI

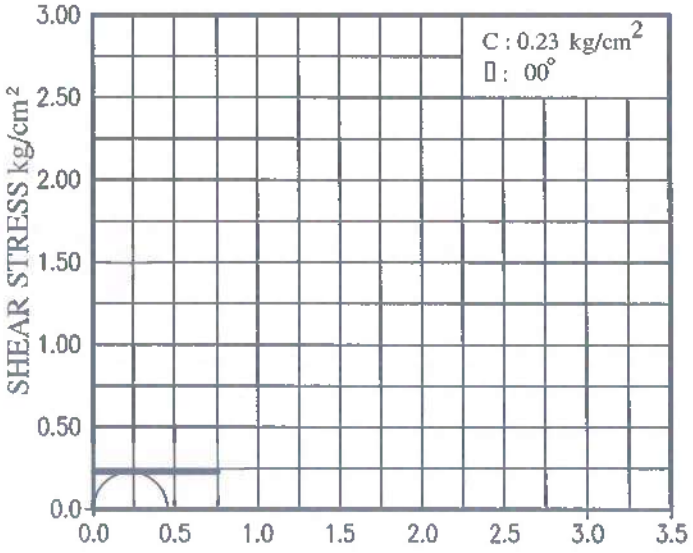
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

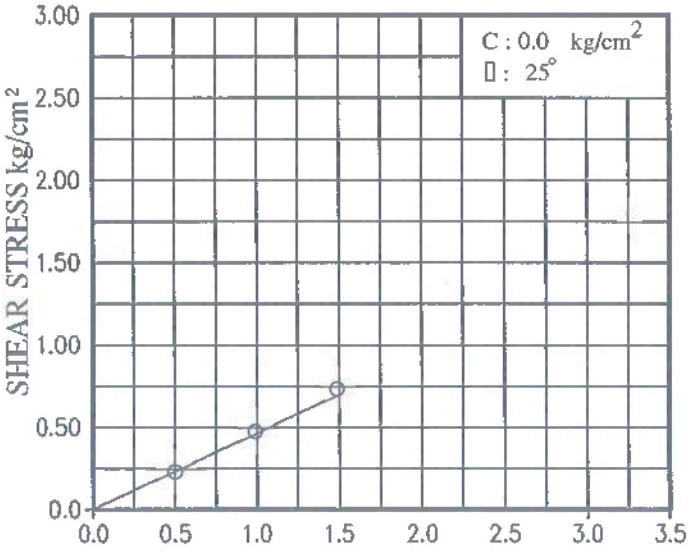
Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

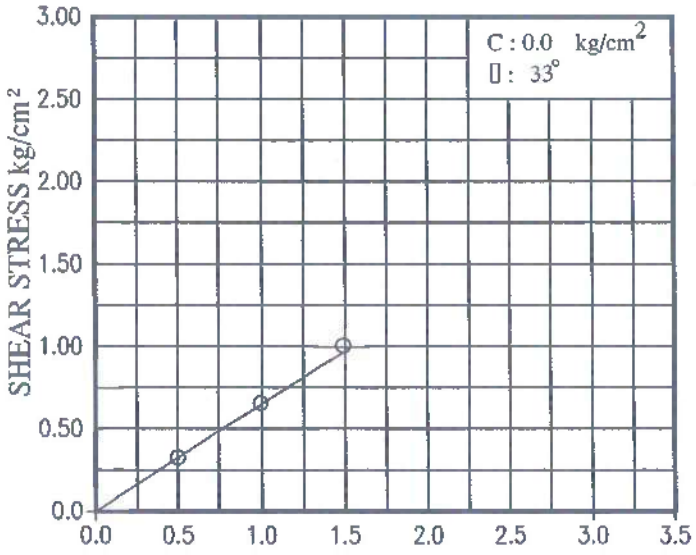
LOC-160/6
DEPTH :- 1.50 m



LOC-160/6
DEPTH :- 3.00 m



LOC-160/6
DEPTH :- 4.50 m



P.K. DUTTA & CO. NAIHATI

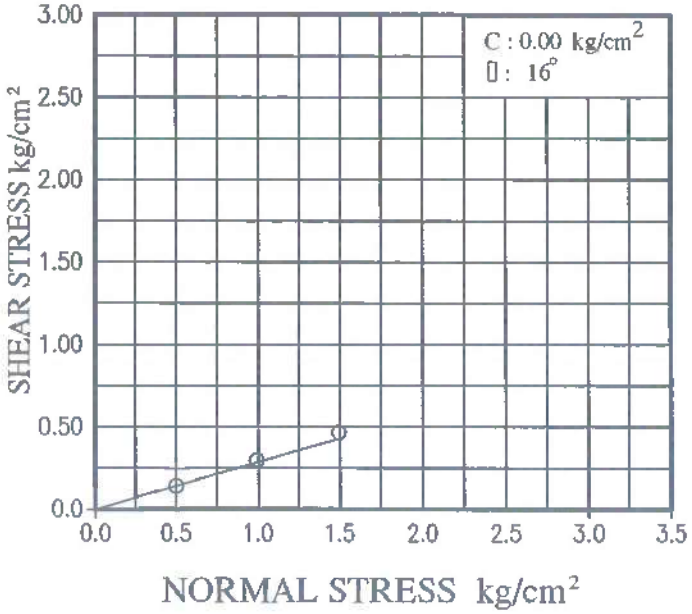
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

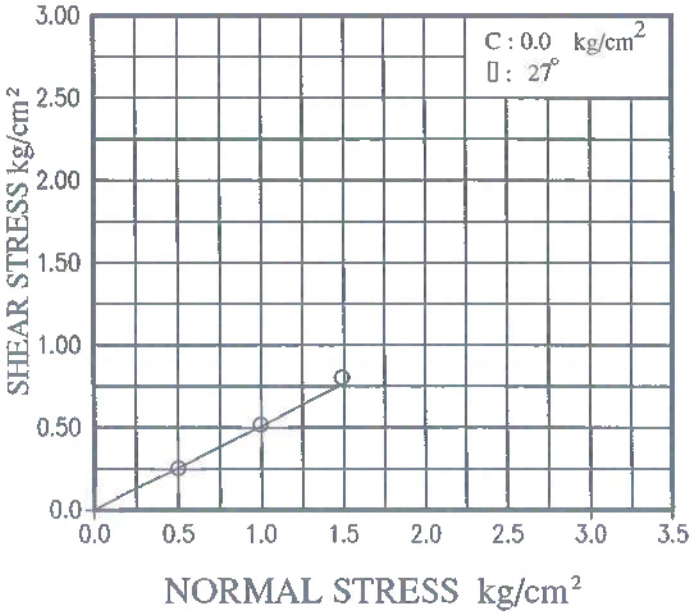
Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

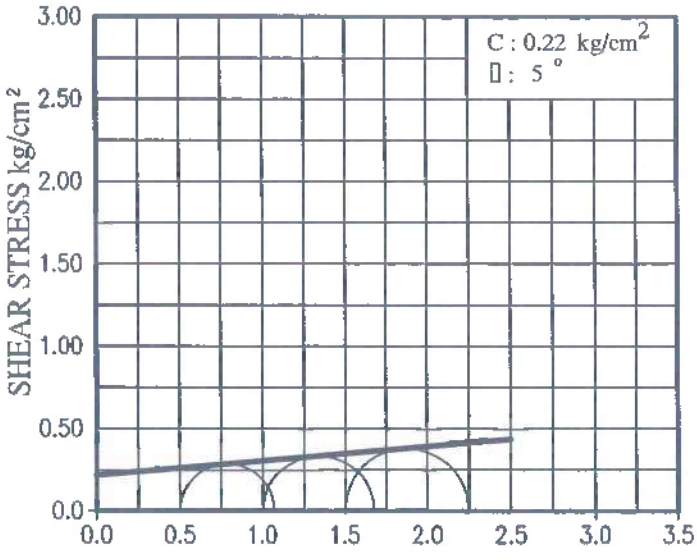
LOC-230/1
DEPTH :- 1.50 m



LOC-230/1
DEPTH :- 6.00 m



LOC-230/1
DEPTH :- 8.00 m



P.K. DUTTA & CO. NAIHATI

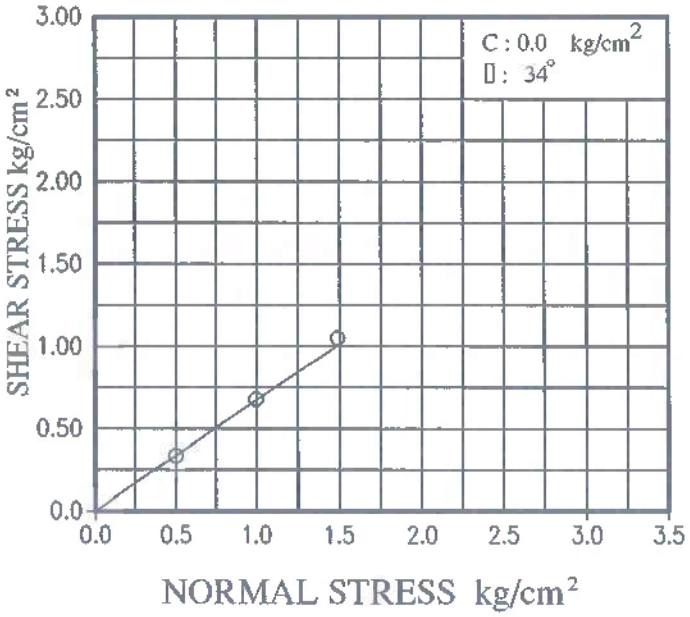
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

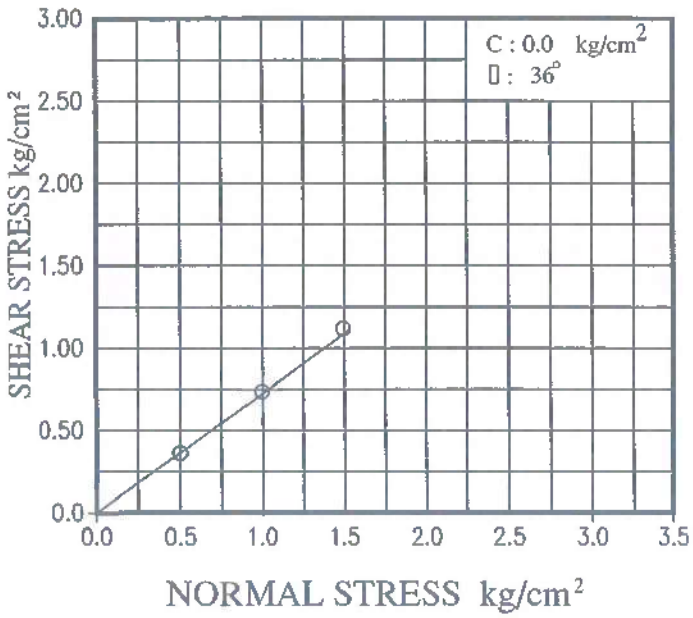
Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

LOC-230/1
DEPTH :- 13.00 m



LOC-230/1
DEPTH :- 34.00 m



P.K. DUTTA & CO. NAIHATI

SIGN FIELD DATA SHEET

P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Boring	JOB Name:- Proop. 400KV D/c chapar – Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 40.0(M) chap/ champabati
	Location No :- AP-34 River Bed.
Commenced On:- 31-08-2026	RL:-
Completed On:- 04-09-2026	Ground Water:- 1.20(M)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M)		Thickness(Mtr)	COLLECTION OF SOIL SAMPLES			N- Value	COLLECTION OF ROCK SAMPLES.	
	From	To		Type	Depth From	Depth To		TCR (%)	RQD (%)
Loose to Medium, dark grey Silty fine Sand with mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	4, 4, 6 = 10		
		3.00		SPT-	3.00	3.45	5, 7, 8 = 15		
Medium, dark grey Silty Sand with mica.	3.00			UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	5, 7, 12 = 19		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	7, 11, 15 = 26		
				UDS-	8.00	8.45			
				DS-	8.50				
		10.00		SPT-	10.00	10.45	11, 17, 22 = 39		

Signature of Site In-Charge.

Dey
(P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Junior Manager
AEGCL

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P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- 'NX' Drilling	JOB Name:- Prop. 400KV D/C Chapar - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 40.0(M) Champabati River
	Location No :- AP-34 River Bed
Commenced On:- 31-08-2026	RL:-
Completed On:- 04-09-2026	Ground Water:- 1.20(M)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Dense, dark grey Silty medium Sand with mica & occasionally gravels observed.	10.00			UDS-	11.00	11.45			
				DS-	11.50				
				SPT-	13.00	13.45	16, 25, 33	= 58	
				UDS-	14.00	14.45			
				DS-	14.50				
				SPT-	16.00	16.45	23, 32, 51	= 83	
		17.50		SPT-	17.50	17.70	48, 55 for 5cm	> 100	
Completely to Highly, fractured, dark/ white in Coloured gravels & boulders with Sand.	17.50			CR-1	17.50	19.00		11%	NIL
				SPT-	19.00	19.07	65 for 7cm (Rebounded)	> 100	
				CR-2	19.00	20.50		14%	NIL
				CR-3	20.50	22.00		15%	NIL
				SPT-	22.00	22.05	63 for 5cm (Rebounded)	> 100	

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for (P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Junior Manager
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SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- 'NX' Drilling	JOB Name:- prop. 400KV D/c chaibasa - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 40.0(M) Champabati River
	Location No :- AP-34 River Bed
Commenced On:- 31-08-2026	RL:-
Completed On:- 04-09-2026	Ground Water:- 1.20(M)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRIPTION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Completely to Highly, Fractured, dark/ White in Coloured gravels & boulders with sand.				CR-4	22.00	23.50		19%	NIL
				CR-5	23.50	25.00		20%	NIL
				CR-6	25.00	26.50		18%	NIL
				CR-7	26.50	28.00		18%	NIL
				CR-8	28.00	29.50		20%	NIL
				CR-9	29.50	31.00		21%	NIL
				CR-10	31.00	32.50		23%	NIL
				C-11	32.50	34.00		23%	NIL
				C-12	34.00	35.50		21%	NIL
				C-13	35.50	37.00		23%	NIL
				C-14	37.00	38.50		22%	NIL
				C-15	38.50	40.00		25%	NIL
		40.0		SPT-	40.00	40.05	76 blows for 5cm (Rebounded)		>100

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SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Drilling	JOB Name:- Prop. 400KV D/c Chapai - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 40.0(M) Beki River
	Location No :- 160/6 Cultivated land
Commenced On:- 06-09-2026	RL:- GPS
Completed On:- 10-09-2026	Ground Water:- 1.50(M) N - 26°35'50.09" E - 90°58'47.60"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Medium Stiff, brownish grey Clayey Silt traces of Sand.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
		2.00		SPT-	2.00	2.45	3, 4, 5 = 9		
Loose to Medium, dark grey Silty Sand with mica.	2.00			SPT-	3.00	3.45	4, 6, 8 = 14		
		3.50		UDS-	4.00	4.20			
Medium dark grey, Silty medium Sand with gravels.	3.50			SPT-	4.50	4.95	17, 30, 35 = 65		
		6.00		SPT-	6.00	6.19	55, 50 for 4cm Rebounded	>100	
Completely to Highly, fractured, dark/whitish grey coloured pebbles, cobbles, gravels etc. with Sand.	6.00			RUN					
				CR-1	6.00	7.50		13%	NIL
				CR-2	7.50	9.00		11%	NIL
				SPT-	9.00	9.06	64 blows for 6cm	>100	

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

Assistant Manager (Civil)
220 KV Rangia GSS
AEGCL, Rangia

Asstt. General Mana
132 KV Grid Sub-Sta
AEGCL, Ranaih

P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Drilling	JOB Name:- prop. 400KV D/c Chapar - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 40.0(M) Beki River Location No :- 160/6 Cultivated Land
Commenced On:- 06-09-2026 Completed On:- 10-09-2026	RL:- GPS Ground Water:- 1.50(M) N - 26°35'50.09" E - 90°58'47.60"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRIPTION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Completely to Highly, fractured, dark/whitish grey coloured pebbles, cobbles, gravels etc. with Sand.				CR-3	9.00	10.50		14%	NIL
				CR-4	10.50	12.00		15%	NIL
				CR-5	12.00	13.50		17%	NIL
				CR-6	13.50	15.00		21%	NIL
				CR-7	15.00	16.50		24%	NIL
Highly to Moderately, dark/Whitish grey coloured gravels & boulders with Sand.	18.00	18.00		CR-8	16.50	18.00		26%	NIL
				CR-9	18.00	19.50		28%	NIL
				CR-10	19.50	21.00		30%	NIL
				CR-11	21.00	22.50		29%	NIL
				CR-12	22.50	24.00		30%	NIL
				CR-13	24.00	25.50		35%	NIL
				CR-14	25.50	27.00		37%	NIL

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

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AEGCL, Rangia

P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1ST FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Drilling	JOB Name:- Proj. 400KV D/C Chalsa - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 40.0(M) Beki River
	Location No :- 160/6 Cultivated Land.
Commenced On:- 06-09-2026	RL:- GPS
Completed On:- 10-09-2026	Ground Water:- 1.50(M) N - 26°35'50.09" E - 90°58'47.60"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Highly to Moderately, dark/whitish grey Coloured gravels & boulders with Sand.		33.00		CR-15	27.00	28.50		30%	NIL
				CR-16	28.50	30.00		29%	NIL
				CR-17	30.00	31.50		27%	NIL
				CR-18	31.50	33.00		25%	NIL
Completely to Highly, dark grey Coloured, pebbles, cobbles, gravels with Sand	33.00			CR-19	33.00	34.50		23%	NIL
				CR-20	34.50	36.00		17%	NIL
				CR-21	36.00	37.50		16%	NIL
				CR-22	37.50	39.00		14%	NIL
				CR-23	39.00	40.00		10%	NIL
		40.00		SPT-	40.00	40.08	69 blows for 8 cm	>100	

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

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P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Drilling	JOB Name:- Proj. 400 KV D/C Chapar - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 40.0(N) Pagladia River
	Location No :- 230/1
Commenced On:- 15-09-2026	RL:- GPS
Completed On:- 19-09-2026	Ground Water:- 0.50(N) N - 26°37'36.1" E - 91°30'37.2"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Loose, dark grey Silty fine Sand with mica	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
		2.00		SPT-	2.00	2.45	2, 2, 3 = 5		
Medium Consistency, dark grey Silty medium to coarse Sand with mica.	2.00			SPT-	3.00	3.45	3, 4, 4 = 8		
				UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	5, 7, 10 = 17		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	7, 9, 11 = 20		
Stiff Consistency, dark grey clayey Silt.	8.00	8.00		UDS-	8.00	8.45			
				DS-	8.50				
				SPT-	10.00	10.45	2, 4, 5 = 9		
				UDS-	11.00	11.45			
		11.50		DS-	11.50				

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

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AEGCL, Rangia

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AEGCL, Rangia

P.K.DUTTA & CO.

SAI TOWER, BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Drilling	JOB Name:- proj. 400KV D/c Chasna - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth In Mtr:- 40.0(M)
	Location No :- 230/1 Pagladia River
Commenced On:- 15-09-2026	RL:- GPS N- 26°37'36.1" E- 91°30'37.2"
Completed On:- 19-09-2026	Ground Water:- 0.50(M)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Dense to very dense, dark grey silty medium to coarse Sand with mica	11.50			SPT-	13.00	13.45	19, 30, 35	65	
				SPT-	14.50	14.70	49, 54 for 5cm (Rebounded)	>	100
		14.50		RUN					
Pebbles, gravels infilling dark grey fine to medium Coarse Sand with mica.	14.50			CR-1	14.50	16.00		5%	NIL
				SPT-	16.00	16.22	48, 50 for 7cm (Rebounded)	>	100
				CR-2	16.00	17.50		5%	NIL
				CR-3	17.50	19.00		6%	NIL
				SPT-	19.00	19.08	65 blows for 8cm (Rebounded)	>	100
				CR-4	19.00	20.50		8%	NIL
				CR-5	20.50	22.00		9%	NIL
				CR-6	22.00	23.50		11%	NIL

Signature of Ske In-Charge.

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Signature of Engineer In- Charge.

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P.K.DUTTA & CO.

SAI TOWER, BLOCK – A, 1st FLOOR, GNo. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Drilling	JOB Name:- Prof. 400KV D/c Chapra - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth In Mtr:- 40.0 (M)
	Location No :- 230/1 Pagladia River
Commenced On:- 15-09-2026	RL:- GPS
Completed On:- 19-09-2026	Ground Water:- 0.50 (M) N - 26°37'36.1" E - 91°30'37.2"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Pebbles, gravels infilling dark grey fine to medium Coarse Sand with mica.		28.00		CR-7	23.50	25.00		12%	NIL
				CR-8	25.00	26.50		7%	NIL
				CR-9	26.50	28.00		5%	NIL
				CR-10	28.00	29.50		NIL	NIL
Dense to very dense, dark grey fine to medium Sand with mica & occasionally gravels & reh gravels.	28.00			SPT-	29.50	29.95	14, 22, 36	= 58	
				SPT-	31.00	31.45	14, 23, 38	= 61	
				SPT-	32.50	32.95	16, 27, 39	= 66	
				SPT-	34.00	34.45	19, 26, 45	= 71	
				SPT-	35.50	35.95	20, 30, 48	= 78	
				SPT-	37.00	37.45	21, 36, 45	= 81	
				SPT-	38.50	38.95	25, 40, 46	= 86	
		40.45		SPT-	40.00	40.45	26, 38, 52	= 90	

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

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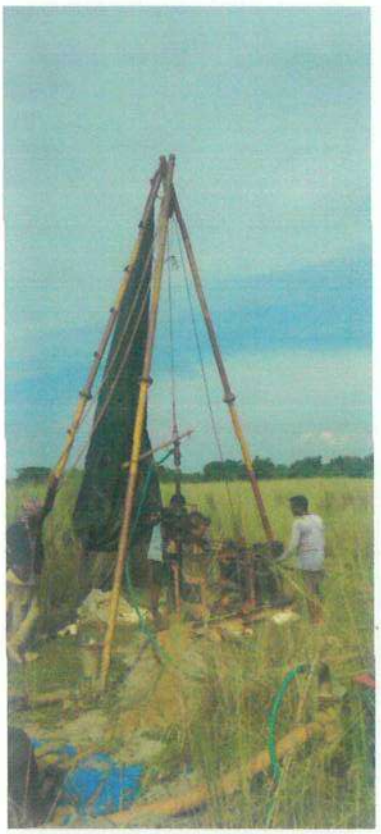
FIELD PHOTOGRAPH



AP-34



LOC-160/6



LOC-230/1

DUTTA & CO. NAIHATI

ASSAM ELECTRICITY GRID CORPORATION LIMITED

Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.
(NORMAL LOCATION UP TO 10.00M)

Dept. Manager (C)
Design & Project
AEGCL, Kahilipara, Ghy-19

Asstt. General Manager (C)
Design & Project
AEGCL, Kahilipara, Ghy-19

SUBMITTED BY:

P.K.DUTTA & CO.
'SAI TOWER' BLOCK-A 1ST FLOOR,
NAIHATI, WEST BWNGAL-743165

APPROVED BY

General Manager (C)
O/o The M.D, AEGCL, Bijulee Bhawan

A) BY WASH BORING METHOD

A.1.0 INTRODUCTION:

The Soil Investigation and laboratory tests for the proposed project for "**Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant**". Field Soil Exploration of bore holes have been completed during 21.08.2026 to 21.09.2026

The objective of this soil investigation consisting of borings including conducting in-situ tests, collection of undisturbed & disturbed soil samples, conducting relevant laboratory tests, to study the soil stratifications, characteristics and engineering properties and suggesting safe approach to design and construction of foundation of proposed structure.

A.2.0 FIELD INVESTIGATION:

A.2.1 GENERAL:

For the design of the foundation for the proposed structure to be constructed at the site, this geotechnical investigation was done. In field work, the type of sub-soil profile and their characterization have been revealed. Laboratory test helps in determining relevant geotechnical properties of the sub-surface deposits leading to finalization of foundation depths and type of the structures and the bearing capacity with particular reference to the sub-surface types and their strength parameters and settlement potentials at the site.




400KV D/C CHAPAR - RANGIA T/L
SOIL INVESTIGATION LOCATION
Legend
Prop. Route
Soil Investigation Loc
170/0
157/3
151/2
141/0
137/2
131/0
120/0
109/0
Google Earth


400KV D/C CHAPAR - RANGIA T/L
SOIL INVESTIGATION LOCATION
Legend
Prop. Route
Soil Investigation Loc
241/0
252/0
220/0
206/0
190/0
182/0
Google Earth

Schedule of boreholes is tabulated form is given below:

Bore Hole No.	Terminating Depth (m)	GPS		Date of Commencement	Date of Completion
		LONGITUDE	LATITUDE		
AP-3	10.00 M	90°19'20.8"	26°14'12.5"	21.08.2026	21.08.2026
AP-29	10.00 M	90°26'00.6"	26°20'10.7"	22.08.2026	22.08.2026
AP-47	10.00 M	90°27'55.4"	26°22'38.6"	23.08.2026	23.08.2026
AP-52	10.00 M	90°28'52.3"	26°23'17.0"	23.08.2026	23.08.2026
AP-66	10.00 M	90°28'47.7"	26°28'6.7"	24.08.2026	24.08.2026
AP-73	10.00 M	90°28'48.5"	26°31'31.3"	25.08.2026	25.08.2026
AP-109	10.00 M	90°38'53.9"	26°32'8.5"	25.08.2026	25.08.2026
AP-120	10.00 M	90°37'47.2"	26°32'54.7"	26.08.2026	26.08.2026
AP-131	10.00 M	90°40'07.3"	26°34'17.1"	26.08.2026	26.08.2026
LOC -137/2	10.00 M	90°45'39.8"	26°33'48.2"	27.08.2026	27.08.2026
AP-141	10.00 M	90°49'7.5"	26°35'33.2"	27.08.2026	27.08.2026
LOC-151/2	10.00 M	90°52'1.4"	26°35'47.3"	28.08.2026	28.08.2026
LOC-157/3	10.00 M	90°55'30.3"	26°35'40.3"	28.08.2026	28.08.2026
AP-170	10.00 M	91°2'50.4"	26°35'47.8"	11.09.2026	11.09.2026
AP-182	10.00 M	91°8'44"	26°35'36"	11.09.2026	11.09.2026
AP-190	10.00 M	91°12'41.9"	26°36'50.9"	12.09.2026	12.09.2026
AP-206	10.00 M	91°20'40.4"	26°37'34.3"	12.09.2026	12.09.2026
AP-220	10.00 M	91°27'1.4"	26°37'21.2"	21.09.2026	21.09.2026
AP-241	10.00 M	91°34'37.6"	26°39'32.4"	21.09.2026	21.09.2026
AP-252	10.00 M	91°36'20.2"	26°38'30.9"	20.09.2026	20.09.2026

A.2.2 BORING/SAMPLING:

Of the different types of explorations, borings are the most practical and relatively correct method of obtaining sub-surface information. 3 (THREE) nos. bore holes of 150 mm diameter were sunk as per specifications and IS: 1892 and were extended up to specified depth 15.00m each for visualizing the stratification of soil. Casings as required were used to retain the borehole. Boring was carried out by Shell and Augur followed by Wash boring method in soil.

The details of these bore holes including field tests of Standard Penetration tests and also collection of disturbed and undisturbed soil samples are given in Bore Logs enclosed. Disturbed & SPT representative samples of sub-surface deposits were collected from bore holes, labeled depth wise and placed in polythene bags. Reference Numbers and depth of these samples are shown in Bore Log Data Sheets.

For proper evaluation of engineering properties of in-situ soils, including shear parameters and consolidation characteristics , representative undisturbed soil samples were collected at intervals along the boreholes, whenever clayey silt/silty clay or silty fine sand with clay binders were encountered.

Disturbed representative soil samples were collected during progress of boring, from shell and also from split-spoon sampler of Standard Penetration Tests conducted at different depth in boreholes. Such soil sample contains all the constituent materials of the respective stratum. Depth and details of the sample are shown in the borehole logs (Annexure).

A.2.3 STANDARD PENETRATION TEST (SPT):

The standard penetration tests were conducted as per IS 2131-1981. The split spoon sampler, connected with a string of drill rods, was lowered into the bottom of the bore hole. The sampler was driven into the soil stratum up to a maximum depth of 450mm. by making use of 63.5 kg. Weight falling freely from a height of 750mm on to an anvil fixed on the top of drill rod. The number of blows required to penetrate each of the successive 150mm. depths was counted to produce a total penetration of 450mm. To avoid seating errors, the blows required for the first 150mm. of penetration was not taken into account. Those required to increase the penetration from 150mm. to 450mm. constituted the N-number. On completion of the test, the sampler was lifted to the ground, opened, and the specimen of the soil sample was stored in polythene bags with the proper identification mark. N-value is noted in borehole log data sheets against the corresponding depth.

Followings are the corrections on SPT values in cohesion-less soil:

1. *Due to overburden: N value for cohesion-less soil shall be corrected for overburden as per Fig. 1 of IS: 2131 (N').*
2. *Due to Dilatancy: The values corrected for overburden shall be corrected for dilatancy if the stratum consists of fine sand and silt below water table for values of N' greater than 15, as under (N"): N" = 15+0.5*(N'-15)*

Typical calculation for N value correction:

BH No.-AP-29: 7.00m to 7.45m. Field N = 22. Water table: 1.50
Effective OVP at the average depth: = 0.76 Kg/cm2.
From Fig 1. of IS: 2131, correction factor = 1.04
So corrected SPT value for overburden, N' = 1.04x22 = 22.88



Dilatancy(N")=15+0.5(22.88-15) = 18.94
Corrected SPT value=19

Same calculation will be valid for other N values in sandy layer. All the correction in detail is presented in a tabular form below.

AVG. BULK DENSITY (gm/cc)		1.87	WATER TABLE (M)				1.60				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-3	2.00	2.45	2.23	10	0.42	0.35	0.35	1.29	12.90	-	13
	3.00	3.45	3.23	6	0.60	0.44	0.44	1.23	7.38	-	7
	5.00	5.45	5.23	7	0.98	0.61	0.61	1.12	7.84	-	8
	7.00	7.45	7.23	13	1.35	0.79	0.79	1.04	13.52	-	14
	10.00	10.45	10.23	24	1.91	1.05	1.05	0.98	23.52	19.26	19

AVG. BULK DENSITY (gm/cc)		1.85	WATER TABLE (M)				1.50				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-29	2.00	2.45	2.23	5	0.41	0.34	0.34	1.30	6.50	-	7
	3.00	3.45	3.23	6	0.60	0.42	0.42	1.25	7.50	-	8
	5.00	5.45	5.23	14	0.97	0.59	0.59	1.13	15.82	15.41	15
	7.00	7.45	7.23	22	1.34	0.76	0.76	1.04	22.88	18.94	19
	8.50	8.95	8.73	28	1.61	0.89	0.89	1.02	28.56	21.78	22
	10.00	10.45	10.23	36	1.89	1.02	1.02	0.99	35.64	25.32	25

AVG. BULK DENSITY (gm/cc)		1.85	WATER TABLE (M)				1.40				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-47	2.00	2.45	2.23	8	0.41	0.33	0.33	1.31	10.48	-	10
	3.00	3.45	3.23	10	0.60	0.41	0.41	1.26	12.60	-	13
	5.00	5.45	5.23	14	0.97	0.58	0.58	1.14	15.96	15.48	15
	7.00	7.45	7.23	23	1.34	0.75	0.75	1.04	23.92	19.46	19
	8.50	8.95	8.73	28	1.61	0.88	0.88	1.02	28.56	21.78	22
	10.00	10.45	10.23	34	1.89	1.01	1.01	1.00	34.00	24.50	25

AVG. BULK DENSITY (gm/cc)		1.84	WATER TABLE (M)				2.50				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-52	2.00	2.45	2.23	4	0.41	0.44	0.41	1.26	5.04	-	5
	3.00	3.45	3.23	5	0.59	0.52	0.52	1.18	5.90	-	6
	5.00	5.45	5.23	10	0.96	0.69	0.69	1.06	10.60	-	11
	7.00	7.45	7.23	16	1.33	0.86	0.86	1.03	16.48	15.74	16
	8.50	8.95	8.73	19	1.61	0.98	0.98	1.00	19.00	17.00	17
	10.00	10.45	10.23	25	1.88	1.11	1.11	0.96	24.00	19.50	20



AVG. BULK DENSITY (gm/cc)		1.84	WATER TABLE (M)				1.10				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-66	2.00	2.45	2.23	6	0.41	0.30	0.30	1.33	7.98	-	8
	3.00	3.45	3.23	13	0.59	0.38	0.38	1.28	16.64	15.82	16
	5.00	5.45	5.23	27	0.96	0.55	0.55	1.16	31.32	23.16	23
	7.00	7.45	7.23	36	1.33	0.72	0.72	1.05	37.80	26.40	26
	8.50	8.95	8.73	41	1.61	0.84	0.84	1.03	42.23	28.62	29
	10.00	10.45	10.23	45	1.88	0.97	0.97	1.01	45.45	30.23	30

AVG. BULK DENSITY (gm/cc)		1.85	WATER TABLE (M)				2.60				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-73	2.00	2.45	2.23	4	0.41	0.45	0.41	1.26	5.04	-	5
	3.00	3.45	3.23	11	0.60	0.53	0.53	1.18	12.98	-	13
	5.00	5.45	5.23	16	0.97	0.70	0.70	1.06	16.96	15.98	16
	7.00	7.45	7.23	24	1.34	0.87	0.87	1.03	24.72	19.86	20
	8.50	8.95	8.73	28	1.61	1.00	1.00	1.00	28.00	21.50	22
	10.00	10.45	10.23	35	1.89	1.13	1.13	0.95	33.25	24.13	24

AVG. BULK DENSITY (gm/cc)		1.85	WATER TABLE (M)				2.30				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-109	2.00	2.45	2.23	7	0.41	0.42	0.41	1.26	8.82	-	9
	3.00	3.45	3.23	11	0.60	0.50	0.50	1.20	13.20	-	13
	5.00	5.45	5.23	19	0.97	0.67	0.67	1.08	20.52	17.76	18
	7.00	7.45	7.23	27	1.34	0.84	0.84	1.03	27.81	21.41	21
	8.50	8.95	8.73	32	1.61	0.97	0.97	1.01	32.32	23.66	24
	10.00	10.45	10.23	40	1.89	1.10	1.10	0.96	38.40	26.70	27

AVG. BULK DENSITY (gm/cc)		1.86	WATER TABLE (M)				2.10				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-120	2.00	2.45	2.23	5	0.41	0.40	0.40	1.26	6.30	-	6
	3.00	3.45	3.23	5	0.60	0.49	0.49	1.20	6.00	-	6
	5.00	5.45	5.23	16	0.97	0.66	0.66	1.09	17.44	16.22	16
	7.00	7.45	7.23	27	1.34	0.83	0.83	1.03	27.81	21.41	21
	8.50	8.95	8.73	31	1.62	0.96	0.96	1.01	31.31	23.16	23
	10.00	10.45	10.23	44	1.90	1.09	1.09	0.96	42.24	28.62	29

AVG. BULK DENSITY (gm/cc)		1.84	WATER TABLE (M)				1.80				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-131	2.00	2.45	2.23	11	0.41	0.37	0.37	1.28	14.08	-	14
	3.00	3.45	3.23	23	0.59	0.45	0.45	1.23	28.29	21.65	22
	5.00	5.45	5.23	30	0.96	0.62	0.62	1.11	33.30	24.15	24
	7.00	7.45	7.23	42	1.33	0.79	0.79	1.04	43.68	29.34	29
	8.50	8.95	8.73	49	1.61	0.91	0.91	1.02	49.98	32.49	32
	10.00	10.45	10.23	57	1.88	1.04	1.04	0.98	55.86	35.43	35

AVG. BULK DENSITY (gm/cc)		1.86	WATER TABLE (M)				1.50				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
LOC-137/2	2.00	2.45	2.23	9	0.41	0.34	0.34	1.30	11.70	-	12
	3.00	3.45	3.23	8	0.60	0.43	0.43	1.24	9.92	-	10
	5.00	5.45	5.23	20	0.97	0.60	0.60	1.12	22.40	18.70	19
	7.00	7.45	7.23	29	1.34	0.77	0.77	1.04	30.16	22.58	23
	8.50	8.95	8.73	42	1.62	0.90	0.90	1.02	42.84	28.92	29
	10.00	10.45	10.23	55	1.90	1.03	1.03	0.99	54.45	34.73	35

AVG. BULK DENSITY (gm/cc)		1.86	WATER TABLE (M)				1.60				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-141	2.00	2.45	2.23	5	0.41	0.35	0.35	1.29	6.45	-	6
	3.00	3.45	3.23	11	0.60	0.44	0.44	1.23	13.53	-	14
	5.00	5.45	5.23	23	0.97	0.61	0.61	1.12	25.76	20.38	20
	7.00	7.45	7.23	31	1.34	0.78	0.78	1.04	32.24	23.62	24
	8.50	8.95	8.73	44	1.62	0.91	0.91	1.02	44.88	29.94	30
	10.00	10.45	10.23	59	1.90	1.04	1.04	0.98	57.82	36.41	36

AVG. BULK DENSITY (gm/cc)		1.85	WATER TABLE (M)				3.50				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
LOC-151/2	2.00	2.45	2.23	10	0.41	0.54	0.41	1.26	12.60	-	13
	3.00	3.45	3.23	26	0.60	0.62	0.60	1.12	29.12	22.06	22
	5.00	5.45	5.23	34	0.97	0.79	0.79	1.04	35.36	25.18	25
	7.00	7.45	7.23	41	1.34	0.96	0.96	1.01	41.41	28.21	28
	8.50	8.95	8.73	46	1.61	1.09	1.09	0.96	44.16	29.58	30
	10.00	10.45	10.23	62	1.89	1.22	1.22	0.94	58.28	36.64	37

AVG. BULK DENSITY (gm/cc)		1.84	WATER TABLE (M)				2.70				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
LOC-157/3	2.00	2.45	2.23	8	0.41	0.46	0.41	1.26	10.08	-	10
	3.00	3.45	3.23	17	0.59	0.54	0.54	1.17	19.89	17.45	17
	5.00	5.45	5.23	30	0.96	0.71	0.71	1.06	31.80	23.40	23
	7.00	7.45	7.23	38	1.33	0.88	0.88	1.02	38.76	26.88	27
	8.50	8.95	8.73	44	1.61	1.00	1.00	1.00	44.00	29.50	30
	10.00	10.45	10.23	56	1.88	1.13	1.13	0.95	53.20	34.10	34

AVG. BULK DENSITY (gm/cc)		1.85	WATER TABLE (M)				1.00				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-170	2.00	2.45	2.23	13	0.41	0.29	0.29	1.34	17.42	16.21	16
	3.00	3.45	3.23	21	0.60	0.37	0.37	1.28	26.88	20.94	21
	5.00	5.45	5.23	35	0.97	0.54	0.54	1.17	40.95	27.98	28
	7.00	7.45	7.23	51	1.34	0.71	0.71	1.06	54.06	34.53	35
	10.00	10.45	10.23	69	1.89	0.97	0.97	1.01	69.69	42.35	42

AVG. BULK DENSITY (gm/cc)		1.90	WATER TABLE (M)				1.50				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-182	2.00	2.45	2.23	5	0.42	0.35	0.35	1.29	6.45	-	6
	3.00	3.45	3.23	8	0.61	0.44	0.44	1.23	9.84	-	10
	5.00	5.45	5.23	10	0.99	0.62	0.62	1.11	11.10	-	11
	7.00	7.45	7.23	13	1.37	0.80	0.80	1.04	13.52	-	14
	10.00	10.45	10.23	17	1.94	1.07	1.07	0.97	16.49	15.75	16

AVG. BULK DENSITY (gm/cc)		1.87	WATER TABLE (M)				1.55				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-190	2.00	2.45	2.23	4	0.42	0.35	0.35	1.29	5.16	-	5
	3.00	3.45	3.23	5	0.60	0.44	0.44	1.23	6.15	-	6
	5.00	5.45	5.23	6	0.98	0.61	0.61	1.12	6.72	-	7
	7.00	7.45	7.23	7	1.35	0.78	0.78	1.04	7.28	-	7
	10.00	10.45	10.23	10	1.91	1.04	1.04	0.98	9.80	-	10

AVG. BULK DENSITY (gm/cc)		1.90	WATER TABLE (M)				1.70				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-206	2.00	2.45	2.23	5	0.42	0.37	0.37	1.28	6.40	-	6
	3.00	3.45	3.23	6	0.61	0.46	0.46	1.23	7.38	-	7
	5.00	5.45	5.23	7	0.99	0.64	0.64	1.09	7.63	-	8
	7.00	7.45	7.23	9	1.37	0.82	0.82	1.04	9.36	-	9
	10.00	10.45	10.23	12	1.94	1.09	1.09	0.96	11.52	-	12

AVG. BULK DENSITY (gm/cc)		1.87	WATER TABLE (M)				1.50				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-220	2.00	2.45	2.23	6	0.42	0.34	0.34	1.30	7.80	-	8
	3.00	3.45	3.23	8	0.60	0.43	0.43	1.24	9.92	-	10
	5.00	5.45	5.23	17	0.98	0.60	0.60	1.12	19.04	17.02	17
	7.00	7.45	7.23	23	1.35	0.78	0.78	1.04	23.92	19.46	19
	10.00	10.45	10.23	28	1.91	1.04	1.04	0.98	27.44	21.22	21

AVG. BULK DENSITY (gm/cc)		1.86	WATER TABLE (M)				1.60				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-241	2.00	2.45	2.23	5	0.41	0.35	0.35	1.29	6.45	-	6
	3.00	3.45	3.23	7	0.60	0.44	0.44	1.23	8.61	-	9
	5.00	5.45	5.23	14	0.97	0.61	0.61	1.12	15.68	15.34	15
	7.00	7.45	7.23	20	1.34	0.78	0.78	1.04	20.80	17.90	18
	10.00	10.45	10.23	27	1.90	1.04	1.04	0.98	26.46	20.73	21



AVG. BULK DENSITY (gm/cc)		1.86	WATER TABLE (M)			1.00				
BH NO.	START DEPTH (m)	END DEPTH (m)	AVG. DEPTH (m)	FIELD N VALUE	EFFECTIVE OVP (kg/cm2)		EFFECTIVE OVP (kg/cm2)	OVP CORR. FACTOR	CORRECTION		CORRECTED N
					ABOVE WT	BELOW WT			OVERBURDEN	DILATANCY	
AP-252	2.00	2.45	2.23	6	0.41	0.29	0.29	1.34	8.04	-	8
	3.00	3.45	3.23	11	0.60	0.38	0.38	1.28	14.08	-	14
	5.00	5.45	5.23	25	0.97	0.55	0.55	1.16	29.00	22.00	22
	7.00	7.45	7.23	47	1.34	0.72	0.72	1.05	49.35	32.18	32
	10.00	10.45	10.23	62	1.90	0.98	0.98	1.00	62.00	38.50	39

A.2.4 MEASUREMENT OF WATER LEVEL:

Depth of level of water was noted when struck in. This is termed as depth of observed water level below existing ground level (EGL). Depth of standing water level (SWL) below EGL after 24 hours of removal of casing was also noted and shown in the profile. Standing water level was not encountered at any Borehole or Trail Pit. However ground water level is considered at ground level for design purpose.

BH No.	Depth (m)	Depth of SWL below EGL (m)	Commenced on	Completed on
AP-3	10.00	1.60M	21.08.2026	21.08.2026
AP-29	10.00	1.50M	22.08.2026	22.08.2026
AP-47	10.00	1.40M	23.08.2026	23.08.2026
AP-52	10.00	2.50M	23.08.2026	23.08.2026
AP-66	10.00	1.10M	24.08.2026	24.08.2026
AP-73	10.00	2.60M	25.08.2026	25.08.2026
AP-109	10.00	2.30M	25.08.2026	25.08.2026
AP-120	10.00	2.10M	26.08.2026	26.08.2026
AP-131	10.00	1.80M	26.08.2026	26.08.2026
LOC-137/2	10.00	1.50M	27.08.2026	27.08.2026
AP-141	10.00	1.60M	27.08.2026	27.08.2026
LOC-151/2	10.00	3.50M	28.08.2026	28.08.2026
LOC-157/3	10.00	2.70M	28.08.2026	28.08.2026

AP-170	10.00	1.00M	11.09.2026	11.09.2026
AP-182	10.00	1.50M	11.09.2026	11.09.2026
AP-190	10.00	1.55M	12.09.2026	12.09.2026
AP-206	10.00	1.70M	12.09.2026	12.09.2026
AP-220	10.00	1.50M	21.09.2026	21.09.2026
AP-241	10.00	1.60M	21.09.2026	21.09.2026
AP-252	10.00	1.00M	20.09.2026	20.09.2026

Note: *SWL=Standing Water Level, EGL=Existing Ground Level*

A.2.5 ROTARY CORE DRILLING:

Conventional diamond core drilling equipment was used for drilling vertical holes up to specified depth at each location. Rotary core drilling in rock was carried out according to IS 1892-1979. This drilling technique was regarded as the most satisfactory method of assessing the character of rock formations, which lie at depth below the ground surface. Specimens of rock in the form of cylindrical cores were recovered from the drill hole by means of a core barrel. Double barrel technique was adopted according to field condition. The core barrel was provided at its lower end with a detachable shoe or core bit, which is of diamond. All rotary core bits were of NX (75mm) size.

A.3.0 LABORATORY TESTING:

For proper identification and classification of the sub-surface and for deriving adequate information regarding its relevant physical and geotechnical properties at the site under investigation, the following laboratory tests were conducted on the soil and rock samples collected from the bore holes:

For Soil Samples:

1. Grain size analysis (Sieve as well as Hydrometer).
2. Liquid Limit & Plastic Limit.
3. Natural Moisture Content.
4. Specific Gravity.
5. Bulk & Dry Density.
6. Triaxial Shear Test (UU)
7. Unconfined Compressive Test (UC)
8. Direct Shear Test (DS)
9. Consolidation Test (**Oedometer test or a One-dimensional compression test.**)
10. Free Swell Index
11. Chemical Analysis

DETAILS OF FOUNDATION CLASSIFICATION:

BH No.	Depth (m)	Depth of SWL below EGL (m)	Type of Foundation
AP-3	10.00	1.60M	P.S
AP-29	10.00	1.50M	P.S
AP-47	10.00	1.40M	P.S
AP-52	10.00	2.50M	WET
AP-66	10.00	1.10M	P.S
AP-73	10.00	2.60M	WET
AP-109	10.00	2.30M	WET
AP-120	10.00	2.10M	WET
AP-131	10.00	1.80M	P.S
LOC-137/2	10.00	1.50M	P.S
AP-141	10.00	1.60M	P.S
LOC-151/2	10.00	3.50M	DRY
LOC-157/3	10.00	2.70M	WET
AP-170	10.00	1.00M	P.S
AP-182	10.00	1.50M	P.S
AP-190	10.00	1.55M	P.S
AP-206	10.00	1.70M	P.S
AP-220	10.00	1.50M	P.S
AP-241	10.00	1.60M	P.S
AP-252	10.00	1.00M	P.S

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General Manager (C)
O/o The MD, AEGCL, Bijulee Bhawan

For Water Samples:

1. Chemical Analysis

The above mentioned laboratory tests were done following the testing procedure given in the relevant parts of IS: 2720 and other relevant IS codes. Results of all tests are furnished in Annexure of this report.

A.4.0 SUBSOIL PROFILE:

A.4.0 SUBSOIL PROFILE & ENGINEERING PROPERTIES:

4.1. BH-AP-3:

STRATUM-I:-

The properties of the layer are as follows:

Description:

This layer is consists of "Stiff consistency, dark grey clayey silt traces of sand with mica."Field "N" value of this layer is 10.This layer is laying after EGL and continues up to 2.50m.

Physical properties		
Gravel	%	0
Sand	%	6
Silt	%	53
Clay	%	41
Free Swell index	%	24.00
IS Classification		ML

Liquid limit	%	31
Plastic limit	%	23
PI		8
Bulk density	g/cc	1.91
Dry density	g/cc	1.51
NMC	%	26.15
Sp. Gr.		2.68

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.30
Ø	°	0
Consolidation		
M_v	m^2/t	0.0021

STRATUM-II:-

The properties of the layer are as follows:

Description:

This layer is consists of " Loose, dark grey silty fine sand with mica." Field "N" value of this layer is 6.This layer lies after 2.50m & continues up to 4.50m.

Physical properties		
Gravel	%	0
Sand	%	66
Silt	%	27
Clay	%	7
Free swell index	%	-
IS Classification	SM	

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.56
NMC	%	18.22
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	19
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, dark grey clayey silt." Field "N" value of this layer is 7. This layer lies after 4.50m & continues up to 6.00m

Physical properties		
Gravel	%	0
Sand	%	4
Silt	%	52
Clay	%	44
Free swell index	%	-
IS Classification		ML

Liquid limit	%	30
Plastic limit	%	23
PI		7
Bulk density	g/cc	1.88
Dry density	g/cc	-
NMC	%	-
Sp. Gr.		2.69

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.22
Ø	°	0
Consolidation		
M_v	m^2/t	0.0020

STRATUM-IV:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose to medium, dark grey silty sand with mica." Average field N value of this layer is 19. This layer lies after 6.00m & continues up to its termination depth (10.00m).

Physical properties		
Gravel	%	0
Sand	%	69
Silt	%	27
Clay	%	4
Free swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.85
Dry density	g/cc	1.55
NMC	%	19
Sp. Gr.		2.66

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0.00
Ø	°	25
Consolidation		
M_v	m^2/t	---

4.2. AP-29:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, brownish to dark grey clayey silt." Field "N" value of this layer is 5. This layer lies after EGL & continues up to 3.00m.

Physical properties		
Gravel	%	0
Sand	%	8
Silt	%	57
Clay	%	35
Free swell Index	%	20.00
IS Classification		ML

Liquid limit	%	30
Plastic limit	%	19
PI		11
Bulk density	g/cc	1.89
Dry density	g/cc	1.52
NMC	%	24.00
Sp. Gr.		2.70

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.25
Ø	°	0
Consolidation		
M_v	m^2/t	0.0018

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose light dark grey silty fine sand with mica." Field "N" value of this layer is 6.This layer lies after 3.00m & continues up to 5.00m.

Physical properties		
Gravel	%	0
Sand	%	65
Silt	%	29
Clay	%	6
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	1.57
NMC	%	16.79
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	18
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium, dark grey silty sand with mica." Average field N value of this layer is 25. This layer lies after 5.00m & continues up to 10.00m.

Physical properties		
Gravel	%	0
Sand	%	68
Silt	%	29
Clay	%	3
Free swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.56
NMC	%	28
Sp. Gr.		2.66

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	28
Consolidation		
M_v	m^2/t	---

4.3. AP – 47/0:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Stiff consistency, brownish to dark grey sandy clay" No SPT & UDS value is encountered in this layer. This layer lies after EGL & continues up to 0.50m.

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, light dark grey silty fine sand with mica." Field N value of this layer is 8. This layer lies after 0.50m & continues up to 3.00m.

Physical properties		
Gravel	%	0
Sand	%	67
Silt	%	28
Clay	%	5
Free swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.60
NMC	%	15
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	19
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose to medium, dark grey silty sand with mica." Average N value of this layer is 22. This layer lies after 3.00m & continues up to its termination depth (10.00m).

Physical properties		
Gravel	%	0
Sand	%	69
Silt	%	28
Clay	%	3
Free swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.60
NMC	%	16
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	26
Consolidation		
M_v	m^2/t	---

4.4. AP – 52/0:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Stiff, brownish grey clayey sand." No SPT & UDS value is encountered in this layer. This layer lies after EGL & continues up to 0.50m.

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, light brownish grey silty fine sand with mica." Field N value of this layer is 4. This layer lies after 0.50m & continues up to 2.50m.

Physical properties		
Gravel	%	0
Sand	%	61
Silt	%	32
Clay	%	7
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	1.56
NMC	%	17.44
Sp. Gr.		2.63

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	16
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of " Loose, dark grey silty fine sand with mica." Field N value of this layer is 5. This layer lies after 2.50m & continues up to 5.00m.

Physical properties		
Gravel	%	0
Sand	%	66
Silt	%	29
Clay	%	5
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.55
NMC	%	18.50
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	18
Consolidation		
M_v	m^2/t	---

STRATUM-IV:-

The properties of the layer are as follows:

Description: This layer is consists of "Medium consistency, dark grey silty sand with mica." Average field N value of this layer is 18. This layer lies after 5.00m & continues up to termination depth (10.00m).

Physical properties		
Gravel	%	0
Sand	%	68
Silt	%	29
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.56
NMC	%	19
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	24
Consolidation		
M_v	m^2/t	---

4.5. AP – 66/0:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, light dark grey silty sand with mica." Field N value of this layer is 6. This layer lies after EGL & continues up to 3.00m.

Physical properties		
Gravel	%	0
Sand	%	63
Silt	%	31
Clay	%	6
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.82
Dry density	g/cc	1.60
NMC	%	13.50
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	17
Consolidation		
M_v	m^2/t	---

STRATUM-II:-

The properties of the layer are as follows:

Description: This layer is consists of "Medium consistency, dark grey silty sand with mica." Average field N value of this layer is 20. This layer lies after 3.00m & continues up to 6.00m.

Physical properties		
Gravel	%	0
Sand	%	68
Silt	%	29
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.61
NMC	%	14.35
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	26
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium to dense, dark grey silty medium to coarses sand with nodules." Average field N value of this layer is 41. This layer lies after 6.00m & continues up to termination depth (10.00m).

Physical properties		
Gravel	%	0
Sand	%	73
Silt	%	22
Clay	%	5
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.62
NMC	%	15
Sp. Gr.		2.66

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	31
Consolidation		
M_v	m^2/t	---

4.6. AP – 73/0:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "soft to medium dark grey clayey silt traces of sand with mica." Field N value of this layer is 4. This layer lies after EGL & continues up to 2.50m.

Physical properties		
Gravel	%	0
Sand	%	9
Silt	%	53
Clay	%	38
Free Swell index	%	21
IS Classification		ML

Liquid limit	%	31.68
Plastic limit	%	23
PI		8.68
Bulk density	g/cc	1.87
Dry density	g/cc	1.47
NMC	%	27.50
Sp. Gr.		2.67

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.24
Ø	°	0
Consolidation		
M_v	m^2/t	0.0016

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium, dark grey silty medium sand with mica." Average field N value of this layer is 23. This layer lies after 2.50m & continues up to termination depth (10.00m).

Physical properties		
Gravel	%	0
Sand	%	67
Silt	%	29
Clay	%	4
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.57
NMC	%	18
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test		
C	kg/cm^2	0
Ø	°	25
Consolidation		
M_v	m^2/t	---

4.7. AP – 109/0:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, light dark grey silty fine to medium sand with mica." Field N value of this layer is 7. This layer lies after EGL & continues up to 3.00m.

Physical properties		
Gravel	%	0
Sand	%	65
Silt	%	28
Clay	%	7
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	1.56
NMC	%	17.02
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	18
Consolidation		
M_v	m^2/t	---

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium, dark grey silty sand with mica." Average field N value of this layer is 15. This layer lies after 3.00m & continues up to 7.00m.

Physical properties		
Gravel	%	0
Sand	%	63
Silt	%	32
Clay	%	5
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.85
Dry density	g/cc	1.56
NMC	%	18.89
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	23
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium to dense, dark grey silty medium sand with nodules." Average field N value of this layer is 33. This layer lies after 7.00m & continues up to termination depth (10.00m).

Physical properties		
Gravel	%	0
Sand	%	70
Silt	%	28
Clay	%	2
Classification		
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.60
NMC	%	16.50
Sp. Gr.		2.66

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	30
Consolidation		
M_v	m^2/t	---

4.8. AP – 120/0:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Soft to medium, dark grey clayey silt traces of sand." Average N value of this layer is 5. This layer lies after EGL & continues up to 3.50m.

Physical properties		
Gravel	%	0
Sand	%	10
Silt	%	57
Clay	%	33
Free Swell index	%	22
IS Classification		ML

Liquid limit	%	30.00
Plastic limit	%	20.50
PI		9.50
Bulk density	g/cc	1.88
Dry density	g/cc	1.49
NMC	%	26.56
Sp. Gr.		2.68

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.24
Ø	°	0
Consolidation		
M_v	m^2/t	0.0017

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose to medium, dark grey silty medium sand with mica." No SPT value encountered in this layer. This layer lies after 3.50m & continues up to 5.00m.

Physical properties		
Gravel	%	0
Sand	%	63
Silt	%	32
Clay	%	5
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	1.59
NMC	%	15
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	22
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium to dense, dark grey silty medium to coarses sand with gravels." Average field N value of this layer is 30. This layer lies after 5.00m & continues up to termination depth (10.00m).

Physical properties		
Gravel	%	7
Sand	%	65
Silt	%	26
Clay	%	2
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.60
NMC	%	16.50
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	29
Consolidation		
M_v	m^2/t	---

4.9. AP – 131/0:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Stiff consistency, dark grey clayey silt." No SPT value is encountered in this layer. This layer lies after EGL & continues up to 1.50m.

Physical properties		
Gravel	%	0
Sand	%	63
Silt	%	33
Clay	%	4
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.82
Dry density	g/cc	1.54
NMC	%	17.86
Sp. Gr.		2.63

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	20
Consolidation		
M_v	m^2/t	---

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, dark grey silty fine sand with mica." Field N value of this layer is 11. This layer lies after 1.50m & continues up to 2.50m.

Physical properties		
Gravel	%	7
Sand	%	67
Silt	%	23
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.55
NMC	%	18.50
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	27
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium, dark grey silty medium sand with gravels." Field N value of this layer is 23. This layer lies after 2.50m & continues up to 5.00m

Physical properties		
Gravel	%	7
Sand	%	67
Silt	%	23
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.55
NMC	%	18.50
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	27
Consolidation		
M_v	m^2/t	---

STRATUM-IV:-

The properties of the layer are as follows:

Description:
This layer is consists of "Dense, dark grey silty medium to coarses sand with gravels." Average field N value of this layer is 45. This layer lies after 5.00m & continues up to termination depth (10.00m).

Physical properties		
Gravel	%	8
Sand	%	70
Silt	%	19
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.85
Dry density	g/cc	1.55
NMC	%	19.25
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	31
Consolidation		
M_v	m^2/t	---

4.10. LOC – 137/2:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Stiff consistency, brownish grey clayey silt traces of sand with mica." Field N value of this layer is 9. This layer lies after EGL & continues up to 3.00m.

Physical properties		
Gravel	%	0
Sand	%	9
Silt	%	56
Clay	%	35
Free Swell index	%	23
IS Classification		ML

Liquid limit	%	32.50
Plastic limit	%	24.00
PI		8.50
Bulk density	g/cc	1.89
Dry density	g/cc	1.49
NMC	%	26.56
Sp. Gr.		2.69

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.27
Ø	°	0
Consolidation		
M_v	m^2/t	0.0021

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, dark grey silty fine sand with mica.." Field N value of this layer is 8. This layer lies after 3.00m & continues up to 5.00m.

Physical properties		
Gravel	%	0
Sand	%	65
Silt	%	30
Clay	%	5
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	1.52
NMC	%	20.04
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test		
C	kg/cm^2	0
Ø	°	19
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium to dense, dark grey silty medium sand with gravels." Field N value of this layer is 37. This layer lies after 5.00m & continues up to termination depth (10.00m)

Physical properties		
Gravel	%	6
Sand	%	68
Silt	%	24
Clay	%	2
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.53
NMC	%	21.78
Sp. Gr.		2.66

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	30
Consolidation		
M_v	m^2/t	---

4.11.AP – 141/0:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, dark grey clayey silt traces of sand with mica." No SPT value is encountered in this layer. This layer lies after EGL & continues up to 2.00m.

Physical properties		
Gravel	%	0
Sand	%	11
Silt	%	52
Clay	%	37
Free Swell index	%	21
IS Classification		ML

Liquid limit	%	31
Plastic limit	%	21.50
PI		9.50
Bulk density	g/cc	1.88
Dry density	g/cc	1.49
NMC	%	26.45
Sp. Gr.		2.68

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.26
Ø	°	0
Consolidation		
M_v	m^2/t	0.0017

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose to medium, dark grey silty sand with mica." Average field N value of this layer is 8. This layer lies after 2.00m & continues up to 4.00m.

Physical properties		
Gravel	%	0
Sand	%	65
Silt	%	32
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	---
NMC	%	---
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	18
Consolidation		
M_v	m^2/t	-

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium to dense, dark grey silty sand mixed with gravels." Average field N value of this layer is 39. This layer lies after 4.00m & continues up to termination depth (10.00m)

Physical properties		
Gravel	%	4
Sand	%	63
Silt	%	29
Clay	%	4
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.85
Dry density	g/cc	1.54
NMC	%	20.38
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	31
Consolidation		
M_v	m^2/t	---

4.12.LOC – 151/2:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, dark grey silty fine sand with mica." Field N value of this layer is 10. This layer lies after EGL & continues up to 3.00m.

Physical properties		
Gravel	%	0
Sand	%	67
Silt	%	28
Clay	%	5
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.55
NMC	%	18.90
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	19
Consolidation		
M_v	m^2/t	---

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium to dense, dark grey silty sand with gravels.." Average field N value of this layer is 42. This layer lies after 2.00m & continues up to termination depth (10.00m).

Physical properties		
Gravel	%	9
Sand	%	61
Silt	%	27
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.54
NMC	%	20.97
Sp. Gr.		2.66

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	30
Consolidation		
M_v	m^2/t	---

4.13. LOC – 157/3:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Stiff consistency, brownish grey clayey silt." No SPT & UDS value is encountered in this layer. This layer lies after EGL & continues up to 1.50m

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose to medium, dark grey silty sand with mica & gravels." Average field N value of this layer is 13. This layer lies after 1.50m & continues up to 5.00m.

Physical properties		
Gravel	%	9
Sand	%	63
Silt	%	25
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	1.56
NMC	%	17.07
Sp. Gr.		2.64

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	21
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Dense, dark grey medium to coarses sand with gravels." Average field N value of this layer is 42. This layer lies after 5.00m & continues up to termination depth (10.00m)

Physical properties		
Gravel	%	8
Sand	%	71
Silt	%	19
Clay	%	2
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.85
Dry density	g/cc	1.57
NMC	%	18.05
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	31
Consolidation		
M_v	m^2/t	---

4.14. AP – 170:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, dark grey silty sand with mica." No SPT value is encountered in this layer. This layer lies after EGL & continues up to 2.00m.

Physical properties		
Gravel	%	0
Sand	%	66
Silt	%	27
Clay	%	7
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.56
NMC	%	18.22
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	18
Consolidation		
M_v	m^2/t	---

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium, dark grey silty sand with mica & gravels." Average field N value of this layer is 17. This layer lies after 2.00m & continues up to 5.00m.

Physical properties		
Gravel	%	4
Sand	%	67
Silt	%	24
Clay	%	5
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.85
Dry density	g/cc	1.55
NMC	%	19.00
Sp. Gr.		2.63

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	23
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Dense to very dense, dark grey medium sand with gravels." Average field N value of this layer is 52. This layer lies after 5.00m & continues up to termination depth (10.00m)

Physical properties		
Gravel	%	5
Sand	%	70
Silt	%	22
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.55
NMC	%	20.18
Sp. Gr.		2.62

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	32
Consolidation		
M_v	m^2/t	---

4.15. AP – 182:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, brownish to dark grey clayey silt traces of sand". Field N value of this layer is 5. This layer lies after EGL & continues up to 3.00m.

Physical properties		
Gravel	%	0
Sand	%	8
Silt	%	54
Clay	%	38
Free Swell index	%	21
IS Classification		ML

Liquid limit	%	31.11
Plastic limit	%	21.00
PI		10.11
Bulk density	g/cc	1.89
Dry density	g/cc	1.50
NMC	%	26.19
Sp. Gr.		2.70

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.23
Ø	°	0
Consolidation		
M_v	m^2/t	0.0017

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Stiff consistency, dark grey clayey silt with sand". Average field N value of this layer is 12. This layer lies after 3.00m & continues up to termination depth (10.00m)

Physical properties		
Gravel	%	0
Sand	%	10
Silt	%	57
Clay	%	33
Free Swell index	%	-
IS Classification		ML

Liquid limit	%	32.33
Plastic limit	%	24.00
PI		8.33
Bulk density	g/cc	1.91
Dry density	g/cc	1.50
NMC	%	27.79
Sp. Gr.		2.70

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.26
Ø	°	0
Consolidation		
M_v	m^2/t	0.0022

4.16. AP – 190:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Soft to medium stiff, brownish to dark grey clayey silt with sand". Field N value of this layer is 4. This layer lies after EGL & continues up to 3.00m.

Physical properties		
Gravel	%	0
Sand	%	9
Silt	%	53
Clay	%	38
Free Swell index	%	20
IS Classification		ML

Liquid limit	%	31.16
Plastic limit	%	21.00
PI		10.16
Bulk density	g/cc	1.87
Dry density	g/cc	1.47
NMC	%	27.29
Sp. Gr.		2.67

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.23
Ø	°	0
Consolidation		
M_v	m^2/t	0.0016

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose, dark grey silty fine sand with mica". Field N value of this layer is 5. This layer lies after 3.00m & continues up to 5.00m.

Physical properties		
Gravel	%	0
Sand	%	66
Silt	%	29
Clay	%	5
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.83
Dry density	g/cc	1.54
NMC	%	18.79
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	18
Consolidation		
M_v	m^2/t	---

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, dark grey clayey silt." Average field N value of this layer is 8. This layer lies after 5.00m & continues up to termination depth (10.00m)

Physical properties		
Gravel	%	0
Sand	%	9
Silt	%	57
Clay	%	34
Free Swell index	%	-
IS Classification		ML

Liquid limit	%	32.25
Plastic limit	%	24.00
PI		8.25
Bulk density	g/cc	1.90
Dry density	g/cc	1.50
NMC	%	26.85
Sp. Gr.		2.69

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.27
Ø	°	0
Consolidation		
M_v	m^2/t	0.0022

4.17. AP – 206:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, brownish to dark grey clayey silt with sand". Average field N value of this layer is 6.This layer lies after EGL & continues up to 7.00m.

Physical properties		
Gravel	%	0
Sand	%	5
Silt	%	53
Clay	%	42
Free Swell index	%	20
IS Classification		ML

Liquid limit	%	30.25
Plastic limit	%	23.22
PI		7.03
Bulk density	g/cc	1.89
Dry density	g/cc	1.50
NMC	%	26.63
Sp. Gr.		2.70

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.23
Ø	°	0
Consolidation		
M_v	m^2/t	0.0019

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Stiff, dark grey clayey silt traces of sand with mica". Average field N value of this layer is 11. This layer lies after 7.00m & continues up to termination depth 10.00m.

Physical properties		
Gravel	%	0
Sand	%	10
Silt	%	53
Clay	%	37
Free Swell index	%	-
IS Classification		ML

Liquid limit	%	31.00
Plastic limit	%	24.00
PI		7.00
Bulk density	g/cc	1.91
Dry density	g/cc	1.49
NMC	%	28.55
Sp. Gr.		2.68

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.31
Ø	°	0
Consolidation		
M_v	m^2/t	0.0023

4.18. AP – 220:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, dark grey silty clay traces of sand". No SPT value is encountered in this layer This layer lies after EGL & continues up to 2.00m.

Physical properties		
Gravel	%	0
Sand	%	4
Silt	%	44
Clay	%	52
Free Swell index	%	25
IS Classification		CI

Liquid limit	%	36.29
Plastic limit	%	21.00
PI		15.29
Bulk density	g/cc	1.88
Dry density	g/cc	1.48
NMC	%	27.35
Sp. Gr.		2.69

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.21
Ø	°	0
Consolidation		
M_v	m^2/t	0.0019

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff consistency dark grey clayey silt." Average field N value of this layer is 7. This layer lies after 2.00m & continues up to 3.50m.

Physical properties		
Gravel	%	0
Sand	%	4
Silt	%	55
Clay	%	41
Free Swell index	%	-
IS Classification		ML

Liquid limit	%	33.56
Plastic limit	%	21.06
PI		12.56
Bulk density	g/cc	1.90
Dry density	g/cc	-
NMC	%	-
Sp. Gr.		2.70

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.24
Ø	°	0
Consolidation		
M_v	m^2/t	0.0021

STRATUM-III:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose to medium, dark grey silty fine sand with mica.." Average field N value of this layer is 23. This layer lies after 3.50m & continues up to termination depth (10.00m)

Physical properties		
Gravel	%	0
Sand	%	67
Silt	%	29
Clay	%	4
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.85
Dry density	g/cc	1.56
NMC	%	18.50
Sp. Gr.		2.64

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0
Ø	°	26
Consolidation		
M_v	m^2/t	---

4.19. AP – 241:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, dark grey clayey silty traces of sand with mica." No SPT value is encountered in this layer. This layer lies after EGL & continues up to 2.00m.

Physical properties		
Gravel	%	0
Sand	%	8
Silt	%	58
Clay	%	34
Free Swell index	%	21
IS Classification		ML

Liquid limit	%	29.00
Plastic limit	%	19.00
PI		10.00
Bulk density	g/cc	1.89
Dry density	g/cc	1.51
NMC	%	25.41
Sp. Gr.		2.70

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.25
Ø	°	0
Consolidation		
M_v	m^2/t	0.0016

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Loose to medium, brownish to dark grey silty sand with mica." Average field N value of this layer is 15. This layer lies after 2.00m & continues up to termination depth 10.00m.

Physical properties		
Gravel	%	0
Sand	%	69
Silt	%	28
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.84
Dry density	g/cc	1.55
NMC	%	19.13
Sp. Gr.		2.66

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	25
Consolidation		
M_v	m^2/t	---

4.20. AP – 252:

STRATUM-I:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, dark grey clayey silty with mica."No SPT & UDS value is encountered in this layer. This layer lies after EGL & continues up to 1.00m.

STRATUM-II:-

The properties of the layer are as follows:

Description:
This layer is consists of "Medium stiff, dark grey silty clay." Average field N value of this layer is 9. This layer lies after 1.00m & continues up to 3.50m.

Physical properties		
Gravel	%	0
Sand	%	5
Silt	%	44
Clay	%	51
Free Swell index	%	-
IS Classification		CI

Liquid limit	%	35.66
Plastic limit	%	22.00
PI		13.66
Bulk density	g/cc	1.88
Dry density	g/cc	1.49
NMC	%	26.55
Sp. Gr.		2.69

Shear strength		
Type of Test		
UC (Unconfined Compressive Test)		
C	kg/cm^2	0.28
Ø	°	0
Consolidation		
M_v	m^2/t	0.0022

STRATUM-III:-

The properties of the layer are as follows:

Description:

This layer is consists of "Loose to medium dark grey silty fine sand with mica." Average field N value of this layer is 36. This layer lies after 3.50m & continues up to 7.50m.

Physical properties		
Gravel	%	0
Sand	%	69
Silt	%	29
Clay	%	2
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.85
Dry density	g/cc	1.60
NMC	%	15.45
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	28
Consolidation		
M_v	m^2/t	---

STRATUM-IV:-

The properties of the layer are as follows:

Description:

This layer is consists of "Very dense, dark grey medium to coarses sand with mica & occasionally gravels." Field N value of this layer is 62. This layer lies after 7.50m & continues up to termination depth (10.00m)

Physical properties		
Gravel	%	5
Sand	%	68
Silt	%	24
Clay	%	3
Free Swell index	%	-
IS Classification		SM

Liquid limit	%	NP
Plastic limit	%	NP
PI		NP
Bulk density	g/cc	1.86
Dry density	g/cc	1.56
NMC	%	19.00
Sp. Gr.		2.65

Shear strength		
Type of Test		
DS (Direct-Shear Test)		
C	kg/cm^2	0
Ø	°	32
Consolidation		
M_v	m^2/t	---

5.0 CHOICE OF FOUNDATION:

In views of the above sub-soil conditions in mind and the type of structure both the aspects regarding allowable bearing capacity for shallow foundation and deep foundation have been discussed in the following paragraphs. Designer can choose the requirement depending upon the loading & geometry of the structure envisaged.

5.0.1 SHALLOW FOUNDATION:

5.1. SAMPLE CALCULATION

5.1.1 AP-73:-

Stratum-I:

Assumed foundation size = 3.00 m x 3.00 m
Depth of foundation = 2.00 m.
The founding depth is falling in Stratum-I.

DETERMINATION OF BEARING CAPACITY:
As per Indian Standard IS 6403: 1981
(For Sqaure Footing)(Width 3.0mX3.0m)

Bearing Capacity as per IS 6403:1981 considering 2.00m depth of foundation

$q_d = 1/F[C.N_c.s_c.d_c.i_c + \gamma'D.(Nq-1).s_q.d_q.i_q + 0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W']$

Where:
q_d= Allowable Bearing Capacity
C= Cohision= 2.4 t/sqm
γ'= Submerged density = $(\gamma-1)$ = 1.87-1 = 0.87 t/m³
For, Ø= 0°, Bearing Capacity factors, Nc=5.14, Nq= 1.00, Nγ= 0.00,
s_q & s_γ= Shape correction. s_q = 1.20 and s_γ = 0.80
s_c=1.30
d_q & d_γ= Depth correction. Here, d_q = 1.00 and d_γ= 1.00
d_c=1.13
i_q & i_γ = Inclination Factor.= (1- α/90) =(1-0/90)=1 (α = inclination of the load to the vertical, in degree); α = 0, [refer : IS 6403-1981, Cls- 5.1.2.3, and B.C Punmia Pg-660]
W'= Water table correction =0.5 (Considering fully submerged condition for design purpose)
F= Factor of safety, considering 3
D= 2.00 metre
B= 3.00 metre
Hence:

$q_d = 1/F[C.Nc.d_c.s_c.i_c + \gamma'D.(Nq-1).s_q.d_q.i_q + 0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W']$
= 1/(3)[2.4*5.14*1.13*1.30*1.00+0.87*2*(1.00-1)*1.20*1.00*1.00+ 0.5*1.87*3*0.00*0.8*1.00*1.00*0.5]
= 6.04 T/Sqm

Settlement Analysis of Shallow Foundation

Settlement, S = H x mv x Δp.
Here,
S= Anticipated Settlement
H= Height of strata= 1.5 B= 1.5X3.0= 4.50 m
mv= Co-efficient of Volume Change = 0.0016 sqm/t

Note – For Δp, As per IS:8009 (Part-I) – 1976, we take 2:1 Stress Distribution method,
Δp = Increment of stress = (3*3*6.04)/{(3+2.25)^2} = 1.97 t/ Sqm
Therefore,
S= 4.5X 0.0016X 1.97 X 1000 = 14.20 mm
The permissible settlement is 40 mm
Hence the allowable bearing capacity of Shallow foundation is 6.04 t/sqm

Stratum-II:
Assumed foundation size = 3.00 m x 3.00 m
Depth of foundation = 3.00 m.
The founding depth is falling in Stratum-II.

DETERMINATION OF BEARING CAPACITY:
As per Indian Standard IS 6403: 1981
(For Sqaure Footing)(Width 3.0mX3.0m)
Bearing Capacity as per IS 6403:1981 considering 3.00m depth of foundation
q_d= 1/F[C.N_c. s_c.d_c.i_c+γ'D.(Nq-1).s_q.d_q.i_q+0.5. γ.B.Nγ.s_γ.d_γ.i_γ W']
Where:
q_d= Allowable Bearing Capacity
C= Cohision= 0 t/sqm
γ'= Submerged density = (γ-1) = 1.84-1 = 0.84 t/m³
For, Ø= 17°, Bearing Capacity factors, Nc=12.34, Nq= 4.77, Nγ= 3.53,
[Considering Local Shear Failure]
s_q & s_γ= Shape correction. s_q = 1.20 and s_γ = 0.80
s_c=1.30
d_q & d_γ= Depth correction. Here, d_q = 1.14 and d_γ= 1.14
d_c=1.27
i_q & i_γ = Inclination Factor.= (1- α/90) =(1-0/90)=1 (α = inclination of the load to the vertical, in degree); α = 0, [refer : IS 6403-1981, Cls- 5.1.2.3, and B.C Punmia Pg-660]
W'= Water table correction =0.5 (Considering fully submerged condition for design purpose)
F= Factor of safety, considering 3
D= 3.00 metre
B= 3.00 metre
Hence:
q_d= 1/F[C.Nc.d_c.s_c.i_c+ γ'D.(Nq-1).s_q.d_q.i_q+0.5. γ.B.Nγ.s_γ.d_γ.i_γ W']
= 1/(3)[0*12.34*1.27*1.30*1.00+0.84*3*(4.77-1)*1.20*1.14*1.00+ 0.5*1.84*3*3.53*0.8*1.14*1.00*0.5]
= 5.81 T/Sqm

Settlement Analysis of Shallow Foundation
According to **IS 8009 (Part I): 1976** clause 9.4.1, settlement of footing of granular soil for a pressure of 10 Mt/Sqm for average corrected **'N'= 19 is 16.40 mm**
Hence, for **5.81** t/sqm pressure the settlement will be = 16.40x5.81/10= **9.53mm**
The permissible settlement is 40 mm
Hence the allowable bearing capacity of Shallow foundation is **5.81** t/sqm

Bearing Capacity as per IS 6403:1981 (AP-3) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (y)	1.91	1.91	1.91	1.91
C	3	3	3	3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0021	0.0021	0.0021	0.0021
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.91	0.91	0.91	0.91
$C.N_c.s_c.d_c.i_c$	24.06	22.05	21.45	21.05
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	24.06	22.05	21.45	21.05
SBC	8.02	7.35	7.15	7.02
Recommended SBC for sattlement of 40mm	8.02	7.35	7.15	7.02
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	8.25	15.12	22.06	28.88
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.62	2.40	2.33	2.29
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-3) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.91	1.91	1.91	1.91
C	3	3	3	3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0021	0.0021	0.0021	0.0021
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.91	0.91	0.91	0.91
$C.N_c.s_c.d_c.i_c$	28.06	24.06	22.65	22.05
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	28.06	24.06	22.65	22.05
SBC	9.35	8.02	7.55	7.35
Recommended SBC for sattlement of 40mm	9.35	8.02	7.55	7.35
For Settlement				
of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	9.62	16.5	23.3	30.24
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.05	2.62	2.47	2.40
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-3) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	7	7	7	7
m_v	0	0	0	0
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Ny	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	1.76	1.38	1.25	1.19
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.38	1.19	1.13	1.09
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.38	1.19	1.13	1.09
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	9.43	8.13	7.72	7.45
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1	1.73	2.46	3.16
NBC	10.43	9.86	10.18	10.61
SBC	3.48	3.29	3.39	3.54
Recommended SBC for sattlement of 40mm	3.48	3.29	3.39	3.54
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	44	58	74	88
Settlement (S)	15.31	19.08	25.09	31.15
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.14	1.07	1.11	1.16
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	19
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (AP-3) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	6	6	6	6
m_v	0	0	0	0
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Nγ	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	2.01	1.5	1.34	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.5	1.25	1.17	1.13
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.5	1.25	1.17	1.13
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
i_c, i_q & i_γ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	11.48	11.39	10.66	10.3
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.09	1.81	2.54	3.28
NBC	12.57	13.2	13.2	13.58
SBC	4.19	4.4	4.4	4.53
Recommended SBC for sattlement of 40mm	4.19	4.40	4.40	4.53
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	44	58	74	88
Settlement (S)	18.44	25.52	32.56	39.86
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.37	1.44	1.44	1.48
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	19
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (AP-3) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (y)	1.88	1.88	1.88	1.88
C	2.2	2.2	2.2	2.2
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0020	0.0020	0.0020	0.0020
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2	1.5	1.33	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.5	1.25	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	29.4	22.05	19.55	18.38
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	29.4	22.05	19.55	18.38
SBC	9.8	7.35	6.52	6.13
Recommended SBC for sattlement of 40mm	9.80	7.35	6.52	6.13
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	9.6	14.4	19.16	24.02
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.20	2.40	2.13	2.00
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

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Bearing Capacity as per IS 6403:1981	(AP-3) (Depth =6m)			
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	16	16	16	16
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.62	1.81	1.54	1.41
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.81	1.41	1.27	1.2
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.81	1.41	1.27	1.2
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	41.76	32.53	29.3	27.69
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.36	3.68	4.98	6.27
NBC	44.12	36.21	34.28	33.96
SBC	14.71	12.07	11.43	11.32
Recommended SBC for sattlement of 40mm	14.71	12.07	11.43	11.32
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	16.5	18.2	19.1	20.8
Settlement (S)	24.27	21.97	21.83	23.55
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.80	3.94	3.73	3.70
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-3) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	16	16	16	16
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.89	1.95	1.63	1.47
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.95	1.47	1.32	1.24
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.95	1.47	1.32	1.24
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	52.49	39.57	35.53	33.38
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.55	3.84	5.17	6.48
NBC	55.04	43.41	40.7	39.86
SBC	18.35	14.47	13.57	13.29
Recommended SBC for sattlement of 40mm	18.35	14.47	13.57	13.29
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	16.5	18.2	19.1	20.8
Settlement (S)	30.28	26.34	25.92	27.64
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	5.99	4.72	4.43	4.34
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17

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SBC & Settlement Summary of AP-3								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	24.06	28.06	10.43	12.57	29.4	44.12	55.04
SBC	1 x 1	8.02	9.35	3.48	4.19	9.8	14.71	18.35
BC for sattlement of 40mm	1 x 1	8.02	9.35	3.48	4.19	9.80	14.71	18.35
Settlement (S)	1 x 1	8.25	9.62	15.31	18.44	9.6	24.27	30.28
NBC	2 x 2	22.05	24.06	9.86	13.2	22.05	36.21	43.41
SBC	2 x 2	7.35	8.02	3.29	4.4	7.35	12.07	14.47
BC for sattlement of 40mm	2 x 2	7.35	8.02	3.29	4.40	7.35	12.07	14.47
Settlement (S)	2 x 2	15.12	16.5	19.08	25.52	14.4	21.97	26.34
NBC	3 x 3	21.45	22.65	10.18	13.2	19.55	34.28	40.7
SBC	3 x 3	7.15	7.55	3.39	4.4	6.52	11.43	13.57
BC for sattlement of 40mm	3 x 3	7.15	7.55	3.39	4.40	6.52	11.43	13.57
Settlement (S)	3 x 3	22.06	23.3	25.09	32.56	19.16	21.83	25.92
NBC	4 x 4	21.05	22.05	10.61	13.58	18.38	33.96	39.86
SBC	4 x 4	7.02	7.35	3.54	4.53	6.13	11.32	13.29
BC for sattlement of 40mm	4 x 4	7.02	7.35	3.54	4.53	6.13	11.32	13.29
Settlement (S)	4 x 4	28.88	30.24	31.15	39.86	24.02	23.55	27.64



Bearing Capacity as per IS 6403:1981 (AP-29) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.89	1.89	1.89	1.89
C	2.5	2.5	2.5	2.5
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0018	0.0018	0.0018	0.0018
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	20.05	18.38	17.87	17.54
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	20.05	18.38	17.87	17.54
SBC	6.68	6.13	5.96	5.85
Recommended SBC for sattlement of 40mm	6.68	6.13	5.96	5.85
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.89	10.81	15.76	20.63
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.18	2.00	1.95	1.91
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-29) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.89	1.89	1.89	1.89
C	2.5	2.5	2.5	2.5
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0018	0.0018	0.0018	0.0018
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	23.39	20.05	18.88	18.38
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	23.39	20.05	18.88	18.38
SBC	7.8	6.68	6.29	6.13
Recommended SBC for sattlement of 40mm	7.8	6.68	6.29	6.13
For Settlement				
of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	6.88	11.78	16.64	21.62
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.55	2.18	2.05	2.00
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-29) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	8	8	8	8
m_v	0	0	0	0
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Ny	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.74	1.37	1.25	1.18
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.37	1.18	1.12	1.09
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.37	1.18	1.12	1.09
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	8.06	6.95	6.59	6.42
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.85	1.46	2.08	2.7
NBC	8.91	8.41	8.67	9.12
SBC	2.97	2.8	2.89	3.04
Recommended SBC for sattlement of 40mm	2.97	2.80	2.89	3.04
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	48	56	62	70
Settlement (S)	14.26	15.68	17.92	21.28
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.97	0.91	0.94	0.99
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981 (AP-29) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	8	8	8	8
m_v	0	0	0	0
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Ny	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.98	1.49	1.33	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.49	1.25	1.16	1.12
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.49	1.25	1.16	1.12
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	9.65	9.81	9.1	8.79
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.92	1.55	2.15	2.77
NBC	10.57	11.36	11.25	11.56
SBC	3.52	3.79	3.75	3.85
Recommended SBC for sattlement of 40mm	3.52	3.79	3.75	3.85
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	48	56	62	70
Settlement (S)	16.9	21.22	23.25	26.95
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.15	1.24	1.22	1.26
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981	(AP-29) (Depth =5m)			
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	20	20	20	20
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.4	1.7	1.47	1.35
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.7	1.35	1.23	1.18
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.7	1.35	1.23	1.18
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	41.13	32.66	29.76	28.55
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.93	4.65	6.36	8.13
NBC	44.06	37.31	36.12	36.68
SBC	14.69	12.44	12.04	12.23
Recommended SBC for sattlement of 40mm	14.69	12.44	12.04	12.23
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	13	15	15.5	16
Settlement (S)	19.1	18.66	18.66	19.57
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.80	4.06	3.93	3.99
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	28
Local shear failure	19



Bearing Capacity as per IS 6403:1981 (AP-29) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	20	20	20	20
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.68	1.84	1.56	1.42
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.84	1.42	1.28	1.21
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.84	1.42	1.28	1.21
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	53.42	41.22	37.16	35.13
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	3.17	4.89	6.61	8.34
NBC	56.59	46.11	43.77	43.47
SBC	18.86	15.37	14.59	14.49
Recommended SBC for sattlement of 40mm	18.86	15.37	14.59	14.49
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	13	15	15.5	16
Settlement (S)	24.52	23.06	22.61	23.18
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	6.16	5.02	4.76	4.73
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	28
Local shear failure	19



Bearing Capacity as per IS 6403:1981 (AP-29) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	20	20	20	20
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.96	1.98	1.65	1.49
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.98	1.49	1.33	1.25
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.98	1.49	1.33	1.25
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	67.06	50.46	45.05	42.34
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	3.41	5.13	6.87	8.61
NBC	70.47	55.59	51.92	50.95
SBC	23.49	18.53	17.31	16.98
Recommended SBC for sattlement of 40mm	23.49	18.53	17.31	16.98
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	13	15	15.5	16
Settlement (S)	30.54	27.8	26.83	27.17
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	7.67	6.05	5.65	5.54
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	28
Local shear failure	19



SBC & Settlement Summary of AP-29								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	20.05	23.39	8.91	10.57	44.06	56.59	70.47
SBC	1 x 1	6.68	7.8	2.97	3.52	14.69	18.86	23.49
BC for sattlement of 40mm	1 x 1	6.68	7.8	2.97	3.52	14.69	18.86	23.49
Settlement (S)	1 x 1	5.89	6.88	14.26	16.9	19.1	24.52	30.54
NBC	2 x 2	18.38	20.05	8.41	11.36	37.31	46.11	55.59
SBC	2 x 2	6.13	6.68	2.8	3.79	12.44	15.37	18.53
BC for sattlement of 40mm	2 x 2	6.13	6.68	2.80	3.79	12.44	15.37	18.53
Settlement (S)	2 x 2	10.81	11.78	15.68	21.22	18.66	23.06	27.8
NBC	3 x 3	17.87	18.88	8.67	11.25	36.12	43.77	51.92
SBC	3 x 3	5.96	6.29	2.89	3.75	12.04	14.59	17.31
BC for sattlement of 40mm	3 x 3	5.96	6.29	2.89	3.75	12.04	14.59	17.31
Settlement (S)	3 x 3	15.76	16.64	17.92	23.25	18.66	22.61	26.83
NBC	4 x 4	17.54	18.38	9.12	11.56	36.68	43.47	50.95
SBC	4 x 4	5.85	6.13	3.04	3.85	12.23	14.49	16.98
BC for sattlement of 40mm	4 x 4	5.85	6.13	3.04	3.85	12.23	14.49	16.98
Settlement (S)	4 x 4	20.63	21.62	21.28	26.95	19.57	23.18	27.17



Bearing Capacity as per IS 6403:1981 (AP-47) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	10	10	10	10
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Ny	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	1.25	1.13	1.08	1.06
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.13	1.06	1.04	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.13	1.06	1.04	1.03
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	2.57	2.41	2.37	2.35
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.82	1.54	2.26	2.99
NBC	3.39	3.95	4.63	5.34
SBC	1.13	1.32	1.54	1.78
Recommended SBC for sattlement of 40mm	1.13	1.32	1.54	1.78
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	30	32	37	39
Settlement (S)	3.39	4.22	5.7	6.94
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.37	0.43	0.50	0.58
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	19
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (AP-47) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	10	10	10	10
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Ny	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	1.5	1.25	1.17	1.13
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.25	1.13	1.08	1.06
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.25	1.13	1.08	1.06
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	5.74	5.15	4.92	4.83
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma.W'$	0.91	1.64	2.35	3.07
NBC	6.65	6.79	7.27	7.9
SBC	2.22	2.26	2.42	2.63
Recommended SBC for sattlement of 40mm	2.22	2.26	2.42	2.63
For Settlement				
of IS 8009 (Part-I) 1976	30	32	37	39
Settlement (S)	6.66	7.23	8.95	10.26
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.72	0.74	0.79	0.86
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	19
Local shear failure	13



Bearing Capacity as per IS 6403:1981	(AP-47) (Depth =3m)			
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	1.81	1.41	1.27	1.2
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.41	1.2	1.14	1.1
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.41	1.2	1.14	1.1
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	16.46	14.01	13.31	12.84
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.85	3.15	4.49	5.78
NBC	18.31	17.16	17.8	18.62
SBC	6.1	5.72	5.93	6.21
Recommended SBC for sattlement of 40mm	6.10	5.72	5.93	6.21
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	8.54	9.04	9.73	10.68
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.99	1.87	1.94	2.03
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-47) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.08	1.54	1.36	1.27
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.54	1.27	1.18	1.14
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.54	1.27	1.18	1.14
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	21.01	19.76	18.36	17.74
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma.W'$	2.02	3.34	4.65	5.99
NBC	23.03	23.1	23.01	23.73
SBC	7.68	7.7	7.67	7.91
Recommended SBC for sattlement of 40mm	7.68	7.70	7.67	7.91
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	10.75	12.17	12.58	13.61
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.51	2.51	2.50	2.58
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981	(AP-47) (Depth =5m)			
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Nγ	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.35	1.68	1.45	1.34
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.68	1.34	1.23	1.17
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.68	1.34	1.23	1.17
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	32.68	26.07	23.93	22.76
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.21	3.52	4.85	6.15
NBC	34.89	29.59	28.78	28.91
SBC	11.63	9.86	9.59	9.64
Recommended SBC for sattlement of 40mm	11.63	9.86	9.59	9.64
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	16.28	15.58	15.73	16.58
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.80	3.22	3.13	3.15
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-47) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.62	1.81	1.54	1.41
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.81	1.41	1.27	1.2
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.81	1.41	1.27	1.2
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	42.25	32.91	29.65	28.01
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.38	3.7	5	6.3
NBC	44.63	36.61	34.65	34.31
SBC	14.88	12.2	11.55	11.44
Recommended SBC for sattlement of 40mm	14.88	12.20	11.55	11.44
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	20.83	19.28	18.94	19.68
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.86	3.98	3.77	3.74
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-47) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.89	1.95	1.63	1.47
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.95	1.47	1.32	1.24
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.95	1.47	1.32	1.24
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	53.11	40.03	35.95	33.77
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.56	3.86	5.2	6.51
NBC	55.67	43.89	41.15	40.28
SBC	18.56	14.63	13.72	13.43
Recommended SBC for sattlement of 40mm	18.56	14.63	13.72	13.43
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	25.98	23.12	22.5	23.1
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	6.06	4.78	4.48	4.39
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17

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SBC & Settlement Summary of AP-47								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	3.39	6.65	18.31	23.03	34.89	44.63	55.67
SBC	1 x 1	1.13	2.22	6.1	7.68	11.63	14.88	18.56
BC for sattlement of 40mm	1 x 1	1.13	2.22	6.10	7.68	11.63	14.88	18.56
Settlement (S)	1 x 1	3.39	6.66	8.54	10.75	16.28	20.83	25.98
NBC	2 x 2	3.95	6.79	17.16	23.1	29.59	36.61	43.89
SBC	2 x 2	1.32	2.26	5.72	7.7	9.86	12.2	14.63
BC for sattlement of 40mm	2 x 2	1.32	2.26	5.72	7.70	9.86	12.20	14.63
Settlement (S)	2 x 2	4.22	7.23	9.04	12.17	15.58	19.28	23.12
NBC	3 x 3	4.63	7.27	17.8	23.01	28.78	34.65	41.15
SBC	3 x 3	1.54	2.42	5.93	7.67	9.59	11.55	13.72
BC for sattlement of 40mm	3 x 3	1.54	2.42	5.93	7.67	9.59	11.55	13.72
Settlement (S)	3 x 3	5.7	8.95	9.73	12.58	15.73	18.94	22.5
NBC	4 x 4	5.34	7.9	18.62	23.73	28.91	34.31	40.28
SBC	4 x 4	1.78	2.63	6.21	7.91	9.64	11.44	13.43
BC for sattlement of 40mm	4 x 4	1.78	2.63	6.21	7.91	9.64	11.44	13.43
Settlement (S)	4 x 4	6.94	10.26	10.68	13.61	16.58	19.68	23.1



Bearing Capacity as per IS 6403:1981 (AP-52) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	11	11	11	11
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	5	5	5	5
Nc	8.5	8.5	8.5	8.5
Nq	2.71	2.71	2.71	2.71
Ny	1.44	1.44	1.44	1.44
Sc	1.3	1.3	1.3	1.3
Dc	1.24	1.12	1.08	1.06
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.12	1.06	1.04	1.03
Sγ	0.8	0.8	0.8	0.8
Dq=Dy	1.12	1.06	1.04	1.03
Tan(45+Ø /2)	1.21	1.21	1.21	1.21
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c..i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	1.91	1.81	1.77	1.75
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.59	1.12	1.64	2.17
NBC	2.5	2.93	3.41	3.92
SBC	0.83	0.98	1.14	1.31
Recommended SBC for sattlement of 40mm	0.83	0.98	1.14	1.31
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	90	120	130	140
Settlement (S)	7.47	11.76	14.82	18.34
ΔP = {SBC x Footing Size}/(width of Foundation +Layer Depth}^2 =	0.27	0.32	0.37	0.43
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	16
Local shear failure	11



Bearing Capacity as per IS 6403:1981	(AP-52) (Depth =2m)			
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	11	11	11	11
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	5	5	5	5
Nc	8.5	8.5	8.5	8.5
Nq	2.71	2.71	2.71	2.71
Ny	1.44	1.44	1.44	1.44
Sc	1.3	1.3	1.3	1.3
Dc	1.48	1.24	1.16	1.12
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.24	1.12	1.08	1.06
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.24	1.12	1.08	1.06
Tan(45+Ø /2)	1.21	1.21	1.21	1.21
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	4.12	3.82	3.68	3.61
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.65	1.18	1.71	2.23
NBC	4.77	5	5.39	5.84
SBC	1.59	1.67	1.8	1.95
Recommended SBC for sattlement of 40mm	1.59	1.67	1.80	1.95
For Settlement				
of IS 8009 (Part-I) 1976	90	120	130	140
Settlement (S)	14.31	20.04	23.4	27.3
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.52	0.55	0.59	0.64
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	16
Local shear failure	11



Bearing Capacity as per IS 6403:1981	(AP-52) (Depth =3m)			
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	6	6	6	6
m_v	0	0	0	0
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Ny	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.74	1.37	1.25	1.18
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.37	1.18	1.12	1.09
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.37	1.18	1.12	1.09
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	8.16	7.03	6.67	6.49
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.85	1.47	2.09	2.71
NBC	9.01	8.5	8.76	9.2
SBC	3	2.83	2.92	3.07
Recommended SBC for sattlement of 40mm	3.00	2.83	2.92	3.07
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	49	67	78	88
Settlement (S)	14.7	18.96	22.78	27.02
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.98	0.92	0.95	1.00
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12

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Bearing Capacity as per IS 6403:1981 (AP-52) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (y)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	6	6	6	6
m_v	0	0	0	0
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Ny	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.98	1.49	1.33	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.49	1.25	1.16	1.12
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.49	1.25	1.16	1.12
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	9.77	9.93	9.21	8.9
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.93	1.55	2.16	2.79
NBC	10.7	11.48	11.37	11.69
SBC	3.57	3.83	3.79	3.9
Recommended SBC for sattlement of 40mm	3.57	3.83	3.79	3.90
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	49	67	78	88
Settlement (S)	17.49	25.66	29.56	34.32
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.17	1.25	1.24	1.27
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981	(AP-52) (Depth =5m)			
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	16	16	16	16
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	16	16	16	16
Nc	11.63	11.63	11.63	11.63
Nq	4.34	4.34	4.34	4.34
Ny	3.06	3.06	3.06	3.06
Sc	1.3	1.3	1.3	1.3
Dc	2.33	1.67	1.44	1.33
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.67	1.33	1.22	1.17
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.67	1.33	1.22	1.17
Tan(45+Ø /2)	1.33	1.33	1.33	1.33
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	28.78	22.92	21.03	20.16
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.9	3.03	4.17	5.33
NBC	30.68	25.95	25.2	25.49
SBC	10.23	8.65	8.4	8.5
Recommended SBC for sattlement of 40mm	10.23	8.65	8.40	8.50
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	16.5	18.2	19.1	20.8
Settlement (S)	16.88	15.74	16.04	17.68
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.34	2.82	2.74	2.78
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	24
Local shear failure	16



Bearing Capacity as per IS 6403:1981	(AP-52) (Depth =6m)			
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	16	16	16	16
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	16	16	16	16
Nc	11.63	11.63	11.63	11.63
Nq	4.34	4.34	4.34	4.34
Ny	3.06	3.06	3.06	3.06
Sc	1.3	1.3	1.3	1.3
Dc	2.6	1.8	1.53	1.4
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.8	1.4	1.27	1.2
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.8	1.4	1.27	1.2
Tan(45+Ø /2)	1.33	1.33	1.33	1.33
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	37.23	28.95	26.27	24.82
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.05	3.19	4.34	5.46
NBC	39.28	32.14	30.61	30.28
SBC	13.09	10.71	10.2	10.09
Recommended SBC for sattlement of 40mm	13.09	10.71	10.20	10.09
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	16.5	18.2	19.1	20.8
Settlement (S)	21.6	19.49	19.48	20.99
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.27	3.50	3.33	3.29
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	24
Local shear failure	16



Bearing Capacity as per IS 6403:1981 (AP-52) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	16	16	16	16
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	16	16	16	16
Nc	11.63	11.63	11.63	11.63
Nq	4.34	4.34	4.34	4.34
Ny	3.06	3.06	3.06	3.06
Sc	1.3	1.3	1.3	1.3
Dc	2.86	1.93	1.62	1.47
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.93	1.47	1.31	1.23
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.93	1.47	1.31	1.23
Tan(45+Ø /2)	1.33	1.33	1.33	1.33
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma' D.(Nq-1).s_q.d_q.i_q$	46.57	35.47	31.61	29.68
$0.5.\ \gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma\ W'$	2.2	3.35	4.47	5.6
NBC	48.77	38.82	36.08	35.28
SBC	16.26	12.94	12.03	11.76
Recommended SBC for sattlement of 40mm	16.26	12.94	12.03	11.76
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	16.5	18.2	19.1	20.8
Settlement (S)	26.83	23.55	22.98	24.46
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	5.31	4.23	3.93	3.84
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	24
Local shear failure	16



SBC & Settlement Summary of AP-52								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	2.5	4.77	9.01	10.7	30.68	39.28	48.77
SBC	1 x 1	0.83	1.59	3	3.57	10.23	13.09	16.26
BC for sattlement of 40mm	1 x 1	0.83	1.59	3.00	3.57	10.23	13.09	16.26
Settlement (S)	1 x 1	7.47	14.31	14.7	17.49	16.88	21.6	26.83
NBC	2 x 2	2.93	5	8.5	11.48	25.95	32.14	38.82
SBC	2 x 2	0.98	1.67	2.83	3.83	8.65	10.71	12.94
BC for sattlement of 40mm	2 x 2	0.98	1.67	2.83	3.83	8.65	10.71	12.94
Settlement (S)	2 x 2	11.76	20.04	18.96	25.66	15.74	19.49	23.55
NBC	3 x 3	3.41	5.39	8.76	11.37	25.2	30.61	36.08
SBC	3 x 3	1.14	1.8	2.92	3.79	8.4	10.2	12.03
BC for sattlement of 40mm	3 x 3	1.14	1.80	2.92	3.79	8.40	10.20	12.03
Settlement (S)	3 x 3	14.82	23.4	22.78	29.56	16.04	19.48	22.98
NBC	4 x 4	3.92	5.84	9.2	11.69	25.49	30.28	35.28
SBC	4 x 4	1.31	1.95	3.07	3.9	8.5	10.09	11.76
BC for sattlement of 40mm	4 x 4	1.31	1.95	3.07	3.90	8.50	10.09	11.76
Settlement (S)	4 x 4	18.34	27.3	27.02	34.32	17.68	20.99	24.46



Bearing Capacity as per IS 6403:1981 (AP-66) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (y)	1.82	1.82	1.82	1.82
C	0	0	0	0
Ø	11	11	11	11
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	8	8	8	8
Nc	8.5	8.5	8.5	8.5
Nq	2.71	2.71	2.71	2.71
Ny	1.44	1.44	1.44	1.44
Sc	1.3	1.3	1.3	1.3
Dc	1.24	1.12	1.08	1.06
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.12	1.06	1.04	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.12	1.06	1.04	1.03
Tan(45+Ø /2)	1.21	1.21	1.21	1.21
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.82	0.82	0.82	0.82
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	1.88	1.78	1.75	1.73
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.59	1.11	1.64	2.16
NBC	2.47	2.89	3.39	3.89
SBC	0.82	0.96	1.13	1.3
Recommended SBC for sattlement of 40mm	0.82	0.96	1.13	1.30
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	48	56	62	70
Settlement (S)	3.94	5.38	7.01	9.1
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.27	0.31	0.37	0.42
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	17
Local shear failure	11



Bearing Capacity as per IS 6403:1981 (AP-66) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (y)	1.82	1.82	1.82	1.82
C	0	0	0	0
Ø	11	11	11	11
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	8	8	8	8
Nc	8.5	8.5	8.5	8.5
Nq	2.71	2.71	2.71	2.71
Ny	1.44	1.44	1.44	1.44
Sc	1.3	1.3	1.3	1.3
Dc	1.48	1.24	1.16	1.12
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.24	1.12	1.08	1.06
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.24	1.12	1.08	1.06
Tan(45+Ø /2)	1.21	1.21	1.21	1.21
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.82	0.82	0.82	0.82
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	4.07	3.77	3.63	3.57
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.65	1.17	1.7	2.22
NBC	4.72	4.94	5.33	5.79
SBC	1.57	1.65	1.78	1.93
Recommended SBC for sattlement of 40mm	1.57	1.65	1.78	1.93
For Settlement				
of IS 8009 (Part-I) 1976	48	56	62	70
Settlement (S)	7.54	9.24	11.04	13.51
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.51	0.54	0.58	0.63
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	17
Local shear failure	11



Bearing Capacity as per IS 6403:1981 (AP-66) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (y)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	1.81	1.41	1.27	1.2
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.41	1.2	1.14	1.1
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.41	1.2	1.14	1.1
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	16.07	13.68	13	12.54
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.83	3.12	4.44	5.72
NBC	17.9	16.8	17.44	18.26
SBC	5.97	5.6	5.81	6.09
Recommended SBC for sattlement of 40mm	5.97	5.60	5.81	6.09
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	8.36	8.85	9.53	10.47
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.95	1.83	1.90	1.99
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-66) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.08	1.54	1.36	1.27
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.54	1.27	1.18	1.14
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.54	1.27	1.18	1.14
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	20.52	19.3	17.94	17.33
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2	3.3	4.6	5.92
NBC	22.52	22.6	22.54	23.25
SBC	7.51	7.53	7.51	7.75
Recommended SBC for sattlement of 40mm	7.51	7.53	7.51	7.75
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	10.51	11.9	12.32	13.33
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.45	2.46	2.45	2.53
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981	(AP-66) (Depth =5m)			
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (y)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.35	1.68	1.45	1.34
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.68	1.34	1.23	1.17
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.68	1.34	1.23	1.17
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	31.92	25.46	23.37	22.23
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.18	3.48	4.79	6.08
NBC	34.1	28.94	28.16	28.31
SBC	11.37	9.65	9.39	9.44
Recommended SBC for sattlement of 40mm	11.37	9.65	9.39	9.44
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	15.92	15.25	15.4	16.24
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.71	3.15	3.07	3.08
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-66) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Ny	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	3.12	2.06	1.71	1.53
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	2.06	1.53	1.35	1.27
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	2.06	1.53	1.35	1.27
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	250.39	185.97	164.09	154.37
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	19.92	29.58	39.16	49.11
NBC	270.31	215.55	203.25	203.48
SBC	90.1	71.85	67.75	67.83
Recommended SBC for sattlement of 40mm	57.14	45.45	39.21	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	63.07	63.23	69.11	73.93
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	29.42	23.46	22.12	22.15
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



Bearing Capacity as per IS 6403:1981 (AP-66) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Ny	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	3.48	2.24	1.83	1.62
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	2.24	1.62	1.41	1.31
Sy	0.8	0.8	0.8	0.8
Dq=Dy	2.24	1.62	1.41	1.31
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	317.65	229.73	199.95	185.77
$0.5.\ \gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma.W'$	21.66	31.33	40.9	50.66
NBC	339.31	261.06	240.85	236.43
SBC	113.1	87.02	80.28	78.81
Recommended SBC for sattlement of 40mm	57.14	45.45	39.21	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	79.17	76.58	81.89	85.9
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	36.93	28.41	26.21	25.73
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



SBC & Settlement Summary of AP-66								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	2.47	4.72	17.9	22.52	34.1	270.31	339.31
SBC	1 x 1	0.82	1.57	5.97	7.51	11.37	90.1	113.1
BC for sattlement of 40mm	1 x 1	0.82	1.57	5.97	7.51	11.37	57.14	57.14
Settlement (S)	1 x 1	3.94	7.54	8.36	10.51	15.92	63.07	79.17
NBC	2 x 2	2.89	4.94	16.8	22.6	28.94	215.55	261.06
SBC	2 x 2	0.96	1.65	5.6	7.53	9.65	71.85	87.02
BC for sattlement of 40mm	2 x 2	0.96	1.65	5.60	7.53	9.65	45.45	45.45
Settlement (S)	2 x 2	5.38	9.24	8.85	11.9	15.25	63.23	76.58
NBC	3 x 3	3.39	5.33	17.44	22.54	28.16	203.25	240.85
SBC	3 x 3	1.13	1.78	5.81	7.51	9.39	67.75	80.28
BC for sattlement of 40mm	3 x 3	1.13	1.78	5.81	7.51	9.39	39.21	39.21
Settlement (S)	3 x 3	7.01	11.04	9.53	12.32	15.4	69.11	81.89
NBC	4 x 4	3.89	5.79	18.26	23.25	28.31	203.48	236.43
SBC	4 x 4	1.3	1.93	6.09	7.75	9.44	67.83	78.81
BC for sattlement of 40mm	4 x 4	1.30	1.93	6.09	7.75	9.44	36.70	36.70
Settlement (S)	4 x 4	9.1	13.51	10.47	13.33	16.24	73.93	85.9



Bearing Capacity as per IS 6403:1981 (AP-73) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.87	1.87	1.87	1.87
C	2.4	2.4	2.4	2.4
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0016	0.0016	0.0016	0.0016
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.1	1.05	1.03	1.03
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.87	0.87	0.87	0.87
$C.N_c.s_c.d_c.i_c$	19.24	17.64	17.16	16.84
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	19.24	17.64	17.16	16.84
SBC	6.41	5.88	5.72	5.61
Recommended SBC for sattlement of 40mm	6.41	5.88	5.72	5.61
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.02	9.22	13.45	17.59
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.09	1.92	1.87	1.83
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

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Bearing Capacity as per IS 6403:1981 (AP-73) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.87	1.87	1.87	1.87
C	2.4	2.4	2.4	2.4
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0016	0.0016	0.0016	0.0016
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.87	0.87	0.87	0.87
$C.N_c.s_c.d_c.i_c$	22.45	19.24	18.12	17.64
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	22.45	19.24	18.12	17.64
SBC	7.48	6.41	6.04	5.88
Recommended SBC for sattlement of 40mm	7.48	6.41	6.04	5.88
For Settlement				
of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.86	10.05	14.2	18.43
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.44	2.09	1.97	1.92
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-73) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Nγ	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	1.81	1.41	1.27	1.2
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.41	1.2	1.14	1.1
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.41	1.2	1.14	1.1
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	16.07	13.68	13	12.54
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.83	3.12	4.44	5.72
NBC	17.9	16.8	17.44	18.26
SBC	5.97	5.6	5.81	6.09
Recommended SBC for sattlement of 40mm	5.97	5.60	5.81	6.09
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	8.36	8.85	9.53	10.47
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.95	1.83	1.90	1.99
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-73) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (y)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.08	1.54	1.36	1.27
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.54	1.27	1.18	1.14
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.54	1.27	1.18	1.14
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	20.52	19.3	17.94	17.33
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2	3.3	4.6	5.92
NBC	22.52	22.6	22.54	23.25
SBC	7.51	7.53	7.51	7.75
Recommended SBC for sattlement of 40mm	7.51	7.53	7.51	7.75
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	10.51	11.9	12.32	13.33
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.45	2.46	2.45	2.53
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-73) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.35	1.68	1.45	1.34
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.68	1.34	1.23	1.17
Sγ	0.8	0.8	0.8	0.8
Dq=Dy	1.68	1.34	1.23	1.17
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, Iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	31.92	25.46	23.37	22.23
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.18	3.48	4.79	6.08
NBC	34.1	28.94	28.16	28.31
SBC	11.37	9.65	9.39	9.44
Recommended SBC for sattlement of 40mm	11.37	9.65	9.39	9.44
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	15.92	15.25	15.4	16.24
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.71	3.15	3.07	3.08
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-73) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.62	1.81	1.54	1.41
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.81	1.41	1.27	1.2
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.81	1.41	1.27	1.2
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	41.27	32.15	28.96	27.36
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.35	3.66	4.95	6.24
NBC	43.62	35.81	33.91	33.6
SBC	14.54	11.94	11.3	11.2
Recommended SBC for sattlement of 40mm	14.54	11.94	11.30	11.20
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	20.36	18.87	18.53	19.26
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.75	3.90	3.69	3.66
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-73) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.89	1.95	1.63	1.47
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.95	1.47	1.32	1.24
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.95	1.47	1.32	1.24
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	51.87	39.1	35.11	32.99
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma.W'$	2.53	3.82	5.14	6.44
NBC	54.4	42.92	40.25	39.43
SBC	18.13	14.31	13.42	13.14
Recommended SBC for sattlement of 40mm	18.13	14.31	13.42	13.14
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	25.38	22.61	22.01	22.6
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	5.92	4.67	4.38	4.29
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



SBC & Settlement Summary of AP-73								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	19.24	22.45	17.9	22.52	34.1	43.62	54.4
SBC	1 x 1	6.41	7.48	5.97	7.51	11.37	14.54	18.13
BC for sattlement of 40mm	1 x 1	6.41	7.48	5.97	7.51	11.37	14.54	18.13
Settlement (S)	1 x 1	5.02	5.86	8.36	10.51	15.92	20.36	25.38
NBC	2 x 2	17.64	19.24	16.8	22.6	28.94	35.81	42.92
SBC	2 x 2	5.88	6.41	5.6	7.53	9.65	11.94	14.31
BC for sattlement of 40mm	2 x 2	5.88	6.41	5.60	7.53	9.65	11.94	14.31
Settlement (S)	2 x 2	9.22	10.05	8.85	11.9	15.25	18.87	22.61
NBC	3 x 3	17.16	18.12	17.44	22.54	28.16	33.91	40.25
SBC	3 x 3	5.72	6.04	5.81	7.51	9.39	11.3	13.42
BC for sattlement of 40mm	3 x 3	5.72	6.04	5.81	7.51	9.39	11.30	13.42
Settlement (S)	3 x 3	13.45	14.2	9.53	12.32	15.4	18.53	22.01
NBC	4 x 4	16.84	17.64	18.26	23.25	28.31	33.6	39.43
SBC	4 x 4	5.61	5.88	6.09	7.75	9.44	11.2	13.14
BC for sattlement of 40mm	4 x 4	5.61	5.88	6.09	7.75	9.44	11.20	13.14
Settlement (S)	4 x 4	17.59	18.43	10.47	13.33	16.24	19.26	22.6



Bearing Capacity as per IS 6403:1981 (AP-109) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	9	9	9	9
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Nγ	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.25	1.12	1.08	1.06
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.12	1.06	1.04	1.03
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.12	1.06	1.04	1.03
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	2.2	2.08	2.04	2.02
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.69	1.31	1.93	2.55
NBC	2.89	3.39	3.97	4.57
SBC	0.96	1.13	1.32	1.52
Recommended SBC for sattlement of 40mm	0.96	1.13	1.32	1.52
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	33	46	53	59
Settlement (S)	3.17	5.2	7	8.97
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.31	0.37	0.43	0.50
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981	(AP-109) (Depth =2m)			
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (y)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	9	9	9	9
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Ny	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.49	1.25	1.16	1.12
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.25	1.12	1.08	1.06
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.25	1.12	1.08	1.06
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	4.83	4.4	4.24	4.16
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.77	1.39	2	2.62
NBC	5.6	5.79	6.24	6.78
SBC	1.87	1.93	2.08	2.26
Recommended SBC for sattlement of 40mm	1.87	1.93	2.08	2.26
For Settlement				
of IS 8009 (Part-I) 1976	33	46	53	59
Settlement (S)	6.17	8.88	11.02	13.33
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.61	0.63	0.68	0.74
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981 (AP-109) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	15	15	15	15
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	15	15	15	15
m_v	0	0	0	0
Nc	10.98	10.98	10.98	10.98
Nq	3.94	3.94	3.94	3.94
Ny	2.65	2.65	2.65	2.65
Sc	1.3	1.3	1.3	1.3
Dc	1.78	1.39	1.26	1.2
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.39	1.2	1.13	1.1
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.39	1.2	1.13	1.1
Tan(45+Ø /2)	1.3	1.3	1.3	1.3
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	12.5	10.8	10.17	9.9
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.36	2.35	3.32	4.31
NBC	13.86	13.15	13.49	14.21
SBC	4.62	4.38	4.5	4.74
Recommended SBC for sattlement of 40mm	4.62	4.38	4.50	4.74
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	17.3	19	20	22
Settlement (S)	7.99	8.32	9	10.43
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.51	1.43	1.47	1.55
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	23
Local shear failure	15



Bearing Capacity as per IS 6403:1981 (AP-109) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	15	15	15	15
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	15	15	15	15
m_v	0	0	0	0
Nc	10.98	10.98	10.98	10.98
Nq	3.94	3.94	3.94	3.94
Ny	2.65	2.65	2.65	2.65
Sc	1.3	1.3	1.3	1.3
Dc	2.04	1.52	1.35	1.26
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.52	1.26	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.52	1.26	1.17	1.13
Tan(45+Ø /2)	1.3	1.3	1.3	1.3
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	15.59	15.11	14.03	13.55
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.49	2.47	3.44	4.43
NBC	17.08	17.58	17.47	17.98
SBC	5.69	5.86	5.82	5.99
Recommended SBC for sattlement of 40mm	5.69	5.86	5.82	5.99
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	17.3	19	20	22
Settlement (S)	9.84	11.13	11.64	13.18
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.86	1.91	1.90	1.96
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	23
Local shear failure	15



Bearing Capacity as per IS 6403:1981	(AP-109) (Depth =5m)			
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	15	15	15	15
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	15	15	15	15
Nc	10.98	10.98	10.98	10.98
Nq	3.94	3.94	3.94	3.94
Ny	2.65	2.65	2.65	2.65
Sc	1.3	1.3	1.3	1.3
Dc	2.3	1.65	1.43	1.33
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.65	1.33	1.22	1.16
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.65	1.33	1.22	1.16
Tan(45+Ø /2)	1.3	1.3	1.3	1.3
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	24.74	19.94	18.29	17.39
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.62	2.61	3.59	4.55
NBC	26.36	22.55	21.88	21.94
SBC	8.79	7.52	7.29	7.31
Recommended SBC for sattlement of 40mm	8.79	7.52	7.29	7.31
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	17.3	19	20	22
Settlement (S)	15.21	14.29	14.58	16.08
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.87	2.46	2.38	2.39
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	23
Local shear failure	15

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Bearing Capacity as per IS 6403:1981	(AP-109) (Depth =6m)			
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	15	15	15	15
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	15	15	15	15
Nc	10.98	10.98	10.98	10.98
Nq	3.94	3.94	3.94	3.94
Ny	2.65	2.65	2.65	2.65
Sc	1.3	1.3	1.3	1.3
Dc	2.56	1.78	1.52	1.39
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.78	1.39	1.26	1.2
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.78	1.39	1.26	1.2
Tan(45+Ø /2)	1.3	1.3	1.3	1.3
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	32.03	25.01	22.67	21.59
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.75	2.73	3.71	4.71
NBC	33.78	27.74	26.38	26.3
SBC	11.26	9.25	8.79	8.77
Recommended SBC for sattlement of 40mm	11.26	9.25	8.79	8.77
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	17.3	19	20	22
Settlement (S)	19.48	17.58	17.58	19.29
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.68	3.02	2.87	2.86
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	23
Local shear failure	15



Bearing Capacity as per IS 6403:1981 (AP-109) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	24	24	24	24
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	3.42	2.21	1.81	1.61
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	2.21	1.61	1.4	1.3
Sy	0.8	0.8	0.8	0.8
Dq=Dy	2.21	1.61	1.4	1.3
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
i_c, i_q & i_γ	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	277.79	202.37	175.98	163.41
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	18.42	26.83	35	43.33
NBC	296.21	229.2	210.98	206.74
SBC	98.74	76.4	70.33	68.91
Recommended SBC for sattlement of 40mm	40.00	36.36	31.50	29.41
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	10	11	12.7	13.6
Settlement (S)	98.74	84.04	89.32	93.72
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	32.24	24.95	22.96	22.50
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30



SBC & Settlement Summary of AP-109								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	2.89	5.6	13.86	17.08	26.36	33.78	296.21
SBC	1 x 1	0.96	1.87	4.62	5.69	8.79	11.26	98.74
BC for sattlement of 40mm	1 x 1	0.96	1.87	4.62	5.69	8.79	11.26	40.00
Settlement (S)	1 x 1	3.17	6.17	7.99	9.84	15.21	19.48	98.74
NBC	2 x 2	3.39	5.79	13.15	17.58	22.55	27.74	229.2
SBC	2 x 2	1.13	1.93	4.38	5.86	7.52	9.25	76.4
BC for sattlement of 40mm	2 x 2	1.13	1.93	4.38	5.86	7.52	9.25	36.36
Settlement (S)	2 x 2	5.2	8.88	8.32	11.13	14.29	17.58	84.04
NBC	3 x 3	3.97	6.24	13.49	17.47	21.88	26.38	210.98
SBC	3 x 3	1.32	2.08	4.5	5.82	7.29	8.79	70.33
BC for sattlement of 40mm	3 x 3	1.32	2.08	4.50	5.82	7.29	8.79	31.50
Settlement (S)	3 x 3	7	11.02	9	11.64	14.58	17.58	89.32
NBC	4 x 4	4.57	6.78	14.21	17.98	21.94	26.3	206.74
SBC	4 x 4	1.52	2.26	4.74	5.99	7.31	8.77	68.91
BC for sattlement of 40mm	4 x 4	1.52	2.26	4.74	5.99	7.31	8.77	29.41
Settlement (S)	4 x 4	8.97	13.33	10.43	13.18	16.08	19.29	93.72



Bearing Capacity as per IS 6403:1981 (AP-120) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (y)	1.88	1.88	1.88	1.88
C	2.4	2.4	2.4	2.4
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0017	0.0017	0.0017	0.0017
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	19.24	17.64	17.16	16.84
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	19.24	17.64	17.16	16.84
SBC	6.41	5.88	5.72	5.61
Recommended SBC for sattlement of 40mm	6.41	5.88	5.72	5.61
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	33	46	53	59
Settlement (S)	5.34	9.79	14.29	18.68
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.09	1.92	1.87	1.83
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-120) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.88	1.88	1.88	1.88
C	2.4	2.4	2.4	2.4
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0017	0.0017	0.0017	0.0017
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	22.45	19.24	18.12	17.64
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	22.45	19.24	18.12	17.64
SBC	7.48	6.41	6.04	5.88
Recommended SBC for sattlement of 40mm	7.48	6.41	6.04	5.88
For Settlement				
of IS 8009 (Part-I) 1976	33	46	53	59
Settlement (S)	6.23	10.67	15.09	19.58
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.44	2.09	1.97	1.92
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-120) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (y)	1.88	1.88	1.88	1.88
C	2.4	2.4	2.4	2.4
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0017	0.0017	0.0017	0.0017
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.6	1.3	1.2	1.15
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.3	1.15	1.1	1.08
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	25.66	20.85	19.24	18.44
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	25.66	20.85	19.24	18.44
SBC	8.55	6.95	6.41	6.15
Recommended SBC for sattlement of 40mm	8.55	6.95	6.41	6.15
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	17.3	19	20	22
Settlement (S)	7.12	11.57	16.01	20.48
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.79	2.27	2.09	2.01
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-120) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	15	15	15	15
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	16	16	16	16
m_v	0	0	0	0
Nc	10.98	10.98	10.98	10.98
Nq	3.94	3.94	3.94	3.94
Ny	2.65	2.65	2.65	2.65
Sc	1.3	1.3	1.3	1.3
Dc	2.04	1.52	1.35	1.26
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.52	1.26	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.52	1.26	1.17	1.13
Tan(45+Ø /2)	1.3	1.3	1.3	1.3
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	15.23	14.76	13.7	13.24
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.47	2.44	3.4	4.38
NBC	16.7	17.2	17.1	17.62
SBC	5.57	5.73	5.7	5.87
Recommended SBC for sattlement of 40mm	5.57	5.73	5.70	5.87
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	16.5	18.2	19.1	20.8
Settlement (S)	9.19	10.43	10.89	12.21
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.82	1.87	1.86	1.92
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	22
Local shear failure	15



Bearing Capacity as per IS 6403:1981 (AP-120) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	22	22	22	22
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.4	1.7	1.47	1.35
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.7	1.35	1.23	1.18
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.7	1.35	1.23	1.18
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	42.11	33.44	30.46	29.23
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.96	4.7	6.42	8.22
NBC	45.07	38.14	36.88	37.45
SBC	15.02	12.71	12.29	12.48
Recommended SBC for sattlement of 40mm	15.02	12.71	12.29	12.48
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	11.2	13	14.1	14.8
Settlement (S)	16.82	16.52	17.33	18.47
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.90	4.15	4.01	4.08
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	29
Local shear failure	19



Bearing Capacity as per IS 6403:1981 (AP-120) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	22	22	22	22
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.68	1.84	1.56	1.42
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.84	1.42	1.28	1.21
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.84	1.42	1.28	1.21
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	54.69	42.2	38.04	35.96
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	3.2	4.94	6.69	8.43
NBC	57.89	47.14	44.73	44.39
SBC	19.3	15.71	14.91	14.8
Recommended SBC for sattlement of 40mm	19.30	15.71	14.91	14.80
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	11.2	13	14.1	14.8
Settlement (S)	21.62	20.42	21.02	21.9
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	6.30	5.13	4.87	4.83
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	29
Local shear failure	19



Bearing Capacity as per IS 6403:1981 (AP-120) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	22	22	22	22
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.96	1.98	1.65	1.49
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.98	1.49	1.33	1.25
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.98	1.49	1.33	1.25
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	68.66	51.67	46.12	43.34
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	3.45	5.19	6.95	8.7
NBC	72.11	56.86	53.07	52.04
SBC	24.04	18.95	17.69	17.35
Recommended SBC for sattlement of 40mm	24.04	18.95	17.69	17.35
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	11.2	13	14.1	14.8
Settlement (S)	26.92	24.64	24.94	25.68
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	7.85	6.19	5.78	5.67
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	29
Local shear failure	19



SBC & Settlement Summary of AP-120								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	19.24	22.45	25.66	16.7	45.07	57.89	72.11
SBC	1 x 1	6.41	7.48	8.55	5.57	15.02	19.3	24.04
BC for sattlement of 40mm	1 x 1	6.41	7.48	8.55	5.57	15.02	19.30	24.04
Settlement (S)	1 x 1	5.34	6.23	7.12	9.19	16.82	21.62	26.92
NBC	2 x 2	17.64	19.24	20.85	17.2	38.14	47.14	56.86
SBC	2 x 2	5.88	6.41	6.95	5.73	12.71	15.71	18.95
BC for sattlement of 40mm	2 x 2	5.88	6.41	6.95	5.73	12.71	15.71	18.95
Settlement (S)	2 x 2	9.79	10.67	11.57	10.43	16.52	20.42	24.64
NBC	3 x 3	17.16	18.12	19.24	17.1	36.88	44.73	53.07
SBC	3 x 3	5.72	6.04	6.41	5.7	12.29	14.91	17.69
BC for sattlement of 40mm	3 x 3	5.72	6.04	6.41	5.70	12.29	14.91	17.69
Settlement (S)	3 x 3	14.29	15.09	16.01	10.89	17.33	21.02	24.94
NBC	4 x 4	16.84	17.64	18.44	17.62	37.45	44.39	52.04
SBC	4 x 4	5.61	5.88	6.15	5.87	12.48	14.8	17.35
BC for sattlement of 40mm	4 x 4	5.61	5.88	6.15	5.87	12.48	14.80	17.35
Settlement (S)	4 x 4	18.68	19.58	20.48	12.21	18.47	21.9	25.68



Bearing Capacity as per IS 6403:1981 (AP-131) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.82	1.82	1.82	1.82
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Nγ	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	1.25	1.13	1.08	1.06
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.13	1.06	1.04	1.03
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.13	1.06	1.04	1.03
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.82	0.82	0.82	0.82
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	2.51	2.36	2.31	2.29
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.81	1.52	2.24	2.95
NBC	3.32	3.88	4.55	5.24
SBC	1.11	1.29	1.52	1.75
Recommended SBC for sattlement of 40mm	1.11	1.29	1.52	1.75
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	20.3	21.6	23.4	25.4
Settlement (S)	2.25	2.79	3.56	4.45
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.36	0.42	0.50	0.57
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	20
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (AP-131) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.82	1.82	1.82	1.82
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Ny	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	1.5	1.25	1.17	1.13
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.25	1.13	1.08	1.06
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.25	1.13	1.08	1.06
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.82	0.82	0.82	0.82
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	5.6	5.03	4.8	4.71
$0.5.\ \gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.9	1.62	2.32	3.04
NBC	6.5	6.65	7.12	7.75
SBC	2.17	2.22	2.37	2.58
Recommended SBC for sattlement of 40mm	2.17	2.22	2.37	2.58
For Settlement				
of IS 8009 (Part-I) 1976	20.3	21.6	23.4	25.4
Settlement (S)	4.41	4.8	5.55	6.55
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.71	0.72	0.77	0.84
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	20
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (AP-131) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	18	18	18	18
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	22	22	22	22
Nc	13.1	13.1	13.1	13.1
Nq	5.26	5.26	5.26	5.26
Ny	4.07	4.07	4.07	4.07
Sc	1.3	1.3	1.3	1.3
Dc	1.83	1.41	1.28	1.21
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.41	1.21	1.14	1.1
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.41	1.21	1.14	1.1
Tan(45+Ø /2)	1.38	1.38	1.38	1.38
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	18.16	15.59	14.69	14.17
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.11	3.62	5.12	6.59
NBC	20.27	19.21	19.81	20.76
SBC	6.76	6.4	6.6	6.92
Recommended SBC for sattlement of 40mm	6.76	6.40	6.60	6.92
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	11.9	13	14.1	14.8
Settlement (S)	8.04	8.32	9.31	10.24
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.21	2.09	2.16	2.26
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	27
Local shear failure	18



Bearing Capacity as per IS 6403:1981 (AP-131) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (y)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	18	18	18	18
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	22	22	22	22
Nc	13.1	13.1	13.1	13.1
Nq	5.26	5.26	5.26	5.26
Ny	4.07	4.07	4.07	4.07
Sc	1.3	1.3	1.3	1.3
Dc	2.1	1.55	1.37	1.28
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.55	1.28	1.18	1.14
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.55	1.28	1.18	1.14
Tan(45+Ø /2)	1.38	1.38	1.38	1.38
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	23.7	21.99	20.27	19.58
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.32	3.83	5.3	6.83
NBC	26.02	25.82	25.57	26.41
SBC	8.67	8.61	8.52	8.8
Recommended SBC for sattlement of 40mm	8.67	8.61	8.52	8.80
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	11.9	13	14.1	14.8
Settlement (S)	10.32	11.19	12.01	13.02
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.83	2.81	2.78	2.87
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	27
Local shear failure	18



Bearing Capacity as per IS 6403:1981	(AP-131) (Depth =5m)			
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	30	30	30	30
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Ny	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	2.77	1.89	1.59	1.44
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.89	1.44	1.3	1.22
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.89	1.44	1.3	1.22
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	189.21	144.16	130.15	122.14
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma.W'$	18.17	27.69	37.5	46.93
NBC	207.38	171.85	167.65	169.07
SBC	69.13	57.28	55.88	56.36
Recommended SBC for sattlement of 40mm	56.34	50.00	44.45	42.11
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7.1	8	9	9.5
Settlement (S)	49.08	45.82	50.29	53.54
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	22.57	18.70	18.25	18.40
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



Bearing Capacity as per IS 6403:1981		(AP-131) (Depth =6m)		
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	30	30	30	30
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Ny	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	3.12	2.06	1.71	1.53
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	2.06	1.53	1.35	1.27
Sy	0.8	0.8	0.8	0.8
Dq=Dy	2.06	1.53	1.35	1.27
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	247.48	183.81	162.18	152.57
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	19.81	29.43	38.95	48.85
NBC	267.29	213.24	201.13	201.42
SBC	89.1	71.08	67.04	67.14
Recommended SBC for sattlement of 40mm	56.34	50.00	44.44	42.11
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7.1	8	9	9.5
Settlement (S)	63.26	56.86	60.34	63.78
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	29.09	23.21	21.89	21.92
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



Bearing Capacity as per IS 6403:1981 (AP-131) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	30	30	30	30
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Nγ	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	3.48	2.24	1.83	1.62
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	2.24	1.62	1.41	1.31
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	2.24	1.62	1.41	1.31
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	313.95	227.06	197.62	183.61
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	21.54	31.16	40.68	50.39
NBC	335.49	258.22	238.3	234
SBC	111.83	86.07	79.43	78
Recommended SBC for sattlement of 40mm	56.34	50.00	44.44	42.11
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7.1	8	9	9.5
Settlement (S)	79.4	68.86	71.49	74.1
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	36.52	28.10	25.94	25.47
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



SBC & Settlement Summary of AP-131								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	3.32	6.5	20.27	26.02	207.38	267.29	335.49
SBC	1 x 1	1.11	2.17	6.76	8.67	69.13	89.1	111.83
BC for sattlement of 40mm	1 x 1	1.11	2.17	6.76	8.67	56.34	56.34	56.34
Settlement (S)	1 x 1	2.25	4.41	8.04	10.32	49.08	63.26	79.4
NBC	2 x 2	3.88	6.65	19.21	25.82	171.85	213.24	258.22
SBC	2 x 2	1.29	2.22	6.4	8.61	57.28	71.08	86.07
BC for sattlement of 40mm	2 x 2	1.29	2.22	6.40	8.61	50.00	50.00	50.00
Settlement (S)	2 x 2	2.79	4.8	8.32	11.19	45.82	56.86	68.86
NBC	3 x 3	4.55	7.12	19.81	25.57	167.65	201.13	238.3
SBC	3 x 3	1.52	2.37	6.6	8.52	55.88	67.04	79.43
BC for sattlement of 40mm	3 x 3	1.52	2.37	6.60	8.52	44.45	44.44	44.44
Settlement (S)	3 x 3	3.56	5.55	9.31	12.01	50.29	60.34	71.49
NBC	4 x 4	5.24	7.75	20.76	26.41	169.07	201.42	234
SBC	4 x 4	1.75	2.58	6.92	8.8	56.36	67.14	78
BC for sattlement of 40mm	4 x 4	1.75	2.58	6.92	8.80	42.11	42.11	42.11
Settlement (S)	4 x 4	4.45	6.55	10.24	13.02	53.54	63.78	74.1



Bearing Capacity as per IS 6403:1981 (LOC-137/2) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.89	1.89	1.89	1.89
C	2.7	2.7	2.7	2.7
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0021	0.0021	0.0021	0.0021
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.1	1.05	1.03	1.03
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	21.65	19.85	19.3	18.94
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	21.65	19.85	19.3	18.94
SBC	7.22	6.62	6.43	6.31
Recommended SBC for sattlement of 40mm	7.22	6.62	6.43	6.31
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	20.3	21.6	23.4	25.4
Settlement (S)	7.43	13.62	19.84	25.96
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.36	2.16	2.10	2.06
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (LOC-137/2) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.89	1.89	1.89	1.89
C	2.7	2.7	2.7	2.7
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0021	0.0021	0.0021	0.0021
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	25.26	21.65	20.39	19.85
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	25.26	21.65	20.39	19.85
SBC	8.42	7.22	6.8	6.62
Recommended SBC for sattlement of 40mm	8.42	7.22	6.80	6.62
For Settlement				
of IS 8009 (Part-I) 1976	20.3	21.6	23.4	25.4
Settlement (S)	8.66	14.85	20.98	27.24
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.75	2.36	2.22	2.16
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (LOC-137/2) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	10	10	10	10
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Ny	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	1.76	1.38	1.25	1.19
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.38	1.19	1.13	1.09
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.38	1.19	1.13	1.09
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	9.32	8.04	7.63	7.36
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1	1.72	2.44	3.14
NBC	10.32	9.76	10.07	10.5
SBC	3.44	3.25	3.36	3.5
Recommended SBC for sattlement of 40mm	3.44	3.25	3.36	3.50
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	27	32	37	39
Settlement (S)	9.29	10.4	12.43	13.65
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.12	1.06	1.10	1.14
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	19
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (LOC-137/2) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (y)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	10	10	10	10
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Ny	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	2.01	1.5	1.34	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.5	1.25	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.5	1.25	1.17	1.13
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
Ic, Iq & Iy	1	1	1	1
Submarged Dencit (y')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	11.34	11.25	10.53	10.17
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.08	1.8	2.53	3.26
NBC	12.42	13.05	13.06	13.43
SBC	4.14	4.35	4.35	4.48
Recommended SBC for sattlement of 40mm	4.14	4.35	4.35	4.48
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	27	32	37	39
Settlement (S)	11.18	13.92	16.1	17.47
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.35	1.42	1.42	1.46
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	19
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (LOC-137/2) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	26	26	26	26
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	2.73	1.87	1.58	1.43
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.87	1.43	1.29	1.22
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.87	1.43	1.29	1.22
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	167.9	128.39	115.82	109.54
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	15.58	23.83	32.25	40.66
NBC	183.48	152.22	148.07	150.2
SBC	61.16	50.74	49.36	50.07
Recommended SBC for sattlement of 40mm	47.06	41.67	35.09	32.52
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	8.5	9.6	11.4	12.3
Settlement (S)	51.99	48.71	56.27	61.59
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	19.97	16.57	16.12	16.35
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30

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Bearing Capacity as per IS 6403:1981 (LOC-137/2) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	26	26	26	26
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	3.08	2.04	1.69	1.52
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	2.04	1.52	1.35	1.26
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	2.04	1.52	1.35	1.26
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	219.79	163.77	145.45	135.75
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	17	25.33	33.75	42
NBC	236.79	189.1	179.2	177.75
SBC	78.93	63.03	59.73	59.25
Recommended SBC for sattlement of 40mm	47.06	41.67	35.09	32.52
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	8.5	9.6	11.4	12.3
Settlement (S)	67.09	60.51	68.09	72.88
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	25.77	20.58	19.50	19.35
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30



Bearing Capacity as per IS 6403:1981 (LOC-137/2) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	26	26	26	26
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	3.42	2.21	1.81	1.61
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	2.21	1.61	1.4	1.3
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	2.21	1.61	1.4	1.3
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
Ic, Iq & Iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	277.79	202.37	175.98	163.41
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma.W'$	18.42	26.83	35	43.33
NBC	296.21	229.2	210.98	206.74
SBC	98.74	76.4	70.33	68.91
Recommended SBC for sattlement of 40mm	47.06	41.67	35.09	32.52
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	8.5	9.6	11.4	12.3
Settlement (S)	83.93	73.34	80.18	84.76
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	32.24	24.95	22.96	22.50
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30



SBC & Settlement Summary of LOC-137/2								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	21.65	25.26	10.32	12.42	183.48	236.79	296.21
SBC	1 x 1	7.22	8.42	3.44	4.14	61.16	78.93	98.74
BC for sattlement of 40mm	1 x 1	7.22	8.42	3.44	4.14	47.06	47.06	47.06
Settlement (S)	1 x 1	7.43	8.66	9.29	11.18	51.99	67.09	83.93
NBC	2 x 2	19.85	21.65	9.76	13.05	152.22	189.1	229.2
SBC	2 x 2	6.62	7.22	3.25	4.35	50.74	63.03	76.4
BC for sattlement of 40mm	2 x 2	6.62	7.22	3.25	4.35	41.67	41.67	41.67
Settlement (S)	2 x 2	13.62	14.85	10.4	13.92	48.71	60.51	73.34
NBC	3 x 3	19.3	20.39	10.07	13.06	148.07	179.2	210.98
SBC	3 x 3	6.43	6.8	3.36	4.35	49.36	59.73	70.33
BC for sattlement of 40mm	3 x 3	6.43	6.80	3.36	4.35	35.09	35.09	35.09
Settlement (S)	3 x 3	19.84	20.98	12.43	16.1	56.27	68.09	80.18
NBC	4 x 4	18.94	19.85	10.5	13.43	150.2	177.75	206.74
SBC	4 x 4	6.31	6.62	3.5	4.48	50.07	59.25	68.91
BC for sattlement of 40mm	4 x 4	6.31	6.62	3.50	4.48	32.52	32.52	32.52
Settlement (S)	4 x 4	25.96	27.24	13.65	17.47	61.59	72.88	84.76



Bearing Capacity as per IS 6403:1981 (AP-141) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (y)	1.88	1.88	1.88	1.88
C	2.6	2.6	2.6	2.6
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0017	0.0017	0.0017	0.0017
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	20.85	19.11	18.59	18.24
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	20.85	19.11	18.59	18.24
SBC	6.95	6.37	6.2	6.08
Recommended SBC for sattlement of 40mm	6.95	6.37	6.20	6.08
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.79	10.61	15.49	20.25
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.27	2.08	2.02	1.99
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981	(AP-141) (Depth =2m)			
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	10	10	10	10
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Nγ	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.49	1.25	1.16	1.12
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.25	1.12	1.08	1.06
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.25	1.12	1.08	1.06
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	4.88	4.45	4.29	4.21
$0.5.\ \gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma\ W'$	0.78	1.39	2.02	2.64
NBC	5.66	5.84	6.31	6.85
SBC	1.89	1.95	2.1	2.28
Recommended SBC for sattlement of 40mm	1.89	1.95	2.10	2.28
For Settlement				
of IS 8009 (Part-I) 1976	27	32	37	39
Settlement (S)	5.1	6.24	7.77	8.89
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.62	0.64	0.69	0.74
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981 (AP-141) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	10	10	10	10
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Nγ	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.74	1.37	1.25	1.18
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.37	1.18	1.12	1.09
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.37	1.18	1.12	1.09
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	8.16	7.03	6.67	6.49
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.85	1.47	2.09	2.71
NBC	9.01	8.5	8.76	9.2
SBC	3	2.83	2.92	3.07
Recommended SBC for sattlement of 40mm	3.00	2.83	2.92	3.07
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	27	32	37	39
Settlement (S)	8.1	9.06	10.8	11.97
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.98	0.92	0.95	1.00
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981 (AP-141) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Nγ	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	2.42	1.71	1.47	1.35
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.71	1.35	1.24	1.18
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.71	1.35	1.24	1.18
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	141.76	108.12	99.31	94.51
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	16.44	25.96	35.77	45.39
NBC	158.2	134.08	135.08	139.9
SBC	52.73	44.69	45.03	46.63
Recommended SBC for sattlement of 40mm	50.63	44.69	39.22	36.69
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7.9	8.8	10.2	10.9
Settlement (S)	41.66	39.33	45.93	50.83
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	17.22	14.59	14.70	15.23
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



Bearing Capacity as per IS 6403:1981	(AP-141) (Depth =5m)			
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Ny	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	2.77	1.89	1.59	1.44
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.89	1.44	1.3	1.22
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.89	1.44	1.3	1.22
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	189.21	144.16	130.15	122.14
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	18.17	27.69	37.5	46.93
NBC	207.38	171.85	167.65	169.07
SBC	69.13	57.28	55.88	56.36
Recommended SBC for sattlement of 40mm	50.64	45.45	39.21	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7.9	8.8	10.2	10.9
Settlement (S)	54.61	50.41	57	61.43
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	22.57	18.70	18.25	18.40
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



Bearing Capacity as per IS 6403:1981 (AP-141) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Ny	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	3.12	2.06	1.71	1.53
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	2.06	1.53	1.35	1.27
Sy	0.8	0.8	0.8	0.8
Dq=Dy	2.06	1.53	1.35	1.27
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	247.48	183.81	162.18	152.57
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	19.81	29.43	38.95	48.85
NBC	267.29	213.24	201.13	201.42
SBC	89.1	71.08	67.04	67.14
Recommended SBC for sattlement of 40mm	50.63	45.45	39.22	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7.9	8.8	10.2	10.9
Settlement (S)	70.39	62.55	68.38	73.18
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	29.09	23.21	21.89	21.92
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



Bearing Capacity as per IS 6403:1981 (AP-141) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Nγ	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	3.48	2.24	1.83	1.62
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	2.24	1.62	1.41	1.31
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	2.24	1.62	1.41	1.31
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	313.95	227.06	197.62	183.61
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	21.54	31.16	40.68	50.39
NBC	335.49	258.22	238.3	234
SBC	111.83	86.07	79.43	78
Recommended SBC for sattlement of 40mm	50.63	45.46	39.22	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7.9	8.8	10.2	10.9
Settlement (S)	88.35	75.74	81.02	85.02
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	36.52	28.10	25.94	25.47
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



SBC & Settlement Summary of AP-141								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	20.85	5.66	9.01	158.2	207.38	267.29	335.49
SBC	1 x 1	6.95	1.89	3	52.73	69.13	89.1	111.83
BC for sattlement of 40mm	1 x 1	6.95	1.89	3.00	50.63	50.64	50.63	50.63
Settlement (S)	1 x 1	5.79	5.1	8.1	41.66	54.61	70.39	88.35
NBC	2 x 2	19.11	5.84	8.5	134.08	171.85	213.24	258.22
SBC	2 x 2	6.37	1.95	2.83	44.69	57.28	71.08	86.07
BC for sattlement of 40mm	2 x 2	6.37	1.95	2.83	44.69	45.45	45.45	45.46
Settlement (S)	2 x 2	10.61	6.24	9.06	39.33	50.41	62.55	75.74
NBC	3 x 3	18.59	6.31	8.76	135.08	167.65	201.13	238.3
SBC	3 x 3	6.2	2.1	2.92	45.03	55.88	67.04	79.43
BC for sattlement of 40mm	3 x 3	6.20	2.10	2.92	39.22	39.21	39.22	39.22
Settlement (S)	3 x 3	15.49	7.77	10.8	45.93	57	68.38	81.02
NBC	4 x 4	18.24	6.85	9.2	139.9	169.07	201.42	234
SBC	4 x 4	6.08	2.28	3.07	46.63	56.36	67.14	78
BC for sattlement of 40mm	4 x 4	6.08	2.28	3.07	36.69	36.70	36.70	36.70
Settlement (S)	4 x 4	20.25	8.89	11.97	50.83	61.43	73.18	85.02



Bearing Capacity as per IS 6403:1981 (LOC-151/2) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	10	10	10	10
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Ny	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	1.25	1.13	1.08	1.06
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.13	1.06	1.04	1.03
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.13	1.06	1.04	1.03
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	2.57	2.41	2.37	2.35
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.82	1.54	2.26	2.99
NBC	3.39	3.95	4.63	5.34
SBC	1.13	1.32	1.54	1.78
Recommended SBC for sattlement of 40mm	1.13	1.32	1.54	1.78
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	30	32	37	39
Settlement (S)	3.39	4.22	5.7	6.94
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.37	0.43	0.50	0.58
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	19
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (LOC-151/2) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	13	13	13	13
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	10	10	10	10
Nc	9.81	9.81	9.81	9.81
Nq	3.26	3.26	3.26	3.26
Nγ	1.97	1.97	1.97	1.97
Sc	1.3	1.3	1.3	1.3
Dc	1.5	1.25	1.17	1.13
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.25	1.13	1.08	1.06
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.25	1.13	1.08	1.06
Tan(45+Ø /2)	1.26	1.26	1.26	1.26
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	5.74	5.15	4.92	4.83
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.91	1.64	2.35	3.07
NBC	6.65	6.79	7.27	7.9
SBC	2.22	2.26	2.42	2.63
Recommended SBC for sattlement of 40mm	2.22	2.26	2.42	2.63
For Settlement				
of IS 8009 (Part-I) 1976	30	32	37	39
Settlement (S)	6.66	7.23	8.95	10.26
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.72	0.74	0.79	0.86
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	19
Local shear failure	13



Bearing Capacity as per IS 6403:1981 (LOC-151/2) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
m_v	0	0	0	0
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	2.04	1.52	1.35	1.26
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.52	1.26	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.52	1.26	1.17	1.13
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	81.88	67.88	63.03	60.87
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	12.67	21	29.25	37.66
NBC	94.55	88.88	92.28	98.53
SBC	31.52	29.63	30.76	32.84
Recommended SBC for sattlement of 40mm	31.52	29.63	30.76	32.84
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	22.06	26.07	31.38	35.8
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	10.29	9.68	10.04	10.72
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30



Bearing Capacity as per IS 6403:1981	(LOC-151/2) (Depth =4m)			
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
m_v	0	0	0	0
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	2.38	1.69	1.46	1.35
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.69	1.35	1.23	1.17
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.69	1.35	1.23	1.17
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	124.26	96.97	88.35	84.04
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	14.08	22.5	30.75	39
NBC	138.34	119.47	119.1	123.04
SBC	46.11	39.82	39.7	41.01
Recommended SBC for sattlement of 40mm	46.11	39.82	39.22	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	32.28	35.04	40.49	44.7
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	15.06	13.00	12.96	13.39
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30



Bearing Capacity as per IS 6403:1981 (LOC-151/2) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	2.73	1.87	1.58	1.43
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.87	1.43	1.29	1.22
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.87	1.43	1.29	1.22
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	167.9	128.39	115.82	109.54
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	15.58	23.83	32.25	40.66
NBC	183.48	152.22	148.07	150.2
SBC	61.16	50.74	49.36	50.07
Recommended SBC for sattlement of 40mm	57.15	45.46	39.21	36.69
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	42.81	44.65	50.35	54.58
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	19.97	16.57	16.12	16.35
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30



Bearing Capacity as per IS 6403:1981 (LOC-151/2) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	3.08	2.04	1.69	1.52
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	2.04	1.52	1.35	1.26
Sy	0.8	0.8	0.8	0.8
Dq=Dy	2.04	1.52	1.35	1.26
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	219.79	163.77	145.45	135.75
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	17	25.33	33.75	42
NBC	236.79	189.1	179.2	177.75
SBC	78.93	63.03	59.73	59.25
Recommended SBC for sattlement of 40mm	57.14	45.45	39.22	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	55.25	55.47	60.92	64.58
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	25.77	20.58	19.50	19.35
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30



Bearing Capacity as per IS 6403:1981 (LOC-151/2) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (y)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	30	30	30	30
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	30.14	30.14	30.14	30.14
Nq	18.4	18.4	18.4	18.4
Ny	22.4	22.4	22.4	22.4
Sc	1.3	1.3	1.3	1.3
Dc	3.42	2.21	1.81	1.61
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	2.21	1.61	1.4	1.3
Sy	0.8	0.8	0.8	0.8
Dq=Dy	2.21	1.61	1.4	1.3
Tan(45+Ø /2)	1.73	1.73	1.73	1.73
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	277.79	202.37	175.98	163.41
$0.5.\ \gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma\ W'$	18.42	26.83	35	43.33
NBC	296.21	229.2	210.98	206.74
SBC	98.74	76.4	70.33	68.91
Recommended SBC for sattlement of 40mm	57.14	45.46	39.21	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	69.12	67.23	71.74	75.11
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	32.24	24.95	22.96	22.50
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	30



SBC & Settlement Summary of LOC-151/2								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	3.39	6.65	94.55	138.34	183.48	236.79	296.21
SBC	1 x 1	1.13	2.22	31.52	46.11	61.16	78.93	98.74
BC for sattlement of 40mm	1 x 1	1.13	2.22	31.52	46.11	57.15	57.14	57.14
Settlement (S)	1 x 1	3.39	6.66	22.06	32.28	42.81	55.25	69.12
NBC	2 x 2	3.95	6.79	88.88	119.47	152.22	189.1	229.2
SBC	2 x 2	1.32	2.26	29.63	39.82	50.74	63.03	76.4
BC for sattlement of 40mm	2 x 2	1.32	2.26	29.63	39.82	45.46	45.45	45.46
Settlement (S)	2 x 2	4.22	7.23	26.07	35.04	44.65	55.47	67.23
NBC	3 x 3	4.63	7.27	92.28	119.1	148.07	179.2	210.98
SBC	3 x 3	1.54	2.42	30.76	39.7	49.36	59.73	70.33
BC for sattlement of 40mm	3 x 3	1.54	2.42	30.76	39.22	39.21	39.22	39.21
Settlement (S)	3 x 3	5.7	8.95	31.38	40.49	50.35	60.92	71.74
NBC	4 x 4	5.34	7.9	98.53	123.04	150.2	177.75	206.74
SBC	4 x 4	1.78	2.63	32.84	41.01	50.07	59.25	68.91
BC for sattlement of 40mm	4 x 4	1.78	2.63	32.84	36.70	36.69	36.70	36.70
Settlement (S)	4 x 4	6.94	10.26	35.8	44.7	54.58	64.58	75.11



Bearing Capacity as per IS 6403:1981 (LOC-157/3) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (y)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	14	14	14	14
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
Nc	10.37	10.37	10.37	10.37
Nq	3.59	3.59	3.59	3.59
Ny	2.29	2.29	2.29	2.29
Sc	1.3	1.3	1.3	1.3
Dc	1.26	1.13	1.09	1.06
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.13	1.06	1.04	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.13	1.06	1.04	1.03
Tan(45+Ø /2)	1.28	1.28	1.28	1.28
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	2.91	2.73	2.68	2.66
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.95	1.78	2.61	3.45
NBC	3.86	4.51	5.29	6.11
SBC	1.29	1.5	1.76	2.04
Recommended SBC for sattlement of 40mm	1.29	1.5	1.76	2.04
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	2.77	3.75	4.75	5.92
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.42	0.49	0.57	0.67
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	21
Local shear failure	14



Bearing Capacity as per IS 6403:1981 (LOC-157/3) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	14	14	14	14
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
Nc	10.37	10.37	10.37	10.37
Nq	3.59	3.59	3.59	3.59
Ny	2.29	2.29	2.29	2.29
Sc	1.3	1.3	1.3	1.3
Dc	1.51	1.26	1.17	1.13
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.26	1.13	1.09	1.06
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.26	1.13	1.09	1.06
Tan(45+Ø /2)	1.28	1.28	1.28	1.28
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	6.6	5.83	5.62	5.47
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.06	1.89	2.74	3.55
NBC	7.66	7.72	8.36	9.02
SBC	2.55	2.57	2.79	3.01
Recommended SBC for sattlement of 40mm	2.55	2.57	2.79	3.01
For Settlement				
of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	5.48	6.43	7.53	8.73
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.83	0.84	0.91	0.98
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	21
Local shear failure	14



Bearing Capacity as per IS 6403:1981 (LOC-157/3) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (y)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	14	14	14	14
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
m_v	0	0	0	0
Nc	10.37	10.37	10.37	10.37
Nq	3.59	3.59	3.59	3.59
Ny	2.29	2.29	2.29	2.29
Sc	1.3	1.3	1.3	1.3
Dc	1.77	1.38	1.26	1.19
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.38	1.19	1.13	1.1
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.38	1.19	1.13	1.1
Tan(45+Ø /2)	1.28	1.28	1.28	1.28
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	10.68	9.21	8.74	8.51
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.16	1.99	2.84	3.69
NBC	11.84	11.2	11.58	12.2
SBC	3.95	3.73	3.86	4.07
Recommended SBC for sattlement of 40mm	3.95	3.73	3.86	4.07
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	8.49	9.33	10.42	11.8
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.29	1.22	1.26	1.33
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	21
Local shear failure	14



Bearing Capacity as per IS 6403:1981 (LOC-157/3) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	14	14	14	14
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
m_v	0	0	0	0
Nc	10.37	10.37	10.37	10.37
Nq	3.59	3.59	3.59	3.59
Nγ	2.29	2.29	2.29	2.29
Sc	1.3	1.3	1.3	1.3
Dc	2.02	1.51	1.34	1.26
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.51	1.26	1.17	1.13
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.51	1.26	1.17	1.13
Tan(45+Ø /2)	1.28	1.28	1.28	1.28
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	13.21	13	12.07	11.66
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.27	2.11	2.94	3.79
NBC	14.48	15.11	15.01	15.45
SBC	4.83	5.04	5	5.15
Recommended SBC for sattlement of 40mm	4.83	5.04	5.00	5.15
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	10.38	12.6	13.5	14.94
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.58	1.65	1.63	1.68
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	21
Local shear failure	14



Bearing Capacity as per IS 6403:1981	(LOC-157/3) (Depth =5m)			
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (y)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Ny	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	2.77	1.89	1.59	1.44
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.89	1.44	1.3	1.22
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.89	1.44	1.3	1.22
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	189.21	144.16	130.15	122.14
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	18.17	27.69	37.5	46.93
NBC	207.38	171.85	167.65	169.07
SBC	69.13	57.28	55.88	56.36
Recommended SBC for sattlement of 40mm	57.14	45.45	39.21	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	48.39	50.41	57	61.43
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	22.57	18.70	18.25	18.40
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



Bearing Capacity as per IS 6403:1981 (LOC-157/3) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Ny	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	3.12	2.06	1.71	1.53
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	2.06	1.53	1.35	1.27
Sy	0.8	0.8	0.8	0.8
Dq=Dy	2.06	1.53	1.35	1.27
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	247.48	183.81	162.18	152.57
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	19.81	29.43	38.95	48.85
NBC	267.29	213.24	201.13	201.42
SBC	89.1	71.08	67.04	67.14
Recommended SBC for sattlement of 40mm	57.14	45.45	39.22	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	62.37	62.55	68.38	73.18
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	29.09	23.21	21.89	21.92
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



Bearing Capacity as per IS 6403:1981 (LOC-157/3) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	31	31	31	31
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	28	28	28	28
Nc	32.67	32.67	32.67	32.67
Nq	20.63	20.63	20.63	20.63
Nγ	25.99	25.99	25.99	25.99
Sc	1.3	1.3	1.3	1.3
Dc	3.48	2.24	1.83	1.62
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	2.24	1.62	1.41	1.31
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	2.24	1.62	1.41	1.31
Tan(45+Ø /2)	1.77	1.77	1.77	1.77
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	313.95	227.06	197.62	183.61
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	21.54	31.16	40.68	50.39
NBC	335.49	258.22	238.3	234
SBC	111.83	86.07	79.43	78
Recommended SBC for sattlement of 40mm	57.14	45.46	39.22	36.70
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	7	8.8	10.2	10.9
Settlement (S)	78.28	75.74	81.02	85.02
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	36.52	28.10	25.94	25.47
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	31



SBC & Settlement Summary of LOC-157/3								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	3.86	7.66	11.84	14.48	207.38	267.29	335.49
SBC	1 x 1	1.29	2.55	3.95	4.83	69.13	89.1	111.83
BC for sattlement of 40mm	1 x 1	1.29	2.55	3.95	4.83	57.14	57.14	57.14
Settlement (S)	1 x 1	2.77	5.48	8.49	10.38	48.39	62.37	78.28
NBC	2 x 2	4.51	7.72	11.2	15.11	171.85	213.24	258.22
SBC	2 x 2	1.5	2.57	3.73	5.04	57.28	71.08	86.07
BC for sattlement of 40mm	2 x 2	1.5	2.57	3.73	5.04	45.45	45.45	45.46
Settlement (S)	2 x 2	3.75	6.43	9.33	12.6	50.41	62.55	75.74
NBC	3 x 3	5.29	8.36	11.58	15.01	167.65	201.13	238.3
SBC	3 x 3	1.76	2.79	3.86	5	55.88	67.04	79.43
BC for sattlement of 40mm	3 x 3	1.76	2.79	3.86	5.00	39.21	39.22	39.22
Settlement (S)	3 x 3	4.75	7.53	10.42	13.5	57	68.38	81.02
NBC	4 x 4	6.11	9.02	12.2	15.45	169.07	201.42	234
SBC	4 x 4	2.04	3.01	4.07	5.15	56.36	67.14	78
BC for sattlement of 40mm	4 x 4	2.04	3.01	4.07	5.15	36.70	36.70	36.70
Settlement (S)	4 x 4	5.92	8.73	11.8	14.94	61.43	73.18	85.02



Bearing Capacity as per IS 6403:1981 (AP-170) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	16	16	16	16
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Nγ	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.25	1.12	1.08	1.06
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.12	1.06	1.04	1.03
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.12	1.06	1.04	1.03
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	2.22	2.1	2.07	2.05
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.7	1.32	1.94	2.56
NBC	2.92	3.42	4.01	4.61
SBC	0.97	1.14	1.34	1.54
Recommended SBC for sattlement of 40mm	0.97	1.14	1.34	1.54
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	16.5	18.2	19.1	20.8
Settlement (S)	1.6	2.07	2.56	3.2
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.32	0.37	0.44	0.50
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981 (AP-170) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	15	15	15	15
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
Nc	10.98	10.98	10.98	10.98
Nq	3.94	3.94	3.94	3.94
Ny	2.65	2.65	2.65	2.65
Sc	1.3	1.3	1.3	1.3
Dc	1.52	1.26	1.17	1.13
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.26	1.13	1.09	1.07
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.26	1.13	1.09	1.07
Tan(45+Ø /2)	1.3	1.3	1.3	1.3
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	7.8	6.78	6.54	6.42
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.24	2.22	3.21	4.2
NBC	9.04	9	9.75	10.62
SBC	3.01	3	3.25	3.54
Recommended SBC for sattlement of 40mm	3.01	3	3.25	3.54
For Settlement				
of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	4.21	4.74	5.33	6.09
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.98	0.98	1.06	1.16
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	23
Local shear failure	15



Bearing Capacity as per IS 6403:1981 (AP-170) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	15	15	15	15
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	10.98	10.98	10.98	10.98
Nq	3.94	3.94	3.94	3.94
Ny	2.65	2.65	2.65	2.65
Sc	1.3	1.3	1.3	1.3
Dc	1.78	1.39	1.26	1.2
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.39	1.2	1.13	1.1
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.39	1.2	1.13	1.1
Tan(45+Ø /2)	1.3	1.3	1.3	1.3
ic, iq & iγ	1	1	1	1
Submerged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	12.5	10.8	10.17	9.9
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.36	2.35	3.32	4.31
NBC	13.86	13.15	13.49	14.21
SBC	4.62	4.38	4.5	4.74
Recommended SBC for sattlement of 40mm	4.62	4.38	4.50	4.74
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	6.47	6.92	7.38	8.15
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.51	1.43	1.47	1.55
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	23
Local shear failure	15



Bearing Capacity as per IS 6403:1981 (AP-170) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	15	15	15	15
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	10.98	10.98	10.98	10.98
Nq	3.94	3.94	3.94	3.94
Ny	2.65	2.65	2.65	2.65
Sc	1.3	1.3	1.3	1.3
Dc	2.04	1.52	1.35	1.26
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.52	1.26	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.52	1.26	1.17	1.13
Tan(45+Ø /2)	1.3	1.3	1.3	1.3
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	15.59	15.11	14.03	13.55
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.49	2.47	3.44	4.43
NBC	17.08	17.58	17.47	17.98
SBC	5.69	5.86	5.82	5.99
Recommended SBC for sattlement of 40mm	5.69	5.86	5.82	5.99
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	7.97	9.26	9.54	10.3
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.86	1.91	1.90	1.96
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	23
Local shear failure	15



Bearing Capacity as per IS 6403:1981 (AP-170) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	32	32	32	32
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	35	35	35	35
Nc	35.49	35.49	35.49	35.49
Nq	23.18	23.18	23.18	23.18
Ny	30.22	30.22	30.22	30.22
Sc	1.3	1.3	1.3	1.3
Dc	2.8	1.9	1.6	1.45
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.9	1.45	1.3	1.23
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.9	1.45	1.3	1.23
Tan(45+Ø /2)	1.8	1.8	1.8	1.8
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	217.45	165.95	148.78	140.77
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	21.36	32.6	43.84	55.31
NBC	238.81	198.55	192.62	196.08
SBC	79.6	66.18	64.21	65.36
Recommended SBC for sattlement of 40mm	67.80	58.83	53.33	50.00
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	5.9	6.8	7.5	8
Settlement (S)	46.96	45	48.16	52.29
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	25.99	21.61	20.97	21.34
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	32



Bearing Capacity as per IS 6403:1981 (AP-170) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	32	32	32	32
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	35	35	35	35
Nc	35.49	35.49	35.49	35.49
Nq	23.18	23.18	23.18	23.18
Ny	30.22	30.22	30.22	30.22
Sc	1.3	1.3	1.3	1.3
Dc	3.16	2.08	1.72	1.54
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	2.08	1.54	1.36	1.27
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	2.08	1.54	1.36	1.27
Tan(45+Ø /2)	1.8	1.8	1.8	1.8
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	285.66	211.5	186.78	174.42
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	23.38	34.62	45.87	57.11
NBC	309.04	246.12	232.65	231.53
SBC	103.01	82.04	77.55	77.18
Recommended SBC for sattlement of 40mm	67.79	58.82	53.34	50.00
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	5.9	6.8	7.5	8
Settlement (S)	60.78	55.79	58.16	61.74
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	33.64	26.79	25.32	25.20
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	32



Bearing Capacity as per IS 6403:1981 (AP-170) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.86	1.86	1.86	1.86
C	0	0	0	0
Ø	32	32	32	32
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	35	35	35	35
Nc	35.49	35.49	35.49	35.49
Nq	23.18	23.18	23.18	23.18
Ny	30.22	30.22	30.22	30.22
Sc	1.3	1.3	1.3	1.3
Dc	3.52	2.26	1.84	1.63
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	2.26	1.63	1.42	1.32
Sy	0.8	0.8	0.8	0.8
Dq=Dy	2.26	1.63	1.42	1.32
Tan(45+Ø /2)	1.8	1.8	1.8	1.8
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.86	0.86	0.86	0.86
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma' D.(Nq-1).s_q.d_q.i_q$	362.12	261.17	227.52	211.5
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	25.41	36.65	47.89	59.36
NBC	387.53	297.82	275.41	270.86
SBC	129.18	99.27	91.8	90.29
Recommended SBC for sattlement of 40mm	67.79	58.83	53.33	50.00
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	5.9	6.8	7.5	8
Settlement (S)	76.22	67.5	68.85	72.23
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	42.18	32.41	29.98	29.48
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	32



SBC & Settlement Summary of AP-170								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	2.92	9.04	13.86	17.08	238.81	309.04	387.53
SBC	1 x 1	0.97	3.01	4.62	5.69	79.6	103.01	129.18
BC for sattlement of 40mm	1 x 1	0.97	3.01	4.62	5.69	67.80	67.79	67.79
Settlement (S)	1 x 1	1.6	4.21	6.47	7.97	46.96	60.78	76.22
NBC	2 x 2	3.42	9	13.15	17.58	198.55	246.12	297.82
SBC	2 x 2	1.14	3	4.38	5.86	66.18	82.04	99.27
BC for sattlement of 40mm	2 x 2	1.14	3	4.38	5.86	58.83	58.82	58.83
Settlement (S)	2 x 2	2.07	4.74	6.92	9.26	45	55.79	67.5
NBC	3 x 3	4.01	9.75	13.49	17.47	192.62	232.65	275.41
SBC	3 x 3	1.34	3.25	4.5	5.82	64.21	77.55	91.8
BC for sattlement of 40mm	3 x 3	1.34	3.25	4.50	5.82	53.33	53.34	53.33
Settlement (S)	3 x 3	2.56	5.33	7.38	9.54	48.16	58.16	68.85
NBC	4 x 4	4.61	10.62	14.21	17.98	196.08	231.53	270.86
SBC	4 x 4	1.54	3.54	4.74	5.99	65.36	77.18	90.29
BC for sattlement of 40mm	4 x 4	1.54	3.54	4.74	5.99	50.00	50.00	50.00
Settlement (S)	4 x 4	3.2	6.09	8.15	10.3	52.29	61.74	72.23



Bearing Capacity as per IS 6403:1981 (AP-182) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.89	1.89	1.89	1.89
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0017	0.0017	0.0017	0.0017
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	18.44	16.91	16.44	16.14
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	18.44	16.91	16.44	16.14
SBC	6.15	5.64	5.48	5.38
Recommended SBC for sattlement of 40mm	6.15	5.64	5.48	5.38
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.12	9.39	13.69	17.92
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.01	1.84	1.79	1.76
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-182) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (y)	1.89	1.89	1.89	1.89
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0017	0.0017	0.0017	0.0017
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	21.52	18.44	17.37	16.91
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	21.52	18.44	17.37	16.91
SBC	7.17	6.15	5.79	5.64
Recommended SBC for sattlement of 40mm	7.17	6.15	5.79	5.64
For Settlement				
of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.97	10.24	14.46	18.78
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.34	2.01	1.89	1.84
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-182) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.91	1.91	1.91	1.91
C	2.6	2.6	2.6	2.6
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.6	1.3	1.2	1.15
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.3	1.15	1.1	1.08
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.91	0.91	0.91	0.91
$C.N_c.s_c.d_c.i_c$	27.8	22.59	20.85	19.98
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	27.8	22.59	20.85	19.98
SBC	9.27	7.53	6.95	6.66
Recommended SBC for sattlement of 40mm	9.27	7.53	6.95	6.66
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	9.99	16.23	22.47	28.71
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.03	2.46	2.27	2.17
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-182) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (y)	1.91	1.91	1.91	1.91
C	2.6	2.6	2.6	2.6
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.8	1.4	1.27	1.2
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.4	1.2	1.13	1.1
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.91	0.91	0.91	0.91
$C.N_c.s_c.d_c.i_c$	31.27	24.32	22.06	20.85
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	31.27	24.32	22.06	20.85
SBC	10.42	8.11	7.35	6.95
Recommended SBC for sattlement of 40mm	10.42	8.11	7.35	6.95
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	11.23	17.48	23.76	29.96
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.40	2.65	2.40	2.27
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-182) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (y)	1.91	1.91	1.91	1.91
C	2.6	2.6	2.6	2.6
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2	1.5	1.33	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.5	1.25	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.91	0.91	0.91	0.91
$C.N_c.s_c.d_c.i_c$	34.75	26.06	23.11	21.72
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	34.75	26.06	23.11	21.72
SBC	11.58	8.69	7.7	7.24
Recommended SBC for sattlement of 40mm	11.58	8.69	7.70	7.24
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	12.48	18.73	24.89	31.21
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.78	2.84	2.51	2.36
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-182) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.91	1.91	1.91	1.91
C	2.6	2.6	2.6	2.6
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2.2	1.6	1.4	1.3
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.6	1.3	1.2	1.15
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.91	0.91	0.91	0.91
$C.N_c.s_c.d_c.i_c$	38.22	27.8	24.32	22.59
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	38.22	27.8	24.32	22.59
SBC	12.74	9.27	8.11	7.53
Recommended SBC for sattlement of 40mm	12.74	9.27	8.11	7.53
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	13.73	19.98	26.22	32.46
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.16	3.03	2.65	2.46
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-182) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (y)	1.91	1.91	1.91	1.91
C	2.6	2.6	2.6	2.6
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2.4	1.7	1.47	1.35
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.7	1.35	1.23	1.18
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.91	0.91	0.91	0.91
$C.N_c.s_c.d_c.i_c$	41.7	29.53	25.54	23.45
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	41.7	29.53	25.54	23.45
SBC	13.9	9.84	8.51	7.82
Recommended SBC for sattlement of 40mm	13.90	9.84	8.51	7.82
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	14.98	21.21	27.51	33.71
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.54	3.21	2.78	2.55
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



SBC & Settlement Summary of AP-182								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	18.44	21.52	27.8	31.27	34.75	38.22	41.7
SBC	1 x 1	6.15	7.17	9.27	10.42	11.58	12.74	13.9
BC for sattlement of 40mm	1 x 1	6.15	7.17	9.27	10.42	11.58	12.74	13.90
Settlement (S)	1 x 1	5.12	5.97	9.99	11.23	12.48	13.73	14.98
NBC	2 x 2	16.91	18.44	22.59	24.32	26.06	27.8	29.53
SBC	2 x 2	5.64	6.15	7.53	8.11	8.69	9.27	9.84
BC for sattlement of 40mm	2 x 2	5.64	6.15	7.53	8.11	8.69	9.27	9.84
Settlement (S)	2 x 2	9.39	10.24	16.23	17.48	18.73	19.98	21.21
NBC	3 x 3	16.44	17.37	20.85	22.06	23.11	24.32	25.54
SBC	3 x 3	5.48	5.79	6.95	7.35	7.7	8.11	8.51
BC for sattlement of 40mm	3 x 3	5.48	5.79	6.95	7.35	7.70	8.11	8.51
Settlement (S)	3 x 3	13.69	14.46	22.47	23.76	24.89	26.22	27.51
NBC	4 x 4	16.14	16.91	19.98	20.85	21.72	22.59	23.45
SBC	4 x 4	5.38	5.64	6.66	6.95	7.24	7.53	7.82
BC for sattlement of 40mm	4 x 4	5.38	5.64	6.66	6.95	7.24	7.53	7.82
Settlement (S)	4 x 4	17.92	18.78	28.71	29.96	31.21	32.46	33.71



Bearing Capacity as per IS 6403:1981 (AP-190) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (y)	1.87	1.87	1.87	1.87
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0016	0.0016	0.0016	0.0016
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.87	0.87	0.87	0.87
$C.N_c.s_c.d_c.i_c$	18.44	16.91	16.44	16.14
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	18.44	16.91	16.44	16.14
SBC	6.15	5.64	5.48	5.38
Recommended SBC for sattlement of 40mm	6.15	5.64	5.48	5.38
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	4.82	8.84	12.88	16.86
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.01	1.84	1.79	1.76
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-190) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.87	1.87	1.87	1.87
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0016	0.0016	0.0016	0.0016
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.87	0.87	0.87	0.87
$C.N_c.s_c.d_c.i_c$	21.52	18.44	17.37	16.91
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	21.52	18.44	17.37	16.91
SBC	7.17	6.15	5.79	5.64
Recommended SBC for sattlement of 40mm	7.17	6.15	5.79	5.64
For Settlement				
of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.62	9.64	13.61	17.68
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.34	2.01	1.89	1.84
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981	(AP-190) (Depth =3m)			
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (y)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	6	6	6	6
m_v	0	0	0	0
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Ny	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.74	1.37	1.25	1.18
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.37	1.18	1.12	1.09
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.37	1.18	1.12	1.09
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, Iq & iy	1	1	1	1
Submarged Dencit (y')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	8.06	6.95	6.59	6.42
$0.5.\ \gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.85	1.46	2.08	2.7
NBC	8.91	8.41	8.67	9.12
SBC	2.97	2.8	2.89	3.04
Recommended SBC for sattlement of 40mm	2.97	2.80	2.89	3.04
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	50	61	72	80
Settlement (S)	14.85	17.08	20.81	24.32
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	0.97	0.91	0.94	0.99
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981 (AP-190) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (y)	1.83	1.83	1.83	1.83
C	0	0	0	0
Ø	12	12	12	12
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	6	6	6	6
m_v	0	0	0	0
Nc	9.28	9.28	9.28	9.28
Nq	2.97	2.97	2.97	2.97
Ny	1.69	1.69	1.69	1.69
Sc	1.3	1.3	1.3	1.3
Dc	1.98	1.49	1.33	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.49	1.25	1.16	1.12
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.49	1.25	1.16	1.12
Tan(45+Ø /2)	1.23	1.23	1.23	1.23
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.83	0.83	0.83	0.83
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	9.65	9.81	9.1	8.79
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0.92	1.55	2.15	2.77
NBC	10.57	11.36	11.25	11.56
SBC	3.52	3.79	3.75	3.85
Recommended SBC for sattlement of 40mm	3.52	3.79	3.75	3.85
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	50	61	72	80
Settlement (S)	17.6	23.12	27	30.8
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.15	1.24	1.22	1.26
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	18
Local shear failure	12



Bearing Capacity as per IS 6403:1981 (AP-190) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (y)	1.9	1.9	1.9	1.9
C	2.7	2.7	2.7	2.7
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2	1.5	1.33	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.5	1.25	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.9	0.9	0.9	0.9
$C.N_c.s_c.d_c.i_c$	36.08	27.06	24	22.55
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	36.08	27.06	24	22.55
SBC	12.03	9.02	8	7.52
Recommended SBC for sattlement of 40mm	12.03	9.02	8.00	7.52
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	12.96	19.44	25.86	32.41
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.93	2.95	2.61	2.46



H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Bearing Capacity as per IS 6403:1981 (AP-190) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.9	1.9	1.9	1.9
C	2.7	2.7	2.7	2.7
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2.2	1.6	1.4	1.3
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.6	1.3	1.2	1.15
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.9	0.9	0.9	0.9
$C.N_c.s_c.d_c.i_c$	39.69	28.87	25.26	23.45
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	39.69	28.87	25.26	23.45
SBC	13.23	9.62	8.42	7.82
Recommended SBC for sattlement of 40mm	13.23	9.62	8.42	7.82
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	14.26	20.73	27.22	33.71
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.32	3.14	2.75	2.55
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-190) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (y)	1.9	1.9	1.9	1.9
C	2.7	2.7	2.7	2.7
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2.4	1.7	1.47	1.35
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.7	1.35	1.23	1.18
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.9	0.9	0.9	0.9
$C.N_c.s_c.d_c.i_c$	43.3	30.67	26.52	24.36
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	43.3	30.67	26.52	24.36
SBC	14.43	10.22	8.84	8.12
Recommended SBC for sattlement of 40mm	14.43	10.22	8.84	8.12
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	15.55	22.03	28.58	35
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.71	3.34	2.89	2.65
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



SBC & Settlement Summary of AP-190								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	18.44	21.52	8.91	10.57	36.08	39.69	43.3
SBC	1 x 1	6.15	7.17	2.97	3.52	12.03	13.23	14.43
BC for sattlement of 40mm	1 x 1	6.15	7.17	2.97	3.52	12.03	13.23	14.43
Settlement (S)	1 x 1	4.82	5.62	14.85	17.6	12.96	14.26	15.55
NBC	2 x 2	16.91	18.44	8.41	11.36	27.06	28.87	30.67
SBC	2 x 2	5.64	6.15	2.8	3.79	9.02	9.62	10.22
BC for sattlement of 40mm	2 x 2	5.64	6.15	2.80	3.79	9.02	9.62	10.22
Settlement (S)	2 x 2	8.84	9.64	17.08	23.12	19.44	20.73	22.03
NBC	3 x 3	16.44	17.37	8.67	11.25	24	25.26	26.52
SBC	3 x 3	5.48	5.79	2.89	3.75	8	8.42	8.84
BC for sattlement of 40mm	3 x 3	5.48	5.79	2.89	3.75	8.00	8.42	8.84
Settlement (S)	3 x 3	12.88	13.61	20.81	27	25.86	27.22	28.58
NBC	4 x 4	16.14	16.91	9.12	11.56	22.55	23.45	24.36
SBC	4 x 4	5.38	5.64	3.04	3.85	7.52	7.82	8.12
BC for sattlement of 40mm	4 x 4	5.38	5.64	3.04	3.85	7.52	7.82	8.12
Settlement (S)	4 x 4	16.86	17.68	24.32	30.8	32.41	33.71	35



Bearing Capacity as per IS 6403:1981 (AP-206) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (y)	1.89	1.89	1.89	1.89
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0019	0.0019	0.0019	0.0019
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	18.44	16.91	16.44	16.14
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	18.44	16.91	16.44	16.14
SBC	6.15	5.64	5.48	5.38
Recommended SBC for sattlement of 40mm	6.15	5.64	5.48	5.38
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.72	10.5	15.3	20.03
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.01	1.84	1.79	1.76
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-206) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (y)	1.89	1.89	1.89	1.89
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0019	0.0019	0.0019	0.0019
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	21.52	18.44	17.37	16.91
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	21.52	18.44	17.37	16.91
SBC	7.17	6.15	5.79	5.64
Recommended SBC for sattlement of 40mm	7.17	6.15	5.79	5.64
For Settlement				
of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	6.67	11.45	16.16	20.99
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.34	2.01	1.89	1.84
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-206) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.89	1.89	1.89	1.89
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0019	0.0019	0.0019	0.0019
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.6	1.3	1.2	1.15
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.3	1.15	1.1	1.08
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	24.59	19.98	18.44	17.67
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	24.59	19.98	18.44	17.67
SBC	8.2	6.66	6.15	5.89
Recommended SBC for sattlement of 40mm	8.20	6.66	6.15	5.89
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	7.63	12.4	17.17	21.93
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.68	2.17	2.01	1.92
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-206) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (y)	1.89	1.89	1.89	1.89
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0019	0.0019	0.0019	0.0019
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.8	1.4	1.27	1.2
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.4	1.2	1.13	1.1
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	27.66	21.52	19.52	18.44
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	27.66	21.52	19.52	18.44
SBC	9.22	7.17	6.51	6.15
Recommended SBC for sattlement of 40mm	9.22	7.17	6.51	6.15
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	8.58	13.34	18.17	22.89
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.01	2.34	2.13	2.01
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-206) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.89	1.89	1.89	1.89
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0019	0.0019	0.0019	0.0019
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2	1.5	1.33	1.25
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.5	1.25	1.17	1.13
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	30.74	23.05	20.44	19.21
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	30.74	23.05	20.44	19.21
SBC	10.25	7.68	6.81	6.4
Recommended SBC for sattlement of 40mm	10.25	7.68	6.81	6.40
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	9.54	14.29	19.01	23.82
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.35	2.51	2.22	2.09
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-206) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (y)	1.89	1.89	1.89	1.89
C	2.3	2.3	2.3	2.3
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0019	0.0019	0.0019	0.0019
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2.2	1.6	1.4	1.3
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.6	1.3	1.2	1.15
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	33.81	24.59	21.52	19.98
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	33.81	24.59	21.52	19.98
SBC	11.27	8.2	7.17	6.66
Recommended SBC for sattlement of 40mm	11.27	8.20	7.17	6.66
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	10.49	15.26	20.02	24.79
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.68	2.68	2.34	2.17
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-206) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (y)	1.91	1.91	1.91	1.91
C	3.1	3.1	3.1	3.1
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0023	0.0023	0.0023	0.0023
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	2.4	1.7	1.47	1.35
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.7	1.35	1.23	1.18
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.91	0.91	0.91	0.91
$C.N_c.s_c.d_c.i_c$	49.71	35.21	30.45	27.96
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	49.71	35.21	30.45	27.96
SBC	16.57	11.74	10.15	9.32
Recommended SBC for sattlement of 40mm	16.57	11.74	10.15	8.88
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	18.67	26.45	34.3	42
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	5.41	3.83	3.31	3.04
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



SBC & Settlement Summary of AP-206								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	18.44	21.52	24.59	27.66	30.74	33.81	49.71
SBC	1 x 1	6.15	7.17	8.2	9.22	10.25	11.27	16.57
BC for sattlement of 40mm	1 x 1	6.15	7.17	8.2	9.22	10.25	11.27	16.57
Settlement (S)	1 x 1	5.72	6.67	7.63	8.58	9.54	10.49	18.67
NBC	2 x 2	16.91	18.44	19.98	21.52	23.05	24.59	35.21
SBC	2 x 2	5.64	6.15	6.66	7.17	7.68	8.2	11.74
BC for sattlement of 40mm	2 x 2	5.64	6.15	6.66	7.17	7.68	8.20	11.74
Settlement (S)	2 x 2	10.5	11.45	12.4	13.34	14.29	15.26	26.45
NBC	3 x 3	16.44	17.37	18.44	19.52	20.44	21.52	30.45
SBC	3 x 3	5.48	5.79	6.15	6.51	6.81	7.17	10.15
BC for sattlement of 40mm	3 x 3	5.48	5.79	6.15	6.51	6.81	7.17	10.15
Settlement (S)	3 x 3	15.3	16.16	17.17	18.17	19.01	20.02	34.3
NBC	4 x 4	16.14	16.91	17.67	18.44	19.21	19.98	27.96
SBC	4 x 4	5.38	5.64	5.89	6.15	6.4	6.66	9.32
BC for sattlement of 40mm	4 x 4	5.38	5.64	5.89	6.15	6.40	6.66	8.88
Settlement (S)	4 x 4	20.03	20.99	21.93	22.89	23.82	24.79	42



Bearing Capacity as per IS 6403:1981 (AP-220) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (y)	1.88	1.88	1.88	1.88
C	2.1	2.1	2.1	2.1
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0019	0.0019	0.0019	0.0019
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	16.84	15.44	15.01	14.73
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	16.84	15.44	15.01	14.73
SBC	5.61	5.15	5	4.91
Recommended SBC for sattlement of 40mm	5.61	5.15	5.00	4.91
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.22	9.59	13.96	18.28
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.83	1.68	1.63	1.60
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-220) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.9	1.9	1.9	1.9
C	2.4	2.4	2.4	2.4
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
m_v	0.0021	0.0021	0.0021	0.0021
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.2	1.1	1.07	1.05
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.9	0.9	0.9	0.9
$C.N_c.s_c.d_c.i_c$	22.45	19.24	18.12	17.64
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	22.45	19.24	18.12	17.64
SBC	7.48	6.41	6.04	5.88
Recommended SBC for sattlement of 40mm	7.48	6.41	6.04	5.88
For Settlement				
of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	7.69	13.19	18.64	24.19
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.44	2.09	1.97	1.92
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

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Bearing Capacity as per IS 6403:1981 (AP-220) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (y)	1.9	1.9	1.9	1.9
C	2.4	2.4	2.4	2.4
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0021	0.0021	0.0021	0.0021
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.6	1.3	1.2	1.15
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.3	1.15	1.1	1.08
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.9	0.9	0.9	0.9
$C.N_c.s_c.d_c.i_c$	25.66	20.85	19.24	18.44
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	25.66	20.85	19.24	18.44
SBC	8.55	6.95	6.41	6.15
Recommended SBC for sattlement of 40mm	8.55	6.95	6.41	6.15
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	8.79	14.3	19.78	25.3
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.79	2.27	2.09	2.01
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981	(AP-220) (Depth =4m)			
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.08	1.54	1.36	1.27
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.54	1.27	1.18	1.14
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.54	1.27	1.18	1.14
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	20.77	19.53	18.15	17.54
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.01	3.32	4.62	5.96
NBC	22.78	22.85	22.77	23.5
SBC	7.59	7.62	7.59	7.83
Recommended SBC for sattlement of 40mm	7.59	7.62	7.59	7.83
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	10.63	12.04	12.45	13.47
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.48	2.49	2.48	2.56
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-220) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (y)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0.0000	0.0000	0.0000	0.0000
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.35	1.68	1.45	1.34
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.68	1.34	1.23	1.17
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.68	1.34	1.23	1.17
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	32.3	25.76	23.65	22.5
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.19	3.5	4.82	6.11
NBC	34.49	29.26	28.47	28.61
SBC	11.5	9.75	9.49	9.54
Recommended SBC for sattlement of 40mm	11.50	9.75	9.49	9.54
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	16.1	15.41	15.56	16.41
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.76	3.18	3.10	3.12
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-220) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.62	1.81	1.54	1.41
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.81	1.41	1.27	1.2
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.81	1.41	1.27	1.2
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	41.76	32.53	29.3	27.69
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.36	3.68	4.98	6.27
NBC	44.12	36.21	34.28	33.96
SBC	14.71	12.07	11.43	11.32
Recommended SBC for sattlement of 40mm	14.71	12.07	11.43	11.32
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	20.59	19.07	18.75	19.47
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.80	3.94	3.73	3.70
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-220) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	19	19	19	19
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.89	1.95	1.63	1.47
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.95	1.47	1.32	1.24
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.95	1.47	1.32	1.24
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	52.49	39.57	35.53	33.38
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.55	3.84	5.17	6.48
NBC	55.04	43.41	40.7	39.86
SBC	18.35	14.47	13.57	13.29
Recommended SBC for sattlement of 40mm	18.35	14.47	13.57	13.29
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	14	15.8	16.4	17.2
Settlement (S)	25.69	22.86	22.25	22.86
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	5.99	4.72	4.43	4.34
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	26
Local shear failure	17



SBC & Settlement Summary of AP-220								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	16.84	22.45	25.66	22.78	34.49	44.12	55.04
SBC	1 x 1	5.61	7.48	8.55	7.59	11.5	14.71	18.35
BC for sattlement of 40mm	1 x 1	5.61	7.48	8.55	7.59	11.50	14.71	18.35
Settlement (S)	1 x 1	5.22	7.69	8.79	10.63	16.1	20.59	25.69
NBC	2 x 2	15.44	19.24	20.85	22.85	29.26	36.21	43.41
SBC	2 x 2	5.15	6.41	6.95	7.62	9.75	12.07	14.47
BC for sattlement of 40mm	2 x 2	5.15	6.41	6.95	7.62	9.75	12.07	14.47
Settlement (S)	2 x 2	9.59	13.19	14.3	12.04	15.41	19.07	22.86
NBC	3 x 3	15.01	18.12	19.24	22.77	28.47	34.28	40.7
SBC	3 x 3	5	6.04	6.41	7.59	9.49	11.43	13.57
BC for sattlement of 40mm	3 x 3	5.00	6.04	6.41	7.59	9.49	11.43	13.57
Settlement (S)	3 x 3	13.96	18.64	19.78	12.45	15.56	18.75	22.25
NBC	4 x 4	14.73	17.64	18.44	23.5	28.61	33.96	39.86
SBC	4 x 4	4.91	5.88	6.15	7.83	9.54	11.32	13.29
BC for sattlement of 40mm	4 x 4	4.91	5.88	6.15	7.83	9.54	11.32	13.29
Settlement (S)	4 x 4	18.28	24.19	25.3	13.47	16.41	19.47	22.86



Bearing Capacity as per IS 6403:1981 (AP-241) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.89	1.89	1.89	1.89
C	2.5	2.5	2.5	2.5
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0016	0.0016	0.0016	0.0016
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.89	0.89	0.89	0.89
$C.N_c.s_c.d_c.i_c$	20.05	18.38	17.87	17.54
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	20.05	18.38	17.87	17.54
SBC	6.68	6.13	5.96	5.85
Recommended SBC for sattlement of 40mm	6.68	6.13	5.96	5.85
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	5.23	9.61	14.01	18.34
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.18	2.00	1.95	1.91
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981	(AP-241) (Depth =2m)			
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	1.54	1.27	1.18	1.14
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.27	1.14	1.09	1.07
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.27	1.14	1.09	1.07
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	10.26	8.66	8.28	8.13
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.65	2.96	4.25	5.56
NBC	11.91	11.62	12.53	13.69
SBC	3.97	3.87	4.18	4.56
Recommended SBC for sattlement of 40mm	3.97	3.87	4.18	4.56
For Settlement				
of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	8.54	9.68	11.29	13.22
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.30	1.26	1.36	1.49
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981	(AP-241) (Depth =3m)			
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	1.81	1.41	1.27	1.2
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.41	1.2	1.14	1.1
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.41	1.2	1.14	1.1
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D_f(Nq-1).s_q.d_q.i_q$	16.07	13.68	13	12.54
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	1.83	3.12	4.44	5.72
NBC	17.9	16.8	17.44	18.26
SBC	5.97	5.6	5.81	6.09
Recommended SBC for sattlement of 40mm	5.97	5.60	5.81	6.09
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	12.84	14	15.69	17.66
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	1.95	1.83	1.90	1.99
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-241) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.08	1.54	1.36	1.27
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.54	1.27	1.18	1.14
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.54	1.27	1.18	1.14
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	20.52	19.3	17.94	17.33
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2	3.3	4.6	5.92
NBC	22.52	22.6	22.54	23.25
SBC	7.51	7.53	7.51	7.75
Recommended SBC for sattlement of 40mm	7.51	7.53	7.51	7.75
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	16.15	18.83	20.28	22.48
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.45	2.46	2.45	2.53
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-241) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.35	1.68	1.45	1.34
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.68	1.34	1.23	1.17
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.68	1.34	1.23	1.17
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	31.92	25.46	23.37	22.23
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.18	3.48	4.79	6.08
NBC	34.1	28.94	28.16	28.31
SBC	11.37	9.65	9.39	9.44
Recommended SBC for sattlement of 40mm	11.37	9.65	9.39	9.44
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	24.45	24.13	25.35	27.38
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.71	3.15	3.07	3.08
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-241) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.62	1.81	1.54	1.41
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.81	1.41	1.27	1.2
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.81	1.41	1.27	1.2
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	41.27	32.15	28.96	27.36
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.35	3.66	4.95	6.24
NBC	43.62	35.81	33.91	33.6
SBC	14.54	11.94	11.3	11.2
Recommended SBC for sattlement of 40mm	14.54	11.94	11.30	11.20
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	31.26	29.85	30.51	32.48
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.75	3.90	3.69	3.66
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



Bearing Capacity as per IS 6403:1981 (AP-241) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.84	1.84	1.84	1.84
C	0	0	0	0
Ø	17	17	17	17
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	14	14	14	14
m_v	0	0	0	0
Nc	12.34	12.34	12.34	12.34
Nq	4.77	4.77	4.77	4.77
Ny	3.53	3.53	3.53	3.53
Sc	1.3	1.3	1.3	1.3
Dc	2.89	1.95	1.63	1.47
Sq	1.2	1.2	1.2	1.2
Dq=Dγ	1	1	1	1
Dq=Dγ	1.95	1.47	1.32	1.24
Sγ	0.8	0.8	0.8	0.8
Dq=Dγ	1.95	1.47	1.32	1.24
Tan(45+Ø /2)	1.35	1.35	1.35	1.35
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.84	0.84	0.84	0.84
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	51.87	39.1	35.11	32.99
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.53	3.82	5.14	6.44
NBC	54.4	42.92	40.25	39.43
SBC	18.13	14.31	13.42	13.14
Recommended SBC for sattlement of 40mm	18.13	14.31	13.42	13.14
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	21.5	25	27	29
Settlement (S)	38.98	35.78	36.23	38.11
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	5.92	4.67	4.38	4.29
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	25
Local shear failure	17



SBC & Settlement Summary of AP-241								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	20.05	11.91	17.9	22.52	34.1	43.62	54.4
SBC	1 x 1	6.68	3.97	5.97	7.51	11.37	14.54	18.13
BC for sattlement of 40mm	1 x 1	6.68	3.97	5.97	7.51	11.37	14.54	18.13
Settlement (S)	1 x 1	5.23	8.54	12.84	16.15	24.45	31.26	38.98
NBC	2 x 2	18.38	11.62	16.8	22.6	28.94	35.81	42.92
SBC	2 x 2	6.13	3.87	5.6	7.53	9.65	11.94	14.31
BC for sattlement of 40mm	2 x 2	6.13	3.87	5.60	7.53	9.65	11.94	14.31
Settlement (S)	2 x 2	9.61	9.68	14	18.83	24.13	29.85	35.78
NBC	3 x 3	17.87	12.53	17.44	22.54	28.16	33.91	40.25
SBC	3 x 3	5.96	4.18	5.81	7.51	9.39	11.3	13.42
BC for sattlement of 40mm	3 x 3	5.96	4.18	5.81	7.51	9.39	11.30	13.42
Settlement (S)	3 x 3	14.01	11.29	15.69		25.35	30.51	36.23
NBC	4 x 4	17.54	13.69	18.26	23.25	28.31	33.6	39.43
SBC	4 x 4	5.85	4.56	6.09	7.75	9.44	11.2	13.14
BC for sattlement of 40mm	4 x 4	5.85	4.56	6.09	7.75	9.44	11.20	13.14
Settlement (S)	4 x 4	18.34	13.22	17.66	22.48	27.38	32.48	38.11



Bearing Capacity as per IS 6403:1981 (AP-252) (Depth =1m)				
Depth (D)	1	1	1	1
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.88	1.88	1.88	1.88
C	2.8	2.8	2.8	2.8
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.2	1.1	1.07	1.05
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.1	1.05	1.03	1.03
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	22.45	20.58	20.02	19.65
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	22.45	20.58	20.02	19.65
SBC	7.48	6.86	6.67	6.55
Recommended SBC for sattlement of 40mm	7.48	6.86	6.67	6.55
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	8.06	14.78	21.56	28.23
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.44	2.24	2.18	2.14
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-252) (Depth =2m)				
Depth (D)	2	2	2	2
Width (B)	1	2	3	4
Bulk Dencit (y)	1.88	1.88	1.88	1.88
C	2.8	2.8	2.8	2.8
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.4	1.2	1.13	1.1
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.2	1.1	1.07	1.05
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iγ	1	1	1	1
Submarged Dencit (y')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	26.19	22.45	21.14	20.58
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	26.19	22.45	21.14	20.58
SBC	8.73	7.48	7.05	6.86
Recommended SBC for sattlement of 40mm	8.73	7.48	7.05	6.86
For Settlement				
of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	9.41	16.12	22.79	29.57
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	2.85	2.44	2.30	2.24
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-252) (Depth =3m)				
Depth (D)	3	3	3	3
Width (B)	1	2	3	4
Bulk Dencit (y)	1.88	1.88	1.88	1.88
C	2.8	2.8	2.8	2.8
Ø	0	0	0	0
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	0	0	0	0
m_v	0.0022	0.0022	0.0022	0.0022
Nc	5.14	5.14	5.14	5.14
Nq	1	1	1	1
Ny	0	0	0	0
Sc	1.3	1.3	1.3	1.3
Dc	1.6	1.3	1.2	1.15
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.3	1.15	1.1	1.08
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1	1	1	1
Tan(45+Ø /2)	1	1	1	1
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.88	0.88	0.88	0.88
$C.N_c.s_c.d_c.i_c$	29.94	24.32	22.45	21.52
$\gamma'D.(Nq-1).s_q.d_q.i_q$	0	0	0	0
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	0	0	0	0
NBC	29.94	24.32	22.45	21.52
SBC	9.98	8.11	7.48	7.17
Recommended SBC for sattlement of 40mm	9.98	8.11	7.48	7.17
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	0	0	0	0
Settlement (S)	10.75	17.48	24.18	30.9
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.26	2.65	2.44	2.34
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3



Bearing Capacity as per IS 6403:1981 (AP-252) (Depth =4m)				
Depth (D)	4	4	4	4
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	27	27	27	27
m_v	0	0	0	0
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.12	1.56	1.37	1.28
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.56	1.28	1.19	1.14
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.56	1.28	1.19	1.14
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	27.42	25.07	23.3	22.33
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.7	4.43	6.18	7.9
NBC	30.12	29.5	29.48	30.23
SBC	10.04	9.83	9.83	10.08
Recommended SBC for sattlement of 40mm	10.04	9.83	9.83	10.08
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	8.7	9.2	10.8	11.6
Settlement (S)	8.73	9.04	10.62	11.69
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	3.28	3.21	3.21	3.29
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	28
Local shear failure	19



Bearing Capacity as per IS 6403:1981 (AP-252) (Depth =5m)				
Depth (D)	5	5	5	5
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	27	27	27	27
m_v	0	0	0	0
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.4	1.7	1.47	1.35
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.7	1.35	1.23	1.18
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.7	1.35	1.23	1.18
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iy	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	41.62	33.05	30.11	28.89
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	2.94	4.68	6.39	8.17
NBC	44.56	37.73	36.5	37.06
SBC	14.85	12.58	12.17	12.35
Recommended SBC for sattlement of 40mm	14.85	12.58	12.17	12.35
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	8.7	9.2	10.8	11.6
Settlement (S)	12.92	11.57	13.14	14.33
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	4.85	4.11	3.97	4.03
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	28
Local shear failure	19



Bearing Capacity as per IS 6403:1981 (AP-252) (Depth =6m)				
Depth (D)	6	6	6	6
Width (B)	1	2	3	4
Bulk Dencit (γ)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	27	27	27	27
m_v	0	0	0	0
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.68	1.84	1.56	1.42
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.84	1.42	1.28	1.21
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.84	1.42	1.28	1.21
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iγ	1	1	1	1
Submarged Dencit (γ')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	54.05	41.71	37.6	35.54
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	3.19	4.92	6.65	8.38
NBC	57.24	46.63	44.25	43.92
SBC	19.08	15.54	14.75	14.64
Recommended SBC for sattlement of 40mm	19.08	15.54	14.75	14.64
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	8.7	9.2	10.8	11.6
Settlement (S)	16.6	14.3	15.93	16.98
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	6.23	5.07	4.82	4.78
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	28
Local shear failure	19



Bearing Capacity as per IS 6403:1981 (AP-252) (Depth =7m)				
Depth (D)	7	7	7	7
Width (B)	1	2	3	4
Bulk Dencit (y)	1.85	1.85	1.85	1.85
C	0	0	0	0
Ø	19	19	19	19
W'	0.5	0.5	0.5	0.5
FOS	3	3	3	3
N Value	27	27	27	27
m_v	0	0	0	0
Nc	13.93	13.93	13.93	13.93
Nq	5.8	5.8	5.8	5.8
Ny	4.68	4.68	4.68	4.68
Sc	1.3	1.3	1.3	1.3
Dc	2.96	1.98	1.65	1.49
Sq	1.2	1.2	1.2	1.2
Dq=Dy	1	1	1	1
Dq=Dy	1.98	1.49	1.33	1.25
Sy	0.8	0.8	0.8	0.8
Dq=Dy	1.98	1.49	1.33	1.25
Tan(45+Ø /2)	1.4	1.4	1.4	1.4
ic, iq & iy	1	1	1	1
Submarged Dencit (y')	0.85	0.85	0.85	0.85
$C.N_c.s_c.d_c.i_c$	0	0	0	0
$\gamma'D.(Nq-1).s_q.d_q.i_q$	67.86	51.07	45.58	42.84
$0.5.\gamma.B.N\gamma.s_\gamma.d_\gamma.i_\gamma W'$	3.43	5.16	6.91	8.66
NBC	71.29	56.23	52.49	51.5
SBC	23.76	18.74	17.5	17.17
Recommended SBC for sattlement of 40mm	23.76	18.74	17.50	17.17
For Settlement				
Sattlement Factor (As per Fig 9 of IS 8009 (Part-I) 1976	8.7	9.2	10.8	11.6
Settlement (S)	20.67	17.24	18.9	19.92
ΔP = (SBC x Footing Size)/(width of Foundation +Layer Depth)^2 =	7.76	6.12	5.71	5.61
H (1.5 x B)	1500	3000	4500	6000
Layer Depth = (1.5 x B)/2	0.75	1.5	2.25	3

Design	Ø
General shear failure	28
Local shear failure	19



SBC & Settlement Summary of AP-252								
Depth (D)		1	2	3	4	5	6	7
Footing Size								
NBC	1 x 1	22.45	26.19	29.94	30.12	44.56	57.24	71.29
SBC	1 x 1	7.48	8.73	9.98	10.04	14.85	19.08	23.76
BC for sattlement of 40mm	1 x 1	7.48	8.73	9.98	10.04	14.85	19.08	23.76
Settlement (S)	1 x 1	8.06	9.41	10.75	8.73	12.92	16.6	20.67
NBC	2 x 2	20.58	22.45	24.32	29.5	37.73	46.63	56.23
SBC	2 x 2	6.86	7.48	8.11	9.83	12.58	15.54	18.74
BC for sattlement of 40mm	2 x 2	6.86	7.48	8.11	9.83	12.58	15.54	18.74
Settlement (S)	2 x 2	14.78	16.12	17.48	9.04	11.57	14.3	17.24
NBC	3 x 3	20.02	21.14	22.45	29.48	36.5	44.25	52.49
SBC	3 x 3	6.67	7.05	7.48	9.83	12.17	14.75	17.5
BC for sattlement of 40mm	3 x 3	6.67	7.05	7.48	9.83	12.17	14.75	17.50
Settlement (S)	3 x 3	21.56	22.79	24.18	10.62	13.14	15.93	18.9
NBC	4 x 4	19.65	20.58	21.52	30.23	37.06	43.92	51.5
SBC	4 x 4	6.55	6.86	7.17	10.08	12.35	14.64	17.17
BC for sattlement of 40mm	4 x 4	6.55	6.86	7.17	10.08	12.35	14.64	17.17
Settlement (S)	4 x 4	28.23	29.57	30.9	11.69	14.33	16.98	19.92



A.6.0. CHEMICAL TESTS

Chemical tests were performed on soil and water samples for determining the pH value, Sulphate, Chloride content etc. The results are given in a tabular form below:

a. Chemical Test on Water Sample
Bore Hole No.- AP-29
Depth – 1.50M

Physical Test Findings:
1. Colour-Colourless **2.**Odour-Agreeable

Chemical Test Findings:

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS: 3025(Part11):1983 Reaffirmed 2012	.....	6.36
2	conductivity at 25^0C	IS: 3025(Part14):2013 Reaffirmed 2006	µS/cm	231
3	Chloride as CL	IS:3025(Part-32):1988 Reaffirmed 2009	mg/l	30
4	Nitrate as NO_3	IS:3025(Part-34):1988 Reaffirmed 2009	mg/l	<1
5	Turbidity	IS:3025(Part-10):1984 Reaffirmed 2012	NTU	94.00
6	Organic matter	IS:3025(Part-47):1994	mg/l	187.0

Minimum detection limit: (i) Nitrate: 1.0mg/l

Bore Hole No-In between AP-170
Depth –1.00M

Physical Test Findings:
1.Colour-Colourless **2.**Odour-Agreeable

Chemical Test Findings:

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS: 3025(Part11):1983 Reaffirmed 2012	.....	6.43
2	conductivity at 25^0C	IS: 3025(Part14):2013 Reaffirmed 2006	µS/cm	216
3	Chloride as CL	IS:3025(Part-32):1988 Reaffirmed 2009	mg/l	38
4	Nitrate as NO_3	IS:3025(Part-34):1988 Reaffirmed 2009	mg/l	<1
5	Turbidity	IS:3025(Part-10):1984 Reaffirmed 2012	NTU	95.10
6	Organic matter	IS:3025(Part-47):1994	mg/l	193.0

Minimum detection limit: (i) Nitrate: 1.0mg/l

b. Chemical Test on Soil Sample
Bore Hole No.- AP-29

Depth –3.00-3.45 M

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS:2720(Part-26):1987	.....	2.64
2	Organic Matter(OM)	IS:2720(Part-22):1972	%	0.28
3	Calcium carbonate ($caco_3$)	IS:2720(Part-23):1976	%	19.19
4	Sulphate(SO_3)	IS:2720(Part-27):1977	mg/kg	5.48
5	Sulphate(SO_4)	IS:2720(Part-27):1977	mg/kg	7.95
6	Chloride	IS:3025(Part-32):1988	%	0.024
7	Salinity as Conductivity	IS:14767-2000	ms	1.68
8	Nitrate	SOP No: RVB/SOP/05/25 As per ICAR 2011 (Department of Agriculture & cooperation , Ministry of Agriculture, Govt. of India)	mg/kg	0.58

Bore Hole No- In between AP-170
Depth –3.00-3.45 M

SL NO	Test Parameters	Test Method	Unit	Result
1	pH value	IS:2720(Part-26):1987	.....	2.69
2	Organic Matter (OM)	IS:2720(Part-22):1972	%	0.35
3	Calcium carbonate ($caco_3$)	IS:2720(Part-23):1976	%	21.15
4	Sulphate(SO_3)	IS:2720(Part-27):1977	mg/kg	5.90
5	Sulphate(SO_4)	IS:2720(Part-27):1977	mg/kg	8.06
6	Chloride	IS:3025(Part-32):1988	%	0.028
7	Salinity as Conductivity	IS:14767-2000	ms	1.66
8	Nitrate	SOP No: RVB/SOP/05/25 As per ICAR 2011 (Department of Agriculture & cooperation , Ministry of Agriculture, Govt. of India)	mg/kg	0.63

Chemical test was carried out on a soil and water samples to determine the pH value, Sulphate and Chloride. It is seen that the values are within permissible limits (as per IS: 456-2000) and so no special cement will be required for foundation concrete. **Either Ordinary Portland cement or Portland slag cement or Portland Pozzolana cement can be used for concreting.**

A.7.0 CONCLUSION AND RECOMMENDATION :

From engineering properties of the deposit following recommendations for foundation are suggested:

Based on the field tests and the foregoing discussion the following are summarized:

a) The subsoil is characterized by clayey silt traces of sand in stratum-I and silty sand with mica continues up to terminating depth of maximum boreholes.

b) The present report deals with the geotechnical investigation findings at the location and the discussion on the aspects regarding allowable bearing capacity of open foundations. However, the Foundation Designer may modulate the type of foundations and other values regarding foundation geometry and soil design parameter to meet any specific design criteria.

c) Water level observations were made during the progress of boring. The depths at which ground water was encountered, was recorded in the respective borelog sheet as standing water level. Standing water level was measured after 24 hours of removal of casing. It was noticed that the standing water level was found within a depth of 1.00 m to 3.50 m below EGL.

d) Precaution in all respect should be taken for nearby existing structures, if any. The final decision regarding the foundation will depend on the judgment of the engineer concerned.

e) Any unsuitable expansive/decomposed if encountered should be replaced.

f) The foundation spacing should be chosen in such a way that there should not be any overlap of pressure bulb of 2 adjacent footings.

g) Determination of recommended allowable bearing capacity has been discussed in the section **5.1 (Sample calculation of SBC) for Shallow Foundation.**

h) Concentration of chlorides, sulphates & pH value are under limit as per IS Code specification. So no special cement will be required for foundation concrete.

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ANNEXURE

FIELD BORE LOG DATA

M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-3	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Barren Land	Northing :-	26°14'12.5"				
Commenced on:-	21.08.2026	Easting :-	90°19'20.8"	SPT	5	Undisturbed (U)	3
Completed on:-	21.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	5
Water Level :- 1.60 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Stiff consistency, dark grey clayey silt traces of sand with mica.			D	1	0.50	----			
								D	2	1.00	----			
								U	1	1.50	1.95			
2.50	3	5	5	10			2.50	S	1	2.00	2.45			
2.50	2	2	4	6	Loose, dark grey silty fine sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
4.50							2.00	D	3	4.50	----			
4.50					Medium stiff, dark grey clayey silt.									
	2	3	4	7				S	3	5.00	5.45			
6.00							1.50							
6.00					Loose, to medium, dark grey silty sand with mica.			U	3	6.00	6.45			
								D	4	6.50	----			
	3	5	8	13				S	4	7.00	7.45			
								D	5	8.50	----			
10.00	7	11	13	24			4.00	S	5	10.00	10.45			

'S' - 'SPT' | 'C' - 'CORE' | 'U' - 'UNDISTURBED SAMPLE' | 'D' - 'DISTURBED SAMPLE' | 'W' - 'WATER SAMPLE' | 'BGL' - 'BELOW GROUND LEVEL'

P.K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-29	Borehole Diameter :- 150 mm Drill Hole:- NX		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°20'10.7"				
Commenced on:-	22.08.2026	Easting :-	90°26'00.6"	SPT	6	Undisturbed (U)	3
Completed on:-	22.08.2026	Termination Depth (m):-10.00 M		Cone	-	Disturbed (D)	4
Water Level :- 1.50 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Medium stiff, brownish to dark grey clayey silt.			D	1	0.50	----			
								D	2	1.00	----			
								U	1	1.50	1.95			
3.00	2	2	3	5			3.00	S	1	2.00	2.45			
3.00	3	3	3	6	Loose light dark grey silty fine sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
5.00							5.00	D	3	4.50	----			
5.00	4	5	9	14	Medium, dark grey silty sand with mica.			S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	7	9	13	22				S	4	7.00	7.45			
	10	13	15	28				S	5	8.50	8.95			
10.00	11	15	21	36			5.00	S	6	10.00	10.45			

'S' - 'SPT' 'C' - 'CORE' 'U' - 'UNDISTURBED SAMPLE' 'D' - 'DISTURBED SAMPLE' 'W' - 'WATER SAMPLE' 'BGL' - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-47	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°22'38.6"				
Commenced on:-	23.08.2026	Easting :-	90°27'55.4"	SPT	6	Undisturbed (U)	3
Completed on:-	23.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 1.40 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Stiff consistency, brownish to dark grey sandy clay.			D	1	0.50	----			
0.50							0.50	D	2	1.00	---			
					Loose, light dark grey silty fine sand with mica.			U	1	1.50	1.95			
3.00	3	4	4	8			2.50	S	1	2.00	2.45			
3.00	4	4	6	10				S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	----			
	5	6	8	14				S	3	5.00	5.45			
					Loose to medium, dark grey silty sand with mica.			U	3	6.00	6.45			
								D	4	6.50	---			
	8	10	13	23				S	4	7.00	7.45			
	10	13	15	28				S	5	8.50	8.95			
10.00	11	15	19	34			7.00	S	6	10.00	10.45			

'S' - 'SPT' | 'C' - 'CORE' | 'U' - 'UNDISTURBED SAMPLE' | 'W' - 'WATER SAMPLE' | 'BGL' - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	AP-52	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Barren Land	Northing :-	26°23'17.0"				
Commenced on:-	23.08.2026	Easting :-	90°28'52.3"	SPT	6	Undisturbed (U)	3
Completed on:-	23.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 2.50 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)`	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Stiff, brownish grey clayey sand.			D	1	0.50	----			
0.50							0.50							
0.50					Loose light, brownish grey silty fine sand with mica.			D	2	1.00	----			
								U	1	1.50	1.95			
2.50	2	2	2	4			2.00	S	1	2.00	2.45			
2.50	2	2	3	5	Loose, dark grey silty fine sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
5.00							2.50	D	3	4.50	---			
5.00	3	4	6	10	Medium consistency, dark grey silty sand with mica.			S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	---			
	4	7	9	16				S	4	7.00	7.45			
	5	8	11	19				S	5	8.50	8.95			
10.00	7	10	15	25			5.00	S	6	10.00	10.45			

'S' - 'SPT' 'C' - 'CORE' 'U' - 'UNDISTURBED SAMPLE' 'D" - 'DISTURBED SAMPLE' 'W' - 'WATER SAMPLE' 'BGL" - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	AP-66	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°28'6.7"				
Commenced on:-	24.08.2026	Easting :-	90°28'47.7"	SPT	6	Undisturbed (U)	3
Completed on:-	24.08.2026	Termination Depth (m):-10.00 M		Cone	-	Disturbed (D)	4
Water Level :- 1.10 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Loose, light dark grey silty sand with mica.			D	1	0.50	---			
								D	2	1.00	----			
								U	1	1.50	1.95			
3.00	2	3	3	6			3.00	S	1	2.00	2.45			
3.00	4	6	7	13	Medium consistency, dark grey silty sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	---			
6.00	7	12	15	27			3.00	S	3	5.00	5.45			
6.00					Medium to dense, dark grey silty medium to courses sand with nodules			U	3	6.00	6.45			
								D	4	6.50	---			
	12	16	20	36				S	4	7.00	7.45			
	13	18	23	41				S	5	8.50	8.95			
10.00	13	20	25	45			4.00	S	6	10.00	10.45			

"S" - "SPT" "C" - "CORE" "U" - "UNDISTURBED SAMPLE" "D" - "DISTURBED SAMPLE" "W" - "WATER SAMPLE" "BGL" - "BELOW GROUND LEVEL"



M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	AP-73	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Barren Land	Northing :-	26°31'31.3"				
Commenced on:-	25.08.2026	Easting :-	90°28'48.5"	SPT	6	Undisturbed (U)	3
Completed on:-	25.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 2.60 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Soft to medium dark grey clayey silt traces of sand with mica.			D	1	0.50	---			
								D	2	1.00	---			
								U	1	1.50	1.95			
2.50	2	2	2	4			2.50	S	1	2.00	2.45			
2.50	3	5	6	11	Medium, dark grey silty medium sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	---			
	5	7	9	16				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	---			
	5	9	15	24				S	4	7.00	7.45			
	7	12	16	28				S	5	8.50	8.95			
10.00	10	14	21	35			10.00	S	6	10.00	10.45			

"S" - "SPT" "C" - "CORE" "U" - "UNDISTURBED SAMPLE" "D" - "DISTURBED SAMPLE" "W" - "WATER SAMPLE" "BGL" - "BELOW GROUND LEVEL"

P. K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	AP-109	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°32'8.5"				
Commenced on:-	25.08.2026	Easting :-	90°33'53.9"	SPT	6	Undisturbed (U)	3
Completed on:-	25.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 2.30M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Loose, light dark grey silty fine to medium sand with mica.			D	1	0.50	---			
								D	2	1.00	---			
								U	1	1.50	1.95			
3.00	3	3	4	7			3.00	S	1	2.00	2.45			
3.00	5	5	6	11	Medium, dark grey silty sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	----			
	6	8	11	19				S	3	5.00	5.45			
								U	3	6.00	6.45			
7.00							7.00	D	4	6.50	----			
7.00	8	12	15	27	Medium to dense, dark grey silty medium sand with nodules			S	4	7.00	7.45			
	8	13	19	32				S	5	8.50	8.95			
10.00	12	17	23	40			3.00	S	6	10.00	10.45			

'S' - 'SPT' 'C' - 'CORE' 'U' - 'UNDISTURBED SAMPLE' 'D' - 'DISTURBED SAMPLE' 'W' - 'WATER SAMPLE' 'BGL' - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	**Client:** ASSAM ELECTRICITY GRID CORPORATION LIMITED. **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-120	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Barren Land	Northing :-	26°32'54.7"				
Commenced on:-	26.08.2026	Easting :-	90°37'47.2"	SPT	6	Undisturbed (U)	3
Completed on:-	26.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 2.10 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Soft to medium, dark grey clayey silt traces of sand.			D	1	0.50	----			
								D	2	1.00	----			
								U	1	1.50	1.95			
	2	2	3	5				S	1	2.00	2.45			
3.50	2	2	3	5			3.50	S	2	3.00	3.45			
3.50					Loose to medium, dark grey silty medium sand with mica.			U	2	4.00	4.45			
5.00							1.50	D	3	4.50	----			
5.00	4	7	9	16	Medium to dense, dark grey silty medium to coarses sand with gravels.			S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	10	11	16	27				S	4	7.00	7.45			
	10	14	17	31				S	5	8.50	8.95			
10.00	13	20	24	44			5.00	S	6	10.00	10.45			

"S" - "SPT" "C" - "CORE" "U" - "UNDISTURBED SAMPLE" "D" - "DISTURBED SAMPLE" "W" - "WATER SAMPLE" "BGL" - "BELOW GROUND LEVEL"

P.K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	AP-131	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°34'17.1"				
Commenced on:-	26.08.2026	Easting :-	90°40'07.3"	SPT	6	Undisturbed (U)	3
Completed on:-	26.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 1.80 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Stiff consistency, dark grey clayey silt.			D	1	0.50	----			
1.50							1.50	D	2	1.00	----			
1.50					Loose, dark grey silty fine sand with mica.			U	1	1.50	1.95			
2.50	4	5	6	11			1.00	S	1	2.00	2.45			
2.50	6	10	13	23	Medium, dark grey silty medium sand with gravels.			S	2	3.00	3.45			
								U	2	4.00	4.45			
5.00							2.50	D	3	4.50	----			
5.00	10	13	17	30	Dense, dark grey silty medium to coarses sand with gravels.			S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	13	17	25	42				S	4	7.00	7.45			
	17	20	29	49				S	5	8.50	8.95			
10.00	19	24	33	57			5.00	S	6	10.00	10.45			

"S" - "SPT" "C" - "CORE" "U" - "UNDISTURBED SAMPLE" "D" - "DISTURBED SAMPLE" "W" - "WATER SAMPLE" "BGL" - "BELOW GROUND LEVEL"

P. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	**Client:** ASSAM ELECTRICITY GRID CORPORATION LIMITED **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	LOC - 137/2	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°33'48.2"				
Commenced on:-	27.08.2026	Easting :-	90°45'39.8"	SPT	6	Undisturbed (U)	3
Completed on:-	27.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 1.50 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Stiff consistency, brownish grey clayey silt traces of sand with mica.			D	1	0.50	---			
								D	2	1.00	---			
								U	1	1.50	1.95			
3.00	3	4	5	9			3.00	S	1	2.00	2.45			
3.00	3	3	5	8	Loose, dark grey silty fine sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
5.00							2.00	D	3	4.50	---			
5.00	5	7	13	20	Medium to dense, dark grey silty medium sand with gravels.			S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	---			
	7	12	17	29				S	4	7.00	7.45			
	11	18	24	42				S	5	8.50	8.95			
10.00	16	23	32	55			5.00	S	6	10.00	10.45			

'S' - 'SPT' | 'C' - 'CORE' | 'U' - 'UNDISTURBED SAMPLE' | 'D' - 'DISTURBED SAMPLE' | 'W' - 'WATER SAMPLE' | 'BGL' - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	**Client:** ASSAM ELECTRICITY GRID CORPORATION LIMITED. **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	AP-141	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°35'33.2"				
Commenced on:-	27.08.2026	Easting :-	90°49'7.5"	SPT	6	Undisturbed (U)	3
Completed on:-	27.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 1.60 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Medium stiff, dark grey clayey silt traces of sand with mica.			D	1	0.50	---			
								D	2	1.00	----			
2.00							2.00	U	1	1.50	1.95			
2.00	2	2	3	5	Loose to medium, dark grey silty sand with mica.			S	1	2.00	2.45			
4.00	3	5	6	11			2.00	S	2	3.00	3.45			
4.00					Medium to dense, dark grey silty sand mixed with gravels.			U	2	4.00	4.45			
								D	3	4.50	---			
	5	10	13	23				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	8	14	17	31				S	4	7.00	7.45			
	13	20	24	44				S	5	8.50	8.95			
10.00	17	23	36	59			6.00	S	6	10.00	10.45			

'S' - 'SPT'	'C' - 'CORE'	'U' - 'UNDISTURBED SAMPLE'	'D' - 'DISTURBED SAMPLE'	'W' - 'WATER SAMPLE'	'BGL' - BELOW GROUND LEVEL'

P. K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	**Client:** ASSAM ELECTRICITY GRID CORPORATION LIMITED. **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	LOC-151/2	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Barren Land	Northing :-	26°35'47.3"				
Commenced on:-	28.08.2026	Easting :-	90°52'1.4"	SPT	6	Undisturbed (U)	3
Completed on:-	28.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 3.50 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Loose, dark grey silty fine sand with mica.			D	1	0.50	----			
								D	2	1.00	----			
								U	1	1.50	1.95			
3.00	4	4	6	10			3.00	S	1	2.00	2.45			
3.00	7	11	15	26	Medium to dense, dark grey silty sand with gravels.			S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	----			
	11	15	19	34				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	13	18	23	41				S	4	7.00	7.45			
	14	20	26	46				S	5	8.50	8.95			
10.00	17	25	37	62			7.00	S	6	10.00	10.45			

'S' - 'SPT' | 'C' - 'CORE' | 'U' - 'UNDISTURBED SAMPLE' | 'D' - 'DISTURBED SAMPLE' | 'W' - 'WATER SAMPLE' | 'BGL' - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	LOC-157/3	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°35'40.3"				
Commenced on:-	28.08.2026	Easting :-	90°55'30.3"	SPT	6	Undisturbed (U)	3
Completed on:-	28.08.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	4
Water Level :- 2.70 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	Penetration 15 cm	Penetration 15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	SAMPLES No.	SAMPLES Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Stiff consistency, brownish grey clayey silt.			D	1	0.50	----			
1.50							1.50	D	2	1.00	----			
1.50					Loose to medium, dark grey silty sand with mica & gravels.			U	1	1.50	1.95			
	2	3	5	8				S	1	2.00	2.45			
	5	7	10	17				S	2	3.00	3.45			
								U	2	4.00	4.45			
5.00							3.50	D	3	4.50	----			
5.00	7	11	19	30	Dense, dark grey medium to coarses sand with gravels.			S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	10	16	22	38				S	4	7.00	7.45			
	11	19	24	43				S	5	8.50	8.95			
10.00	19	25	31	56			5.00	S	6	10.00	10.45			

'S' - 'SPT' 'C' - 'CORE' 'U' - 'UNDISTURBED SAMPLE' 'D' - 'DISTURBED SAMPLE' 'W' - 'WATER SAMPLE' 'BGL' - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	**Client:** ASSAM ELECTRICITY GRID CORPORATION LIMITED. **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-170	Borehole Diameter :- 150 mm Drill Hole:- NX		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°35'47.8"				
Commenced on:-	11.09.2026	Easting :-	91°2'50.4"	SPT	5	Undisturbed (U)	3
Completed on:-	11.09.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	5
Water Level :- 1.00 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Loose, dark grey silty sand with mica.			D	1	0.50	----			
								D	2	1.00	----			
2.00							2.00	U	1	1.50	1.95			
2.00	6	6	7	13	Medium, dark grey silty sand with mica & gravels.			S	1	2.00	2.45			
	7	9	12	21				S	2	3.00	3.45			
								U	2	4.00	4.45			
5.00							3.00	D	3	4.50	----			
5.00	13	15	20	35	Dense to very dense, dark grey medium sand with gravels.			S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	15	23	28	51				S	4	7.00	7.45			
								D	5	8.50	----			
10.00	16	27	42	69			5.00	S	5	10.00	10.45			

"S" - "SPT" "C" - "CORE" "U" - "UNDISTURBED SAMPLE" "D" - "DISTURBED SAMPLE" "W" - "WATER SAMPLE" "BGL" - "BELOW GROUND LEVEL"



M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-182	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°35'36"				
Commenced on:-	11.09.2026	Easting :-	91°8'44"	SPT	5	Undisturbed (U)	4
Completed on:-	11.09.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	5
Water Level :- 1.50 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Medium stiff, brownish to dark grey clayey silt traces of sand.			D	1	0.50	---			
								D	2	1.00	---			
								U	1	1.50	1.95			
3.00	2	2	3	5			3.00	S	1	2.00	2.45			
3.00	3	3	5	8	Stiff consistency, dark grey clayey silt with sand.			S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	---			
	3	4	6	10				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	---			
	4	6	7	13				S	4	7.00	7.45			
								U	4	8.00	8.45			
								D	5	8.50	---			
10.00	6	7	10	17			7.00	S	5	10.00	10.45			

'S' - 'SPT' 'C' - 'CORE' 'U' - 'UNDISTURBED SAMPLE' 'D' - 'DISTURBED SAMPLE' 'W' - 'WATER SAMPLE' 'BGL' - 'BELOW GROUND LEVEL'



M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-190	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°36'50.9"				
Commenced on:-	12.09.2026	Easting :-	91°12'41.9"	SPT	5	Undisturbed (U)	4
Completed on:-	12.09.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	5
Water Level :- 1.55 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Soft to medium stiff, brownish to dark grey clayey silt with sand.			D	1	0.50	----			
								D	2	1.00	----			
								U	1	1.50	1.95			
3.00	2	2	2	4			3.00	S	1	2.00	2.45			
3.00	2	2	3	5	Loose, dark grey silty fine sand with mica.			S	2	3.00	3.45			
								U	2	4.00	4.45			
5.00							2.00	D	3	4.50	----			
5.00	2	3	3	6	Medium stiff, dark grey clayey silt.			S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	2	3	4	7				S	4	7.00	7.45			
								U	4	8.00	8.45			
								D	5	8.50	----			
10.00	3	4	6	10			5.00	S	5	10.00	10.45			

"S" - "SPT" "C" - "CORE" "U" - "UNDISTURBED SAMPLE" "D" - "DISTURBED SAMPLE" "W" - "WATER SAMPLE" "BGL" - "BELOW GROUND LEVEL"



M/s P.K.Dutta & Co.	**Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED.** **Project:** Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	**BORE LOG DATA SHEET**

Bore Hole No. :-	AP-206	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°37'34.3"				
Commenced on:-	12.09.2026	Easting :-	91°20'40.4"	SPT	5	Undisturbed (U)	4
Completed on:-	12.09.2026	Termination Depth (m) :-10.00 M		Cone	-	Distubed (D)	5
Water Level :- 1.70 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Medium stiff, brownish to dark grey clayey silt with sand.			D	1	0.50	---			
								D	2	1.00	---			
								U	1	1.50	1.95			
	2	2	3	5				S	1	2.00	2.45			
	2	3	3	6				S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	----			
	3	3	4	7				S	3	5.00	5.45			
								U	3	6.00	6.45			
7.00							7.00	D	4	6.50	----			
7.00	4	4	5	9	Stiff, dark grey clayey silt traces of sand with mica.			S	4	7.00	7.45			
								U	4	8.00	8.45			
								D	5	8.50	---			
10.00	4	5	7	12			3.00	S	5	10.00	10.45			

"S" - 'SPT' | "C" - 'CORE' | "U" - 'UNDISTURBED SAMPLE' | "D" - 'DISTURBED SAMPLE' | "W" - 'WATER SAMPLE' | "BGL" - 'BELOW GROUND LEVEL'

P.K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-220	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°37'21.2"				
Commenced on:-	21.09.2026	Easting :-	91°27'1.4"	SPT	5	Undisturbed (U)	4
Completed on:-	21.09.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	5
Water Level :- 1.50 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Medium stiff, dark grey silty clay traces of sand.			D	1	0.50	----			
								D	2	1.00	----			
2.00							2.00	U	1	1.50	1.95			
2.00	2	3	3	6	Medium stiff consistency dark grey clayey silt.			S	1	2.00	2.45			
3.50	3	3	5	8			1.50	S	2	3.00	3.45			
3.50					Loose to medium, dark grey silty fine sand with mica.			U	2	4.00	4.45			
								D	3	4.50	----			
	5	7	10	17				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	7	10	13	23				S	4	7.00	7.45			
								U	4	8.00	8.45			
								D	5	8.50	----			
10.00	7	12	16	28			6.50	S	5	10.00	10.45			

"S" - "SPT" "C" - "CORE" "U" - "UNDISTURBED SAMPLE" "D" - "DISTURBED SAMPLE" "W" - "WATER SAMPLE" "BGL" - "BELOW GROUND LEVEL"

P.K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-241	Borehole Diameter :- 150 mm. Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°33'32.4"				
Commenced on:-	21.09.2026	Easting :-	91°34'37.6"	SPT	5	Undisturbed (U)	4
Completed on:-	21.09.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	5
Water Level :- 1.60 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Medium stiff, dark grey clayey silty traces of sand with mica.			D	1	0.50	---			
								D	2	1.00	---			
2.00							2.00	U	1	1.50	1.95			
2.00	2	2	3	5	Loose to medium, brownish to dark grey silty sand with mica.			S	1	2.00	2.45			
	3	3	4	7				S	2	3.00	3.45			
								U	2	4.00	4.45			
								D	3	4.50	----			
	4	6	8	14				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	----			
	5	8	12	20				S	4	7.00	7.45			
								U	4	8.00	8.45			
								D	5	8.50	----			
10.00	7	11	16	27			10.00	S	5	10.00	10.45			

'S' - 'SPT' | 'C' -'CORE' | 'U' - 'UNDISTURBED SAMPLE' | 'D' - 'DISTURBED SAMPLE' | 'W' - 'WATER SAMPLE' | 'BGL' - 'BELOW GROUND LEVEL'

P.K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	Client: ASSAM ELECTRICITY GRID CORPORATION LIMITED. Project: Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.	BORE LOG DATA SHEET

Bore Hole No. :-	AP-252	Borehole Diameter :- 150 mm Drill Hole:- NX.		Field Tests	Nos	Samples	Nos
Land Type :-	Cultivated Land	Northing :-	26°38'30.9"				
Commenced on:-	20.09.2026	Easting :-	91°36'20.2"	SPT	5	Undisturbed (U)	4
Completed on:-	20.09.2026	Termination Depth (m):-10.00 M		Cone	-	Distubed (D)	5
Water Level :- 1.00 M				Vane	-	Core (C)	-

DEPTH (m.)	Penetration 15 cm	15 cm	15 cm	N value	STRATA DESCRIPTION	Symbol	Thickness (m)	SAMPLES Type	No.	Depth (m.)		Core Recovery (%)	R.Q.D. (%)	Remarks
0.00					Medium stiff, dark grey clayey silty with mica.			D	1	0.50	---			
1.00							1.00	D	2	1.00	----			
1.00					Medium stiff, dark grey silty clay			U	1	1.50	1.95			
	2	3	3	6				S	1	2.00	2.45			
3.50	3	5	6	11			2.50	S	2	3.00	3.45			
3.50					Loose to medium dark grey silty fine sand with mica.			U	2	4.00	4.45			
								D	3	4.50	----			
	7	11	14	25				S	3	5.00	5.45			
								U	3	6.00	6.45			
								D	4	6.50	---			
7.50	13	20	27	47			4.00	S	4	7.00	7.45			
7.50					Very dense, dark grey medium to coarses sand with mica & occasionally gravels.			U	4	8.00	8.45			
								D	5	8.50	----			
10.00	17	26	36	62			2.50	S	5	10.00	10.45			

"S" - 'SPT'	"C" - 'CORE'	"U" - 'UNDISTURBED SAMPLE'	"D" - 'DISTURBED SAMPLE'	"W" - 'WATER SAMPLE'	'BGL' - 'BELOW GROUND LEVEL'



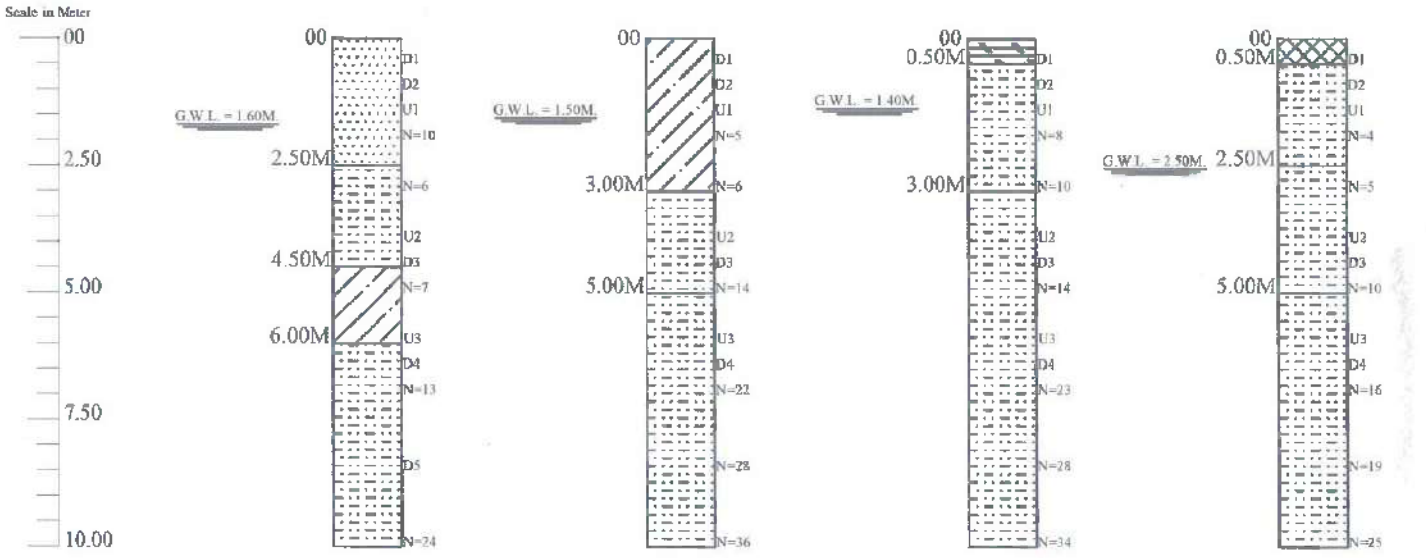
SUBSOIL PROFILE

M/s P.K.DUTTA & CO.	Generalised Subsoil Profile

CLIENT:- ASSAM ELECTRICITY GRID CORPORATION LIMITED.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Generalised Subsoil Profile



AP-3
Depth = 10.00 m.

AP-29
Depth = 10.00 m.

AP-47
Depth = 10.00 m.

AP-52
Depth = 10.00 m.

- Clayey silt traces of sand with mica.
- Silty sand/fine sand/medium sand with mica.
- Clayey silt.
- Sandy clay.
- Clayey sand.

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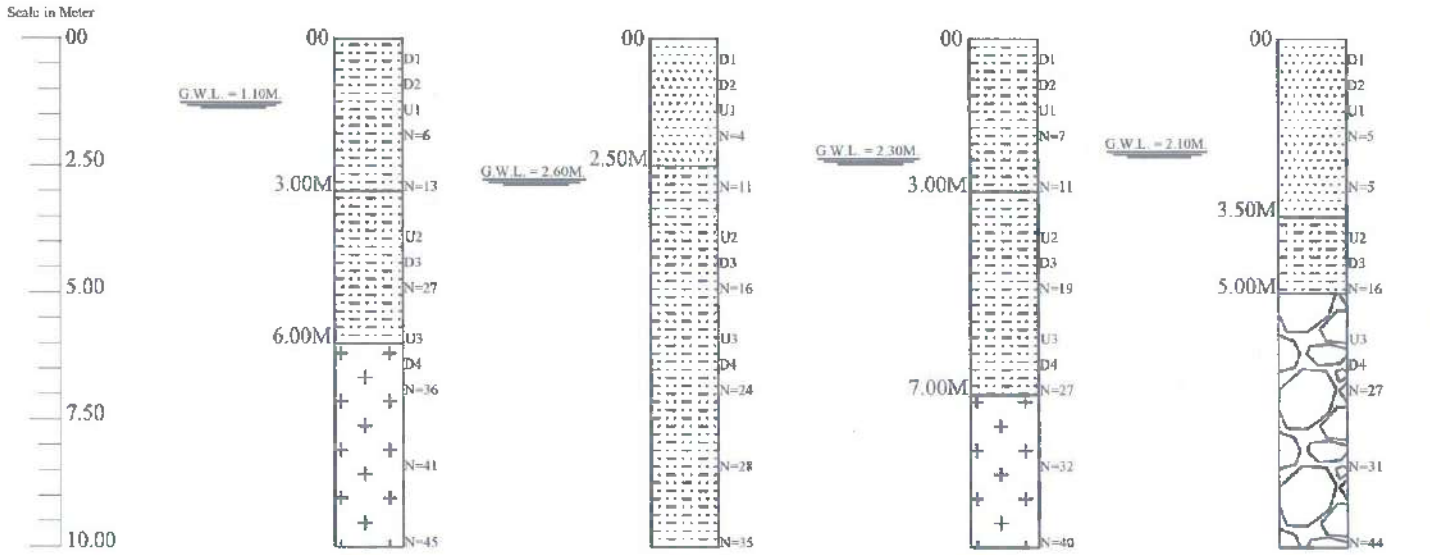
NOTE:
1) "N" means Standard Penetration Test value.
2) "U" means Undisturbed Soil Sample.
3) "D" means Disturbed Soil Sample.
4) "SWL" means Standing water Level.
5) Thickness of each startum is shown in left side of each borehole.

M/s P.K.DUTTA & CO.	Generalised Subsoil Profile

CLIENT:- ASSAM ELECTRICITY GRID CORPORATION LIMITED.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Generalised Subsoil Profile



AP-66
Depth = 10.00 m.

AP-73
Depth = 10.00 m.

AP-109
Depth = 10.00 m.

AP-120
Depth = 10.00 m.

Silty sand/fine sand/medium sand with mica.

Silty medium/medium to coarses sand with nodules.

Clayey silt traces of sand./sand with mica.

Silty medium to coarses sand with gravels.

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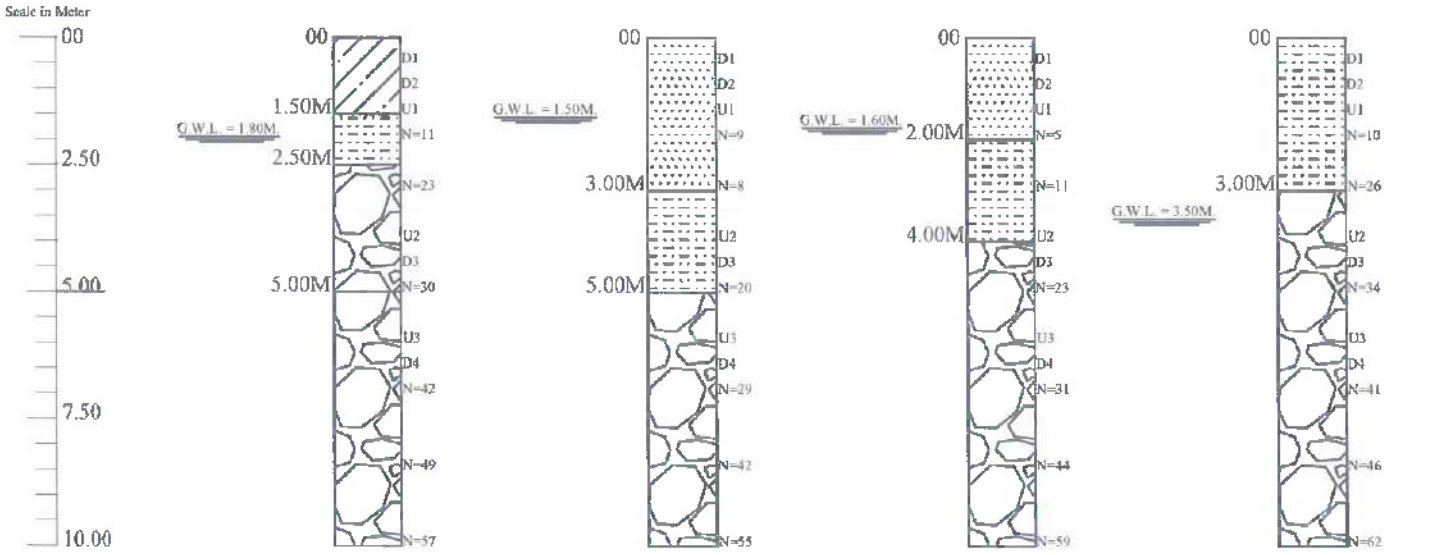
NOTE:
1) "N" means Standard Penetration Test value.
2) "U" means Undisturbed Soil Sample.
3) "D" means Disturbed Soil Sample.
4) "SWL" means Standing water Level.

M/s P.K.DUTTA & CO.	Generalised Subsoil Profile

CLIENT:- ASSAM ELECTRICITY GRID CORPORATION LIMITED.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Generalised Subsoil Profile



AP-131
Depth = 10.00 m.

LOC-137/2
Depth = 10.00 m.

AP-141
Depth = 10.00 m.

LOC-151-2
Depth = 10.00 m.

- Clayey silt.
- Silty sand/fine sand/medium sand with mica.
- Silty sand/ medium sand/medium to coarses sand with gravels.
- Clayey silt traces of sand/ sand with mica.

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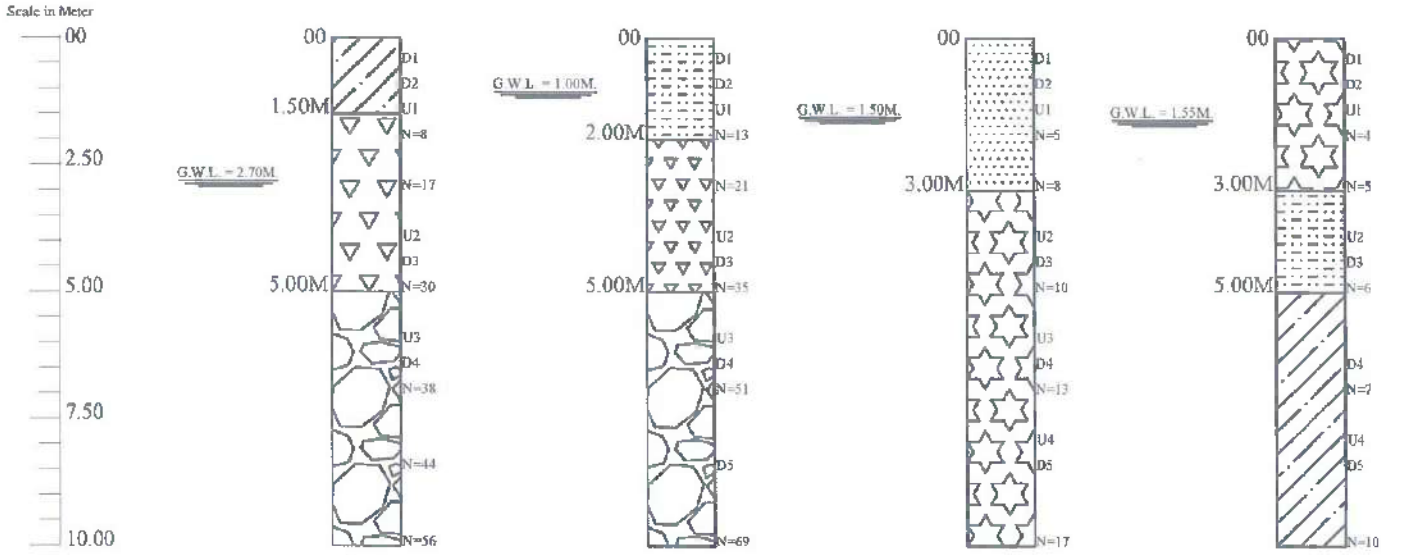
NOTE:
1) "N" means Standard Penetration Test value.
2) "U" means Undisturbed Soil Sample.
3) "D" means Disturbed Soil Sample.
4) "SWL" means Standing water Level.
5) Thickness of each startum is shown in left side of each borehole.

M/s P.K.DUTTA & CO.	Generalised Subsoil Profile

CLIENT:- ASSAM ELECTRICITY GRID CORPORATION LIMITED.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Generalised Subsoil Profile



LOC-157/3
Depth = 10.00 m.

LOC-170
Depth = 10.00 m.

AP-182
Depth = 10.00 m.

LOC-190
Depth = 10.00 m.

Clayey silt.

Silty sand with mica & gravels.

Silty sand/ medium sand/medium to coarses sand with gravels.

Silty sand/fine sand/medium sand with mica.

Clayey silt traces of sand/ sand with mica.

Clayey silt with sand.

P.K. DUTTA & CO. NAIHATI

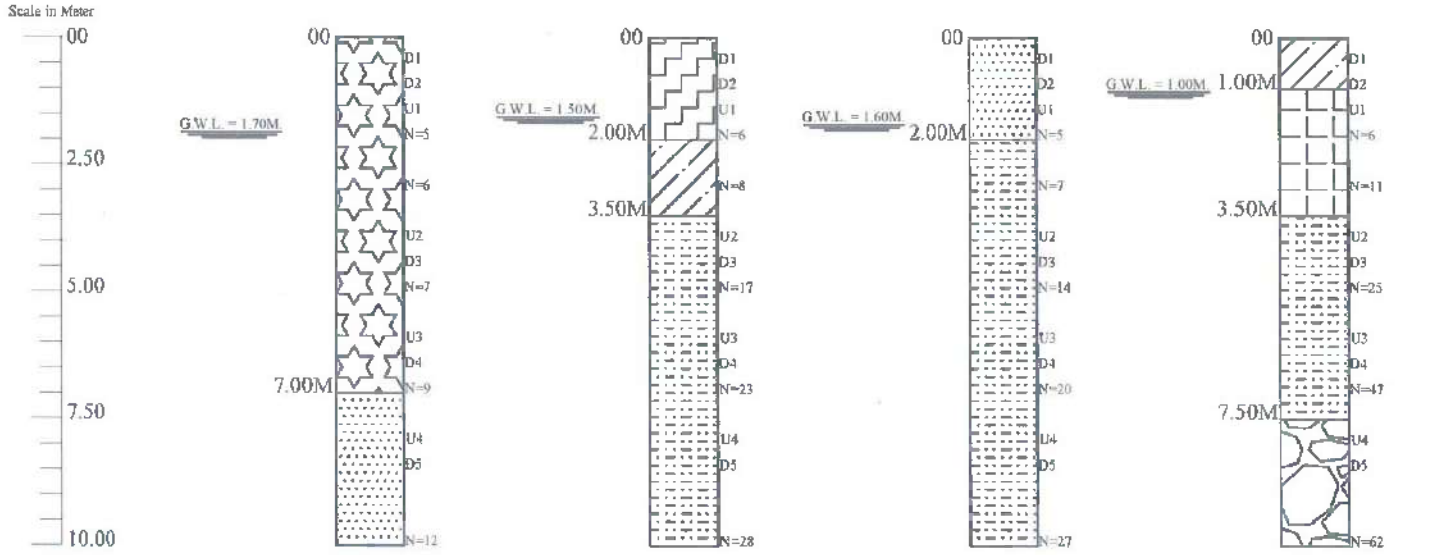
NOTE:
1) "N" means Standard Penetration Test value.
2) "U" means Undisturbed Soil Sample.
3) "D" means Disturbed Soil Sample.
4) "SWL" means Standing water Level.
5) Thickness of each startum is shown in left side of each borehole.

M/s P.K.DUTTA & CO.	Generalised Subsoil Profile

CLIENT:- ASSAM ELECTRICITY GRID CORPORATION LIMITED.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Generalised Subsoil Profile



AP-206
Depth = 10.00 m.

LOC-220
Depth = 10.00 m.

AP-241
Depth = 10.00 m.

LOC-252
Depth = 10.00 m.

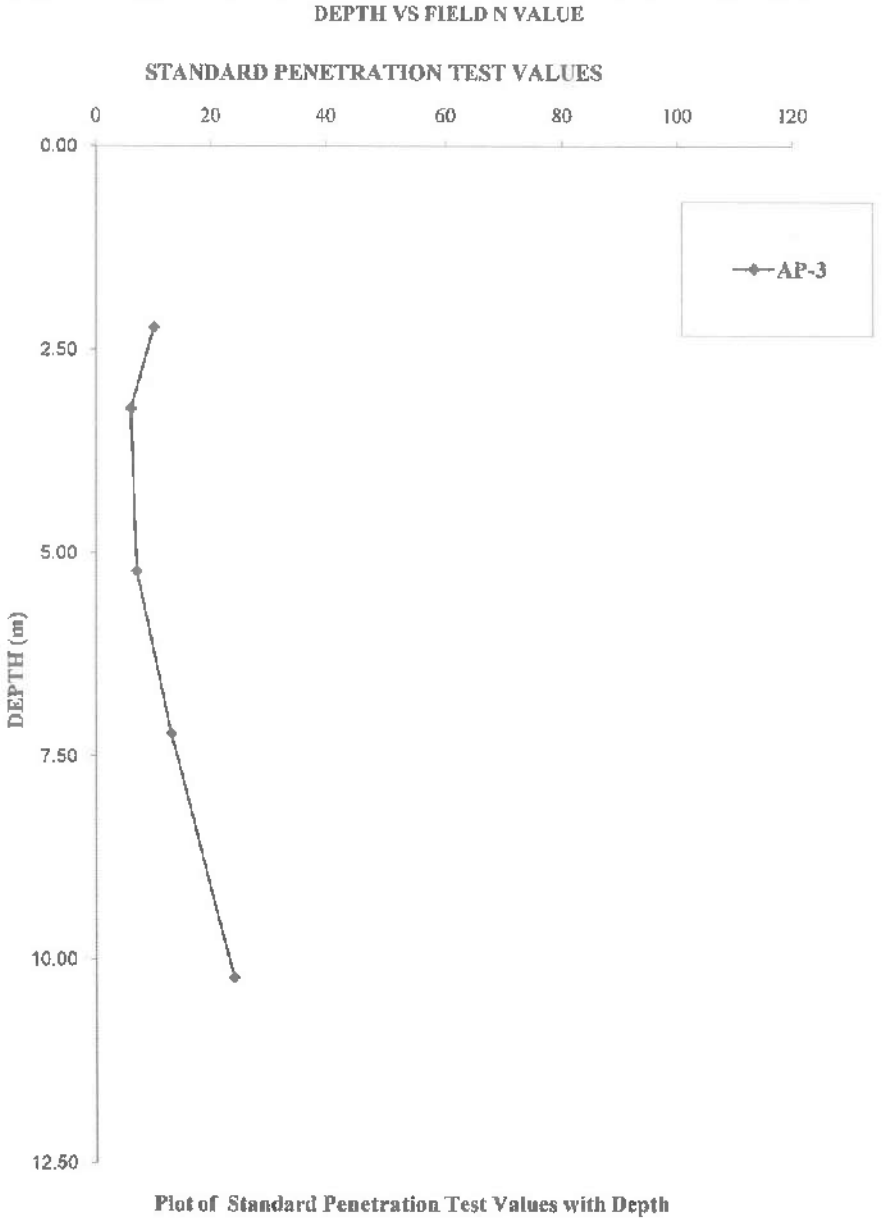
- Clayey silt with sand.
- Clayey silt traces of sand/ sand with mica.
- Silty clay traces of sand.
- Clayey silt/Clayey silt with mica.
- Silty sand/fine sand/medium sand with mica.
- Silty clay.
- Medium to coarses sand with mica gravels.

P.K. DUTTA & CO. NAIHATI

NOTE:
1) "N" means Standard Penetration Test value.
2) "U" means Undisturbed Soil Sample.
3) "D" means Disturbed Soil Sample.
4) "SWL" means Standing water Level.
5) Thickness of each startum is shown in left side of each borehole.

PLOT OF SPT VALUES WITH DEPTH

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE
Client :-	**ASSAM ELECTRICITY GRID CORPORATION LIMITED.**
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

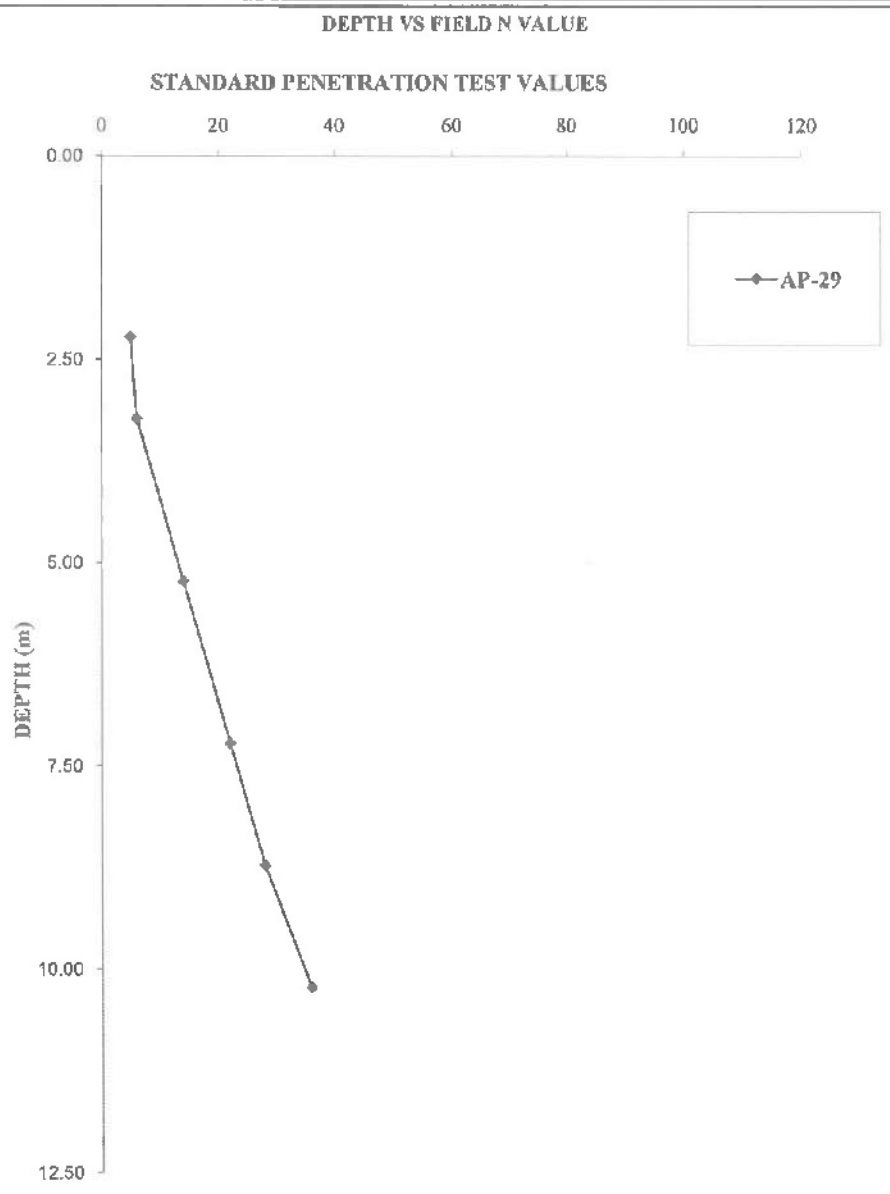


Plot of Standard Penetration Test Values with Depth



M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

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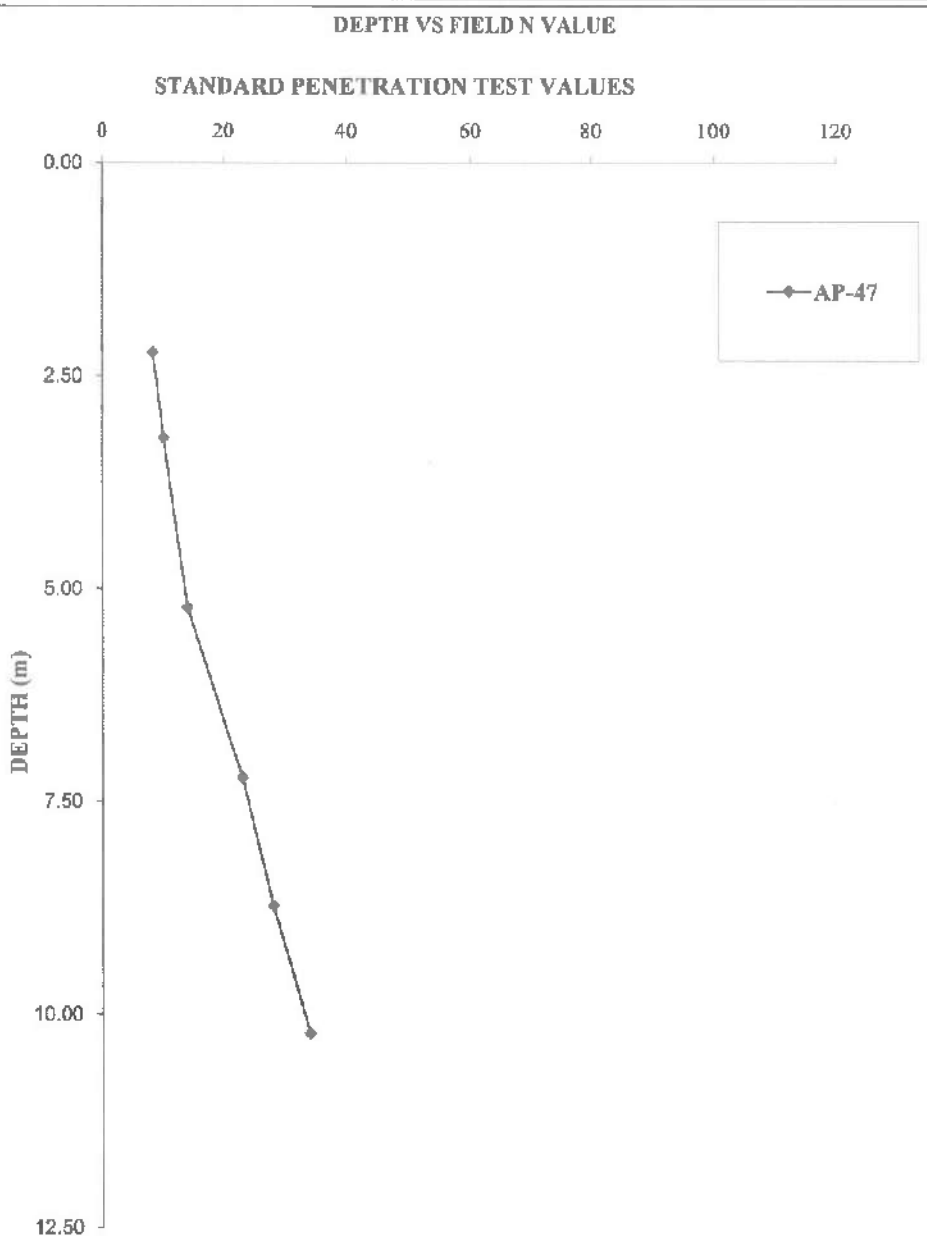


Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

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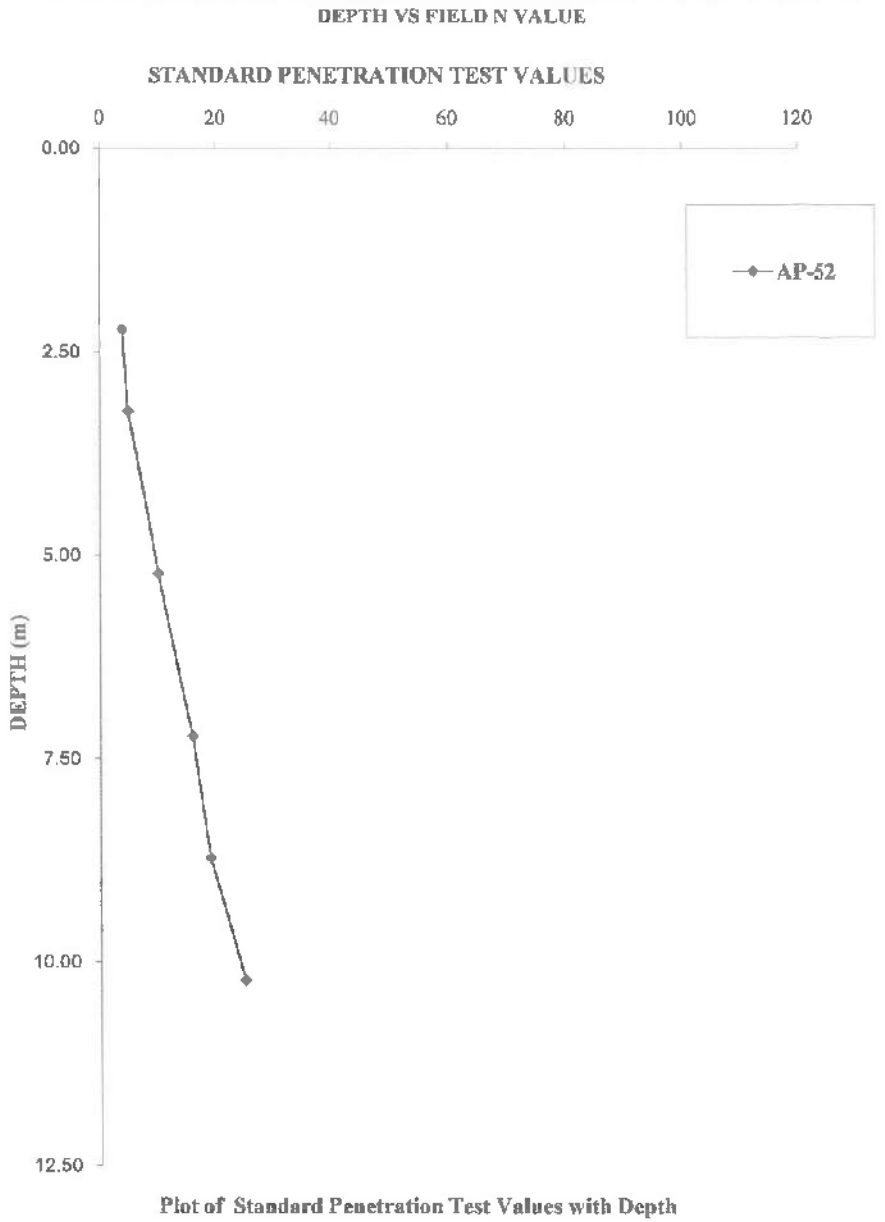


Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

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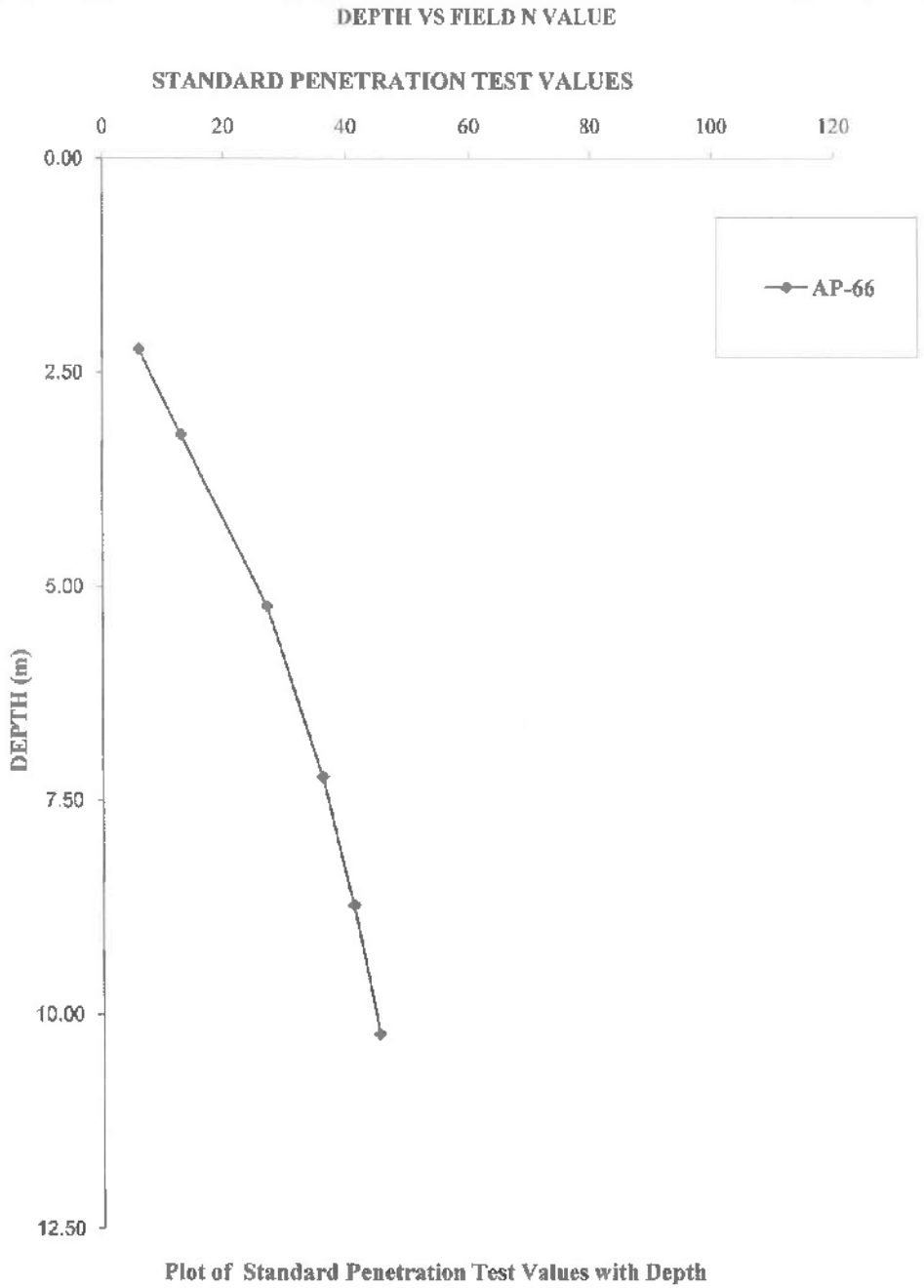


Plot of Standard Penetration Test Values with Depth

P. K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

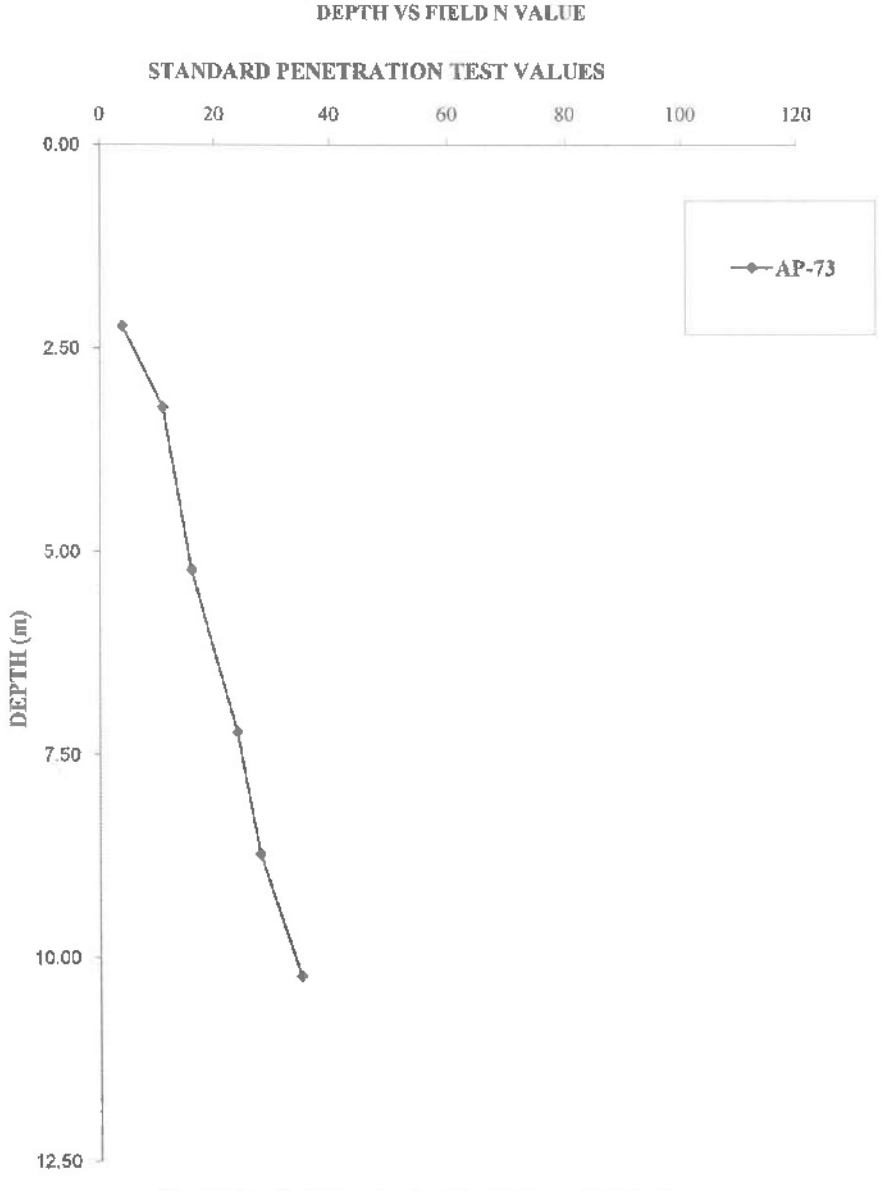
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Plot of Standard Penetration Test Values with Depth

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

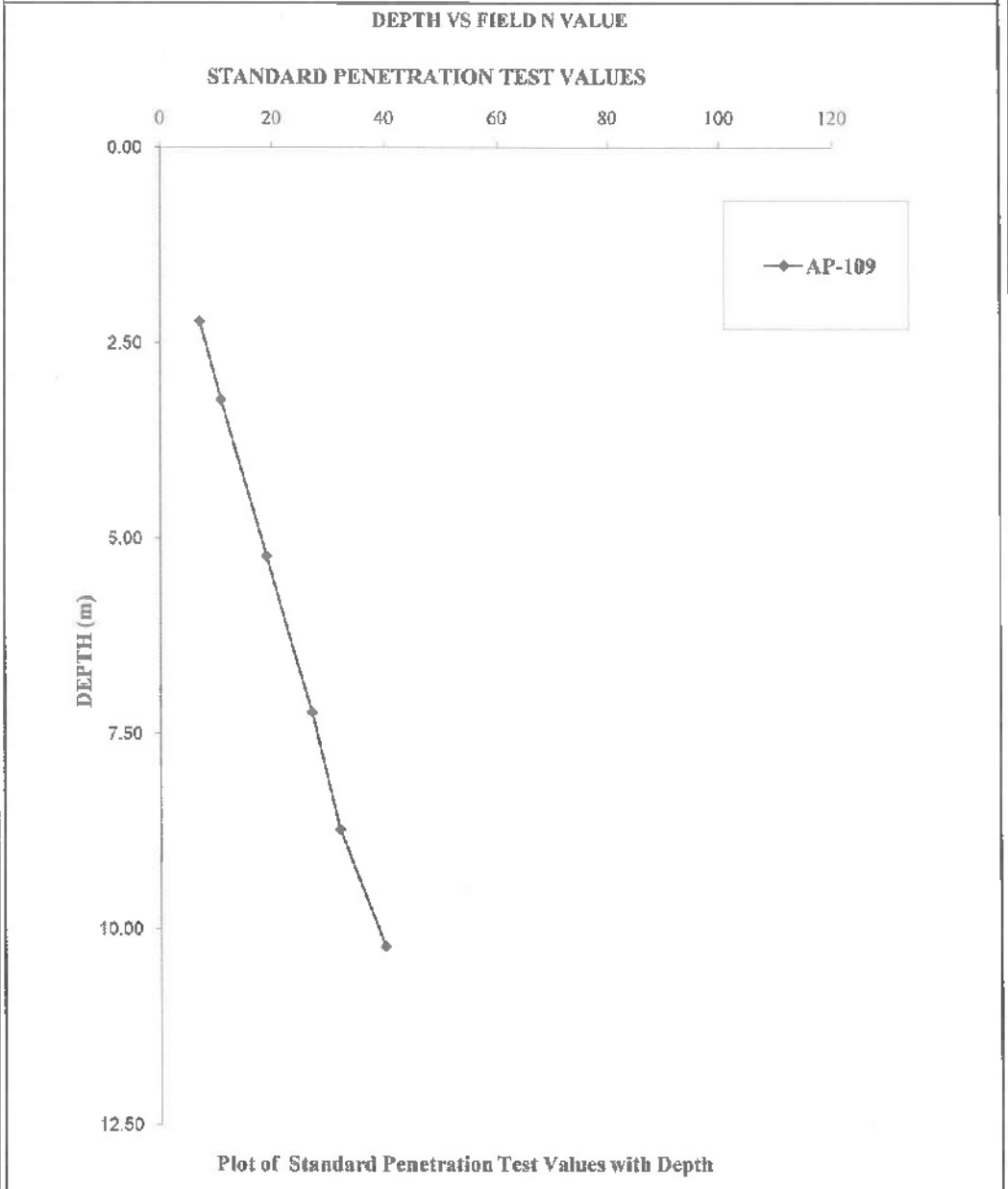
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Plot of Standard Penetration Test Values with Depth

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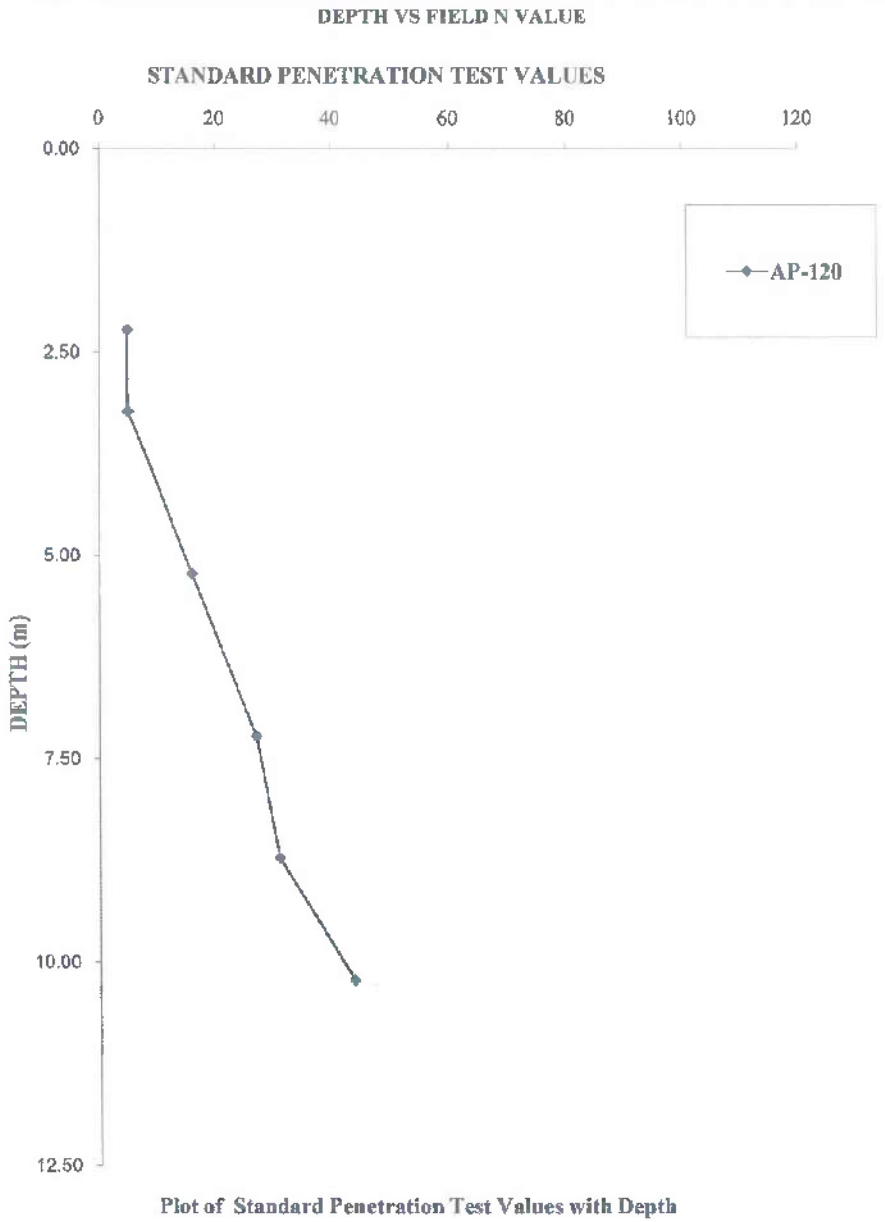


Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO NAIHATI

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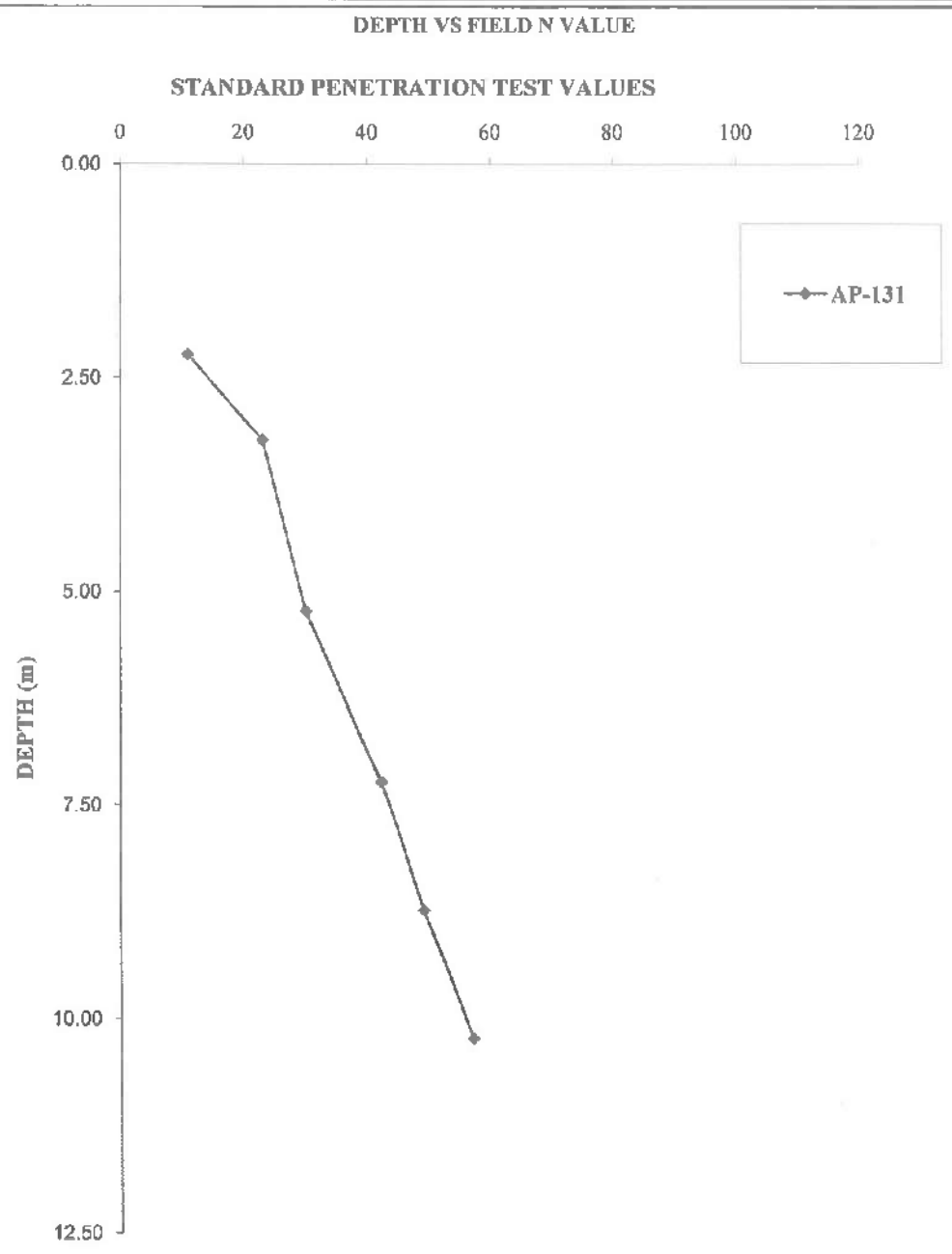


Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

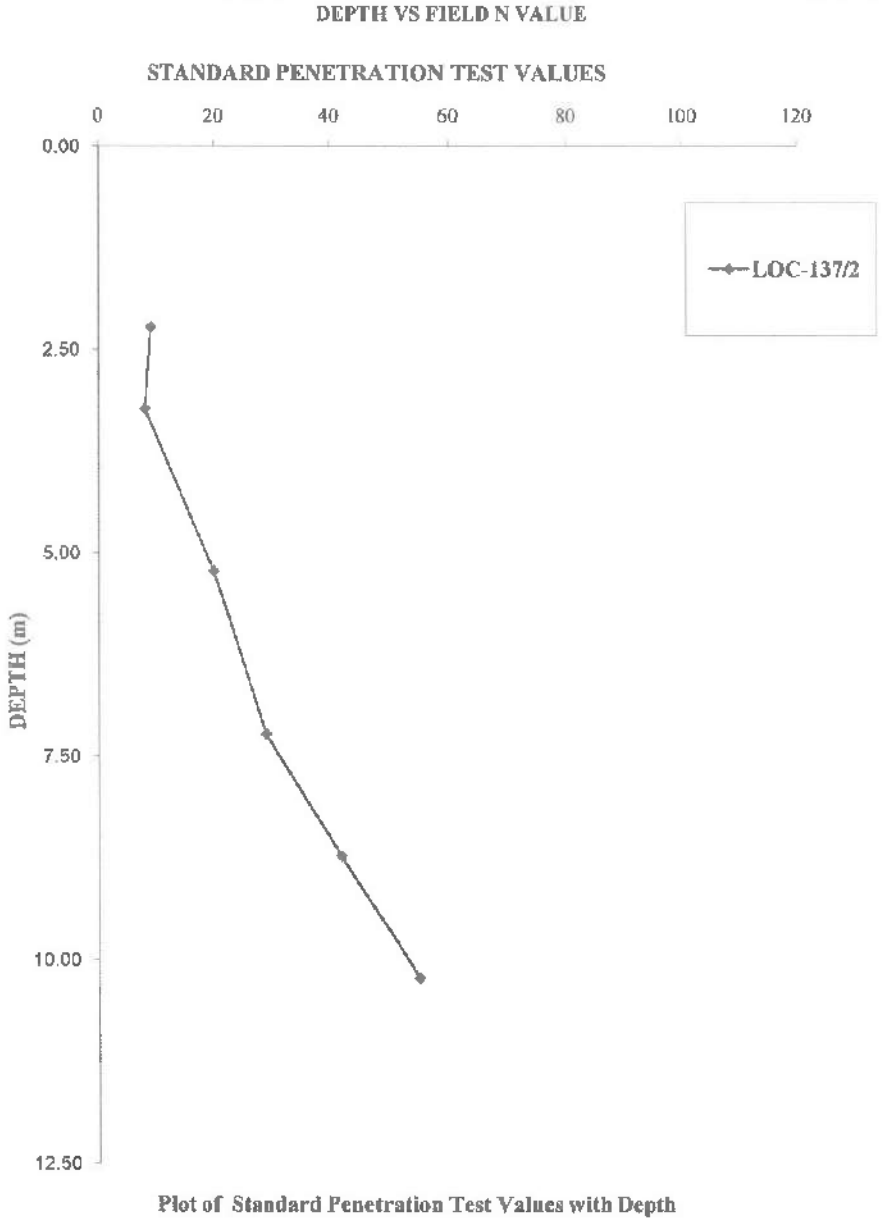
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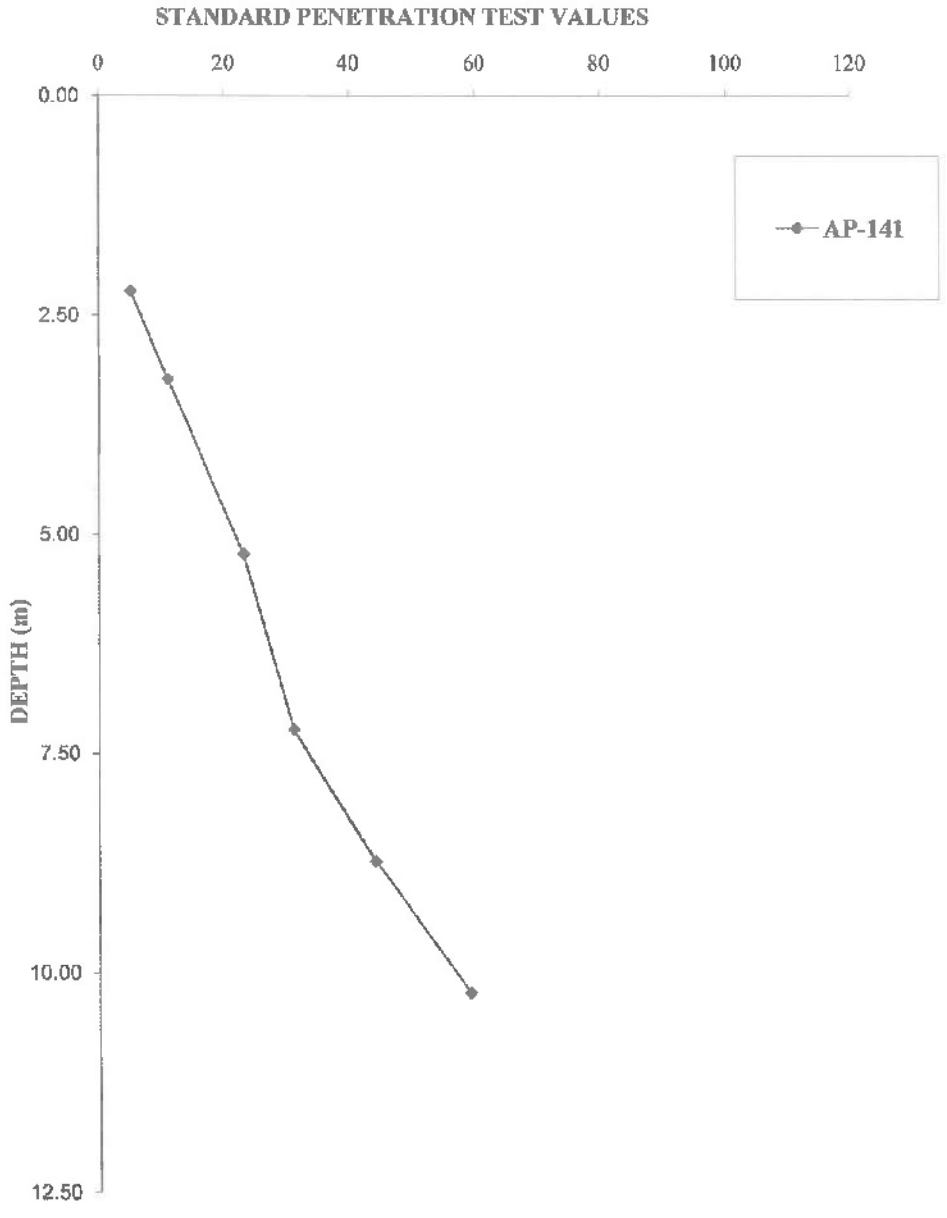
Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

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DEPTH VS FIELD N VALUE

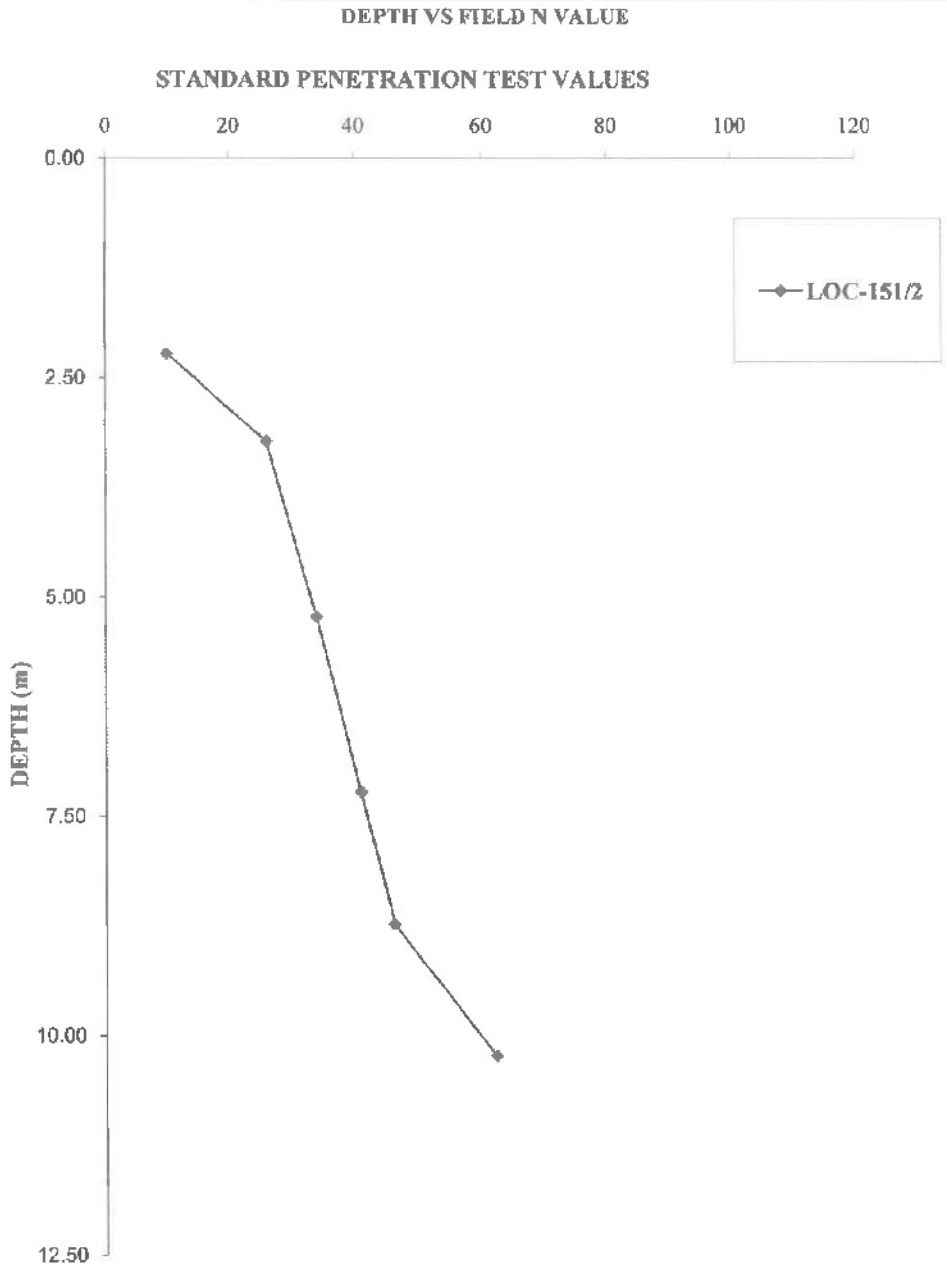


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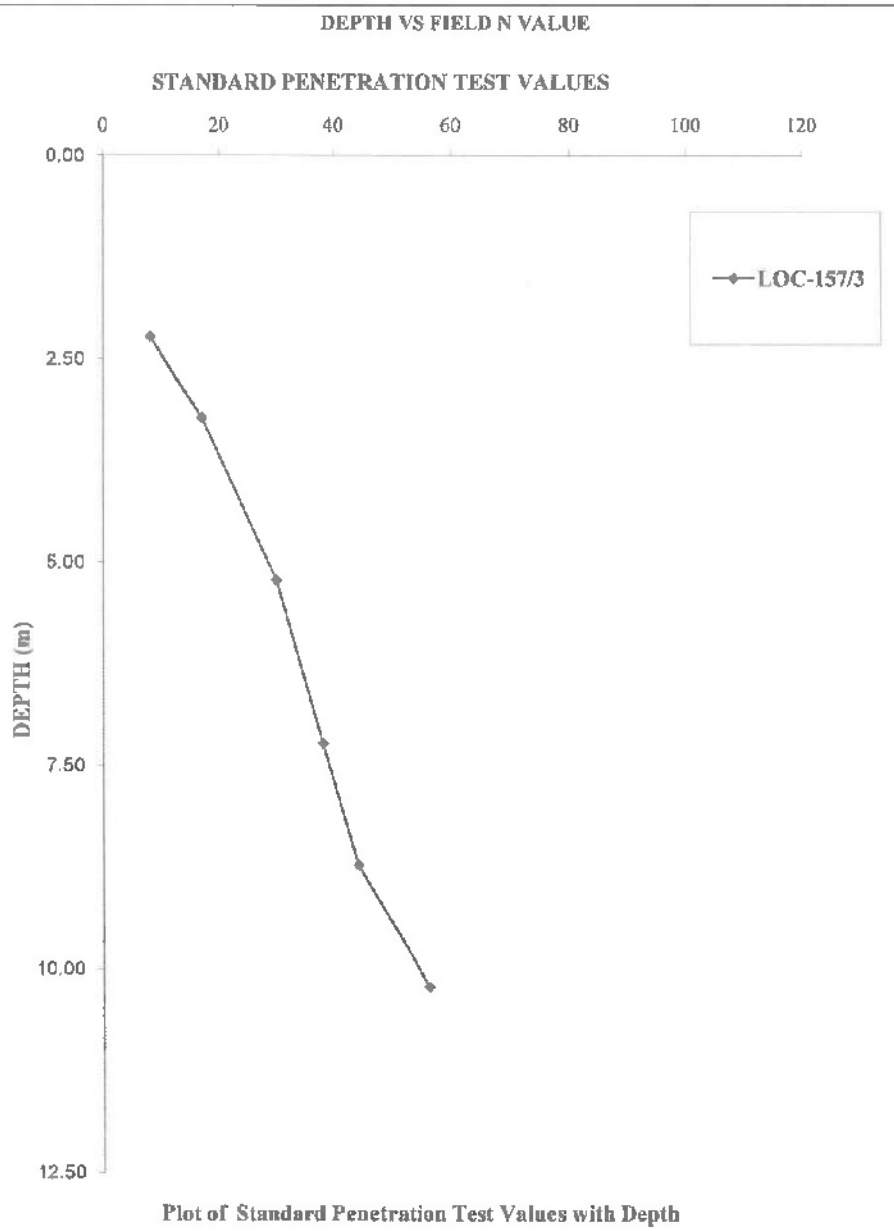


Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO NAIHATI

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

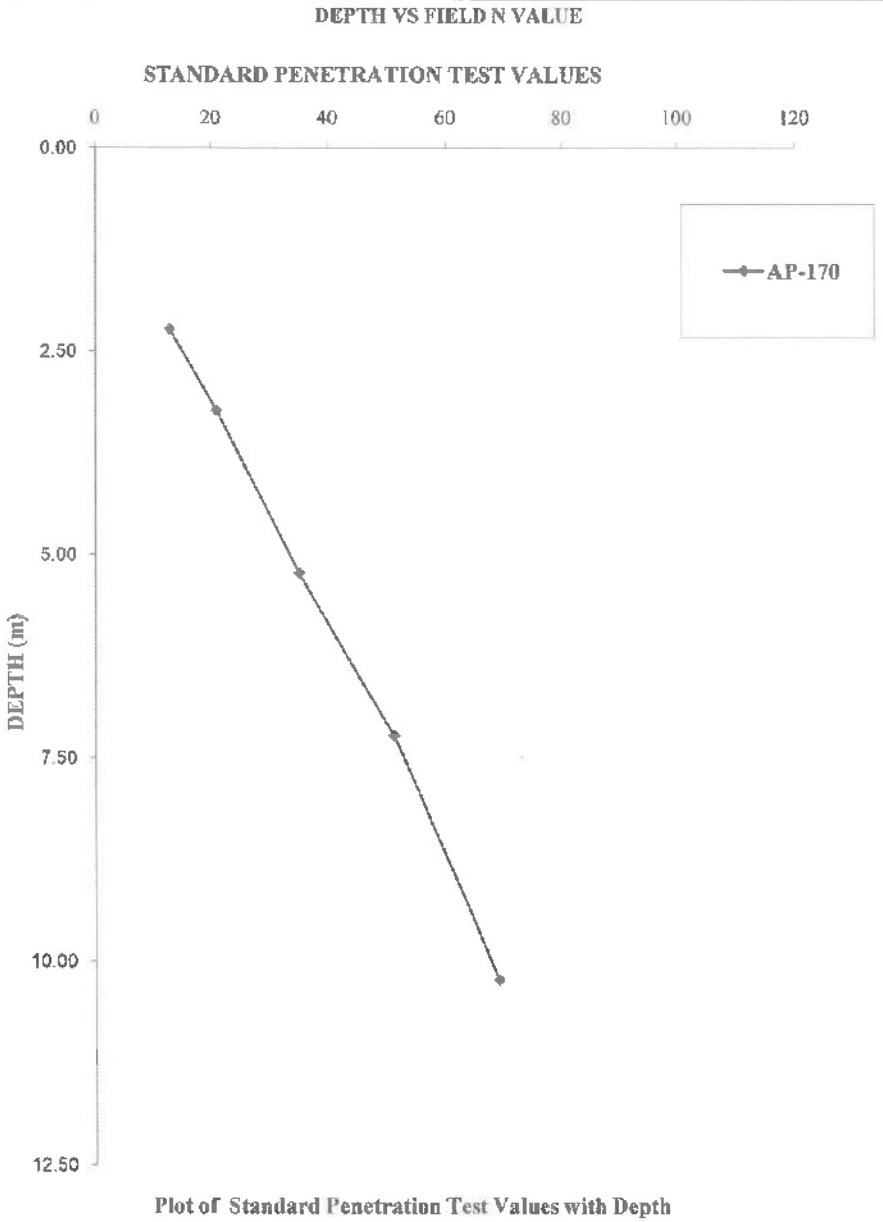
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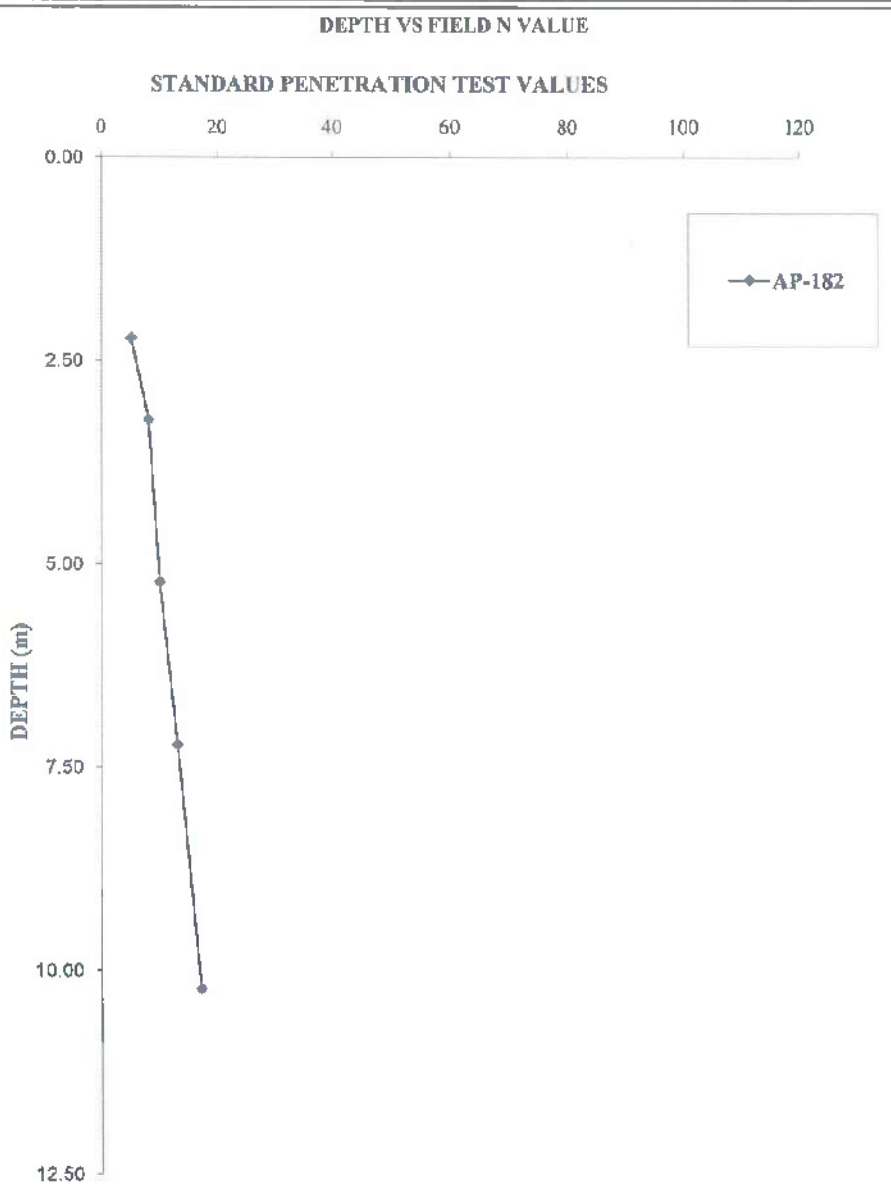


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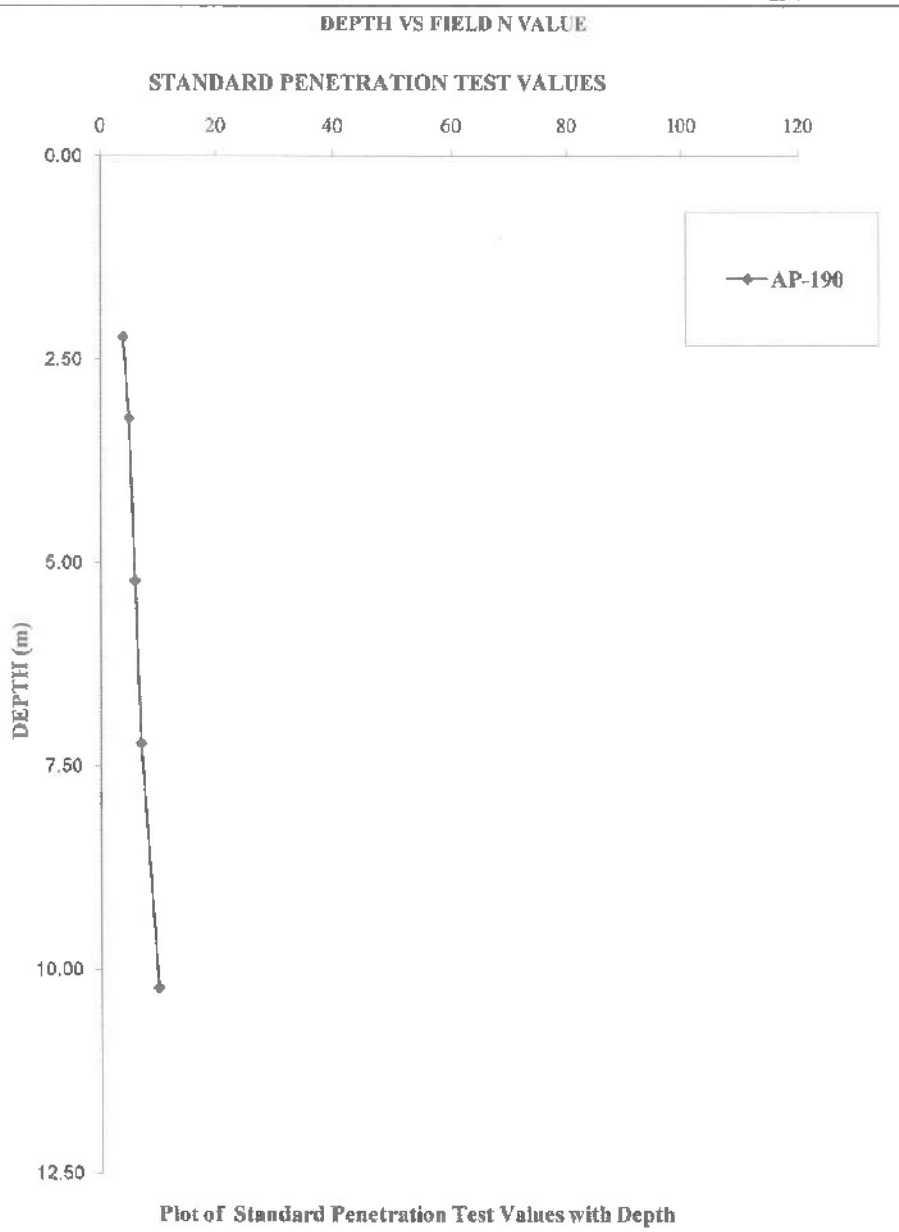


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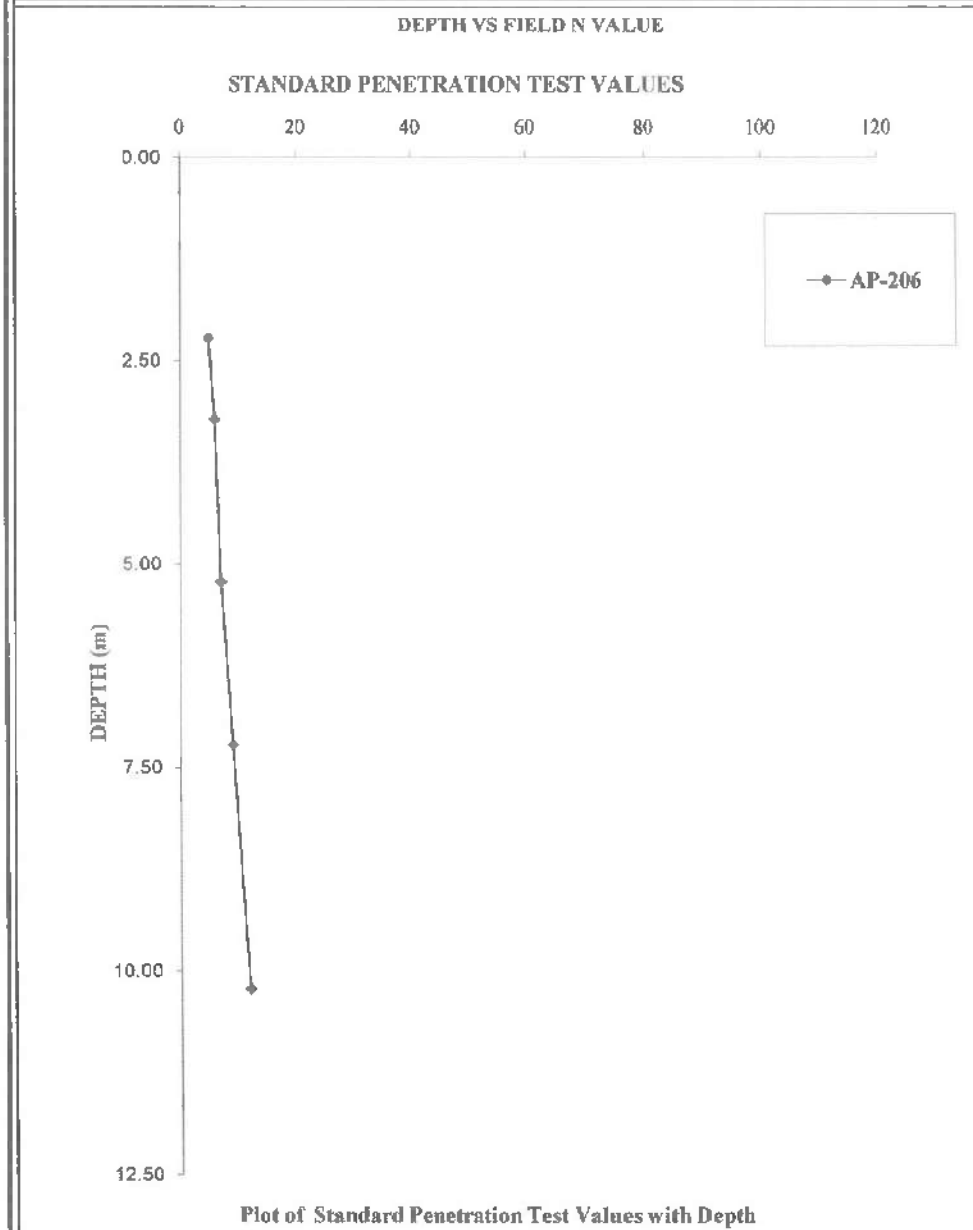


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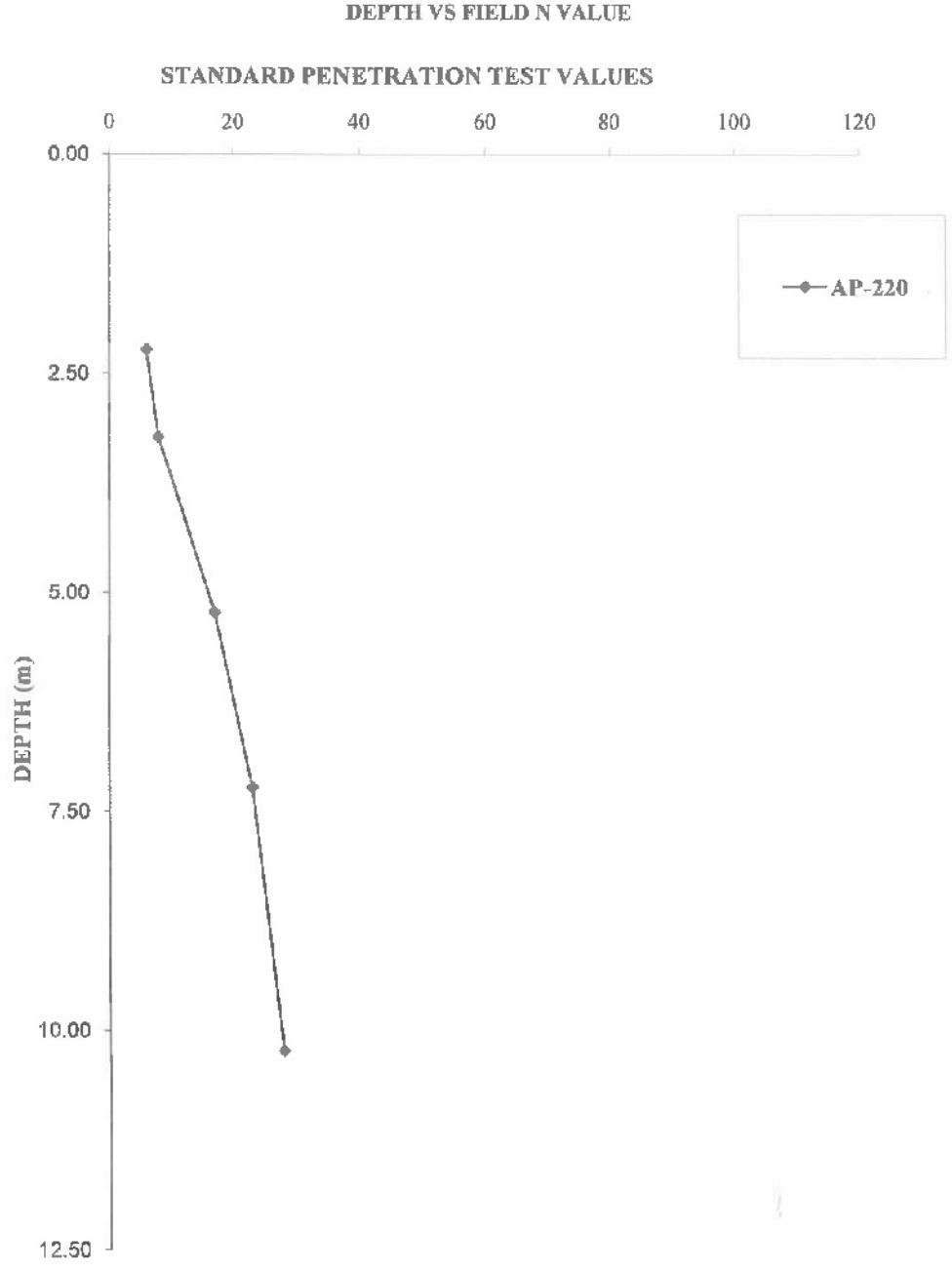


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P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co	STANDARD PENETRATION TEST CURVE

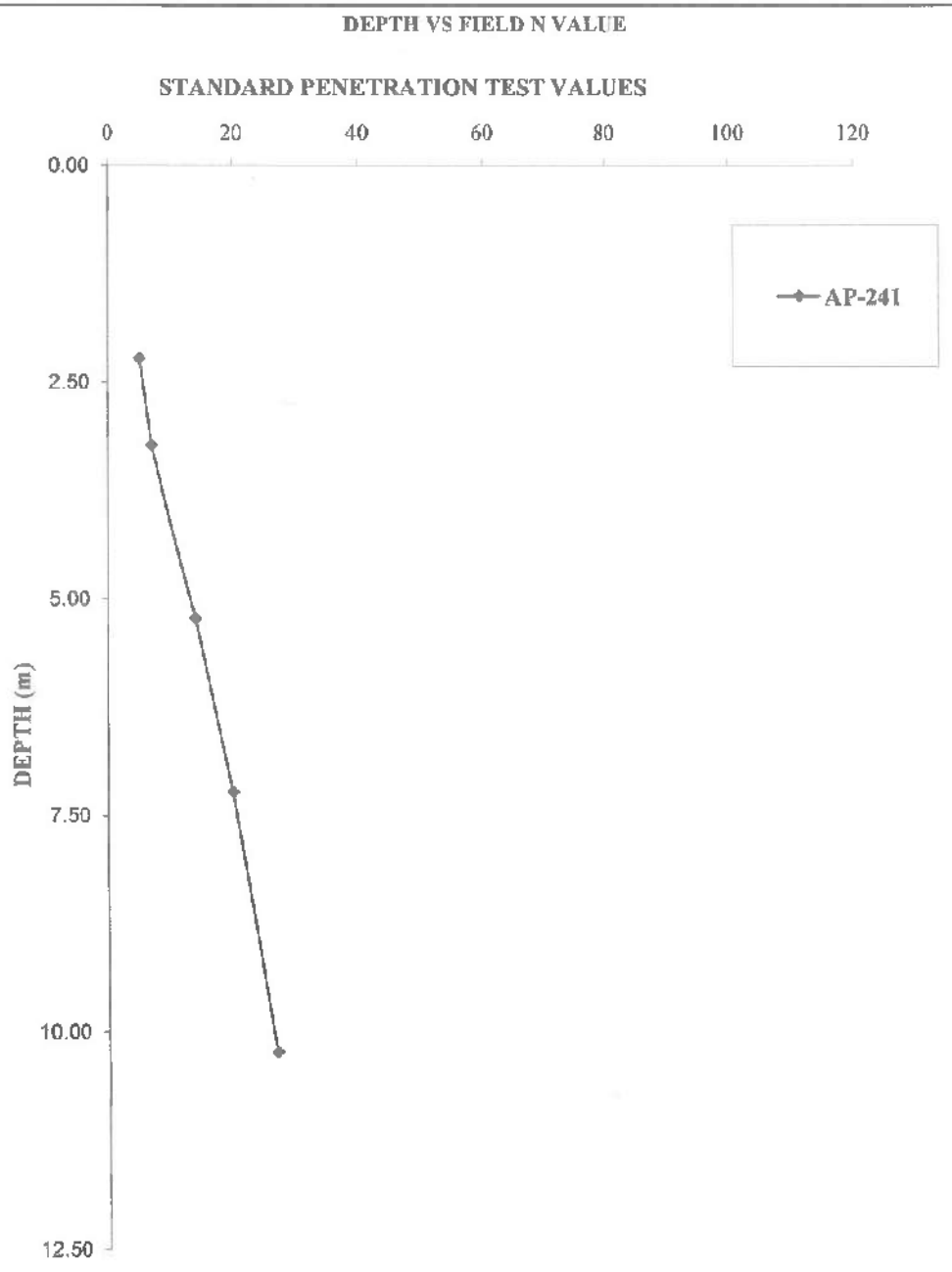
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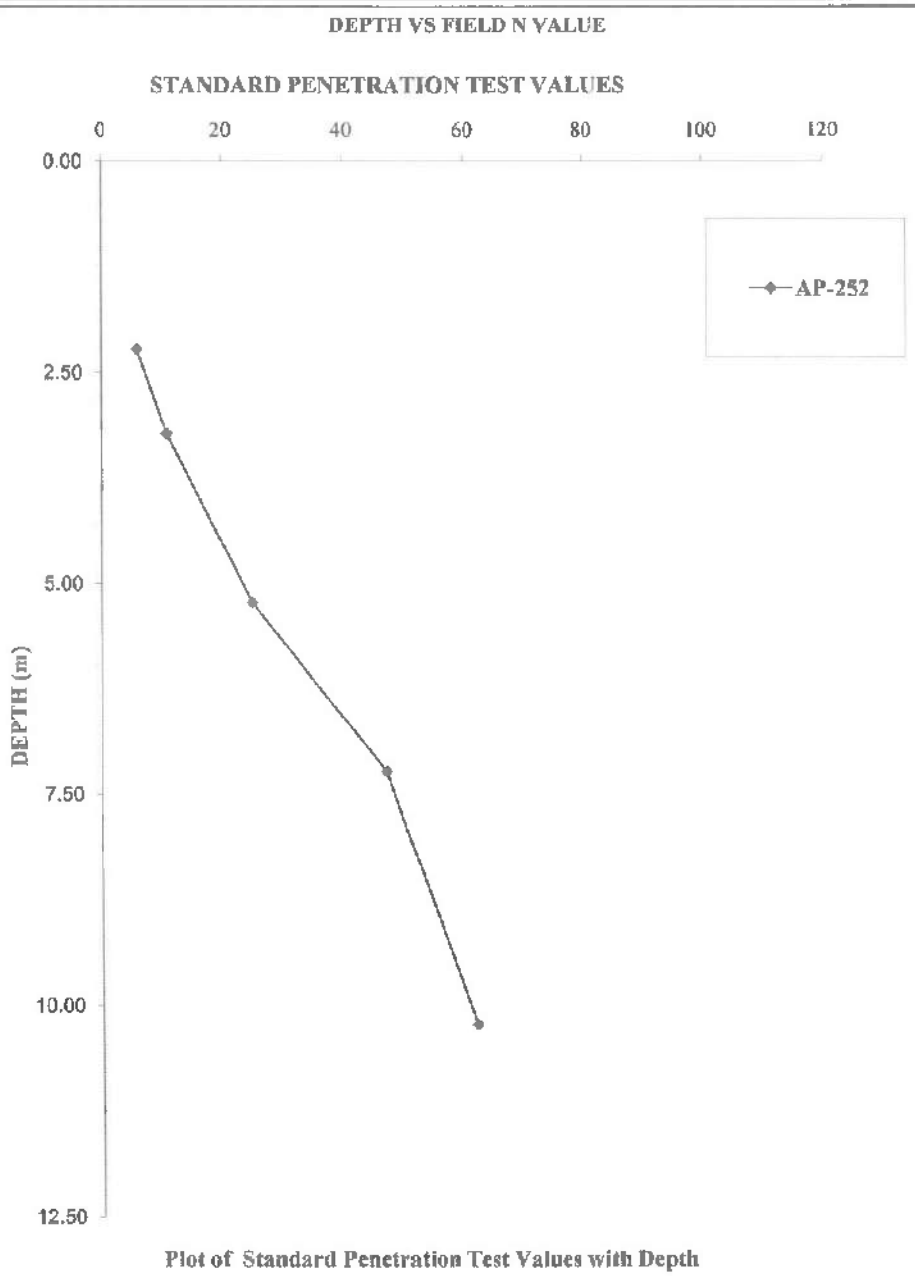


Plot of Standard Penetration Test Values with Depth

DUTTA & CO NAIHATI

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Plot of Standard Penetration Test Values with Depth

P.K. DUTTA & CO. NAIHATI

LABORATORY TEST RESULTS OF SOIL

Client: Assam Electricity Grid Corporation Limited.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No	Sample Number	Depth (m)	Sample Description	Bulk Density	Dry Density	Sp. Gravity	Nat. Moisture	Mv	Shear Strength (kg/cm²)		Type of Test	Atter. Limits			IS Classification	Free swell	Grain Size			
									Cohesion	Friction		LL	PL	PI			Gravel	Sand	Silt	Clay
				gms/cc	gms/cc		%	t/sqm	kg/sqcm	Deg.		%	%	%			%	%	%	%
AP-3	U1	1.50	Stiff consistency, dark grey clayey silt traces of sand with mica.	1.91	1.51	2.68	26.15	0.0021	0.30	0.00	UC	31.00	23.00	8.00	ML	24	0.00	6.00	53.00	41.00
	U2	4.00	Loose, dark grey silty fine sand with mica.	1.84	1.56	2.65	18.22	-	0.00	19.00	DS	NP	NP	NP	SM	-	0.00	66.00	27.00	7.00
	*S3	5.00	Medium stiff, dark grey clayey silt.	1.88	-	2.69	-	0.0020	0.22	0.00	UC	30.00	23.00	7.00	ML	-	0.00	4.00	52.00	44.00
	U3	6.00	Loose to medium, dark grey silty sand with mica.	1.85	1.55	2.66	19.00	-	0.00	25.00	DS	NP	NP	NP	SM	-	0.00	69.00	27.00	4.00
AP-29	U1	1.50	Medium stiff, brownish to dark grey clayey silt.	1.89	1.52	2.70	24.00	0.0018	0.25	0.00	UC	30.00	19.00	11.00	ML	20	0.00	8.00	57.00	35.00
	U2	4.00	Loose light dark grey silty fine sand with mica.	1.83	1.57	2.65	16.79	-	0.00	18.00	DS	NP	NP	NP	SM	-	0.00	65.00	29.00	6.00
	U3	6.00	Medium, dark grey silty sand with mica.	1.84	1.56	2.66	17.93	-	0.00	28.00	DS	NP	NP	NP	SM	-	0.00	68.00	29.00	3.00
AP-47	U1	1.50	Loose, light dark grey silty fine sand with mica.	1.84	1.60	2.64	15.00	-	0.00	19.00	DS	NP	NP	NP	SM	-	0.00	67.00	28.00	5.00
	U3	6.00	Loose to medium, dark grey silty sand with mica.	1.86	1.60	2.65	16.00	-	0.00	26.00	DS	NP	NP	NP	SM	-	0.00	69.00	28.00	3.00
AP-52	U1	1.50	Loose, light, brownish grey silty fine sand with mica.	1.83	1.56	2.63	17.44	-	0.00	16.00	DS	NP	NP	NP	SM	-	0.00	61.00	32.00	7.00
	U2	4.00	Loose, dark grey silty fine sand with mica.	1.84	1.55	2.65	18.50	-	0.00	18.00	DS	NP	NP	NP	SM	-	0.00	66.00	29.00	5.00
	U3	6.00	Medium consistency, dark grey silty sand with mica.	1.86	1.56	2.65	19.00	-	0.00	24.00	DS	NP	NP	NP	SM	-	0.00	68.00	29.00	3.00

Unconfined Compressive Strength Test:IS 2720 (Part 10) Plastic Limit:IS 2720 (Part 5) ConsolidationTest:IS 2720 (Part 15) Liquid limit:IS 2720 (Part 5)

Specific Gravity: IS 2720 (Part 3) Grain Size Analysis:IS 2720 (Part 4) Direct Shear Test (DS) : IS 2720 (Part 13) Triaxial Test (UU): IS 2720 (Part 11) Natural Moisture Content: IS 2720 (Part 2) *-Remould Sample

Client: Assam Electricity Grid Corporation Limited.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No	Sample Number	Depth (m)	Sample Description	Bulk Density	Dry Density	Sp Gravity	Nat. Moisture	Mv	Shear Strength (kg/cm²)		Type of Test	Atter. Limits			IS Classification	Free swell	Grain Size				Test Method
									Cohesion	Friction		LL	PL	PI			Gravel	Sand	Silt	Clay	
				gm/cc	gm/cc		%	t/sqm	kg/sqcm	Deg.		%	%	%			%	%	%	%	
AP-66	U1	1.50	Loose, light, brownish grey silty fine sand with mica.	1.82	1.60	2.64	13.50	-	0.00	17.00	DS	NP	NP	NP	SM	-	0.00	63.00	31.00	6.00	*See the Note
	U2	4.00	Loose, dark grey silty fine sand with mica.	1.84	1.61	2.64	14.35	-	0.00	26.00	DS	NP	NP	NP	SM	-	0.00	68.00	29.00	3.00	*See the Note
	U3	6.00	Medium consistency, dark grey silty sand with mica.	1.86	1.62	2.66	15.00	-	0.00	31.00	DS	NP	NP	NP	SM	-	0.00	73.00	22.00	5.00	*See the Note
AP-73	U1	1.50	Soft to medium dark grey clayey silt traces of sand with mica.	1.87	1.47	2.67	27.50	0.0016	0.24	0.00	UC	31.68	23.00	8.68	ML	21	0.00	9.00	53.00	38.00	*See the Note
	U2	4.00	Medium, dark grey silty medium sand with mica.	1.83	1.56	2.65	17.00	-	0.00	24.00	DS	NP	NP	NP	SM	-	0.00	65.00	31.00	4.00	*See the Note
	U3	6.00		1.85	1.57	2.65	18.00	-	0.00	25.00	DS	NP	NP	NP	SM	-	0.00	68.00	27.00	5.00	*See the Note
AP-109	U1	1.50	Loose, light dark grey silty fine to medium sand with mica.	1.83	1.56	2.64	17.02	-	0.00	18.00	DS	NP	NP	NP	SM	-	0.00	65.00	28.00	7.00	*See the Note
	U2	4.00	Medium, dark grey silty sand with mica.	1.85	1.56	2.64	18.89	-	0.00	23.00	DS	NP	NP	NP	SM	-	0.00	63.00	32.00	5.00	*See the Note
	U3	6.00	Medium to dense, dark grey silty medium sand with nodules.	1.86	1.60	2.66	16.50	-	0.00	30.00	DS	NP	NP	NP	SM	-	0.00	70.00	28.00	2.00	*See the Note
AP-120	U1	1.50	Soft to medium, dark grey clayey silt traces of sand.	1.88	1.49	2.68	26.56	0.0017	0.24	0.00	UC	30.00	20.50	9.50	ML	22	0.00	10.00	57.00	33.00	*See the Note
	U2	4.00	Loose to medium, dark grey silty medium sand with mica.	1.83	1.59	2.65	15.00	-	0.00	22.00	DS	NP	NP	NP	SM	-	0.00	63.00	32.00	5.00	*See the Note
	U3	6.00	Medium to dense, dark grey silty medium to coarses sand with gravels	1.86	1.60	2.65	16.50	-	0.00	29.00	DS	NP	NP	NP	SM	-	7.00	65.00	26.00	2.00	*See the Note

Unconfined Compressive Strength Test:IS 2720 (Part 10) Plastic Limit:IS 2720 (Part 5) Consolidation Test:IS 2720 (Part 15) Liquid limit:IS 2720 (Part 5)

Specific Gravity: IS 2720 (Part 3) Grain Size Analysis:IS 2720 (Part 4) Direct Shear Test (DS) : IS 2720 (Part 13) Triaxial Test (UU): IS 2720 (Part 11) Natural Moisture Content: IS 2720 (Part 2) *-Remould Sample



Client: Assam Electricity Grid Corporation Limited.

PROJECT:-Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No	Sample Number	Depth (m)	Sample Description	Bulk Density	Dry Density	Sp. Gravity	Nat. Moisture	Mv	Shear Strength /kg/cm²		Type of Test	Atter. Limits			IS Classification	Free swell	Gram Size				Test Method
									Cohesion	Friction		LL	PL	PI			Gravel	Sand	Silt	Clay	
				gms/cc	gms/cc		%	t/sqm	kg/sqcm	Deg		%	%	%			%	%	%	%	
AP-131	U1	1.50	Loose, dark grey silty fine sand with mica.	1.82	1.54	2.63	17.86	-	0.00	20.00	DS	NP	NP	NP	SM	-	0.00	68.00	33.00	4.00	*See the Note
	U2	4.00	Medium, dark grey silty medium sand with gravels.	1.84	1.55	2.64	18.50	-	0.00	27.00	DS	NP	NP	NP	SM	-	7.00	67.00	23.00	3.00	*See the Note
	U3	6.00	Dense, dark grey silty medium to courses sand with gravels.	1.85	1.55	2.65	19.25	-	0.00	31.00	DS	NP	NP	NP	SM	-	8.00	70.00	19.00	3.00	*See the Note
Loc-137/2	U1	1.50	Stiff consistency, brownish grey clayey silt traces of sand with mica.	1.89	1.49	2.69	26.56	0.0021	0.27	0.00	UC	32.50	24.00	8.50	ML	23	0.00	9.00	56.00	35.00	*See the Note
	U2	4.00	Loose, dark grey silty fine sand with mica.	1.83	1.52	2.65	20.04	-	0.00	19.00	DS	NP	NP	NP	SM	-	0.00	65.00	30.00	5.00	*See the Note
	U3	6.00	Medium to dense, dark grey silty medium sand with gravels.	1.86	1.53	2.66	21.78	-	0.00	30.00	DS	NP	NP	NP	SM	-	6.00	68.00	24.00	2.00	*See the Note
AP-141	U1	1.50	Medium stiff, dark grey clayey silt traces of sand with mica.	1.88	1.49	2.68	26.45	0.0017	0.26	0.00	UC	31.00	21.50	9.50	ML	21	0.00	11.00	52.00	37.00	*See the Note
	S3*	3.00	Loose to medium, dark grey silty sand with mica.	1.84	-	2.64	-	-	0.00	18.00	DS	NP	NP	NP	SM	-	0.00	65.00	32.00	3.00	*See the Note
	U2	6.00	Medium to dense, dark grey silty sand mixed with gravels.	1.85	1.54	2.65	20.38	-	0.00	31.00	DS	NP	NP	NP	SM	-	4.00	63.00	29.00	4.00	*See the Note
LOC-151/2	U1	1.50	Loose, dark grey silty fine sand with mica.	1.84	1.55	2.64	18.90	-	0.00	19.00	DS	NP	NP	NP	SM	-	0.00	67.00	28.00	5.00	*See the Note
	U2	4.00	Medium to dense, dark grey silty sand with gravels.	1.86	1.55	2.65	20.28	-	0.00	29.00	DS	NP	NP	NP	SM	-	8.00	60.00	29.00	3.00	*See the Note
	U3	6.00		1.86	1.53	2.66	21.65	-	0.00	30.00	DS	NP	NP	NP	SM	-	10.00	62.00	25.00	3.00	*See the Note

Unconfined Compressive Strength Test:IS 2720 (Part 10) Plastic Limit:IS 2720 (Part 5) Consolidation Test: IS 2720 (Part 15) Liquid limit:IS 2720 (Part 5)

Specific Gravity: IS 2720 (Part 3) Grain Size Analysis:IS 2720 (Part 4) Direct Shear Test (DS) : IS 2720 (Part 13) Triaxial Test (UU): IS 2720 (Part 11) Natural Moisture Contents IS 2720 (Part 2) *-Remould Sample

DUTTA & CO NAIHATI

Client: Assam Electricity Grid Corporation Limited.

PROJECT:- Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No	Sample Number	Depth (m)	Sample Description	Bulk Density	Dry Density	Sp. Gravity	Nat. Moisture	Mv	Shear Strength (kg/cm²)		Type of Test	Atter. Limits			IS Classification	Free swell	Grain Size				Test Method
									Cohesion	Friction		LL	PL	PI			Gravel	Sand	Silt	Clay	
				gms/cc	gms/cc		%	t/sqm	kg/sqcm	Deg.		%	%	%			%	%	%	%	
LOC-157/3	U1	1.50	Loose to medium, dark grey silty sand with mica & gravels	1.82	1.56	2.63	16.79	-	0.00	20.00	DS	NP	NP	NP	SM	-	8.00	62.00	26.00	4.00	*See the Note
	U2	4.00		1.83	1.56	2.64	17.35	-	0.00	21.00	DS	NP	NP	NP	SM	-	9.00	64.00	24.00	3.00	*See the Note
	U3	6.00	Dense, dark grey medium to coarses sand with gravels	1.85	1.57	2.65	17.67	-	0.00	30.00	DS	NP	NP	NP	SM	-	7.00	70.00	20.00	3.00	*See the Note
	U4	8.00		1.85	1.56	2.65	18.43	-	0.00	32.00	DS	NP	NP	NP	SM	-	9.00	72.00	17.00	2.00	*See the Note
AP-170	U1	1.50	Loose dark grey silty sand with mica.	1.84	1.56	2.65	18.22	-	0.00	18.00	DS	NP	NP	NP	SM	-	0.00	66.00	27.00	7.00	*See the Note
	U2	4.00	Medium, dark grey silty sand with mica & gravels	1.85	1.55	2.63	19.00	-	0.00	23.00	DS	NP	NP	NP	SM	-	4.00	67.00	24.00	5.00	*See the Note
	U3	6.00	Dense to very dense, dark grey medium sand with gravels,	1.86	1.55	2.62	20.18	-	0.00	32.00	DS	NP	NP	NP	SM	-	5.00	70.00	22.00	3.00	*See the Note
AP-182	U1	1.50	Medium stiff, brownish to dark grey clayey silt traces of sand.	1.89	1.50	2.70	26.19	0.0017	0.23	0.00	UC	31.11	21.00	10.11	ML	21	0.00	8.00	54.00	38.00	*See the Note
	U2	4.00	Stiff consistency, dark grey clayey silt with sand.	1.90	1.50	2.69	27.00	0.0021	0.25	0.00	UC	32.50	24.00	8.50	ML	-	0.00	9.00	56.00	35.00	*See the Note
	U3	6.00		1.91	1.49	2.70	28.58	0.0023	0.27	0.00	UC	32.15	24.00	8.15	ML	-	0.00	10.00	58.00	32.00	*See the Note
AP-190	U1	1.50	Soft to medium stiff brownish to dark grey clayey silt with sand.	1.87	1.47	2.67	27.29	0.0016	0.23	0.00	UC	31.16	21.00	10.16	ML	20	0.00	9.00	53.00	38.00	*See the Note
	U2	4.00	Loose dark grey silty fine sand with mica.	1.83	1.54	2.65	18.79	-	0.00	18.00	DS	NP	NP	NP	SM	-	0.00	66.00	29.00	5.00	*See the Note
	U3	6.00	Medium stiff, dark grey clayey silt.	1.89	1.50	2.68	26.29	0.0021	0.26	0.00	UC	32.50	24.00	8.50	ML	-	0.00	9.00	56.00	35.00	*See the Note
	U4	8.00		1.90	1.49	2.70	27.41	0.0023	0.27	0.00	UC	32.00	24.00	8.00	ML	-	0.00	9.00	58.00	33.00	*See the Note

Unconfined Compressive Strength Test:IS 2720 (Part 10) Plastic Limit:IS 2720 (Part 5) ConsolidationTest:IS 2720 (Part 15) Liquid limit:IS 2720 (Part 5)

Specific Gravity: IS 2720 (Part 3) Grain Size Analysis:IS 2720 (Part 4) Direct Shear Test (DS) : IS 2720 (Part 13) Triaxial Test (UU): IS 2720 (Part 11) Natural Moisture Content: IS 2720 (Part 2) *-Remould Sample



Client: Assam Electricity Grid Corporation Limited.

PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No	Sample Number	Depth (m)	Sample Description	Bulk Density	Dry Density	Sp. Gravity	Nat. Moisture	Mv	Shear Strength (kg/cm²)		Type of Test	Atter. Limits			IS Classification	Free swell	Grain Size				Test Method
									Cohesion	Friction		LL	PL	PI			Gravel	Sand	Silt	Clay	
				gms/cc	gms/cc		%	t/sqm	kg/sqcm	Deg.		%	%	%			%	%	%	%	
AP-206	U1	1.50	Medium stiff, brownish to dark grey clayey silt with sand.	1.88	1.49	2.69	26.25	0.0018	0.22	0.00	UC	30.00	23.56	6.44	ML	20	0.00	4.00	52.00	44.00	*See the Note
	U2	4.00		1.90	1.50	2.70	27.00	0.0020	0.23	0.00	UC	30.50	22.88	7.62	ML	-	0.00	6.00	54.00	40.00	*See the Note
	U4	8.00	Stiff dark grey clayey silt traces of sand with mica.	1.91	1.49	2.68	28.55	0.0023	0.31	0.00	UC	31.00	24.00	7.00	ML	-	0.00	10.00	53.00	37.00	*See the Note
AP-220	U1	1.50	Medium stiff, dark grey silty clay traces of sand.	1.88	1.48	2.69	27.35	0.0019	0.21	0.00	UC	36.29	21.00	15.29	CI	25	0.00	4.00	44.00	52.00	*See the Note
	S2	3.00	Medium stiff consistency dark clayey silt	1.90	-	2.70	-	0.0021	0.24	0.00	UC	33.56	21.00	12.56	ML	-	0.00	4.00	55.00	41.00	*See the Note
	U3	6.00	Loose to medium, dark grey silty fine sand with mica.	1.84	1.55	2.63	18.35	-	0.00	25.00	DS	NP	NP	NP	SM	-	0.00	66.00	30.00	4.00	*See the Note
	U4	8.00		1.85	1.56	2.65	18.65	-	0.00	26.00	DS	NP	NP	NP	SM	-	0.00	68.00	29.00	3.00	*See the Note
AP-241	U1	1.50	Medium stiff dark grey clayey silt traces of sand with mica.	1.89	1.51	2.70	25.41	0.0016	0.25	0.00	UC	29.00	19.00	10.00	ML	21	0.00	8.00	58.00	34.00	*See the Note
	U2	4.00	Loose to medium, dark grey silty fine sand with mica.	1.83	1.54	2.65	19.00	-	0.00	24.00	DS	NP	NP	NP	SM	-	0.00	68.00	28.00	4.00	*See the Note
	U3	6.00		1.85	1.55	2.66	19.25	-	0.00	25.00	DS	NP	NP	NP	SM	-	0.00	69.00	28.00	3.00	*See the Note
AP-252	U1	1.50	Medium stiff, dark grey silty clay	1.88	1.49	2.69	26.55	0.0022	0.28	0.00	UC	35.66	22.00	13.66	CI	-	0.00	5.00	44.00	51.00	*See the Note
	U2	4.00	Loose to medium, dark grey silty fine sand with mica.	1.84	1.60	2.64	15.35	-	0.00	27.00	DS	NP	NP	NP	SM	-	0.00	67.00	30.00	3.00	*See the Note
	U3	6.00		1.85	1.60	2.65	15.55	-	0.00	28.00	DS	NP	NP	NP	SM	-	0.00	70.00	28.00	2.00	*See the Note
	U4	8.00	Very dense, dark grey medium to coarses sand with mica & occasionally gravels	1.86	1.56	2.65	19.00	-	0.00	32.00	DS	NP	NP	NP	SM	-	5.00	68.00	24.00	3.00	*See the Note

Unconfined Compressive Strength Test:IS 2720 (Part 10) Plastic Limit:IS 2720 (Part 5) ConsolidationTest:IS 2720 (Part 15) Liquid limit:IS 2720 (Part 5)

Specific Gravity: IS 2720 (Part 3) Grain Size Analysis:IS 2720 (Part 4) Direct Shear Test (DS) : IS 2720 (Part 13) Triaxial Test (UU): IS 2720 (Part 11) Natural Moisture Content: IS 2720 (Part 2) *-Remould Sample

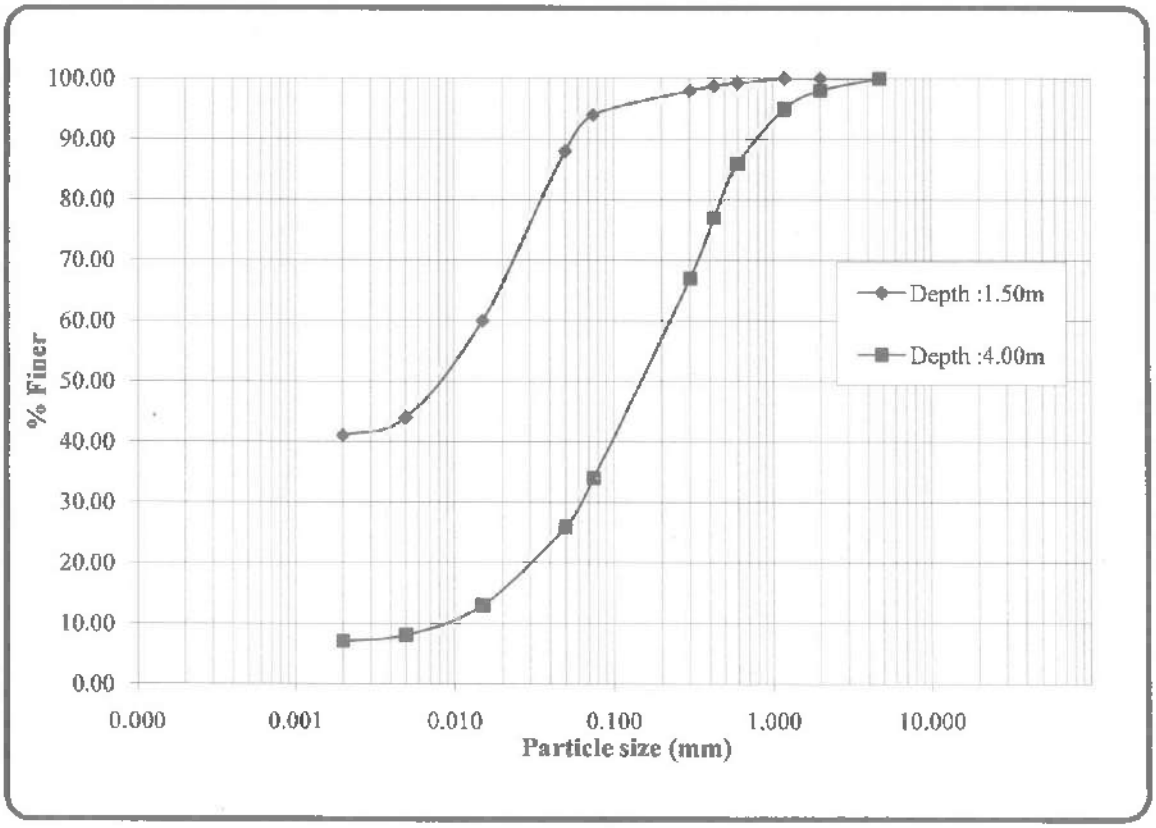
DUTTA & CO NAHATI

GRAIN SIZE DISTRIBUTION CURVES

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	**Assam Electricity Grid Corporation Limited**
Project :-	**Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.**

Bore Hole No. AP-3



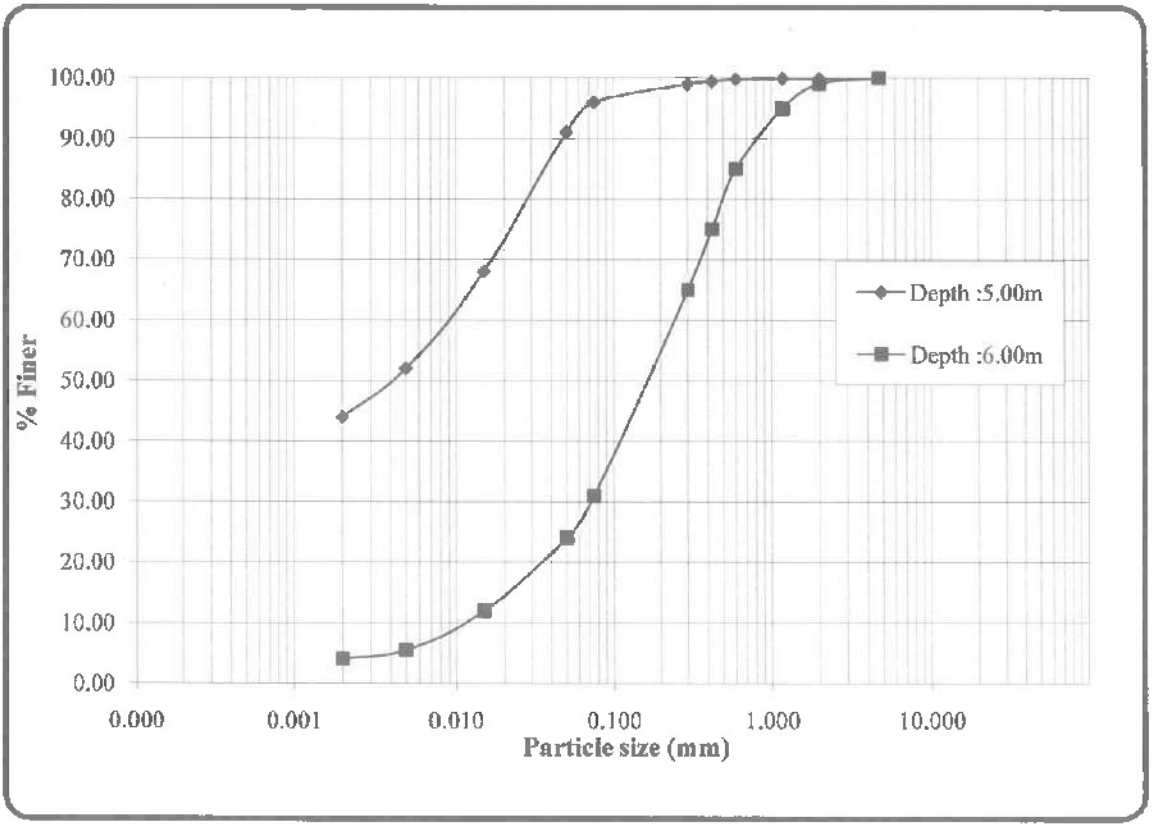
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-3, U-1, 1.50m	41.00	53.00	6.00	0.00
AP-3, U-2, 4.00m	7.00	27.00	66.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-3

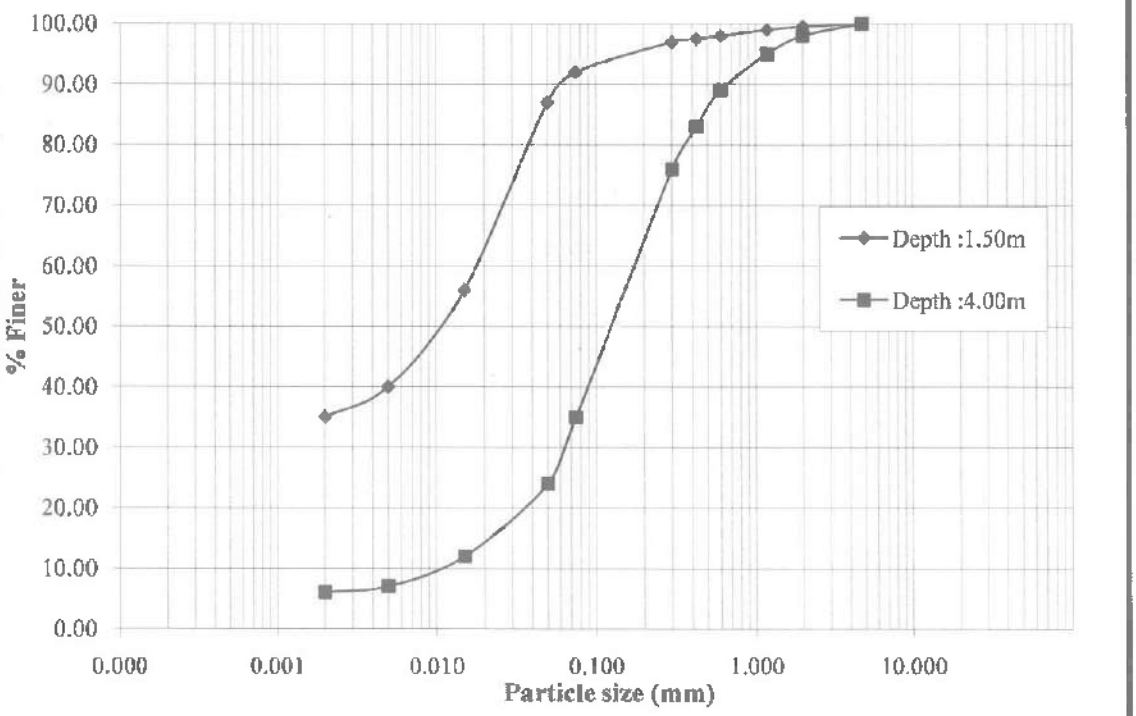


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-3, S-3, 5.00m	44.00	52.00	4.00	0.00
AP-3, U-3, 6.00m	4.00	27.00	69.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-29

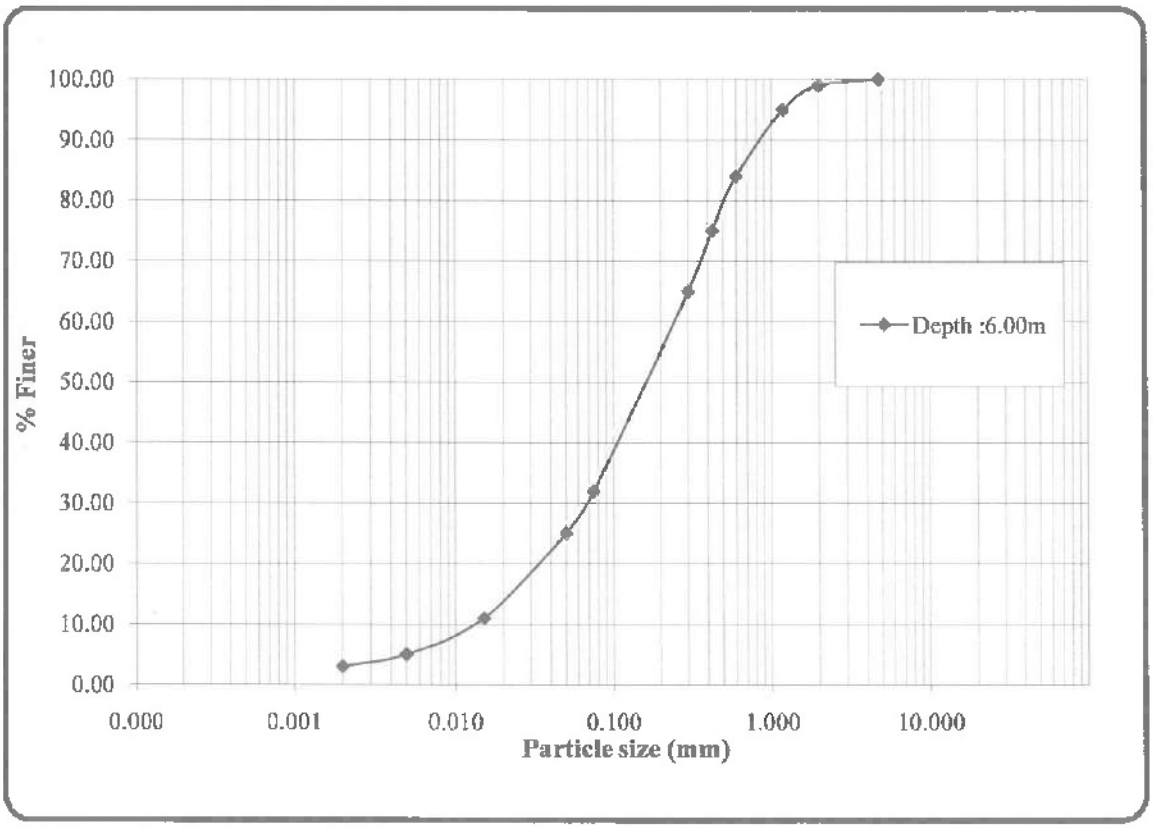


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-29, U-1, 1.50m	35.00	57.00	8.00	0.00
AP-29, U-2, 4.00m	6.00	29.00	65.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	**Assam Electricity Grid Corporation Limited**
Project :-	**Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.**

Bore Hole No. AP-29

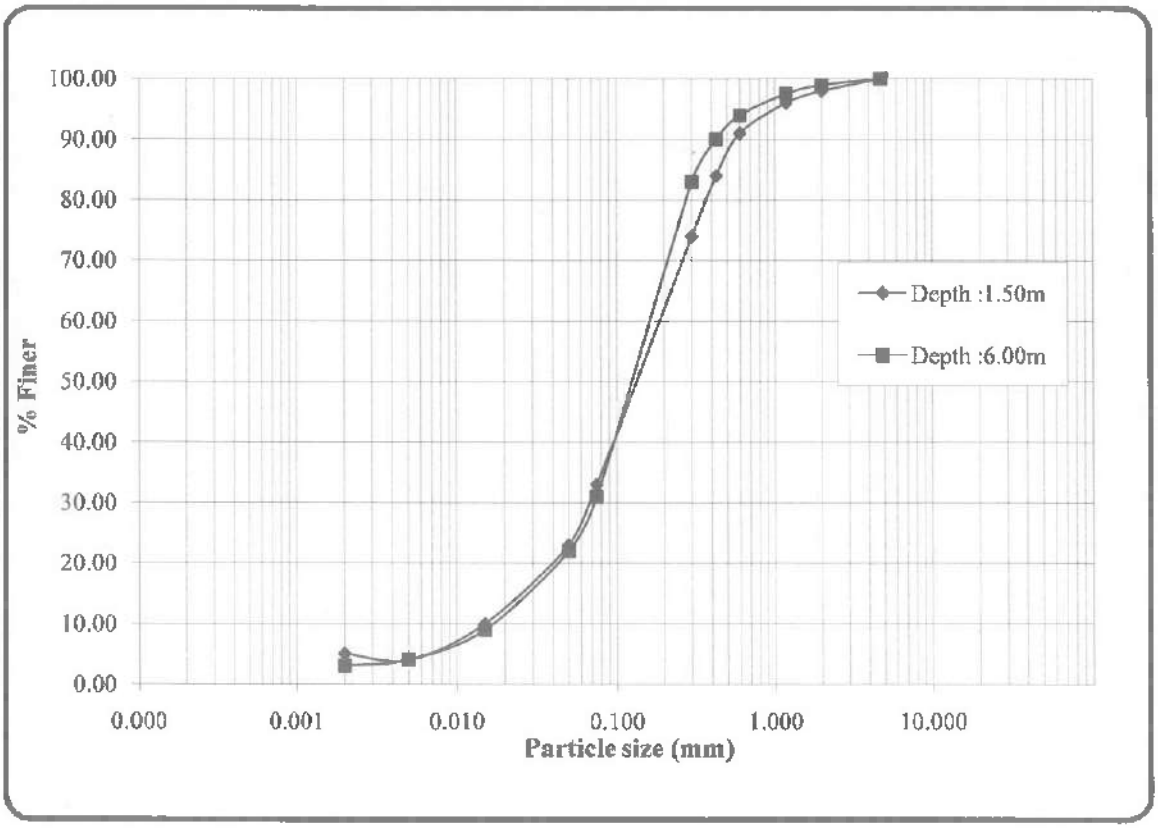


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-29, U-3, 6.00m	3.00	29.00	68.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-47

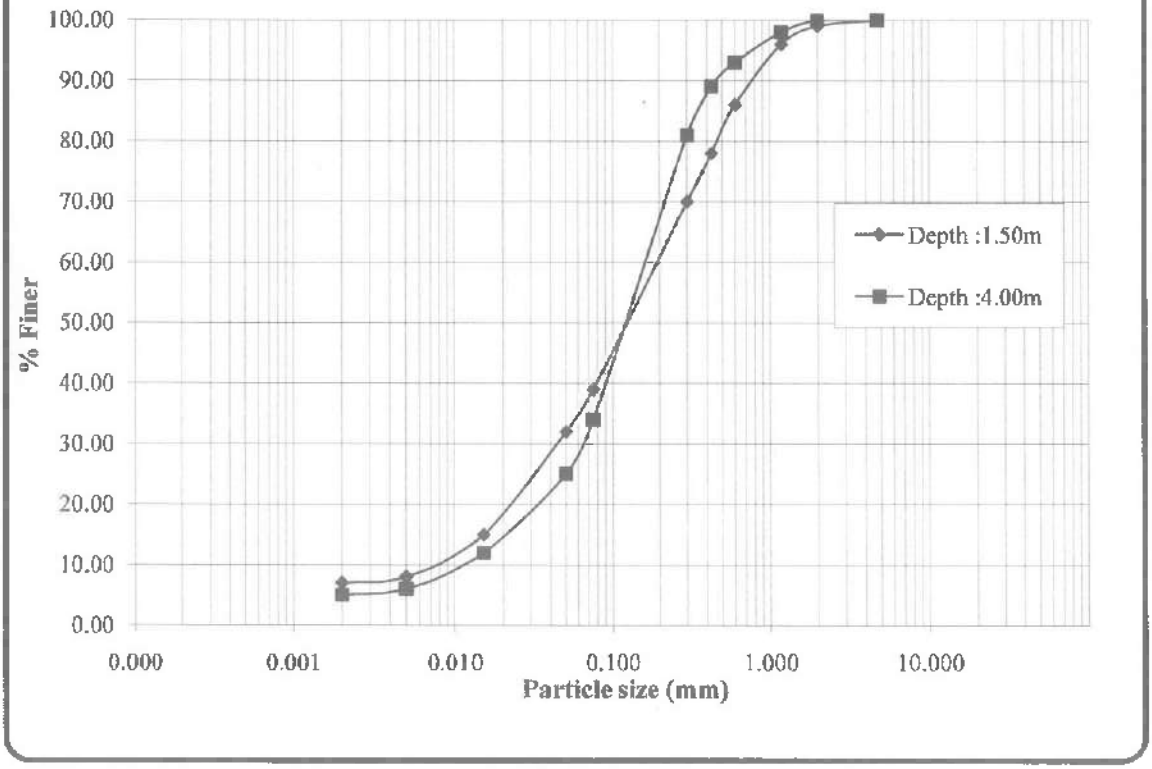


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-47, U-1, 1.50m	5.00	28.00	67.00	0.00
AP-47, U-3, 6.00m	3.00	28.00	69.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-52



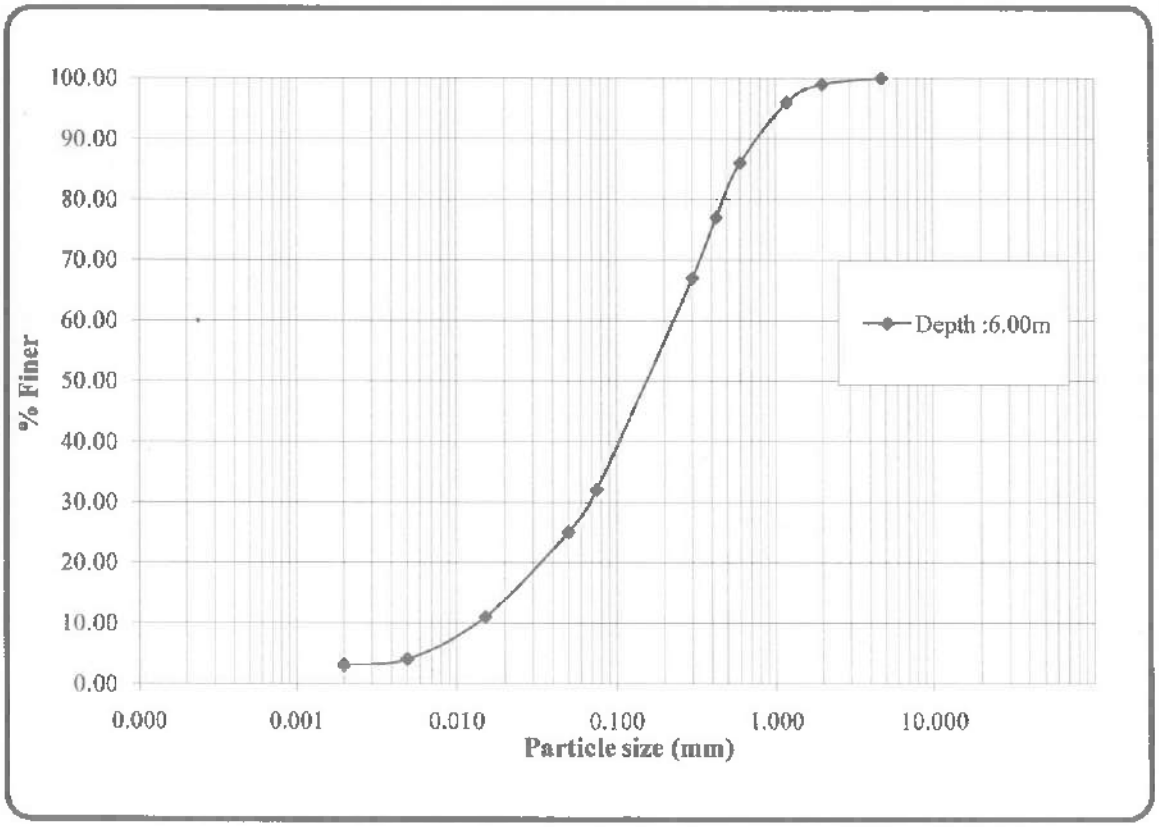
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-52, U-1, 1.50m	7.00	32.00	61.00	0.00
AP-52, U-2, 4.00m	5.00	29.00	66.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-52



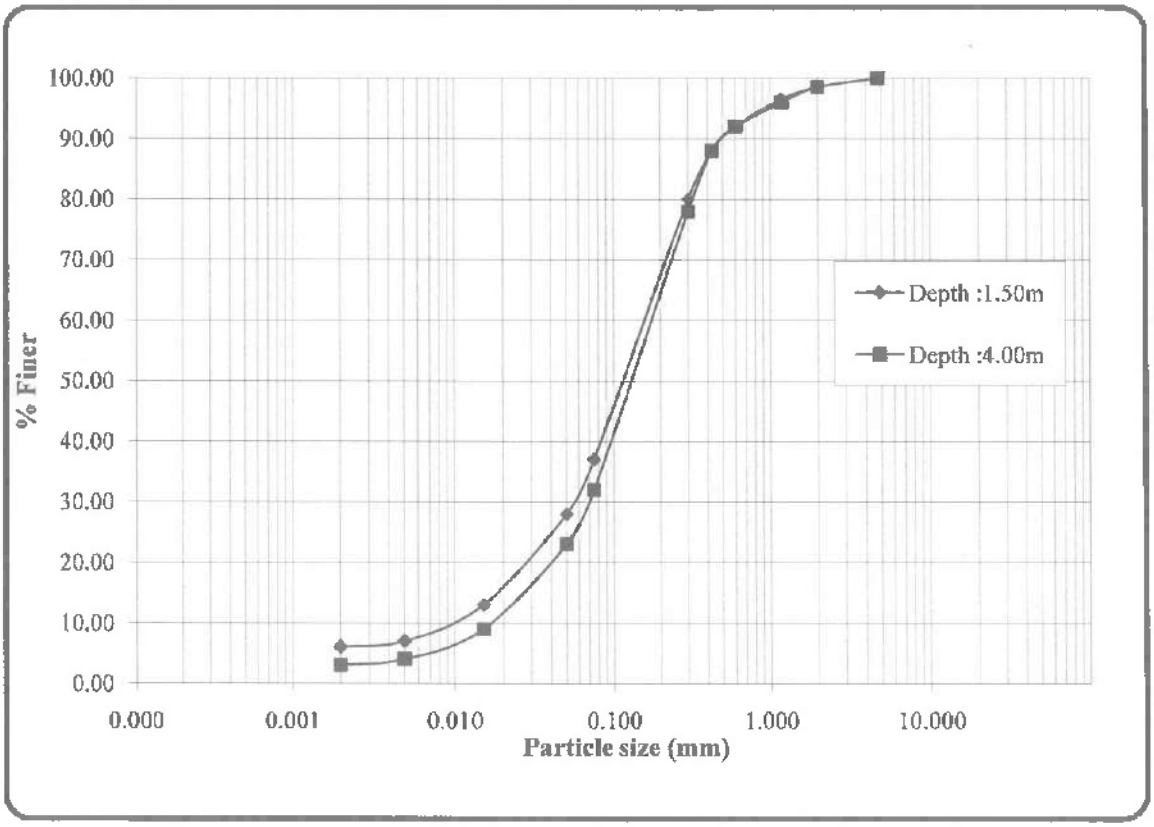
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-52, U-3, 6.00m	3.00	29.00	68.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-66



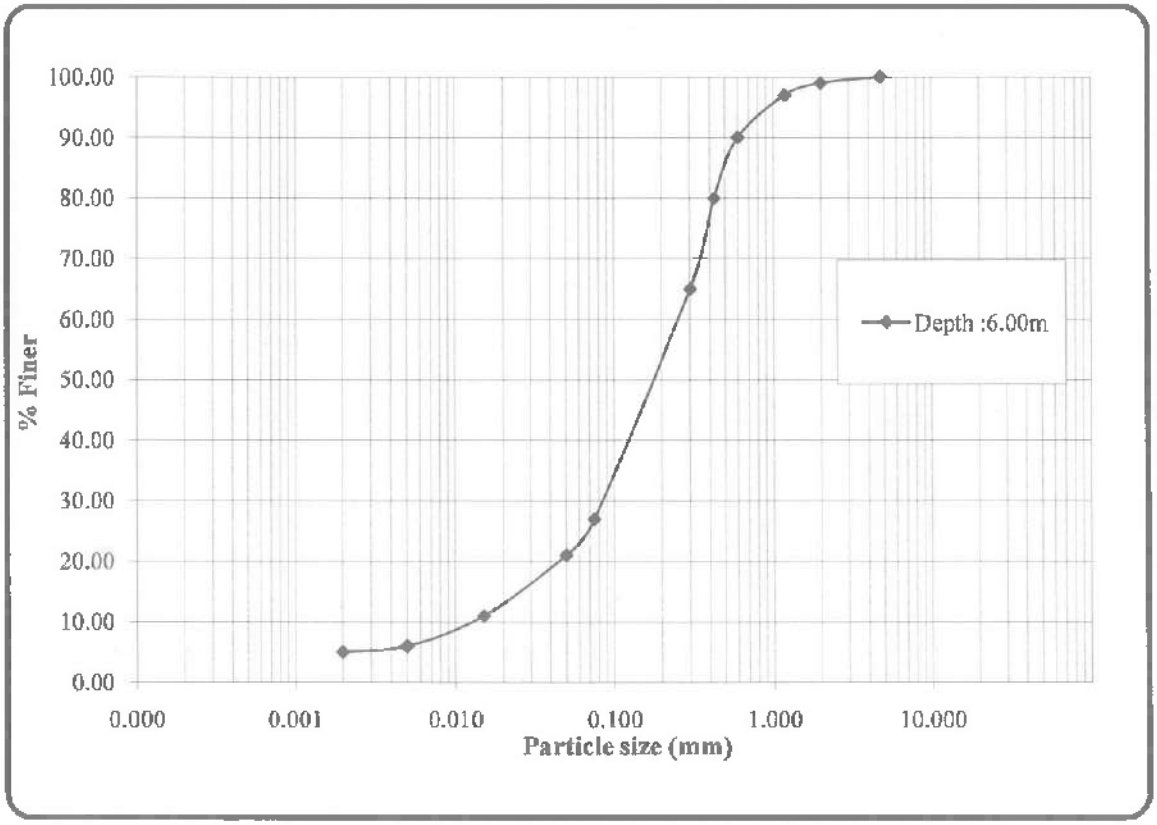
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-66, U-1, 1.50m	6.00	31.00	63.00	0.00
AP-66, U-2, 4.00m	3.00	29.00	68.00	0.00

P. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-66

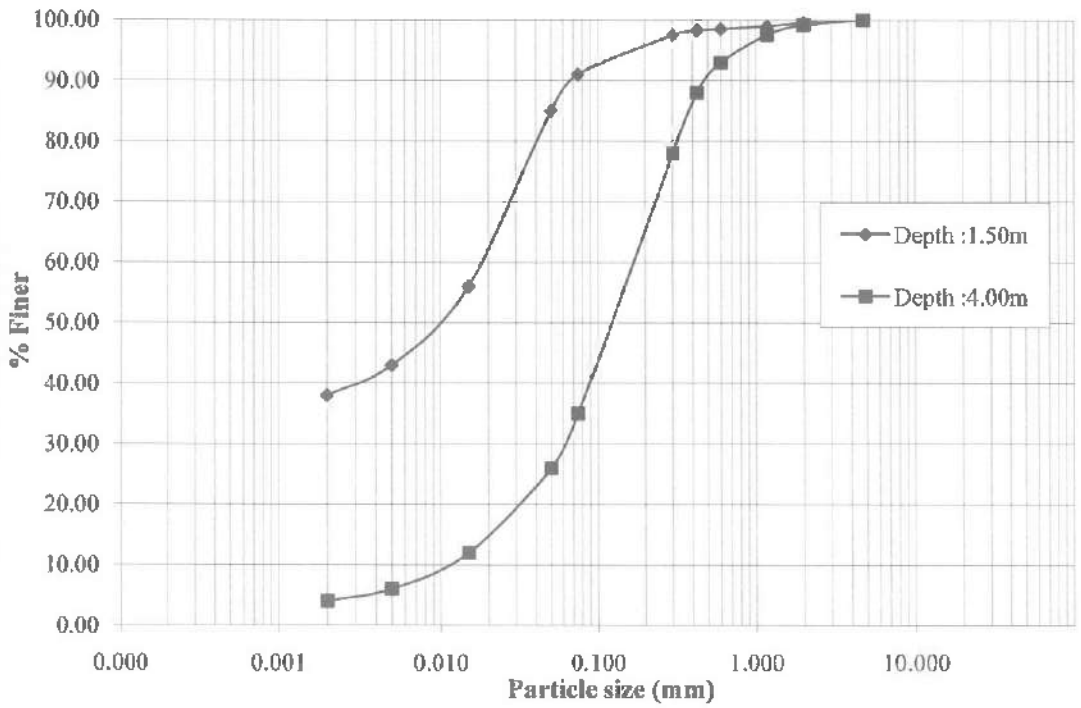


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-66, U-3, 6.00m	5.00	22.00	73.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-73

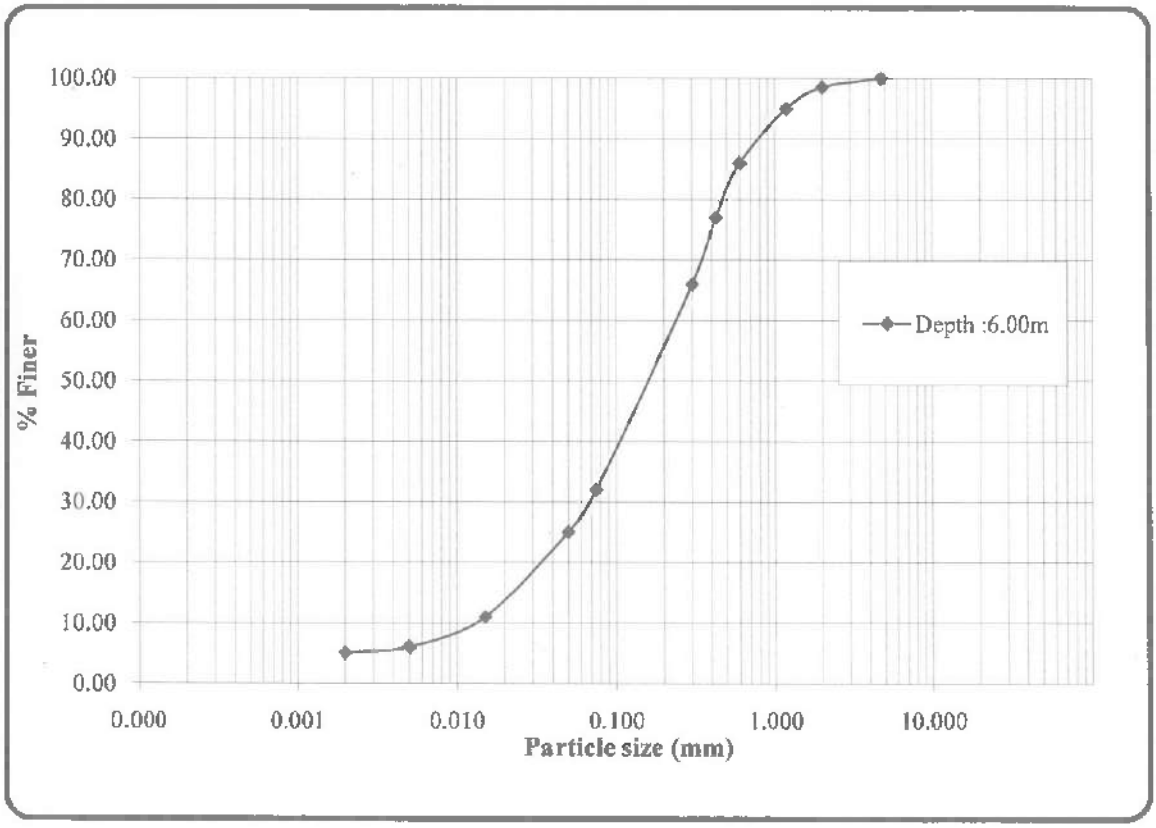


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-73, U-1, 1.50m	38.00	53.00	9.00	0.00
AP-73, U-2, 4.00m	4.00	31.00	65.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-73

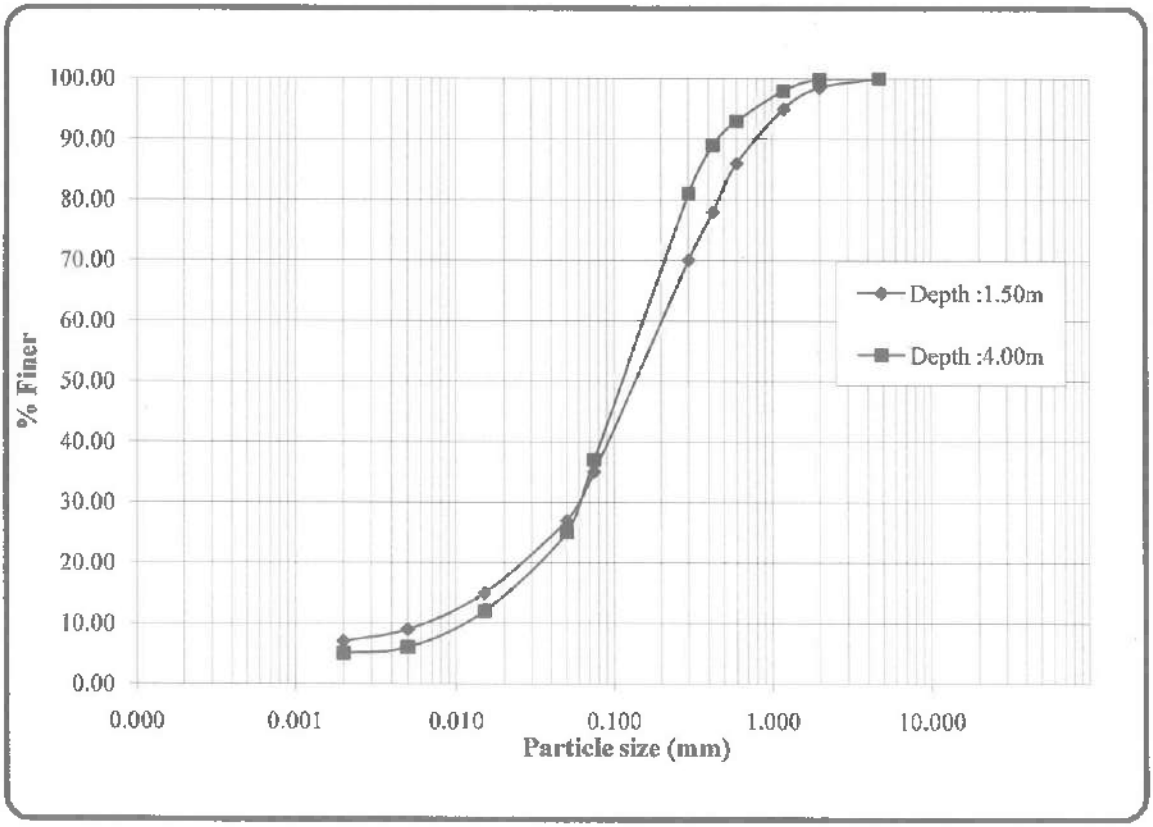


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-73, U-3, 6.00m	5.00	27.00	68.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-109



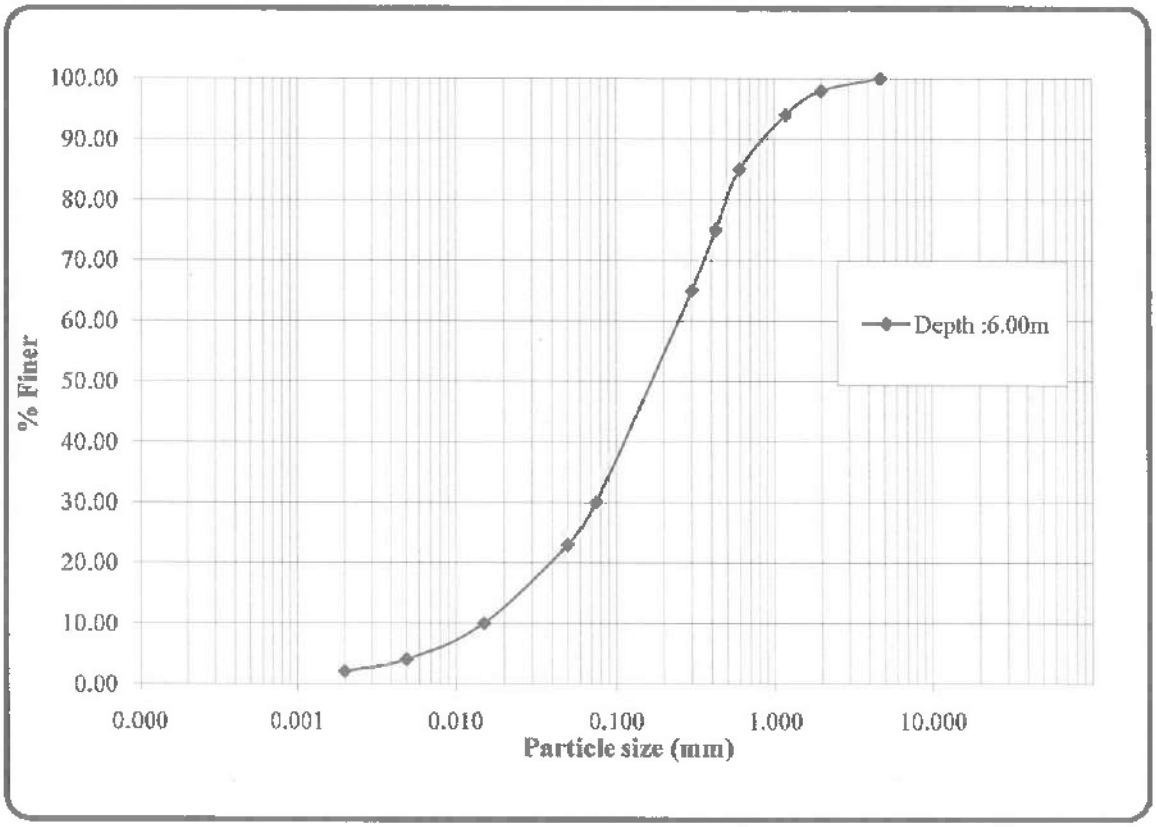
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-109, U-1, 1.50m	7.00	28.00	65.00	0.00
AP-109, U-2, 4.00m	5.00	32.00	63.00	0.00

P. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-109



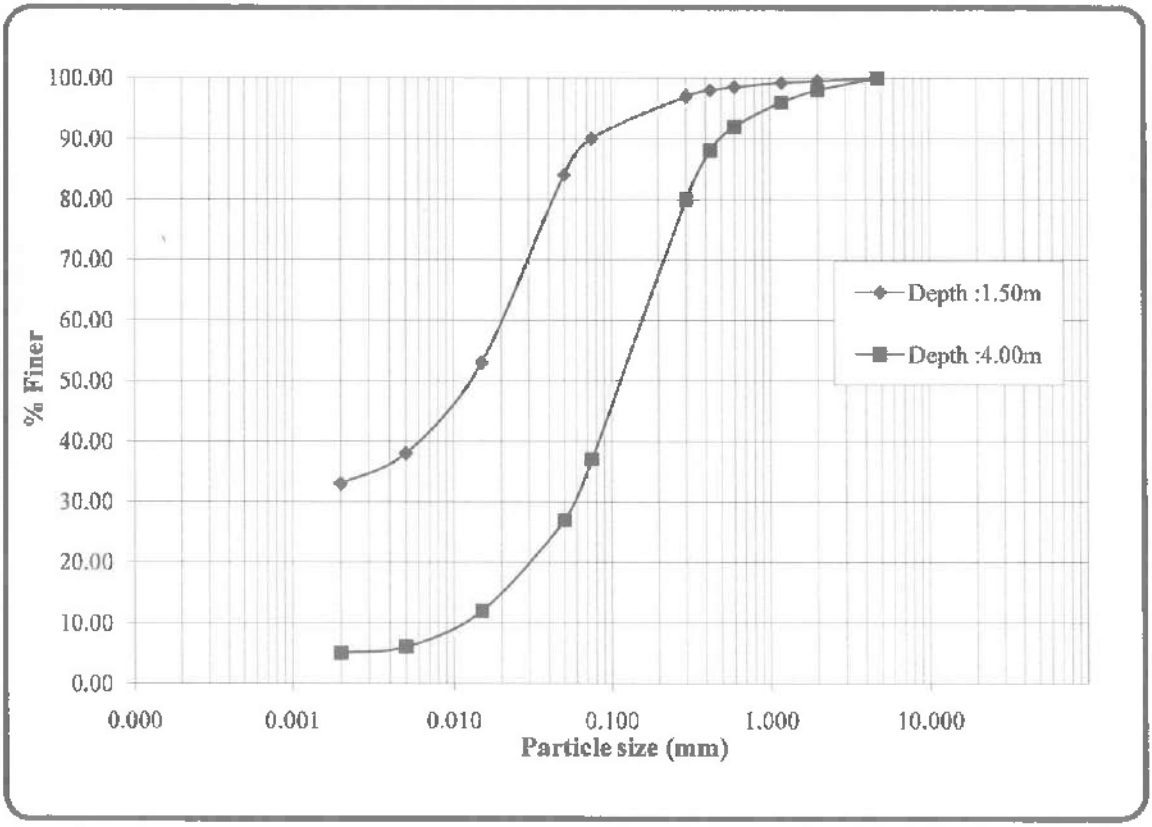
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-109, U-3, 6.00m	2.00	28.00	70.00	0.00

P. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-120



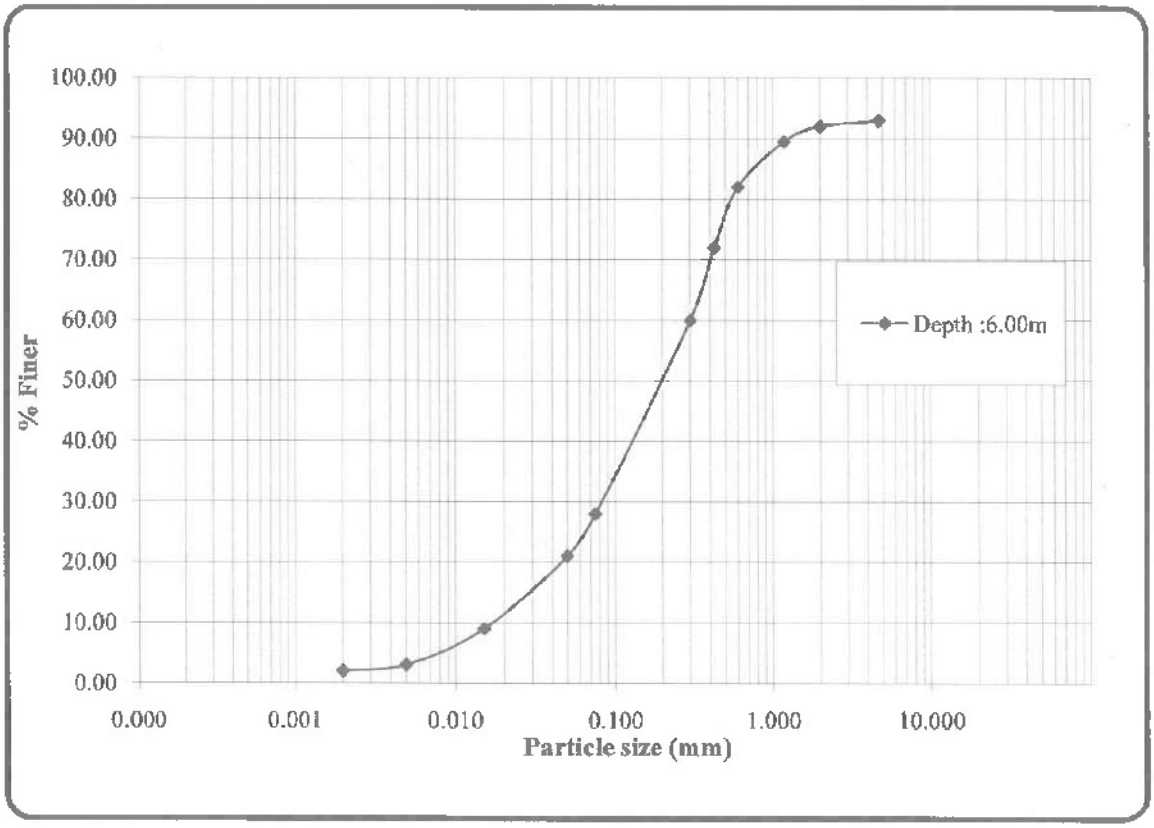
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-120, U-1, 1.50m	33.00	57.00	10.00	0.00
AP-120, U-2, 4.00m	5.00	32.00	63.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-120



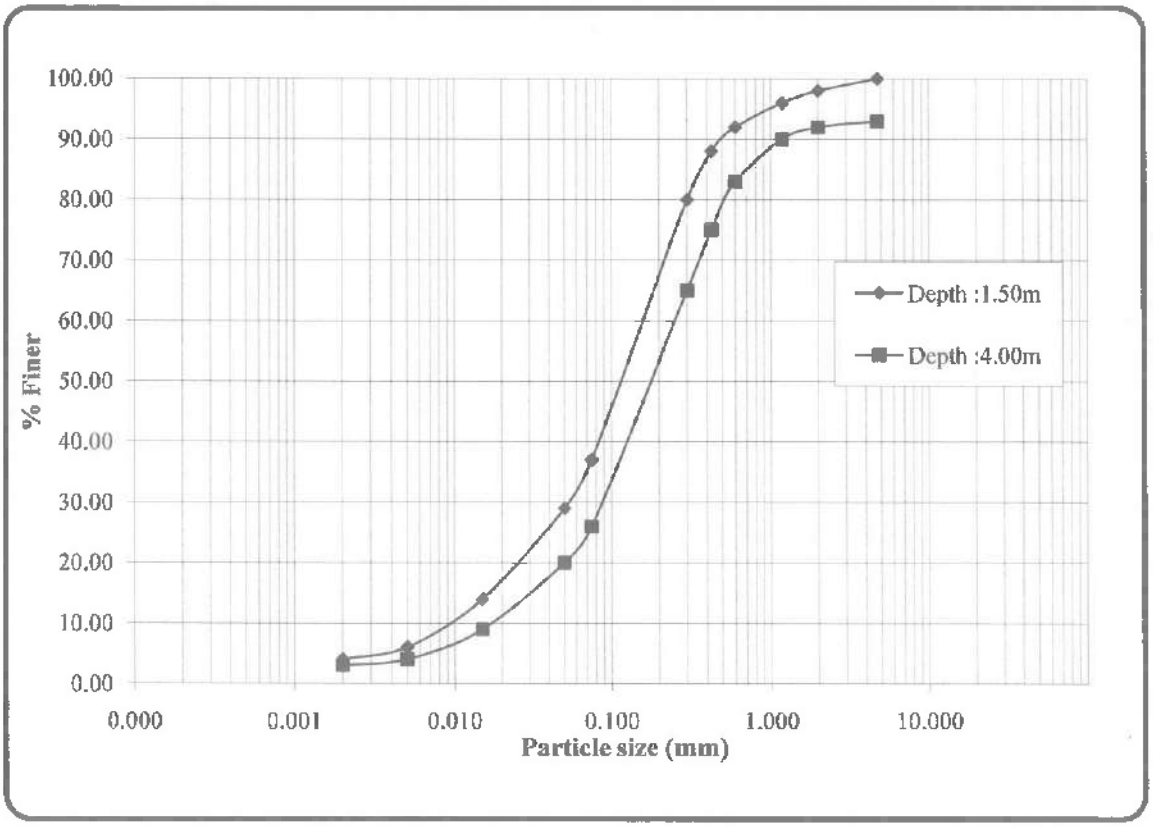
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-109, U-3, 6.00m	2.00	26.00	65.00	7.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-131

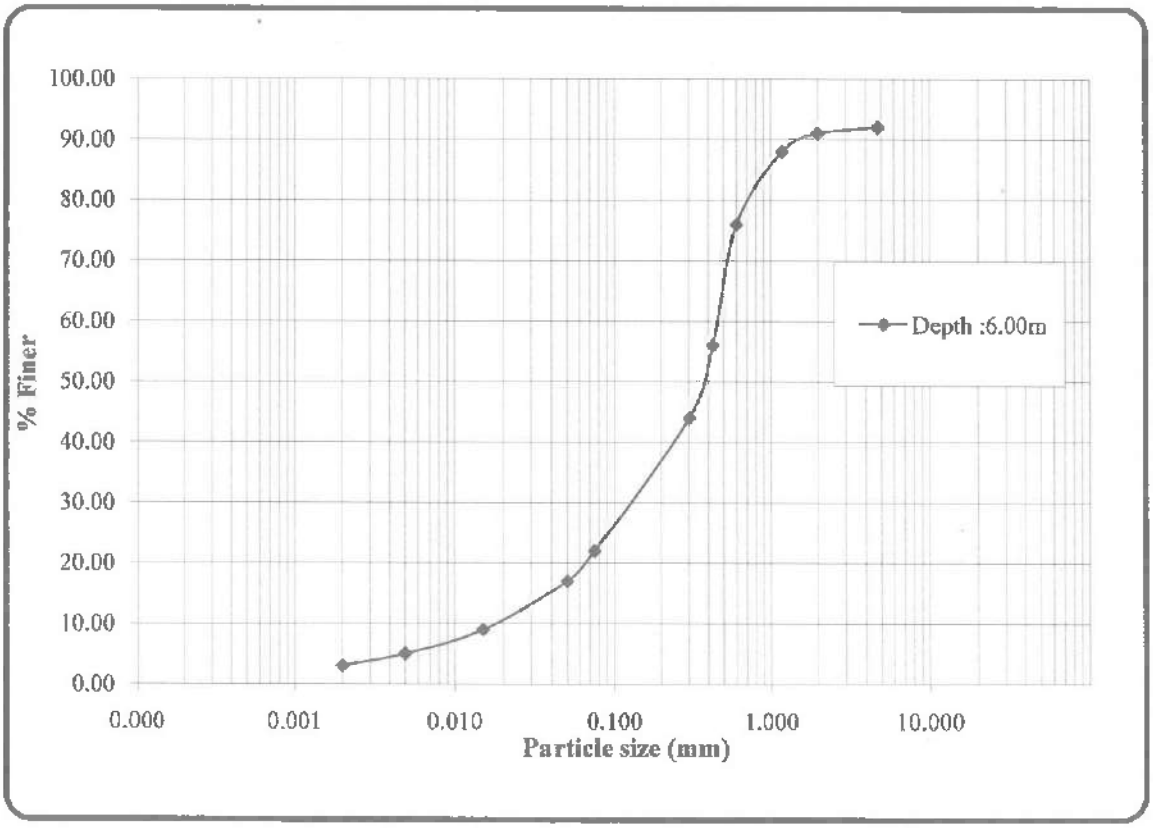


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-131, U-1, 1.50m	4.00	33.00	63.00	0.00
AP-131, U-2, 4.00m	3.00	23.00	67.00	7.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-131

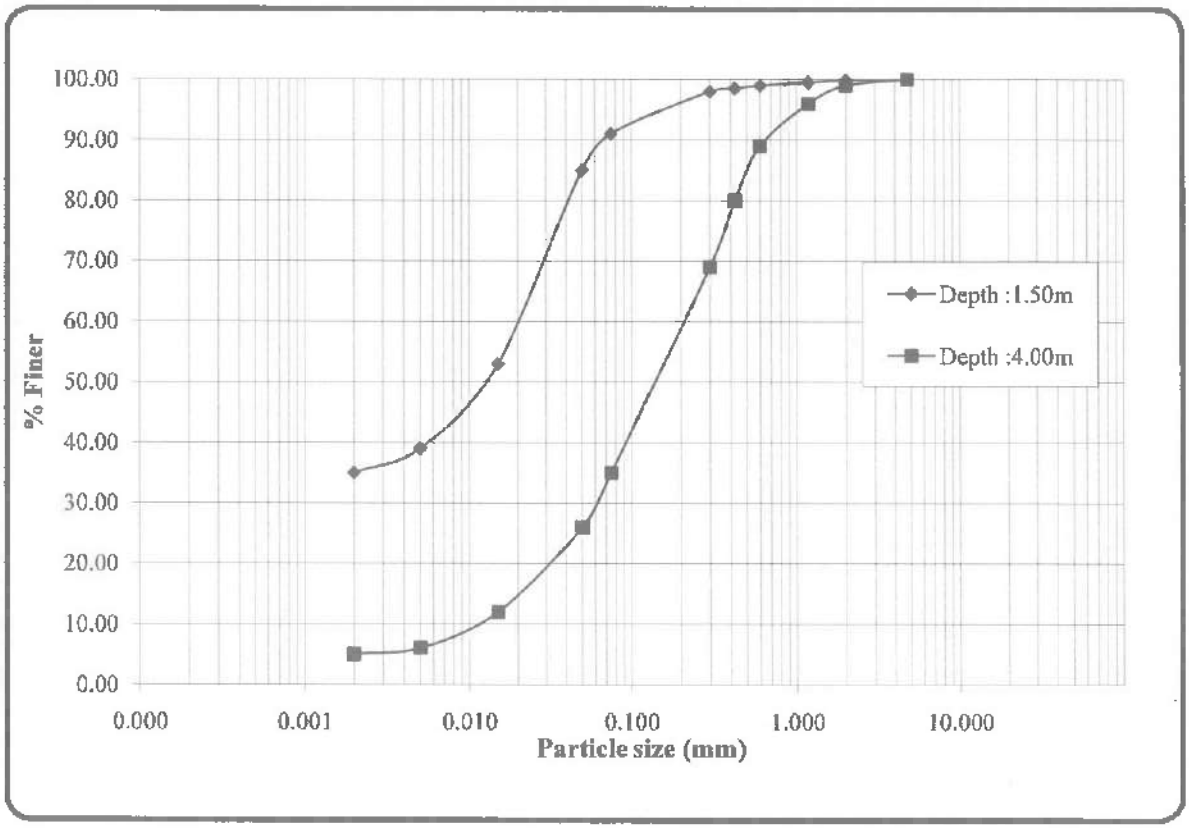


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-131, U-3, 6.00m	3.00	19.00	70.00	8.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-137/2



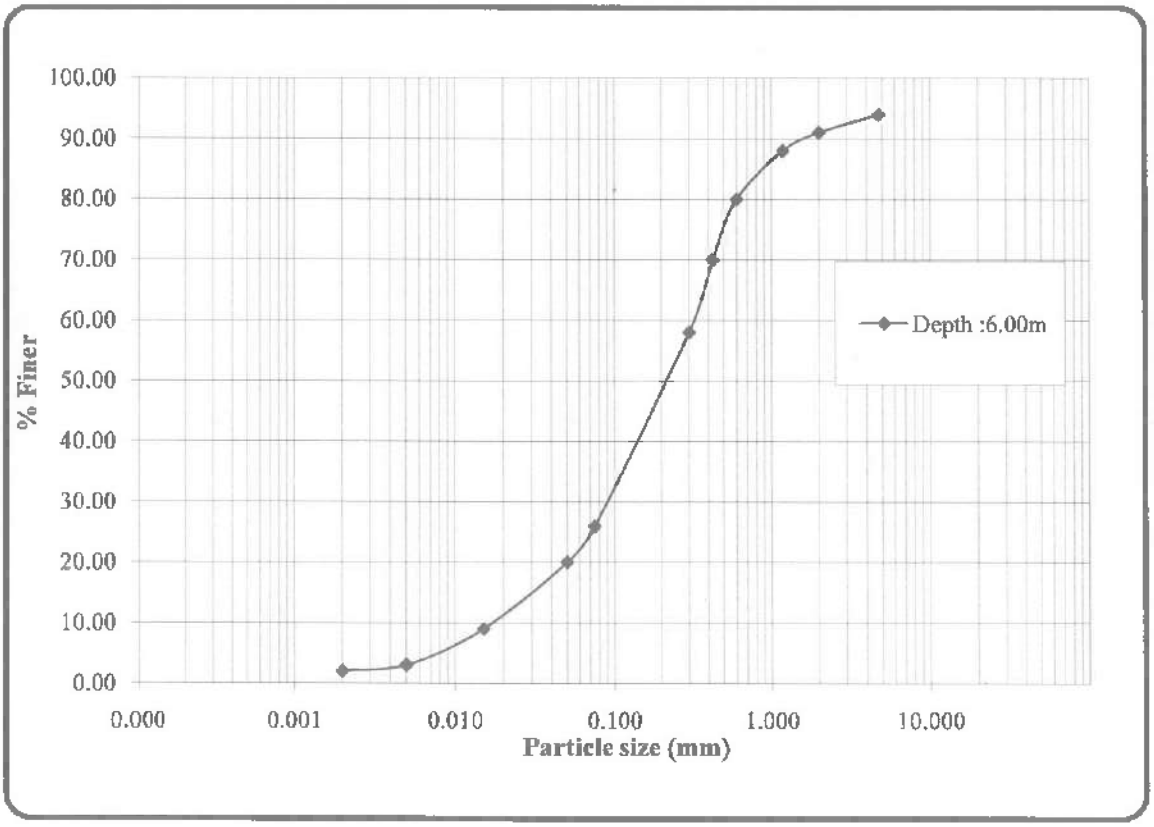
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-137/2, U-1, 1.50m	35.00	56.00	9.00	0.00
LOC-137/2, U-2, 4.00m	5.00	30.00	65.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-137/2



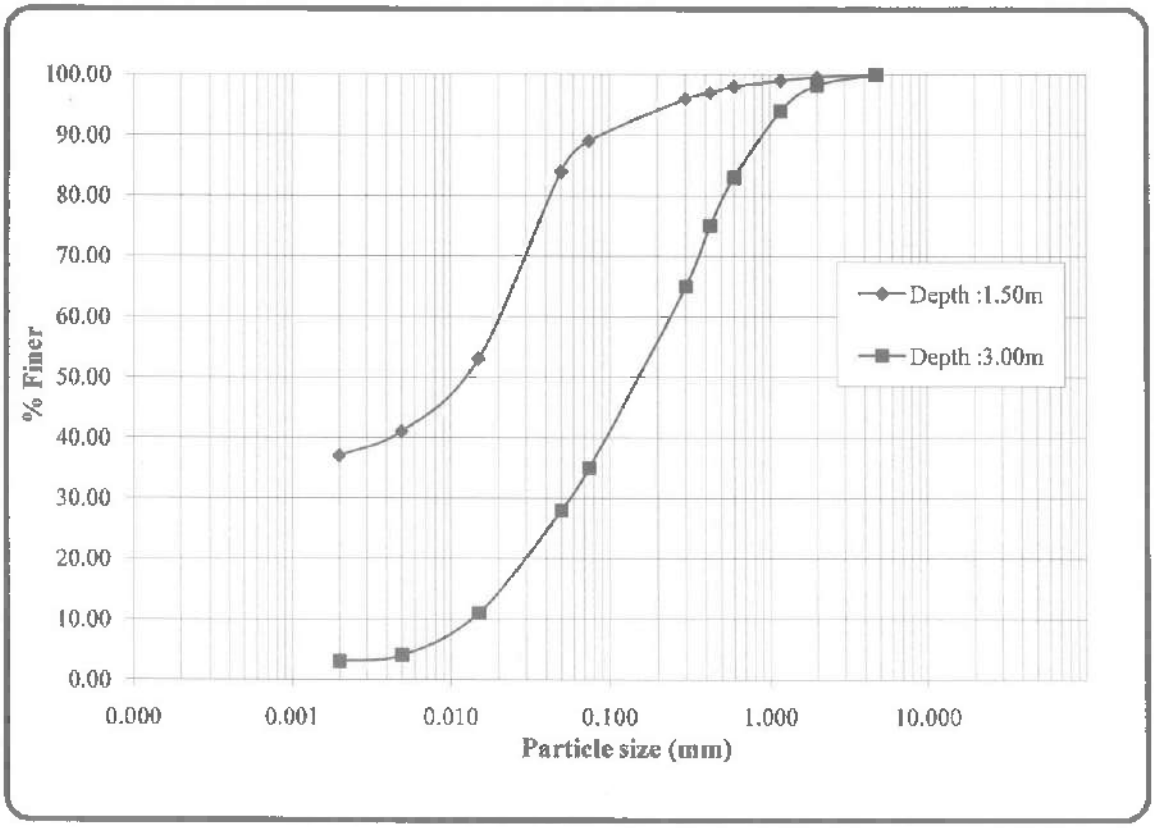
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-131, U-3, 6.00m	2.00	24.00	68.00	6.00

DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-141



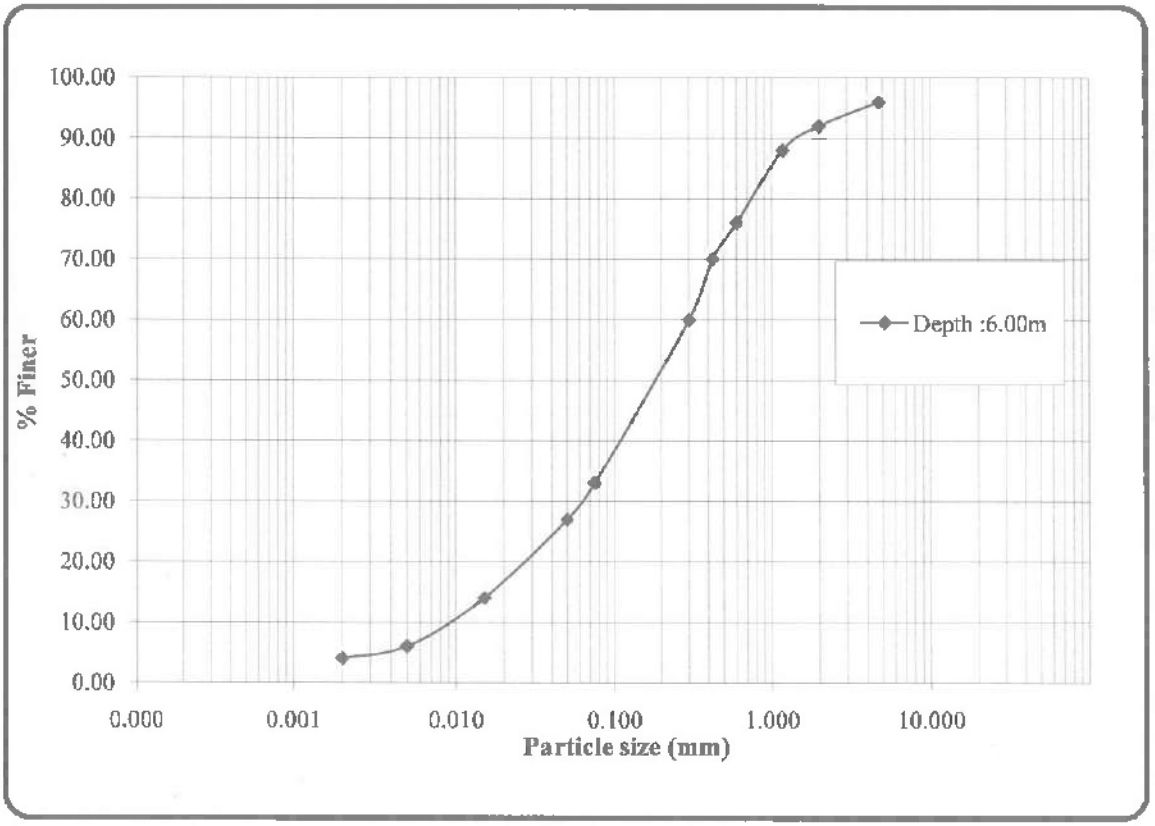
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-141, U-1, 1.50m	37.00	52.00	11.00	0.00
AP-141, S-3, 3.00m	3.00	32.00	65.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-141



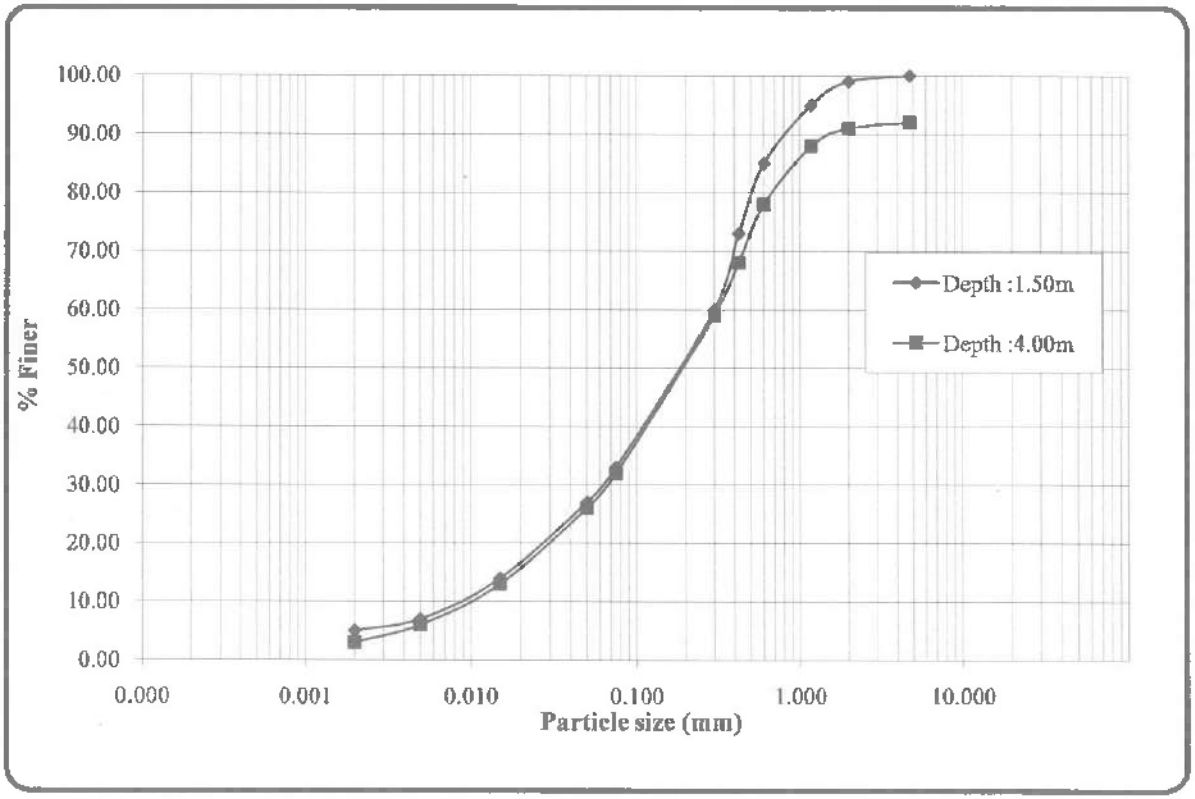
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-141, U-2, 6.00m	4.00	29.00	63.00	4.00

DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-151/2



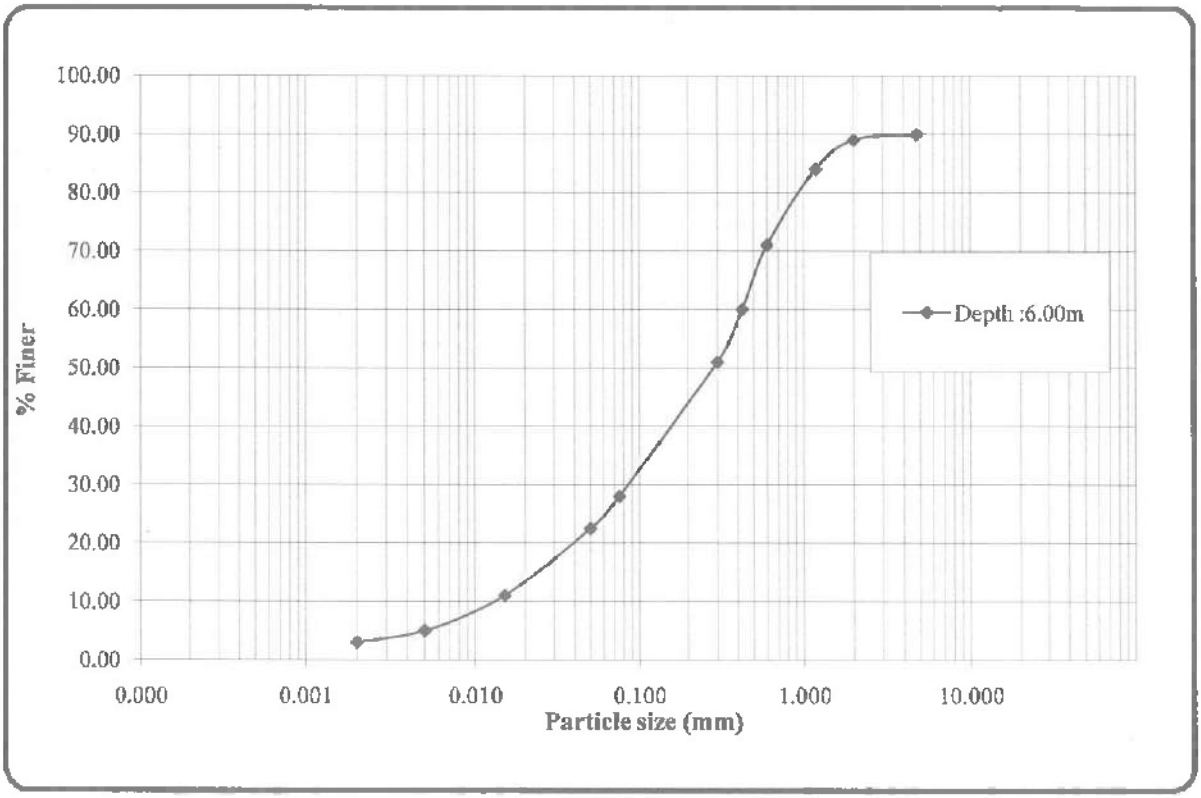
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-151/2, U-1, 1.50m	5.00	28.00	67.00	0.00
LOC-151/2, U-2, 4.00m	3.00	29.00	60.00	8.00

P. K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-151/2



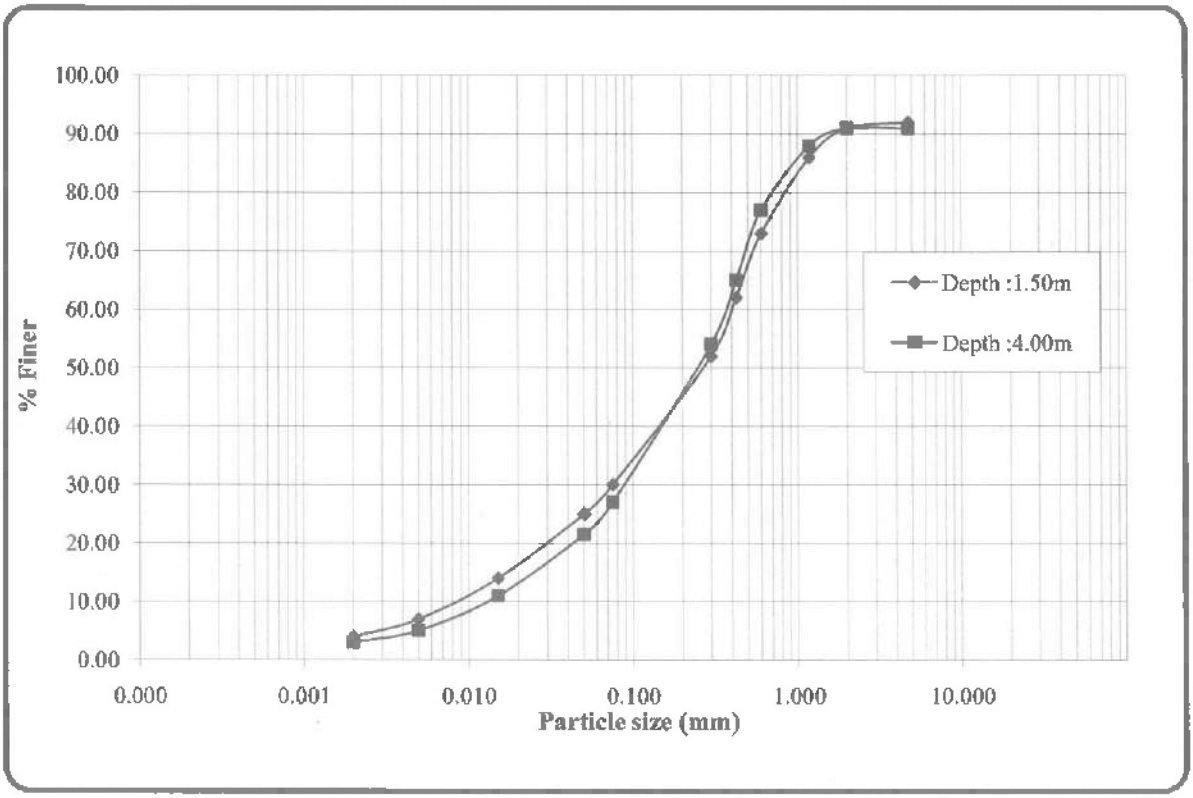
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-151/2, U-3, 6.00m	3.00	25.00	62.00	10.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-157/3



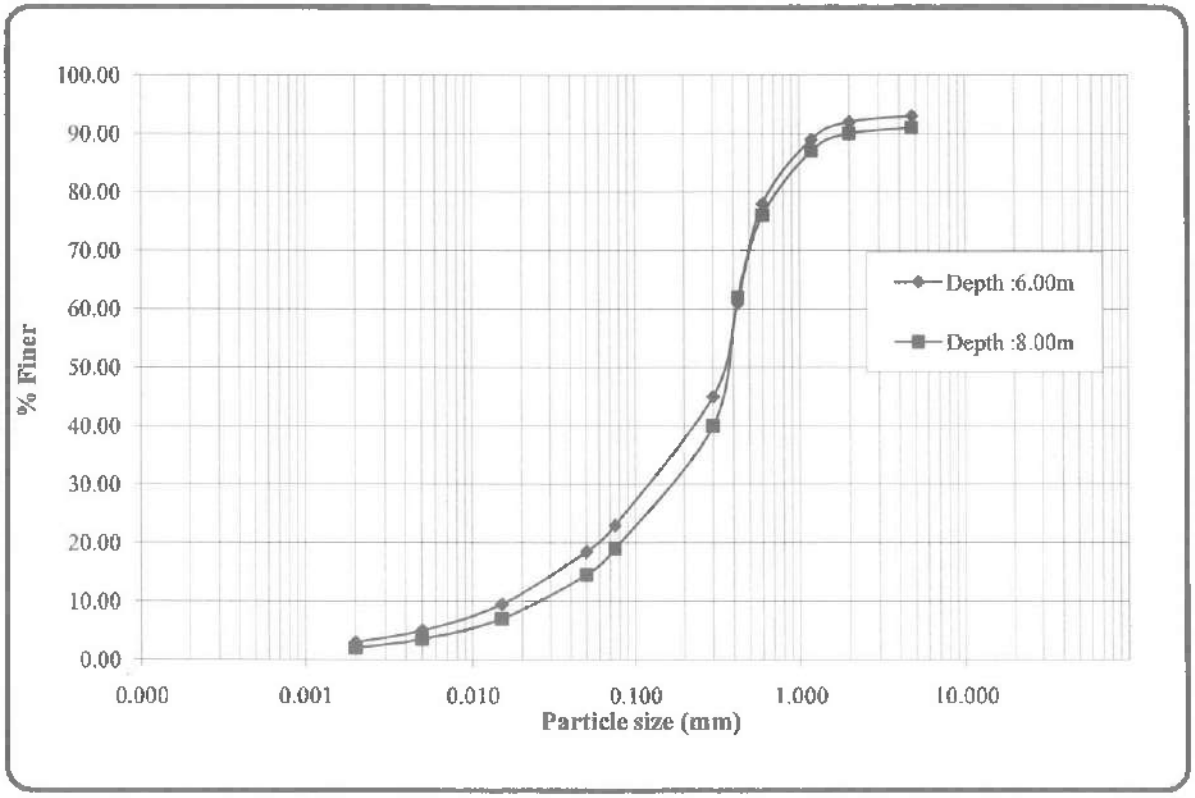
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-157/3, U-1, 1.50m	4.00	26.00	62.00	8.00
LOC-157/3, U-2, 4.00m	3.00	24.00	64.00	9.00

P. K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. LOC-157/3



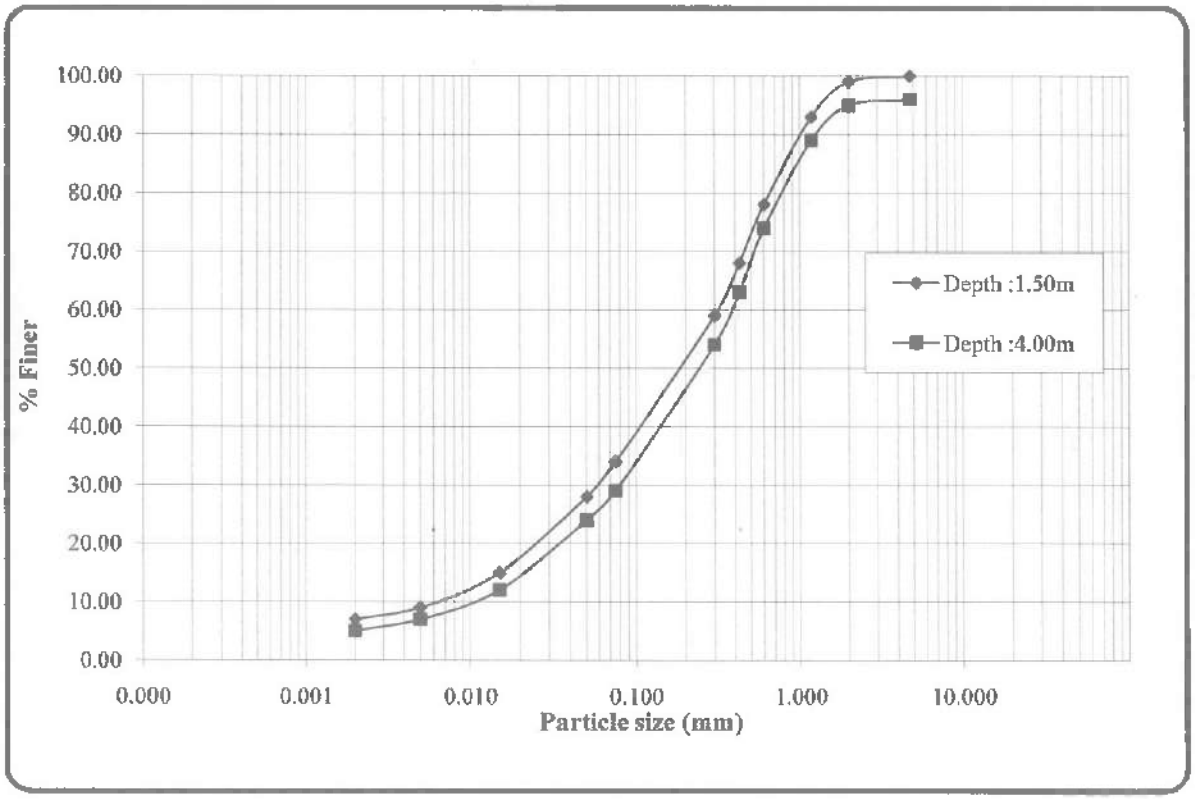
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-157/3, U-3, 6.00m	3.00	20.00	70.00	7.00
LOC-157/3, U-4, 8.00m	2.00	17.00	72.00	9.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-170



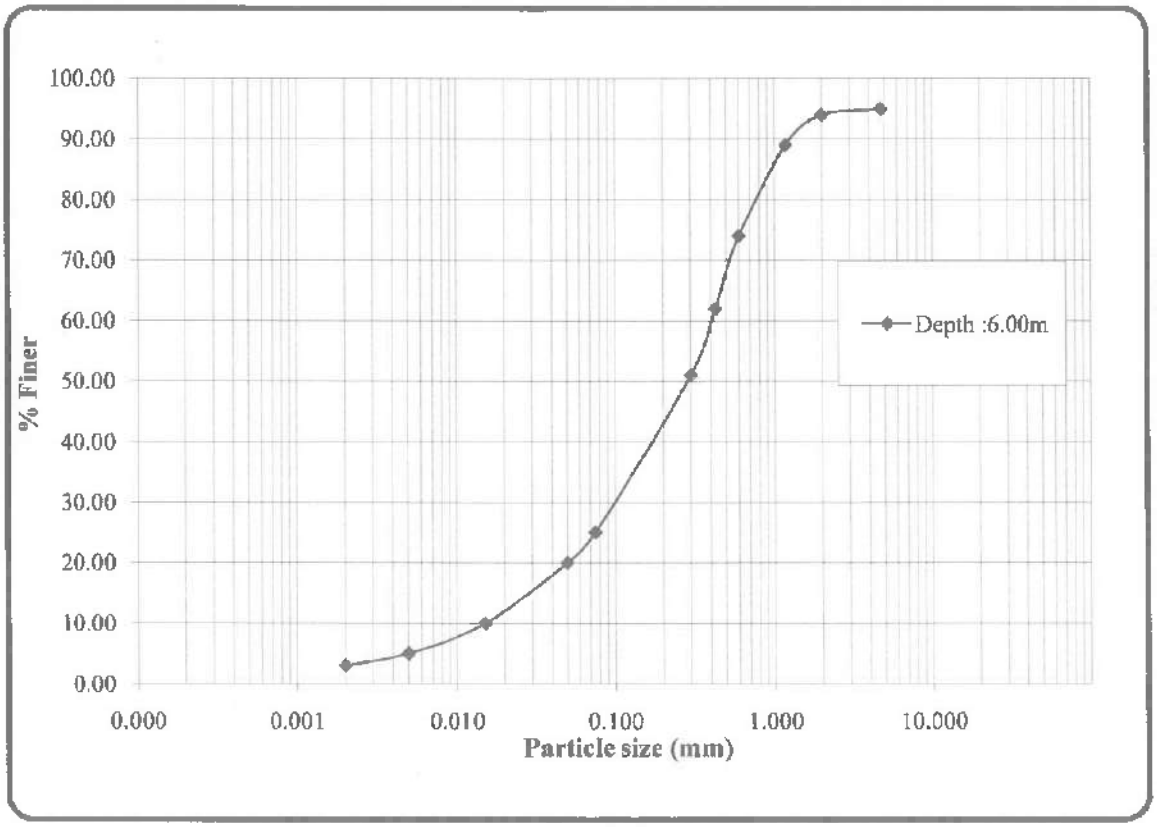
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
LOC-157/3, U-1, 1.50m	7.00	27.00	66.00	0.00
LOC-157/3, U-2, 4.00m	5.00	24.00	67.00	4.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-170



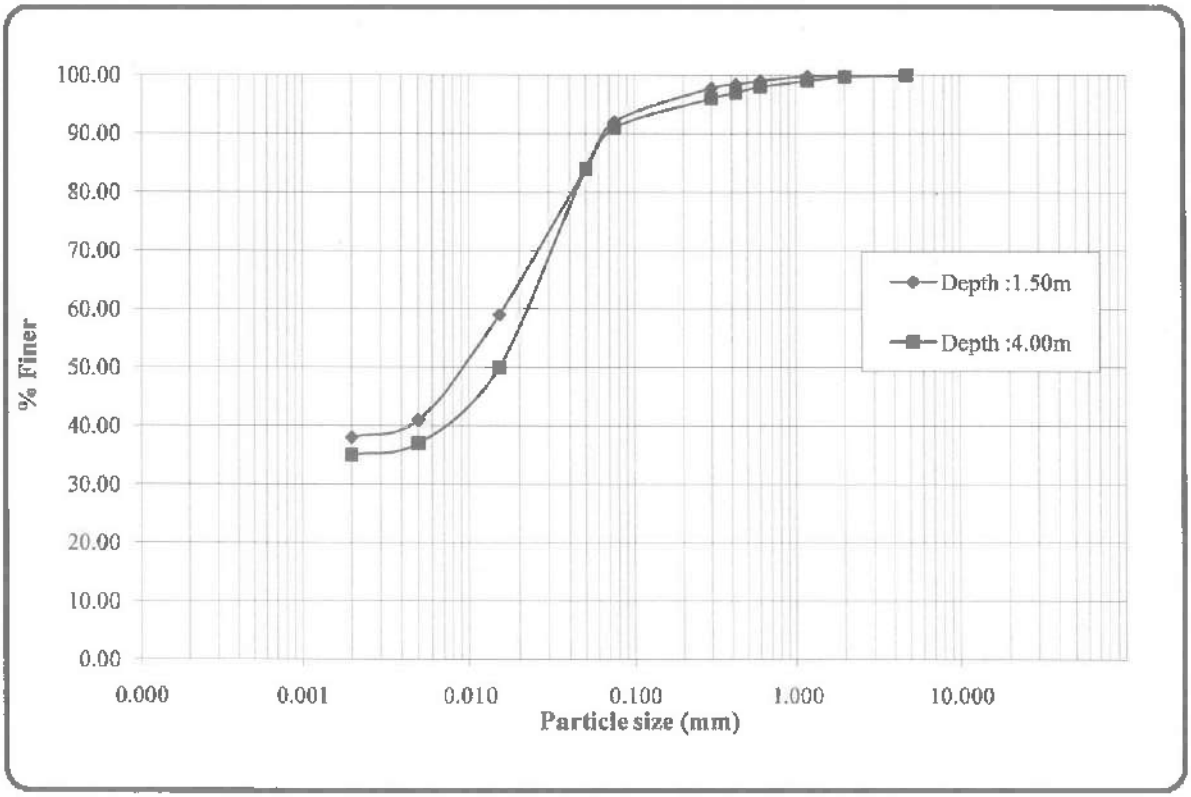
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-170, U-3, 6.00m	3.00	22.00	70.00	5.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-182



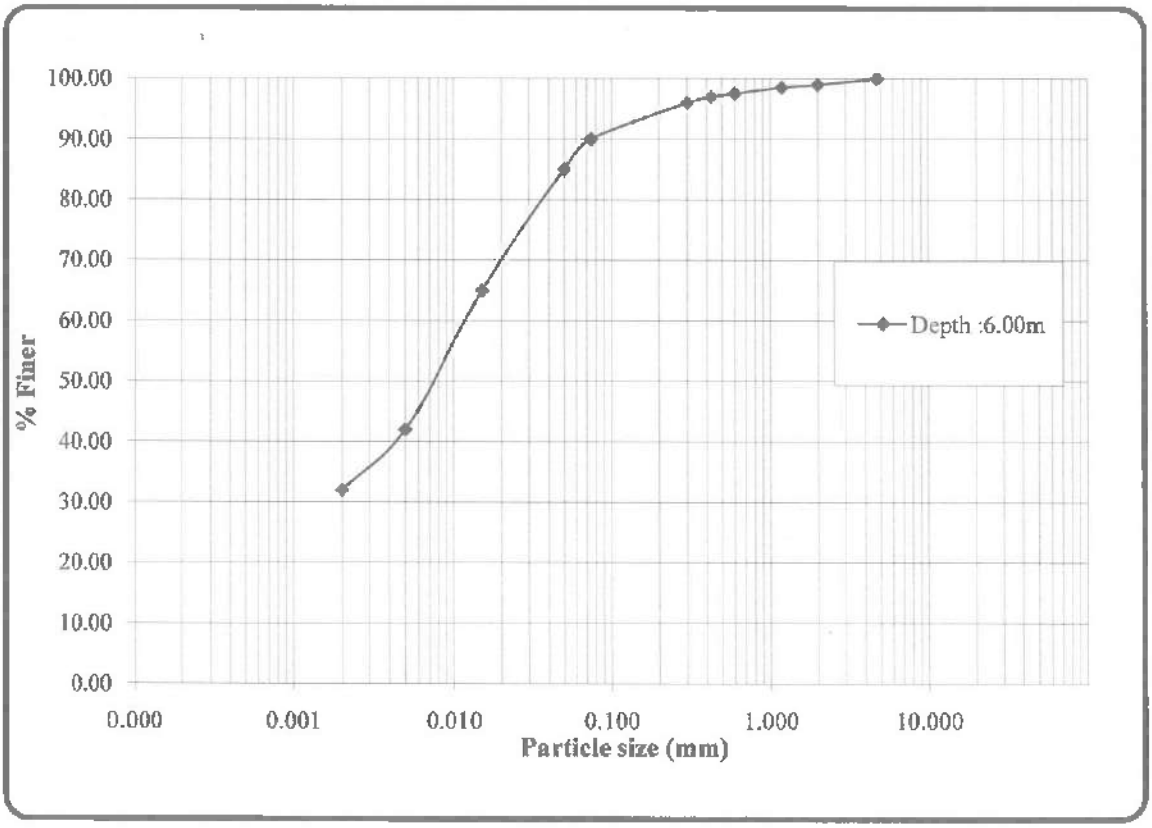
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-182, U-1, 1.50m	38.00	54.00	8.00	0.00
AP-182, U-2, 4.00m	35.00	56.00	9.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-182



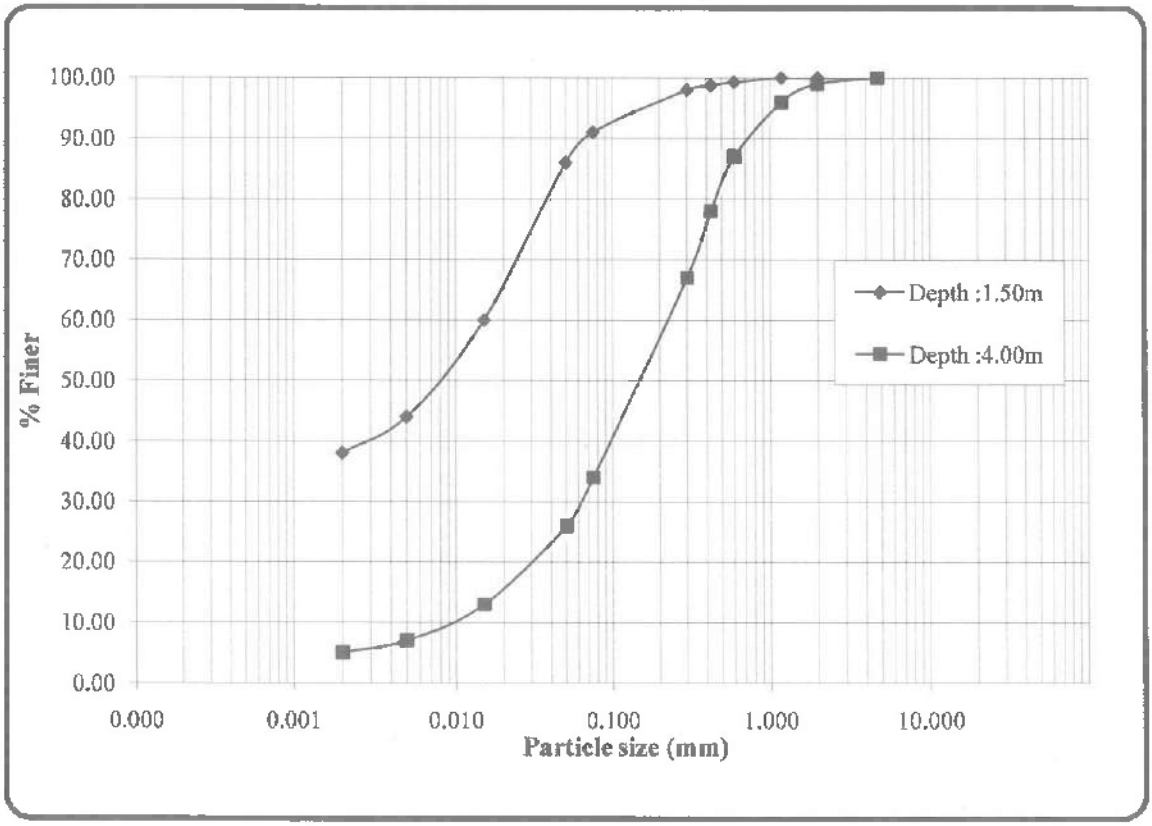
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-182, U-3, 6.00m	32.00	58.00	10.00	0.00



M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-190

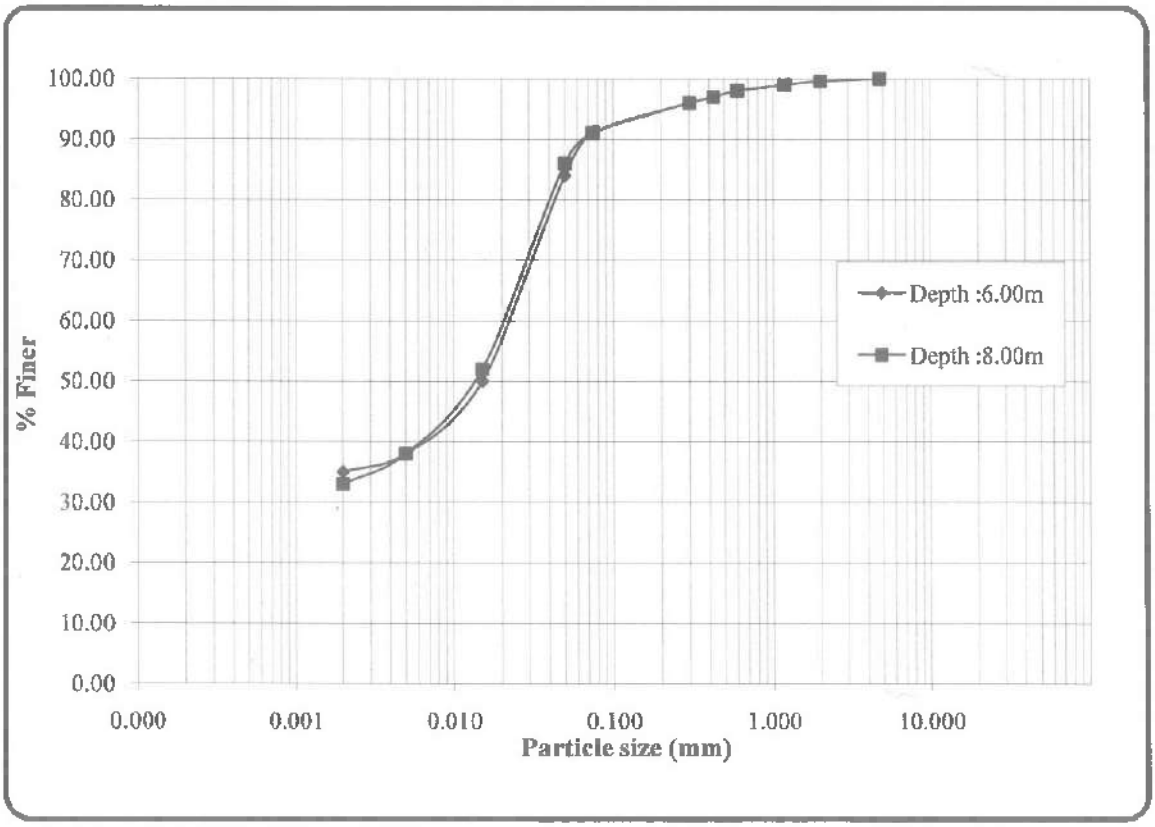


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-190, U-1, 1.50m	38.00	53.00	9.00	0.00
AP-190, U-2, 4.00m	5.00	29.00	66.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-190



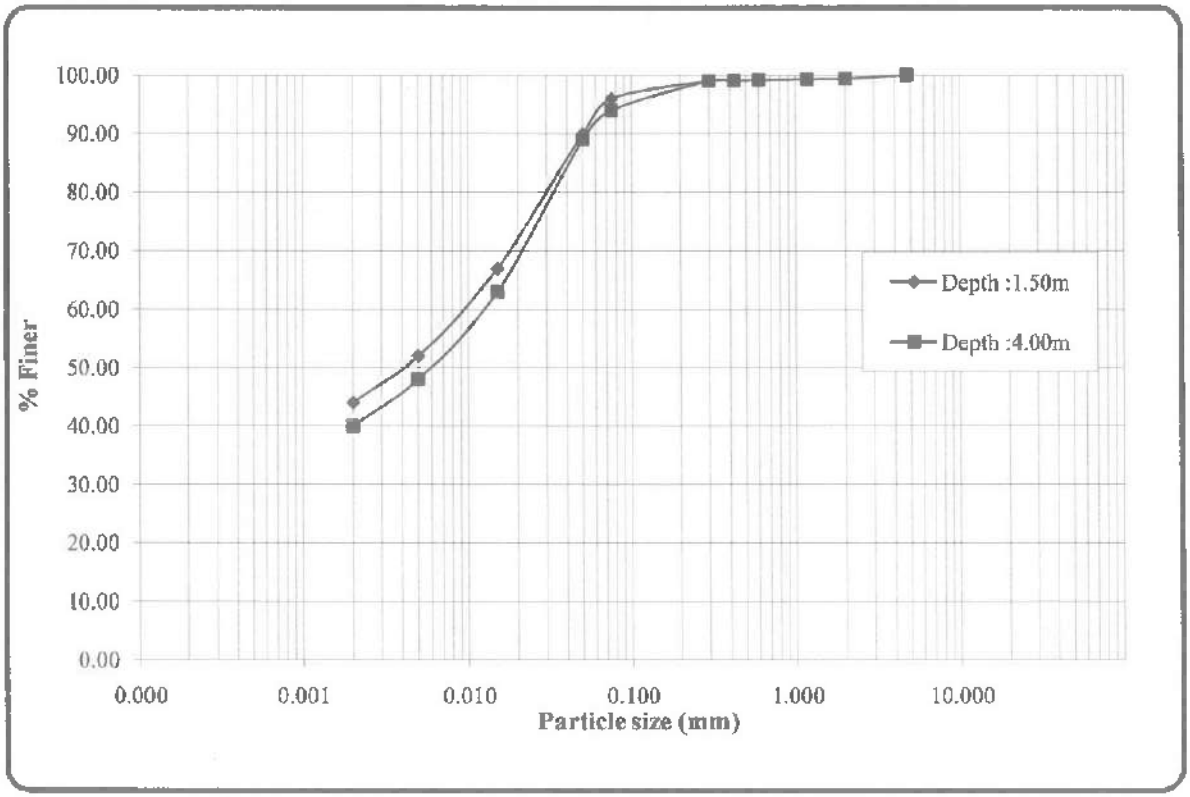
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-190, U-3, 6.00m	35.00	56.00	9.00	0.00
AP-190, U-4, 8.00m	33.00	58.00	9.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-206

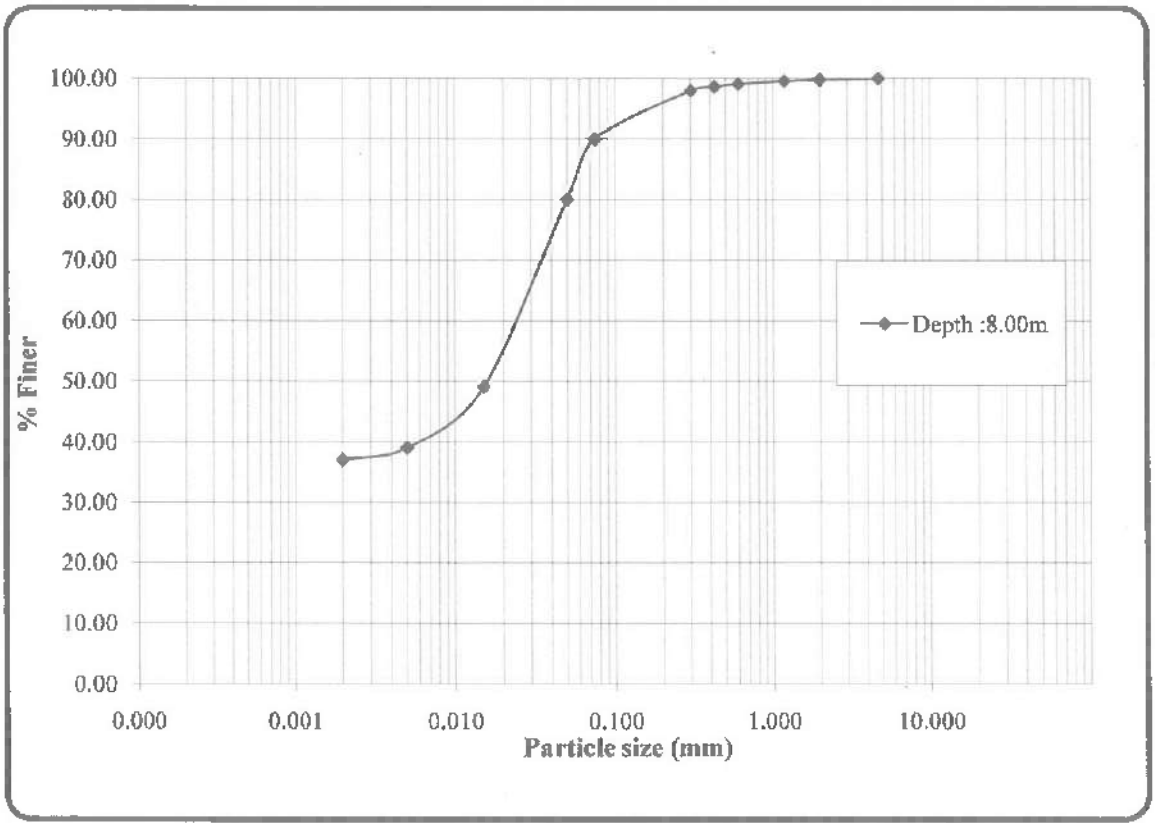


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-206, U-1, 1.50m	44.00	52.00	4.00	0.00
AP-206, U-2, 4.00m	40.00	54.00	6.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-206



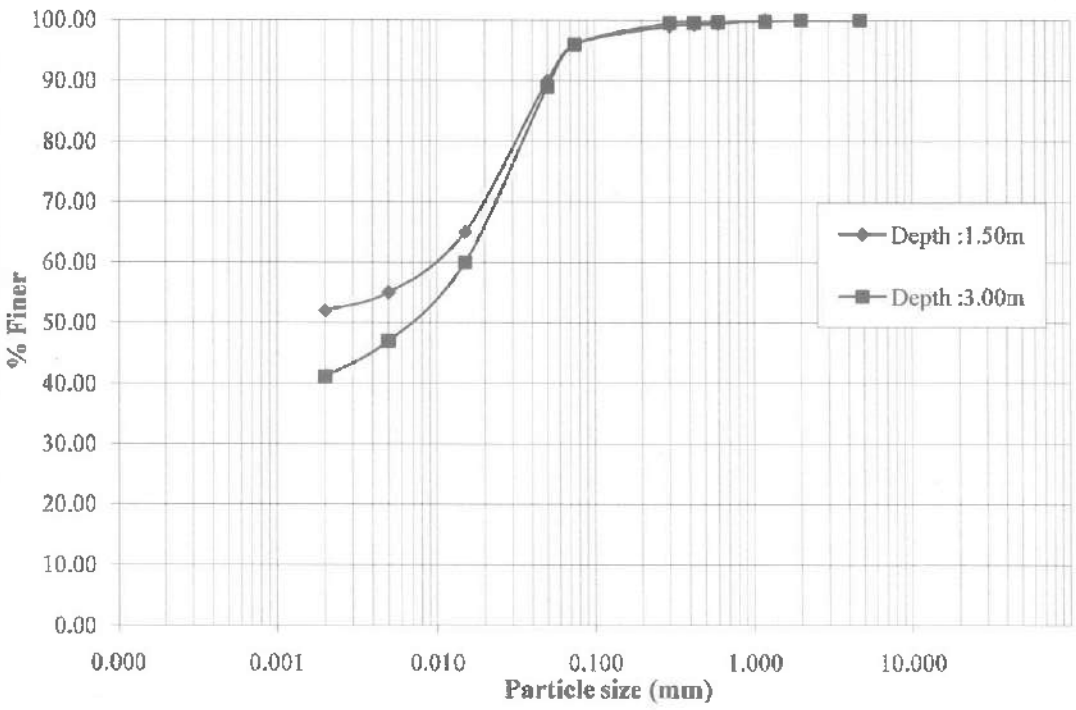
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-206, U-4, 8.00m	37.00	53.00	10.00	0.00

P. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-220



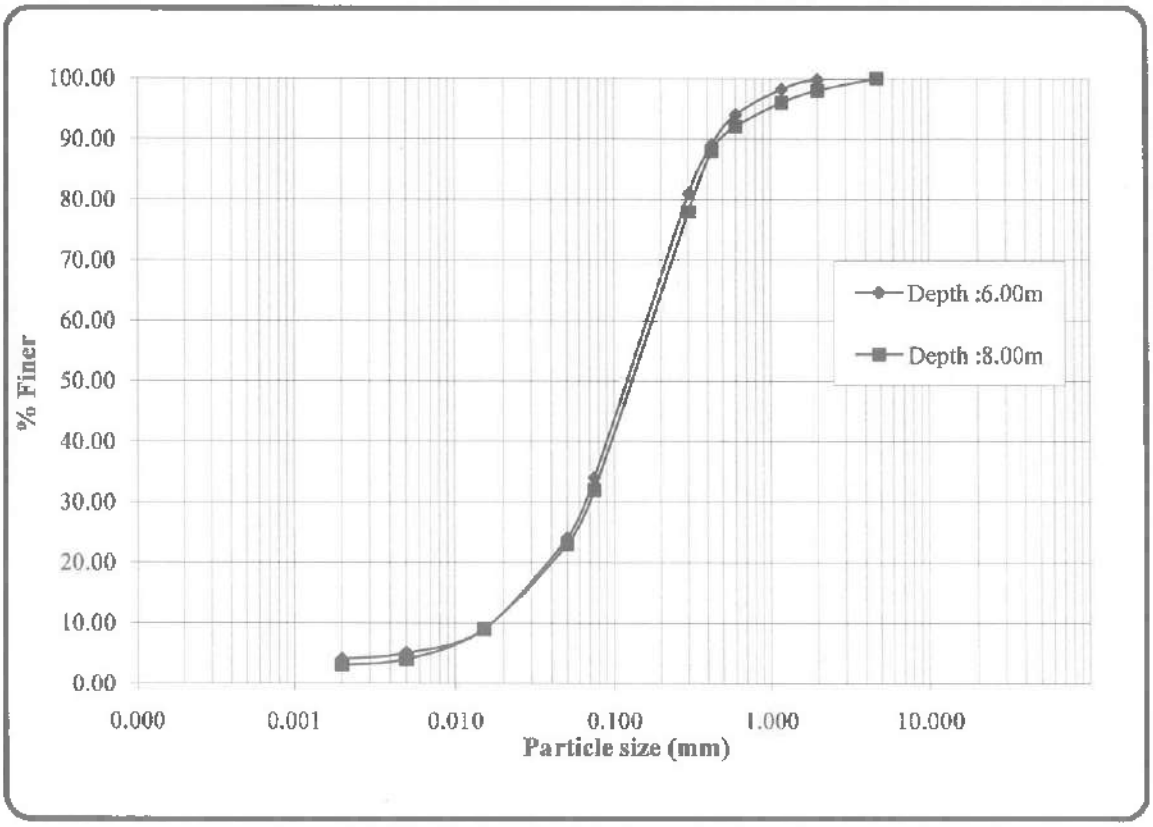
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-220, U-1, 1.50m	52.00	44.00	4.00	0.00
AP-220, S-2, 3.00m	41.00	55.00	4.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-220



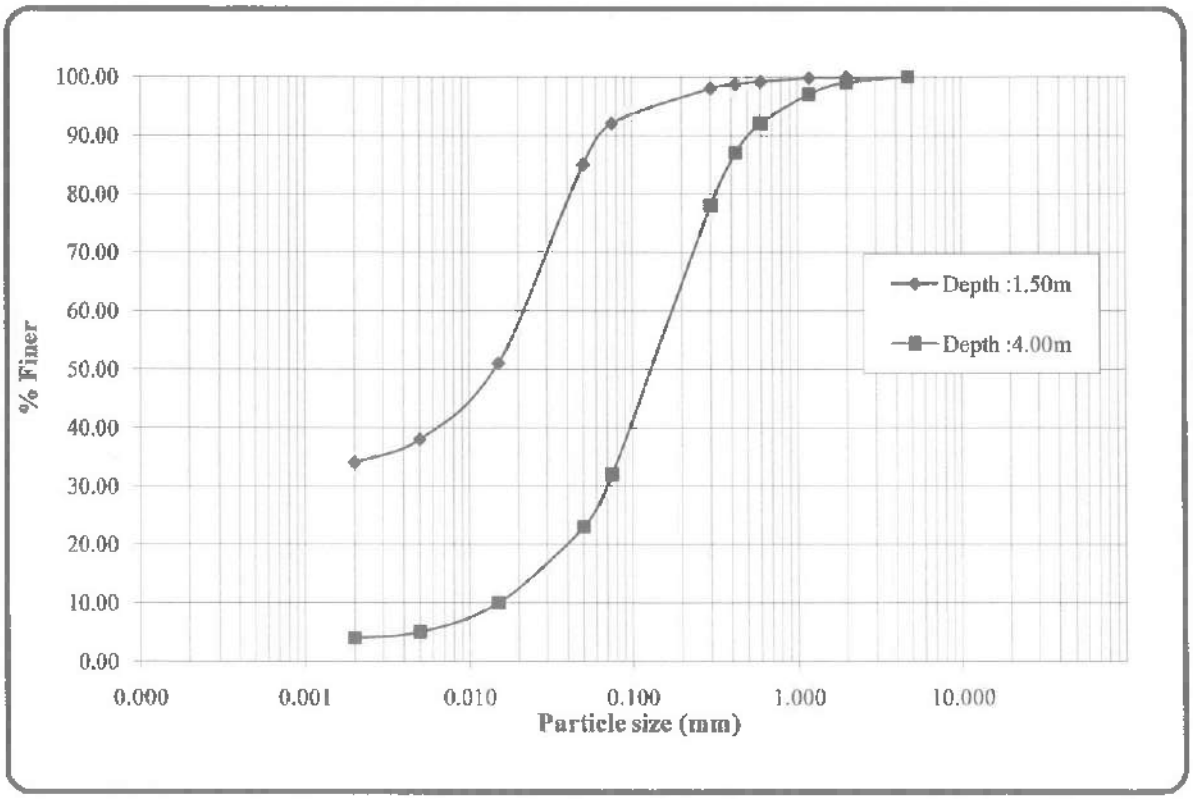
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-220, U-3, 6.00m	4.00	30.00	66.00	0.00
AP-220, U-4, 8.00m	3.00	29.00	68.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-241



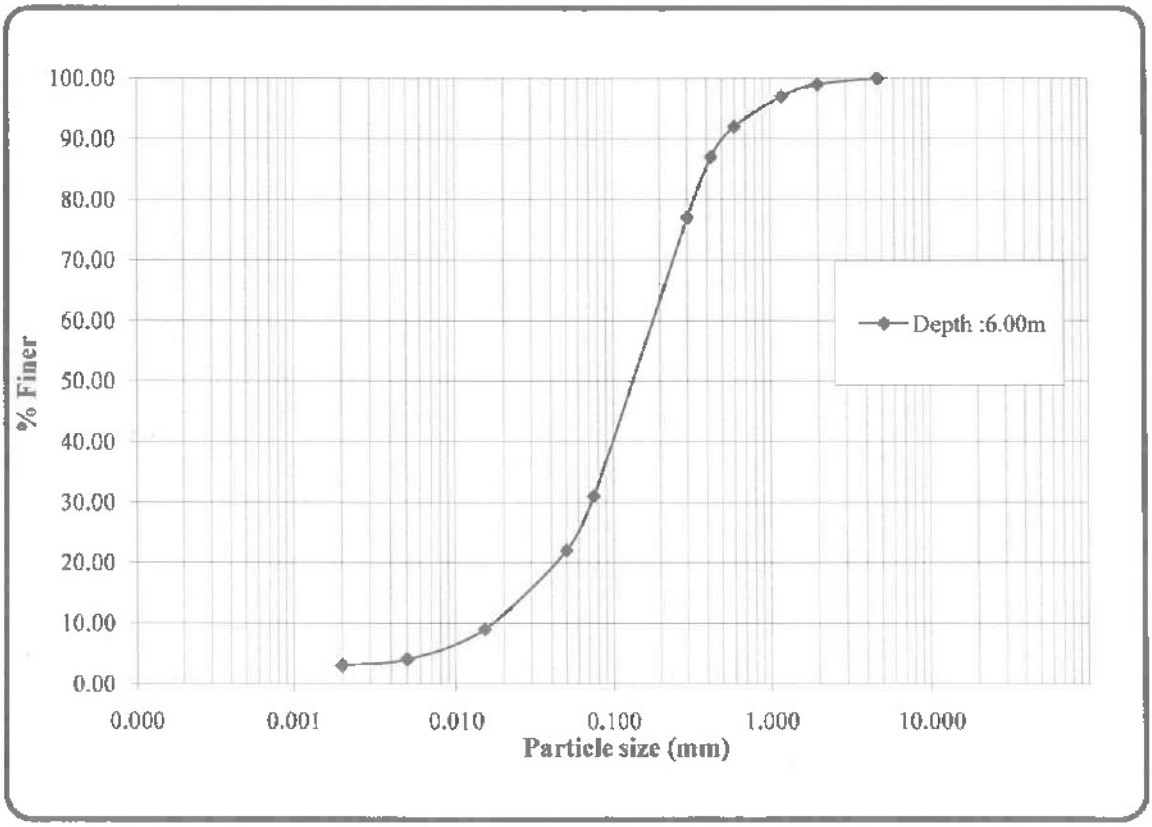
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-241, U-1, 1.50m	34.00	58.00	8.00	0.00
AP-241, U-2, 4.00m	4.00	28.00	68.00	0.00

P.K. DUTTA & CO. NAIHATI

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-241



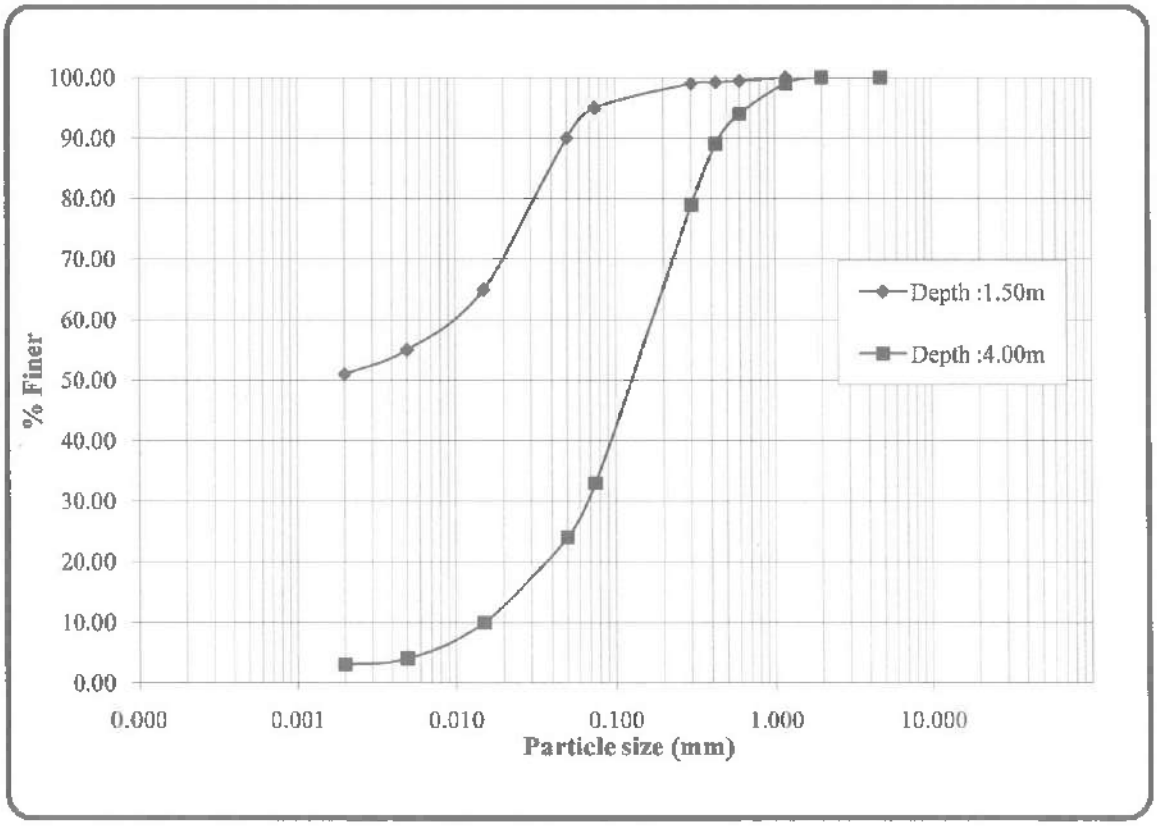
Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-241, U-3, 6.00m	3.00	28.00	69.00	0.00



M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-252

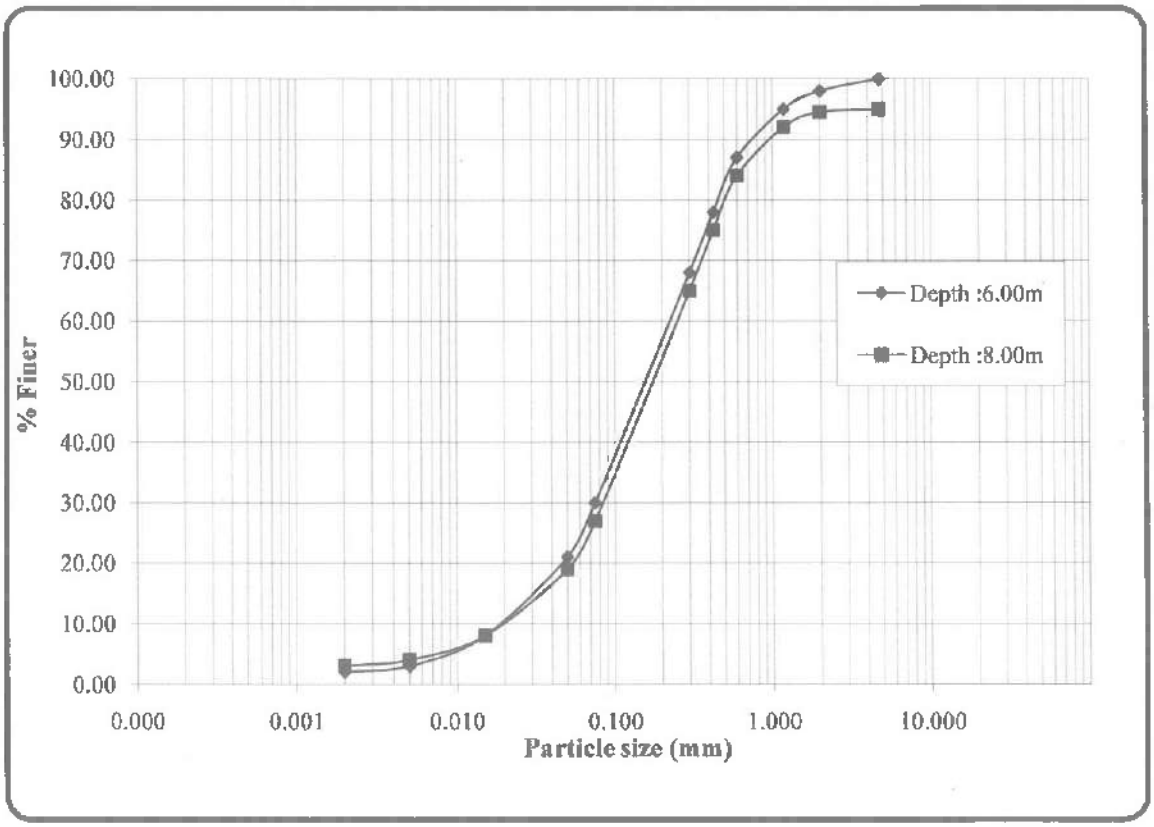


Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-252, U-1, 1.50m	51.00	44.00	5.00	0.00
AP-252, U-2, 4.00m	3.00	30.00	67.00	0.00

M/s. P.K.Dutta & Co.	GRAIN SIZE DISTRIBUTION CURVE

Client :-	Assam Electricity Grid Corporation Limited
Project :-	Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

Bore Hole No. AP-252



Grain Size (mm)	<0.002	0.002-0.075	0.075-4.75	>4.75
Sample No.	Clay (%)	Silt (%)	Sand (%)	Gravel (%)
AP-252, U-3, 6.00m	2.00	28.00	70.00	0.00
AP-252, U-4, 8.00m	3.00	24.00	68.00	5.00

P.K. DUTTA & CO. NAIHATI

SHEAR TEST CURVES

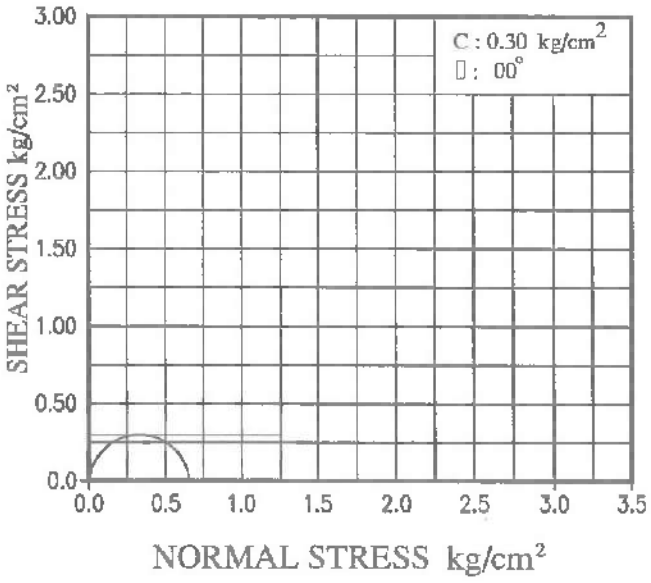
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

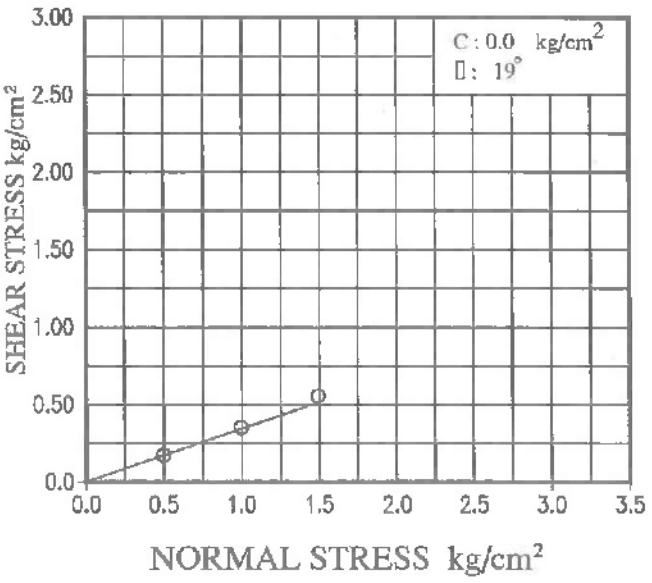
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

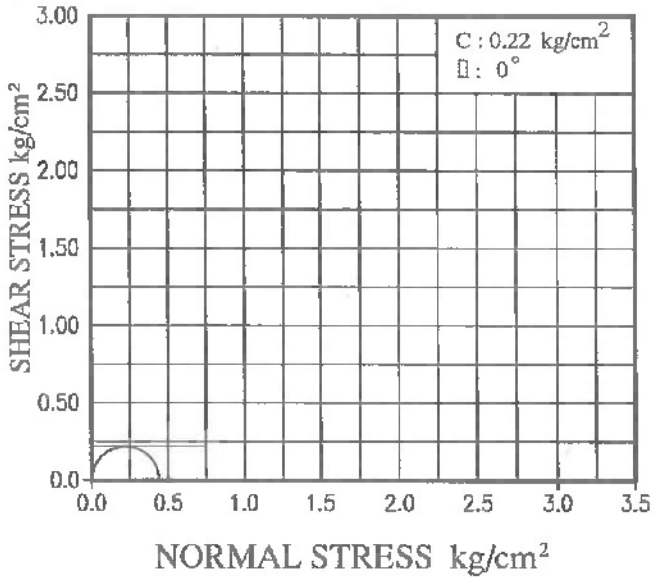
AP-3
DEPTH :- 1.50 m



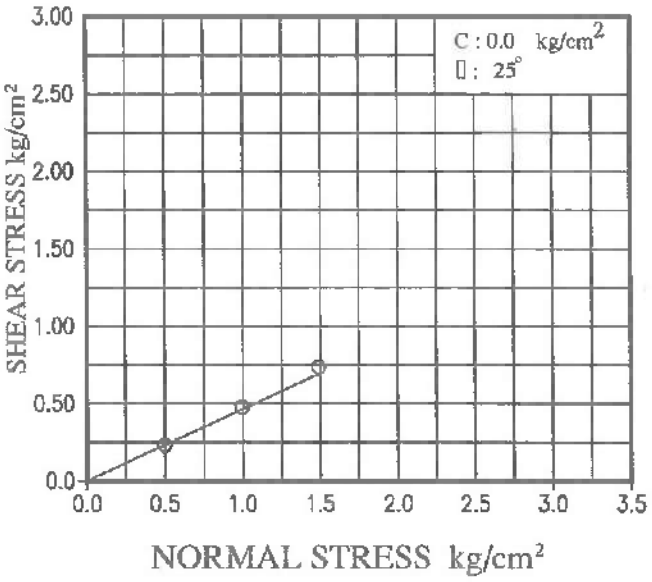
AP-3
DEPTH :- 4.00 m



AP-3
DEPTH :- 5.00 m



AP-3
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

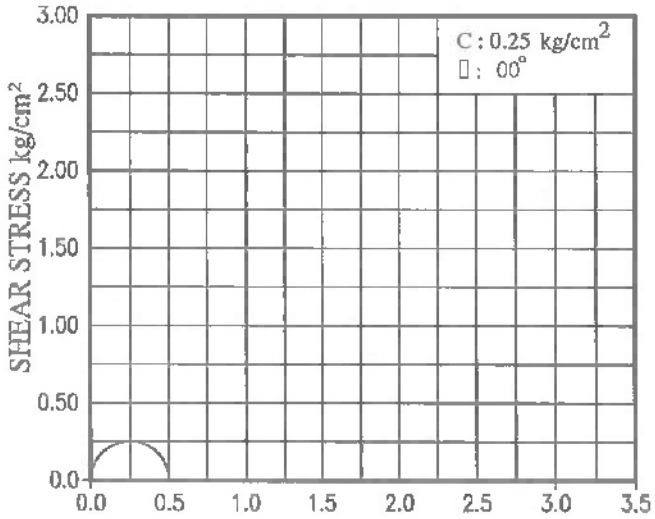
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

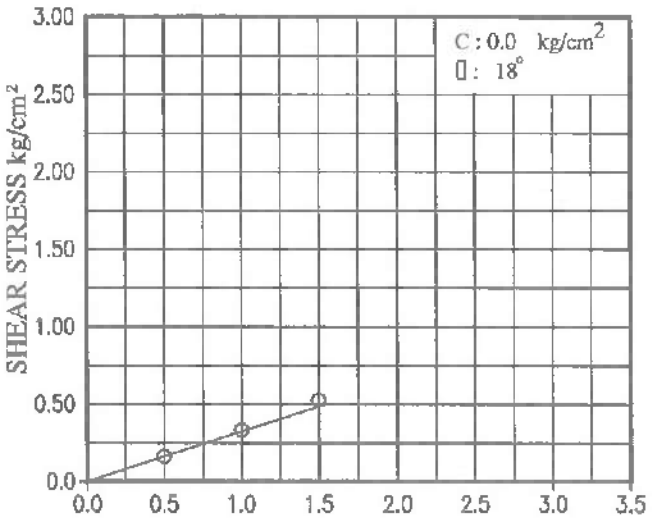
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

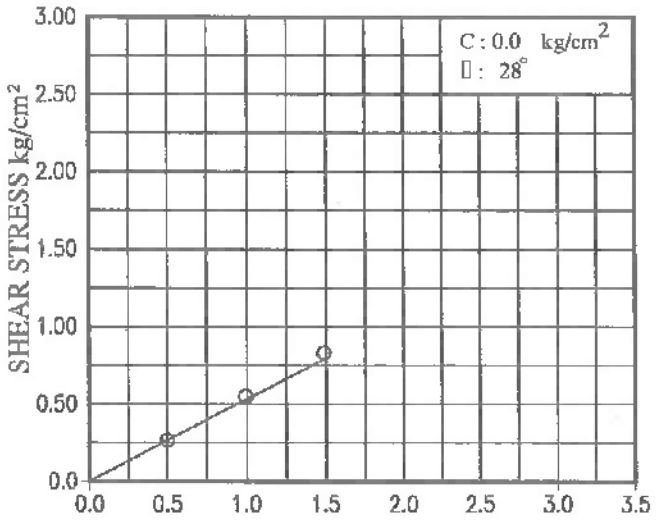
AP-29
DEPTH :- 1.50 m



AP-29
DEPTH :- 4.00 m



AP-29
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

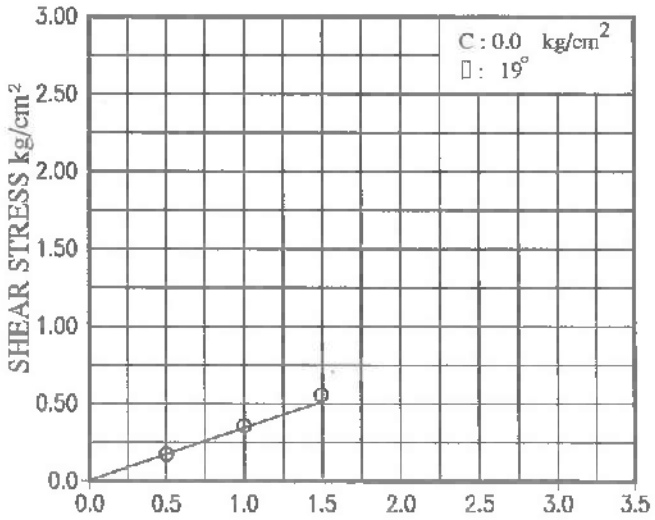
Client : **Assam Electricity Grid Corporation Limited**

PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

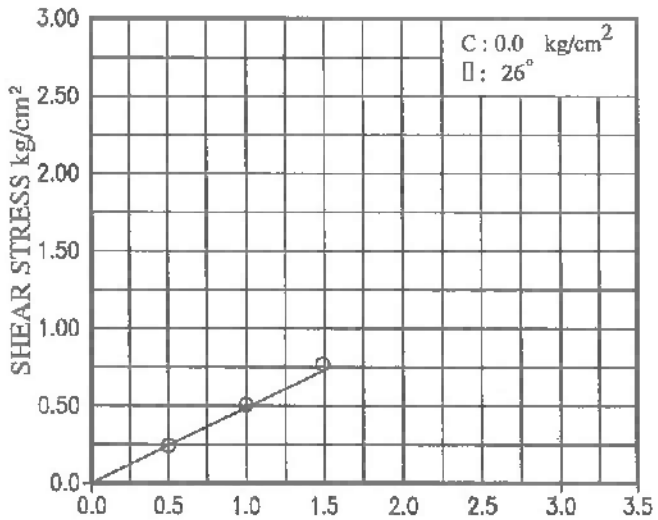
AP-47

DEPTH :- 1.50 m



AP-47

DEPTH :- 6.00 m



P. K. DUTTA & CO. NAIHATI

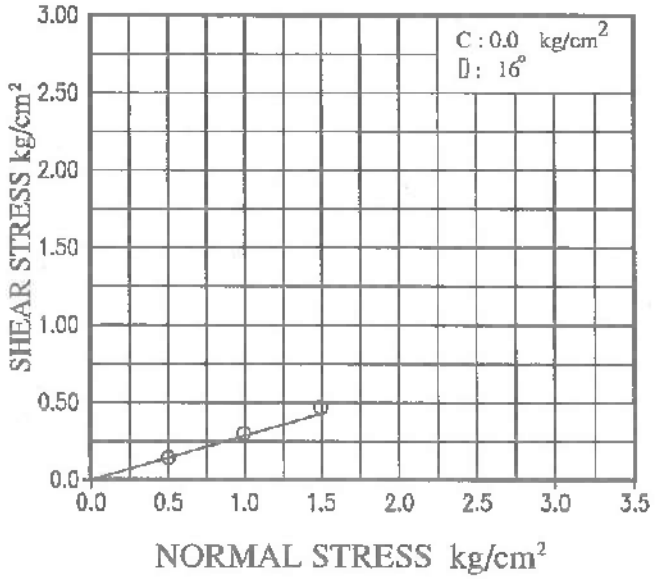
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

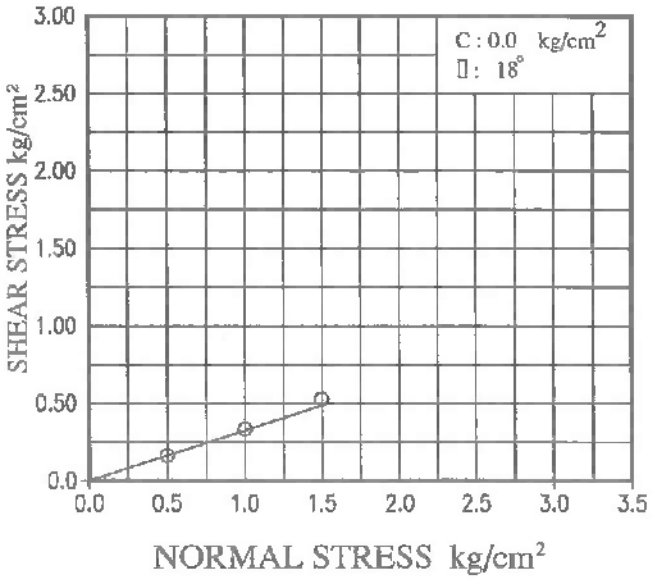
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

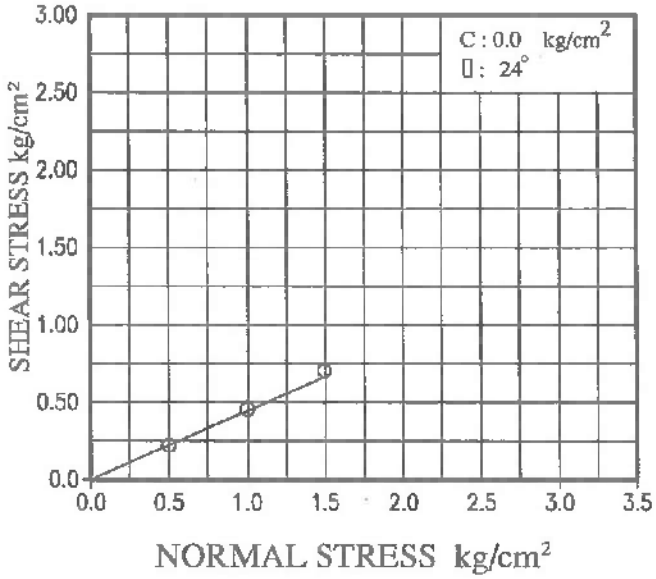
AP-52
DEPTH :- 1.50 m



AP-52
DEPTH :- 4.00 m



AP-52
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

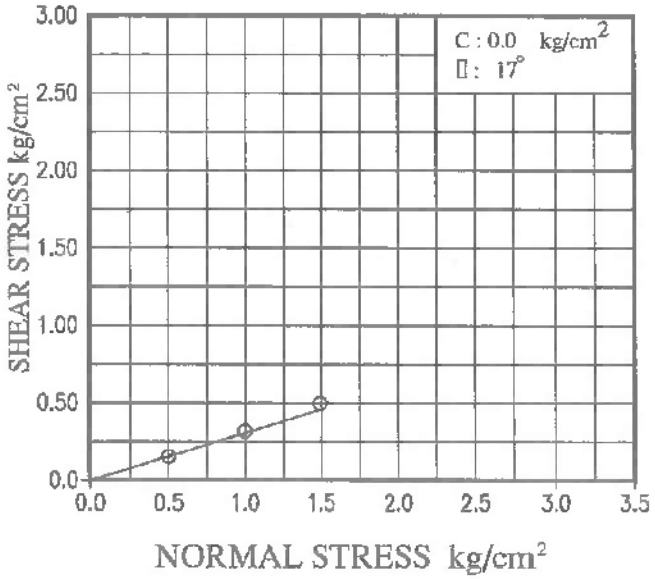
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

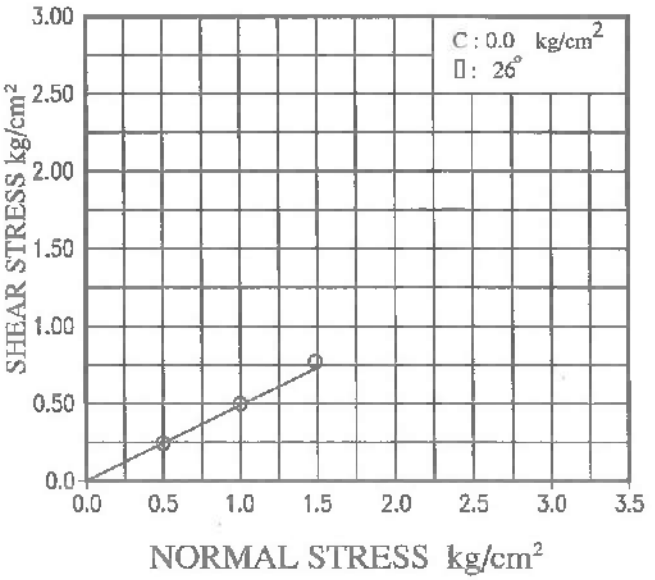
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

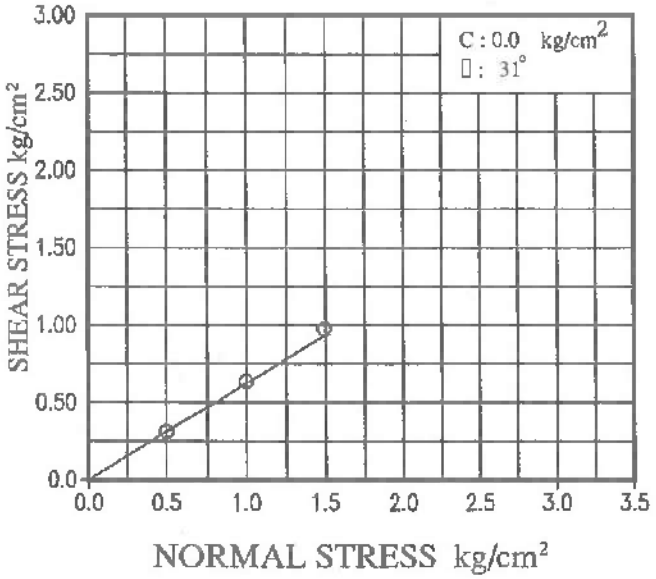
AP-66
DEPTH :- 1.50 m



AP-66
DEPTH :- 4.00 m



AP-66
DEPTH :- 6.00 m



P. DUTTA & CO. NAIHATI

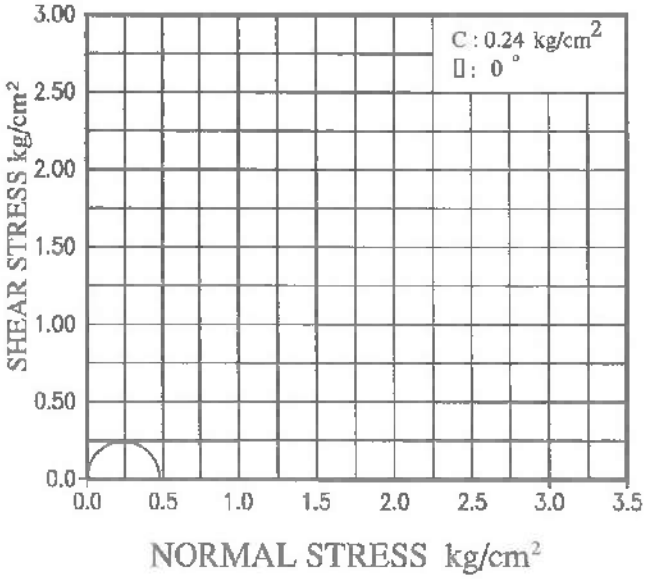
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

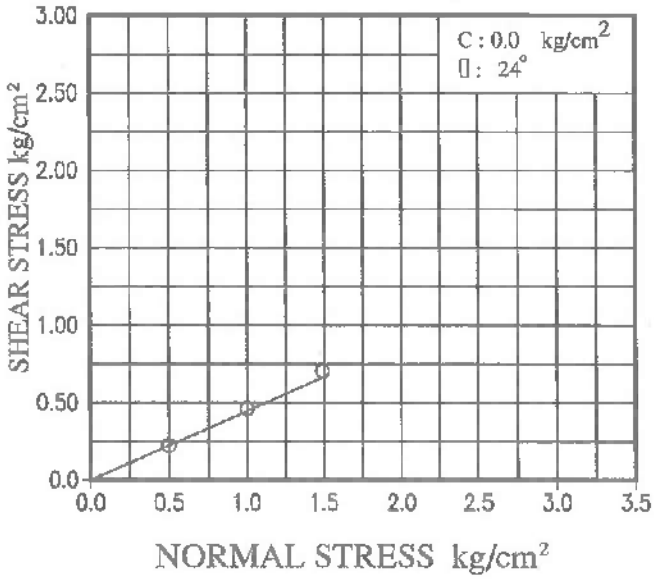
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

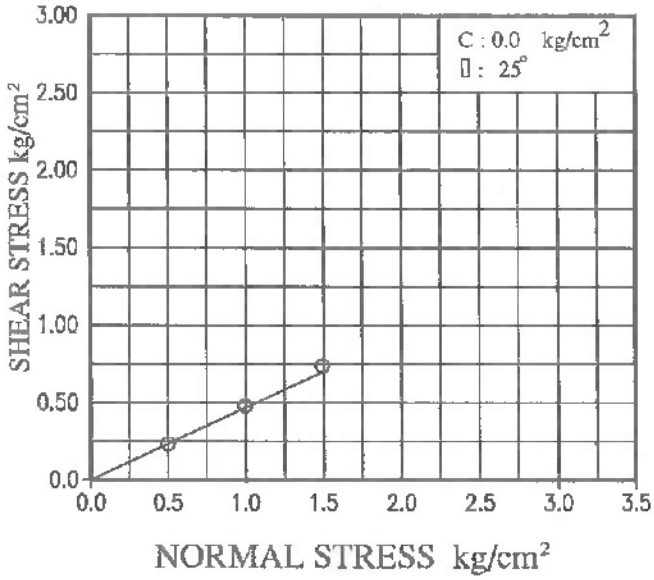
AP-73
DEPTH :- 1.50 m



AP-73
DEPTH :- 4.00 m



AP-73
DEPTH :- 6.00 m



P. K. DUTTA & CO. NAIHATI

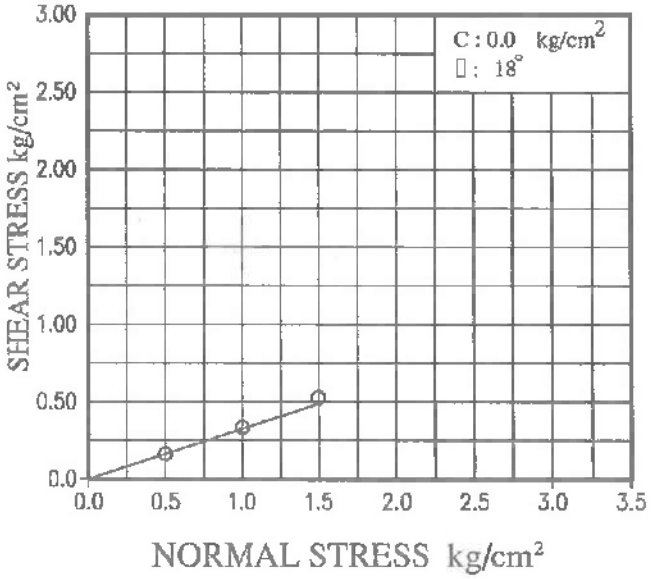
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

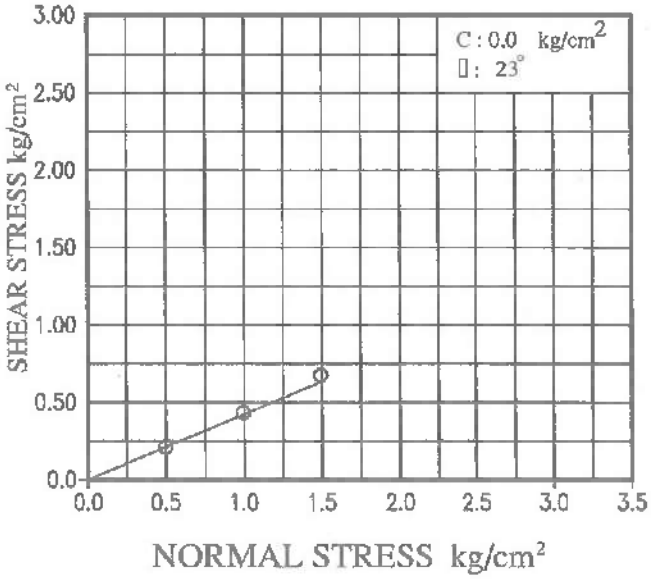
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

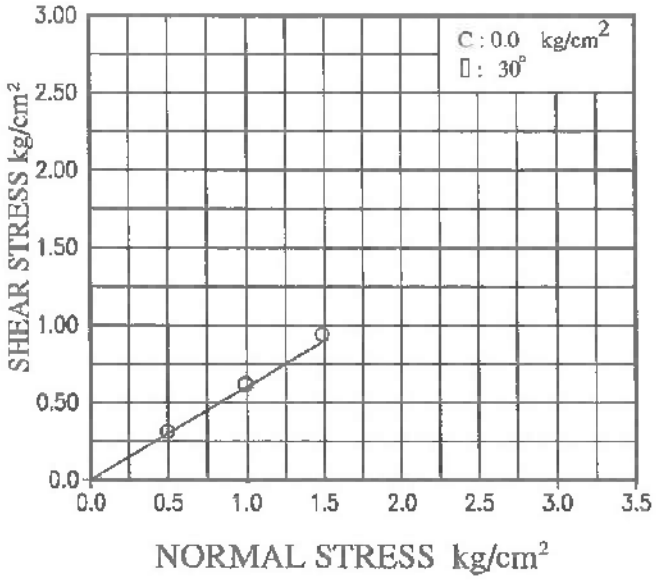
AP-109
DEPTH :- 1.50 m



AP-109
DEPTH :- 4.00 m



AP-109
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

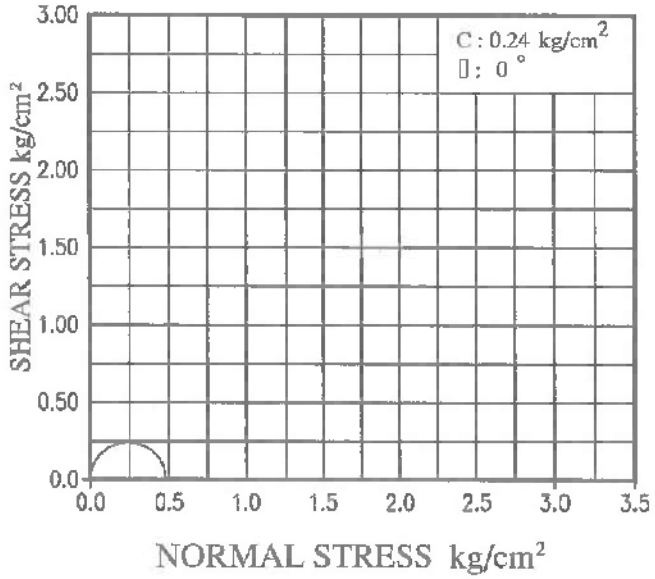
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

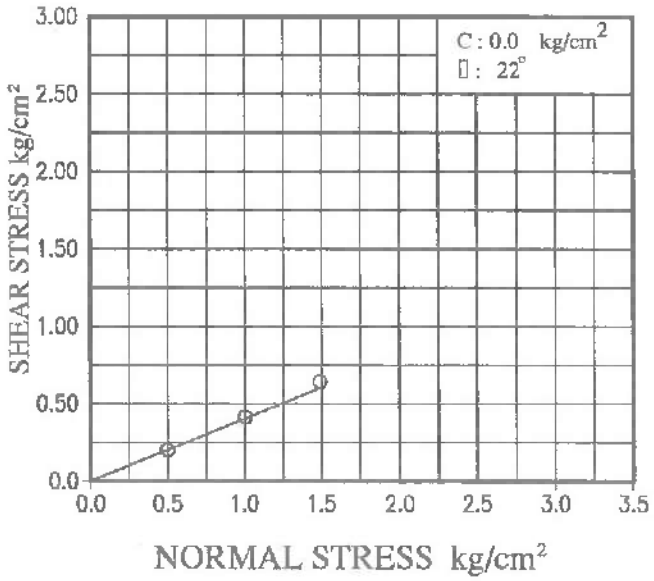
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

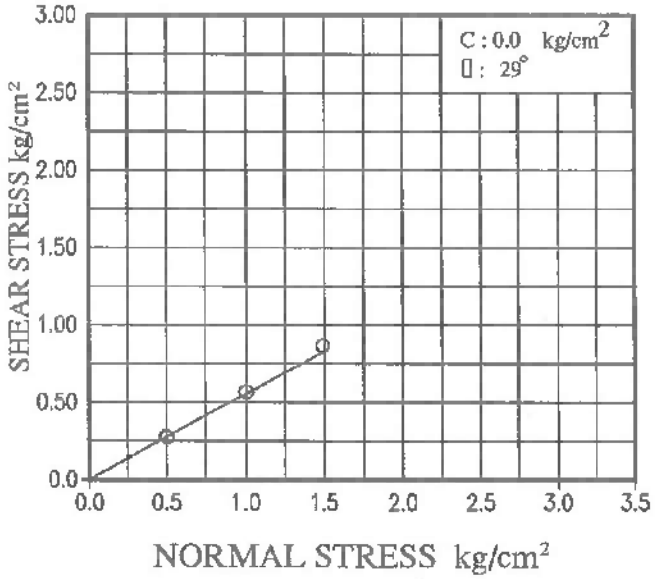
AP-120
DEPTH :- 1.50 m



AP-120
DEPTH :- 4.00 m



AP-120
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

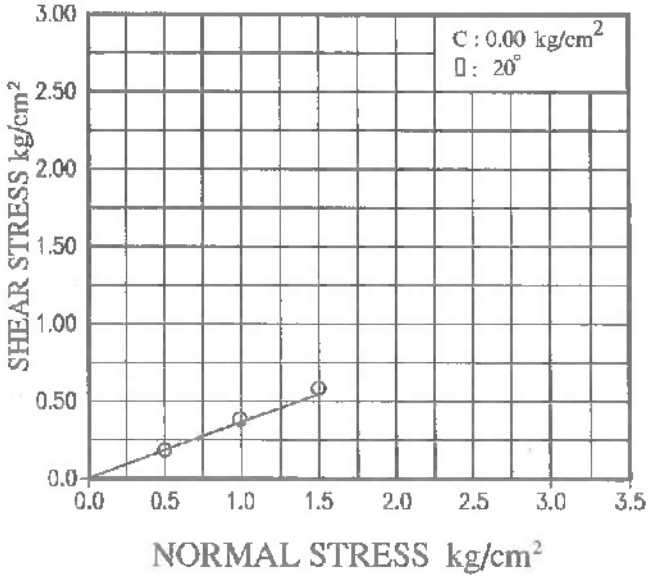
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

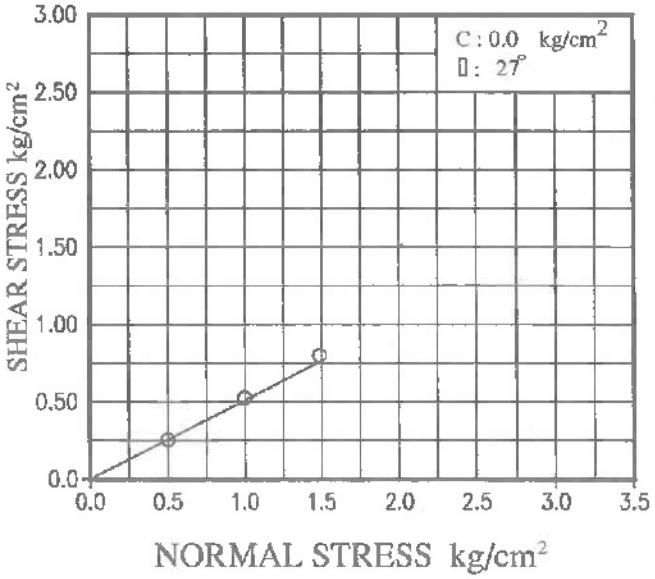
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

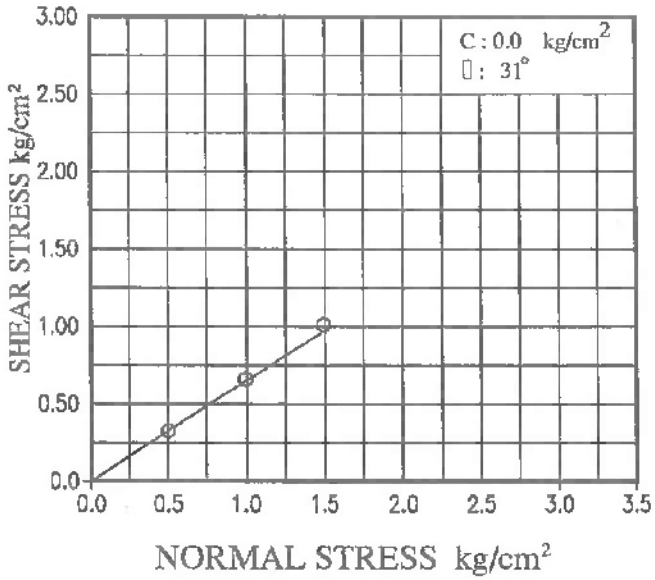
AP-131
DEPTH :- 1.50 m



AP-131
DEPTH :- 4.00 m



AP-131
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

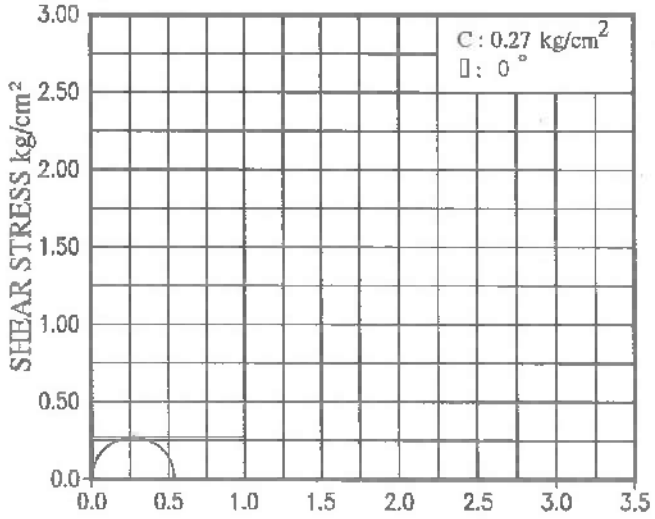
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

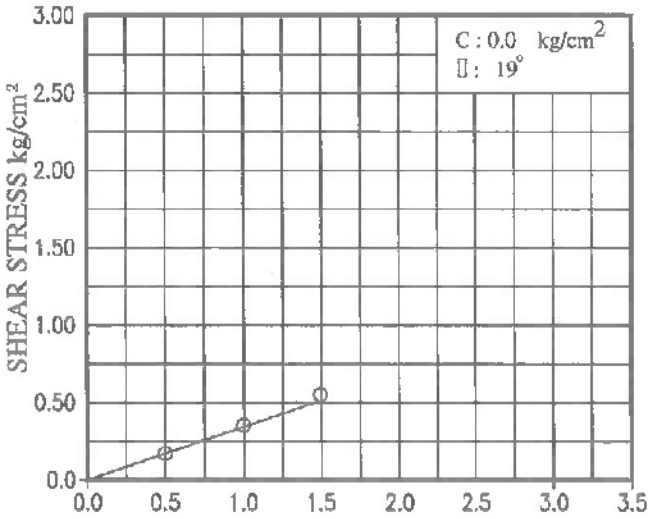
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

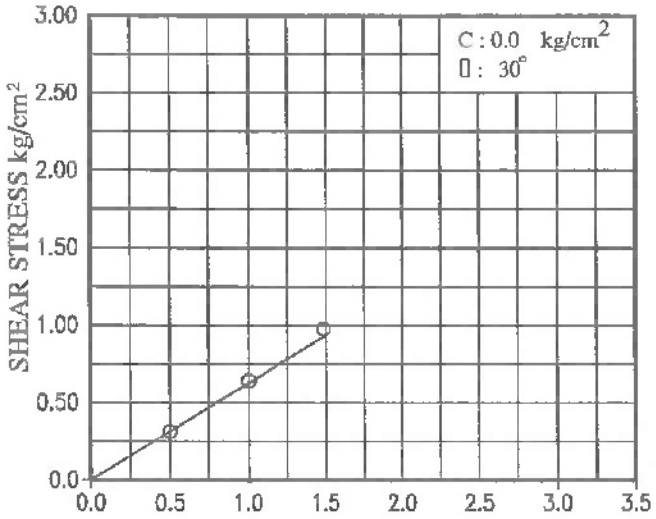
LOC-137/2
DEPTH :- 1.50 m



LOC-137/2
DEPTH :- 4.00 m



LOC-137/2
DEPTH :- 6.00 m



P. DUTTA & CO. NAIHATI

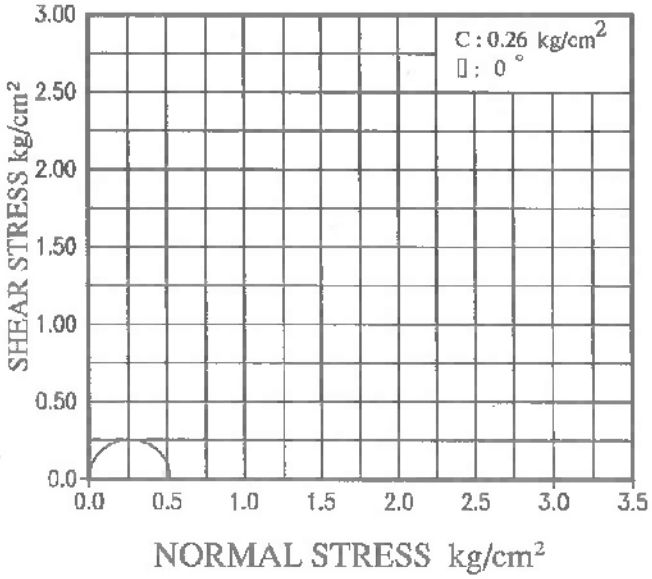
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

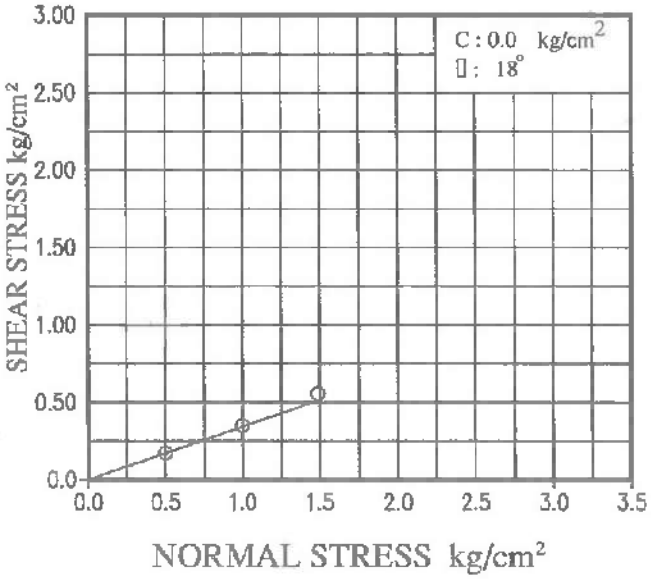
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

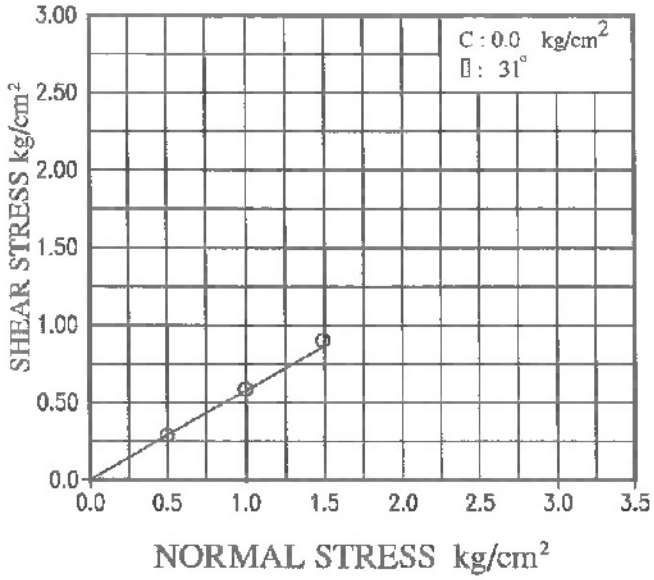
AP-141/0
DEPTH :- 1.50 m



AP-141/0
DEPTH :- 3.00 m



AP-141/0
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

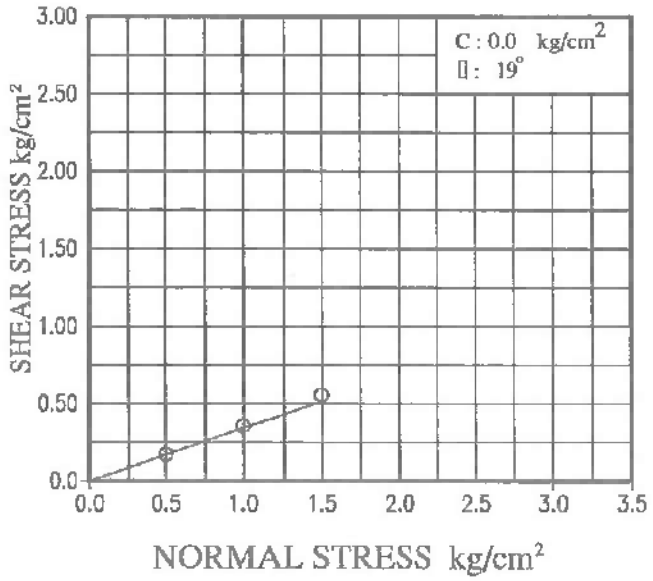
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

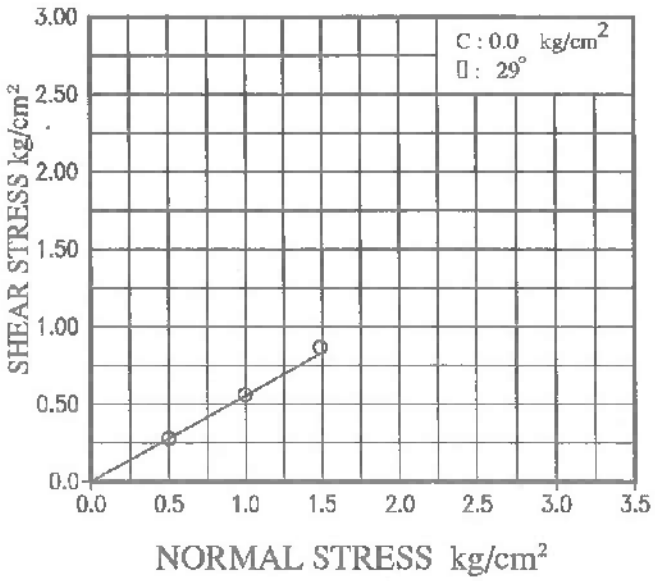
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

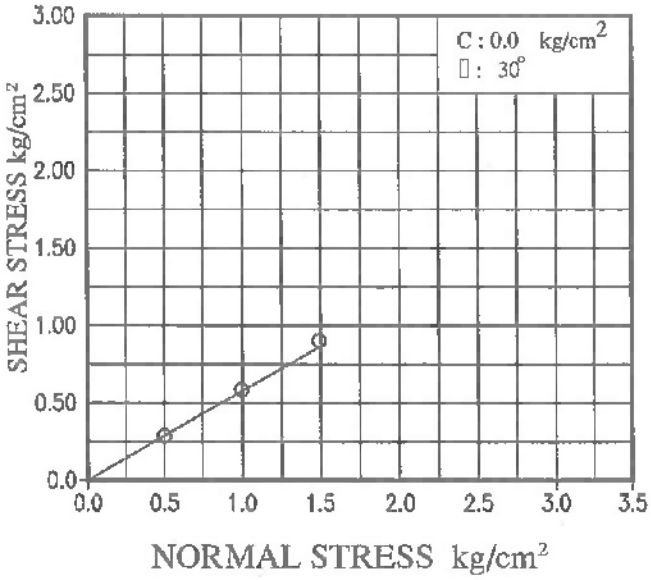
LOC-151/2
DEPTH :- 1.50 m



LOC-151/2
DEPTH :- 4.00 m



LOC-151/2
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

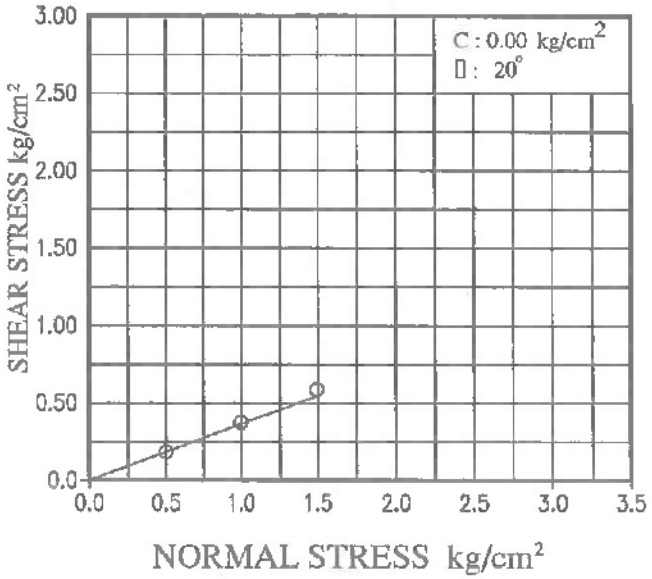
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

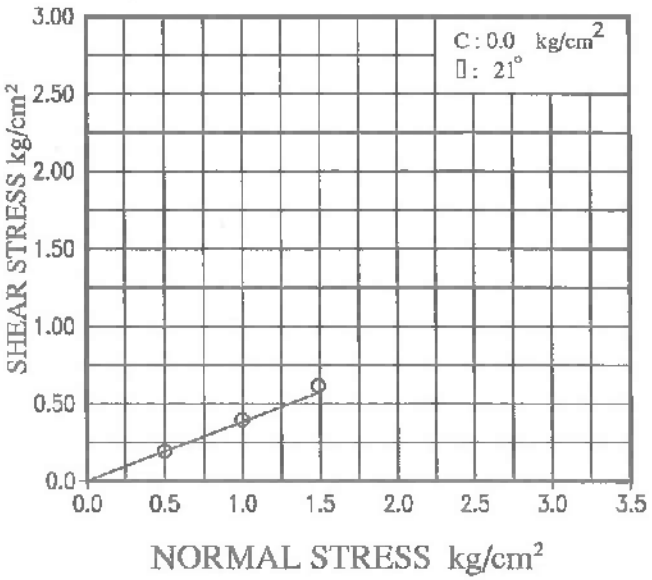
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

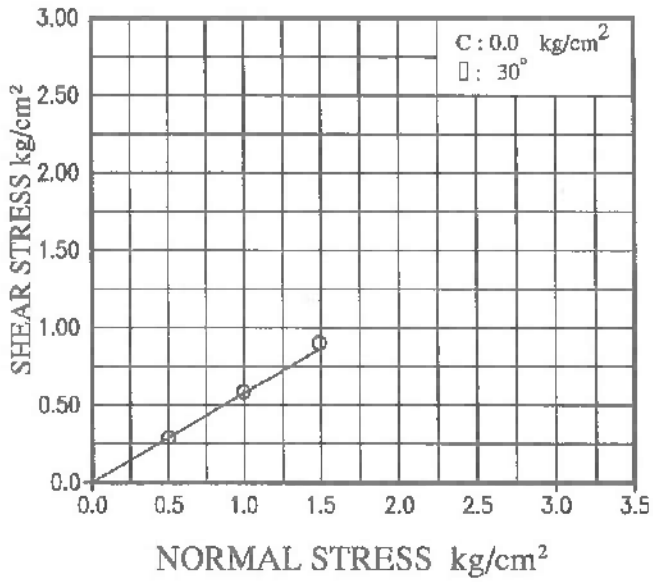
LOC-157/3
DEPTH :- 1.50 m



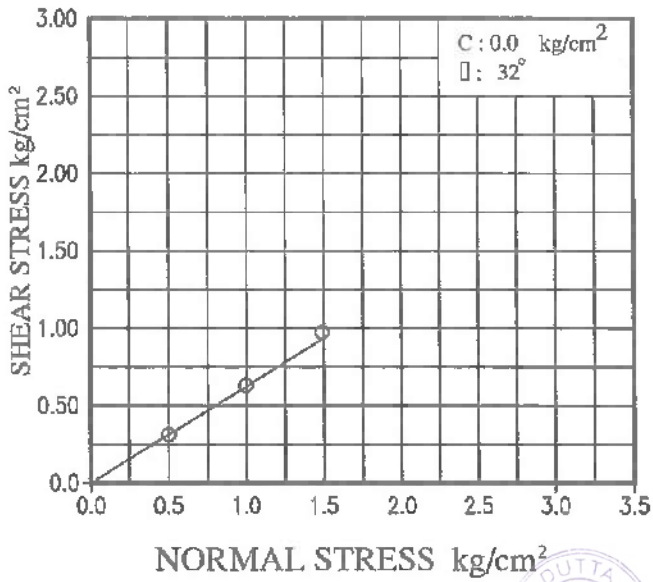
LOC-157/3
DEPTH :- 4.00 m



LOC-157/3
DEPTH :- 6.00 m



LOC-157/3
DEPTH :- 8.00 m



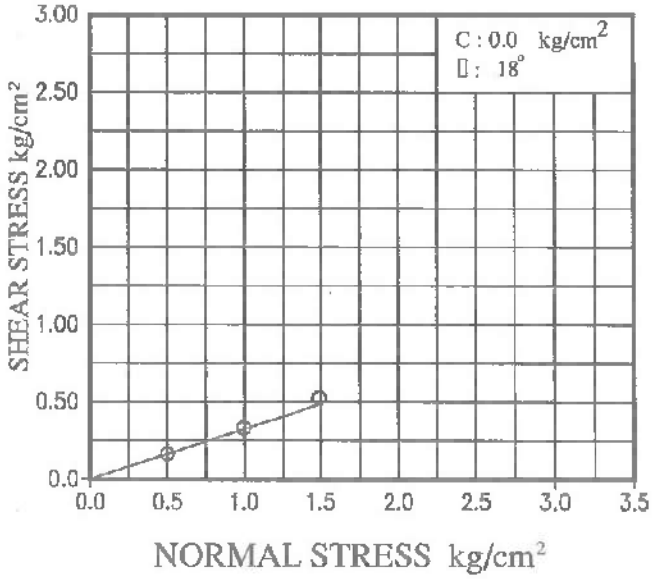
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

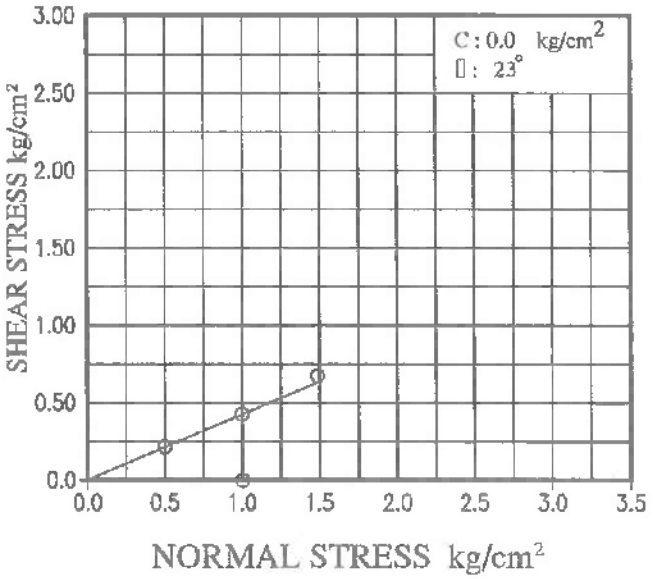
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

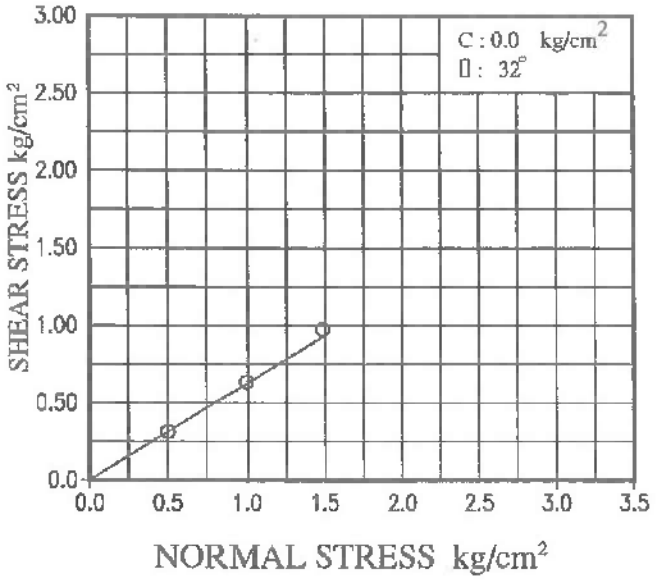
AP-170
DEPTH :- 1.50 m



AP-170
DEPTH :- 4.00 m



AP-170
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

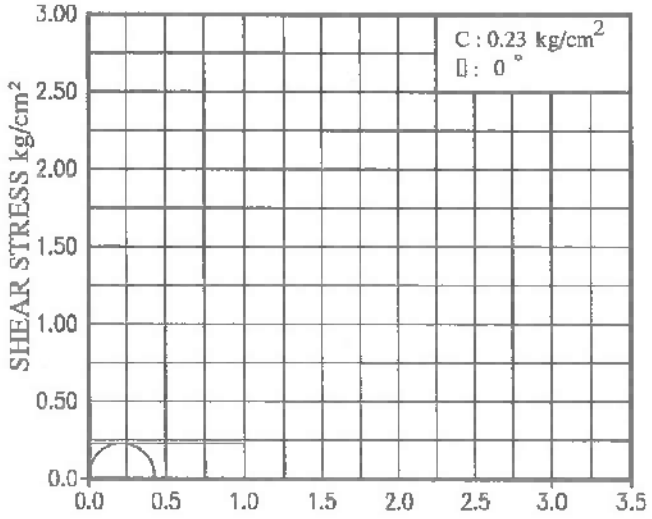
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

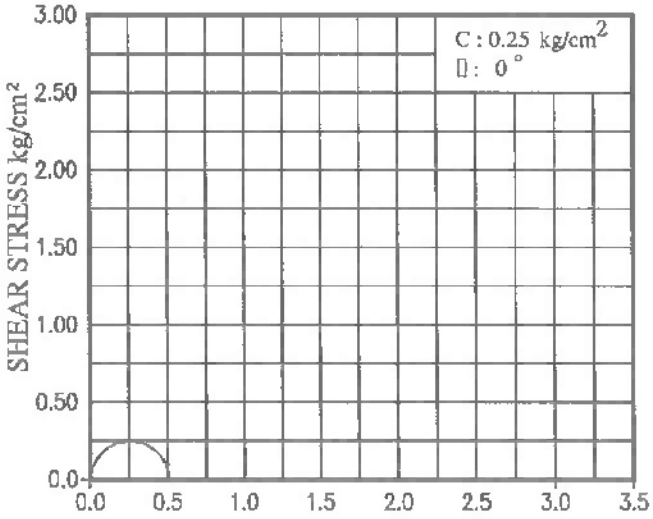
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

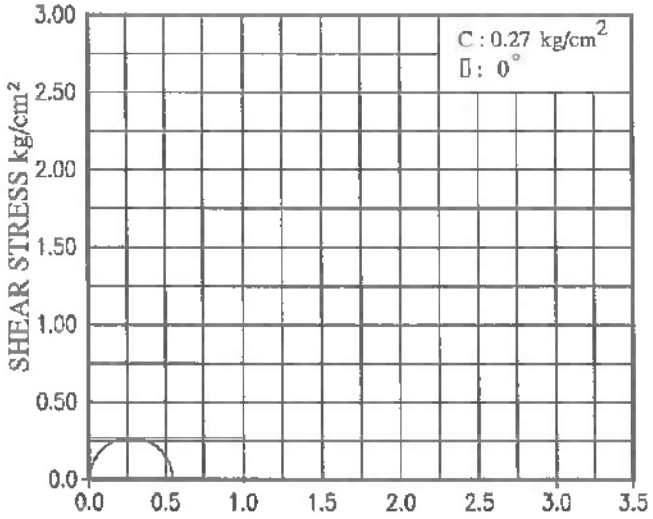
AP-182
DEPTH :- 1.50 m



AP-182
DEPTH :- 4.00 m



AP-182
DEPTH :- 6.00 m



P.K. DUTTA & CO. NAIHATI

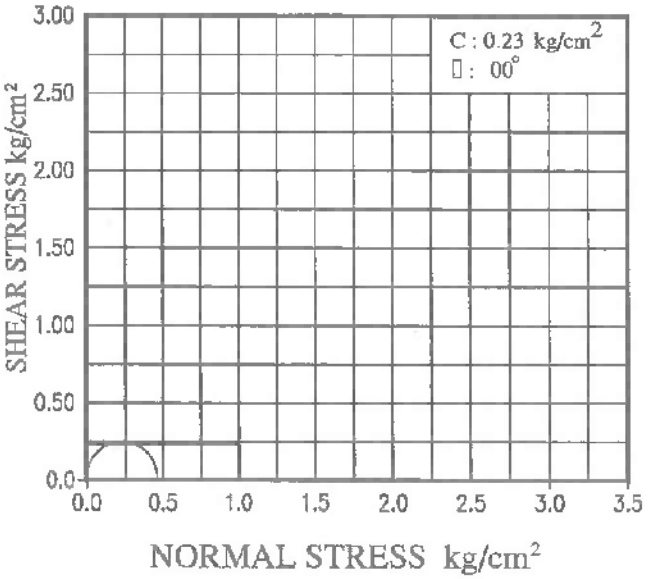
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

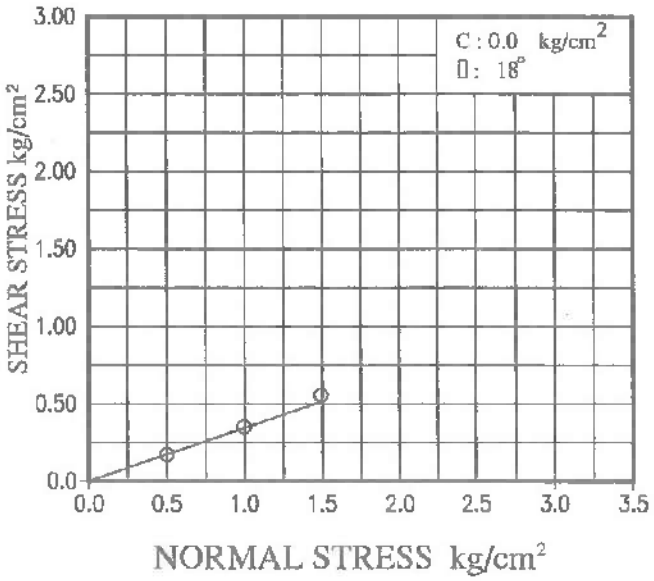
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

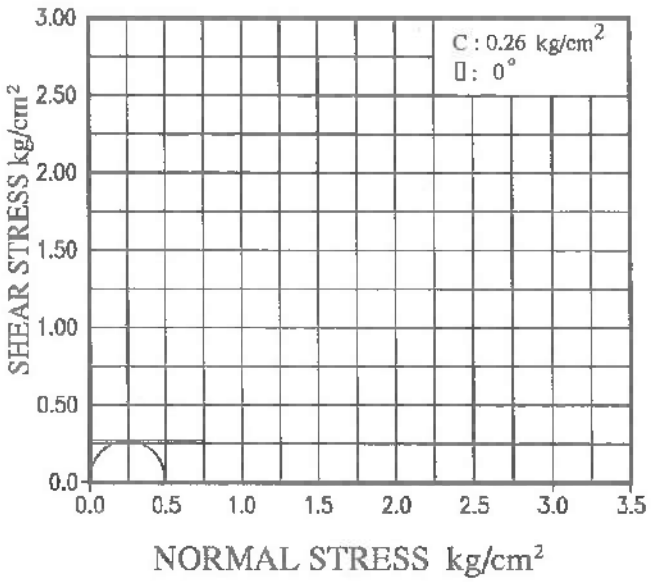
AP-190
DEPTH :- 1.50 m



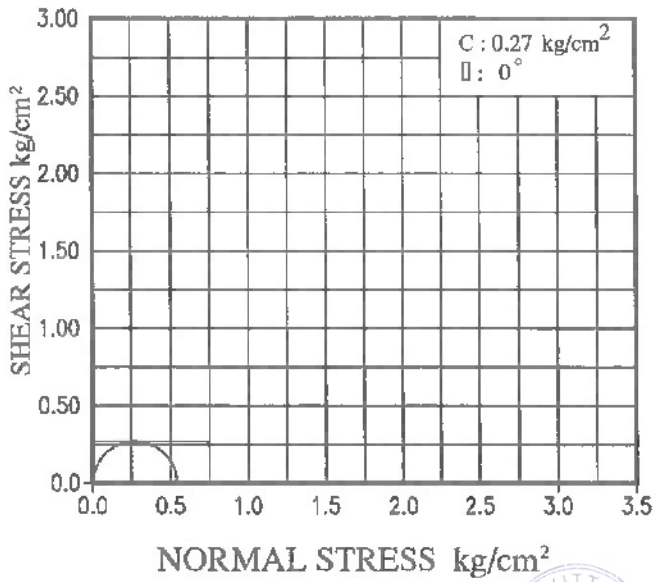
AP-190
DEPTH :- 4.00 m



AP-190
DEPTH :- 6.00 m



AP-190
DEPTH :- 8.00 m



P.K. DUTTA & CO. NAIHATI

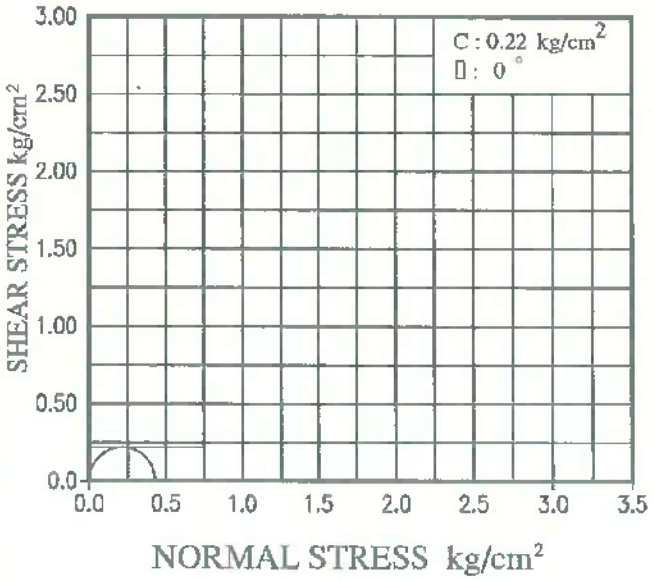
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

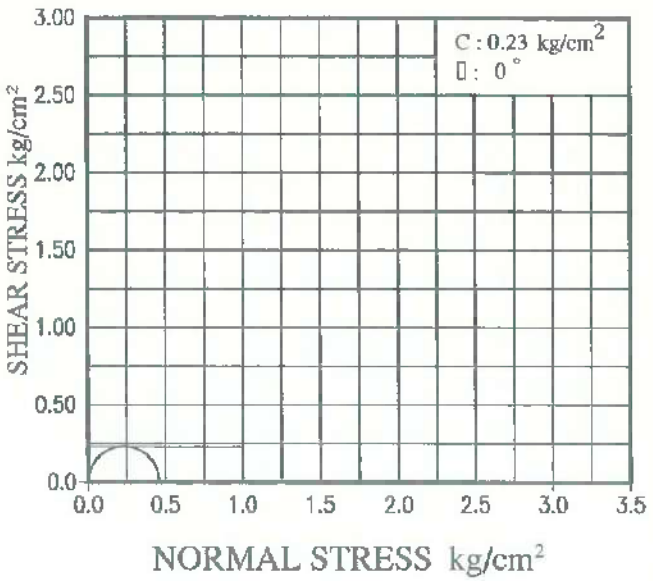
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

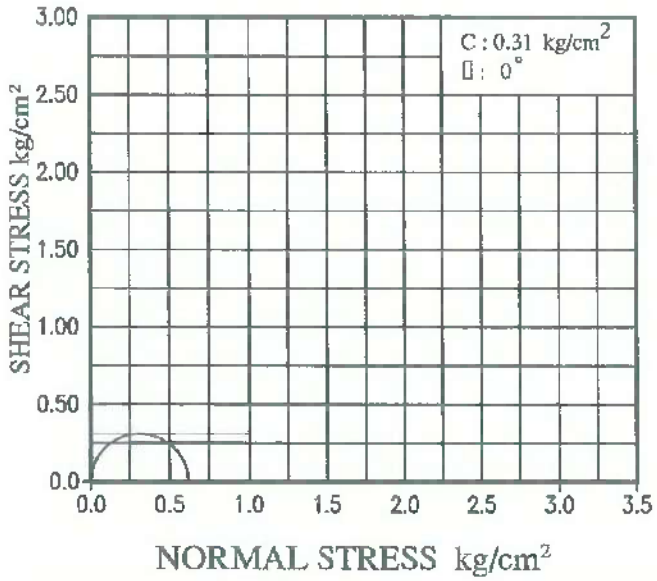
AP-206
DEPTH :- 1.50 m



AP-206
DEPTH :- 4.00 m



AP-206
DEPTH :- 8.00 m



P.K. DUTTA & CO. NAIHATI

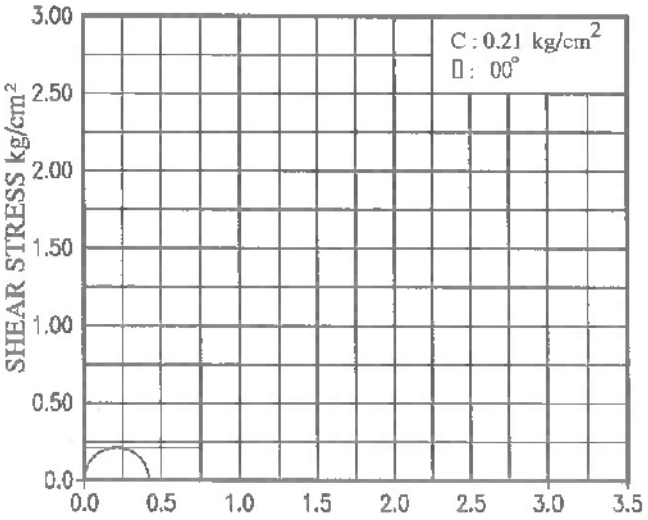
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

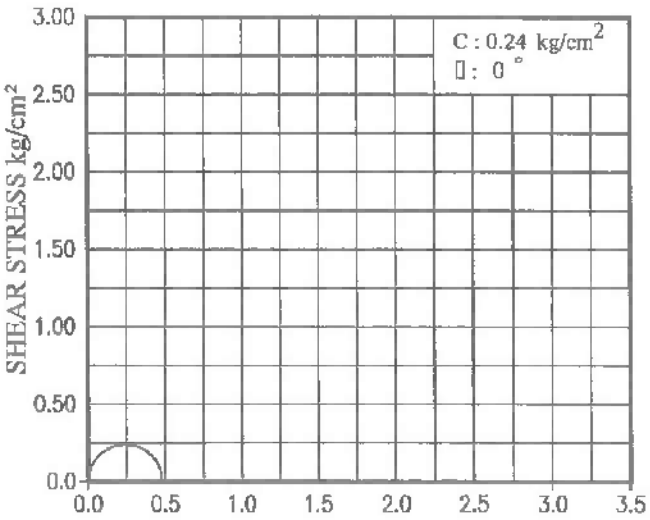
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

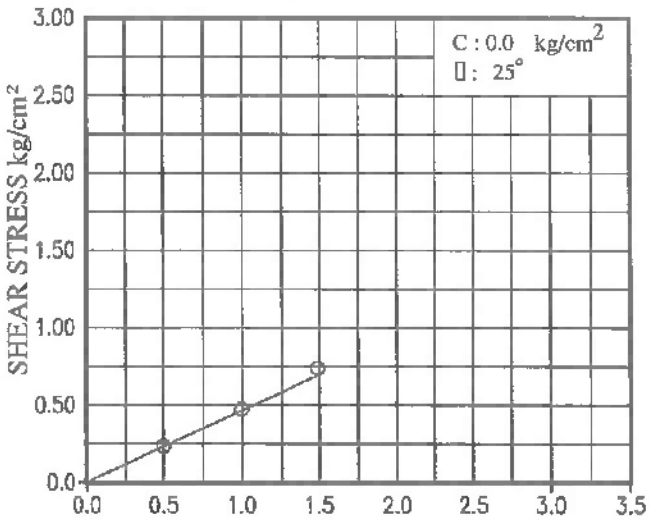
AP-220
DEPTH :- 1.50 m



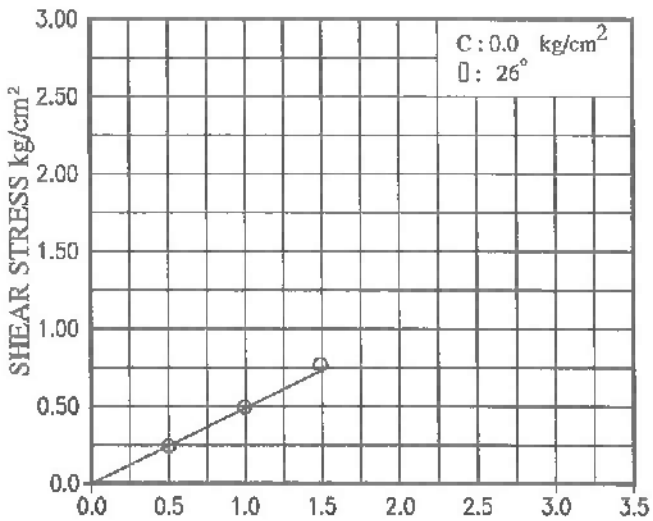
AP-220
DEPTH :- 3.00 m



AP-220
DEPTH :- 6.00 m



AP-220
DEPTH :- 8.00 m



P. DUTTA & CO. NAIHATI

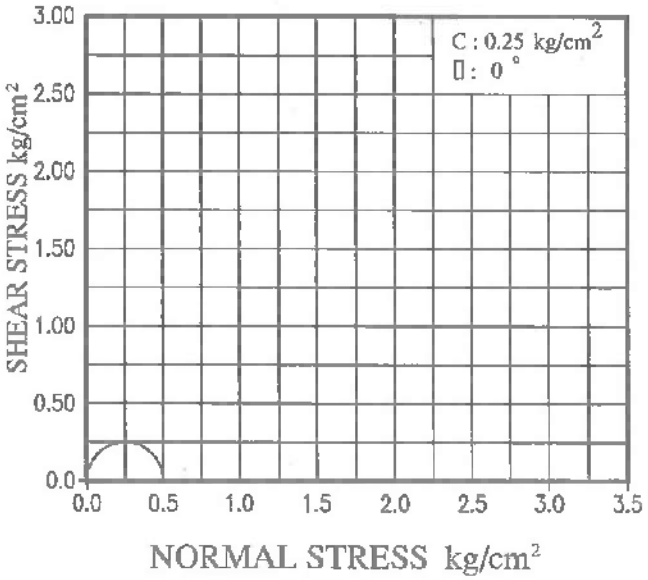
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

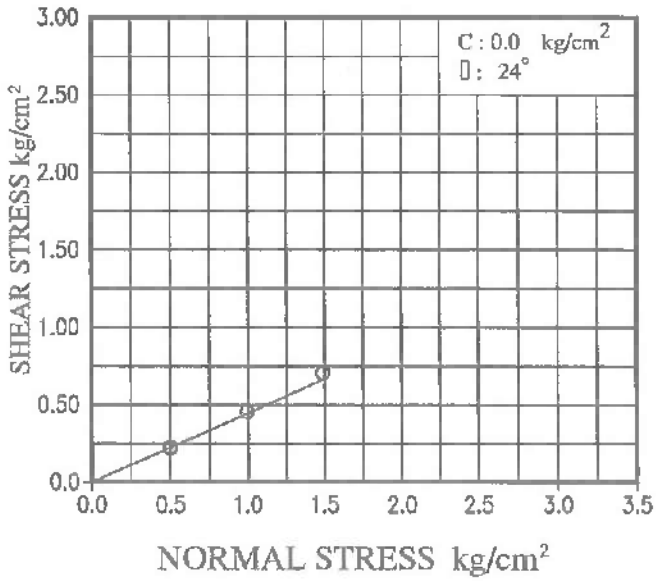
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

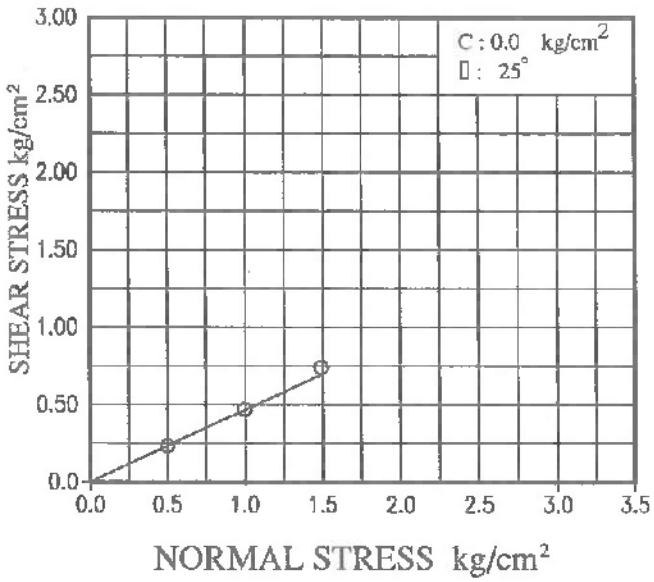
AP-241
DEPTH :- 1.50 m



AP-241
DEPTH :- 4.00 m



AP-241
DEPTH :- 6.00 m



DUTTA & CO. NAIHATI

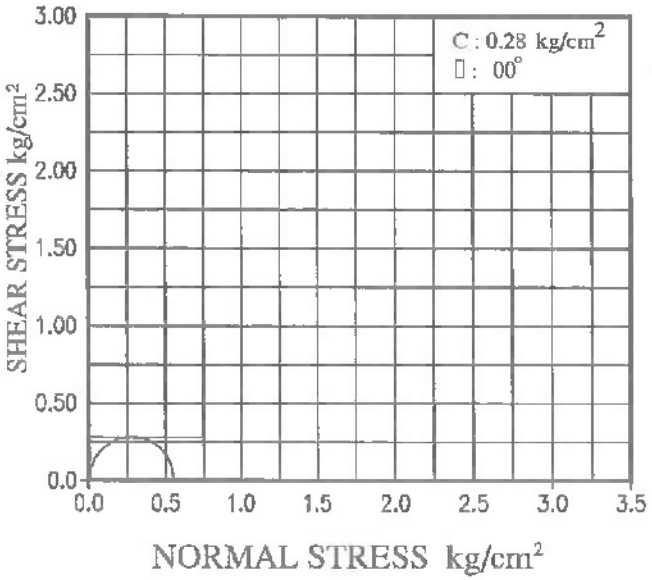
M/s P.K.Dutta & Co.	SHEAR TESTS CURVES

Client : **Assam Electricity Grid Corporation Limited**

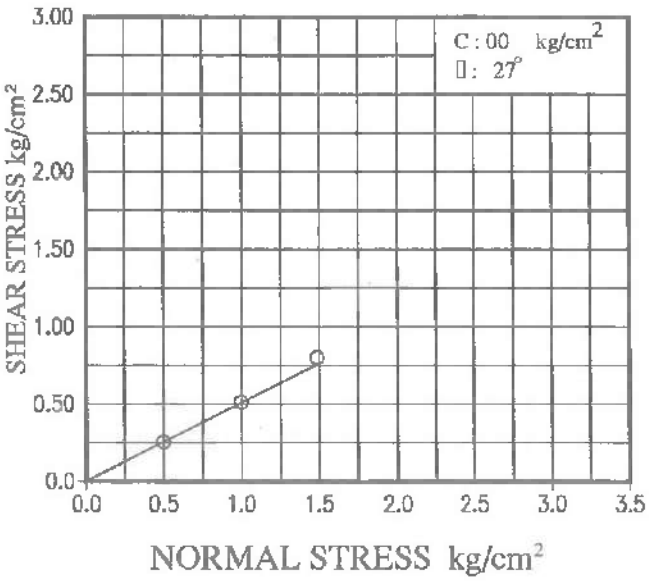
PROJECT: -Conducting Route Alignment, Detailed Survey, and Soil Investigation for BOQ Preparation of Proposed 400kV Double Circuit Chapar-Rangia Transmission Line for Evacuation of Power from 3200 MW Chapar Thermal Power Plant.

SHEAR CURVE

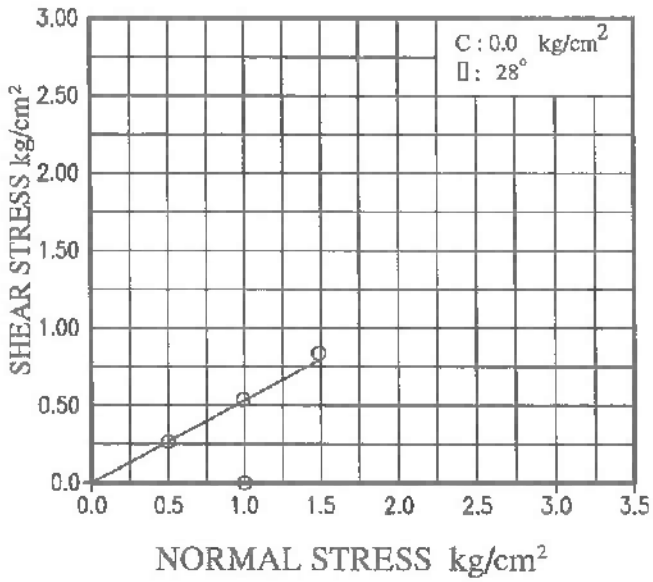
AP-252
DEPTH :- 1.50 m



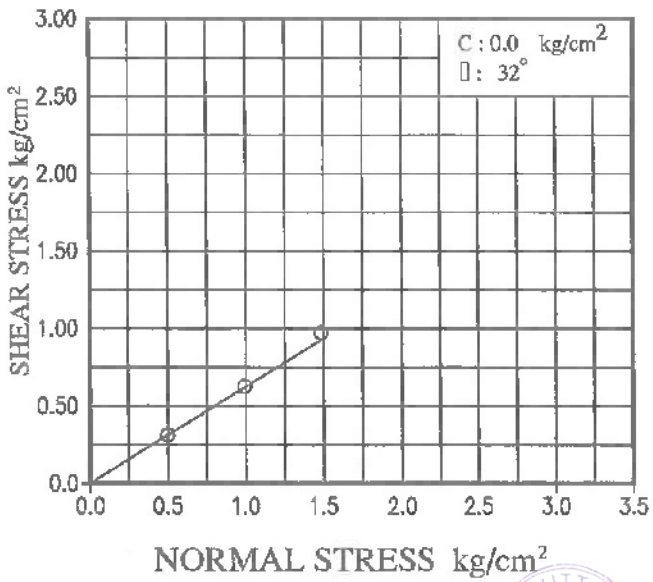
AP-252
DEPTH :- 4.00 m



AP-252
DEPTH :- 6.00 m



AP-252
DEPTH :- 8.00 m



P.K. DUTTA & CO. NAIHATI

SIGN FIELD DATA SHEET

P.K.DUTTA &CO.

SAI TOWER, BLOCK – A, 1st Floor, 6 No. Bijoynagar, Naihati, 24pgs(N) W.B. Pin - 743165

Type of boring: Auger & Mud-Circulation.	JOB Name: prop 400kV D/C chabua - Rangia T/L
	CLIENT: AEGCL
Dia. Of Hole: 150mm/NX	Depth in Mtr: 10.0 (M)
	Location No.: AP-3 Ranga loc.
Commenced on: 21-08-2026	RL: GPS
Completed on: 21-08-2026	Ground Water: 1.60 (M) N - 26°14'12.5" E - 90°19'20.8"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T.

DESCRIPTION	DEPTH(M) From	DEPTH(M) To	Thickness (Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES TCR(%)	RQD(%)
Stiff Consistency, dark grey clayey Silt traces of Sand with mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
		2.50		SPT-	2.00	2.45	3,5,5 = 10		
Loose, dark grey Silty fine Sand with mica.	2.50			SPT-	3.00	3.45	2,2,4 = 6		
				UDS-	4.00	4.45			
		4.50		DS-	4.50				
Medium Stiff, dark grey clayey Silt	4.50			SPT-	5.00	5.45	2,3,4 = 7		
				UDS-	6.00	6.45			
	6.00	6.00		DS-	6.50				
Loose to Medium, dark grey Silty Sand with mica.				SPT-	7.00	7.45	3,5,8 = 13		
				DS-	8.50				
				SPT-	10.00	10.45	7,11,13 = 24		
		10.45							

Signature of Site In-Charge
(P.K. Dutta & Co.)

Signature of Engineer In-Charge
Junior Manager, AEGCL

Scanned with OKEN Scanner

P.K.DUTTA &CO.

SAI TOWER, BLOCK – A, 1st Floor, 6 No. Bijoynagar, Naihati, 24pgs(N) W.B. Pin - 743165

Type of boring : Auger & Mud-Circulation	JOB Name: Prop. 400KV D/C Chaibasa - Rangia T/L
	CLIENT : AEGCL
Dia. Of Hole: 150mm/NX	Depth in Mtr : 10.0(M)
	Location No. : AP-29 Cultivated Land.
Commenced on: 22-08-2026	RL : GPS N - 26°20'10.7"
Completed on: 22-08-2026	Ground Water : 1.50(M) E - 90°26'09.6"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T.

DESCRIPTION	DEPTH(M) From	DEPTH(M) To	Thickness (Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES TCR(%)	RQD(%)
Medium Stiff, brownish to dark grey Clayey Silt.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	2, 2, 3 = 5		
Loose Light dark grey Silty Fine Sand with mica.	3.00	3.00		SPT-	3.00	3.45	3, 3, 3 = 6		
				UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	4, 5, 9 = 14		
		5.00		UDS-	6.00	6.45			
Medium, dark grey to Silty Sand with mica.	5.00			DS-	6.50				
	~~7.00~~	~~7.00~~		SPT-	7.00	7.45	7, 9, 13 = 22		
				SPT-	8.50	8.95	10, 13, 15 = 28		
				SPT-	10.00	10.45	11, 15, 21 = 36		
		10.45							

Signature of Site In-Charge
(P.K. Dutta & Co.)

Signature of Engineer In-Charge
Junior Manager
AEGCL

Scanned with OKEN Scanner

P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud - Circulation	JOB Name:- Prop. 400KV D/c Chapar - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(M) Location No :- AP-47 Cultivated Land.
Commenced On:- 23-08-2026 Completed On:- 23-08-2026	RL:- Ground Water:- 1.40(M)

GPS
N - 26°22'38.6"
E - 90°27'55.4"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Stiff Consistency, brownish to dark grey Sandy clay	0.00	0.50		DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
Loose, Light dark grey Silty fine Sand with mica.	0.50	3.00		SPT-	2.00	2.45	3, 4, 4 = 8		
				SPT-	3.00	3.45	4, 4, 6 = 10		
				UDS-	4.00	4.45			
Loose to Medium, dark grey Silty Sand with mica.	3.00	10.45		DS-	4.50				
				SPT-	5.00	5.45	5, 6, 8 = 14		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	8, 10, 13 = 23		
				SPT-	8.50	8.95	10, 13, 15 = 28		
				SPT-	10.00	10.45	11, 15, 19 = 34		

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

Junior Manager
AEGCL

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SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud-Circulation	JOB Name:- proj. 400kV D/c Chapai – Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(M) Location No :- AP-52 Baepen Land
Commenced On:- 23-08-2026 Completed On:- 23-08-2026	RL:- Ground Water:- 2.50 (M) GPS N - 26°23'17.0" E - 90°28'52.3"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Stiff, brownish grey clayey Sand.	0.00	0.50		DS -	0.50				
				DS-	1.00				
Loose Light, brownish grey Silty Fine Sand with mica.	0.50	2.50		UDS-	1.50	1.95			
				SPT-	2.00	2.45	2, 2, 2 = 4		
Loose, dark grey Silty fine Sand with mica.	2.50	5.00		SPT-	3.00	3.45	2, 2, 3 = 5		
				UDS-	4.00	4.45			
				DS-	4.50				
Medium Consistency, dark grey Silty Sand with mica.	5.00	10.45		SPT-	5.00	5.45	3, 4, 6 = 10		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	4, 7, 9 = 16		
				SPT-	8.50	8.95	5, 8, 11 = 19		
				SPT-	10.00	10.45	7, 10, 15 = 25		

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

Junior Manager
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SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud-Circulation	JOB Name:- Proj. 400KV D/C Chapar - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0 (M)
	Location No :- AP-66 Cultivated Land
Commenced On:- 24-08-2026	RL:- GPS
Completed On:- 24-08-2026	Ground Water:- 1.10(M) N - 26°28'6.7" E - 90°28'47.7"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Loose, Light dark grey Silty Sand with mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	2, 3, 3 = 6		
Medium Consistency, dark grey Silty Sand with mica.	3.00	3.00		SPT-	3.00	3.45	4, 6, 7 = 13		
				UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	7, 12, 15 = 27		
		6.00		UDS-	6.00	6.45			
Medium to dense, dark grey Silty medium to coarse Sand with nodules.	6.00			DS-	6.50				
				SPT-	7.00	7.45	12, 16, 20 = 36		
				SPT-	8.50	8.95	13, 18, 23 = 41		
				SPT-	10.00	10.45	13, 20, 25 = 45		
		10.45							

Signature of Site In-Charge.

For (P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Junior Manager
AEGCL

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Type of Boring:- Auger & Mud-Circulation	JOB Name:- Prop. 400KV D/c Chapai - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth In Mtr:- 10.0(M) Location No :- AP-73 Barren land.
Commenced On:- 25-08-2026 Completed On:- 25-08-2026	RL:- Ground Water:- 2.60(M) GPS N-26°31'31.3" E-90°28'48.5"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRIPTION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Soft to Medium dark grey clayey silt traces of Sand & silt mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
		2.50		SPT-	2.00	2.45	2, 2, 2 = 4		
Medium, dark grey Silty medium Sand with mica.	2.50			SPT-	3.00	3.45	3, 5, 6 = 11		
				UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	5, 7, 9 = 16		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	5, 9, 15 = 24		
				SPT-	8.50	8.95	7, 12, 16 = 28		
		10.45		SPT-	10.00	10.45	10, 14, 21 = 35		

Signature of Site In-Charge.

for (P.K.Dutta & Co.)

Signature of Engineer In- Charge.

Hifaj Ali Ahmed
Junior Manager (Civil)
132 KV Grid Sub-Station Division
AEGCL, Dhaligaon

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Type of Boring:- Auger & Mud - Circulation	JOB Name:- Prop. 400 KV D/c chapan - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(M)
	Location No :- AP-109 Cultivated Land.
Commenced On:- 25-08-2026	RL:- GPS
Completed On:- 25-08-2026.	Ground Water:- 2.30(M) N - 26°32' 8.5" E - 90°38' 53.9"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	ROD (%)
Loose, Light dark grey Silty fine to Medium Sand with mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	3, 3, 4 = 7		
Medium, dark grey Silty Sand with mica.	3.00	3.00		SPT-	3.00	3.45	5, 5, 6 = 11		
				UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	6, 8, 11 = 18		
				UDS-	6.00	6.45			
Medium to Dense, dark grey Silty medium Sand with nodules.				DS-	6.50				
	7.00	7.00		SPT-	7.00	7.45	8, 12, 15 = 27		
				SPT-	8.50	8.95	8, 13, 19 = 32		
				SPT-	10.00	10.45	12, 17, 23 = 40		
		10.45							

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Type of Boring:- Auger & Mud -circulation	JOB Name:- Prop. 400KV D/c chaibas - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0 (M) Location No :- AP-120 Barren land.
Commenced On:- 26-08-2026 Completed On:- 26-08-2026	RL:- GPS N - 26°32'54.7" E - 90°37'47.2" Ground Water:- 2.10 (M)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Soft to Medium, dark grey clayey Silt traces of Sand.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	2, 2, 3 = 5		
		3.50		SPT-	3.00	3.45	2, 2, 3 = 5		
Loose to Medium, dark grey Silty medium Sand With mica.	3.50			UDS-	4.00	4.45			
				DS-	4.50				
		5.00		SPT-	5.00	5.45	4, 7, 9 = 16		
	5.00			UDS-	6.00	6.45			
Medium to Dense, dark grey Silty medium to Coarse Sand With gravels.				DS-	6.50				
				SPT-	7.00	7.45	10, 11, 16 = 27		
				SPT-	8.50	8.95	10, 14, 17 = 31		
		10.45		SPT-	10.00	10.45	13, 20, 24 = 44		

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SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud - circulation	JOB Name:- proj. 400KV D/c Chapar - Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth In Mtr:- 10.0(M)
	Location No :- AP-131 Cultivated Land
Commenced On:- 26-08-2026	RL:- GPS N - 26°34'17.1"
Completed On:- 26-08-2026	Ground Water:- 1.80(M) E - 90°40'07.3"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Stiff Consistency, dark grey clayey Silt.	0.00			DS-	0.50				
				DS-	1.00				
		1.50		UDS-	1.50	1.95			
Loose, dark grey Silty fine Sand with mica.	1.50			SPT-	2.00	2.45	4, 5, 6 = 11		
		2.50		SPT-	3.00	3.45	6, 10, 13 = 23		
Medium, dark grey Silty medium Sand with gravels.	2.50			UDS-	4.00	4.45			
				DS-	4.50				
		@ 5.00		SPT-	5.00	5.45	10, 13, 17 = 30		
Dense, dark grey Silty medium to Coarse Sand with gravels.	5.00			UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	13, 17, 25 = 42		
				SPT-	8.50	8.95	17, 20, 29 = 49		
		10.45		SPT-	10.00	10.45	19, 24, 33 = 57		

Signature of Site In-Charge.

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132 KV Grid Sub-Station Division
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SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud-Circulation	JOB Name:- Proj. 400kV D/C Chapai – Rangia T/L
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth In Mtr:- 10.0 (M)
	Location No :- 137/2 Cultivated Land.
Commenced On:- 27-08-2026	RL:- GPS
Completed On:- 27-08-2026	Ground Water:- 1.50(M) N - 26°33'48.2" E - 90°45'39.8"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Stiff Consistency, brownish grey clayey Silt traced of Sand With mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	3, 4, 5 = 9		
Loose, dark grey Silty fine Sand with mica.	3.00	3.00		SPT-	3.00	3.45	3, 3, 5 = 8		
				UDS-	4.00	4.45			
				DS-	4.50				
Medium to Dense, dark grey Silty medium Sand with gravels.	5.00	5.00		SPT-	5.00	5.45	5, 7, 13 = 20		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	7, 12, 17 = 29		
				SPT-	8.50	8.95	11, 18, 24 = 42		
				SPT-	10.00	10.45	16, 23, 32 = 55		
		10.45							

Signature of Site In-Charge.

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132 KV Grid Sub-Station Division
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SAI TOWER, BLOCK – A, 1st Floor, 6 No. Bijoynagar, Naihati, 24pgs(N) W.B. Pin - 743165

Type of boring : Auger & Mud-Circulation	JOB Name: Prop. 400KV D/c chapar – Rangia T/L
	CLIENT : AEGCL
Dia. Of Hole: 150mm/NX	Depth in Mtr : 10.0 (M)
	Location No. : AP- 141 Cultivated land
Commenced on: 27-08-2026	RL : GPS
Completed on: 27-08-2026	Ground Water : 1.60(M) N – 26°35'33.2" E – 90°49'7.5"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T.

DESCRIPTION	DEPTH(M) From	DEPTH(M) To	Thickness (Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES TCR(%)	RQD(%)
Medium Stiff, dark grey clayey Silt traces of Sand with mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
		2.00		SPT-	2.00	2.45	2, 2, 3 = 5		
Loose to Medium, dark grey Silty Sand with mica.	2.00			SPT-	3.00	3.45	3, 5, 6 = 11		
				UDS-	4.00	4.45			
		4.00		DS-	4.50				
Medium to Dense, dark grey Silty Sand mixed with gravels.	4.00			SPT-	5.00	5.45	5, 10, 13 = 23		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	8, 14, 17 = 31		
				SPT-	8.50	8.95	13, 20, 24 = 44		
		10.45		SPT-	10.00	10.45	17, 23, 36 = 59		

Signature of Site In-Charge
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Junior Manager (Civil)
132 KV Grid Sub-Station Division
AEGCL, Dhaligaon
Signature of Engineer In-Charge

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SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Aug & Mud-Circulation	JOB Name:- Prop. 400kV D/c Chapar - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(N) Location No :- 151/2 Barren Land
Commenced On:- 28-08-2026 Completed On:- 28-08-2026	RL:- GPS Ground Water:- 3.50(N) N-26°35'47.3" E-90°52'1.4"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Loose, dark grey Silty fine Sand with mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	4, 4, 6 = 10		
Medium to Dense, dark grey Silty Sand with gravels.	3.00	3.00		SPT-	3.00	3.45	7, 11, 15 = 26		
				UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	11, 15, 19 = 34		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	13, 18, 23 = 41		
				SPT-	8.50	8.95	14, 20, 26 = 46		
		10.45		SPT-	10.00	10.45	17, 25, 37 = 62		

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

Hifej Ali Ahmed
Junior Manager (Civil)
132 KV Grid Sub-Station Division
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SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud - circulation	JOB Name:- Prop. 400KV D/c charpan - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0 (M) Location No :- 157/3 Cultivated land
Commenced On:- 28-08-2026 Completed On:- 28-08-2026	RL:- GPS N - 26°35'40.3" E - 90°55'30.3" Ground Water:- 2.70 (M)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Stiff Consistency, brownish grey clayey Silt.	0.00			DS-	0.50				
				DS-	1.00				
		1.50		UDS-	1.50	1.95			
Loose to Medium, dark grey Silty Sand with mica & gravels.	1.50			SPT-	2.00	2.45	2, 3, 5 = 8		
				SPT-	3.00	3.45	5, 7, 10 = 17		
				UDS-	4.00	4.45			
				DS-	4.50				
Dense, dark grey medium to coarse Sand with gravels.	5.00	5.00		SPT-	5.00	5.45	7, 11, 19 = 30		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	10, 16, 22 = 38		
				SPT-	8.50	8.95	11, 19, 24 = 44		
		10.45		SPT-	10.00	10.45	14, 25, 31 = 56		

Signature of Site In-Charge.

(P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Hifaj Ali Ahmed
Junior Manager (Civil)
132 KV Grid Sub-Station Division
AEGCL, Dhaligaon

P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud-circulation	JOB Name:- Proj. 400kV Chapar - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(M) Location No :- AP-170 Cultivated land
Commenced On:- 11-09-2026 Completed On:- 11-09-2026	RL:- GPS N - 26°35'47.8" E - 91° 2' 50.4" Ground Water:- 1.00(M)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Loose, dark grey Silty Sand with mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
		2.00		SPT-	2.00	2.45	6, 6, 7 = 13		
Medium, dark grey Silty Sand with mica & gravels.	2.00			SPT-	3.00	3.45	7, 9, 12 = 21		
				UDS-	4.00	4.45			
				DS-	4.50				
		5.00		SPT-	5.00	5.45	13, 15, 20 = 35		
Dense to very dense, dark grey medium Sand with gravels.	5.00			UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	15, 23, 28 = 51		
				DS-	8.50				
		10.45		SPT-	10.00	10.45	16, 27, 42 = 69		

Signature of Site In-Charge.

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Signature of Engineer In- Charge.

Assistant Manager (Civil)
220 KV Rangia GSS
AEGCL, Rangia

Asstt. General Mana
132 KV Grid Sub-Sta
AEGCL, Rangia

P.K.DUTTA & CO.

SAI TOWER, BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud-circulation	JOB Name:- Proj. 400KV D/C Chabua - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(M) Location No :- AP-182 Cultivated land
Commenced On:- 11-09-2026 Completed On:- 11-09-2026	RL:- GPS N - 26°35'36" E - 91°8'44" Ground Water:- 1.50(M)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Medium Stiff, brownish to dark grey clayey Silt traces of Sand.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	2, 2, 3 = 5		
		3.00		SPT-	3.00	3.45	3, 3, 5 = 8		
Stiff Consistency, dark grey clayey Silt with Sand.	3.00			UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	3, 4, 6 = 10		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	4, 6, 7 = 13		
				UDS-	8.00	8.45			
				DS-	8.50				
		10.45		SPT-	10.00	10.45	6, 7, 10 = 17		

Signature of Site In-Charge.

P.K. Dutta & Co.

Signature of Engineer In- Charge.

Assistant Manager (Civil)
220 KV Rangia GSS
AEGCL, Rangia

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132 KV Grid Sub-Stat
AEGCL, Rangia

P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud-Circulation.	JOB Name:- Prop. 400KV D/C Chalan - Rangia T/L.
	CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0 (M)
	Location No :- AP-190 Cultivated Land
Commenced On:- 12-09-2026	RL:- GPS N - 26°36'50.9"
Completed On:- 12-09-2026	Ground Water:- 1.55 (M) E - 91°12'41.9"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Soft to Medium Stiff, brownish to dark grey clayey Silt with Sand.	0.00			DS -	0.50				
				DS -	1.00				
				UDS -	1.50	1.95			
				SPT -	2.00	2.45	2, 2, 2 = 4		
Loose, dark grey Silty fine Sand with mica.	3.00	3.00		SPT -	3.00	3.45	2, 2, 3 = 5		
				UDS -	4.00	4.45			
				DS -	4.50				
		5.00		SPT -	5.00	5.45	2, 3, 3 = 6		
Medium Stiff, dark grey clayey Silt	5.00			UDS -	6.00	6.45			
				DS -	6.50				
				SPT -	7.00	7.45	2, 3, 4 = 7		
				UDS -	8.00	8.45			
				DS -	8.50				
		10.45		SPT -	10.00	10.45	3, 4, 6 = 10		

Signature of Site In-Charge.

(P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Assistant Manager (Civil)
220 KV Rangia GSS
AEGCL, Rangia

Asstt. General Manager
132 KV Grid Sub-Station
AEGCL, Rangia

P.K.DUTTA & CO.

SAI TOWER , BLOCK– A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud- circulation	JOB Name:- Prop. 400kV D/c Chapar - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(M) Location No :- AP-206 Cultivated land
Commenced On:- 12-09-2026 Completed On:- 12-09-2026	RL:- Ground Water:- 1.70(M) GPS N - 26°37'34.3" E - 91°20'40.4"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Medium Stiff, brownish to dark grey clayey Silt with Sand.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
				SPT-	2.00	2.45	2, 2, 3 = 5		
				SPT-	3.00	3.45	2, 3, 3 = 6		
				UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	3, 3, 4 = 7		
				UDS-	6.00	6.45			
				DS-	6.50				
Stiff, dark grey clayey Silt traces of Sand with mica.	7.00	7.00		SPT-	7.00	7.45	4, 4, 5 = 9		
				UDS-	8.00	8.45			
				DS-	8.50				
		10.45		SPT-	10.00	10.45	4, 5, 7 = 12		

Signature of Site In-Charge.

(P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Assistant Manager (Civil)
220 KV Rangia GSS
AEGCL, Rangia

Asstt. General Mana
132 KV Grid Sub-Sta

P.K. DUTTA & CO.

SAI TOWER, BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud-Circulation	JOB Name:- prop. 400KV Chuzon - Pongio T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(11) Location No:- AP-220 Cultivated land
Commenced On:- 21-09-2024 Completed On:- 21-09-2024	RL:- GPS N - 24°37'21.2" E - 91°27'1.4" Ground Water:- 1.50(11)

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRIPTION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RCD (%)
Medium Stiff, dark grey Silty clay traces of Sand.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
		2.00		SPT-	2.00	2.45	2, 3, 3 = 6		
Medium Stiff Cohesionless dark grey clayey Silt	2.00			SPT-	3.00	3.45	3, 2, 5 = 2		
				UDS-	4.00	4.45			
		3.50		DS-	4.50				
Loose to Medium, dark grey Silty fine Sand with mica.	3.50			SPT-	5.00	5.45	5, 7, 10 = 17		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	7, 10, 13 = 23		
				UDS-	8.00	8.45			
				DS-	8.50				
		10.45		SPT-	10.00	10.45	7, 12, 16 = 28		

Signature of Site In-Charge.

(P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Assistant Manager (Civil)
220 KV Rangia GSS
AEGCL, Rangia

Asstt. General Manage
132 KV Grid Sub-Statio
AEGCL, Rangia

P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Auger & Mud-Circulation	JOB Name:- Proj. 400kV Chapar - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0(M) Location No :- AP-241 Cultivated Land.
Commenced On:- 21-09-2026 Completed On:- 21-09-2026	RL:- Ground Water:- 1.60(M)

GPS
N - 26°39'32.4"
E - 91°34'37.6"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N-Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Medium Stiff, dark grey Clayey Silt traces of Sand with mica.	0.00			DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
		2.00		SPT-	2.00	2.45	2, 2, 3 = 5		
Loose to Medium, brownish to dark grey Silty Sand with mica.	2.00			SPT-	3.00	3.45	3, 3, 4 = 7		
				UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	4, 6, 8 = 14		
				UDS-	6.00	6.45			
				DS-	6.50				
				SPT-	7.00	7.45	5, 8, 12 = 20		
				UDS-	8.00	8.45			
				DS-	8.50				
		10.45		SPT-	10.00	10.45	7, 11, 16 = 27		

Signature of Site In-Charge.

(P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Assistant Manager (Civil)
220 KV Rangia GSS
AEGCL, Rangia

Asstt. General Manage
132 KV Grid Sub-Statio
AEGCL, Rangia

P.K.DUTTA & CO.

SAI TOWER , BLOCK – A, 1st FLOOR, 6No. Bijoynagar, Naihati, 24PGS (N) W.B Pin-743165

Type of Boring:- Pages & Drilling	JOB Name:- Prop. 400kv chapar - Rangia T/L CLIENT:- AEGCL
Dia Of Hole : 150mm/NX	Depth in Mtr:- 10.0 (M) Location No :- AP-252 Cultivated Land
Commenced On:- 20-09-2026 Completed On:- 20-09-2026	RL:- GPS N- 26°38'30.9" Ground Water:- 1.00 (M) E- 91°36' 20.2"

D= Disturbed Sample, U= Undisturbed Sample, P=S.P.T

DESCRITION	DEPTH(M) From	DEPTH(M) To	Thickness(Mtr)	COLLECTION OF SOIL SAMPLES Type	Depth From	Depth To	N- Value	COLLECTION OF ROCK SAMPLES. TCR (%)	RQD (%)
Medium stiff, dark grey clayey Silt with mica.	0.00	1.00		DS-	0.50				
				DS-	1.00				
				UDS-	1.50	1.95			
Medium stiff, dark grey Silty clay	1.00			SPT-	2.00	2.45	2, 3, 3 = 6		
				SPT-	3.00	3.45	3, 5, 6 = 11		
Loose to Medium dark grey Silty fine Sand with mica.	3.50	3.50		UDS-	4.00	4.45			
				DS-	4.50				
				SPT-	5.00	5.45	7, 11, 14 = 25		
				UDS-	6.00	6.45			
Very dense, dark grey medium to Coarse Sand with mica & Occasionally Gravels.	7.50	7.50		DS-	6.50				
				SPT-	7.00	7.45	13, 20, 27 = 47		
				UDS-	8.00	8.45			
				DS-	8.50				
		10.45		SPT-	10.00	10.45	17, 26, 36 = 62		

Signature of Site In-Charge.

(P.K. Dutta & Co.)

Signature of Engineer In- Charge.

Assistant Manager (Civil)
220 KV Rangia GSS
AEGCL

Asstt. General Mana
132 KV Grid Sub-Sta
AEGCL Rangia

FIELD PHOTOGRAPH



AP-3



AP-29



AP-47



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S. DUTTA & CO. NAIHATI



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AP-109



AP-120



AP-131



LOC-137/2

DUTTA & CO. NAIHATI



AP-141



LOC-151/2



LOC-157/3



AP-170



AP-182



AP-190



AP-206



AP-220



AP-241



AP-252

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