

NRSS XXIX Transmission Limited (NRSS-XXIX)

Amendment- III (Clarifications / Replies to the Pre-bid Queries)

17.08.2023

Subject: Clarifications on NIT Dated 21/07/2023 for selection of Bidder for Augmentation of transformation capacity at Amargarh (GIS) S/s by 1x315MVA, 400/220 kV ICT (3rd) (three single phase units of 105MVA) along with associated transformer bays along with GIB (420 kV & 245 kV 1-ph indoor and outdoor GIB) on LSTK basis.

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1)	02 Section-II ITB	33.1	Within twenty-eight (28) days after receipt of the Notification of Award, the successful Bidder shall furnish the performance security for 10% (Ten percent) of the Contract Price plus additional performance securities, if any,	Within twenty-eight (28) days after receipt of the Notification of Award, the successful Bidder shall furnish the performance security for 3% (Three percent) of the Contract Price.	Various central government bodies like Northern railway consider 3% CPBG. Hence request you to consider 3% in place of 10%.	The provision of Clause 33.1 of Section-II (ITB) of Volume-I of Bidding Documents shall remain unchanged.
2)	02 Section-II ITB	13.1 and 13.2	The Bidder shall furnish as part of its bid, a Bid Security of INR 5 lakh (Five lakh Only) for an initial period of 180 days.	We request to waive off the Earnest Money deposit and Bid security declaration can be accepted with bid.		The Bids shall be submitted in Hard Copy only as detailed in Sl. No. 8 of Section - III (BDS) of Volume-I of the Bidding Documents. Revised Provisions of: Sl. No 7 of Section - III (BDS) of Volume-I of the Bidding Documents: Supplementing ITB Clause 13 Bid Security shall not be applicable in this Project. All Bidders shall submit as part of their Bid, a duly signed Bid Securing Declaration attached as Annexure-I. This will form a part of 'Other Bid Forms' of Volume-III of Bidding Documents.

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						In the Bidding Documents wherever there is a provision of submission of Bid Security, it shall be replaced with Bid Securing Declaration. Subsequently Bid Security Form as provided in 'Other Bid Forms' of Volume-III of Bidding Documents shall be read as 'Deleted'.
3)	General	Vol-II Technical Specifications	-	Equipment specifications are not present with the tender documents. We understand that, PGCIL specification to be followed which are available as on June'2023. Kindly confirm that bidder's understanding is correct.		Equipments specifications are provided in "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents.
4)	General	Vol-II Drawings	-	Design of earthing shall be for 50kg or 70kg body weight. Kindly confirm. Also provide the GIS Building earthing layout plan.		Bidders are advised to conduct a site survey and acquaint themselves with the existing GIS earthing in place. Also, the number of earthing points of GIS to be installed shall be as per practices of GIS OEM or existing earthing provisions in the installed GIS, whichever is higher. For existing switchyard, main earth mat is present and same shall be extended for the present Scope of Work as per the provided earthing layout. Please refer to the existing drawing enclosed with Volume-II named as - "4. Existing Earthing Layout for Switchyard"
5)	General	Vol-II Drawings	-	Earthing shall be considered only for present area and does not include future area, as shown in the layout as per fencing area.		Earthing for the present Scope of Work shall be provided by the Contractor.
6)	General	GCC 9.2/ Appendix-2	The prices shall remain firm and fixed during the currency of the Contract	Prices are variable as per IEEMA. The base date shall be one month prior to technical bid opening. The bidder shall quote base prices for the Ex-Works price component of the equipment/materials (Transformer, Insulating Oil, CVT, SA, PVC/XLPE insulated Power & Control Cables), the complete equipment procured as spares (Transformer, CVT, SA, PVC/XLPE insulated Power & Control Cables), Substation Structures and installation (including civil works) price component of the equipment/materials. These price components for certain equipment/		As this is a short duration project on LSTK basis, the provisions of Appendix-2: Price Adjustment of Section-IV (GCC) of Volume-I of Bidding Document will remain unchanged.

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				materials, as specified, shall be subject to price adjustment to reflect changes in the cost of labour and material components as per the provisions given in Appendix-A		
7)	General	BDS ITB 13.1 and 13.2	The Bidder shall furnish as part of its bid, a Bid Security of INR 5 lakh (5 lakh Only) for an initial period of 180 days.	We request you to please waive off the Earnest money deposit (EMD) BG.		Please refer to reply at S. No. 2 above.
8)		06-Section - VI Forms and Procedures Appendix 1(A) Terms & Procedures of Payment for Supply of Goods (Volume-I, GCC)		We request you to allow us Progressive payment for For Supply of Transformer and GIS on Prorata basis - Progressive payment of Eighty Percent (80%) of the Ex-Works, 100% for Taxes and Freight & Insurance after receipt of material at Site, issue of MRN/ MRHOV and certification from Employer.		The Payment terms of the Contract shall remain the same.
9)	General	Vol-II Technical Specifications	Please provide the Existing GIS technical specification, drawings with Make and Model			The "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents provides the details regarding the technical requirement in the new GIS. Please refer to the specification. For more details, bidders are advised to conduct a site survey and acquaint themselves with the existing GIS details. Make of the existing GIS is GE.
10)	General	Vol-II Technical Specifications	Please provide the Existing specification of CRP SAS, Transformer, VMS for integration with Make and Model			Please refer to the specification of all the major items provided in the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents and additionally the Bidders are advised to conduct a site survey for more details.

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						Make of the items is as follows: 1) CRP-SAS: GE 2) Transformer: GE 3) VMS: Delcom
11)	General	Vol-II Technical Specifications	Spare feeders are available in ACDB,DCDB existing panel. Hence we are not considering any extension in present scope			Please refer to Clause 3.K of the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents.
12)	General	Vol-II Technical Specifications	We are considering HVWS system for FF protection of transformer. Understand that common oil collection pit for connecting all the transformer soak pit is not available. Please clarify the scope of this if it is to be considered in bidder scope.			Please refer to the Clause 3.L of the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents. NIFPES with portable fire extinguishers shall be provided for the Transformers. Further, adequate water hydrants (wherever required as per the existing system) with the necessary piping interface in line with the existing system shall be provided. For the Transformer Oil pit, refer to clause 10.3.5 of the "Technical Specification of Amargarh Substation - Civil Works" of Volume-II of Bidding Documents. For the new present scope, transformer oil pit shall be connected to the new common Oil collection pit.
13)	General	Vol-II Technical Specifications	Creepage distance details are not available. Please confirm the creepage to be considered.			Please refer to the Clause 3.A of the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents.
14)	General	Vol-II Technical Specifications	Existing lighting panel for illumination have spare feeders to cater present scope. Please confirm our understanding			Please refer to the Clause 3.N of the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents and conduct the site survey to understand the requirement of lighting in the buildings and the outdoor area.
15)	General	Vol-II Technical Specifications	Battery and charger scope is not envised under present scope. Please confirm our understanding			Please refer to Clause 3.K of the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents.

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16)	General	Vol-II Technical Specifications	Spare ports are available in communication panel. Hence we are not considering any extension in present scope. Please confirm our understanding			Please refer to Scope of Work and specification in the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents.
17)	General		Any repairing related to existing building structures or electrical work is not in bidder scope.			Not in the Bidders' Scope of Work. However, if there is any damage in any of the existing buildings during construction, then the Contractor has to rectify the same without any additional cost to the Employer.
18)	General-Civil		Please provide the existing GIS PEB Building drawings for extension			Please refer to Annexure-IIA and Annexure-IIB in this regard. The Bidder are advised to conduct a site survey in this regard that whether extension of building is required or not.
19)	General-Mechanical		As per site visit, we understand that new EOT crane for the extension of building is required due to center column at the extension side of building. Please confirm our understanding.			GIS equipment shall be placed in the existing building. The Bidders are advised to conduct a site survey in this regard that whether extension of building is required or not.
20)	General-Mechanical		We understand that existing AHU can cater the present scope of extension. AHU is not in bidder scope for the extended part of building only AHU duct extension is required. Please confirm our understanding.			Please refer to Clause 3.0 of the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of Bidding Documents.
21)	Section SCC	V 7	Standard warranty for following equipments shall be considered as below: Transformer- 5 Years. Others: 24 months	Please confirm that the Defect Liability Period is 2 years (i.e. 24 months) from the date of commissioning. It is requested to kindly maintain the defect liability period of Transformers same as 2 years instead of 5 years. Further please confirm that for validity of Performance Guarantees, the defect liability period shall be considered as 24 months.		The provision of S.No. 7 of Section-V (SCC) of Volume-I of Bidding Documents shall remain unchanged.
22)	Section GCC	IV 29. Limitatio	the aggregate liability of the Contractor to the Employer, whether under the	With respect to the standard industry practise and tenders, it is requested to kindly consider the		The provision of Clause 29 (b) of Section-IV (GCC) of Volume-I of

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		n of Liability (b)	Contract, in tort or otherwise, shall not exceed 110% of the total Contract Price, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Contractor to indemnify the Employer with respect to patent infringement.	limitation of liability to be 100% of the total contract price instead of 110%.		Bidding Documents shall remain unchanged.
23)	Section GCC IV	37. Extension of Time for Completion	37.1. The Time(s) for Completion specified in the SCC shall be extended if the Contractor is delayed or impeded in the performance of any of its obligations under the Contract by reason of any of the following: (a) any Change in the Facilities as provided in GCC Clause 36 (b) any occurrence of Force Majeure as provided in GCC Clause 35 (c) any suspension order given by the Employer under GCC Clause 38 hereof or reduction in the rate of progress pursuant to GCC Clause 38.2 or (d) any changes in laws and regulations as provided in GCC Clause 34 or by such period as shall be fair and reasonable in all the circumstances and as shall fairly reflect the delay or impediment sustained by the Contractor.	Since for timely completion of the Project, the timely obligations of both the contracting parties i.e. Employer and Contractor are required, hence please confirm that in case of delay and / or default and / or breach of any of the obligations of the Employer and its deployed other Contractor's, equivalent extension of time shall be provided by the Employer to the Contractor. Further, we also request you to kindly confirm that Extension of Time shall also be provided in case of delays due to the reasons not attributable to the Contractor.		Please refer to Clause 37.1 of Section-IV (GCC) of Volume-I of Bidding Documents . In the cases not specified in Clause 37.1 of Section-IV (GCC) of Volume-I of Bidding Documents the Contractor may refer to Clause 37.2 of Section-IV (GCC) of Volume-I of Bidding Documents.
24)	Section GCC IV	37. Extension of Time for Completion		With respect to the Extension of Time (Clause 37.1), the Contract provides the provision of additional cost on account of Changes in the Facilities, Suspension Order given by the Employer (except for Contractor's default), and Changes in laws and regulations, along with the extension of time. However, please confirm that in case when the obligations of the Employer are delayed or may be due to various reasons not attributable to the Contractor, which leads to delay in Time for Completion, for which Extension of Time shall be		As this is a short duration project on LSTK basis, the provisions of Appendix-2: Price Adjustment of Section-IV (GCC) of Volume-I of Bidding Document will remain unchanged.

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				provided by the Employer and the cost escalation, cost overruns, prolongation, idling charges and other justifiable costs and expenses shall also be paid to the Contractor including cost of BG extensions, site running expenses, Insurance extensions, warranty extensions etc.		
25)	Section GCC	IV 39.1. Termination for Employer's Convenience	39.1.3. In the event of termination of the Contract under GCC Clause 39.1.1, the Employer shall pay to the Contractor the following amounts: (a) the Contract Price, properly attributable to the parts of the Facilities executed by the Contractor as of the date of termination (b) the costs reasonably incurred by the Contractor in the removal of the Contractor's Equipment from the Site and in the repatriation of the Contractor's and its Subcontractors' personnel (c) costs incurred by the Contractor in protecting the Facilities and leaving the Site in a clean and safe condition pursuant to paragraph (a) of GCC Clause 39.1.2	We request you to kindly provide the following cost as well in addition to those mentioned in the referred clause d) any amounts to be paid by the Contractor to its Subcontractors in connection with the termination of any subcontracts, including any cancellation charges e) the value of any unused or partially used Plant and Equipment on the Site f) the cost of satisfying all other obligations, commitments and claims that the Contractor may in good faith have undertaken with third parties in connection with the Contract and not covered above		The provision of Clause 39.1 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.
26)	Section GCC	IV	Termination by Contractor owing to Employer's default	If the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. In case of failure of the Employer to provide the above, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, the Contractor shall have the right to terminate the Contract.		Please refer to Clause 39 of Section-IV (GCC) of Volume-I of Bidding Document.

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				Accordingly, upon termination, the Contractor shall be paid in accordance with such payments as would have been paid by Employer to the Contractor upon Termination for Employer's Convenience. Please confirm		
27)	Section IV GCC		Suspension by Contractor owing to Employer's default	If the Employer has failed to pay the Contractor any sum due under the Contract within the specified period, has failed to approve any invoice or supporting documents without just cause, or commits a substantial breach of the Contract, the Contractor may give a notice to the Employer that requires payment of such sum, with interest thereon, requires approval of such invoice or supporting documents, or specifies the breach and requires the Employer to remedy the same, as the case may be. In case of failure of the Employer to provide the above, or if the Contractor is still unable to carry out any of its obligations under the Contract for any reason attributable to the Employer, the Contractor shall have the right to suspend or reduce the rate of progress of the Contract. If the Contractor's performance of its obligations is suspended or the rate of progress is reduced, then the Time for Completion shall be extended, and any and all additional costs or expenses incurred by the Contractor as a result of such suspension or reduction shall be paid by the Employer to the Contractor in addition to the Contract Price. Please confirm		Please refer to Clause 38 of Section-IV (GCC) of Volume-I of Bidding Document.
28)	Section IV GCC	35. Force Majeure	35.1. "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation,	It is requested to kindly include pandemic, quarantine restrictions, any government restriction orders as well.		The provision of Clause 35.1 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.

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			the following: (a) war, hostilities or warlike operations (whether war be declared or not), invasion, act of foreign enemy and civil war, (b) rebellion, revolution, insurrection, mutiny, usurpation of government, conspiracy, riot and civil commotion (c) earthquake, landslide, volcanic activity, flood or cyclone, or other inclement weather condition, nuclear and pressure waves or other natural or physical disaster,			
29)	Section IV GCC	35. Force Majeure	35.4. The party who has given such notice shall be excused from the performance or punctual performance of its obligations under the Contract for so long as the relevant event of Force Majeure continues and to the extent that such party's performance is prevented, hindered or delayed. The Time for Completion shall be extended in accordance with GCC Clause 37. However, Employer shall not provide any cost escalation / over-run / prolongation resulting from time over-run due to force majeure activities.	It is requested to kindly pay the minimum deductibles in case of any insurance claims occurring during the Force Majeure. Further please confirm that Force Majeure shall not apply to any obligation of the Employer to make payments to the Contractor herein.		As this is a short duration project on LSTK basis, the provisions of Appendix-2: Price Adjustment of Section-IV (GCC) of Volume-I of Bidding Document will remain unchanged.
30)	Section IV GCC	36. Change in the Facilities		It is requested to kindly confirm that the quantity variation / change in facilities shall be limited to +/- 10% of the Original Contract Price, subsequent to which the rates shall be discussed and mutually agreed between the Employer and Contractor.		The provision of Clause 36 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.
31)	Section IV GCC	1. Definitions	(p) "Effective Date" means the date of Notification of Award from which the Time for Completion shall be determined.	Please confirm that the Effective date shall be considered as the date when last of the following activities / event has been completed a) Issuance of Notification of Award b) Receipt of Advance payment from Employer c) Receipt of hindrance free and encumbrance free complete site d) Signing of the Contract Agreement		The provision of Clause 1.1.(p) of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.

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32)	Section GCC	IV 1. Definitions	(v) "Mandatory Spare Parts" means the spares required for continuous operation as per CEA guidelines (Guidelines For Availability Of Spares And Inventories For Power Transmission System (Transmission Lines & Substation/Switchyard) Assets, July 2020).	Request to please provide us the mandatory spare list enabling us to quote		Please refer to the Annexure - B (SOW) Mandatory Spare Parts of the "Scope of Work" of Volume-II of the Bidding Documents.
33)	Section GCC	IV 1.2. Order of precedence	Following will be the order of precedence of the tender documents. i. Specific conditions of the contract (SCC) ii. General conditions of the contract (GCC) iii. Specifications iv. Drawings	It is requested to kindly consider the following Order of Precedence a) Contract Agreement and its Appendices b) Notification of Award c) Any MOM, clarification, response to queries, amendments, addendums, corrigendums etc. d) SCC e) GCC f) Specifications g) Drawings h) Bidders's Bid		The provision of Clause 1.2 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.
34)	Section GCC	IV 3. Scope of Facilities	3.1. The Contractor shall, unless specifically excluded in the Contract, perform all such work and/or supply all such items and materials not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Completion of the Facilities as if such work and/or items and materials were expressly mentioned in the Contract.	Please confirm that the Contractor's scope shall be limited to the scope of work as mentioned in the technical specifications and any addition or deletion beyond which shall be routed thru Change in facilities / Change order.		Confirmed
35)	Section GCC	IV 6. Contractor's Responsibilities	6.3. Employer Permits: The Contractor shall obtain/ procure, on behalf of the Employer, all statutory and regulatory clearances permits/approvals/licenses including without limitation approvals from CEA/CERC/SLDC/RPC/RLDC/Chief Electrical Inspector etc. required for successful charging and commissioning of the Facilities. All such approvals shall be obtained in the name of the Owner. All related	Shall be as per the scope given. Please confirm.		Confirmed

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			documentation, paperwork, and liasoning for the same shall be done by the Contractor in consultation with the Employer and Employer shall provide all requisite support/ assistance, as needed. Any payment that may be required to be paid towards procurement of any approval/ clearance under this Clause 6.3, shall be paid directly by the Employer/ Owner to the concerned authorities.			
36)	Section IV GCC	7.1. Site Conditions	7.1.2. The Contractor confirms that it has entered into this Contract on the basis of a proper examination of the data relating to the Facilities, access to land, soil strata, water level at land, topography, requirement of cutting-filling etc. The Bidders are advised to conduct independent geo-technical investigation, contouring of land etc. to acquaint themselves with the site conditions. The Contractor acknowledges that any failure to acquaint itself with any such data and information shall not relieve its responsibility for properly estimating the difficulty or cost of successfully performing the Facilities.	Please confirm the following If, during the execution of the Contract, the Contractor shall encounter on the Site any physical conditions (other than climatic conditions) or artificial obstructions that could not have been reasonably foreseen prior to the date of the Contract Agreement by an experienced contractor on the basis of reasonable examination of the data relating to the Facilities provided by the Employer, and on the basis of information that it could have obtained from a visual inspection of the Site (if access thereto was available) or other data readily available to it relating to the Facilities, and if the Contractor determines that it will in consequence of such conditions or obstructions incur additional cost and expense or require additional time to perform its obligations under the Contract that would not have been required if such physical conditions or artificial obstructions had not been encountered, then before performing additional work or using additional Plant and Equipment or Contractor's Equipment, the Contractor shall promptly be provided with a) Any reasonable additional cost and expense incurred by the Contractor to overcome such physical conditions or artificial obstructions shall be paid by the Employer to the Contractor as an addition to the Contract Price. b) If the Contractor is delayed or impeded in the performance of the Contract because of any such		Please refer to Clause 7.1.2 and Clause 36 of Section-IV (GCC) of Volume-I of Bidding Documents .

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				physical conditions or artificial obstructions, the Time for Completion shall be extended.		
37)	Section GCC	IV 7.2. Bid Information	<p>7.2.1. It shall be deemed that by submitting a Bid, the Bidder has:</p> <p>(a) made a complete and careful examination of the Bidding Documents, Appendices annexed to the Contract;</p> <p>(b) received all relevant information requested from the Employer and/or Owner;</p> <p>(c) accepted the risk of inadequacy, error or mistake in the information provided in the Bidding Documents or furnished by or on behalf of the Employer relating to any of the matters referred to in Clause 7.1 above. No claim shall be admissible at any stage on this account.</p> <p>(d) satisfied itself about all matters, things and information including matters referred to in Clause 7.1 hereinabove necessary and required for submitting an informed Bid, execution of the Project in accordance with the Bidding Documents and performance of all of its obligations thereunder;</p> <p>(e) acknowledged and agreed that inadequacy, lack of completeness or incorrectness of information provided in the Bidding Documents or ignorance of any of the matters referred to in Clause 7.1 hereinabove shall not be a basis for any claim for compensation, damages, extension of time for performance of its obligations, loss of profits etc. from the Authority, or a ground for termination of the Agreement by the Contractor;</p> <p>(f) acknowledged that it does not have a Conflict of Interest; and</p>	<p>Please confirm the following</p> <p>Bidder's Bid is based on the information, data, details, specifications etc, as provided in the Tender Documents / Bidding Documents. In case of any discrepancy, omission, error, inadequacy, mistake, incompleteness, incorrectness etc. in the Bidding Document, the Employer shall be liable and responsible for the same and the Contractor shall disclaim any responsibility on account of the above.</p> <p>And accordingly it is requested to kindly delete the clauses 7.2.1 (c), (d) and (e).</p>		The provision of Clause 7 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.

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			(g) agreed to be bound by the undertakings provided by it under and in terms hereof.			
38)	Section GCC IV	7. Verification of Information	7.3. The Employer shall not be liable for any omission, mistake or error in respect of any of the above or on account of any matter or thing arising out of or concerning or relating to RFP, including any error or mistake therein or in any information or data given by the Employer.	Please confirm the following Bidder's Bid is based on the information, data, details, specifications etc, as provided in the Tender Documents / Bidding Documents. In case of any discrepancy, omission, error, inadequacy, mistake, incompleteness, incorrectness etc. in the Bidding Document, the Employer shall be liable and responsible for the same and the Contractor shall disclaim any responsibility on account of the above.		The provision of Clause 7 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.
39)	Section GCC IV	11.2. Advance Bank Guarantee	11.2.1. The Contractor shall, within twenty-eight (28) days of the Effective Date, provide a security in an amount equal to as follows: a. 100% (one hundred percent) of the amount equivalent to Advance Payment 1, as defined in Appendix-1 (A), for Supply of Goods (hereinafter referred to as "Advance Bank Guarantee 1"); and b. 100% (one hundred percent) of the amount equivalent to Advance Payment 2, as defined in Appendix-1 (B), for Supply of Services (hereinafter referred to as "Advance Bank Guarantee 2"). The above shall be calculated in accordance with the corresponding Appendix - 1 (A) and Appendix - 1(B) respectively of the Contract, and in the same currency(ies) with initial validity of up to ninety (90) days beyond the date of Operational Acceptance of the Facilities in accordance with GCC Clause 23.1. The same shall be extended by the Contractor time to time till ninety (90) days beyond the actual date of Operational Acceptance of the	Please confirm that ABG validity shall be till Operational Acceptance and the claim period shall be 3 months from the Operational Acceptance.		Please refer to Clause 11.2 of Section-IV (GCC) of Volume-I of Bidding Documents .

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			Facilities, as may be required under the Contract. 11.2.2. The security shall be in the Form of unconditional and irrevocable Bank Guarantee(s) attached hereto in Section VI - Sample Forms and Procedures with claim period valid for twelve (12) months from the date of expiry of the Bank Guarantee. The security shall be discharged after the date it ceases to be in force and after completion of the facilities or relevant part thereof corresponding to which advance has been drawn.			
40)	Section GCC	IV 11.3. Performance Security	11.3.1. The Contractor shall, within twenty-eight (28) days of the notification of award, provide a performance security ("Performance Bank Guarantee") for the due performance of the Contract in the amount equivalent to Ten percent (10%) of the Contract Price, with a validity upto ninety (90) days beyond the Defect Liability Period. The same shall be extended by the Contractor time to time till ninety (90) days beyond the actual Defect Liability Period, as may be required under the Contract.	Please confirm that a) PBG of 5% of the Contract Price shall be provided instead of 10% of the Contract Price b) PBG shall be valid till Defect Liability period (24 months from Operational Acceptance) with claim period of 3 months.		Please refer to Clause 11.3 of Section-IV (GCC) of Volume-I of Bidding Documents .
41)	Section GCC	IV 12. Taxes and Duties	12.5. Employer would not bear any liability on account of any other taxes, duties, levies including BOCW, labor cess or any other local taxes (if any) that may be applicable.	Please confirm that BOCW shall be applicable only on the Service Portion and not on the Supply Portion Contract Price.		Please refer to Clause 12 of Section-IV (GCC) of Volume-I of Bidding Documents .
42)	Section GCC	IV 13. Copy Right	13.2. Notwithstanding the provisions of Clause GCC 11.1 above, the copyright in all drawings, documents and other materials containing data and information for design(s) and otherwise which have been developed by the Contractor or by any third party	Please confirm that the Employer shall reproduce all drawings, documents and other material furnished to the Employer by the Contractor for the purpose of the Contract only including, if required, for operation and maintenance.		The provision of Clause 13 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
			under the Contract shall remain vested in the Employer.			
43)	Section IV GCC	23.1.2.8.	<p>In the event that the Contractor is unable to proceed with the Precommissioning of the Facilities pursuant to Clause 23.1.2 for reasons attributable to the Employer either on account of nonavailability of other facilities under the responsibilities of other contractor(s), or for reasons beyond the Employer's control, the following provisions shall apply: When the Contractor is notified by the Project Manager that he will be unable to proceed with the activities and obligations pursuant to above GCC Clause 23.1.2.8, the Contractor shall be entitled to the following:</p> <p>a) the Time of Completion shall be extended for the period of suspension without imposition of liquidated damages pursuant to GCC Clause 24.2.</p> <p>b) payments due to the Contractor in accordance with the provisions specified in Appendix 1(A): (Terms & Procedure of Payment for Supply of Goods) and Appendix 1(B): Terms & Procedure of Payment for Supply of Services)), which would have not been payable in normal circumstances due to noncompletion of the said activities and obligations, shall be released to the Contractor against submission of a security in the form of a bank guarantee of equivalent amount acceptable to the Employer, and which shall become null and void when the Contractor will have complied with its obligations regarding these payments.</p> <p>c) the additional charges toward the care of the Facilities pursuant to GCC Clause 31.1 shall be reimbursed to the</p>	<p>In addition to the referred costs, please confirm that following cost shall also be payable</p> <p>d) the expenses payable by the Contractor towards extension of bank guarantees, warranty extensions, insurance extensions etc shall also be reimbursed.</p>		<p>The provision of Clause 23.1.2 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.</p>

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/Amendments	NSRR XXIX Response
			Contractor by the Employer for the period between the notification mentioned above and the notification mentioned in GCC Clause 23.1.2.10 below. The provisions of GCC Clause 32.2 shall apply to the Facilities during the same period.			
44)	Section GCC	IV 24. Completion Time Guarantee	24.2. If the Contractor fails to comply with the Time for Completion in accordance with Clause GCC 24 for the whole of the facilities, (or a part for which a separate time for completion is agreed) then the Contractor shall pay to the Employer a sum equivalent to half percent (0.5%) of the Contract Price plus GST payable thereon for the whole of the facilities, (or a part for which a separate time for completion is agreed) as liquidated damages for such default and not as a penalty, without prejudice to the Employer's other remedies under the Contract, for each week or part thereof which shall elapse between the relevant Time for Completion and the date stated in Taking Over Certificate of the whole of the Works (or a part for which a separate time for completion is agreed) subject to the limit of five percent (5%) of Contract Price plus GST payable thereon for the whole of the facilities, (or a part for which a separate time for completion is agreed).	Please confirm that LD shall be levied on the unexecuted portion of the Contract Price.		The provision of Clause 24.2 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.
45)	Section GCC	IV 25.8.	If the Facilities or any part thereof cannot be used by reason of such defect and/or making good of such defect, the Defect Liability Period of the Facilities or such part, as the case may be, shall be extended by a period equal to the period during which the Facilities or such part cannot be used by the Employer because of any of the aforesaid reasons. Upon correction of	Please confirm that sun-set clause for defect liability period shall be maximum 36 months from the Operational Acceptance subsequent to which all the obligations of the Contractor with respect to Defect Liability Period shall cease.		The provision of Clause 25.8 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
			the defects in the Facilities or any part thereof by repair/replacement, such repair/replacement shall have the Defect Liability Period extended by a period mentioned in GCC Clause 25.2 from the time of such replacement/repair of the facilities or any part thereof.			
46)	Section IV GCC	25.8.1	At the end of the Defect Liability Period, the Contractor's Liability ceases except for latent defects. The Contractor's liability for latent defects warranty shall be limited to period of ten (10) years from the end of Defect Liability Period. For the purpose of this clause, the latent defects shall be the defects inherently lying within the material or arising out of design deficiency, which do not manifest themselves during the Defect Liability Period defined in this GCC Clause 25, but later.	Please confirm that Latent defect liability period shall be 5 years from the defect liability period completion.		Please refer to Clause 25.8 of Section-IV (GCC) of Volume-I of Bidding Documents .
47)	Section IV GCC	33. Insurance	33.1. The Contractor shall take necessary insurance policies of appropriate value so as to protect the Services against any perils and as required to be covered for performance of the scope of Services under this Contract, excluding the insurance policies which is not specifically mentioned in this Contract and shall include, but not be limited to, cover for fire and allied risks, miscellaneous accidents, loss or damage in transit, theft, pilferage, riot and strikes and malicious damages, civil commotion, weather conditions, accidents of all kinds, etc. The scope of such insurance shall be adequate to cover the replacement/reinstatement cost of the Services for all risks up to and including delivery of goods and other	Inline with clause 33.5 of GCC, please confirm that no escalation clause is applicable while taking Insurance.		Please refer to Clause 33.1 of Section-IV (GCC) of Volume-I of Bidding Documents .

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
			costs till the Services are delivered at Site. Details of the insurance obtained for the purposes of this Contract is as below: a) Marine Cargo Policy/ Transit Insurance Policy during transportation of the Equipments for one hundred and fifteen per cent (115%) of the Contract Value with fifty per cent (50%) escalation clause b) Erection All Risks Policy (EAR) / Contractor All Risk Policy Insurance - during storage, erection and commissioning covering all the perils provided in the policy as a basic cover and the addon coverage of earthquake, terrorism, sabotage, extended maintenance cover for Defect Liability Period, design defect, 50-50 clause, 72 hours clause, loss minimization clause, waiver of subrogation clause (for projects of more than Rs.100 crores, cover for offsite storage/fabrication (over Rs.100 crores) for one hundred and fifteen per cent (115%) of Contract Value plus one hundred and fifteen per cent (115%) of OSM with fifty per cent (50%) escalation clause.			
48)	Section IV GCC	33. Insurance	33.5. The Contractor shall take the insurance for an amount equivalent to hundred and fifteen per cent (115%) of complete Contract Value with no escalation clause.			There is no suggestions from the Bidder on the subject. Hence, cannot be answered.
49)	Section IV GCC	Appendix - 1(A): Terms & Procedure of Payment for Supply of Goods	(a) Ten per cent (10%) of the ex-works Supply Price (without Taxes and Duties, and freight and insurance) paid as interest free advance ("Advance Payment 1") upon compliance to the conditions mentioned below by the Contractor: (i) Submission of Advance Bank Guarantee 1 of an amount equivalent to	It is requested to kindly remove the condition of PERT network / Bar Chart approval while releasing the advance payment.		The Payment terms of the Contract shall remain the same.

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
			Advance Payment 1 in accordance with GCC Clause 11.2 and; (ii) Submission of Performance Bank Guarantee of ten per cent (10%) of the Contract Price. (iii) Detailed PERT Network/Bar chart and its approval by the Employer.			
50)	Section GCC	IV Appendix - 1(B): Terms & Procedure of Payment for Supply of Services	1. Terms Of Payment (a) Ten per cent (10%) of the Service Price (including GST) paid as interest free advance ("Advance Payment 2") upon compliance to the conditions mentioned below by the Contractor: (i) Submission of Advance Bank Guarantee 2 of an amount equivalent to Advance Payment 2 in accordance with GCC Clause 11.2 and; (ii) Submission of Performance Bank Guarantee of ten per cent (10%) of the Contract Price. (iii) Detailed PERT Network/Bar chart and its approval by the Employer.			There is no suggestions from the Bidder on the subject. Hence, cannot be answered.
51)	Section GCC	IV Appendix - 1(A): Terms & Procedure of Payment for Supply of Goods	(d) Payment Mechanism All payments shall be made within thirty (30) days of submission of an undisputed invoice by the Contractor, complete in all respects and supported by all requisite documents and fulfilment of stipulated conditions hereunder, by electronic payment mechanism (e-payment) to the account of Contractor designated by written notice to Employer. Payments to Contractor shall be made in Indian Rupees to such accounts as are designated by the Party receiving payment.	Please confirm that except advance and retention payment, balance payments shall be made to the Contractor thru Letter of Credit at Sight.		The Payment terms of the Contract shall remain the same.
52)	Section GCC	IV Appendix - 1(B): Terms & Procedure of	(d) Payment Mechanism All payments shall be made within thirty (30) days of submission of an undisputed invoice by the Contractor, complete in all respects and supported			There is no suggestions from the Bidder on the subject. Hence, cannot be answered.

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/Amendments	NSRR XXIX Response
		Payment for Supply of Services	by all requisite documents and fulfilment of stipulated conditions hereunder, by electronic payment mechanism (e-payment) to the account of Contractor designated by written notice to employer. Payments to Contractor shall be made in Indian Rupees to such accounts as are designated by the Party receiving payment.			
53)	Section IV GCC	Appendix - 1(A): Terms & Procedure of Payment for Supply of Goods	7.5 Due Dates for Payment Payment shall be made upon fulfilment of the conditions specified in Clause 1(a) of this Appendix and receipt of the Contractor's undisputed invoice along with all necessary supporting documents for such Payment.	Please confirm that in case of delayed payment from Employer, interest shall be paid to the Contractor as well on the delayed payment for the delayed period which can be calculated @ SBI's MCLR rate		The Payment terms of the Contract shall remain the same.
54)	Section IV GCC	Appendix - 1(B): Terms & Procedure of Payment for Supply of Services	7.5 Due Dates for Payment Payment shall be made upon fulfilment of the conditions specified in Clause 1(a) of this Appendix and receipt of the Contractor's undisputed invoice along with all necessary supporting documents for such Payment.			There is no suggestions from the Bidder on the subject. Hence, cannot be answered.
55)	Section IV GCC	Appendix - 2: Price Adjustment	PRICE ADJUSTMENT The prices shall remain firm and fixed during the currency of the Contract.	Please confirm that the Prices shall be variable based on latest IEEMA formula.		As this is a short duration project on LSTK basis, the provisions of Appendix-2: Price Adjustment of Section-IV (GCC) of Volume-I of Bidding Document will remain unchanged.
56)	Volume -I / Section - IV: General Conditions of the Contract	Appendix - 1(A) & 1(B)	Appendix - 1(A): Terms & Procedure of Payment for Supply of Goods. & Appendix - 1(B): Terms & Procedure of Payment for Supply of Services	We Propose following payment terms for the project Supply terms of payment for Main Equipments (Transformer , GIS & C&P Panels) : - Interest Free Advance : Twenty percent (20%) of the Ex-works price component of Main Equipment/Materials (including Mandatory Spares) shall be paid through ABG & PBG with 7 days		There is no suggestions from the Bidder on the subject. Hence, cannot be answered.

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
				<p>submission of Invoice and BG</p> <p>- 10% Payment of the Ex-works prices on Main equipment's drawing (SLD & GA) submission approval (Transformer , 400KV and 220KV GIS) through L/C within 30 7 days on submission of Invoice.</p> <p>- Progressive payment Sixty Five (65%) Fifty percent (50%) of the Ex-Works price component of Main Equipment/Materials)+100% F&I + 100% Taxes against dispatch documents through L/C at sight within 30 days on submission of Invoice.</p> <p>- Progressive payment Fifteen percent (15%) of the Ex-Works price component of Main Equipment/Materials) on receipt & verification at site through L/C within 30 days on submission of Invoice.</p> <p>- 5% Five percent (5%) of the Ex-works price of supply contract shall be paid on commissioning through L/C within 30 days on submission of Invoice.</p> <p>In case commissioning is delayed due to reasons not attributable to GE, payment shall be released after 60 days of Scheduled commissioning date.</p> <p>Service portion Including CIVIL (Appendix -1 B.) - Service terms of payment for Main Equipments (Transformer , GIS & C&P Panels)</p> <p>-20% Interest Free Advance payment against submission of ABG & PBG .</p> <p>- Sixty percent (60%) of the Service Price (including GST) within thirty (30) days on pro-rata basis on installations after certification of invoices,</p> <p>- Fifteen (15%) of the Service Price (including GST) within thirty (30) days on pro-rata basis on Commissioning after certification of invoices.</p> <p>- Five percent (5%) of Service Price (including GST) shall be paid within thirty (30) days after Operational Acceptance of the complete Facility</p>		
57)	Volume -I / Section - IV: General	Appendix - 2 Price	The prices shall remain firm and fixed during the currency of the Contract.	We would like to inform that unprecedented cost rise of the commodity items like Copper, CRGO , Oil, Steel, Aluminum etc in past. Still market is not		As this is a short duration project on LSTK basis, the provisions of Appendix-2: Price Adjustment of

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
	Conditions of the Contract	Adjustment		stabilised & uncertain. Material equipment's /material under this package are also impacted. Keeping in view of price variation & present geo political crises it is possible to bid with variable prices , hence we propose for the variable prices as per IEEMA formula. We further add that project with duration of more than 12 months, it is very challenging to maintain firm price for long duration projects. We request Indrigrid to consider our request for variable prices basis as per IEEMA formula.		Section-IV (GCC) of Volume-I of Bidding Document will remain unchanged.
58)	Volume -I / Section - IV: General Conditions of the Contract	40. Assignment	Neither the Employer nor the Contractor shall, without the express prior written consent of the other party (which consent shall not be unreasonably withheld), assign to any third party the Contract or any part thereof, or any right, benefit, obligation or interest therein or thereunder.	Please add the following at the end of the Clause: Nothing herein shall affect the right of the Contractor to assign receivable under the Contract by way of factoring.		The provision of Clause 40 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.
59)	Volume -I / Section - IV: General Conditions of the Contract	35. Force Majeure	Force Majeure: "Force Majeure" shall mean any event beyond the reasonable control of the Employer or of the Contractor, as the case may be, and which is unavoidable notwithstanding the reasonable care of the party affected, and shall include, without limitation, the following: (a) war, hostilities or warlike operations (whether war be declared or not), invasion, act of foreign enemy and civil war, (b) rebellion, revolution, insurrection, mutiny, usurpation of government, conspiracy, riot and civil commotion,	In addition to the mentioned Force Majeure Clause would request you to add the following: We request you to please add pandemic & epidamic in your Force Majeure Clause in addition please also add the following: In the event of any delays and adverse impacts, Bidder reserves the right for an equitable adjustment of the schedule and prices herein to offset the effects of Pandemic / epidamic delays."		The provision of Clause 35 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.
60)		28. Indemnity against infringe	Such indemnity shall not cover any use of the Facilities or any part thereof other than for the purpose indicated by or to be reasonably inferred from the	Please add the below clause as 25.1: Contractor shall have no obligation or liability with respect to any Claim based upon (a) Products or		The provision of Clause 28 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
		ment of Intellectual Property	Contract, any infringement resulting from the use of the Facilities or any part thereof, or any products produced thereby in association or combination with any other equipment, plant or materials not supplied by the Contractor, pursuant to the Contract Agreement.	Services that have been modified, or revised, (b) failure of Employer to implement any update provided by Contractor that would have prevented the Claim, or (c) Products or Services made or performed to Employer 's specifications. For avoidance of any doubt each party shall retain ownership of all confidential information and intellectual property it had prior to the contract. All rights in and to products not expressly granted to Employer are reserved by contractor. All new intellectual property conceived or created by contractor in the performance of this contract, whether alone or with any contribution from Employer, shall be owned exclusively by contractor. Employer agrees to deliver assignment documentation as necessary to achieve that result.		
61)		39. Termination	Termination for Employers Default.	As the clause for "Termination for Employer's default is missing in the contract, we request for the inclusion of the following clause: "In case of breach or any material default including delay in payments by M/S Indigrid , it becomes bankrupt or insolvent, has a receiving order issued against it, compounds with its creditors, or, being a corporation, if a resolution is passed or order is made for its winding up (other than a voluntary liquidation for the purposes of amalgamation or reconstruction), a receiver is appointed over any part of its undertaking or assets, or if the Employer takes or suffers any other analogous action in consequence of debt , the bidder shall have right to terminate the contract .In such events M/S Indigrid shall make payment to the bidder for all the works executed ,supplies made, and for the WIP at GE and their vendors work including cancellation charges if any payable to the vendors"		The provision of Clause 39 of Section-IV (GCC) of Volume-I of Bidding Documents shall remain unchanged.
62)	New Clause	SAFETY		Contractor has no responsibility or liability for the pre-existing condition of Purchaser's equipment or the Site. Prior to Contractor starting any work at Site, Purchaser will provide documentation that identifies the presence and condition of any Hazardous		Please refer to Clause 7.1 of Section-IV (GCC) of Volume-I of Bidding Documents .

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
				Materials existing in or about Purchaser's equipment or the Site that Contractor may encounter while performing under this Contract. Purchaser shall disclose to Contractor industrial hygiene and environmental monitoring data regarding conditions that may affect Contractor's work or personnel at the Site. Purchaser shall keep Contractor informed of changes in any such conditions.		
63)	New Clause	GENERAL INDEMNITY		Purchaser (as an "Indemnifying Party") shall indemnify the Contractor (as an "Indemnified Party") from and against claims brought by a third party, on account of personal injury or damage to the third party's tangible property, to the extent caused by the negligence of the Indemnifying Party in connection with this Contract. In the event the injury or damage is caused by joint or concurrent negligence of Purchaser and Contractor, the loss or expense shall be borne by each party in proportion to its degree of negligence. For purposes of Contractor's indemnity obligation, no part of the Products or Site is considered third party property.		Please refer to Clause 11.5 of Section-IV (GCC) of Volume-I of Bidding Documents .
64)	Volume - II/Technical Specification for Amargarh Substation - Civil Works	Si . No . 2 /Page no 5 of 40	GEOTECHNICAL INVESTIGATION:	Under this project for extension job in existing Sub station , We request you to share soil investigation report to estimate civil work and same report shall be considered for civil design during exection .		Please refer to enclosed Annexure-III for Soil Investigation Report of existing setup. For more details, Bidders are advised to conduct a site survey and acquaint themselves with Civil Works including Soil strata for present Scope of Work, also consider the relevant soil parameters accordingly for foundation design.
65)	Volume - I / Section - V: Special Conditions of Contract	Duration in months from the effective date of Contract	14 (Fourteen) Months	Considering the topographical location of the site and complexity of the project, the completion schedule of 14 months is not adequate. The bidder requests to kindly provide the completion schedule of 24 months for the scope of work related to the project. This is to inform that based on the return of experience in view of site location , Transportation challenges & weather conditions (Winter / Snowfall - non working months) , we have propose project completion period of 24 Months. However, we agree for the project completion period of 18 months considering the EX works supply &		The provision of S. No. 2 of Section-V (SCC) of Volume-I of Bidding Documents shall remain unchanged.

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
				transportation of the main equipments shall be in Indigrid scope.		
66)	Volume -I / Section - V: Special Conditions of Contract	Sr. No. 7	Standard warranty for following equipments shall be considered as below: Transformer- 5 Years. Others: 24 months	Standard Warrantry for following equipments shall be as below: Transformer - 18 Months from the date of supply or 24 Months from the date of commissioning whichever is earlier. Others : 18 Months.		The provision of S. No. 7 of Section-V (SCC) of Volume-I of Bidding Documents shall remain unchanged.
67)	Volume -I/GCC	Si no u of Definitio ns and Interpret ation, Page no 3 of GCC	Lump Sum Turnkey (LSTK)" means all the facilities required for the system as mentioned in the Scope of Work including Design, Engineering, Procurement, Construction (Associated Civil, Erection and Installation works), Testing & Commissioning, Freight & Transportation, Insurance, Water & Electricity and other associated works required for successful Completion and Operation of the Scope of Work	Bidder scope is extention of GIS in existing GIS substation . All infrastructure is availble at site . There fore bidder request you to please provide the construction water ,Electricity and CRANE / Hydra of suitable capcity at free of cost to bidder		Please refer to Clause 1.1. (u) of Section-IV (GCC) of Volume-I of Bidding Documents.
68)	Volume -II Technical Specification for Amargarh Substation - Electrical Works			Please provide detail Technical Spec of the 315 MVA Auto Transformer		Please refer to the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of the Bidding Documents. For more details, Bidders are advised to conduct a site survey.
69)	Volume -II Technical Specification for Amargarh Substation - Electrical Works			Please provide detail Technical Spec of the 400KV , 220KV GIS and CRP/SAS		Please refer to the "Technical Specification of Amargarh Substation - Electrical Works" of Volume-II of the Bidding Documents. For more details, Bidders are advised to conduct a site survey.
70)	Volume -II Technical Specification for Amargarh Substation - Electrical Works	Si no.O	GIS Hall and Adjoining Relay Panel Room	We request you to please provide the make and model of HVAC along with detail drawing of HVAC		Make of existing AHU system in GIS is Flowgain. Bidders are advised to conduct a site survey for more information.

Amendment- III (Clarifications / Replies to the Pre-bid Queries)

Sl. No.	Name of the Document	Clause no.	Existing Provision	Suggested texts for amendments/Query/Clarification Sought	Rationale for the Clarification/ Amendments	NSRR XXIX Response
71)	Volume -II Technical Specification for Amargarh Substation - Electrical Works	Si no. Q	Visual Monitoring System (VMS) for watch and ward of substation premises	We request you to please provide make of VMS		Make of existing VMS is Delcom.
72)	Volume -II / Scope of work	Annexure -C	List of Condition Monitoring Instruments	Please provide detail technical specification for Condition Monitoring Instruments in Annexure -C if these instruments to be supplied by the bidders,		The detailed specification shall be uploaded shortly on the portal as Annexure-IV.

NRSS XXIX Transmission Limited

Bid-Securing Declaration

[To be provided on Company Letterhead]

Date:

Design, engineering, supply, testing at manufacturer's works, transportation, unloading and delivery at site including insurance & storage, all associated civil works, erection, testing and commissioning at site along with all equipments, fittings, accessories, foundation bolts (if any) cables and Mandatory Spare Parts and Condition Monitoring Instruments for Augmentation of Transformation capacity at Amargarh (GIS) S/s on LSTK basis.

To: *[insert Name and Address of Employer]*

We, *[insert name of the Bidder]* understand that, according to bid conditions, Bids must be supported by a Bid-Securing Declaration.

We the Bidder hereby declare that, if we are in breach of any of our obligation(s) under the bidding conditions as brought out below, our bid for the Project shall be considered as non-responsive:

- (1) If we withdraw our bid during the period of bid validity specified by us in the Bid Form; or
- (2) In the event of us being a successful Bidder, if we fail within the specified time limit
 - (i) To sign the Contract Agreement, in accordance with ITB Clause 32, or
 - (ii) To furnish the required Performance Security, in accordance with ITB Clause 33.
- or
- (3) In any other case specifically provided for in ITB.

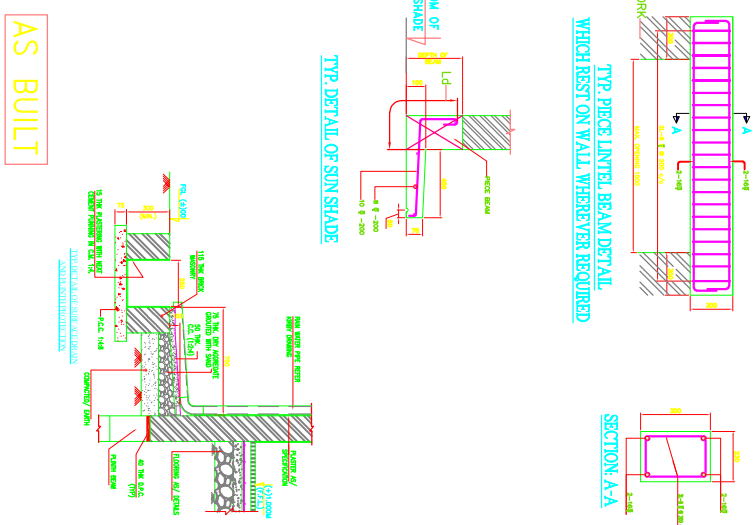
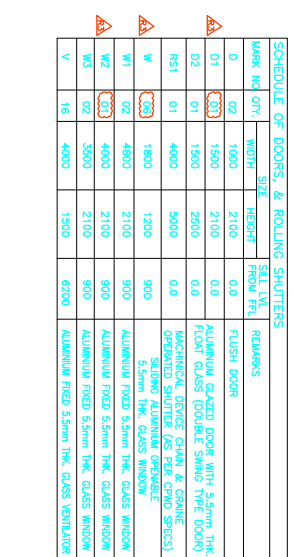
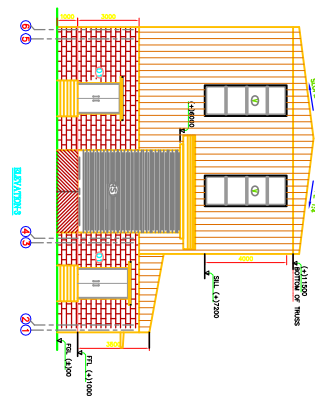
Name of the Bidder_____

Name of the person duly authorized to sign the Bid on behalf of the Bidder_____

Title of the person signing the Bid_____

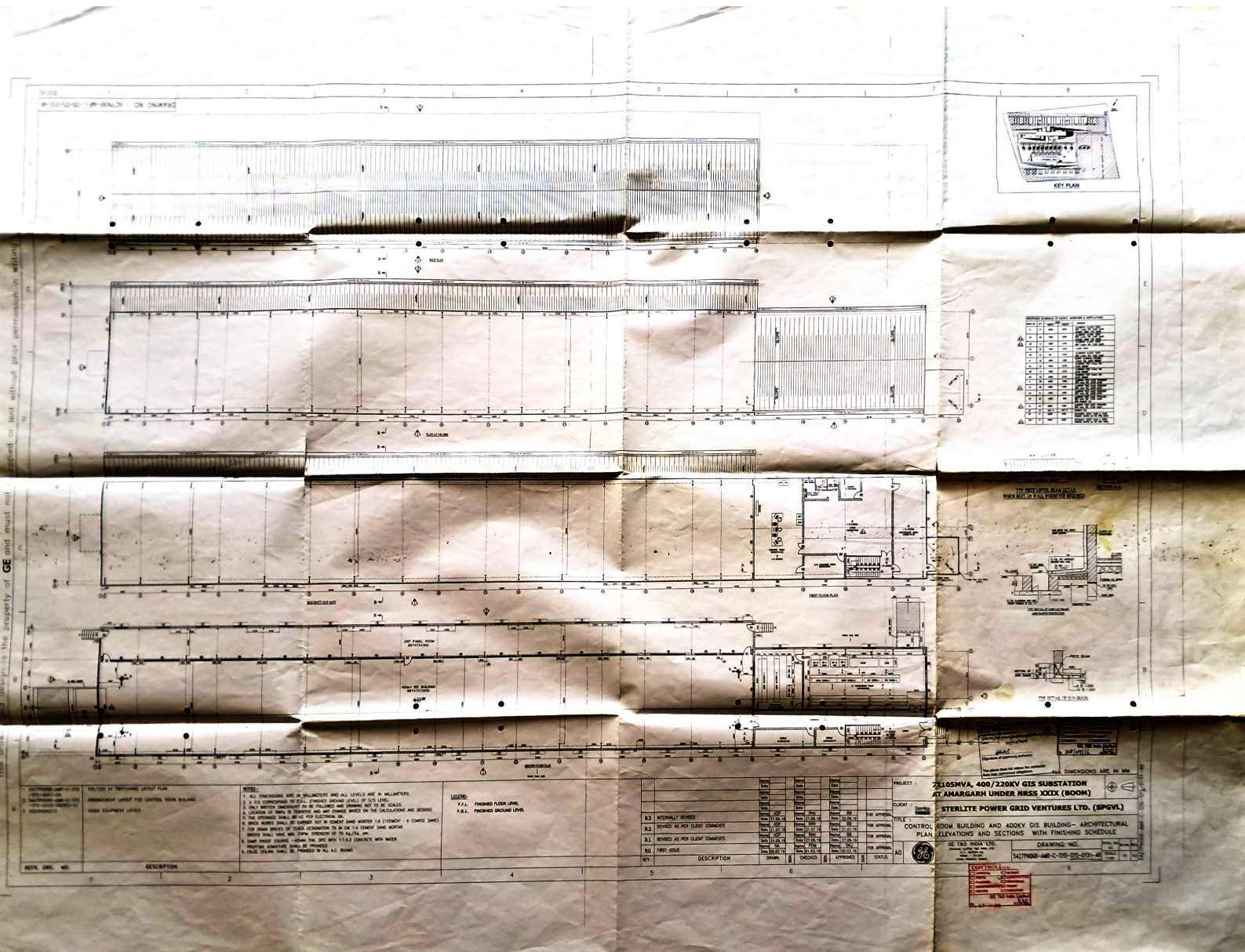
Signature of the person named above_____

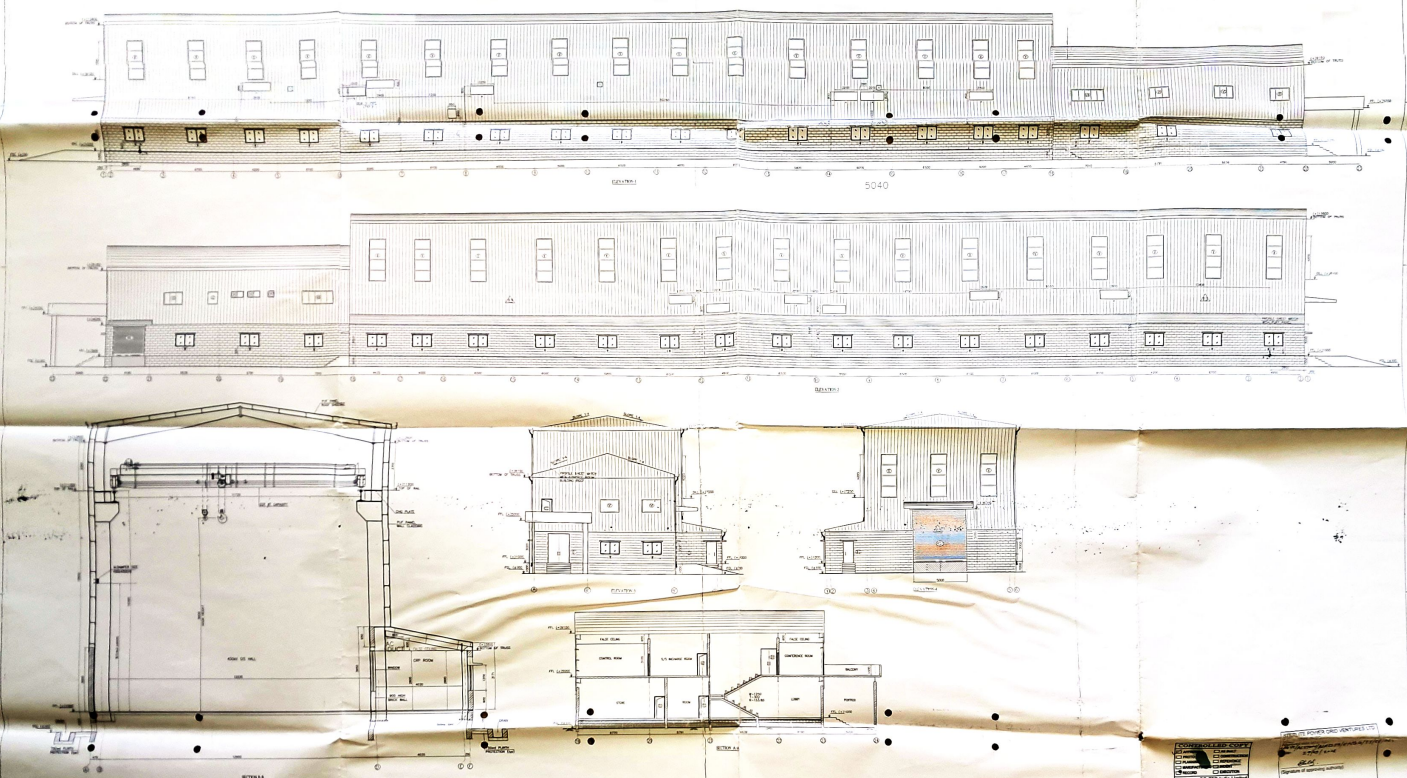
Date signed _____ day of _____, __



5427PN068-AMR-C-SYD-SYS-0152-AR

GE and must be approved or lent without prior permission in writing.





54774000-0000-1-000	400/220 w/ SWITCHYARD LAYOUT PLAN
500-0000-00	
54774000-0000-1-000	ARRANGEMENT LAYOUT FOR CONTROL ROOM BUILDING
000-0000-000000-01	
0000000000	00000 EQUIPMENT LAYOUT


NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL LEVELS ARE IN MILLIMETERS.
2. B.S. CONFORMING TO F.G.L. (FINISHED GRADE LEVEL) OF THE SLOTTED.
3. ONLY VERTICAL DIMENSIONS TO BE FOLLOWED AND DRAWING NOT TO BE SCALED.
4. LOCATION OF FIRMS IS TENTATIVE AND MAY CHANGE BASED ON THE CALCULATIONS AND DECISIONS OF THE CLIENT.
5. THE OPENINGS SHALL BE MADE FOR ELECTRICAL, TELEPHONE, CABLE OR CLASSIFICATION 75 SHALL BE USED.
6. BRICK WORK SHALL BE CARRIED OUT IN CEMENT SAND MORTAR 1:6 (CEMENT : 6 COARSE SAND : 12 FINE SAND).
7. EXTERIOR WALLS - 180mm THICK CEMENT SAND PLASTER WITH UNDER LAYER OF 12mm THICK CEMENT SAND PLASTER.
8. INTERIOR WALLS - 120mm THICK CEMENT SAND PLASTER WITH UNDER LAYER OF 12mm THICK CEMENT SAND PLASTER.
9. CEILING WALLS - 120mm THICK CEMENT SAND PLASTER WITH UNDER LAYER OF 12mm THICK CEMENT SAND PLASTER.
10. FLOORING SHALL BE 120mm THICK CEMENT SAND PLASTER WITH UNDER LAYER OF 12mm THICK CEMENT SAND PLASTER.

LEGEND:-
F.F.L. FINISHED FLOOR LEVEL
F.G.L. FINISHED GROUND LEVEL

RETR. ORG. NO.	DESCRIPTION
1	2
3	4

		Name	Date	Name	Date	
		Name	Date	Name	Date	
		Name	Date	Name	Date	
		Name	Date	Name	Date	
		Name	Date	Name	Date	
R3	INTERNALLY FORGED	ASPT	2/21/16	ASPT	2/21/16	FOR APPROVAL
R2	FORGED AS PER CLIENT COMMENTS	CDATA 2/21/16	ASPT	2/21/16	ASPT	2/21/16
R1	FORGED AS PER CLIENT COMMENTS	ASPT	2/21/16	ASPT	2/21/16	FOR APPROVAL
R0	FIRST ISSUE	ASPT	2/21/16	ASPT	2/21/16	FOR APPROVAL
KEY	DESCRIPTION	CLINICAL	CHECKED	APPROVED	STATUS	

PROJECT :		7X105MVA, 400/220KV GIS SUBSTATION AT AMARGARH UNDER NRSS XXIX (BOOM)		ALL OPERATIONS ARE IN PROGRESS	
CLIENT :		STERLITE POWER GRID VENTURES LTD. (SPGVCL)		DATE :	
TITLE :		CONTROL ROOM BUILDING AND 400KV GIS BUILDING- ARCHITECTURAL PLAN, ELEVATIONS AND SECTIONS WITH FINISHING SCHEDULE			
AO :		 GE T&D INDIA LTD. Plot No. 10, Phase 1, Industrial Area, Badli, New Delhi - 110028		DRAWING NO. 5427PM068-AMR-C-DTD-STD-0151-AR	
				TOTAL SHEETS : 10 SHEET NO. : 01	

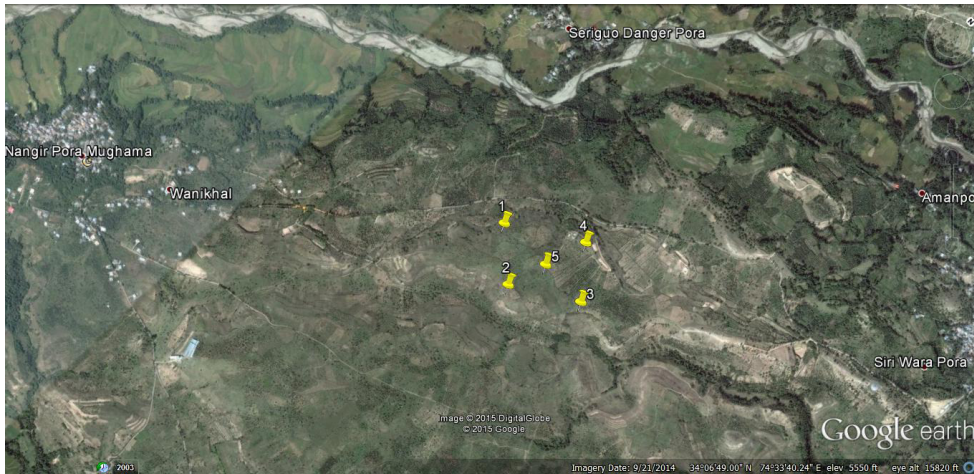
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BY GE TAO THIS 10/10/00

24-10
Rec'd
Shahar 24/4/16

Geotechnical Investigation Report
of
400/220 KV GIS Sub-Station at Khor Pattan



Forwarded to:

Strelite Power Grid Venture Limited

Space Engineers' Consortium (P) Ltd.
281, Jawahar Nagar, Srinagar (J&K)-190008

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1.0 INTRODUCTION

1.1 Strelite Power Grid Venture (SPGVL) at Khor Pattan part of 400/220 KV D/C Samba-Amargarh Transmission line of project. SGPVL has entrusted the job of soil investigation of proposed sub-station at some tower locations to Space Engineers Consortium Pvt. Ltd. The geotechnical investigation has been conducted in accordance with the requirements of the SPGVL. This report details with the field and laboratory investigation conducted, data presentation, analysis of field and laboratory test results and recommendations thereto of the proposed sub-station.

2.0 Scope of Work

The scope of work as per the requirement of SVGPL is given below

- i) 15m deep bore hole at five locations.
- ii) Conducting Standard Penetration Test at specified intervals (depths)
- iii) Taking undisturbed samples at specified intervals (depths)
- iv) Marking of water table position, if available
- v) Conducting laboratory tests as per I.S code of practice
- vi) Submission of detailed Geo-technical report.

3.0 Project Brief and Location Plan

The proposed 400/220 KV GIS sub-station at Khor Pattan district Baramulla is situated North West of Srinagar and the site is situated on Karewa. The bore hole locations investigated by SECL are given in the following Table 1:

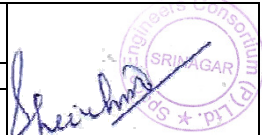
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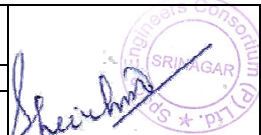
Table -1

S. No	Angle point	Coordinates		Village Name	District	R.L m	Remarks
		E	N				
01	A	459528	3774879	Khor Pattan	Baramulla	100.438	
02	B	459702	3774732	Khor Pattan	Baramulla	109.849	
03	C	459935	3774881	Khor Pattan	Baramulla	102.194	
04	D	459789	3775046	Khor Pattan	Baramulla	98.482	
05	E	459744	3774883	Khor Pattan	Baramulla	103.880	

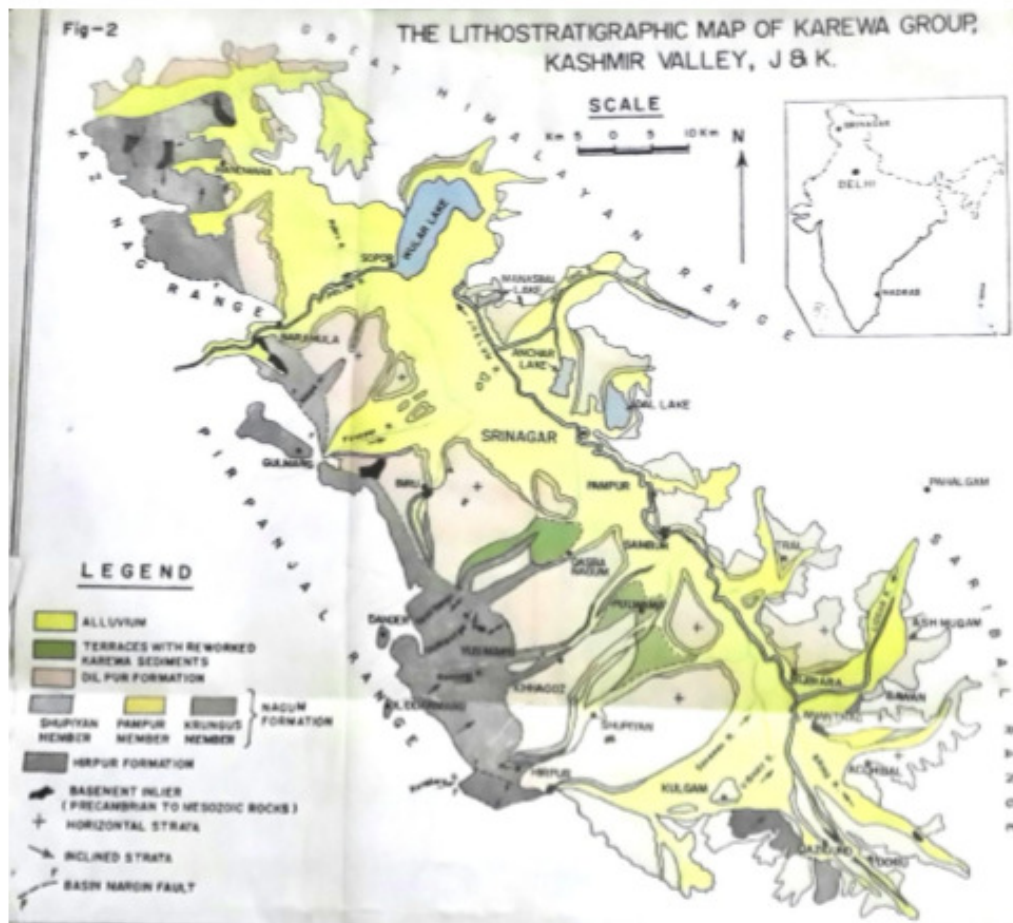
4.0 Geological and Seismological


Geology of Kashmir

- 4.1 The sequence of un-consolidated clay, and conglomerate, with lignite of PLIOCENE to quaternary age in the Kashmir valley, overlying the pre-cambrian to Mesozoic basement rocks and overlain, in turn, by the more recent river alluvia is defined lithostratigraphically as the Karewa group. The soft, un-consolidated sand – clay – conglomerate rocks of Karewa group characterize the Kashmir valley and occupy nearly half of the Kashmir valley floor. The Karewa deposits represent a sequence of fluvial, lacustrine and Aeolian sediments that were deposited initially in the framework of a large lake which once covered the whole of Kashmir valley floor and that the Karewa succession is invariably topped by

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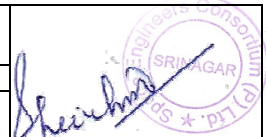
4.2 The major lithological constituents of karewa group are plastic, gray to bluish – gray clay, light – gray sandy clay, fine to coarse, green to purple sand, conglomerate, lignite and lignitic clay in the lower part (i.e. Hirpur formation), fine to coarse greenish sand, gray and ochre sandy clay, ochre and cream coloured marl and marklekor and gravel in the middle part (i.e. Nagum formation) and brown silt in the upper part (i.e. Dilpur formation).



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4.3 The lithostratigraphic map of the karewa group is as under:

Age		Lithostratigraphy		KASHMIR VALLEY	
Recent				South – Western part	North – Eastern part
		Alluvium		<div>ALLUVIAM</div>	
P L E I S T O C E N E	Upper	DILPUR FORMATION			
	Middle	NAGUM FORMATION		Shopian Member angular unconformity	Pampore Member Krungus Member disconformity
	Lower	KAREWA GROUP	HIRPUR FORMATION		
P L I O C E N E	Upper				
	Lower				
		PRE – KAREWA		MOSTLY PALAEOZOIC AND TRIASSIC BASEMENT	

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5.0 Field Investigation

5.1 Mobilization and De-mobilization

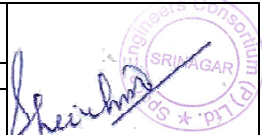
The drilling auger along with all the accessories and man power were mobilized at site on 03-07-2015 to execute the geotechnical investigation works at the specified locations. The investigation work was started on same day after completion of necessary documentation(s) on site. The site work from the BH1 (A) was started on 03-07-2015 and was completed on 08-07-2015 under constant supervision of client's representative.

5.2 Summary of Field Work

A plan showing the number of boreholes executed at various location as per the scope of work is presented in Illustrations on Plate 1.

The summary of the field activities completed all the five locations is presented below in Table 2.

BH ID	Start	Finish	Coordinates		Termination Depth below Existing Ground Level m	R.L m	Ground Water Depth, m
			E	N			
A	03-07-2015	04-07-2015	459528	3774879	15.0	100.438	NIL
B	07-07-2015	08-07-2015	459702	3774732	15.0	109.849	NIL
C	04-07-2015	05-07-2015	459935	3774881	15.0	102.194	NIL
D	05-07-2015	06-07-2015	459789	3775046	13.50	98.482	NIL
E	06-07-2015	07-07-2015	459744	3774883	13.50	103.880	NIL

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5.3 Boring / Drilling

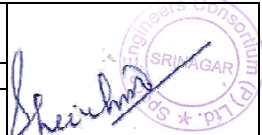
The boring works were carried out by deploying auger rig units at specified locations. Sampling comprised collection of disturbed samples from SPT split spoon sampler and shoe and undisturbed soil samples of suitable diameter. Sampling frequency was as per the specification or as per the instruction of Engineer in-charge

The field data as recorded on site after completion of borehole in the boreholes are presented in the borehole logs in Annexure -I and summarized above in Table 2

5.4 Standard Penetration Testing

The standard penetration tests (SPT) were conducted in the boreholes in accordance with IS 2131. The tests were carried out using a split spoon sampler complete with a drive shoe and drive head fitted with a non-return valve. The basis of the test consists of dropping of a hammer of mass 63.5 kg on to a drive head from a height of 750 mm. The number of blows (N) required to achieve a penetration of the split spoon sampler by 300 mm (after its penetration under gravity and below the seating drive) is regarded as the penetration resistance. The blow counts for each 150 mm penetration were recorded. If number of blows for 150mm penetration exceeds 50, refusal is noted. SPT-N value indicates compactness of soil. The disturbed representative soil samples thus obtained from split spoon sampler are packed, labeled, sealed and sent for the laboratory testing.

The plots of observed and corrected 'N' values are enclosed as fig. 1 & 2 respectively.

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6.0 LABORATORY TESTS

6.1 Summary of laboratory tests

The soil samples meant for testing were transported to SECL laboratory at Srinagar. The laboratory tests were carried out as per relevant parts of Indian Standard Code of Practice, in compliance with the technical specifications of the contract. Testing has been carried out as per the approved laboratory test schedule issued by client's representative.

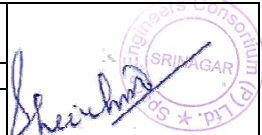
Table 3 Summary of Laboratory Tests on Soil Samples

SI. No	Test Designation	Standard Codes
1	Grain Size Distribution	IS 2720 (Part 4)
2	Atterberg Limit	IS 2720 (Part 5)
3	Moisture content determination	IS 2720 (Part 5)
4	Bulk density	IS 2720 (Part 1)
5	Specific gravity	IS 2720 (Part 3)
6	Unconsolidated Undrained Triaxial Tests	IS: 2720 (Part 11)
7	Unconfined Compression Tests	IS: 2720 (Part 10)
8	Chemical Tests on soil samples	
8.1	Sulphate Content (water extract)	BS 1377 (Part-3)
8.2	Chloride Content	BS 1377 (Part-3)
8.3	pH measurement	IS 2720 (Part-26)

6.2 Brief procedures of laboratory tests on soil samples

6.2.1 Particle Size Distribution

The particle size distribution were determined on soil samples in accordance with the wet sieving method described in IS: 2720 (Part 4). Compliance with the Standard, with respect to minimum sample quantity is dependent on the maximum

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significant grain size and the method of sampling. In particular, for SPT samples, the quantity of soil available for testing is typically about 100g. This sample quantity is considered representative where grain sizes range up to 4.75mm (i.e. to coarse sand size). Where significant quantities of coarser particles are present, the particle size distribution obtained from such samples should be regarded as indicative only.

6.2.2 Sedimentation / Hydrometer Analysis

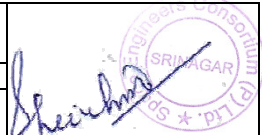
Sedimentation analyses were performed for soil samples in accordance with the hydrometer method described in IS: 2720 (Part 4). The analysis provides an estimate of the particle size distribution for the fine fraction ($<75\mu\text{m}$) of a soil sample. The analysis is performed by monitoring the rate of settlement of soil particles initially suspended uniformly in distilled water. The rate of settlement, which is monitored by observing the change in fluid density with the hydrometer device, is theoretically related to the size of particles setting out of suspension.

6.2.3 Atterberg's Limits

The Atterberg's Limits comprising liquid limit, plastic limit, shrinkage limit and plasticity index were performed on soil samples in accordance with the relevant methods described in IS: 2720 (Part 5 & 6). The liquid limit has been determined using the Casagrande apparatus method. The soil sample preparation, in accordance with the code of practice, included removal of soil particles retained on the $425\mu\text{m}$ sieve. Accordingly, where a significant quantity of coarser particles was present, it should be noted that the Atterberg Limits results are representative of the relatively fine soil fraction, and not of the complete soil sample.

6.2.4 Natural Moisture Content, Density and Specific Gravity

Natural moisture content of undisturbed soil samples collected from trial pits, has been determined as per procedure given in IS 2720 (Part-II). Bulk density and dry density of the undisturbed samples has been determined using mass and volume of the same and natural moisture content. The specific gravity tests specified in the Indian Standard (IS 2720 Part-

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6.2.5 Unconsolidated Undrained Triaxial Test

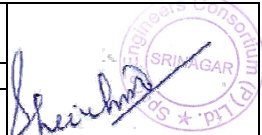
The Unconsolidated Undrained tests were performed on undisturbed soil sample in accordance with IS 2720 (Part XI). The shear strength parameters of cohesive soils are evaluated by conducting UU test. The standard specimen size used for testing was 38 mm diameter and 76mm height. The test was conducted at standard confining pressures of 50kpa, 100kpa and 200 kpa and the sample was sheared up to failure or 20% of axial strain whichever is earlier. The stress strain curves are plotted for each confining pressure and undrained strength is determined. The strength parameters are then determined by drawing Mohr Stress circles.

6.2.6 Unconfined Compression Test

Strength test was performed on undisturbed soil sample in accordance with IS 2720 (Part X). It is a special type of UU test where the confining pressure is zero. An axial load is rapidly applied to the specimen until it fails in shear. The soil is fully saturated and fully undrained, undrained shear strength is half of the failure stress.

7.0 Geo technical Assessment

Sub soil condition that exists in the study area is mainly clayey silt/silty clay/sandy silt with traces of clay falling under IS classifications ML-CL, MS-SC group. This is typical of quartzary and recently laid material overlying Karewas. Ground water table has not been encountered upto the drilled depth.

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7.1 The location-wise geo technical details are described in following section.

7.2 BH 1 (A)

The BH was drilled to a depth of 15.0m reckoned from the BH surface RL of 100.438m (w.r.t assumed level). Upto about 5.0m depth, the sub-soil is silty clay with about 99% passing 75 μ IS: sieve. This part of the sub-strata is fine grained. Below 6.0m depth and upto about 9.0m depth the sub-strata is classified as coarse grained as per IS: system of classification and comprises clayey silt with fine of low plasticity with 26% component <75 micron size. Between 9.0m to 15.0m, the sub-strata is again silty clay with 75-92% passing 75 μ sieve. Below 14.0m and upto terminal depth of 15.0m the sub-strata comprises non plastic clayey silt. Percentage of particles <75 μ range from 30%. Both the field and laboratory identification of the sub-soil strata show that at this BH location the sub-strata is predominantly fine grained (IS: system of soil classification).

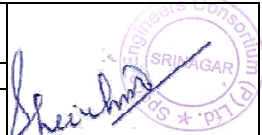
7.2.1 SPT values N range from 15-98, indicating very stiff to hard consistency of the sub-strata.

7.2.2 Liquid limit values range from NP - 43% indicating sub-strata of Non plastic to medium plasticity

7.2.3 Values of 'C' ranges from 0.04 to 0.15, and ' ϕ ' angle of internal friction ranges from 21.5 $^{\circ}$ to 30 $^{\circ}$.

7.3 BH 2 (B)

The BH was drilled to a depth of 15.0m reckoned from the BH surface RL of 109.849m (w.r.t assumed level). Upto about 6.0m depth, the sub-soil is clayey silt/sandy silt with about 61% passing 75 μ IS: sieve. This part of the sub-strata is fine grained. Below 6.0m depth and upto about 12.0m depth the sub-strata is classified as fine grained as per IS: system of classification and comprises silty clay of low plasticity with 80-82% component <75 micron size. Beyond 12.0m, the sub-strata is clayey silt with sand 19% passing 75 μ sieve. Both the field and

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laboratory identification of the sub-soil strata show that at this BH location the sub-strata is predominantly fine grained (IS: system of soil classification).

7.3.1 SPT values N range from 20-54, indicating very stiff to hard consistency of the sub-strata.

7.3.2 Liquid limit values range from 6-12% indicating sub-strata of low plasticity.

7.3.3 Values of 'C' ranges from 0.01 to 0.07, and ' ϕ ' angle of internal friction ranges from 25.94 to 30.2.

7.4 BH 3 (C)

The BH was drilled to a depth of 15.0m reckoned from the BH surface RL of 102.194m (w.r.t assumed level). Upto about 6.0m depth, the sub-soil is silty clay with about 98% passing 75 μ IS: sieve. This part of the sub-strata is fine grained. Below 6.0m depth and upto about 15.0m i.e upto desired depth the sub-strata is classified as coarse grained as per IS: system of classification and comprises clayey silt with sand with 31-49% component <75 micron size. Both the field and laboratory identification of the sub-soil strata show that at this BH location the sub-strata is predominantly coarse grained (IS: system of soil classification).

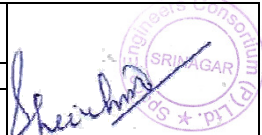
7.4.1 SPT values N range from 20-85, indicating very stiff to hard consistency of the sub-strata.

7.4.2 Liquid limit values range from 5-20% indicating sub-strata of low to medium plasticity

7.4.3 Values of 'C' ranges from 0.02 to 0.11, and ' ϕ ' angle of internal friction ranges from 25.4 to 28.2.

7.5 BH 4 (D)

The BH was drilled to a depth of 15.0m reckoned from the BH surface RL of 98.482m (w.r.t assumed level). Upto about 6.0m depth, the sub-soil is silty clay

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with about 84-98% passing 75 μ IS: sieve. This part of the sub-strata is fine grained. Below 6.0m depth and upto about 9.0m depth the sub-strata is classified as fine grained as per IS: system of classification and comprises clayey silt with fine sand of low plasticity with 57% component <75 micron size. Between 12.0m to the terminal depth of the sub-strata is again silty clay with 93% passing 75 μ sieve. Both the field and laboratory identification of the sub-soil strata show that at this BH location the sub-strata is predominantly fine grained (IS: system of soil classification).

7.5.1 SPT values N range from 23-46, indicating very stiff to hard consistency of the sub-strata.

7.5.2 Liquid limit values range from 12-23% indicating sub-strata of Non plastic to medium plasticity

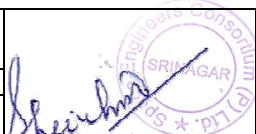
7.5.3 Values of 'C' ranges from 0.09 to 0.11, and ' ϕ ' angle of internal friction ranges from 22.0 to 28.0.

7.6 BH 5 (E)

The BH was drilled to a depth of 15.0m reckoned from the BH surface RL of 103.880m (w.r.t assumed level). Upto about 6.0m depth, the sub-soil is silty clay with about 99% passing 75 μ IS: sieve. This part of the sub-strata is fine grained. Below 6.0m depth upto the terminal depth the sub-strata is classified as coarse grained as per IS: system of classification and comprises clayey silt with fine sand of low plasticity with 48% component <75 micron size. Both the field and laboratory identification of the sub-soil strata show that at this BH location the sub-strata is predominantly fine grained (IS: system of soil classification).

7.6.1 SPT values N range from 26-75, indicating very stiff to hard consistency of the sub-strata.

7.6.2 Liquid limit values range from 12-19% indicating sub-strata of low plasticity to medium plasticity

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7.6.3 Values of 'C' ranges from 0.02 to 0.15, and 'φ' angle of internal friction ranges from 21.5 to 28.6.

7.7 It is observed from the bore log data that the subsoil condition that exists at bore hole location comprised of alternate layers clayey silt /silty clay with traces of fine sand extending to a depth of 15.0 m exhibiting very stiff to hard consistency.

7.8 The N value profile with depth is given in fig. 1 together with corrected N value. The lab test results are given in ANNEXURE-II

7.9 Grain size distribution, direct shear test table is given in Annexure-III enclosed with sample depth details. The sub-soil condition for design of foundation is ML-CL, CL, CI exhibiting N-value ranging between 15 to 98 thereby showing very stiff to hard consistency.

7.10 Safe Bearing Capacity Values

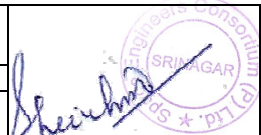
Following are the location wise safe bearing capacity values computed on local shear failure criteria and on settlement criteria.

BH1 –A

S.No.	Depth (m)	Bearing Capacity Shear Criteria (t/m ²)	Bearing Capacity Settlement Criteria (t/m ²)	Allowable Bearing Capacity (t/m ²)
		3mX3m	3mX3m	3mX3m
1	3.0	24.46	9.46	9.46
2	3.5	27.42	10.56	10.56

BH2-B

S.No.	Depth (m)	Bearing Capacity Shear Criteria (t/m ²)	Bearing Capacity Settlement Criteria (t/m ²)	Allowable Bearing Capacity (t/m ²)
		3mX3m	3mX3m	3mX3m
1	3.0	25.73	9.6	9.6
2	3.5	29.26	10.78	10.78

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BH3 –C

S.No.	Depth (m)	Bearing Capacity Shear Criteria (t/m ²)	Bearing Capacity Settlement Criteria (t/m ²)	Allowable Bearing Capacity (t/m ²)
		3mX3m	3mX3m	3mX3m
1	3.0	26.12	9.8	9.8
2	3.5	29.49	10.98	10.98

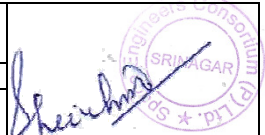
BH4 –D

S.No.	Depth (m)	Bearing Capacity Shear Criteria (t/m ²)	Bearing Capacity Settlement Criteria (t/m ²)	Allowable Bearing Capacity (t/m ²)
		3mX3m	3mX3m	3mX3m
1	3.0	24.56	9.14	9.14
2	3.5	27.54	10.21	10.21

BH5 –E

		Bearing Capacity Shear Criteria (t/m ²)	Bearing Capacity Settlement Criteria (t/m ²)	Allowable Bearing Capacity (t/m ²)
		3mX3m	3mX3m	3mX3m
S.No.	Depth (m)	17.55	8.00	8.00
		19.68	8.91	8.91

Note: Compression ratio $C_R = \frac{C_c}{1+e_0}$ have been taken as 0.10 – 0.12 in absence of consolidation test results lying with AIMIL Ltd.

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8.0 Conclusions & Recommendations

1. The Substratum upto the depth explored is typical of the “KAREWA” formations in Kashmir valley. Both field identification and laboratory tests confirm the soil type to be silt of low to medium plasticity with some fine sand and traces of clay.
2. Standard Penetration Tests (STP's) indicate the sub-strata to be very stiff to hard in consistency. Its compactness increases significantly with depth right below the top soil and upto the explored depth of 15.0 meters.
3. No ground water was observed in the bore hole during boring operations. Local enquiry indicated the ground water level to be 20.0 meters below NSL. There is no probability of its rising anywhere near to the footing base.
4. Bearing capacity computations have been made based on:
 - i. size of footing = 3.0 m x 3.0 m
 - ii. depth of foundation = 3.0 m & 3.5 m
5. Bearing capacity have been computed on both
 - i. Local Shear failure criteria:

Net ultimate bearing capacity q'_d is given by the expression

$$q'_d = \frac{2}{3} \times C \times N'_c \times S_c \times d_c \times i_c + q' (N'_q - 1) S_q \times d_q \times i_q + \frac{1}{2} \times B \times \gamma \times N'_\gamma \times S_\gamma \times d_\gamma \times i_\gamma \times W'$$

N'_c, N'_q, N'_γ = Bearing capacity factors

S_c, S_q, S_γ = shape factors

d_c, d_q, d_γ = depth factors

i_c, i_q, i_γ = inclination factors

B = foundation width (m)

W' = correction factor for water table

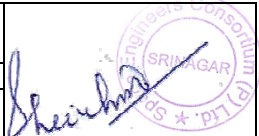
γ = bulk unit weight of foundation soil (t/m^3)

and on ii. Settlement criteria:

$$S \text{ (Settlement in mm)} = C_c / (1 + e_0) \times H \times 1000 \times \log ((P_0 + \Delta P) / P_0)$$

C_c = compressibility index

e_0 = initial void ratio

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- H = thickness of compressible layer (m)
- P_0 = initial stress intensity at C/L of compressible layer (t/m^2)
- ΔP = incremental pressure intensity due to superimposed loading at C/L of the compressible layer (t/m^2)
- S_{cor} (corrected settlement) = $S \times D_f \times R_f$
- D_f = depth factor
- R_f = rigidity factor = 0.8

6. An allowable bearing capacity of $9.0 t/m^2$ is recommended for an isolated footing type foundation.

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Codes and Standards for Geo technical Investigation:

- IS: 1080 Code of practice for design and construction of simple spread foundations.
- IS: 1498 Classification and identification of soils for general engineering purposes.
- IS: 1892 Code of practice for subsurface investigation for foundation.
- IS: 1904 Code of practice for design and construction of foundations in soils : General requirements.
- IS: 2131 Method of standard penetration tests for soils.
- IS: 2132 Code of practice for thin walled tube sampling of soils.
- IS: 2720 Method of test for soils (Relevant parts).
- IS: 2950 Code of practice for design and construction of raft Part – I foundation.
- IS: 4434 Code of practice for in-situ vane shear test for soils.
- IS: 4464 Code of practice for presentation for drilling information and core description in foundation investigation.
- IS: 4968 Method for subsurface sounding of soils – Dynamic Part–II method using cone and bentonite slurry.
- IS: 5249 Method of test for determination of in-situ dynamic properties of soil.
- IS: 5313 Guide for core drilling observations.
- IS: 6065 Recommendation for the preparation of geological and geotechnical maps for river valley project.
- IS: 6926 Code of practice for diamond core drilling for site investigation of river valley projects.
- IS: 6935 Method of determination of water level in a bore hole.
- IS: 8009 Code of practice for calculation for settlement of Part–II foundation subjected to symmetrical vertical loads – Deep foundations.
- IS: 9143 Method for the determination of unconfined compressive strength of rock materials.
- IS: 12070 Code of practice for design and construction of shallow foundations on rocks.

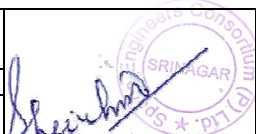
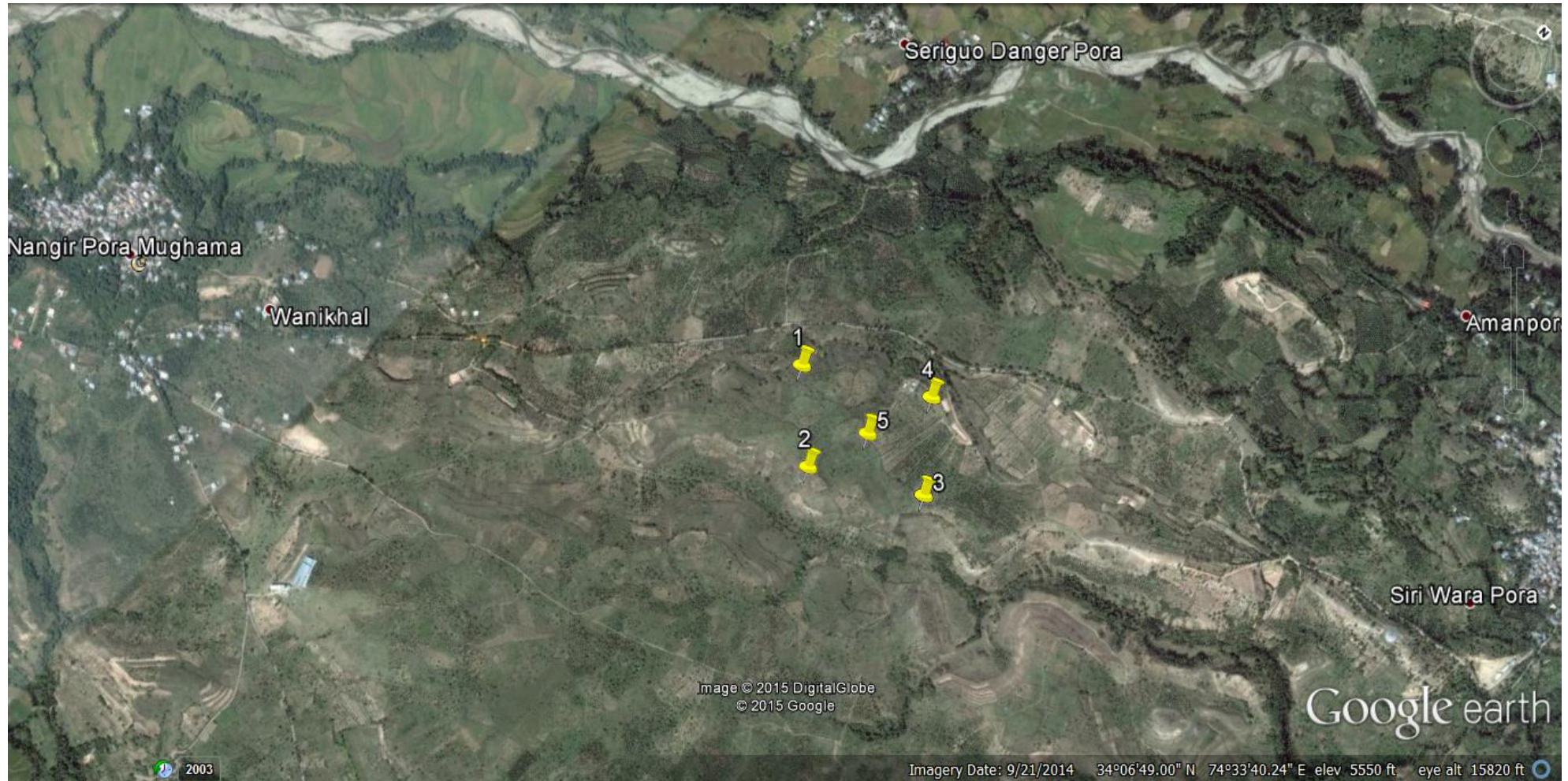
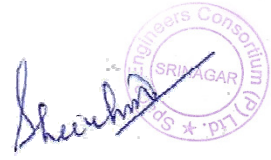









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Plate-I



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Project		400/220 KV GIS Sub Station at Khor Pattan																	
Client		Strelite Power Grid Venture								Co-ordinates : E 459528 N 459528									
Equipment		Auger Boring								Date : 03-07-2015									
Drilling Orientation		Vertical								R.L. (m) : 100.438m (w.r.t Assumed Level)									
Location		Khor Pattan								T.D. (m) : 85.438m (w.r.t Assumed level)									
Bore hole No		01 (A)																	
Field Information (Borehole Log)									Laboratory Data										
Depth below EGL (m)	Samples & in situ test depth (m)	Sample Type	Blow Counts	SPT N Value	Layer Thickness (m)	Legend	Symbol	Description	Clay %	Sand %	Gravel %	LL %	PI %	C Kg/cm2	ϕ (Deg)	q _u (Kg/cm ²)	C _c	e ₀	G
1.5	1.5-1.95		6,7,8	15		CI		Brownish silty clay/clayey silt of medium Plasticity	98.95	1.05	-	43	17	0.14	23.61	0.42			2.58
3.0																			
4.5	4.5-4.95		7,7,8	15					35.89	64.11		24	8	0.02	30.78			2.77	
6.0																			6.0-6.5
7.5	7.5-7.95		10,12,15	27		SM-SC		Brownish clayey silt with fine sand of low plasticity	92.25	7.75		35	13	0.15	21.50				
9																			9.0-9.5
10.5	10.5-10.95		11,19,18	37		CL		Brownish silty clay/clayey silt of low plasticity	74.82	25.18		27	8		0.31			2.83	
12.0																			12.0-12.5
13.5	13.5-13.95		21,45,51	98		SM-SC		Brownish clayey silt with fine sand of low to non plastic nature	30.01	69.99		NP		0.04	30.10				
15.0																			15.0-15.5
						SM													

Abbreviations & Symbols

 SPT (Standard penetration test)
 UDS (Undisturbed sample)
 MSL Mean Sea level
 LL Liquid Limit
 PI Plasticity Index




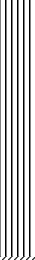



T.D Termination Depth
 EGL Existing Ground Level
 RL Reduced Level
 G Specific Gravity
 q_u Unaxial Compression Strength

C Cohesion
 φ Angle of internal friction
 Cc Coefficient of
 e₀ Void ratio



Project		400/220 KV GIS Sub Station at Khor Pattan																	
Client		Strelite Power Grid Venture								Co-ordinates : E 459702 N 3774732									
Equipment		Auger Boring								Date : 07-07-2015									
Drilling Orientation		Vertical								R.L. (m) : 109.849 (w.r.t Assumed Level)									
Location		Khor Pattan								T.D. (m) : 94.849m (w.r.t Assumed level)									
Bore hole No		02 (B)																	
Field Information (Borehole Log)									Laboratory Data										
Depth below EGL (m)	Samples & in situ test depth (m)	Sample Type	Blow Counts	SPT N Value	Layer Thickness (m)	Legend	Symbol	Description	Clay % + Silt %	Sand %	Gravel %	LL %	PI %	C Kg/cm2	ϕ (Deg)	q _u (Kg/cm ²)	C _c	e ₀	G
1.5	1.5-1.95		7,9,14	23		SM-SC		Brownish clayey silt/sandy silt of low plasticity	60.38	39.62		30	11	0.01	30.20	0.83			2.79
3.0																			
4.5	4.5-4.95		7,9,11	20															
6.0	6.0-6.5				6.0				82.90	17.91		30	12	0.07	25.94				
7.5	7.5-7.95		6,11,14	25		CL		Brownish silty clay/clayey silt of low plasticity	80.88	19.12									
9	9.0-9.5																		
10.5	10.5-10.95		5,9,13	22															
12.0	12.0-12.5				6.0				18.78	81.22		26	6	0.06	27.04				2.80
13.5	13.5-13.95		22,31,23	54		SM-SC		Brownish clayey silt with sand											
15.0	15.0-15.5				3.0														





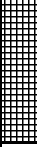
Abbreviations & Symbols

	SPT (Standard penetration test)	T.D	Termination Depth	C	Cohesion
	UDS (Undisturbed sample)	EGL	Existing Ground Level	ϕ	Angle of internal friction
MSL	Mean Sea level	RL	Reduced Level	Cc	Coefficient of
LL	Liquid Limit	G	Specific Gravity	e_0	Void ratio
PI	Plasticity Index	q_u	Uniaxial Compression Strength		

Project		: 400/220 KV GIS Sub Station at Khor Pattan																		
Client		: Strelite Power Grid Venture								Co-ordinates : E 459935 N 3774881										
Equipment		: Auger Boring								Date : 04-07-2015										
Drilling Orientation		: Vertical								R.L. (m) : 102.194 (w.r.t Assumed Level)										
Location		: Khor Pattan								T.D. (m) : 87.194 m (w.r.t Assumed level)										
Bore hole No		: 03 (C)																		
Field Information (Borehole Log)									Laboratory Data											
Depth below EGL (m)	Samples & in situ test depth (m)	Sample Type	Blow Counts	SPT N Value	Layer Thickness (m)	Legend	Symbol	Description	Clay % + Silt %	Sand %	Gravel %	LL %	PI %	C Kg/cm2	ϕ (Deg)	q _u (Kg/cm ²)	C _c	e ₀	G	
1.5	1.5-1.95		6,9,11	20		CI		Brownish silty clay/clayey silt of medium Plasticity	98.00	2.00		39	20	0.11	25.42	1.37			2.60	
3.0																				3.0-3.50
4.5																				4.5-4.95
6.0	6.0-6.5		9,13,16	29	6.0				49.73	50.27		24	8	0.09	27.00				2.75	
7.5	7.5-7.95																			
9	9.0-9.5																			
10.5	10.5-10.95		9,28,41	69		SM-SC		Brownish clayey silt /Sandy silt of low plasticity	31.41	68.59		21	5	0.02	28.23				2.80	
12.0	12.0-12.5																			
13.5	13.5-13.95																			
15.0	15.0-15.5		16,38,47	85	9.0															












Abbreviations & Symbols

	SPT (Standard penetration test)	T.D	Termination Depth	C	Cohesion
	UDS (Undisturbed sample)	EGL	Existing Ground Level	ϕ	Angle of internal friction
MSL	Mean Sea level	RL	Reduced Level	Cc	Coefficient of
LL	Liquid Limit	G	Specific Gravity	e_0	Void ratio
PI	Plasticity Index	q_u	Uniaxial Compression Strength		

Project		400/220 KV GIS Sub Station at Khor Pattan																	
Client		Strelite Power Grid Venture								Co-ordinates : E 459789 N 3775046									
Equipment		Auger Boring								Date : 05-07-2015									
Drilling Orientation		Vertical								R.L. (m) : 98.482m (w.r.t Assumed Level)									
Location		Khor Pattan								T.D. (m) : 83.482 (w.r.t Assumed level)									
Bore hole No		04 (D)																	
Field Information (Borehole Log)										Laboratory Data									
Depth below EGL (m)	Samples & in situ test depth (m)	Sample Type	Blow Counts	SPT N Value	Layer Thickness (m)	Legend	Symbol	Description	Clay % + Silt %	Sand %	Gravel%	LL %	PI %	C Kg/cm2	φ (Deg)	q _u (Kg/cm ²)	C _c	e ₀	G
1.5	1.5-1.95		6,9,14	23		CI		Brownish silty clay of medium Plasticity	98.41	1.59		42	23	0.11	23.91	0.62			2.54
3.0																			
	3.0-3.50	⊗	6,9,17	26					83.99	16.01		37	16	0.09	28.06				
4.5	4.5-4.95																		
6.0	6.0-6.5	⊗			6.0														
7.5	7.5-7.95		8,14,16	30		SM-SC		Brownish clayey silt / sandy silt of low plasticity	57.10	42.90									
9	9.0-9.5	⊗																	
10.5	10.5-10.95		15,18,25	43					93.79	6.21		35	12	0.10	22.00				2.63
12.0	12.0-12.5	⊗			6.0														
13.5	13.5-13.95		14,19,27	46		CL		Brownish clayey silt of low plasticity											
	15.0-15.5	⊗			3.0														

Abbreviations & Symbols

↓	SPT (Standard penetration test)	T.D	Termination Depth	C	Cohesion
⊗	UDS (Undisturbed sample)	EGL	Existing Ground Level	φ	Angle of intrenal friction
MSL	Mean Sea level	RL	Reduced Level	Cc	Coefficient of
LL	Liquid Limit	G	Specific Gravity	e ₀	Void ratio
PI	Plasticity Index	qu	Uniaxial Compression Strength		

Project : 400/220 KV GIS Sub Station at Khor Pattan																			
Client :		Strelite Power Grid Venture								Co-ordinates : E 459744 N 3774883									
Equipment :		Auger Boring								Date : 06-07-2015									
Drilling Orientation :		Vertical								R.L. (m) : 103.880m (w.r.t Assumed Level)									
Location :		Khor Pattan								T.D. (m) : 88.880m (w.r.t Assumed level)									
Bore hole No :		05 (E)																	
Field Information (Borehole Log)									Laboratory Data										
Depth below EGL (m)	Samples & in situ test depth (m)	Sample Type	Blow Counts	SPT N Value	Layer Thickness (m)	Legend	Symbol	Description	Clay % + Silt %	Sand %	Gravel %	LL %	PI %	C Kg/cm2	φ (Deg)	q _u (Kg/cm ²)	C _c	e ₀	G
1.5	1.5-1.95		9,12,14	26		CI		Brownish silty clay/clayey silt of medium Plasticity	99.70	0.30		39	18	0.02	21.54	1.19			2.63
3.0																			
4.5	4.5-4.95		8,14,17	31															
6.0	6.0-6.5				6.0				99.34	0.66		41	19	0.15	23.70				
7.5	7.5-7.95		9,12,14	26				Brownish clayey silt/sandy silt of low plasticity	58.28	41.72									2.63
9	9.0-9.5																		
10.5	10.5-10.95		18,40,45	85		SM-SC													
12.0	12.0-12.5																		
13.5	13.5-13.95		18,35,40	75															
15.0	15.0-15.5				9.0														

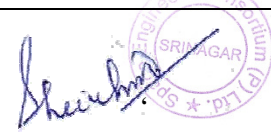
Abbreviations & Symbols

↓	SPT (Standard penetration test)	T.D	Termination Depth	C	Cohesion
⊗	UDS (Undisturbed sample)	EGL	Existing Ground Level	φ	Angle of internal friction
MSL	Mean Sea level	RL	Reduced Level	Cc	Coefficient of
LL	Liquid Limit	G	Specific Gravity	e ₀	Void ratio
PI	Plasticity Index	qu	Uniaxial Compression Strength		

ANNEXURE-II

A- Summary of Results of Laboratory Tests on Soil

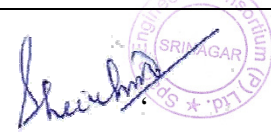
Date of Boring: 03-07-2015				Name of the Project: 400/220 KV GIS Sub-Station at Khor Pattan														Bore Hole No:1	
Ground Elevation (RL in m) : 100.438				Co-ordinates: E 459528 N 459528										Termination Depth: 15.0m				Water Table: NIL	
Soil Details			Grain Size Distribution					Soil Density (kg/cm²)			Atterberg Limits			Direct Shear / Triaxial Shear Test		U.C Test		Consolidation	
Depth	Type of sample:	Soil Classification	% passing 75µ sieve	Gravel	% sand	% silt	% clay	Natural moisture content %	Bulk Density g/cc	Natural dry density γ _d gm/cc	Liquid limit (%)	Plastic Limit (%)	Plasticity (PI)	Cohesion ‘C’ Kg/cm ²	Angle of repose φ (Deg)	q _u (Kg/cm ²)	Specific Gravity	C _c	e ₀
3.0		CI	98.95		1.05				1.966		43	26	17	0.14	23.61	0.42	2.579		
6.0		SM-SC	35.89		64.11				2.170		24	16	8	0.02	30.78		2.773		
9.0		CL	92.25		7.75				1.997		35	22	13	0.15	21.50				
12.0		SM-SC	74.82		25.18				1.808		27	19	8			0.31	2.833		
15.0		SM	30.01		69.99				1.705		NP	NP	NP	0.04	30.10				
Date of Boring : 07-07-2015				Termination Depth : 15.0m										Bore Hole No : 2					
Ground Elevation (RL in m): 109.849				Co-ordinates E 459702 N 3774732										Water Table: NIL					
3.0		SM-SC	60.38		39.62				2.068		30	19	11	0.01	30.20	0.83	2.794		
6.0		CL	82.09		17.91				2.030		30	18	12	0.07	25.94				
9.0		CL	80.88		19.12				1.958										
12.0		SM-SC	18.78		81.22				1.909		26	20	6	0.06	27.04		2.803		

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ANNEXURE-II

A- Summary of Results of Laboratory Tests on Soil

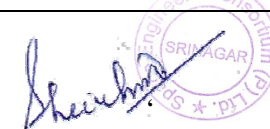
Date of Boring: 04-07-2015				Name of the Project: 400/220 KV GIS Sub-Station at Khor Pattan														Bore Hole No:3	
Ground Elevation (RL in m) 102.194				Co-ordinates: E 459935 N 3774881										Termination Depth: 15.0m			Water Table: NIL		
Soil Details			Grain Size Distribution					Soil Density (kg/cm ²)			Atterberg Limits			Direct Shear / Triaxial Shear Test		U.C Test		Consolidation	
Depth	Type of sample:	Soil Classification	% passing 75 μ sieve	Gravel	% sand	% silt	%clay	Natural moisture content %	Bulk Density g/cc	Natural dry density γ_d gm/cc	Liquid limit (%)	Plastic Limit (%)	Plasticity (PI)	Cohesion ‘C’ Kg/cm ²	Angle of repose ϕ (Deg)	q_u (Kg/cm ²)	Specific Gravity	C_c	e_0
3.0		CI	98		2				2.137		39	19	20	0.11	25.42	1.37	2.601		
6.0		SM-SC	49.73		50.27				1.999		24	16	8	0.09	27.00		2.752		
9.0		SM-SC	31.41		68.59				2.070		21	16	5	0.02	28.23				
12.0		SM-SC	45.65		54.35				2.081		29	18	11			0.25	2.797		
Date of Boring : 05-07-2015				Termination Depth : 15.0m										Bore Hole No : 4					
Ground Elevation (RL in m): 98.482				Co-ordinates : E 459789 N 3775046										Water Table: NIL					
3.0		CI	98.41		1.59				1.788		42	19	23	0.11	23.91	0.62	2.543		
6.0		CI	83.99		16.01				1.903		37	21	16	0.09	28.06				
9.0		SM-SC	57.10		42.9				2.070										
12.0		CL	93.79		6.21				1.905		35	23	12	0.10	22.00		2.626		

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ANNEXURE-II

A- Summary of Results of Laboratory Tests on Soil

Date of Boring: 06-07-2015				Name of the Project: 400/220 KV GIS Sub-Station at Khor Pattan														Bore Hole No: 5	
Ground Elevation (RL in m) : 103.880				Co-ordinates: E 459744 N 3774883										Termination Depth: 15.0				Water Table: NIL	
Soil Details			Grain Size Distribution					Soil Density (kg/cm ²)			Atterberg Limits			Direct Shear / Triaxial Shear Test		U.C Test		Consolidation	
Depth	Type of sample:	Soil Classification	% passing 75µ sieve	Gravel	% sand	% silt	%clay	Natural moisture content %	Bulk Density g/cc	Natural dry density γ _d gm/cc	Liquid limit (%)	Plastic Limit (%)	Plasticity (PI)	Cohesion ‘C’ Kg/cm ²	Angle of repose φ (Deg)	q _u (Kg/cm ²)	Specific Gravity	C _c	e ₀
3.0		CI	99.70		0.3				1.949		39	21	18	0.02	21.54	1.19	2.633		
6.0		CI	99.34		0.66				1.852		41	22	19	0.15	23.70				
9.0		SM-SC	58.28		41.72				1.980										
12.0		SM-SC	48.31		51.69				1.874		30	18	12	0.04	28.62		2.632		

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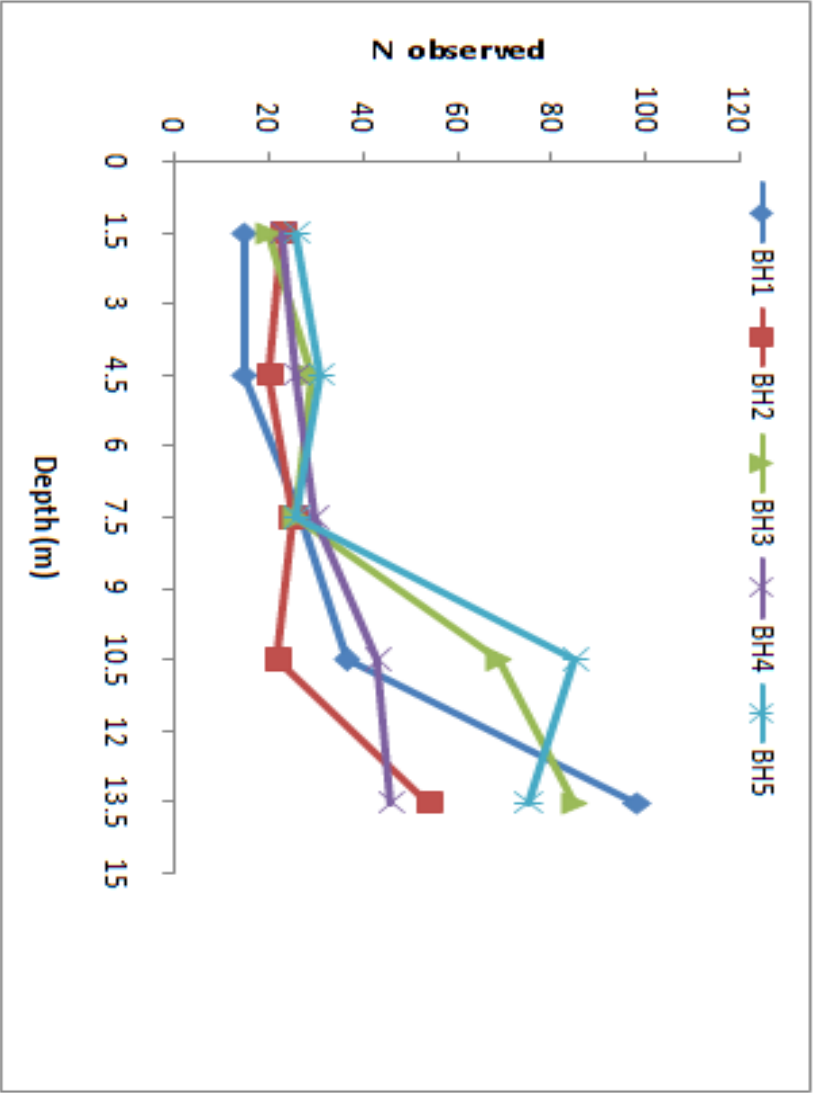
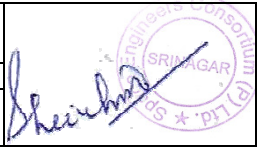


Fig. 1

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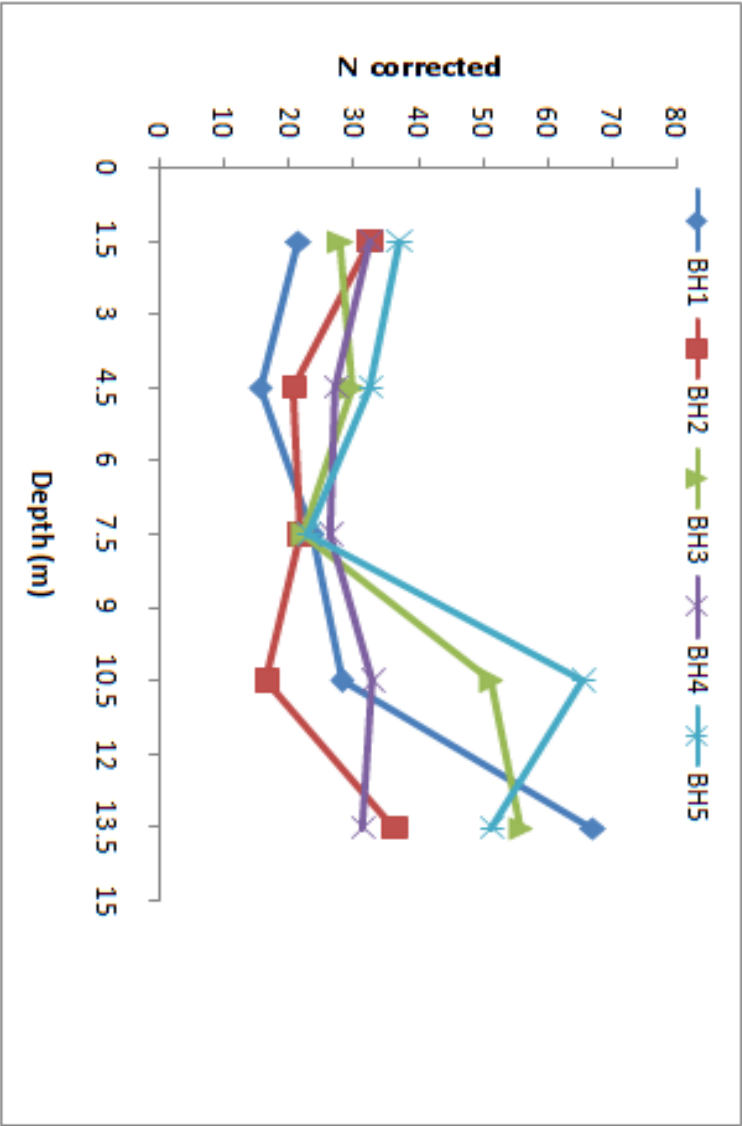
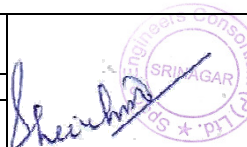


Fig. 2

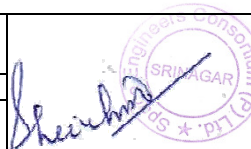


Field work in progress at 400/220 KV GIS Sub-station
at Khor Pattan, Baramulla

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Visual identification of soil at 400/220 KV GIS Sub-station
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