CORRIGENDUM-2

This **Corrigendum No. 2 dated 03.02.2025** to **Tender No. *CQI8171P25*** *for* ***'EPCOM of 300 TPD of Segregated MSW based Compressed Biogas (CBG) Plant for Commercial use at Bhubaneswar, Odisha'*** is issued to amend the following:

(i) The changes in the bid document are enclosed as **Annexure-A** (copy enclosed).

(ii) The responses to the Pre-Bid queries have been enclosed as **Annexure-B** (copy enclosed).

(iii) Extension of bid closing & opening dates & time:

(a) Extended Bid Closing Date & Time: **18.02.2025 [1400 Hrs (IST)]**

(b) Extended Bid Opening Date & Time: **18.02.2025 [1500 Hrs (IST)]**

(iv) All other terms and conditions of the Bid Document remain unchanged. Details can be viewed at www.oil-india.com.

Sd/-

B. Borgohain

Manager-C&P

ANNEXURE-A

Amendments to Tender No.: CQI8171P25

Sr. No.	Clause No.	Existing Provision	Amendment
1.	2.0 Pg. No. 4	(xiv)Defect Liability Period 12 (Twelve) months from the date of stabilization as accepted by OIL.	**Forwarding Letter/(xiv)** (xiv) Defect Liability Period 12 (Twelve) months from the date of successful completion of **PGTR test**.
2.	2.0 Pg. No. 4	(xvii) Duration of Contract: The duration of the contract shall before a period of 18 (Eighteen) months from the date of issue of Letter of Award (LOA) and 30 (thirty) days period for Commencement of work) from the date of issue of Letter of Award (LOA).	**Forwarding Letter/(xiv)** (xvii) Duration of Contract: The duration of the contract shall be for a period of 23 (Twenty-three) months from the date of issue of Letter of Award (LOA) and 15 (fifteen) days period for Commencement of work) from the date of issue of Letter of Award (LOA).
3.	2.0 Pg. No. 4	(xx) Site Visit	**Forwarding Letter/(xx)** Site Visit: Bidders are advised to visit the site before submission of bid. The site visit can be scheduled on 6th and 7th February 2025 between 10:00 Am to 3:00 PM. For this please inform Mr Biplab Kumar Kisan, E.E. Sanitation, BMC, Mobile: 700835318
4.	Clause 2.7.3 pg no. 21	All duties (except customs duty which will be borne by the Company) and taxes (excluding GST) including Corporate Income Tax, Personal Tax, Odisha Entry Tax etc. and other Cess/levies payable by the successful bidder under the Contract for which this Bid Document is being issued, shall be included in the rates, prices and total Bid Price submitted by the bidder and the evaluation and comparison of bids shall be made considering the quoted GST in the Price Bid Format.	**SECTION-II INSTRUCTION TO BIDDERS/2.7.3** The clause is being amended up to the following extent: 2.7.3. All duties and taxes (excluding GST) including Corporate Income Tax, Personal Tax, Odisha Entry Tax etc. and other Cess/levies payable by the successful bidder under the Contract for which this Bid Document is being issued, shall be included in the rates, prices and total Bid

Sr. No.	Clause No.	Existing Provision	Amendment
		For example, personal taxes and/or any corporate taxes arising out of the profits on the contract as per rules of the country shall be borne by the bidder	Price submitted by the bidder and the evaluation and comparison of bids shall be made considering the quoted GST in the Price Bid Format. For example, personal taxes and/or any corporate taxes arising out of the profits on the contract as per rules of the country shall be borne by the bidder
5.	Clause 2.12.2.2 Pg 27 to 558	Timely delivery of the documents in physical form as stated in Para 12.2 above is the responsibility of the bidder. Bidders should send the same through Registered Post or by Courier Services or by hand delivery to the Officer in Charge of the particular tender before the Bid Closing Date and Time. Company shall not be responsible for any postal delay/transit loss.	**SECTION-II INSTRUCTION TO BIDDERS/2.12.2.2** The clause is being amended up to the following extent: Timely delivery of the documents in physical form as stated in Para 2.12.2 above is the responsibility of the bidder. Bidders should send the same through Registered Post or by Courier Services or by hand delivery to the Officer in Charge of the particular tender before the Bid Closing Date and Time. Company shall not be responsible for any postal delay/transit loss.
6.	Clause 2.13.3 Pg 27 of 558	The documents in physical form as stated in Para 12.2 must be received by the Company at the address specified in the “Forwarding Letter” on or before 12:45 Hrs (IST) on the Bid Closing Date mentioned in the "Forwarding Letter". Timely delivery of the same at the address mentioned in the Forwarding Letter is the responsibility of the Bidders.	**SECTION-II INSTRUCTION TO BIDDERS/2.13.3** The clause is being amended up to the following extent: The documents in physical form as stated in Para 2.12 .2 must be received by the Company at the address specified in the “Forwarding Letter” on or before 12:45 Hrs. (IST) on the Bid Closing Date mentioned in the "Forwarding Letter". Timely delivery of the same at the address mentioned in the Forwarding Letter is the responsibility of the Bidders.
7.	Clause 2.23.3 Page 21 of 558	**Notification of Award** Upon the successful Bidder’s furnishing of Performance Security pursuant to Clause 24.0 below, the Company	**SECTION-II INSTRUCTION TO BIDDERS/2.23.3** The clause is being amended up to the following extent:

Sr. No.	Clause No.	Existing Provision	Amendment
		will promptly notify each unsuccessful Bidder.	**Notification of Award** Upon the successful Bidder's furnishing of Performance Security pursuant to **Clause 2.24** below, the Company will promptly notify each unsuccessful Bidder.
8.	3.3.1 EXPERIENCE OF THE BIDDER: Pg no 41 of 558	a) Shall have prior experience of setting up and operation and maintenance of Unsegregated MSW waste to Biogas/Bio-CNG plant including ETP for at least 3 (three) year of O&M experience in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding. ➢ One plant of minimum 240 TPD Feedstock capacity **OR** ➢ Two plants of minimum 150 TPD Feedstock capacity **OR** ➢ Three plants of minimum 120 TPD Feedstock capacity **Definition of Developer:** "Developer means the Company responsible for Design, Engineering, Financing, Construction, Procurement, Installation, Commissioning of the Biogas/CBG Project based on Municipal Solid Waste (MSW) as feed stock at single location and Operation & Maintenance (O&M) for the same plant in India as on date of bid submission. For Operation & Maintenance experience, the developer should be the O&M service provider of its own constructed plant or by their own subsidiary shall also be allowed.	**SECTION III TECHNICAL CRITERIA/3.3/3.3.1** The clause is being amended up to the following extent; a) Shall have prior experience of setting up and operation and maintenance of Unsegregated MSW waste to Biogas/Bio-CNG plant including ETP in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding. ➢ One plant of minimum 160 TPD Feedstock capacity **OR** ➢ Two plants of minimum 100 TPD Feedstock capacity **OR** ➢ Three plants of minimum 80 TPD Feedstock capacity b) Shall have prior experience of operation and maintenance of Unsegregated MSW waste to Biogas/Bio-CNG plant including ETP of a minimum capacity of 80 TPD plant for at least 2 (two) years of O&M experience in last 10 Financial years. **Definition of Developer:** "Developer means the Company responsible for Design, Engineering, Financing, Construction, Procurement, Installation, Commissioning and Operation & Maintenance

Sr. No.	Clause No.	Existing Provision	Amendment
		Definition of EPCOM "EPCOM means the Company which has experience for Design, Engineering, Construction, Procurement, Installation, Commissioning of Biogas/CBG Project based on Municipal Solid Waste (MSW) as feed stock executed at single location and Operation & Maintenance (O&M) for the same plant in India as on date of bid submission. For Operation & Maintenance experience, the EPCOM should be the O&M service provider of its own constructed plant or by their own subsidiary shall also be allowed. **Definition of Similar Work:** Design, Engineering, Construction, Procurement, Installation, Commissioning of Biogas/CBG Project based on MSW as feed stock, executed at single location and operation and maintenance of the same plant with single point responsibility.	(O&M) of the Biogas/ CBG Project based on Municipal Solid Waste (MSW) as feed stock at single location and Operation & Maintenance (O&M) for the same plant in India as on date of bid submission. For Operation & Maintenance experience, the developer should be the O&M service provider of its own constructed plant or by their own subsidiary or sister company (having equity more than 51%) shall also be allowed **Definition of EPCOM** **"**EPCOM means the Company which has experience for Design, Engineering, Construction, Procurement, Installation, Commissioning and Operation & Maintenance (O&M) of the Biogas/ CBG Project based on mixed MSW segregation plant followed by a separate dry and wet waste processing line executed at single location and for the same plant in India as on date of bid submission. For Operation & Maintenance experience, the O&M of the constructed plant or by their subsidiary or sister company (having equity more than 51%) shall also be allowed **Definition of Similar Work:** Design, Engineering, Construction, Procurement, Installation, Commissioning and successful 3 years operation and maintenance of Biogas/CBG Project based on Mixed MSW segregation plant followed by a separate dry

Sr. No.	Clause No.	Existing Provision	Amendment
			and wet waste processing line executed at single location and for the same plant with single point responsibility.
9.	Clause 5.1 Pg. No. 101-104 of 558	**DEFINITIONS & INTERPITATION** **Acts/Codes** shall mean, but not limited to as described in clause 5.9, including the latest amendments, and/or replacements **COMMISSIONING** means Commissioning of the unit will be considered once the biogas generation is established from MSW feed of minimum 30 MT/day (As per clause 5.12) **Mechanical completion & pre-commissioning** means as defined in clause 5.11 **Major facilities** mean as listed at clause 5.7 **Performance Guarantee Test Run** (**PGTR**) means procedure as defined at clause 5.20 **Stabilisation Period** will be achieved once the biogas generation is established from MSW feed of minimum 30 MT/day for minimum 7 days with all the sections like pre-treatment, hydrolyser, digestor, purification, compression and effluent treatment are operational**.** **Time Schedule** shall mean the period by which the work shall be completed as agreed herein between the Owner and the Contractor as per clause no.5.11.7 & 5.12.1 **Temporary facilities** mean as defined at clause 5.6	**SECTION-V SPECIAL CONDITION OF CONTRACT/DEFINATION & INTERPITATION** Clause 5.1 is being amended up to the following extent; **DEFINITIONS & INTERPITATION** **Acts/Codes** shall mean, but not limited to as described in clause 5.10, including the latest amendments, and/or replacements **COMMISSIONING** means Commissioning of the unit will be considered once the biogas generation is established from MSW feed of minimum 30 MT/day (As per clause 5.13) **Mechanical completion & pre-commissioning** means as defined in clause 5.12 **Major facilities** mean as listed at clause 5.8 **Performance Guarantee Test Run** (**PGTR**) means procedure as defined at clause 5.23 **Stabilisation Period** will be achieved once the biogas generation is established from MSW feed of minimum 30 MT/day for minimum **15** days with all the sections like pre-treatment, hydrolyser, digestor, purification, compression and effluent treatment are operational**.** **Time Schedule** shall mean the period by which the work shall be completed as agreed herein between the Owner

Sr. No.	Clause No.	Existing Provision	Amendment
			and the Contractor as per clause no.5.12.7 & 5.13.1 **Temporary facilities** mean as defined at clause 5.7
10.	Clause 5.2 Pg. No. 104 of 558	Topographic Survey with Contours: Will be uploaded before Pre bid meeting Soil Investigation Report: Will be uploaded before Pre bid meeting.	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.2** The clause is being amended up to the following extent; Features of Project Site (In table) Row no. 4: Topography: The indicative topography report of the land identified is attached at Appendix -1 Row no. 5: Soil Investigation Report: The indicative Soil test reports is attached as Appendix-2.
11.	Clause 5.5.1 Pg no 107 of 558	The above list is indicative but not exhaustive. Any other approval which might be required as part of construction, commissioning, and operation of the plant it is the bidder's responsibility to obtain the same. The contractor on his own /or in support of the PMC must coordinate with the concerned regulatory bodies for obtaining the approvals. All the original copies of the approval must be submitted to OIL. Facilitating for the approvals required if any will be considered by OIL but it is the contractor's responsibility to obtain the same prior to construction/operation as applicable	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.5** The clause is being amended up to the following extent; 5.5.1. The above list is indicative but not exhaustive. Any other approval which might be required as part of construction, commissioning, and operation of the plant it is the bidder's responsibility to obtain the same. The bidder, jointly in coordination with OIL/PMC, will take responsibility for obtaining all necessary statutory clearances/approvals prior to construction/operation as applicable. Successful bidder is to take the prime responsibility and accountability, while OIL /PMC will provide necessary support to facilitate the approvals required including statutory fee. All the original copies of the approvals must be submitted to OIL.
12.	Clause 5.6.29 Pg 110 of 558	PGTR shall be conducted within 3 months from date of commissioning	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.6** The clause is being amended up to the following extent;

Sr. No.	Clause No.	Existing Provision	Amendment
			5.6.29. PGTR shall be conducted within **6 months** from date of commissioning.
13.	Clause 5.13 Pg no 120 of 558	5.13 **COMMISSIONING & STABILIZATION** 5.13.1 The time period for Commissioning and Stabilization is 18 months from the date of LOA. 5.13.2 Commissioning of the unit will be considered once the biogas generation is established from MSW feed of minimum 100 MT/day for minimum 7 days with all the sections like pre-treatment, hydrolyser, digestor, purification, compression and effluent treatment are operational. Only after obtaining the commissioning certificate from PMC/ OIL project will be deemed to be considered as commissioned. All related physical and financial milestones will be processed only after obtaining the certificate from OIL & PMC.	**SECTION-V SPECIAL CONDITION OF CONTRACT** The is being amended as follows: **5.13 COMMISSIONING & STABILIZATION** 5.13.1 The time period for Commissioning is 2 (two) months after Mechanical completion and Stabilization is 4 (four) months from the date of Commissioning. **5.13.2 Commissioning** of the unit will be considered once the biogas generation is established from MSW feed of minimum 30 MT/day. **5.13.3 Stabilization** of the unit will be considered when the plant is ready for PGTR and the biogas generation is established from MSW feed of minimum 30 MT/day for minimum of 15 days with all sections like pretreatment, hydrolyser, digestor, purification, and effluent treatment plant are operational 5.13.4 Contractor can offer the PGTR test at any time after the satisfactory stabilization without waiting for 4 months. 5.13.5 The Comprehensive Operation & Maintenance period shall start from the date of successful completion of PGTR test and O & M charges shall be payable accordingly.

Sr. No.	Clause No.	Existing Provision	Amendment
			All related physical and financial milestones will be processed only after obtaining the certificate from OIL & PMC.
14.	Clause 5.14.5 Pg no 121 of 558	CONTRACTOR while ordering of all Equipment shall ensure that the guarantee of supply of spares for a period of 25 years or entire life of the equipment shall be obtained by the CONTRACTOR. The CONTRACTOR shall submit the written compliance to the OWNER in this regard.	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.14** The clause 5.14.5 Stands Deleted
15.	Clause 5.15.3 Pg no 121 of 558	CONTRACTOR is required to Maintain minimum stock of all such lubricants and consumable for requirement of minimum Six Months and ensure to replenish them periodically and maintain a proper record of stock which should be submitted to Owner / PMC.	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.15** The clause is being amended up to following extent; 5.15.3. CONTRACTOR is required to Maintain minimum stock of all such lubricants and consumable for requirement of minimum 3 (Three) months and ensure to replenish them periodically and maintain a proper record of stock which should be submitted to Owner / PMC.
16.	Clause 5.16.1 Pg No 123 of 558	The works are to be completed in all respects within a period of 18 (Eighteen) months from the date of issue of Letter of Acceptance (LOA)/PO.	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.16.1** The clause is being amended up to following extent; The second last para is being amended as follows: The works are to be completed in all respects within a period of 23 (Twenty-three) months from the date of issue of Letter of Acceptance (LOA)/PO.
17.	Clause 5.19.1 Pg no 128 of	Defect Liability Period would be 12 months from the	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.19 DEFECT LIABILITY PERIOD (DLP)**

Sr. No.	Clause No.	Existing Provision	Amendment
	558	date of Successful Commissioning and Stabilization.	The clause is revised as under: 5.19.1. Defect Liability Period would be 12 months from the date of Successful completion of PGTR test.
18.	Clause 5.21.1 Page 128 & 129 of 558	**PBG for EPC work:** Within 15 days of receipt of the Letter of Acceptance/Notification of Award/Purchase order, PBG @ 10 % of purchase order value exclusive of taxes (i.e.10 % of EPC contract value) excluding Operations & Comprehensive Maintenance portion must be submitted by the contractor as per format attached as Annexure- 8. The Performance Bank Guarantee shall be valid for a duration of 33 months as per (Considering 18 Months for commissioning and 12 months of Defect liability period).	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.21 CONTRACT CUM EQUIPEMENT PERFORMANCE BANK GURANTEE (CPBG)** The clause is being amended up to following extent; **5.21.1 PBG For EPC work:** Within 15 days of receipt of the Letter of Acceptance/Notification of Award/Purchase order, PBG @ 10 % of purchase order value exclusive of taxes (i.e.10 % of EPC contract value) excluding Operations & Comprehensive Maintenance portion must be submitted by the contractor as per format attached as Annexure- 8. The Performance Bank Guarantee shall be valid for a duration of 38 months as per (Considering Mechanical completion, commissioning, Stabilization, successful PGTR and 12 months of Defect liability period). The claim period of the Performance Bank Guarantee (BG) shall be further 12 months beyond the validity of the BG.
19.	Clause 5.26 page 132 of 558	**Procedure of checking of Guaranteed production of Biogas:** The test period shall be for uninterrupted 96 hours. At the start of PGTR test, the reading of following flow meters shall be recorded and logged	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.26 Procedure of checking of Guaranteed production of Biogas:** The clause is being amended up to following extent; **Para 1:**

Sr. No.	Clause No.	Existing Provision	Amendment
		1) Flow meters installed at slurry feeding line to inlet of digester 2) Flow meters installed at Biogas pipeline to inlet of Gas purification system To measure the volatile solids in the inlet slurry to digester, 4 to 8 samples at regular intervals during 96 hours of PGTR duration shall be tested for volatile solids. The details of sample testing procedure, testing methodology and number of test samples shall be discussed and finalized before the start of PGTR at least 7 days in advance. In case of shortfall in guaranteed output of Biogas in 96 hrs. cumulative basis is exceeding 2%, the PGTR will not be considered successful.	The test period shall be for uninterrupted 30 days. At the start of PGTR test, the reading of following flow meters shall be recorded and logged **Para 2:** To measure the volatile solids in the inlet slurry to digester, the samples will be drawn every 4 hours daily during feeding period of PGTR duration and same shall be tested for volatile solids. The details of sample testing procedure, testing methodology and number of test samples shall be discussed and finalized before the start of PGTR at least 7 days in advance. **Para 3:** In case of shortfall in guaranteed output of Biogas in 30 days cumulative basis is exceeding 2%, the PGTR will not be considered successful. The contractor will be offered a chance to correct the design and offer a second PGTR test during the next 3 months. Failure of the second PGTR test shall attract price discount to Owner corresponding to shortfall of Biogas at the rate defined in the contract.
20.	Clause 5.27.1.2 Pg 133 of 558	SO-MSW shall be fed to the digester after removal of rejects / impurities like plastic, paper, rubber, sand / grit, metals, non-digestible, etc. Generally, 1 MT of volatile solids in SO-MSW produces 400 – 500 Nm3 of raw biogas with minimum 50% CH4 content. Vendor shall design and operate the entire plant in such a way so that minimum 400 Nm3 of raw biogas at inlet of gas purification system with minimum 50% CH4 content is produced per MT of volatile solids fed to the digester in the form of slurry.	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.27/5.27.1 Quality and Quantity of Biogas:** The clause is being amended up to following extent; 5.27.1.2. SO-MSW shall be fed to the digester after removal of rejects / impurities like plastic, paper, rubber, sand / grit, metals, non-digestible, etc. Generally, 1 MT of volatile solids in SO-MSW produces 400 – 500 Nm3 of raw biogas with minimum 50% CH4 content. Vendor shall design and operate the entire plant in such a way so that

Sr. No.	Clause No.	Existing Provision	Amendment
		To calculate the above, samples of the slurry feeding to digesters will be drawn every 4 hours daily during feeding period. The composite sample of all the samples drawn daily shall be tested for volatile solids jointly at a mutually agreed accredited/Own plant lab. The total quantity of volatile solids in a particular day shall be calculated based on flow of total slurry fed to the digester and percentage of volatile solids checked on that day. Accordingly, Biogas production quantity (volume as well as its weight) from the digester shall be reconciled for each three days/96 hours of PGTR. Price discount shall be levied for shortfall of as defined in the contract.	minimum 425 Nm3 of raw biogas at inlet of gas purification system with minimum 50% CH4 content is produced per MT of volatile solids fed to the digester in the form of slurry. To calculate the above, samples of the slurry feeding to digesters will be drawn every 4 hours daily during feeding period. The composite sample of all the samples drawn daily shall be tested for volatile solids jointly at a mutually agreed accredited / Own plant lab. The total quantity of volatile solids in a particular day shall be calculated based on flow of total slurry fed to the digester and percentage of volatile solids checked on that day. Accordingly, Biogas production quantity (volume as well a its weight) from the digester shall be reconciled for each day during PGTR test. Price discount shall be levied for shortfall of as defined in the contract.
21.	Clause 5.27.1.4 Pg 134 of 558	The vendor shall ensure that CH4 loss from raw Biogas at inlet of gas purification system to purified CBG delivered to gas network shall not be more than 3%. CH4 production quantity (Volume as well as weight) shall be calculated based on flowmeters and gas chromatograph at both the locations i.e. inlet of gas purification system and final CBG delivery to gas network. After that CH4 loss shall be calculated for PGTR period i.e. 96 hours and if the CH4 loss exceeds 3% the PGTR will not be considered successful.	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.27/5.27.1.4 Quality and Quantity of Biogas:** The sub-clause is being amended as under: The vendor shall ensure that CH_4 loss from raw Biogas at inlet of gas purification system to purified CBG delivered to gas network shall not be more than 3%. CH_4 production quantity (Volume as well as weight) shall be calculated based on flowmeters and gas chromatograph at both the locations i.e. inlet of gas purification system and final CBG delivery to gas network. After that CH_4 loss shall be calculated for PGTR period i.e. 30 days and if the CH_4 loss exceeds 3% the PGTR will not be considered successful.

Sr. No.	Clause No.	Existing Provision	Amendment
22.	Clause 5.28.1 Pg. No. 135 of 558	5.28: Quantity and Quality of FOM 5.28.1. The quality of FOM produced shall be in strict conformity to specification/composition as mentioned in technical bid package and no deviation shall be allowed. Bidder should comply with all the requirements as per Gazette Notification No. 2051 dated 14.07.2020 and No. 1972 dated 01.06.2021 issued by Ministry of Agriculture and Farmers Welfare regarding inclusion of Fermented Organic manure (FOM) under fertilizer (Inorganic, organic or mixed) (control) act 1985.	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.28 Quality and Quantity of FOM** The clause 5.28 is being amended up to the following extent; 5.28.1. Stands deleted
23.	Clause 5.29.2 Pg. No. 136 & 137 of 558	SO-MSW shall be fed to the digester after removal of rejects/impurities like plastic, paper, rubber, sand/grit, metals, non-digestible, etc. Generally, 1 MT of volatile solids in SO-MSW produces 400 – 500 Nm3 of raw biogas with minimum 50% CH4 content depending on the quality of SO-MSW. Vendor shall design and operate the entire plant in such a way so that minimum 400 Nm3 of raw biogas at the inlet of gas purification system with minimum 50% CH4 content is produced per MT of volatile solids fed to the digester in the form of slurry. Vendor shall ensure that CH4 loss from production of raw biogas measured at the inlet of gas purification system to purified CBG delivered to refinery/customer shall not be more than 3%. If the shortfall of CBG quantity (Volume as well its weight) finally delivered to Gas network piping header on monthly basis over the quantity discovered during the final PGTR is more than 1%, a price discount @ 100% of prevailing RLNG purchase price for OIL (incl. of applicable taxes) shall	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.29** The clause is being amended up to following extent; **5.29.2. Para 1** SO-MSW shall be fed to the digester after removal of rejects/impurities like plastic, paper, rubber, sand/grit, metals, non-digestible, etc. Generally, 1 MT of volatile solids in SO-MSW produces 400 – 500 Nm3 of raw biogas with minimum 50% CH4 content depending on the quality of SO-MSW.Vendor shall design and operate the entire plant in such a way so that minimum **425 Nm3** of raw biogas at the inlet of gas purification system with minimum 50% CH4 content is produced per MT of volatile solids fed to the digester in the form of slurry. **5.29.2 Para 4:** Vendor shall ensure that CH4 loss from production of raw biogas measured at the inlet of gas purification system to purified CBG delivered to refinery/customer shall not be

Sr. No.	Clause No.	Existing Provision	Amendment
		be levied for shortfall of CBG beyond 1% subject to a maximum of 50% of monthly O&M bill. However, in case if there is any process upset / startup / shutdown / other eventualities attributable to the vendor, relaxation for the said time period subject to maximum of 48 hours on cumulative basis shall be given in a month. Accordingly, the price discount shall be reconciled and levied on a monthly O&M payment.	more than 3%.If the shortfall of CBG quantity (Volume as well its weight) finally delivered to Gas network piping header **on Quarterly** basis over the quantity discovered during the final PGTR is more than 1%, a price discount @ 100% of prevailing RLNG purchase price for OIL (incl. of applicable taxes) shall be levied for shortfall of CBG beyond 1% subject to a maximum of 50% **of Quarterly O&M charges from O & M bills.** **5.29.2 Last Para** However, in case if there is any process upset / startup / shutdown / other eventualities attributable to the vendor, relaxation for the said time period subject to maximum of 48 hours on cumulative basis shall be given in a month. Accordingly, the price discount shall be reconciled and levied **on Quarterly basis from** O&M payment.
24.	Clause 5.29.3 Pg. No. 137 of 558	5.29.3: Quantity and Quality of FOM 5.29.3. Digestate from digesters shall be separated into solid – liquid separator. Solid part shall be sent for composting under aerobic conditions and nutrients shall be added to maintain the specifications as mentioned in the technical specification. The plant is expected to produce 2.62 MT per day Fermented Organic Manure (FOM). FOM shall be ensured odorless.	**SECTION-V SPECIAL CONDITION OF CONTRACT/5.29 Performance during O&M period:** 5.29.3. Stands deleted
25.	Clause 6 Pg no 153 of 558	**Price Schedule – 6**: Grand Summary (For Award of Works)	**SECTION-VI PRICE BID**

<table>
<tr><th>Sr. No.</th><th>Clause No.</th><th>Existing Provision</th><th>Amendment</th></tr>
<tr><td></td><td></td><td></td><td>Price Schedule – 6: Grand Summary (For Award of Works)

Please replace the existing with revised Price Schedule - 6 attached with this Corrigendum.

The revision is in GST for EPC works to be calculated as composite</td></tr>
<tr><td>26.</td><td>Clause 7.1.2
Pg no 148</td><td>Scope of Work: Specific</td><td>SECTION-VII DETAILED SCOPE OF WORK/7.1

7.1.2. Scope of Work: Specific

In addition to the existing clause:

• To provide adequate number of Bore Well with necessary pumping and storage system as per Water requirement during construction, commissioning and O & M of the plant</td></tr>
<tr><td>27.</td><td>Clause 7.6
Pg. No. 162 of 558</td><td>Key Milestones
Notwithstanding anything mentioned elsewhere in the tender, the contractor shall adhere to the “Key Milestone Schedule” submitted along with the technical bid. It shall be considered by OIL as the basis for levying price discount on account of delay in the implementation of the Project, in case the bidder is awarded the Contract and signs the Concession Agreement.

<table><tr><th>Sr. No.</th><th>Description of Milestones</th><th>Key Milestone Schedule from LoA</th></tr><tr><td>1</td><td>Mechanical Completion of all Project Works</td><td>Within 15 Months</td></tr></table></td><td>SECTION-VII DETAILED SCOPE OF WORK/7.6 Key Milestones

The clause is being amended up to the following extent;

Notwithstanding anything mentioned elsewhere in the tender, the contractor shall adhere to the “Key Milestone Schedule” submitted along with the technical bid. It shall be considered by OIL as the basis for levying price discount on account of delay in the implementation of the Project, in case the bidder is awarded the Contract and signs the Concession Agreement.
<table><tr><th>Sr. No.</th><th>Description of Milestones</th><th>Key Milestone</th><th>Cumulative time</th></tr></table></td></tr>
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<tr><td>2</td><td>Commissioning & Stabilization</td><td>15+ 3=18 Months</td></tr>
<tr><td>3</td><td>Completion of PGTR</td><td>18+3 =21 Months</td></tr>
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<tr><th></th><th></th><th>Schedule from LoA</th><th>Period in Months from LoA</th></tr>
<tr><td>1</td><td>Mechanical Completion of all Project Works</td><td>Within 15 Months</td><td>15</td></tr>
<tr><td>2</td><td>Commissioning</td><td>Within 2 Months</td><td>17</td></tr>
<tr><td></td><td>Stabilization</td><td>Within 4 Months</td><td>21</td></tr>
<tr><td>3</td><td>Completion of PGTR</td><td>Within 2 Months</td><td>23</td></tr>
</table>
</td></tr>
<tr><td>28.</td><td>Clause 7.7
Pg 162 of 558</td><td>OIL's Responsibility
• Approach Road up to the Project Site.
• Project Site free of all encumbrances / encroachments, on which the complete Plant shall be constructed.
• Incoming HT Power Supply from nearby “Source” up to the Site boundary.
• Incoming Potable Water Line + Service Water Line + Internet Broadband Line from nearby “Source” up to the Site.
• Input Segregated Municipal Solid Waste
• CBG Transmission Pipeline up to the terminal point within the boundary
• Sale of all Products (Elemental Sulphur, Compressed Bio-Gas, Compost etc.) to be generated in the Plant.
• Disposal of all Process Rejects (RDF, Inert, Excess Treated Effluent etc.) from Plant to the required Disposal Points.
• Drawings and Documents as tabulated below.
❖ Site Plan</td><td>SECTION-VII DETAILED SCOPE OF WORK/7.7 OIL’s Responsibility

The clause is being amended up to the following extent;

• Approach Road up to the Project Site.
• Project Site free of all encumbrances / encroachments, on which the complete Plant shall be constructed.
• Incoming HT Power Supply from nearby “Source” up to the Site boundary.
• Internet Broadband Line from nearby “Source” up to the Site.
• Input Segregated Municipal Solid Waste
• CBG Transmission Pipeline up to the terminal point near the boundary
• Sale of all Products (Elemental Sulphur, Compressed Bio-Gas, Compost etc.) to be generated in the Plant.</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Clause No.</th><th>Existing Provision</th><th>Amendment</th></tr>
<tr><td></td><td></td><td>❖ Preliminary Topographical Survey Drawing / Contour Drawing of the Site. However, The Contractor need to satisfy with report and may conduct more investigation at his own cost, if required
❖ Preliminary Geo-Technical Investigation Report of the Site.</td><td>• Disposal of all Process Rejects (RDF, Inert, Excess Treated Effluent etc.) from Plant to the required Disposal Points.
• Drawings and Documents as tabulated below.
❖ Site Plan
❖ Preliminary Topographical Survey Drawing / Contour Drawing of the Site. However, The Contractor need to satisfy with report and may conduct more investigation at his own cost, if required
❖ Geo-Technical Investigation Report of the Site.</td></tr>
<tr><td>29.</td><td>Clause 7.8
Pg no 163 of 558</td><td>Contractor’s Responsibility</td><td>SECTION-VII DETAILED SCOPE OF WORK/7.8 Contractor’s Responsibility:

In addition to the existing clause:

To provide adequate number of Bore well for the water requirement during construction, commissioning and Operation & Maintenance of Plant.</td></tr>
<tr><td>30.</td><td>Clause 7.9.5
Page 172 & 173 of 558</td><td>7.9.5. Bio-Methanation System

(1) Digesters: table
The technical Specifications are as follows:

<table>
<tr><th>Sr.No.</th><th>Description</th><th>Unit</th><th>Remark</th></tr>
<tr><td>6</td><td>Hydraulic Retention Time to be provided</td><td>days</td><td>• 36 (min.) excluding Free Board</td></tr>
<tr><td>14</td><td>Material of Construction:</td><td></td><td></td></tr>
<tr><td></td><td>Tank:</td><td>-</td><td>• RCC M30 + Internal PU</td></tr>
</table>
</td><td>SECTION-VII DETAILED SCOPE OF WORK/ 7.9.5/ (1) Digesters

The clause is being amended up to the following extent;

Clause number is amended to (4) Digesters

<table>
<tr><th>Sr. No.</th><th>Description</th><th>Unit</th><th>Remark</th></tr>
<tr><td>6</td><td>Hydraulic Retention Time to be provided</td><td>days</td><td>• 36 (max.) excluding Free Board</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th>Sr. No.</th><th>Clause No.</th><th>Existing Provision</th><th>Amendment</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><td></td><td></td><td></td><td>Coating of 1150 – 1300 micron DFT in Bio-Gas Storage Area; or</td></tr>
<tr><td></td><td></td><td>-</td><td>• Glass-fused-to-Steel (Glass-Lined-Steel)</td></tr>
</table>
</td><td>
<table>
<tr><td>14</td><td>Material of Construction:</td><td></td><td></td></tr>
<tr><td></td><td>Tank:</td><td>-</td><td>• RCC M30 + Internal PU Coating of 1150 – 1300 micron DFT in Bio-Gas Storage Area; or</td></tr>
</table>
</td></tr>
<tr><td>31.</td><td>Clause 7.9.9 Pg no 177 of 558</td><td>Odouring System
The CONTRACTOR shall also ensure to install odorization system and as per the standards CBG delivered shall be odorized similar to a level found in local distribution (see IS 15319).</td><td>SECTION-VII DETAILED SCOPE OF WORK/ 7.9.9 Odouring System

Last line (BOLD) is being amended as follows;

The CONTRACTOR shall also ensure to install odorization system and as per the standards CBG delivered shall be odorized similar to a level found in local distribution (see IS 15319) with a minimum of 12mg /M^3.</td></tr>
<tr><td>32.</td><td>Clause 7.9.10 Pg. No. 178 of 558</td><td>The purified Biogas shall be compressed at 6/7 bar, if required, for injection in OIL’s Pipeline.</td><td>The purified Biogas shall be compressed, if required, for injection at 4 bars in GAIL’s Pipeline.</td></tr>
<tr><td>33.</td><td>Clause 7.9.12 Pg no 191 of 558</td><td></td><td>SECTION-VII DETAILED SCOPE OF WORK/7.9.12 Composting Facility:

In addition to the existing clause:</td></tr>
</table>

Sr. No.	Clause No.	Existing Provision	Amendment
			(3) Bagging and packing Unit for FOM Filling Machine Comprising of Semiautomatic Twin-Screw Feeder with coarse and fine feed screw with Maximum Output of 280 bags of 50 kg /hour. Solid Organic fertilizer Generation per Day- 15 Tons/day Total storage required for 10 days – 150 MT Weight of each bag – 40/50 kg per bag Bags will be arranged by the bidder at his own cost for filling.
34.	Clause7.9.15 Pg no 198	**(e) Potable Water Network** OIL shall provide a Potable Water Line up to the battery limit of the Plant. This incoming potable water line shall be terminated in a underground Water Storage Tank, from where it shall be pumped to all Buildings for various human consumption e.g. drinking, handwash, shower etc. Usage of water from the incoming Potable Water Line provided by OIL shall be on a chargeable basis as per prevailing rates.	**SECTION-VII DETAILED SCOPE OF WORK/7.9.15 Miscellaneous Plants and Facilities:** The clause is being amended up to following extent: **(e) Potable Water Network** The existing clause is deleted and replaced as under: Water requirements for the plant operations and drinking purposes shall be arranged by the bidder. A bore well along with necessary pumping, storage and pipe line system shall be developed to meet water requirement during construction, commissioning and O & M of the plant.
35.	Clause7.9.15 Pg no 198 of 558	**(f) Service Water Network**	**SECTION-VII DETAILED SCOPE OF WORK/7.9.15 Miscellaneous Plants and Facilities:**

Sr. No.	Clause No.	Existing Provision	Amendment
		OIL shall provide a Treated Water Line up to the battery limit of the Plant for all other water requirements (other than human consumption as stated above) e.g. In Organic Extraction System, Preparation of Chemical Solution, Washing (Floor, Equipment, Vehicles etc.), Horticulture/Gardening and Fire Fighting System etc. shall be met by the Treated Water. The treated water shall be stored in a Service Water Storage Tank from where it shall be pumped to the Service Water Network. Service Water Line shall be painted with proper color coding and proper signage "Not Suitable for Drinking" at adequate locations.	The clause is being amended up to following extent: **The Bidder** shall provide a Treated Water Line up to the battery limit of the Plant for all other water requirements (other than human consumption as stated above) e.g. In Organic Extraction System, Preparation of Chemical Solution, Washing (Floor, Equipment, Vehicles etc.), Horticulture/Gardening and Fire Fighting System etc. shall be met by the Treated Water. The treated water shall be stored in a Service Water Storage Tank from where it shall be pumped to the Service Water Network. Service Water Line shall be painted with proper colour coding and proper signage "Not Suitable for Drinking" at adequate locations.
36.	Clause7.9.15 Pg no 198 of 558	**(g) Fire Fighting System + Fire Water Network** A Fire Water Tank shall be provided for storing Fire Water. This Tank shall have provisions for receiving water from Potable Water Line as well as Service Water Line. The Fire Water Tank shall always be kept in a fully filled condition. Necessary Fire Hydrant Pumps and Jockey Pumps shall be provided to pump water into the Fire Fighting Network with suitable hydrant connections as per specifications.	**SECTION-VII DETAILED SCOPE OF WORK/7.9.15 Miscellaneous Plants and Facilities:** **(g) Fire Fighting System + Fire Water Network** The clause is being amended up to following extent: A Fire Water Tank shall be provided for storing Fire Water. This Tank shall have provisions for receiving **borewell/potable/service** water. The Fire Water Tank shall always be kept in a fully filled condition. Necessary Fire Hydrant Pumps and Jockey Pumps shall be provided to pump water into the Fire Fighting Network with suitable hydrant connections as per specifications.
37.	Clause 8.2.5 Pg No 230 of 558	Foundation Conditions: The footings/foundations/piling arrangements shall rest	**SECTION-VIII TECHNICAL SPECIFICATIONS/8.2/8.2.5 Foundation Conditions:**

<table>
<tr><th>Sr. No.</th><th>Clause No.</th><th>Existing Provision</th><th>Amendment</th></tr>
<tr><td></td><td></td><td>on firm strata. The foundations shall be so engineered that short term and long-term settlements (including differential settlement between adjoining columns / walls) is within permissible limits as per stipulations of IS 1904 – 1986 and IS 456 – 2000 (latest revision). In case of pile foundations, only precast pre- bored piles shall be used.</td><td>The clause is being amended as follows:

The footings/foundations/piling arrangements shall rest on firm strata. The foundations shall be so engineered that short term and long-term settlements (including differential settlement between adjoining columns/walls) is within permissible limits as per stipulations of IS 1904 – 1986 and IS 456 – 2000 (latest revision)..</td></tr>
<tr><td>38.</td><td>Clause 8.4.3 Pg No 248 & 249 of 558</td><td>Coarse Aggregate:

3) Coarse aggregates shall be supplied in the following sizes:
Nominal size — Maximum size — Minimum size
10mm — 12mm — 5mm
0mm — 25mm — 10mm
40mm — 40mm — 20mm
80mm — 80mm — 40mm</td><td>SECTION-VIII TECHICAL SPECIFICATIONS/8.4/8.4.3 Coarse Aggregates:

The clause is being amended up to following extent:

3. Coarse aggregates shall be supplied in the following sizes:
<table><tr><th>Nominal size</th><th>Maximum size</th><th>Minimum size</th></tr><tr><td>10mm</td><td>12mm</td><td>5mm</td></tr><tr><td>20mm</td><td>25mm</td><td>10mm</td></tr><tr><td>40mm</td><td>40mm</td><td>20mm</td></tr><tr><td>80mm</td><td>80mm</td><td>40mm</td></tr></table></td></tr>
<tr><td>39.</td><td>Cause 8.21.1.3 pg no 399 of 558</td><td>Scope of Work: General
Scope includes Electrical Substation, Power Generation and Power Evacuation Units.</td><td>SECTION-VIII TECHNICAL SPECIFICATIONS/8.21/8.21.1.3 Scope of Work: General:

This is being clarified as follows:

HT Transmission line up to plant boundary is in the scope of OIL. All the requirements within the boundary are in the scope of bidder</td></tr>
</table>

Sr. No.	Clause No.	Existing Provision	Amendment
40.	Clause 8.23 Pg. No. 472 of 558	List Of Approved Makes/ Brands / Manufacturers / Vendors	Revised list is attached at **Appendix-3**
41.	BRS-2 Pg no 511 of 558	**S No 1 – 3.3 TECHNICAL CRITERIA** Shall have prior experience of setting up and operation and maintenance of Unsegregated MSW waste to Biogas/Bio-CNG plant including ETP for at least 3 (three) year of O&M experience in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding. ➢ One plant of minimum 240 TPD Feedstock capacity **OR** ➢ Two plants of minimum 150 TPD Feedstock capacity **OR** ➢ Three plants of minimum 120 TPD Feedstock capacity	**S No 1 – 3.3 TECHNICAL CRITERIA** The clause is being amended up to the following extent; a) Shall have prior experience of setting up and operation and maintenance of Unsegregated MSW waste to Biogas/Bio-CNG plant including ETP in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding. ➢ One plant of minimum 160 TPD Feedstock capacity **OR** ➢ Two plants of minimum 100 TPD Feedstock capacity **OR** ➢ Three plants of minimum 80 TPD Feedstock capacity b) Shall have prior experience of operation and maintenance of Unsegregated MSW waste to Biogas/Bio-CNG plant including ETP of a minimum capacity of 80 TPD plant for at least 2 (two) years of O&M experience in last 10 Financial years.
42.	Annexure -6 Pg no 547 of 558	**GA DRAWING OF THE PROJECT LAYOUT** The Bidder should enclose the following drawings with the bid: i. Project layout ii. Single line schematic diagram of electrical system for grid interfacing iii. General drawings of electrical installations	**SECTION-X LIST OF ANNEXURES** **Annexure – 6 - GA DRAWING OF THE PROJECT LAYOUT** The clause has been amended up to the following extent:

ANNEXURE-A

Sr. No.	Clause No.	Existing Provision	Amendment
		including unit substations control & metering station, etc. iv. General arrangement drawings and circuit diagrams of major electrical equipment.	The Bidder should enclose the following drawings with the bid: i. Project layout ii. Single line schematic diagram of electrical system for grid interfacing The Bidder should enclose the following drawings after successful bid: iii. General drawings of electrical installations including unit substations control & metering station, etc. iv. General arrangement drawings and circuit diagrams of major electrical equipment.

Attachments:

1. Appendix-1 - Topography report
2. Appendix -2 – Soil Test Report
3. Price Schedule – 6 (Revised)- Grand Summary (For Award of Works)
4. Appendix -3 - Revised List of Approved Makes/ Brands / Manufacturers / Vendors

ANNEXURE-B

Response to Pre bid Queries

Sub: Tender No. **CQl8171P25**- *EPCOM of 300TPD of Segregated MSW based Compressed Biogas Pant for Commercial use at Bhubaneswar, Odisha.*

(A) Response to queries of SFC Environmental Technologies Limited

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
1	Pg.No. 4 of 558	(XVII): Duration of the Contract: The duration of the contract shall be for a period of 18 (Eighteen) months from the date of commencement of work.	Additionally, we propose an amendment to the commencement period to align it with the completion of all statutory approvals and permits & increase the duration of the contract from 18 months to 24 months.	(XVII): Duration of the Contract: The duration of the contract shall be for a period of 24 (Twenty Four) months from the date of commencement of work. Additional 6 months for commissioning, stabilization and PGTR related activities.	Please refer Corrigendum - 2
2	Clause 3.3.1 Pg.No. 41 of 558	Shall have prior experience of setting up and operation and maintenance of Segregated MSW waste to Biogas/Bio-CNG plant including ETP for at least 3 (three) year of O&M experience in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding.	We rrequest that the technical qualification criteria be revised accordingly to promote equitable participation.	Shall have prior experience of setting up and operation and maintenance of Segregated MSW waste to Biogas/Bio-CNG plant including ETP for at least 2 (two) year of O&M experience in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding. One plant of minimum 160 TPD Feedstock capacity or	Please refer Corrigendum - 2

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
		One plant of minimum 240 TPD Feedstock capacity or Two plants of minimum 150 TPD Feedstock capacity Or Three plants of minimum 120 TPD Feedstock capacity		Two plants of minimum 100 TPD Feedstock capacity Or Three plants of minimum 90 TPD Feedstock capacity	
3	Pg.No. 41, 42 of 558	For Operation & Maintenance experience, the developer/EPCOM should be the O&M service provider of its own constructed plant or by their own subsidiary shall also be allowed.	Shouldn't the same eligibility criteria apply to the Developer/EPCOM for demonstrating experience in project development activities, such as design, engineering, financing, construction, procurement, installation, and commissioning?	In addition for O&M Experience add following: "For Design, Engineering, Construction, Procurement, Installation, and Commissioning experience, the Developer/EPCOM should have directly undertaken such activities or may claim the experience of its subsidiary or sister company, provided the parent entity holds an equity stake of more than 51% in such subsidiary or sister company."	Please refer Corrigendum - 2
4	Clause 3.6.8 Pg.No. 51 of 558	In case of identical overall lowest offered rate by more than 1 (one) bidder, the selection will be made by draw of lot between the	Selection should be based on merit	In the event of identical overall lowest offered rates submitted by more than one bidder, the selection of the successful bidder shall be determined by the Company based on the technical strength of the offers.	Tender conditions Prevail

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
		parties offering the same overall lowest price.			
5	Clause 24.1 Pg.No. 78 of 558	CONTRACTOR shall not subcontract, transfer or assign the contract, or any part under this contract, to any third party(ies). Except for the main services under this contract, CONTRACTOR may sub-contract the petty support services subject to COMPANY's prior written approval. However, CONTRACTOR shall be fully responsible for complete execution and performance of the services under the Contract.	We request clarification on the subcontracting restrictions outlined in the clause. Considering the scale and complexity of large infrastructure projects, it is common practice to allow subcontracting for specific categories of work, such as civil construction and erection of electro-mechanical components. This approach ensures efficient project execution while promoting local employment and economic growth.	CONTRACTOR shall not subcontract, transfer or assign the contract, or any part under this contract, to any third party(ies). Except for the main services under this contract, CONTRACTOR may sub-contract civil works, electro-mechanical works and other ancillary services subject to COMPANY's prior written approval. However, CONTRACTOR shall be fully responsible for complete execution and performance of the services under the Contract. OR Define ''Petty Support Services" as part of SCC as: "Petty Support Services" shall include, but are not limited to, civil works, erection of electro-mechanical components, minor fabrication, installation tasks, and other ancillary activities required to support the primary scope of work. Such services shall be carried out in compliance with the	Tender conditions Prevail

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
				applicable standards, regulations, and the terms and conditions of the Contract.	
6	Clause 44.0 Pg.No. 95 of 558	Termination	Doesn't have curing period	Addition of sentence as new clause before "consequence of termination" under SCC : For all the termination provisions stated above, the COMPANY shall provide the CONTRACTOR with a curing period of 45 days to rectify or remedy the breach or default. If the CONTRACTOR fails to address the issue within the specified curing period, the COMPANY shall have the right to terminate the contract in accordance with the terms outlined herein.	Tender conditions Prevail
7	Clause 44.5 Pg.No. 96 of 558	Termination for Unsatisfactory Performance: If the COMPANY considers that, the performance of the CONTRACTOR is unsatisfactory, or not as per the provision of the Contract, the COMPANY shall notify the CONTRACTOR in writing and specify in details the cause of dissatisfaction. The	Request to add a curing period of 45 days.	Termination for Unsatisfactory Performance: If the COMPANY considers that, the performance of the CONTRACTOR is unsatisfactory, or not as per the provision of the Contract, the COMPANY shall notify the CONTRACTOR in writing and specify in details the cause of dissatisfaction. The COMPANY shall have the option to terminate the Contract by giving 90 days notice in writing to the CONTRACTOR, if CONTRACTOR fails to comply with the requisitions contained in the said written notice issued by the COMPANY.	Tender conditions Prevail

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
		COMPANY shall have the option to terminate the Contract by giving 15 days notice in writing to the CONTRACTOR, if CONTRACTOR fails to comply with the requisitions contained in the said written notice issued by the COMPANY. In the event CONTRACTOR rectifies its non-performance to the satisfaction of the COMPANY, the option of termination may not be exercised by the COMPANY. If however CONTRACTOR repeats non-performance subsequently, COMPANY shall exercise the option to terminate contract by giving 07 days notice. Such CONTRACTOR shall be put on holiday as per the Banning Policy of OIL [available at www.oil-india.in].		In the event CONTRACTOR rectifies its non- performance to the satisfaction of the COMPANY, the option of termination may not be exercised by the COMPANY. If however, CONTRACTOR repeats non-performance subsequently, COMPANY shall exercise the option to terminate contract by giving 07 days notice. Such CONTRACTOR shall be put on holiday as per the Banning Policy of OIL [available at www.oil- india.in].	

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
8	Clause 45.0 Pg.No. 97 of 558	In such an event (i.e. termination under Article No. 44.4 to 44.9 above), the contract shall stand terminated and shall cease to be in force from the date of such notification by the COMPANY. Thereafter the CONTRACTOR shall stop forthwith any of the work then in progress, except those work which the COMPANY may, in writing, require to be done to safeguard any property or work, or installations from damages, and the COMPANY may take over the remaining unfinished work of the CONTRACTOR and complete the same through a fresh CONTRACTOR or by other means, at the risk and cost of the CONTRACTOR, and any of its sureties if any, shall be liable to the COMPANY	Termination terms including financial liability shall be as per the contractual obligation agreed between the COMPANY & CONTRACTOR. Post termination, if the COMPANY engages with any third party, any associated costs shall not be borne by CONTRACTOR.	In the event of termination under Articles 44.4 to 44.9 above, the Contract shall stand terminated and shall cease to be in force from the date of such notification by the COMPANY after following due termination process. Upon termination, the CONTRACTOR shall immediately cease all work in progress, except for any work that the COMPANY may, in writing, direct to be completed to safeguard property, work, or installations from damage. The COMPANY may then take over the remaining unfinished work and complete it through a new CONTRACTOR or by other means. In such cases, the COMPANY shall bear the cost of engaging a third party and any associated costs, and these shall not be charged to or borne by the CONTRACTOR. Any excess cost incurred by the COMPANY in completing the work over and above the cost specified in the schedule of quantities and rates/prices shall be borne by the COMPANY, and the CONTRACTOR shall not be liable for such excess cost.	Tender conditions Prevail

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
		for any excess cost occasioned by such work having to be so taken over and completed by the COMPANY over and above the cost at the rate/cost specified in the schedule of quantities and rates/prices.			
9	Clause 5.2 Pg.No. 104 of 558	Topographical Survey With Contours and Soil Investigation Report: Will be uploaded before Pre bid meeting	We kindly request that the Topographic Survey with Contours, including the HFL and the Soil Investigation Report be provided at the earliest and included as part of the tender document. These documents are critical for accurate site assessment and design preparation, enabling bidders to account for the specific conditions of the location in the civil estimates. It is also recommended that a clause be included requiring all civil works designs and assumptions to be certified by a Chartered Engineer in the tender submission to ensure the	The CONTRACTOR shall submit a Chartered Engineer's certificate along with its estimation details, confirming that the civil estimation of the CONTRACTOR has duly considered the Soil Investigation Reports & Topographic Survey provided as per the tender. During the tender evaluation stage if the COMPANY finds that the CONTRACTOR has not submitted/ taken into consideration Chartered Engineer's recommendations, then it may decide to disqualify the CONTRACTOR.	Please refer Corrigendum - 2

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
			reliability and accuracy of engineering considerations.		
10	Clause 5.5 Pg.No. 106 of 558 Clause 7.8 Pg.No. 163 of 558	Statutory and Other Requirements Indicative List of Statutory Permissions / Licenses / Sanctions / NOC	The list of statutory permissions and approvals in the tender document includes critical permits such as Environmental Clearance (EC), Consent to Establish, and others. As obtaining these statutory approvals is typically the responsibility of the COMPANY, we seek clarification on the role of the EPC CONTRACTOR in this context. Specifically, while the responsibility for obtaining these statutory permits and approvals rests with the COMPANY, the CONTRACTOR may be required to assist in the process.	"Obtaining all statutory permissions, licenses, sanctions, and NOCs listed shall remain the COMPANY's responsibility. The CONTRACTOR shall assist the COMPANY in seeking the requisite approvals, including preparing all necessary paperwork, documentation, and liaising with relevant authorities to facilitate the approval process. The COMPANY shall provide reasonable support and assistance, including, but not limited to, providing requisite documents, letters of authorization, and coordination with stakeholders, as necessary. Both parties shall cooperate in good faith to ensure the timely completion of the approval process."	5.5.1 Please refer Corrigendum - 2
11	Clause 5.8 Pg.No. 111 of 558	List of Major Facilities	The list of major equipment needs to be updated to align with the Scope of Work and Price Schedule. The current list does not match the specified requirements. The updated list accurately reflects the equipment outlined in the		The list is indicative only as written in the clause

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
			Scope of Work and also the items detailed in the Price Schedule.		
12	Clause 5.14.4 5.14.5 Pg.No. 121 of 558	5.14.4: Spares list for each equipment will be finalized during Detailed Engineering. All spare parts furnished by contractor shall be wrapped and packaged so that they will be preserved in original as-new condition under normal conditions of storage. For 10 years O&M, Contractor may use spares from above, however will have to replenish those spares to the original quantity by the contractor immediately after consumption. And after 10 years O&M period, all spares as per original list and qty shall be handed over to OIL. 5.14.5: Contractor while ordering of all Equipment shall ensure that the	As the O&M period is limited to 10 years, we request confirmation that the supply of spare parts will be ensured for the duration of the 10-year O&M contract. Beyond this period, it is understood that the OWNER shall liaise directly with the manufacturer for spare parts procurement. Could you please confirm that this is the intended arrangement? We believe that guaranteeing the supply of spare parts for 25 years or the entire life of the equipment is not practical, as manufacturers often change production lines, discontinue models, or revise product standards within a shorter cycle (typically 7–15 years). Given that the O&M obligation is limited to 10 years, the requirement for a 25-year guarantee places an undue	5.14.4: "Obtaining and maintaining spares for the equipment for the duration of the 10-year O&M period shall be the responsibility of the CONTRACTOR. After the 10-year O&M period, all spare parts as per the original list and quantity shall be handed over to OIL. The OWNER shall directly liaise with the manufacturer for any future spare parts supply beyond the O&M period." 5.14.5: "The CONTRACTOR shall ensure the guarantee of the supply of spare parts for a period of 10 years, aligning with the O&M contract duration. After the O&M period, the OWNER may directly liaise with the manufacturer for spare parts supply."	5.14.4. Tender conditions Prevail 5.14.5 Please refer Corrigendum - 2

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
		guarantee of supply of spares for a period of 25 years or entire life of the equipment shall be obtained by the Contractor. The contractor shall submit the written compliance to the OWNER in this regard.	burden on the CONTRACTOR. Therefore, we request that the guarantee for spare parts be limited to the 10-year O&M period, with an option for the OWNER to liaise directly with the manufacturer for further spares supply after that period.		
13	Clause 5.22 Pg.No. 129 of 558	Bidder shall guarantee the injection of Bio Gas at the purification point should be equal to or more than 425 NM3 and ensure that CH4 loss from raw Biogas at inlet of gas purification system to purified CBG delivered to gas network shall not be more than 3%.	Correction in Clause	Bidder shall guarantee the injection of Bio Gas at the purification point should be equal to or more than 425 NM3 per MT of the Volatiles Solids (VS) in the Feed Slurry to the Digester and ensure that CH4 loss from raw Biogas at inlet of gas purification system to purified CBG delivered to gas network shall not be more than 3%.	Tender Coditions Prevails
14	Clause 5.26 Pg.No. 129 of 558	Procedure for Checking Guaranteed Production of Biogas	The current clause mandates a 96-hour PGTR (Performance Guaranteed Test Run) for biogas production, which may not be sufficient to account for variations in the feed quality.		Please refer Corrigendum - 2

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
15	Clause 5.27 Pg.No. 133 of 558	Guarantee and Price Discount:	Request to addition of the clause to SCC	The following clauses have to be included in Special Conditions of Contract: a) The quality variation of volatile solids in the incoming waste shall be covered by operating lab scale digester in parallel to the large scale digesters . Once stabilization is complete and when PGTR starts, the biogas output from the lab scale digesters shall be used as a baseline to compare the performance of the large scale digesters. b) The technical specifications for the lab scale digesters including the gas measurement apparatus and its accessories shall be added to the scope of work and the cost for the same shall be included in the price bid. c) The Contractor will take the responsibility of the startup and operation of the lab scale digester in parallel to the large scale digesters when commissioning starts and must measure the biogas output from the lab scale digesters on a daily basis.	Please refer Corrigendum - 2

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
				d) If the biogas output measured from the lab scale digesters is lesser than the guaranteed biogas yield quoted by the contractor, then the guarantees shall be revised/corrected to the biogas output measured from the lab scale digesters. e) If the biogas output measured from the lab scale digesters is more than the guaranteed biogas yield quoted by the contractor, then the existing guarantees for biogas yield, O&M cost, electricity cost shall remain the same. The increase in O&M, electricity costs for purifying the additional biogas generated shall be compensated by the incremental revenue and the net revenue shall be realized by OIL.	
16	Annexure-6 Pg.No. 547 of 558	The Bidder should enclose the following drawings with the bid: i. Project layout ii. Single line schematic diagram of electrical system for grid interfacing	Clarify, apart from the layout, are the highlighted documents mandatory during the bidding stage?	The Bidder should enclose the following drawings with the bid: i. Project layout Additional documents like : ii.Single line schematic diagram of electrical system for grid interfacing	Please refer Corrigendum - 2

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
		iii. General drawings of electrical installations including unit substations control & metering station, etc. iv. General arrangement drawings and circuit diagrams of major electrical equipment.		iii. General drawings of electrical installations including unit substations control & metering station, etc. iv. General arrangement drawings and circuit diagrams of major electrical equipment. Shall be submitted by the L1 bidder as mutually agreed between the Parties	
17	Page 121 Clause 5.14.5	CONTRACTOR while ordering of all Equipment shall ensure that the guarantee of supply of spares for a period of 25 years or entire life of the equipment shall be obtained by the CONTRACTOR. The CONTRACTOR shall submit the written compliance to the OWNER in this regard.	Supply of spares shall be ensured up till the CONTRACTOR is involved for O&M of the plant	CONTRACTOR while ordering of all Equipment shall ensure the guarantee of supply of spares for the O&M period of 10 (ten) years shall be obtained by the CONTRACTOR. The CONTRACTOR shall submit the written compliance to the OWNER in this regard. Beyond this period, the OWNER shall liaise directly with the manufacturers or suppliers for spare parts procurement post expiry of O&M period.	Deleted Please refer Corrigendum - 2
18	Page 105 Clause 5.3 (iii) Site Visit / Site Details	The bidders shall carry out Mandatory site visit on the designated slots published along with the tender documents. Bids submitted by vendors	A competent representative from the OIL shall be present at site who is familiar with local conditions and coordinate with local Govt Authorities to provide site specific information . To ensure that there are no issues	Pl add – A competent representative from OIL will be present during the Site visit who will assist the bidder in obtaining all site specific information and ccordianate with local Govt authorities in obtaining site specific information related to power supply , water supply ,	Please refer Corrigendum - 2

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
		who have not carried out mandatory site visit, the bidder will be solely responsible for any error/ omission in their offer. iv. The site visit can be undertaken be from 09:30 Hrs to 16:00 Hrs. The contact details of OIL's representative is as under: Name: Mobile Number: E mail Id: v. The detailed topography survey report and contouring of the land as well as soil test report shall be provided to the bidders. vi. The bidder should make pre-bid site visits to the proposed location at	with local communities and villagers. The schedule for the visit shall be informed.	permissions, if any , for project construction.	
19		Information to be Provided a) Bidder shall provide Approach & Methodology used for processing of segregated MSW and to get maximum output of CBG in BRS_17 b) Bidder shall provide performance chart of running plant for estimated output	a) Approach and Methodology for Maximum CBG output shall also include Waste Characterisation , BMP Tests , seasonal variations , composition of Organic matter , VS	Please add: a)Approach and Methodology for Maximum CBG output shall also include Waste Characterisation , BMP Tests , seasonal variations , composition of Organic matter , VS Solids , BMP analysis. Please clarify b)Bidder shall provide performance chart of the running	Tender Conditions Prevail

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
		verses actual output or copy of PGTR test report can be enclosed. c) Owner/Consultant may visit CBG/Biogas plants (considered in Eligibility criteria) during technical evaluation of the bids. Though all cost of travelling. Boarding will be borne by owner yet arrangement for visit required to be made by bidder which interalia includes plant visit, access to plant performance. Proper person needs to available at site during such visit	Solids , BMP analysis. Please clarify b) Bidder shall provide performance chart of the running plant for a specific period . Please clarify. c) Owner / Consulatant visit shall be decided with minimum 7 days notice.	plant for a specific period . c)Owner / Consulatant visit shall be decided with minimum 7 days notice	
20	Page 162 Clause 7.7	OIL's responsibility :	Waste Characterisation which includes Organic fraction composition and analysis , Volatile Solids composition and analysis , Bio Methane Potential Test	OIL will provide reports on MSW-SOW characteristic comprising of Organic fraction composition and analysis , Volatile Solids Composition and analysis , Bio methane potential	Please refer Corrigendum - 2
21	Page 124 5.16.2.	Payment Against Approval of Design , Drawings , Data Sheet during the execution stage.	OIL shall provide the List of Drawings to be submitted for Approval and For information . Also the time required for approval shall be max 15 days , beyond which Technical	OIL will provide the List of Drawings to be provided for APPROVAL and FOR INFORMATION category in bid documents. Max 15 days will be taken for approval of drawings / technical documents beyond which the	The list of drawinga are to be submitted by succesfull bidder to OIL / PMC for approval

ANNEXURE-B

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for Amendment	OIL's reply
			Documents will be deemed to be approved	documents will be deemed to be approved.	
22	Page 4 Point xxi	Pre-bid Meeting Conference	Prebid meeting shall be organized Online / Virtual for the convenience of the bidders	For those bidders who are unable to attend Prebid meeting physically , Online / Virtual mode meeting is acceptable to OIL.	Link provided

ANNEXURE-B

(B) Response to queries of Khilari Infrastructure Pvt Ltd.

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for the Amendment	OIL's reply
1	Clause 3.3.1	Shall have prior experience of setting up and operation and maintenance of Segregated MSW waste to Biagas/Bio-CNG plant including ETP for at least 3 (three) year of O&M experience in last 1O Financial years of following capacity. The said Plant should be in operation at the time of bidding One Plant of minimum 240 TPD Feedstock capacity; **OR** Two Plants of minimum 150 TPD Feedstock capacity; **OR** Three Plants of minimum 120 TPD Feedstock capacity	Relaxation requested	Shall have prior experience of setting up and operation and maintenance of segregated OR Unsegregated MSW waste to Biogas/Bio-CNG plant including ETP for at least 2 (two) year of O&M experience in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding. 1 Plant of minimum 100 TPD feedstock capacity; **Or** 2 Plants of minimum 75 TPD feedstock capacity. **Or** 3 Plants of minimum 50 TPD feedstock capacity;	Please refer Corrigendum - 2

ANNEXURE-B

(C) Response to queries of Nutzen Engineering Solutions LLP

Sr. No.	Clause No.	Existing Provision	Clarification Required	Suggested Text for the Amendment	Clarification
1	Clause 3.3.1	Shall have prior experience of setting up and operation and maintenance of Segregated MSW waste to Biagas/Bio-CNG plant including ETP for at least 3 (three) year of O&M experience in last 1O Financial years of following capacity. The said Plant should be in operation at the time of bidding One Plant of minimum 240 TPD Feedstock capacity; **OR** Two Plants of minimum TPD Feedstock capacity; **OR** Three Plants of minimum 120 TPD Feedstock capacity	A relaxation is being sought for technical qualification	Shall have prior experience of setting up and operation and maintenance of Unsegregated or segregated MSW waste to Biogas/Bio-CNG plant including ETP for at least 2 (two) year of O&M experience in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding. One Plant of minimum 100 TPD feedstock capacity; **OR** Two Plants of minimum 75 TPD feedstock capacity. **OR** Three Plants of minimum 50 TPF feedstock capacity;	Please refer Corrigendum - 2

ANNEXURE-B

(D) Response to queries of Renergy Dynamics Pvt Ltd

No.	Clause No	Existing Provision	Clarification Required	Suggested text for the amendment	OIL's reply
1.	**IFB No. CQI8171P25**	Date and Time of Submission	Extension for submission of Bid	Please provide the extension for submission of Bid at least 15 days from response to queries	Please refer Corrigendum - 2
2.	3.2	**ELIGIBILTY CRITERIA**	The bidder must be incorporated in India and must maintain more than or equal to 20% local content (LC) for the offered services to be eligible to bid against this tender	We understand that Bidder should be registered anywhere in India instead of tender's state. OR Bidder will provide the undertaking for 20% local contents to participate in Bid. Please confirm the understanding	Tender conditions Prevail
3.	3.2	**ELIGIBILTY CRITERIA**	The bidder must e incorporated in India and must maintain more than or equal to 20% local content (LC) for the offered services to be eligible to bid against this tender	If above, understanding is incorrect, Bidder can make JV/Consortium with local (Firm register in Assam) firm and participate in Bid. Please confirm he understanding	Tender conditions Prevail
4.	3.3.1	**EXPERIENCE OF THE BIDDER**	Shall have prior experience of setting up and operation and maintenance of Segregated MSW waste to Biogas/Bio-CNG plant including ETP for at least 3 (three) year of O&M experience in the last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding.	We would like to bring your attention that we established in April 2023 and all projects are under execution stage. Hence, requesting to allow to participate in the bid due to experience to process the MSW.	Please refer Corrigendum - 2

ANNEXURE-B

No.	Clause No	Existing Provision	Clarification Required	Suggested text for the amendment	OIL's reply
5.	3.3.1	**EXPERIENCE OF THE BIDDER**	Shall have prior experience of setting up and operation and maintenance of Segregated MSW waste to Biogas/Bio-CNG plant including ETP for at least 3 (three) year of O&M experience in last 10 Financial years of following capacity. The said Plant should be in operation at the time of bidding.	We would like to bring your attention that we established in April 2023 and from onwards, we are executed the 6 projects (Agri based and MSW based) which we nightlight via separate email. We are executed 3 MSW Projects 1. Process of 350TPD segregated MSW at Paraygraj 2. Process of 350TPD segregated MSW at Navsari 3. Process of 1000TPD segregated MSW at Hyderabad All above projects are under execution stage. Hence, Bidder requested to allow the experience of	Please refer Corrigendum - 2
6.	3.3.1	**Notes on EC Clause 3.3 above:**	f) Bid from Limited Liability Partnership (LLP) /joint Venture (JV)/Consortium arenot acceptable	Bidder requested to allow the JV/Consortium in case ongoing projects are not acceptable by consultant/client.	Tender conditions Prevail
7.	3.4	**FINANCIAL CRITERIA OF BEC**	The bidder must have annual financial turnover from operation of **Rs. 48.95 Crore** in any of the preceding three (3) financial years reckoned from the original bid closing date as per the Audited Annual Reports	We would like to bring your attention that we established in April 2023. Hence, requested to allow to participate in bid due to non-availability of 3 years annual reports.	Tender conditions Prevail

ANNEXURE-B

(E) Response to queries of GPS Renewables

No.	Clause No	Existing Provision	Clarification Required	Suggested text for the amendment	OIL's reply
1	7.9.3	Pg. 166 Requirement of Wind-Shifter after the Organics Extractor	Based on our experience, we would suggest to remove the requirement of a wind shifter as OIL can save on CAPEX.	Removal of the requirement of a Wind shifter.	Tender Conditions Prevails
2	7.9.5	Pg. 174 Design Biogas Flow of a minimum of 45,000 Nm3/day	The Design Biogas Flow requirement is mentioned as 45,000 Nm3 per Day or 150 Nm3 per Tonne MSW. This is on the higher side and is not practically achievable. We would request OIL to clarify if this requirement is correct?	The Design Biogas Flow requirement should ideally be in the range of 25,000 Nm3 per Day to 27,000 Nm3 per Day. We would request OIL to reconsider.	Tender Conditions Prevails
3	7.9.3	Pg. 166 The Organics Extraction System	We request clarification from OIL on whether we can use Trommels as part of the Organics Extraction Module.	NA	Tender Conditions Prevails

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MAGNETIC 3°
NORTH

TBM-1
E= 3000.001
N= 2002.505
L= 101.447

TBM-2
E= 3013.817
N= 1995.721
L= 101.892

TBM-3
E=3005.399
N=1988.463
L=100.79

TBM-4
E=2999.115
N=1979.911
L=100.907

AREA=
5602.096 SQM.

BUILDING

TIN SHED

BUILDING

STORE ROOM

STORE ROOM

STORE ROOM

DUMP AREA

DUMP AREA

BT ROAD

BT ROAD

BT ROAD

BT ROAD

BT ROAD

<< TO SBI COLONY

<< TO TANKAPANI ROAD

TO PURI BYPASS ROAD BHUBANESWAR >>

SECURITY

FENCING

CT ROAD

CT ROAD

CT ROAD

POND

TOTAL SURVEYED
AREA= 61123.912 SQM.
= 15.104 ACRES

THIS AREA

KEY PLAN

TBM DETAIL OF FOR CBG PLANT AT BHUVNESHWAR, ODISHA

SR. NO.	GLOBAL EASTING	GLOBAL NORTHING	LEVEL	LOCAL EASTING	LOCAL NORTHING	Text Content
1	381907.9	2241643.075	101.447	3000.001	2002.505	TBM-1
2	381922	2241636.753	101.892	3013.817	1995.721	TBM-2
3	381913.8	2241629.218	101.892	3005.399	1988.463	TBM-3
4	381907.8	2241620.453	101.892	2999.115	1979.911	TBM-4

NOTE:
(1) ALL DIMENSIONS AND LEVELS ARE IN METER UNLESS NOTED OTHERWISE.
(2) NORTH SHOW ON THE DRAWING IS ACTUAL.
(3) MAX. LEVEL = 107.22
(4) MIN. LEVEL = 98.118
(5) AVG. LEVEL = 100.307
(6) AREA = 61123.912 SQM.=15.105 ACRES
(7) GRIL LEVEL = 5X5M. & CONTOUR = 0.5M

LEGEND

1	AEROTION TANK	
2	BED LEVEL	137.554
3	BORE HOLE/BORE WELL	
4	BUILDING/ SHOP/ STRUCTURE	
5	BOUNDARY WALL	
6	BT ROAD	
7	BRICKS ROAD	
8	CONCRETE ROAD	
9	CART TRACK	
10	CULVERT/BRIDGE	
11	DRAIN WITH INVERT LEVEL	200
12	Proposed Water Pipe Line	
13	PIPE LINE	
14	ELECTRIC POLE/DOUBLE POLE	
15	FEED TANK, FIRE WATER TANK	
16	PUMP HOUSE	
17	FENCING WIRE	
18	FOREST Land	
19	GATE	
20	HAND PUMP	
21	HIGH TENSION ELECTRIC POLE	
22	LIGHT POLE/JUNCTION LIGHT POLE	
23	MAN HOLE	
24	OFC PILLAR LINE	
25	ROAD LEVELS	124.975
26	RAILWAY ELECTRIC POLE	
27	SIGN BOARD	
28	TBM WITH DETAIL	
29	BENCH MARK PILLAR	
30	TELEPHONE TOWER	
31	TAP OF WATER PIPELINE	
32	TREE	
33	TEMPLE	
34	TRANSFORMER	
35	TOILET BUILDING	
36	TIN SHED	
37	WATER TANK	
38	WATCH TOWER	

Customer
Oil India Ltd.
(A GOVERNMENT OF INDIA ENTERPRISE)
(Bhupneshwar, Odisha)

Submitted By:-
BHASKRAM JYOTISH ANUSANDHAN KENDRA Pvt. Ltd.
OFFICE NO.03, BUILDING NO.02, GOKULDHAM CHS LTD,
SUKAPUR, NEW PANVEL, DISTRICT-RAIGAD,
MAHARASHTRA-410206
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Project
Topographical Survey Plan for CBG Plant at Bhuvneshwar, Odisha

Title
TOPOGRAPHY SURVEY DRAWING.

DESCRIPTION	NAME	SIGNATURE	DATE
PREPARED BY :	MR. ____		
CHECKED BY :	MR. ____		
APPROVED BY :	MR. ____		

Drawing No. BJAK/TSOIL-24/2024
Sheet 01/02
Date DEC. 2024
Scale NTS
Paper Size A0
Rev. R0

SOIL INVESTIGATION WORK AT BHUBANESWAR, ODISHA

Document No.- BJAKPL/01/2025/03
Month & Year - January, 2025

SUBMITTED TO:

OIL INDIA LIMITED, BHUBANESWAR, ODISHA

SUBMITTED BY:

BHASKRAM JYOTISH ANUSANDHAN KENDRA PVT.LTD

(ISO 9001:2015 & 45001: 2018 Certified Organization)

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1.0 INTRODUCTION:

Oil India Limited has proposed **Soil Investigation Work at Bhubaneswar, Odisha.** The purpose of the investigation was to determine the sub soil stratification, geotechnical information & safe bearing capacity, so as to provide information that will assist the structural engineers in the design of the foundations and the relevant works. The work was awarded to M/s Bhaskram Jyotish Anusandhan Kendra Pvt. Ltd. vide letter number: BD(G)/02/04/2024/713 dated 16.12.2024.

Objectives:

- To determine the probable sub surface conditions such as stratification, denseness or hardness of the strata, position of ground water table etc.
- To give probable range of safe bearing capacity for the structure. To accomplish these purposes, the study was conducted in the following phases.
- Drilling boreholes in order to determine site stratification and to collect disturb & undisturbed soil samples for laboratory testing.
- Testing on selected soil samples in the laboratory to determine physical and engineering properties of the soil samples.
- Analyzing all field and laboratory data in order to develop engineering recommendations for foundation design and construction.

Field work of borehole and other tests are summarized as under.

Table No.-1 (Borehole Summary)

S. No.	Bore No.	Termination Depth (m)	Water Table (EGL) (m)	Local		RL (m)	Date of field work
				Northing	Easting		
1	BH-01	20.00	1.00	1967.917	2980.907	99.671	21.12.2024
2	BH-02	20.00	0.98	1923.305	2976.793	99.294	23.12.2024
3	BH-03	20.00	1.05	1882.930	2909.884	99.661	24.12.2024
4	BH-04	20.00	1.02	1846.508	2912.980	99.194	22.12.2024
5	BH-05	20.00	0.95	1761.013	2818.097	98.183	25.12.2024

The job was conducted under the guidance and supervision of representatives from Oil India Limited, Bhubaneswar, Odisha, and M/s Bhaskram Jyotish Anusandhan Kendra Pvt. Ltd.

2.0 GEOLOGY:

2.1 Geography:

Bhubaneswar is the capital and the largest city of the Indian state of Odisha. It is located in the Khordha district. The city cordinates at 20.27°N and 85.84°E and is situated in the eastern coastal plains. In the southwest of the city lies the Mahanadi River. At an average altitude of 45 m (148 ft) above sea level it is also surrounded by the Daya River and the Kuakhai River in the south and east respectively. Chandaka Wildlife Sanctuary and Nandankanan Zoo lie in the western and northern parts of Bhubaneswar. River Mahanadi that waters the region forms the northern boundary of Bhubaneswar metropolitan area. According to the census of 2011 India, Bhubaneswar had a population of 837,737.

2.2 Geomorphological Conditions:

The deltaic alluvial soil in the eastern part of the district and the red loamy soils in the northwestern part of the district come under this class. It consists of a wide range of soils including mixed red and black soils, red earth, red loamy soils, red sandy soils, red gravelly soils and other alluvial soils. The red soils are light textured, usually devoid of lime concretions deficient in nitrogen, phosphate & organic matter. The hilly terrain is prominent in southwestern and western part. The area is underlain by Precambrian hard rocks and major part of this terrain is capped by laterities and lateritic gravels.

2.3. Temperature & Rainfall:

The district is characterized by a tropical monsoon climate having three distinct seasons in a year, viz winter, summer and rainy seasons. May is the hottest month with mean daily maximum temp of 380 C, while December is the coldest month with mean daily temperature of 15.70 C. The normal annual rainfall is 1449.1mm & the annual average rainfall is 1436.1mm. The relative humidity varies from 48 to 85 % at Bhubaneswar. The mean monthly potential evapotranspiration values of the district ranges from 57mm in January to 284mm in May.

2.4 Seismicity:

Bhubaneswar, Odisha comes under seismicity zone III. Seismic activity is another factor influencing the area's geomorphology, as the region lies in a seismically active zone near the Himalayas. This geological activity has led to minor landform changes, impacting soil stability and water retention capabilities in certain areas.

3. FIELD WORK:

3.1 Boreholes

Five boreholes were drilled up to the depth of 20.00m from the existing ground level (EGL). The work was carried out in accordance with IS: 1892 – 2021. The location of the borehole was identified in due consultation with concerned officials of the client.

3.2 Disturbed Samples

Disturbed representative samples were collected, logged, labelled and placed in polythene bags.

3.3 Undisturbed Samples

Undisturbed soil samples are collected in 100 mm diameter thin-walled sampler (Shelby tube) from the borehole at various depth.

3.4 Water Samples

The water table below the existing ground level is measured in all the boreholes. The table was encountered in the borehole as indicated above at the time of sub surface investigation carried out in the month of December, 2024. The observations from the boreholes at "SITE" indicated the presence of water table from 0.95m to 1.05m of depth the existing ground level. However, water table has been considered at EGL for design calculation.

3.5 Standard Penetration Test:

The standard penetration tests were conducted in bore by using Auto Trip Hammer as per IS: 2131: 1981 (Reaffirmed 1987). The split spoon sampler resting on the bottom of bore hole is allowed to sink under its own weight, then the split spoon sampler is seated 15 cm with the blows of hammer falling through 750mm. The driving assembly consists of a driving head and a 63.5 kg weight. It is ensured that the energy of the falling weight is not reduced by friction between the drive weight and the guides or between ropes. The rods to which the sampler is attached for driving are straight, tightly coupled and straight in alignment. Thereafter the split spoon sampler is further driven by 30cm. The number of blows required to drive each 15cm penetration is recorded. The first 15cm of drive considered as seating drive. The total blows required for the second and third 15cm penetration is termed as a penetration resistance - N value.

4.0 LABORATORY TESTING

4.1 The following laboratory tests were performed on undisturbed and disturbed soil samples as per relevant Indian Standards for identification, classification purposes and to obtain other relevant engineering properties of the sub-surface formation.

A. Tests on Soil Samples:

Summary of IS code to be carried out for the Project		
Sl. No.	**Type of Test**	**Standard Code followed for carrying out the test**
A	**Field Test**	
1	Standard Penetration Test (SPT)	IS: 2131: 1981
B	**Tests on Soil (Laboratory Test)**	
1	Particle Size Distribution	IS 2720; P-4
2	Hydrometer test	IS 2720; P-4
3	Atterberg Limits	IS 2720; P-5 & 6
4	Specific Gravity	IS 2720; P-3
5	Moisture content	IS 2720; P-2
6	Direct Shear Test	IS 2720 (Part 13)
7	Consolidation Test	IS 2720 (Part 15)
8	Unconfined Compressive Test	IS 2720 (Part 11)

4.2 All these tests are conducted as per relevant IS Code where such exists and the test results are tabulated in Tables attached with the report.

5.0 CONCLUSIONS AND RECOMMENDATIONS:

5.1 Subsurface strata at investigation site at Bhubaneswar, Odisha is found to consist of landfill/scrap/filled-up soil up to 7.50m from existing ground level (EGL).

5.2 Removal of landfill/scrap/filled-up soil up to 7.50m from existing ground level (EGL) is recommended.

5.3 Natural ground level (NGL) is found at the depth of 7.50m from EGL. From NGL, the soil is found to be consist of medium plasticity clay followed by silty sand and poorly graded sand up to 20.00 m termination depth below EGL.

5.4 The ground water table was encountered in the borehole at the time of investigation (December-2024) and the same has been reported in relevant borehole details. Due to the potential for significant groundwater fluctuations from tidal influence and seasonal variations, the water table is conservatively assumed at ground level (EGL) for design calculations.

5.5 IS 6403 and IS 12070 are applicable for shallow foundations on soil stratum rock stratum, respectively. The permissible settlement will be 25mm and 12mm in soil and rock stratum, respectively.

5.6 The bearing capacity of different foundations placed at a particular depth below the Natural Ground Level (NGL) has been reported in Annexure- C of the report.

5.7 It shall be ensured that all foundations rest on one type of subsoil layer to minimize the effect of differential settlements.

5.8 Recommendations on the type of cement shall be as per table-4 of IS 456.

5.9 The results of the laboratory tests are incorporated in para 8 of the report. The designer may adopt suitable values as per requirement.

5.10 For deep excavations, the necessary code of safety shall be referred to as mentioned in IS: 3764-1992. Excavation shall be carried out with proper retention system.

5.11 For excavation and construction of foundation, proper dewatering and drainage system shall be ensured. For the design and analysis of the dewatering system, IS 9759:1981 shall be referred.

5.12 This report documents the factual data derived from field records and laboratory analyses performed during the geotechnical investigation at the aforementioned site. The interpretations and conclusions presented herein are based solely on the samples obtained and the assumption of consistent subsurface conditions. In the event that

variations in subsurface strata or groundwater conditions are encountered during excavation or construction activities, M/s BJAK should be consulted to reassess and, if required, amend the recommendations provided in this report.

For BHASKRAM JYOTISH ANUSANDHAN KENDRA PVT. LTD.

Prepared By

(Dr Ankit Kumar)
PhD *(Geotechnical Engineering)*
Thapar Institute of Engineering & Technology

For BHASKRAM JYOTISH ANUSANDHAN KENDRA PVT. LTD.

AUTHORIZED SIGNATORY

6.0 Lists of Annexures:

ANNEXURE 'A': STRATIFICATION

ANNEXURE 'B': OBSERVED & CORRECTED N-VALUES

ANNEXURE 'C': SUMMARY OF SBC (ISOLATED-SQUARE)

Annexure A

Soil Stratification of borehole

Bore Hole No.	Depth (m)	Stratifcation	Observed SPT value
BH-01	0.00-7.50	Brownish Intermediate clay having medium plasticity (CI)	10,2,3,7
	7.50-12.00	Brownish loose clayey sand having low plasticity (SC)	11
	12.00-16.50	Brownish medium dense non-plastic silty sand(SM)	53,62,65
	16.50-20.00	Brownish poorly graded silty sand having no plasticity (SP)	70,82
BH-02	0.00-7.50	Brownish Intermediate clay having medium plasticity (CI)	12,13,13,16
	7.50-10.50	Brownish loose clayey sand having low plasticity (SC)	21
	10.50-16.50	Brownish medium dense non-plastic silty sand(SM)	29,37,41
	16.50-20.00	Brownish poorly graded silty sand having no plasticity (SP)	55,67
BH-03	0.00-7.50	Brownish Intermediate clay having medium plasticity (CI)	15,19,21,26
	7.50-10.50	Brownish loose clayey sand having low plasticity (SC)	33
	10.50-13.50	Brownish medium dense non-plastic silty sand(SM)	41
	13.50-16.50	Brownish Poorly graded medium dense silty sand (SP-SM)	44,48
	16.50-20.00	Brownish poorly graded silty sand having no plasticity (SP)	53,69
BH-04	0.00-7.50	Brownish Intermediate clay having medium plasticity (CI)	17,22,29,33
	7.50-10.50	Brownish loose clayey sand having low plasticity (SC)	42
	10.50-15.00	Brownish medium dense non-plastic silty sand(SM)	47,52
	16.50-20.00	Brownish Poorly graded medium dense silty sand (SP-SM)	56,64,78
BH-05	0.00-7.50	Brownish Intermediate clay having medium plasticity (CI)	10,28,31,35
	7.50-10.50	Brownish loose clayey sand having low plasticity (SC)	37
	10.50-15.00	Brownish medium dense non-plastic silty sand(SM)	40,44
	15.00-18.00	Brownish Poorly graded medium dense silty sand (SP-SM)	57,65
	18.00-20.00	Brownish poorly graded silty sand having no plasticity (SP)	77

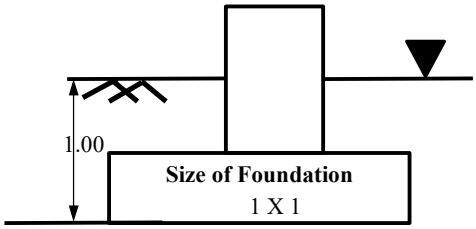
ANNEXURE-B

BH.No/BR.No.	Depth (m)	N - VALUE			N - Value for last 300mm	C_N	N'	Final corrected (N') value after dilatancy correction (N'')
		N1 (0-150) mm	N2 (150-300) mm	N3 (300-450) mm				
BH-01	0.50	4	5	5	10	1.00	10.0	10
	1.50	1	1	1	2	1.00	2.0	2
	4.50	1	1	2	3	1.00	3.0	3
	7.50	2	3	4	7	1.00	7.0	7
	10.50	3	4	7	11	1.00	11.0	11
	13.50	16	19	34	53	1.09	58.0	36
	15.00	23	24	38	62	1.04	64.6	40
	16.50	24	26	39	65	1.00	64.8	40
	18.00	25	28	42	70	0.95	66.5	41
	20.00	27	36	46	82	0.92	75.1	45
BH-02	0.50	2	5	7	12	1.00	12.0	12
	1.50	1	4	9	13	1.00	13.0	13
	4.50	3	6	7	13	1.00	13.0	13
	7.50	4	7	9	16	1.00	16.0	16
	10.50	7	9	12	21	1.00	21.0	21
	13.50	11	14	15	29	1.09	31.7	23
	15.00	13	18	19	37	1.04	38.6	27
	16.50	13	19	22	41	1.00	40.9	28
	18.00	14	21	34	55	0.95	52.3	34
	20.00	16	24	43	67	0.92	61.3	38
BH-03	0.50	3	6	9	15	1.00	15.0	15
	1.50	4	8	11	19	1.00	19.0	19
	4.50	6	9	12	21	1.00	21.0	21
	7.50	8	12	14	26	1.00	26.0	26
	10.50	9	14	19	33	1.00	33.0	33
	13.50	12	16	25	41	1.09	44.8	30
	15.00	14	18	26	44	1.04	45.9	30
	16.50	16	21	27	48	1.00	47.9	31
	18.00	18	25	28	53	0.95	50.4	33
	20.00	20	31	38	69	0.92	63.2	39
	0.50	2	7	10	17	1.00	17.0	17

BH-04	1.50	5	9	13	22	1.00	22.0	22
	4.50	8	13	16	29	1.00	29.0	29
	7.50	9	15	18	33	1.00	33.0	33
	10.50	11	19	23	42	1.00	42.0	42
	13.50	13	20	27	47	1.09	51.4	33
	15.00	14	21	31	52	1.04	54.2	35
	16.50	15	23	33	56	1.00	55.9	35
	18.00	19	28	36	64	0.95	60.8	38
	20.00	21	34	44	78	0.92	71.4	43
BH-05	0.50	1	3	7	10	1.00	10.0	10
	1.50	6	13	15	28	1.00	28.0	28
	4.50	9	14	17	31	1.00	31.0	31
	7.50	11	15	20	35	1.00	35.0	35
	10.50	13	16	21	37	1.00	37.0	37
	13.50	14	17	23	40	1.09	43.8	29
	15.00	18	19	25	44	1.04	45.9	30
	16.50	19	29	28	57	1.00	56.9	36
	18.00	20	31	34	65	0.95	61.8	38
	20.00	23	35	42	77	0.92	70.5	43

Sample Calculation for Allowable Bearing Capacity (Isolated)

Ref : BH 1 at Depth 1.00



Width of Foundation (B)	:	1.00	m
Length of Foundation (L)	:	1.00	m
Depth of Foundation (D_f)	:	1.00	m
Shape of Foundation	:	Square	
Ground Water table (GWT)	:	At surface	
Natural Moisture Content (NMC)	:	12.75	%
Bulk Density of Soil (γ_b)	:	18.90	kN/m^3
Specific Gravity of Soil (G_s)	:	2.64	
Void Ratio	:	0.57	
Saturated Density of Soil (γ_{sat})	:	19.69	kN/m^3
Cohesion (c)	:	5.00	kN/m^3
phi (ϕ)	:	31.00	^{0}
Type of failure	:	General shear failure	
Factors of safety	:	2.5	

Ultimate Net Bearing Capacity

(a) Shear Criterion — As per IS 6403 : 1981 (Reaffirmed Year : 2021)

For General Shear Failure $Q_{nu} = c \times Nc \times Sc \times dc \times ic + q \times (Nq-1) \times sq \times dq \times iq + 0.5 \times B \times \gamma \times N\gamma \times S\gamma \times d\gamma \times I\gamma \times W'$

For Local Shear Failure $Q_{nu} = 0.67 \times c \times N'c \times Sc \times dc \times ic + q \times (N'q-1) \times sq \times dq \times iq + 0.5 \times B \times \gamma \times N'\gamma \times S\gamma \times d\gamma \times I\gamma$

$\phi' = \tan^{-1} \times 0.67 \times \tan \phi$

$\phi' = 21.90^0$

q = Total Surcharge Pressure at the Base Level of Foundation

$= \gamma_{sub} \times D_f$

$= 9.88$ kN/m^2

Factors considered

N_c	= 32.67	S_c	= 1.30	D_c	= 1.27	I_c	= 1
N_q	= 20.63	S_q	= 1.20	D_q	= 1.13	I_q	= 1
N_γ	= 25.99	S_γ	= 0.80	D_γ	= 1.13	I_γ	= 1
W'	= 0.5						

Qnu	= 881.00	kN/m^2
Qns	= 352.40	kN/m^2
	= 35.24	t/m^2

(b) Settlement Criteria — As per IS 8009 : Part 1 : 1976 (Reaffirmed Year : 2018)

Corrected SPT	= 14		
Settlement compute from SPT	= 16	mm	
Correction factor	= 0.5		
Actual settlement	$= \frac{Settlement\ compute\ from\ SPT}{correction\ factor\ (W')}$		
	$= \frac{16}{0.5}$		
	= 32	$mm/(kg/cm^2)$	
	= 0.78	kg/cm^2	
	= 7.81	t/m^2	For 25 mm settlement
	= 12.50	t/m^2	For 40 mm settlement

ANNEXURE - C

Allowable bearing Capacity (t/m^2)

BH No.	Depth (m.) from NGL	Size of footing	Shear Criteria. (t/m^2)	25 mm Settlement (t/m^2)	40 mm Settlement (t/m^2)	Recommended SBC (t/m2)
BH-1 to 5	1.00	1.00x1.00	35.24	7.81	12.50	**7.81**
		2.00x2.00	34.11	7.72	12.35	**7.72**
		3.00x3.00	30.05	7.58	12.12	**7.58**
	2.00	1.00x1.00	52.40	10.42	16.67	**10.42**
		2.00x2.00	39.27	8.93	14.29	**8.93**
		3.00x3.00	38.42	11.36	18.18	**11.36**
	3.00	1.00x1.00	61.15	12.50	20.00	**12.50**
		2.00x2.00	47.77	12.76	20.41	**12.76**
		3.00x3.00	50.82	13.59	21.74	**13.59**

7.0 ABBREVIATION

DS	Disturbed Sample
UDS	Undisturbed Sample
SPT	Standard Penetration Test
FCBR	Field California Bearing Ratio
SBC	Safe Bearing Capacity
PI	Plasticity Index
LL	Liquid Limit
PL	Plastic Limit
UCS	Unconfined compressive strength
DUU	Direct Unconsolidated Undrain Test
SP	Poorly Graded Sand
SM	Medium Sand
SC	Clayey Sand

8.0 Laboratory Report

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BOREHOLE NO :	**BH-01**
PROJECT NAME:	**Soil Investigation work at Bhubaneswar, Odisha**
CLIENT NAME:	**Oil India Limited**

Termination Depth (m.):	**20.00**
Water Table (m.):	**1.00**

LABSHEET

Sr No.	Depth (m.)	Type of Sample	Observed SPT N value	Consolidation Test (Cc)	UCS (kg/cm^2)	Specific Gravity	Grain Size Analysis					Hydrometer Test		Atterberge's Limits			Soil Group	Natural Density		Moisture Content (%)	Free Swell Index (%)	Shear Parameters		
							Gravel (%)	Sand			S&C (%)	Silt (%)	Clay (%)	LL	PL	PI		Bulk Density (gm/cc)	Dry Density (gm/cc)			Type of Test	Cohesion (kg/cm2)	Angle of Friction (ϕ)
								C (%)	M (%)	F (%)				(%)	(%)	(%)								
1	0.50	SPT	10				0.00	0.00	1.02	39.42	59.56	35.14	24.42	38.71	19.74	18.97	CI							
2	1.50	SPT	2				0.00	0.00	13.62	17.94	68.44	40.38	28.06	44.49	23.58	20.91	CI	1.82	1.58	14.87				
3	3.00	UDS	-				0.00	0.00	11.36	14.54	74.10	43.72	30.38	48.17	25.53	22.64	CI							
4	4.50	SPT	3				0.00	0.00	12.55	18.64	68.81	40.60	28.21	44.73	23.71	21.02	CI							
5	6.00	UDS	-				0.00	0.00	15.66	23.55	60.79	35.87	24.92	39.51	20.94	18.57	CI							
6	7.50	SPT	7				0.00	0.00	18.32	26.32	55.36	32.66	22.70	35.98	19.07	16.91	CI							
7	9.00	UDS	-				0.00	0.00	22.58	30.57	46.85			30.45	16.14	14.31	SC							
8	10.50	SPT	11				0.00	0.00	20.84	32.12	47.04			30.58	15.18	15.40	SC							
9	12.00	UDS	-				0.00	0.00	25.64	44.25	30.11			19.57	10.37	9.20	SC					DUU	0.09	31.15
10	13.50	SPT	53			2.68	0.00	0.00	49.25	24.77	25.98			16.89	NP	NP	SM							
11	15.00	SPT	62				0.00	2.82	64.86	17.12	15.20			9.88	NP	NP	SM							
12	16.50	SPT	65				0.00	3.12	60.23	24.65	12.00			7.80	NP	NP	SM							
13	18.00	SPT	70				0.00	3.50	56.56	37.12	2.82						SP							
14	20.00	SPT	82				0.00	6.66	52.43	37.44	3.47						SP							

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BOREHOLE NO :	**BH-02**
PROJECT NAME:	**Soil Investigation work at Bhubaneswar, Odisha**
CLIENT NAME:	**Oil India Limited**

Termination Depth (m.):	**20.00**
Water Table (m.):	**0.98**

LABSHEET

Sr No.	Depth (m.)	Type of Sample	Observed SPT N value	Consolidation Test (Cc)	UCS (kg/cm^2)	Specific Gravity	Grain Size Analysis					Hydrometer Test		Atterberge's Limits			Soil Group	Natural Density		Moisture Content (%)	Free Swell Index (%)	Shear Parameters		
							Gravel (%)	Sand			S&C (%)	Silt (%)	Clay (%)	LL	PL	PI		Bulk Density (gm/cc)	Dry Density (gm/cc)			Type of Test	Cohesion (kg/cm2)	Angle of Friction (ϕ)
								C (%)	M (%)	F (%)				(%)	(%)	(%)								
1	0.50	SPT	12				0.00	0.00	1.05	40.60	58.35	34.42	23.92	37.93	20.10	17.82	CI							
2	1.50	SPT	13			2.72	0.00	0.00	14.03	18.48	67.49	39.82	27.67	43.87	23.25	20.62	CI	1.83	1.62	13.25				
3	3.00	UDS	-				0.00	0.00	11.70	14.98	73.32	43.26	30.06	47.66	25.26	22.40	CI							
4	4.50	SPT	13				0.00	0.00	12.93	19.20	67.87	40.05	27.83	44.12	23.38	20.74	CI							
5	6.00	UDS	-				0.00	0.00	16.13	24.26	59.61	35.17	24.44	38.75	20.54	18.21	CI							
6	7.50	SPT	16				0.00	0.00	18.87	27.11	54.02	31.87	22.15	35.11	18.61	16.50	CI							
7	9.00	UDS	-				0.00	0.00	23.26	31.49	45.26			29.42	15.59	13.83	SC							
8	10.50	SPT	21			2.66	0.00	0.00	18.38	33.08	48.54			31.55	16.72	14.83	SC							
9	12.00	UDS	-				0.00	0.00	26.41	45.58	28.01			16.21	NP	NP	SM					DUU	0.10	30.85
10	13.50	SPT	29				0.00	0.00	50.73	25.51	23.76			15.44	NP	NP	SM							
11	15.00	SPT	37				0.00	2.90	66.81	17.63	12.66			8.23	NP	NP	SM							
12	16.50	SPT	41				0.00	3.21	60.00	25.39	11.40			7.41	NP	NP	SM							
13	18.00	SPT	55				0.00	3.61	55.23	38.23	2.93						SP							
14	20.00	SPT	67				0.00	3.87	56.42	37.96	1.75						SP							

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BOREHOLE NO :	**BH-03**		
PROJECT NAME:	**Soil Investigation work at Bhubaneswar, Odisha**		
CLIENT NAME:	**Oil India Limited**	**Termination Depth (m.):**	**20.00**
		Water Table (m.):	**1.05**

LABSHEET

Sr No.	Depth (m.)	Type of Sample	Observed SPT N value	Consolidation Test (Cc)	UCS (kg/cm^2)	Specific Gravity	Grain Size Analysis					Hydrometer Test		Atterberge's Limits			Soil Group	Natural Density		Moisture Content (%)	Free Swell Index (%)	Shear Parameters		
							Gravel (%)	Sand			S&C (%)	Silt (%)	Clay (%)	LL	PL	PI		Bulk Density (gm/cc)	Dry Density (gm/cc)			Type of Test	Cohesion (kg/cm2)	Angle of Friction (ϕ)
								C (%)	M (%)	F (%)				(%)	(%)	(%)								
1	0.50	SPT	15				0.00	0.00	2.51	35.68	61.81	36.47	25.34	40.18	21.29	18.88	CI							
2	1.50	SPT	19			2.72	0.00	0.00	10.24	28.45	61.31	36.17	25.14	39.85	21.12	18.73	CI	1.82	1.60	13.75				
3	3.00	UDS	-				0.00	0.00	10.25	12.74	77.01	45.44	31.57	49.06	26.00	23.06	CI							
4	4.50	SPT	21				0.00	0.00	11.78	16.42	71.80	42.36	29.44	46.67	24.74	21.93	CI							
5	6.00	UDS	-				0.00	0.00	15.23	20.41	64.36	37.97	26.39	41.83	22.17	19.66	CI							
6	7.50	SPT	26				0.00	0.00	14.23	20.47	65.30	38.53	26.77	42.45	22.50	19.95	CI							
7	9.00	UDS	-				0.00	0.00	24.55	31.45	44.00			28.60	15.16	13.44	SC							
8	10.50	SPT	33				0.00	0.00	28.59	30.44	40.97			24.62	13.05	11.57	SC							
9	12.00	UDS	-			2.66	0.00	0.00	27.45	42.55	30.00			15.50	NP	NP	SM					DUU	0.10	30.80
10	13.50	SPT	41				0.00	0.00	42.38	28.41	29.21			11.50	NP	NP	SM							
11	15.00	SPT	44				0.00	8.25	59.44	20.44	11.87						SP-SM							
12	16.50	SPT	48				0.00	4.00	65.23	25.14	5.63						SP-SM							
13	18.00	SPT	53				0.00	4.55	60.21	32.47	2.77						SP							
14	20.00	SPT	69				0.00	4.34	61.14	32.54	1.98						SP							

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BOREHOLE NO :	**BH-04**		
PROJECT NAME:	**Soil Investigation work at Bhubaneswar, Odisha**		
CLIENT NAME:	**Oil India Limited**	**Termination Depth (m.):**	**20.00**
		Water Table (m.):	**1.02**

LABSHEET

Sr No.	Depth (m.)	Type of Sample	Observed SPT N value	Consolidation Test (Cc)	UCS (kg/cm^2)	Specific Gravity	Grain Size Analysis					Hydrometer Test		Atterberge's Limits			Soil Group	Natural Density		Moisture Content (%)	Free Swell Index (%)	Shear Parameters		
							Gravel (%)	Sand			S&C (%)	Silt (%)	Clay (%)	LL	PL	PI		Bulk Density (gm/cc)	Dry Density (gm/cc)			Type of Test	Cohesion (kg/cm2)	Angle of Friction (Φ)
								C (%)	M (%)	F (%)				(%)	(%)	(%)								
1	0.50	SPT	17				0.00	0.00	2.59	36.75	60.66	35.79	24.87	39.43	20.90	18.53	CI							
2	1.50	SPT	22			2.73	0.00	0.00	10.55	29.30	60.15	35.49	24.66	39.10	20.72	18.38	CI	1.82	1.56	16.87				
3	3.00	UDS	-				0.00	0.00	10.56	13.12	76.32	45.03	31.29	49.61	26.29	23.32	CI							
4	4.50	SPT	29				0.00	0.00	12.13	16.91	70.95	41.86	29.09	46.12	24.44	21.68	CI							
5	6.00	UDS	-				0.00	0.00	15.69	21.02	63.29	37.34	25.95	41.14	21.80	19.34	CI							
6	7.50	SPT	33				0.00	0.00	14.66	21.08	64.26	37.91	26.35	41.77	22.14	19.63	CI							
7	9.00	UDS	-				0.00	0.00	25.29	32.39	42.32			27.51	14.58	12.93	SC							
8	10.50	SPT	42				0.00	0.00	29.45	31.35	39.20			25.48	13.50	11.98	SC							
9	12.00	UDS	-			2.66	0.00	0.00	28.27	43.83	27.90			18.14	NP	NP	SM					DUU	0.12	30.45
10	13.50	SPT	47				0.00	0.00	43.65	29.26	27.09						SM							
11	15.00	SPT	52				0.00	3.35	61.22	21.05	14.38						SM							
12	16.50	SPT	56				0.00	4.12	60.00	25.89	9.99						SP-SM							
13	18.00	SPT	64				0.00	4.69	55.23	33.44	6.64						SP-SM							
14	20.00	SPT	78				0.00	5.18	54.32	32.68	7.82						SP-SM							

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BOREHOLE NO :	**BH-05**		
PROJECT NAME:	**Soil Investigation work at Bhubaneswar, Odisha**		
CLIENT NAME:	**Oil India Limited**	**Termination Depth (m.):**	**20.00**
		Water Table (m.):	**0.95**

LABSHEET

Sr No.	Depth (m.)	Type of Sample	Observed SPT N value	Consolidation Test (Cc)	UCS (kg/cm^2)	Specific Gravity	Grain Size Analysis					Hydrometer Test		Atterberge's Limits			Soil Group	Natural Density		Moisture Content (%)	Free Swell Index (%)	Shear Parameters		
							Gravel (%)	Sand			S&C (%)	Silt (%)	Clay (%)	LL	PL	PI		Bulk Density (gm/cc)	Dry Density (gm/cc)			Type of Test	Cohesion (kg/cm2)	Angle of Friction (ϕ)
								C (%)	M (%)	F (%)				(%)	(%)	(%)								
1	0.50	SPT	10				0.00	0.00	2.59	34.25	63.16	37.27	25.90	41.06	21.76	19.30	CI							
2	1.50	SPT	28			2.72	0.00	0.00	10.55	27.31	62.14	36.66	25.48	40.39	21.41	18.98	CI	1.81	1.55	16.48				
3	3.00	UDS	-				0.00	6.54	10.56	12.23	70.67	41.70	28.98	45.94	24.35	21.59	CI							
4	4.50	SPT	31				0.00	7.56	12.13	15.76	64.54	38.08	26.46	41.95	22.24	19.72	CI							
5	6.00	UDS	-				0.00	5.23	15.69	19.59	59.49	35.10	24.39	38.67	20.49	18.17	CI							
6	7.50	SPT	35				0.00	4.26	14.66	19.65	61.43	36.24	25.19	39.93	21.16	18.77	CI				35.00			
7	9.00	UDS	-			2.70	0.00	3.25	25.29	30.19	41.27			26.83	14.22	12.61	SC							
8	10.50	SPT	37				0.00	2.58	29.45	29.22	38.75			25.19	13.35	11.84	SC							
9	12.00	UDS	-				0.00	0.00	28.27	40.85	30.88			15.98	NP	NP	SM					DUU	0.11	30.09
10	13.50	SPT	40				0.00	0.00	43.65	27.27	29.08			11.90	NP	NP	SM							
11	15.00	SPT	44				0.00	3.54	61.22	19.62	15.61						SM							
12	16.50	SPT	57				0.00	4.64	60.00	24.13	11.23						SP-SM							
13	18.00	SPT	65				0.00	5.23	55.23	31.17	8.37						SP-SM							
14	20.00	SPT	77				0.00	6.28	56.41	32.52	4.79						SP							

9.0 Borelogs and Graphs/Plots

BHASKRAM JYOTISH ANUSANDHAN KENDRA PVT. LTD.

OFFICE NO.03, GOKULDHAM CHS LTD, SUKAPUR, NEW PANVEL, DIST-RAIGAD, MAHARASHTRA-410206
E-mail: info@bhaskramgroup.com, Website-www.bhaskramgroup.com, Phone no. 9867158937

NAME OF PROJECT	:-	Soil Investigation Work at Bhubaneswar, Odisha	DIA OF BORING	:-	150 mm
NAME OF CLIENT	:-	Oil India Limited	DATE OF BORING	:-	21.12.2024
METHOD OF BORING	:-	Rotary drilling	GWT (m)	:-	1.00
BOREHOLE NO.	:-	BH-01	TERMINATION DEPTH (m)	:-	20.00

BOREHOLE SUMMARY

Depth (m)	Visual Discription	Legends	Soil / Rock Classification	Thickness of starta (m)	G.W.T. (m)	Type of Sample	Observed SPT value
0.50	Brownish Intermediate clay having medium plasticity (CI) **(Filled up soil)**		CI	7.50	▽	SPT	10
1.50						SPT	2
3.00						UDS	-
4.50						SPT	3
6.00						UDS	-
7.50						SPT	7
9.00	Brownish loose clayey sand having low plasticity (SC)		SC	4.50		UDS	-
10.50						SPT	11
12.00						UDS	-
13.50	Brownish medium dense non-plastic silty sand (SM)		SM	4.50		SPT	53
15.00						SPT	62
16.50						SPT	65
18.00	Brownish poorly graded silty sand having no plasticity (SP)		SP	3.50		SPT	70
20.00						SPT	82

Notation :-							
	CL		WT	▽	SM	UDS	Undisturbed Sample
	SP-SM		SP		SC	SPT	Standard Penetration Test

BHASKRAM JYOTISH ANUSANDHAN KENDRA PVT. LTD.

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E-mail: info@bhaskramgroup.com, Website-www.bhaskramgroup.com, Phone no. 9867158937

NAME OF PROJECT	:-	Soil Investigation Work at Bhubaneswar, Odisha	DIA OF BORING	:-	150 mm
NAME OF CLIENT	:-	Oil India Limited	DATE OF BORING	:-	23.12.204
METHOD OF BORING	:-	Rotary drilling	GWT (m)	:-	0.98
BOREHOLE NO.	:-	BH-02	TERMINATION DEPTH (m)	:-	20.00

BOREHOLE SUMMARY

Depth (m)	Visual Discription	Legends	Soil / Rock Classification	Thickness of starta (m)	G.W.T. (m)	Type of Sample	Observed SPT value
0.50	Brownish Intermediate clay having medium plasticity (CI) **(Filled up soil)**		CI	7.50		SPT	12
1.50						SPT	13
3.00						UDS	-
4.50						SPT	13
6.00						UDS	-
7.50						SPT	16
9.00	Brownish loose clayey sand having low plasticity (SC)		SC	3.00		UDS	-
10.50						SPT	21
12.00	Brownish medium dense non-plastic silty sand (SM)		SM	6.00		UDS	-
13.50						SPT	29
15.00						SPT	37
16.50						SPT	41
18.00	Brownish poorly graded silty sand having no plasticity (SP)		SP	3.50		SPT	55
20.00						SPT	67

Notation :-							
CL		WT		SM		UDS	Undisturbed Sample
SP-SM		SP		SC		SPT	Standard Penetration Test

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E-mail: info@bhaskramgroup.com, Website-www.bhaskramgroup.com, Phone no. 9867158937

NAME OF PROJECT	:-	Soil Investigation Work at Bhubaneswar, Odisha	DIA OF BORING	:-	150 mm
NAME OF CLIENT	:-	Oil India Limited	DATE OF BORING	:-	24.12.2024
METHOD OF BORING	:-	Rotary drilling	GWT (m)	:-	1.05
BOREHOLE NO.	:-	BH-03	TERMINATION DEPTH (m)	:-	20.00

BOREHOLE SUMMARY

Depth (m)	Visual Discription	Legends	Soil / Rock Classification	Thickness of starta (m)	G.W.T. (m)	Type of Sample	Observed SPT value
0.50	Brownish Intermediate clay having medium plasticity (CI) **(Filled up soil)**		CI	7.50	▽	SPT	15
1.50						SPT	19
3.00						UDS	-
4.50						SPT	21
6.00						UDS	-
7.50						SPT	26
9.00	Brownish loose clayey sand having low plasticity (SC)		SP-SM	3.00		UDS	-
10.50						SPT	33
12.00	Brownish medium dense non-plastic silty sand (SM)		SM	3.00		UDS	-
13.50						SPT	41
15.00	Brownish Poorly graded medium dense silty sand (SP-SM)		SP-SM	3.00		SPT	44
16.50						SPT	48
18.00	Brownish poorly graded silty sand having no plasticity (SP)		SP	3.50		SPT	53
20.00						SPT	69

Notation :-							
CL		WT	▽	SM		UDS	Undisturbed Sample
SP-SM		SP		SC		SPT	Standard Penetration Test

BHASKRAM JYOTISH ANUSANDHAN KENDRA PVT. LTD.

OFFICE NO.03, GOKULDHAM CHS LTD, SUKAPUR, NEW PANVEL, DIST-RAIGAD, MAHARASHTRA-410206
E-mail: info@bhaskramgroup.com, Website-www.bhaskramgroup.com, Phone no. 9867158937

NAME OF PROJECT	:-	Soil Investigation Work at Bhubaneswar, Odisha	DIA OF BORING	:-	150 mm
NAME OF CLIENT	:-	Oil India Limited	DATE OF BORING	:-	22.12.2024
METHOD OF BORING	:-	Rotary drilling	GWT (m)	:-	1.02
BOREHOLE NO.	:-	BH-04	TERMINATION DEPTH (m)	:-	20.00

BOREHOLE SUMMARY

Depth (m)	Visual Discription	Legends	Soil / Rock Classification	Thickness of starta (m)	G.W.T. (m)	Type of Sample	Observed SPT value
0.50	Brownish Intermediate clay having medium plasticity (CI) **(Filled up soil)**		CI	7.50	▽	SPT	17
1.50						SPT	22
3.00						UDS	-
4.50						SPT	29
6.00						UDS	-
7.50						SPT	33
9.00	Brownish loose clayey sand having low plasticity (SC)		SC	3.00		UDS	-
10.50						SPT	42
12.00	Brownish medium dense non-plastic silty sand (SM)		SM	4.50		UDS	-
13.50						SPT	47
15.00						SPT	52
16.50	Brownish Poorly graded medium dense silty sand (SP-SM)		SP-SM	5.00		SPT	56
18.00						SPT	64
20.00						SPT	78

Notation :-							
CL		WT	▽	SM		UDS	Undisturbed Sample
SP-SM		SP		SC		SPT	Standard Penetration Test

BHASKRAM JYOTISH ANUSANDHAN KENDRA PVT. LTD.

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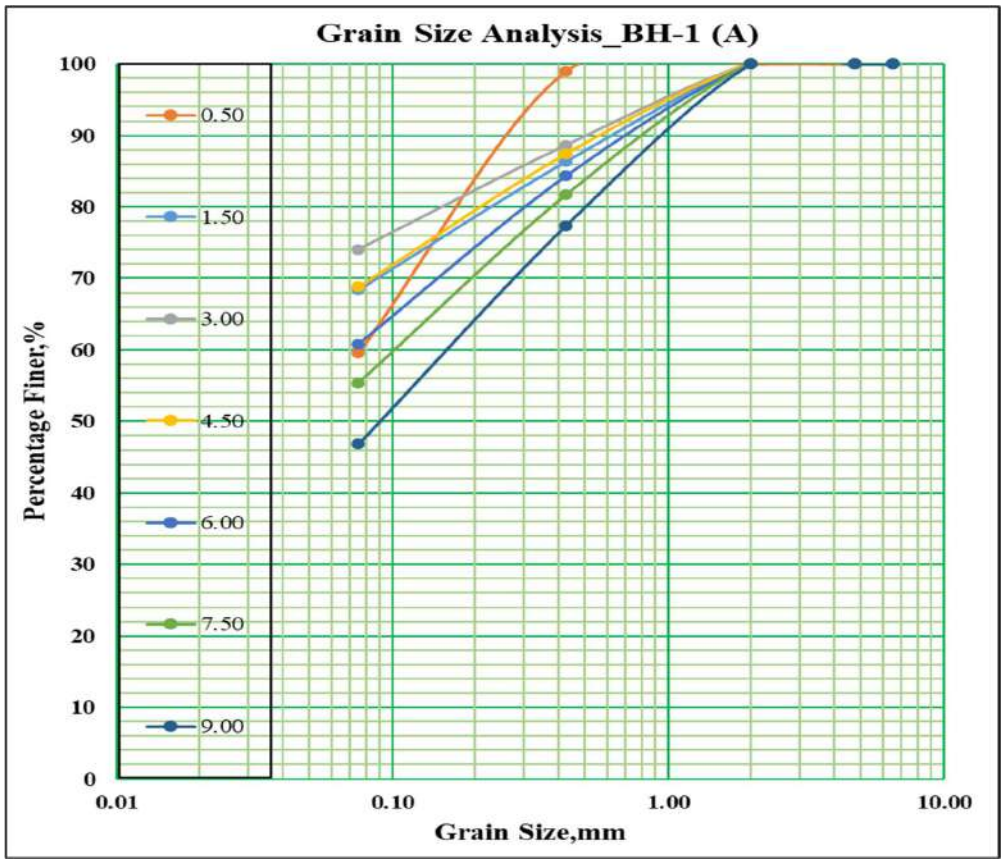
E-mail: info@bhaskramgroup.com, Website-www.bhaskramgroup.com, Phone no. 9867158937

NAME OF PROJECT	:-	Soil Investigation Work at Bhubaneswar, Odisha	DIA OF BORING	:-	150 mm
NAME OF CLIENT	:-	Oil India Limited	DATE OF BORING	:-	25.12.2024
METHOD OF BORING	:-	Rotary drilling	GWT (m)	:-	0.95
BOREHOLE NO.	:-	BH-05	TERMINATION DEPTH (m)	:-	20.00

BOREHOLE SUMMARY

Depth (m)	Visual Discription	Legends	Soil / Rock Classification	Thickness of starta (m)	G.W.T. (m)	Type of Sample	Observed SPT value
0.50	Brownish Intermediate clay having medium plasticity (CI) **(Filled up soil)**		CI	7.50	▽	SPT	10
1.50						SPT	28
3.00						UDS	-
4.50						SPT	31
6.00						UDS	-
7.50						SPT	35
9.00	Brownish loose clayey sand having low plasticity (SC)		SC	3.00		UDS	-
10.50						SPT	37
12.00	Brownish medium dense non-plastic silty sand (SM)		SM	4.50		UDS	-
13.50						SPT	40
15.00						SPT	44
16.50	Brownish Poorly graded medium dense silty sand (SP-SM)		SP-SM	3.00		SPT	57
18.00						SPT	65
20.00	Brownish poorly graded silty sand having no plasticity (SP)		SP	2.00		SPT	77

Notation :-							
	CL		WT	▽	SM	UDS	Undisturbed Sample
	SP-SM		SP		SC	SPT	Standard Penetration Test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Grain Size,mm
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4.50
6.00
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60
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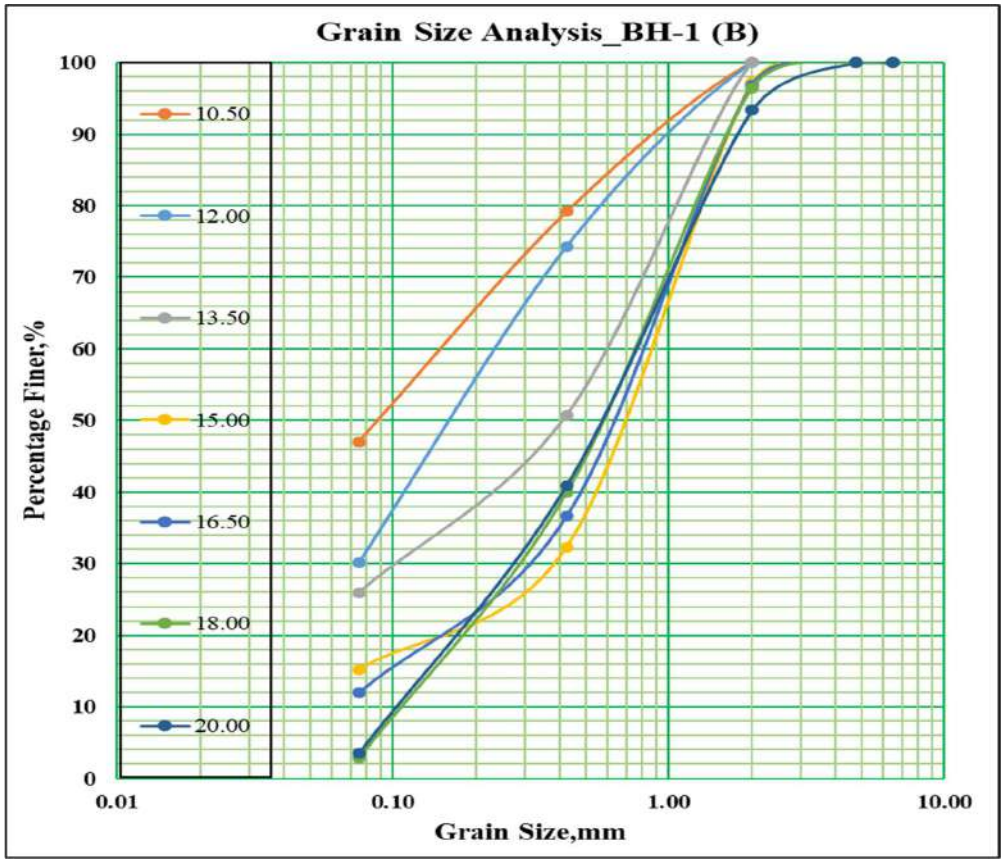
1.00
10.00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Percentage Finer,%
Grain Size,mm
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60
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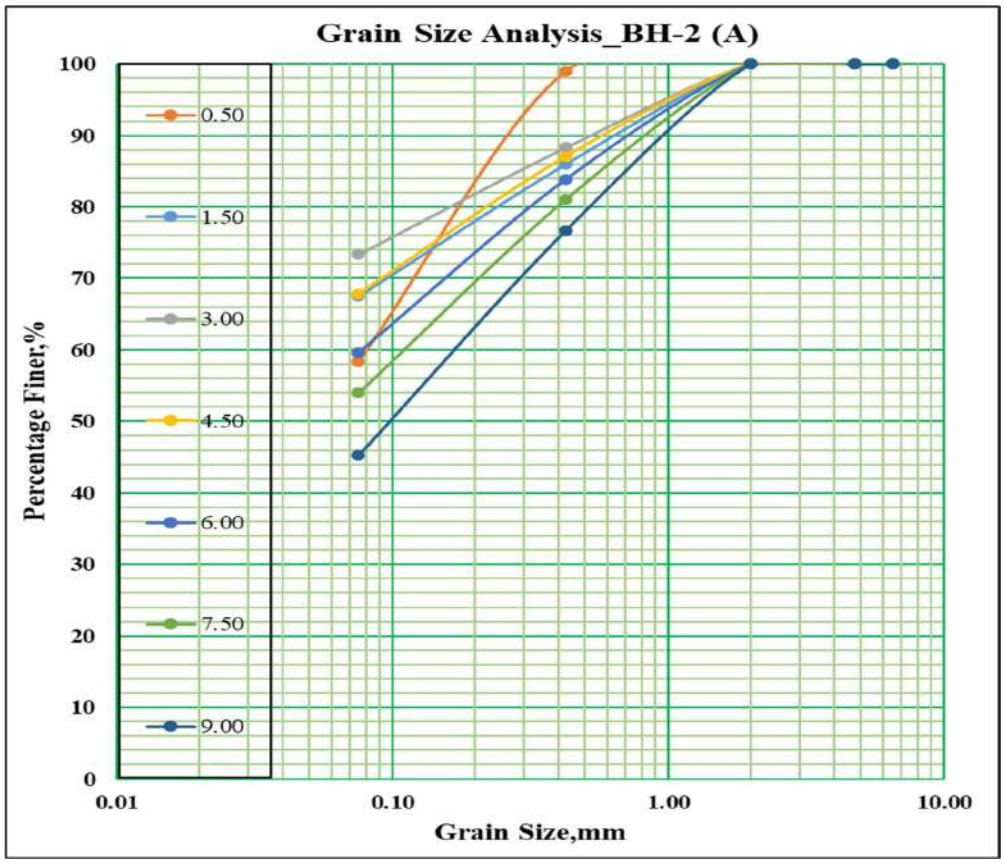
1.00
10.00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Grain Size,mm
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4.50
6.00
7.50
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80
90
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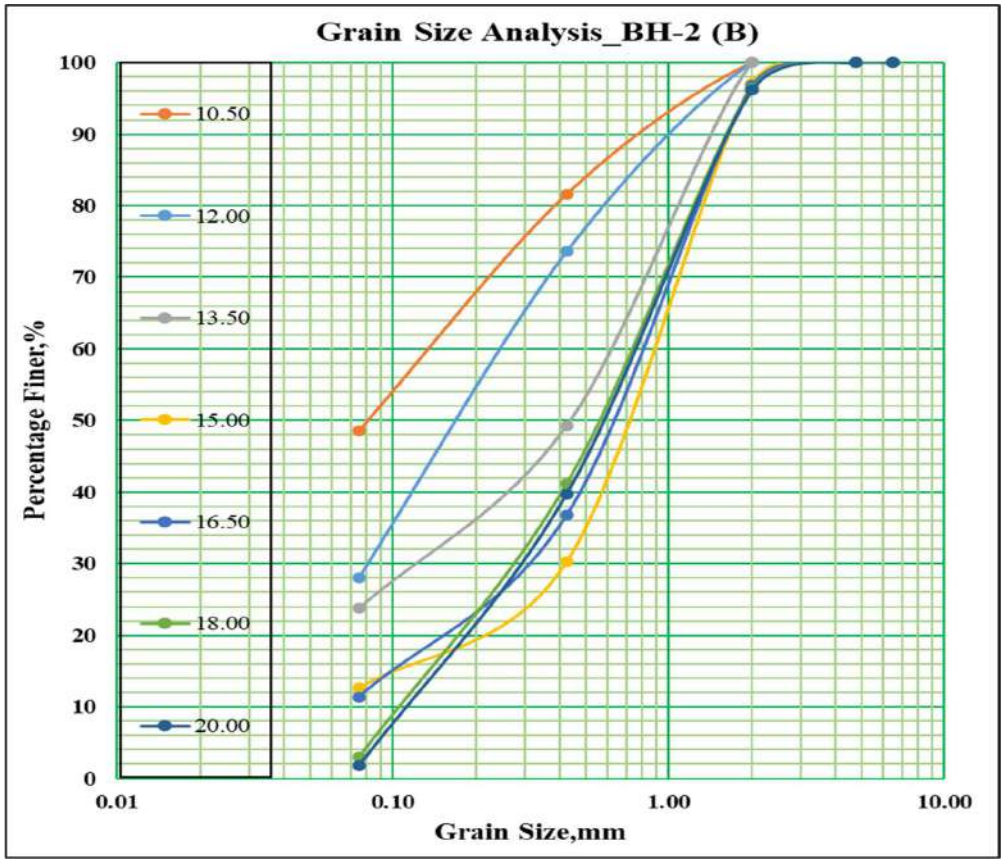
10.00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Percentage Finer,%
Grain Size,mm
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15.00
16.50
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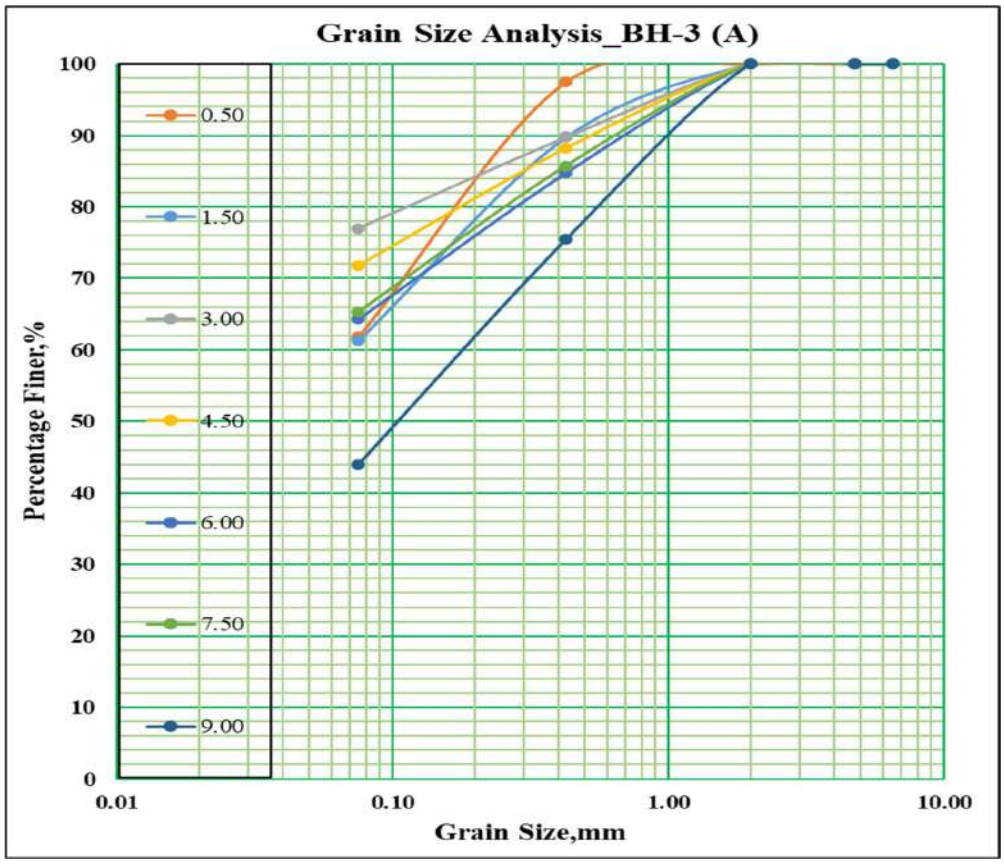
10.00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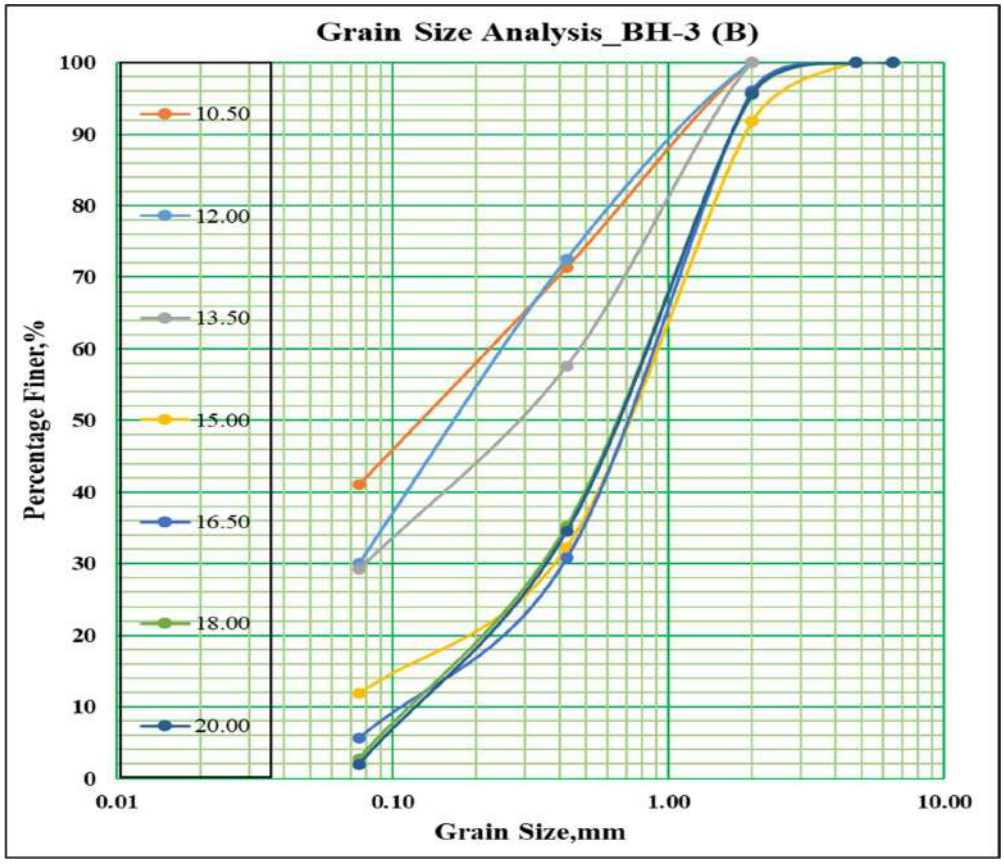
10.00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Grain Size,mm
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0.10
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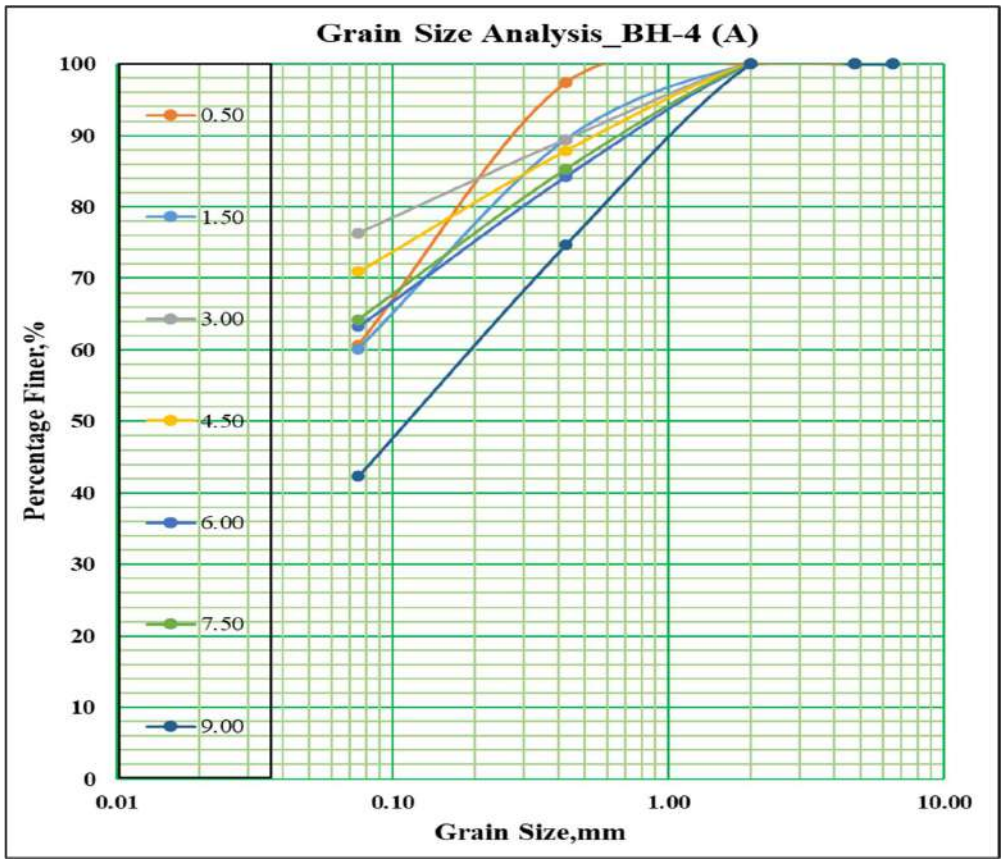
10.00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Grain Size,mm
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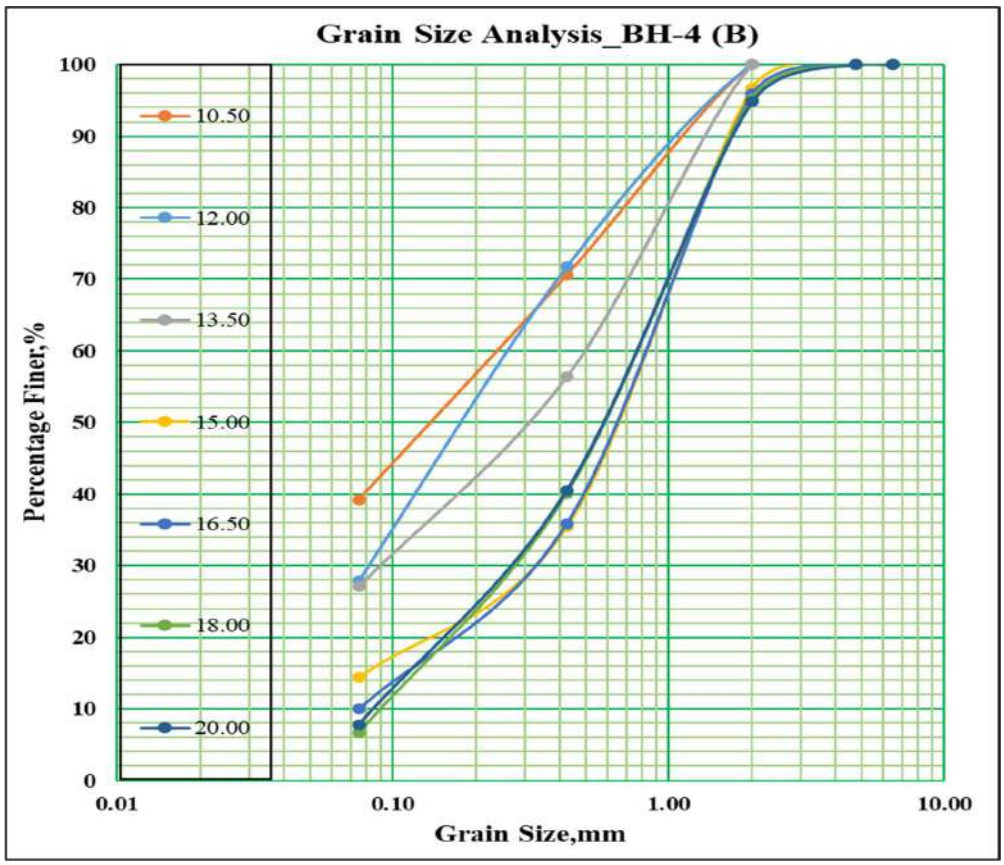
50
60
70
80
90
100
0.01
0.10
1.00
10.00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Grain Size,mm
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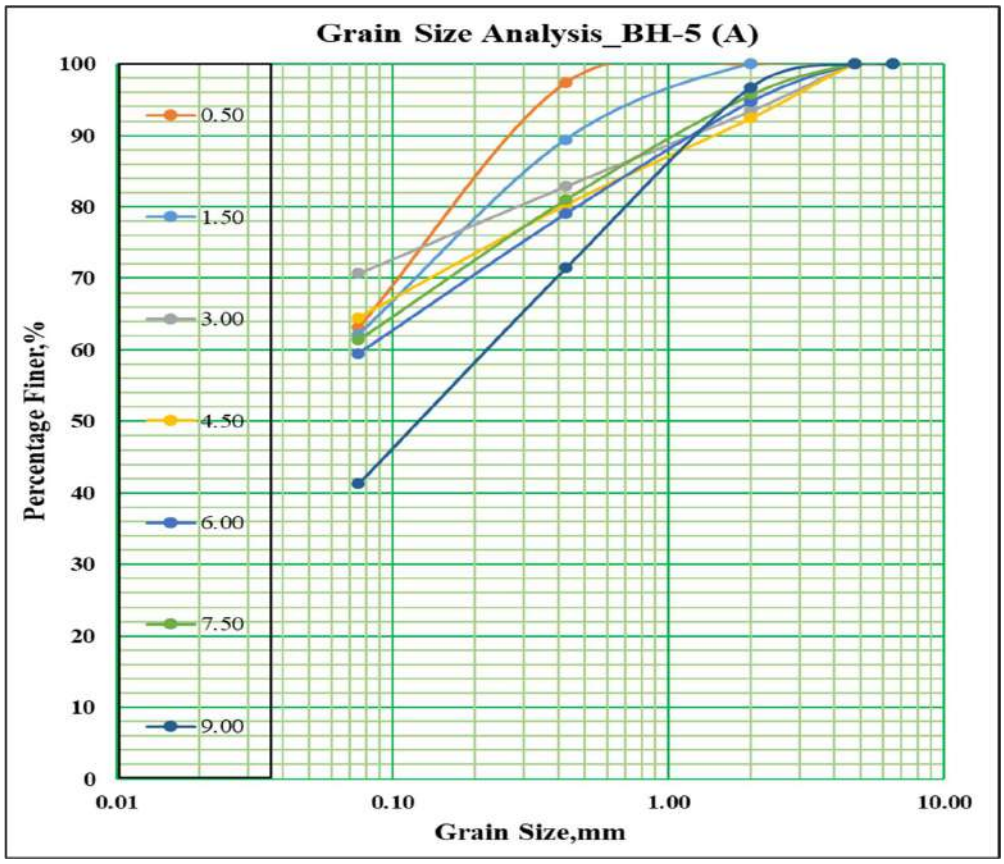
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Grain Size,mm
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6.00
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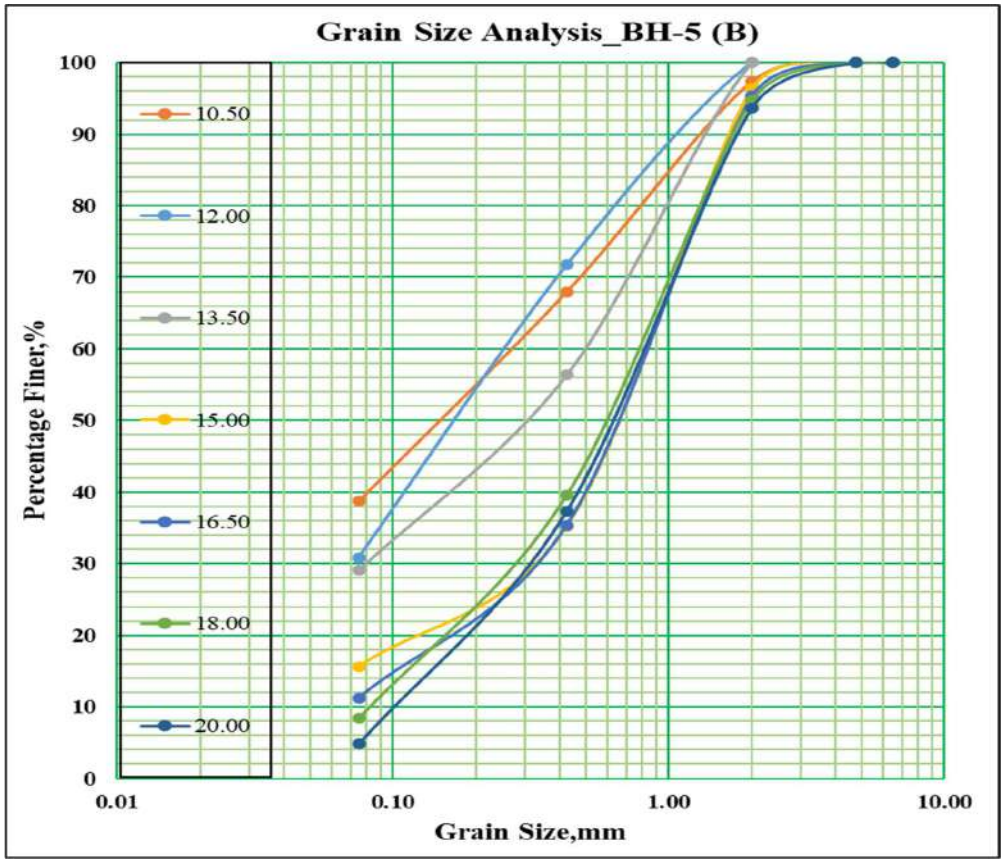
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10
20
30
40
50
60
70
80
90
100
0.01
0.10
1.00
10.00

10.0 Liquefaction Analysis

Liquefaction analysis of sub- soil strata of project site as per IS 1893 Part-1-2016

Seismicity zone - III
Peak ground acceleration (PGA) – 0.16 g
Moment magnitude (Mw) - 6.0
Ground water table – At surface

Depth below EGL (m)	Liquefiable
0.50	No
1.50	No
3.00	No
4.50	No
6.00	No
7.50	No
9.00	No
10.50	No
12.00	No
13.50	No
15.00	No
16.50	No
18.00	No
20.00	No

11.0 Sample and Site Photographs

BH-1 @3.00M

BH-1 @1.5M

BH-1 @6.00

BH-1 @ 9.5M

BH-1 @13.5M

Shot on moto g72
Kumar Navnit

Revised Price Schedule – 6: Grand Summary (For Award of Works)

Sr. No.	Description	Total B.F. from Pg. No.	Amount Rs.
5.1	Design, Drawings and Documentation (Price Schedule – 1)		
5.2	Civil Works (Price Schedule – 2)		
5.3	Supply, Installation and Commissioning of Mechanical Equipment (both outside and within country) and other Services (Price Schedule – 3)		
5.4	Supply, Installation and Commissioning of Electrical and Instrumentation Equipment (both outside and within country) and other Services (Price Schedule – 4)		
5.5	Sub total		
5.6	**GST on 5.5 Subtotal @13.8%**		
A	Total cost of EPC inclusive of GST (A)		
5.7	Operation and Maintenance Cost of the Plant and Facilities for 10 years (Price Schedule – 5)		
5.8	GST on 5.7 Subtotal @18%		
B	Total O&M cost inclusive of GST		
C=(A+B)	Total inclusive of GST		

Note:

- "Grand Total" specified above shall be considered as the "Award Value of Work" including prevailing GST and shall be final and binding on the bidder.
- GST on EPC is considered as composite @13.8% and during O & M as 18% .

_____

Signature of Authorized Signatory with Seal

Name:
Designation:
Date:
Place:

Appendix -3

8.23 LIST OF APPROVED MATERIALS, BRANDS & MANUFACTURERS ALONG WITH INSPECTION CATEGORY

LIST OF APPROVED MAKES / BRANDS / MANUFACTURERS / VENDORS

Mechanical:

Sr. No.	Items	Make / Brand / Manufacturer / Vendor	Inspection Category
1.	Infeed Bunker	Wuxi Wilson, Affan Engineers	A
2.	Bag Opener & Film Remover	Matthiessen, Lagertechnik, BRT Hartner	B
3.	Disc Screen	Nihot, Lubo	B
4.	Iron Separator	Goudsmit, Steinert	B
5.	Wind sifter	Nihot, Lubo	B
6.	Infeed Bunker	Smicon, Wuxi Wilson, Equivalent	A
7.	Iron Separator / Eddy Current Separator	Bakker, Goudsmit, STEINERT, Equivalent	B
8.	Organic Extraction System	Smicon, Haarslev,Tietjen, Wackerbauer, Equivalent	A
9.	Grit Removal System	DRYCAKE, FLSmidth, Fluiteco, McLanahan, Smicon, Equivalent	B
10.	Mixer for Digesters	Anaergia, Stallkamp, SUMA, Armatech, Haarslave, Equivalent	B
11.	Dual Fuel Hot Water Generation System	ME Energy, Thermax, Equivalent	B
12.	Bio-Gas Holder (Double Membrane Type)	Eco Membrane, Nesemeier, Sattler, Vergas, VSO, Baur, Sion or Equivalent	B
13.	Bio-Gas Flaring System	CRA, GGE, Nutzen, Equivalent	B
14.	Bio-Gas Desulphurization System	CRA, DMT, DU Digital, GGE, Green Power, Nutzen, Praj, PAQUES, SLPP RE-NEW, Equivalent	B
15.	Bio-Gas Genset	Caterpillar, Jenbacher, MWM, Siemens, Equivalent	A
16.	Bio-Gas Purification / Upgradation System	Bio-Gas Engineering, Clarke Energy, Nutzen, SLPP RE-NEW, Equivalent	A
17.	High-Pressure Compressor	Bauer, Burckhardt, Chicago Pneumatic, Jyotech, ICL, Equivalent	A

Sr. No.	Items	Make / Brand / Manufacturer / Vendor	Inspection Category
18.	**Sludge Dewatering System:**		
	Decanter Centrifuge	Alfa Laval, GEA Westfalia, Humboldt, Hiller, ITE, Pennwalt, Pieralisi, Equivalent	B
	Belt Filter Press	Alfa Laval, Andritz, Dewaco, EMO, FLSmidth, Siemens, Teknofanghi, Equivalent	B
	Press Screw Separator	CRI-MAN, EYS, FAN, Paulmichl, WAM, Equivalent	B
19.	Solar Drying System	IST-Anlagenbau, Equivalent	B
20.	Thermal Drying System	Huber, Kilburn, VOMM, Equivalent	B
21.	Conveyor	BRT Hartner, Dutch Spiral, Eggersmann, Fluiteco, Integrated Pacline, JASH, WAM, Westeria, Wuxi Wilson, Equivalent	B
22.	Weighbridge	Avery, Eagle, Endeavour, Expert, Precision, Statweigh, Equivalent	B
23.	Fan	EVG Engi-Con, Hyderabad Pollution Controls, Howden, Nadi Airtechnics, Equivalent	B
24.	**Pump:**		
	Centrifugal Pump	ABS, Egger, Flow more, Grundfos, Homa, Hydrocal, Johnson, Jyoti, Kirloskar, Kishor, KSB, Wilo, Sulzer, Roto pumps, Equivalent	B
	Screw Pump	Tushaco Pumps, Alekton Engineering, All weiler India Pvt Ltd, Bhawna Enterprise	B
	Progressive Cavity Pump	Allweiler, Netzsch, Roto, Wangen, Equivalent	B
	Metering Pump	Grosvenor, Grundfos, Milton Roy, Prominent, Positive Metering, Sandur, Shapotools, Equivalent	B
	Compressor	Atlas Copco, ELGI, Ingersoll Rand, Kirloskar Pneumatic, BHEL, Bharat Pumps & Compressor Equivalent	B
25.	Air Blower	Air control & chemical, Batliboi	B

Sr. No.	Items	Make / Brand / Manufacturer / Vendor	Inspection Category
		Envoi mental Engineering, Flakt India Ltd., Arzen, Airvak, Everest, Kaiser, Kay, KPT, Siemens, Swam, Turbo Max, Equivalent	
26.	**Pipe:**		
	• MS Pipe	Jindal, Tata, SAIL, Welspun, Equivalent	C
	• SS Pipe	Jindal, Prakash, Ratnamani, Remi, SAIL, Heavy Metal & Tubes, Metal Tube Industry, Amol Steel Corporation, Equivalent	C
	• CI Pipe	Electro Steel, Kesoram, Equivalent	C
	• DI Pipe	Electro Steel, Jindal, Welspun, Equivalent	C
	• HDPE Pipe	Astral, Duraline, Georg Fischer, Reliance, Equivalent	C
	• UPVC Pipe	Astral, Georg Fisher, Equivalent	C
27.	Valves	Audco, ARI, BDK, Fischer, Jash, Hawa, Intervalve, Kiroloskar, VAG, Virgo Valves & Controls, Xomox Sanmar, Equivalent	B
28.	Electrical Hoist	Brady & Morris, Kone Cranes & Demag, Elephant, Hercules, AD cranes Engineers, Grip Engineers, Consolidated Hoist, Meeka Machinery, Equivalent	C
29.	Double Girder EOT Crane	Brady & Morris, Electro Mech, Konecranes & Demag, , AD cranes Engineers, Grip Engineers, Meeka Machinery Equivalent	B
30.	**Earthmovers / Vehicles:**		
	• Wheel Loader / Crawler Excavator	BEML, Caterpillar, Doosan, Escorts, JCB, L&T, Liebherr, TATA, Volvo, Equivalent	C
	• Skid Steer Loader	Caterpillar, Bobcat, JCB, Vectra, Equivalent	C
	• Truck	AMW, Ashok Leyland, Bharat Benz, Eicher, Mahindra & Mahindra, TATA, Volvo,	C

Sr. No.	Items	Make / Brand / Manufacturer / Vendor	Inspection Category
		Equivalent	
	• Suction Tanker	Isuzu, Kam-Avida, TPS, Equivalent	C
	• Tractor	Eicher, Escorts, John Deere, Mahindra & Mahindra, New Holland, Equivalent	C
26	Cleaning Equipment	Karcher, Nilkamal, Roots, Equivalent	C

Note: For equivalent