Request For Quotation For Carrying out Soil Investigation for the Seaport-Airport Road Project

June 2026

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About Us

KIIFCON Private Limited (KIIFCON), a wholly owned subsidiary of Kerala Infrastructure Investment Fund Board (KIIFB), offers consultancy services including professional technical services, sustainable and innovative solutions for infrastructure development.

KIIFCON aims to revolutionize Kerala's infrastructure sector by providing expert technical services to engineering organizations. Their focus spans across various sectors, including transportation, buildings, energy, urban infrastructure, and public-private partnerships (PPP) transactions.

KIIFCON offers a diverse range of services designed to meet the needs of various sectors. Major Key Service areas of KIIFCON are outlined below:

- Consulting & Advisory Services
- Environment Services
- Design & Engineering
- Project & Contract Management
- Geographic Information System
- Quality Management

KIIFCON invites Request for Quotation for carrying out soil investigation for Seaport-Airport Road (Phase –II Section-A Package 2&3) at Cochin, Kerala.

Method Statement for Trial Pits, bore holes, Soil Sampling and Testing

1.Objective

To determine the subsurface soil profile and collect representative soil samples for laboratory testing.

2. Location of Trial Pits

Trial pits shall be excavated along the proposed location as per Annexure A

3. Size and Depth of Trial Pits

- Each trial pit shall be 1.5 m × 2.0 m.
- Excavation shall continue up to firm strata or to a maximum depth of 2.0 m, whichever is encountered earlier.

4. Sampling Procedure

- Two soil samples shall be collected from each trial pit at 1000 mm vertical intervals, if change in soil strata is observed.
- If a change in soil strata is observed, samples shall be collected from each distinct stratum.
- The thickness and description of each stratum should be properly recorded.

5. Quantity of Samples

- A sufficient quantity of soil shall be collected for laboratory testing, typically 20–25 kg per stratum.

6. Sample Identification and Preservation

- Each sample shall be properly tagged and labeled with details including:
- Chainage
- Trial pit number
- Depth
- Soil stratum
- Samples shall be stored and transported to lab carefully to avoid contamination.

7. Safety Measures

- Proper barricading shall be provided around open trial pits.
- Excavation work shall comply with site safety guidelines.
- Backfilling should be done after taking samples
- Lastly take exact coordinates of trial pit location.

8. Soil Stratification Record

Layer No.	From Depth (m)	To Depth (m)	Thickness (m)	Soil Description	Sample ID
1					
2					
3					
4					
5					

Groundwater Encountered: Yes / No

Depth of Water Table (if any): _____

9. Laboratory Testing Scope – Soil Samples

The following laboratory tests shall be conducted as applicable and as per relevant IS codes:

Testing on soil samples:

- Specific Gravity
- Grain Size Analysis (Sieve & Hydrometer)
- Atterberg Limits (LL, PL, PI)
- Shrinkage limit
- Free Swell Index
- Optimum Moisture Content (Heavy Compaction)
- Maximum Dry Density (Heavy Compaction)
- California Bearing Ratio (CBR) (Soaked / Unsoaked)

For Borehole:

Scope of Work

The scope of work includes conducting geotechnical investigations for the proposed Major Bridge, Culverts and VUPs project, comprising:

- Setting out and execution of boreholes at specified locations as per Annexure A.
- Excavation of 2.0 m deep trial pit (TP) / disturbed sample collection prior to borehole drilling, for CBR test.
- Collection of soil and rock samples.
- Conducting in-situ and laboratory testing.

Preparation of bore logs and geotechnical report.

Methodology of Work

Initial Disturbed Sampling (Up to 2.0 m Depth)

- Before commencement of borehole drilling, disturbed soil samples shall be collected up to 2.0 m depth by Trial pit excavation for CBR test.
- The soil strata shall be visually examined and logged.
- Disturbed samples shall be properly labeled and sealed.

Borehole Drilling

- Drilling shall be carried out using rotary drilling/hydraulic method.
- Temporary casing shall be provided wherever required to prevent collapse.
- Diameter of borehole shall generally be 100–150 mm (as per specification).

Sampling in Soil Strata

Standard Penetration Test (SPT) shall be conducted at:

- 1.0 m intervals up to 10 m depth,
- 1.5 m intervals in between 10 m – 20 m depth
- 3.0 m intervals in between 20 m – 30 m depth
- Or at every change of strata. Or as directed by engineer in charge.
- The number of blows per 15 cm should be recorded.

UDS Sample collection (UDS)

- Undisturbed samples (UDS) shall be collected in cohesive soils using thin wall samples wherever required.
- Ensured preservation of in-situ natural moisture content of cohesive soils
- Typical sample size: 75 mm to 100 mm diameter and 450 mm length
- Sampling carried out at every 3.0 m interval
- Additional samples taken at locations with significant changes in soil strata or as per engineer in charge

- Sealed the UDS sampler using wax to prevent loss of moisture.
- Proper care taken during sampling, sealing, and transportation

Rock Coring

- Rock coring shall be carried out using diamond core barrel.
- Core recovery and RQD (Rock Quality Designation) shall be recorded in field borelogs.
- Core shall be preserved in properly labeled core boxes.
- Rock strata description including weathering, joint spacing, fracture condition shall be recorded in field bore log and same will be reflected in final bore log.

In-Situ Testing

The following in-situ tests shall be conducted:

- Standard Penetration Test (SPT)
- UDS Sample collection
- Field permeability test (if required)
- Water table observation after 24 hours from borehole termination before removing casing.

Laboratory Testing on borehole samples

1 Soil Testing (On UDS Sample)

- Natural Moisture Content of UDS/SPT sample
- Bulk Density
- Grain Size Analysis (With hydrometer analysis)
- Atterberg Limits
- Specific Gravity
- Free Swell index
- Shear Parameters (Triaxle Cu and UU)
- Unconfined Compressive Strength (UCS)
- Consolidation test (With Graphs) including,
    - Coefficient of consolidation (Cv)
    - Compression Index (Cc)
    - Initial void ratio
    - Pre consolidation pressure (Pc)
    - Degree of consolidation (U)
    - Coefficient of permeability (k)
    - Time required for 50% and 90% consolidation.
- Chemical test on soil & water sample each bore hole.

2 Soil Testing (DS Sample)

- Optimum Moisture Content (Heavy Compaction)

- Maximum Dry Density (Heavy Compaction)
- California Bearing Ratio (CBR) (Soaked / Unsoaked)
- Grain size analysis
- Atterberg limit
- Specific gravity

3 Rock Testing (If taken)

- Uniaxial Compressive Strength (UCS)
- Point Load Test
- Water Absorption
- Specific Gravity
- Porosity
- Dry density

Termination Criteria of Boreholes

Boreholes shall be terminated in accordance with the following criteria:

- Drilling shall be carried out up to 5 m in soft rock and 3 m in hard rock, or to a maximum depth of 30 m, whichever is achieved earlier.
- If the borehole termination depth of 30 m is reached without encountering a competent founding stratum, further drilling shall be carried out as directed by the Engineer-in-Charge.
- In case clay strata are encountered at the termination depth, undisturbed samples shall be collected, and additional laboratory tests such as consolidation and shear strength tests shall be conducted to evaluate settlement characteristics.
- In case sandy strata are encountered at the termination depth, the suitability for termination shall be assessed based on SPT values, relative density, and recommendations of the Engineer-in-Charge.

Recording & Documentation

- Bore logs shall be prepared showing:
  - Depth
  - Strata description depth wise.
  - SPT values
  - Core recovery
  - RQD
  - Groundwater table
  - Reduced level of existing ground.
- All samples shall be properly labelled in core box with:
  - Borehole number
  - Depth
  - Date
  - Core box number

- Final Geotechnical Report shall include:
  - Bore logs for each borehole.
  - Laboratory test results
  - Engineering interpretation.
  - SBC at every 3 m depth and at every change in strata.
  - Sample Calculation of SBC and Pile capacity with settlement analysis In annexure.
  - Foundation recommendations

Safety Measures

- Barricading around borehole location.
- Use of PPE (Helmet, gloves, safety shoes).
- Proper handling of drilling rods and casing.
- Safe disposal of drilling slurry.
- Backfill of boreholes using bentonite/cement grout after completion.

Deliverables

Geotechnical investigation report with recommendations.

General Conditions

- Proposals shall remain valid till **15-07-2026;**
- During this period, the Consultant shall maintain its original Proposal without any change in the proposed rates and the total price.
- Only NABL Accredited Testing Laboratory quote proposal shall be accepted.
- Payment shall be made only after submission and approval of final investigation report.
- The duration of the above-mentioned services will be 45 days from the date of commencement of the work.

The proposal shall be submitted on or before **15.06.2026, 3PM** in a **sealed cover** titled "Quotation For Carrying out Soil Investigation for the Seaport-Airport Road Project" to the following address:

The Director(P&E)
KIIFCON, 7th Floor, Felicity Square,
MG Road, Thiruvananthapuram- 695001,
Kerala**.**

- Any clarification/ communication may be addressed to kiifcon@kiifb.org

Schedule of fees:

Sl No	Description	Unit	Rate
1.0 -	**Geo technical investigation (As per IS:1498 & IS:2720(Part-I onwards) and other relevant IS codes):**		
i	Mobilisation & demobilisation charges of machinery	LS	
1.0 -A	**Boring with rotary power drilling equipment:**		
i	For ordinary soil: boring upto 10 m	Per bore hole	
ii	For ordinary soil: boring between 10m to 20m	per meter	
iii	For ordinary soil: boring between 20m to 30m	per meter	
iv	For ordinary soil: Every additional depth beyond 30m	per meter	
v	For soft rock: between 0 to 10m	per meter	
vi	For soft rock: between 10 to 20m	per meter	
vii	For soft rock: between 20 to 30m	per meter	
viii	For soft rock: Every additional depth beyond 30m	per meter	
1.0 - B	**Boring through Hard Rock using Tungsten Carbide drilling Bit:**		
i	For Hard Rock: between 0 to 10 m	per meter	
ii	For Hard Rock: between 10 to 20 m	per meter	
iii	For Hard Rock: Every additional depth beyond 20m	per meter	
1.0 -C	**Collecting disturbed and undisturbed samples from boreholes/trial pits as specified**	Each	
1.0 - D	**Excavation of Trial pits as specified**	Per meter depth	
1.1	**Collection of samples disturbed or undisturbed from each bore hole for lab test including packing**	Each	
1.2	**Report and recommendations:**		
i	Report for the boreholes & trial Pits as per Annexure A	LS	
1.3	**Laboratory tests on soil & rock samples:**		
i	Conducting Atterberg's limit (Liquid Limit, Plastic Limit and Shrinkage limit) as specified	Each	
ii	Conducting Natural water content on soil samples as specified	Each	
iii	Conducting Bulk and dry density tests on soil samples as specified	Each	
1.4	**Grain size analysis on soil samples:**		
i	Conducting Sieve analysis for grain size distribution on samples as specified	Each	
ii	Consucting Hydrometer Analysis for grain size distribution on samples as specified	Each	
1.5	**Triaxial shear tests on soil samples:**		
i	Conducting tri-axial Unconsolidated Undrained (UU) test on soil samples	Each	

ii	Consucting Unconfined Compression Tests on soil samples as specified	Each	
iii	Conducting Direct Shear Test on soil samples as specified	Each	
iv	Conducting Standard Proctor Density test on soil samples as specified	Each	
v	Conducting Modified Proctor Density test on soil samples as specified	Each	
1.6	**Laboratory CBR on soil samples**		
i	Conducting Laboratory Un-soaked CBR Tests on soil samples as specified	Each	
ii	Conducting Laboratory Soaked CBR Tests on soil samples as specified	Each	
iii	Conducting Swelling Potential and Swelling Pressure tests on soil samples as specified, if soil is expansive nature	Each	
iv	Conducting Shrinkage limit test on soil samples as specified, If soil is expansive nature	Each	
1.7	**Conducting Chemical tests on soil & water samples as specified:**		
i	Conducting Chemical test on soil samples as specified	Each	
ii	Conducting Chemical test on ground water samples	Each	

Annexure A

Bore Hole Detail

KIIFCON_Airport Seaport Road (Phase –II Section-A Package 2&3) at Cochin, Kerala.-26.05.2026

TP/BH No.	Borehole for BOX CULVERTs / VUPs	Chainage	Coordinates	
			Latitude	Longitude
BH-01	LVUP	CH: 2+480	10° 4'10.60 N	76°20'42.06"E
BH-01A	BOX CULVERT	CH: 2+842	10° 4'17.29"N	76°20'51.72"E
TP-01	PAVEMENT	CH:2+700_LHS	10° 4'16.09"N	76°20'46.75"E
TP-02	PAVEMENT	CH:3+200_RHS	10° 4'16.72"N	76°21'3.23"E
BH-02	BOX CULVERT	CH:3+295	10° 4'18.09"N	76°21'6.38"E
TP-03	PAVEMENT	CH:3+700_LHS	10° 4'27.95"N	76°21'13.81"E
BH-03	BOX CULVERT & LVUP	CH:3+775	10° 4'30.23"N	76°21'14.13"E
BH-04	BOX CULVERT	CH:4+093	10° 4'40.89"N	76°21'13.51"E
TP-04	PAVEMENT	CH:4+200_RHS	10° 4'44.21"N	76°21'13.64"E
BH-05	BOX CULVERT & LVUP	CH:4+275	10° 4'46.66"N	76°21'13.23"E
BH-05A	VUP	CH:5+000	10° 5'10.42"N	76°21'16.62"E
TP-05	PAVEMENT	CH:4+750_LHS	10° 5'1.94"N	76°21'15.32"E
TP-06	PAVEMENT	CH:5+200_RHS	10° 5'16.18"N	76°21'18.42"E
BH-06	BOX CULVERT	CH:5+450	10° 5'23.73"N	76°21'21.42"E
TP-07	PAVEMENT	CH:5+700_LHS	10° 5'30.26"N	76°21'26.29"E
TP-08	PAVEMENT	CH:6+200_RHS	10° 5'41.31"N	76°21'38.32"E
TP-09	PAVEMENT	CH:6+700_LHS	10° 5'54.34"N	76°21'48.23"E
BH-07	BOX CULVERT	CH:7+0260	10° 6'2.72"N	76°21'54.83"E
TP-10	PAVEMENT	CH:7+200_RHS	10° 6'7.05"N	76°21'58.60"E
BH-08	BOX CULVERT & LVUP	CH:7+325	10° 6'10.03"N	76°22'1.16"E
BH-09	BOX CULVERT	CH:7+700	10° 6'16.23"N	76°22'11.75"E
BH-09A	VUP and BOX CULVERT	CH:7+900	10° 6'18.80"N	76°22'17.64"E
TP-11	PAVEMENT	CH:8+200_LHS	10° 6'23.58"N	76°22'26.37"E
BH-10	BOX CULVERT	CH:8+400	10° 6'29.25"N	76°22'29.66"E
TP-12	PAVEMENT	CH:8+700_RHS	10° 6'37.93"N	76°22'34.12"E
BH-11	BOX CULVERT	CH:8+800	10° 6'40.59"N	76°22'36.17"E
BH-12	BOX CULVERT	CH:9+200	10° 6'52.71"N	76°22'39.88"E
BH-13	LVUP	CH.6+760	10° 5'55.83"N	76°21'49.80"E
BH-14	LVUP	CH.8+578	10° 6'34.59"N	76°22'32.45"E

MJB BH No	Chainage	Latitude	Longitude
MJB BH-01	5+720 LHS	10° 5'30.57"N	76°21'26.43"E
MJB BH-02	5+720 RHS	10° 5'30.47"N	76°21'27.35"E
MJB BH-03	6+070	10° 5'38.74"N	76°21'35.16"E
MJB BH-04	6+400	10° 5'46.23"N	76°21'42.70"E
MJB BH-05	6+520	10° 5'49.11"N	76°21'44.91"E

Total No of Boreholes -22

Total Trialpit No-12