

# NATIONAL ENGINEERING SERVICES PAKISTAN (PVT) LIMITED

NESPAK HOUSE: 1-C, Block-N, Model Town Extension, Lahore - 54700, Pakistan



Ref: P-40188/024/luH/01/1600

Date: March 09, 2022

## GEOTECH SURVEY OF DHA CITY KARACHI (NORTH) PACKAGE-I, PACKAGE-II, PACKAGE-III and PACKAGE-IV Invitation of Bids for Geotechnical Investigations (Field and Laboratory Works)

Dear Sir,

Sealed bids (**Technical and Financial for all packages in separate sealed envelopes**) are invited in accordance with the attached **BOQ** and **qualification criteria** from drilling Contractors/Companies for carrying out the geotechnical investigations for the subject project.

The Bidders may quote for maximum of two packages. However, to qualify for two packages the bidder shall demonstrate its capability in terms of T&P, Manpower and Financial Resources to complete the works in time as per attached qualification criteria. In case same bidder qualifies for more than one package, undersigned reserves the right to award the work for more than one package based upon availability of resources.

The companies capable of carrying out subject work are requested to provide their Company's Profile and the following documents along with their sealed bids:

1. PEC Registration Certificate
2. FBR & PRA Registration Certificates
3. List of Similar Projects completed during last three years
4. Financial Capability
5. Equipment Capability
6. Personnel Capability
7. Litigation History
8. HSE Policies

The work comprises; execution of boreholes up to maximum 60 m depth below natural surface level (NSL) in overburden soils by Straight Rotary/heavy percussion drilling rig, core drilling, excavation of test pits, performance of SPTs in boreholes, performance of field density tests in test pits, performance of Cone Penetration Test (CPT), installation of standpipe piezometers in boreholes, collection of disturbed/undisturbed soil samples, collection of water samples and laboratory testing of selected soil/rock/water samples. The field and laboratory work shall have to be completed according to the following time schedule:

### PACKAGE-I, PACKAGE-II AND PACKAGE-III (Boreholes Drilling)

Sr. No.	Minimum No. of Straight Rotary Rig Required	Time for Completion of Field Investigations	Time for Completion of Laboratory Testing	Total Time for Completion of Field & Laboratory Investigations
1	4 for each Package	5 weeks	3 weeks	8 weeks

Telephone : +92-42-99090000  
E-mail : info@nespak.com.pk  
Website : www.nespak.com.pk

Fax : +92-42-99231950  
P.O.Box : 1351, Lahore, Pakistan



**PACKAGE-IV (Testpits Excavation)**

Sr. No.	Time for Completion of Field Investigations	Time for Completion of Laboratory Testing	Total Time for Completion of Field & Laboratory Investigations
1	3 weeks	4 weeks	7 weeks

Your bids shall be valid for a time period of ninety (90) days after the bid opening. **The work shall be executed under the instructions and full-time supervision of NESPAK engineers/geologists and the successful bidder shall mobilize to the site on three (03) days' notice after issuance of Letter of Award/Acceptance.**

**The coordinates and ground elevations of all the investigation and CPT points by total station shall have to be provided to NESPAK before completion of investigation at site by the Contractor. The approved laboratory, where testing is to be carried out, shall be pursued by the successful bidder for timely completion of the assigned laboratory testing.**

The successful bidder shall be responsible for providing the field borehole & test pit logs, summary of laboratory test results and detailed laboratory test results to NESPAK, within the contract period. **A premium of up to 25 % will be admissible on the official rates of the soil laboratory, selected for testing of samples. This premium has been allowed as compensation to the Contractor for making advance payment to the laboratory and later following-up for obtaining test results in time. The name of the laboratory should be provided on page 2 of 2 (Annexure-1).**

You are advised to carry out a detailed site visit to obtain firsthand information regarding site conditions before submitting the most competitive rates in the attached BOQs. Please note that the work is of sensitive nature and shall be executed by using appropriate equipment of high quality with utmost care. The Engineer holds the right to inspect the equipment before mobilization and to obtain assurance from Contractor regarding the quality of work.

A Pre-Bid meeting will take place on the date, time and place as follows:

Date: **March 17, 2022**

Time: **1100 hours**

Place: Conference Room

Geotechnical & Geoenvironmental Engineering Division

NESPAK House, I-C, Block N,

Model Town Extension, Lahore Pakistan - 54700

**The bidders shall submit a bid security amounting to 2% of bid price at the time of submission of bids in the form of pay order or bank draft in favor of M/s NESPAK.**

Your **most competitive** sealed bids (**inclusive of all taxes**) in accordance with the BOQ and qualification criteria, should reach the office of the undersigned by 1400 hours on or before **March 28, 2022**. Technical bids would be opened on the same day at 1500 hours after their receipt in the presence of those bidders who wish to be present.

Financial bids would be opened after evaluation of Technical bids, at a time, date and venue announced and communicated to the technically responsive bidders in advance. However, the final decision to accept/reject any or all the bids as per PPRA rules solely lies with the undersigned. The entire work shall be carried out in accordance with the requirements of the General Bidding Documents for Geotechnical

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Investigations available at NESPAK website ([www.nespak.com.pk](http://www.nespak.com.pk)). **Payment of the entire work shall be made by NESPAK upon receipt of payments from Client. Contractor may raise his first invoice upon completion of 50 % field work. Payment will be made for 50 % of field work only. Remaining payment will be made after completion of whole work including submission of all the laboratory test results.**

for National Engineering Services Pakistan (Pvt.) Limited



(IRFAN UL HAQ)

Vice-President/Head

Geotechnical & Geoenvironmental Engineering Division



**GEOTECH SURVEY OF DHA CITY KARACHI (NORTH)  
PACKAGE-I, PACKAGE-II, PACKAGE-III and PACKAGE-IV**

**1. Qualification Criteria**

Qualification will be based on the criteria given in the following paras regarding the Applicant's experience, personnel and equipment capabilities, financial position and litigation history, as demonstrated by the Applicant's responses in the Forms attached as Annex-A to this Document. The Employer reserves the right to waive minor deviations, if these do not materially affect the capability of an Applicant to perform the contract by the Applicant.

Experience and resources of the Company intended to be employed as sub-contractor shall not be taken into account in determining the Applicant's compliance with the qualifying criteria. However, for joint venture, collective experience, resources and financial soundness of all partners shall be considered.

The Bidders may quote for one or multiple packages. However, to qualify for multiple packages the bidder shall demonstrate its capability in terms of T&P, ManPower and Financial Resources to complete the works in time as per attached qualification criteria. In case same bidder qualifies for more than one package, undersigned reserve the right to award the work for any one or more than one package.

**1.1 General Information**

Application Form A-1 attached in Annex-A.

**1.2 Experience of the Firm**

The Applicant shall meet the following minimum criteria:

- 1) Successful experience as contractor in the execution of at least five (5) projects involving bulk of geotechnical investigations within the last three (03) years. This experience should specifically be of geotechnical investigations of similar nature. The Applicant will supply information as per the format specified in the Application Form A-2 attached in Annex-A.

**1.3 Personnel Capabilities**

The Applicant must have in his employment, suitably qualified and experience personnel to fulfill the positions tabulated below. The Applicant will supply information as per the format specified in the Application Form A-3 attached in Annex-A.

Sr. No.	Position	Qualification*	No. Package-I	No. Package-II	No. Package-III	No. Package-IV	Minimum Experience (Years)
1	Technical Manager	B.Sc. Civil Engg.	1	1	1	1	10
2	Site Geologist/ Supervisor/ Engineer	M.Sc. Geology/B.Sc. Geological Engg/ B.Sc Geology (4)	4	4	4	2	5
3	HSE	HSE Certification	1	1	1	1	1



	Supervisor	course					
4	Driller	Literate	4	4	4	0	10
5	Skilled Labour	-	As required	As required	As required	As required	-

#### 1.4 Equipment Capabilities

The Applicant should own, or have assured access to the following key items of equipment in full working order, and must demonstrate that, based on known commitments, these will be available for deployment on the proposed works.

Sr. No.	Equipment Type & Characteristics	Minimum Number Required Package-I	Minimum Number Required Package-II	Minimum Number Required Package-III	Minimum Number Required Package-IV
1	Straight Rotary Drilling rig complete in all respects including drilling rods, bits, mud pumps etc. along with at least one stand-by rig. The equipment shall be capable to obtain core recovery more than 80 percent and to complete the investigations within the time schedule.	4	4	4	-
2	Percussion Boring Set (>250 mm diameter), complete in all respects including tripod, chisel / bit etc.	2	2	2	-
3	Casing set having various diameters for all types of boring at least 60 m in length with casing bits.	4	4	4	-
4	Standard penetration test equipment complete in all respects including all rods, split spoon sampler, hammer and containers etc.	4	4	4	-
5	Core barrels (single and double tube) including coring and casing bits.	4 each	4 each	4 each	-
6	Shelby/Denison/Pitcher samplers	4 each	4 each	4 each	-
7	UDS tubes & Split Spoon Samplers	As Required	As Required	As Required	-
8	CPT equipment	1	-	-	-
9	Complete setup for piezometers installation	1	1	1	-
10	Hydraulic jacks with all accessories for the extraction of	4	4	4	-



Sr. No.	Equipment Type & Characteristics	Minimum Number Required Package-I	Minimum Number Required Package-II	Minimum Number Required Package-III	Minimum Number Required Package-IV
	casings				
11	Electrically operated sounder for groundwater level measurement	4	4	4	-
12	Testpit excavation equipment/hand tools complete in all respect	-	-	-	4 sets
13	Field density test apparatus (with 6 and 12 inches dia. cone) complete in all respect	-	-	-	4
14	Wooden box for the preservation of undisturbed soil/rock samples	As required	As required	As required	-
15	Transport for mobilization of equipment	As required	As required	As required	As required

The Applicant will supply information as per the format specified in the Application Form A-4 attached in Annex-A.

#### 1.5 Financial Capabilities

The Applicant shall meet the following minimum criteria:

- 1) Average annual turnover which is also termed as income from contracting for procurement of geotechnical investigations and is defined as billing for works completed during the last three (3) years of at least Rs. 8.0 million or the said figure has been achieved in any year during the last three (3) years.

The Applicant shall also provide evidence of financial health such as bank account statements, available line of credits, etc., to show the soundness of the Applicant's financial position for procurement of geotechnical investigations works. The Applicant will provide annual turnover of the geotechnical investigation works carried out by him during the last three years. The Applicant will supply annual turnover information as per the format specified in the Application Form A-5 attached in Annex-A.

#### 1.6 Litigation History

The Applicant should provide accurate information on any litigation or arbitration resulting from Contracts completed or under execution over the last three (03) years. The Applicant will supply information as per the format specified in the Application Form A-6 attached in Annex-A. A consistent/ overwhelming history of litigation against the Applicant may result in rejection of the application. In case an Applicant claims Nil litigation, he shall submit the same statement on the letter head of his company.

#### 1.7 Application of Health, Safety and Environmental Standards

The Applicant should provide the HSE Policies and supporting documentary evidence for the following:



- i) First Aid Box
- ii) Personnel Protective Equipments (PPEs)
- iii) Standard Operating Procedures (SOPs)
- iv) Health, Safety and Environmental (HSE) Policies
- v) HSE staff

The Applicant will supply information as per the format specified in the Application Form A-7 attached in Annex-A.



**General Information**

All individual Applicants applying for qualification are requested to complete the information in this form. Nationality information (if applicable) is also to be provided for foreign owners as required under the PEC Bye-Laws as a Partnership.

1.	Name of Firm	
2.	Head Office Address	
3.	Telephone	Contact Person: Name: Title: Cell No.
4.	Fax	E-mail
5.	Place of Incorporation/Registration Certificates of the firm*	Year of incorporation/registration

**\* Registration certificates must include:**

- Valid registration with Pakistan Engineering Council (PEC)
- Valid registration with Federal Board of Revenue (FBR)
- Valid registration with Provincial Revenue Authority (PRA)
- Proof of active taxpayer of FBR & PRA





## Experience of the Firm

Name of Applicant: \_\_\_\_\_

Sr. No.	Name of Project	Value of Geotech Contract* (Pak Rs.)	Contract Duration

**\*Attach copy of Letter of Awards / Project Completion Certificates for any five (5) latest projects involving bulk of geotechnical investigations within the last three (03) years.**



## Personnel Capabilities

Name of Applicant: \_\_\_\_\_

Sr. No.	Name of Person	Qualification	Designation/ Position*	Total Experience

*\*Attach CVs of the Key Staff Members.*



**Equipment Capabilities**

*Name of Applicant:* \_\_\_\_\_

Sr. No.	Equipment Description	Capacity	Number of Equipment	Working Condition a) Very good b) Good c) Satisfactory	Current Location



**Financial Capabilities***Name of Applicant:* \_\_\_\_\_

Year	Annual Turnover (in PKR)
2020 – 2021	
2019 – 2020	
2018 – 2019	

*Note: Financial soundness certificate from the bank(s) as specified in section 1.5 must be provided by the Applicant*



**Litigation History**

Name of Applicant: \_\_\_\_\_

Year	Award for or against Applicant	Name of Client, cause of litigation, and matter in dispute	Disputed amount (current value Pak Rs. or equivalent)



**Health, Safety and Environmental (HSE) Policies Personal Protective Equipment (PPE) and Standard Operating Procedures (SOP) of the Contractor**

*Name of Applicant:* \_\_\_\_\_

*The Applicant should provide the following policies/supporting documentary evidence as required in Para 1.7.*

**A. HSE Policies**

Please attach HSE Policies

**B. Details of PPE Available with the Contractor**

Sr. No.	Type of PPE	Total Number

**C. Details of SOPs of the Contractor**

Please attach the copies of SOPs



CONSULTANCY SERVICES FOR GEOTECH SURVEY OF DHA CITY KARACHI (NORTH) PACKAGE-I					
GEOTECHNICAL INVESTIGATIONS BILL OF QUANTITIES					
Sr. No.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
A.	<b>FIELD INVESTIGATIONS</b>				
A1	Mobilization and demobilization of atleast four (04) straight rotary/heavy percussion drilling rigs alongwith allied accessories at site. The equipment shall be adequate in quantity to meet the time schedule.	LS	1		
A2	Setting and Shifting of drilling rig. from one investigation point to another in the project area and arrangement of water for drilling.	No.	24		
A3	Execution of twenty four (24) boreholes in overburden soils or up to the bedrock, whichever is met earlier by straight rotary/heavy percussion method including backfilling of boreholes to their original position using cement-sand-bentonite mix. Minimum permissible diameter of borehole is 150 mm for percussion method and 101 mm for straight rotary method.	L.M.			
	i) Execution of borehole(s) from NSL to maximum 15 m depth		200		
	ii) Execution of borehole(s) from 15.0 m to maximum 20 m depth		40		
	iii) Execution of borehole(s) from 20.0 m to maximum 30 m depth		30		
	iv) Execution of borehole(s) from 30.0 m to maximum 45 m depth		15		
	v) Execution of borehole(s) from 45.0 m to maximum 60 m depth		15		
A4	Continuous core drilling (NX size) in bedrock up to a maximum depth of 8 to 10 m below rock strike level using double tube core barrel, including extraction, preservation of core samples in core boxes, waxing of core samples, photography of rock cores and transportation of core samples to the approved laboratory.	L.M.	207		
A5	Performance of Standard Penetration Tests (SPTs) in boreholes generally at 1 to 1.5 m depth interval or as necessary along with collection of SPT samples, including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	250		
A6	Collection of relatively undisturbed soil samples from boreholes through Denison/ Pitcher/ Shelby sampler, including their waxing, labelling, packing, storage & transportation to an approved testing laboratory.	No.	20		
A7	Performance of Cone Penetration Test (CPT) using Dutch cone with maximum investigation depth of 10 m below NSL including shifting from one point to another.	L.M.	100		
A8	Installation of four (04) stand pipe piezometers (GI Pipe) of maximum 30 m length in boreholes executed for geotechnical investigations, and monitoring of water levels on daily basis during investigations.	L.M.	100		
A9	Collection of water samples from borehole (if encountered) including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	10		
<b>Sub-Total A =</b>					
<p>1. Verticality should be ensured in the boreholes specified for the installation of piezometers.</p> <p>2. Establishment of coordinates and ground elevations of all the boreholes and testpits using total station is included in the scope of work. The coordinates should be provided with reference to a permanent bench mark established at site.</p> <p>3. Preferred method of drilling will be straight rotary method. Percussion drilling will only be allowed in case of gravelly strata.</p> <p>4. All the disturbed/undisturbed soil samples shall be stored and transported as per ASTM standards. The area ratio and clearance ratio of the thin walled tube, should be in strict compliance with relevant ASTM standard.</p> <p>5. Contractor will be responsible for arrangement of Personnel Protective Equipments (PPEs) such as safety helmets and jackets for NESPAK site supervisory / visiting staff.</p>					



CONSULTANCY SERVICES FOR GEOTECH SURVEY OF DHA CITY KARACHI (NORTH)  
PACKAGE-I

GEOTECHNICAL INVESTIGATIONS

BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
<b>B.</b>	<b>LABORATORY TESTING</b>				
B1	Sieve analysis	No.	85		
B2	Hydrometer analysis (with pretreatment)	No.	17		
B3	Liquid and plastic limits	No.	26		
B4	Bulk and dry density	No.	20		
B5	Consolidation with Swell Potential measurement	No.	10		
B6	Direct Shear (undisturbed samples)	No.	10		
B7	Direct Shear (Fully softened and residual $\phi$ )	No.	5		
B8	Unconfined Compression (on soil samples)	No.	12		
B9	Uniaxial Compression (on rock samples)	No.	33		
B10	Triaxial compression(Consolidated undrained CU)	No.	3		
B11	Point Load Test	No.	26		
B12	Sulphate content	No.	10		
B13	Chloride content	No.	10		
B14	Organic matter content	No.	10		
B15	Complete chemical analysis of water samples i.e TDS, SO <sub>4</sub> , CL & pH	No.	10		
	<b>Sub-Total B =</b>				
	<b>Total (A+B)=</b>				
Name of Laboratory: _____					





CONSULTANCY SERVICES FOR GEOTECH SURVEY OF DHA CITY KARACHI (NORTH) PACKAGE-II					
GEOTECHNICAL INVESTIGATIONS BILL OF QUANTITIES					
Sr. No.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
A	<b>FIELD INVESTIGATIONS</b>				
A1	Mobilization and demobilization of atleast four (04) straight rotary/heavy percussion drilling rigs alongwith allied accessories at site. The equipment shall be adequate in quantity to meet the time schedule.	LS	1		
A2	Setting and Shifting of drilling rig. from one investigation point to another in the project area and arrangement of water for drilling.	No.	24		
A3	Execution of twenty four (24) boreholes in overburden soils or up to the bedrock, whichever is met earlier by straight rotary/heavy percussion method including backfilling of boreholes to their original position using cement-sand-bentonite mix. Minimum permissible diameter of borehole is 150 mm for percussion method and 101 mm for straight rotary method.	L.M.			
	i) Execution of borehole(s) from NSL to maximum 15 m depth		200		
	ii) Execution of borehole(s) from 15.0 m to maximum 20 m depth		40		
	iii) Execution of borehole(s) from 20.0 m to maximum 30 m depth		20		
	iv) Execution of borehole(s) from 30.0 m to maximum 45 m depth		15		
	v) Execution of borehole(s) from 45.0 m to maximum 60 m depth		15		
A4	Continuous core drilling (NX size) in bedrock up to a maximum depth of 8 to 10 m below rock strike level using double tube core barrel, including extraction, preservation of core samples in core boxes, waxing of core samples, photography of rock cores and transportation of core samples to the approved laboratory.	L.M.	207		
A5	Performance of Standard Penetration Tests (SPTs) in boreholes generally at 1 to 1.5 m depth interval or as necessary along with collection of SPT samples, including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	250		
A6	Collection of relatively undisturbed soil samples from boreholes through Denison/ Pitcher/ Shelby sampler, including their waxing, labelling, packing, storage & transportation to an approved testing laboratory.	No.	20		
A7	Installation of four (04) stand pipe piezometers (GI Pipe) of maximum 30 m length in boreholes excavated for geotechnical investigations, and monitoring of water levels on daily basis during investigations	L.M.	100		
A8	Collection of water samples from borehole (if encountered) including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	10		
<b>Sub-Total A =</b>					
<p>1. Verticality should be ensured in the boreholes specified for the installation of piezometers.</p> <p>2. Establishment of coordinates and ground elevations of all the boreholes and testpits using total station is included in the scope of work. The coordinates should be provided with reference to a permanent bench mark established at site.</p> <p>3. Preferred method of drilling will be straight rotary method. Percussion drilling will only be allowed in case of gravelly strata.</p> <p>4. All the disturbed/undisturbed soil samples shall be stored and transported as per ASTM standards. The area ratio and clearance ratio of the thin walled tube, should be in strict compliance with relevant ASTM standard.</p> <p>5. Contractor will be responsible for arrangement of Personnel Protective Equipments (PPEs) such as safety helmets and jackets for NESPAK site supervisory / visiting staff.</p>					



CONSULTANCY SERVICES FOR GEOTECH SURVEY OF DHA CITY KARACHI (NORTH)  
PACAKAGE-II

GEOTECHNICAL INVESTIGATIONS

BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
<b>B.</b>	<b>LABORATORY TESTING</b>				
B1	Sieve analysis	No.	85		
B2	Hydrometer analysis (with pretreatment)	No.	17		
B3	Liquid and plastic limits	No.	26		
B4	Bulk and dry density	No.	20		
B5	Consolidation with Swell Potential measurement	No.	10		
B6	Direct Shear (undisturbed samples)	No.	10		
B7	Direct Shear (Fully softened and residual $\phi$ )	No.	5		
B8	Unconfined Compression (on soil samples)	No.	12		
B9	Uniaxial Compression (on rock samples)	No.	33		
B10	Triaxial compression(Consolidated undrained CU)	No.	3		
B11	Point Load Test	No.	26		
B12	Sulphate content	No.	10		
B13	Chloride content	No.	10		
B14	Organic matter content	No.	10		
B15	Complete chemical analysis of water samples i.e TDS, SO <sub>4</sub> , CL & pH	No.	10		
	<b>Sub-Total B =</b>				
	<b>Total (A+B)=</b>				
Name of Laboratory: _____					



CONSULTANCY SERVICES FOR GEOTECH SURVEY OF DHA CITY KARACHI (NORTH) PACKAGE-III					
GEOTECHNICAL INVESTIGATIONS BILL OF QUANTITIES					
Sr. No.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
A	<b>FIELD INVESTIGATIONS</b>				
A1	Mobilization and demobilization of atleast four (04) straight rotary/heavy percussion drilling rigs alongwith allied accessories at site. The equipment shall be adequate in quantity to meet the time schedule.	LS	1		
A2	Setting and Shifting of drilling rig. from one investigation point to another in the project area and arrangement of water for drilling.	No.	24		
A3	Execution of twenty four (24) boreholes in overburden soils or up to the bedrock, whichever is met earlier by straight rotary/heavy percussion method including backfilling of boreholes to their original position using cement-sand-bentonite mix. Minimum permissible diameter of borehole is 150 mm for percussion method and 101 mm for straight rotary method.	L.M.			
	i) Execution of borehole(s) from NSL to maximum 15 m depth		200		
	ii) Execution of borehole(s) from 15.0 m to maximum 20 m depth		40		
	iii) Execution of borehole(s) from 20.0 m to maximum 30 m depth		20		
	iv) Execution of borehole(s) from 30.0 m to maximum 45 m depth		15		
	v) Execution of borehole(s) from 45.0 m to maximum 60 m depth		15		
A4	Continuous core drilling (NX size) in bedrock up to a maximum depth of 8 to 10 m below rock strike level using double tube core barrel, including extraction, preservation of core samples in core boxes, waxing of core samples, photography of rock cores and transportation of core samples to the approved laboratory.	L.M.	207		
A5	Performance of Standard Penetration Tests (SPTs) in boreholes generally at 1 to 1.5 m depth interval or as necessary along with collection of SPT samples, including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	250		
A6	Collection of relatively undisturbed soil samples from boreholes through Denison/ Pitcher/ Shelby sampler, including their waxing, labelling, packing, storage & transportation to an approved testing laboratory.	No.	20		
A7	Installation of four (04) stand pipe piezometers (GI Pipe) of maximum 30 m length in boreholes executed for geotechnical investigations, and monitoring of water levels on daily basis during investigations.	L.M.	100		
A8	Collection of water samples from borehole (if encountered) including their labelling, packing, storage & transportation to an approved testing laboratory.	No.	10		
<b>Sub-Total A =</b>					
<p>1. Verticality should be ensured in the boreholes specified for the installation of piezometers.</p> <p>2. Establishment of coordinates and ground elevations of all the boreholes and testpits using total station is included in the scope of work. The coordinates should be provided with reference to a permanent bench mark established at site.</p> <p>3. Preferred method of drilling will be straight rotary method. Percussion drilling will only be allowed in case of gravelly strata.</p> <p>4. All the disturbed/undisturbed soil samples shall be stored and transported as per ASTM standards. The area ratio and clearance ratio of the thin walled tube, should be in strict compliance with relevant ASTM standard.</p> <p>5. Contractor will be responsible for arrangement of Personnel Protective Equipments (PPEs) such as safety helmets and jackets for NESPAK site supervisory / visiting staff.</p>					



CONSULTANCY SERVICES FOR GEOTECH SURVEY OF DHA CITY KARACHI (NORTH)  
PACAKAGE-III

GEOTECHNICAL INVESTIGATIONS

BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
<b>B.</b>	<b>LABORATORY TESTING</b>				
B1	Sieve analysis	No.	85		
B2	Hydrometer analysis (with pretreatment)	No.	17		
B3	Liquid and plastic limits	No.	26		
B4	Bulk and dry density	No.	20		
B5	Consolidation with Swell Potential measurement	No.	10		
B6	Direct Shear (undisturbed samples)	No.	10		
B7	Direct Shear (Fully softened and residual $\phi$ )	No.	5		
B8	Unconfined Compression (on soil samples)	No.	12		
B9	Uniaxial Compression (on rock samples)	No.	33		
B10	Triaxial compression(Consolidated undrained CU)	No.	3		
B11	Point Load Test	No.	26		
B12	Sulphate content	No.	10		
B13	Chloride content	No.	10		
B14	Organic matter content	No.	10		
B15	Complete chemical analysis of water samples i.e TDS, SO <sub>4</sub> , CL & pH	No.	10		
	<b>Sub-Total B =</b>				
	<b>Total (A+B)=</b>				
Name of Laboratory: _____					



CONSULTANCY SERVICES FOR GEOTECH SURVEY OF DHA CITY KARACHI (NORTH)					
PACKAGE-IV					
SOIL AND MATERIAL INVESTIGATIONS					
BILL OF QUANTITIES					
Sr. No.	Description	Unit	Qty.	Rate (Rs.)	Amount (Rs.)
A	<b>FIELD INVESTIGATIONS</b>				
A1	Mobilization and demobilization of hand digging tools and apparatus for field density test at site including shifting from one investigation point to another.	L.S.	1		
A2	Excavation of one hundred twenty (120) testpits up to a maximum depth of 1.50 m in overburden soils or up to the bedrock, whichever is met earlier including backfilling of pits to original condition.	L.M.	180		
A3	Excavation of five (05) borrow area testpits up to a maximum depth of 2.0 m in overburden soils including backfilling of pits to original condition.	L.M.	10		
A4	Performance of field density tests by sand replacement method in testpits generally @ 1 test/pit at selected horizons, including determination of in-situ bulk and dry density and collection of small disturbed samples in moisture tins for moisture content determination in laboratory by oven drying method as well as labelling, packing, storage & transportation to an approved testing laboratory.	No.	120		
A5	Collection of bulk soil samples (60 kg for sandy/clayey soils & 120 kg for gravelly soils) from testpits including their labeling, packing, storage & transportation to an approved testing laboratory.	No.	120		
A6	Collection of bulk soil samples (60 kg for sandy/clayey soils & 120 kg for gravelly soils) from borrow area testpits including their labeling, packing, storage & transportation to an approved testing laboratory.	No.	5		
	<b>Sub-Total A =</b>				
<p>1. Establishment of coordinates and ground elevations of all the testpits using total station is included in the scope of work. The coordinates should be provided with reference to a permanent bench mark established at site.</p> <p>2. Contractor will be responsible for arrangement of Personnel Protective Equipments (PPEs) such as safety helmets and jackets for NESPAK site supervisory / visiting staff.</p>					



CONSULTANCY SERVICES FOR GEOTECH SURVEY OF DHA CITY KARACHI (NORTH)  
PACKAGE-IV

SOIL AND MATERIAL INVESTIGATIONS

BILL OF QUANTITIES

Sr. No.	Description	Unit	Qty.	Rate	Amount
<b>B.</b>	<b>LABORATORY TESTING</b>				
B1	Sieve analysis	No.	125		
B2	Hydrometer analysis (with pretreatment)	No.	40		
B3	Liquid and plastic limits	No.	50		
B4	Sodium Sulphate Soundness Test	No.	8		
B5	Los Angles Abrasion Test	No.	5		
B6	Petrographic Analysis	No.	5		
B7	Modified AASHTO Compaction	No.	125		
B8	3-point Soaked CBR	No.	125		
	<b>Sub-Total B =</b>				
	<b>Total (A+B)=</b>				
Name of Laboratory: _____					

