



ENERGY FIJI LIMITED

BIDDING DOCUMENT

**CARRY OUT GEO-TECHNICAL
INVESTIGATION FOR TAMAVUA-I-WAI &
WAILEKUTU 33KV TRANSMISSION LINE
CROSSING BRIDGE PROJECT FOR ENERGY
FIJI LIMITED**

TENDER NO: MR 262/2024

Addendum No. 1

REVISION NOTES:

Date	Notes	Prepared By	Rev No.
23/08/2024	Addendum No.1 compiled and issued	Amitesh Arunesh Chand	1

No	Description
1	<p>3. Scope of work, Page 9 -10</p> <p>Change</p> <p>3.2 Borehole Drilling</p> <p>a. “Drill 5 boreholes to a depth until reach hard strata at the site Tamavua-i-wai and Wailekutu site (location attached). Boreholes will be used to obtain soil samples and assess subsurface conditions. Bore holes shall be taken at specified locations to obtain information about the sub-soil profile, its nature and strength and to collect soil samples for strata identification and conducting laboratory tests. The diameter of the borehole shall be such as to permit collection of undisturbed sample of 90 mm to 100 mm diameter. However, the diameter shall be 150mm as per relevant code. The minimum diameter of the bore shall be 150 mm and boring shall be carried out in accordance with the provisions of standards and as per this specification.”</p> <p>Note: 4 Machine boreholes required on foreshore, 2 at each end (per site) and 1 Machine borehole required on offshore in middle of the river (per site).</p> <p>to</p> <p>3.2 Borehole Drilling</p> <p>b. “Drill 2 boreholes to a depth until reach hard strata at the site Tamavua-i-wai and Drill 2 boreholes to a depth until reach hard strata at the site Wailekutu site (location attached). Boreholes will be used to obtain soil samples and assess subsurface conditions. Bore holes shall be taken at specified locations to obtain information about the sub-soil profile, its nature and strength and to collect soil samples for strata identification and conducting laboratory tests. The diameter of the borehole shall be such as to permit collection of undisturbed sample of 90 mm to 100 mm diameter. However, the diameter shall be 150mm as per relevant code. The minimum diameter of the bore shall be 150 mm and boring shall be carried out in accordance with the provisions of standards and as per this specification.”</p>
2	<p>3. Scope of work, Page 10</p> <p>Remove</p> <p>3.3 Auger Boring</p> <p>Auger boring can be adopted in soft to stiff cohesive soils above water table. Augers shall be of helical or post-hole type which may be manually or power operated. While boring, care shall be taken to minimize the disturbance to the deposits below the bottom of the bore hole. The cuttings brought up by the auger shall be carefully examined in the field and the description of all the strata shall be duly recorded. No water shall be introduced from the top while conducting Auger boring.</p> <p>Note 2 auger boring required on foreshore, 1 at each end (per site).</p>
3	<p>3. Scope of work, Page 11</p> <p>Change</p> <p>3.4 Standard Penetration Test (SPT)</p> <p>“This test shall be conducted in all types of soil deposits met within a bore hole, to find the variation in the soil stratification by correlating with the number of blows required for unit penetration of standard penetrometer. This test shall be conducted at intervals agreed by the EFL and CONTRACTOR and every change of strata to the satisfaction of the EFL. The starting depth of performing SPT shall be 0.5m depth below ground level. This depth shall be staggered in alternate boreholes. The depth interval between the top levels of Standard penetration test and next undisturbed sampling shall not be less than 1.0 m. The</p>

	<p>specifications for the equipment's and other accessories, procedure for conducting the test, presentation of test results and collection of the disturbed soil samples.</p> <p>For conducting the test, the bottom of borehole shall be cleaned properly and the spoon shall be properly and centrally seated in position in the borehole. It is necessary to ensure that drive hammer is of specified weight and has a specified free fall. It shall be ensured that energy of the falling weight is not reduced by friction between the drive weight and guides or between rope and winch drum. Only BIS recommended standard connecting rods shall be used for the test.</p> <p>This test shall be carried out by driving a standard split spoon sampler in the bore hole by means of a 650 N hammer having a free fall of 0.75 m. The sampler shall be driven using the hammer and for 450 mm. While driving the number of blows for every 150 mm penetration and the penetration for every 50 blows shall be recorded. The number of blows for the last 300 mm drive shall be reported as N value. This test shall be discontinued when the blow count is equal to 100 and the penetration shall be recorded. Refusal shall be considered to be met with when the blow count is equal to or greater than 100. At the location where the test is discontinued the penetration and the number of blows shall also be reported. Sufficient quantity of disturbed soil samples shall be collected from the split spoon sampler for identification and laboratory testing. The sample shall be visually classified and recorded at the site and shall be properly preserved and labelled for future identification.</p> <p>Note: 4 Machine boreholes required on foreshore, 2 at each end (per site) and 1 Machine borehole required on offshore in middle of the river (per site).”</p> <p>To</p> <p>3.5 Standard Penetration Test (SPT)</p> <p>“2 (SPT) test is required at Tamavua-i-wai site and 2 (SPT) test required at Wailekutu site. This test shall be conducted in all types of soil deposits met within a bore hole, to find the variation in the soil stratification by correlating with the number of blows required for unit penetration of standard penetrometer. This test shall be conducted at intervals agreed by the EFL and CONTRACTOR and every change of strata to the satisfaction of the EFL. The starting depth of performing SPT shall be 0.5m depth below ground level. This depth shall be staggered in alternate boreholes. The depth interval between the top levels of Standard penetration test and next undisturbed sampling shall not be less than 1.0 m. The specifications for the equipment's and other accessories, procedure for conducting the test, presentation of test results and collection of the disturbed soil samples.</p> <p>For conducting the test, the bottom of borehole shall be cleaned properly and the spoon shall be properly and centrally seated in position in the borehole. It is necessary to ensure that drive hammer is of specified weight and has a specified free fall. It shall be ensured that energy of the falling weight is not reduced by friction between the drive weight and guides or between rope and winch drum. Only BIS recommended standard connecting rods shall be used for the test.</p> <p>This test shall be carried out by driving a standard split spoon sampler in the bore hole by means of a 650 N hammer having a free fall of 0.75 m. The sampler shall be driven using the hammer and for 450 mm. While driving the number of blows for every 150 mm penetration and the penetration for every 50 blows shall be recorded. The number of blows for the last 300 mm drive shall be reported as N value. This test shall be discontinued when the blow count is equal to 100 and the penetration shall be recorded. Refusal shall be considered to be met with when the blow count is equal to or greater than 100. At the location where the test is discontinued the penetration and the number of blows shall also be reported. Sufficient quantity of disturbed soil samples shall be collected from the split spoon sampler for identification and laboratory testing. The sample shall be visually classified and recorded at the site and shall be properly preserved and labelled for future identification.</p>
4	<p>3. Scope of work, Page 15</p> <p>Change</p>

3.7 In-Situ Testing

3.7.8 Required Tests on Samples:

The CONTRACTOR is required to carry out the following tests and submit detailed reports with recommendations:

a. Tests on Undisturbed and Disturbed Samples

1. Visual and Engineering Classification
2. Sieve Analysis and Hydrometer Analysis
3. Liquid, Plastic, and Shrinkage limits
4. Specific Gravity
5. Chemical Analysis
6. Swell pressure and Free Swell index determination
7. Proctor Compaction test
8. California Bearing Ratio

To

3.7 In-Situ Testing

3.7.8 Required Tests on Samples:

The CONTRACTOR is required to carry out the following tests and submit detailed reports with recommendations:

b. Tests on Undisturbed and Disturbed Samples

1. Visual and Engineering Classification
2. Sieve Analysis and Hydrometer Analysis
3. Liquid, Plastic, and Shrinkage limits
4. Specific Gravity
5. Swell pressure and Free Swell index determination
6. Proctor Compaction test
7. California Bearing Ratio

**5 14. Payment Schedules and Terms, page 22 & 23
Change**

The payment will be based on **LUM-SUM** basis. EFL will not be making any advance payment for this work. **The prices quoted shall be inclusive of provisional tax for local service providers.**

Refer to the table below for Mode of Payments for Each Milestone.

item	Description	Amount
1.0	Mobilization of necessary boring equipment's, other in situ test equipment's, men and materials to the project site for carrying out the geotechnical investigation and demobilization of the same after completion of all the field works etc all complete as per specification, drawing and as directed in scope.	
1.1	Setting up boring rig at each bore hole location as directed in scope including Shifting of rig from one borehole to other excluding first borehole on LAND. First setting of each rig deployed will not be paid as it is a paid under item 1.0 Note: Setting up boring rig at each borehole Location as per scope. (Any crisscross or back and forth movement of boring rig can take place. No additional compensation will be payable by the EFL for such movements). (The arrangement shall include	

	formation of local mound for creation of platform for borehole drilling in the event of any inundation in the area).	
1.2	<p>Making 150 mm nominal diameter boreholes at required locations in all types of soil/sand/ash including hardened laterite, weathered rock and soft rock (RQD<25%) using suitable approved method of boring including chiselling, cleaning, providing casing pipe as required or as directed; The starting depth of performing SPT shall be 0.5m below ground level. Collection of water samples and disturbed samples, observation such as ground water, etc., collection of undisturbed soil/ash samples at every 1.5 m interval and at change of strata and sealing the container; transportation of all the collected samples to the laboratory and back filling of boreholes with bentonite-cement grout on completion of the same, complete as per specification and instructions of the Engineer, for depths below natural ground level as given below:</p> <p>a) From natural ground level until hard rock level is reach or</p> <p>b) Until the Hard ground surface is reach which will be suitable for EFL cable crossing bridge.</p>	
1.3	<p>Conducting Field vane shear test at required locations:</p> <p>a) Tamavua-i-wai b) Wailekutu</p> <p>And at depths 500mm below ground level including collection of disturbed soil samples at the test depth all complete as per specification and relevant standards.</p>	
1.4	Conducting field CBR tests at required locations, including all complete including saturation as per specification and directions of the Engineer	
1.5	Conducting field Dynamic cone penetration (DCP) tests at required locations, and depth up to 3m or more as required, all complete including saturation as per specification and directions of the Engineer	
1.6	<p>Conducting various laboratory tests on soil samples at an approved laboratory including preparation of soil samples to determine the following properties of soil, preparation & submission of report of geotechnical investigation and foundation recommendation etc. all complete as per specification.</p> <p>a) Natural Moisture content, bulk and dry density for UDS Samples b) Sieve Analysis c) Hydrometer or Pipette Analysis d) Liquid Limit and Plastic Limit (Atterberg's Limits and plasticity index (LL, PL and PI) e) Shrinkage Limit and shrinkage ratio f) Specific gravity g) Standard proctor compaction test h) Unconfined Compressive strength test on undisturbed soil samples or soil samples compacted to specified density. i) Direct Shear Test</p>	

	j) Chemical Analysis of soil including sulphates, chlorides, ph value etc.	
2.0	Preparation and submission of report & Drawings as required.	
3.0	Total Cost (VIP)	
<p>To</p> <p>14. Payment Schedules and Terms</p> <p>The payment will be based on LUM-SUM basis. EFL will not be making any advance payment for this work. The prices quoted shall be inclusive of provisional tax for local service providers.</p> <p>Refer to the table below for Mode of Payments for Each Milestone.</p>		
item	Description	Amount
1.0	Mobilization of necessary boring equipment's, other in situ test equipment's, men and materials to the project site for carrying out the geotechnical investigation and demobilization of the same after completion of all the field works etc all complete as per specification, drawing and as directed in scope.	
1.1	<p>Setting up boring rig at each bore hole location as directed in scope / site location diagram including Shifting of rig from one borehole to other excluding first borehole on LAND. First setting of each rig deployed will not be paid as it is a paid under item 1.0</p> <p>Note: Setting up boring rig at each borehole Location as per scope / site location diagram. (Any crisscross or back and forth movement of boring rig can take place. No additional compensation will be payable by the EFL for such movements). (The arrangement shall include formation of local mound for creation of platform for borehole drilling in the event of any inundation in the area).</p>	
1.2	<p>Making 150 mm nominal diameter boreholes at required locations in all types of soil/sand/ash including hardened laterite, weathered rock and soft rock (RQD<25%) using suitable approved method of boring including chiselling, cleaning, providing casing pipe as required or as directed; The starting depth of performing SPT shall be 0.5m below ground level. Collection of water samples and disturbed samples, observation such as ground water, etc., collection of undisturbed soil/ash samples at every 1.5 m interval and at change of strata and sealing the container; transportation of all the collected samples to the laboratory and back filling of boreholes with bentonite-cement grout on completion of the same, complete as per specification and instructions of the Engineer, for depths below natural ground level as given below:</p> <p>a) From natural ground level until hard rock level is reach or</p> <p>b) Until the Hard ground surface is reach which will be suitable for EFL cable crossing bridge.</p>	
1.3	<p>Conducting Field vane shear test at required locations:</p> <p>a) Tamavua-i-wai</p> <p>b) Wailekutu</p> <p>And at depths 500mm below ground level including collection of disturbed soil samples at</p>	

		the test depth all complete as per specification and relevant standards.	
	1.4	Conducting field CBR tests at required locations, including all complete including saturation as per specification and directions of the Engineer	
	1.5	Conducting field Dynamic cone penetration (DCP) tests at required locations, and depth up to 3m or more as required, all complete including saturation as per specification and directions of the Engineer	
	1.6	Conducting various laboratory tests on soil samples at an approved laboratory including preparation of soil samples to determine the following properties of soil, preparation & submission of report of geotechnical investigation and foundation recommendation etc. all complete as per specification. a) Natural Moisture content, bulk and dry density for UDS Samples b) Sieve Analysis c) Hydrometer or Pipette Analysis d) Liquid Limit and Plastic Limit (Atterberg's Limits and plasticity index (LL, PL and PI) e) Shrinkage Limit and shrinkage ratio f) Specific gravity g) Standard proctor compaction test h) Unconfined Compressive strength test on undisturbed soil samples or soil samples compacted to specified density. i) Direct Shear Test	
	2.0	Preparation and submission of report & Drawings as required.	
	3.0	Total Cost (VIP)	
6	<p>3. Scope of work, Page 19</p> <p>Replace</p> <p>Site location is as shown in the map below.</p> <p>To</p> <p>Site location is as shown in the map below in Appendix 1 and Appendix 2.</p>		

APPENDIX 1



Figure 1: The area hatched on the Locality Map is area subjected to Geo-technical Investigation for Tamavua-i-wai.

APPENDIX 2



Figure 2: The area hatched on the Locality Map is area subjected to Geo-technical Investigation for Wailekutu.