

WORK INSTRUCTIONS FOR ENGINEERS

Compiled by : _____ GKH

Checked by : _____ LSS

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**CH-011. CHECKLIST FOR BOREHOLE
TESTING**

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30.0 CHECKLIST FOR BOREHOLE TESTING

No.	CHECKLIST ITEMS	ACKNOWLEDGED BY	CHECKED BY	
		S.I. Contractor	G&P GEOTECHNICS SDN BHD (G&P)	
1.0	EQUIPMENT APPRAISAL	SIGNATURE	YES	NO
1.1	Casing: <ul style="list-style-type: none"> NW (I.D 76mm, O.D 89mm) HW (I.D 101mm, O.D 115mm) 		<input type="checkbox"/>	<input type="checkbox"/>
1.2	Rod: <ul style="list-style-type: none"> AW (O.D 44mm) Drill rods in standard length (e.g. 3.0m, 1.5m, 1.0m). 		<input type="checkbox"/>	<input type="checkbox"/>
1.3	Split Spoon: <ul style="list-style-type: none"> Driving shoe is in good condition (not dented). Sample head has a ball check valve. 		<input type="checkbox"/>	<input type="checkbox"/>
1.4	Undisturbed Sampling Tube: <ul style="list-style-type: none"> U75 (I.D 75mm) for piston and thin wall tube U72 (I.D. 72mm) for mazier sampler tube and make sure the spring inside the tube is functioning. UD tube and cutting edge are free from surface irregularities (dents, rust, etc.) and in good conditions Make sure all type of undisturbed sample tubes shall have 1m in length 		<input type="checkbox"/>	<input type="checkbox"/>
1.5	Chart for visual description <ul style="list-style-type: none"> For Soil For Rock 		<input type="checkbox"/>	<input type="checkbox"/>
1.6	<u>REMARKS:</u> Contractor must make available Hydrochloric acid (diluted to 10% concentration) at site (especially when working at the site underlain by limestone formation) for testing and confirmation of limestone or other rocks containing carbonate minerals.		<input type="checkbox"/>	<input type="checkbox"/>
2.0	STANDARD PENETRATION TEST (SPT)	SIGNATURE	YES	NO
2.1	General procedures: <ul style="list-style-type: none"> Borehole advances by rotary wash boring method. (Note: percussive drilling is not allowed) SPT to be carried out below casing. Keep borehole water level equal to or higher than elevation of groundwater for silty and sandy soils to prevent 'boiling'. Check the water source for the boring works. Dirty water (with rubbish, dirty colour and smelly) totally cannot be used. Water used for wash boring shall be clean water. Use pH paper (to be provided by contractor) to check the pH value of the water used. 		<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>

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3.3	REMARKS: <ul style="list-style-type: none"> The contractor shall try hard to get the UD recovery with minimum of 600mm so that there are sufficient soil samples for laboratory tests. 			
4.0	ROCK CORING	SIGNATURE	YES	NO
4.1	General Procedures: <ul style="list-style-type: none"> Determine coring depth when lowering down rods and core barrel. Coring by using triple tube core barrel (NMLC) for minimum 54mm dia. Drillers are to stay close at machine. If less than 50% core recovery, the following run to be reduced to 0.5m coring length to improve recovery Record the time taken for every 1.5 m rock coring in the borehole logging form. The rock description should follow B.S Standard (type of rock, color, fracture, RQD, CRR, dip angle, spacing and GSI) and record in borehole log if there's more than one type of rocks in one core. 		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.2	Extraction and Storage of Cores: <ul style="list-style-type: none"> Remove cores from barrel by hydraulic pressure. Place cores in standard core box systematically and follow the angle of the joints. Show core loss by spacer –spun or woods with label its either core loss or cavities. Store core box under cover from rain and sunlight. Photograph cores in core box with legible information (label the depth, recovery and RQD of each rock core samples) and arranged the core boxes systematically according to its depth. Carry out acid test in order to confirm those rock core samples are limestone/marble or not. 		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
4.3	REMARKS: 			
5.0	VANE SHEAR TEST (VST)	SIGNATURE	YES	NO
5.1	Equipment: <ul style="list-style-type: none"> Vane type: Geonor/Acker Vane diameter: 50mm/65mm (for Geonor Vane) 		<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
5.2	Calibration:		<input type="checkbox"/>	<input type="checkbox"/>

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	<ul style="list-style-type: none"> ● Calibration certificate for equipment (last calibration must be within 3 months). ● Calibration chart for vane. (Note: Testing cannot proceed without the certificate) ● Calibration the vane in water to check the functionality of the equipment. 		<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>
5.3	<p>General Procedures:</p> <ul style="list-style-type: none"> ● Torque head measuring instrument firmly secured against movement with respect to ground level. ● Applicable vane size (for Geonor Vane): 55mm X 110mm for $S_{uv} = 50$ to 100 kPa; 65mm X 130mm for $S_{uv} = 0$ to 60 kPa. ● Vane to rotate at a rate of 6 degrees/min. ● Elapse time of 5 minutes before remoulding test. 		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5.4	<p>REMARKS:</p>			
	<p>NOTE: Once this copy is signed, the above guidelines have been clearly defined and understood by the contractor. Therefore, there shall be no problems in repeating the testing procedures for the borehole without the presence of G&P representation.</p>			

