reducing geotechnical uncertainty
Insitu Geotech Services Pty Ltd IGS
ABN 46 091 597 661
20 Jensen Rd Banyo 4014

PLANT HAZARD ASSESSMENT

RIG: **"ESME" – All-Terrain In Situ Testing Rig**

SITE/PROJECT: **Generic Project**

Personnel Involved	Assessed By	Project Operator	Off-Sider	Notes re Operator/Off-Sider Training
	Allan McConnell			In situ testing is a "niche" business with very few rigs in Australia. There are no specific training courses or certificates available. IGS undertakes our own in-house training, much of this on-the-job. Off-siders may be trainee rig operators, or even well-experienced trained operators working as assistant to a newly trained operator for mentoring purposes.
Qualifications/Training:	Registered Professional Engineer			
General Notes:	This Risk Assessment was made on the date shown below. It is a part of IGS's normal operation that the rig is also inspected daily in a pre-start as a precaution against changes that may have occurred (eg equipment failures or modifications) that may impact on risk This is recorded on the Operator's Daily Record Sheet.			

GENERAL INFORMATION ON THE RIG

Rig Data & Purpose

All-terrain rig on balloon tyres

Year Built: 2000 (refurb 2009)

On-board broadband

Differential GPS

Mass 11-22t adjustable

Push capability (up to 200kN)

Test Types:
- CPTu & Tee-Bar
- DMT & SDMT
- Vane Shear

Also:
- Piezometers
- Standpipes
- Vertek piston sampling
- Eziprobe Sampling

Mobility Information

Drive is fully hydraulic with radial piston motor on hub of each wheel. Tyre pressures are adjusted as required to suit terrain.

Two-speed drive - maximum travel speed is 3.2km/hr. Minimum speed unloaded is 1.6km/hr

Drive system automatically brakes in a fail-safe manner when not being driven.

Drive controls are by joy stick at each end of rig. Hence rig does not ever need to "reverse". Operator moves to appropriate end to drive rig forward at all relevant times. Joy sticks are isolated when not traversing

Joy sticks are deadman controls. If released, rig stops and brakes auto-apply.

Diesel engine is mounted fully external to cabin (at end not visible in this photo). External mounting ensures quiet work space inside cabin and positive isolation from engine heat and exhaust fumes.

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No	Potential Hazard	Checked Yes	Checked No	Checked N/A	Control Methods in Place	Adequate Yes	Adequate No	Notes on Existing Controls or Additional Control Required	Action Date	Done Date
1	**CRUSHING AND CUTTING** - Can any person be crushed or cut due to:									
1.1	unexpected movement of the rig	√			rig can only start in neutral	√		start and drive systems are apart		
					reversing/travel alarm	√				
					amber flashing beacon	√				
					rear view mirror	N/A		not required – rig drives both ends		
					pedals/controls non-slip	√		no pedals but joysticks are good		
					controls have appropriate knobs	√				
					reversing lights fitted	√		traversing lights both ends		
					reversing camera fitted	N/A		not required – rig drives both ends		
1.2	lack of capacity for plant to be slowed, stopped or immobilised	√			park brake operational	√				
					battery isolator fitted	√				
					emergency isolator fitted	√				
					rig can only travel at 3.2 km/hr	√				
					drive system is deadman braked	√				
1.3	the plant tipping or rolling	√			rig has very low centre of gravity	√		90% of rig mass is below 1m height		
					rig can only travel at 3.2 km/hr	√		traverses at walking speed		
					rig self-stalls on oversteep slopes	√		cannot drive up oversteep slopes		
					rig base grounds if wheels sink	√		remains stable if one side sinks		
					rig has very robust cabin frame	√				
1.4	being thrown from the plant	√			rig can only travel at 3.2 km/hr	√				
					rig has operable/lockable door	√				
1.5	coming into contact with sharp objects	√			engine is external and guarded	√				
					no visible signs of sharp objects	√				

RISK ASSESSMENT											
No	Potential Hazard	Checked Yes	Checked No	Checked N/A	Control Methods in Place	Adequate Yes	Adequate No	Notes on Existing Controls or Additional Control Required	Action Date	Done Date
2	**STRIKING - Can any person be struck by moving parts due to:**									
2.1	working pieces being ejected	√			push head is purpose-designed	√		only work pieces are CPT push rods these cannot be ejected from the slow-moving purpose-designed pusher system		
					push-pull clamps restrain rods	√				
					pusher moves slowly - 2cm/sec	√				
					"nip point" decals fitted	√				
2.2	mobility of plant travelling	√			reversing/travel alarm	√				
					amber flashing beacon	√				
					rear view mirror	N/A		not required – rig drives both ends		
					reversing lights fitted	√		traversing lights both ends		
					reversing camera fitted	N/A		not required – rig drives both ends		
					rig can only travel at 3.2 km/hr	√				
2.3	controls unidentified	√			controls are all identified	√				
					and are labelled in clear English	√				
3	**ENTANGLEMENT – Can anything become entangled in moving parts**									
3.1	in engine area	√			engine is externally mounted	√				
					engine is guarded	√				
3.2	in cabin during testing	√			pusher moves slowly - 2cm/sec	√				
					"nip point" decals fitted	√				
4	**FALLING – SLIPPING – Can any person fall/slip due to:**									
4.1	lack of proper work platform	√			work cabin is purpose-designed	√				
					floor has non-slip surfaces	√				
4.2	lack of proper stairs/steps	√			cabin floor is only 1m high	√		potential fall-height is very low		
					steps to cabin are purpose-built	√		3-points of contact provided		
4.3	lack of guardrails / handrails	√			hand-holds provided in doorway	√		doorway is only relevant location		

RISK ASSESSMENT

No	Potential Hazard	Checked Yes	Checked No	Checked N/A	Control Methods in Place	Adequate Yes	Adequate No	Notes on Existing Controls or Additional Control Required	Action Date	Done Date
4.3	poor housekeeping	√			no visible lubricant leakage	√				
					no consumables used in operation	√		ie no litter build-up		
					work area is purpose-designed	√				
5	**ERGONOMIC – Can any person be injured due to:**									
5.1	poor seating	√			operator stands when working	√		operator moves about cabin		
					off-sider sits on low bench	√		off-sider deems this satisfactory		
5.2	constrained body effort	√			all controls are in operator's reach	√				
6	**HIGH TEMPERATURE – Can any person be burnt due to contact with hot parts:**									
6.1	around engine area	√			engine is quite separate to cabin	√				
					engine is guarded	√				
					exhaust is high – out of reach	√				
6.2	in cabin during operation	√			no engine or exhaust access	√				
					hydraulic system has thermometer	√		observations indicate hydraulics may become hot but not scalding		
					hydraulic hoses are wrapped	√				
					hot warning decals fitted	√				
7	**ELECTRICAL – Can any person be shocked due to:**									
7.1	coming into contact with live electrical conductors	√			most wiring on rig is 12v	√				
					240v wiring is tagged and tested	√				
7.2	lack of tag out procedure	√			240v only from small generator	√				
					tag out procedure is in place					
7.3	damaged leads & switches	√			no visible signs of damage	√				
					all devices are tested and tagged	√				
7.4	batteries are not protected	√			batteries are in locked cage	√				

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8	**OTHER HAZARDS – Can any person be injured due to:**									
8.1	fumes or dust	√			engine fumes are outside cabin	√				
					doors & windows seal adequately	√				
					air con fitted for extreme times	√				
8.2	noise	√			noise level in cabin is low	√		62-65db idling ~72-74db full power		
9	**OPERATOR – Have the following areas been addressed:**									
9.1	Is the operator trained and qualified to operate this plant	√			in-house trained by IGS construction industry card holder Risk Management – Certificate 3	√ √ √		no external rig training available		
10	**DOCUMENTATION – Can documentation be provided:**									
10.1	Operation Manual issued	√			rig purpose-built	√		no unitised manual exists		
					testing systems	√		manual available for CPT & DMT		
10.2	Servicing and Maintenance records	√			records maintained by company	√		available on request (attached)		
11	**STRUCTURE – Can any person be injured due to structural defects**									
11.1	Design Certificate	√			records maintained by company	√		available on request		
11.2	Engineer's observations during construction and loading	√			records maintained by company	√		available on request		