MV GEO SOVEREIGN

DP2 GEOTECHNICAL SURVEY VESSEL

NOTICE: Particulars are believed to be correct and subject to revision without prior notice. Interested parties must inspect vessel to check on suitability of the Company's equipment. Company has exercised due diligence to ensure that the data contained herein is reasonably accurate. However, the Company does not warrant the accuracy or completeness of the data. In no event shall the Company be liable for any damages whatsoever arising out of the use or inability to use the data contained herein. All optional equipment for Charterers' usage shall be agreed by the Company. Updated as at 7 February 2023.

MV GEO SOVEREIGN
TECHNICAL SPECIFICATIONS

VESSEL SPECIFICATIONS

Year Built	2006
Place Built	Jaya Marine, Batam, Indonesia
Flag	Kiribati
Classification	ABS
Vessel IMO Number	9376139

PRINCIPLE DIMENSIONS

Length Overall	70.05 m
Breadth (Moulded)	14.95 m
Depth (Moulded)	6.10 m
Draft (Moulded)	5.00 m
GRT / NRT (MT)	1,951 T

MAIN MACHINERY

Main Propulsion	2 x 2,750 bhp
Main Generator	2x370kW
Emergency Gen	1x60kW
Bow Thruster	2 x 515 kW tunnel (8T)
Stern Thruster	1 x 515 kW tunnel (8T)
Steering Gear	2 x 45 degrees
Rudders	Conventional Split
Propeller	2 x CPP with Nozzles

ACCOMMODATION

4 x 1 berth Cabins	4
3 x 2 berth Cabins	6
10 x 4 berth Cabins	40
Total Berths	**50 (All fully air-conditioned)**

(Number of berths for Charterers' usage as per charter party agreement)

DYNAMIC POSITIONING SYSTEM

Kongsberg DPS
2 x DP Controller
2 x Wind Sensor
3 x Master Gyro
1 x HIPAP 500
1 x CyScan - Guidance Marine MK3
2 x DGPS
Joystick control of all thrusters & propellers Power Management System

DECK EQUIPMENT

Bow Anchors	High Holding 2 x 1,590kg
Chains	440m x 38mm
Windlass	9.2T @ 12m/min
Deck Crane	1x 5Ton @ 14m

AUXILIARY EQUIPMENT

Rescue Zone	Port & Starboard Side
Oily Water Separator	1 x 1m3/hr MARPOL Standard
Water Maker	2 x 5T/day Reverse Osmosis
Sewage Treatment	1x 40 men per day

COMMUNICATION & NAVIGATION EQUIPMENT

2xSART
1 x NAVTEX
1 x EPIRB 2 x Radars ARPA
1 x Doppler Speed Log
2 x Master Gyro with 5 Repeaters 1 x Magnetic Compass
1 x GPS
1 x Echo Sounder
1 x Set of GMDSS (Area 3)
3 x VHF GMDSS
1 x Ship Security Alert System
1 x AIS

FIRE FIGHTING EQUIPMENT

External :	
FIFI 1	2x1500m3/hrpumps 2x 1200 m3 / hr monitors
Internal :	Emergency Fire Pump CO2 System in Engine Room Fire Detection & Alarm System Electrical BA Recharging Compressor

MV GEO SOVEREIGN

TECHNICAL SPECIFICATIONS

FACILITIES

Hospital – 1x Bed
Recreation Room
Meeting Room for 10 pax
Client Office for 2 pax
Prayer Room

CAPACITIES

Fuel Oil	810 m3 @ 100%
Potable Water	415 m3 @ 100%
Clear Deck Area	490m2
Deck Strength	7.5 T/m2

DISCHARGE RATES

Fuel Oil	1x100m3/hr@75mhd
Portable Water	1 x 100 m3/hr @ 75 mhd

SPEED & CONSUMPTION

10 knots @ 11.8T / day
13 knots @ 13.3T / day

SAFETY / LIFESAVING EQUIPMENT

Search Lights	4x2000W
Flood Lights	5x1000W
Life Rafts	As per SOLAS Requirement
Lifebuoys	8 pcs w/ Buoy Lights
Life Jackets	48 Pcs
Immersion Suit	42 Pcs
Rescue Boat	As per SOLAS Requirement
Air Breathing App	6 Set Apparatus

GEOTECHNICAL SURVEY EQUIPMENT

MAXIMUM DRILLING CAPACITY : 550M (Including Water Depth)
Please see separate list for full technical details

MOONPOOL : 2.4m x 2.3m

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DRILLING RIG EQUIPMENTS

MARINE DRILLING RIG (ENV25) SPECIFICATION

ENV25 drilling rig, built to meet the driller's needs, assembled on a main independent base frame. This drilling rig fully hydraulically operated offer highly advanced technical solutions which extremely economical, easy maneuverability and reliability.

DRILLING MAST
Drill centerline in plane of front chords. Ladder is sited so as to allow safe and convenient access to the rooster box (sampling platform) at any position in the derrick. The derrick is divided into three (3) sections;
- Main Derrick
- Crow Block
- Sub Derrick for CPTU

SPECIFICATIONS
Overall height : 24m
Main Derrick Size : 2.4mLx2.4mWx12mH
Crown Block Size : 2.4mLx2.4mWx2mH
Sub Derrick Size : 1.5mLx1.5mWx5mH
Travel : 14m
Capacity : Derrick can lift 570m 5 1/2" FH API drill pipe + 10T SBF with 1500m lifting wire. The rotary head can drill 80m in water depth of 470m water depth

ROOSTER BOX (SAMPLING PLATFORM)
The rooster box is suspended from the four falls of the drilling line in the derrick. It is composed essentially of two ram housings each incorporating a 24" sheaves through which the drilling line is routed. These housings are connected to box section and the complete assembly is guided to run between the front chords of the derrick.

SPECIFICATIONS
Dimension : 2.0m x 3.0m
Fall of wire : 6 nos
Sampling Winch : can be mounted

DRILLING CONSOLE
Equipped with 4 spool valve bank to supply draw work (from two banks for max speed), pipe clamp, template winch, tong rams, sample winch and etc. Also fitted with compensator change / blow down control, relevant gauges, mud flow controls, load cell indicator, emergency shut down device (air control) and power swivel servo controls. It also equipped with Wison APV CPTU data acquisition system.

MAIN POWER PACK
2 X 200HP air cool GM engine driving a four stage gear pump, come with relief valve block filters. The engine is enclosed and access is afforded by 6 soundproofed doors. The engine is fitted with an air starter, and exhaust spark arrestor and an Amot protection system which shuts down on overspeed, high water temperature, low water pressure and low oil pressure. Engine RPM, oil pressure and water temperature are monitored by gauge mounted on the exterior of the rear bulkhead. Pressure gauge is mounted at this same location to monitor the hydraulic pressure of each output, return line pressure and suction vacuum.

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MARINE DRILLING RIG (ENV25) SPECIFICATION

SEABED TEMPLATE, SEABED CLAMP, SHEAR RAM AND BIT GUIDE

The seabed template has two functions namely toprovide a seabed reaction for the hydraulic action of the hydraulic action of the down hole testing equipment as it penetrates the soil and to provide a re-entry template for the drill string, should it be necessary to withdraw the string from the borehole at any time (e.g. to change the drill bit). The seabed template weighs approximately 10 tones and this weight is concentrated in the base which is built up of 12" hole to allow for the passage of the drill string. A seabed clamp is bolted on top of the plates which is identical in construction to the clamp and is used to grip the pipe to transmit the reaction from seabed template to the drill string and hence to the down hole equipment. To provide the re-entry facility the seabed template is used in conjunction with the Bit Guide. This fabrication is essentially a box section connection two guides which enclose and run on the SBF Deployment wires. The guide has a central adjustable opening which loosely encloses the drill string above the bit such that the bit will not pass through it. A shear ram is bolted on top of the plates which is identical in construction to the shear ram and used to shear the drill pipe on the emergency of uncontrolled of shallow gas.

POWER SWIVEL

The function of the Power Swivel is to suspend and rotate the drill string and allow for the introduction of drilling fluids and sampling tools when required. The swivel itself consists of a gear case carrying a vertical hollow spindle mounted on taper roller bearings. A worm wheel pinion is fitted around the spindle within the case and is driven by two horizontal worm shafts which are powered by externally mounted Commercial gear motors. The gear case is oil filled and provision is made greasing the main bearings. The complete Power Swivel assembly is gimbal mounted into the Sampling Platform. Provision is made for greasing the gimbal bushings. The Power Swivel is connected to the drill string by means of a drive sub which is flagged to the hollow spindle and has a 4 1/2" IF Pin on its lower end to suit the drill string.

SPECIFICATIONS

Model : Dando MK 1000
Rotary head torque : 25,000nm
Rotary Head Speed : 150 RPM
Lifting Capacity : 40 ton

DRAW WORKS WINCH

The draw works winch is a Braden CH210A-36120-01-1 with high speed reverse. The winch is powered by a high efficiency gear motor designed specifically for winch applications to provide smooth operation. The motor torque is then transmitted and multiplied by the highly efficient computer-aided designed gear train to the winch drum. All rotating components are supported by an anti-friction bearing and run in oil minimize any frictional losses. Load control when lowering is maintained by the patented Braden brake valve known for its smooth performance. The brake not only provides smooth load control but also adapts well to most any hydraulic system. The brake is also backed up by an internal automatic multi-disc spring applied hydraulic released safety brake.

SPECIFICATIONS

Pull at First Layer : 9 tons in 0-12 m/min
Pull at Full Drum : 7.5 tons in 0-15 m/min
Drum Capacity : 120m x 22mm Ø wire rope

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MARINE DRILLING RIG (ENV25) SPECIFICATION

HEADLINE WINCH

The headline winch is a Pullmaster PL5-12-210-1 with high performance, high efficiency winch planetary winch, having equal speed in forward and reverse rotation.
The automatic, multi-disc type brake of this unit is effective in one direction only and achieves an exceptionally smooth lowering control of the maximum load in a step less operation. The winch is powered by a hydraulic gear motor and the required reduction ratio of 39:1 is established by two planetary stages. The hydraulic motor drives directly into the planetary reductions. Dynamic braking is then achieved by modulation of the winch control valve handle. When the control returns to neutral position the brake applies automatically.

HEAVY LOAD WINCH

The heavy load winch is a Braden CH120A with high speed reverse. The winch is powered by a high efficiency gear motor designed specifically for winch applications to provide smooth operation. The motor torque is then transmitted and multiplied by the highly efficient computer-aided designed gear train to the winch drum. All rotating components are supported by an anti-friction bearing and run in oil minimize any frictional losses. Load control when lowering is maintained by the patented Braden brake valve known for its smooth performance. The brake not only provides smooth load control but also adapts well to most any hydraulic system. The brake is also backed up by an internal automatic multi-disc spring applied hydraulic released safety brake.

SPECIFICATION

Pull at First Layer : 22 tons in 0-10 m/min
Pull at Full Drum : 7.5 tons in 0-12 m/min
Drum Capacity : 1200m x 22mm Ø wire rope

SAMPLING WINCH

The sampling winch is a M+S Hydraulic MTB400 with high performance, high efficiency winch planetary winch, having equal speed in forward and reverse rotation. The automatic, multi-disc type brake of this unit is effective in one direction only and achieves an exceptionally smooth lowering control of the maximum load in a step less operation. The winch is powered by a hydraulic gear motor and the required reduction ratio of 41:1 is established by two planetary stages. The hydraulic motor drives directly into the planetary reductions. Dynamic braking is then achieved by modulation of the winch control valve handle. When the control returns to neutral position the brake applies automatically.

SPECIFICATION

Pull at First Layer : 200kg at 0-20 m/min
Drum Capacity : 600m x 8mm Ø wire rope

TAIL LINE WINCH

The headline winch is a Pullmaster PL5-12-210- with high performance, high efficiency winch planetary winch, having equal speedin forward and reverse rotation. The automatic, multi-disc type brake of this unit is effective in one direction only and achieves an exceptionally smooth loweringcontrol of the maximum load in a step less operation. The winch is powered by a hydraulic gear motor and the required reduction ratio of 34:1 is established by two planetary stages. The hydraulic motor drives directly into the planetary reductions. Dynamic braking is then achieved by modulation of the winch control valve handle. When the control returns to neutral position the brake applies automatically.

SPECIFICATION

Pull at First Layer : 2 tons in 0-10 m/min
Drum Capacity : 60m x 12mm Ø wire rope

MARINE DRILLING RIG (ENV25) SPECIFICATION

HEAVE MOTION COMPENSATOR AND LINE TENSION (FOR SEABED TEMPLATE) SYSTEM

The function of the heave motion compensator compensatory and line tension (for seabed template) system is to apply a nearly constant tension to the string and seabed template whilst accommodating the relative vertical motion between the drill string/seabed template and the drill derrick resultant from vessel's heave. A standard hydraulic pressure is applied to the annulus of the two rams that link the travel to the roster box (sampling platform) and mounted on the base drilling rig. This hydraulic pressure is maintained by means of a Piston Accumulator connected to high pressure air cylinders.

The main components of the system are:-

- High Pressure Air Compressor
- Charge Pack
- Low Pressure Air Compressor
- Air Storage
- Accumulator

MUD SYSTEM

The function of the mud system is to mix and supply suitable mud at the required flow rate and at sufficient pressure to the drill bit via the drill string.

Mud is required to:

- Lubricate the drill bit and aid penetration.
- Lubricate the drill string.
- Lift cuttings up the annulus.
- Suspend cuttings during sampling. -Stabilize the borehole.
- Overcome down hole pressure if required.
- A seawater polymer mud is used to which Barite weighting material is added as required.

The main components of the system are:

- Mud Tank Agitator
- Mud Pump
- Mud Drill

MARINE DRILLING RIG (ENV25) SPECIFICATION

PIPE RUNNING EQUIPMENT
The Component items are: -

1. DRILL PIPE - Drill pipes are 5 1/2" API Range II grade E drill pipe with and external upset tool joints with 4 1⁄2" I.F threaded connections. The internal diameter of the tool joints is bored out to 4" to allow for the passage of down hole testing equipment.

2. DRILL COLLAR - The drill collars are 6 1/2° OD and 4° ID a single collar is approximately 5m long but they are normally made up into double strands. 2 to 6 single collars are normally used depending on soil conditions and these are positioned above the BHA. Connections are 4 1/2" IF.

3. DRAG BITS - Drag bits have short blades, each forged to a cutting edge and faced with tungsten carbide tips. Drag bits have a shearing action and cut rapidly in sands, clays and some soft rock formations.

4. TRICONE ROLLER BIT - Tricone Roller bits have three or more cones ("rollers" or "cutters") made with hardened steel teeth or tungsten carbide inserts of varied shapes, length and spacing. They are designed so that each tooth applies pressure at a different point on the bottom of the hole as the cones rotate. The teeth of adjacent cones inter-mission so that self- cleaning occurs. The cutting surfaces of all roller bits are flushed by jets of drilling fluid directed from the inside (center) of the bit.

5. MOUSEHOLE CLAMP - The mousehole clamp is designed to locate the tubular in line with the tilted power swivel to facilitate their addition to or removal from the drill String. The clamp must also prevent rotation of the tube to allow connections to the power to be made or broken.

6. DECK CLAMP - The function of the PIPE CLAMP is to suspend the drill string and to prevent its rotation to facilitate the make up and break out of connections during pipe tripping.

7. LIGHT MANUAL TONG - The light manual tong is employed to make up and break out connections to higher torque requirements than that afforded by the Power Swivel alone.

8. PIPE ELEVATOR - The pipe elevator was designed specifically to enhance safety and efficiency. The Drill Pipe can be stabbed directly into pipe elevators and the tool's narrow profile latch design provides a wide, clear opening, without obstruction.

9. SAFETY CLAMP - The need of safety clamp for safest handling of flush joint pipe and drill collars.

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WISON – APB REAL-TIME (A.P. Van Den Berg Icone Digital Wireline CPT System) SPECIFICATIONS

WISON – APB REAL-TIME
(A.P. Van Den Berg Icone Digital Wireline CPT System)
SPECIFICATION

OVERVIEW
• proven wire line CPT system with a pushing force of 50, 100 or 150 kN
• water depth + drilling depth up to **480 m**, CPT stroke up to 3 m
• suitable for 5, 10 and 15 cm2 Icones
• Bottom Hole Assembly for multi-tooling
• suitable for soil sampling with the Push or Piston Sampler
• remote-controlled and electrical constant tensioning winch • software for realtime data acquisition and control

DESCRIPTION
The WISON-APB system is basically a double-acting cylinder with the soil-testing instrument attached to the end of the piston rod. An umbilical is released from a remote-controlled and electrically driven constant tension. The System is capable of performing CPT's and taking soil samples at depths up to 550m.

The WISON-APB works in conjunction with A.P. van den Berg's digital Icone data acquisition system, consisting of the Icontrol and Icones. It enables measurement of cone resistance (q_),c local friction (fs), pore water pressure (u) and inclination (Ix/y). The Icone is easily extendable with click-on modules to measure other than the four standard parameters.

TECHNICAL DATA	WISON-APB 50 kN	WISON-APB 100 kN
Penetration down thrust	50 kN	100 kN
Stroke length	3000mm	1000mm
Total tool length	9430mm	5430mm
Largest overall diameter		90mm
Minimal Drill string ID		4" (101.6 mm)

SPECIFICATIONS CPT AND SAMPLING	
Icone sizes / type	Icone 10 cm² / CPTU
Icone modules	Vane & Seismic
Sample & tube length	895 mm / 995 mm

WIVATAP OFFSHORE
1. Product Description
The system consists of a down-the-hole unit, a wire (replacing the data acquisition system) and a surface control unit. The down-the-hole unit fits in the one meter push cylinder (WISON-APB 100 kN) replacing the cone. The data acquisition system is replaced by a wire and surface control unit. The length of the WIVATAP is constructed such that the latching ring on the drill string for the 3 meter tool is used when working with the WIVATAP and the one meter tool. After the WIVATAP is pushed one meter into the soil vane testing can commence. A reaction frame above the rotating vane delivers the rotational reaction force required to rotate the vane. This possible rotation of the push cylinder is prevented.

2. Technical Specifications
• Torque : 70 Nm maximum
• Speed of rotation : 0.1 – 1.0 °/sec
• Maximum inaccuracy : 0.5 % of full scale

3. Product Consist
• Down the hole WIVATAP-100
• Down hole motor speed control
• Down hole data acquisition system
• Control box WIVATAP with supply and data output RS 232 (RS232 to USB converter included)
• Connecting cables and connectors
• Set vanes.

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WISON – APB REAL-TIME
(A.P. Van Den Berg Icone Digital Wireline CPT System)
SPECIFICATION

THE WINCH

The winch is remote controlled, which makes the WISON-APB very easy to operate during testing. Most of the time a small lab is used for data acquisition system and therefore it is very convenient to have the control of the WISON-APB system next to the data acquisition system.

Overall dimensions : 2.2m L x 2.2m W x 2.25m H (height during operations 3m)
Drum dimensions : ID 1.22m x OD 1.9m x 0.722m W
Weight : 3850 kg including cable
Electrical power supply : 20 KVA supply voltage 400 volt 50/60 Hz
Rotation speed drum : Adjustable between 0-22 r.p.m
Pulling speed maximum : 80m/min (1st layer)
110m/min (7th layer)
Pulling force : 12.2kN (1st layer)
840kN (7th layer)
Other facilitates : Electrical water pump (12 liter at 5MPa), Hydraulic power pack for operating & De-airing hydraulic power pack

LATCHING SUB

The latching sub, needed to latch the thrust cylinders down the hole and relay the pushing force onto the drill-string, consists of four specially drill collars with locking grooves, spacers and stop ringing for the WISON-APB 50/100kN in various testing modes. The latching subs are provided standard with an API-4½" IF screw thread. The outer diameter is 6.5". The total length is approximately 6.9m.

TESTING SYSTEMS

1. Sampler.

Wire-line push and piston sampler adapters to fit underneath the WISONAPB 100kN trust system. Samples are taken with a simple single tube system. The sample tube is driven into the soil by the continuing rate of penetration of 20mm per second. This guarantees undisturbed samples in most soil types. The push sample tubes have a length of 1020mm. The maximum length of the sample is 900mm.

2. Penetrometers (Electrical Cone)

The cone penetrometer is pushed into the soil by either the WISON-APB 50kN or WISON-APB 100kN. The standard rate of penetration of 20mm per second guarantees CPT results compliant with all international CPT standards.

Ranges

Point resistance : 0-100 MPa max.
Inaccuracy 0.1MPa
Location friction : 0-0.75 MPa max.
Inaccuracy 0.01MPa
Pore pressure : 0-1.0/2.5/5.0 MPa max.
Inaccuracy 0.5% from
For class one tests the cones can be specially calibrated

WISON – APB REAL-TIME
(A.P. Van Den Berg Icone Digital Wireline CPT System)
SPECIFICATION

2. Penetrometers (Electrical Cone)

A) Cone and System Test Unit
This set is used for system validation on location and has an accuracy of 2%. The cone and system test unit consist of a manually operated hydraulic pump with calibration gauges, a hydraulic jack to transfer the hydraulic pressure onto a load on the cone and high pressure chamber of testing the pore water pressure sensor.

B) Vacuum Pump and De-Airing Device
Vacuum installation needed for de-airing of electrical pore pressure cones. Without properly de-airing the pore pressure cones reliable pore water measurements are not possible. Electrical specifications: 230V 400VA.

DEPLOYMENT SYSTEM

1. Umbilical Cable
Umbilical cable 600m length with hydraulic high-pressure hose (inner diameter 9mm) in the center, surrounded by 8 copper cores for the electrical measurements. The cone penetration mode uses 2 cores, for vane shear testing 7 cores are used and for testing with seismic cones all 8 cores are required. A watertight polyurethane mantle surrounds those cores. Steel wires for hoisting purposes and finally a watertight outer skin of polyurethane again surround this. The break tensile strength of the umbilical is 9.0kg.

2. Connection House (Water-Head)
The connection house connects the umbilical cable to the down the hole tools by means of shear bolts that will fail in case the down the hole tool is stuck inside the drill-string thus releasing the umbilical cable. It can also contain the DA system and connections to other measuring devices. A pressure-regulating valve is fitted to control penetration speed.

3. Constant Tension Winch for Down The Hole Tools.
An electric driven frequency controlled constant tension winch for the umbilical cable. The hydraulic hose inside the umbilical cable is connected through a rotary with the hydraulic measuring cylinder.
The hydraulic measuring cylinder is used for:
- Penetration depth measuring.
- Pressure transforming to the working pressure of the down the hole tools.
- Barrier between the hydraulic oil from the power pack and the Airo-fluid used by the down the hole tools.

Furthermore the winch is fitted with a slip-ring housing with 8 rings and brushes for the connection to the umbilical cores used for supply and data transmission of the measured parameters.

4. Cable Conducting Wheel
The special designed cable-conducting wheel Ø1260mm to minimize the wear on the cable ensure a maximum life span of the umbilical cable. The cable-conducting wheel is used to guide the umbilical trough the derrick into the drill-string. The hanging point of the conducting wheel needs to be 9m above the drill-string with an offset of 600mm from the center of the drill-string in the direction of the winch location.

WISON – APB REAL-TIME
(A.P. Van Den Berg Icone Digital Wireline CPT System)
SPECIFICATION

PARAMETERS AND DATA ACQUISITION

The measured cone parameters are digitized and transmitted via the two supply conductors. Supply of and communicate with the DA system is through a receiver demodulator. They communicate by frequency shift signal on a proven format that is identical to the RS232 protocol, as usual between PC and associated equipment. This system uses only two wires of the umbilical cable.The transceiver-demodulator supplies the DA transmitter-modulator system and is connected to the measuring cylinder for penetration depth information. The unit also connects to a PC/laptop (RS232). Electrical power requirement 230V 50Hz 100VA.

The system consists of the following components:-

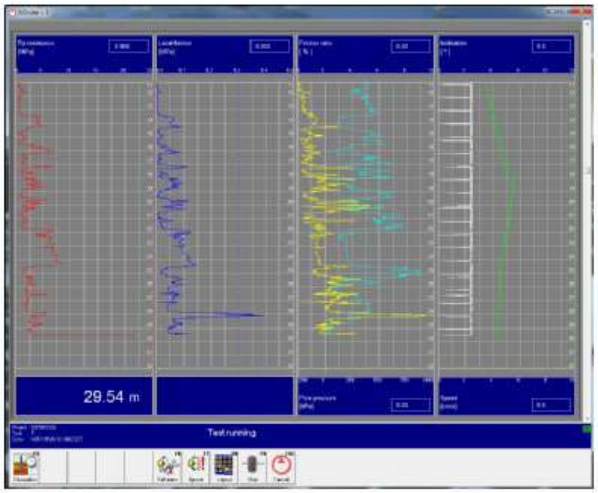
I. A constant voltage source for cone supply.
II. A drift compensated amplifier unit for four channels.
III. A 16-bit A/D conversion of cone signals; for excellent accuracy the cone supply source is also used as reference for the A/D converter.
IV. A microprocessor unit.
V. A modulator and transceiver.

SOFTWARE

Ifield and Ibase

A.P Van Den Berg develops and maintains two CPT software packages, Ifield and Ibase.

These two packages together provide the necessary functionality for registration, processing, management and presentation of Cone Penetration Testing (CPT) data. These packages are mutually connected and offer a user-friendly access to these functionalities.



Ifield CPT Software

Ibase office Software

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