Drillmec HH-300 spec.

ISO 9001
FM 534725

ISO 14001
EMS 567074

ISO 18001
OHS 567075

ICELAND DRILLING

HH-300

Drillmec HH-300

Fast moving trailer mounted automatic drilling rig.

Designed for cold climate and Geothermal applications and is fully capable of working in heavy winds.

Year of construction 2007

It is capable of drilling to 5500 m. with 3 ½“ DP and to 4000 m. with 5” DP.

Truck loads in transport: 66

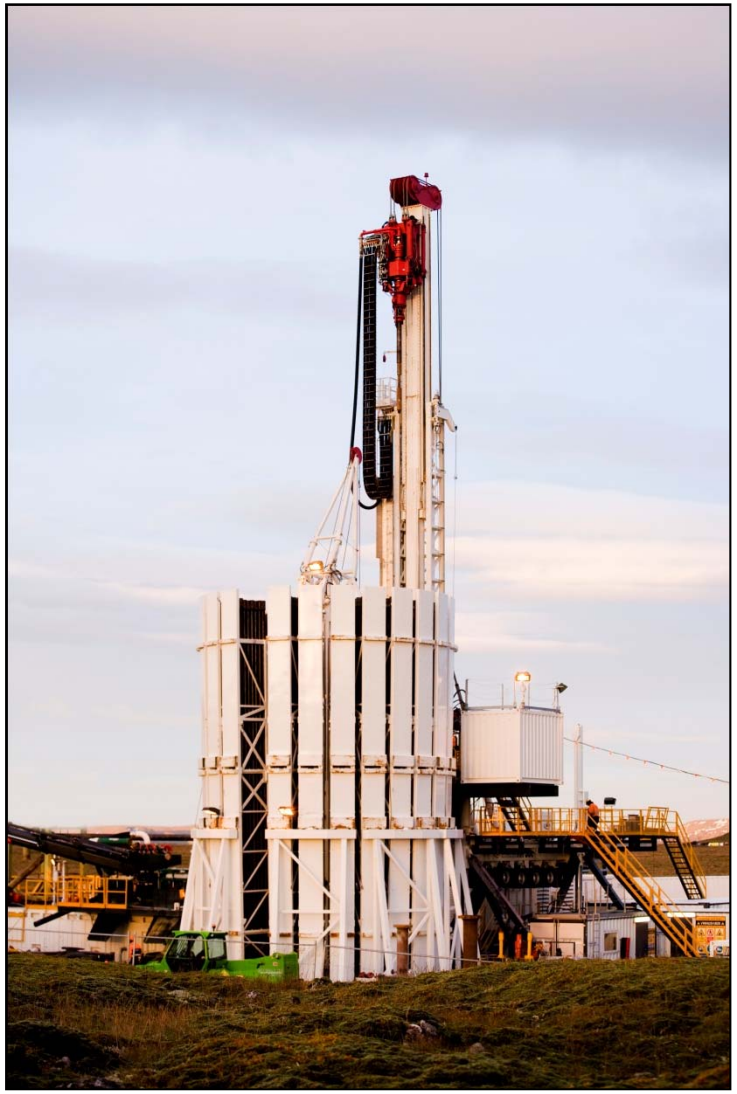
Drilling Crew: 1 tool pusher, 1 driller, 1 assistant driller and 2 floor hands per shift plus 1 mechanic with electrical skills.

The overall hydraulic controls of the rig is exceptionally accurate which reduces the wear on the equipment and increases the safety for the crew.

HH-300

Telescopic Mast

Working stroke	16 m
Static Hook load	272 ton
Pull down capacity	30 ton
Clear height	22,55 m
Max casing operation length	14,63 m



HH-300

Substructure

Clear Working height 6,8 m

Front neck 7 axle trailer with double wheel tires designed for CE and Icelandic road rules.

Easy mounting of the rig trailer on the substructure.

This open substructure concept gives an easy access to the BOP’s.

HH-300

Top Drive

Drillmec Top Drive driven by hydraulic motors.

The Top Drive can be tilted out from the center well and to the center of the mouse hole for adding or removing a DP.

The benefits of top drives is that if it is necessary to back-ream it is possible to have the circulation on all the time since the top drive is connected to the string.

Another huge advantage for the top drive is that the driller is able to have constant circulation while tripping out reducing the risk of a cuttings slide and differential sticking.

ID full opening	76 mm (3”)
Rotation speed	0 to 200 rpm
Torque	5000 daNm
Circulation pressure	350 bar

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Top Drive

The HH-series rigs are all equipped with an accurate WOB (Weight on Bit) system which is fully automated. The driller sets the WOB and the system keeps it constant. This makes steering in deviated wells much easier and reduces doglegs plus it increases the bits life.

Our experience is that this automatic WOB performs in faster drilling because there is never a lack of load on the bit.

HH-300

Independent Driven Rotary Table

Max. rotation speed 60 rpm

Max torque 1.020daNm

Max opening through the rotary:
698,5 mm (27 ½“)

Max opening through the drill floor without the rotary 1200mm (47 ¼”). The rotary can be easily removed.

Automatic power slips

Drill pipe holding cap. 3 ½” - 5”

Drill collar holding cap. 6 ½” - 7”- 8” - 11”

Tubing holding cap. 2 3/8” - 2 7/8”

Casing holding cap. 7” - 13 3/8” but larger casings require manual slips.

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Automatic hydraulic power tong

Operating diameter is	3,5” - 11”
Max make up torque	18.700 daNm
Max brake out torque	22.500 daNm

Automatic Torque Wrench

The hydraulic torque wrench is mounted on the top drive main body.

Operating diameter is	3 1/8” - 8”
Max make-up torque	8.600 daNm
Max break-out torque	12.300 daNm

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Automatic hydraulic power tong

Power tong PLC controled fully automatic make up.

Touch screen for make up torque selection.

Less hands involved in making up drill string, less potential injuries.

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Casing make-up

Running the casing in is an extremely simple task when using the HH-series. The rigs are equipped with a casing make-up tool which clamps on the casing and screws the casing using the top drive. There is a casing backup slips in the rotary table which holds the casing while making-up. The make-up is remotely operated by the driller inside the control cabin.

A big benefit to this casing make-up device allows us to run-in the casing in windy conditions which reduces the risk of stopping operations because of a strong wind.

The HH-series sophisticated hydraulic height, RPM and torque control minimizes damage of the threads.

The use of this equipment eliminates the need for a special service company to run-in the casing.

HH-300

Casing make-up

Casing make-up with double hook, allows the casing to be lifted and rotated with adjusteble torque, as well as fluid circulation while running casing. All operated from drillers control cabin.

Casing brought up to drill-floor

Casing device

HH-300

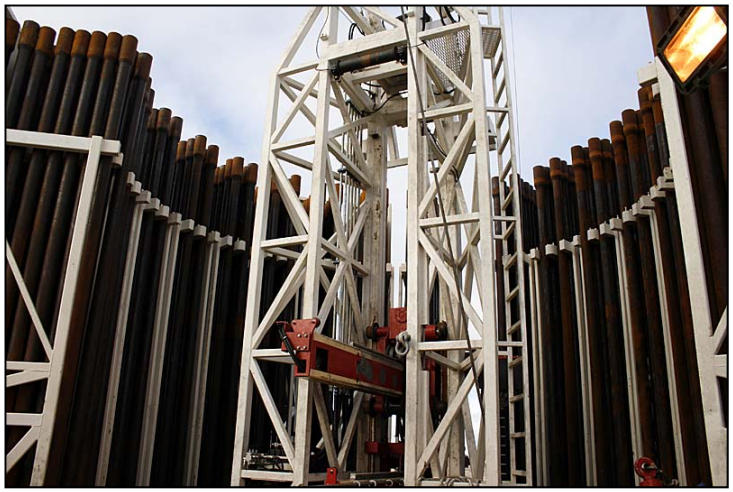
Automatic Pipe Handling System

The HH-300 is equipped with an fast, fully automatic pipe handling system.

The pipe bins are installed by the pipe handler with all the pipes, ready for use.

The pipe handler automatically removes or adds a pipe to the mouse hole according to the workmode (trip-in/trip-out).

Bins storage capacity: 272 DP’s total 3700m.

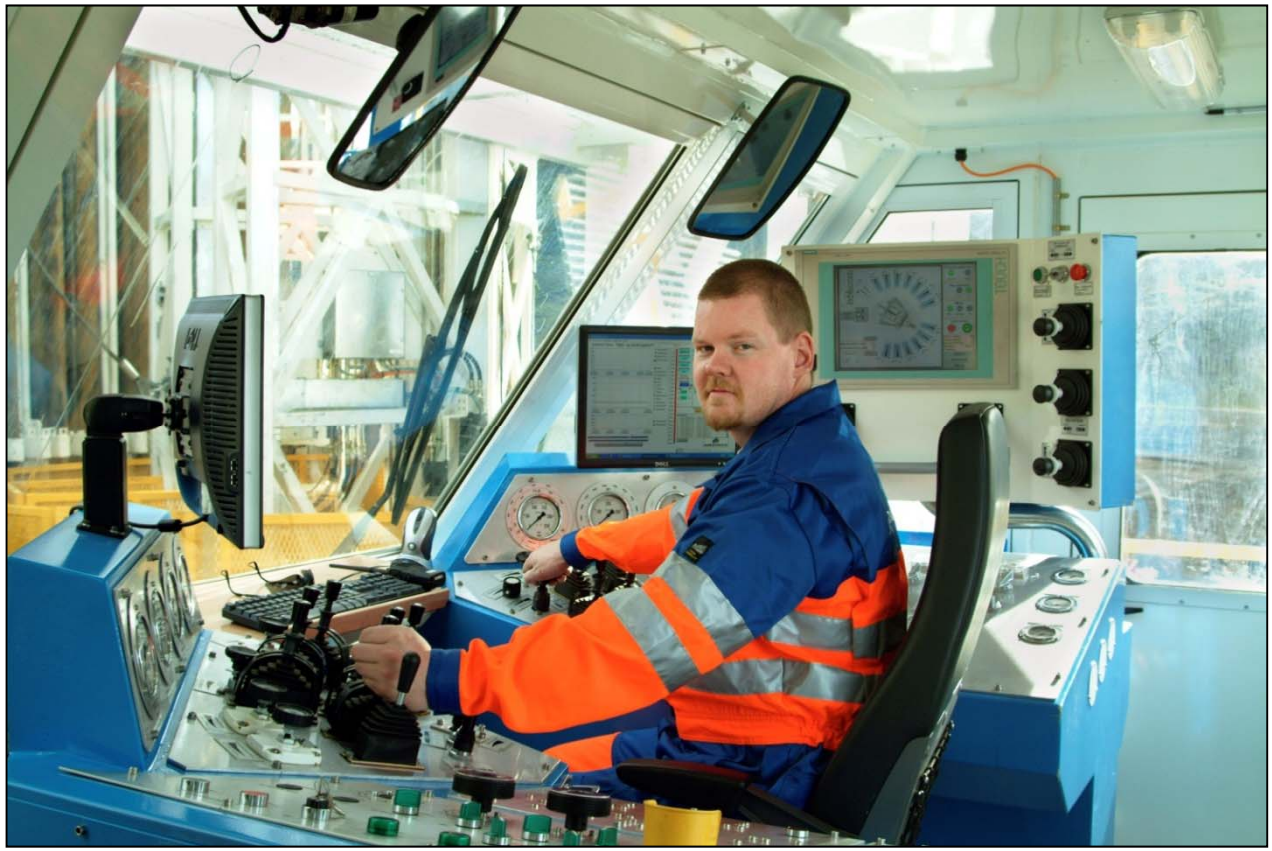


HH-300

Control cabin

The control cabin is ergonomically designed to reduce the strain for the driller and to have all the controls within the drillers reach.

The driller has a full view of the operations on the drill floor and the mast plus a very good view to the mud system.



HH-300

Hydraulic Power-Packs

The rig is powered by two hydraulic power units combined in one silenced container mounted on a trailer. It is possible to run the complete rig with only one unit increasing the rigs running reliability.

One auxiliary hydraulic power unit is mounted on the rigs trailer for rig-up and rig-down purpose and requires only a small generator.

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Mud system:

Three Drillmec 9T 1000 mud pumps.

Each pump is a triplex single acting 1000 hp pump electrically driven.

Capacity, each pump:

Max volume:

37 l/sec @ 185 bar

32 l/sec @ 215 bar

27 l/sec @ 253 bar

23 l/sec @ 300 bar

19 l/sec @ 350 bar

Max pressure: 350 bar

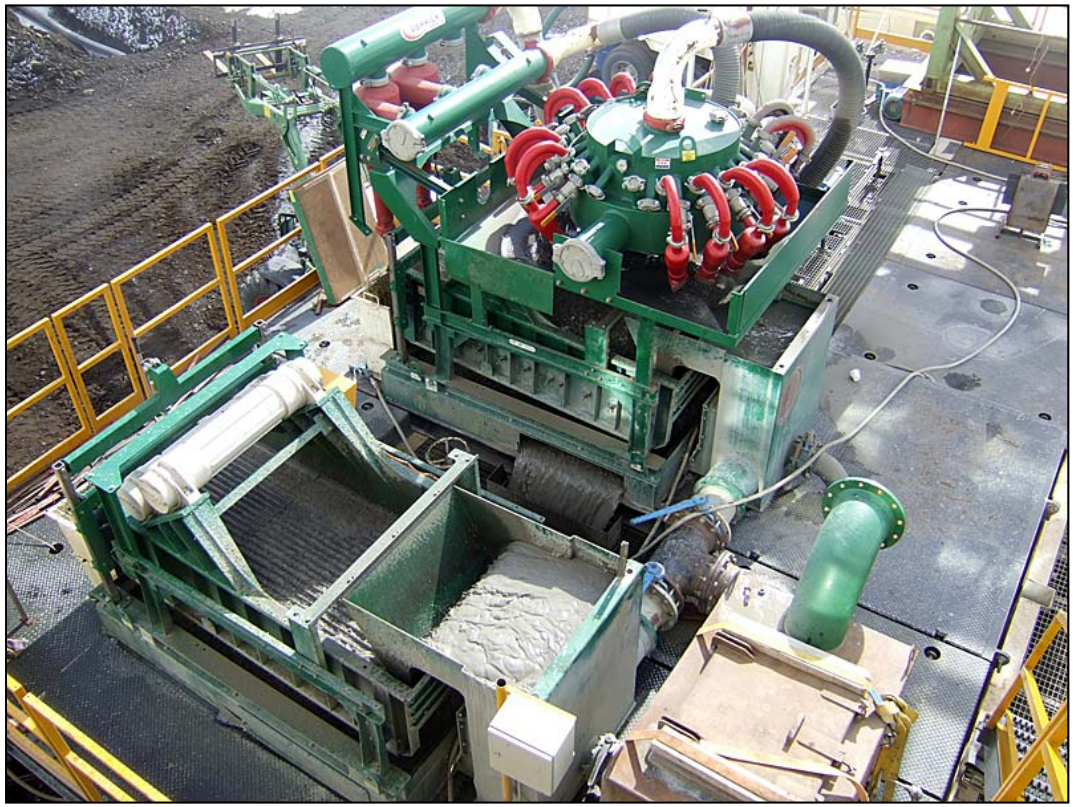
HH-300

Mud system:

Tank system with mud treatment, Derrick Flo-line Cleaner 2000, cooling and mixing unit.

Especially designed for Geothermal operations.

Tank capacity: 180 m^3



HH-300

Power Control Room specially designed for Drillmec HH-300.

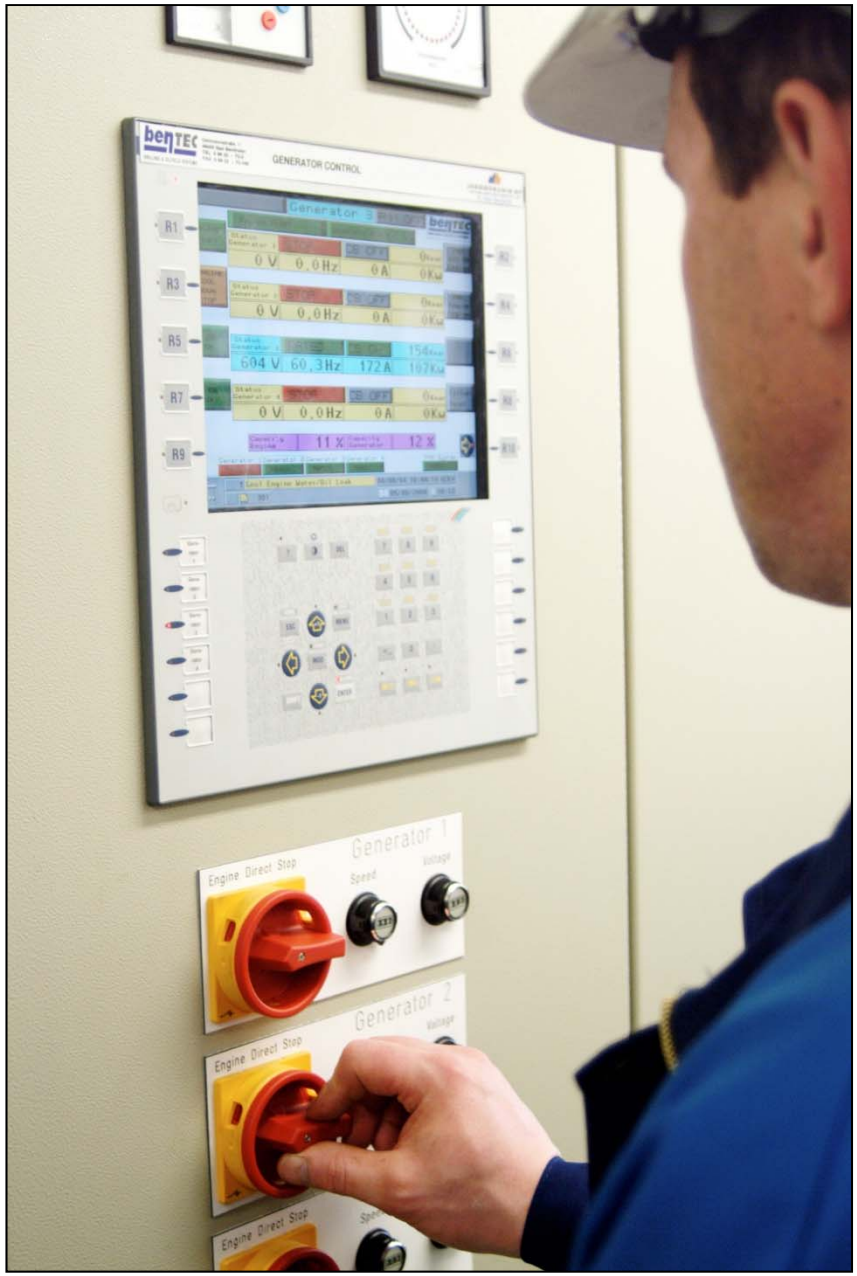
The SCR-system is designed to operate:

Four 1470 KVA Generator Sets, CAT 3512B

Three 1000 hp Mud-pumps.

Remotely controlled MCC (Motor Control Center) for the complete rig and mud system.

All the unit is PLC controlled and monitored.



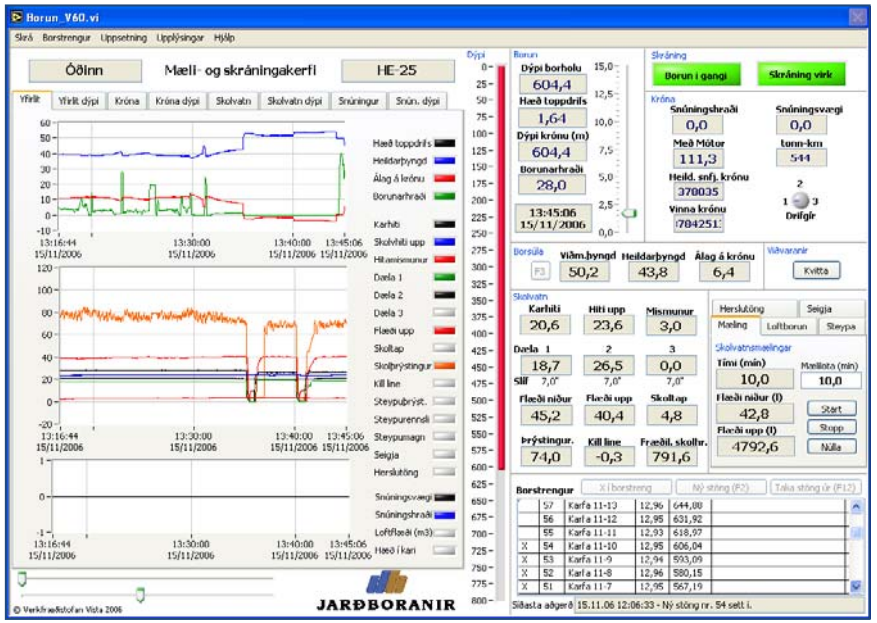
HH-300

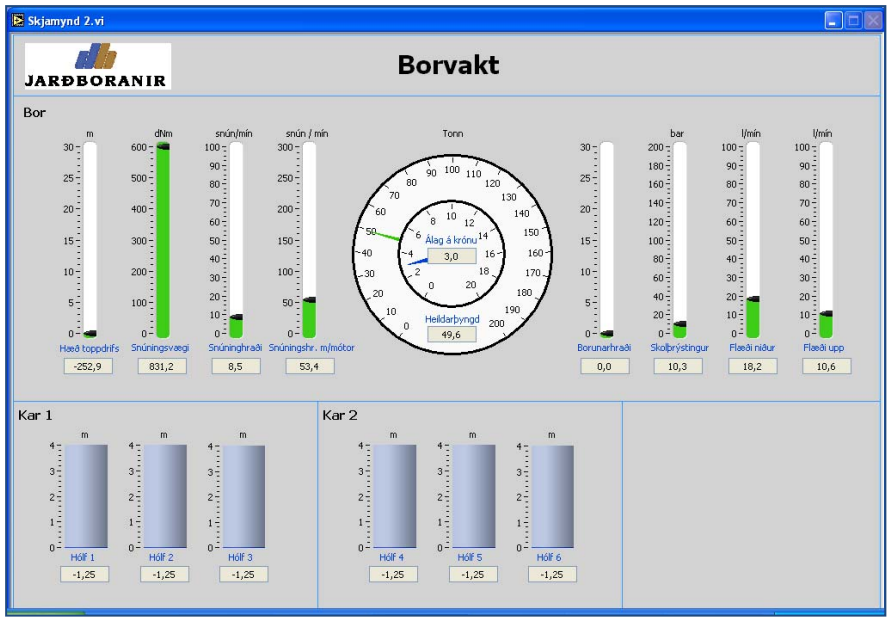
Data logging of drilling parameters:

The rig is equipped with a Data Logging and Monitoring system for all major drilling parameters.

All data is stored in a MS-SQL database for easy data access for other systems if needed.

The data is accessible locally using special client software and from the Internet using a standard web browser to monitor the drilling parameters live or to look back at the history of the well.





HH-300

BOP EQUIPMENT

Size - Type - WP – Manufacturer

21 ¼” - Rotating Head - 2000 psi WP - Washington
13 5/8” - Rotating Head - 3000 psi WP - Washington

21 ¼” - Annular BOP - 2000 psi WP - Shaffer
21 ¼ “ - Double LWS BOP- 2000 psi WP- Shaffer

13 5/8” - Annular BOP - 3000 psi WP - Shaffer
13 5/8” - Double LXT BOP- 3000 psi WP- Shaffer

HH-300

Accumulator:

R & T unit 1627T.

140 l/m @ 210 bar.

With triplex pump, two air operated pumps and 21 E-series standard bladder 42 liter bottles.

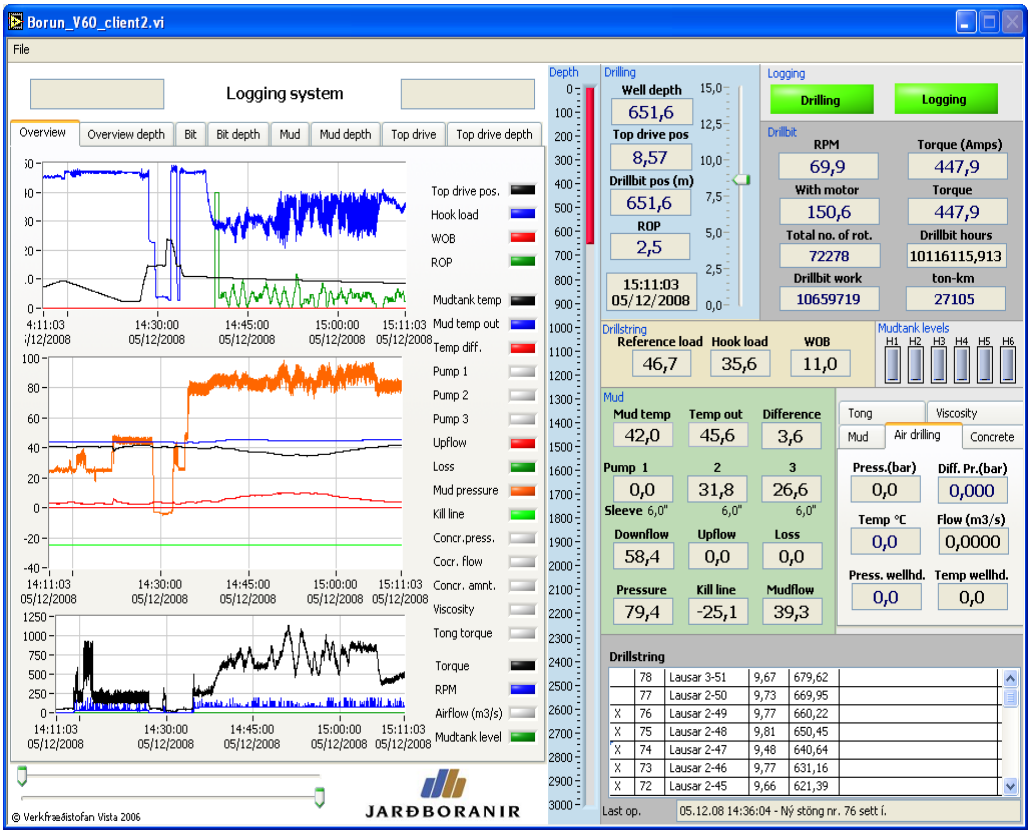
A drillers remote control R & T

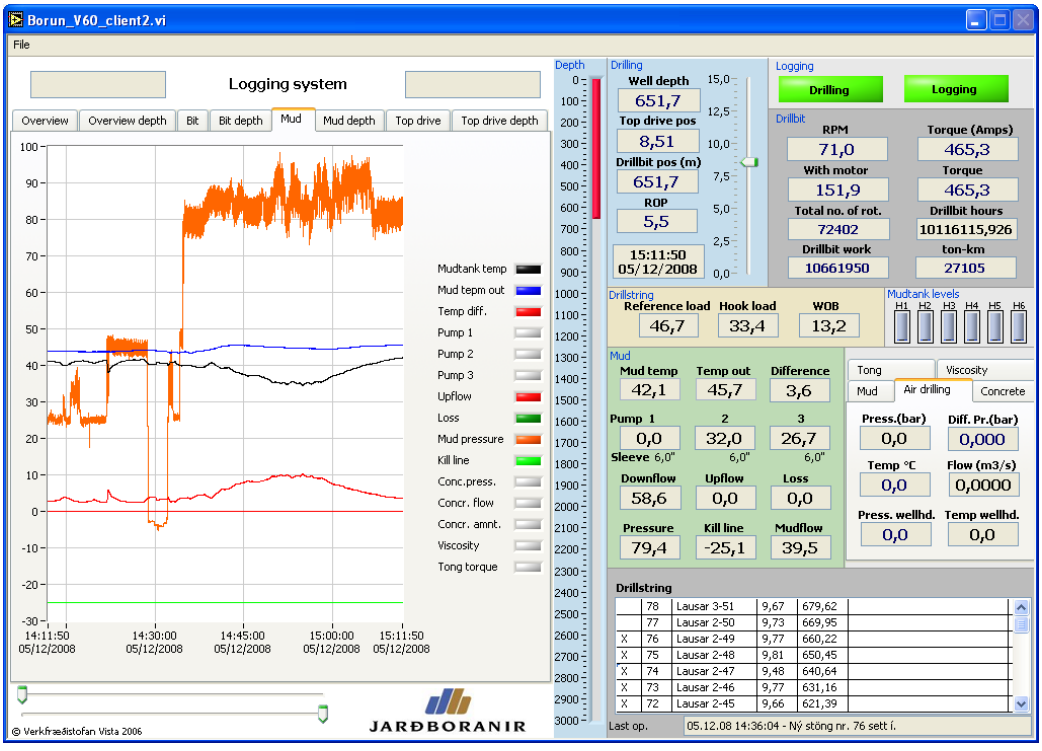
Rig Instrumentation:

Automatic recording and monitoring of all major drilling parameters.

All drilling parameters are stored in a MS SQL-database and is accessible on the rig.

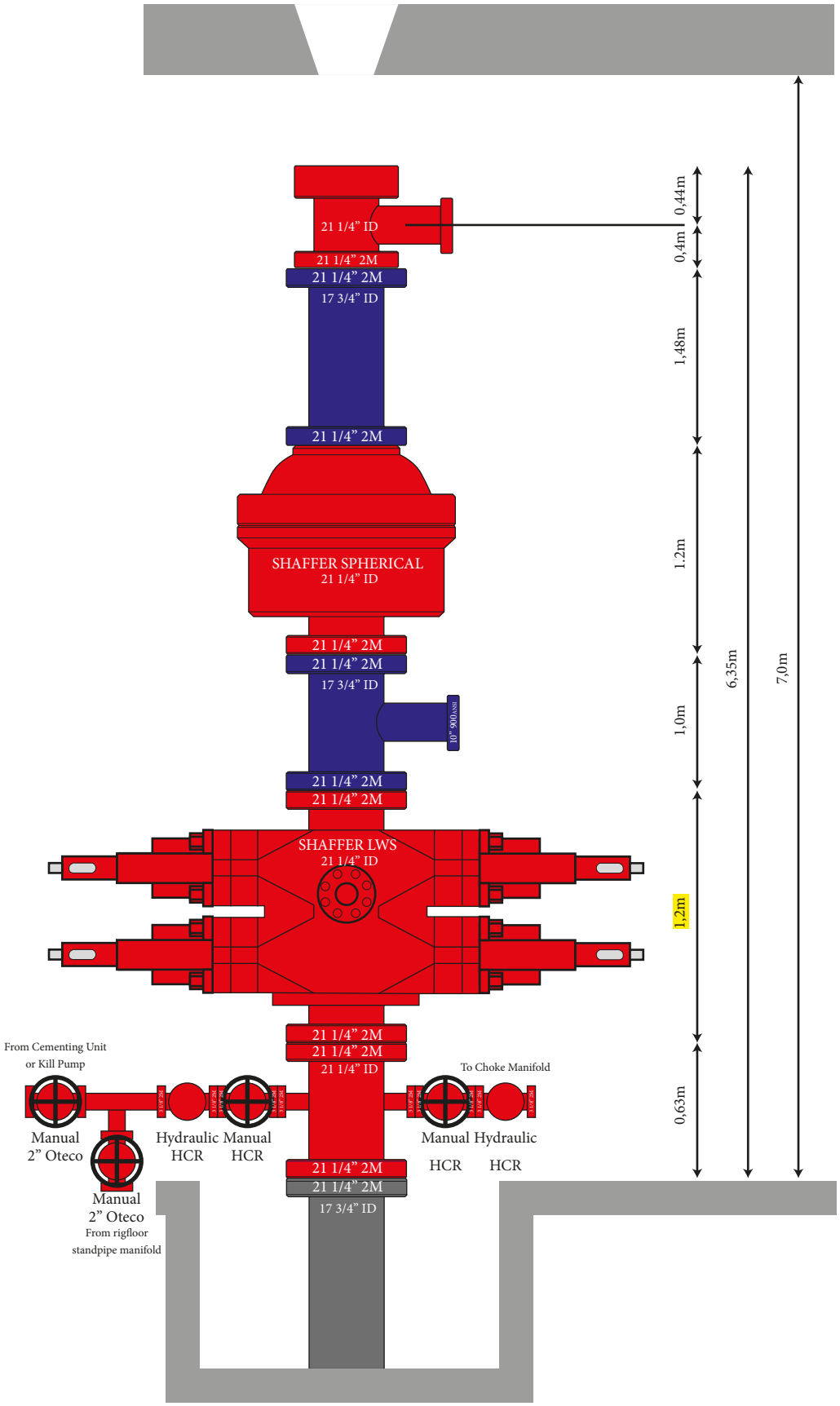
This display are also accessable live for our customers, over the Internet using a standard web browser.





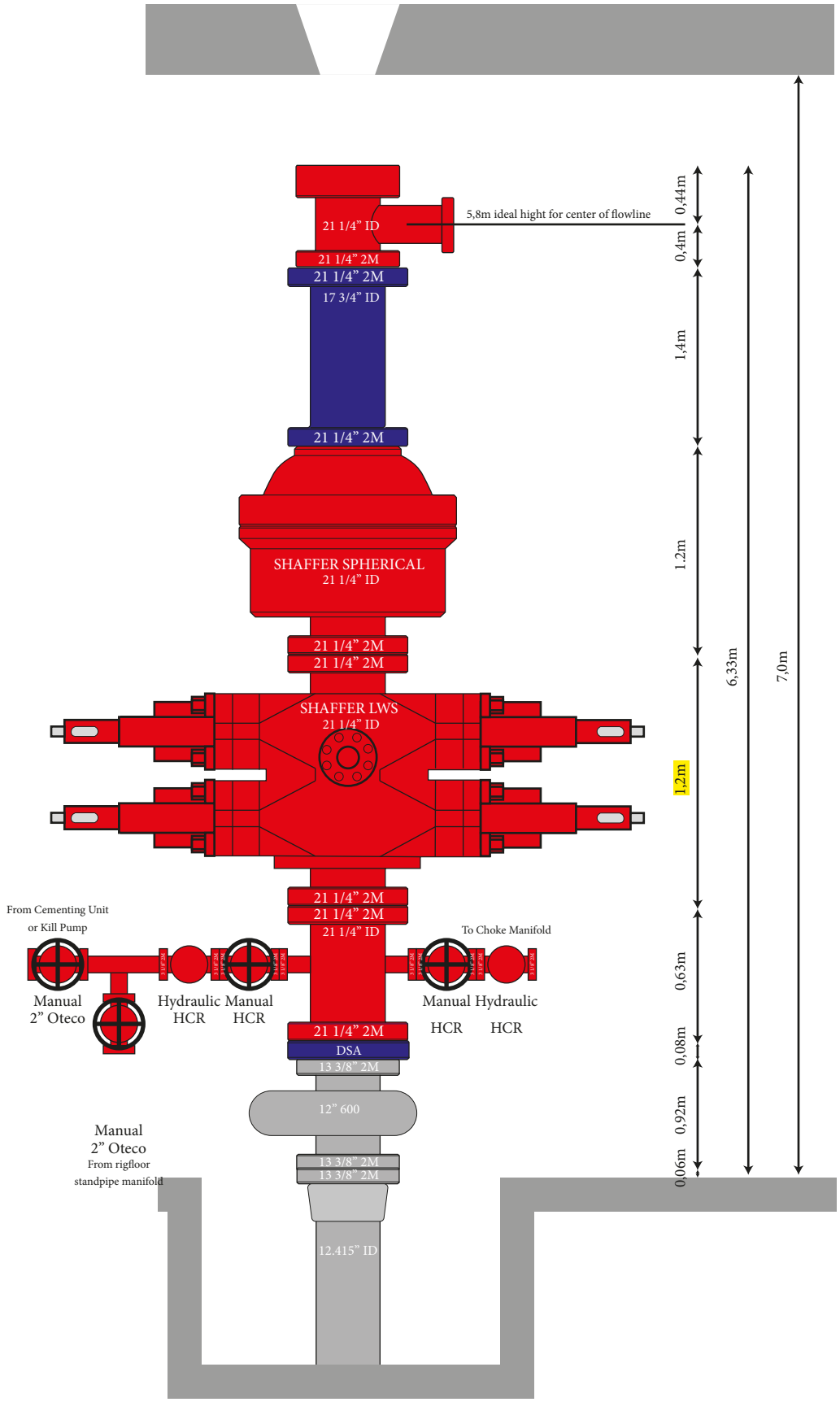
ICELAND DRILLING RIG TÝR
21 1/4” Stack on 18 5/8” Casing

ICELAND DRILLING



ICELAND DRILLING RIG TÝR
21 1/4” Stack on 13 3/8” Casing

ICELAND DRILLING



Mud System

Rigs standard mud tank system (See attached drawing)

Please keep in mind that the drawing is only showing 2 shale shakers. The third shaker has been added and can be seen on the overview picture.

TOTAL OF 4 MOBILE UNITS. (Within EU transport regulation). 3 mudtanks and 1 unit with mud hopper and big sack silo. Capacity of standard tank system is 180 M3 with 9 compartments and 1 sandtrap.

Ability to draw from 4 compartmented tanks when mixing (orange pipe in drawing 1). Direct treated mud from the hopper discharge to 7 compartmented tanks. Paddle agitators are in 7 compartments. Sub surface gun lines in 9 compartments.

Tank 1. is the sandtrap. Mud flows from shale shaker into compartment 1. From compartment 1 the mud is picked up by a centrifugal pump (green) that is located in the mud mixing unit and pumped through the Desander and into compartment nr. 2. From there it is picked up by another centrifugal pump (blue) and pumped through the Desilter and into compartment nr. 3.

Mud is then ready to be mixed from compartments 3,4,5 and 6 with new mixed mud from the whopper. The mud is then discharged (orange pipe in drawing 2) from the whopper to compartments 4,5,6,7,8 and 9.

Mud pumps can suck from compartments 4,5,6,7,8 and 9 and from this compartments the mud is pumped into the well.

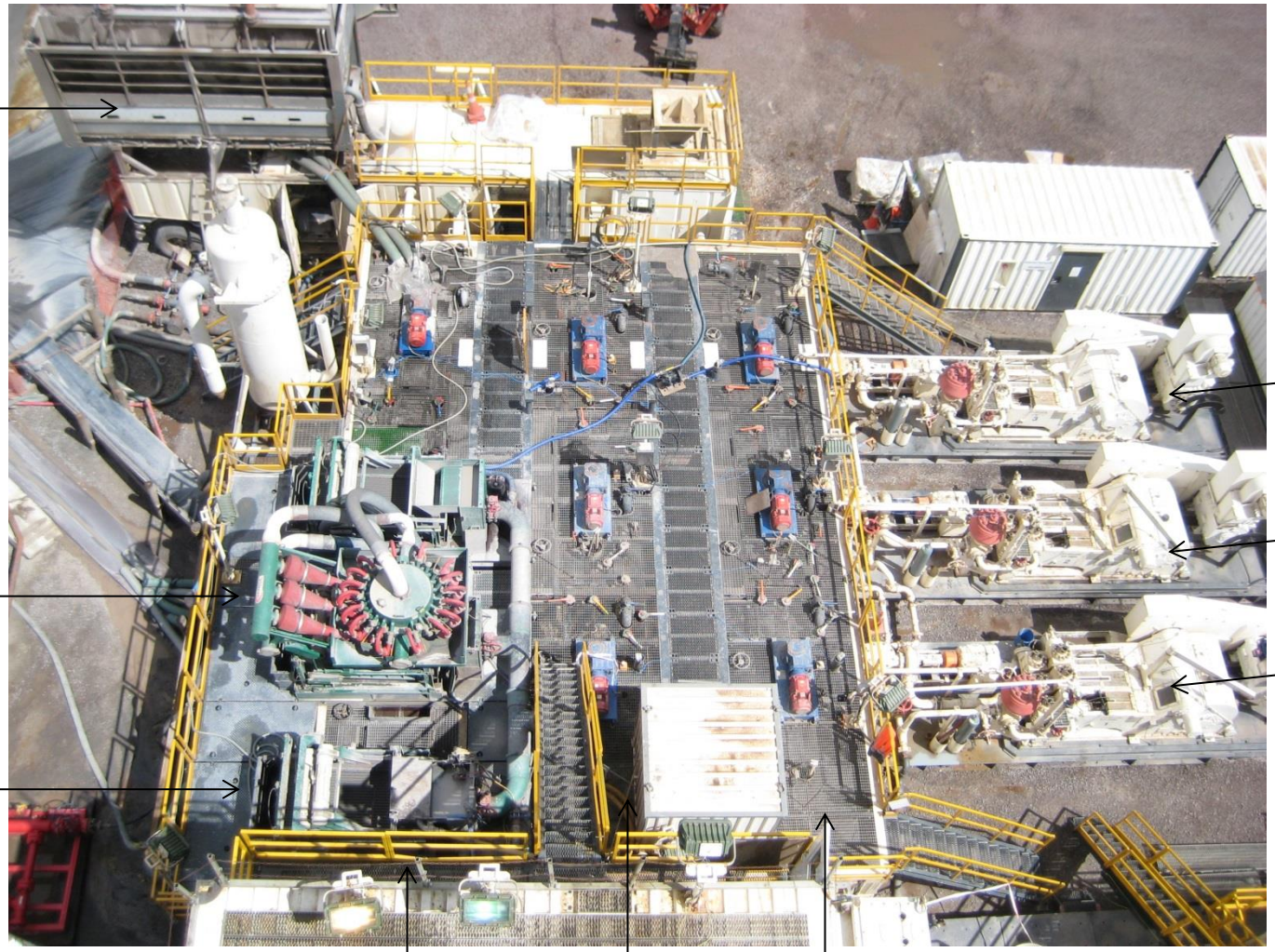
See further volume of these tanks on the standard mud diagram.

Mud cooler. When using the mud cooler mud is picked up from compartment 3 and from the cooler the mud returns to compartments 3 or 6.

ICELAND DRILLING

Overview of Drillmec HH-300 Mud system

Picture taken from Rig‘s mast



AUTOCAD

C1 C2 C3 C4 C5 C6 C7 C8 C9 C10

DESANDERS TANK
DESILTERS TANK
MUD TANK
SAND TRAP
SHALE SHAKER
SHALE SHAKER
DESILTER
DESANDER
FLOW LINE
DN 12"
SOLID REMOVAL
MUD TANK 1
MUD TANK 2 - SUCTION
MUD TANK 3 - SUCTION
Output with 2" NPT
Output with 2" NPT
MUD PUMP 1 SUCTION LINE
MUD PUMP 2 SUCTION LINE
MUD PUMP 3 SUCTION LINE
WASTE PIT
OVERFLOW PIPE
TO CEMENTING EQUIPEMENT
INLET WATER LINE
PUMP, COOLERS AND MUD HOPPER SKID (SERVICE UNIT)
-1- MUDD PUMP BAKER HUGHES 8x6x14 CASING WITH IMPELLER 12"
-2- DESILTER PUMP BAKER HUGHES 8x6x14 CASING WITH IMPELLER 12"
-3- DESANDER PUMP BAKER HUGHES 8x6x14 CASING WITH IMPELLER 12"
-4- COOLER PUMP BAKER HUGHES 8x6x14 CASING WITH IMPELLER 12"
-5- TANK 3 TRANSFERT PUMP BAKER HUGHES 8x6x14 CASING
WATER PUMP MISSION 3x2-1/2
SILO 1100 Kg CAPACITY STORAGE
tank 1: desander line
tank 2: mud gun line
tank 3: mud gun line
tank 2 and 3 supply line
COOLER MUD / WATER
COOLER WATER / AIR
MUD PUMP
KEY PLAN
M.T.S.
MUD TANK 1 - SOLID REMOVAL
MUD TANK 2 - SUCTION
MUD TANK 3 - SUCTION
PUMP, COOLERS AND MUD HOPPER SKID
MIXER
MUD GUN
SUCTION BUTTERFLY VALVE
OVER FLOW
MUD HOPPER
TANK UNION
DESCARGE VALVE
GATE
BUTTERFLY VALVE
VICTAULIC CONNECTION

RIG TYR - Type HH300

TANK NO.		TANK 1			TANK 2			TANK 3	
Total tank volume in theory	205	70 m3			70 m3			64 m3	
Effectiv tank volume	180	62 m3			62 m3			56 m3	
Compartment no.		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
		Sandtrap	Desander	Desilter	Mud tank	Mud tank	Mud tank	Mud tank	Mud tank	Mud tank	Mud tank
Length		3	3,286	3,104	3,87	4,36	3,8	5,17	5,17	3,8	3,36
Height		1,3525	2,4	2,4	2,4	2,4	2,405*		2,4	2,4	2,4
Width		2,45	2,45	2,45	2,45	2,45	2,45	2,45	2,45	2,45	2,45
Volume		10	19	18	23	26	22	22	22	22	20

* Tank hight is varying

Nr.	Data	Revisione	Nome
1	27/10/2006	REVISED AS JARDBORAMR INDICATIONS	Sanzani M.
2	04/12/2006	CHANGED OUTLET PIPE OF DESILTER & DESANDER PUMPS FORM 6" TO 8"	Sanzani M.
3	04/12/2006	CHANGED SHALE SHAKER BY-PASS SYSTEM	Sanzani M.

TOLLERANZE GENERALI
CARPENTERIA ±2 mm
MACCHINE UTENSILI
☐ CEMENTAZIONE – TEMPRA
☐ TEMPRA INDUZIONE
☐ BONIFICA VEDI UNI EN 10083/1
☐

TRATTAMENTO TERMICO
dureza superficiale HRC
dureza HRC
TEMPRA A INDUZIONE:
☐ LOCALIZZATA ☐ TOTALE
dureza superficiale HB
carico di snervamento N/mm²
carico di rottura N/mm²
BONIFICA SU:
☐ GREZZO ☐ SGROSSATO

quote senza decimali ±1 mm
quote con 1 decimale ±0.50 mm
quote con 2 decimali ±0.25 mm
ANGOLI ±0.50 gradi
CONCENTRICITA' 0.25 mm

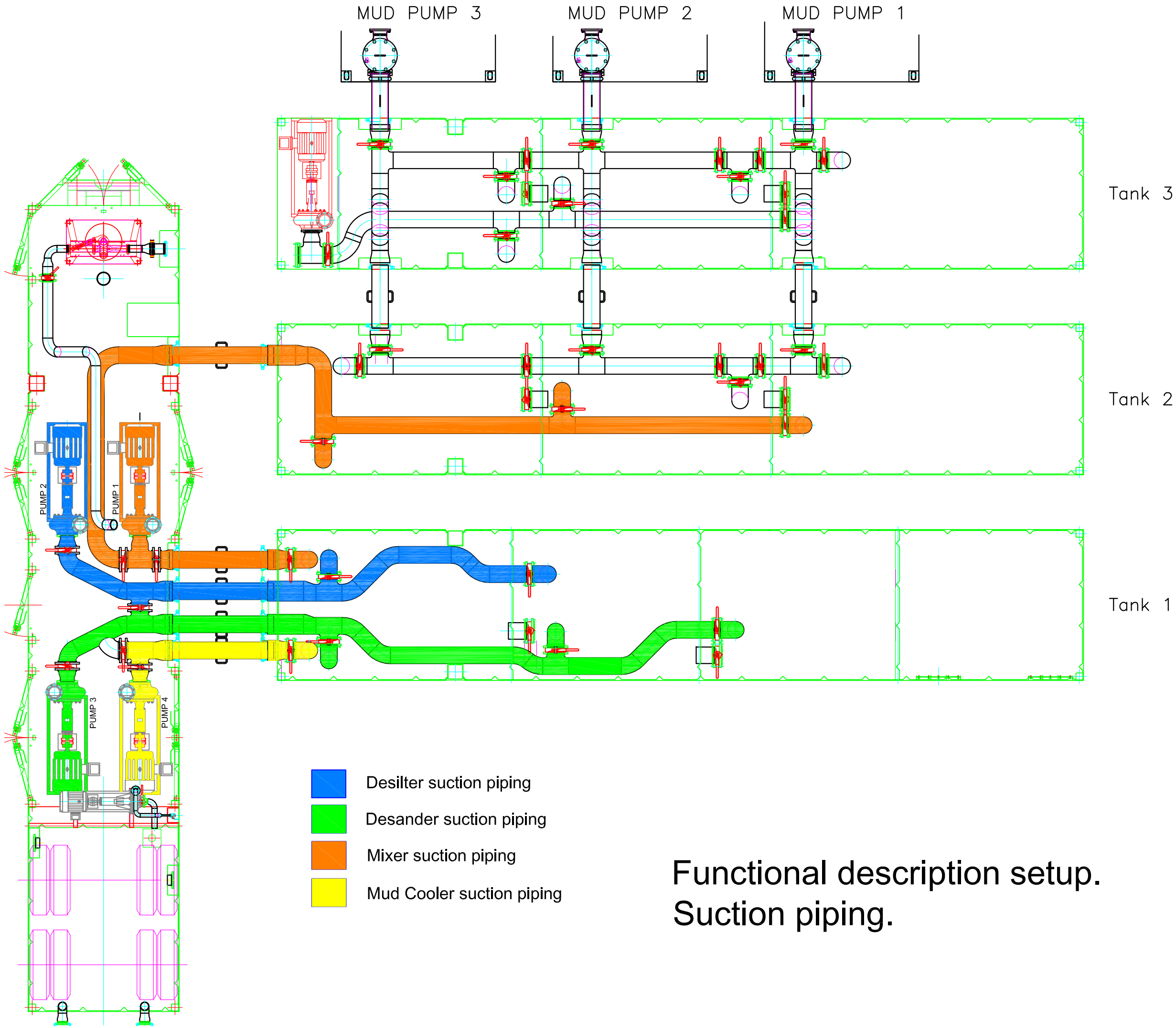
alla profondita' efficace mm

MASSA (Kg) MACCHINA TIPO HH 300 GRUPPO 0 STATO

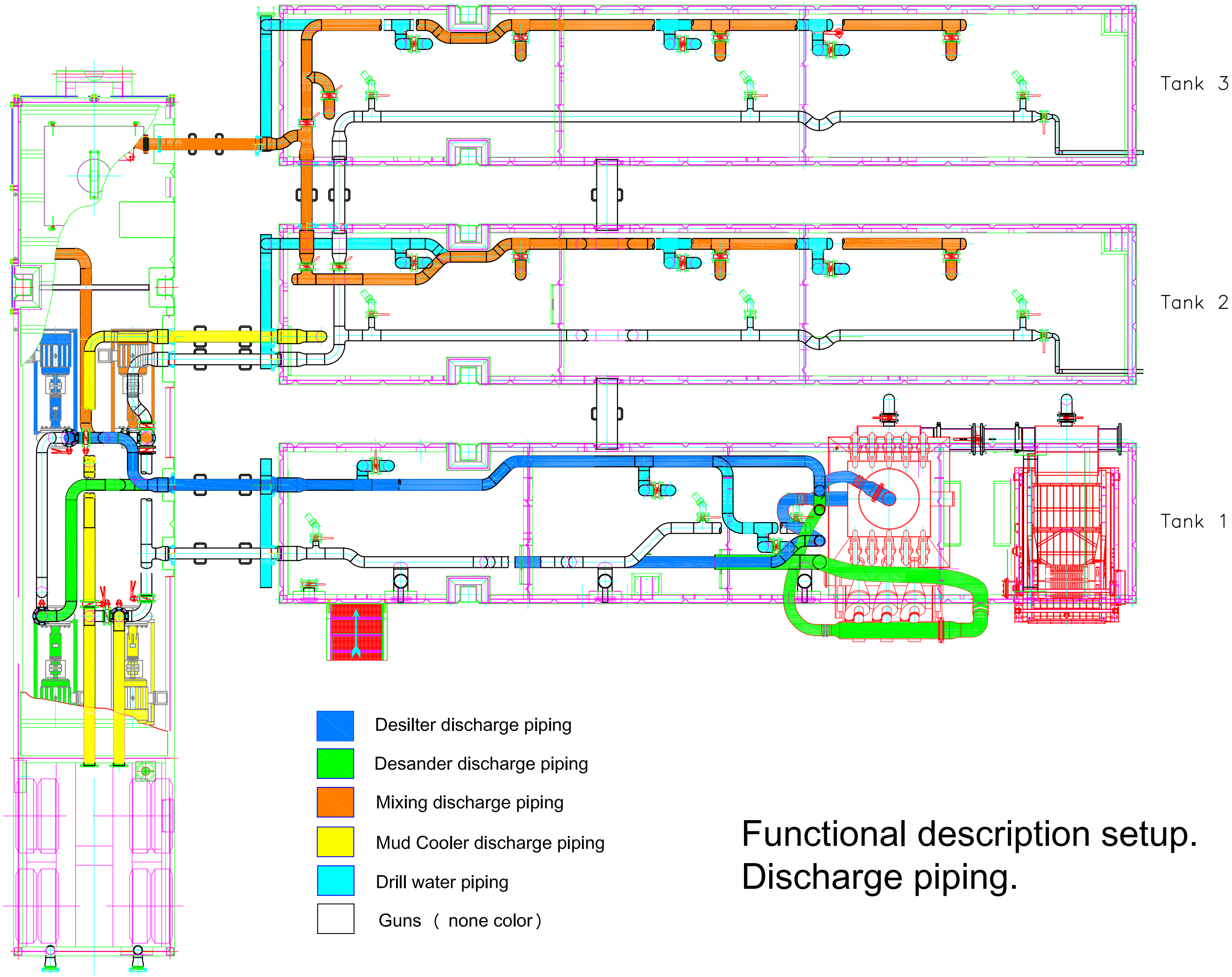
DISEGNATO 22/09/2006 CONTROLLATO 28/09/2006 APPROVATO S.M. Sanzani M.
REVISIONE-VER 3-0 FOGLIO 1 di 1 SCALA 1:1

DESIGNAZIONE P & ID NUMERO CODICE S000 2742

DISA TECHNOLOGIES



Functional description setup.
Suction piping.



Functional description setup.
Discharge piping.

CASING RUNNING USING CASING MAKE UP DEVICE (ATTACHED TO TOPDRIVE) AND AUTOMATIC CASING SLIPS

Install automatic casing slips in table

Casing slips in place.

Soft sling attached to casing

CASING RUNNING USING CASING MAKE UP DEVICE (ATTACHED TO TOPDRIVE) AND AUTOMATIC CASING SLIPS

Controlled lifting of casing up into V door

Lower and attach Elevator to casing

Ensure casing collar comes inside casing make up device

CASING RUNNING USING CASING MAKE UP DEVICE (ATTACHED TO TOPDRIVE) AND AUTOMATIC CASING SLIPS

Lift casing

Lower casing into collar

Rotate casing and make up using top drive make-up

CASING RUNNING USING CASING MAKE UP DEVICE (ATTACHED TO TOPDRIVE) AND AUTOMATIC CASING SLIPS

Lower casing into well and set automatic slips

Release elevator