



海領船舶  
—Highling Dredger—

SHANDONG HIGHLING DREDGE CO.,LTD.

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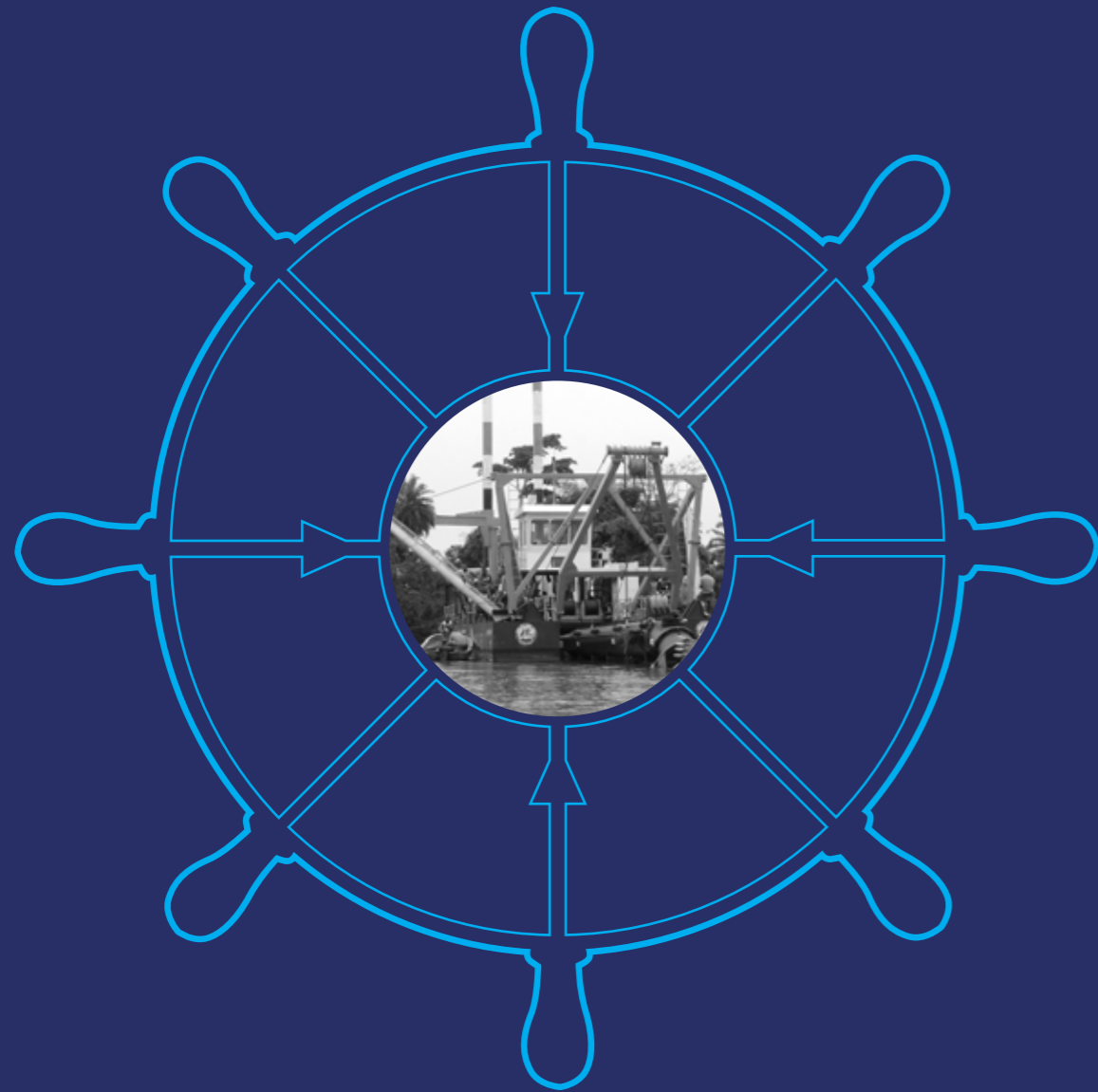
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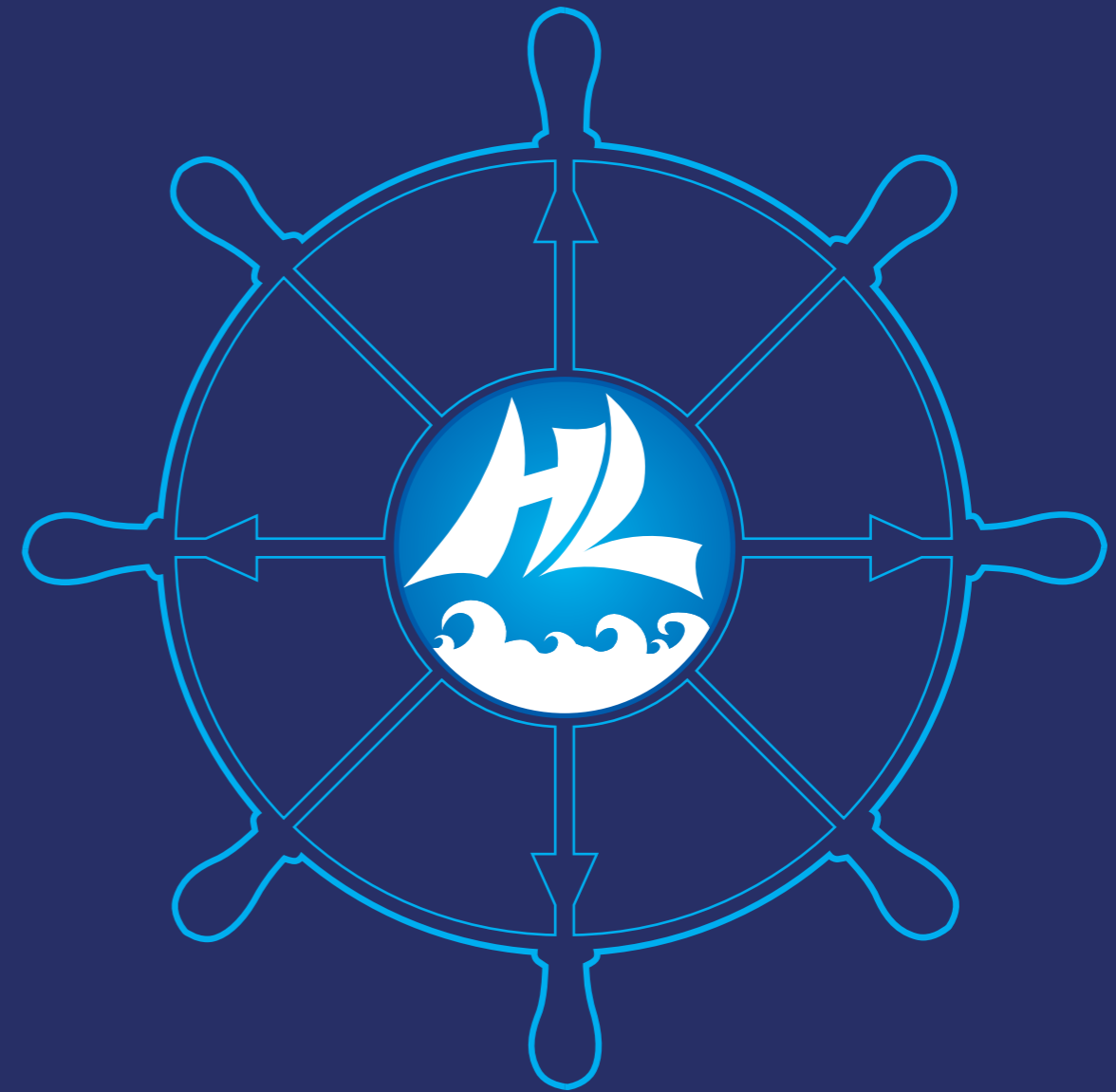
Website: [www.highlingdredge.com](http://www.highlingdredge.com)

[www.chinadredges.en.alibaba.com](http://www.chinadredges.en.alibaba.com)



ADVANCED TECHNOLOGY, QUALIFIED DREDGER

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ADVANCED TECHNOLOGY, QUALIFIED DREDGER

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# INNOVATION

Development Profession Integrity





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## Company introduction

China Shandong Leading Dredging Equipment and Machinery Co., Ltd. was established in 1992. Over years of development, the company has been the largest production center of cutter suction dredgers, sand mining machinery and gold dredging machinery all over the country. It is located in Coastal Developing Zone in Weifang city, Shandong Province. With an area of more than two hundred acres, the company owns blanking workshop, gold panning machinery processing workshop, machining workshop, anti-corrosion workshop, general assembly workshop, product debugging and testing center before ex-factory.

The products are of a great variety including 800—20000m<sup>3</sup>/h large scale dredging and sand mining equipments (which includes hydraulic cutter suction type, hydraulic bucket wheel type, mechanical cutter suction type and suction type), gold panning dredger, iron extracting dredger, iron extracting equipments, sand sieving machines, crusher, weathering sand producing lines (break, rinsing and separating). All the products are with different sizes for customers' choices. We can also design and produce special types of machinery according to customers' requirements.

We have professional R&D department, CAD drawing design center, quality control department and after-sales service department. Our company has more than over 500 employees, including 5 professional senior engineers on dredger building and researching, 16 designers on machinery construction, 8 engineers on quality inspecting and controlling as well as 10 after-sales service engineers. To go ahead, we have cooperated with port offices, channel dredging departments and riverway administrations. To meet the needs of market and the customers, we have established good cooperation relationships with famous Shijiazhuang Kingda Pump Industry Group Co., Ltd. and national famous Changchun Gold Research Institute in according to the feedback from customers and our own practical experience. We also have signed primary agency agreements with trade companies in more than ten countries such as Brazil, Argentina, Benin, Egypt, Poland, Nigeria, Ukraine, Indonesia, and North Korea. During recent years, the cutter suction dredgers, gold panning dredgers and assorted ore selecting platforms on sea we produced have been successfully exported to above countries.

In order to expand market and provide better services to customers, we have built after-sale offices overseas. At home, the products have been sold well after them being put on the market in more than twenty provinces and autonomous regions such as Shandong, Henan, Anhui, Shanxi, Hebei, Hunan, Hubei, Neimeng, Guangxi, Gansu, Shanxi, Xinjiang, Yunnan, Sichuan, Heilongjiang, Jilin, and Liaoning.

Based on honest, mutual benefit and development, we welcome customers warmly both from home and abroad to visit our company and talk over with us.

# HIGHLIGHT THE STRENGTH

Added to the infinite future Create  
Calue for Customers To create profits for enterprises



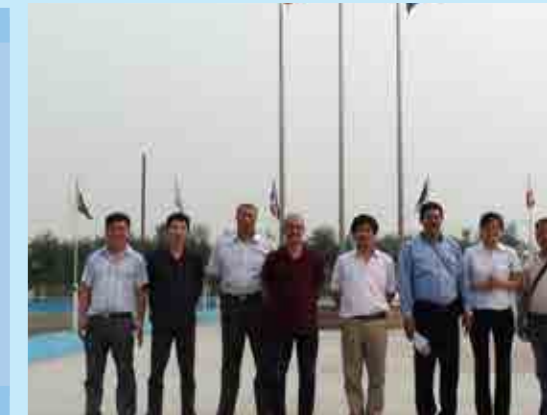


# ABOUT DREDGER



→ QUALITY FIRST → → →

# CUSTOMER NEGOTIATION





# CERTIFICATE



格式: M1102R01

  
**中国船级社质量认证公司**  
CHINA CLASSIFICATION SOCIETY CERTIFICATION COMPANY  
**质量管理体系认证证书**  
QUALITY MANAGEMENT SYSTEM CERTIFICATE

编号: No.00514Q20533R0M

兹证明  
**山东海领船舶机械有限公司**  
(注册/生产地址: 山东省潍坊市滨海经济开发区先进制造业产业园新海大街99号  
邮编: 261108)

This is to certify that the Quality Management System (QMS) of

**SHANDONG LEADING DREDGING EQUIPMENT AND MACHINERY CO., LTD.**

(Registered/Production Add: No.99, XINHAI ROAD, BINHAI ECONOMY DEVELOPMENT ZONE, WEIFANG CITY, SHANGDONG PROVINCE, 261108, P.R.CHINA)

建立的质量管理体系符合标准: GB/T 19001-2008 / ISO 9001:2008.  
has been found to conform to standard GB/T 19001-2008 / ISO 9001:2008.

本证书对下述范围的质量管理体系有效: \*疏浚挖泥设备的设计、制造\*。  
This certificate is valid to the following scope for QMS: \*DESIGN AND MANUFACTURE OF DREDGING VESSEL EQUIPMENT\*.

本证书有效期至: 2017年4月1日。  
This certificate is valid until **1 April 2017**.

  
发证日期: 2014年4月2日  
Issued on **2 April 2014**

总经理:   
General Manager **Huang Shiyuan**

中国船级社质量认证公司 山东省潍坊市滨海经济开发区... 电话: +86 536 2111111... 网址: www.ccs.com.cn



## About dredger

### Dredger introduction

The dredger we produced is self-propelled or non self-propelled , portable cutter suction dredger. The hull uses dismantle and box-like structure, assembly at working site, which is equipped with horizontal shifting devices, cutter ladder lifting devices, spud devices, deck crane and so on. It can also be equipped with anchoring poles and trolley devices to increase capacity.

Generally, it has functions on sand dredging, mud dredging, port building and deepening, sand and mud is conveying and discharging by pipeline and floater. It can produce certain amount of vacuum by the centrifugal pump.

The dredge pump is driven by the main diesel engine through the reducing gear box.  
The alternator, which driven by the auxiliary diesel engine, supplies electricity for power and lighting of the whole dredger.

Generator supplies electricity for lighting and emergency using when dredger doesn' t working.  
Cutter head is driven by hydraulic motor; cutter bearing has lubrication seal-in units.  
The dredger is moved by alternate swing of the spuds. The spuds are lifted by the hydraulic cylinder.

The shifting winches, cutter ladder and lifting winch are driven by the hydraulic motor.  
The hydraulic oil pump is driven by the auxiliary diesel engine.  
Functions of cutter suction dredger: dredging river, dredging sand, desilting, reclamation for channels and land, and building roads.

Applicability this machine: To pass low bridge easily, the controlling room and rest room are dismantable. Connecting parts for cabin room and deck are easily dismantled joints,.

Construction: it consists of three pontoons: one main pontoon and two side pontoons. The pontoons are connect- ed by the connecting pieces and tightened by high intensity bolts and nuts.

### Working site of cutter suction dredger: sea, port, lake, and river.

Soil conditions: relative hard soil, harden sand, sludge, sea sand, river sand, clay, mud, and so on.

The design, construction, quality inspection is according to the standards and regulations of CCS. The hull, machin- ery equipments and other spares are at the requirements of CCS. The hull is square, cross keel, which is full welding steel structure, and authorized by CCS.

#### Dredger working condition

The Maximum Temperature	50°C
The Minimum Temperature	-10°C
The Maximum Temperature of engine room	50°C
The Maximum Temperature of The River (Sea) Water	30°C
The Relative Humidity	≤80%

#### Arrangement of the complete dredger

##### Main equipments on the dredger:

- Cutter head and driving system
- Frame of cutter head
- Frame of ladder A
- lifting winch for sand suction pipe
- Right and left traversing winch
- Operating room
- Dredging pump
- Deck crane
- Gearbox of dredging pump
- Main diesel oil engine and auxiliary diesel oil engine
- Generator and auxiliary equipment
- Position spud and accessories

# QUALITY IS FIRST



Working site of cutter suction dredger: sea, port, lake, and river.

Operating room equipped on the dredger  
 Operating room is located in the front of the main deck; its size is according to the dredger's inches.  
 The operating room has two doors, two fixed windows and two adjustable windows.

Composition of the system

- One main engine pontoon
- Two side pontoons
- Connected devices of floating pontoon
- Upper structures
- Equipment base and special strengthen devices and equipments

Cutter suction sand dredger model list

Model	Inch	Diameter pipe	Water flow	Solid capacity	Dredging depth	Distance
HLC150	8/6 Inch	200/150mm	550m <sup>3</sup> /h	110cbm/h	Max. 6m	600m
HLC200	10/8 Inch	250/200mm	800m <sup>3</sup> /h	160 cbm/h	Max.8m	800m
HLC250A	12/10 inch	300/250mm	1100 m <sup>3</sup> /h	220 cbm/h	Max.10m	1100m
HLC250B	12/10 Inch	300/250mm	1450m <sup>3</sup> /h	290 cbm/h	Max.10m	1100m
HLC300	14/12 Inch	350/300mm	2500m <sup>3</sup> /h	500 cbm/h	Max.12m	1200m
HLC300A	14/12 Inch	350/300mm	2500m <sup>3</sup> /h	750 cbm/h	Max.22m	1700m
HLC450	24/18 Inch	600/450mm	3500m <sup>3</sup> /h	700 cbm/h	Max.15m	1500m
HLC450A	24/18 Inch	600/450mm	3500m <sup>3</sup> /h	1050cbm/h	Max.25m	1800m
HLC500	26/20 Inch	650/500mm	6000m <sup>3</sup> /h	1200 cbm/h	Max.15m	2000m
HLC500A	26/20 Inch	650/500mm	6000m <sup>3</sup> /h	1800 cbm/h	Max. 25m	2000m
HLC600	30/24 Inch	750/600mm	8000m <sup>3</sup> /h	1600 cbm/h	Max.18m	1800m



**HLC150 6inch 550m<sup>3</sup>/h hydraulic cutter suction dredger**


Water flow	550m <sup>3</sup> /h
Solid sand capacity	110cbm/h
Max. dredging depth 45°	6m
Discharge distance	600m
LOA	17m
Dredger after assembly	Length* width* depth 13*5.2*1.5m
Engine room pontoon	Length* width* depth 8.255*2.2*1.5m
Side pontoon	Length* width* depth 11*1.5*1.5m
Structure	Can be dismantle and assembly at working site
Diameter suction pipe	200mm/8inch
Diameter discharge pipe	150mm/6inch
Main engine power&type	160kw /Weichai Power
Rotate speed	1500r/min
Hydraulic winch	25 kn
Hydraulic cutter power	30 kw
Diameter cutter head	1000mm
Diameter spud cylinder	100 mm
Spud diameter and length	Φ273mmx8m
Emergency genset power	NO
Max. oil consumption	24L/H

**8inch HLC200 800m<sup>3</sup>/h hydraulic cutter suction dredger with depth 8m**

Name	HLC200 hydraulic cutter suction dredger
Type	Cutter suction dredger
HLC200 8inch 800m <sup>3</sup> /h hydraulic cutter suction dredger	
Water flow	800m <sup>3</sup> /h
Solid sand capacity	160cbm/h
Max. dredging depth 45°	8m
Discharge distance	600m
LOA	23m
Dredger after assembly	Length* width* depth 16*7*2m
Engine room pontoon	Length* width* depth 11.55*3*2m
Side pontoon	Length* width* depth 14*2*2m
Structure	Can be dismantle and assembly at working site
Average draught	1.4m
Diameter suction pipe	250mm/10inch
Diameter discharge pipe	200mm/8inch
Main engine power&type	224kw Cummins engine
Rotate speed	1800r/min
Hydraulic winch	40 kn
Hydraulic cutter power	50 kw
Diameter cutter head	1300mm
Diameter spud cylinder	100 mm
Spud diameter and length	Φ325mmx11m
Emergency genset power	24GF Cummins
Max. oil consumption	33.6L/H



**10inch HLC250**

 1450 m<sup>3</sup>/h hydraulic cutter suction dredger with depth 10m


Water flow	1450m <sup>3</sup> /h
Solid sand capacity	290cbm/h
Max. dredging depth 45°	10m
Discharge distance	1100m
LOA	26m
Dredger after assembly	Length* width* depth 19*7*2m
Engine room pontoon	Length* width* depth 11.55*3*2m
Side pontoon	Length* width* depth 16*2*2m
Structure	Can be dismantle and assembly at working site
Average draught	1.4m
Diameter suction pipe	300mm/12inch
Diameter discharge pipe	250mm/10inch
Main engine	351 kw Cummins engine
Rotate speed	1800r/min
Hydraulic winch	50 kn
Hydraulic cutter power	50 kw
Diameter cutter head	1300mm
Diameter spud cylinder	100 mm
Spud diameter	Φ325mmx14m
Emergency genset power	24GF Cummins
Max. oil consumption	52.6L/H

**12inch HLC300**

 2500 m<sup>3</sup>/h hydraulic cutter suction dredger with depth 12m


Name	HLC300 hydraulic cutter suction dredger
Type	Cutter suction dredger
Year	2009
Water flow	2500m <sup>3</sup> /h
Solid sand capacity	500cbm/h
Max. dredging depth 45°	12m
Discharge distance	1200m
LOA	31m
Dredger after assembly	Length* width* depth 23*7.5*2.5m
Engine room pontoon	Length* width* depth 13.75*3.5*2.5m
Side pontoon	Length* width* depth 20*2*2.5m
Structure	Can be dismantle and assembly at working site
Average draught	1.7m
Diameter suction pipe	350mm/14inch
Diameter discharge pipe	300mm/12inch
Engine power&type	596kw Cummins engine
Rotate speed	1800r/min
Auxiliary engine power	224kw Cummins engine
Rotate speed	1800r/min
Hydraulic winch	100 kn
Hydraulic cutter power	80 kw
Diameter cutter head	1500mm
Diameter spud cylinder	160 mm
Spud diameter	Φ457mmx14m
Emergency genset power	24GF Cummins
Max. oil consumption	123L/H



**18inch HLC450** 3500 m<sup>3</sup>/h hydraulic cutter suction dredger



Water flow	3500m <sup>3</sup> /h
Solid sand capacity	700cbm/h
Max. dredging depth 45°	15m
Discharge distance	1500m
LOA	36m
Dredger after assembly	Length* width* depth 27*8.5*2.5m
Engine room pontoon	Length* width* depth 15.4*3.5*2.5m
Side pontoon	Length* width* depth 24*2.5*2.5m
Structure	Can be dismantle and assemble at working site
Average draught	1.7m
Diameter suction pipe	600mm/24inch
Diameter discharge pipe	450mm/18inch
Main engine power	895kw
Rotate speed	1800r/min
Auxiliary engine power	298kw
Rotate speed	1800r/min
Hydraulic winch	150 kn
Hydraulic cutter power	170 kw
Diameter cutter head	1700mm
Diameter spud cylinder	160 mm
Spud diameter	Φ510mmx21m
Emergency genset power	24 GF Cummnis
Max. oil consumption	178.9 L/H

**20inch HLC500** 6000 m<sup>3</sup>/h hydraulic cutter suction dredger

Water flow	6000m <sup>3</sup> /h
Solid sand capacity	1200cbm/h
Max. dredging depth 45°	15m
Discharge distance	2000m
LOA	41m
Dredger after assembly	Length* width* depth 31*9.3*2.75m
Engine room pontoon	Length* width* depth 18.15*3.7*2.75m
Side pontoon	Length* width* depth 28*2.75*2.75m
Structure	Can be dismantle and assembly at working site
Average draught	1.7m
Diameter suction pipe	650mm/26inch
Diameter discharge pipe	500mm/20inch
Main engine power	1740kw
Rotate speed	1650r/min
Auxiliary engine power	450kw
Rotate speed	1500r/min
Hydraulic winch	240 kn
Hydraulic cutter power	300 kw
Diameter cutter head	2050mm
Diameter spud cylinder	160 mm
Spud diameter and length	Φ720mmx21m
Emergency genset power	30 GF
Max. oil consumption	336L/H



24inch HLC600 8000 m3/h hydraulic cutter suction dredger



Water flow	8000m3/h
Solid sand capacity	1600cbm/h
Max. dredging depth 45°	18m
Discharge distance	2500m
LOA	49m
Dredger after assembly	Length* width* depth 38*11.5*3.5m
Engine room pontoon	Length* width* depth 24.2*4.5*3.5m
Side pontoon	Length* width* depth 36*3*3.5m
Structure	Can be dismantle and assemble at working site
Diameter suction pipe	750mm/30inch
Diameter discharge pipe	600mm/24inch
Main engine power	2206kw
Rotate speed	600r/min
Auxiliary engine power	600kw
Rotate speed	1800r/min
Hydraulic winch	450 kn
Hydraulic cutter power	500 kw
Diameter cutter head	2200mm
Diameter spud cylinder	250 mm
Spud dia. and length	Φ820mmx25m
Emergency genset power	75GF Cummins
Max. oil consumption	674 L/H

12inch HLC300A 2500m3/h cutter suction dredger with depth 20m

Water flow	2500m3/h
Solid sand capacity	750cbm/h
Max. dredging depth 45°	20m
Discharge distance	1800m
LOA	42m
Dredger after assembly	Length* width* depth 36*8.5*2.5m
Engine room pontoon	Length* width* depth 13.75*3.5*2.5m
Side pontoon	Length* width* depth 34*2*2.5m
Structure	Can be dismantle and assembly at working site
Average draught	1.7m
Diameter suction pipe	350mm/14inch
Diameter discharge pipe	300mm/12inch
Main engine power&type	600kw
Rotate speed	1800r/min
Auxiliary engine power	224kw
Rotate speed	1800r/min
Hydraulic winch	160/80kn
Hydraulic cutter power	80 kw
Diameter cutter head	1500mm
Diameter spud cylinder	160 mm
Spud diameter and length	Φ457mmx14m
Emergency genset power	24GF
Max. oil consumption	123L/H



18inch HLC450A 3500 m<sup>3</sup>/h hydraulic cutter suction dredger with depth 20m



Name	HLC450A hydraulic cutter suction dredger
Type	Cutter suction dredger
Year	2009
Water flow	3500m <sup>3</sup> /h
Solid sand capacity	1050 cbm/h
Max. dredging depth 45°	25m
Discharge distance	2000m
LOA	43m
Dredger after assembly	Length* width* depth 38*9*2.5m
Engine room pontoon	Length* width* depth 15.4*3.5*2.5m
Side pontoon	Length* width* depth 36*2.75*2.5m
Structure	Can be dismantle and assembly at working site
Average draught	1.7m
Diameter suction pipe	600mm/24inch
Diameter discharge pipe	450mm/18inch
Main engine power&type	895kw
Rotate speed	1800r/min
Auxiliary engine power	447kw
Rotate speed	1800r/min
Hydraulic winch	160/100 kn
Hydraulic cutter power	170 kw
Diameter cutter head	1700mm
Diameter spud cylinder	160 mm
Spud diameter	Φ510mmx21m
Emergency genset power	24 GF Cummins
Max. oil consumption	201 L/H

20inch HLC500A 6000 m<sup>3</sup>/h hydraulic cutter suction dredger with depth 20m

Water flow	6000m <sup>3</sup> /h
Solid sand capacity	1800cbm/h
Max. dredging depth 45°	20m
Discharge distance	2000m
LOA	46m
Dredger after assembly	Length* width* depth 39*10.5*2.75m
Engine room pontoon	Length* width* depth 18.15*3.5*2.75m
Side pontoon	Length* width* depth 38*3.5*2.75m
Structure	Can be dismantle and assemble at working site
Average draught	1.7m
Diameter suction pipe	650mm/26inch
Diameter discharge pipe	500mm/20inch
Main engine power	1740kw MWM engine
Rotate speed	1800r/min
Auxiliary engine power	920kw MWM engine
Rotate speed	1800r/min
Hydraulic winch	240 kn
Hydraulic cutter power	300 kw
Diameter cutter head	2050mm
Diameter spud cylinder	160 mm
Spud diameter and length	Φ720mmx21m
Emergency genset power	30 GF Cummins
Max. oil consumption	399L/H



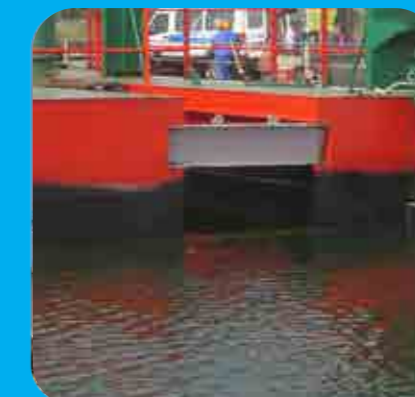
20inch HLC500A 6000 m<sup>3</sup>/h hydraulic cutter suction dredger with depth 20m



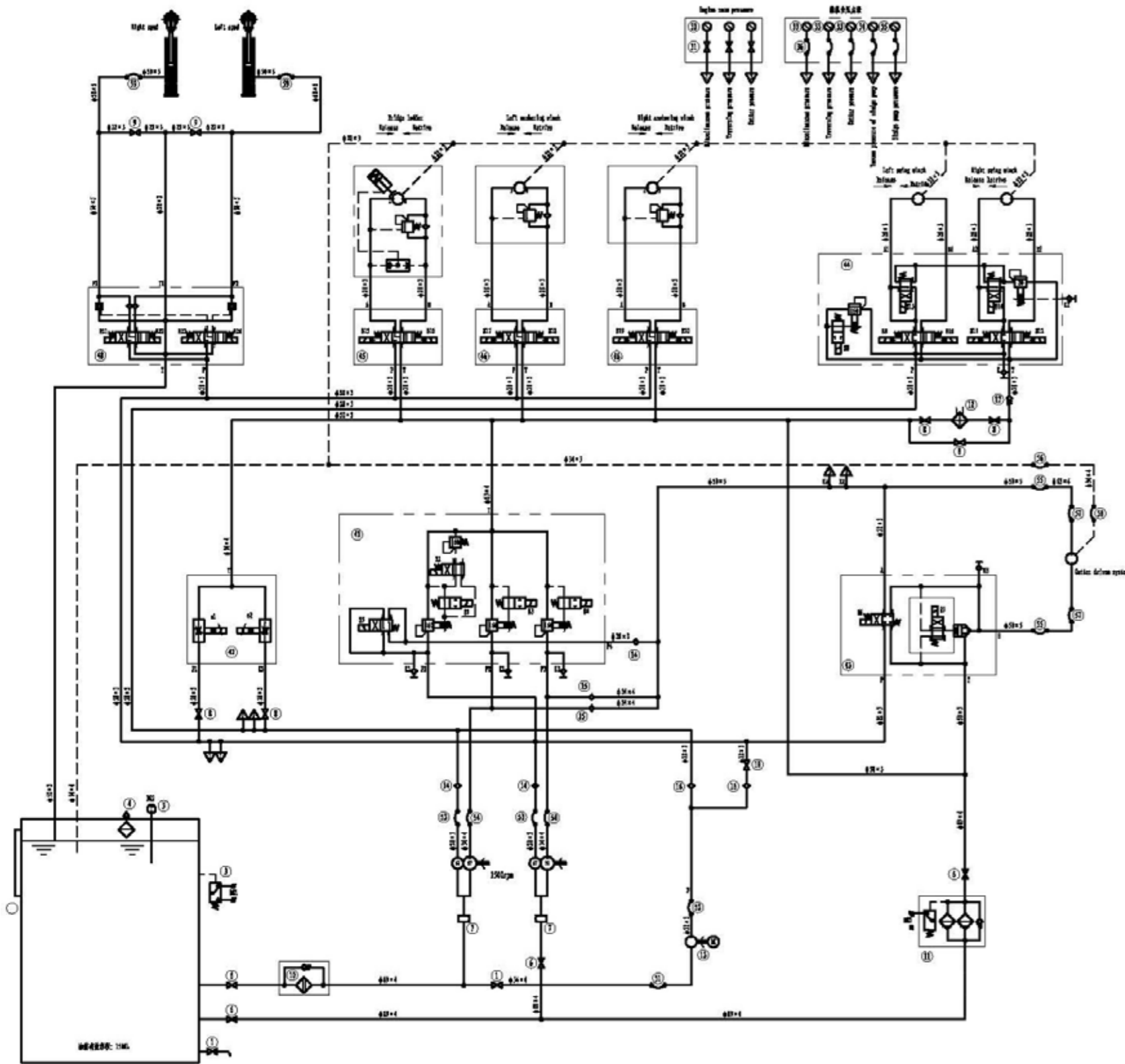
Water flow	6000m <sup>3</sup> /h
Solid sand capacity	1800cbm/h
Max. dredging depth 45°	20m
Discharge distance	2000m
LOA	46m
Dredger after assembly	Length* width* depth 39*10.5*2.75m
Engine room pontoon	Length* width* depth 18.15*3.5*2.75m
Side pontoon	Length* width* depth 38*3.5*2.75m
Structure	Can be dismantle and assemble at working site
Average draught	1.7m
Diameter suction pipe	650mm/26inch
Diameter discharge pipe	500mm/20inch
Main engine power	1740kw MWM engine
Rotate speed	1800r/min
Auxiliary engine power	920kw MWM engine
Rotate speed	1800r/min
Hydraulic winch	240 kn
Hydraulic cutter power	300 kw
Diameter cutter head	2050mm
Diameter spud cylinder	160 mm
Spud diameter and length	Φ720mmx21m
Emergency genset power	30 GF Cummins
Max. oil consumption	399L/H

# OUTFITTING PARTS

The outfitting parts will be equipped according to the request of dredger.



# HYDRAULIC VALVES



					Hydraulic system of CSD			SCHEMEE DESIGN	
					General Arrangement				
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AUDIT									
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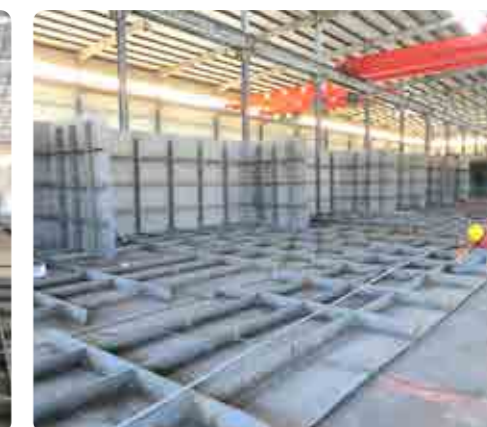


Hydraulic valves

Hydraulic valves are one of the most important parts of the hydraulic system



# Dredger production

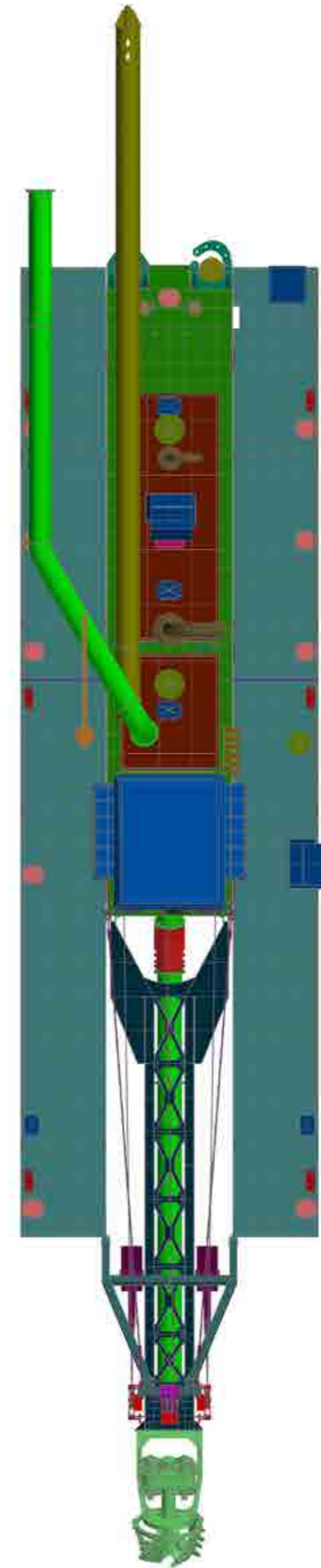
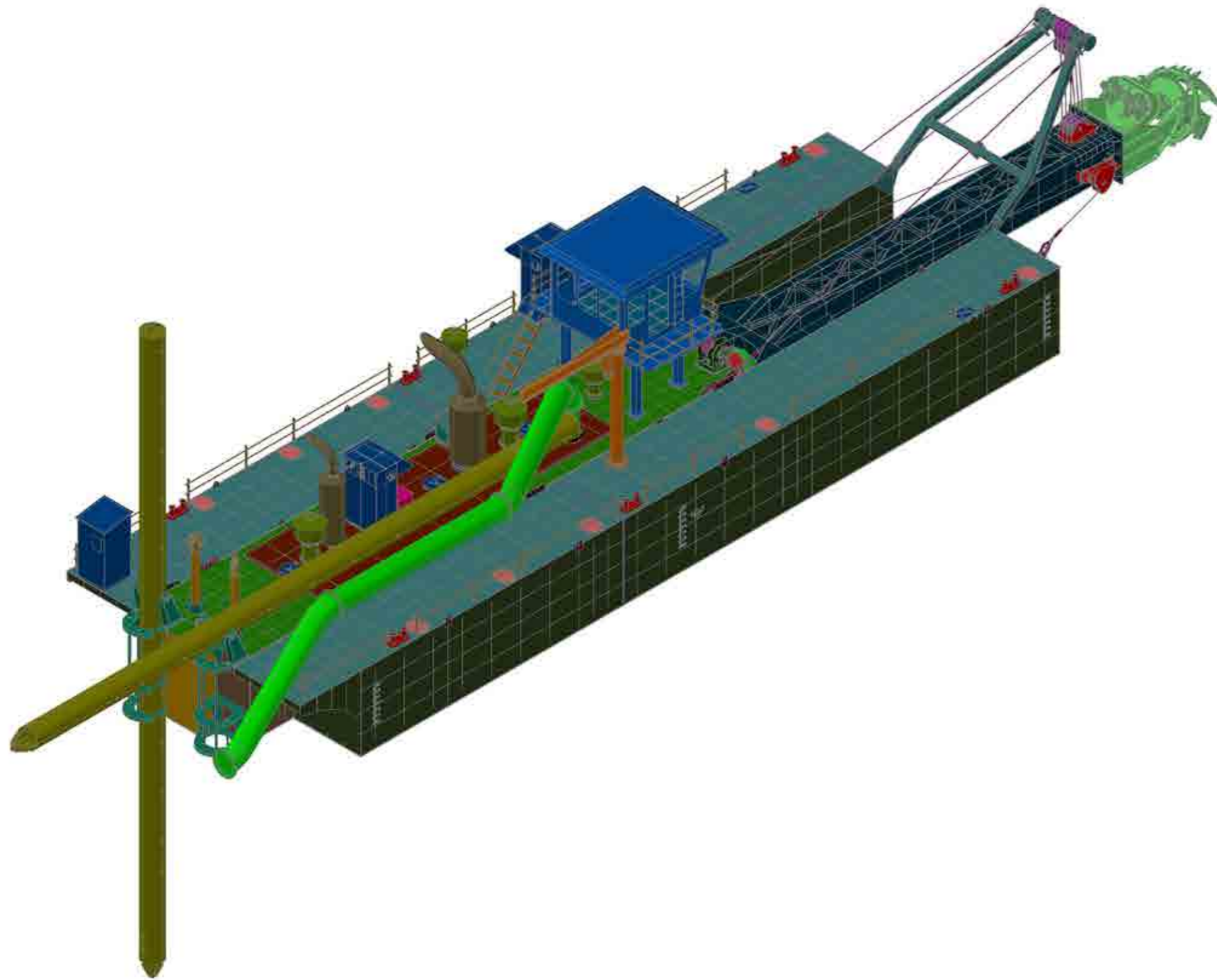


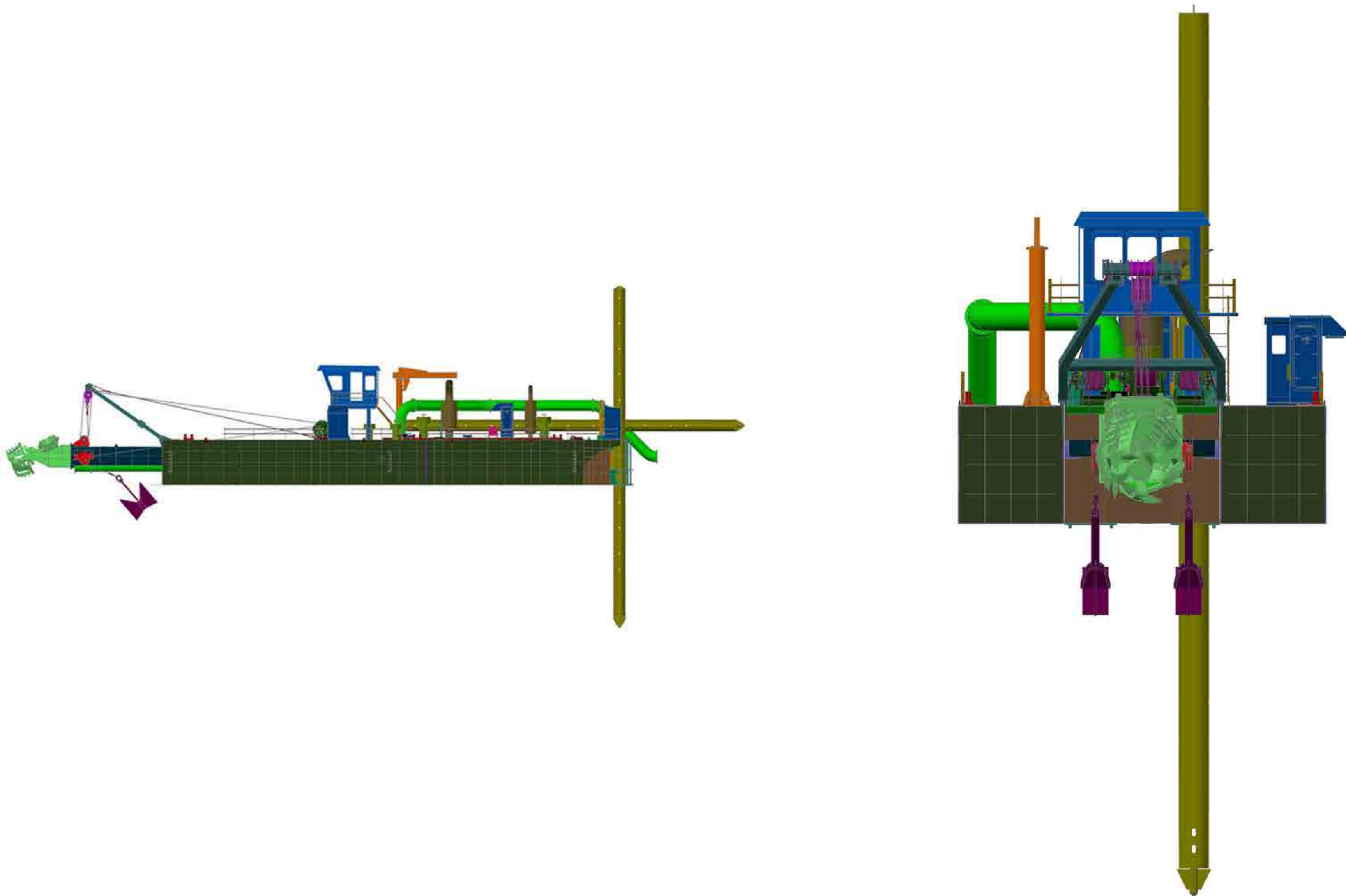
# DREDGER TRANSPORTATION AND INSTALLATION



# 3D drawings for cutter suction dredger

Dismantle type and can be assembly at working place





## Dredger installation in working place

### HLC500 20inch cutter suction dredger

Diameter suction/discharge pipeline: 650/500mm 26/20inch

Water flow: 6000m<sup>3</sup>/h

Solid capacity: 1200 cbm/h

Dredging depth: 15m

Discharge distance: 2000 m

Dredger sold country : Nigeria



## Dredger installation in working place

### HLC300 12inch cutter suction dredger

Diameter suction/discharge pipeline: 350/300mm 14/12inch

Water flow: 2500m<sup>3</sup>/h

Solid capacity: 500 cbm/h

Dredging depth: 13m

Discharge distance: 1700 m

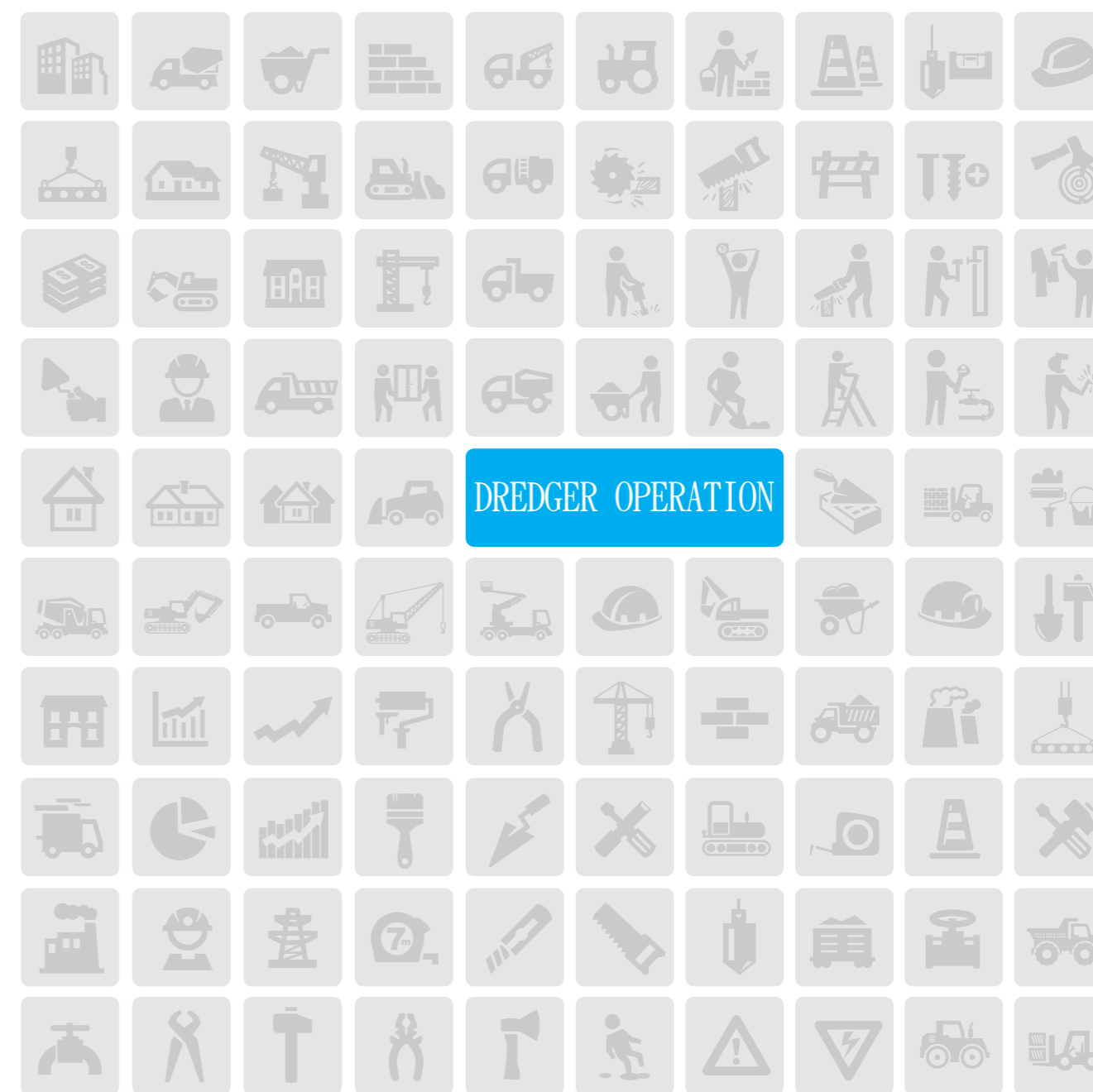
Dredger sold country: Nigeria, Argentina, Columbia



# Dredger installation in working place

<b>HLC450 18inch cutter suction dredger</b>	
Diameter suction/discharge pipeline: 600/450mm 24/18inch	
Water flow:	3500m <sup>3</sup> /h
Solid capacity:	700 cbm/h
Dredging depth:	15m
Discharge distance:	1500 m
Dredger sold country :	Nigeria, Iran, Saudi Arabia





# DREDGER OPERATION

Highling Dredger, leading manufacturer of  
dredging equipment and machinery



## 【Preface】

We sincerely thank you for your trust and choosing our HL series cutter suction dredgers and chain bucket dredgers, which includes HL-200, HL-250, HL-300, HL-400, HI-500, HL-600, HL-700 etc.. To correctly operate the dredger and avoid injuring operator himself and others, please carefully read this instruction book before using.

Hailing Leading dredger focuses on designing and manufacturing more advanced dredgers, and reserving the right to change the design, update the manufacturing equipments and technology. This manual will be onboard with the dredger.



## Product Overview

The varieties of dredgers are cutter suction dredger, bucket wheel dredger, grab dredger and jet suction dredger. They are absolutely necessary widely used, efficient and cost-saving tool in modern production and are mainly used to desilt and deepening channel, excavate and maintain waterways, expand shoreline or create land and pumping sand. In these dredging equipments, cutter suction dredger is of higher efficiency.



## Working Principle Description

The engine of the dredger provides power, then the gear box will transit it to the sand pump, the former is driven to rotate and create vacuum in suction pipe. In this way, the mixture composed of mud, sand and water and cut by the cutter head or bucket wheel is sucked into the sand pump through the inlet pipeline, and then discharged by the pump to the appointed place through outlet pipeline which is connected to the outlet of the sad pump.



## Structure and Component

### Hull



The hull is made of three pontoons –One main pontoons and two side pontoons, that is a wider main pontoon in the middle, carrying diesel engine and pump - to which two side pontoons as flotation tank are connected by pothook in the lower part and connecting board through high strength bolt in the upper part. This structure is of reliable stability.

Function of the main pontoon: to guarantee a certain buoyancy and provide a place to install equipment, such as main engine, gear box, sand pump, main generator set, auxiliary generator set, hydraulic oil tank, electrical system, hydraulic pump, starting system, recycling cooling system for hydraulic system motor, and other pumps. Function of side pontoon: to guarantee certain buoyancy and carry fuel tank, fresh water tank, storage, and air tank.

### Deck

The deck is equipped with engine cabin, operating room, deck crane, toilet, hydraulic cylinder, reverse spud frame, left traverse winch, bridge winch, right traverse winch and frame A of bridge lifting.

The engine cabin is consisting of pipeline, main engine expansion tank, skylights, ventilation fans, silencers.

The operating room is a workplace for the dredger operators, which is equipped with operating cabinets, instruments, electrical cabinets, air conditioning and other equipments.

The deck crane, installed beside the sand pump, is a kind of lifting equipment with cantilever and mainly used as a tool when repairing the sand pump and replacing the wearing parts.

The main function of the left and right traversing winches is made the dredger moving from left to right as a fan-shape.

Left (Right) traversing winch is used to wrap wire line around the winch drum, and provides power to make the dredger move left by tensioning the wire rope. The other end of the wire rope goes through the left pulley fixed on the ladder bridge and fastens on the anchor. The angle between the center line of the dredger and wire rope is required to be 65~80 degrees. The position anchor should be 50 meters left (right) away from the dredger under water. (Anchoring distance depends on your working condition, if the condition allows, the further it is, and the steadier the anchor is.)

Lifting bridge winch, working in the same way as the traversing winches, the wire rope going through a pulley block which fixed on the A frame and ladder bridge respectively, using to lifting the ladder bridge, so as to control the depth of dredging work.

The engine drives the hydraulic pump to provide power to hydraulic system, and the power, through hydraulic oil tank and hydraulic pipeline, is transmitted to the hydraulic components and drives the left traversing winch, right traversing winch and lifting winch to work.

The operator can control electromagnets power on and power off by operating the change-over switch button on operation panel to make the winches retrieve and release the wire rope.

The ladder bridge and the cutter head part is mainly made of ladder bridge steel structure, suction pipe, left and right traversing pulley, ladder bridge ascending and descending pulley block, hydraulic pipe, cutter head, cutter head driving hydraulic motor, gear box etc.. The ladder bridge is fixed on the main pontoon by two axle pins. Its main function is to install suction pipe and make the cutter head descend to certain depth and cut sand.



## Structure and Component

### ► Spud part

Two spuds, two hydraulic cylinder, and two down pile frame.

Spuds are steel hollow cylinders which are customized according to average draught, water flow and dredging depth of the dredger.

The main function of spuds is to fix the dredger in certain point and provide a fulcrum for the dredger to do fan-shape movement. There is two type of moving forward during construction: one is alternately use the spud during the fan-shape movement, the other is pushing the spud forward directly.

There are two spuds, main spud and vice spud.

During construction processing, only one is inserted into the sand. Two spuds are inserted at the same time is not allowed to.

The spuds are fixed on the stern with hoops. Down pile frame is auxiliary equipment used to erect and put down the spuds.

Situations that need put down the spuds: when moving from one work site to another work site, there are bridges, electrical obstacles of the voyage; when meeting seven storm winds during construction. The spud is only being erected when enter the work site and prepare to start work. (The process to erect and put down the spud is risky, pay more attention to personal safety.)

### ► Cutter head

The ladder bridge and the cutter head part is mainly made of ladder bridge steel structure, suction pipe, left and right traversing pulley, ladder bridge ascending and descending pulley block, hydraulic pipe, cutter head, cutter head driving hydraulic motor, gear box etc.. The ladder bridge is fixed on the main pontoon by two axle pins. Its main function is to install suction pipe and make the cutter head descend to certain depth and cut sand.



## The dredger are composed of five system

Hydraulic system, electrical system, cooling and fire system, flushing system, dredging power system, sand discharging system and starting system.

### ► Hydraulic system

Hydraulic system: the most important parts of cutter suction dredger and wheel bucket dredger. The hydraulic system requirements are very high, and strict; it's the main artery of the entire dredger.

An integral hydraulic system includes hydraulic oil tanks, hydraulic pump, hydraulic valve manifold, solenoid valve, hydraulic pipes, hydraulic components, electrical actuator and so on.



### ► The hydraulic system of our dredger are composed of five manifolds,



Left traverse winch manifolds



Right traverse winch manifold



Ladder bridge lifting winch manifold



Spud manifolds



Cutter pressure adjustment manifold

Among them on pressure regulator is used to control left / right traverse winch manifolds, ladder bridge winch manifold and spuds manifold and adjust the pressure of the system. Besides, we install an emergency hydraulic pump group in the system; it is mainly used for maintenance, adjustment and other emergency conditions, when the engine and the gearbox fail to work, and it can achieve full functions of the hydraulic system, but it can not be used for normal production.

## Instruction for hydraulic valves maintaining

Next, we introduce the function of each manifolds, and common trouble shooting ways.

**Left / right traverse manifolds:** using to control the left / right traverse to release or retrieve wire line.

**Ladder bridge lifting winch manifolds:** using to control cutter frame to ascend or descend, and composed of electro-hydraulic change valve and balanced valve.

**Spud manifolds:** the slow release of the stern pile is controlled by throttle needle valve.

The manifolds is used to control the left and right spud to ascend and descend, and composed of solenoid valves and pilot controlled check valve.

**If the above mentioned manifolds fail to move, it may have the following cause,**

※ The electro-hydraulic valve blocked, in this case, please remove the valve and wash it with clean diesel, then reinstall it according to what it is before.

※ Solenoid valve is not energized; please check if the circuit is breakdown or not.

※ Solenoid valve coil damaged, please replace the coil.

**Note: The above failure may be caused by the internal damage of hydraulic motor that drives winches.**

**Cutter pressure adjustment manifolds:** There are two pilot relief valves which are used to control hydraulic pump pressure and drive the cutter to rotate. If the cutter lost pressure, it may because by the following reasons.

※ The pilot relief valve blocked, in this case, please remove the valve and wash it with clean diesel, then reinstall it according to what it is before.

※ Pilot relief valve is not energized; please check if the circuit is breakdown.

※ Solenoid valve coil damaged, please replace the coil.

**Miscellaneous pressure adjustment manifolds as follows**

Its functions have been introduced above; here we introduced the adjustment method and fault processing method.

※ Miscellaneous relief valve has a rotating handle, when rotating clockwise, pressure rises; when rotating counterclockwise, pressure drops. The pressure adjustment range is 8~10Mpa. If the other systems have no action except the cutter, this may caused by following reasons

※ The pilot relief valve blocked, in this case, please remove the valve and wash it with clean diesel, then reinstall it according to what it is before.

※ Pilot relief valve is not energized; please check if the circuit is breakdown.

※ Solenoid valve coil damaged, please replace the coil.

**Besides, there are another two valves:** 1. flow control valve 2. left traverse back pressure regulating valve.

※ Flow control valve, which is installed in series in the pipe of left/right traverse winch system, is used to adjust the speed (according to your needs) of left/right traverse winches.

**Left traverse back pressure regulating valve:** used to control the winch to retrieve or release wire line by adjust the pressure of oil return pressure. Cutter suction dredger cuts and breaks sand with its cutter head, when the dredger make fan-shape movement to the left, we call it anti-knife; on the contrary, when the dredger move to the right, we call it syn-knife.

**The difference between anti-knife and syn-knife is:** when cutting harder sandy soil, syn-knife may slide through it and reduce cutting effect; instead, there is a cutting resistance to make anti-knife avoid sliding cutter. In order to avoid sliding cutter and improve cutting efficiency, back pressure valve is applied to increase pressure on syn-knife.

**Applications of main generator:** providing electricity for seal water pump, miscellaneous pump, lighting, air conditioning.

**Applications of standby generator set:** providing electricity for the above equipment when the dredger stopping working, or maintenance, or meeting an emergency condition.

**Charger:** using for accumulator charging

**Battery:** provides electricity for diesel engine starting, hydraulic solenoid valve closing, 24v lighting and signal light.

**Electrical cabinet:** used to control electrical equipments on board and include generator, knife switch, seal water pump, miscellaneous pump, hydraulic pump, fan, air-break switch for lighting, air switch and earth leakage protection devices. On the panel, there are voltage dial gauge; working and emergency generator transfer switches; start / stop buttons for emergency hydraulic pump, sand pump, sealed pump, miscellaneous pump, and fans.

**Operation platform configuration as follows:**

1. Main switch knob: turn on / off 24v power source in the operating desk.
2. Cutter switch and turning machine for alignment switch: for dredger bugging, and cutter repairing.
3. Left and right traversing winch switches: for dredger does fan-shaped movement.
4. Cutter ladder button: using for ladder raising and lowering to control the dredging depth.
5. Cutter head switch: for cutter head rotating and controlling tap position.
6. Mud pump switch: using to control the gearbox get row and off row, controlling pump start and stop
7. Right spud and left spud switch: for spud raising and lowering control.
8. Engine monitoring meter: for engine checking in the working process.
9. Back pressure control valve: using to adjust size of left traversing back pressure.
10. Meters : miscellaneous gauge, cutter head pressure gage, discharge pressure gauge, vacuum gauge.
11. Miscellaneous gauge: using for pressure showing of hydraulic system and hybrid system, usually it can be adjusted from 8 ~ 12Mpa.
12. Cutter head pressure gage: using for pressure showing of hydraulic system and cutter head, usually it can adjusted from 8 ~ 12Mpa.
13. Discharge pressure gauge: using for pressure showing of pipeline discharging. Usually when it is the max. discharge distance and good concentration, the pressure is about 0.5MPa.
14. Vacuum gauge: using for concentration showing tube in the discharge pipe. Generally it is around 0.04 ~ 0.06Mpa.

## Operating specifications and procedures:

Firstly, before the dredger working, it is a very important to check the following goods complete or not : life jackets, lifebuoys and other life-saving equipment and sand boxes, fire buckets, fire extinguishers. Working safety is everyone's responsibility.

Comprehensive inspection before launching the new dredger as follows:

hull seepage or not, whether the connections are tightly fixed or not, screws installed or not, screw accessories are enough or not. (Note: dredger in our company is dismantle type, so pay attention to the above-mentioned parts); When dredger working check water leakage or not of the dredger main pontoons, side pontoons, each compartment and cabin. All of these checking working done, this dredger can be working at the working site (Note: dredger in our company has been tested before ex-factory for the mentioned conditions).

Matters need attention steps and precautions before dredger working are as follows: first to lubricate all points of the dredger with butter and lubricating oil; diesel fuel tank filling (Note: diesel oil standard model is given according to the local climate and environment.) Adding water to engine internal recycle to the specified range (Note: antifreeze added in the cold zone, adding water to the scale of 3/4 expansion tank, sometimes may be at the highest of level gauge).

Adding hydraulic oil to the hydraulic tanks of the hydraulic system, oil is to be the top of hydraulic level gauge.

Hydraulic oil selection: when ambient temperature is below 20 degrees Celsius, anti-wear hydraulic oil ( L-HM46 ) ; when it is 20 to 30 degrees Celsius L-HM68 needed, when is more than 30 degrees Celsius, 100 L-HM100 is good. Temperature of working hydraulic system is less than 90 degrees Celsius.

Grease filling points as following: pulleys on the ladder bridge, left and right traverse pulleys, A-frame pulleys, bridge connection axis between ladder bridge and main pontoon, lifting pulley axle pin and the fuel tank base axle pin.

Engine oil adding points: 1. bearing box of cutter head , 2 hybrid pump bearings base, 3. sand pump bearing boxes (in two forms: butter filled, engine oil filled), 4 gearbox, 5. engine (Note: engine oil added according to gearbox and engine manual).

### Preparation before starting the engine:

Firstly, checking cycle water level inside the engine; secondly, checking hydraulic oil tank and opening the tank outlet valves; thirdly, checking oil lever of engine, gearbox, sand pump, and bearing boxes; fourthly, opening seabed valves outside circulating water system, adjusting all valves under working condition. Such as, jet water pump, miscellaneous pump, sea water pump and so on; and finally going to operating cabin to view all switch buttons are on the stop state. (Disconnect the 24v power supply), ensure all that is in the very condition, and then opening the knife switch under the engine room, last starting the engine (start engine is available in two configurations, one is electric start, the other is gas start.)

### Matters Need Attention/Attentions

Starting the engine, idle running about 10 minutes, only when water temperature, oil temperature and oil pressure meet requirement, the dredger begins to work. (Note: specific requirements according to the onboard engine manual). Before Engine drives the sand pump to work, opening 24v power supply master switch in the operating cabinet, rotating ladder bridge button to have ladder bridge winch down, and having ladder bridge, sand pipeline and cutter head submergence into the water; and then start the jet water pump for water pumping; thirdly rowing on through row button on the operating desk; at that time engine drives gear box and sand pump to work, and slowly increasing rotating speed of engine to required speed. (Note: only at the lowest rotating speed, the row switch can be turn on; at high speed, is definitely allowed to turn on). In the state there is water flows from pipeline, the dredger can do the daily working. (In the working process, when dredger does the fan movement, two spuds are not allowed to insert into mud at the same time). When sand pump needs to be suspend, it musts at the minimum speed and then off row will be successfully.

**Note that in the working process, workers in the cabin need to observe the cabin inside situation through smell, listen, look, and touch etc.**

- ※ Smell, whether there is peculiar smell or not;
- ※ Listening, if there is abnormal sound;
- ※ Supervising monitoring instruments is normal or not, hydraulic system is leaking or not, cooling system leaking or not, engine leakage or not (water leaks, oil spills, air leakage)
- ※ Touching shell to feel temperature high or not, vibration strong or not.

The deck workers need also supervising deck through by smell, hear, see of the situation. Hearing whether there is the smelly taste, listen to whether there is abnormal sound, monitoring instruments is normal or not which near operating cabinet surrounding the dredger; on the deck, the hydraulic system pipelines and underwater pipelines spill oil or not; observing running situation of the lifting winch and rope for lateral displacement winch and pulley operation.

When the dredger ready to stop working, first upgrading ladder bridge in order to having cutter head leaves the sand layer; secondly, staying for some time in the water level, then continue the pumping process, all sediment discharge in the pipelines will be washed out by water; thirdly, reduce engine to the minimum speed, and off row, so that the sand pump can be stop working, then upgrading ladder bridge to leave the water level, adding the bridge safety rope, all rotary switch at this time on the controlling cabinet to remain in a stopped state, after that, stop the engine, turn off the seabed valve, the hydraulic tank valve, cutting off the power supply inside the cabin, closing windows and doors.

### Dredger working process classification as follows

- ※ dredger starting work
- ※ dredger working process
- ※ dredger ends its work

#### Dredger starting work as follows:

Preparation work before the dredger starting.

Firstly, arranging workers to the working site to measure water depth and working environment by service ship. Because for spud erecting, the water depth must be deep enough. If both are met, tugging the dredger to the working site and erecting the spuds. Secondly, start the standby generator set, having the hydraulic system to work properly through emergency hydraulic pump, releasing traverse mooring ropes on right and left, having them bypass the sliding pulley on the ladder bridge; then leading the wire rope through back of the main pontoon anti sent to spud roots for one perimeter and fixed; thirdly, according to the terrain, making the ladder bridge to the deepest water depth (depth of not more than dredging depth); at the time, starting the traverse winches, slowly closing mooring rope to let spud slowly erected, this including right mooring rope for right spud, and left one for left spud.

Special Attention to safety and staff need to avoid rope suddenly disconnected from the spuds. After spud erected, connecting wire rope on the spud, then having the wire rope connected to the wire rope of hydraulic cylinder, applying hydraulic cylinder to adjust to the very height to the construction area, put down the spud to make dredger insert into the mud for fixing, so with the normal start-up procedure to start the engine, traverse winches to put anchor for locating.

#### Construction on working site, concentrate seriously on operations:

Working environment condition is not more than 6 wind velocity; water flow is not too bigger, also pay attention to where there is tide. All the above aspects satisfied, dredger can start working. In the working process, should be noted that the spud lifting height, especially do not allow the two spuds insert into mud at the same time. Pay attention to running conditions of engine and hydraulic system. Besides, observe all instruments, if there is sailing ship, pay attention to its movement.

**Stopping working for the day:** the dredger can be stopped after the completion of the project. Before stopping , it must be sure that the dredger pipeline is flushed, if there is fresh water in the pipeline, it can be dismantle with the spuds.

# Maintenance of the dredger

Dredger maintenance refers to machinery and equipment maintenance according to the manual onboard. Hydraulic system maintenance refers to hydraulic oil adding and supplement. To ensure that the hydraulic oil is clean and must not any water infiltration, if any water to seep into, then replace the hydraulic oil. Pay attention to the entire dredger all connections bolt is loose or not, if loose fasten it at once.

1). Painting maintenance of dredger by-cycle, which includes dredger maintenance in river and in the sea. For inland water use, maintain once every two year with standard inland marine painting. For sea water use, maintain once a year with standard marine painting.

Our respectable clients, thank you for choosing our dredgers, we sincerely hope you can put forward valuable suggestions; this will make our products better and reasonable.

Note: If this operation manual has discrepancy on your practices, your practices prevail



## Maintenance and Repairing of Cutter Suction Dredger

Cutter suction dredger needs to be maintaining and repairing because of its working environment. Cutter suction dredger is working in water for river channel digging, desilting, sand mining, port building and reclamation. Because of its special working with water and mud, its workload is relatively heavy with open-air operations; after working years by years, will do some damage to dredger parts such as pontoons, machinery, engines, generators; in order to extend the life of the dredger, strengthen maintenance and repair is a must to dredger itself.

Dredger maintenance include: dredger pontoons maintenance, dredging machinery maintenance, engines maintenance, electrical system maintenance, hydraulic system maintenance and so on.

### **dredger pontoons maintenance**

The dredger is dismantling type and can be assembly in the working site; it is composed by several pontoons to connect each other with hooks, bolts and nuts. Dredger is in moving condition during work, so all connections should be checked and maintenance in regular; loosen connection should be tightened, fixed, or replaced in order to keep dredger in good working condition.

Surface of dredger pontoons are painting layers by layers, it is soaked by wind, sand, and rain, in order to prevent corrosion, every day the surface should be rushed and cleaned, and check the paint in regular.

To extend dredger life, dredger pontoons' surface should be repainted in one year; pontoons under-water should be repainted with corrosion preventive painting in 3 years according to working condition. Dredger minor repair in one year, general repair in three years, bigger repair in five years.

### **Dredging machinery maintenance and repairing**

Dredging machinery is included: traversing winch, cutter ladder, cutter ladder winch, cutter head device, traversing winch pulleys, cutter ladder pulleys, spud devices and lifting devices, To these equipment, daily maintenance should be carried out, to inspect machinery lubrication is flexible or not, need oiling lubrication or not, if any machinery is oil leaking or loosened, should be tightened and fixed in time, to prevent any accident in the future.

### **Engines maintenance and repair**

The engine is the heart of dredger, the engine does not work, and dredger will stop working, because engine provides power for various mechanical dredging, hydraulic transmission, and electricity. It is particularly important for engine maintenance and repair. We must take it seriously to keep the engine in good working so that to ensure dredger normal operation, and high working efficiency. Technical maintenance of the engine can reduce mechanical failures, and extend the life of the engines.



Technical maintenance of the engine is including day maintenance, primary maintenance, secondary maintenance and tertiary maintenance

## Day Maintenance

Cleaning the dust and oil around engines, pumps and ancillary equipment, check the joints is loosening or not; if loosening, tighten bolts in time.

Check engine oil condition, oil quantity and oil quality inside oil shell, if oil suddenly reduced or increased is found, and there are metal shavings or other variation inside, the oil should be replaced with new oil.

Check and correct the valve clearance.

Check conditions of the electrical equipment, oil cleaning, water stains cleaning, dust cleaning, and joints fastening.

Check tightness conditions of all connections

Check oil stock conditions of different oil supply system, connection of various components in order to refueling tighten connection in time.

Check conditions of cooling system: cooling pump is working or not, cooling water tank is adequate or not, cooling water is added in time or not.

### Contents for primary maintenance after dredger working 100–150 hours

Daily maintenance work

Check crankshaft and other driven equipment is moved off-center or not, if moved, then corrected.

Check bolt connection and snap rings are loosened or not, if loosened, tighten them in time.

Cleaning oil tanks and oil filters, remove dirt from tanks and filters.

Checks rotate working parts of engines, filling lub. oil to all running parts.

Cleaning oil bottom parts, cleaning engine oil filter, after filtering engine oil, add new one.

Cleaning the air filter

Check the cooling system, and water pump bearings, and add butter to the place where should be.



### Secondary Technical Maintenance after dredger running 300–400 hours

Second technical maintenance is based on primary maintenance is finished

Check the fuel system, cleaning the diesel tank, filters, oil pipelines, fuel pump and oil injectors, etc...

Checking spares on crank rod connection structure, gas system, cooling system, rotate adjust structure, if any is loosened, repairing and tightening on time.

Check cleaning lubrication system, crank tank, engine oil pipe, oil pump, and cooler. Change engine oil accordingly.

Washing cylinder covers, removing coke, grinding valves, cleaning exhaust pipe.

Check generator and start motor is normal or not, testing and maintaining accordingly.



### Tertiary maintenance after dredger working 700–1000 hours.

Tertiary maintenance is based on secondary maintenance is finished.

Cleaning and checking structures of main equipment parts, checking conditions of cylinders, pistons, piston rings, piston pins, as well as the mechanical linkage bearings, etc... in order to repair or replace damaged parts in time and meet the technical requirements of the design, have engines work normally.

## Maintenance and repairing of electrical systems.

**Electrical systems are including generators, motors, power distribution boxes, console panels in operating room, electric valves, batteries and so on.**

For electrical equipment, it should be kept in clean, no dust, no oil, no water mark, check damaged and loosened joints in time to avoid short circuit and burn, so that can prevent any accidents.

Check belt tension by hand pressure, take bending to bottom at the center of belt by a distance of 10-15mm. Doing dust-protection work accordingly.

Check temperature of generator, if temperature is too high to stop for checking.

Check conditions of bearing lubrication, add new lubrication if needed.

After every 300 --- 400 hours working, open dust cover to remove dust and oil dirty.

Avoid putting generator in the moisture environment.

Check connections of regulator; interceptor; and wire rope in regular; if any problems among them identified, then maintenance in time.

Checking battery voltage, and charging condition in regular.

To electricity panel in operating room, need to keep it clean and no wire rope exposed, in order to prevent disconnection and short-circuiting. In daily operating, check wire rope is loosen, with barbed or not in regular is requirement to operator.

### Fifth, hydraulic motor maintenance and repairing on dredger.

**Hydraulic motor is the mayor machinery in the dredging process, should do a good job on maintaining.**

Keep machines on dredger are clean, no loosing, and no oil is spilt.

Observe operating conditions of the motor, if there is any difference with normal working.

Head of oil spill tube up must be parallel to the surface of motor oil, It is does not be higher than the oil, nor less than the crankshaft end. Otherwise it will cause increased wear oil-free cavity, the cavity pressure above the oil level will rise prone top cylinder phenomenon, the link derailment accident. crankshaft.



## Procedure for dredger testing in the factory testing center

Before 2 weeks of dredger testing, we will inform customers to our factory for dredger testing; if customer cannot come, videos and pictures will be sent to them for references.

### ► Preparing work before testing

After dredger assembly finished, cleaning the dredger deck and pontoons, if any parts are broken or painting are damaged, repairing and repainting before testing. Moor dredger in a safe place before testing. Check all conditions of machinery installation and connection. If any parts are install not reasonable; any connection parts are loosened and any parts are missed for installation. Get all oil and cooling water ready and put into machines for testing.



### ► Testing contents

Check working condition of electricity when all machines are working. Using of the emergency pump to check conditions of hydraulic system operation, other systems, and mechanical dredging work. After system working condition checked, will check engines running and power capacity. After engine testing finished, dredging pump will be tested and rotates at different speed with clean water. Upon testing completion of electricity system, hydraulic system, engines, and dredging pump, main pump hydraulic pump will be opened and hydraulic system load performance is tested to check operation of the work of the various hydraulic machinery and systems



### ► After testing

After testing finished, all equipment performances and testing recorded will be printed as report. After all report finished, send to customer as review. After testing, do a good job on dredger and workers safety. After testing, all work about dredger dismantle should be prepared and let customer knows when and what time will do delivery.



# DREDGER SPARE AND PICTURES

## Technical specifications for 300HP workboat/tugboat



### Main specifications for workboat pontoons

Item	Specification	Note
Overall Length	12.0m	
Overall width	6.0m	
Depth	2.0m	
Draught	1.5m	
Speed	20km/h	
Displacement:	80T	
Weight	60T	
Structure:	Can be dismantle and assembly at working place	
Delivery time	30 days after deposit received.	

### Oil tank and fresh water tank for loading

Diesel oil tank capacity:	20T
Fresh water capacity:	3T

### Main engine and hydraulic system

Item	Specification	Note
Diesel engine model	6BTA5.9-M150	Cummins engine
Engine power	150HP@1800r/min	
Quantity	2sets	
Bed for resting	2 beds	
Equipped with a means of navigation and communication (VHF + 02 Talke Walke + GPS + liferaft for 04 peoples)		
Deck crane lifting weight	1.5T	
Outreach :	3m	
Operation system	Hydraulic steering operation	
Function: workers on duty and off duty; different oil transportation; water transportation; spares transportation for dredger; dredger tugging; pipeline and floater connecting; anchoring; maintaining of dredger and pump and so on.		

Diesel engine of Cummins engine and DEUTZ-MAN engine



Dredging pumps



Hydraulic winch, cutter head



# AFTER SALE SERVICE



## After-sale services

Since foundation from 1992, Highling Dredge Machinery has always realized the impact than down time and transportation can have on the customers, especially since many dredging operations take place in remote locations. That is why dredgers are designed for low maintenance and dismantle type pontoons for convenient transportation and installation.

In the event that our customers dredging experience unskilled or mechanical failure or they just need to shoot a minor problem, Highling Dredge engineers are available at customer' s services, that is, we are at a service rep on call 24hours a day, and seven days a week. All dredger from HIghling, there are always engineers for installation and training if customers needs.

Before dredger ex-factory, it will be tested in the factory testing for performance and safety like in the work place; and also we will advise easy wearing spare parts to customers if they needs spare parts can shipped with complete dredger; after dredger is running in the working place, if customers needs easy wearing spares, they are shipped by air, land, or sea.



THE LATEST STARTING OF DEVELOPMENT