

**SPECIFICATIONS  
FOR  
ELLICOTT  
670 SERIES DRAGON MODEL  
CUTTERHEAD DREDGE  
FOR 42 FEET (12.8 METER) DIGGING DEPTH**

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**SPECIFICATIONS**

**ELLICOTT SERIES 670**

**1. GENERAL:**

Length - overall - feet (meters)	85'-8"	(26.11)
Width - overall - feet (meters)	20'-7/8"	(6.12)
Height - overall - feet (meters) (Spuds installed and elevated)	57'-1"	(17.4)
Height - overall - feet (meters) (Spuds, spud hoists, muffler, removed)	11'-6"	(3.5)
Dry Weight - approximate, (With spuds) - U.S. Tons (Kg)	69.3	(62.9)
Draft - maximum - feet (meters) (With spuds installed and elevated)	3'-4"	(1.01)
Draft - maximum - feet (meters) (With spuds removed)	2'-4"	(0.71)
Minimum digging depth - feet (meters)	4'-0"	(1.22)
Maximum digging depth - feet (meters) (@ 65 degrees)	42'-0"	(12.8)
Channel width @ 80° total swing angle @ minimum digging depth - feet (meters)	103'-0"	(33.22)
Channel width @ 80° total swing angle @ maximum digging depth - feet (meters)	81'-0"	(24.69)
Fuel capacity - gallons (m <sup>3</sup> )	2700	(10.22)
Ladder length (m) - approx. from centerline of trunnion pin to end of cutter – feet (meters)	46'-8"	(14.22)

2. **CENTER HULL TANK: ONE (1)**

Welded steel construction with ladder well forward.

Designed to A.B.S. River Rules.

1/4" (6 mm) end plates.

1/4" (6 mm) bottom plate.

1/4" (6 mm) side plates.

1/4" (6 mm) deck plate.

3/16" (5 mm) internal bulkheads.

Built-in hydraulic oil tank.

Built-in fuel oil tanks

Watertight manhole covers.

Four lifting lugs. (Suitable for lifting complete dry dredge less spuds)

Length	)	54'-0"	(16.46)
Depth	) Moulded - feet (meters)	4'-0"	(1.22)
Width	)	11'-11 3/4"	(3.65)

3. **SIDE HULL TANKS: (ONE [1] PORT AND ONE [1] STARBOARD)**

Welded steel construction. Easily demountable from center hull tank using vertical pins.

Designed to A.B.S. River Rules.

3/16" (5 mm) end plates.

3/16" (5 mm) bottom plate.

3/16" (5 mm) side plates.

3/16" (5 mm) deck plate.

Watertight manhole covers.

3. **SIDE HULL TANKS: (ONE [1] PORT AND ONE [1] STARBOARD)**  
**(Continued):**

Built-in ballast tanks.

Three (3) deck cleats each (mounted on outboard edge).

Four (4) lifting lugs.

Length	)	54'-1 1/4"	(16.5)
Depth	) Moulded - feet (meters)	4'-0"	(1.22)
Width	) Each tank	3'-11-3/8"	(1.20)

4. **DREDGE PUMP:**

Ellicott Series 600 pump.

14" (356 mm) suction.

14" (356 mm) discharge.

37" (940 mm) diameter high efficiency impeller with 7" (178 mm) particle clearance and patented recessed expeller vanes on both suction and engine sides - thread mounted.

Alloy cast iron (Ni-Hard 4) wearing parts - pump case, impeller and head liners - 500 BHN minimum.

Steel side heads, front head is adjustable to suit liner and impeller wear.

Packed stuffing box with flushing water connection and replaceable 316 stainless steel heavy duty shaft sleeve for sea and fresh water service.

Heavy duty alloy steel pump shaft with high capacity anti-friction roller bearings for thrust and radial loads with internal stainless steel oil cooler and dual grease purged seals on water end. Shaft equipped with wrench flats to facilitate impeller removal.

Bearing housing internally sandblasted to white metal and coated with oil proof crankcase sealer.

Gear belt driven by diesel engine.

Pump compartment sized to allow dredge to remain afloat when pump compartment is flooded to the main deck.

5. **DIESEL ENGINE:**

Caterpillar Model C27 DITA tube cooled with mechanical multi-plate disconnect clutch and residential muffler.

Rated 800 SHP (596 kw) continuous at 1800 R.P.M.

24 volt D.C. electric starting with 60 amp alternator and 220 amp-hour batteries.

Throttle control operable from lever room.

Marine power display in lever room.

6. **SWING WINCHES:**

Two (2) reversible independent hydraulically driven swing winches - 10,500 pounds (4763 Kg) line pull @ 75 feet (22.8 meters) per minute.

5/8" (16 mm) diameter rope

Totally enclosed planetary gearing with anti-friction bearings.

Gear type hydraulic motor.

Dynamic hydraulic braking for normal swinging for reduced maintenance.

Totally enclosed automatic mooring brake - friction type.

Single lever control for each winch in lever room.

Reinforced hull for winch support.

7. **LADDER HOIST:**

Independent winch operated ladder hoist system.

Single lever control from lever room with raise, lower and neutral positions.

**8. SPUD HOISTS:**

Two (2) independent hydraulic cylinder operated sling lift wire rope spud hoists. Cylinders have rod end cushions and freefall valve for good spud penetration. Cylinders also have chrome plated rods and spherical ball bushing end fittings.

Grease lubricated sheaves and 1/2 inch diameter wire rope arranged for two (2) part tackle.

Single lever control for each spud in control room.

**9. HYDRAULIC SYSTEM:**

Quadruple hydraulic gear pump flexible coupled to front end of diesel engine.

330 gallon (1250 liter) reservoir with level gauge and temperature gauge.

Individual circuits for cutter, swing winches, spud hoists, and ladder hoist. Single lever control for each function in lever room.

Pump protected with suction strainer (75 mesh, with magnets) and return line filter (10 micron).

All circuits protected with relief valves.

Forward, neutral and reverse available for all functions. Speed control provided for swing winches and cutter.

**10. DREDGE PIPING:**

14" I.D. X 3/8" (356 mm I.D. X 9.5 mm) wall abrasion resistant suction pipe bolted in ladder.

Heavy duty flanged rubber suction hose designed for full vacuum service, provides for flexibility between hull and ladder.

Flanged suction cleanout trap with gasketed cover provided on dredge pump. (Stone box)

14" I.D. X 3/8" (356 mm I.D. X 9.5 mm) discharge pipe on hull with standard connector flange at stern.

14" I.D. (356 mm) cast steel flap valve in deck discharge pipe.

11. **SERVICE WATER SYSTEM: (FOR DREDGE PUMP GLAND FLUSHING, OIL COOLING AND PRIMING)**

Centrifugal service water pump. Belt driven from engine - anti-friction bearings - cast iron construction - provides 60 GPM (227 l.p.m.) and minimum of 10 psi (0.7 kg/cm<sup>2</sup>) over dredge pump discharge pressure.

Sea chest with cleanable strainer and shut-off valve.

Dredge pump priming eductor (water powered) with piping system included.

Deck wash valve (hose bib) included.

12. **ELECTRICAL SYSTEM:**

24 volt D.C. circuit powered from diesel engine starting batteries.

13. **LIGHTING SYSTEM:**

24 volt D.C. lighting system.

Two (2) floodlights for aft end, two (2) floodlights for forward end - 24 volt.

One (1) dome light in lever room - 24 V.

One (1) light in pump room - 24 V.

14. **LEVER ROOM AND CONTROL PANEL:**

Removable welded steel lever room with tinted Plexiglas windows all around and lockable door.

Sound proofing and insulation of minimum one inch (25.4 mm) thick foam rubber.

360 degree rotating operators chair with adjustable position.

Desk type control panel with fingertip levers for all dredging functions and illuminated dials for night operation.



14. **LEVER ROOM AND CONTROL PANEL (Continued):**

Following instrument controls included:

- a. Dredge pump vacuum gauge.
- b. Dredge pump discharge gauge.
- c. Cutter hydraulic pressure gauge.
- d. Swing Following instrument controls included:
  - e. Dredge pump vacuum gauge.
  - f. Dredge pump discharge gauge.hydraulic pressure gauge.
  - g. Service water pressure gauge.
  - h. Engine tachometer.
  - i. Engine oil pressure gauge with alarm light.
  - j. Engine water temperature gauge with alarm light.
  - l. Engine throttle control.
  - l. Instrument light switch with dimmer.
  - m. Cutter forward - neutral-reverse-speed control.
  - n. Port swing forward - neutral-reverse-speed control.
  - o. Starboard swing forward - neutral-reverse-speed control.
  - p. Port spud - raise - neutral-freefall control.
  - q. Starboard spud - raise - neutral-freefall control.
  - r. Ladder – raise –neutral-lower control.
  - s. Dynamic hydraulic braking for each swing winch.
  - t. Ladder depth gauge - sliding board type in view of operator.
  - u. Switch panel for all lights (circuit breaker panel).
  - t. Low level alarm for hydraulic oil reservoir.

15. **SPUDS:**

Two (2) tubular steel spuds.

16 inches (406 mm) O.D. X 0.375 inches (9.5 mm) minimum wall X 51'-0" (15.54 m) long.

Steel point on lower end and cap with lifting lug on upper end.

Cross tubes for stowing with two (2) cross pins.

Fabricated steel spud guides at deck and bottom with removable pin connected gates.

Spud wells and associated hull structure are designed to withstand spud failure loads.

16. **DREDGING LADDER:**

Heavy duty dredging ladder fabricated from structural steel with suction pipe mounted internally to eliminate dragging at shallow digging depths. All structural components shall have a minimum length of 8 feet (2.44 m) without weld joints where applicable.

Approximately 46.8 feet (14.22 m) long from centerline of trunnion pin to end of cutter.

42'-0" (12.7 m) dredging depth @ 65 degree inclination.

Heavy duty trunnions with removable grease lubricated pins mounted in hull ladder well.

Steel stowage pins for securing ladder for towing and maintenance.

Submerged piston type hydraulic cutter motor and planetary reducer with direct spline connection to cutter shaft.

100 H.P. (74.6 Kw) cutter motor at 36 R.P.M. cutter speed.

41.0 inch (1041 mm) diameter - 6 blade cutter - cast steel plain edge blades with keyed and tapered shaft connection.

Alloy steel cutter shaft with anti-friction bearings and watertight seal - spline connected to reducer. Oil filled housing with positive internal pressure.

Grease lubricated swing sheave blocks for 5/8 inch (16 mm) diameter rope.

**17. SAFETY EQUIPMENT:**

1. Deck edge safety rail - OSHA approved.
2. Life vests (three)
3. Life rings (two)
4. A.B.C. fire extinguishers (two)
5. Automatic bilge pump system (24 V.D.C.) for dredge pump compartment.

**18. PAINTING:**

The dredge shall be painted according to Ellicott's standard schedule. The hull (consisting of the center tank and side tanks) shall be sandblasted before painting internally and externally to a commercial grade (SSPC-SP-6). All other steel work shall be wire brushed and thoroughly cleaned of loose mill scale, rust, oil, or other foreign matter before painting.

The hull shall be given one (1) coat of Carbomastic 15 or equal on the interior and exterior of (5) mils thickness and an additional coat of Carboline D890 or equal on the exterior of (5) mils thickness.

All fuel compartments shall receive one (1) coat of a fuel oil resistant elastomer coating (minimum thickness 1.0 mils).

All other surfaces shall receive a primer coat of five (5) mils thickness of Carbomastic 15 or equal and a finish coat of five (5) mils thickness of Carboline D890 or equal.

The primer coat will be allowed to dry thoroughly and harden before application of the finish coat. Carbomastic 15 is a high solids aluminum epoxy mastic. Carboline D890 is a high solids epoxy polyamide.

Colors shall be Ellicott standard:

Hull	-	Blue
House	-	White
Ladder & Machinery	-	Red
Spuds	-	Black

**19. SHOP AND FIELD TESTING:**

The dredge shall be completely assembled in Ellicott's shop and tested as far as practical under no load or simulated load conditions to insure proper operation.

Upon launching and final assembly, the dredge shall be fully tested by Ellicott to insure that all equipment is operating properly.

**20. INSTRUCTION MANUALS AND DOCUMENTS:**

Two (2) sets of manuals shall be provided. Each set shall include the following:

- Instructions for the operation and maintenance of the dredge.
- Repair parts information for equipment manufactured by Ellicott.
- Operating instructions and parts information for equipment.
- Field assembly and launching recommendations.

**21. OPTIONS (AVAILABLE AT ADDITIONAL COST):**

- Swing winch cables 5/8 inch (16 mm) diameter x 200 feet (61 m) long
- Lifting rig
- Hull zinc's (cathodic protection)
- Cutter knife
- Suction cleanout knife
- Impeller lifting hook
- Pump handling crane
- Stern jib crane for discharge hose
- Lever room heater
- Lever room air conditioner
- Production meter
- 6 blade cutter with replaceable teeth
- 14 inch (356 mm) discharge hose
- Swing anchors - 2 @ 500 pounds (227 Kg)
- Mast with navigation signals
- Tool kit

21. **OPTIONS (AVAILABLE AT ADDITIONAL COST) (Continued):**

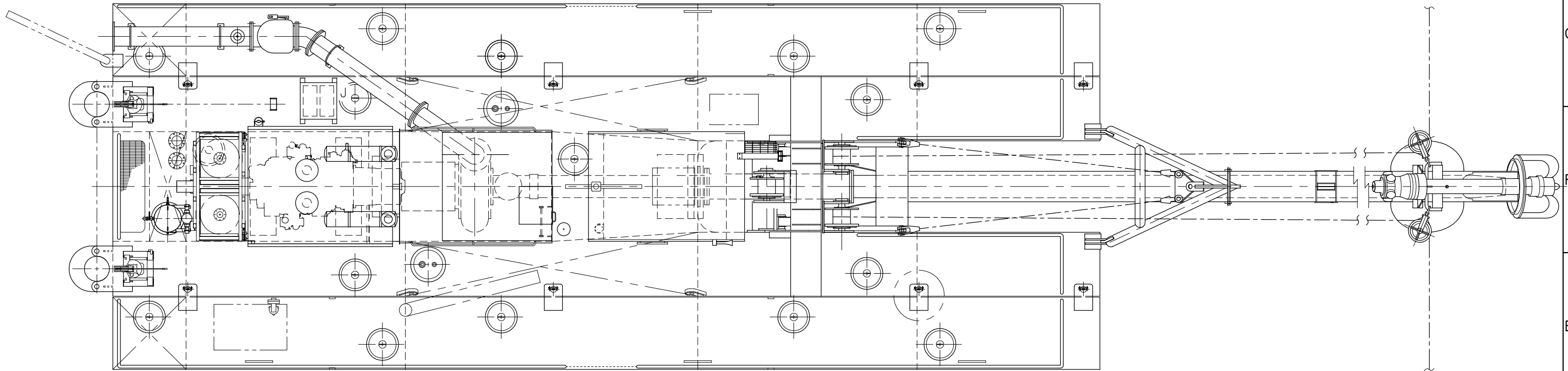
Engine located in a lockable enclosure with removable service panels, ventilation provisions and sound insulation to minimize external noise.

22. **SUMMARY:**

All materials and machinery components will be new and the workmanship shall be of high order.

It is the policy of manufacturer to make continual improvements in the design and manufacture of our products; therefore, the right is reserved to modify these specifications to provide for the use of any such improvements which may have been developed prior to the time of actual manufacture.

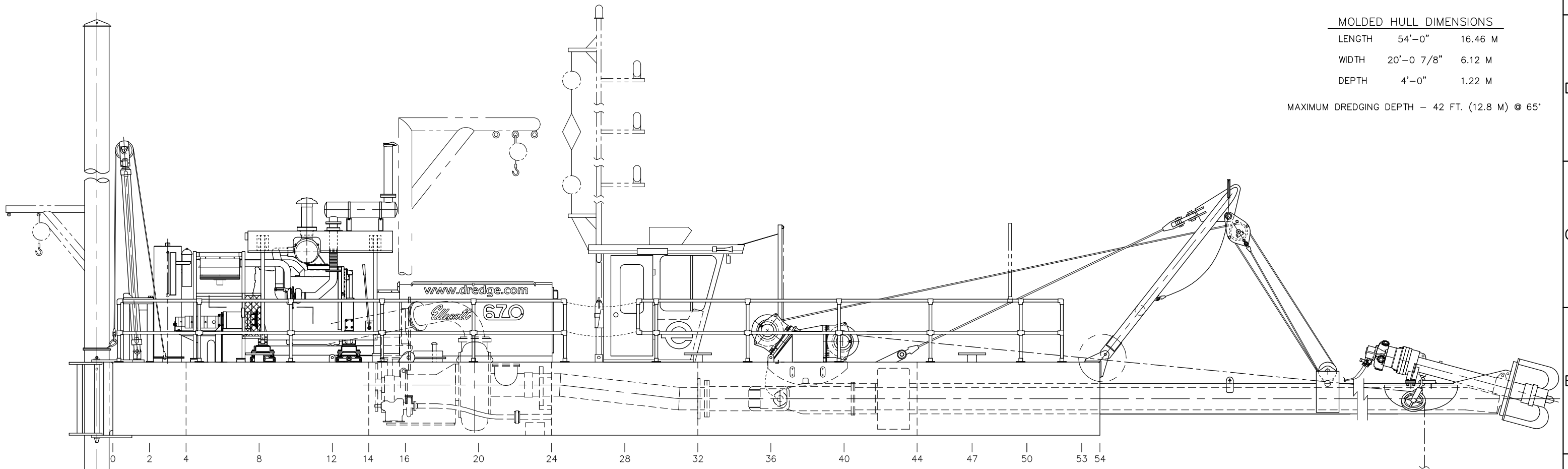
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**MOLDED HULL DIMENSIONS**

LENGTH	54'-0"	16.46 M
WIDTH	20'-0 7/8"	6.12 M
DEPTH	4'-0"	1.22 M

MAXIMUM DREDGING DEPTH - 42 FT. (12.8 M) @ 65'



DO NOT SCALE - ALL DIMENSIONS SHOWN WITHOUT DIMENSION LINES REFER TO DATUM LINE MARKED "0"

SH. 1 OF 3

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SHT. 2	6					SERIES	
SHT. 3	5	5352	8/09/12	LAV	WMR	670	
A10.B11	4	4688	06/13/11	LAV	SIM	100HP/42' D.D.	
BOM	3	4550	4/8/11	LAV	JAN	MADE FROM	
	2	4209	5/18/10	AHE	SJC	4-149240	
SHT. 2	1	4016	10/20/08	WFC	MHV	CAD	
SHT. 3						DO NOT EDIT	

DIMENSIONAL TOLERANCES UNLESS OTHERWISE NOTED COMM. STOCK SIZES EXCLUDED	
1 - PLACE DECIMAL ±	~
2 - PLACE DECIMAL ±	~
3 - PLACE DECIMAL ±	~
ANGULAR MACHINED SURFACES ± 30'	
MACHINED SURFACE TEXTURE $\sqrt{32}$	

<b>ELLICOTT</b> BALTIMORE, MARYLAND, U.S.A.		DREDGE, ASSEMBLY	
		SCALE 3/8" = 12.0	DATE: 7/8/09
DR. WFC	CHK. MHV	APPR. AMH	FIRST USED
		MFG. SLS	NO.4 150050

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