MC252 Demobilization Project

for

MC252-1

DTS Buoy Clump Weight Recovery

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1	12/17 /2010	Dusty Mathus	Update after HAZID		
2	12/31 /2010	Dusty Mathus	Update equipment list and drawing for rigging that is available, and after Readiness Review Appendix F removed, as it is issued as a separate document		Appendix B, C, D & F

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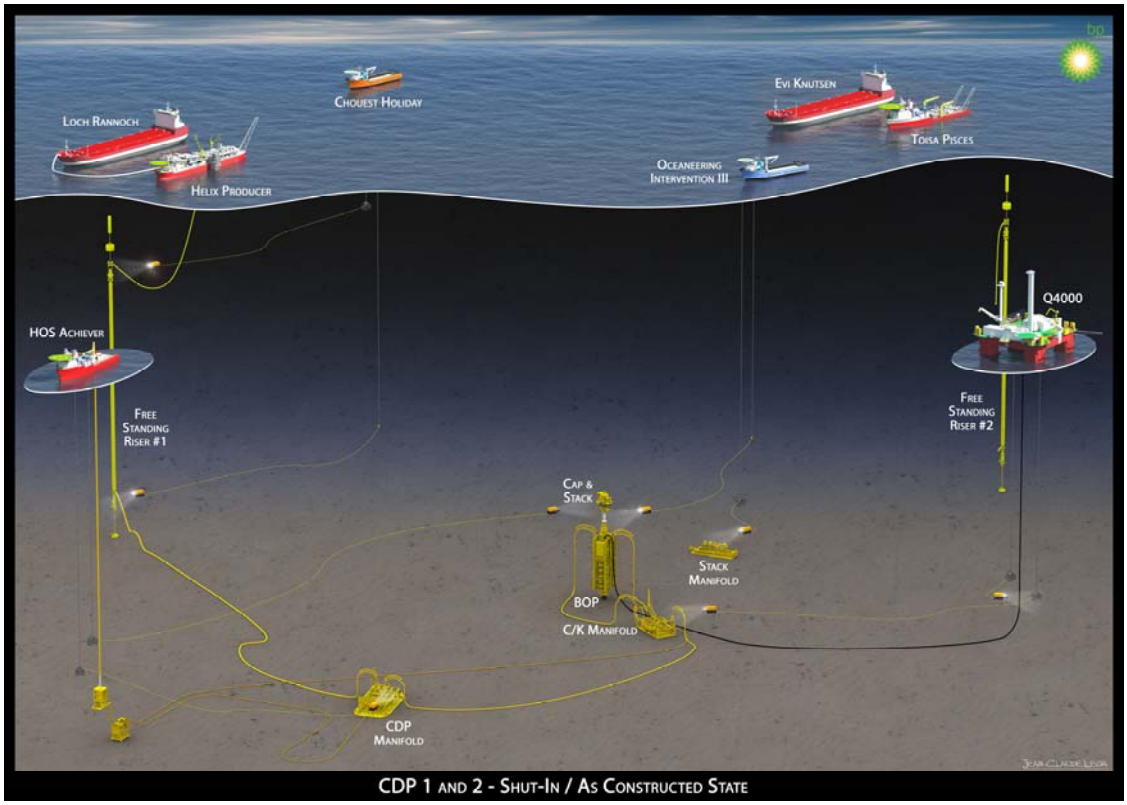
1 Introduction

The Containment and Disposal Project (CDP) objective was to contain the spill flowing at the BOP level located at MC252-1. This was accomplished utilizing a Free Standing Riser system composed of rigid pipe-in-pipe riser, flexible jumpers, containment and storage vessels, and an IWOCS-based/Hydrate Inhibition System (HIS).

As part of the Macondo Demobilization Project (MDP) these CDP system components will undergo de-commissioning and de-construction. This process requires that hydrocarbons/drilling mud, or base oil/drilling mud, be purged from the jumpers, flowlines, risers, and manifolds; the HIS be flushed; and of all of these components are recovered to the surface for transport, preservation, and storage.



CDP 1 and 2 - Shut-In / As Constructed State

The recovery of the DTS Buoy and Clump Weight is part of a larger effort to deconstruct, recover and demobilize the MC 252 temporary response equipment. A holistic recovery plan (MC252-1 Temporary Installed Subsea Equipment Recovery Plan, 2200-T2-DO-PR-4746) has been developed which includes categorizing response equipment as:

- Evidence (Legal Hold).
- Temporary Kit to be Recovered (Non-Legal).
- Abandon In-Place.

It should be noted that the DTS Buoy and Clump Weight have not been characterized as legal hold kit. Therefore, custody transfer and quarantine protocols do not apply to the recovery and demobilization of the equipment to be recovered per this procedure. The legal hold category primarily pertains to BOP and flow-related equipment.

The equipment will be recovered to surface and demobilized.

2 Scope

At the request of BP America (BP), InterMoor Incorporated (InterMoor) has developed procedures for the recovery of the Helix *Producer 1's* (*HP1*) temporary Disconnectable Transfer System (DTS) buoy, tether, and clump weight at the Macondo field in Mississippi Canyon (MC) Block 252. The DTS buoy was installed at the MC-252 location during the first week of July 2010. The *HP1* was contracted by BP to increase the containment capacity of the spill by capturing oil and flaring gas.

The *HP1* is a ship-shaped Floating Production Unit (FPU) with Dynamic Positioning (DP) capabilities. The DTS buoy is a disconnectable riser buoy through which petroleum is transferred from subsea assets to the processing facilities on board the *HP1*. If a hurricane approaches the Gulf of Mexico (GoM), the *HP1* will release the DTS buoy, allowing it to descend to a predetermined disconnected position where it is held in place by a clump weight.

The 130 m.ton clump weight consists of a tether and chains hung from a spreader bar beneath the DTS buoy. An extra 50 m.ton of added ballast weight was also connected directly to the tether. The spreader bar is attached to the keel of the DTS buoy by the tether consisting of torque-neutral polyester rope with short chain sections. When disconnected from the FPU, the spreader bar rests on the seafloor and the length of the tether keeps the DTS buoy keel is at an approximate depth of 150 ft. Therefore, the top of the riser buoy remains at 110 ft depth. The approximate water depth at the riser buoy location is 5,020 ft (1,530 m).

This report is to outline the procedures to recover the DTS buoy, tether, and clump weight now that the HP1 has departed the field. A recovery vessel and an Anchor Handling Tug/Supply (AHTS) vessel will be required to recover the DTS buoy, tether, and clump weight. Two (2) vessels will be used to complete this recovery, but subsea assets and wreckage from the *Deepwater Horizon* create congested conditions around the Macondo location.

This document details the procedures necessary to successfully complete the DTS Buoy and clump weight recovery operations for the HP1, which includes the following:

- InterMoor safety policy;
- Responsibilities of senior personnel;
- Communication protocols;
- Tether configuration;
- Detailed vessel / deck procedures ;
- Contingency procedures.

3 Abbreviations

The following abbreviations may be used in this report:

AHTS	Anchor Handling Tug / Supply vessel
BP	BP America
CCW	Counter Clockwise
CW	Clockwise
DGPS	Differential Global Positioning System
DP	Dynamic Positioning
EEIPS	Extra Extra Improved Plough Steel
FES	Flexible Engineered Solutions, LTD.
FPU	Floating Production Unit
ft	Feet
GMDSS	Global Maritime Distress and Safety System
GoM	Gulf of Mexico
Helix	Helix Energy Solutions Group, Inc
HP1	Helix Producer 1
HSE	Health, Safety and Environment
in	Inch
InterMoor	InterMoor Incorporated
IWRC	Independent Wire Rope Core
JSA	Job Safety Analysis
kip	1,000-lbs
KOS	Kiewit Offshore Services
kt	Knots

m	Meter
MBL	Minimum Breaking Load
MC	Mississippi Canyon
ML	Mooring Line
MOC	Management of Change
nm	Nautical Mile
POB	Personnel On Board
PPE	Personal Protective Equipment
PRA	Project Risk Assessment
QCDC	Quick Connect/Disconnect
SIMOPS	Simultaneous Operations
SWA	Safe Work Area
TBD	To Be Determined
s.ton	Short ton (2,000-lbs)
tonne (te) or m.ton	Metric Ton (2,204.62-lbs)
VHF	Very High Frequency
VPIC	BP Vessel Person in Charge

4 Safety

4.1. General

InterMoor has a strong commitment to Health, Safety and Environment (HSE) performance. It is the policy of InterMoor that all of its activities will be conducted in such a way as to:

- Maintain a SAFE, HEALTHY and INJURY FREE workplace;
- Respect and avoid damage to the ENVIRONMENT;
- Document, monitor, and ensure safe systems of work that avoid accidents, anticipate hazards, and reduce risks to an acceptable level;
- Comply with all applicable laws, regulations, BP's requirements, and industry-recognized best practices;
- Ensure HSE Management is a prime responsibility of line management from our Executive Management to first-line supervisory level;
- Ensure respect for Health and Safety and care for the Environment is an integral part of and is inseparable from our daily operations.

The specific objectives of the Company are to:

- Develop a high degree of HSE awareness, involvement and competence of personnel through management communication, training and coaching programs;
- Design solutions to avoid the need for corrective measures;
- Set targets for improvements and measure, appraise and report performance;
- Provide adequate and appropriate resources to implement the HSE Policy;
- Achieve continuous performance improvement of the HSE system;
- Support the identification of risks and assessment of hazards in work activities;
- Evaluate potential Supplier HSE Systems to ensure alignment with Company Policy;
- Investigate all events where injuries, damage to property or the environment has occurred and ensure that corrective actions are undertaken and are communicated in a timely manner;
- Conduct planned HSE System revisions to verify its implementation and effectiveness.

All operations shall be performed in a safe manner. All operations will be conducted per the InterMoor HSE Manual. Safety has the highest priority of all, and before any work is started, each departmental Manager (i.e., Deck Foremen, Captains, etc.) must ensure all operations are performed in a safe manner. The job should always be organized with safety as the dominant issue. All personnel should be continuously informed and updated as to possible risks involved in the operations. All personnel have the authority to stop the job should a new safety risk be identified.

A JSA shall be conducted for all jobs performed by InterMoor and associated Companies and contract personnel involving a new process or significant HSE risk. At the time of task assignment, the Supervisor or a trained designee and the personnel performing the task shall analyze the task. Work activities shall not commence until all parties are satisfied that hazards have been identified, and appropriate measures have been taken to protect the task performer(s) from the hazards.

A safety meeting will be held aboard each vessel involved in the operation prior to the commencement of work. This safety meeting will be conducted by the Captain / Deck Foreman aboard the vessel and will describe the operation to be conducted, describe the type of personal protection equipment to be worn, discuss general safety measures and discuss specific safety measures particular to the operation to be conducted.

4.2. General Safety Briefing

- Running wires.
- AHTS heave with slack wire snap loads.
- Personnel deck responsibilities clearly defined.
- Only designated personnel will give winch instructions.
- Only designated personnel will communicate between the vessels.
- Be deliberate throughout task execution - if you are not sure, do not do it.
- Inform deck foreman immediately of anything that compromises safety on deck.
- Do not attempt to operate deck equipment with which you are unfamiliar.
- Deck will be clear of personnel unless operation being conducted requires deck personnel.
- If you are not on shift, stay clear of deck operations.
- Be aware and observe specific safety instructions given by Vessel Captains or designated Supervisors.
- Task specific safety meetings to be arranged by anyone if required.
- The job can be shut down by anyone if a safety concern is identified.
- Follow vessel rules.
- Be considerate of those off shift trying to rest.

Immediately inform the BP Representative of any incidents both verbally and later in a written report from InterMoor's HSE Department.

5 Responsibilities and Communication

5.1. Responsibilities

Every person involved with the operation has a vested interest in ensuring the operation proceeds as planned and without incident. As such, each person has the right to question any detail, large or small, during pre-job meetings and during the operation itself. If anything appears out of place, or if a piece of information is vague, contradictory, or unclear, that person has the right and the responsibility to bring their questions or concerns to the attention of the Superintendent, InterMoor Field Engineer, and / or to the person specifically responsible for that aspect of the operation. In return, the person to whom the question is addressed has the responsibility of answering the question, whether by confirmation, by clarifying the information in greater detail, or by taking corrective action toward the issue.

The roles and responsibilities of the key personnel involved in the mooring operations are summarized below:

- BP Representative.
- Superintendent.
- Vessel Masters.
- Survey Operators.
- InterMoor Project Manager.
- InterMoor Field Engineer.

Responsibilities of the BP Representative

A BP Representative will be onboard the recovery vessel as well as the AHTS during the riser buoy and clump weight recovery activities at MC-252. The BP representative will be the sole point of contact between BP shore personnel and the InterMoor recovery team. Their responsibilities will also include the following:

- Observe all riser buoy and clump weight recovery operations to ensure the integrity of subsea assets remain intact;
- Authorize change request forms for procedural changes;
- Be familiar with the requirements of the BP SIMOPS plan and ensure that offshore operations are performed in accordance with the plan;
- Participate in daily conference calls;
- Contribute to daily operational safety and Job Safety Analysis (JSA) briefings.

Responsibilities of the Deck Superintendents

The Superintendents will oversee all deck operations. Their responsibilities include the following:

- Review complete procedure prior to starting the job;
- Complete a JSA prior to the commencement of mobilization and again before recovery activities begin;
- Verify all equipment on the provided equipment list is loaded and serial numbers and sizes are correct;
- Ensure equipment has been properly inventoried during mobilization;
- Visually inspect all equipment to ensure suitability / integrity of equipment and complete checklists. Report any unsuitable / damaged equipment;
- Immediately report any discrepancies in sizes, serial numbers or identification tags to the InterMoor Field Engineer;
- Count, inspect, and record all gear going on and off the vessel;
- Ensure procedures are enacted in a safe and effective manner;
- Direct crew activities on deck throughout the offshore operations;

- Inspect all lifting slings, shackles, and work wires during mobilization and verify checklists;
- Update the InterMoor Field Engineer on recovery activities throughout offshore operations;
- Conduct all operational safety and JSA briefings.

Responsibilities of the Vessel Masters

The Vessel Masters onboard the AHTS will be responsible for the safety of their vessel and all personnel on their vessel throughout the recovery operations. Vessel Masters have the final word with safety issues. Vessel Masters will also have the following responsibilities:

- Maneuver vessel during recovery operations;
- Ensure appropriate navigation warnings are issued at regular intervals;
- Be familiar with the requirements of the BP SIMOPS plan and ensure that offshore operations are performed in accordance with the plan;
- Maintain a safe working environment for deck crews;
- Ensure safety of all personnel onboard vessel;
- Discuss with the BP Representative any issues in order to ensure that marine operations are conducted according to good marine practice;
- Contribute to daily operational safety and JSA briefings.

Responsibilities of the InterMoor Project Manager

An InterMoor Project Manager may be offshore during ground chain recovery activities. In the absence of a Project Manager, the InterMoor Field Engineer will assume the Project Manager's offshore duties. Their responsibilities are as follows:

- Liaise with the BP Representative on the status of operations;
- Understand BP requirements regarding HSE and ensure that all relevant personnel are made aware of these requirements (i.e. training, licenses, etc.);
- Maintain a safe working environment throughout the recovery;
- Provide management and guidance to InterMoor Field Engineers and Operations personnel throughout recovery;
- Liaise with InterMoor shore side facilities in Houston, TX, Fourchon, LA and Amelia, LA;
- Contribute to daily operational safety and JSA briefings;
- Provide guidance and approval for all MOCs issued on the project.

Responsibilities of the InterMoor Field Engineer

InterMoor Field Engineers will be offshore during the riser buoy and clump weight recovery activities. Their responsibilities will include the following:

- Coordinate with Superintendent and/or Material Coordinator to verify all equipment is loaded and properly sea-fastened during mobilization;
- Verify checklists are properly filled out at each stage of operations;
- Signoff on manifest before leaving dock;
- Maintain a log book of activities throughout recovery;
- Contribute to daily operational safety and JSA briefings;
- Issue daily reports to BP and InterMoor offices throughout operations;
- Report to the InterMoor Project Manager for guidance and daily activities;
- Monitor operational activities to ensure that procedural and safety requirements for the operation are followed;
- Be familiar with the requirements of BP's SIMOPS plan and ensure that offshore operations are performed in accordance with the plan;
- Verify all equipment provided on the equipment list is loaded and serial numbers and sizes are correct;
- Perform any required field engineering calculations and engineering support for the operation;
- Provide guidance to crew on deck activities throughout the recovery operations;
- Keep a detailed log of component positions, component makeup, and serial numbers for as-built documentation.

5.2. Communication

Other vessels may be present in the field performing other work and should be informed of the status of the recovery operation immediately upon their entry into the field. All vessels will maintain radio watch on channel 16 as well as all relevant GMDSS frequencies.

The communication plan during operations will be as follows:

AHTS Work Deck and AHTS Bridge

The primary method of communication between the work deck and the bridge of the vessel will be via VHF radio. In the event that other traffic on the primary working channel is disrupting communication between the parties involved, an alternate channel will be chosen and all parties will be informed. The secondary method of communication between the work deck and the bridge will be through the use of hand signals and an external loud speaker.

AHTS Bridge and AHTS ROV

The primary method of communication between the vessel's bridge and the ROV, if available, will be via predetermined VHF radio channel. In the event that other traffic is disrupting communication between the parties involved, an alternate channel will be chosen and all parties will be informed. The secondary method of communication between the bridge and the ROV will be through the use of clear-communications system.

AHTS Bridge and Recovery Vessel

The primary method of communication between the bridges of both vessels will be via predetermined VHF radio channel. In the event that other traffic is disrupting communication between the parties involved, an alternate channel will be chosen and all parties will be informed.

5.3. Contact Information

Table 1: Project Contact Information

NAME	POSITION	PHONE	CELL #	Email
BP				
Kris Kimmell	Recovery Lead BP Rep on Iron Horse	-	509-308-0450	kimmk2@bp.com
Kirk Cantrell	VPIC BP Rep on AHTS	-	985-519-0977	kirk.cantrell@bp.com
Marcus Rose	Onshore APIC		713-820-3562	marcus.rose@bp.com
Harold Reeves	Subsea Ops Advisor		713-907-3739	harold.reeves@bp.com
Mike Harville	Recovery Manager		281-384-1229	mike.harville@bp.com
HOS				
Harry Turner	Operations Manager	985-727-6897	985-966-0801	harry.turner@hornbeckoffshore.com
Paul Lubrano	Engineer	985-624-1196	985-246-0407	paul.lubrano@hornbeckoffshore.com
C-Innovations				
Lucas Cribley	Project Manager		985-258-8065	lucas.cribley@c-innovations.com
Fugro (Surveyor)				
Tony Gray	Project Manager	713-346-3742	713-203-3593	agray@fugrochance.com
Kyle Beeson	Project Coordinator	713-346-3667	713-305-4409	kbeeson@fugrochance.com
Larry Prewitt	Marine Manager	337-268-3130		lprewitt@fugrochance.com
InterMoor				
Operations	24 hr/day	985-385-3083 800-451-8106	985-312-9016	operations@intermoor.com
Larry Puckett	Vice President, Operations	985-385-3083 800-451-8106	985-312-9004	lpuckett@intermoor.com
John Bryan	HSE Director	985-372-2227	985-855-0857	jbryan@intermoor.com
Kent Longridge	Principal Engineer	832-399-5028	832-794-0737	klongridge@intermoor.com
Jamie Armstrong	Lead Engineer	832-399-5002	713-408-2049	jarmstrong@intermoor.com
Joe Hebert	Operations Manager	985-372-2203	985-312-9014	jhebert@intermoor.com
Mike Niewald	Project Specialist	832-399-	832-633-5928	mniewald@intermoor.com
Dusty Mathus	Project Manager	832-399-5053	214-232-6452	dmathus@intermoor.com

6 Technical Data

6.1. Field Data

The Macondo field is located in the Gulf of Mexico, at MC-252.

Table 2: Macondo As-Left Particulars

Water Depth	Approximately 5,020-ft
DTS Top Depth	113-ft
DTS Keel Depth	154-ft
Spreader Bar Depth	5,008-ft
Water Depth at DTS	5,019-ft
Length of Tether	4,854-ft (see note below)
Last Recorded DTS Buoy Coordinates	X: 1,201,109.5-ft E Y: 10,430,995.5-ft N
Geodetic Datum	NAD27
Zone	UTM 16 North

Note: Includes polyester stretch under load.

Other vessels, subsea assets, and wreckage from the Deepwater Horizon create hazardous conditions around the Macondo location. The surveying company will be responsible for monitoring the positions of the assets and the work vessel(s) throughout the recovery operation. Operations over any subsea assets at this location will be minimized.

6.2. DTS Buoy Calculations

The DTS buoy was weighed at 109-m.ton by Kiewit's crane during mobilization onto the Dionne. The gross buoyancy was calculated to be 244-m.ton. See Table 3 below for DTS net buoyancy.

Table 3: DTS Net Buoyancy Calculations

Component	Force [m.tons]
DTS Gross Buoyancy	+244
DTS Weight	-109
DTS Buoy Net Buoyancy	**+135-m.ton**

During installation operations, the 131-m.ton clump weight was installed as well as 48-m.ton of additional ballast chains. See Appendix D for complete as-built information sheets and weight calculations. See Table 4 below for weight added to DTS system.

Table 4: DTS Weights Installed

Component	Wet Weight [m.tons]
Tether	18.5
Clump Weight	112.8
Added Weight No. 1	12.9
Added Weight No. 2	6.0
Added Weight No. 3	13.3
Added Weight No. 4	15.5
DTS System Total Ballast Weight	**179-m.ton**

6.3. Equipment Configuration

The HP1 riser buoy has been installed with a clump weight connected by a tether. The components, as detailed in the elevation drawing in Appendix A, for the clump weight consist of the following:

Clump Weight (131.3-m.ton):

- Riser Buoy padeye:
  - 175-Ton alloy shackle.
  - 150-Ton alloy shackle.
- 60-ft x 3 1/4-in. Studlink Chain:
  - 150-Ton alloy shackle.
  - 200-Ton polyester shackle.
- 2,000-ft x 7-in Torque-Neutral Polyester Rope (with thimble eyes):
  - 200-Ton polyester shackle.
- 5-ft x 3 5/8-in. Studless Connecting Chain:
  - 200-Ton polyester shackle.
- 1,500-ft x 7-in Torque-Neutral Polyester Rope (with thimble eyes):
  - 200-Ton polyester shackle.
- 5-ft x 3 5/8-in Studless Connecting Chain:
  - 200-Ton polyester shackle.
- 1,000-ft x 7-in Torque-Neutral Polyester Rope (with thimble eyes):
  - 200-Ton polyester shackle.
  - 150-Ton alloy shackle.
- 25-ft x 3 1/4-in. Studlink Chain:
  - 150-Ton alloy shackle.
- No 3 Triplate (3rd slot – 150-Ton wide-body sling shackle with 20-ft x 3-in EEIPS wire grommet):
  - 150-Ton alloy shackle.
- 55-ft x 3 1/4-in. Studlink Chain:
  - 150-Ton alloy shackle.
- No 3 Triplate:
  - (2) 120-Ton alloy shackles.
- (2) 20-ft x 3 1/4-in Studlink Chain Bridle:
  - (2) 120-Ton alloy shackles.
- Spreader Bar.
- 1,260-ft (798 links) x 4 3/4-in Studlink Chain evenly distributed beneath the spreader bar (fourteen (14) 90-ft sections).

Additional ballast chains are connected to the tether. Each additional ballast chain will be individually disconnected and recovered from the clump weight assembly. The additional ballast chains consist of the following:

Additional Ballast Chain No. 1 (12.9-m.ton):

- Tether Chain:
  - 110-Ton elongated shackle.
  - 85-Ton shackle.
- 30-ft x 1 1/2-in Sacrificial sling:
- 90-ft (57 links) x 4 3/4-in chain:
  - 200-Ton chain shackle.
- 58-ft (37 links) x 4 3/4-in chain:
  - 85-Ton shackle.
- 20-ft x 3-in floating recovery sling.

Additional Ballast Chain No. 2 (6-m.ton):

- Tether Chain:
  - 110-Ton elongated shackle.
  - 85-Ton shackle.
- 30-ft x 1 1/2-in Sacrificial sling.
- 150-ft (138 links) x 3 1/4-in chain.

Additional Ballast Chain No. 3 (13.3-m.ton):

- Tether Chain:
  - 110-Ton elongated shackle.
- 30-ft x 1 1/2-in Sacrificial sling.
- 90-ft (57 links) x 4 3/4-in chain:
  - 200-Ton chain shackle.
- 63-ft (40 links) x 4 3/4-in chain:
  - 85-Ton shackle.
- 20-ft x 3-in floating recovery sling.

Additional Ballast Chain No. 4 (15.5-m.ton):

- Tether Chain:
  - 110-Ton elongated shackle.
- 30-ft x 1 1/2-in Sacrificial sling.
- 90-ft (57 links) x 4 3/4-in chain:
  - 4 3/4-in Kenter link.
- 90-ft (57 links) x 4 3/4-in chain:
  - 85-Ton shackle.
- 20-ft x 3-in floating recovery sling.

6.4. Equipment Specifications

The specifications for the tether components are provided in Table 5.

Table 5: Tether Component Specifications

Component	Diameter	Wet Weight	Minimum Break Strength
Studlink Chain - R4	4 3/4-in.	186-lbs/ft	3,055-kips
Studlink Chain - R4	3 1/4-in.	87.3-lbs/ft	1,570-kips
Studless Chain - R4	3 5/8-in.	98.7-lbs/ft	1,915-kips
Wire Rope - EEIPS	3-in.	13.8-lbs/ft	935-kips
Polyester Rope	7-in.	3.5-lbs/ft	1,730-kips
Polyester Thimble	N/A	130-lbs	2,200-kips
200-Ton Polyester shackle	4 1/4-in.	390-lbs	2,200-kips
175-Ton allow shackle	4-in.	307-lbs	1,929-kips
150-Ton allow shackle	3 3/4-in.	215-lbs	1,653-kips
150-Ton wide-body sling shackle	3 3/4-in.	307-lbs	1,653-kips
120-Ton allow shackle	3 1/4-in.	134-lbs	1,322-kips
No. 3 Triplate	N/A	478-lbs	1,653-kips

6.5. Estimated Recovery Time Breakdown

Table 6 describe the estimated time for each stage of the recovery.

Table 6: Estimated Recovery Time Breakdown

Task	Duration Estimated (hr)	Duration with Contingency (hr)
Connect Rigging to DTS Buoy **Note: Not including pre-job meeting.**	4	8
Additional Ballast Chain Recovery	3	6
Clump Weight Recovery to AHTS Stern	5	10
Tether Recovery	7	14
DTS Recovery to Deck	4	8
Clump Weight Recovery to Deck	1	2
Total Duration	**24**	**48**

6.6. Recovery Parameters

The following details are the governing parameters associated with the recovery of the riser buoy and clump weight:

Weather Limits

The weather conditions will be closely monitored prior to the commencement of operations. Several steps in the operation are influenced by the environmental conditions, including the crew's ability to safely work on the deck and the vessel's ability to maintain station. However, the most weather sensitive operation will be when the recovery vessel is in close proximity to the AHTS.

- Preferred weather conditions for recovery operations are a maximum 5-ft H_s sea state, 2-kt current and 20-kt wind.

The final decision to suspend operations will be made by the senior personnel offshore (i.e. BP representative, InterMoor Project Manager, Deck Superintendents, Vessel Master) based on the weather forecast, vessel maneuverability, and on keeping the safety of the crew the top priority.

Recovery Vessel

The recovery vessel will be responsible for recovering the DTS buoy. The recovery vessel will need the following specifications:

- At least one (1) crane for recovering the DTS buoy on one side of the vessel;
  - 400-ton crane (minimum);
- At least one (1) ROV.

AHTS

The AHTS will be responsible for recovering the tether. The AHTS will need the following specifications:

- Two (2) shark jaws with minimum 500-m.ton capacity each;
- A split stern roller, with 8-ft minimum diameter, so the polyester rope can be recovered on one stern roller while the clump weight holds the other stern roller stationary;
- Winch capacity for at least the work wire and (1) 2,000-ft polyester section;
- Storage capacity for three (3) sections of polyester totaling 4,500-ft length;
- Minimum 6,000-ft usable work wire;
- At least one (1) ROV.

InterMoor Polyester Best Handling Practices

The polyester being recovered will be handled in accordance with InterMoor's best handling practices in an effort to eliminate the potential for damaging the polyester sections. The following specific guidelines will be observed:

- A minimum bending radius should be observed. The minimum bending radius (D/d) with very low line tensions should be larger than six (6);
- Torque or twist in the polyester rope should be avoided;
- Polyester ropes should not be run over surfaces which have sharp edges, grooves, nicks, or other abrasive features;
- Polyester rope contact with sharp gritty materials should be avoided;
- Care should be taken when applying shearing force to the polyester rope;
- There should be no "hot work," such as welding, in the vicinity of the polyester rope;
- Frictional heat from excessive slippage of the polyester rope over a capstan, drum, stern roller, etc. must be avoided;
- Care should be taken that polyester ropes do not get tangled or knotted;
- Abrasion or fouling of the polyester rope with other equipment such as steel wire rope, chains, or connectors must be avoided;
- Chasers should not be used on polyester rope;

- Shark jaws designed for steel wire rope and chains should not be used on polyester rope;
- If the polyester rope is laid on the seabed, it must be protected with a filter against external abrasion and ingress of abrasive particles.

7 Riser Buoy and Clump Weight Recovery Operations

7.1. Overview

A recovery vessel and an AHTS will be responsible for the riser buoy and clump weight recovery. The procedures have been developed based on the HOS Iron Horse as the recovery vessel and the *Max Chouest* as the AHTS.

The DTS buoy weighs 109 m.ton in air with an additional 6 m.ton of lifting rigging. The DTS buoy has a calculated gross buoyancy of 244 m.ton. The riser buoy net buoyancy is approximately 135 m.ton in sea water during recovery. With the 179 m.ton load of the clump weight, the crane should read approximately 44 m.ton when both the DTS buoy and clump weight are submerged.

7.2. Mobilization

The recovery vessel will likely mobilize and demobilize at the HOS dock in Fourchon, LA. The AHTS will mobilize at InterMoor's dock in Fourchon, LA. The AHTS will likely demobilize the DTS buoy and clump weight at Fourchon Heavy Lift, but will need to demobilize the polyester at the InterMoor dock. After the polyester is demobilized onto spools or a container, it can be transported to BP's location of choice. Equipment lists detailing the entire tool spread required for the clump weight recovery operations are contained in Appendix B.

A pre-job meeting with all relevant personnel will be held on the recovery vessel to go over procedures, vessel positions, safe working area, personnel responsibilities, communications, and determine VHF or UHF working channels.

7.3. Connect Rigging to DTS Buoy

The task descriptions below, in Table 7, describes connecting the recovery rigging to the DTS buoy.

Table 7: Connect Rigging to DTS Buoy

Task No.	Task Description	Drawing Ref.
1.	The recovery vessel will maneuver to the DTS buoy location, as directed by the recovery vessel Superintendent. *NOTE: The crane block will be rigged for single fall.* *NOTE: The recovery vessel will deploy fenders*	
2.	The recovery vessel will lower the lifting rigging to the top of the DTS buoy. *NOTE: The top of the DTS buoy is at approximately 100 ft depth, but actual depth depends on where the DTS buoy was left.*	Appendix C Figure 1
3.	The recovery vessel ROV will connect the lifting sling to the DTS buoy padeye with a 200 ton ROV shackle and crane will tension to 5 m.ton. *NOTE: The crane will be boomed out as far as possible to minimize the risk of an uncontrolled ascent of the DTS directly under the recovery vessel.*	
Anticipated Duration = 4-hr	**Duration with Contingency = 8-hr**	

7.4. Additional Ballast Chain Recovery

The task descriptions below, in Table 8, describes the recovery of additional ballast chains No. 1 - 4 to the deck of the AHTS. Procedural drawings for the recovery of additional ballast chains are found in Appendix C.

Table 8: Additional Ballast Chain Recovery

Task No.	Task Description	Drawing Ref.
1.	Connect rigging assembly to AHTS work wire.	Appendix C Figure 2
2.	Lower AHTS work wire and ROV to approximately 4,900 ft depth. *NOTE: Water depth may vary depending on where the DTS buoy was positioned.*	
3.	The ROV will guide the AHTS until the hook is at the tether.	
4.	The ROV will connect the ROV hook to the recovery sling on the first additional ballast chain.	Appendix C Figure 3
5.	The AHTS will haul-in the work wire to take the load until the sacrificial sling is slack. *NOTE: The recovery vessel crane operator will continue to monitor the load and communicate any change to the vessel superintendent.* *NOTE: A second ROV will monitor the DTS buoy lifting rigging.*	
6.	*NOTE: Prior to cut, confirm with recovery vessel that tension maintained at 5 m.ton.* *NOTE: Prior to cut,ROV is to position itself so not to sustain any damage should the ballast chain swing toward the AHTS when the load is transferred after cutting the sacrificial sling.* The ROV will cut the sacrificial sling on the additional ballast chain.	
7.	Repeat steps 4 through 7 to connect to a second additional ballast chain. *NOTE: Additional ballast chain No. 2 (3 ¼ in. x 150 ft chain) does not have a recovery sling and therefore a grommet will be sent down so that the ROV will thread the grommet into the chain before the sacrificial sling is cut.*	
8.	The AHTS will clear the area.	

9.	The recovery vessel will recover the riser buoy to the surface then maintain a nominal 20 m.ton hook load. *NOTE: The DTS will have approximately 17.5 degree tilt while being lifted from a single padeye.* *NOTE: Crane tension needs to be controlled at all times to prevent positive buoyancy of the DTS buoy. A minimum crane load of approximately 20 m.ton is recommended.* *NOTE: As the DTS is being recovered to surface, ROV will monitor the chain curtain as it comes out of the mud.*	
10.	Repeat steps 4 through 7 to disconnect to the remaining additional ballast chains.	
11.	The AHTS will recover the additional ballast chains to deck.	
Anticipated Duration = 3-hr	**Duration with Contingency = 6-hr**	

7.5. Clump Weight Recovery to AHTS Stern

The task descriptions below, in Table 9, describe the clump weight recovery to the stern of the AHTS. Procedural drawings for the recovery of the clump weight to the stern of the AHTS are found in Appendix C.

Table 9: Clump Weight Recovery to AHTS Stern

Task No.	Task Description	Drawing Ref.
1.	Before beginning operations, confirm vessel orientations and positions with both vessel Captains as discussed in pre-job meeting.	
2.	The AHTS will lower the work wire to approximately 200 ft off bottom. *NOTE: **Preferred Option -** The 200 ton ROV hook will have already been pre-rigged to the work wire. Upon inspection of the recovery grommet, the AHTS may re-rig for the contingency option.* *NOTE: **Contingency Option -** The wide-body J-Chaser will have already been pre-rigged to the work wire.*	
3.	The ROV will guide the hook to the rigging above the spreader bar.	
4.	***Preferred Option -*** The ROV will connect recovery grommet to ROV hook. ***Contingency Option -*** The ROV will hook the J-Chaser to the triplate of the chain bridle just above the spreader bar.	Appendix C Figure 4

5.	As the load is transferred to the AHTS, this leads to an increase in buoyancy of DTS buoy. Therefore, simultaneously, the crane will slowly adjust DTS buoy height to maintain crane tension at approximately 20 m.ton. Both vessels will continue constant communication.	
6.	The AHTS will move slowly away from the riser buoy as the work wire is hauled in to recover the clump weight to surface. *NOTE: Both vessels may move to an area of with less water depth prior to starting recovery to surface for in the event that the clump weight were to drop it would hit bottom with out shock loading crane. The recovery locations will be designated by the BP Representative, see Appendix A for possible locations.* *NOTE: AHTS will then move to starboard-aft direction of the recovery vessel until approximately 2,500 to 3,500 ft away from the DTS riser buoy. Pre-plan vessel orientations and positions with both vessel Captains before beginning operation.* *NOTE: AHTS ROV will monitor that the polyester does not become fouled in the spreader bar and chain.*	Appendix C Figure 5
7.	The AHTS will haul in the work wire until the clump weight is approximately 300 ft below the stern roller.	
8.	***Preferred Option -*** The AHTS will lower a second work wire prerigged with the wide body J-Chaser. ***Contingency Option -*** The AHTS will lower a second work wire prerigged with the 200 ton ROV hook.	
9.	***Preferred Option -*** The ROV will connect the J-Chaser to the triplate of the chain bridle just above the spreader bar. ***Contingency Option -*** The ROV will connect the 200 ton ROV hook to the clump weight recovery grommet	
10.	The AHTS will haul in both work wires, with the load on the J-Chaser, until the connecting chain and lower chain are pulled up on deck and secured in the shark jaws.	Appendix C Figure 6
Anticipated Duration = 5-hr		**Duration with Contingency = 10-hr**

7.6. Tether Recovery

The task descriptions below, in Table 10, describe the tether recovery by the AHTS. Procedural drawings for the recovery of the tether are found in Appendix C. To prevent friction damage on the polyester jacket, the AHTS is required to have two (2) stern rollers so that the polyester rope can be recovered on one side while the other is restrained due to the clump weight.

Table 10: Tether Recovery

Task No.	Task Description	Drawing Ref.
1.	The AHTS will disconnect the connecting chain from the triplate.	Appendix C Figure 7
2.	The AHTS will attach the work wire to the end of the connecting chain.	
3.	The AHTS will haul-in on the work wire to get the end of the polyester on deck.	Appendix C Figure 8
4.	The AHTS will secure the polyester with primary and secondary Chinese finger stoppers.	Appendix C Figure 9
5.	The AHTS will remove the 3 ¼ in. x 25 ft connecting chain from the end of the polyester.	
6.	The AHTS will remove the shackles and thimble from the polyester eye.	
7.	The AHTS will connect tow drum work wire to the polyester eye via synthetic grommet and conecting link.	
8.	The AHTS will pick up on the tow drum work wire just enough to take the load.	
9.	The AHTS will remove the stoppers from the polyester.	
10.	The AHTS will haul-in the tow drum work wire to recover the first polyester section while moving toward the DTS buoy.	Appendix C Figure 10
11.	The AHTS will continue to recover the polyester section until the second polyester section comes on deck.	Appendix C Figure 11
12.	The AHTS will secure the second polyester section with Chinese finger stoppers.	
13.	If necessary, the polyester sections can be transferred from the tow drum to a storage drum.	

14.	Repeat Task No. 4 - 13 to recover the second and third sections of polyester until the 3 ¼ in. x 60 ft upper chain is recovered to deck and secured in the shark jaws.	Appendix C Figure 12
Anticipated Duration = 7-hr	**Duration with Contingency = 14-hr**	

7.7. DTS Recovery to Deck

The task descriptions below, in Table 11A, describe the preferred method for recovering the DTS buoy to the AHTS deck. Procedural drawings for the recovery of the DTS are found in Appendix C.

Table 11A: DTS Recovery to AHTS Deck

Task No.	Task Description	Drawing Ref.
1.	The AHTS may need to cut the upper chain, length TBD in the field.	
2.	AHTS will connect the work wire to the upper chain.	
3.	AHTS will open the shark jaws, pay out the work wire, and move to a safe distance from the recovery vessel.	
4.	AHTS will install seafastening cradles to deck. *NOTE: The seafastening details were issued from InterMoor in a separate document, see 11327-TM-02.*	
5.	AHTS will be repositioned near the recovery vessel and all personnel will be cleared from the deck.	
6.	The crane will position the DTS over the AHTS deck as the work wire is hauled in to recover the slack. *NOTE: The approximate load for the crane is 110 m.ton.*	Appendix C Figure 13
7.	The AHTS will haul in on the work wire until the upper chain is taut to holdback the bottom of the DTS. *NOTE: Crane operator and winch operator will maintain constant communication of loads.*	Appendix C Figure 14
8.	The recovery vessel will pay out the crane to lower the DTS buoy to land on the mats on the deck of the AHTS. *NOTE: The lower DTS frame structure may experience some over stress resulting in damage to some of the members.*	
9.	The AHTS work wire will haul in or pay out as necessary to continue to hold tension on the bottom of the DTS while the crane pays out to lay down the DTS to horizontal position.	
10.	The AHTS crew will disconnect the crane from the DTS buoy.	
11.	The AHTS will install the chocks and secure the DTS buoy to the seafastenings.	

12.	The seafastening will be approved by the Marine Warranty Surveyor and the Captain of the AHTS.	Figure 20
Anticipated Duration = 10-hr	**Duration with Contingency = 20-hr**	

The task descriptions below, in Table 11B, describe the contingency method for recovering the DTS buoy to recovery vessel deck if weather or other operational concerns do not allow for the DTS to go directly to the AHTS deck.

Table 121B: DTS Recovery to Recovery Vessel Deck then AHTS Deck

Task No.	Task Description	Drawing Ref.
1.	The crane will position the DTS buoy just behind the stern roller and the upper chain is re-secured in the shark jaws.	
2.	The work wire is disconnected from the upper chain.	
3.	The AHTS may need cut the upper chain, length TBD in the field.	
4.	AHTS will open the shark jaws to trip the upper chain.	
5.	The AHTS will clear the area and install seafastening cradles to deck. *NOTE: The seafastening details were issued from InterMoor in a separate document, see 11327-TM-02.*	
6.	The crane will lift the DTS onto the Recovery Vessel deck. *NOTE: The approximate load for the crane is 110 m.ton.* *NOTE: The DTS will have approximately 17.5 degree tilt while being lifted from a single padeye.*	
7.	The crane will lower the DTS buoy to land on the mats on the deck of the recovery vessel. *NOTE: The mats will have a slot in the middle to allow for the chain to be positioned without interfering with the landing of the lower structure of the buoy.*	
8.	While the crane is still connected to the top padeye holding tension, the recovery vessel will connect rigging from the second crane to the lower structure.	
9.	The first crane will lift the DTS off the deck, then the second crane will lift the bottom of the buoy until it is horizontal.	
10.	Both cranes will lower the DTS to the deck of the recovery vessel.	

11.	The recovery vessel will temporarily secure the DTS to the deck. *NOTE: The seafastening details were issued from InterMoor in a separate document, see 11327-TM-02.*	
12.	The recovery vessel will re-rig the DTS for a horizontal lift with a single crane.	Appendix A Figure 19
13.	The horizontal lifting rigging will be connected to the crane.	
14.	Once the weather or operational conditions improve, the AHTS will reposition next to the recovery vessel.	
15.	The crane lifts the DTS off the recovery vessel deck and swings the buoy overboard.	
16.	The crane will land the DTS in a horizontal position on the deck of the AHTS.	
17.	The AHTS crew will disconnect the crane from the DTS buoy.	
18.	The AHTS will install the chocks and secure the DTS buoy to the seafastenings.	
19.	The seafastening will be approved by the Marine Warranty Surveyor and the Captain of the AHTS.	
Anticipated Duration = 4-hr	**Duration with Contingency = 8-hr**	

7.8. Clump Weight Recovery to AHTS Deck

The task descriptions below, in Table 12, describe the clump weight lifting and recovery to deck. Procedural drawings for the recovery of the clump weight are found in Appendix C.

Table 13: Clump Weight Recovery to AHTS Deck

Task No.	Task Description	Drawing Ref.
1.	The AHTS will reposition on the side of the recovery vessel so as to be within reach of the crane, as directed by the recovery vessel Superintendent. *NOTE: The AHTS will maintain at least a 20 ft clearance from the recovery vessel.*	Appendix C Figure 15
2.	The AHTS will connect the anchor drum work wire to the lower clump weight chain	
3.	The recovery vessel will boom its crane out over the deck of the AHTS.	
4.	The AHTS deck crew will rig the main block to the 3 in. grommet on the 3rd slot of the triplate connected to the lower tether chain currently in the jaws. *NOTE: Upon inspection, the 3 in. grommet may be replaced with another grommet/sling, if necessary.*	Appendix C Figure 16
5.	The AHTS pays out the anchor drum work wire, as directed by the AHTS Deck Superintendent, until there is an appropriate amount of slack.	
6.	As the recovery vessel crane takes the load, it will lift the spreader bar out of the water. *NOTE: The crane load will be approximately 120 m.ton.*	
7.	The crane lowers the spreader bar onto the AHTS deck as the AHTS hauls in on its anchor drum work wire. *NOTE: The work wire is to remain slack during this operation.*	Appendix C Figure 17
8.	Once the spreader bar is on deck, the AHTS deck crew will disconnect the crane hook from the 3 in. x 20 ft grommet.	
9.	The AHTS will prepare for transit.	Appendix C Figure 18
Anticipated Duration = 1-hr	**Duration with Contingency = 2-hr**	

8 Contingency Procedures

8.1. General

The riser buoy and clump weight recovery operations are to be performed as described in Section 7 of this report. However, unforeseen circumstances may require altering or adjusting the operations. In an effort to be proactive, several of the most likely contingency situations and their respective course of action are described below. It should be noted that the procedures below are guidelines only, and may need to be adjusted or expanded upon to fit the actual situation.

8.2. Emergency Response

In the event of dropped objects, equipment failure, fluid discharges or personnel illness / injury, the Vessel Captain and / or InterMoor Field Engineer will immediately notify the BP Representative.

In the event of a DP failure, the Captain will immediately contact the other vessel and initiate the vessel's on-board procedures. Also, the deck crew will be immediately alerted to clear the area near all working wires that are in the water.

Note: If DP fails during the tether recovery, the risk of the two vessels clashing is minimal. The maximum horizontal force exerted by the tether catenary, between the two vessels, is only 6-kips.

8.3. Weather

Weather forecasts will be obtained and monitored prior to the commencement of the recovery operations. Operations will not proceed if the weather forecast is not favorable for safe operations. In the event that the weather conditions are not as previously forecasted, the following actions will be taken depending on the status of the operation:

Upon Arrival

If the weather conditions upon arrival are not as forecasted and are above the acceptable working limits, as determined from a crew safety or vessel maneuverability perspective, then the operation(s) will be delayed until such time as the weather conditions improve to within the acceptable limits and the forecast is favorable for a period of at least 24-hrs. It may still be possible to perform other preparatory work on the vessel. Any operations that can be safely completed will be performed to minimize the effect of weather down time.

During Installation Operations

The weather will be continually monitored during the course of installation operations. Weather forecasts will be available every 6-hrs to 12-hrs. These forecasts and conditions will be used to determine an appropriate course of action at each stage of operations. The decision must be made to either: continue recovery of the DTS Buoy and clump weight, stop work and hold position until the conditions improve, or lower the DTS Buoy and clump weight back to the sea floor and slack / disconnect the rigging. Recovering the DTS Buoy and clump weight to deck may preset significant safety risks to deck crew depending on the severity of vessel motions. As decisions are made, all relevant parties will be notified on the status of operations.

8.4. Tether Recovery Components

The recovery of the riser buoy and clump weight submits the various components used in the process to loads well within their operating capacities. The components used for operations have been chosen specifically for the tasks for which they will be used. However, if for any reason one or more of the components becomes damaged during the operation, the following actions will be taken depending on the component:

Winch Wire

The work wire will be continually inspected for wear and structural damage during each phase of operations. Should the work wire be damaged, the wire will be inspected and a suitable course of action will be evaluated. If necessary, the wire will be cut and re-terminated behind the damaged section.

Recovery Equipment

Spare connectors / shackles will be brought on board for the job. Spare chain and polyester will be available onshore in the unlikely event that any damage occurs during the recovery. If required, an AHTS vessel can be called upon to mobilize the chain from Fourchon. Spare sockets will be brought on board in the unlikely event that any of the work wire is damaged during the recovery. If possible, the wire will be cut and re-terminated behind the damaged section or the supply vessel will return to Fourchon, LA in order to mobilize spare mooring wire available onshore.

ROV

Any ROV breakdown or failure will be evaluated by the ROV crew. ROV load out will contain standard spare equipment. If required, the ROV will be recovered to deck to allow repairs. If the required parts are not onboard then it may be possible to have them sent out by a crew / supply vessel or helicopter. Operations that do not depend on the ROV will be completed as applicable. ROV dependent operations will be suspended until the required part(s) are made available and the ROV is repaired. Should the ROV cutter fail, a backup grinder will be used to cut the sacrificial slings.

8.5. Vessel or Mechanical

Any mechanical or vessel problem will be evaluated by the Captain or the Chief Engineer and the required repair made offshore, if possible. If the problem cannot be resolved in the field, the vessel will make preparations to go to shore for repairs.

8.6. Navigation Equipment

If the navigation equipment fails to operate properly, every attempt shall be made to resolve the issue offshore. If the system cannot be fixed, the situation will be examined and discussed with all relevant parties.

8.7. Illness or Injury

In the unlikely event that a crew member must be evacuated to shore because of illness or injury, the affected crew member can be evacuated by either crew boat or helicopter.

8.8. Simultaneous Operations

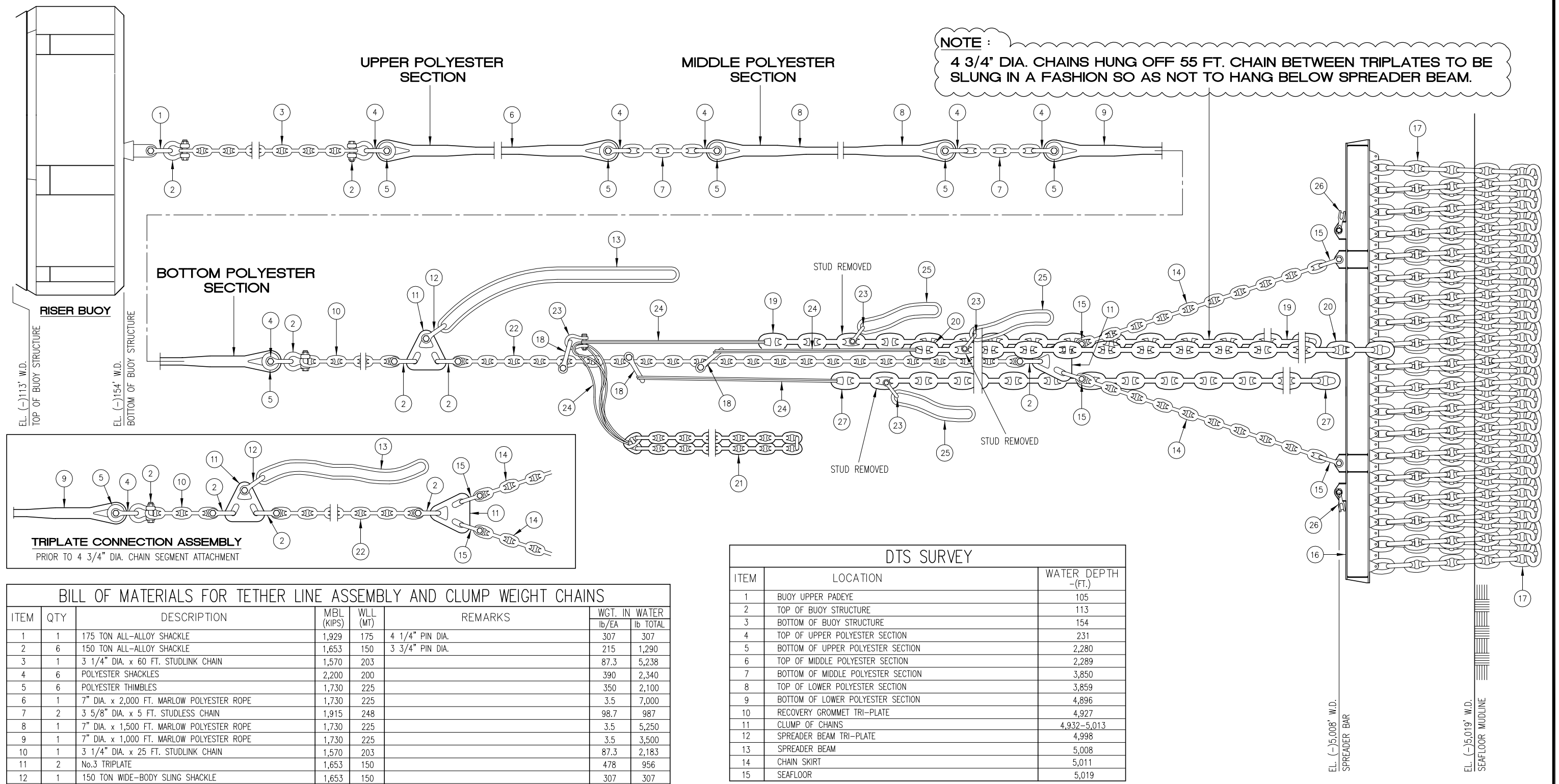
The recovery operation will be comprised of simultaneous operations involving several vessels, in addition to any ongoing day to day activities in the field. All operations will be governed by the criteria set forth in BP's SIMOPS plan.

9 Appendix A: Clump Weight and DTS Buoy Drawings

Table 14: Table of Drawings

Drawing Title	Drawing No.
Overview of Riser Buoy and Clump Weight Assembly	11225_PL_Figure 1_Rev 11
Winch Wire ROV Hook Stinger Detail	Figure 2
Winch Wire J-Chaser Stinger Detail	Figure 3
Iron Horse Crane Stinger Detail	Figure 4
Dual Chain Recovery Rigging Detail	Figure 5
DTS/Clump Weight Contingency Lifting Arrangement	Figure 6
Riser Buoy Displacement	Figure 7
Riser Buoy Dimensions	Sketch 001
Riser Buoy General Arrangement	2257_0010_Rev 1
Riser Buoy Lifting Frame	2257_0001_Rev 9
Riser Buoy	2257_009_Rev 1
Lower Structure Reinforcement	NA_Rev A
DTS Buoy Lifting Points Arrangement	B1103-2-100-001_Rev 0
Range and Bearing to DTS Buoy Recovery Locations	Sketch 002

Operator: DEOPL03 Last Rev. Date: 12/15/10 Time: 07:51:47 File Name: P:\11300\11327\RECOVERY\PARTSLIST\11327_PL_FIG-01_R11.DWG Project Code: 11327-01



NOTE :
4 3/4" DIA. CHAINS HUNG OFF 55 FT. CHAIN BETWEEN TRIPLATES TO BE SLUNG IN A FASHION SO AS NOT TO HANG BELOW SPREADER BEAM.

TRIPLATE CONNECTION ASSEMBLY
PRIOR TO 4 3/4" DIA. CHAIN SEGMENT ATTACHMENT

BILL OF MATERIALS FOR TETHER LINE ASSEMBLY AND CLUMP WEIGHT CHAINS

ITEM	QTY	DESCRIPTION	MBL (KIPS)	WLL (MT)	REMARKS	WGT. IN WATER lb/EA	WGT. IN WATER lb TOTAL
1	1	175 TON ALL-ALLOY SHACKLE	1,929	175	4 1/4" PIN DIA.	307	307
2	6	150 TON ALL-ALLOY SHACKLE	1,653	150	3 3/4" PIN DIA.	215	1,290
3	1	3 1/4" DIA. x 60 FT. STUDLINK CHAIN	1,570	203		87.3	5,238
4	6	POLYESTER SHACKLES	2,200	200		390	2,340
5	6	POLYESTER THIMBLES	1,730	225		350	2,100
6	1	7" DIA. x 2,000 FT. MARLOW POLYESTER ROPE	1,730	225		3.5	7,000
7	2	3 5/8" DIA. x 5 FT. STUDLESS CHAIN	1,915	248		98.7	987
8	1	7" DIA. x 1,500 FT. MARLOW POLYESTER ROPE	1,730	225		3.5	5,250
9	1	7" DIA. x 1,000 FT. MARLOW POLYESTER ROPE	1,730	225		3.5	3,500
10	1	3 1/4" DIA. x 25 FT. STUDLINK CHAIN	1,570	203		87.3	2,183
11	2	No.3 TRIPLATE	1,653	150		478	956
12	1	150 TON WIDE-BODY SLING SHACKLE	1,653	150		307	307
13	1	3" DIA. x 20 FT. EEIPS GROMMET	935	186		13.8	552
14	2	3" 1/4" DIA. x 20 FT. STUDLINK CHAIN	1,570	203		87.3	3,492
15	4	120 TON ALL-ALLOY SHACKLE	1,322	120	3 1/4" PIN DIA.	134	536
16	1	SPREADER BAR	N/A	N/A		13,225	13,225
17	14	4 3/4" DIA. x 90 FT. STUDLINK CHAIN	3,280	425	798 LINKS (295 lb./LINK)	186.5	234,990
18	3	110 TON ELONGATED SHACKLE	550	110		134	402
19	1	4 3/4" DIA. x 148 FT. STUDLINK CHAIN - ADDITION CHAIN #1	3,280	425	94 LINKS	186.5	27,602
20	1	4 3/4" DIA. x 180 FT. STUDLINK CHAIN - ADDITION CHAIN #4	3,280	425	115 LINKS	186.5	33,930
21	1	3 1/4" DIA. x 150 FT. STUDLINK CHAIN - ADDITION CHAIN #2	1,570	203	30 FT. REMOVED FROM ITEM 10, 120 FT. REMOVED FROM ITEM 3	87.3	13,095
22	1	3 1/4" DIA. x 55 FT. STUDLINK CHAIN	1,570	203		87.3	4,802
23	4	85 TON SHACKLE	1,124	85		120	480
24	4	1 1/2" DIA. x 30 FT. SLING	250	72	DOUBLED THRU TO BE 4-PARTED	3.45	414
25	3	SYNTHETIC RECOVERY SLING	483	94		-	-
26	2	120 TON WIDE-BODY SLING SHACKLE	1,322	120		210	420
27	1	4 3/4" DIA. x 153 FT. STUDLINK CHAIN - ADDITION CHAIN #3	3,280	425	97 LINKS	186.5	28,535
					TOTAL WEIGHT IN SEAWATER	289,474 lb.=179m.ton	

DTS SURVEY

ITEM	LOCATION	WATER DEPTH -(FT.)
1	BUOY UPPER PADEYE	105
2	TOP OF BUOY STRUCTURE	113
3	BOTTOM OF BUOY STRUCTURE	154
4	TOP OF UPPER POLYESTER SECTION	231
5	BOTTOM OF UPPER POLYESTER SECTION	2,280
6	TOP OF MIDDLE POLYESTER SECTION	2,289
7	BOTTOM OF MIDDLE POLYESTER SECTION	3,850
8	TOP OF LOWER POLYESTER SECTION	3,859
9	BOTTOM OF LOWER POLYESTER SECTION	4,896
10	RECOVERY GROMMET TRI-PLATE	4,927
11	CLUMP OF CHAINS	4,932-5,013
12	SPREADER BEAM TRI-PLATE	4,998
13	SPREADER BEAM	5,008
14	CHAIN SKIRT	5,011
15	SEAFLOOR	5,019

NOTE: FROM CASEY CHOUEST ROV SURVEY PERFORMED ON JULY 4-5.

BP AMERICA PRODUCTION COMPANY
DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

OVERVIEW OF RISER BUOY CLUMP WEIGHT ASSEMBLY

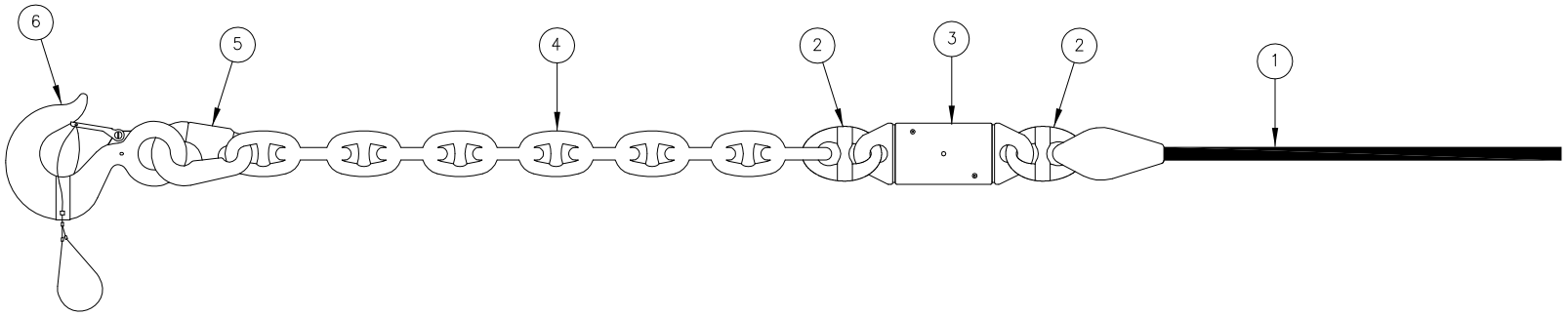
(PRIOR TO HOOK-UP OF RISER and QCDC)
(AS-BUILT)

FIGURE 1 rev. 11

INTERMOOR

ASSEMBLY PARTS LIST

ITEM No.	QTY.	DESCRIPTION
1	1	3 1/2" DIA. x 6,000 FT. WINCH WIRE
2	2	3 1/4" SLIM LINE RAMFOR LINK
3	1	MOORLINK SWIVEL WLL 224 ST
4	1	3 1/4" DIA. x 12 LINKS ANCHOR CHAIN
5	1	No.8 PEAR LINK
6	1	200 TON ROV HOOK



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

(WINCH WIRE ROV HOOK STINGER DETAIL)

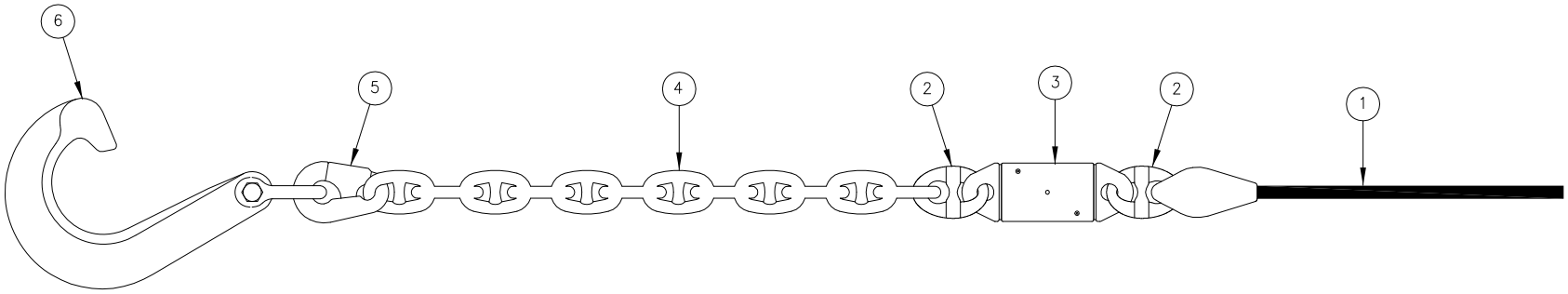
INTERMOOR

FIGURE 2

Operator: DEOPL03 Last Rev. Date: 12/16/10 Time: 15:31:33 File Name: P:\11300\11327\RECOVERY\PARTSLIST\11327_PL_FIG-03_R1.DWG Project Code: 11327-01

ASSEMBLY PARTS LIST

ITEM No.	QTY.	DESCRIPTION
1	1	3 1/2" DIA. x 6,000 FT. WINCH WIRE
2	2	3 1/4" SLIM LINE RAMFOR LINK
3	1	MOORLINK SWIVEL WLL 224 ST
4	1	3 1/4" DIA. x 12 LINKS ANCHOR CHAIN
5	1	No.8 PEAR LINK
6	1	J-CHASER



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

(WINCH WIRE J-CHASER STINGER DETAIL)

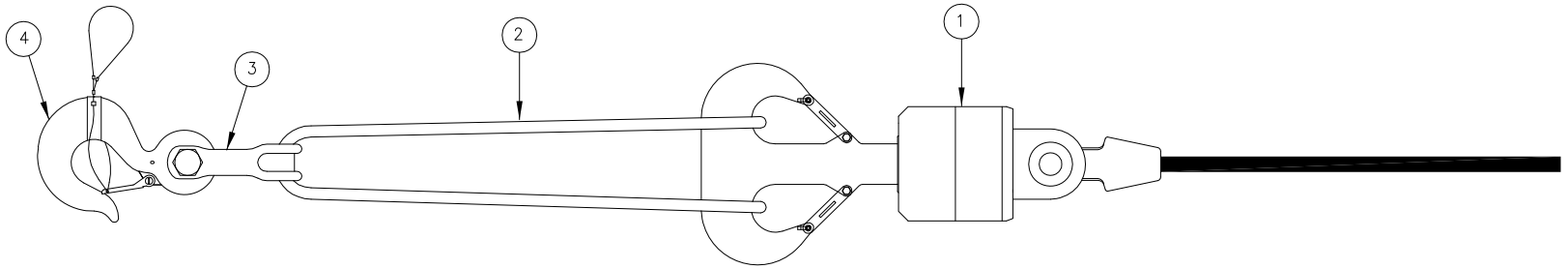
INTERMOOR

FIGURE 3

Operator: DEOPL03 Last Rev. Date: 12/16/10 Time: 15:40:33 File Name: P:\11300\11327\RECOVERY\PARTSLIST\11327_PL_FIG-04_R1.DWG Project Code: 11327-01

ASSEMBLY PARTS LIST

ITEM No.	QTY.	DESCRIPTION
1	1	IRON HORSE CRANE BLOCK
2	1	20 FT. = 10 FT. IN BASKET 400 ST TPXC GROMMET
3	1	200 TON WIDE BODY SHACKLE
4	1	200 TON ROV HOOK



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

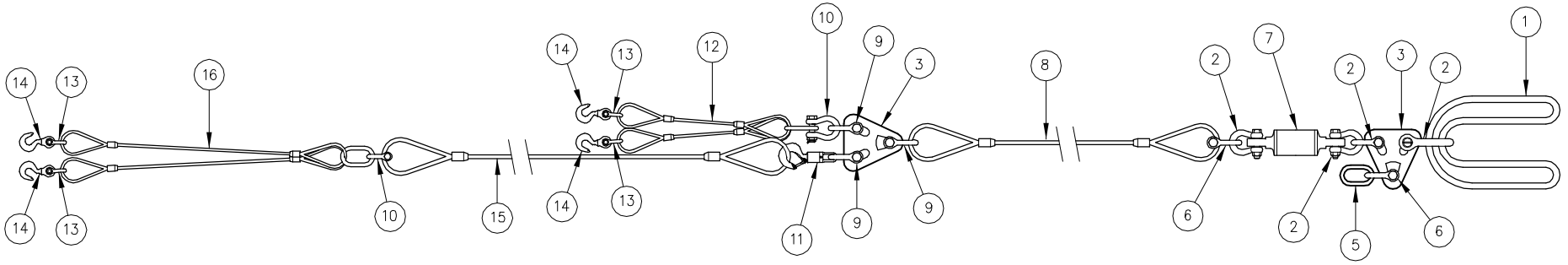
(IRON HORSE CRANE STINGER DETAIL)

INTERMOOR

FIGURE 4

ASSEMBLY PARTS LIST

ITEM No.	QTY.	DESCRIPTION
1	1	10 FT. TPXC 12,500 GROMMET (BASKETED TO 5 FT.)
2	4	85 TON SHACKLE
3	2	No.2 TRIPLATE WLL 70.3 mt
4	–	–
5	1	2 1/2" DIA. MASTER LINK
6	2	85 TON ALLOY SHACKLE
7	1	K212 75 TON SWIVEL
8	1	2 1/2" DIA. x 25 FT. SOFT EYE WIRE ROPE
9	3	55 TON SHACKLE
10	2	55 TON ALLOY SHACKLE
11	1	45 TON SWIVEL HOOK
12	1	1 1/2" DIA. x 6 FT. 2-PART SOFT EYE WIRE SLING w/2 1/2" D-RING
13	4	25 TON SHACKLE
14	4	30 TON ROV HOOK
15	1	2 " DIA. x 20 FT. SOFT EYE WIRE ROPE
16	1	1 1/2" DIA. x 10 FT. 2-PART SOFT EYE WIRE SLING w/2 1/2" D-RING



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

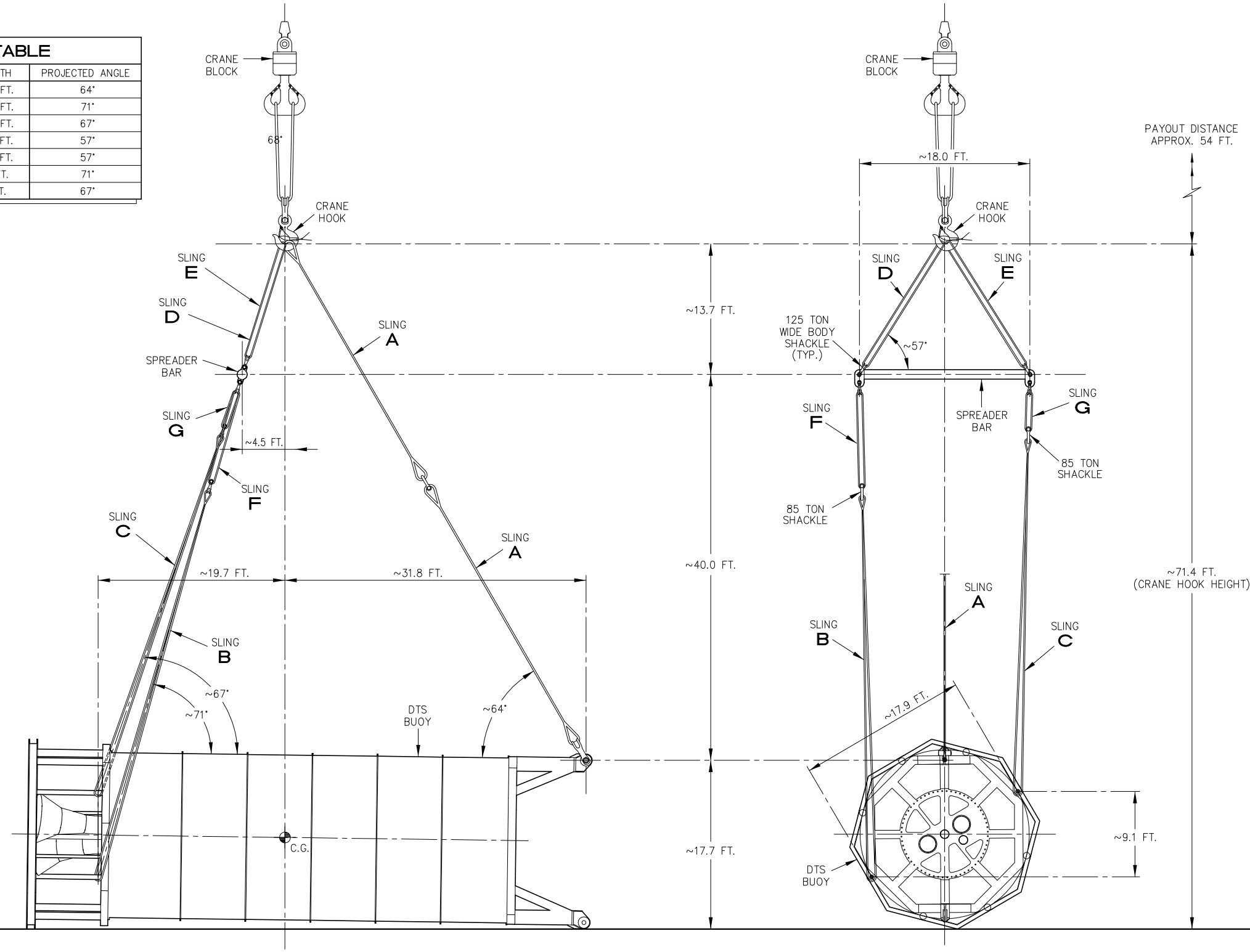
DTS/CLUMP WEIGHT RECOVERY PROCEDURES

(DUAL CHAIN RECOVERY RIGGING DETAIL)

INTERMOOR

FIGURE 5

SLING PROPERTIES TABLE			
SLING	DESCRIPTION	LENGTH	PROJECTED ANGLE
A	3" DIA x 30 FT. SLINGS	30.0 FT.	64°
B	1 3/4" DIA. EIPS (BASKET)	88.0 FT.	71°
C	1 3/4" DIA. EIPS (BASKET)	83.0 FT.	67°
D	TPXCF (15,000)	15.5 FT.	57°
E	TPXCF (15,000)	15.5 FT.	57°
F	TPXC (12,500)	10 FT.	71°
G	TPXC (7,000) (BASKET)	8 FT.	67°



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DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT CONTINGENCY RECOVERY LIFTING ARRANGEMENT

(USING RECOVERY VESSEL)

FIGURE 6

INTERMOOR

	ALL IN WATER			
	Weight (te	Displacement	Net Buoy	
1			0	lower QCDC
2			0	QCDC spool
3	6.1	1.04	-5.06	lift frame
4			0	import valves
5			0	export valve
6			0	gas valve
7			0	pipe
8			0	lugs
9	1.74	0	-1.74	clump support
10	**7.84**	**1.04**	**-6.8**	sub total
11	12	1.567	-10.433	base frame
12	4.155	0.543	-3.612	top diaphragm
13	4.155	0.543	-3.612	btm diaphragm
14	13.997	1.827	-12.17	mid diaphragms
15	26.456	0	-26.456	inner tubes
16	0	0	0	inner tubes
17	2.968	0	-2.968	I-tubes
18	1.486	0	-1.486	Umb/clump tube
19	5.273	39.18	33.907	wt compartment
20	5.273	39.18	33.907	wt compartment
21	5.273	39.18	33.907	wt compartment
22	5.273	39.18	33.907	wt compartment
23	5.273	39.18	33.907	wt compartment
24	5.273	42.25	36.977	wt compartment
	96.855	**242.63**	**145.775**	sub total
25	**104.695**	**243.67**	**138.975**	
3% tolerance	**107.8359**	**Net Buoy**	**135.8342**	**mTonnes**
		Tether weight	**179**	**mTonnes**
		Net weight	**-43.1659**	**mTonnes**

Note: Riser and umbilical weights not included

	ALL IN WATER with out added weight			
	Weight (te)	Displacement	Net Buoy	
1			0	lower QCDC
2			0	QCDC spool
3	6.1	1.04	-5.06	lift frame
4			0	import valves
5			0	export valve
6			0	gas valve
7			0	pipe
8			0	lugs
9	1.74	0	-1.74	clump support
10	**7.84**	**1.04**	**-6.8**	sub total
11	12	1.567	-10.433	base frame
12	4.155	0.543	-3.612	top diaphragm
13	4.155	0.543	-3.612	btm diaphragm
14	13.997	1.827	-12.17	mid diaphragms
15	26.456	0	-26.456	inner tubes
16	0	0	0	inner tubes
17	2.968	0	-2.968	I-tubes
18	1.486	0	-1.486	Umb/clump tube
19	5.273	39.18	33.907	wt compartment
20	5.273	39.18	33.907	wt compartment
21	5.273	39.18	33.907	wt compartment
22	5.273	39.18	33.907	wt compartment
23	5.273	39.18	33.907	wt compartment
24	5.273	42.25	36.977	wt compartment
	96.855	**242.63**	**145.775**	sub total
25	**104.695**	**243.67**	**138.975**	
3% tolerance	**107.83585**	**Net Buoy**	**135.8342**	**mTonnes**
		Tether weight	**137.3**	**mTonnes**
		Net weight	**-1.46585**	**mTonnes**

Note: Riser and umbilical weights not included
Note: Remove Additional Ballast Chains No 1, 3, & 4

	60% of buoy out of water (deck at +23ft)			
	Weight (te	Displacement	Net Buoy	
1		0	0	Not installed
2		0	0	Not installed
3	6.1	0	-6.1	Not in water
4		0	0	Not installed
5		0	0	Not installed
6		0	0	Not installed
7		0	0	Not installed
8		0	0	Not installed
9	1.74	0	-1.74	
10	**7.84**	**0**	**-7.84**	
11	12	1.567	-10.433	
12	4.155	0	-4.155	Not in water
13	4.155	0.543	-3.612	
14	13.997	1.1	-12.897	part in water
15	26.456	0	-26.456	
16	0	0	0	
17	2.968	0	-2.968	
18	1.486	0	-1.486	
19	5.273	0	-5.273	Not in water
20	5.273	0	-5.273	Not in water
21	5.273	0	-5.273	Not in water
22	5.273	12.7	7.427	
23	5.273	39.18	33.907	
24	5.273	42.25	36.977	
	96.855	**97.34**	**0.485**	
25	**104.695**	**97.34**	**-7.355**	
3% tolerance	**107.8359**	**Net Buoy**	**-10.4959**	**mTonnes**
		Tether weight	**9.5**	**mTonnes**
		Net weight	**-19.9959**	**mTonnes**

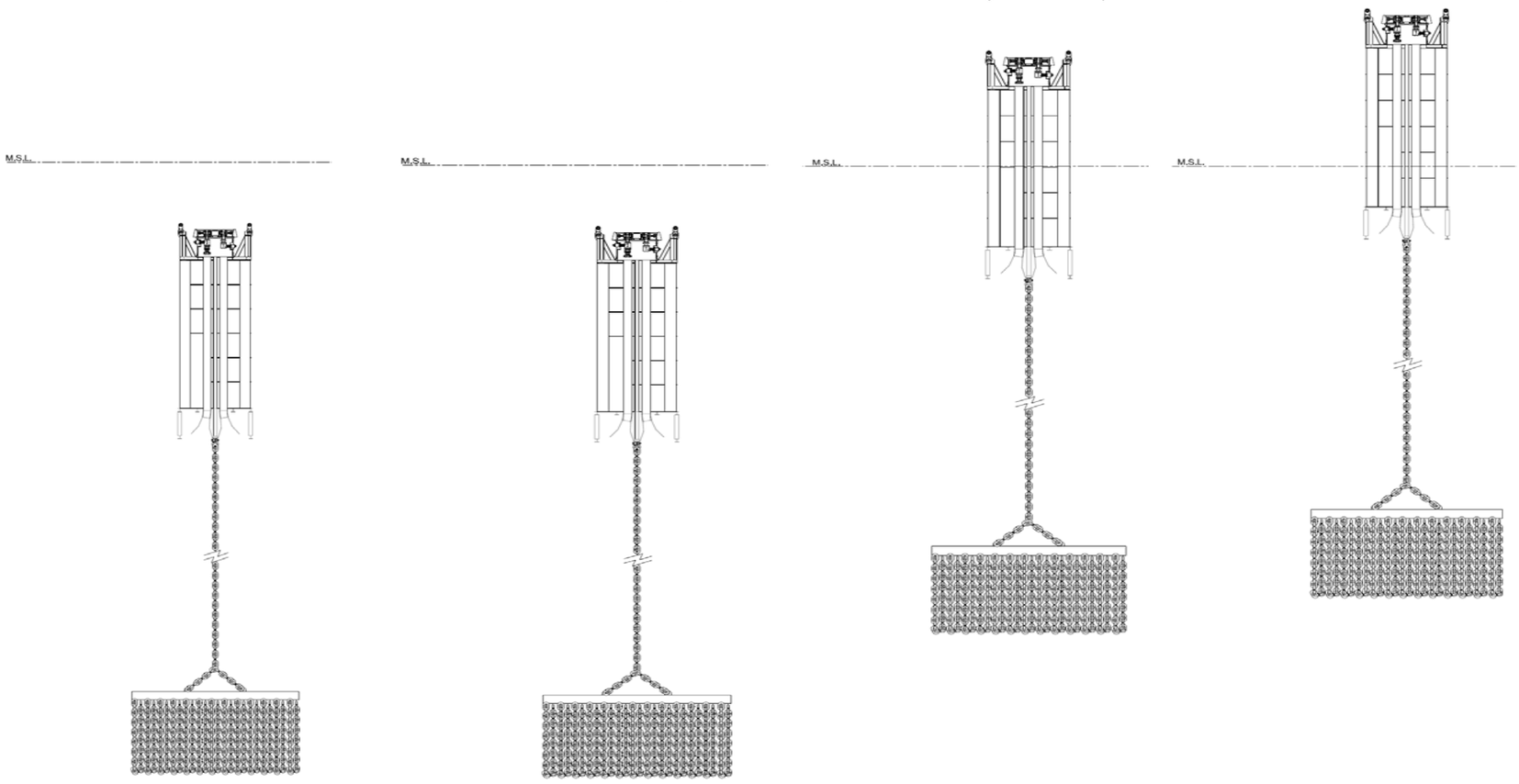
Note: Riser and umbilical weights not included
Note: 9.5 m.ton = 1/2 of the weight of tether caterary between vessels

	75% of buoy out of water (deck at +30ft)			
	Weight (te	Displacement	Net Buoy	
1		0	0	Not installed
2		0	0	Not installed
3	6.1	0	-6.1	Not in water
4		0	0	Not installed
5		0	0	Not installed
6		0	0	Not installed
7		0	0	Not installed
8		0	0	Not installed
9	1.74	0	-1.74	
10	**7.84**	**0**	**-7.84**	
11	12	1.567	-10.433	
12	4.155	0	-4.155	Not in water
13	4.155	0.543	-3.612	
14	13.997	0.37	-13.627	part in water
15	26.456	0	-26.456	
16	0	0	0	
17	2.968	0	-2.968	
18	1.486	0	-1.486	
19	5.273	0	-5.273	Not in water
20	5.273	0	-5.273	Not in water
21	5.273	0	-5.273	Not in water
22	5.273	0	-5.273	Not in water
23	5.273	19.6	14.327	Part in water
24	5.273	42.25	36.977	
	96.855	**64.33**	**-32.525**	
25	**104.695**	**64.33**	**-40.365**	
3% tolerance	**107.8359**	**Net Buoy**	**-43.5059**	**mTonnes**
		Tether weight	**9.5**	**mTonnes**
		Net weight	**-53.0059**	**mTonnes**

Note: Riser and umbilical weights not included

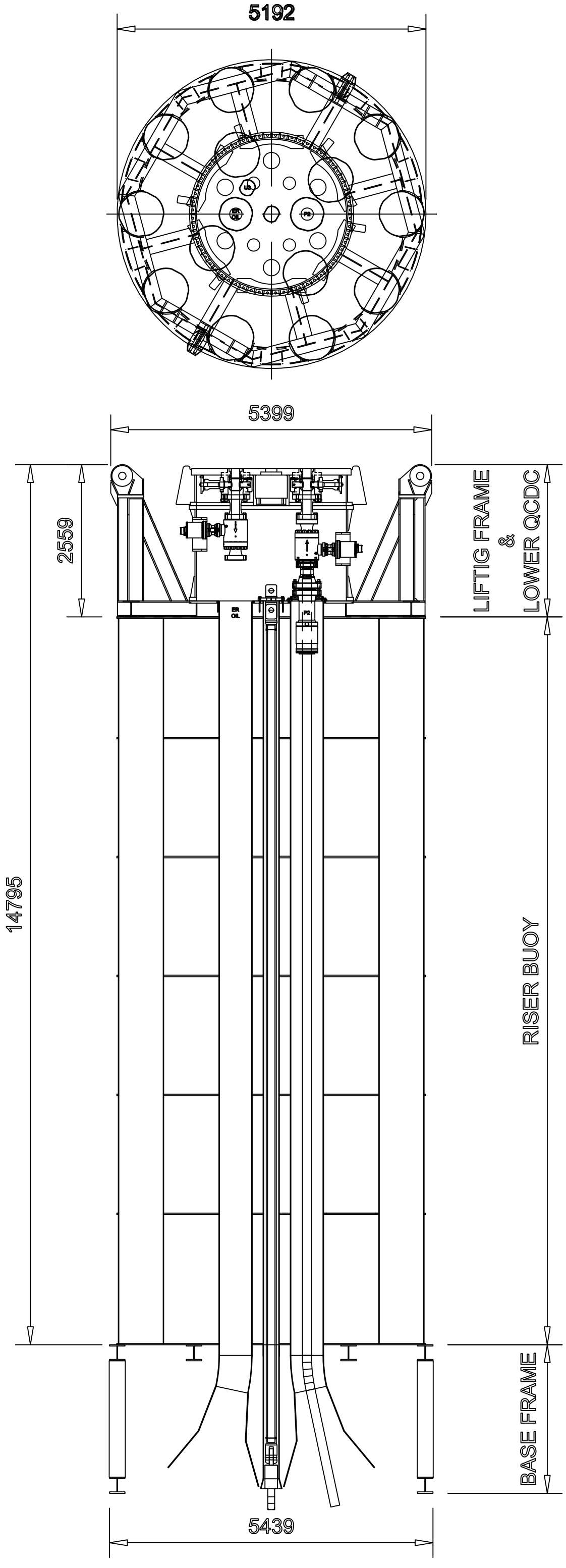
	100% of buoy out of water (deck at +48.3ft]			
	Weight (te)	Displacement	Net Buoy	
1		0	0	Not installed
2		0	0	Not installed
3	6.1	0	-6.1	Not in water
4		0	0	Not installed
5		0	0	Not installed
6		0	0	Not installed
7		0	0	Not installed
8		0	0	Not installed
9	1.74	0	-1.74	
10	**7.84**	**0**	**-7.84**	
11	12	0	-12	
12	4.155	0	-4.155	Not in water
13	4.155	0	-4.155	
14	13.997	0	-13.997	part in water
15	26.456	0	-26.456	
16	0	0	0	
17	2.968	0	-2.968	
18	1.486	0	-1.486	
19	5.273	0	-5.273	Not in water
20	5.273	0	-5.273	Not in water
21	5.273	0	-5.273	Not in water
22	5.273	0	-5.273	Not in water
23	5.273	0	-5.273	Part in water
24	5.273	0	-5.273	
	96.855	**0**	**-96.855**	
25	**104.695**	**0**	**-104.695**	
3% tolerance	**107.83585**	**Net Buoy**	**-107.836**	**mTonnes**
		Tether weight	**137.3**	**mTonnes**
		Net weight	**-245.136**	**mTonnes**

Note: Riser and umbilical weights not included



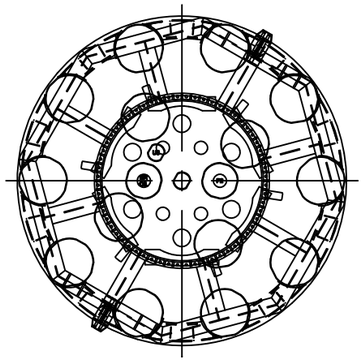
Riser Buoy Displacement

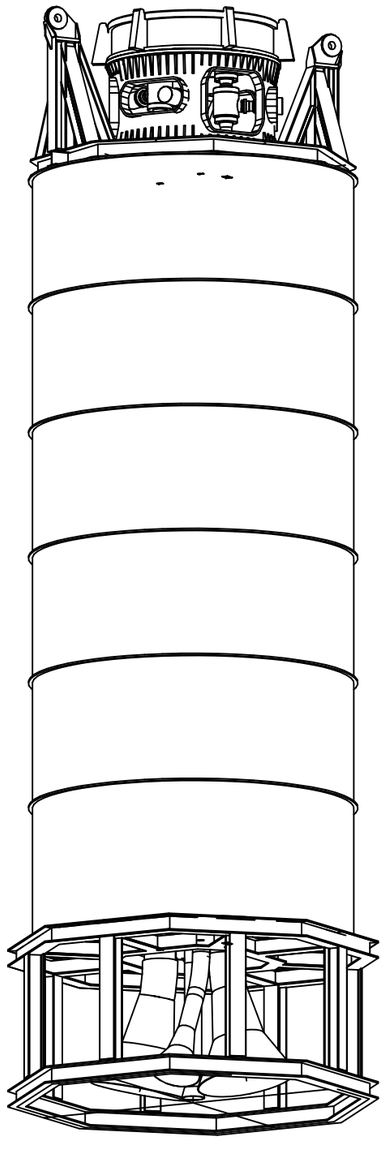
Figure 3

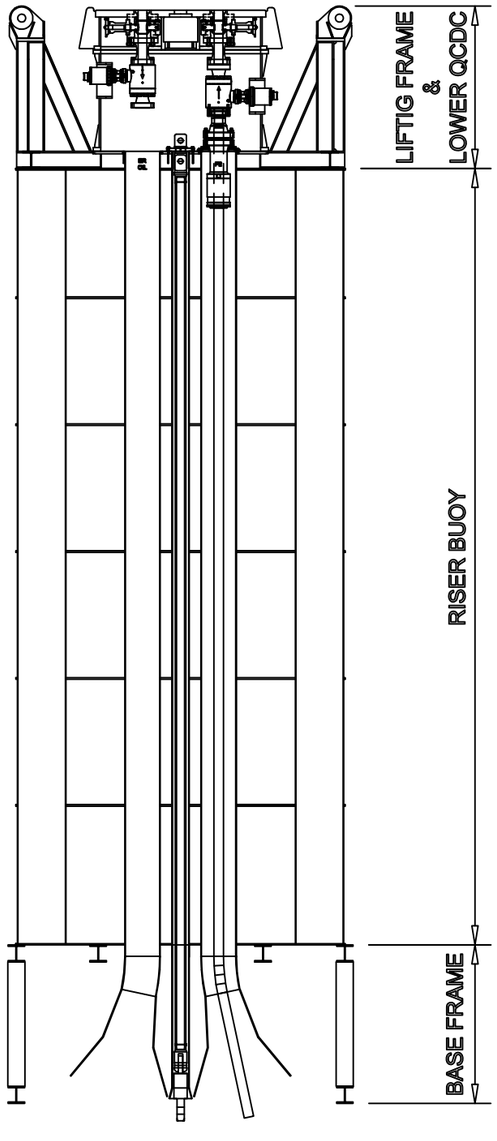


Riser Buoy Dimensions
Sketch 001

REFERENCE DRAWINGS:	
Drawing No.	Title







N/A	1	FIRST ISSUE	22.06.10	PG	IL
CRCN	Rev	Modification	Date	Drawn	Appd

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Project Number	2257
Drawing Title	RISER BUOY GENERAL ARRANGEMENT

Drawing No.	2257_0010		Sheet	01 of 01	
Drawn by:	PG	Date: 22.06.10	Scale:-	NTS	Size:- A3
Checked by:	BR	Date: 22.06.10	Filename:-	2257_0010_01_1	

REFERENCE DRAWINGS:	
Drawing No.	Title

NOTES:

ALL DIMENSIONS IN MILLIMETRES UNLESS STATED OTHERWISE.

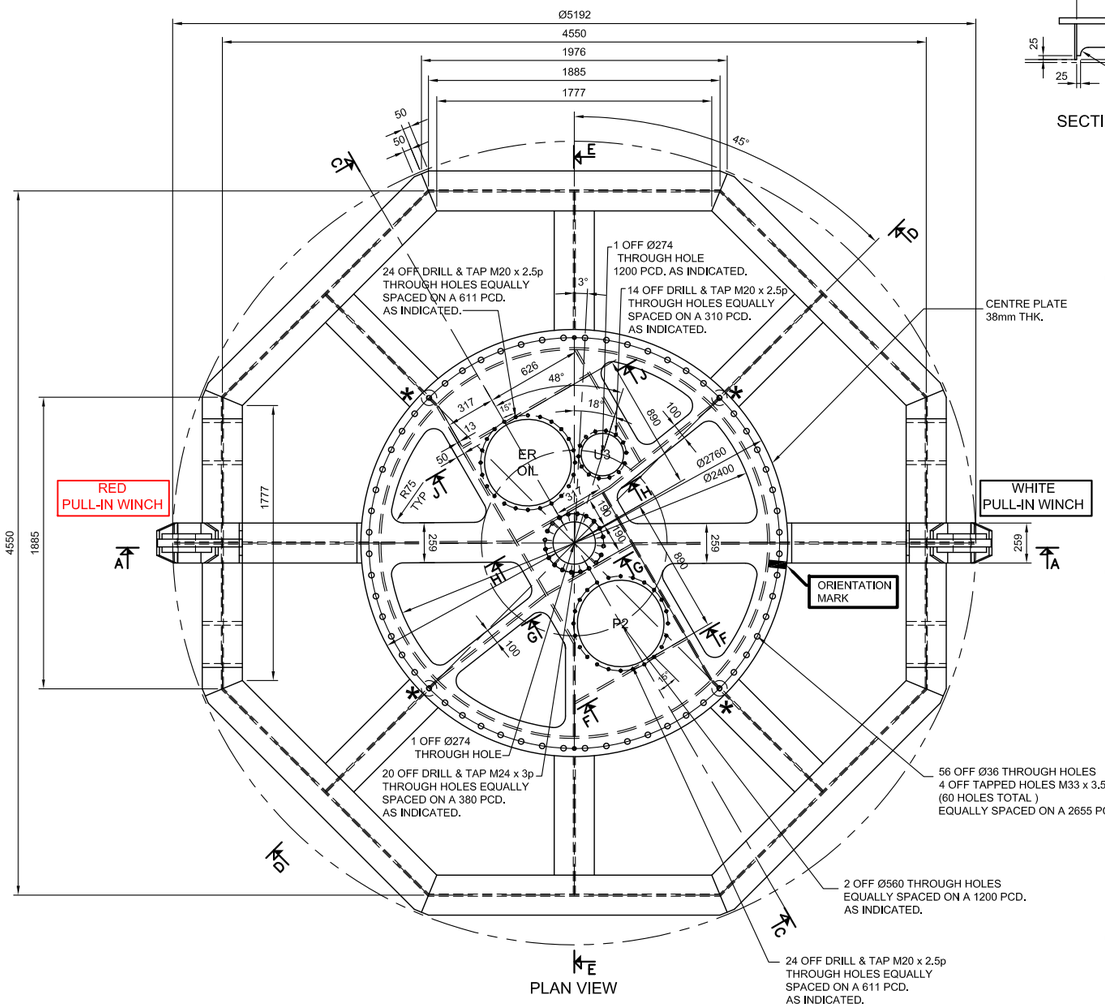
ALL MATERIAL BSEN 10025 S355 J2 (GRADE 50D EQUIVALENT).

ALL WELDING TO BE DOUBLE CONTINUOUS FILLET WELDS UNLESS STATED OTHERWISE.

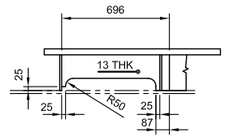
ALL WELD DIMENSIONS INDICATE MINIMUM LEG LENGTH.

ALL FILLET WELDING TO BE SUBJECT TO 10 % MPI.

ALL FULL PENETRATION WELDING TO BE 100 % MPI.



PLAN VIEW



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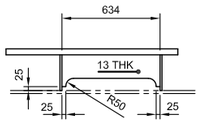

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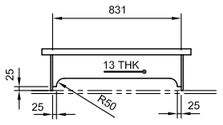

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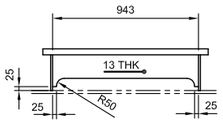

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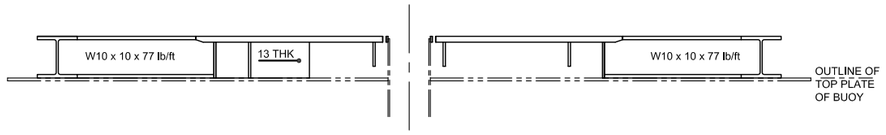

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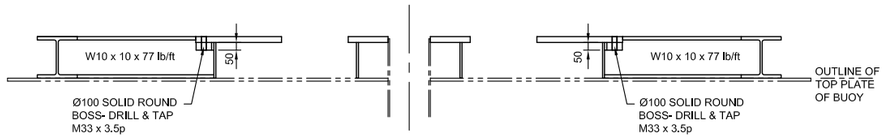

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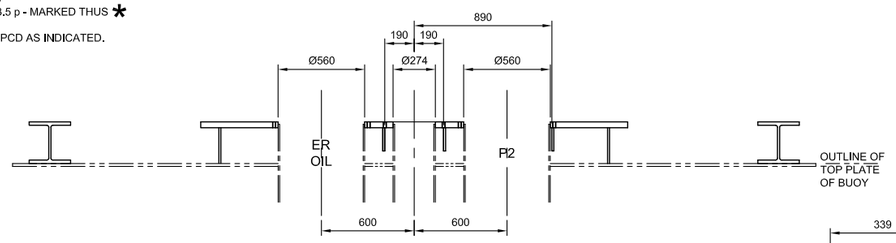

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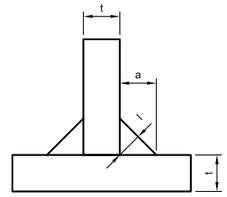
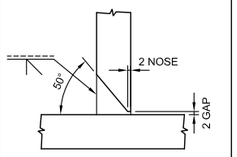
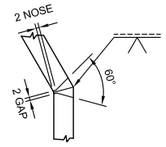


t = LEAST PLATE THICKNESS

THICKNESS 't' mm	THROAT 'l' mm	LEG 'a' mm
T < 6	2.83	4
6 < T < 12	4.95	7
12 < T < 16	6.37	9
16 < T < 20	8.49	12
20 < T < 24	9.91	14
24 < T < 28	12.02	17
28 < T < 32	14.14	20



TYPICAL FULL PEN PREP



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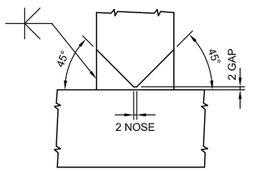

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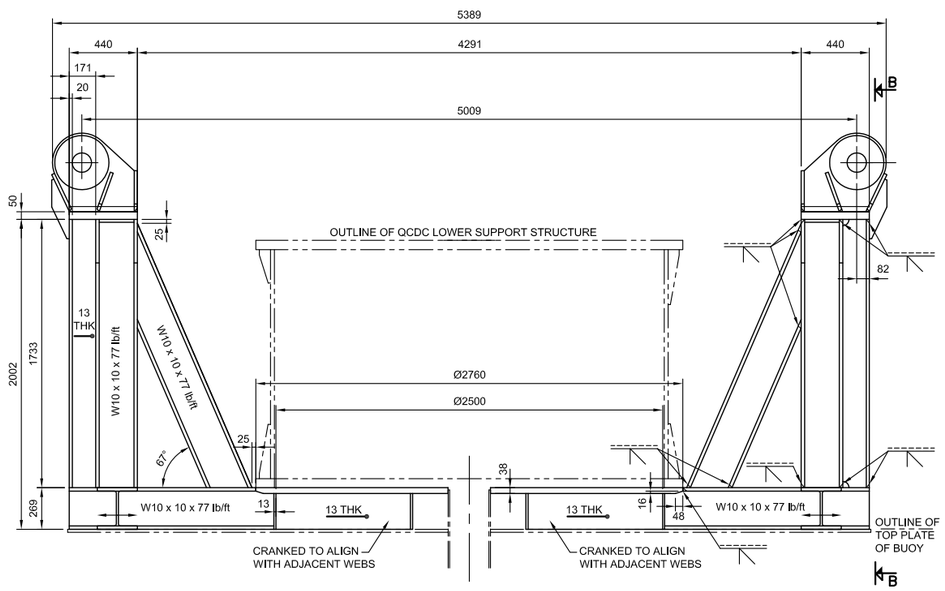

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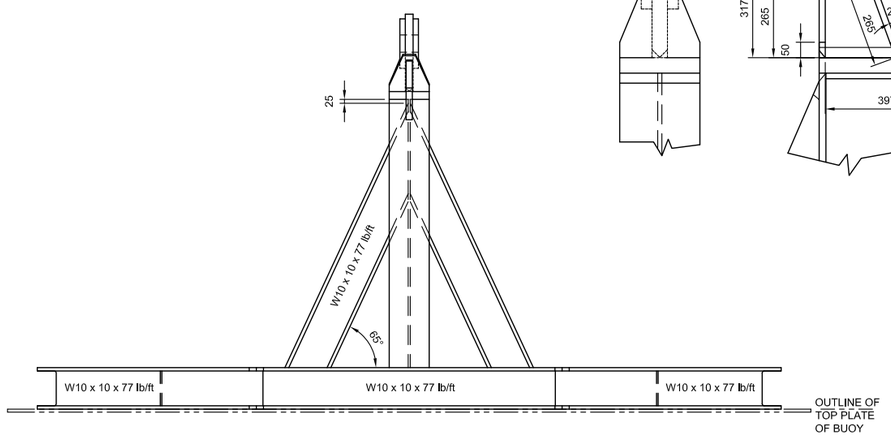
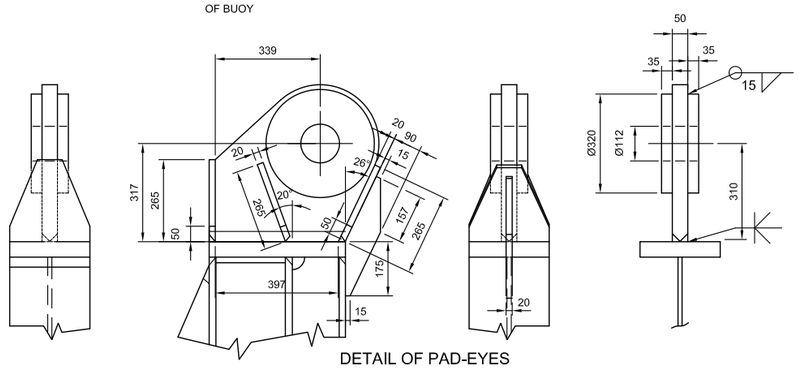


ELEVATION 'B - B'



DETAIL OF PAD-EYES
SCALE1:10

NA	9	ORIENTATION MARKING ADDED	21.06.10	PG	IL
NA	8	RED & WHITE PULL-IN WINCH NOTE ADDED	21.06.10	PG	IL
NA	7	WELD MPI NOTES MODIFIED	15.06.10	PG	IL
NA	6	P2 BOLT HOLE NOTE CORRECTED	15.06.10	PG	IL
NA	5	CLUMP WT BOLT HOLE PCD CORRECTED	15.06.10	PG	IL
NA	4	PAD-EYE DETAILS ADDED	15.06.10	PG	IL
NA	3	RISER TUBES 22°, FLG 259 WIDE, TAP HOLES	15.06.10	PG	IL
NA	2	LOCATION OF U3 TUBE CHANGED	11.06.10	PG	IL
N/A	1	FIRST ISSUE	11.06.10	PG	IL
CRCN	Rev	Modification	Date	Drawn	Appd

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Drawing Title	RISER BUOY LIFTING FRAME
Drawing No.	2257_0001
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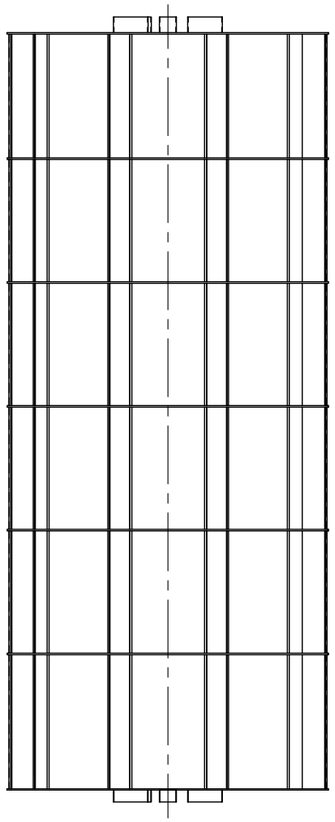
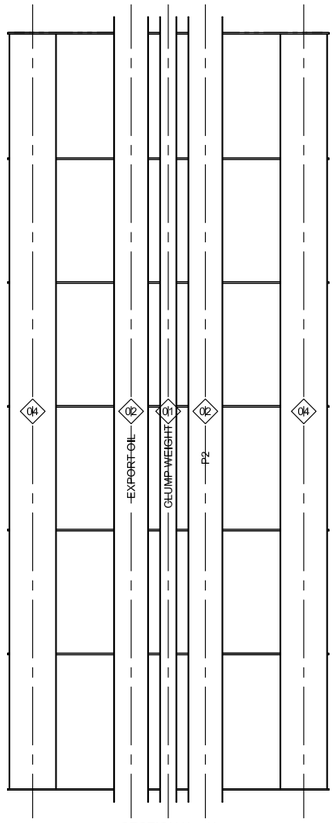
Drawn by:	PG
Date:	11.06.10
Scale:-	1:20 UNO
Size:-	A1
Checked by:	BR
Date:	11.06.10
Filename:-	2257_0001_01_9

REFERENCE DRAWINGS:	
Drawing No.	Title



ELEVATION



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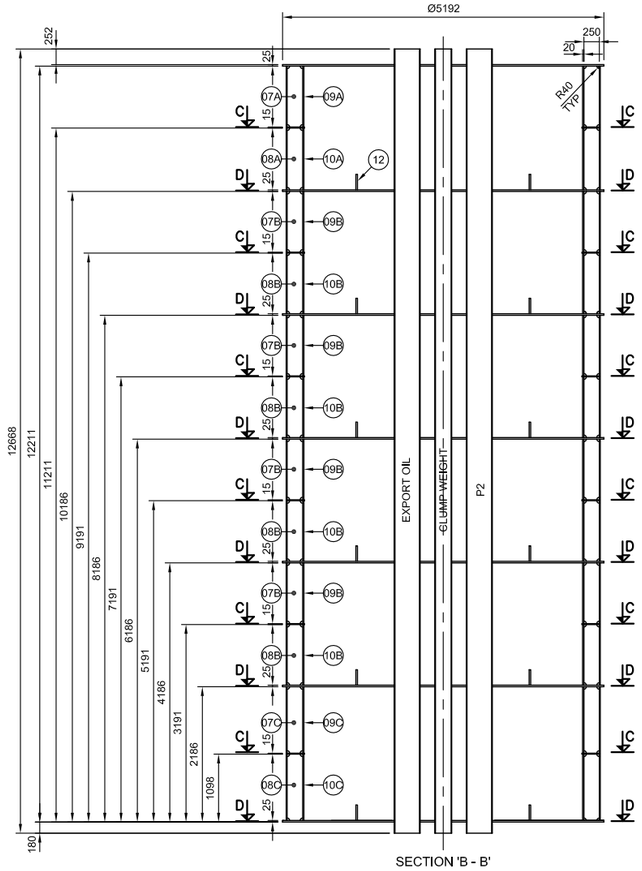

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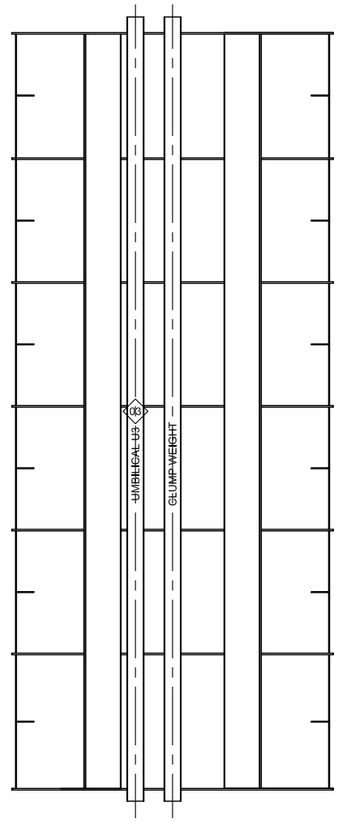

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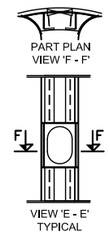
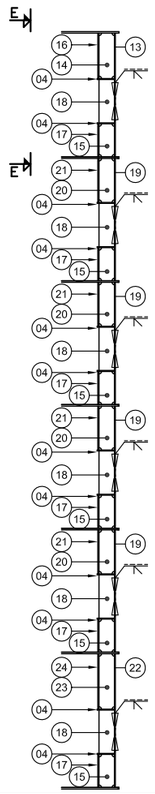
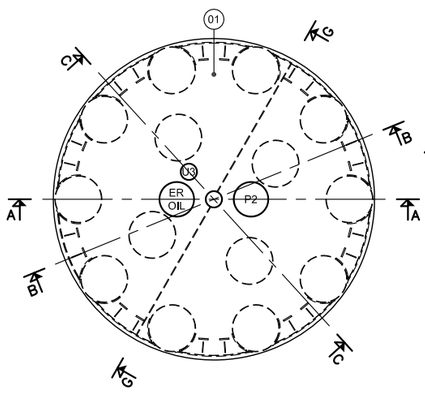


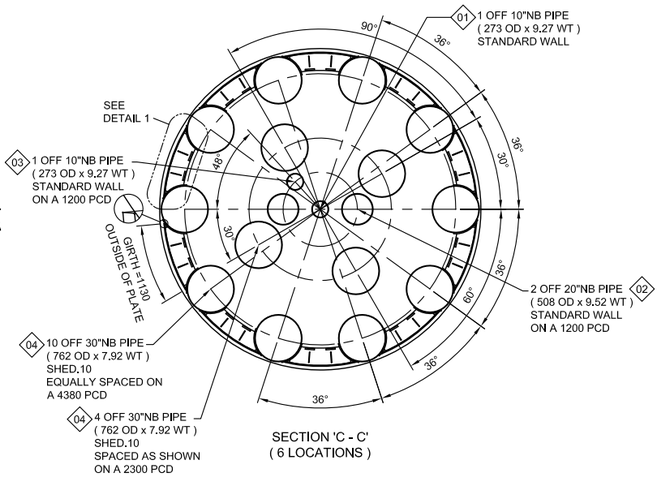


ONE ACCESS HOLE REQUIRED FOR EACH VERTICAL SECTION OF RISER BUOY. (LOCATIONS DETERMINED AT SITE)

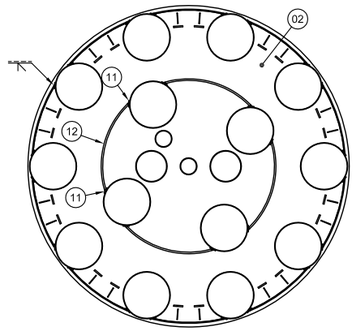
PART SECTION
IN WAY OF ACCESS HOLES

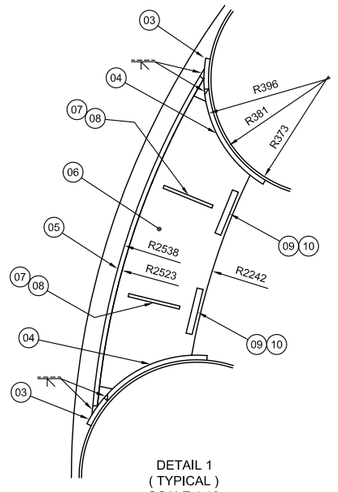


PLAN VIEW



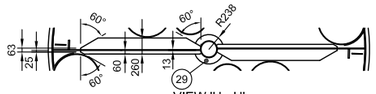
SECTION 'C - C'
(6 LOCATIONS)



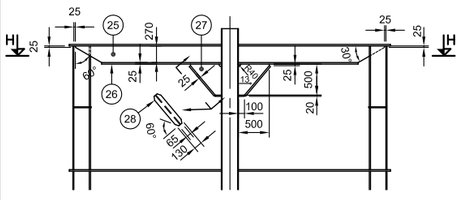


SECTION 'D - D'
(6 LOCATIONS)

DETAIL 1
(TYPICAL)
SCALE 1:10



VIEW 'H - H'



SECTION 'G - G'

TOTAL WEIGHT 85014.88 KG

ITEM NUMBER/DESCRIPTION	MATERIAL GRADE	L mm	B mm	AREA m2	THK mm	NO. OFF	KG/M kg	WEIGHT kg
PLATES								
ITEM 1-TOP & BOTTOM PLATE	API 2H	5192	5192	20.541	25.0	2.0	7.85	8062.34
ITEM 2- DIAPHRAGMS	API 2H	5192	5192	14.226	25.0	5.0	7.85	13959.26
ITEM 3A- DOUBLER PLATE	API 2H	2000	100	0.200	15.0	20.0	7.85	471.00
ITEM 3B- DOUBLER PLATE	API 2H	1975	100	0.198	15.0	20.0	7.85	466.29
ITEM 3C- DOUBLER PLATE	API 2H	2161	100	0.216	15.0	20.0	7.85	508.68
ITEM 4- DOUBLER PLATE	API 2H	375	100	0.038	15.0	120.0	7.85	536.94
ITEM 5A- SHELL	API 2H	2000	1130	2.260	15.0	8.0	7.85	2128.92
ITEM 5B- SHELL	API 2H	1975	1130	2.232	15.0	32.0	7.85	8410.18
ITEM 5C- SHELL	API 2H	2161	1130	2.442	15.0	8.0	7.85	2300.36
ITEM 6- STRINGER	API 2H	987	301	0.222	15.0	60.0	7.85	1568.43
ITEM 7A- SHELL STIFFENER WEB	API 2H	985	250	0.244	10.0	18.0	7.85	344.77
ITEM 7B- SHELL STIFFENER WEB	API 2H	980	250	0.240	10.0	78.0	7.85	1469.52
ITEM 7C- SHELL STIFFENER WEB	API 2H	1073	250	0.263	10.0	18.0	7.85	371.62
ITEM 8A- SHELL STIFFENER WEB	API 2H	1000	250	0.247	10.0	18.0	7.85	349.01
ITEM 8B- SHELL STIFFENER WEB	API 2H	980	250	0.240	10.0	78.0	7.85	1469.52
ITEM 8C- SHELL STIFFENER WEB	API 2H	1073	250	0.263	10.0	18.0	7.85	371.62
ITEM 9A- SHELL STIFFENER FLANGE	API 2H	985	150	0.148	20.0	18.0	7.85	418.25
ITEM 9B- SHELL STIFFENER FLANGE	API 2H	980	150	0.147	20.0	78.0	7.85	1800.16
ITEM 9C- SHELL STIFFENER FLANGE	API 2H	1073	150	0.161	20.0	18.0	7.85	454.99
ITEM 10A- SHELL STIFFENER FLANGE	API 2H	1000	150	0.150	20.0	18.0	7.85	423.90
ITEM 10B- SHELL STIFFENER FLANGE	API 2H	980	150	0.147	20.0	78.0	7.85	1800.16
ITEM 10C- SHELL STIFFENER FLANGE	API 2H	1073	150	0.161	20.0	18.0	7.85	454.99
ITEM 11- DOUBLER PLATE	API 2H	275	100	0.028	15.0	48.0	7.85	158.26
ITEM 12- DIAPHRAGM STIFFENER WEB	API 2H	1481	250	0.370	25.0	24.0	7.85	1742.70
ITEM 13- SHELL	API 2H	2000	1130	2.260	15.0	1.0	7.85	266.12
ITEM 14- SHELL STIFFENER WEB	API 2H	735	250	0.179	10.0	2.0	7.85	28.10
ITEM 15- SHELL STIFFENER WEB	API 2H	535	250	0.129	10.0	12.0	7.85	121.52
ITEM 16- SHELL FTIFFENER FLANGE	API 2H	735	150	0.110	20.0	2.0	7.85	34.54
ITEM 17- SHELL STIFFENER FLANGE	API 2H	535	150	0.080	20.0	12.0	7.85	150.72
ITEM 18- SHELL STIFFENER WEB	API 2H	700	250	0.175	10.0	12.0	7.85	164.85
ITEM 19- SHELL	API 2H	1975	1130	2.232	15.0	4.0	7.85	1051.27
ITEM 20- SHELL STIFFENER WEB	API 2H	710	250	0.172	10.0	8.0	7.85	108.02
ITEM 21- SHELL STIFFENER FLANGE	API 2H	710	150	0.107	20.0	8.0	7.85	134.39
ITEM 22- SHELL	API 2H	2161	1130	2.442	15.0	1.0	7.85	287.55
ITEM 23- SHELL STIFFENER WEB	API 2H	896	250	0.219	10.0	2.0	7.85	34.38
ITEM 24- SHELL STIFFENER FLANGE	API 2H	896	150	0.134	20.0	2.0	7.85	42.08
ITEM 25- TOP PLATE STIFFENER WEB	API 2H	2361	270	0.585	13.0	2.0	7.85	119.40
ITEM 26- TOP PLATE STIFFENER FLG	API 2H	1953	260	0.465	25.0	2.0	7.85	182.51
ITEM 27 - BRACKET	API 2H	500	500	0.154	13.0	2.0	7.85	31.43
ITEM 28 -BRACKET FLANGE	API 2H	621	130	0.077	25.0	2.0	7.85	30.22
ITEM 29 -BRACKET FLANGE	API 2H	475	475	0.188	20.0	1.0	7.85	29.52
								52858.48
SECTIONS								
ITEM 1 - 10"nb std wall pipe(273od x 9.27 wt)	API 5L X52	12668				1.0	60.29	763.75
ITEM 2 - 20"nb std wall pipe(508od x 9.52 wt)	API 5L X52	12668				2.0	117.07	2966.09
ITEM 3 - 10"nb std wall pipe(273od x 9.27 wt)	API 5L X52	12668				1.0	60.29	763.75
ITEM 4 - 30"nb sch10 pipe(762od x 7.92 wt)	API 5L X52	12211				14.0	147.33	25186.65
								29680.25
3% WELDING								2476.16
								2476.16
								85014.88

NOTES:

ALL DIMENSIONS IN MILLIMETRES UNLESS STATED OTHERWISE.

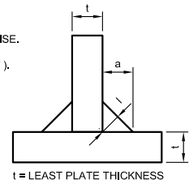
ALL MATERIAL BSEN 10025 S355 J2 (GRADE 50D EQUIVALENT).

ALL WELDING TO BE DOUBLE CONTINUOUS FILLET WELDS UNLESS STATED OTHERWISE.

ALL WELD DIMENSIONS INDICATE MINIMUM LEG LENGTH.

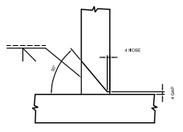
ALL FILLET WELDING TO BE SUBJECT TO 10% MPI.

ALL FULL PENETRATION WELDING TO BE 100% MPI.



t = LEAST PLATE THICKNESS

THICKNESS ' t ' mm	THROAT ' f ' mm	LEG ' a ' mm
T < 6	2,83	4
6 < T < 12	4,95	7
12 < T < 16	6,37	9
16 < T < 20	8,49	12
20 < T < 24	9,91	14
24 < T < 28	12,02	17
28 < T < 32	14,14	20



TYPICAL FULL PEN PREP

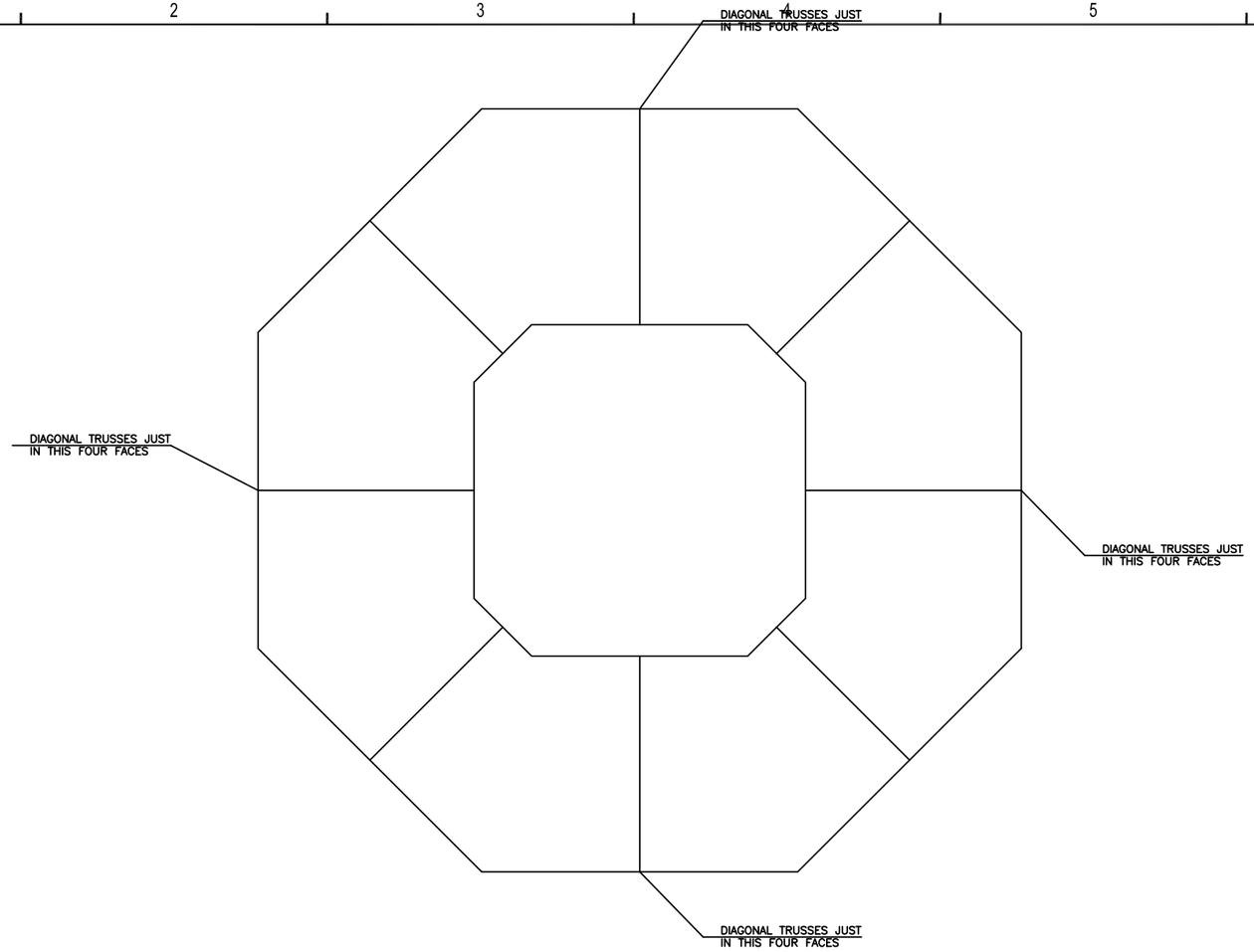
CRCN	Rev	Modification	Date	Drawn	Appd
N/A	1	FIRST ISSUE	22.06.10	PG	IL

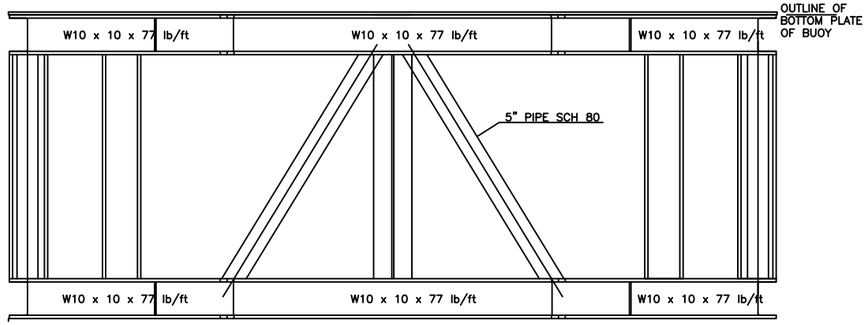
This is a CAD produced drawing - no manual modifications are to be made.
DO NOT SCALE FROM THIS DRAWING - if in doubt ASK.

Flexible Engineered Solutions Ltd.
8 Ennerdale Road, Kitty Brewster Industrial Estate,
Blyth, Northumberland, NE24 4RT, England.
Tel: (01670) 359500 Fax: (01670) 359600
E-mail: fes@fesltd.co.uk Web Site: www.fesltd.co.uk

Project Number	2257
Drawing Title	RISER BUOY
Drawing No.	2257_0009
Sheet	01 of 02
Drawn by:	PG Date: 22.06.10
Scale:-	1:50 UNO
Size:-	A1
Checked by:	BR Date: 22.06.10
Filename:-	2257_0009_01_1

REVISIONS						
REV	DESCRIPTION	ACMA APPVL DATE	ACMA APPVL BY	ABS	USCG	OTHER





Texas Registered Engineering Firm F-4491

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DRAWN	
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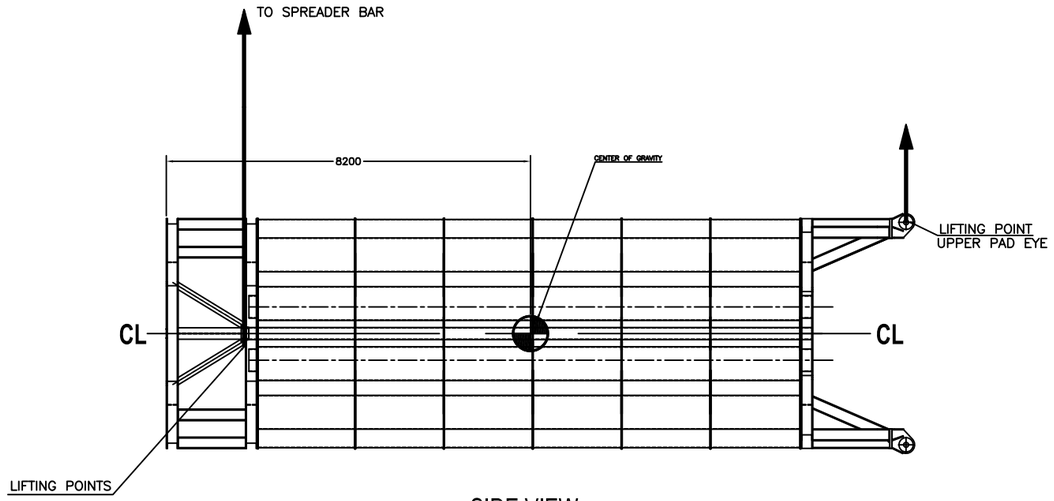
ENGINEER	
APPROVED	
DATE	

ALAN C. McCLURE ASSOCIATES, INC.
NAVAL ARCHITECTS ENGINEERS
2929 BRIARPARK, STE. 220 HOUSTON,TEXAS 77042

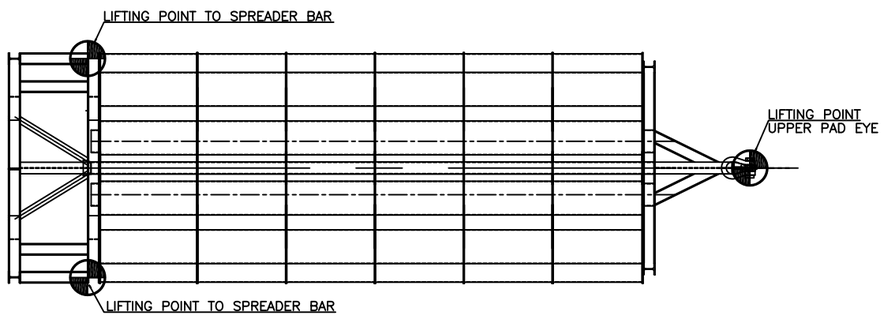
SCALE	JOB NUMBER	DRAWING NUMBER	SHEET 1 OF	REV
				A

FILENAME:

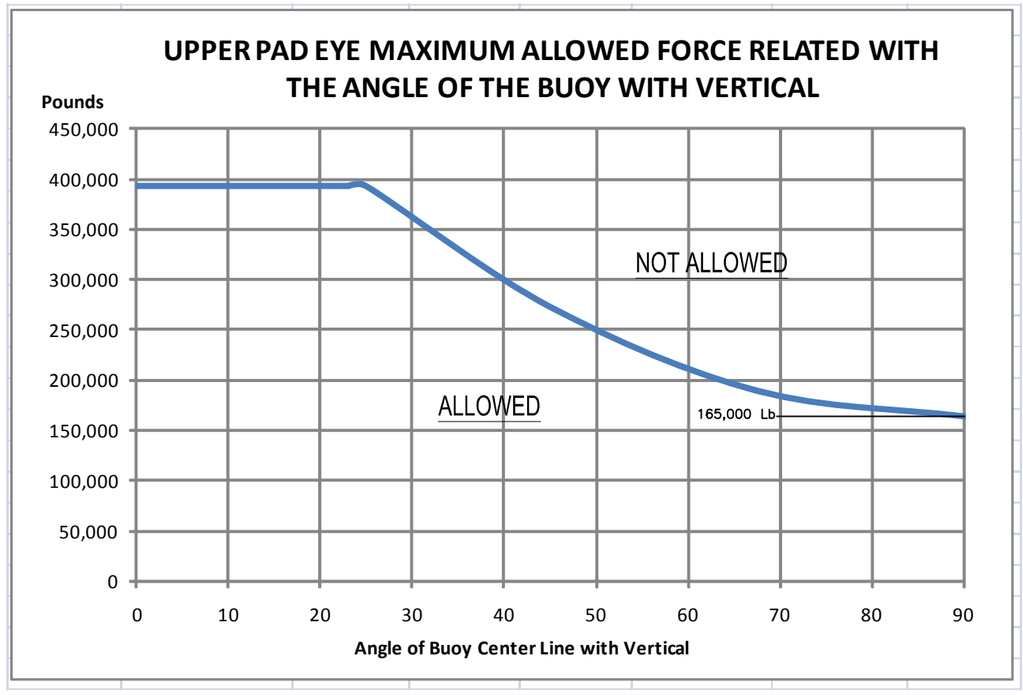
REVISIONS						
REV	DESCRIPTION	ACMA APPVL DATE	BY	ABS	USCG	OTHER
0	ISSUED FOR CLIENT	09-21-10	MGL			



SIDE VIEW



TOP VIEW



NOTE: THE LIFTING POINTS IN THE LOWER STRUCTURE ARE IN A PLANE 90° TO THE PLANE OF THE UPPER STRUCTURE PAD EYES.

	DRAWING NO.	REFERENCE DRAWINGS	DATE	REV.
4	0???-0001-01-1	RISER BUOY GENERAL ARR'GT – FES	---	--
3	B1094-100-003	BUOY BSE FRAME STRUCT. REINFORCE	06-16-10	0
2	0???-0001-01-1	RISER BUOY MODIFICATION – FES	---	--
1	2257-0001-01-4	RISER BUOY LIFTING FRAME – FES	06-15-10	4

HELIX ENERGY SOLUTIONS

ALAN C. McCLURE ASSOCIATES, INC.
NAVAL ARCHITECTS ENGINEERS
2929 BRIARPARK, STE. 220 HOUSTON,TEXAS 77042

EXAMINED BY	SIGNATURE
DRAWN	MGL
CHECKED	
ENGINEER	MGL
APPROVED	
DATE	09-21-10

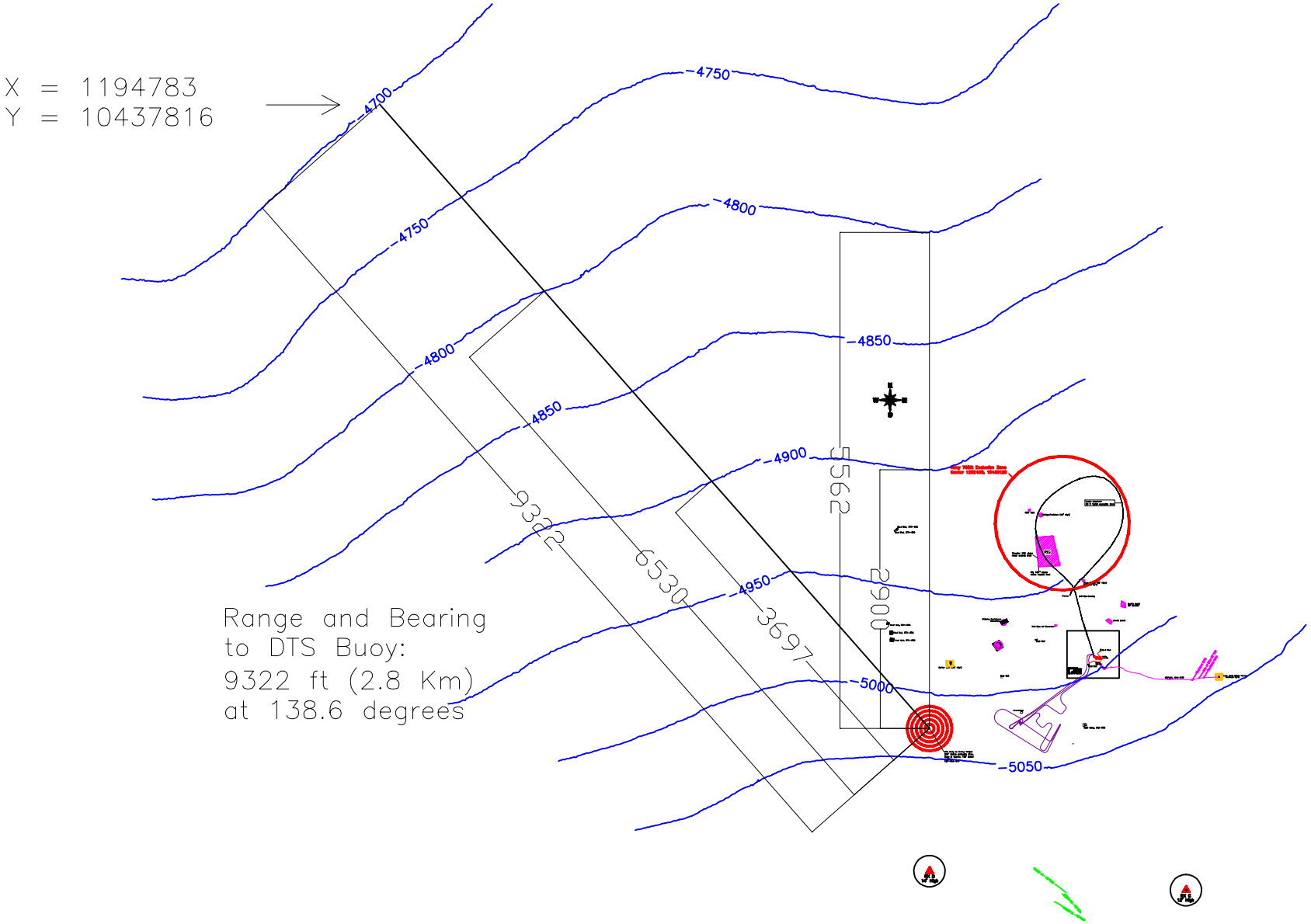
HELIX PRODUCER I

DTS BUOY LIFTING POINTS ARRANGEMENT

SCALE	JOB NUMBER	DRAWING NUMBER	SHEET	REV
NOT SCALE	B1103-2	100-001	1 OF 1	0

Texas Registered Engineering Firm F-4491

FILENAME: B1103-2-100-001-A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Y = 10437816
4700
4750
4800
4850
4900
4950
5000
5050
9322
6530
3697
5562
2900
Range and Bearing
to DTS Buoy:
9322 ft (2.8 Km)
at 138.6 degrees

Appendix B: Equipment List

Table 15: Equipment List

AHTS Equipment List			
Item No.	**Req'd Total**	**Spare**	**Description**
Work Wires and Chains (InterMoor Supplied)			
1.	1	0	6000' x 3 ½" Work Wire • Used for clump weight to seafloor and deck use • Longer lengths acceptable
2.	0	0	650' x 3 ½" Work Wire • Used for poly deployment and deck use
3.	1	1	12' x 3 ¼" Studlink Chain • Between swivel and work wire
4.	0	1	5' x 3 ¼" Studlink Chain • Between swivel and work wire
5.	0	2	• Spare tugger wire
Connectors (InterMoor Supplied)			
6.	4	2	55-ton Green Pin Shackles • Connect deadman sling (x2) • Connect work wire to ROV hook (x2) • General/contingency
7.	4	2	85-ton Green Pin Shackles • Connect deadman sling (x2) • Connect work wire to ROV hook (x2) General/contingency
8.	2	0	125 ton Wide Body Shackle • Connects the primary Chinese finger stoppers to the winch drum work wire (x1) • Connects the secondary Chinese finger stoppers to the deadman chain on deck (x1)
9.	0	2	75 ton Wide Body Shackle • General/contingency
10.	0	2	110 ton Elongated Shackle • General/contingency

AHTS Equipment List			
Item No.	**Req'd Total**	**Spare**	**Description**
11.	1	0	100 ton Wide Mouth Shackle • Polyester guide shackle
12.	0	1	120-ton Alloy Shackles • From Helix inventory
13.	0	1	150-ton Alloy Shackles • From Helix inventory
14.	3	2	3" Kenters • Connect poly section to drum • General/contingency
15.	2	2	3 ¼" Kenter • Lowering rigging assembly • General/contingency
16.	2	2	3 ½" Kenter Links • Connect to work swivel assembly (x2)
17.	2	2	Slimline Ramfor link • Lowering rigging assembly General/contingency
18.	1	1	#8 Pear Links • Lowering rigging assembly • General/contingency
19.	0	2	#7 Pear Links a. General/contingency
Misc Tools / Equipment (InterMoor Supplied)			
20.	0	1	3 ¼" Pelican Hook • Used as deadman for 3 ¼" chain
21.	1	1	3 ¼" Deadman Chain or Deadman Sling (aka Pelican Hook Sling) • Length TBD by Superintendent
22.	2	2	2" x 10' Flat Nylon Straps • Pulling polyester sections around on deck (x2)
23.	0	1	200 Ton ROV Hook • Transfer load of clump weight from AHTS to DTS
24.	1	0	Moorlink Swivel Assembly – WLL 224 ST • General use
25.	1	0	75 ton padeye to padeye swivel • Additional Chain recovery rigging

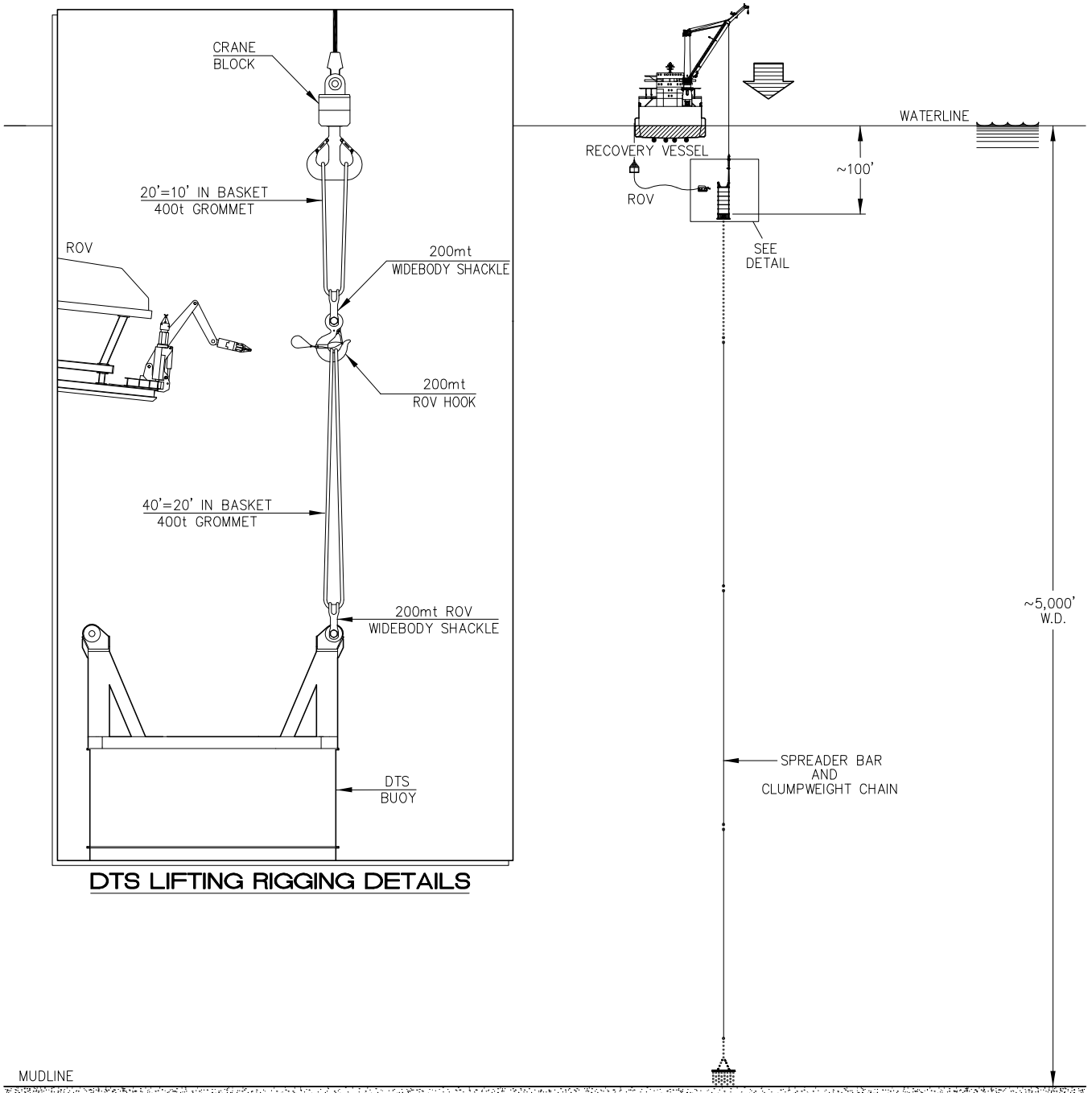
AHTS Equipment List			
Item No.	**Req'd Total**	**Spare**	**Description**
26.	0	2	3 ½" Peewee Sockets • Reterminating damaged or broken work wire (contingency)
27.	6	3	1 ¾" x 50' Amsteel Blue Synthetic Grommets • Primary and secondary Chinese finger stoppers during polyester deployment (x2 New) • Connects polyester section to vessel work wire during polyester deployment (x3 Used) • Recover Added Chain #2 • Contingency to replace clump weight recovery grommet
28.	1	0	Wide-body J-Chaser • Assist in recovering clump weight
29.	1	0	Wide-body J-Lock • Contingency
30.	1	0	Toolbox w/ Standard Tool Spread • Includes deck tools, snatch blocks, rigging chains, and chain binders • Socket Fast • Oxy-acetylene cutting torch and gas supply bottles • Misc shackles / links at discretion of Deck Superintendent • Spare PPE gear
31.	1	0	Welder's Bag • Includes welding rods, cutting tips, and other welding/cutting supplies • Includes face shield, welding gloves, and other specialized PPE gear
32.	2	0	Welding Machine • Seafasten DTS buoy to deck
33.	1	0	Seafastening cradle & clips • Seafasten DTS buoy to deck
Misc Tools / Equipment (BP Supplied)			
34.	1	0	ROV 2" wire cutter

AHTS Equipment List			
Item No.	**Req'd Total**	**Spare**	**Description**
35.	1	0	200 Ton ROV Hook • Transfer load of clump weight from AHTS to DTS
36.	1	0	10' Grommet TPXC 30,000 Replacement sling for decking clump weight
37.	1	1	10' Grommet TPXC 12,500 • Additional Chain recovery rigging • Basketed
38.	1	0	2 ½" dia x 25' soft eye wire rope • Additional Chain recovery rigging
39.	1	0	2" dia x 20' soft eye wire rope • Additional Chain recovery rigging
40.	1	0	1 ½" dia x 10' soft eye wire rope 2 part bridle w/ 2 ½" D-ring • Additional Chain recovery rigging
41.	1	0	1 ½" dia x 6' soft eye wire rope 2 part bridle w/ 2 ½" D-ring • Additional Chain recovery rigging
42.	4	0	85 ton shackle • Additional Chain recovery rigging
43.	3	0	85 ton alloy shackle • Additional Chain recovery rigging
44.	3	0	55 ton shackle • Additional Chain recovery rigging
45.	2	0	55 ton alloy shackle • Additional Chain recovery rigging
46.	0	1	35 ton shackle • Additional Chain recovery rigging
47.	4	0	25 ton shackle • Additional Chain recovery rigging
48.	1	0	45 ton swivel hook Additional Chain recovery rigging
49.	4	0	30 ton ROV hook • Additional Chain recovery rigging
50.	2	0	No 2 triplate WLL 70 m.ton • Additional Chain recovery rigging
51.	0	1	1 ½" Master Link • Additional Chain recovery rigging • Contingency

AHTS Equipment List			
Item No.	**Req'd Total**	**Spare**	**Description**
52.	0	2	1 ¾" Master Link • Additional Chain recovery rigging • Contingency
53.	0	1	2" Master Link • Additional Chain recovery rigging • Contingency
54.	1	0	2 ½" Master Link • Additional Chain recovery rigging
55.	1	0	Crane Pads/Timbers

Appendix C: DTS Buoy and Clump Weight Recovery Procedure Drawings

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:53:25 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-01.DWG Project Code: 11327-01



DTS LIFTING RIGGING DETAILS

BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

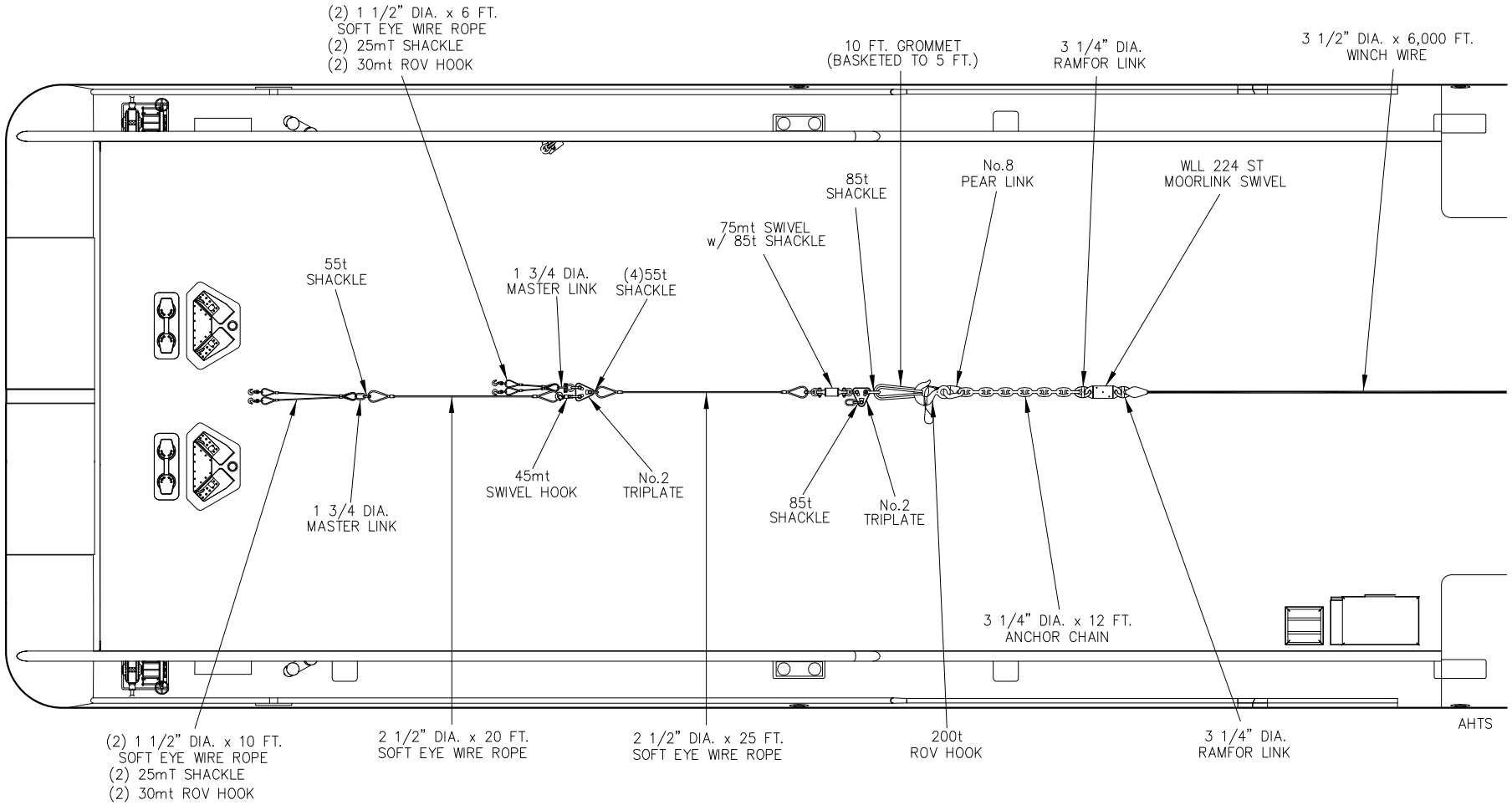
(USING RECOVERY VESSEL AND AHTS)

- THE INSTALLATION VESSEL LOWERS THE CRANE BLOCK UNTIL THE RIGGING IS JUST ABOVE THE DTS.
- ROV CONNECTS THE CRANE RIGGING TO THE DTS BUOY.

FIGURE 1

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/30/10 Time: 08:14:23 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-02.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

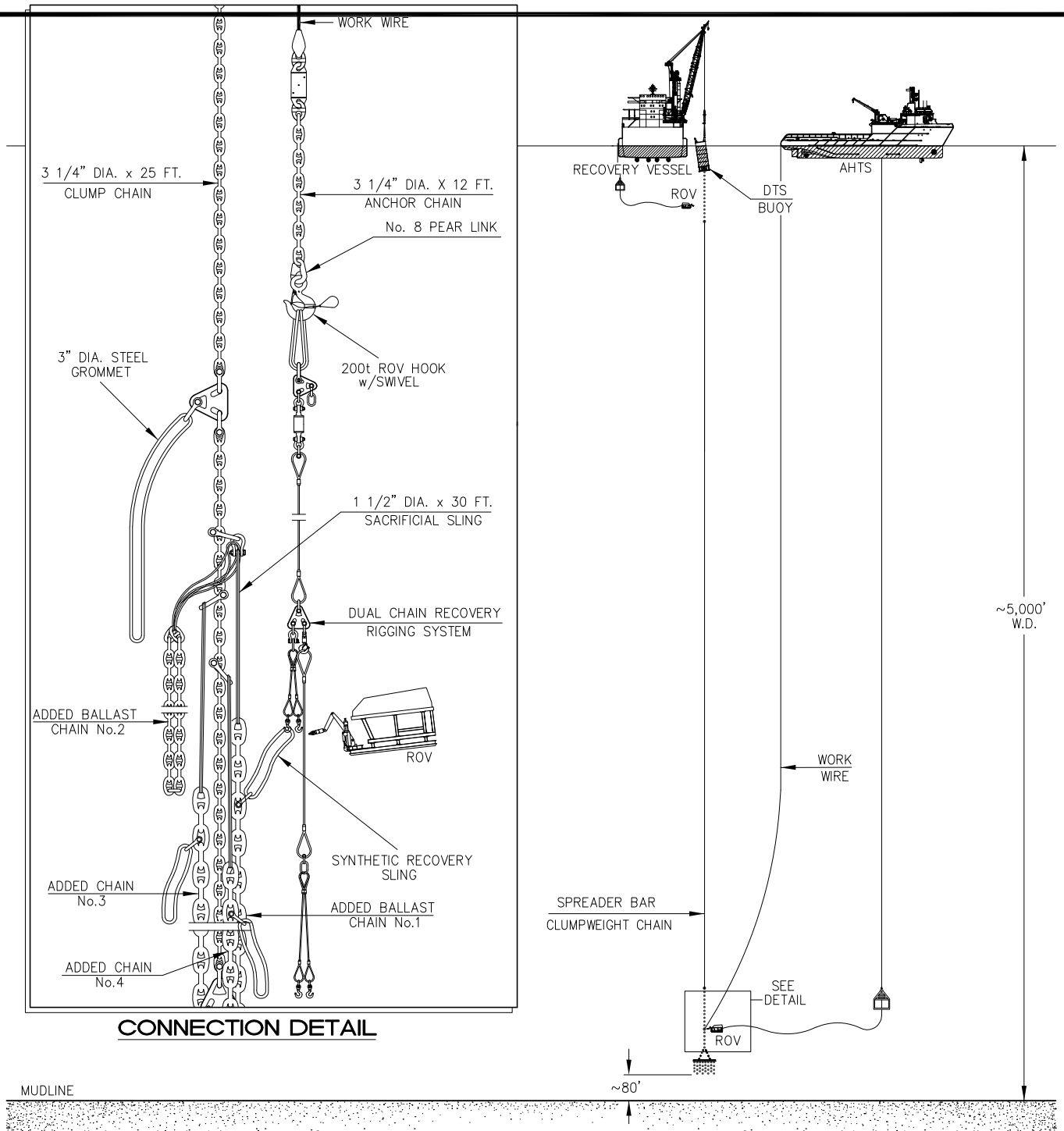
(USING RECOVERY VESSEL AND AHTS)

- WINCH WIRE IS PAYED OUT ON DECK AND STINGER SECTION IS CONNECTED.
- DUAL CHAIN RECOVERY SYSTEM IS CONNECTED TO WINCH WIRE STINGER CONNECTION.
- SYSTEM IS OVERBOARDED AND LOWERED TO CLUMP CHAIN.

FIGURE 2

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/30/10 Time: 08:18:12 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-03.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

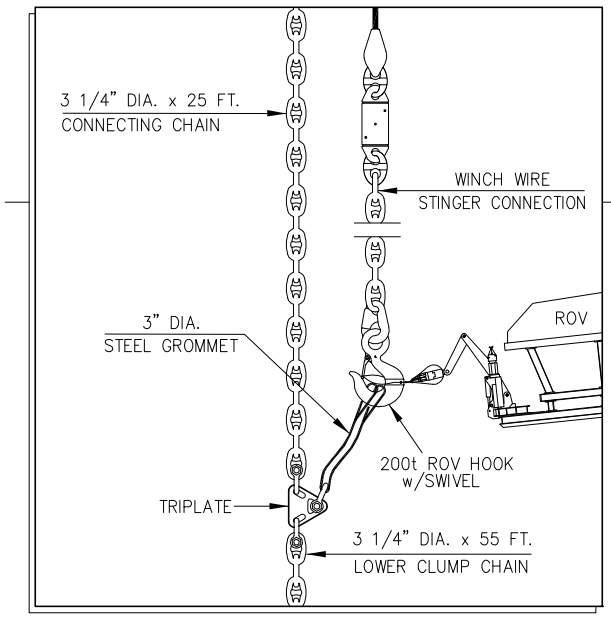
(USING RECOVERY VESSEL AND AHTS)

- AHTS WORK WIRE AND ROV HOOK IS LOWERED TO THE ADDED BALLAST CHAINS.
- AHTS ATTACHES SYNTHETIC RECOVERY SLING TO ROV HOOK.

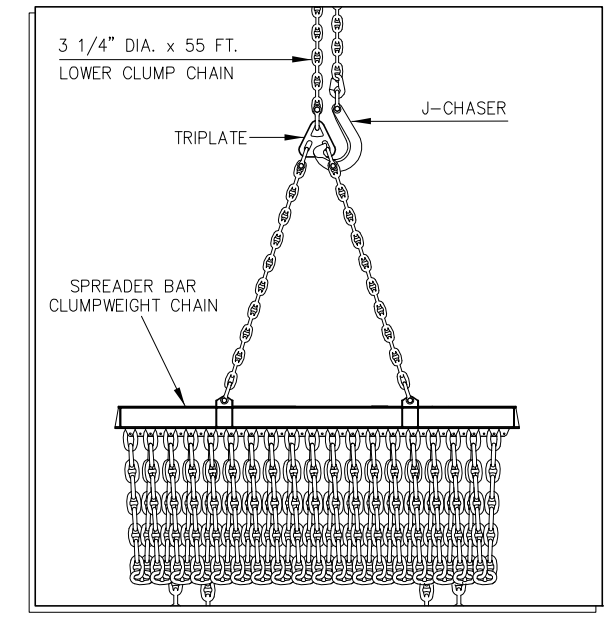
FIGURE 3

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:53:05 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-04.DWG Project Code: 11327-01



CONNECTION DETAIL



ALTERNATE CONNECTION DETAIL

BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

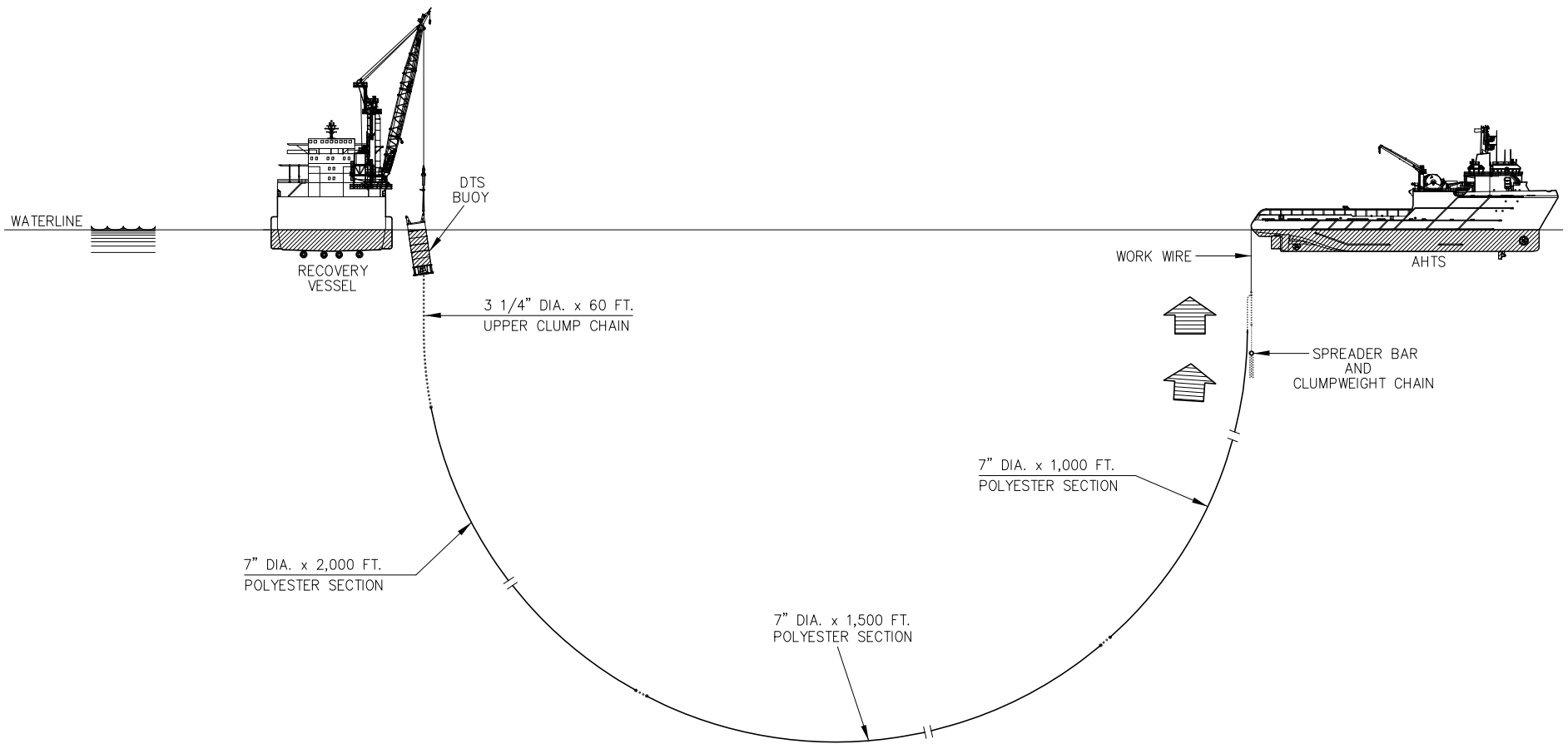
(USING RECOVERY VESSEL AND AHTS)

- AHTS WORK WIRE AND ROV HOOK IS LOWERED TO THE UPPER TRIPLATE.
- AHTS ATTACHES STEEL GROMMET TO ROV HOOK.
- AHTS BEGINS RECOVERING WORK WIRE.

FIGURE 4

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:52:58 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-05.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

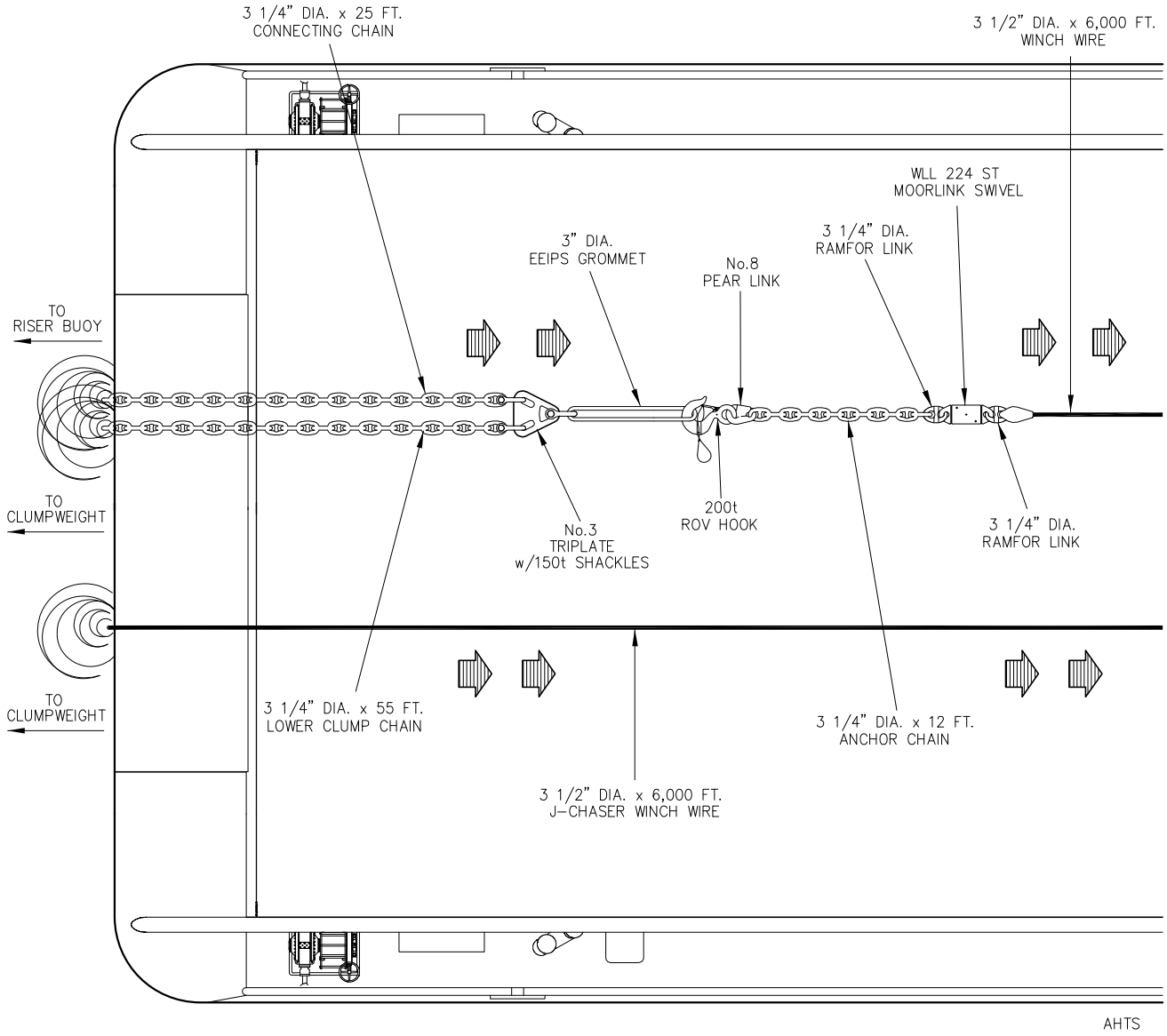
(USING RECOVERY VESSEL AND AHTS)

- HAUL IN WORK WIRE TO HAUL IN THE CLUMP WEIGHT CONNECTION.

FIGURE 5

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:52:48 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-06.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

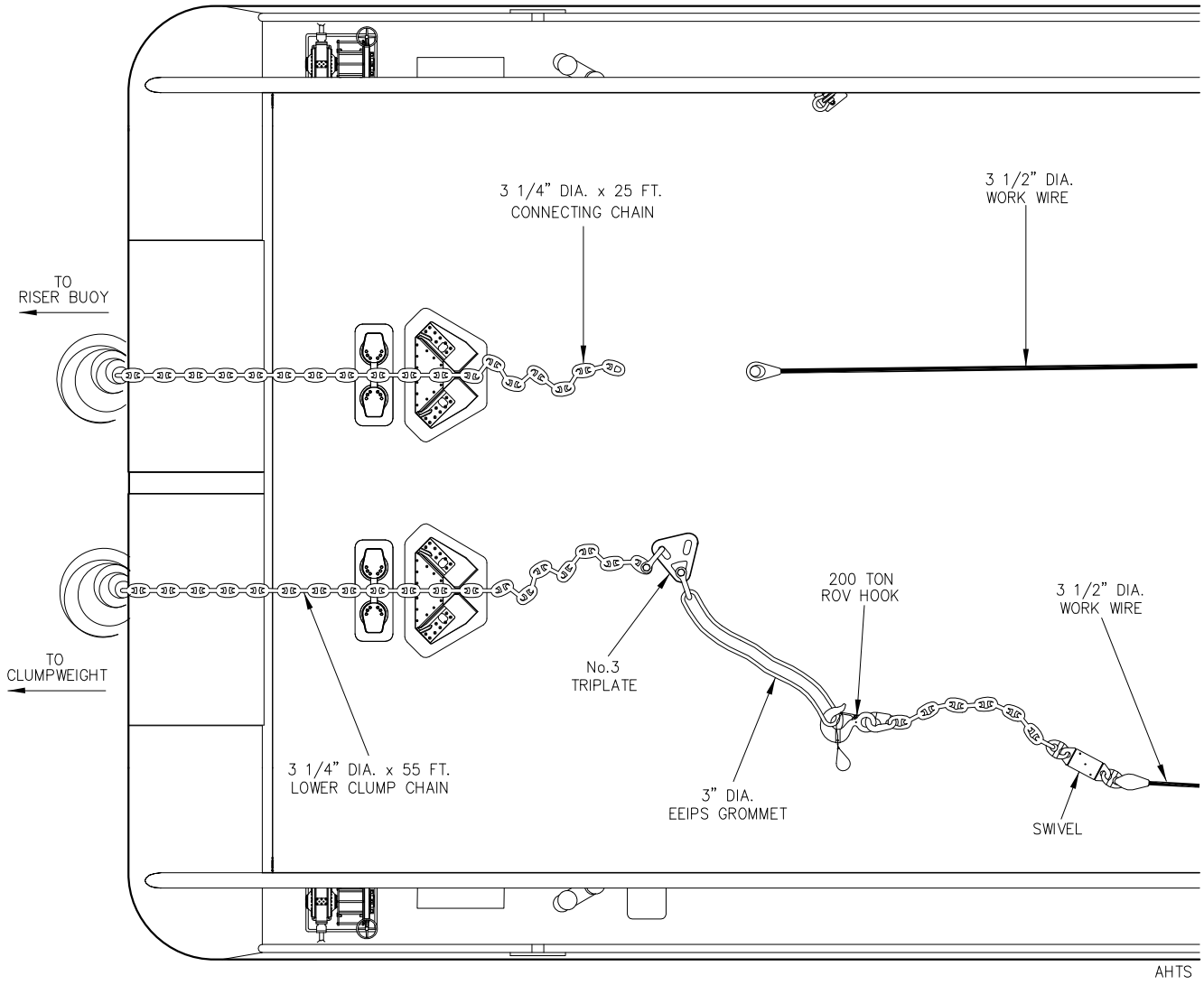
(USING RECOVERY VESSEL AND AHTS)

- RECOVER UPPER TRIPLATE ON DECK.
- SECURE LOWER CLUMP CHAIN AND CONNECTING CHAIN IN SHARK JAWS.

FIGURE 6

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:52:40 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-07.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

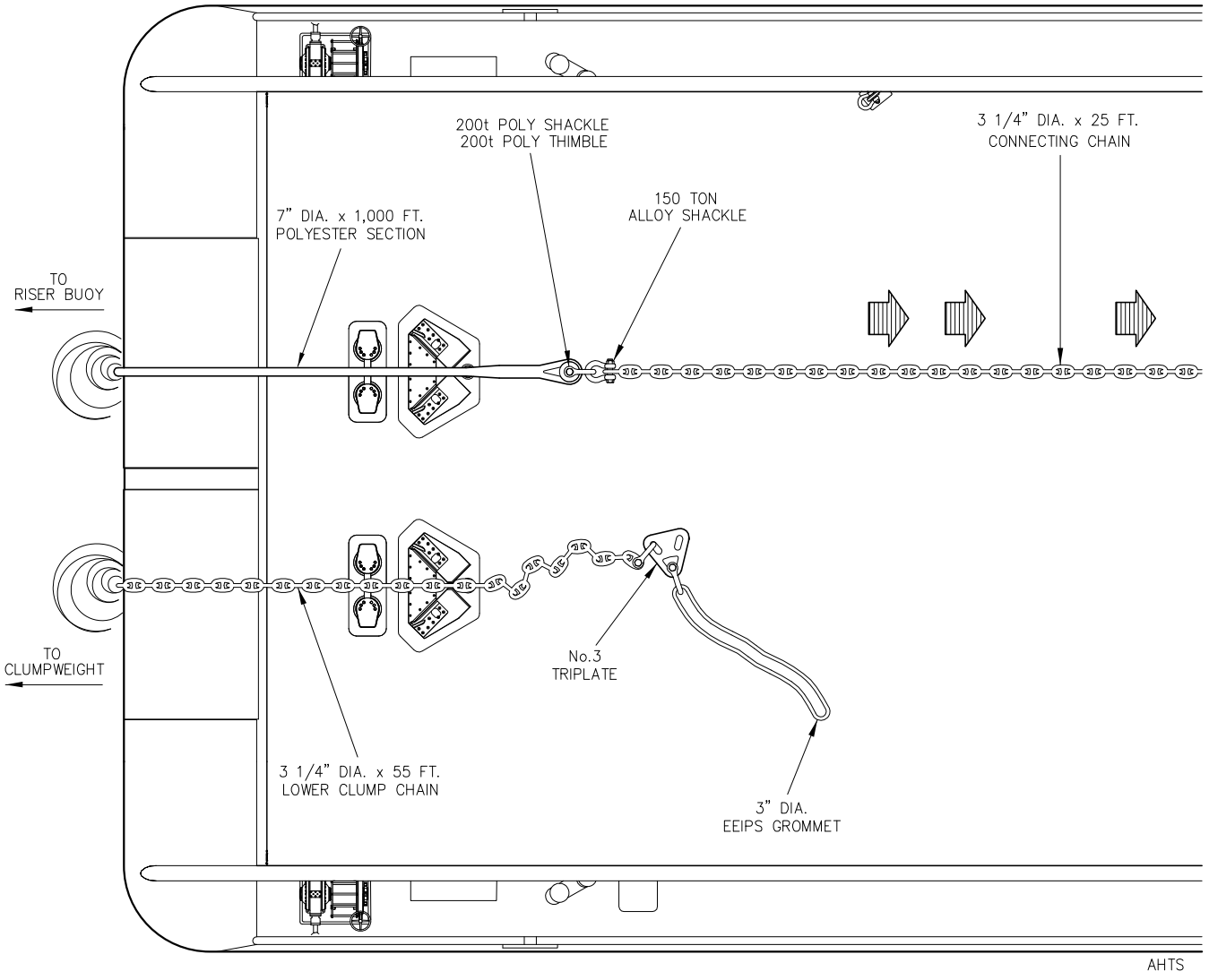
(USING RECOVERY VESSEL AND AHTS)

- DISCONNECT CONNECTING CHAIN FROM UPPER TRIPLATE.
- ATTACH WORK WIRE TO CONNECTING CHAIN.
- DISCONNECT ROV HOOK ASSEMBLY.

FIGURE 7

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/29/10 Time: 08:06:09 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-08.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

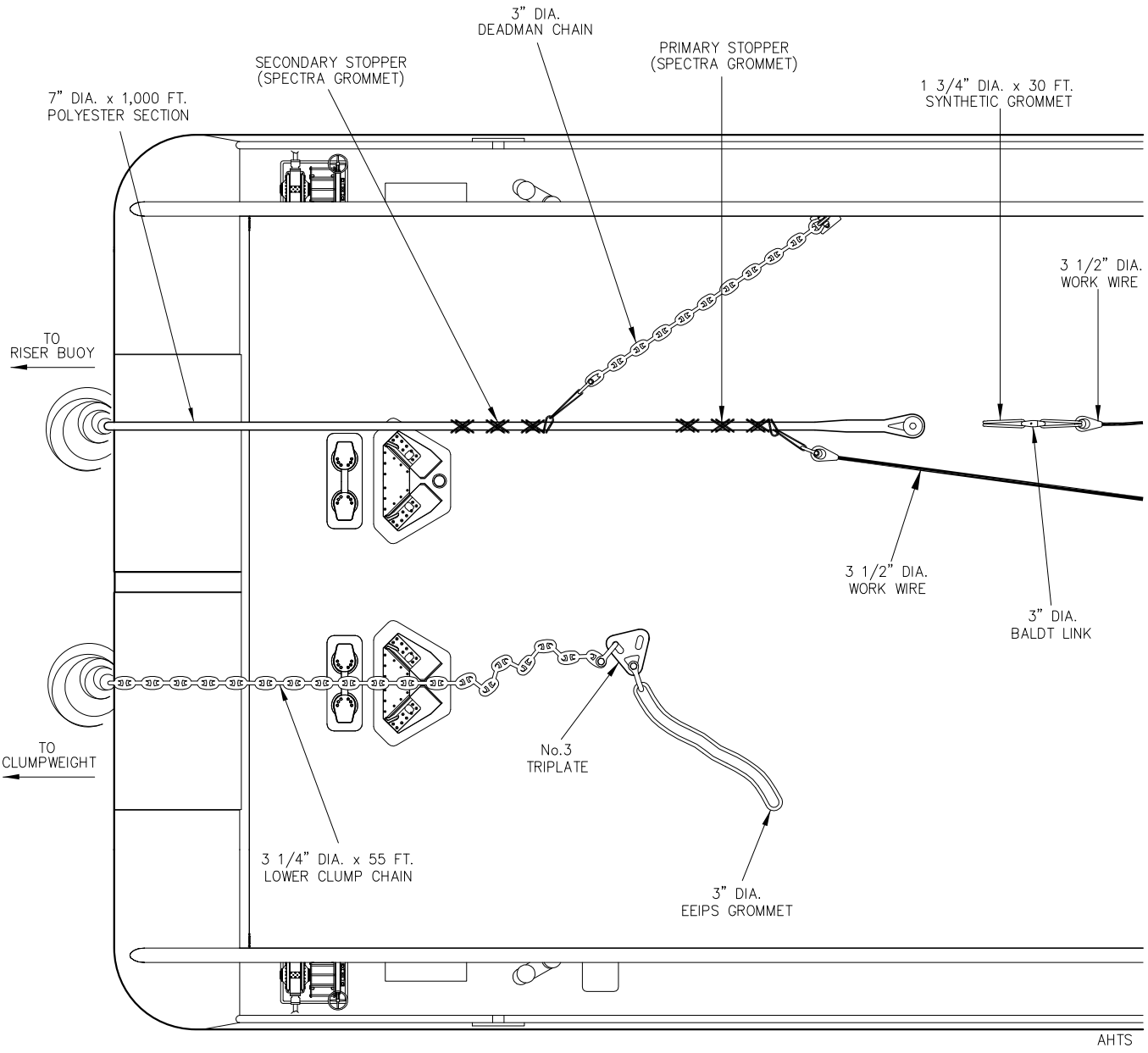
(USING RECOVERY VESSEL AND AHTS)

- RECOVER CONNECTING CHAIN UNTIL POLYESTER CAN BE SECURED ON DECK.

FIGURE 8

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/15/10 Time: 07:23:55 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-09.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

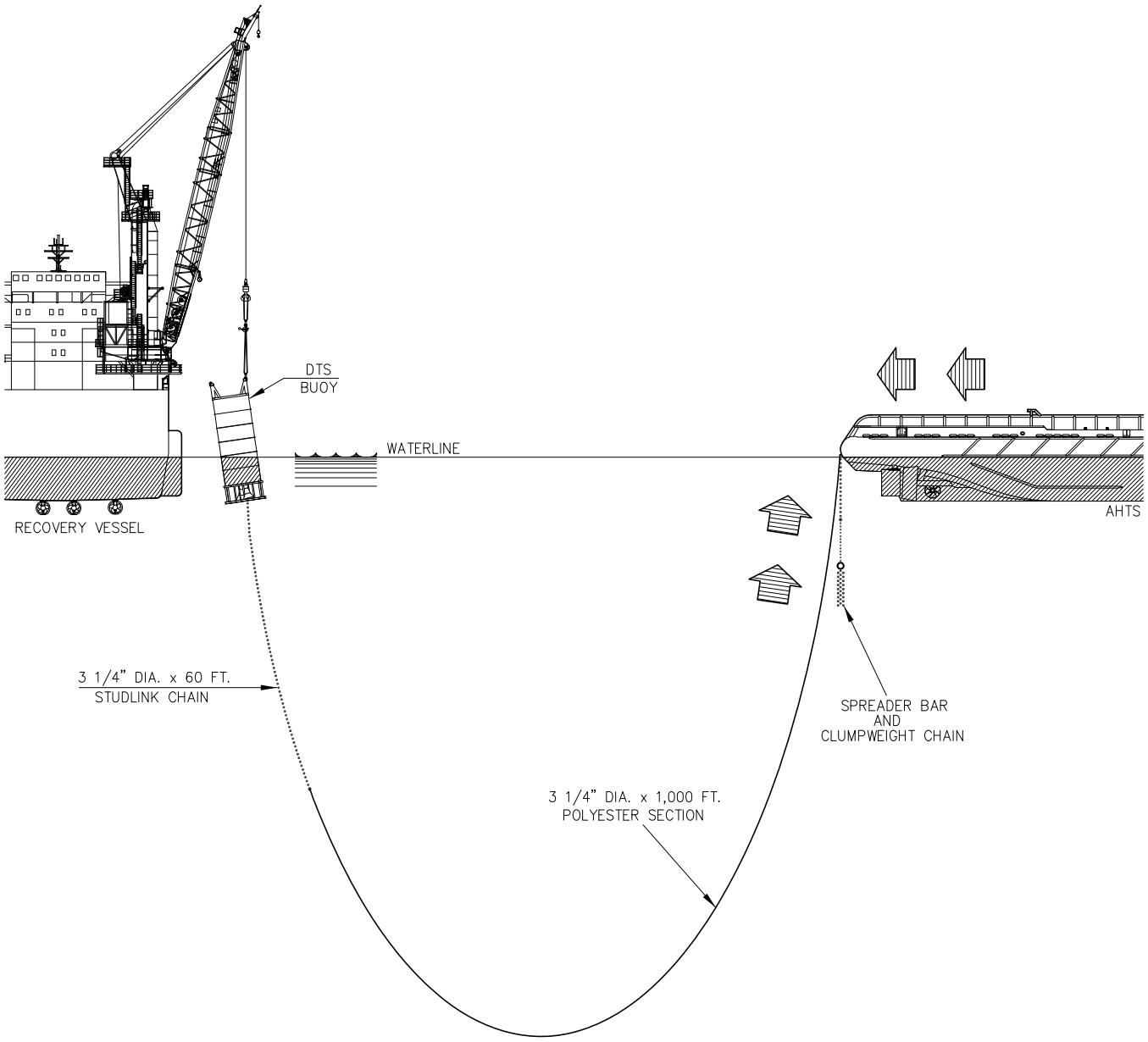
(USING RECOVERY VESSEL AND AHTS)

- THE END OF 1,000 FT. SECTION OF POLYESTER IS SECURED WITH CHINESE STOPPERS.
- THE POLYESTER IS CONNECTED TO THE TOW DRUM AND RECOVERED.

FIGURE 9

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:52:34 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-10.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

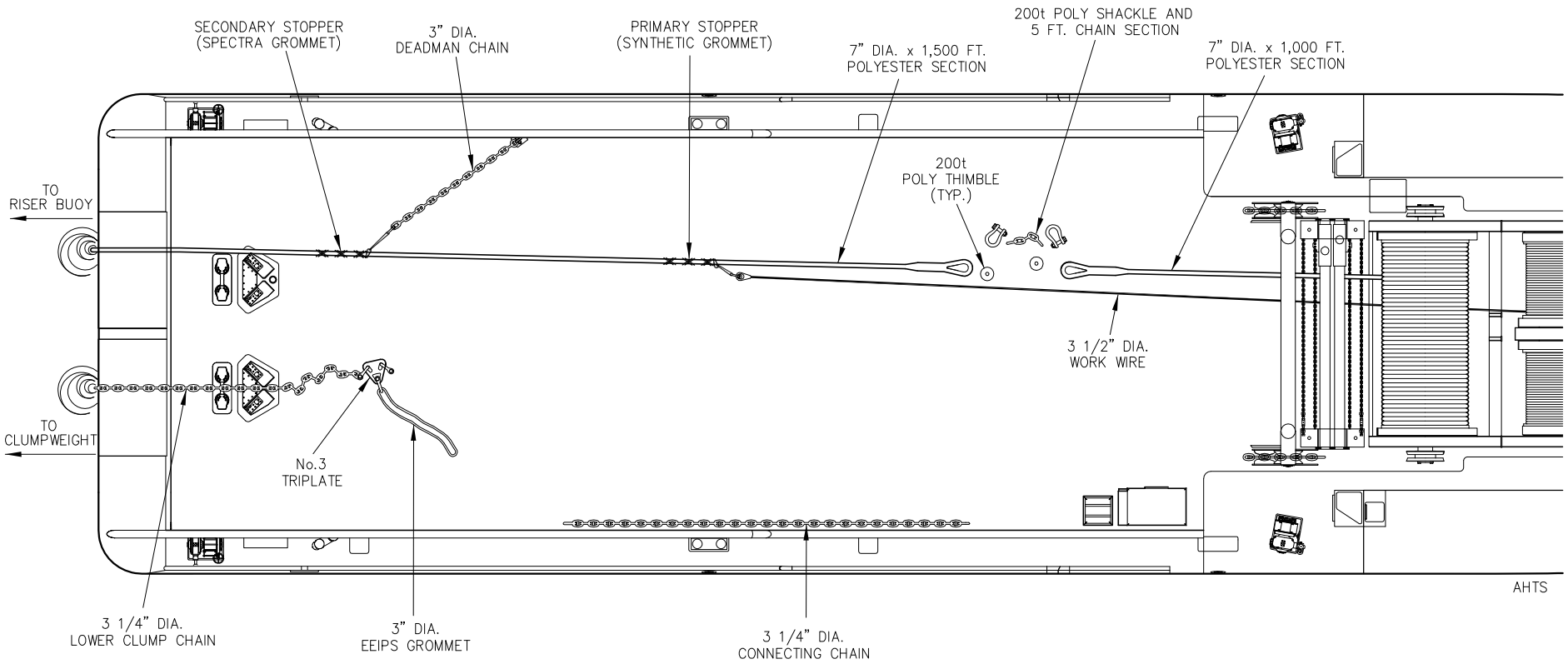
(USING RECOVERY VESSEL AND AHTS)

- THE AHTS CONTINUES TO RECOVER THE POLYESTER, WHILE MOVING TOWARDS THE DTS BUOY.

FIGURE 10

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/15/10 Time: 07:23:43 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-11.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

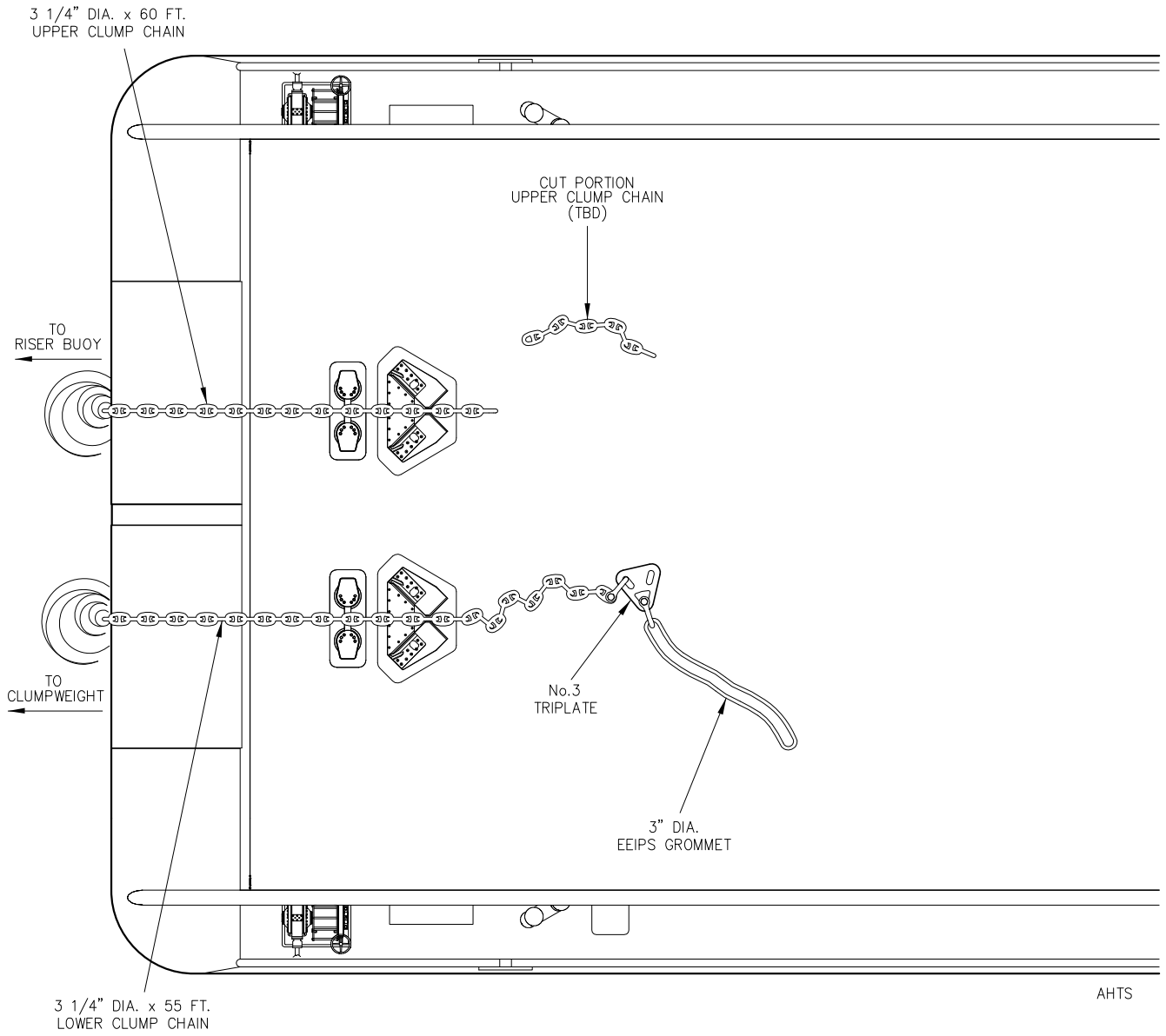
(USING RECOVERY VESSEL AND AHTS)

- THE END OF THE 1,500 FT. SECTION OF POLYESTER IS SECURED WITH CHINESE STOPPERS.
- THE POLYESTER SECTIONS ARE DISCONNECTED.

FIGURE 11

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/15/10 Time: 07:23:37 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-12.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

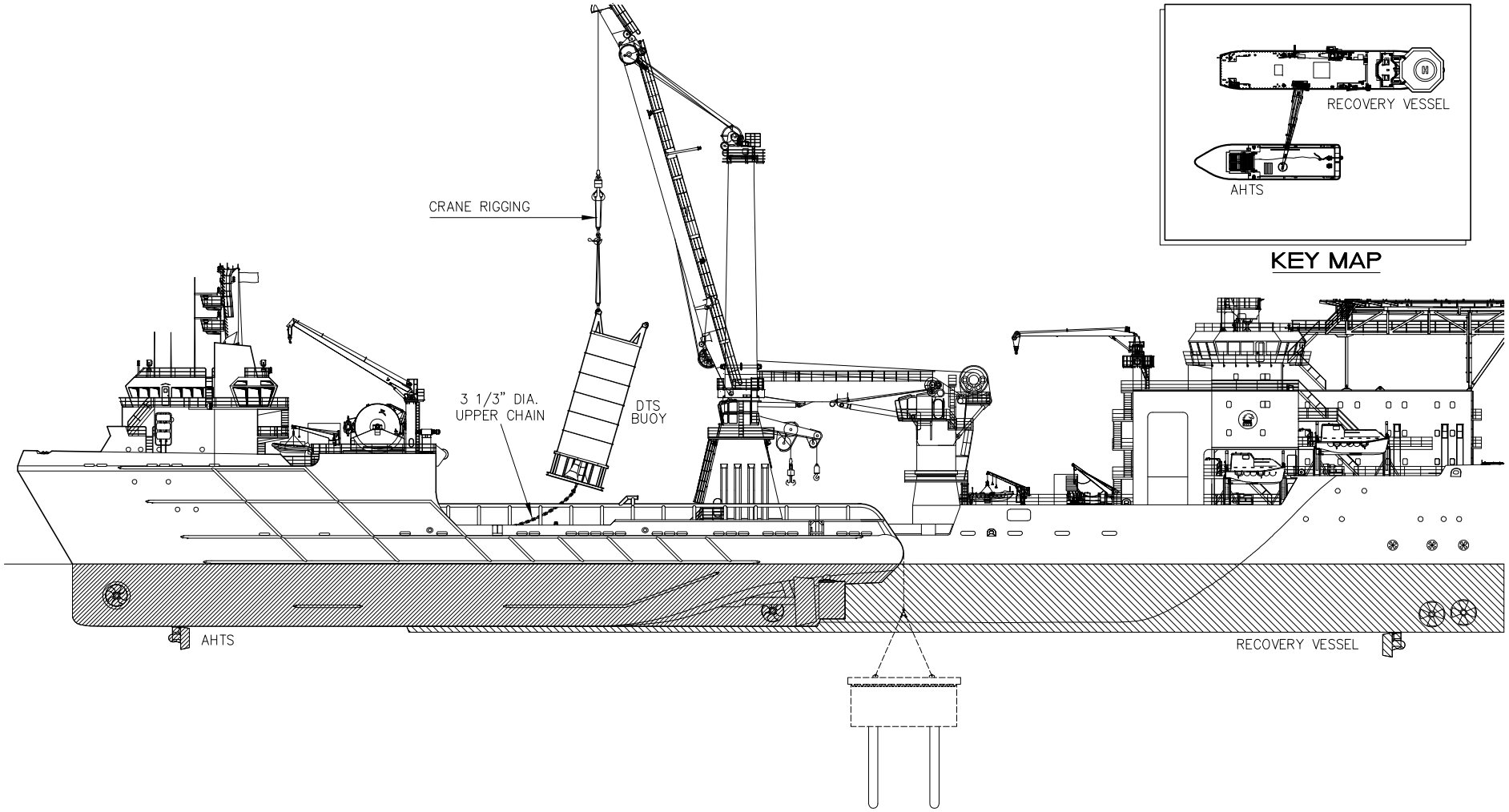
(USING RECOVERY VESSEL AND AHTS)

- CONTINUE POLYESTER RECOVERY UNTIL THE UPPER CLUMP CHAIN IS RECOVERED.
- THE 2,000 FT. POLYESTER SECTION IS DISCONNECTED FROM UPPER CLUMP CHAIN.
- MAY NEED TO CUT THE UPPER CHAIN TO APPROPRIATE LENGTH.

FIGURE 12

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 13:37:29 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-13.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

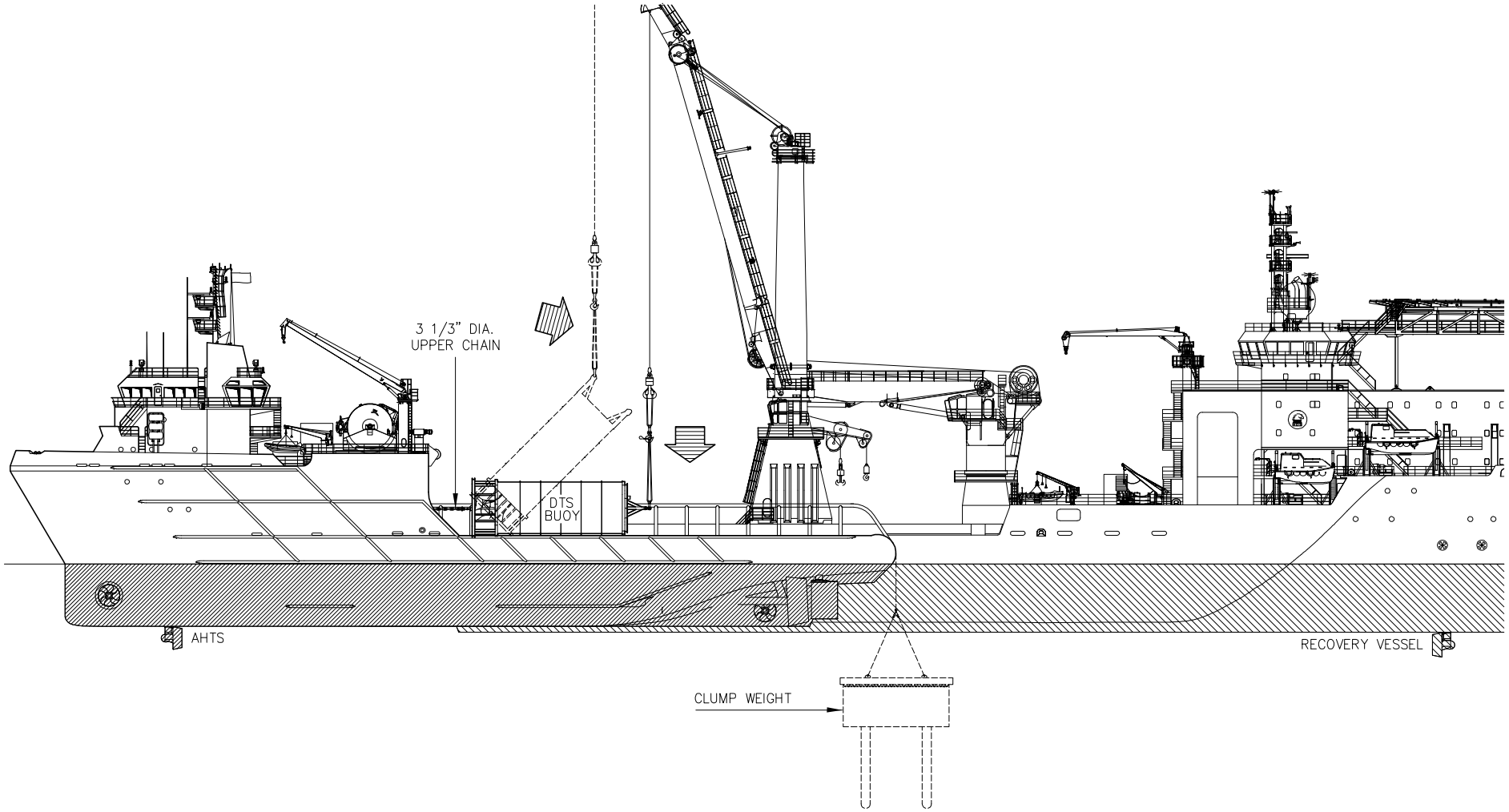
(USING RECOVERY VESSEL AND AHTS)

- AHTS WILL CONNECT WORK WIRE TO UPPER CHAIN.
- AHTS RELEASES UPPER CHAIN FROM SHARK JAWS.
- CRANE WILL POSITION DTS OVER AHTS DECK.

FIGURE 13

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:52:22 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-14.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

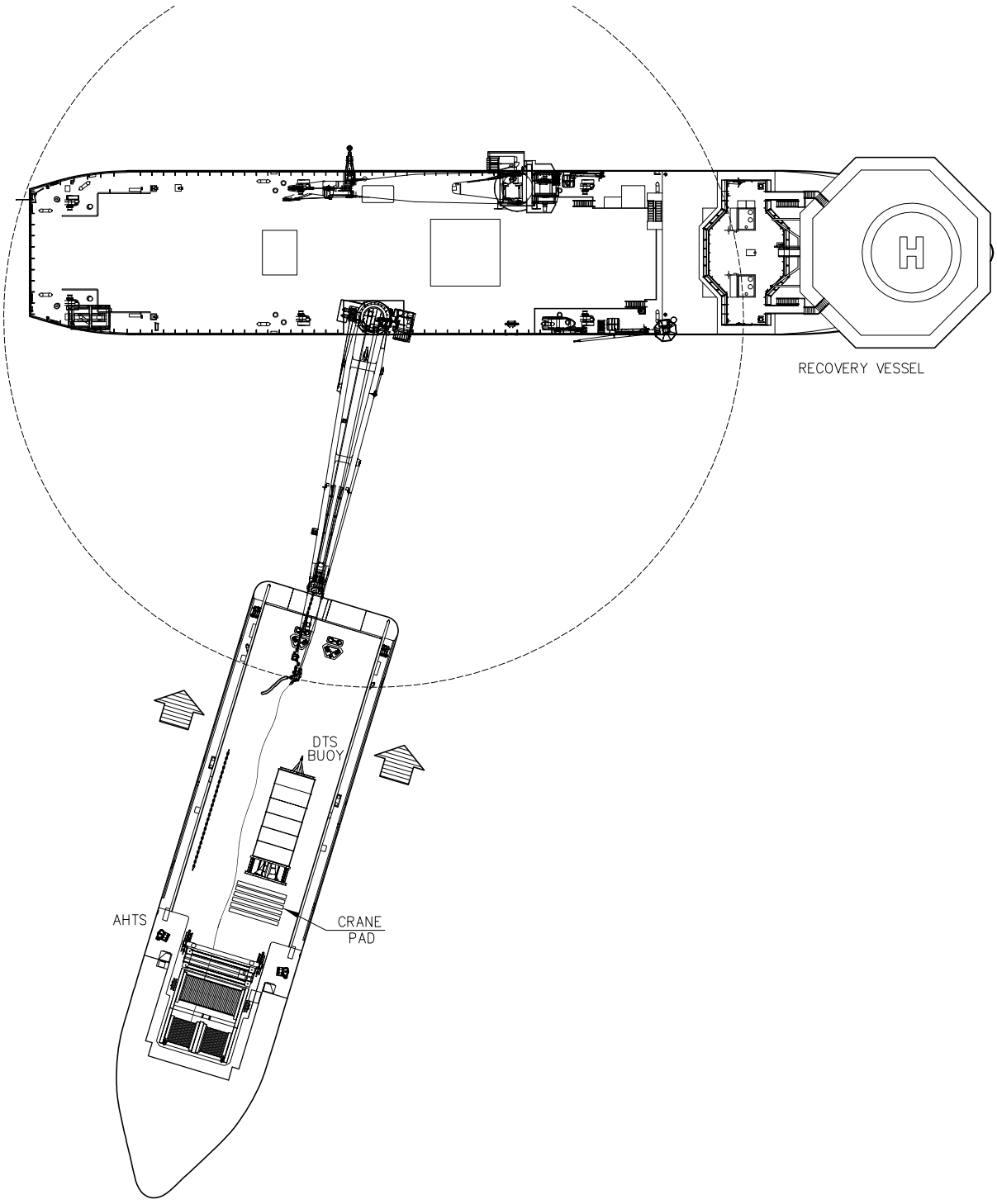
(USING RECOVERY VESSEL AND AHTS)

- AHTS TENSIONS UP ON CHAIN.
- THE REVOVERY VESSEL WILL SET THE DTS BUOY ON THE DECK OF THE AHTS.
- CONNECT SEAFASTENING TO DTS BUOY, THEN RELEASE CRANE.

FIGURE 14

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 14:24:50 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-15.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

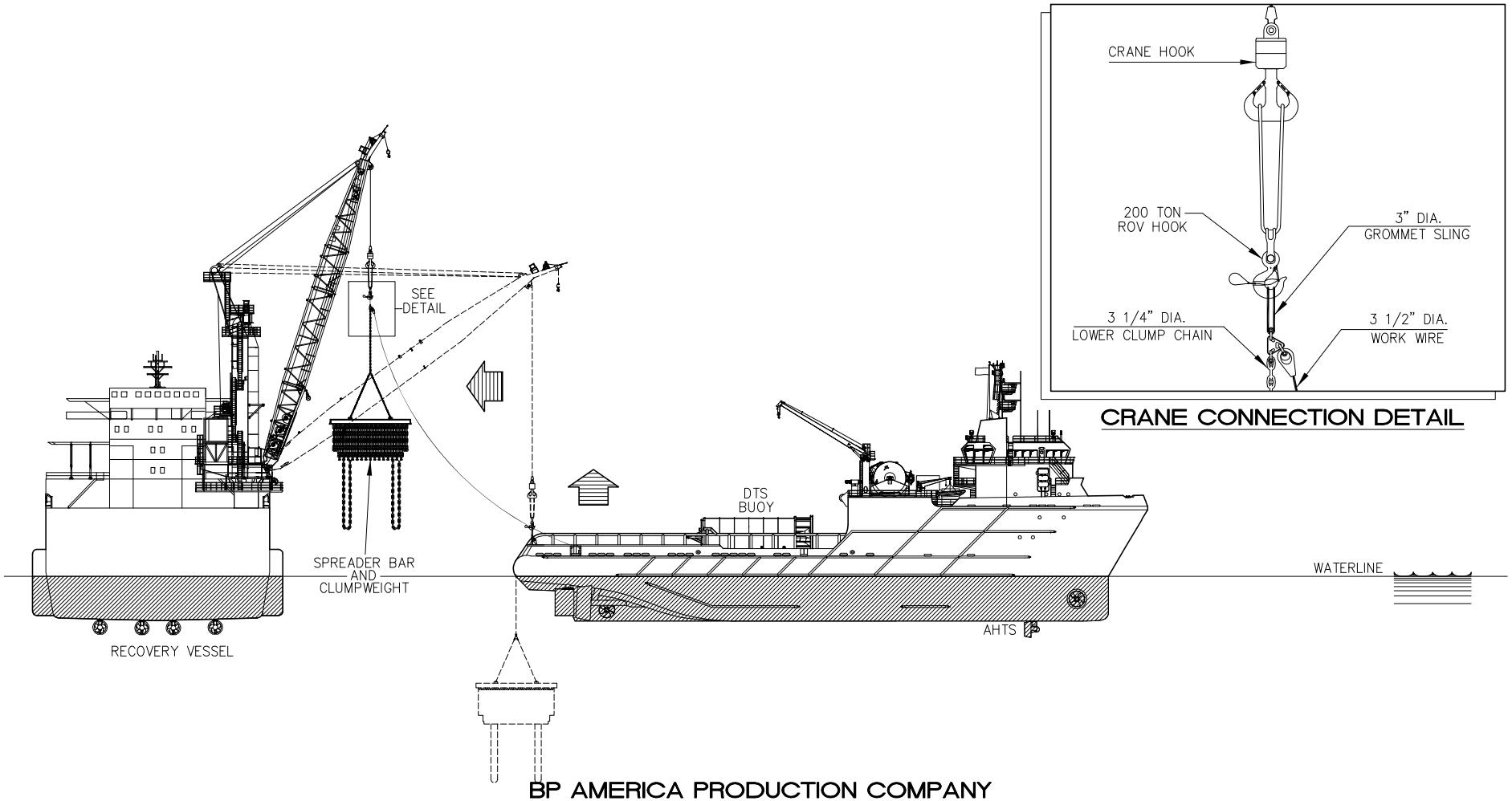
(USING RECOVERY VESSEL AND AHTS)

- AHTS WILL REPOSITION UNDER CRANE.

FIGURE 15

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:52:14 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-16.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

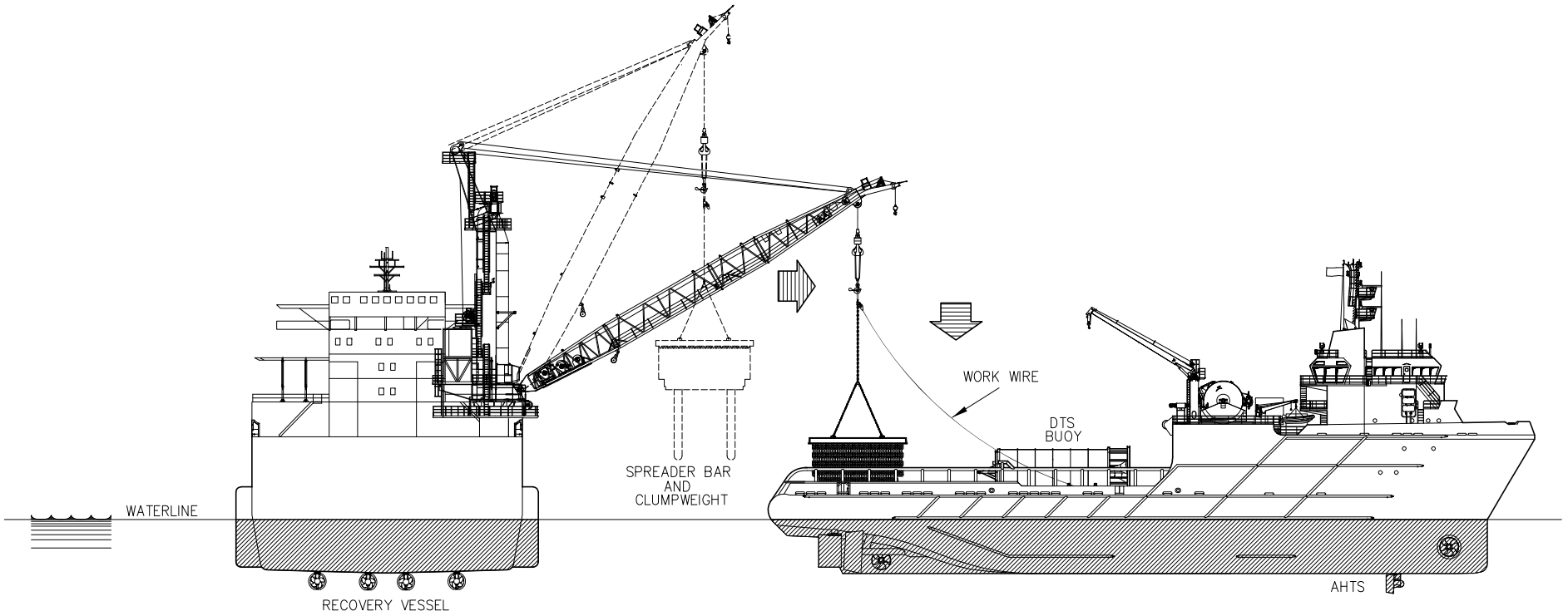
(USING RECOVERY VESSEL AND AHTS)

- CONNECT CRANE BLOCK TO 3" GROMMET ON THIRD SLOT OF TRIPLATE.
- CRANE TAKES THE LOAD OF CLUMP WEIGHT AND SHARK JAWS ARE RELEASED.
- CRANE LIFTS CLUMP WEIGHT OUT OF WATER WHILE AHTS PAYS OUT WORK WIRE.

FIGURE 16

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 07:52:06 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\11327_C1_FIG-17.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

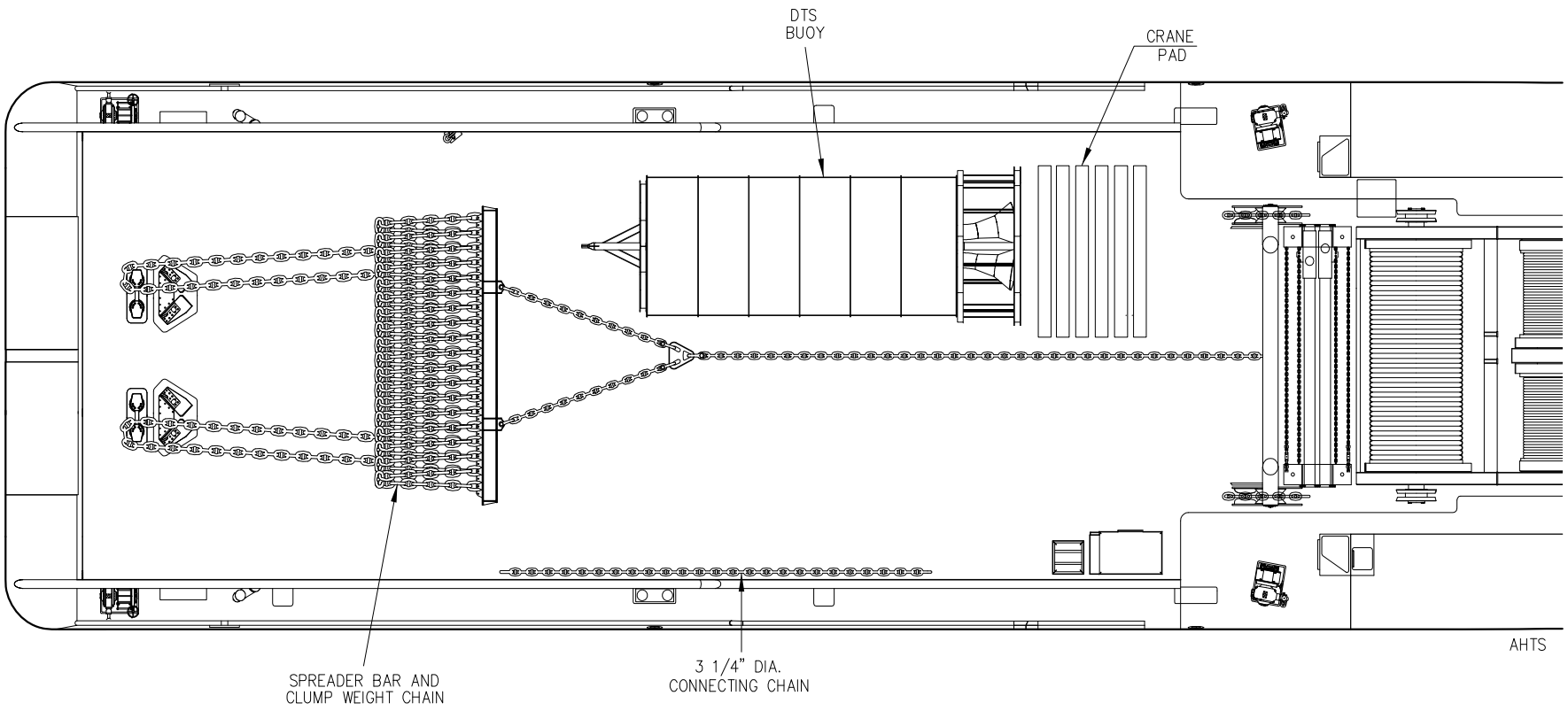
DTS/CLUMP WEIGHT RECOVERY PROCEDURES

(USING RECOVERY VESSEL AND AHTS)

- THE RECOVERY VESSEL WILL LOWER THE SPEADER BAR TO AHTS DECK AS AHTS RECOVERS WORK WIRE.
- THE RECOVERY VESSEL CRANE IS DISCONNECTED FROM THE TRI-PLATE AND GROMMET.

INTERMOOR

FIGURE 17



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT RECOVERY PROCEDURES

(USING RECOVERY VESSEL AND AHTS)

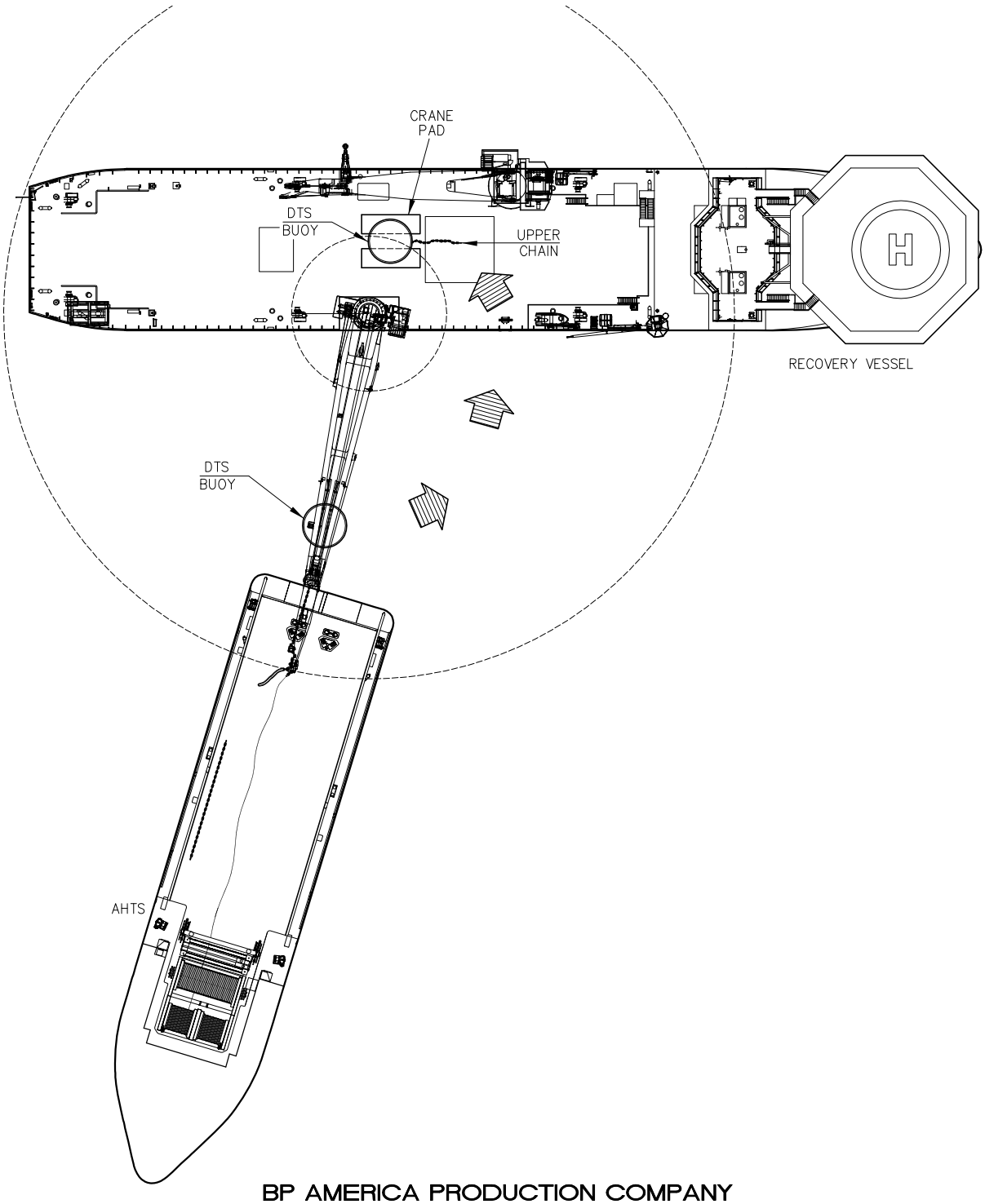
- THE DECK IS PREPARED FOR TRANSIT.

INTERMOOR

FIGURE 18

Appendix D: Contingency DTS Buoy Recovery Procedure Drawings

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 10:33:25 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\OPTION 2\11327_02_FIG-01.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT CONTINGENCY RECOVERY PROCEDURES

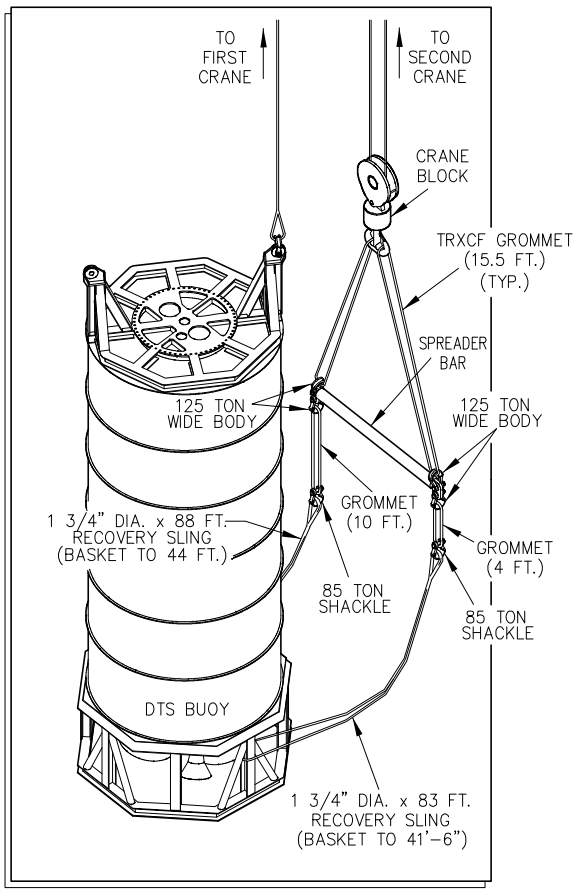
(USING RECOVERY VESSEL AND AHTS)

- OPEN THE JAW TO TRIP THE UPPER CHAIN.
- CRANE WILL SWING BOOM UNTIL DTS IS OVER RECOVERY DECK.
- CRANE WILL LOWER DTS TO LAND IN A VERTICAL POSITION ON THE CRANE PADS.

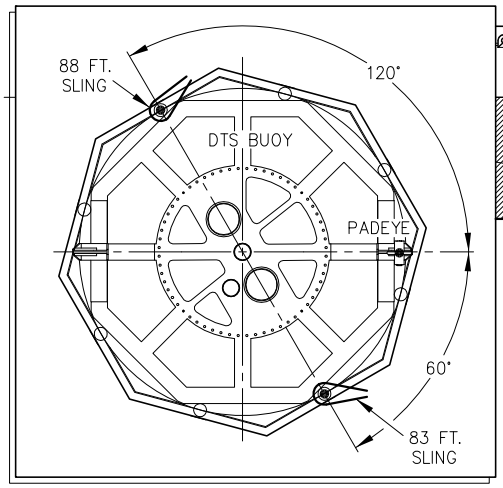
FIGURE 1

INTERMOOR

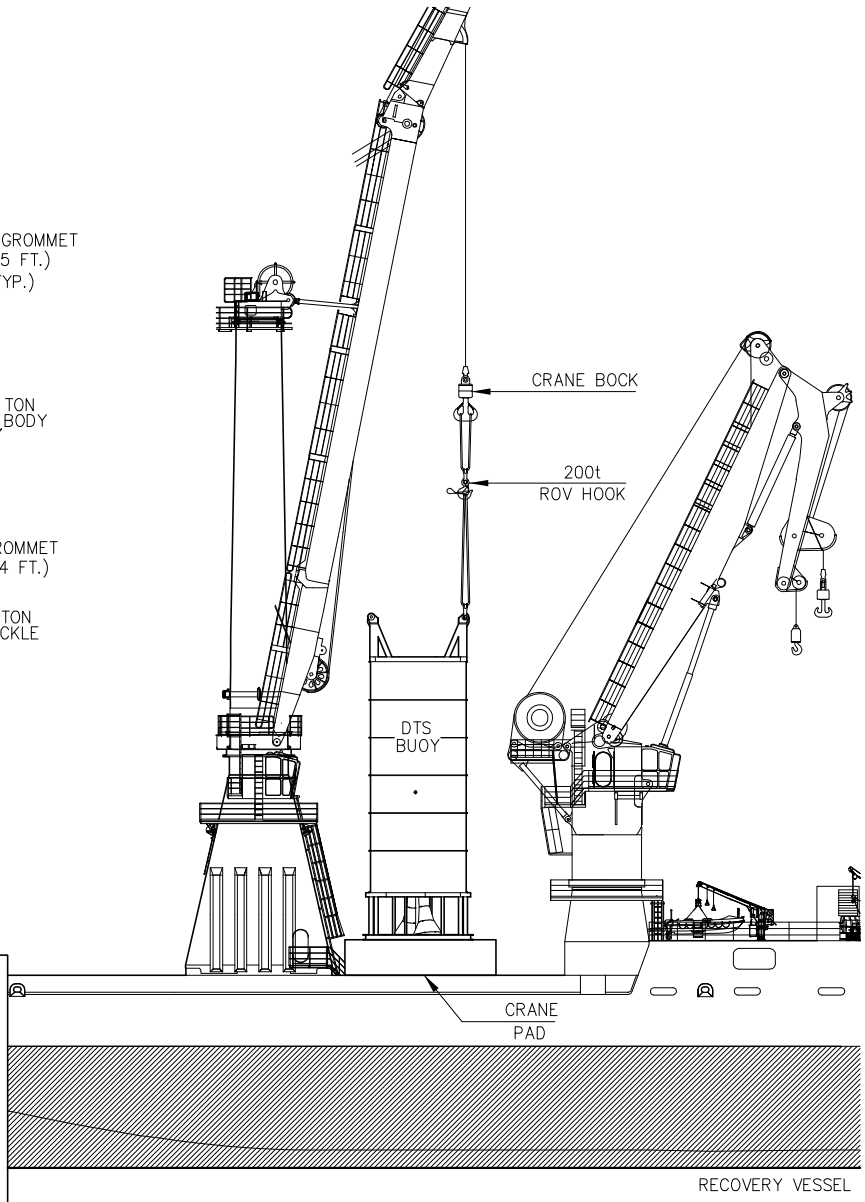
Operator: DEOPL03 Last Rev. Date: 12/30/10 Time: 11:42:07 File Name: P:\11300\11327\RECOVERY\OPTION- 2\11327_02_FIG-02.DWG Project Code: 11327-01



DTS BUOY RIGGING DETAIL



SLING ORIENTATION PLAN



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT CONTINGENCY RECOVERY PROCEDURES

(USING RECOVERY VESSEL AND AHTS)

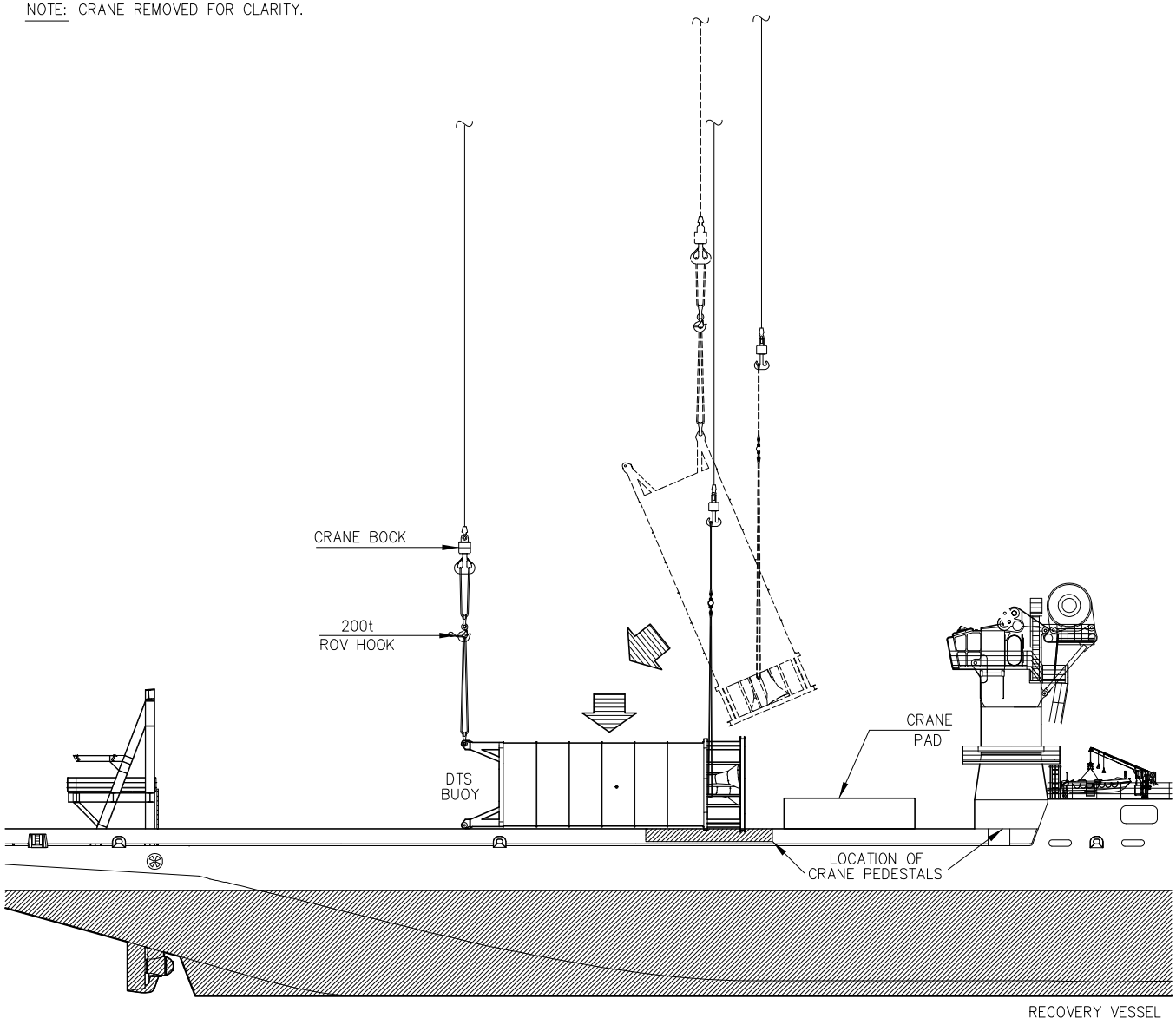
● CONNECT LOWER RIGGING TO BOTTOM STRUCTURE OF DTS.

FIGURE 2

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 14:51:03 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\OPTION 2\11327_02_FIG-03.DWG Project Code: 11327-01

NOTE: CRANE REMOVED FOR CLARITY.



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT CONTINGENCY RECOVERY PROCEDURES

(USING RECOVERY VESSEL AND AHTS)

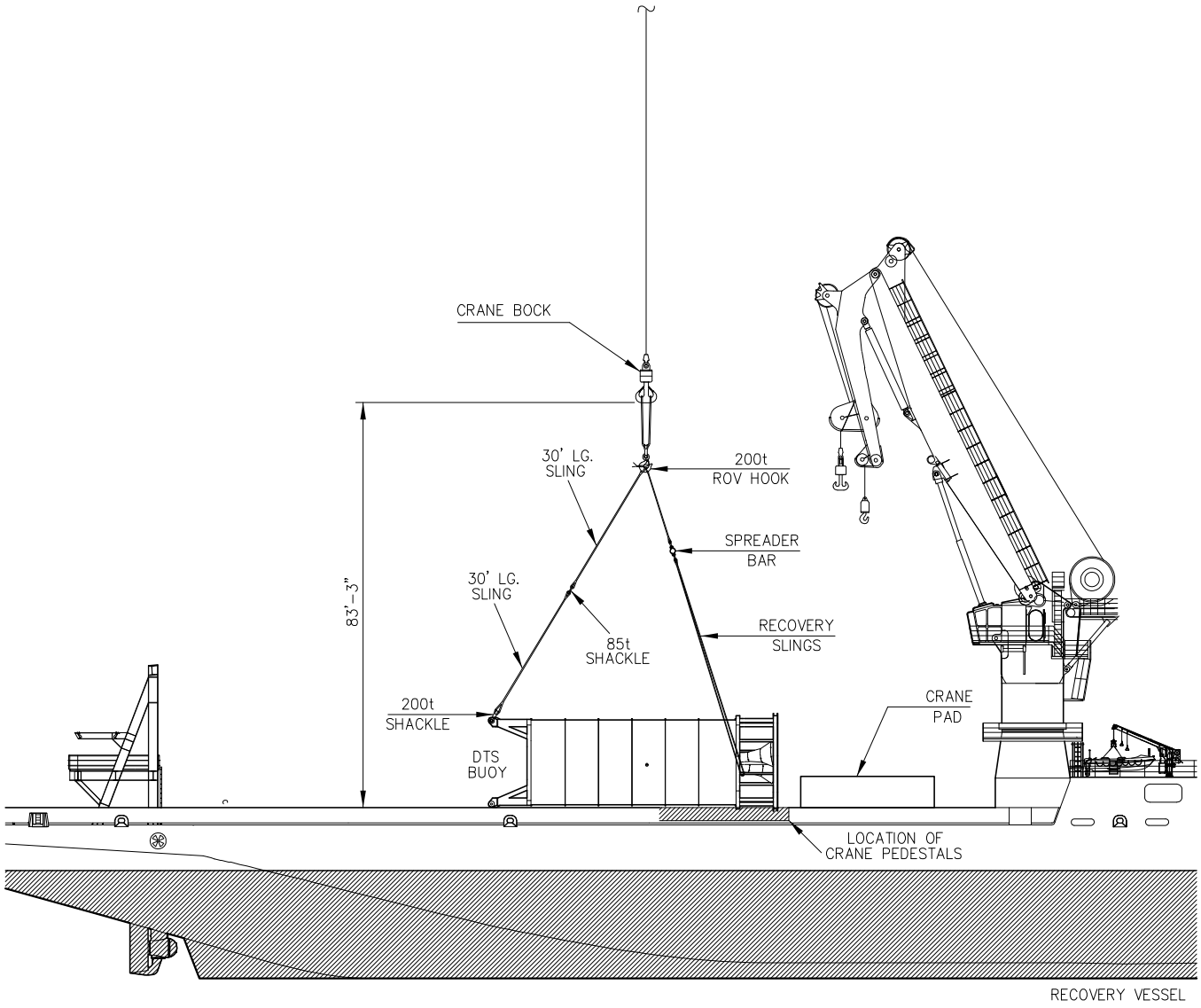
- CRANE WILL PICK UP DTS AND ROTATE TO HORIZONTAL POSITION.

FIGURE 3

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/29/10 Time: 08:42:18 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\OPTION 2\11327_02_FIG-04.DWG Project Code: 11327-01

NOTE: CRANE REMOVED FOR CLARITY.



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT CONTINGENCY RECOVERY PROCEDURES

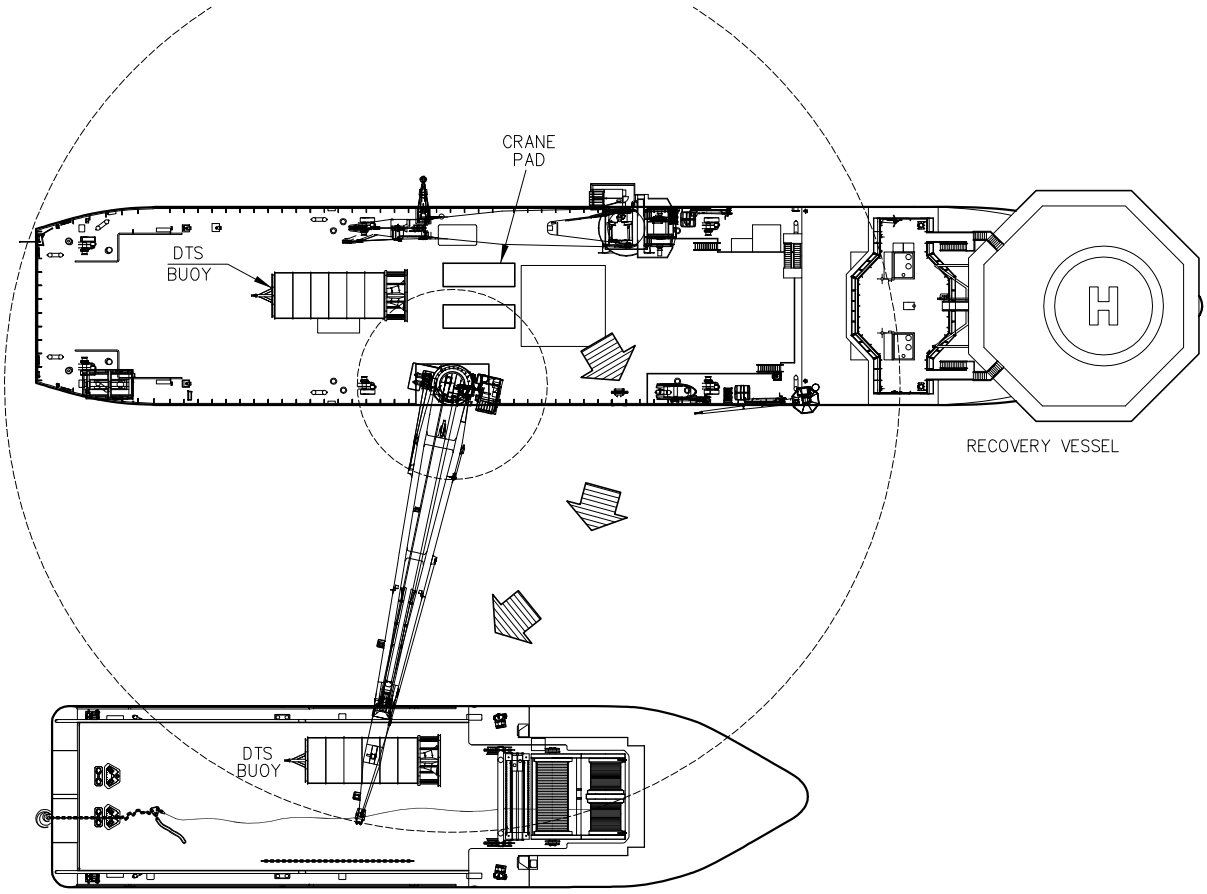
(USING RECOVERY VESSEL AND AHTS)

- CRANES WILL SET DTS ON DECK OF IRON HORSE JUST AFT OF CRANE PAD.
- RE RIG DTS FOR SINGLE CRANE LIFT.

FIGURE 4

INTERMOOR

Operator: DEOPL03 Last Rev. Date: 12/17/10 Time: 13:30:33 File Name: P:\11300\11327\RECOVERY\1-CRANE OPTION\OPTION 2\11327_02_FIG-05.DWG Project Code: 11327-01



BP AMERICA PRODUCTION COMPANY

DTS BUOY AND CLUMP WEIGHT RECOVERY AT MC-252

DTS/CLUMP WEIGHT CONTINGENCY RECOVERY PROCEDURES

(USING RECOVERY VESSEL AND AHTS)

- CRAN WILL LIFT AND TRANSFER DTS TO AHTS.

FIGURE 5

INTERMOOR

Appendix E: Clump Weight As-Builts

Macondo MC-252 - DTS Buoy Installation - July 2010
As-Built Information Sheet
130 Ton Tether and Clump Weight
Installation Job # 11225-04

Item #	Description	Length / Size	Owner	Certificate or Serial #'s	Notes / Comments	Wet Weight (lbs)	Wet Weight (m.ton)
	DTS Clump Weight Attachment	-	Helix	N/A		-	-
1	175t super shackle	175mT	Helix	LR ROT 0914617-41		307	0.14
2	150t super shackle	150mT	Helix	LR ROT 0804039-22		215	0.10
3	3.25" studlink upper chain	60' x 3.25"	Helix	3463-70		5,238	2.38
4	150t super shackle	150mT	Helix	LR ROT 0804039-38		215	0.10
5	200t elongated poly shackle	200mT	Helix	3507-26		390	0.18
6	Polyester Thimble	200mT	Helix	3508-106		350	0.16
7	7" polyester rope	2,000' x 7"	Helix	700P-0013		7,000	3.18
8	Polyester Thimble	200mT	Helix	3508-90		350	0.16
9	200t elongated poly shackle	200mT	Helix	3507-55		390	0.18
10	3.625" studless chain	5' x 3.625"	Helix	No Tag		494	0.22
11	200t elongated poly shackle	200mT	Helix	3507-23		390	0.18
12	Polyester Thimble	200mT	Helix	3508-109		350	0.16
13	7" polyester rope	1,500' x 7"	Helix	700P-0014		5,250	2.38
14	Polyester Thimble	200mT	Helix	3508-97		350	0.16
15	200t elongated poly shackle	200mT	Helix	3507-07		390	0.18
16	3.625" studless chain	5' x 3.625"	Helix	No Tag		494	0.22
17	200t elongated poly shackle	200mT	Helix	3507-25		390	0.18
18	Polyester Thimble	200mT	Helix	3508-105		350	0.16
19	7" polyester rope	1,000' x 7"	Helix	700P-0045		3,500	1.59
20	Polyester Thimble	200mT	Helix	3508-101		350	0.16
21	200t elongated poly shackle	200mT	Helix	3507-15		390	0.18
22	150t super shackle	150mT	Helix	LR ROT 0707577-91		215	0.10
23	3.25" studlink connecting chain	25' x 3.25"	Helix	3463-90	23 links	2,183	0.99
24	150t super shackle	150mT	Helix	LR ROT 0804039-52		215	0.10
25	Triplate	No. 3	Helix	V-692		478	0.22
26	150t sling shackle	150mT	Helix	NTS0400352/29	hanging free	307	0.14
27	3" steel EEIPS grommet	20' x 3"	Helix	C1-08299-2-1	hanging free	552	0.25
28	150t super shackle	150mT	Helix	LR ROT 080439-40		215	0.10
29	3.25" studlink lower chain	55' x 3.25"	Helix	3463-77	50 links	4,802	2.18
30	150t super shackle	150mT	Helix	LR ROT 0707555-12		215	0.10
31	Triplate	No. 3	Helix	U-1067		478	0.22
32	Two (2) 120t super shackle	120mT	Helix	Not Recorded		268	0.12
33	Two (2) 3.25" studlink bridle chain	20' x 3.25"	Helix	3463-76 & 3463-76A	17 links each	3,492	1.58
34	Two (2) 120t super shackle	120mT	Helix	Not Recorded		268	0.12
35	Spreader Beam	-	Helix	S.B. 01		13,225	6.00
36	Two (2) 120t sling shackle	120mT	Helix	Not Recorded		420	0.19
37	(14) 4.75" Studlink Chain Shots	90' x 4.75"	Helix	No Tag	1260' = 798 links	234,990	106.59
						289,474 lb	**131.3 m.ton**

Macondo MC-252 - DTS Buoy Installation - July 2010
As-Built Information Sheet
No. 1 - 13 Ton Additional Chain
Installation Job # 11225-04

Item #	Description	Length / Size	Owner	Certificate or Serial #'s	Notes / Comments	Wet Weight (lbs)	Wet Weight (m.ton)
	3.25" studlink lower chain	-	Helix		Accounted for in clump weight	-	-
1	110t elongated d-shackle	110mt	Helix	N/A		134	0.06
2	85t shackle	85mt	Helix	N/A		120	0.05
3	1 1/2" steel sling	30' x 1.5"	Helix	N/A		104	0.05
4	4.75" studlink chain	90' x 4.75"	Helix	N/A	57 links	16,785	7.61
5	85t shackle	85mt	Helix	N/A		120	0.05
6	3.5" synthetic recovery sling	25' x 3.5"	Helix	N/A	Spectra - MBS=720 kip	N/A	N/A
7	200t elongated poly shackle	200mT	Helix	N/A		390	0.18
8	4.75" studlink chain	58' x 4.75"	Helix	N/A	37 links	10,817	4.91
						28,470 lb	**12.9 m.ton**

Macondo MC-252 - DTS Buoy Installation - July 2010
As-Built Information Sheet
No. 2 - 6 Ton Additional Chain
Installation Job # 11225-04

Item #	Description	Length / Size	Owner	Certificate or Serial #'s	Notes / Comments	Wet Weight (lbs)	Wet Weight (m.ton)
	3.25" studlink lower chain	-	Helix		Accounted for in Added Chain No. 1	-	-
	110t elongated d-shackle	-	Helix		Accounted for in Added Chain No. 1	-	-
	85t shackle	-	Helix		Accounted for in Added Chain No. 1	-	-
1	1 1/2" steel sling	30' x 1.5"	Helix	N/A		104	0.05
2	3.25" studlink chain	150' x 3.25"	Helix	N/A		13,095	5.94
						13,199 lb	**6 m.ton**

Macondo MC-252 - DTS Buoy Installation - July 2010
As-Built Information Sheet
No. 3 - 13 Ton Additional Chain
Installation Job # 11225-04

Item #	Description	Length / Size	Owner	Certificate or Serial #'s	Notes / Comments	Wet Weight (lbs)	Wet Weight (m.ton)
	3.25" studlink lower chain	-	Helix		Accounted for in clump weight	-	-
1	110t elongated d-shackle	110mt	Helix	N/A		134	0.06
3	1 1/2" steel sling	30' x 1.5"	Helix	N/A		104	0.05
4	4.75" studlink chain	90' x 4.75"	Helix	N/A	57 links	16,785	7.61
5	85t shackle	85mt	Helix	N/A		120	0.05
6	3.5" synthetic recovery sling	25' x 3.5"	Helix	N/A	Spectra - MBS=720 kip	N/A	N/A
7	200t elongated poly shackle	200mT	Helix	N/A		390	0.18
8	4.75" studlink chain	63' x 4.75"	Helix	N/A	40 links	11,750	5.33
						29,282 lb	**13.3 m.ton**

Macondo MC-252 - DTS Buoy Installation - July 2010
As-Built Information Sheet
No. 4 - 15 Ton Additional Chain
Installation Job # 11225-04

Item #	Description	Length / Size	Owner	Certificate or Serial #'s	Notes / Comments	Wet Weight (lbs)	Wet Weight (m.ton)
	3.25" studlink lower chain	-	Helix		Accounted for in clump weight	-	-
1	110t elongated d-shackle	110mt	Helix	N/A		134	0.06
2	1 1/2" steel sling	30' x 1.5"	Helix	N/A		104	0.05
3	4.75" studlink chain	90' x 4.75"	Helix	N/A	57 links	16,785	7.61
4	85t shackle	85mt	Helix	N/A		120	0.05
5	1.75" synthetic grommet	50' x 1.75"	Helix	N/A	Amsteel Blue - MBS=483 kips	N/A	N/A
6	4 3/4" kenter link	425mt	Helix	N/A		360	0.16
7	4.75" studlink chain	90' x 4.75"	Helix	N/A	57 links	16,785	7.61
						34,288 lb	**15.5 m.ton**