

	OFFSHORE CONSTRUCTION SPECIALISTS PILE HANDLING SYSTEM FOR OCS WEB	  URS is a member of Registrar of Standards (Holdings) Ltd.
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OCS provides equipment and engineering service for various offshore pile handling services.

1.0 PILE INTERNAL LIFTING TOOL (ILT)

OCS ILT is designed for fail safe lifting of pipe/pile and structures. This lifting device which can be clamped to the open ended tube, e.g., conductors, foundation piles or caisson or line pipe, without having the need for welded attachment. With the tool clamped in the tubular, the tubular object can be lifted. The internal pile lifting tool can be inserted into a pile, either in a vertical or horizontal position. A stabbing cone at the bottom end of the clamp facilitates stabbing. The stopper plate on top of the ILT and guide spacers on the side of the ILT facilitates in positioning.

The horizontal pick-up arm, installed to handle the unloaded clamp horizontally, can easily be removed to allow passage of the tool through narrow pile guides. The clamp consists of a machined inner body with a padeye on top for lifting. The padeye is suited for a 500t shackle as a maximum.

Ten wedge assemblies are equally spaced around the circumference of the inner body. These wedge assemblies are provided with tungsten carbide segments, which grip themselves into the wall of the pile. The weight of the lifted object causes the tool to grip harder, when the grippers are in contact with the tubular inner wall before lifting commences. This is achieved by activating the hydraulic cylinder (double acting) built into the tool. The hydraulic cylinder pushes the grippers outwards to create the initial clamping force.

The clamp and release motion of a double acting hydraulic cylinder, integrated internally, are transferred to the outer wedges by the shell (guide pipe) of the clamp.

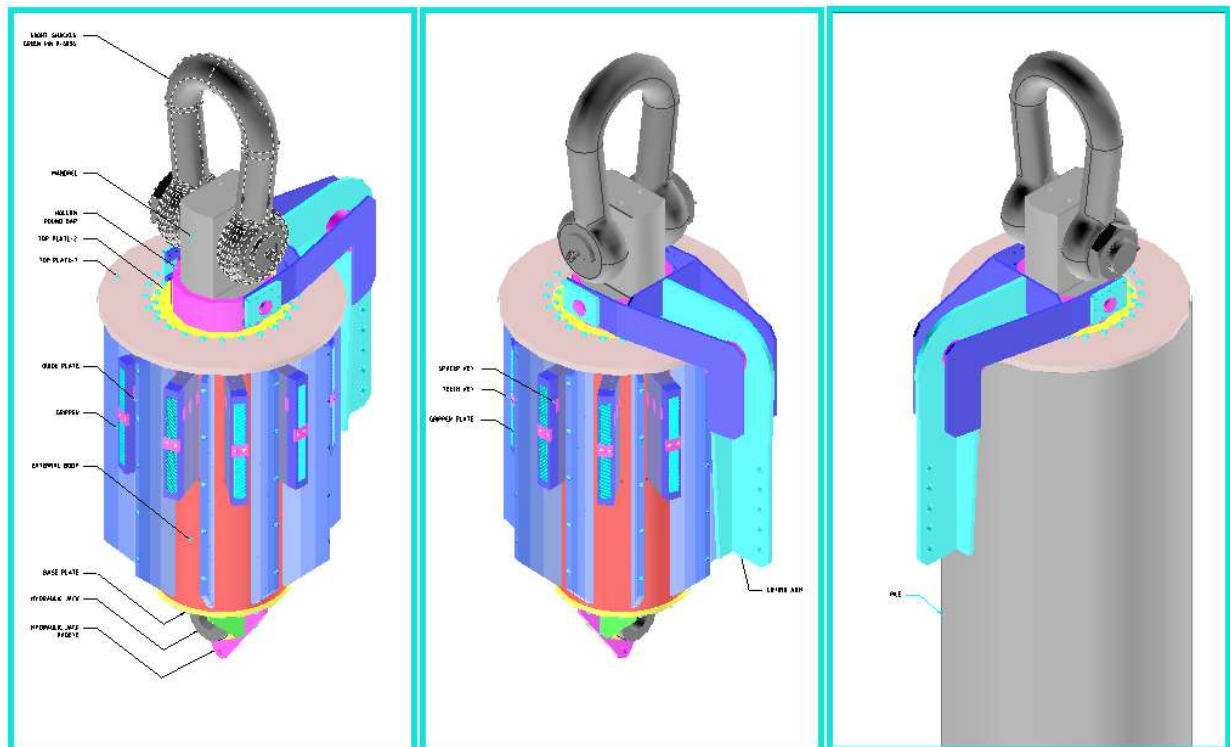
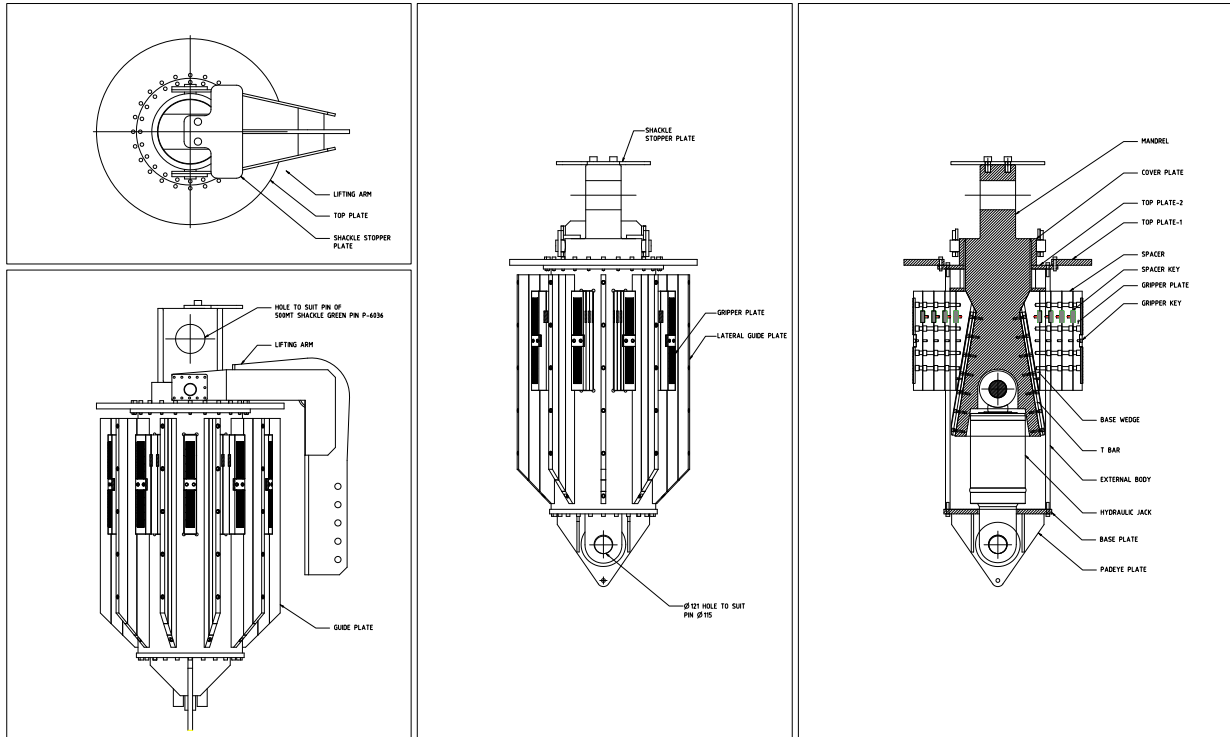
The ILT can be used for a range of tubular diameters and a range of wall thickness. This is done by extending the grippers. Extension of the grippers is achieved by mounting spacer bricks on the wedges. Depending on project requirements the ILT can be set up for pile OD: 30", 36", 42", 48" and 54".

Other application for the ILT:

- (1) For the use of recovering/lowering open pipeline from/to seabed, the ILT is termed "Pipeline Recovery Tool (PRT) and will utilize the same functions as the ILT however it will be equipped with a hot-stab connection to be enable the gripping function using ROV (future plan).
- (2) The ILT can be used for subsea frame lifting. This is done where the lifting points are rigged up to an open tubular section with external padeyes. The ILT is inserted into the open tubular and lift like a pile, but, is connected to rigging and a frame. The ILT can be inserted subsea and activated subsea and lift the subsea frame out to surface.

Description	Parameter (30" – 60")	Parameter (24" – 42")
Pile Diameter Range	30" – 60"	24" – 42"
Wall Thickness Range	12 mm – 60mm	12mm – 40mm
Vertical Working Load Limit	500 MT	330 MT
Horizontal Working Load Limit	125 MT	45 MT
Clamping Pressure	165 Bar	180 Bar

**the maximum allowable load may have to be adapted for thin wall piles/pipes*



PROJECT PHOTOS



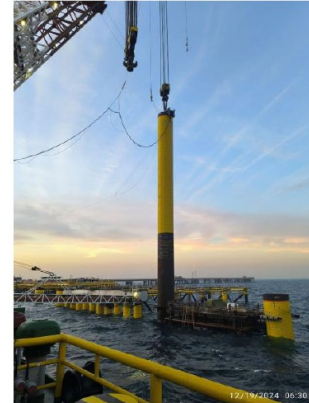
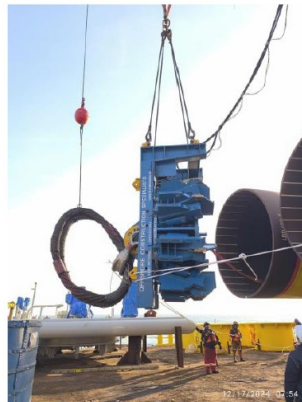
2.0 MONOPOD INTERNAL LIFTING TOOL (ILT)

Similar to our pile previous ILT, our latest 158"/ 4m ILT (patent pending) is an engineering marvel that has a vertical load limit of 800 MT and specifically suit for typical monopole or monopod structure. While large-diameter ILTs exist in the market, OCS introduced an innovative approach with a unique load path design, marking the first application of this concept.

The OCS ILT is distinguished by its use of individual wedges (8 in total) combined with an independent jacking system, which utilizes a total of 16 jacks. The tool is designed with eight-wedge assemblies, which are equally spaced around the circumference of the inner body. The grippers are designed like wedges which are pushed out of the tool hydraulically with 16 cylinders. These wedge assemblies are provided with hardened alloy steel gripping segments (buttons), which grip themselves into the wall of the pile when extended.

This innovative design ensured that the ILT performed exceptionally well.

Description	Parameter 158" (4m)
Pile Diameter Range	158"
Wall Thickness Range	65mm – 100mm
Vertical Working Load Limit	800 MT
Horizontal Working Load Limit	400 MT
Clamping Pressure	230 Bar

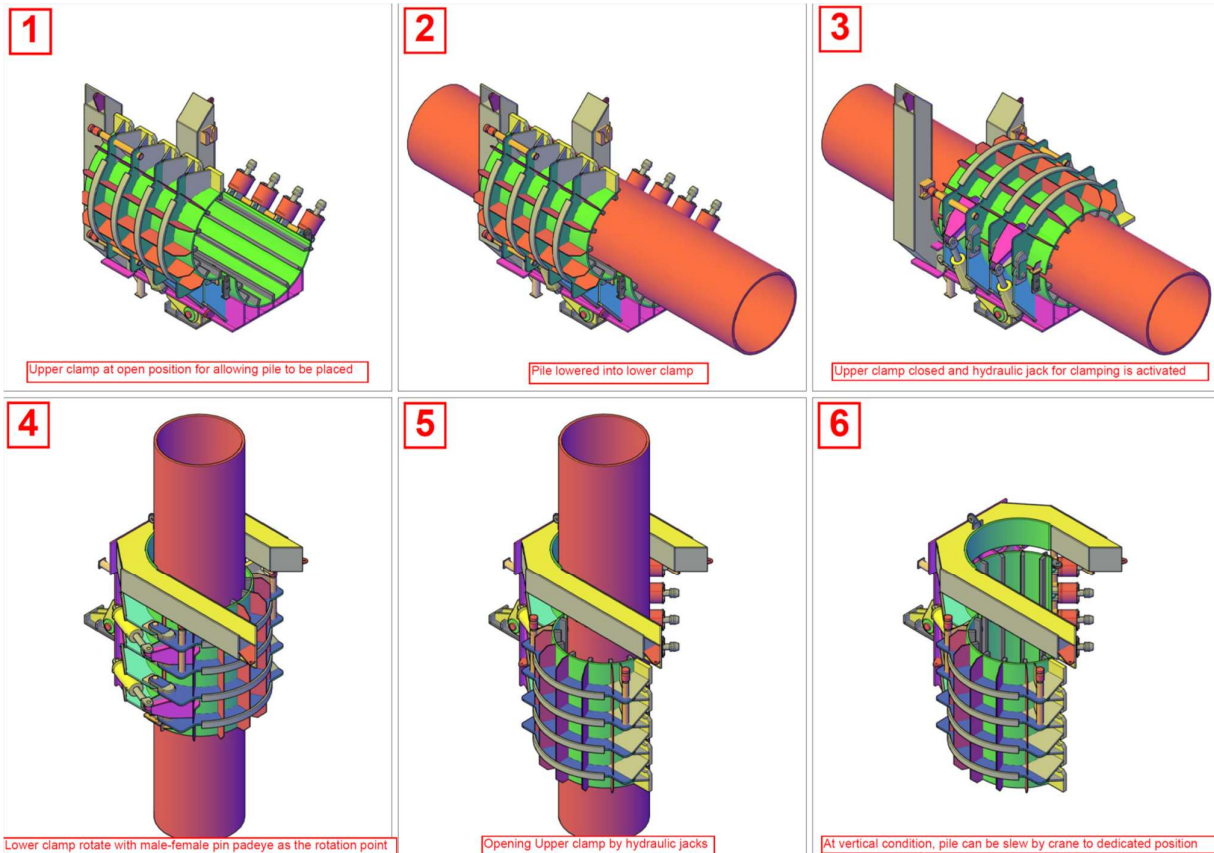


3.0 PILE UPENDING CLAMP (PUC)

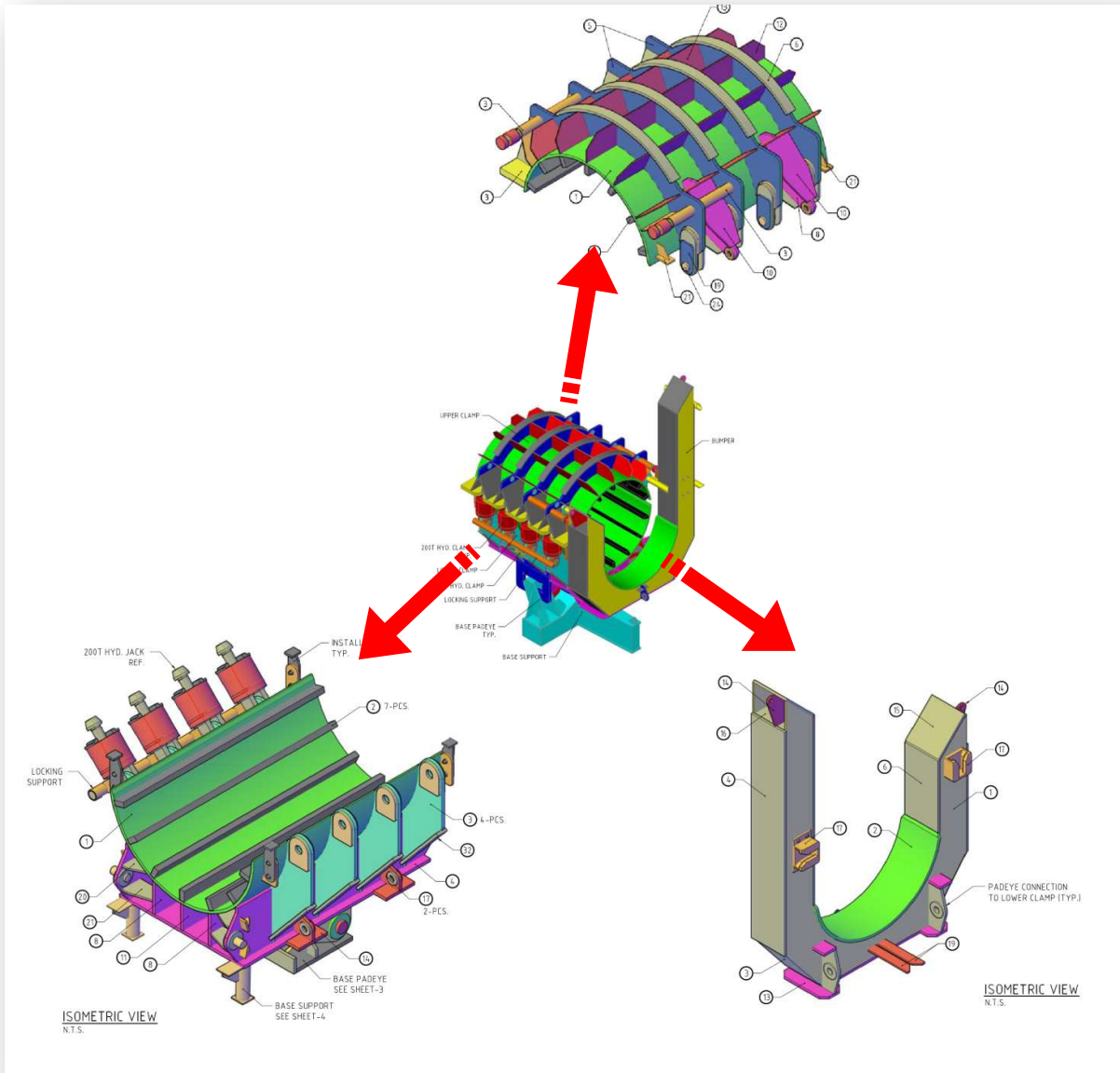
OCS Pile Upending Clamp (PUC) is designed for upend tubular piles (from horizontal to vertical position) during offshore piling operations. It is a hydraulically operated clamping tool which consists of a bottom rotating part and a clamping structure. The bottom rotating part will have male-female padeye set together with its grillage and to be welded onto the ship deck structure. The clamping structure can be opened, closed, locked and unlocked hydraulically. The upending frame will be designed with a pile holding capacity of 600 metric tonnes.

Item	Data
Maximum Pile Diameter	96"
Minimum Pile Diameter	60"
Maximum Pile Weight	600T
Structural Self Weight	48~62 MT (depend on Pile OD)
Jack Design Pressure	180 bar

The pile upending frame is used primarily to upend long piles where hook height of the derrick crane is not sufficient to perform direct upending on the barge deck.

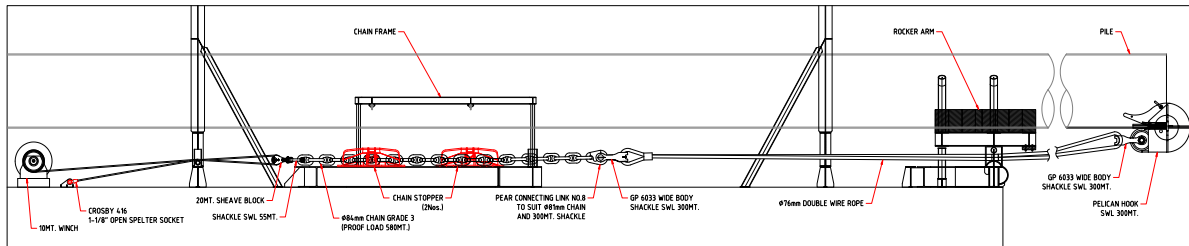


In the case that PUC handling process has dimension and lift capacity constraint, OCS PUC can be dismantled into 3 parts as shown below and re-assembly at project location.

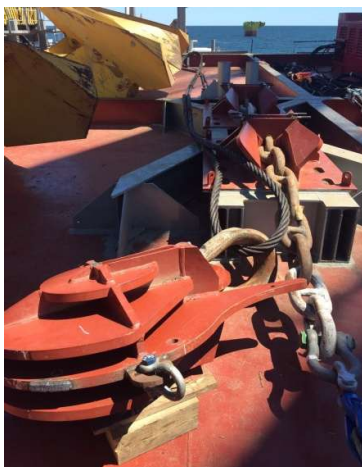


4.0 ROCKER ARM + PELICAN HOOK + CHAIN STOPPER SYSTEM

OCS designed and fabricated pile upending support frame using combination system of rocker arm, pelican hook and chain stopper system for 300MT SWL capacity (84" OD). This upending support system doesn't require any pile clamping system and can be independently operated using normal rigging configuration.



Rocker arm will be placed at the barge end and act as a rotation point. After pile lay horizontally on its support, set combination of wire rope and chain, will be connected to pelican hook. Once pelican hook structure is hooked at the end of pile cantilever part, chain will be pulled by winch so that chain can be tighten and locked at the chain locker frame. During pile upending, pelican hook and its connected rigging will resist the pile not to slide. Two chain stoppers are provided to have more room to play with the chain length.



5.0 PILE LAUNCH AND ROCKER ARM SYSTEM

OCS designed and fabricated upending support frame using combination system of rocker arm and launch systems. This system were adopted for Zawtika development project located in the Gulf of Moattama, Myanmar, where the longest single pile is 143m length. No pile clamping mechanism is required for this system.

In general, pile will be placed at the side of the barge crane on temporary support built to suit the pile characteristic. After ILT connected, one of the pile flat support will act as rocker arm and will force pile to rolling (launch) toward the seaside.

In doing so, Two (2) support frames (support A and B) are fabricated and installed at the port side of the barge. With the help of spreader frame, pile will be lifted from the material barge and placed on top of support A and B. Once ILT is engaged, pile will be upended a bit and support A (near to the crane) will be fully rotary retracted followed by support B which will act as rocker arm table and push the pile further to sea (launch).

<https://www.youtube.com/watch?v=zGaulO3dJeE>



