METHOD STATEMENT

THE DEPLOYMENT OF NEW ANCHORS
AND RETRIEVAL OF EXISTING ANCHOR CHAINS OF
THE YIU LIAN FLOATING DOCK NO.3

<table>
<thead>
<tr>
<th>Document Number</th>
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<tbody>
<tr>
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</tbody>
</table>
METHOD STATEMENT

THE DEPLOYMENT OF NEW ANCHORS
AND RETRIEVAL OF EXISTING ANCHOR CHAINS OF
THE YIU LIAN FLOATING DOCK NO.3

This method statement provides operational guidance which is intended to assist the personnel directly involved in deploying the new anchors of the floating dock namely Yiu Lian Floating Dock No.3 when she is to be moored at a new site at southwest coast of Tsing Yi, and the retrieving of anchor chains when she leaves her existing mooring at Yam O.

The contents of the method statement are arranged in two parts. Part I contains information of the new anchor and covers operational procedure of anchor deployment. Part II covers method of retrieval of and procedure for cutting the anchor chains after leaving of the floating dock at Yam O. Detailed activities are described under the following headings:

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Part I

1. Description of the New Anchor

The new anchor is of a deadweight type consisting of a solid block of concrete with reinforced steel bars, which is also known as a “sinker”. The anchor relies on its weight, resistance of the soil and friction with the seabed to generate holding power which is designed to resist a pulling force of 300 tons.

The height and base width of the new anchor is of 3.5 M and 6 M respectively, it is a flat shape with four sides of equal length of 4.5 M on top. The anchor shall be so concreted that, in the upright position, it shall be sit with the back straight, the two sides are at a slope from the bottom to the top; however, the front shall be relatively inclined afterward, a relatively steep slope reaches to the top edge. The bottom shall be had an n-shaped notch opening of 2.3 M deep at the transverse axis. Details of construction of the anchor are as shown on the construction profile (Appendix 1-1).

The front of the new anchor is to be fitted with a connection eye-plate where the anchor chain is linked with a shackle. Four lifting plates are placed on top, since they are required for transportation.

The new anchor requires a seabed that can be penetrated. As the upper layer of the seabed of Tsing Yi site consisting of soft clay in a thickness of 2-3 M, that allows at least full penetration of the anchor; therefore, an anchor trench is not required. This self-penetration property makes dredging work is not necessary at the new site in the southwest coast of Tsing Yi before the anchor deployment.

Prior to the arrival of the floating dock, all the anchors with adequate lengths of mooring chains should be present and in position. The expected time for the completion of deploying of one anchor is four (4) hours; for two (2) anchors a day, the estimated duration for the whole process is to be twenty (22) days, with a eight (8) days break for collecting the retrieved anchor chains from the existing site. Detailed planning and scheduling of the project refers to the Master Schedule (Appendix1-2).

The floating dock shall be positioned so as to supply sufficient restoring force to maintain her position during operation and must be provided for survival under severe weather conditions. Additionally, the purpose of the mooring system is to give adequate spaces to the operation performed. The mooring pattern of the floating dock is as shown on the Layout Plan of Mooring Pattern (Appendix 1-3).
2. Method of Deploying New Anchors at Tsing Yi Site

The deployment of the anchors at Tsing Yi Site is to be carried out by a Flat Top Derrick Crane Barge with lifting capacity of 230 tons (SWL), as the anchor’s weight is 170 tons. Anchoring and mooring systems of the barge should have sufficient strength to withstand loads of the anchor and relevant environmental loads due to wind, waves and current.

For position indication, marker buoy which, at the right place for the anchor to sit on, will be set prior to the lifting for anchor deployment. Another maker buoy for lateral positioning of the anchor will symmetrically be fixed for laying the anchor chain.

To avoid getting entangled of the workboat’s anchors and the deployed chains, a derrick barge will be moored at the lateral direction to winch the crane barge out of potential involvement. A tugboat will also be used to safe guard at side in order to avoid reckless marina entering the working area.

Mooring buoy with flash light will be linked to the deployed anchor for indication purpose and will act as an important pickup buoy for raising the anchor chain embedding in the seabed.

The guard boat is to be station at the site while the deployment of anchor is to begin.
3. Typical Arrangement and Accessories for Pre-anchoring

The complete system, an anchor and length of anchor chain, temporary installed pickup buoy attached to the liftpoint of the anchor chain, a strap used between anchor chain and the anchor should be present and in position prior to the arrival of the floating dock. Details are shown in the following illustrations:

Following illustration shows a state of being prepared for receiving the floating dock, all anchors and chains are in position with temporary installed equipment.
Appendix

1-1 Construction Profile of New Anchor
Appendix

1-2  Project Master Schedule
Appendix

1-3 Layout Plan of Mooring Pattern

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<table>
<thead>
<tr>
<th>LEGEND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø102mm anchor chain with 175tons sinker</td>
</tr>
<tr>
<td>Ø76mm anchor chain with 80tons sinker</td>
</tr>
</tbody>
</table>

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Client: Yiu Lian Dockyard Ltd
Consultant & Contractor: Maritime Mechanics Ltd

General Mooring Arrangement for the Relocation of Yiu Lian No.3 at Tsing Yi Island

Drawing No.: YL/MS/AR02R  11.04.2009
Part II

The releasing of the floating dock from existing moorings needs to go through a series of stages, which includes 1.) to dismount and retrieve partial of the anchor chains before leaving of the floating dock; 2.) to dismount remaining anchor chains for releasing the floating dock; and 3.) to retrieve the anchor chains after leaving of the floating dock. The entire duration estimated for the process of retrieving all the anchor chains is 21 days. Detailed activities and expected duration are described as follows.

1. Method of Retrieving Anchor Chain Before Leaving of the Floating Dock

There is a precedence requirement to dismount and retrieve partial of the anchor chains couple of days before the scheduled removal day of the floating dock. The exact number of anchor chains to be dismounted and retrieved refers to mooring strength verification, which is documented in advance. The following illustrations reveal which activities must be performed in sequence. The estimated duration of dismounting the first part of anchor chains is six (6) days, and the expected length of subsequent retrieving activity is nine (9) days. There are some overlaps between the two activities that, cutting on a dismounted chain can be performed while dismounting of another chain is being executed by other unit.
2. Method of Dismounting Anchor Chain for Releasing the Floating Dock

On the date of removal, dismounting of remaining anchor chains which, to facilitate the journey of the floating dock to Shekou by tow, should be started at the same time and completed within a two hours to three hours time frame. The estimated time includes anchor chains dismounted from the floating dock to be temporary attached on a pickup buoy as below illustrated.
3. Method of Retrieving Anchor Chain After Leaving of the Floating Dock

Turning to the activity of retrieving the last anchor chains at existing Yam O site, a crane barge will be deployed. The barge should endeavour to complete a process of lifting, cutting and collecting of the anchor chains to Tsing Yi site, for an estimated duration of twelve (12) days.

![Diagram of crane barge retrieving anchor chains](image)

4. Procedure for Cutting off Anchor Chains

Trenches prepared for existing anchor sinkers at Yam O site were dredged up to 5m in depth, when these sinkers were settle in, a layer of gravel of around 2m in thickness was placed on top, this process implies that all sinkers were buried below the seabed at least 2m. For the mooring attachment, one end of the anchor chains was connected to a connection eye-plate on the front end of the sinkers, which was in a position of the least 3.5m below the seabed. The anchor chains from the connection were then laid on and embedded to the seabed before they were linked to the floating dock.

For retrieving the anchor chains, there is special requirement that no anchor chain and its remains shall be left on the seabed. During the decommissioning works, the locations of all the un-removed sinkers and anchor chains will be logged as GPS readings. After the decommissioning works are completed, a visual examination for any uncovered sinkers or chains on the seabed within the whole affected area will be carried out by diver. If any uncovered sinkers are found on the seabed, they will be removed according to the requirements in the EIA report. If any uncovered anchor chains are found on the seabed, they will be removed immediately after being cut by divers. Conditions along selected strips of seabed where individual sinkers-chains are located will be closely inspected by closed-circuit television and recorded as evidentiary video footages, as proof for the absence of uncovered sinkers or chains on the seabed. The video recording will be conducted over the strips of seabed for 5 selected sinkers-chains at representative locations evenly distributed over the affected area. The visual examination and video recording will be conducted within 2 weeks after completion of the decommissioning works, and when underwater visibility is sufficiently high to allow unhampered visual inspection and recording of clear video images.
A diver's report with pertinent photographs and video footages of the seabed conditions will be prepared and submitted to EPD for inspection. In the diver's report, drawings showing the locations of all the remaining sinkers and chains as well as the specific positions where the video footages and photographs are taken will be included. The video footages recorded will be submitted with the diver's report as VCDs or DVDs. Information about the date, time and location for the footage of each sinker-chain will be provided.

The anchor chains after retrieval would only remain small trenches on the seabed. These small trenches could be backfilled naturally by tide and current in a few days.

Procedure for cutting off anchor chains is described as follows:

Procedure 1

After the Floating Dock was removed from the existing site, work barge will commence to retrieve anchor chain from the sea. The barge will retrieve the chain by its lifting hook and manoeuvre disturbance to the sea bed. Since the chain end was secured by Ø36mm wire and at the barge can easily retrieve app. ¾ length on deck.

Procedure 2

When the submerged chain was held straight on top of the buried sinker, the chain onboard will firmly be locked by steel cable. The vertical chain in the sea will then be hanged by a "Deployment Sling" slightly above the deck level. Worker will apply "Ace-Oxy" flame cutting to the link near the side of the barge. Since the chain is held safely at both on deck and at the main hook, there is no tension to that link after cut.

Coordinates of the sinker will be record by GPS in the surface for future reference.
**Procedure 3**

After the chain was cut, the barge will manoeuvre according to the laying direction of the chain. The main hook will also lower the chain until it lay flat in the seabed. One end of the Deployment Sling will drop to the sea and rewinding back chain in the bottom. Same procedures (1-3) through the end link of the abandon will apply to the rest of retrieval works.
5. **Proposal of Bathymetric Survey**

**Introduction**

It is required to carry out a bathymetric survey after the removal of the Yiu Lian Floating Dock No.3 from Yam O site, North Lantau. The purpose of the bathymetric survey is to clarify, whether there have any very uneven seabed profile right under the footprint of the floating dock after the removal.

As existing anchor sinkers at Yam O site were buried under seabed in pre-dredged trenches for years and it only requires to lift the chains straight, to cut it at the sea surface level. The remaining length of the anchor chains which, to be laid and leveled with the sea floor after cutting, would immediately embed to clays, nothing might suddenly stand above the seabed after removal of the floating dock.

However, if any abandoned objects which, were reasonably believed to be belonged to the project proponent, found very unevenly standing above right under the footprint of the floating dock in the survey, will be raised or removed with a crane barge or other method approved by the Environmental Protection Department depending on the circumstances. If there is indication that sinkers or anchor chains are not buried below the seabed, crane barge and underwater cutting will respectively be employed for removal.

The bathymetric survey will be carried out within two (2) weeks time after the decommissioning of the floating dock. It will be subjected to the receipt of ten (10) hours good weather forecast. Arrangement will be made with the Hong Kong Observatory, to supply weather forecast with a further two (2) days prior to the survey. If from stress of weather or some other unforeseeable cause which would affect the accuracy of the survey, the survey should be suspended until a fine weather is expected.

A survey standard issued by Marine Department is accepted for use in the bathymetric survey. The survey standard referred to is as follows:

**General**
Survey shall be carried out using high-resolution multibeam echo sounder to obtain 100% bottom coverage.

Cubic features greater than 1m shall be discernible by sounder equipment.

**Specific**
1. **Sounding Density**: Full bottom coverage by multibeam echo sounder
2. **Frequency**: 180-455kHz
3. **Positional Accuracy**: 2m at 95% confidence level
4. **Depth Accuracy**: 0.3m at 95% confidence level
5. **Checkline**: All swaths shall be crossed at least once, by a checkline to confirm the accuracy of position fixing, depth measurement and depth reduction.
6. Sounding Plan : Scale shall not be less than 1:2,500
: Soundings presented shall be the minimum depths of seabed, i.e. shoal-biased soundings shall be selected.
: Soundings presented shall be in their actual surveyed positions and not in equal-spaced grid positions.
: Soundings shall be referred to Chart Datum.

7. Digital Data : Digital data shall be in ASCII format consisting of Northing, Easting and Depth of the soundings.

The bathymetric survey has been contracted to EGS, which is certified to the ISO9001 quality standard, provides global specialist multi-disciplinary support to earth sciences and surveying. To provide a quick and ready reference, proposals for conducting the survey are produced below.

5.1 The Survey

5.1.1 Survey Technique

EGS would propose to carry out the survey using the Swath Bathymetry (Multibeam echo sounding) technique to confirm the seabed level in great details.

The swath echo sounder transmits pulses of sound down through the water column in the shape of a fan, to both sides of the survey boat rather than lines. The travel times of the echoes returning to the boat depend on the water depth and on the direction of the beam. The swath system corrects the travel times for the beam angle, as well as the boat heading and motion, to give water depth across the whole fan. As the boat moves through the water, the whole seabed within the fan corridor is covered, giving 100% coverage of seabed levels. The boat travels along adjacent tracks so that the adjacent corridors overlap, building up 100% coverage of the whole area and leaving no gaps. The size of each survey pixel varies with boat speed and water depth, but is typically 0.5m² to 2 m².

The survey would be carried out in accordance with the requirements of Hydrographic Survey Standards (Standard Order) of Marine Department.

5.1.2 Survey Details

5.1.2.1 Vessel

EGS would propose to use a commercially licensed vessel, the MV Wing Hung 2 to perform the survey work.

5.1.2.2 Echo Sounding

EGS would use a multi-beam swath system to perform the survey. It is a single frequency instrument, which operates at 455KHz.
5.1.2.3 Spacing of Sounding Lines

An area of 350m x 550m which covers the 28 buried sinkers and the dock would be scanned with the swan system. Since water depth over the area is about 15-28m, parallel survey lines at 30m intervals would be proposed for the survey. Such dense survey spacing would ensure sufficient data coverage and overlap for the survey purpose.

5.1.2.4 Survey Plot

Survey plot would be presented in accordance with Marine Department’s IHO Special Order Standard. The survey values will be using the true position at a spacing of around 5m on the plan in CD.

5.2 Equipment

The following equipment would be mobilized:

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS positioning system</td>
<td>C-Nav GcGPS</td>
</tr>
<tr>
<td>Navigation system</td>
<td>The EGS navigation software</td>
</tr>
<tr>
<td>Multibeam echo sounder</td>
<td>The Reson 8125, a 120° horizontal coverage swath system with a 455KHz frequency transducers DMS 5 component heave compensator Gyro-compass</td>
</tr>
<tr>
<td>Survey echo sounder</td>
<td>Atlas Deso 25 or equivalent echo sounder</td>
</tr>
<tr>
<td>Generators, spares</td>
<td>As necessary</td>
</tr>
<tr>
<td>Survey boat</td>
<td>Class III survey vessel and speedboat</td>
</tr>
</tbody>
</table>

5.3 Horizontal and Vertical Location Control

5.3.1 Basic System

The C-Nav system is a new innovative global, real-time, decimeter accurate GPS system commonly referred to as a GcGPS system (Globally Corrected GPS). C-Nav corrections are not based on traditional pseudo range DGPS. C-Nav GcGPS operates in real time, providing seamless global coverage and decimeter capable position in the offshore world, between the latitudes of 75 degree North and South.

The system provides corrected positions to an accuracy of +/- 1m without the need for a shore-based transmitted system.

5.3.2 The EGS Computerized Navigation System

The EGS computerized navigation system would be added to the basic system, for basic navigation along selected survey lines and to control the fixing of other equipment in use.

In this case, the Hong Kong Metric Grid would be adopted for the survey.
5.3.3 Vertical Control

The tide data collected at EGS tide gauge located at Tung Chung and T8 would be used to reduce survey data to Chart Datum (CD).

5.4 Programme and Access to The Site

The following programme is considered to be realistic, presuming Marine Notice issued for carrying out the survey:

<table>
<thead>
<tr>
<th>Item</th>
<th>Working Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructed</td>
<td>Day 0</td>
</tr>
<tr>
<td>Apply Marine Notice</td>
<td>Day 1</td>
</tr>
<tr>
<td>Obtain Marine Notice</td>
<td>Day 15</td>
</tr>
<tr>
<td>Start mobilizing survey system</td>
<td>Day 16</td>
</tr>
<tr>
<td>Commence and Complete survey by</td>
<td>Day 17</td>
</tr>
<tr>
<td>Submit report by</td>
<td>Day 24</td>
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</tbody>
</table>

The survey is to be conducted in fine weather day. It is assumed that the site is clear for surveying prior to the commencement of the survey work.

EGS has assumed that the survey will be carried out as one single operation and the whole site are available for survey.

5.5 Reporting

EGS will submit three copies of report together with digital data in ASCII format and digital copy in CAD format on completion of the survey.


To assist in the handling of cases of anchor blocks, anchor chains and their remains that may be found being left on the seabed, the actions in accordance with the Event and Action Plan in Appendix 2-1 should be carried out.
## Appendix 2-1  Event and Action Plan for Decommissioning Work
(In the case of the anchor blocks, anchor chains and their remains are found being left on the seabed)

<table>
<thead>
<tr>
<th>EVENT</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchor block being stood above the seabed</td>
<td>1. Discuss the heavy lifting method with IEC and Contractor;</td>
</tr>
<tr>
<td></td>
<td>2. Take the precaution of monitoring data; and</td>
</tr>
<tr>
<td></td>
<td>3. Carry out the Event and Action Plan for water quality if monitoring results indicate the water quality criteria exceed the Action or Limit Levels.</td>
</tr>
<tr>
<td></td>
<td>1. Discuss with ET and Contractor on the heavy lifting method;</td>
</tr>
<tr>
<td></td>
<td>2. Review proposal on the new working method submitted by Contractor and advise the Project Proponent accordingly; and</td>
</tr>
<tr>
<td></td>
<td>3. Assess the effectiveness of the implemented working method.</td>
</tr>
<tr>
<td></td>
<td>1. Discuss with IEC on the proposed heavy lifting method; and</td>
</tr>
<tr>
<td></td>
<td>2. Make agreement on the lifting method to be implemented.</td>
</tr>
<tr>
<td></td>
<td>3. On completion of seabed restoration, submit diver’s report for inspection by EPD.</td>
</tr>
<tr>
<td></td>
<td>1. Inform the Project Proponent and confirm notification of the finding in writing;</td>
</tr>
<tr>
<td></td>
<td>2. Consider new working method to employ a heavy lifting;</td>
</tr>
<tr>
<td></td>
<td>3. Discuss with ET and IEC and propose a crane barge lifting to Project Proponent; and</td>
</tr>
<tr>
<td></td>
<td>4. Implement the agreed method;</td>
</tr>
<tr>
<td></td>
<td>5. Inspect the site by diver to confirm seabed restoration and prepare diver’s report</td>
</tr>
<tr>
<td>Anchor chain being protruded from the seabed</td>
<td>1. Discuss the underwater cutting method with IEC and Contractor;</td>
</tr>
<tr>
<td></td>
<td>2. Take the precaution of monitoring data; and</td>
</tr>
<tr>
<td></td>
<td>3. Carry out the Event and Action Plan for water quality if monitoring results indicate the water quality criteria exceed the Action or Limit Levels.</td>
</tr>
<tr>
<td></td>
<td>1. Discuss with ET and Contractor on the underwater cutting method;</td>
</tr>
<tr>
<td></td>
<td>2. Review proposal on the underwater cutting method submitted by Contractor and advise the Project Proponent accordingly; and</td>
</tr>
<tr>
<td></td>
<td>3. Assess the effectiveness of the implemented working method.</td>
</tr>
<tr>
<td></td>
<td>1. Discuss with IEC on the proposed underwater cutting method;</td>
</tr>
<tr>
<td></td>
<td>2. Make agreement on the underwater cutting method to be implemented.</td>
</tr>
<tr>
<td></td>
<td>3. On completion of seabed restoration, submit diver’s report for inspection by EPD.</td>
</tr>
<tr>
<td></td>
<td>1. Inform the Project Proponent and confirm notification of the finding in writing;</td>
</tr>
<tr>
<td></td>
<td>2. Consider to employ divers and cutting appliances for underwater cutting;</td>
</tr>
<tr>
<td></td>
<td>3. Discuss with ET and IEC and propose cutting method to Project Proponent; and</td>
</tr>
<tr>
<td></td>
<td>4. Implement the agreed method.</td>
</tr>
<tr>
<td></td>
<td>5. Inspect the site by diver to confirm seabed restoration and prepare diver’s report</td>
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</tbody>
</table>
### PROJECT MANAGEMENT POSITION

<table>
<thead>
<tr>
<th>EVENT</th>
<th>ET/ET Leader</th>
<th>IEC</th>
<th>Project Proponent</th>
<th>Contractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abandoned objects being found right under the footprint of the floating dock</td>
<td>1. Discuss the removal method with IEC and Contractor; 2. Take the precaution of monitoring data; and 3. Carry out the Event and Action Plan for water quality if monitoring results indicate the water quality criteria exceed the Action or Limit Levels.</td>
<td>1. Discuss with ET and Contractor on the removal method; 2. Review proposal on the removal method submitted by Contractor and advise the Project Proponent accordingly; and 3. Assess the effectiveness of the implemented working method</td>
<td>1. Discuss with IEC on the proposed removal method; and 2. Make agreement on the underwater cutting method to be implemented. 3. On completion of seabed restoration, submit diver’s report for inspection by EPD.</td>
<td>1. Inform the Project Proponent and confirm notification of the finding in writing; 2. Consider to employ divers for removal; 3. Discuss with ET and IEC and propose removal method to Project Proponent; and 4. Implement the agreed method. 5. Inspect the site by diver to confirm seabed restoration and prepare diver’s report</td>
</tr>
</tbody>
</table>