# Ship/Shore Compatibility Checklist

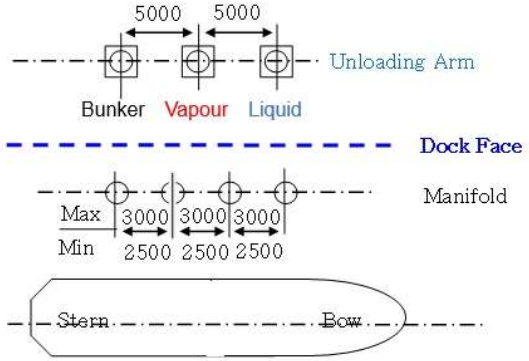
HAMINA LNG LTD.

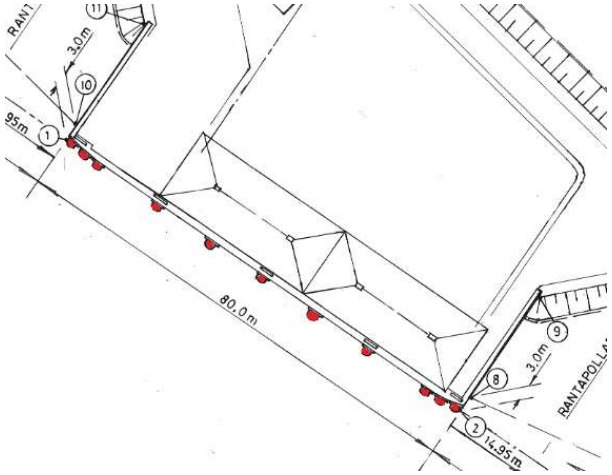
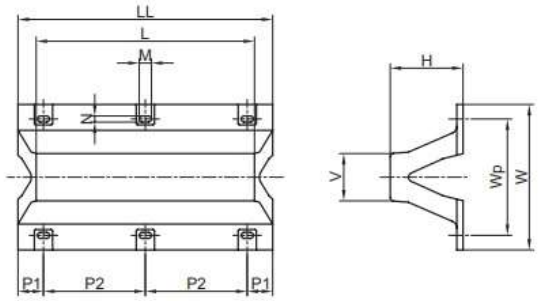
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## **Ship/Shore Compatibility Study.** Name of ship:

| Items | Shore Specification | Ship Specification | Remarks |
|---|---|---|---|
| **1. General Port Information**<br>1.1. General | ▪ **Port name**: Port of HaminaKotka<br>-Tel: + 358 20 790 8800<br>-Address: Satamantie 4, 49460 HAMINA<br>-E-mail: office@haminakotka.fi<br>▪ **Name of operating company**: Hamina LNG Ltd<br>-24/7 Control Room Tel: + 358 40 772 4555<br>-Address: Terminaaliranta 5, 49460 HAMINA<br>**60° 51′ N, 27° 16′ E**<br>▪ **Person to contact regarding terminal information**<br>-Name: Loading Masters / LNG Terminal Plant<br>-Tel: + 358 40 772 4555<br>-E-mail: loadingmaster@haminalng.fi<br>▪ **Note! Berth Ö3 is shared with other local operators** | | |
| 1.2. Weather Limits<br>(1) Max Wind Speed | (1) Berthing (TBA m/sec) / Stop cargo (17m/sec) | | **Weather information from terminal** |
| (2) SVT vendors wind limits | (2) Maneuvering / connected (17m/sec) | | |
| (3) Thunder | (3) Hold loading if electrical activity | | |
| 1.3. Port Water Level<br>(1) Tide Level | (1) Tide Level: Unit (m)<br>**High : EL + 0,05 m**<br>**Low : EL – 0,05 m** | | |

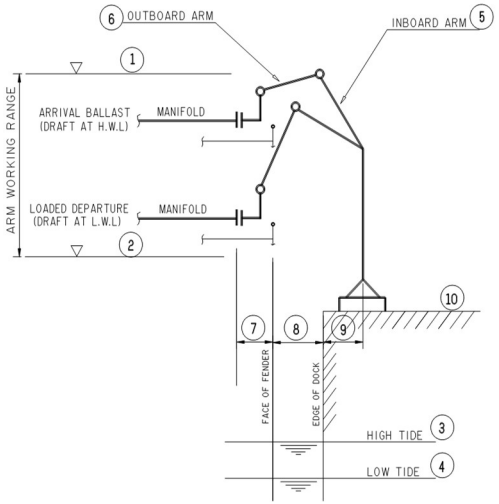
| Items | Shore Specification | Ship Specification | Remarks |
|---|---|---|---|
| **2. Vessel Limitations**<br>(1) Type of Vessel<br>(2) Breadth<br>(3) Tank Capacity (Min/Max)<br>(4) Draught (Design)<br>(5) LOA (Length Overall)<br>(6) DWT(Deadweight)<br>(7) DT(Displacement)<br>(8) ~ (11) Ship Side | Investigation objective vessel result of port capacity<br>(1) Membrane or Moss<br>(2) 30 m<br>(3) 5,000 $m^3$ (Min) / 25,000 $m^3$ (Max)<br>(4) 12 m (Membrane) / 12 m (Moss)<br>(5) 180 m<br>(6) N/A<br>(7) N/A<br>(8) Name of Operator<br>(9) Cargo Arrival Date (dd/mm/yy)<br>(10) Cargo Port of Loading (Port/Nationality)<br>(11) Expected Unloading Volume ($m^3$)<br>(12) **Ship using vapour return line: yes/no** | **2. Vessel Limitations**<br>1.<br>2.<br>3.<br>4.<br>5.<br>6.<br>7.<br>8.<br>9.<br>10.<br>11.<br>12. | If Breadth over 32m, contact pilot for more information.<br><br>If LOA 181m – 220m, contact Loading Master for more information. |
| **3. Manifold Arrangement** | **3. Manifold arrangement (Unit: mm)**<br> | **3. Manifold Arrangement** | |
| | a. Berthing: Portside alongside (Main)<br>b. Distance between manifold deck and SDP: more than 1 m | a)<br>b) | |

| Items | Shore Specification | Ship Specification | Remarks |
|---|---|---|---|
| **4. Fender / Flat Body**<br><br>4.1 Fender Arrangement<br><br>4.2 Maximum Design | **4.1 Fender Arrangement**<br><br><br>**4.2 Maximum Design**<br><br><br>Type: Lambda LMD (CL1)<br>- Fender size: H = 800 mm, L = 2000 mm<br>- Effective area: 1,04 $m^2$, total: 3,12 $m^2$<br>- Distance between fenders: 11.0 m<br>- Reaction force: 52,5%: 589 kN / 55%: 645 kN<br>- Energy absorption: 52,5%: 198 kN/m, 55%: 210 kN/m | **4. Fender / Flat Body** | See attach file 1<br><br>Vessel responsible to berth safely |

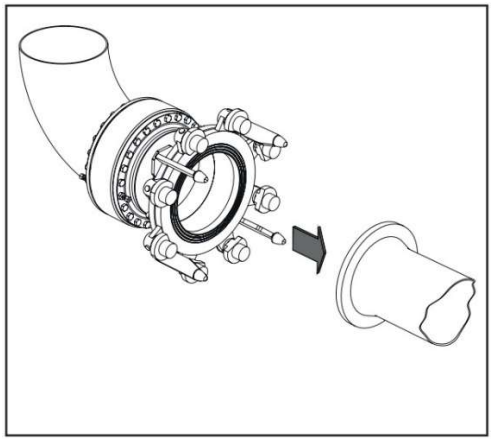
<table>
<tr><th>Items</th><th>Shore Specification</th><th>Ship Specification</th><th>Remarks</th></tr>
<tr>
<td>4.3 Mooring Arrangement</td>
<td>4.3 Mooring Facilities
<table>
<tr><th>No.</th><th>MD-1</th><th>MD-2</th><th>MD-3</th><th>MD-4</th><th>MD-5</th><th>MD-6</th><th>MD-7</th><th>Remarks</th></tr>
<tr><td>Hooks x Set</td><td>2x1</td><td>2x1</td><td>2x1</td><td>1x1</td><td>2x1</td><td>2x1</td><td>2x1</td><td></td></tr>
<tr><td>Hook capa.</td><td>100tn</td><td>100tn</td><td>100tn</td><td>100tn</td><td>100tn</td><td>100tn</td><td>100tn</td><td></td></tr>
<tr><th>No.</th><th>BD-1</th><th>BD-2</th><th>BD-3</th><th>BD-4</th><th>BD-5</th><th>BD-6</th><th></th><th>Remarks</th></tr>
<tr><td>Hooks x Set</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td>N/A</td><td></td><td></td></tr>
<tr><td>Hook capa.</td><td>75tn</td><td>75tn</td><td>75tn</td><td>75tn</td><td>75tn</td><td>75tn</td><td></td><td></td></tr>
</table>
QRH (Quick Release Hook): Manual QRH</td>
<td>4.3 Mooring Arrangement</td>
<td>See attach file 2</td>
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<tr>
<td>4.4 Optimooring</td>
<td>See attach file 3; Optimooring</td>
<td></td>
<td>See attach file 3</td>
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<td>5. Unloading Arm / Cargo Pump</td>
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<td>5. Unloading Arm / Cargo Pump</td>
<td>See attach file 4</td>
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<tr>
<td>5.1 Unloading Arm L101&102</td>
<td>5.1. Unloading Arms Working Range L101 & L102 (Unloading / Vapour)</td>
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<td>(1) Loading Arm Working Range</td>
<td>
<table>
<tr><th>Item</th><th></th><th></th><th>(m)</th></tr>
<tr><td>Working range of unloading arm (From sea level)</td><td>High</td><td>1</td><td>18,4</td></tr>
<tr><td></td><td>Low</td><td>2</td><td>4,5</td></tr>
<tr><td>Tide level</td><td>High</td><td>3</td><td>+ 0,05</td></tr>
<tr><td></td><td>Low</td><td>4</td><td>-0,05</td></tr>
<tr><td>Heave & List</td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>Unloading arm length</td><td>Inboard arm</td><td>5</td><td>8,3</td></tr>
<tr><td></td><td>Outboard arm</td><td>6</td><td>8,3</td></tr>
<tr><td>Distance</td><td></td><td>7</td><td>5,125</td></tr>
<tr><td></td><td></td><td>8</td><td>1,0</td></tr>
<tr><td></td><td></td><td>9</td><td>5,0</td></tr>
<tr><td></td><td>Above datum</td><td>10</td><td>9,0</td></tr>
</table>
</td>
<td>(1)</td>
<td>Normal sea level from jetty surface -2,4m (Working range of unloading arm 16,0m from jetty surface)</td>
</tr>
</table>

| Items | Shore Specification | Ship Specification | Remarks |
|---|---|---|---|
| 5.2 Bunkering Arm L481 | 5.2. Bunker Arm Working Range L481 (Liquid & Vapour) | | See attach file 5 |

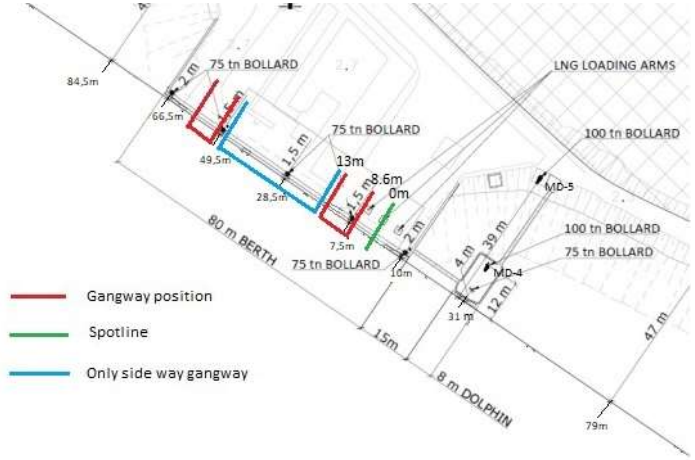
| Item | | | (m) |
|---|---|---|---|
| Working range of unloading arm (From sea level) | High | 1 | 18,4 |
| | Low | 2 | 2,4 |
| Tide level | High | 3 | + 0,05 |
| | Low | 4 | -0,05 |
| Heave & List | | | |
| | | | |
| Unloading arm length | Inboard arm | 5 | 8,3 |
| | Outboard arm | 6 | 9,6 |
| Distance | | 7 | 5,125 |
| | | 8 | 1,0 |
| | | 9 | 5,0 |
| | Above datum | 10 | 9,0 |




Normal sea level from jetty surface -2,4m (Working range of unloading arm 16,0m from jetty surface)

| Items | Shore Specification | Ship Specification | Remarks |
|---|---|---|---|
| (2) Flow rate (max) | (2) Liquid: 2000 $m^3$/h / 1 arm, Vapour: 1730 $m^3$/h / 1 arm<br>Bunker: 1000 $m^3$/h / 1 arm | (2) | |
| (3) Number | (3) Liquid: 1 arm, Vapour: 1 arm, Bunker: 1 arm | (3) | |
| (4) Size | (4) Liquid / Vapour arms: 12″ (≈300mm), Bunker arm: 8″ (≈200mm) | (4) | |
| (5) Quick Release Coupler | (5) Type: ERS (Emergency Release System) Double Ball Valve<br>with PERC (Powered Emergency Release Coupler) | (5) | |
| (6) Design Pressure | (6) Design Pressure<br>a. Liquid / bunker: 19 bar<br>b. NG Vapour Return (Free flow): 19 bar | (6) | |
| (7) Flange Specification | (7) Flange Specification | (7) | |
| a. Flange | a. Liquid: 12” 150 lbs RF<br>Vapour: 12” 150 lbs RF<br>Bunker: 8" 150 lbs RF | a. | |
| b. Connection Type | b. Manual QC/DC | b. | |
| c. Gasket | c. Not required. Double seal fitted on flange face. | c. | |
| (8) Strainer | (8) Mesh size required: 60 Mesh | (8) | |
| (9) Condition of Manifold | (9) Shiny and undamaged / Ra=3,2-12,5μm (EN 1092-1:2001 (E)<br><br>*Picture of manifold and arm connection* | (9) | |

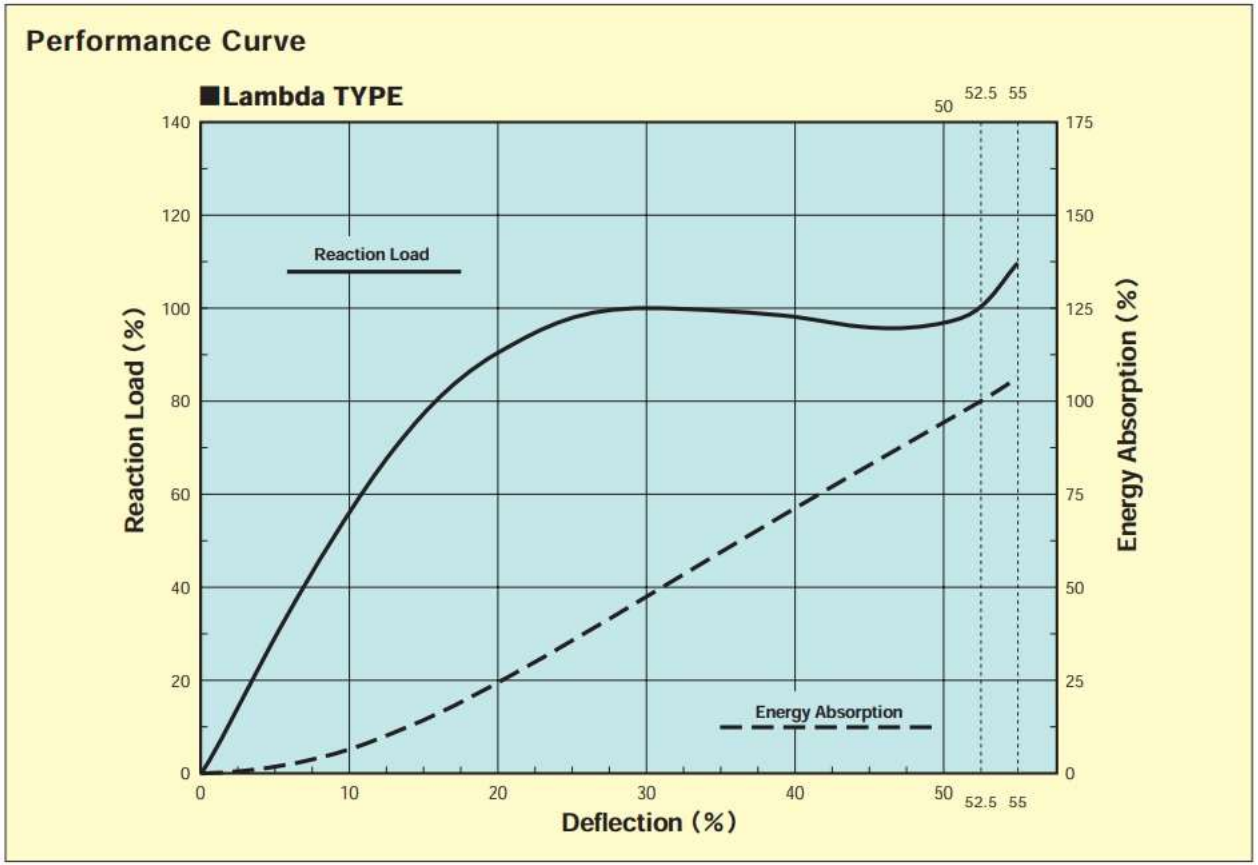
| Items | Shore Specification | Ship Specification | Remarks |
|---|---|---|---|
| 6. ESD / Communication System | | | See attach file 6 |
| 6.1 Optical Fiber System | 6.1 Optical Fiber System | 6.1 Optical Fiber System | |
| a. Manufacturer | a. TRELLEBORG (USL-8815-V3) | a. | |
| b. Connector Type | b. 2-way Expanded-Beam Hermaphroditic Fibre Connector | b. | |
| c. Connection Box Position | c. Infront Loading Arm L102 (USL-8812-V3-801) | c. | |
| d. Cable Length | d. 50 m | d. | |
| e. Pin Allocation | e. Optical System (Attachment) | e. | |
| f. Connection | f. Are you able to connect? **YES / NO** | f. | f. See attach file 6 |
| 6.2 Electric System | 6.2 Electric System | 6.2 Electric System | |
| a. Manufacturer | a. TRELLEBORG (USL-8817-V2) | a. | |
| b. Connector type | b. 5-way SeaTechnik SIGTTO Type Female Connector | b. | |
| c. Connector Position | c. Infront Loading Arm L102 (USL-8812-V3-801) | c. | |
| d. Cable Length | d. 50 m | d. | |
| e. Pin Allocation | e. Electrical System (Attachment) | e. | |
| f. Connection | f. Are you able to connect? **YES / NO** | f. | f. See attach file 6 |
| 6.3 Pneumatic System | 6.3 Pneumatic Hose | 6.3 Pneumatic System | |
| a. Manufacturer | a. TRELLEBORG (USL-8823-V0) | a. | |
| b. Connector Type | b. SNAP-TITE PHC8-8H 1/2” | b. | |
| c. Connector Position | c. Infront Loading Arm L102 (USL-8812-V3-801) | c. | |
| d. Hose Length | d. 50 m | d. | |
| e. Air Pressure | e. Air Pressure<br>* Normal Pressure: 6.0 - 10.0 bar<br>* Trip Pressure: 3,0 bar | e. | |
| f. Connection | f. Are you able to connect? **YES / NO** | f. | f. See attach file 6 |

| Items | Shore Specification | Ship Specification | Remarks |
|---|---|---|---|
| 6.4 Pendant System<br>a. Manufacturer<br>b. Connector Type<br>c. Connector Position<br>d. Cable Length | 6.4 Pendant System<br>a. TRELLEBORG (USL-8818)<br>b. 5-way SeaTechnik SIGTTO Type Female Connector<br>c. Infront Loading Arm L102 (USL-8812-V3-801)<br>d. 25 m | 6.4 Pendant System<br>a.<br>b.<br>c.<br>d. | |
| 7. Gangway<br>7.1 Position of gangway | 7.1 Gangway Position<br> | 7.1 Position of gangway | |
| a. Connector Position | a. Location: ~8,6-13 m or 49,5-66,5 m from spotting line. Side way gangway 13-49,5 m from spotting line. | | |
| b. Specification | b. Specification<br>(Using vessel own gangway) | | |

| Items | Shore Specification | Ship Specification | Remarks |
|---|---|---|---|
| 8. Support Craft | | | |
| (1) Tugboats | (1) Found more information: https://www.haminakotka.com/<br>• Suggestion to use tug, wind min. 8 m/s<br>• Recommendation to use tug, wind min. 13 m/s<br>• Order to use tug, wind min. 17 m/s | | See attach file 7 |
| (2) Zone management | (2) Moving at LNG jetty/process area are forbidden.<br>Zone security area is 30m around ship based on SFS 3355 standard. | | |
| 9. Other | (1) Vessel should inform the Terminal of estimated ship's tank pressure and liquid temperature at her berthing time by 3 days / 2 days / 1 day before her berthing.<br>(2) Vessel should inform the Terminal about need of Vapour arm before berthing. | 9. Others | Shore tank normal operating pressure: 100-220 mbar |

Attachments:

1.Performance Curve

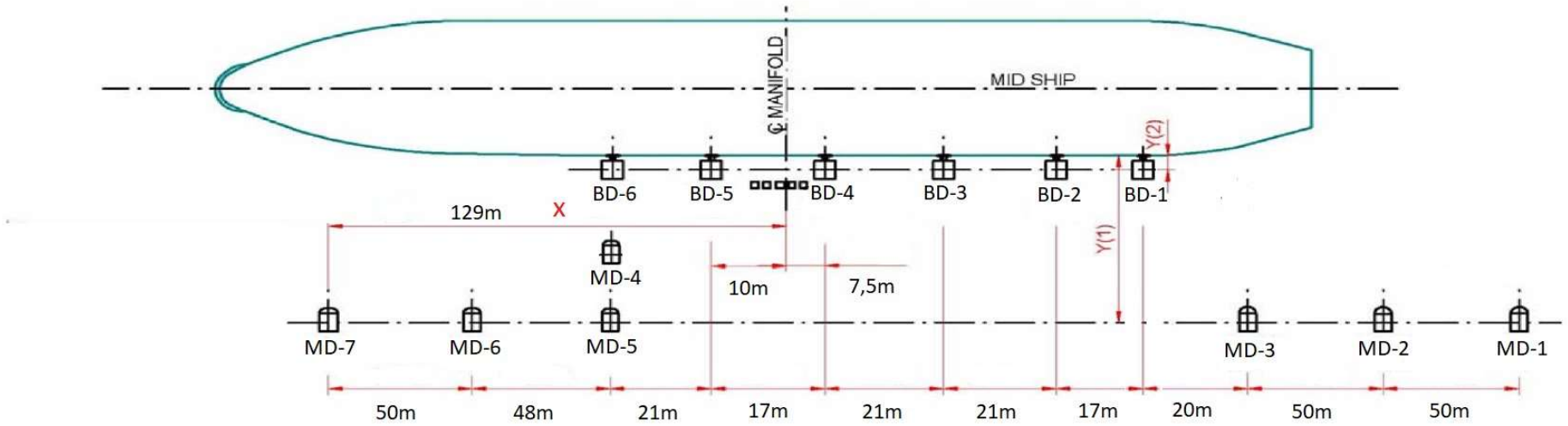


# 2. Mooring Facilities



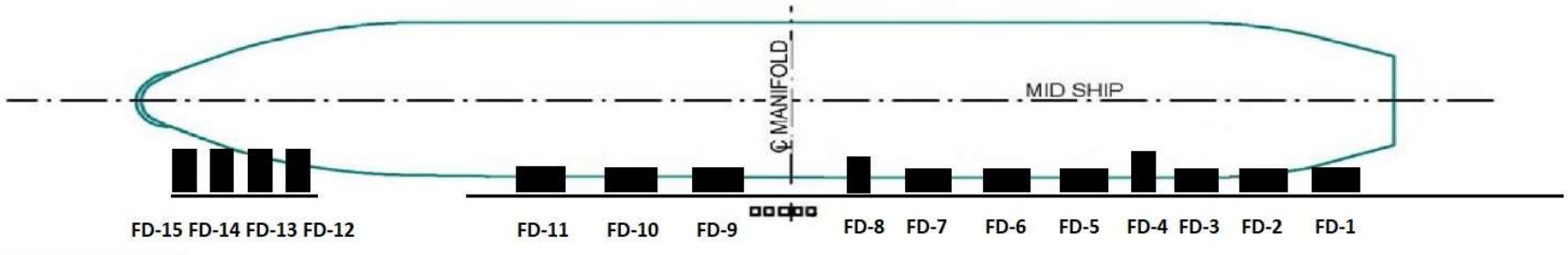
3. Optimooring (0-point vapour arm), Left to Right of Screen Site Plane Points: **304°**

| Optimoor | Terminal | X | Y |
|---|---|---|---|
| A | MD-1 | 184,5m | 57m Y(1) |
| B | MD-2 | 134,5m | 49m Y(1) |
| C | MD-3 | 84,5m | 40m Y(1) |
| D | BD-1 | 66,5m | 2m Y(2) |
| E | BD-2 | 49,5m | 1,5m Y(2) |
| F | BD-3 | 28,5m | 1,5m Y(2) |
| G | BD-4 | 7,5m | 1,5m Y(2) |
| H | BD-5 | -10m | 2m Y(2) |
| I | BD-6 | -31m | 2m Y(2) |
| J | MD-4 | -31m | 12m Y(1) |
| K | MD-5 | -31m | 39m Y(1) |
| L | MD-6 | -79m | 47m Y(1) |
| M | MD-7 | -129m | 55m Y(1) |

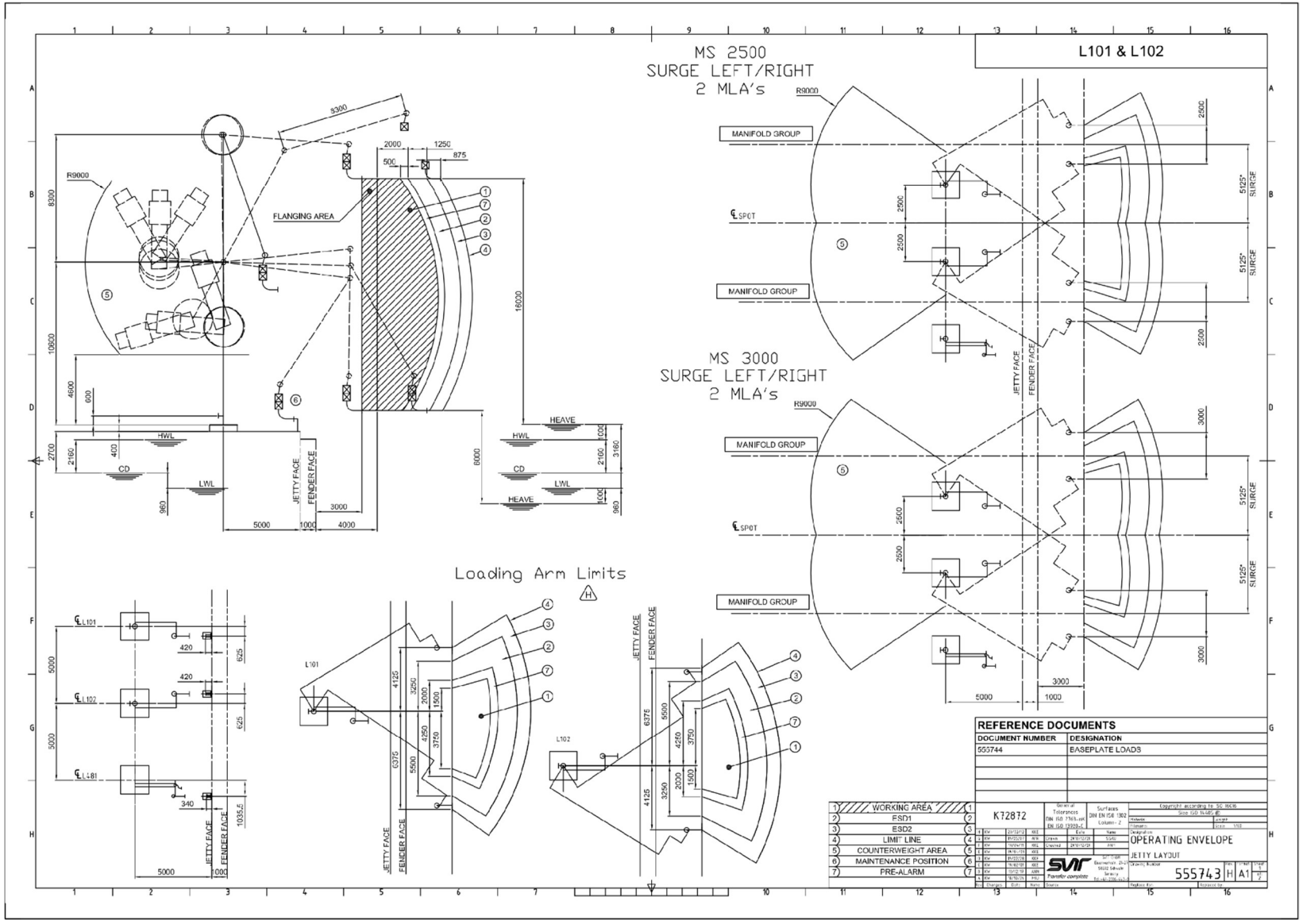


3.1 Fenders position for optimooring

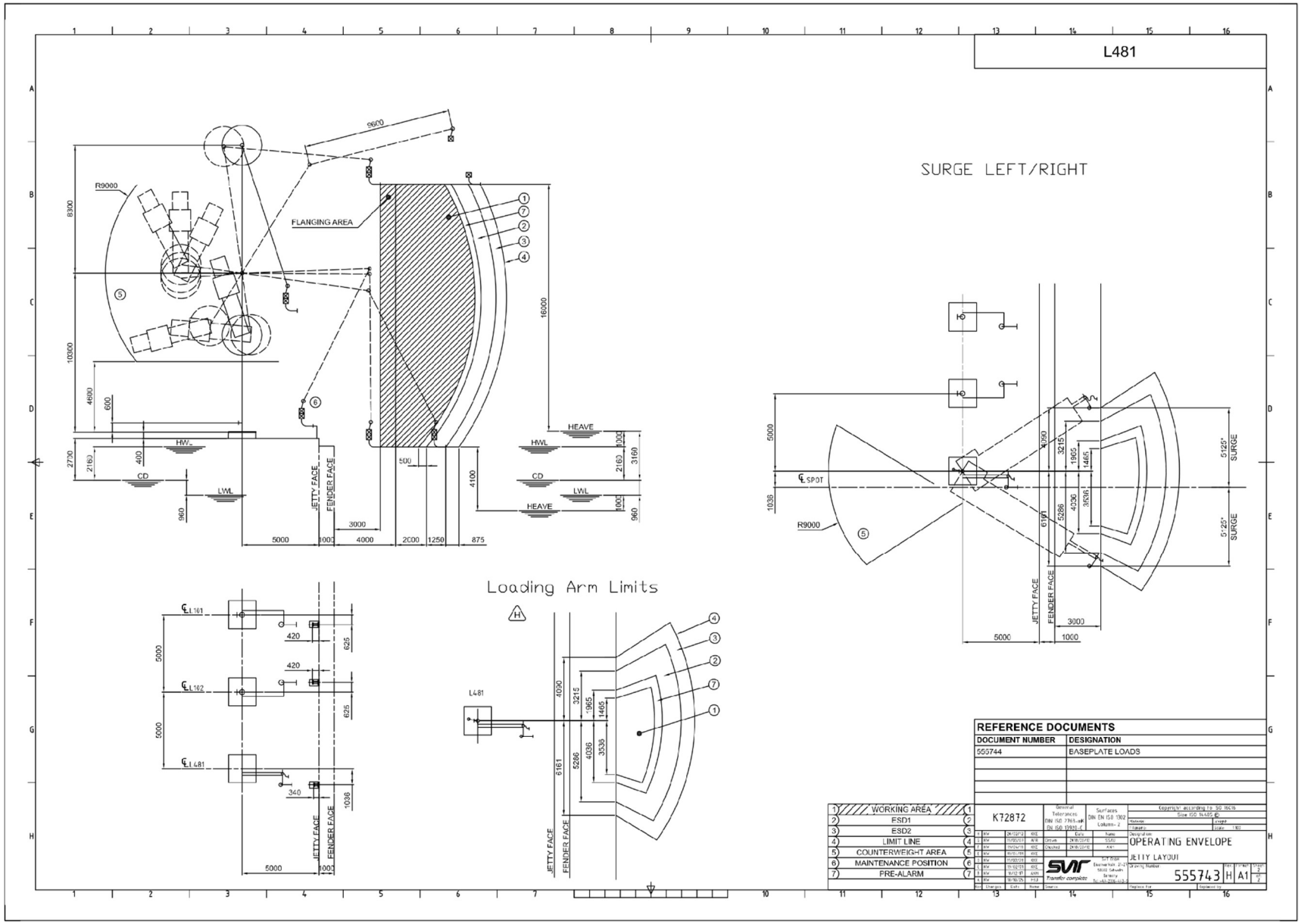
| | Terminal | X |
|---|---|---|
| A | FD-1 | -33.6m |
| B | FD-2 | -31,6m |
| C | FD-3 | -29,6m |
| D | FD-4 | -27,8m |
| E | FD-5 | -10,1m |
| F | FD-6 | -7,7m |
| G | FD-7 | -5,3m |
| H | FD-8 | 7,2m |
| I | FD-9 | 15,8m |
| J | FD-10 | 28,6m |
| K | FD-11 | 41,3m |
| L | FD-12 | 49,8m |
| M | FD-13 | 62,5m |
| N | FD-14 | 64,7m |
| O | FD-15 | 66,9m |



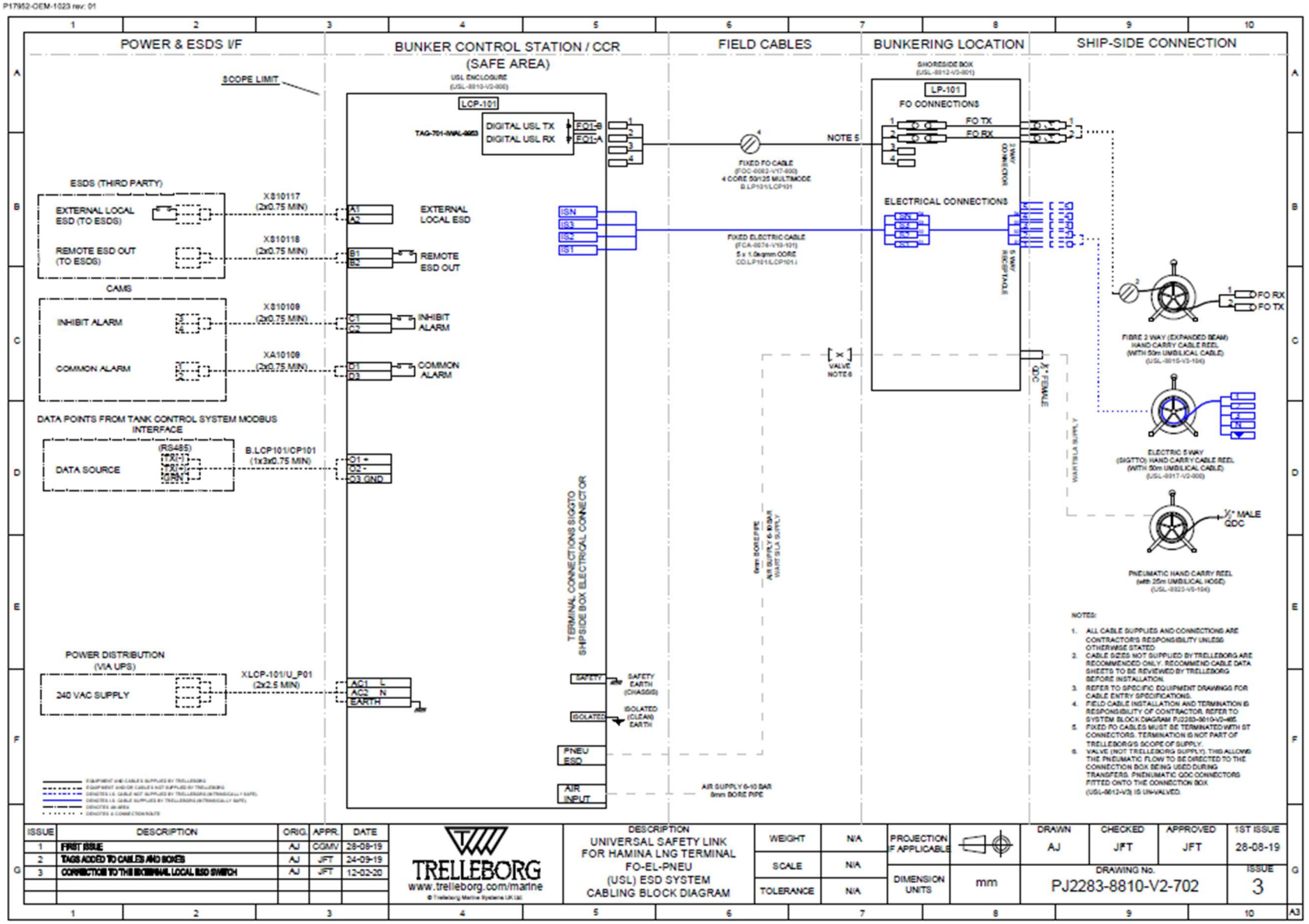
# 4. Unloading Arms Working Range L101 & L102 (Unloading / Vapour)

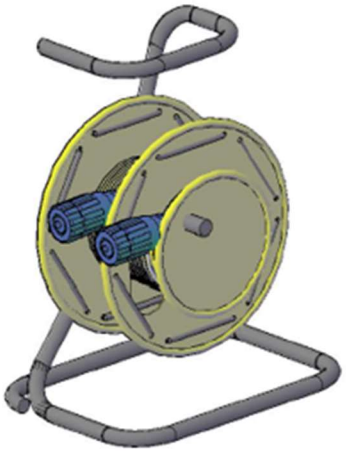


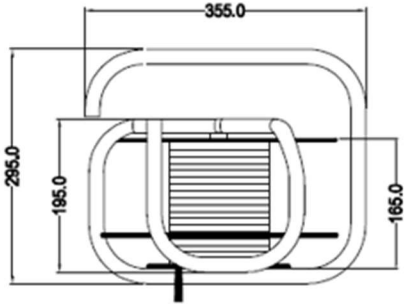
# 5. Bunker Arm Working Range L481 (Liquid & Vapour)



# 6. ESD / Communication System

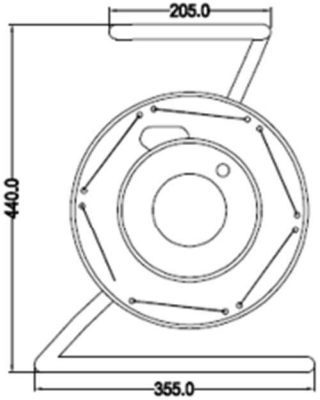


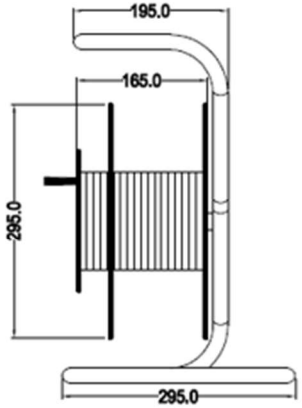





DRAWING No.

USL-8817-V2-800



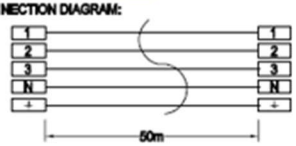

## SIGTTO Connector



PIN LAYOUT DIAGRAM:



CONNECTION DIAGRAM:

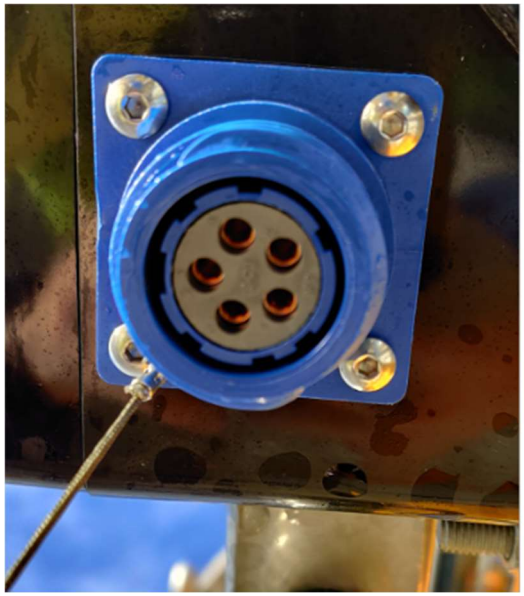



Connector notes:
Connector and Protective cap supplied
IP65 Rated Ingress Protection

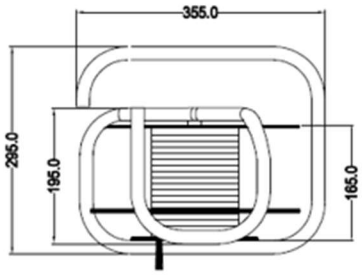
PVC Cable notes:
Number of Cores: 5
Conductor size of each core: 1.0mm²
Cable Outer Diam: 7.1mm
Min. Bending Radius: 15 x OD
External Colour: Blue (RAL 5015)

Carry on SIGTTO reel notes:
Material: 316 SS
Finish: Powder coat
Drum Colour :Yellow
Frame Colour : Black
Cable length : 50m

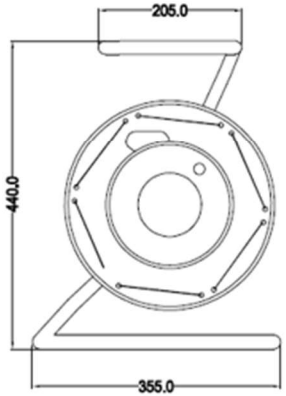
All dimensions in mm

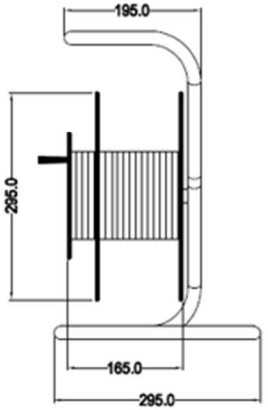




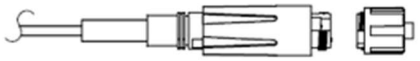



USL-8815-V3-104

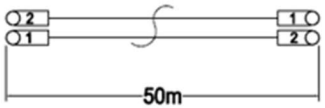



## 2 Way Expanded Beam F.O Connector



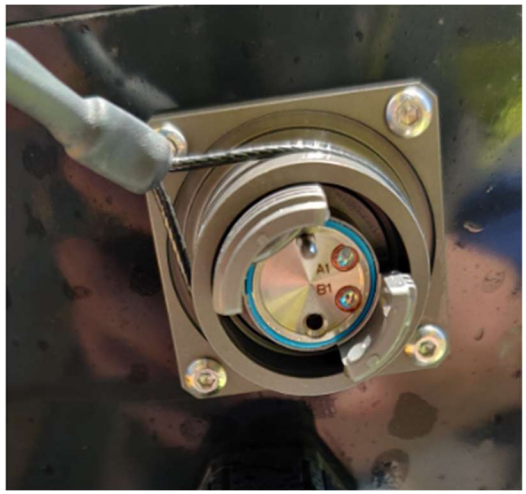
**CONNECTION DIAGRAM:**

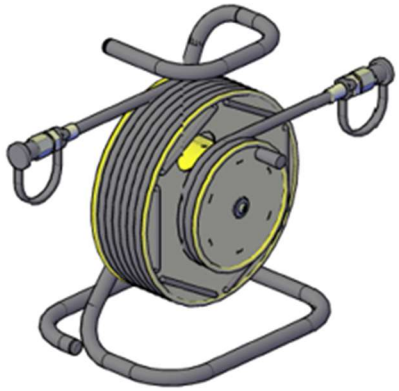



Connector notes:
Connector and Protective cap supplied
Cross-over type connector
Hermaphroditic MIL-DTL-83526 type connector
IP65 Rated Ingress Protection

Cable notes:
Multimode 50 / 125 Military Tactical Deployment Cable
Outer Jacket : Core- Locked Flame Retardant Polyurethane
Maximum Attenuation 3.5/1.5dB/km @ 800/1300 nm
Bandwith 500MHz-km @ 800/1300 nm
Cable Weight: 29kg/km
Cable Diameter (Nominal) : 5.6mm
Max Operating Tensile Load :1,800N
Min Operating Bend Radius : 4.5 cm
Operating Temperature : -55°C to +71°C

Carry on F.O reel notes:
Material: 316 S.S
Finish: Powder coat
Drum Colour :Yellow
Frame Colour : Black
Cable length : 50m





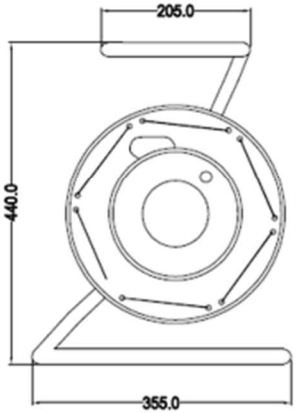
NOTE: ISOMETRIC VIEW NOT TO SCALE

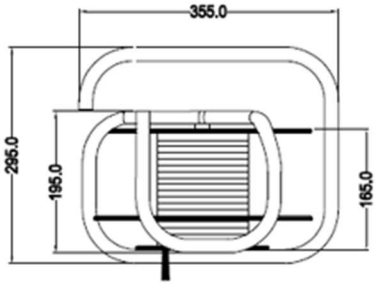
Connector Notes (At Both Ends):
QDC Nipple Cap (Stockit - 500028)
QDC Open Male Nipple (Stockit - 500012)
1/2" Fibre Washer (Stockit 500007)

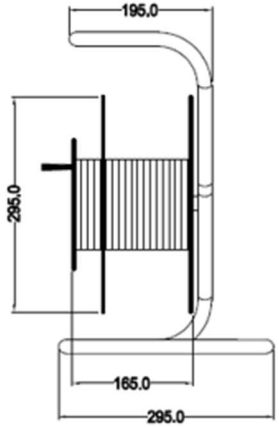
Hose notes:
1/4" Antiststic air hose with
1/2" BSPP St/Steel fittings
Stockit - 500078

Carry on SIGTTO reel notes:
Material: 316 SS
Finish: Powder coat
Drum Colour :Yellow
Frame Colour : Black
Cable length : 25m

## USL-8823-V0-104






## 7. Jetty/Tugboat information

### Hamina Ö FG

| Berth Information Ö | | | | | | | | | | | | | Port guidelines for the use of tug(s) concidering wind direction and speed | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cargo type: | Berth: | Length m: | Max draught: | Max vessel length: | Safe clearance depth: | Fender type: | Fender size: | Distance betw. Fenders m: | Bollard type: | Bollard design SWL: | Distance betw. Bollards m: | Height above sea level (m): | Heading angle: | Affecting wind directions | Suggestion to use tug | Recommendation to use tug | Order to use tug |
| Liquid Bulk / Gas | Ö1 | 35 | * | 130 m | 10.0 | Sumitomo lateral rubber cylinder<br>Beta type vertical/lateral | 300 H x 2 000 L<br>600 H x 2 000 L x 1 000 W | 6.5 | Big-T<br>Vinch hook | 750 kN<br>600 kN | Adequate | 2.4 | 338 degrees | N, NE, E, SE, S, SW, W | 10 m/s | 15 m/s | 20 m/s |
| | Ö2 | 75 | * | 185 m | 11.2 | Sumitomo lateral rubber cylinder<br>Beta type vertical/lateral | 300 H x 2 000 L<br>600 H x 2 000 L x 1 000 W | 9.5 | Big-T<br>Vinch hook | 750 kN<br>750 kN | 15 | 2.4 | 338 degrees | N, NE, E, SE, S, SW, W | 10 m/s | 15 m/s | 20 m/s |
| | Ö3 | 80 | 12.0 | 260 m | 13.2 | Sumitomo Lambda type vertical/lateral | 800H x 2 000 L x 1 000 W | 11.0 | Tube Vinch hook | 1 000 kN | 21<br>50 | 2.4 | 304 degrees | NE, E, SE, S, SW, W, NW | 8 m/s | 13 m/s | 17 m/s |
| | | | * Please see Principles for Depth Practice in Harbour Basins (HaminaKotka 2020) | | | | | | | | | | | | | | |