<table>
<thead>
<tr>
<th>JETTY</th>
<th>DEPTH A/S(m)</th>
<th>APPROACH DEPTH(m)</th>
<th>MIN LOA (m)</th>
<th>MAX LOA (m)</th>
<th>MAX DISPL (tons)</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1E</td>
<td>10.9</td>
<td>15.1</td>
<td>-</td>
<td>110</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>1W</td>
<td>10.9</td>
<td>15.1</td>
<td>-</td>
<td>110</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8.8</td>
<td>15.1</td>
<td>-</td>
<td>170</td>
<td>54,000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>11.1</td>
<td>15.1</td>
<td>-</td>
<td>170</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>11.9</td>
<td>15.1</td>
<td>-</td>
<td>190</td>
<td>44,000</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>12.9</td>
<td>15.1</td>
<td>70</td>
<td>190</td>
<td>55,000</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>16.5</td>
<td>15.1</td>
<td>120</td>
<td>275</td>
<td>193,000</td>
<td>For vessels &gt;75000GT, 4 big tugs in attendance for Berthing and Unberthing</td>
</tr>
<tr>
<td>7</td>
<td>13.6</td>
<td>15.1</td>
<td>90</td>
<td>245</td>
<td>100,000</td>
<td>High spot of 12.4m located 0.8c NW 1st Bukom Bn</td>
</tr>
<tr>
<td>8</td>
<td>16.4</td>
<td>15.1</td>
<td>90</td>
<td>275</td>
<td>180,000</td>
<td>Berthing speed of up to 0.15m/s at a berthing angle of 6 degrees; For vessels &gt;75000GT, 4 big tugs in attendance for Berthing &amp; Unberthing</td>
</tr>
<tr>
<td>9</td>
<td>13.1</td>
<td>15.1</td>
<td>-</td>
<td>190</td>
<td>65,000</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>15.5</td>
<td>15.1</td>
<td>90</td>
<td>265</td>
<td>150,000</td>
<td></td>
</tr>
<tr>
<td>10A</td>
<td>2.9</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>The use of anchor is prohibited</td>
</tr>
<tr>
<td>10B</td>
<td>5.9</td>
<td>-</td>
<td>-</td>
<td>60</td>
<td>2,000</td>
<td>The use of anchor is prohibited</td>
</tr>
<tr>
<td>11</td>
<td>5.5</td>
<td>7.6</td>
<td>-</td>
<td>120</td>
<td>8,000</td>
<td>LPG Berth; See General Info item 9</td>
</tr>
<tr>
<td>12</td>
<td>13.0</td>
<td>15.1</td>
<td>-</td>
<td>120</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>10.5</td>
<td>10.5</td>
<td>98</td>
<td>155</td>
<td>21,500</td>
<td>Ethylene Berth; See General Info item 10.</td>
</tr>
<tr>
<td>OSPJ</td>
<td>10.4</td>
<td>10.3</td>
<td>206</td>
<td>50,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSSBM</td>
<td>23.5</td>
<td>22.8</td>
<td>235</td>
<td>345</td>
<td>355,000</td>
<td>“Swing Radius” 457m</td>
</tr>
</tbody>
</table>

Note: The maximum length may be increased depending on the jetty occupancy at the adjacent wharves
GENERAL INFORMATION

1. The least depth between 2\(^{nd}\) and 3\(^{rd}\) Bukom Beacons is 14.3m - 0.8 cables South-East of 2\(^{nd}\) Bukom Bn. (Note location of high spot of 11.6m - 1.1 cables South-East of 4\(^{TH}\) the Bukom Bn and 12.4 located 0.8c NW 1st Bukom Bn).

2. Counter current can be expected when the predicted maximum East-going stream (Ebb Tide) in the Western Anchorage is $\geq 1.0$ knot. It is predicted to commence from about 2 to 3 hrs before the time of the predicted maximum Ebb Tide and continues till the time of the next slack water.

3. The safe approach to jetties along eastern edge of Pulau Bukom during Eastgoing (Ebb Tide) stream and West-going (Flood Tide) stream are on page 8 and 9.

4. The fenders at OS#9 protrude 1.5m from the wharf face and is not visible at certain heights of tide.

5. The number of mooring boats attending to vessels berthing at Shell Terminal are as follows:
   a) One Mooring Boat
      i) Vessels LOA $\leq 100$m
   b) Two Mooring Boats
      i) Vessels LOA $> 100$m
   c) In circumstances where two mooring boats are required e.g. inclement weather conditions, vessels with slow reaction engines, etc 2 mooring boats could be requested.

6. Mooring arrangements as required by Marine Officer (Shell Bukom):
   a) For vessels $> 5000$ GRT, the minimum mooring requirement would be 2 lines, 2 backsprings and 2 breastlines for each end.
   b) Mixed mooring of wires and synthetic ropes in same direction must be avoided to avoid uneven load distribution on ropes with differing load handling properties.

Caution: Beware of underwater marine cables and pipelines in the approach of Berth 11, 12 & 13.

7. No berthing of vessel above the maximum displacement.
8. VLCCs anchoring at ATRAF on the EBB tide should be programmed for a tidal strength $\leq 1$ knot. 1 big tug should be in attendance.

9. Two tugs are recommended to assist for berthing and unberthing of LPG vessels at OS11, due to underwater cables in the area. Pilots may, on consultation with the master, request for additional tug, if necessary.

10. All gas/chemical carriers to OS13 to be assisted by 2 tugs, regardless of bow thrusters’ condition.

11. Vessel Navigating within Bukom waters for berthing/un-berthing shall have the required number of tugs made fast/assisting in line with MPA Towage Guidelines. Prior to entering Bukom waters if tugs are not in vicinity, Bukom pilot to contact Bukom operations and do not proceed for berthing.

12. For departure, at all times, required tug(s) shall made fast/assisting until vessel has safely cleared of Bukom waters.

13. Communication: Pilot Walkie talkie P03 VHF Channel 19 (Bukom Operation)

**PILOTAGE GUIDELINES**

1. **BERTHING (DAY)**
   a) **Flood Tide**
      i) OSSBM Programmed with at least 3 hours of west-going stream.
      ii) OS1 to OS5, OS7, OS9, OS 10, OS11, OS12, OS13 & OSPJ No restriction.
      iii) OS10A, B Tidal strength $\leq 0.5$ knot.
      iv) OS6 & OS8 For vessels $>75000$GT, tidal strength $\leq 1.0$kt
   b) **Ebb Tide**
      i) OSSBM No berthing.
      ii) OS1 to OS9 and OS12 When no counter current exists and
OS#10 occupied by vessel > 10,000 GT - vessels' displacements restricted to ≤ 25,000 tons.

When no counter current exists and OS#10 occupied by vessel ≤ 10,000 GT – generally no restriction.

When counter current exists - vessels’ displacement restricted to ≤ 25,000 tons.

iii) OS10 When no counter current exists – No restriction

When counter current exists - vessels’ displacements restricted to ≤ 25,000 tons.

iv) OS10A, OS10B & OS13 No restriction.

iv) OS11 Tidal strength ≤ 0.5 knot

v) OS6 & OS8 No berthing for vessels > 75000GT

2. UNBERTHING (DAY)

a) Flood Tide

i) OSSBM, OSPJ No restriction.

Port A/S

ii) OS1 to OS9
OS10A, B
OS11, OS12 & OS13 No restriction.

iii) OS10
Draft >11.0m or displacement >40,000 tons Tidal strength ≤1.0 knot.

Starboard A/S

i) OS1 to OS5, OS7, OS9, OS 10, OS11, OS12, OS13 & OSPJ No restriction.

ii) OS10A, B Tidal strength ≤ 1.0 knot. (assisting big tug to provide towline).
v) OS6 & OS8  For vessels >75000GT, tidal strength \leq 1.0\text{kt}

\textbf{b) Ebb Tide}

i) OSSBM  No unberthing if draft is > 15.0m.

\textbf{Port A/S}

ii) OS1 to OS10
    OS10A, B,
    OS12, OS13, OSPJ  No restriction.

iii) OS11  No restriction

\textbf{Starboard A/S}

iv) OS1 to OS10
    OS11
    OS12, OS13, OSPJ  No restriction.

v) OS10A, B  Tidal strength \leq 1.0\text{knot (assisting big tug to provide towline)}

vi) OS6 & OS8  No unberthing for vessels > 75000GT

\textbf{3. BERTHING (NIGHT)}

\textbf{a) Flood Tide}

i) OSSBM  Programmed with at least 3 hours of west-going stream.

ii) OS1 to OS10
    OS11A and B and
    OS12, OS13, OSPJ  No restriction.

iii) OS10A, B  Tidal strength \leq 0.5\text{knot.}

iv) OS6 & OS8  No berthing for vessels > 75000GT
b) **Ebb Tide**

i) OSSBM  

No berthing.

ii) OS1 to OS8  

When no counter current exists and OS#10 occupied by vessel > 10,000 GT – vessels’ displacements restricted to ≤ 25,000 tons.

When counter current exists - vessels’ displacement restricted to ≤ 25,000 or (≤ 26,000 tons for Shell ‘H’ class vessels)

iii) OS9 and OS12  

When no counter current exists and OS 10 occupied by vessel > 10,000 GT- vessels’ displacements restricted to ≤ 25,000 tons.

When counter current exists – vessels’ displacements restricted to ≤ 12,000 tons.

iv) OS10  

When no counter current exists – no restriction.

When counter current exists – vessels’ displacements restricted to ≤ 25,000 tons.

v) OS10A, B, OS13 & OSPJ  

No restriction.

vi) OS11  

Tidal strength ≤ 0.5 knots

vii) OS6 & OS8  

No berthing for vessels > 75000GT

4. **UNBERTHING (NIGHT)**

a) **Flood Tide**

i) OSSBM, OS13, OSPJ  

No restriction.
**Port A/S**

ii) OS1 to OS9
OS10A, B
OS11
OS12

No restriction.

iii) OS10
Draft >11.0m
or displacement > 40,000 tons.

Tidal strength ≤ 1.0 knot.

**Starboard A/S**

iv) OS1 to OS10
OS11 and OS12

No restriction.

v) OS10A, B

Tidal strength < 0.5 knot (assisting big tug to provide towline)

vi) OS6 & OS8

No unberthing for vessels > 75000GT

b) **Ebb Tide**

i) OSSBM

No unberthing if draft is > 15.0m.

ii) OS13, OSPJ

No restriction.

**Port A/S**

iii) OS1 to OS10
OS10A, B and OS12

No restriction.

iv) OS11

No restriction

**Starboard A/S**

v) OS1 to OS10, OS12

No restriction

vi) OS10A, B

Tidal strength ≤ 0.5 knot. (assisting big tug to provide towline)

vii) OS11

No restriction.

viii) OS7 & 8

Vessels > 10,000 GT should whenever practicable exit between Second and Third Bukom Beacon or via Bukom #10.

ix) OS6 & OS8

No unberthing for vessels > 75000GT
# TUG ASSIGNMENT GUIDELINES

<table>
<thead>
<tr>
<th>LENGTH OVERALL OF VESSEL (LOA)</th>
<th>NUMBER OF TUGS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 100 metres</td>
<td>1 small tug</td>
<td></td>
</tr>
<tr>
<td>101 to 152 metres</td>
<td>2 small tugs</td>
<td></td>
</tr>
<tr>
<td>153 to 180 metres</td>
<td>2 medium tugs</td>
<td></td>
</tr>
<tr>
<td>181 to 220 metres</td>
<td>2 medium tugs</td>
<td></td>
</tr>
<tr>
<td>221 to 280 metres</td>
<td>2 big tugs</td>
<td></td>
</tr>
<tr>
<td>281 metres and above</td>
<td>4 big tugs</td>
<td></td>
</tr>
</tbody>
</table>

A vessel equipped with a suitable bow/stern thruster(s), in good working condition, may dispense with the need for a tug in that position.

Generally, for movements at Shell's Single Buoy Mooring (SBM) and its berths at Pulau Bukom the Terminal should be consulted for their tug recommendation/requirement.
SAFE APPROACH

Flood Tide

Location where tugs should have been made fast when approaching from West

Location where tugs should have been made fast when approaching from North

Vessel to stem the Flood Tide Stream and enter Bukom Channel by passing West of First Bukom Beacon

Flood Tide Stream
Location where tugs should have been made fast when approaching from North

Vessel to stem the Ebb Tide Stream and enter Bukom Channel by passing West of Fourth Bukom Beacon

Location where tugs should have been made fast when approaching from South
CHARLET

Chartlet for illustration purposes only, not to be used for navigation. For navigation, mariners are advised to use the appropriate BA nautical charts.