



Certificat B

NAVIGATION

LEX BENTNER (LBENTNER@PT.LU)

Tidal Heights



Tides

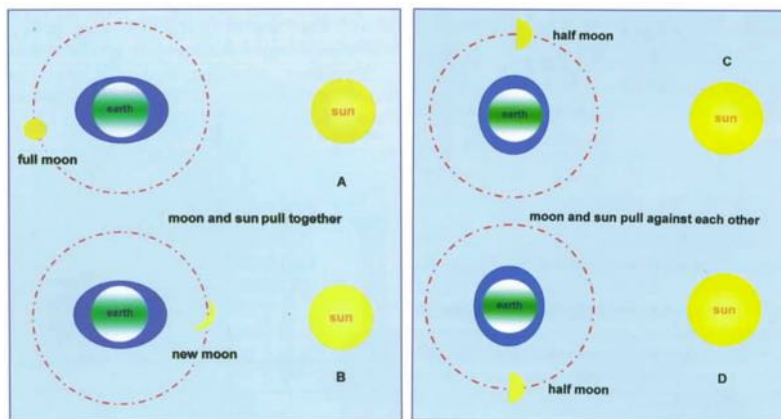


Fig 5.1 Spring tides: the gravitational effect of the Moon and Sun working together.

Fig 5.2 Neap tides – the pull from the Moon and the Sun are in opposition.

Tidal levels

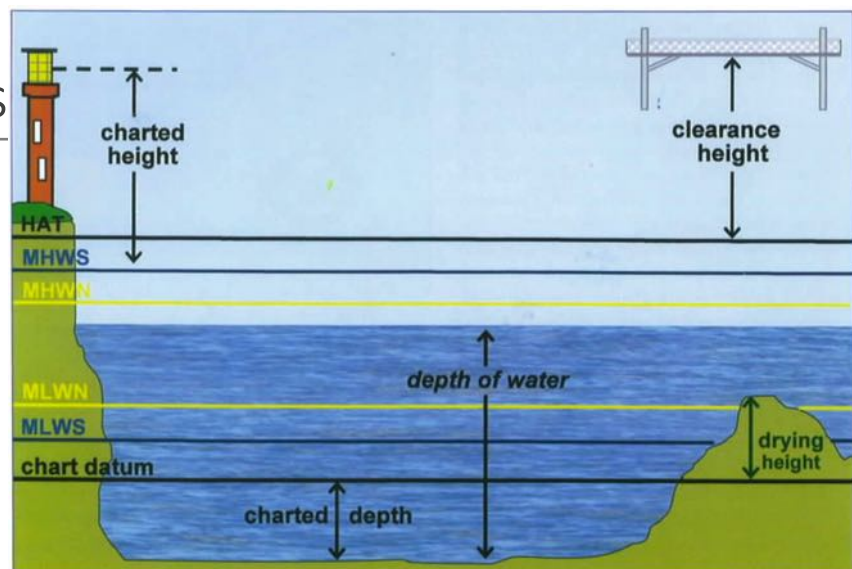
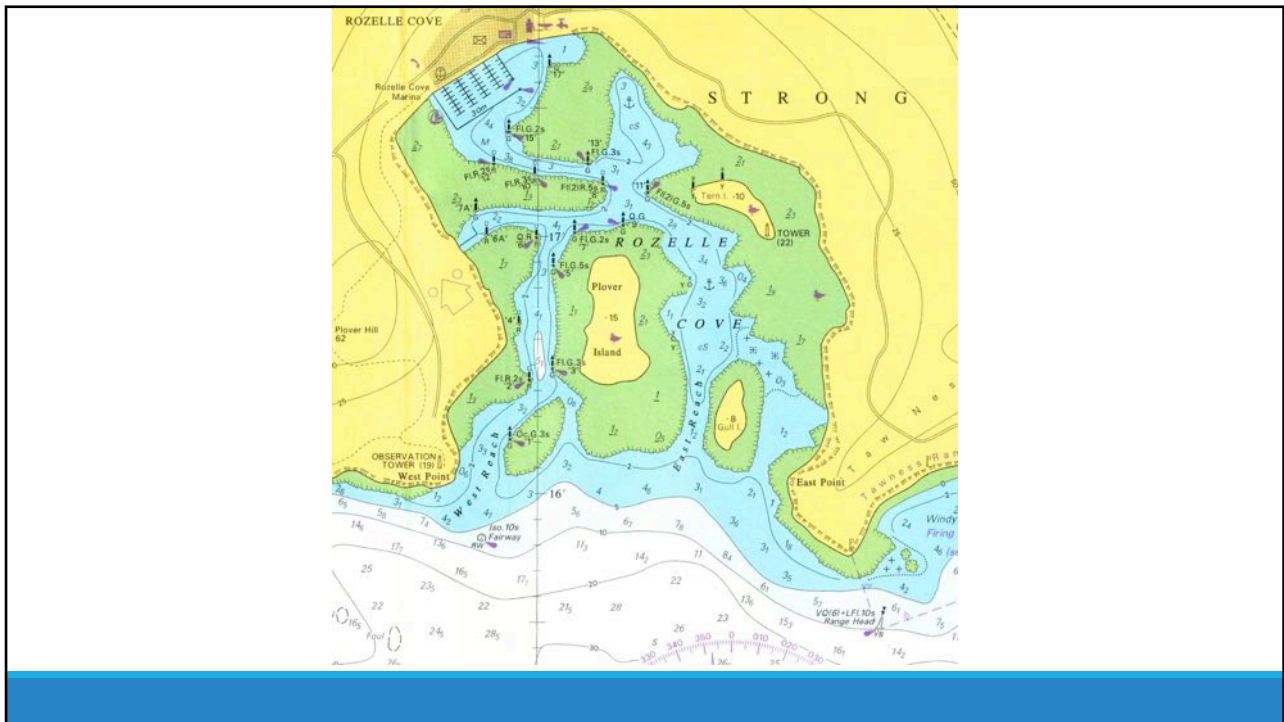


Fig 5.3 Tidal levels.



tidal height needed

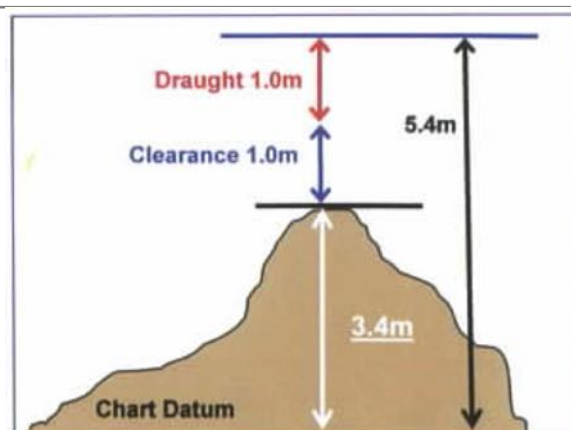
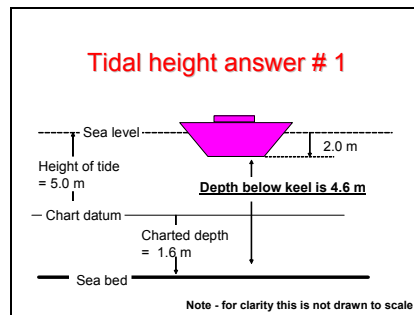


Fig 5.9 The height of tide required is 5.4m.

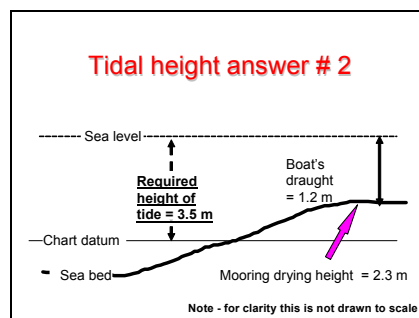
1. Charted depth 1.6m, height of tide 5.0m, draught of boat 2.0m. What is the depth below our keel?

- The answer is 4.6 metres.



2. My boat draws 1.2m and my mooring has a drying height of 2.3m. What height of tide do I need before she will float?

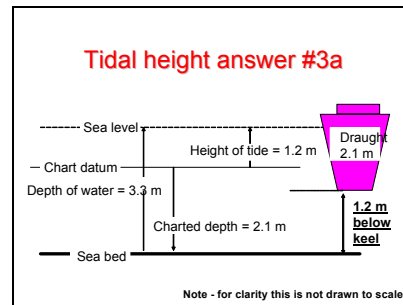
- The answer is 3.5 metres.



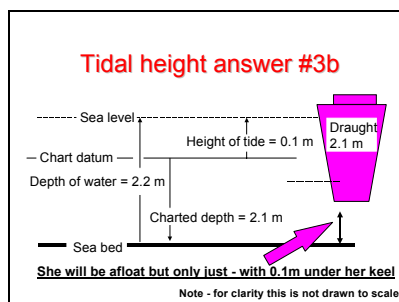
3. Depth of water 3.3m. Draught 2.1m. Height of tide 1.2m. Predicted Low water height 0.1m. How much water is under my keel?

- The answer is 1.2 metres.

Figure 21 - Tidal height answer 2

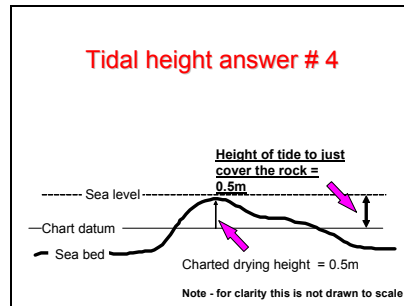


- Will my boat be afloat at low water?
- The answer is that she will be, but only just. The clearance under her keel will be 0.1 metres.



4. A rock has a charted drying height of 0.5m. What predicted LW height would just cover it?

- The answer is 0.5m.



5. Taking our rock again. If the height of tide is 2.3m and boat's draught 1.5m how much clearance should there be under our keel? Would you cross it if there were a 0.5m swell (i.e. the height of the waves is 0.5m from top to bottom)?

The answers are:

- There will be 0.3m under her keel.
- No - the effect of a 0.5 metre swell is that the water oscillates around the sea level to give us a lowest level that is half the swell's height below the predicted sea level. Put another way - in the trough of a wave the sea level will be 0.25 metres below its predicted height ON AVERAGE (because waves vary in height) in a half metre swell. We could easily go aground and would actually expect that nerve shattering 'crunch' as our keel hits the rock!

Swell heights often exceed half a metre. In a three metre swell, which is not at all uncommon, we should plan on the sea level being **at least** one and a half metres **below** our predictions!

A wise navigator would add at least another metre to allow for the boat's movement and the variability of the wave height. The consequence of dropping several tons of boat onto an unyielding surface will be damage, or even the loss of our boat, so it pays to be prudent.

Figure 24 - Covering the rock - answer 4

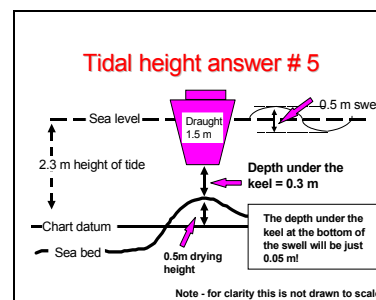


Figure 25 - Clearing a rock - answer 5

6. Highest astronomical tide (HAT) is 5.0m. A power line has a clearance of 15.5m just ahead of you. The chart notes that the safe clearance to avoid arcing is a minimum of 0.5m! Height of tide is 3.5m and the height of your masthead is 16.3m. Can you clear the line and by how much? Would you go ahead? If pressure were very high, or low would you change your mind?

The answers are:

- Yes by 0.2 metres.
- No - I would prefer to wait for a lower tide if only because I would prefer to keep the expensive electronics at my masthead working!
- If the pressure were very high then I might go ahead because we would expect the height of tide to be reduced (the tide has 'cut'). A combination of low pressure and hot weather (makes the power lines sag a bit as they expand!) would make me very nervous!

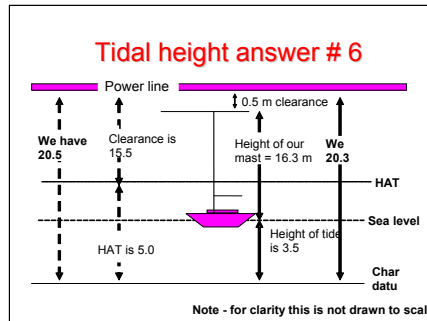


Figure 26 - Passing under a bridge - answer 6

Standard Port

VICTORIA - Standard Port

46°26'.15N 006°12'.20W
Northern Territories CHART RYA 3.

Standard Port VICTORIA (→)

DESCRIPTION. Victoria is a busy port with both general cargo and container docks. Shelter is generally good within the breakwater, but the area can be effected by strong katabatic gusts during NW'y gales. Excellent shelter within the marina which has 20 V berths. Anchoring is permitted in the northern area of the harbour clear of the marina entrance. Good holding in cS

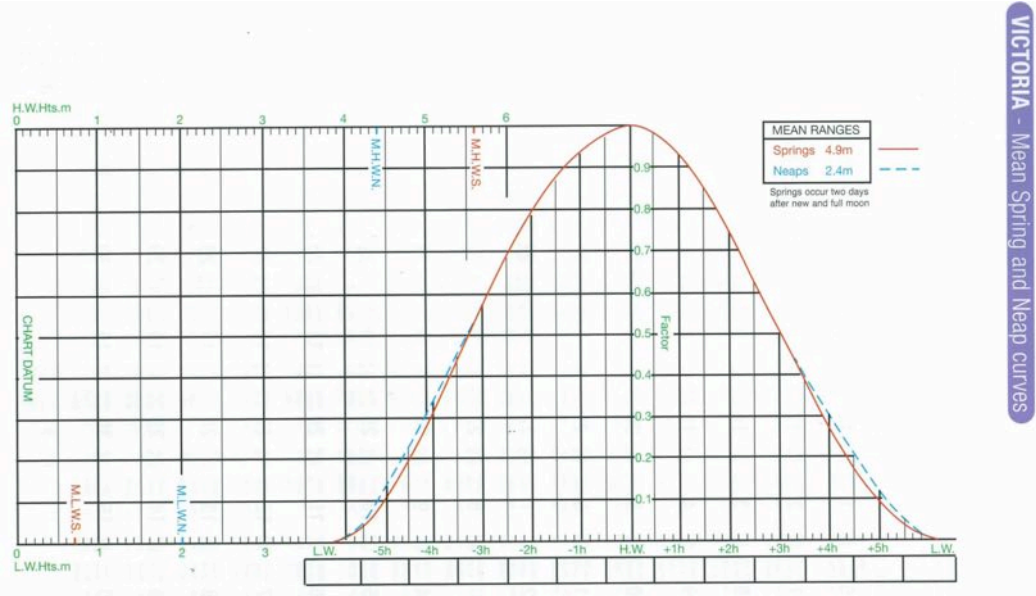
VICTORIA - Standard Port

TIME ZONE UT
For Summer Time add ONE
hour in non-shaded areas

SPRING & NEAP TIDES
Dates in red are SPRINGS
Dates in blue are NEAPS

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

| JANUARY | | | | FEBRUARY | | | | MARCH | | | | APRIL | | | |
|---------|-----|---------|-----|----------|-----|---------|-----|---------|-----|---------|-----|---------|-----|---------|-----|
| Time | m | Time | m | Time | m | Time | m | Time | m | Time | m | Time | m | Time | m |
| 1 0510 | 0.9 | 16 0549 | 1.2 | 1 0028 | 5.7 | 16 0028 | 5.1 | 1 0524 | 0.3 | 16 0532 | 0.9 | 1 0024 | 5.7 | 16 0000 | 5.3 |
| TU 1126 | 5.8 | W 1201 | 5.5 | F 0627 | 0.6 | SA 0629 | 1.2 | F 1139 | 6.2 | SA 1142 | 5.5 | M 0628 | 0.4 | TU 0607 | 1.0 |
| 2354 | 5.6 | W 1814 | 1.1 | F 1245 | 6.0 | SA 1242 | 5.4 | F 1755 | 0.0 | SA 1750 | 0.9 | M 1247 | 5.8 | TU 1219 | 5.2 |
| | | | | 1903 | 0.4 | 1851 | 1.1 | | | 2359 | 5.2 | 1858 | 0.6 | 1821 | 1.1 |
| 2 0556 | 0.9 | 17 0024 | 5.1 | 2 0115 | 5.5 | 17 0100 | 5.0 | 2 0006 | 5.8 | 17 0601 | 1.0 | 2 0108 | 5.4 | 17 0033 | 5.2 |
| 1212 | 5.8 | TH 0623 | 1.3 | 0714 | 0.8 | 0702 | 1.3 | 0606 | 0.3 | 1213 | 5.4 | 0714 | 0.7 | 0642 | 1.2 |
| W 1830 | 0.7 | TH 1235 | 6.4 | SA 1333 | 5.8 | SU 1315 | 5.3 | SA 1224 | 6.1 | SU 1819 | 1.0 | TU 1334 | 5.4 | W 1255 | 5.1 |
| | | 1949 | 1.2 | 1952 | 0.6 | 1924 | 1.3 | 1839 | 0.2 | | | 1944 | 1.1 | 1858 | 1.3 |
| 3 0043 | 5.5 | 18 0058 | 5.0 | 3 0204 | 5.3 | 18 0133 | 4.9 | 3 0050 | 5.8 | 18 0028 | 5.2 | 3 0155 | 5.1 | 18 0109 | 5.0 |
| 0643 | 1.0 | F 0658 | 1.5 | 0803 | 1.0 | 0736 | 1.5 | 0651 | 0.5 | 0632 | 1.1 | 0606 | 1.2 | 0723 | 1.4 |
| TH 1301 | 5.7 | F 1311 | 5.3 | SU 1423 | 5.5 | M 1350 | 5.1 | SU 1310 | 5.9 | M 1245 | 5.3 | W 1427 | 4.9 | TH 1338 | 4.9 |
| 1920 | 0.8 | 1925 | 1.4 | 2045 | 1.0 | 2000 | 1.5 | 1925 | 0.5 | 1850 | 1.1 | 2037 | 1.6 | 1941 | 1.6 |
| 4 0135 | 5.3 | 19 0134 | 4.8 | 4 0257 | 5.0 | 19 0209 | 4.7 | 4 0135 | 5.4 | 19 0099 | 5.0 | 4 0248 | 4.8 | 19 0153 | 4.8 |
| 0733 | 1.2 | 0734 | 1.6 | 0658 | 1.4 | 0616 | 1.7 | 0737 | 0.8 | 0705 | 1.3 | 0607 | 1.6 | 0813 | 1.6 |
| F 1353 | 5.6 | SA 1348 | 5.1 | M 1520 | 5.2 | TU 1430 | 4.8 | M 1357 | 5.5 | TU 1318 | 5.1 | TH 1532 | 4.5 | F 1429 | 4.6 |
| 2015 | 0.9 | 2003 | 1.5 | 2144 | 1.3 | 2043 | 1.7 | 2013 | 0.9 | 1924 | 1.3 | 2144 | 2.0 | 2036 | 1.8 |
| 5 0230 | 5.1 | 20 0213 | 4.7 | 5 0358 | 4.7 | 20 0254 | 4.5 | 5 0223 | 5.1 | 20 0133 | 4.9 | 5 0357 | 4.5 | 20 0252 | 4.6 |
| SA 0628 | 1.4 | 0815 | 1.9 | 1003 | 1.7 | 0905 | 2.0 | 0629 | 1.2 | 0743 | 1.5 | 1028 | 1.9 | 0921 | 1.8 |
| SA 1449 | 5.4 | SU 1429 | 4.9 | TU 1627 | 4.9 | W 1521 | 4.6 | TU 1450 | 5.1 | W 1356 | 4.9 | F 1704 | 4.2 | SA 1542 | 4.4 |
| 2115 | 1.1 | 2046 | 1.7 | 2253 | 1.6 | 2138 | 2.0 | 2109 | 1.4 | 2004 | 1.6 | 2310 | 2.3 | 2151 | 2.1 |



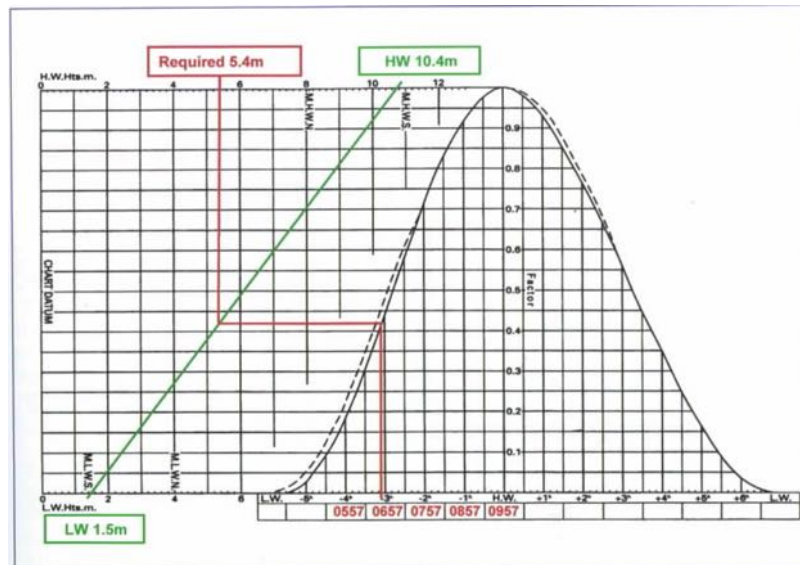


Fig 5.10 There is sufficient water to enter the bay just a few minutes before 0700. Best not to try it any earlier if a sure clearance of one metre is required..

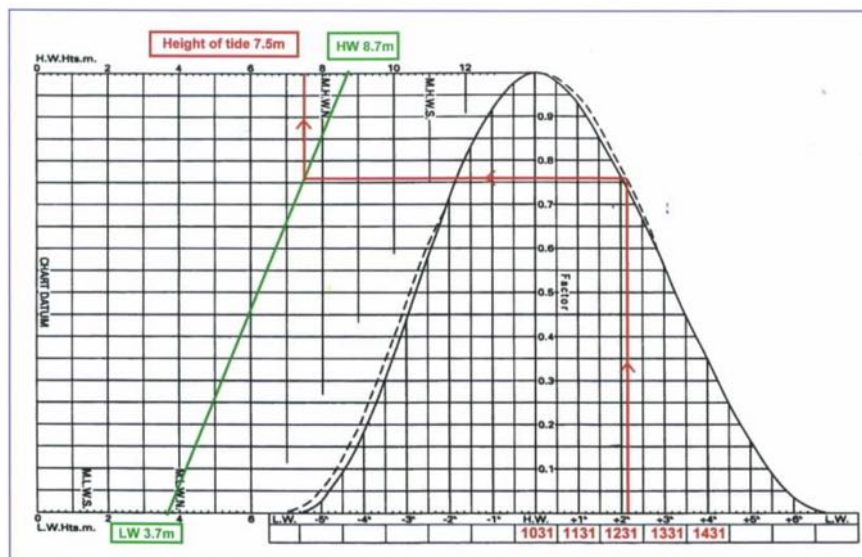


Fig 5.11 Calculating the height of tide for a given time.

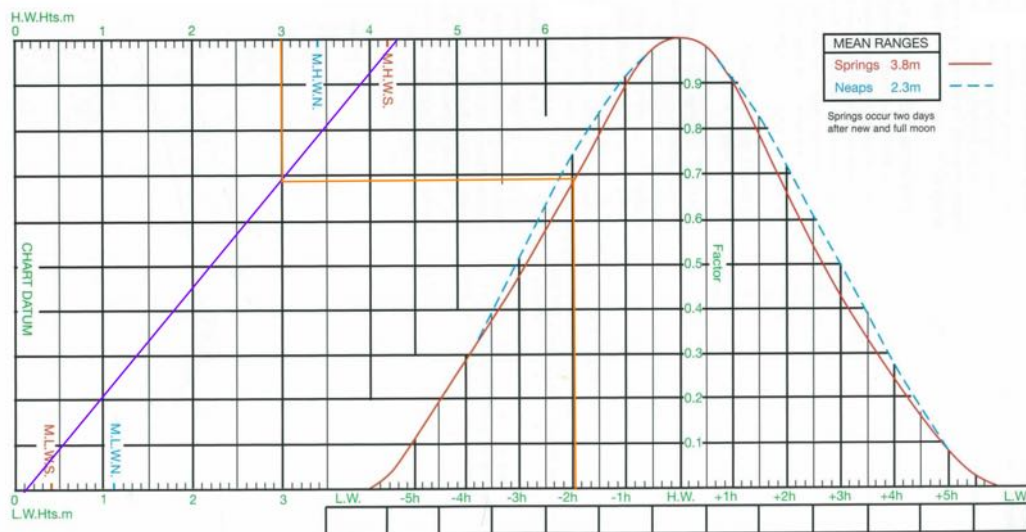
Übung

Port Fraser

26. Abrèl Muerges

Priddy Bank (0.5m) Inner Swashway

Déifgang : 2.0 m + 1.5 m Sëcherheet



Tidal Anomalies

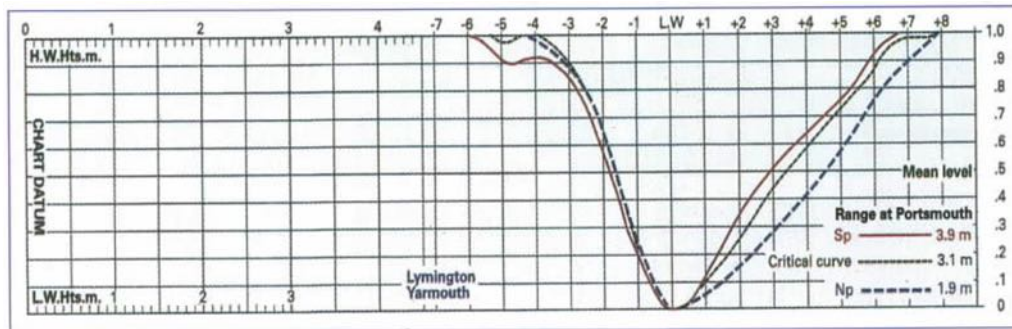


Fig 5.18 Tidal curve for Lymington and Yarmouth.

