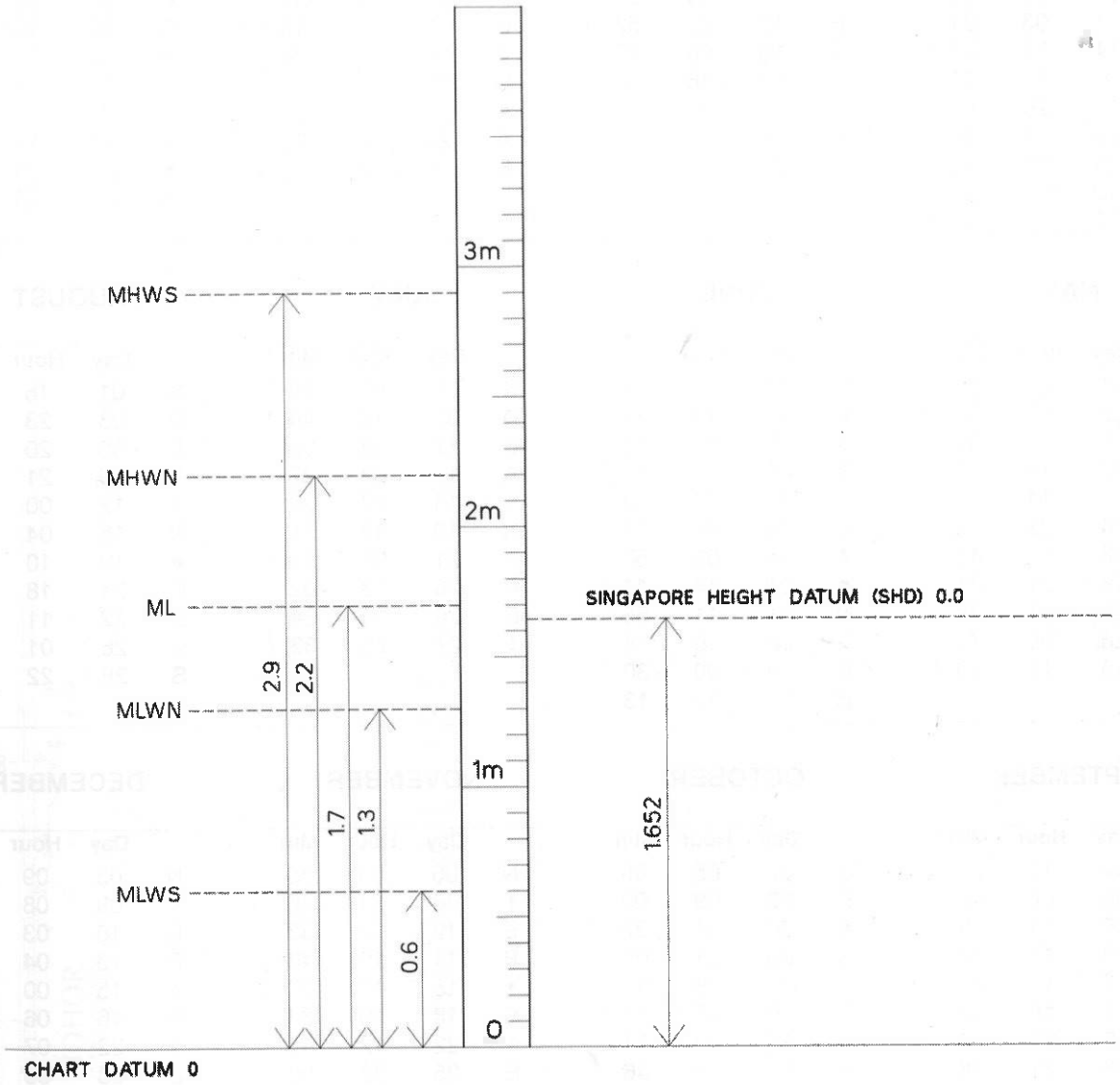
# TIDAL LEVELS FOR TIDAL STATIONS

| Stations /Positions In WGS 84 | Heights In Metres Above Chart Datum | | | | | Reference To SHD |
|---|---|---|---|---|---|---|
| | MHWS | MHWN | MLWN | MLWS | ML | |
| **West Tuas**<br>1° 20.7'N 103° 38.0'E | 3.0 | 2.2 | 1.2 | 0.3 | 1.7 | 1.636m below SHD |
| **Sultan Shoal Lighthouse**<br>1° 14.6'N 103° 39.0'E | 3.0 | 2.3 | 1.3 | 0.5 | 1.8 | 1.741m below SHD |
| **Raffles Lighthouse**<br>1° 09.6'N 103° 44.5'E | 2.9 | 2.2 | 1.3 | 0.5 | 1.7 | - |
| **West Coast**<br>1° 17.5'N 103° 45.7'E | 3.0 | 2.3 | 1.3 | 0.6 | 1.8 | 1.722m below SHD |
| **Bukom**<br>1° 13.5'N 103° 46.7'E | 2.8 | 2.1 | 1.2 | 0.5 | 1.7 | - |
| **Tanjong Pagar**<br>1° 15.7'N 103° 51.1'E | 2.9 | 2.2 | 1.3 | 0.6 | 1.7 | 1.652m below SHD |
| **Tanah Merah**<br>1° 18.7'N 103° 59.3'E | 2.7 | 2.1 | 1.2 | 0.6 | 1.6 | 1.566m below SHD |
| **Tanjong Changi**<br>1° 23.4'N 103° 59.9'E | 2.9 | 2.3 | 1.3 | 0.7 | 1.8 | 1.713m below SHD |
| **Sembawang**<br>1° 27.9'N 103° 50.1'E | 3.1 | 2.5 | 1.4 | 0.7 | 1.9 | 1.830m below SHD |
| **Singapore Strait – Horsburgh Lighthouse**<br>1° 19.8'N 104° 24.2'E | 2.6 | 2.2 | 1.4 | 1.0 | 1.8 | - |

**Legend:**

**SHD** - Singapore Height Datum
**ML** - Mean Level
**MLWS** - Mean Low Water Springs
**MLWN** - Mean Low Water Neaps
**MHWN** - Mean High Water Neaps
**MHWS** - Mean High Water Springs

# RELATIONSHIP BETWEEN VARIOUS LEVELS IN TANJONG PAGAR




HEIGHTS IN METRES

# ASTRONOMICAL DATA 2020

## JANUARY

| | Day | Hour | Min |
|---|---|---|---|
| A | 02 | 09 | 30 |
| ☽ | 03 | 12 | 45 |
| E | 03 | 12 | 51 |
| N | 10 | 14 | 03 |
| O | 11 | 03 | 21 |
| P | 14 | 04 | 21 |
| E | 16 | 20 | 11 |
| ☾ | 17 | 20 | 58 |
| S | 23 | 11 | 34 |
| ● | 25 | 05 | 42 |
| A | 30 | 05 | 27 |
| E | 30 | 20 | 18 |

## FEBRUARY

| | Day | Hour | Min |
|---|---|---|---|
| ☽ | 02 | 09 | 42 |
| N | 07 | 00 | 09 |
| O | 09 | 15 | 33 |
| P | 11 | 04 | 28 |
| E | 13 | 02 | 52 |
| ☾ | 16 | 06 | 17 |
| S | 19 | 16 | 54 |
| ● | 23 | 23 | 32 |
| A | 26 | 19 | 34 |
| E | 27 | 02 | 29 |

## MARCH

| | Day | Hour | Min |
|---|---|---|---|
| ☽ | 03 | 03 | 57 |
| N | 05 | 09 | 34 |
| O | 10 | 01 | 48 |
| P | 10 | 14 | 30 |
| E | 11 | 12 | 15 |
| ☾ | 16 | 17 | 34 |
| S | 17 | 22 | 01 |
| ● | 24 | 17 | 28 |
| A | 24 | 23 | 23 |
| E | 25 | 08 | 13 |

## APRIL

| | Day | Hour | Min |
|---|---|---|---|
| N | 01 | 17 | 13 |
| ☽ | 01 | 18 | 21 |
| E | 07 | 23 | 20 |
| P | 08 | 02 | 09 |
| O | 08 | 10 | 35 |
| S | 14 | 05 | 00 |
| ☾ | 15 | 06 | 56 |
| A | 21 | 03 | 00 |
| E | 21 | 14 | 26 |
| ● | 23 | 10 | 26 |
| N | 28 | 23 | 22 |

## MAY

| | Day | Hour | Min |
|---|---|---|---|
| ☽ | 01 | 04 | 38 |
| E | 05 | 09 | 58 |
| P | 06 | 11 | 03 |
| O | 07 | 18 | 45 |
| S | 11 | 14 | 14 |
| ☾ | 14 | 22 | 03 |
| A | 18 | 15 | 45 |
| E | 18 | 21 | 31 |
| ● | 23 | 01 | 39 |
| N | 26 | 05 | 13 |
| ☽ | 30 | 11 | 30 |

## JUNE

| | Day | Hour | Min |
|---|---|---|---|
| E | 01 | 18 | 26 |
| P | 03 | 11 | 38 |
| O | 06 | 03 | 12 |
| S | 08 | 00 | 23 |
| ☾ | 13 | 14 | 24 |
| E | 15 | 05 | 16 |
| A | 15 | 08 | 57 |
| ● | 21 | 14 | 41 |
| N | 22 | 11 | 55 |
| ☽ | 28 | 16 | 16 |
| E | 29 | 00 | 30 |
| P | 30 | 10 | 13 |

## JULY

| | Day | Hour | Min |
|---|---|---|---|
| S | 05 | 09 | 35 |
| O | 05 | 12 | 44 |
| E | 12 | 13 | 02 |
| A | 13 | 03 | 27 |
| ☾ | 13 | 07 | 29 |
| N | 19 | 19 | 51 |
| ● | 21 | 01 | 33 |
| P | 25 | 13 | 02 |
| E | 26 | 05 | 34 |
| ☽ | 27 | 20 | 33 |

## AUGUST

| | Day | Hour | Min |
|---|---|---|---|
| S | 01 | 16 | 44 |
| O | 03 | 23 | 59 |
| E | 08 | 20 | 16 |
| A | 09 | 21 | 50 |
| ☾ | 12 | 00 | 45 |
| N | 16 | 04 | 39 |
| ● | 19 | 10 | 42 |
| P | 21 | 18 | 57 |
| E | 22 | 11 | 48 |
| ☽ | 26 | 01 | 58 |
| S | 28 | 22 | 04 |

## SEPTEMBER

| | Day | Hour | Min |
|---|---|---|---|
| O | 02 | 13 | 22 |
| E | 05 | 02 | 49 |
| A | 06 | 14 | 29 |
| ☾ | 10 | 17 | 26 |
| N | 12 | 13 | 23 |
| ● | 17 | 19 | 00 |
| E | 18 | 20 | 36 |
| P | 18 | 21 | 48 |
| ☽ | 24 | 09 | 55 |
| S | 25 | 03 | 11 |

## OCTOBER

| | Day | Hour | Min |
|---|---|---|---|
| O | 02 | 05 | 05 |
| E | 02 | 09 | 00 |
| A | 04 | 01 | 22 |
| N | 09 | 21 | 05 |
| ☾ | 10 | 08 | 40 |
| E | 16 | 07 | 31 |
| ● | 17 | 03 | 31 |
| P | 17 | 07 | 46 |
| S | 22 | 10 | 04 |
| ☽ | 23 | 21 | 23 |
| E | 29 | 15 | 17 |
| A | 31 | 02 | 45 |
| O | 31 | 22 | 49 |

## NOVEMBER

| | Day | Hour | Min |
|---|---|---|---|
| N | 06 | 03 | 30 |
| ☾ | 08 | 21 | 46 |
| E | 12 | 18 | 33 |
| P | 14 | 19 | 43 |
| ● | 15 | 13 | 07 |
| S | 18 | 19 | 33 |
| ☽ | 22 | 12 | 45 |
| E | 25 | 22 | 03 |
| A | 27 | 08 | 29 |
| O | 30 | 17 | 30 |

## DECEMBER

| | Day | Hour | Min |
|---|---|---|---|
| N | 03 | 09 | 23 |
| ☾ | 08 | 08 | 37 |
| E | 10 | 03 | 21 |
| P | 13 | 04 | 42 |
| ● | 15 | 00 | 17 |
| S | 16 | 06 | 25 |
| ☽ | 22 | 07 | 41 |
| E | 23 | 05 | 24 |
| A | 25 | 00 | 31 |
| O | 30 | 11 | 28 |
| N | 30 | 15 | 54 |

### Symbols For Astronomical Data

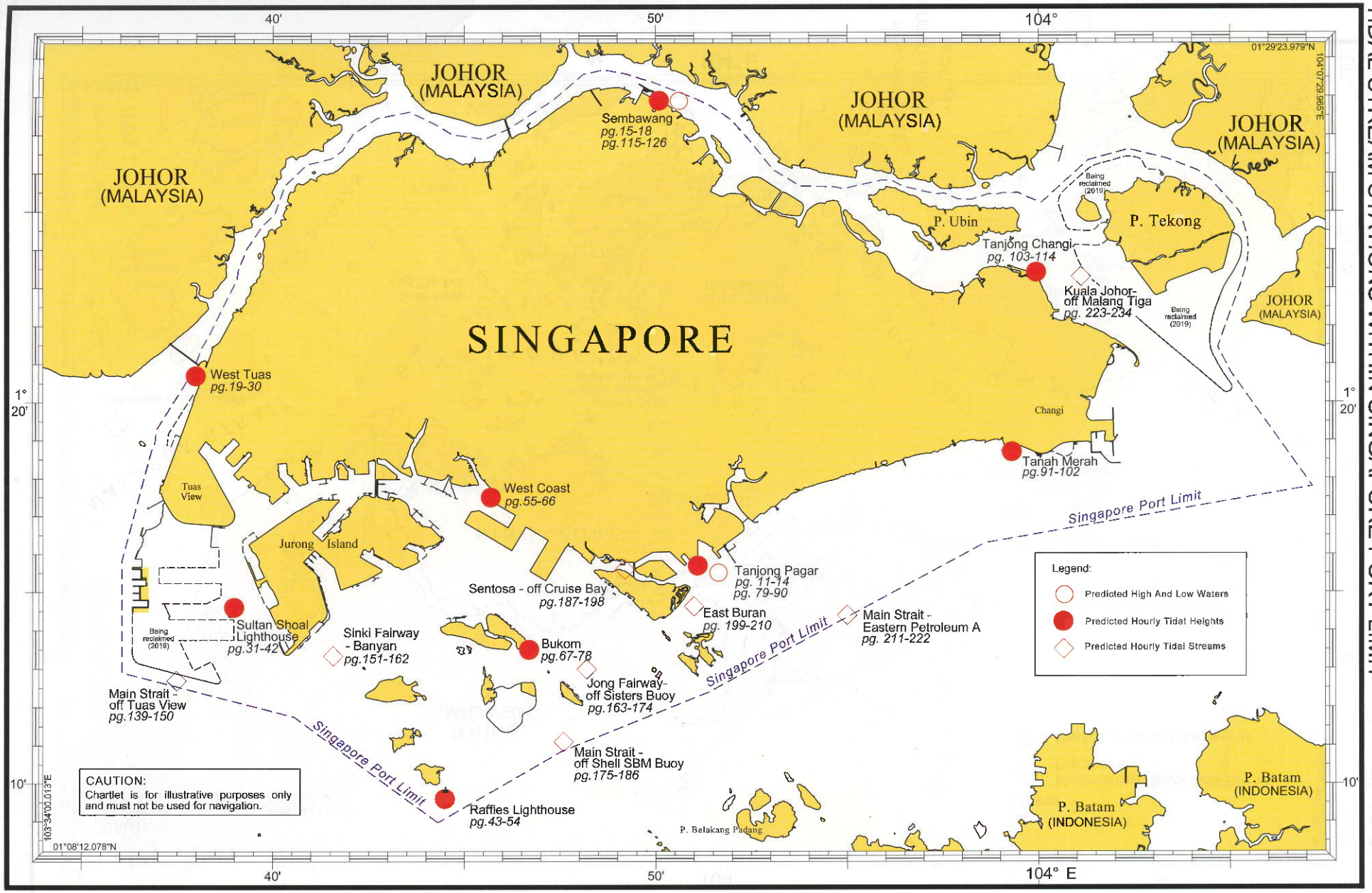
P PERIGEE*
☽ FIRST QUARTER
N MAXIMUM DECLINATION NORTH*

A APOGEE
☾ LAST QUARTER
S MAXIMUM DECLINATION SOUTH*

● NEW MOON*
E MOON ON EQUATOR
○ FULL MOON*

The lunar phenomena, which are marked with * have a superior effect on tides.

# LOCATIONS OF PREDICTED TIDAL HEIGHT AND TIDAL STREAM STATIONS WITHIN SINGAPORE PORT LIMIT



# High and Low Water Predictions

# YEAR 2020

HIGH AND LOW WATERS

TIMES AND HEIGHTS OF HIGH AND **LOW WATERS**

## SEMBAWANG

LAT 01° 27.9'N LONG 103° 50.1'E

### OCTOBER

| | TIME | METRE | | TIME | METRE |
|---|---|---|---|---|---|
| | 0450 | 0.5 | | 0422 | 0.4 |
| 1 | 1135 | 3.0 | 16 | 1109 | 3.2 |
| TH | 1703 | 0.9 | F | 1641 | 0.7 |
| | 2335 | 3.1 | | 2318 | 3.4 |
| | 0526 | 0.5 | | 0505 | 0.4 |
| 2 | 1156 | 3.0 | 17 | 1143 | 3.3 |
| F | 1735 | 0.8 | SA | 1722 | 0.4 |
| ○ | | | ● | | |
| | 0005 | 3.2 | | 0005 | 3.6 |
| 3 | 0558 | 0.6 | 18 | 0546 | 0.5 |
| SA | 1218 | 3.1 | SU | 1216 | 3.4 |
| | 1805 | 0.7 | | 1801 | 0.2 |
| | 0037 | 3.2 | | 0052 | 3.6 |
| 4 | 0624 | 0.7 | 19 | 0626 | 0.7 |
| SU | 1245 | 3.1 | M | 1252 | 3.4 |
| | 1831 | 0.6 | | 1841 | 0.1 |
| | 0109 | 3.2 | | 0139 | 3.6 |
| 5 | 0650 | 0.8 | 20 | 0705 | 1.0 |
| M | 1311 | 3.1 | TU | 1326 | 3.3 |
| | 1856 | 0.5 | | 1918 | 0.1 |
| | 0141 | 3.1 | | 0231 | 3.4 |
| 6 | 0713 | 0.9 | 21 | 0743 | 1.2 |
| TU | 1337 | 3.1 | W | 1401 | 3.2 |
| | 1920 | 0.5 | | 2000 | 0.2 |
| | 0215 | 3.0 | | 0330 | 3.2 |
| 7 | 0739 | 1.1 | 22 | 0824 | 1.5 |
| W | 1403 | 3.0 | TH | 1437 | 3.1 |
| | 1948 | 0.5 | | 2048 | 0.4 |
| | 0250 | 2.8 | | 0446 | 2.9 |
| 8 | 0809 | 1.3 | 23 | 0915 | 1.8 |
| TH | 1431 | 2.9 | F | 1518 | 2.9 |
| | 2022 | 0.6 | ☽ | 2152 | 0.7 |
| | 0335 | 2.7 | | 0609 | 2.8 |
| 9 | 0845 | 1.5 | 24 | 1026 | 2.0 |
| F | 1501 | 2.8 | SA | 1611 | 2.6 |
| | 2103 | 0.8 | | 2328 | 0.9 |
| | 0443 | 2.5 | | 0730 | 2.7 |
| 10 | 0931 | 1.8 | 25 | 1200 | 2.0 |
| SA | 1537 | 2.6 | SU | 1758 | 2.4 |
| ☾ | 2207 | 1.0 | | | |
| | 0646 | 2.4 | | 0056 | 1.0 |
| 11 | 1116 | 2.0 | 26 | 0843 | 2.8 |
| SU | 1631 | 2.5 | M | 1330 | 1.9 |
| | | | | 2007 | 2.5 |
| | 0026 | 1.0 | | 0209 | 1.0 |
| 12 | 0831 | 2.5 | 27 | 0935 | 2.9 |
| M | 1316 | 1.9 | TU | 1443 | 1.6 |
| | 1839 | 2.4 | | 2122 | 2.7 |
| | 0146 | 0.9 | | 0305 | 1.0 |
| 13 | 0931 | 2.8 | 28 | 1007 | 2.9 |
| TU | 1422 | 1.6 | W | 1528 | 1.4 |
| | 2028 | 2.6 | | 2209 | 2.8 |
| | 0245 | 0.7 | | 0348 | 0.9 |
| 14 | 1009 | 3.0 | 29 | 1031 | 3.0 |
| W | 1513 | 1.3 | TH | 1603 | 1.1 |
| | 2141 | 2.9 | | 2245 | 3.0 |
| | 0335 | 0.6 | | 0424 | 0.9 |
| 15 | 1039 | 3.1 | 30 | 1050 | 3.0 |
| TH | 1558 | 1.0 | F | 1637 | 0.9 |
| | 2233 | 3.2 | | 2316 | 3.1 |
| | | | | 0458 | 0.9 |
| | | | 31 | 1115 | 3.1 |
| | | | SA | 1707 | 0.7 |
| | | | ○ | 2348 | 3.2 |

### NOVEMBER

| | TIME | METRE | | TIME | METRE |
|---|---|---|---|---|---|
| | 0528 | 0.9 | | 0522 | 1.0 |
| 1 | 1141 | 3.1 | 16 | 1145 | 3.4 |
| SU | 1735 | 0.6 | M | 1739 | 0.1 |
| | 0022 | 3.2 | | 0045 | 3.6 |
| 2 | 0554 | 1.0 | 17 | 0605 | 1.2 |
| M | 1209 | 3.2 | TU | 1222 | 3.4 |
| | 1801 | 0.5 | | 1820 | 0.0 |
| | 0056 | 3.2 | | 0135 | 3.5 |
| 3 | 0622 | 1.1 | 18 | 0646 | 1.4 |
| TU | 1237 | 3.2 | W | 1300 | 3.4 |
| | 1828 | 0.4 | | 1901 | 0.1 |
| | 0130 | 3.2 | | 0231 | 3.4 |
| 4 | 0650 | 1.3 | 19 | 0728 | 1.6 |
| W | 1305 | 3.1 | TH | 1337 | 3.3 |
| | 1856 | 0.4 | | 1946 | 0.2 |
| | 0203 | 3.1 | | 0335 | 3.2 |
| 5 | 0720 | 1.4 | 20 | 0813 | 1.7 |
| TH | 1333 | 3.1 | F | 1418 | 3.1 |
| | 1928 | 0.5 | | 2035 | 0.5 |
| | 0241 | 2.9 | | 0441 | 3.0 |
| 6 | 0754 | 1.5 | 21 | 0905 | 1.8 |
| F | 1401 | 3.0 | SA | 1501 | 2.9 |
| | 2003 | 0.6 | | 2133 | 0.8 |
| | 0328 | 2.8 | | 0541 | 2.9 |
| 7 | 0835 | 1.7 | 22 | 1005 | 1.9 |
| SA | 1433 | 2.9 | SU | 1600 | 2.7 |
| | 2046 | 0.7 | ☽ | 2243 | 1.0 |
| | 0446 | 2.7 | | 0639 | 2.8 |
| 8 | 0933 | 1.8 | 23 | 1116 | 1.9 |
| SU | 1513 | 2.8 | M | 1733 | 2.5 |
| ☾ | 2150 | 0.9 | | | |
| | 0618 | 2.7 | | 0003 | 1.2 |
| 9 | 1100 | 1.9 | 24 | 0737 | 2.8 |
| M | 1620 | 2.6 | TU | 1241 | 1.9 |
| | 2330 | 1.0 | | 1915 | 2.4 |
| | 0733 | 2.7 | | 0122 | 1.3 |
| 10 | 1231 | 1.8 | 25 | 0826 | 2.8 |
| TU | 1822 | 2.5 | W | 1407 | 1.7 |
| | | | | 2041 | 2.5 |
| | 0101 | 1.0 | | 0228 | 1.3 |
| 11 | 0835 | 2.9 | 26 | 0905 | 2.8 |
| W | 1345 | 1.6 | TH | 1501 | 1.4 |
| | 2003 | 2.7 | | 2139 | 2.7 |
| | 0211 | 1.0 | | 0315 | 1.3 |
| 12 | 0918 | 3.0 | 27 | 0935 | 2.9 |
| TH | 1443 | 1.3 | F | 1537 | 1.1 |
| | 2120 | 3.0 | | 2224 | 2.9 |
| | 0307 | 0.9 | | 0352 | 1.3 |
| 13 | 0956 | 3.1 | 28 | 1005 | 3.0 |
| F | 1531 | 0.9 | SA | 1609 | 0.9 |
| | 2216 | 3.2 | | 2303 | 3.0 |
| | 0356 | 0.9 | | 0426 | 1.3 |
| 14 | 1031 | 3.3 | 29 | 1035 | 3.1 |
| SA | 1615 | 0.5 | SU | 1639 | 0.7 |
| | 2307 | 3.5 | | 2341 | 3.1 |
| | 0441 | 0.9 | | 0456 | 1.3 |
| 15 | 1107 | 3.3 | 30 | 1107 | 3.1 |
| SU | 1658 | 0.3 | M | 1707 | 0.5 |
| ● | 2356 | 3.6 | ○ | | |

### DECEMBER

| | TIME | METRE | | TIME | METRE |
|---|---|---|---|---|---|
| | 0018 | 3.2 | | 0046 | 3.5 |
| 1 | 0528 | 1.4 | 16 | 0548 | 1.6 |
| TU | 1139 | 3.2 | W | 1201 | 3.4 |
| | 1737 | 0.4 | | 1807 | 0.1 |
| | 0056 | 3.2 | | 0139 | 3.4 |
| 2 | 0600 | 1.5 | 17 | 0633 | 1.6 |
| W | 1209 | 3.2 | TH | 1243 | 3.3 |
| | 1809 | 0.4 | | 1852 | 0.2 |
| | 0131 | 3.1 | | 0231 | 3.3 |
| 3 | 0635 | 1.5 | 18 | 0718 | 1.7 |
| TH | 1239 | 3.2 | F | 1324 | 3.3 |
| | 1843 | 0.4 | | 1939 | 0.3 |
| | 0207 | 3.1 | | 0322 | 3.2 |
| 4 | 0713 | 1.6 | 19 | 0803 | 1.7 |
| F | 1311 | 3.1 | SA | 1405 | 3.2 |
| | 1916 | 0.4 | | 2024 | 0.5 |
| | 0246 | 3.0 | | 0409 | 3.1 |
| 5 | 0752 | 1.7 | 20 | 0848 | 1.7 |
| SA | 1343 | 3.1 | SU | 1450 | 3.0 |
| | 1956 | 0.5 | | 2109 | 0.8 |
| | 0333 | 3.0 | | 0452 | 3.0 |
| 6 | 0837 | 1.7 | 21 | 0935 | 1.7 |
| SU | 1420 | 3.0 | M | 1537 | 2.8 |
| | 2041 | 0.6 | | 2156 | 1.0 |
| | 0431 | 2.9 | | 0533 | 2.9 |
| 7 | 0930 | 1.7 | 22 | 1026 | 1.8 |
| M | 1509 | 2.9 | TU | 1643 | 2.6 |
| | 2139 | 0.8 | ☽ | 2248 | 1.3 |
| | 0533 | 2.9 | | 0613 | 2.8 |
| 8 | 1033 | 1.7 | 23 | 1130 | 1.7 |
| TU | 1620 | 2.7 | W | 1805 | 2.4 |
| ☾ | 2248 | 1.0 | | | |
| | 0631 | 2.9 | | 0001 | 1.5 |
| 9 | 1145 | 1.6 | 24 | 0656 | 2.7 |
| W | 1800 | 2.7 | TH | 1309 | 1.6 |
| | | | | 1930 | 2.4 |
| | 0007 | 1.1 | | 0131 | 1.6 |
| 10 | 0728 | 2.9 | 25 | 0741 | 2.7 |
| TH | 1303 | 1.4 | F | 1424 | 1.4 |
| | 1933 | 2.7 | | 2101 | 2.5 |
| | 0128 | 1.2 | | 0233 | 1.7 |
| 11 | 0820 | 3.0 | 26 | 0828 | 2.8 |
| F | 1411 | 1.1 | SA | 1507 | 1.2 |
| | 2100 | 2.9 | | 2216 | 2.7 |
| | 0231 | 1.3 | | 0316 | 1.7 |
| 12 | 0907 | 3.1 | 27 | 0913 | 2.9 |
| SA | 1505 | 0.8 | SU | 1541 | 0.9 |
| | 2207 | 3.1 | | 2307 | 2.9 |
| | 0328 | 1.3 | | 0354 | 1.7 |
| 13 | 0952 | 3.2 | 28 | 0956 | 2.9 |
| SU | 1552 | 0.5 | M | 1613 | 0.7 |
| | 2303 | 3.3 | | 2352 | 3.0 |
| | 0416 | 1.4 | | 0428 | 1.7 |
| 14 | 1035 | 3.3 | 29 | 1035 | 3.0 |
| M | 1639 | 0.2 | TU | 1645 | 0.5 |
| | 2356 | 3.4 | | | |
| | 0503 | 1.5 | | 0030 | 3.1 |
| 15 | 1118 | 3.3 | 30 | 0505 | 1.6 |
| TU | 1724 | 0.1 | W | 1111 | 3.1 |
| ● | | | ○ | 1720 | 0.4 |
| | | | | 0105 | 3.1 |
| | | | 31 | 0545 | 1.6 |
| | | | TH | 1146 | 3.1 |
| | | | | 1758 | 0.4 |

# Hourly Tidal Height Predictions

# OCTOBER 2020

## HOURLY TIDAL HEIGHTS

HEIGHTS IN METRES

**SEMBAWANG**

LAT 01° 27.9'N LONG 103° 50.1'E

| DAY\HR | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | **2.8** | **2.4** | **1.9** | **1.2** | **0.7** | **0.5** | 0.8 | 1.2 | 1.6 | 2.1 | 2.6 | 2.9 | 3.0 | **2.7** | **2.3** | **1.8** | **1.2** | **0.9** | 1.1 | 1.5 | 1.8 | 2.2 | 2.7 | 3.0 |
| 2 | ○ | 3.1 | **2.7** | **2.2** | **1.7** | **1.0** | **0.6** | 0.6 | 1.0 | 1.4 | 1.8 | 2.4 | 2.9 | 3.0 | **2.8** | **2.4** | **1.9** | **1.4** | **0.9** | **0.8** | 1.2 | 1.6 | 2.0 | 2.5 | 2.9 |
| 3 | | 3.2 | **3.0** | **2.6** | **2.0** | **1.4** | **0.8** | **0.6** | 0.8 | 1.2 | 1.6 | 2.2 | 2.7 | 3.0 | **3.0** | **2.6** | **2.1** | **1.5** | **0.9** | **0.7** | 0.9 | 1.3 | 1.7 | 2.2 | 2.7 |
| 4 | | 3.1 | 3.2 | **2.9** | **2.4** | **1.8** | **1.1** | **0.7** | 0.8 | 1.1 | 1.5 | 1.9 | 2.5 | 3.0 | 3.1 | **2.8** | **2.2** | **1.7** | **1.1** | **0.6** | **0.6** | 1.0 | 1.4 | 1.9 | 2.4 |
| 5 | | 2.9 | 3.2 | **3.1** | **2.7** | **2.1** | **1.5** | **1.0** | **0.8** | 1.1 | 1.4 | 1.8 | 2.3 | 2.8 | 3.1 | **2.9** | **2.5** | **1.9** | **1.3** | **0.7** | **0.5** | 0.8 | 1.1 | 1.6 | 2.1 |
| 6 | | 2.6 | 3.0 | 3.1 | **2.9** | **2.5** | **1.9** | **1.3** | **1.0** | 1.1 | 1.4 | 1.7 | 2.1 | 2.6 | 3.0 | 3.0 | **2.7** | **2.1** | **1.5** | **0.9** | **0.5** | 0.6 | 0.9 | 1.3 | 1.7 |
| 7 | | 2.2 | 2.7 | 3.0 | **2.9** | **2.7** | **2.2** | **1.7** | **1.2** | **1.1** | 1.4 | 1.7 | 2.0 | 2.4 | 2.8 | 3.0 | **2.8** | **2.4** | **1.8** | **1.2** | **0.7** | **0.5** | 0.8 | 1.1 | 1.4 |
| 8 | | 1.8 | 2.3 | 2.7 | 2.8 | **2.7** | **2.5** | **2.1** | **1.6** | **1.3** | 1.4 | 1.8 | 2.0 | 2.3 | 2.6 | 2.9 | 2.9 | **2.6** | **2.1** | **1.6** | **1.0** | **0.6** | 0.7 | 1.0 | 1.3 |
| 9 | | 1.5 | 1.9 | 2.4 | 2.6 | 2.6 | **2.5** | **2.3** | **2.0** | **1.6** | **1.5** | 1.7 | 2.0 | 2.2 | 2.4 | 2.7 | 2.8 | **2.7** | **2.3** | **1.9** | **1.4** | **1.0** | **0.8** | 0.9 | 1.1 |
| 10 | ☾ | 1.3 | 1.6 | 1.9 | 2.3 | 2.4 | 2.5 | **2.4** | **2.3** | **2.0** | **1.8** | **1.8** | 1.9 | 2.1 | 2.2 | 2.4 | 2.6 | 2.6 | **2.5** | **2.2** | **1.8** | **1.4** | **1.1** | **1.0** | 1.0 |
| 11 | | 1.1 | 1.3 | 1.5 | 1.9 | 2.1 | 2.3 | 2.4 | 2.4 | **2.3** | **2.2** | **2.0** | **2.0** | 2.0 | 2.1 | 2.2 | 2.4 | 2.5 | 2.5 | **2.4** | **2.2** | **1.9** | **1.6** | **1.3** | **1.1** |
| 12 | | **1.0** | 1.0 | 1.2 | 1.4 | 1.7 | 2.0 | 2.3 | 2.4 | 2.5 | **2.5** | **2.4** | **2.2** | **2.0** | **1.9** | 1.9 | 2.0 | 2.2 | 2.3 | 2.4 | 2.4 | **2.3** | **2.1** | **1.8** | **1.5** |
| 13 | | **1.2** | **0.9** | **0.9** | 1.0 | 1.3 | 1.7 | 2.0 | 2.3 | 2.6 | 2.7 | 2.7 | **2.5** | **2.1** | **1.8** | **1.6** | 1.7 | 1.9 | 2.1 | 2.2 | 2.4 | 2.6 | **2.5** | **2.4** | **2.0** |
| 14 | | **1.5** | **1.1** | **0.8** | **0.7** | 0.9 | 1.3 | 1.6 | 2.1 | 2.5 | 2.8 | 2.9 | **2.8** | **2.5** | **2.0** | **1.5** | **1.3** | 1.4 | 1.7 | 2.0 | 2.3 | 2.6 | 2.8 | 2.9 | **2.6** |
| 15 | | **2.1** | **1.5** | **1.0** | **0.6** | **0.6** | 0.9 | 1.3 | 1.7 | 2.2 | 2.7 | 3.0 | 3.1 | **2.8** | **2.2** | **1.7** | **1.2** | **1.0** | 1.2 | 1.6 | 2.0 | 2.4 | 2.9 | 3.1 | 3.1 |
| 16 | | **2.8** | **2.1** | **1.5** | **0.9** | **0.5** | 0.5 | 0.9 | 1.4 | 1.9 | 2.5 | 3.0 | 3.2 | **3.1** | **2.6** | **1.9** | **1.3** | **0.8** | **0.7** | 1.0 | 1.5 | 2.1 | 2.6 | 3.1 | 3.4 |
| 17 | ● | **3.3** | **2.8** | **2.1** | **1.4** | **0.8** | **0.4** | 0.6 | 1.1 | 1.6 | 2.2 | 2.7 | 3.2 | 3.3 | **2.9** | **2.2** | **1.6** | **0.9** | **0.4** | 0.5 | 1.0 | 1.6 | 2.2 | 2.8 | 3.3 |
| 18 | | 3.6 | **3.4** | **2.8** | **2.1** | **1.4** | **0.7** | **0.5** | 0.9 | 1.4 | 1.9 | 2.5 | 3.0 | 3.3 | **3.2** | **2.6** | **1.9** | **1.2** | **0.5** | **0.2** | 0.5 | 1.0 | 1.6 | 2.3 | 2.9 |
| 19 | | 3.5 | 3.6 | **3.3** | **2.7** | **2.1** | **1.3** | **0.8** | 0.8 | 1.2 | 1.7 | 2.2 | 2.7 | 3.2 | 3.4 | **3.0** | **2.3** | **1.6** | **0.8** | **0.2** | **0.1** | 0.5 | 1.0 | 1.7 | 2.3 |
| 20 | | 3.0 | 3.5 | 3.5 | **3.2** | **2.7** | **2.0** | **1.3** | **1.0** | 1.2 | 1.5 | 2.0 | 2.5 | 2.9 | 3.3 | **3.2** | **2.7** | **2.0** | **1.3** | **0.6** | **0.1** | 0.2 | 0.6 | 1.1 | 1.7 |
| 21 | | 2.4 | 3.0 | 3.3 | 3.3 | **3.1** | **2.6** | **1.9** | **1.4** | **1.3** | 1.5 | 1.9 | 2.2 | 2.7 | 3.1 | 3.2 | **3.0** | **2.5** | **1.8** | **1.1** | **0.5** | **0.2** | 0.4 | 0.8 | 1.2 |
| 22 | | 1.8 | 2.3 | 2.8 | 3.1 | 3.1 | **2.9** | **2.5** | **1.9** | **1.5** | 1.6 | 1.8 | 2.1 | 2.5 | 2.8 | 3.0 | 3.1 | **2.8** | **2.3** | **1.7** | **1.0** | **0.5** | **0.4** | 0.6 | 0.9 |
| 23 | ☽ | 1.3 | 1.8 | 2.2 | 2.7 | 2.9 | 2.9 | **2.8** | **2.4** | **2.0** | **1.8** | 1.8 | 2.0 | 2.3 | 2.5 | 2.7 | 2.9 | **2.8** | **2.6** | **2.2** | **1.6** | **1.1** | **0.8** | **0.7** | 0.8 |
| 24 | | 1.0 | 1.3 | 1.7 | 2.1 | 2.4 | 2.7 | 2.8 | **2.7** | **2.4** | **2.1** | **2.0** | 2.0 | 2.1 | 2.3 | 2.4 | 2.6 | 2.6 | **2.6** | **2.4** | **2.1** | **1.7** | **1.4** | **1.1** | **0.9** |
| 25 | | 1.0 | 1.1 | 1.3 | 1.6 | 2.0 | 2.3 | 2.5 | 2.7 | **2.7** | **2.5** | **2.3** | **2.1** | **2.0** | 2.1 | 2.2 | 2.2 | 2.3 | 2.4 | 2.4 | **2.4** | **2.2** | **2.0** | **1.7** | **1.3** |
| 26 | | **1.1** | **1.0** | 1.1 | 1.3 | 1.6 | 1.9 | 2.2 | 2.5 | 2.7 | 2.8 | **2.6** | **2.3** | **2.1** | **1.9** | **1.9** | 2.0 | 2.0 | 2.1 | 2.3 | 2.4 | 2.5 | **2.4** | **2.2** | **1.9** |
| 27 | | **1.5** | **1.2** | **1.0** | 1.1 | 1.3 | 1.5 | 1.9 | 2.3 | 2.6 | 2.8 | 2.8 | **2.6** | **2.3** | **1.9** | **1.7** | **1.6** | 1.7 | 1.8 | 2.0 | 2.2 | 2.5 | 2.6 | **2.6** | **2.4** |
| 28 | | **2.0** | **1.5** | **1.1** | **1.0** | 1.1 | 1.3 | 1.6 | 2.0 | 2.4 | 2.8 | 2.9 | **2.8** | **2.5** | **2.1** | **1.6** | **1.4** | 1.4 | 1.5 | 1.7 | 2.0 | 2.4 | 2.7 | 2.8 | **2.7** |
| 29 | | **2.4** | **2.0** | **1.4** | **1.0** | **0.9** | 1.1 | 1.4 | 1.8 | 2.2 | 2.7 | 2.9 | 2.9 | **2.7** | **2.3** | **1.8** | **1.3** | **1.1** | 1.2 | 1.5 | 1.8 | 2.2 | 2.6 | 2.9 | 3.0 |
| 30 | | **2.8** | **2.4** | **1.8** | **1.3** | **0.9** | 0.9 | 1.2 | 1.6 | 2.0 | 2.5 | 2.9 | 3.0 | **2.8** | **2.4** | **1.9** | **1.4** | **1.0** | **0.9** | 1.2 | 1.5 | 1.9 | 2.4 | 2.9 | 3.1 |

## NOVEMBER 2020

**HOURLY TIDAL HEIGHTS**

HEIGHTS IN METRES

## SEMBAWANG

LAT 01° 27.9'N LONG 103° 50.1'E

| DAY\HR | | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 3.2 | 3.0 | 2.6 | 2.0 | 1.4 | 1.0 | 1.0 | 1.3 | 1.7 | 2.1 | 2.6 | 3.0 | 3.1 | 2.8 | 2.3 | 1.7 | 1.1 | 0.6 | 0.6 | 0.9 | 1.3 | 1.8 | 2.4 | 2.9 |
| 2 | | 3.2 | 3.2 | 2.9 | 2.4 | 1.8 | 1.2 | 1.0 | 1.2 | 1.6 | 1.9 | 2.4 | 2.9 | 3.2 | 3.0 | 2.5 | 1.9 | 1.3 | 0.7 | 0.5 | 0.7 | 1.1 | 1.5 | 2.0 | 2.6 |
| 3 | | 3.1 | 3.2 | 3.1 | 2.7 | 2.2 | 1.6 | 1.2 | 1.2 | 1.5 | 1.9 | 2.2 | 2.7 | 3.1 | 3.1 | 2.8 | 2.2 | 1.6 | 0.9 | 0.5 | 0.5 | 0.8 | 1.3 | 1.7 | 2.3 |
| 4 | | 2.8 | 3.1 | 3.1 | 2.9 | 2.5 | 2.0 | 1.4 | 1.3 | 1.5 | 1.8 | 2.1 | 2.5 | 2.9 | 3.1 | 3.0 | 2.5 | 1.9 | 1.2 | 0.6 | 0.4 | 0.6 | 1.0 | 1.4 | 1.9 |
| 5 | | 2.4 | 2.9 | 3.0 | 3.0 | 2.7 | 2.3 | 1.8 | 1.4 | 1.5 | 1.8 | 2.1 | 2.4 | 2.8 | 3.0 | 3.1 | 2.7 | 2.2 | 1.5 | 0.9 | 0.5 | 0.5 | 0.8 | 1.2 | 1.6 |
| 6 | | 2.1 | 2.6 | 2.9 | 2.9 | 2.8 | 2.6 | 2.2 | 1.7 | 1.5 | 1.7 | 2.0 | 2.3 | 2.6 | 2.9 | 3.0 | 2.9 | 2.4 | 1.9 | 1.3 | 0.8 | 0.6 | 0.7 | 1.0 | 1.3 |
| 7 | | 1.7 | 2.2 | 2.6 | 2.8 | 2.8 | 2.7 | 2.4 | 2.1 | 1.7 | 1.7 | 1.9 | 2.1 | 2.4 | 2.7 | 2.9 | 2.9 | 2.6 | 2.2 | 1.7 | 1.2 | 0.8 | 0.7 | 0.9 | 1.1 |
| 8 | ☾ | 1.4 | 1.8 | 2.2 | 2.5 | 2.7 | 2.7 | 2.6 | 2.4 | 2.1 | 1.9 | 1.9 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 | 2.7 | 2.5 | 2.1 | 1.7 | 1.3 | 1.0 | 0.9 | 1.0 |
| 9 | | 1.2 | 1.4 | 1.8 | 2.1 | 2.4 | 2.6 | 2.7 | 2.6 | 2.5 | 2.2 | 2.0 | 1.9 | 2.0 | 2.1 | 2.3 | 2.5 | 2.6 | 2.6 | 2.4 | 2.2 | 1.8 | 1.5 | 1.2 | 1.0 |
| 10 | | 1.0 | 1.2 | 1.4 | 1.7 | 2.1 | 2.3 | 2.6 | 2.7 | 2.7 | 2.6 | 2.3 | 2.0 | 1.8 | 1.8 | 1.9 | 2.1 | 2.3 | 2.4 | 2.5 | 2.5 | 2.3 | 2.1 | 1.7 | 1.4 |
| 11 | | 1.1 | 1.0 | 1.1 | 1.3 | 1.7 | 2.0 | 2.3 | 2.6 | 2.8 | 2.8 | 2.6 | 2.3 | 1.9 | 1.6 | 1.6 | 1.7 | 1.9 | 2.1 | 2.4 | 2.6 | 2.7 | 2.6 | 2.3 | 1.9 |
| 12 | | 1.5 | 1.1 | 1.0 | 1.0 | 1.3 | 1.6 | 2.0 | 2.5 | 2.8 | 3.0 | 2.9 | 2.6 | 2.1 | 1.6 | 1.3 | 1.3 | 1.4 | 1.7 | 2.1 | 2.4 | 2.8 | 2.9 | 2.9 | 2.6 |
| 13 | | 2.1 | 1.5 | 1.1 | 0.9 | 1.0 | 1.3 | 1.7 | 2.2 | 2.7 | 3.0 | 3.1 | 2.9 | 2.4 | 1.8 | 1.3 | 0.9 | 0.9 | 1.2 | 1.6 | 2.1 | 2.6 | 3.0 | 3.2 | 3.1 |
| 14 | | 2.7 | 2.1 | 1.6 | 1.0 | 0.9 | 1.1 | 1.5 | 1.9 | 2.4 | 2.9 | 3.2 | 3.2 | 2.8 | 2.1 | 1.5 | 0.9 | 0.6 | 0.7 | 1.1 | 1.6 | 2.2 | 2.7 | 3.2 | 3.5 |
| 15 | ● | 3.3 | 2.8 | 2.2 | 1.6 | 1.0 | 0.9 | 1.3 | 1.7 | 2.2 | 2.7 | 3.1 | 3.3 | 3.1 | 2.5 | 1.8 | 1.1 | 0.5 | 0.3 | 0.5 | 1.0 | 1.6 | 2.3 | 2.9 | 3.4 |
| 16 | | 3.6 | 3.3 | 2.8 | 2.2 | 1.5 | 1.1 | 1.1 | 1.5 | 2.0 | 2.4 | 2.9 | 3.3 | 3.4 | 3.0 | 2.2 | 1.5 | 0.8 | 0.2 | 0.1 | 0.5 | 1.1 | 1.7 | 2.4 | 3.0 |
| 17 | | 3.5 | 3.6 | 3.3 | 2.8 | 2.2 | 1.5 | 1.2 | 1.4 | 1.8 | 2.2 | 2.7 | 3.1 | 3.4 | 3.3 | 2.7 | 2.0 | 1.2 | 0.5 | 0.0 | 0.1 | 0.6 | 1.1 | 1.8 | 2.4 |
| 18 | | 3.0 | 3.5 | 3.5 | 3.2 | 2.8 | 2.1 | 1.5 | 1.4 | 1.7 | 2.0 | 2.5 | 2.9 | 3.2 | 3.4 | 3.1 | 2.5 | 1.8 | 1.0 | 0.4 | 0.1 | 0.3 | 0.7 | 1.2 | 1.9 |
| 19 | | 2.5 | 3.0 | 3.3 | 3.3 | 3.1 | 2.7 | 2.0 | 1.6 | 1.6 | 1.9 | 2.3 | 2.6 | 3.0 | 3.2 | 3.3 | 2.9 | 2.3 | 1.6 | 0.9 | 0.4 | 0.2 | 0.5 | 0.9 | 1.4 |
| 20 | | 1.9 | 2.5 | 2.9 | 3.2 | 3.2 | 3.0 | 2.5 | 2.0 | 1.7 | 1.8 | 2.1 | 2.4 | 2.7 | 2.9 | 3.1 | 3.0 | 2.7 | 2.2 | 1.5 | 0.9 | 0.5 | 0.5 | 0.7 | 1.1 |
| 21 | | 1.5 | 2.0 | 2.4 | 2.8 | 3.0 | 3.0 | 2.8 | 2.4 | 2.0 | 1.8 | 1.9 | 2.2 | 2.4 | 2.7 | 2.8 | 2.9 | 2.8 | 2.5 | 2.1 | 1.5 | 1.1 | 0.8 | 0.8 | 1.0 |
| 22 | ☽ | 1.3 | 1.6 | 2.0 | 2.4 | 2.7 | 2.9 | 2.9 | 2.7 | 2.4 | 2.1 | 1.9 | 2.0 | 2.2 | 2.4 | 2.5 | 2.6 | 2.7 | 2.6 | 2.4 | 2.1 | 1.6 | 1.3 | 1.1 | 1.0 |
| 23 | | 1.2 | 1.4 | 1.7 | 2.0 | 2.3 | 2.6 | 2.8 | 2.8 | 2.6 | 2.3 | 2.1 | 1.9 | 2.0 | 2.1 | 2.2 | 2.3 | 2.4 | 2.5 | 2.5 | 2.4 | 2.1 | 1.8 | 1.5 | 1.3 |
| 24 | | 1.2 | 1.3 | 1.5 | 1.7 | 2.0 | 2.3 | 2.5 | 2.7 | 2.7 | 2.6 | 2.3 | 2.1 | 1.9 | 1.9 | 1.9 | 2.0 | 2.1 | 2.2 | 2.4 | 2.4 | 2.4 | 2.3 | 2.0 | 1.7 |
| 25 | | 1.5 | 1.3 | 1.3 | 1.5 | 1.7 | 2.0 | 2.3 | 2.6 | 2.8 | 2.7 | 2.6 | 2.3 | 2.0 | 1.7 | 1.7 | 1.7 | 1.8 | 1.9 | 2.1 | 2.4 | 2.5 | 2.5 | 2.4 | 2.2 |
| 26 | | 1.8 | 1.5 | 1.3 | 1.3 | 1.5 | 1.7 | 2.1 | 2.4 | 2.7 | 2.8 | 2.7 | 2.5 | 2.1 | 1.8 | 1.5 | 1.4 | 1.4 | 1.6 | 1.8 | 2.2 | 2.5 | 2.7 | 2.7 | 2.5 |
| 27 | | 2.2 | 1.9 | 1.5 | 1.3 | 1.4 | 1.6 | 1.9 | 2.2 | 2.6 | 2.9 | 2.9 | 2.7 | 2.3 | 1.9 | 1.5 | 1.2 | 1.1 | 1.3 | 1.5 | 1.9 | 2.3 | 2.7 | 2.9 | 2.8 |
| 28 | | 2.6 | 2.2 | 1.8 | 1.4 | 1.3 | 1.4 | 1.7 | 2.0 | 2.5 | 2.8 | 3.0 | 2.9 | 2.5 | 2.1 | 1.6 | 1.1 | 0.9 | 1.0 | 1.2 | 1.6 | 2.1 | 2.5 | 2.9 | 3.0 |
| 29 | | 2.9 | 2.6 | 2.2 | 1.7 | 1.3 | 1.4 | 1.6 | 1.9 | 2.3 | 2.7 | 3.0 | 3.0 | 2.8 | 2.3 | 1.7 | 1.2 | 0.8 | 0.7 | 0.9 | 1.3 | 1.8 | 2.3 | 2.7 | 3.1 |
| 30 | ○ | 3.1 | 2.9 | 2.5 | 2.0 | 1.5 | 1.3 | 1.5 | 1.8 | 2.1 | 2.5 | 2.9 | 3.1 | 3.0 | 2.5 | 2.0 | 1.4 | 0.8 | 0.5 | 0.7 | 1.0 | 1.5 | 2.0 | 2.5 | 2.9 |

# DECEMBER 2020

## HOURLY TIDAL HEIGHTS

HEIGHTS IN METRES

## SEMBAWANG

LAT 01° 27.9'N LONG 103° 50.1'E

| DAY\HR | | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | 3.2 | **3.1** | **2.9** | **2.4** | **1.8** | **1.4** | 1.5 | 1.7 | 2.0 | 2.4 | 2.8 | 3.1 | 3.1 | **2.8** | **2.3** | **1.6** | **1.0** | **0.5** | **0.5** | 0.8 | 1.2 | 1.6 | 2.2 | 2.7 |
| 2 | | 3.1 | 3.2 | **3.1** | **2.8** | **2.2** | **1.7** | **1.5** | 1.6 | 2.0 | 2.3 | 2.6 | 3.0 | 3.2 | **3.0** | **2.5** | **1.9** | **1.3** | **0.7** | **0.4** | 0.5 | 0.9 | 1.4 | 1.9 | 2.4 |
| 3 | | 2.8 | 3.1 | 3.1 | **2.9** | **2.6** | **2.0** | **1.6** | **1.6** | 1.9 | 2.2 | 2.5 | 2.8 | 3.1 | 3.1 | **2.8** | **2.3** | **1.6** | **1.0** | **0.5** | **0.4** | 0.7 | 1.1 | 1.6 | 2.1 |
| 4 | | 2.6 | 2.9 | 3.1 | **3.0** | **2.8** | **2.4** | **1.9** | **1.6** | 1.7 | 2.0 | 2.4 | 2.7 | 3.0 | 3.1 | **3.0** | **2.6** | **2.0** | **1.4** | **0.8** | **0.4** | 0.5 | 0.9 | 1.3 | 1.7 |
| 5 | | 2.3 | 2.7 | 3.0 | 3.0 | **2.9** | **2.7** | **2.2** | **1.8** | **1.7** | 1.8 | 2.2 | 2.5 | 2.8 | 3.0 | 3.1 | **2.8** | **2.4** | **1.8** | **1.2** | **0.7** | **0.5** | 0.7 | 1.0 | 1.4 |
| 6 | | 1.9 | 2.4 | 2.7 | 2.9 | 2.9 | **2.8** | **2.5** | **2.1** | **1.8** | **1.7** | 1.9 | 2.2 | 2.6 | 2.8 | 3.0 | **3.0** | **2.7** | **2.2** | **1.7** | **1.1** | **0.7** | **0.6** | 0.8 | 1.2 |
| 7 | | 1.6 | 2.0 | 2.4 | 2.7 | 2.9 | 2.9 | **2.7** | **2.4** | **2.0** | **1.8** | **1.8** | 2.0 | 2.2 | 2.5 | 2.8 | 2.9 | **2.8** | **2.6** | **2.1** | **1.6** | **1.2** | **0.9** | **0.8** | 1.0 |
| 8 | ☾ | 1.3 | 1.6 | 2.1 | 2.4 | 2.7 | 2.9 | 2.9 | **2.7** | **2.4** | **2.0** | **1.8** | **1.7** | 1.9 | 2.1 | 2.4 | 2.6 | 2.7 | **2.7** | **2.5** | **2.2** | **1.8** | **1.3** | **1.0** | **1.0** |
| 9 | | 1.1 | 1.3 | 1.7 | 2.1 | 2.4 | 2.7 | 2.8 | 2.9 | **2.7** | **2.3** | **2.0** | **1.7** | **1.6** | 1.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.6 | **2.6** | **2.3** | **2.0** | **1.6** | **1.3** |
| 10 | | **1.1** | 1.2 | 1.4 | 1.7 | 2.1 | 2.4 | 2.7 | 2.9 | **2.9** | **2.7** | **2.3** | **1.9** | **1.6** | **1.4** | 1.5 | 1.7 | 2.0 | 2.2 | 2.5 | 2.7 | 2.7 | **2.5** | **2.2** | **1.8** |
| 11 | | **1.5** | **1.3** | 1.3 | 1.5 | 1.8 | 2.1 | 2.5 | 2.8 | 3.0 | **2.9** | **2.6** | **2.2** | **1.7** | **1.3** | **1.1** | 1.2 | 1.5 | 1.8 | 2.2 | 2.5 | 2.8 | 2.9 | **2.8** | **2.5** |
| 12 | | **2.0** | **1.6** | **1.3** | **1.3** | 1.6 | 1.9 | 2.2 | 2.6 | 2.9 | 3.1 | **2.9** | **2.5** | **2.0** | **1.4** | **1.0** | **0.8** | 0.9 | 1.3 | 1.7 | 2.2 | 2.6 | 3.0 | 3.1 | **3.0** |
| 13 | | **2.6** | **2.2** | **1.7** | **1.4** | 1.4 | 1.7 | 2.0 | 2.4 | 2.8 | 3.1 | 3.2 | **2.9** | **2.4** | **1.7** | **1.1** | **0.6** | **0.5** | 0.7 | 1.1 | 1.7 | 2.2 | 2.7 | 3.1 | 3.3 |
| 14 | | **3.2** | **2.8** | **2.3** | **1.8** | **1.4** | 1.5 | 1.9 | 2.2 | 2.6 | 3.0 | 3.2 | 3.2 | **2.8** | **2.2** | **1.5** | **0.8** | **0.3** | **0.3** | 0.6 | 1.1 | 1.7 | 2.3 | 2.8 | 3.3 |
| 15 | ● | 3.4 | **3.2** | **2.9** | **2.3** | **1.7** | **1.5** | 1.7 | 2.0 | 2.4 | 2.8 | 3.1 | 3.3 | **3.2** | **2.7** | **2.0** | **1.3** | **0.6** | **0.1** | 0.2 | 0.6 | 1.2 | 1.8 | 2.3 | 2.9 |
| 16 | | 3.3 | 3.5 | **3.2** | **2.9** | **2.3** | **1.7** | **1.6** | 1.8 | 2.2 | 2.6 | 3.0 | 3.2 | 3.4 | **3.1** | **2.5** | **1.8** | **1.1** | **0.4** | **0.1** | 0.2 | 0.7 | 1.3 | 1.9 | 2.4 |
| 17 | | 3.0 | 3.4 | 3.4 | **3.2** | **2.8** | **2.2** | **1.7** | **1.7** | 2.0 | 2.4 | 2.7 | 3.0 | 3.3 | 3.3 | **3.0** | **2.4** | **1.6** | **0.9** | **0.3** | **0.2** | 0.4 | 0.9 | 1.4 | 1.9 |
| 18 | | 2.5 | 3.0 | 3.3 | 3.3 | **3.1** | **2.6** | **2.0** | **1.7** | 1.8 | 2.1 | 2.5 | 2.8 | 3.0 | 3.3 | **3.2** | **2.8** | **2.2** | **1.5** | **0.8** | **0.4** | **0.3** | 0.6 | 1.1 | 1.6 |
| 19 | | 2.1 | 2.6 | 3.0 | 3.2 | **3.2** | **2.9** | **2.4** | **1.9** | **1.7** | 1.9 | 2.2 | 2.5 | 2.8 | 3.0 | 3.2 | **3.0** | **2.6** | **2.1** | **1.4** | **0.9** | **0.5** | 0.6 | 0.9 | 1.3 |
| 20 | | 1.7 | 2.2 | 2.6 | 3.0 | 3.1 | **3.0** | **2.7** | **2.2** | **1.8** | **1.7** | 1.9 | 2.2 | 2.5 | 2.7 | 2.9 | 3.0 | **2.8** | **2.5** | **1.9** | **1.4** | **0.9** | **0.8** | 0.9 | 1.1 |
| 21 | | 1.5 | 1.9 | 2.3 | 2.7 | 2.9 | 3.0 | **2.8** | **2.5** | **2.1** | **1.8** | **1.8** | 2.0 | 2.2 | 2.4 | 2.6 | 2.7 | 2.8 | **2.6** | **2.3** | **1.9** | **1.4** | **1.1** | **1.0** | 1.1 |
| 22 | ☽ | 1.4 | 1.7 | 2.0 | 2.4 | 2.7 | 2.8 | 2.8 | **2.6** | **2.3** | **2.0** | **1.8** | 1.8 | 1.9 | 2.1 | 2.3 | 2.4 | 2.5 | 2.6 | **2.5** | **2.2** | **1.9** | **1.5** | **1.3** | **1.3** |
| 23 | | 1.4 | 1.6 | 1.8 | 2.1 | 2.4 | 2.7 | 2.8 | **2.7** | **2.5** | **2.2** | **1.9** | **1.8** | **1.8** | 1.8 | 2.0 | 2.1 | 2.2 | 2.4 | 2.4 | **2.4** | **2.2** | **2.0** | **1.7** | **1.6** |
| 24 | | **1.5** | 1.5 | 1.7 | 1.9 | 2.2 | 2.4 | 2.7 | 2.7 | **2.6** | **2.4** | **2.1** | **1.9** | **1.7** | **1.6** | 1.7 | 1.8 | 1.9 | 2.1 | 2.3 | 2.4 | **2.4** | **2.3** | **2.1** | **1.9** |
| 25 | | **1.7** | **1.6** | **1.6** | 1.8 | 2.0 | 2.2 | 2.5 | 2.7 | 2.7 | **2.6** | **2.4** | **2.1** | **1.8** | **1.5** | **1.4** | 1.4 | 1.5 | 1.7 | 2.0 | 2.3 | 2.4 | 2.5 | **2.4** | **2.3** |
| 26 | | **2.1** | **1.8** | **1.7** | **1.7** | 1.8 | 2.0 | 2.3 | 2.6 | 2.8 | **2.8** | **2.6** | **2.3** | **1.9** | **1.6** | **1.3** | **1.2** | 1.2 | 1.4 | 1.7 | 2.0 | 2.3 | 2.6 | 2.7 | **2.6** |
| 27 | | **2.5** | **2.2** | **1.9** | **1.7** | 1.7 | 1.9 | 2.1 | 2.4 | 2.7 | 2.9 | **2.8** | **2.5** | **2.2** | **1.7** | **1.3** | **1.0** | **0.9** | 1.1 | 1.4 | 1.7 | 2.1 | 2.5 | 2.7 | 2.8 |
| 28 | | **2.8** | **2.5** | **2.1** | **1.8** | **1.7** | 1.8 | 2.0 | 2.3 | 2.6 | 2.9 | 2.9 | **2.8** | **2.4** | **2.0** | **1.4** | **0.9** | **0.7** | 0.8 | 1.1 | 1.4 | 1.9 | 2.3 | 2.7 | 2.9 |
| 29 | | 3.0 | **2.9** | **2.5** | **2.0** | **1.7** | 1.7 | 1.9 | 2.2 | 2.5 | 2.8 | 3.0 | 3.0 | **2.7** | **2.3** | **1.7** | **1.1** | **0.6** | **0.5** | 0.8 | 1.2 | 1.6 | 2.0 | 2.5 | 2.9 |
| 30 | ○ | 3.1 | **3.1** | **2.8** | **2.4** | **1.9** | **1.6** | 1.8 | 2.1 | 2.4 | 2.6 | 2.9 | 3.1 | **3.0** | **2.6** | **2.0** | **1.4** | **0.8** | **0.4** | 0.5 | 0.9 | 1.3 | 1.8 | 2.2 | 2.7 |
| 31 | | 3.0 | 3.1 | **3.0** | **2.7** | **2.2** | **1.7** | **1.6** | 1.9 | 2.2 | 2.5 | 2.8 | 3.0 | 3.1 | **2.9** | **2.4** | **1.8** | **1.1** | **0.6** | **0.4** | 0.6 | 1.0 | 1.5 | 1.9 | 2.4 |