TIDE TABLES AND PORT INFORMATION

2011

PORT OF LONDON AUTHORITY

SVITZER TOWAGE LTD

MARINE HOUSE
DENTON WHARF, MARK LANE
GRAVESEND
KENT DA12 2PL

Tel: 01474 359361
Fax: 01474 321380

Duty Controllers – 24 hours
Tel: 01474 335388
Email: gbgvs.all@svitzer.com

PORT OF LONDON
AUTHORITY

Handbook
of
Tide Tables
and Port Information

2011

Price £2.50

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www.pla.co.uk

About the Port of London Authority
The Port of London Authority has been managing a range of duties on the tidal Thames for more than 100 years. Our principal responsibility is the safety of navigation along 95 miles of river from Teddington Lock to the North Sea.

We also promote the use of the tidal Thames, work to ensure security of port operations, and are responsible for protecting the marine environment.

We have a team of over 350 skilled staff within the Authority and our Hydrographic department, which prepares these tide tables annually, is renowned as a centre of excellence in the UK ports industry.

We operate the Vessel Traffic Services (VTS) centre at Gravesend, and the navigational control centre at the Thames Barrier. We also crew survey vessels, harbour patrol launches and salvage craft.

Commitments
Our commitments are to help sustain the economy of London and the South East and support the quality of life for communities along the river by:

- Keeping the river safe for all users – from the largest ships to the smallest rowing boats
- Realising the river's sustainable development potential – principally making sure freight movements can switch from road to water
- Protecting the river's environment – making sure that developments in the river are properly managed
- Maintaining open, honest and consistent communications with all those who share our passion for the river

Funding
We are funded through the fees paid by vessels using the Port, charges for the services we provide such as pilotage, and rents for anything in, under or over the river. We do not get any of our funding from the Government or local authorities. We aim to realise a small annual surplus to enable continued reinvestment in our operations.

PORT OF LONDON HYDROGRAPHIC SERVICE

With a statutory responsibility to survey 400 square miles of the Thames from Teddington to the southern North Sea, the PLA has the most sophisticated in-house survey capability of any UK port. Take advantage of a service that offers:

- **Value** - low mobilisation or weather downtime costs.
- **Experience** - time served surveyors and local crews.
- **Quality** - Purpose built craft and the latest equipment, including multibeam.
- **Response** - Most surveys completed within a week of receiving instruction.

Services include Bathymetric charting, dredging support, civil engineering surveys, volume computations, environmental monitoring, sampling and analysis, object location and water movement measurement.

Visit us on **www.pla.co.uk/hydrohomepage**

Contact details on page 7 of this handbook

ALL TIDAL AND ASTRONOMICAL DATA ARE IN GREENWICH MEAN TIME – ONE HOUR MUST BE ADDED AT ALL TIMES WHEN BRITISH SUMMER TIME IS IN FORCE.

BST will be kept in Great Britain from 0100 27th March to 0100 30th October 2011.

The DATUM or zero of the predictions for tidal information in this book is the same as that used on PLA and Admiralty Charts. The relationship of this Chart Datum and Ordnance Datum (Newlyn) is given on page 33.

In addition to this Handbook, the PLA publish:

TIDAL HEIGHTS AT HOURLY INTERVALS
These books give the predicted height of the tide at every hour during the year, and are published separately for London Bridge, Tower Pier; North Woolwich; Tilbury; Coryton; Southend; Shivering Sands; Margate and Walton-on-the-Naze.

The Hourly Heights are available in pdf format digitally on the PLA website. Hard copy can be provided on request - telephone 01474 562269 for a small administrative charge.

The tidal predictions are PLA Copyright. The Sun and Moon data are Crown Copyright and have been computed and supplied by the UK Hydrographic Office with permission of the Controller of Her Majesty's Stationery Office.

The information in this Handbook is correct at the time of going to press (Sep 2010).

The PLA does not accept responsibility in law for the information in these tables.

NOTE:
Low Water levels in the upper reaches of the tidal Thames are greatly affected by the land water flow at Teddington Weir. They frequently fall below chart datum when this flow is significantly reduced, typically during the summer months.

CONTENTS

PORT OF LONDON AUTHORITY
Chief Executive Mr. Richard Everitt

OPERATIONAL TELEPHONE NUMBERS AND ADDRESSES
HARBOUR, PILOTAGE & VESSEL TRAFFIC SERVICES

Chief Harbour Master	Rear Admiral D. Snelson	(01474) 562268
Harbour Master (Upper District)	Capt D. Phillips	(0207) 743 7912
Harbour Master (Lower District)	Capt R. Stanbrook	(01474) 562212
VTS Manager	Mr B. Goldman	(01474) 562299
Harbour Master (SMS)/Port Security Officer	Capt. J. Parkes	(01474) 562266
Contingencies Manager	Dr S. Taylor	(01474) 562213
Environment & Management Systems Manager	Nicola Jenkins	(01474) 562221
Pilotage		
Marine Pilotage Manager	Mr P. Steen	(01474) 562300
Pilotage Operations Manager	Capt. C. L. Phillips	(01474) 562326
Pilotage Resources Manager	Capt. R. G. Flynn	(01474) 562520
Commercial Development Manager	Miss G. Frost	(01474) 562243
Port Control Centre, Gravesend	Duty Port Controller	(01474) 560311
	Pilotage Co-ordinator	(01474) 562333
	Shipping Information & Pilotage orders	(01474) 560311
PEC Contact Number	Pilotage Resources Manager	(01474) 562520
Vessel Licensing		
Marine Surveyor	Mr T. Prior	(01474) 562365
Hydrographic Services		
Port Hydrographer	Capt J. D. Pinder	(01474) 562210
Deputy Port Hydrographer	Mr J. Dillon-Leetch	(01474) 562208
Thames Barrier Navigation Centre	Duty Officer	0208 855 0315
Richmond Lock	Lock Keeper	0208 940 0634
	Asst Harbour Master (Upper)	07841 364 204
Notice to Mariners/Navigation Publication Enquiries		(01474) 562269
Tidal/Chart Enquiries		(01474) 562206

SUPPORT SERVICES

Director of Marine Operations	Mr P Steen	(01474) 562289
Civil Engineer	Mr A. McKay	(01474) 562249
Navigation Systems Engineer	Mr G. Shaw	(01474) 562353
Marine Engineer	Mr A. Cartwright	(01474) 562500
Marine Services Manager	Capt G. Buckby	(01474) 562402

PRINCIPAL OFFICES

London River House
Royal Pier Road
Gravesend, Kent DA12 2BG
Tel: (01474) 562200
Fax: (01474) 562281

Bakers' Hall
7 Harp Lane
London EC3R 6LB
Tel: 0207 743 7900 Answerphone only
Fax: 0207 743 7999

OPERATIONAL ADDRESSES

Pilotage Service

	Administration	Operations
London River House Royal Pier Road Gravesend, Kent DA12 2BG	Tel: (01474) 562362 Fax: (01474) 562378	Tel: (01474) 562333 Fax: (01474) 352996

Vessel Traffic Service
('Shipcon' - for Vessel Information & Pilotage Orders)

Port Control Centre
London River House
Royal Pier Road
Gravesend, Kent DA12 2BG
Also see PISCES on www.pla.co.uk
Tel: (01474) 560311
Fax: (01474) 352996
Email: shipcon@pla.co.uk

Thames Barrier Navigation Centre
34, Bowater Road
London SE18 5TF
Tel: 0208 855 0315
Fax: 0208 312 7679

Hydrographic Service

London River House
Royal Pier Road
Gravesend, Kent
DA12 2BG
Tel: (01474) 562206
Fax: (01474) 562314

Marine Services

Marine House,
Mark Lane
Gravesend, Kent
DA12 2PL
Tel: (01474) 562444
Fax: (01474) 562403

DESCRIPTION OF PORT LIMITS

Port Limits are described in Schedule 1 of the Port of London Act 1968 (as amended) but in general terms include the tidal Thames from Teddington, encompassing both banks up to mean high water, eastward to Foulness Point in the north and Warden Point in the south. In the estuary the limits extend from Foulness point to Gunfleet Old Lighthouse, thence to a position 3 miles north of Margate, and back to Warden Point. The port limits exclude the River Medway and certain other creeks and rivers.

PILOTAGE

1. **London Pilotage District Limits**
   These are fully described in current Pilotage Directions and can be described as the same as the Port Limits, but from Putney Bridge seaward and extend beyond port limits to the north east to the Long Sand Head.

2. **Pilotage Directions**
   Information regarding the latest Pilotage directions and regulations relating to the ordering of pilots and the issuing of Pilotage Exemption Certificates are contained in current Pilotage Directions, copies of which may be obtained from the Pilotage Service Administration Office, Navigation Publication Enquiries or PLA website www.pla.co.uk (see page 7).

3. **VTS Area**
   The VTS Area for London VTS is from Teddington Lock in the West, to the boundary of the Sunk Precautionary Area in the North, thence to the London Arrival/Departure Arc in the East.

NAVIGATIONAL SAFETY MANAGEMENT SYSTEM

In meeting its responsibilities under the Port Marine Safety Code, the PLA maintains the port's Navigational Safety Management System (SMS) based on a current and dynamic Formal Risk Assessment of marine operations within the port.

Information about the Navigational SMS can be found on the PLA's website at **www.pla.co.uk**. Questions and requests for additional information can be made through the Navigational Safety Systems Co-ordinator at the PLA's Gravesend office (01474 562269).

The PLA's regulatory framework, in support of the Navigational SMS, currently consists of the following publications:

Port of London Act 1968 (as amended)
General Directions for Navigation in the Port of London 2009
Port of London Pilotage Directions 2010
River Bylaws 1978 (as amended)
Craft and Boat Registration and Regulation Byelaws 2000 (as amended)
Dangerous Substances in Bulk Byelaws 1991 (as amended)
Permanent Notices to Mariners 2008
Notices to Mariners (as promulgated)
Notices to Agents, Berth and Ship Operators (as promulgated)
Code of Practice for Ship Towage Operations on the Thames 2010
Code of Practice for the Safe Mooring of Vessels on the Thames 2010
Code of Practice for the Embarkation and Disembarkation of Pilots on the Thames 2008
Code of Practice for Craft Towage on the Thames 2007
Code of Practice for Passenger Vessel Operations on the Thames 2009
River Thames Recreational Users Guide
Rowing on the Tideway - A Code of Practice for Rowing on the Tidal Thames above Putney 2009
Guidance to Berth Operators 2008

All the above documents are published and are free to download from the PLA's website. Alternatively hard copy publications may be obtained, for a nominal charge, from the Navigational Safety Systems Co-ordinator at the Gravesend office Tel: 01474 562269.

PORT COMMUNICATIONS

"Sunk VTS" (Sunk Inner Precautionary Area & TSS) Run by the MCA from CNIS Dover

V.H.F. Channels	14*, 9
Radar Coverage	Sunk Area

"London VTS" Estuary Sector (Outer Reporting Points to S.R. No 4 Buoy) Run by PLA from Gravesend

V.H.F. Channels	69*, 18
Radar Coverage	Outer Port Limit to Thameshaven
Tidal Information	Walton, Margate, Shivering Sand & Southend
Telephone:	(01474) 560311

"London VTS" River Sector (S.R. No 4 Buoy to Crayfordness) Run by PLA from Gravesend

V.H.F. Channels	68*, 20
Radar Coverage	S.R. No 1 Buoy to Erith
Tidal Information	Shivering Sand, Southend, Coryton and Tilbury
Telephone:	(01474) 560311

"London VTS" Barrier Sector (Crayfordness to Teddington incl. Thames Barrier Control Zone) Run by PLA from TBNC, Woolwich.**

V.H.F. Channels	14*, 22
Radar Coverage	Crayfordness to Greenwich
Tidal Information	Silvertown, Charlton & Tower Pier
Telephone:	0208 855 0315

"Medway VTS" (River Medway and approaches) Run by Medway Ports from Sheerness

V.H.F. Channels	73, 74*, 16 & 22
Radar Coverage	River Medway and approaches
Tidal Information	Sheerness (01795) 596596
Telephone:	Sheerness (01795) 663025

"Sunk Pilots" (Boarding/Landing at Sunk Light Vessel)

V.H.F. Channel 9

"North East Spit Pilots" (Boarding/Landing at N.E. Spit buoy)

V.H.F. Channel 9

"Sheerness Pilots" (Boarding/Landing at the Warps and Oaze Deep)

V.H.F. Channel 69, 74

"London Pilots" (Boarding/Landing at Gravesend)

V.H.F. Channel 9

"Thames Patrol" (PLA Harbour Services Patrol Launches)

V.H.F. Channels 69, 14, 68 & 16

Ship/Tug communications

V.H.F. Channels normally available are:

Thames:	6, 8 & 10
Medway	6 & 9

"London Coastguard" (Maritime Rescue Co-ordination Centre) Run by the MCA from TBNC, Woolwich

VHF Channels: 16 & 67

*** Station's primary working frequency**

****Thames Barrier Control Zone** — The river between Margaretness and Blackwall Point is subject to special navigational requirements concerning passage through the Thames Barrier. Mariners must observe traffic signals displayed on the barrier piers which indicate those spans open to navigation. Instructions will also be broadcast by TBNC on Channel 14.

For full details of navigational requirements for the Thames Barrier Control Zone, refer to the current General Direction for Navigation in the Port of London and Pilotage Directions. Details of planned closures are published by PLA Notices to Mariners twice each year.

COMMUNICATION PROCEDURES, REPORTING REQUIREMENTS & TRAFFIC MANAGEMENT

Full details of the requirements for reporting vessel movements in the Thames are to be found in the current General Directions for Navigation in the Port of London.

INWARDS

All Ships:

a) 24 hours before arrival; pass ETA and draught to Agents/Owners for onward transmission to the Port Control Centre (PCC) at Gravesend. Where ships from near ports cannot give the above notice an ETA should be passed within one hour of departure from the last port of call.
b) In addition, Agents /Owners of vessels bound for the Port of Tilbury should contact the Marine Co-ordinator, telephone (01375) 852456.
c) On passing the first Waypoint; pass all information not previously passed through agent and pertinent to the vessels arrival in the Port by VHF to PCC. Pass compliancy report in accordance with GD 13 and report security level.
d) On passing each Waypoint; report by VHF to PCC for confirmation of onward clearance.
e) On passing Sunk Head Tower Buoy or if using the Fisherman's Gat, on passing the London Arrival/Departure arc or the North East Spit Buoy INWARD - declare a provisional ETA for Black Deep No 7 Buoy and Knock John No 1 buoy. They are to report again when passing Black Deep No 5 Buoy, or if using the Fisherman's Gat the Outer Fisherman's Buoy giving a revised ETA for Knock John No 1 Buoy.

Ships requiring Pilots:

a) A request for a pilot should be passed to the PCC (Shipcon), with ETA at the pilot station, at the same time as the 24 hours notice of arrival is given. A pro-forma to assist in giving the required information may be obtained from the PLA Website, or upon request.
b) A **CONFIRMED** order for a pilot must be given to PCC (Shipcon) at least 8 hours before ETA at outer pilot station.
c) Changes of ETA should be passed to the PCC (Shipcon) up to 4 hours before ETA at the outer pilot station. Thereafter, any changes to ETA should be made by VHF radio to the appropriate boarding/landing station.

OUTWARDS or SHIFTING BERTH

All Ships:

a) 24 hours before proposed movement in the river; pass ETD and draught to Agents/Owners for onward transmission to the PCC.
b) Immediately prior to commencement of movement in the river; pass all information pertinent to the vessels movement in the river by VHF to PCC.
c) On passing each Waypoint; report by VHF to PCC for confirmation of onward clearance.
d) On passing Sea Reach No 4 Buoy or, if departing the Medway ports, on passing the wreck of the Richard Montgomery, OUTWARD- declare the channels beyond Sea Reach No 1 buoy which they intend to use for navigation and, if planning to use the Princes Channel, make a specific declaration if planning to use the Princes Channel DW route.
e) On passing Sea Reach No 1 buoy or the Medway buoy, and planning to use the Knock John Channel OUTWARD- report ETA for Knock John No 4 and No 7 buoys, and report again at SE Mouse buoy with an updated ETA for Knock John No 7 buoy.

Knock John Channel

In the channel between Knock John No. 1 Buoy and the Knock John No. 4 Buoy the following traffic management procedures apply as per GD 14

a) Passing and overtaking within the buoyed channel may be permitted subject to the agreement of the Masters of the vessels involved except when an LNG vessel is involved. (See GD 25), however
b) One-way traffic working will normally be agreed between vessels or imposed by London VTS for traffic restricted by size or draught to navigating within the buoyed channel, and
c) Vessels navigating with the tide should normally have priority and
d) Smaller vessel not constrained to the buoyed channel outside the buoy line without restrictions, but should ensure that other traffic and London VTS are informed.

Princes Channel

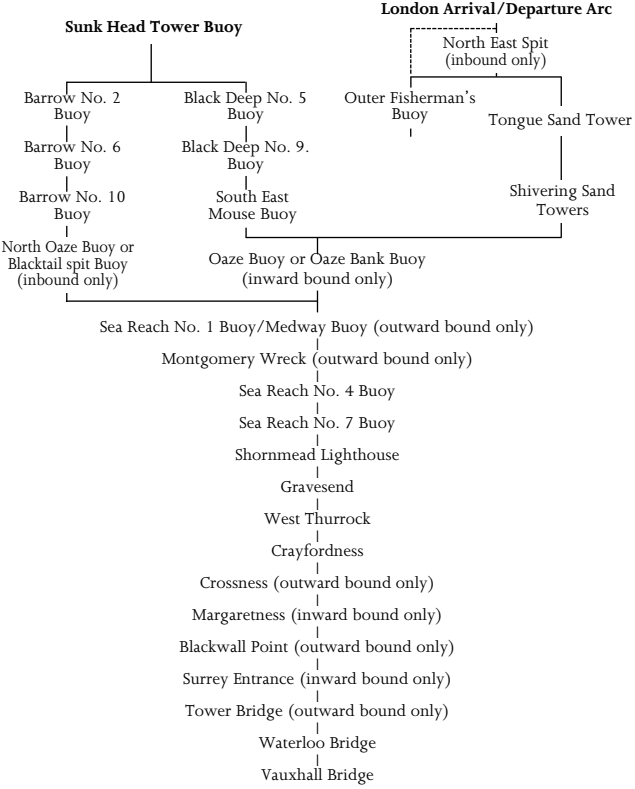
Reporting Vessels navigating in the Princes Channel are subject to the following traffic management procedures as per GD 15:

a) the deep water route is considered to be a two-way channel; passing and overtaking is normally permitted
b) in extreme conditions of weather, tide or traffic density, one-way traffic working may be agreed between vessels or imposed by London VTS for traffic restricted by size or draught to navigating within the deep water route
c) when one-way traffic working has been imposed, vessels navigating with the tide should normally have priority and
d) LNG vessels are not permitted to navigate the Princes Channel.

Ships requiring Pilots:

a) A request for a pilot should be passed to the PCC at the same time as the 24 hours notice of departure is given.
b) A **CONFIRMED** order for a pilot must be given to PCC at least 4 hours before ETD.
c) Changes to ETD should be passed to the PCC up to 2 hours before ETD. Thereafter, any changes to ETD should be passed to Gravesend Pilots by VHF channel 9 or by telephone to (01474) 560311.

REPORTING POINTS (WAYPOINTS)



For vessels using the inshore passages in the estuary:

North	**South**
South Whitaker Buoy	South East Margate Buoy
Maplin Buoy	Spaniard Buoy

SEARCH AND RESCUE RESPONSIBILITIES AND ARRANGEMENTS FOR THE TIDAL THAMES

Introduction
This notice serves to clarify and confirm for mariners, the Search and Rescue (SAR) co-ordination arrangements currently in place in the Port of London.

Thames Coastguard
Thames Coastguard based at Walton-on-the Naze has responsibility for the initiation and co-ordination of all SAR operations in the Thames estuary to seaward of Holehaven Creek (Canvey Island).

London Coastguard
London Coastguard has responsibility for the initiation and co-ordination operations on the River Thames up-river of Canvey Island.

RNLI Stations
RNLI lifeboat stations are located at Teddington, Chiswick, Waterloo Pier (Tower), Gravesend, Southend-on-Sea, Sheerness, Whistable, Margate, Ramsgate, Burnham, Clacton, Walton-on-the Naze and Harwich.

VHF Communications and Alerts
HM Coastguard maintains a continuous listening for distress or urgency calls on VHF Channel 16.

The Port of London Authority does not routinely maintain a listening watch on VHF Channel 16 but has the ability to set watch on VHF Ch 16 if required.

Any SAR alert on the tidal Thames should be raised via one of the following methods:

- "MAYDAY" or "PAN-PAN" or other call on Channel 16 or the appropriate London VTS port working frequency.
- Dialling 999 and asking for the Coastguard.
- Distress alert on VHF DSC

Should a distress or urgency call be transmitted on a port frequency (Channels 14, 68 or 69) rather than VHF Channel 16, this will be acknowledged by London VTS who will immediately notify HM Coastguard. Mariners may assume that, once a distress call has been acknowledged by London VTS, that the call will be passed to the appropriate Coastguard centre.

If the initial call is made on one of the port working frequencies, there is no requirement to repeat the call on VHF Channel 16. The casualty should maintain watch on the frequencies on which the initial call is made unless directed to change channels by London VTS or HM Coastguard.

If calling on VHF, mariners should be mindfull of the greater likelihood of immediate local assistance being available through the utilisation of a port working frequency particularly up-river of Crayfordness (Channel 14). For similar reasons, HM Coastguard may also decide that the incident should continue to be co-ordinated on the port working frequency, in which case other traffic not allocated to the incident should minimise transmissions or may be directed to another frequency.

London VTS will continue to co-ordinate marine emergencies and major incidents other than SAR incidents and to manage vessel traffic not involved in, or allocated to, a SAR incident.

TABLE OF DISTANCES WITHIN THE PORT OF LONDON
Landward Limit to Seaward Limit

Sea miles		Land Miles
81.9	via Barrow Deep Channel	94.3
80.9	via Knock John Channel and Black Deep	93.2

TABLE OF DISTANCES WITHIN THE PORT OF LONDON

Above London Bridge

Sea miles		Land Miles
16.08	PLA Landward Limit	18.52
15.14	Eel Pie Island (Lower End)	17.43
15.04	Ham Landing Stage	17.32
14.55	Petersham Drawdock	16.75
13.97	Richmond Bridge	16.09
13.67	Richmond Railway Bridge	15.74
13.64	Twickenham Bridge	15.71
13.49	Richmond Lock & Footbridge (Recording Tide Gauge)	15.53
13.00	Isleworth Ait Sewage Outfalls	14.97
12.91	Church Ferry, Isleworth	14.87
11.88	River Brent and Grand Union Canal	13.68
11.33	Kew Bridge	13.05
11.30	Kew Pier	13.01
10.98	Kew Railway Bridge	12.64
10.22	Chiswick Bridge	11.77
10.16	University Stone, Mortlake	11.70
9.55	Barnes Railway Bridge	11.00
8.15	Hammersmith Pier	9.38
7.97	Hammersmith Bridge	9.18
7.73	Harrods Quay	8.90
6.92	Beverley Brook	7.97
6.54	Putney Pier	7.53
6.52	University Stone, Putney	7.51
6.45	Putney Bridge	7.43
6.31	Fulham Railway Bridge	7.27
5.74	Wandsworth Creek	6.61
5.46	Wandsworth Bridge	6.29
4.83	Battersea Railway Bridge	5.56
4.57	Chelsea Creek & Lots Rd. Generating Station	5.26
4.27	Battersea Road Bridge	4.92
4.04	Albert Bridge	4.65
4.02	Cadogan Pier	4.63
3.40	Chelsea Bridge	3.92
3.31	Victoria Railway Bridge	3.81
3.18	Battersea Generating Station	3.66
2.46	Vauxhall Bridge	2.83
2.02	Lambeth Bridge	2.33
1.64	Westminster Bridge	1.89
1.60	Westminster Pier (Recording Tide Gauge)	1.84
1.32	Charing Cross Bridge	1.52
1.12	Waterloo Bridge	1.29
0.63	Blackfriars Road Bridge	0.73
0.41	Millennium Footbridge	0.48
0.24	Southwark Bridge	0.28
0.16	Cannon Street Railway Bridge	0.18
0.00	London Bridge	0.00

TABLE OF DISTANCES WITHIN THE PORT OF LONDON

From London Bridge and Gravesend

Sea Miles From London Bridge		Sea Miles from Gravesend
	Upper Pool	
0.00	London Bridge	23.13
0.33	Tower Pier (Recording Tide Gauge)	22.80
0.48	Tower Bridge	22.65
0.73	St. Saviour's Dock	22.40
	Lower Pool	
1.05	Cherry Garden Pier	22.08
1.26	Wapping Pier	21.87
1.34	Thames Tunnel	21.79
1.62	Rotherhithe Tunnel	21.51
	Limehouse Reach	
2.08	Limehouse Basin Entrance	21.05
2.69	West India Pier	20.44
3.02	Greenland Dock Entrance	20.11
3.50	Convoys Jetty	19.63
	Greenwich Reach	
3.87	Deptford Creek Entrance	19.26
4.17	Greenwich Pier	18.96
4.27	Greenwich Royal Naval College	18.86
	Blackwall Reach	
4.99	Victoria Deep Water Terminal (U/end)	18.14
5.39	India & Millwall Dock Entrance	17.74
5.55	Blackwall Tunnel (Western)	17.58
	Bugsby's Reach	
6.08	Bow Creek (River Lee) Entrance	17.05
6.70	Hookness Point	16.43
	Woolwich Reach	
7.01	Cory's Pier (Recording Tide Gauge)	16.12
7.40	Thames Flood Barrier	15.73
7.52	Thames Barrier Navigation Centre (Woolwich Radio)	15.61
7.76	Tate & Lyle's Jetty (Recording Tide Gauge)	15.37
8.33	Woolwich Ferry & Foot Tunnel	14.80
	Gallions Reach	
8.89	Gallions or Bulls Point	14.24
9.10	King George V Dock Entrance	14.03
9.23	Gallions Marina Entrance	13.90

TABLE OF DISTANCES WITHIN THE PORT OF LONDON

From London Bridge and Gravesend

Sea Miles From London Bridge		Sea Miles from Gravesend
	Barking Reach	
9.87	Margaretness Lighthouse	13.26
10.12	Barking Creek (River Roding) Entrance	13.01
10.49	Barking Petroleum Limit for Seagoing Tankers	12.64
10.58	Barking Point	12.55
	Halfway Reach	
11.35	Crossness Point Lighthouse	11.78
11.90	Dagenham Dock No. 4 Jetty (U/end)	11.23
12.15	Ford's Jetty (U/end) (Ferry)	10.98
	Erith Reach	
13.02	Jenningtree Point	10.11
13.55	Rainham Pumping Unit	9.58
14.41	Erith Causeway	8.72
	Erith Rands	
14.45	Coldharbour Point Lighthouse	8.68
14.47	Erith Pier (Recording Tide Gauge)	8.66
15.49	Crayfordness Lighthouse	7.64
	Long Reach	
15.89	Dartford Creek Entrance	7.24
16.29	Harrison's Jetty	6.84
17.22	Littlebrook Generating Station (U/end)	5.91
17.68	Queen Elizabeth II Bridge	5.45
17.98	Van Ommeren Tank Terminal (U/end)	5.15
	St Clements Reach	
18.75	Stoneness Lighthouse	4.38
19.41	Overhead Electric Transmission Cables	3.72
	Northfleet Hope	
20.11	Broadness Lighthouse	3.02
20.85	Tilbury Grain Terminal (U/end)	2.28
21.44	Tilbury Container Services (L/end) (Recording Tide Gauge)	1.69
21.51	Tilbury Dock Entrance	1.62
21.70	Northfleet Traffic Warning Light	1.43
	Gravesend Reach	
22.00	Tilbury Cargo Jetty (U/end)	1.13
22.68	London International Cruise Terminal	0.45
23.13	Port Control Centre, Gravesend	0.00
23.15	Royal Terrace Pier	0.02
23.90	Denton Wharf (Recording Tide Gauge)	0.77
24.45	Diver Buoy	1.32
25.12	Tilbury Buoy	1.99

TABLE OF DISTANCES WITHIN THE PORT OF LONDON

From London Bridge and Gravesend

Sea Miles From London Bridge		Sea Miles from Gravesend
	Lower Hope	
25.55	Coalhouse Point	2.42
25.78	Ovens Buoy	2.65
26.49	Mucking No. 7 Buoy	3.36
27.23	Mucking No. 5 Buoy	4.10
	Sea Reach	
27.67	Lower Hope Point	4.54
27.88	Mucking No. 3 Buoy	4.75
27.98	Lower Hope Buoy	4.85
28.50	Mucking No. 1 Buoy	5.37
28.75	West Blyth Buoy	5.62
29.20	Shell Haven Jetties	6.07
30.50	Coryton No. 5 Jetty (Recording Tide Gauge)	7.37
30.79	Mid Blyth Buoy	7.66
31.25	Holehaven Creek Entrance	8.12
31.85	Calor Gas Jetty Canvey (Tanker Warning Light)	8.72
33.69	Chapman Buoy	10.56
33.82	Sea Reach No. 7 Buoy	10.69
34.29	East Blyth Buoy	11.16
35.58	Sea Reach No. 6 Buoy	12.45
36.08	Crowstone — London Stone Line	12.95
36.57	Sea Reach No. 5 Buoy	13.44
37.57	Southend Pier Head (Recording Tide Gauge)	14.44
38.32	Sea Reach No. 4 Buoy	15.19
39.83	Sea Reach No. 3 Buoy	16.70
41.85	Sea Reach No. 2 Buoy	18.72
43.62	Sea Reach No. 1 Buoy — PLA former seaward limit	20.49
	Seaward Limit	
64.82	When proceeding via Knock John Channel to a position near Black Deep No. 6 Buoy	41.69
65.82	When proceeding via Barrow Deep Channel to a position near the Barrow No. 2 Buoy	42.69

Note:— The above table gives the distances when the various marks are abeam of the normal Channel course.

OUTER ESTUARY

TABLE OF DISTANCES IN SEA MILES

FISHERMAN'S GAT ROUTE

No. 1 Sea Reach Buoy

2.8	Oaze Buoy				
9.6	6.8	Knock John No. 7 Buoy			
18.4	15.6	8.8	Inner Fisherman Buoy		
22.3	19.5	12.7	3.9	Outer Fisherman Buoy	
31.9	29.1	22.3	13.5	9.6	NE Spit Pilot Station

PRINCES CHANNEL ROUTE

No. 1 Sea Reach Buoy

2.8	Oaze Buoy					
7.7	4.9	Shivering Sand Tower				
8.8	6.0	1.1	Princes No. 6 Buoy			
13.0	10.2	5.3	4.2	Princes No. 2 Buoy		
16.4	13.6	8.7	7.6	3.4	Princes Buoy	
21.6	18.8	13.9	12.8	8.6	5.2	E. Margate Buoy
24.7	21.9	17.0	15.9	11.7	8.3	3.1	NE Spit Pilot Station

OUTER ESTUARY

TABLE OF DISTANCES IN SEA MILES

BARROW DEEP AND WARP ROUTE

No. 1 Sea Reach Buoy

5.6						SW Barrow Buoy
10.5	4.9					Barrow No. 10 Buoy
15.9	10.3	5.4				Barrow No. 6 Buoy
21.8	16.2	11.3	5.9			Barrow No. 3 Buoy
29.5	23.9	19.0	13.6	7.7		Sunk Head Tower Buoy
34.7	29.1	24.2	18.8	12.9	5.2	Sunk Inner

KNOCK JOHN CHANNEL & BLACK DEEP ROUTE

No. 1 Sea Reach Buoy

9.6						Knock John No. 7 Buoy
12.8	3.2					Knock John No. 1 Buoy
18.5	8.9	5.7				Black Deep No. 7 Buoy
25.6	16	12.8	7.1			Black Deep No. 3 Buoy
31	21.4	18.2	12.5	5.4		Sunk Head Tower Buoy
36.4	26.8	23.6	17.9	10.8	5.4	Sunk Inner

RIVER THAMES — DESIGNATED ANCHORAGES
LONDON BRIDGE TO THAMESHAVEN

Name	Area	Restriction
Regents Canal	North Side Lower Pool	2 hours
West India Dock (1)	North Side Blackwall Reach	2 hours
Bow Creek (1)	North Side Bugsbys Reach	2 hours
Barking Creek Entrance	North Side Barking Reach	2 hours
Thamesmead	South Side Barking Reach	4 hours
Belvedere	South Side Erith Reach	2 hours
Erith	South Side Erith Rands	2 hours
Long Reach (2)	South Side Long Reach	12 hours
St. Clements	South Side St. Clements Reach	12 hours
Gravesend Lower (3)	South Side Lower Gravesend Reach	12 hours Max Length 100m
Higham Bight (3)	South Side Lower Gravesend Reach	Unrestricted Max Length 100m

Notes

(1) West India Dock and Bow Creek anchorages lie over the Jubilee Line tube tunnels. Vessels using these anchorages are exempt from the general requirement not to anchor within 60 metres of a tunnel.

(2) The Anchorage in Long Reach will normally be reserved for vessels of a size greater than 100m (328 feet) in length.

(3) Demarcation line between Gravesend Lower and Higham Bight Anchorages is an imaginary line extending 000° (T) from the upper outer corner of Clubbs Jetty at Denton, as shown on Admiralty Chart 1186.

RIVER THAMES — DESIGNATED ANCHORAGES
YANTLET TO THE BARROW

Name	Area	Restriction
Yantlet Small Ship	Between East Blyth buoy and 1000 metres East of West Nore Sand buoy — South Side Yanlet Channel	Unrestricted
Leigh Small Ship	Between West Leigh Middle buoy and Southend Pier — North Side Yantlet Channel	Unrestricted
Southend Small Ship	Off Southend Pier, North Side Yantlet Channel	Unrestricted
Southend Deep Water	Between West & South Shoebury buoys — North Side Yantlet Channel	Unrestricted
Warp	Off Blacktail Split	Large Tankers staging only
Mouse	ENE of North Oaze buoy	Unrestricted
Great Nore	Area to the North of the Medway Channel between Nos 1 and 7 buoys	Adminstered by Medway Ports
Little Nore	Between Grain Hard buoy and No. 11 Medway buoy — North Side Medway Channel	
Sheerness Small Ship	Between West Cant buoy and No. 8 Medway buoy — South Side Medway Channel	
Knob Deep Draught K1 & K2	Oaze Deep in vicinity of Knob buoy	Large vessels staging only
Knob Special K3	Inner end of Knob Channel	Medway LNG
Shivering Sand	N. E. of Shivering Sand Towers	Unrestricted (See note 3)
Barrow Deep	W. of Barrow No. 3 Buoy	Unrestricted (See note 3)
Black Deep	Black Deep between Black Deep 5 and Black Deep 7 buoys	Large Vessels staging only

RIVER THAMES — DESIGNATED ANCHORAGE BERTHS

SEA REACH - SOUTHEND

Name	Latitude N. WGS 84	Longitude E.	Radius (Cables)	Depth (m) at C.D.	Bearing (T)	Distance (Miles)
					From Phoenix Unit	
A	51° 30.367	0° 44.471	1.67	8.1	264	0.94
B	51° 30.142	0° 45.193	1.67	11.3	236	0.58
C	51° 30.007	0° 45.703	1.67	10.9	199.5	0.49
D	51° 29.968	0° 46.236	1.67	10.4	161	0.53
E	51° 29.950	0° 46.789	1.67	11.7	135	0.73
F	51° 29.928	0° 47.329	1.67	11.6	122.5	1.01
O	51° 29.796	0° 45.249	1.67	6.2	213.5	0.81
P	51° 29.683	0° 45.750	1.67	7.1	189.5	0.80
Q	51° 29.669	0° 46.309	1.67	7.7	165	0.83
R	51° 29.608	0° 46.834	1.67	8.4	148	1.02
S	51° 29.596	0° 47.407	1.67	9.1	134	1.25
					From Shoebury Beacon	
Z1	51° 29.742	0° 47.715	1.67	13.4	240	1.11
Z2	51° 29.731	0° 48.349	2.00	13.2	225	0.80
Z3	51° 29.757	0° 49.209	2.50	12.0	183	054
Z4	51° 29.841	0° 49.998	1.67	11.0	133.5	0.66
Z5	51° 29.908	0° 50.591	1.67	10.8	115	0.92
Z6	51° 30.024	0° 51.143	1.67	10.5	103	1.21
Z7	51° 30.084	0° 51.722	1.67	10.2	098	1.56
Z8	51° 30.180	0° 52.238	1.67	10.7	093.5	1.87
					From Blacktail Bn W	
Z9	51° 30.240	0° 52.864	1.67	10.4	230	1.90
Z10	51° 30.366	0° 53.482	1.67	11.3	224.5	1.53
Z11	51° 30.509	0° 54.195	2.00	11.5	213.5	1.14
Z12	51° 30.626	0° 55.069	2.50	11.6	185.5	0.84

WARP AND KNOB

W1	51° 30.878	0° 55.886	2.50	13.3	144	0.73
W2	51° 31.193	0° 57.123	2.50	14.3	102.5	1.23
					From S.S. North Tower	
K1	51° 30.633	1° 03.217	2.50	15.6	305	1.20
K2	51° 31.329	1° 05.085	2.50	12.5	007.5	1.40
K3	51° 30.360	1° 04.000	2.60	12.6	310.0	0.63

GREAT NORE

Refer to Medway Ports Authority

Notes 1. WI & 2 and K1 & 2 anchor berths are normally used for staging large vessels. K3 may be used by other vessels provided a LNG vessel is not expected.
2. Depths shown in these berths are correct at the time of going to press. More recent information may be available from Port Control Centre, Gravesend.
3. To be used primarily by vessels awaiting clearance of restricted visibilty as per the Pilotage Direction. Usable in clear visibilty by small to medium sized vessels, subject to approval given by Port Control.

DIRECTIONS TO VESSELS ANCHORING
General Directions for Navigation in the Port of London 2009 states:

23. NAVIGATING CHANNELS, WAITING AND ANCHORING

(1) No vessel shall navigate in a fairway of the Thames or Anchor in a Designated Anchorage in the Thames unless such fairway or Designated Anchorage (as the case may be) is the fairway or Designated Anchorage most suitable for a vessel of that draught and size. in particlar, vessels with an operating draught of less than 6.0 metres shall not be navigated along the Black Deep, except with the express permission of the Harbourmaster.

(2) Unless otherwise specifically authorised by a VTS Centre, Vessels are permitted to wait for a berth in the Thames only:
a) at a mooring allocated to the vessel by a Harbourmaster for that purpose, or
b) in a Designated Anchorage.

(3) Except in an emergency, or with the permission of the Harbourmaster, vessels are not permitted to wait in a Designated Anchorage:
a) for longer than a period (if any) specified for anchoring in such an area by the Harbourmaster: and
b) where the vessel's dimensions would normally preclude it using that anchorage.

(4) Vessels are not to be anchored in a Fairway, other than in an emergency or for the purpose of manoeuvring or with the prior approval of the Harbourmaster.

Definitions

"Designated Anchorage" means an area designated by a Harbourmaster as an anchorage area or berth and published on charts, in the PLA Handbook of Tide Tables and Port Information or in Notices to Mariners.

"Fairway" means a regular course or track of shipping, comprising all marked and/or chartered navigable channels within the Thames.

RIVER THAMES — DESIGNATED EXPLOSIVE ANCHORAGES
HIGHAM TO CHAPMAN

Higham Bight — *Northern limit:*—
The South Channel edge down to the gas pipe crossing.
— *Western limit:*—
An imaginary line in a 000° direction from the upper outer corner of Clubbs Jetty at Denton. Excluding any portion which lies within the dredged channel.

Mucking Coaster — Within a 0.67 cables radius measured from a point 245° by 0.80 miles from the Waterman's Stone at Lower Hope Point. Barges may anchor within the area shown on Admiralty chart 1186.

Chapman — Within a one mile radius downstream of the Chapman Buoy north of the dredged channel.

CHAPMAN ANCHOR BERTHS

Name	Latitude N. WGS 84	Longitude E. WGS 84	Radius (Cables)	Depth at C.D. (m)	Max. Ship length
C1	51° 30.297	0° 37.410	1.33	9.7	137m
C2	51° 30.297	0° 37.947	1.33	12.0	137m
C3	51° 30.312	0° 38.484	1.67	9.6	183m

N.B. Vessels other than those working or carrying explosives may use the above anchorages providing permission has been granted by the harbour master at Port Control Centre, Gravesend.

VESSELS CARRYING DANGEROUS GOODS

Information on any special navigation conditions applying to vessels carrying bulk or packaged dangerous substances or which, if having carried such substances in bulk, remains non gas free, is available from the Port Control Centre, Gravesend.

PUBLIC SHIP TIERS & MOORINGS
(Refer to Page 38 in the PLA Handbook of Tides and Port Information)

NOTICE

Vessels using or lying at Public Moorings in the River Thames provided by the Port of London Authority are at the sole risk of owners or persons causing them to use or lie at such moorings.

The length shown is the maximum length of ship with 4.6m (15ft) freeboard which can be accommodated between the buoys of the Tier. For ships of unusual build of high freeboard, the Authority's Officers may reduce the lengths of vessels using the moorings by approximately 3.0m (10 ft) in length for every 1.5m (5ft).

The depths shown indicate the least water over a width of 30m (98 ft) between the screws or within the radius given in the case of a Swinging Mooring at the time of the latest survey. Depth given will be reduced when the tide falls below Chart Datum.

Application for the use of the tier or mooring should be made in advance to:-
Port Control Centre, Gravesend DA12 2BG
Telephone 01474 560311
For latest information, visit the PLA website

Latest Depth Information

Name of Mooring	*Ship Length (m)*	*Date of Survey*	*Ruling Depth*
Tower Bridge Upper Mooring	158	25 01 10	6.1m
George's Stairs Tier	71	25 01 10	5.3m
Greenwich Tier	128/208	06 04 10	8.1m
E. Woolwich Upper Tier	113	28 04 09	7.1m
E. Woolwich Middle Tier	103	28 04 09	4.5m
E. Woolwich Lower Tier	73	28 04 09	4.9m
Thamesmead Tier	100	06 01 09	5.6m
Erith Swing Mooring	95	10 03 09	4.9m
Erith Tier	122	10 03 09	6.9m
Greenhithe Swing Mooring	94	06 07 09	6.5m
Denton Small Ship Mooring	82	24 07 09	5.6m

OPERATIONAL INFORMATION FOR VESSELS USING PORT OF TILBURY LOCK

DIMENSIONS

Length of Lock	**304.8m**	**1,000 ft**
Width at Impounded Level	**33.5m**	**110 ft**
Depth on outer sill below chart datum	**7.3m**	**23.85 ft**

NOTES

1. The period during which the Tilbury lock system can be operated is dependent on three factors:—

(i) The height of water above the lock sills.
(ii) The construction of the lock pierheads.
(iii) Depth of water in lock approach.

2. The variation between Neap and Spring tides, together with abnormal tidal conditions caused by strong winds and also limitations imposed by siltation in the approach channels and lock entrances, do not permit any definite times relative to each H.W. to be laid down. For this reason, the following information can only be of a general nature and is intended to assist mariners approaching the Port of Tilbury to obtain some indication of the time they should arrive at Gravesend in order to dock on a particular tide.

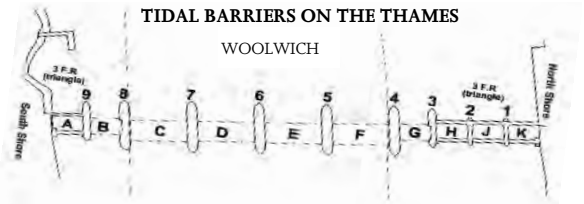
3. **More precise information can be obtained by direct reference to the Port of Tilbury Harbour Master, Tel: Tilbury (01375) 852447.**

4. Sill depths and lock dimensions are shown above. To find the level of water over the sill at any time, add the sill depth below chart datum to the height of the tide at the time required.

5. The height of the tide can be estimated by using tables of predicted hourly heights (see page 4).

6. If the actual height of tide at any time is required, it can be obtained on request from **London VTS** (see page 10).

7. There is a flood gate installed at the river end of Tilbury lock as part of the overall Thames Flood Defences. The lock will be closed to shipping when this gate is in the defence position. Information will be broadcast by **London VTS**.



River Thames - **Thames Barrier Control Zone**: Margaretness to Blackwall Point.

Full details of navigation procedures in the **TBCZ** are contained in **General Direction 16** for Navigation in the Port of London 2006.

Electronic Notice Boards with lights at Barking Power Station, Blackwall Stairs (N. Shore) and Blackwall Point (S. Shore).
Flashing Amber Lt. = Proceed with extreme caution.
Flashing Red Lt. = Navigation within Zone prohibited.
Red St. Andrew's Crosses (Lt) from Piers = Barrier or Span Closed.
Green Arrows (Lt) from Piers = Span Open.

In low visibility, Racons (morse 'T') and high-intensity directional fixed white lights operate on either side of spans C, D, E and F in conjunction with the green arrows.

It is extremely dangerous to go through a Span that is marked Closed (for navigation), the gates may be in a semi-raised position.
Small Craft: Do not navigate above Thames Refinery jetty or below Gulf Oil Island unless intending to pass through the Barrier.

ALL GATES CLOSED: No vessel to navigate within 200m. of Barrier due to turbulence.

Depth over sill: Spans C, D & E, F = 5.8m. C.D. Spans B,G = 1.25M. C.D.

Call **London VTS** (Barrier Control) on Channel 14 at Margaretness and/or Blackwall Pt for permission to pass through the Barrier. If no VHF Radio then pass through between Green Arrows. Use the side spans whenever possible, i.e. B or G.
Vessels fitted with a working engine should use motor power to navigate through the Thames Barrier.

BARKING CREEK	MHWS clearance	33.5m	Creek Barriers show Fl.R. when closed.
DARTFORD CREEK	MHWS clearance	12.2m	
EASTHAVEN CREEK	MHWS clearance	3.3m	
FOBBING CREEK	MHWS clearance	9.3m	
BENFLEET CREEK	MHWS clearance	1.6m	

THAMES BRIDGE CLEARANCES

Minimum Headway of NAVIGABLE ARCH in METRES above:

Bridge Name (Quoted Arch)	Chart Datum	MHWS	MHWN	MLWN	MLWS
Snapper (1)	5.4	2.7	4.0	5.4*	5.4*
Richmond (3)	7.9	5.3	6.5	7.9*	7.9*
Richmond Railway (2)	8.0	5.4	6.6	8.0*	8.0*
Twickenham (2)	8.5	5.9	7.1	8.5*	8.5*
Richmond Foot** (2)	10.4	5.5	6.7	10.4	10.4
Kew (2)	10.5	5.2	6.4	10.4	10.5
Kew Railway (4)	10.9	5.5	6.7	10.8	10.9
Chiswick (2)	12.0	6.6	7.8	11.9	12.0
Barnes Railway (2)	10.9	5.4	6.6	10.7	10.9
Hammersmith (South) (2)	9.3	3.6	4.7	9.0	9.3
Putney (3)	11.2	5.3	6.4	10.8	11.1
Fulham Railway (3)	12.8	6.8	8.0	12.3	12.7
Wandsworth (2)	11.9	5.8	7.0	11.4	11.8
Battersea Railway (3)	12.1	6.0	7.1	11.5	11.9
Battersea (3)	11.8	5.6	6.7	11.2	11.7
Albert (2)	11.6	5.4	6.5	11.0	11.5
Chelsea (2)	13.0	6.6	7.8	12.3	12.8
Victoria Railway (2)	12.4	6.1	7.2	11.7	12.2
Vauxhall (3)	12.2	5.7	6.9	11.4	12.0
Lambeth (3)	13.1	6.4	7.6	12.2	12.8
Westminster (4)	12.2	5.4	6.5	11.1	11.8
Charing Cross Railway (3)	13.7	7.0	8.1	12.7	13.3
Waterloo (3)	15.4	8.6	9.8	14.3	15.0
Blackfriars (3)	13.9	7.0	8.1	12.7	13.5
Blackfriars Railway (3)	14.2	7.3	8.5	13.0	13.8
Millennium Foot (2)	15.8	8.9	10.1	14.7	15.5
Southwark (3)	14.1	7.2	8.3	12.9	13.7
Cannon Street Railway (3)	14.2	7.2	8.4	13.0	13.8
London Bridge (2)	15.8	8.7	9.9	14.5	15.4
Tower (Closed) (2)	15.6	8.5	9.7	14.3	15.2
Tower (Open) (2)	49.6	42.5	43.7	48.3	49.2
QE2 (5)	60.7	54.1	55.2	59.3	60.2

BOW CREEK BRIDGE CLEARANCES

Minimum Headway of NAVIGABLE ARCH in METRES above:

Bridge Name	Chart Datum	MHWS	MHWN	MLWN	MLWS
Lower Lea Crossing	16.5	9.4	10.6	15.1	16.0
Docklands Light Railway	16.2	9.1	10.3	14.8	15.7
Canning Town Old Railway	12.1	5	6.2	10.7	11.6
Dock Road Foot	13.3	6.2	7.4	11.9	12.8
Canning Town Road	12.3	5.2	6.4	10.9	11.8
Barge Dock Foot	16.8	9.7	10.9	15.4	16.3
Ailsa Wharf	12.5	5.4	6.6	11.1	12.0
Twelve Trees Road	12.1	5	6.2	10.7	11.6
Bow Locks Foot	12.2	5.1	6.3	10.8	11.7
District Line Rail	10.3	3.2	4.4	8.9	9.8
Hammersmith & City Rail	10.3	3.2	4.4	8.9	9.8
Channelsea Island Foot	10.4	3.3	4.5	9.0	9.9

* Refers to headway above maintained water level.
** For details of the operation of the weir sluice-gates and lock associated with this bridge see page 31.

The arch number to which the measurement refers is given in the parenthesis next to the bridge name. Arches are numbered from the north shore to south shore.

Further information on all the bridges and individual arch heights can be found at www.pla.co.uk/bridgeheights and in the PLA "Mariners' Guide to Bridges on the Tidal Thames".

CHART DATUMS & STANDARD LEVELS IN THE PORT OF LONDON

1. Chart Datum is set to approximately the level of Lowest Astronomical Tide (L.A.T.)

2. Low Water levels in the upper reaches of the tidal Thames are greatly affected by the land water flow at Teddington Weir. **They frequently fall below chart datum** when this flow is significantly reduced, typically during the summer months.

3. Maintained level and chart datum above Richmond half tide weir are both 1.72 metres above Ordnance Datum (Newlyn).

4. Trinity High Water (T.H.W.) is deemed, by the Port of London Act, 1968, to be a level having a value of 11.4 feet **(i.e. 3.475 metres)** above Ordnance Datum (Newlyn).

Tidal Station	Level of Chart Datum below Ordnance Datum (Newlyn) m	Standard levels above local C.D.			
		Mean Low Water Springs	Mean Low Water Neaps	Mean High Water Neaps	Mean High Water Springs
WALTON	2.16	0.5	1.2	3.5	4.2
MARGATE	2.50	0.5	1.3	4.0	4.7
SHIVERING SAND	–	0.5	1.3	4.4	5.2
SOUTHEND	2.90	0.5	1.4	4.8	5.8
CANVEY	2.97	0.6	1.4	5.0	6.1
CORYTON	3.05	0.6	1.4	5.1	6.1
TILBURY	3.12	0.5	1.4	5.4	6.4
GREENHITHE	3.20	0.5	1.4	5.5	6.6
DAGENHAM	3.28	0.5	1.4	5.7	6.8
NORTH WOOLWICH	3.35	0.5	1.5	5.9	7.0
TOWER	3.20	0.4	1.3	5.9	7.1
BLACKFRIARS	3.05	0.4	1.2	5.8	6.9
WESTMINSTER	2.90	0.4	1.1	5.6	6.8
VAUXHALL	2.59	0.2	0.8	5.3	6.4
VICTORIA RAIL	2.44	0.2	0.7	5.2	6.4
ALBERT BRIDGE	2.29	0.1	0.6	5.1	6.2
WANDSWORTH	2.13	0.1	0.5	4.9	6.1
PUTNEY	1.98	0.1	0.5	4.8	6.0
HAMMERSMITH	1.68	0.0	0.3	4.6	5.7
BARNES	1.37	0.0	0.2	4.3	5.5
CHISWICK	1.22	0.0	0.1	4.2	5.4
KEW	1.07	0.0	0.1	4.1	5.3
BRENTFORD	0.91	0.0	0.0	4.0	5.2
RICHMOND	0.61	-	-	3.7	4.9
TWICKENHAM	Note 3	-	-	1.5	2.7

TABLE OF AVERAGE TIME DIFFERENCES

The times of high and low water at the following places on the River Thames may be found **approximately** by applying the differences shown to the times of high and low water given in the Tide Tables.

DIFFERENCES ON LONDON BRIDGE (TOWER PIER)

	For H.W.	For L.W.
	h m	h m
Teddington Lock	add 1 01	add —
*Richmond Lock	add 1 01	add 2 50
Kew Bridge	add 0 52	add 2 46
Barnes Railway Bridge	add 0 44	add 2 19
Hammersmith Bridge	add 0 38	add 1 58
Putney Bridge	add 0 31	add 1 38
Chelsea Bridge	add 0 14	add 0 45
Greenland Dock Entrance	sub 0 9	sub 0 14

The sluice gates at Richmond Weir are raised approximately 2 hours before and 2 hours after high tide at Richmond Lock, depending on fluvial flows. In periods of unusual low and high fluvial flows, please contact the Lock Foreman for an up-to-date assessment of when the weirs will be raised. During this period, passage through the navigation spans of Richmond Footbridge is available. At all other times Richmond Lock may be used: length 76.2m width 7.9m for which there is a £5 charge per vessel. Predicted times and heights of high and low waters are available for Richmond Lock and Chelsea at www.pla.co.uk

DIFFERENCES ON NORTH WOOLWICH

Greenwich Pier and Buoys	add 0 13	add 0 21
India & Millwall Dock Entrance	add 0 10	add 0 19
Royal Victoria Dock, Western Entrance	add 0 7	add 0 14

DIFFERENCES ON TILBURY

	For H.W.	For L.W.
	h m	h m
Ford's (Dagenham)	add 0 23	add 0 33
Purfleet	add 0 12	add 0 17
London International Cruise Terminal	sub 0 4	sub 0 4
Diver Shoal	sub 0 7	sub 0 7

DIFFERENCES ON SOUTHEND-ON-SEA

Lower Hope Point	add 0 17	add 0 20
Holehaven	add 0 13	add 0 13
West Oaze Buoy	sub 0 10	sub 0 10

DIFFERENCES ON MARGATE

Princes Channel Bar	add 0 18	add 0 17
N.E. Spit	sub 0 10	sub 0 5

DIFFERENCES ON WALTON-ON-THE-NAZE

Knock John	add 0 28	add 0 35
Little Sunk	add 0 9	add 0 12
Sunk Pilot Station	sub 0 5	sub 0 14

PLA Tide Tables

including
Sunrise & Sunset

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Moonrise & Moonset
for 2011
on pages 38 - 91

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JANUARY 2011

TIME ZONE UT(GMT)

	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 SA	0227	1.0	0259	1.2	0307	1.2	0320	1.2	0349	1.3	0422	1.4	0452	1.4	**1** SA
	0850	3.8	0908	4.3	0917	4.7	0937	5.2	1008	5.8	1034	6.4	1056	6.3	
	1503	0.8	1532	1.0	1537	1.0	1553	1.0	1620	1.1	1652	1.2	1725	1.2	
	2128	3.8	2150	4.3	2158	4.7	2217	5.1	2248	5.7	2313	6.3	2335	6.2	
2 SU	0337	0.9	0406	1.0	0416	1.0	0434	1.1	0509	1.1	0540	1.2	0611	1.2	**2** SU
	0950	3.9	1015	4.4	1022	4.9	1041	5.3	1113	6.0	1141	6.5	1202	6.5	
	1604	0.9	1628	1.0	1637	1.0	1656	1.0	1730	1.1	1801	1.2	1838	1.2	
	2223	3.9	2246	4.4	2256	4.8	2315	5.3	2347	5.9					
3 M	0439	0.7	0508	0.9	0517	0.8	0539	0.8	0615	0.9	0015	6.4	0036	6.4	**3** M
	1042	4.0	1112	4.5	1118	5.0	1135	5.5	1208	6.1	0649	1.0	0716	0.9	
	1655	0.9	1718	1.0	1729	0.9	1750	1.0	1827	1.1	1239	6.7	1259	6.6	
	2311	4.0	2332	4.5	2346	4.9					1901	1.1	1934	1.1	
4 TU ●	0531	0.5	0600	0.7	0609	0.6	0003	5.4	0036	6.0	0107	6.6	0128	6.5	**4** TU ●
	1129	4.1	1200	4.6	1206	5.1	0634	0.6	0710	0.7	0745	0.8	0810	0.7	
	1739	0.8	1801	1.0	1814	0.9	1222	5.6	1256	6.3	1328	6.9	1349	6.8	
	2354	4.1					1836	1.0	1914	1.0	1949	1.1	2021	1.1	
5 W	0616	0.4	0011	4.6	0027	5.1	0046	5.5	0119	6.1	0151	6.7	0212	6.6	**5** W
	1212	4.1	0644	0.6	0655	0.5	0721	0.5	0758	0.6	0832	0.7	0857	0.6	
	1819	0.8	1242	4.6	1248	5.2	1305	5.7	1340	6.3	1411	7.0	1433	6.9	
			1839	1.0	1854	0.9	1916	1.0	1955	1.0	2029	1.1	2103	1.1	
6 TH	0034	4.1	0047	4.6	0105	5.1	0124	5.6	0158	6.2	0231	6.8	0252	6.7	**6** TH
	0656	0.4	0723	0.6	0736	0.5	0802	0.5	0839	0.6	0913	0.7	0939	0.6	
	1252	4.1	1321	4.6	1327	5.2	1345	5.7	1420	6.4	1451	7.0	1513	6.9	
	1854	0.8	1915	1.0	1931	0.9	1950	1.0	2029	1.0	2101	1.2	2139	1.1	
7 F	0111	4.1	0123	4.6	0141	5.1	0201	5.6	0235	6.2	0308	6.8	0327	6.7	**7** F
	0732	0.4	0757	0.6	0812	0.5	0834	0.5	0912	0.6	0945	0.7	1014	0.7	
	1331	4.1	1357	4.5	1405	5.1	1423	5.6	1458	6.3	1529	6.9	1550	6.8	
	1928	0.9	1949	1.0	2003	0.9	2020	1.0	2058	1.1	2129	1.2	2208	1.2	

8	0145	4.1	0158	4.6	0216	5.1	0236	5.6	0310	6.2	0342	6.7	0400	6.7	**8**
	0804	0.4	0829	0.6	0841	0.6	0900	0.6	0937	0.7	1007	0.8	1041	0.8	
SA	1408	4.0	1431	4.5	1441	5.0	1500	5.5	1534	6.2	1603	6.8	1623	6.7	SA
	1958	0.9	2022	1.0	2035	1.0	2050	1.0	2126	1.1	2200	1.1	2234	1.2	
9	0218	4.0	0234	4.6	0250	5.1	0309	5.5	0342	6.1	0413	6.7	0431	6.6	**9**
SU	0833	0.5	0859	0.7	0908	0.6	0925	0.6	1000	0.7	1030	0.8	1102	0.8	**SU**
	1444	3.9	1505	4.4	1516	4.9	1535	5.4	1607	6.0	1636	6.6	1654	6.6	
	2027	0.9	2055	1.1	2108	1.0	2122	1.1	2157	1.1	2233	1.2	2304	1.2	
10	0252	4.0	0309	4.5	0325	5.0	0342	5.4	0414	6.0	0443	6.6	0501	6.5	**10**
	0902	0.6	0931	0.8	0939	0.7	0954	0.7	1026	0.8	1059	0.8	1128	0.8	
M	1520	3.8	1539	4.2	1551	4.7	1609	5.2	1640	5.8	1707	6.4	1725	6.4	M
	2100	1.0	2131	1.2	2144	1.1	2156	1.1	2230	1.2	2307	1.3	2336	1.3	
11	0328	3.9	0344	4.4	0400	4.8	0416	5.2	0446	5.9	0514	6.4	0533	6.4	**11**
	0934	0.7	1006	0.9	1012	0.8	1025	0.8	1056	0.9	1130	0.9	1156	0.9	
TU	1557	3.6	1615	4.1	1628	4.6	1644	5.0	1715	5.6	1740	6.2	1759	6.2	TU
	2140	1.1	2211	1.3	2223	1.2	2232	1.3	2304	1.3	2341	1.4			
12	0408	3.7	0423	4.2	0439	4.6	0454	5.1	0523	5.7	0550	6.2	0009	1.4	**12**
	1012	0.8	1046	1.1	1050	1.0	1058	1.0	1127	1.1	1201	1.1	0608	6.2	
W	1640	3.5	1656	4.0	1709	4.4	1725	4.8	1755	5.4	1819	6.0	1227	1.1	W
☽	2226	1.2	2258	1.5	2307	1.4	2314	1.5	2343	1.5			1837	6.0	☽
13	0455	3.6	0509	4.1	0525	4.4	0540	4.9	0609	5.5	0015	1.6	0044	1.6	**13**
	1101	1.0	1135	1.2	1135	1.2	1139	1.2	1205	1.3	0633	6.0	0652	5.9	
TH	1734	3.4	1746	3.8	1759	4.3	1815	4.7	1846	5.3	1237	1.3	1302	1.3	TH
	2328	1.3	2356	1.6							1907	5.8	1925	5.8	
14	0556	3.4	0605	3.9	0004	1.6	0008	1.6	0034	1.7	0102	1.8	0128	1.7	**14**
	1211	1.1	1238	1.4	0621	4.3	0639	4.7	0709	5.3	0732	5.8	0747	5.7	
F	1840	3.3	1855	3.8	1239	1.4	1237	1.4	1259	1.5	1328	1.5	1349	1.5	F
					1901	4.2	1920	4.6	1950	5.2	2016	5.7	2034	5.6	
15	0100	1.3	0118	1.6	0125	1.6	0130	1.7	0146	1.8	0209	1.9	0229	1.8	**15**
	0706	3.4	0721	3.8	0732	4.2	0752	4.6	0822	5.2	0853	5.7	0911	5.7	
SA	1337	1.1	1358	1.4	1402	1.4	1407	1.5	1419	1.6	1442	1.6	1500	1.6	SA
	1949	3.4	2020	3.9	2019	4.2	2034	4.6	2102	5.2	2134	5.7	2155	5.7	

JANUARY 2011

TIME ZONE UT(GMT)

	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 SU	0219	1.2	0245	1.4	0255	1.4	0304	1.5	0324	1.6	0345	1.8	0417	1.7	**16** SU
	0817	3.5	0841	3.9	0850	4.3	0906	4.8	0935	5.4	1007	5.9	1030	5.9	
	1443	1.1	1509	1.3	1517	1.3	1530	1.4	1549	1.5	1610	1.6	1642	1.5	
	2057	3.6	2126	4.1	2132	4.4	2145	4.9	2216	5.4	2243	6.0	2305	6.0	
17 M	0320	1.0	0349	1.2	0402	1.1	0415	1.2	0443	1.3	0511	1.4	0535	1.4	**17** M
	0922	3.6	0946	4.1	0956	4.5	1010	5.0	1043	5.7	1111	6.3	1135	6.2	
	1539	1.0	1607	1.2	1617	1.1	1633	1.2	1658	1.3	1724	1.3	1751	1.3	
	2157	3.7	2221	4.3	2231	4.7	2246	5.1	2320	5.7	2347	6.3			
18 TU	0414	0.7	0444	0.9	0457	0.8	0514	0.9	0546	0.9	0615	1.0	0009	6.3	**18** TU
	1017	3.9	1042	4.3	1052	4.8	1106	5.3	1141	6.0	1210	6.6	0640	1.0	
	1628	0.9	1656	1.0	1707	1.0	1726	1.0	1756	1.1	1826	1.2	1232	6.6	
	2248	3.9	2309	4.4	2322	4.9	2338	5.4					1854	1.2	
19 W O	0503	0.5	0534	0.7	0547	0.6	0606	0.6	0014	6.0	0042	6.6	0104	6.6	**19** W O
	1106	4.1	1132	4.5	1141	5.0	1156	5.6	0642	0.7	0714	0.7	0743	0.7	
	1712	0.8	1741	0.9	1753	0.8	1814	0.9	1232	6.3	1303	7.0	1324	6.9	
	2335	4.1	2352	4.6					1847	1.0	1923	1.0	1957	1.1	
20 TH	0549	0.3	0621	0.6	0008	5.1	0026	5.6	0102	6.2	0132	6.8	0153	6.8	**20** TH
	1152	4.3	1218	4.7	0633	0.4	0655	0.4	0734	0.5	0810	0.5	0841	0.5	
	1755	0.7	1824	0.8	1228	5.3	1244	5.9	1319	6.6	1352	7.2	1413	7.1	
					1836	0.7	1858	0.8	1936	0.9	2017	0.9	2053	0.9	
21 F	0020	4.3	0034	4.7	0053	5.3	0111	5.8	0146	6.4	0218	7.0	0239	6.9	**21** F
	0634	0.2	0705	0.4	0719	0.2	0742	0.2	0823	0.3	0901	0.3	0932	0.3	
	1238	4.4	1306	4.8	1314	5.4	1330	6.1	1405	6.7	1438	7.4	1459	7.3	
	1837	0.6	1906	0.7	1920	0.6	1942	0.7	2022	0.8	2106	0.8	2142	0.8	
22 SA	0105	4.4	0117	4.9	0136	5.4	0155	5.9	0229	6.6	0302	7.2	0322	7.1	**22** SA
	0719	0.1	0749	0.3	0803	0.1	0827	0.1	0908	0.1	0947	0.1	1018	0.1	
	1324	4.5	1352	4.9	1359	5.5	1415	6.2	1450	6.8	1522	7.5	1543	7.4	
	1919	0.6	1948	0.7	2004	0.6	2027	0.6	2107	0.7	2151	0.7	2226	0.7	

23	0148	4.4	0201	4.9	0218	5.5	0237	6.0	0311	6.7	0344	7.2	0403	7.2	**23**
SU	0803	0.0	0832	0.2	0845	0.0	0910	0.0	0949	0.0	1029	0.0	1100	0.0	**SU**
	1409	4.4	1438	4.8	1443	5.5	1500	6.1	1534	6.8	1606	7.4	1626	7.4	
	2003	0.6	2031	0.7	2048	0.6	2110	0.7	2149	0.7	2231	0.7	2306	0.7	
24	0230	4.4	0244	4.9	0300	5.5	0319	6.0	0353	6.6	0424	7.2	0443	7.1	**24**
M	0846	0.1	0914	0.3	0926	0.1	0951	0.1	1028	0.1	1107	0.1	1137	0.1	M
	1454	4.3	1522	4.7	1528	5.3	1545	5.9	1619	6.6	1649	7.2	1710	7.2	
	2047	0.7	2114	0.8	2131	0.7	2152	0.7	2230	0.8	2309	0.8	2343	0.8	
25	0313	4.3	0327	4.9	0343	5.4	0401	5.9	0435	6.5	0505	7.1	0524	7.0	**25**
TU	0930	0.2	0956	0.4	1007	0.3	1029	0.3	1105	0.3	1141	0.2	1211	0.3	TU
	1541	4.1	1605	4.5	1614	5.1	1630	5.7	1704	6.3	1733	6.9	1755	6.9	
	2134	0.8	2159	0.9	2215	0.8	2234	0.9	2310	0.9	2346	0.9			
26	0358	4.2	0412	4.7	0428	5.2	0445	5.7	0519	6.3	0548	6.9	0020	0.9	**26**
W	1017	0.4	1041	0.6	1051	0.5	1109	0.5	1141	0.5	1215	0.5	0607	6.8	W
☾	1631	3.9	1651	4.3	1703	4.9	1719	5.4	1752	6.0	1821	6.6	1246	0.5	☾
	2228	0.9	2250	1.1	2305	1.0	2321	1.0	2354	1.1			1843	6.6	
27	0450	4.0	0506	4.5	0521	5.0	0537	5.4	0610	6.1	0026	1.1	0101	1.1	**27**
TH	1112	0.6	1134	0.8	1142	0.8	1157	0.8	1225	0.8	0637	6.6	0658	6.6	TH
	1729	3.7	1750	4.1	1759	4.6	1816	5.0	1847	5.7	1255	0.9	1327	0.9	
	2331	1.0	2353	1.2							1917	6.3	1939	6.3	
28	0554	3.8	0614	4.3	0005	1.2	0020	1.2	0048	1.3	0116	1.4	0151	1.4	**28**
F	1217	0.8	1243	1.1	0624	4.7	0641	5.1	0713	5.8	0742	6.3	0801	6.3	F
	1838	3.5	1904	4.0	1247	1.1	1300	1.1	1323	1.1	1352	1.2	1424	1.2	
					1908	4.4	1925	4.8	1953	5.4	2024	6.0	2043	6.0	
29	0046	1.1	0116	1.3	0123	1.3	0135	1.3	0158	1.5	0227	1.6	0259	1.6	**29**
SA	0715	3.6	0734	4.1	0742	4.5	0800	4.9	0828	5.6	0857	6.1	0916	6.1	SA
	1330	1.0	1401	1.2	1402	1.3	1414	1.3	1433	1.4	1507	1.5	1535	1.5	
	1959	3.5	2021	4.0	2028	4.4	2046	4.7	2112	5.3	2137	5.9	2157	5.8	
30	0212	1.0	0243	1.3	0248	1.3	0258	1.3	0321	1.5	0353	1.6	0421	1.6	**30**
SU	0835	3.6	0857	4.1	0904	4.5	0922	4.9	0950	5.5	1015	6.1	1036	6.0	**SU**
	1449	1.1	1515	1.3	1520	1.3	1531	1.3	1555	1.4	1626	1.5	1654	1.5	
	2115	3.6	2136	4.1	2146	4.5	2204	4.9	2233	5.5	2258	6.0	2319	5.9	
31	0337	0.9	0406	1.1	0410	1.1	0426	1.1	0458	1.2	0527	1.3	0553	1.3	**31**
M	0943	3.8	1013	4.2	1018	4.7	1034	5.1	1104	5.8	1133	6.3	1152	6.2	M
	1558	1.0	1621	1.2	1628	1.2	1644	1.2	1717	1.3	1747	1.4	1818	1.4	
	2215	3.8	2238	4.3	2249	4.7	2307	5.1	2337	5.7					

FEBRUARY 2011

TIME ZONE UT(GMT)

	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 TU	0439	0.7	0510	0.9	0514	0.8	0535	0.8	0607	0.9	0006	6.2	0026	6.2	**1** TU
	1037	3.9	1110	4.4	1115	4.9	1131	5.4	1202	6.0	0640	1.0	0703	0.9	
	1648	1.0	1712	1.1	1720	1.1	1740	1.1	1814	1.2	1233	6.6	1252	6.5	
	2302	3.9	2325	4.4	2338	4.9	2356	5.3			1849	1.2	1917	1.2	
2 W	0526	0.5	0556	0.7	0603	0.6	0626	0.6	0027	5.9	0058	6.5	0118	6.5	**2** W
	1121	4.0	1155	4.5	1200	5.0	1216	5.5	0659	0.7	0733	0.7	0756	0.7	
	1728	0.9	1751	1.0	1803	1.0	1825	1.0	1249	6.2	1320	6.8	1340	6.7	
	2343	4.0							1900	1.1	1936	1.1	2005	1.1	
3 TH ●	0604	0.4	0003	4.5	0018	5.0	0035	5.5	0109	6.1	0140	6.7	0201	6.6	**3** TH ●
	1200	4.0	0633	0.6	0643	0.5	0707	0.5	0742	0.6	0817	0.6	0841	0.6	
	1802	0.8	1232	4.5	1238	5.1	1254	5.6	1329	6.2	1400	6.9	1421	6.8	
			1824	1.0	1839	0.9	1901	0.9	1939	1.0	2016	1.1	2046	1.1	
4 F	0019	4.1	0035	4.6	0052	5.1	0110	5.6	0144	6.2	0216	6.8	0237	6.7	**4** F
	0637	0.4	0704	0.6	0718	0.5	0742	0.5	0818	0.6	0853	0.6	0920	0.6	
	1236	4.1	1304	4.5	1312	5.1	1329	5.6	1404	6.3	1436	6.9	1458	6.8	
	1834	0.8	1856	0.9	1913	0.9	1933	0.9	2012	1.0	2048	1.1	2122	1.1	
5 SA	0052	4.1	0105	4.7	0123	5.2	0142	5.6	0217	6.2	0249	6.8	0310	6.8	**5** SA
	0707	0.4	0732	0.6	0747	0.5	0809	0.5	0847	0.6	0921	0.6	0952	0.7	
	1310	4.1	1334	4.5	1344	5.1	1402	5.6	1437	6.3	1508	6.9	1529	6.8	
	1905	0.8	1928	0.9	1943	0.9	2002	0.9	2041	1.0	2115	1.0	2153	1.1	
6 **SU**	0122	4.2	0137	4.7	0154	5.2	0213	5.7	0247	6.3	0320	6.9	0339	6.8	**6** **SU**
	0735	0.4	0800	0.6	0814	0.5	0832	0.5	0910	0.6	0942	0.6	1018	0.7	
	1343	4.0	1404	4.5	1415	5.1	1434	5.6	1507	6.2	1538	6.8	1557	6.8	
	1933	0.8	1959	0.9	2013	0.9	2031	0.9	2108	0.9	2144	1.0	2219	1.0	
7 M	0153	4.1	0210	4.7	0225	5.2	0244	5.7	0317	6.3	0349	6.9	0407	6.8	**7** M
	0801	0.4	0828	0.6	0839	0.5	0857	0.5	0933	0.6	1006	0.6	1039	0.7	
	1414	3.9	1435	4.4	1446	5.0	1504	5.5	1536	6.1	1606	6.7	1624	6.7	
	2001	0.8	2030	0.9	2044	0.9	2101	0.9	2136	0.9	2215	1.0	2246	1.0	

8 TU	0223	4.1	0242	4.6	0256	5.1	0315	5.6	0346	6.2	0417	6.8	0435	6.7	**8** TU
	0826	0.5	0856	0.7	0907	0.6	0923	0.6	0957	0.6	1033	0.6	1102	0.7	
	1444	3.8	1506	4.3	1516	4.9	1534	5.3	1605	6.0	1634	6.6	1652	6.6	
	2031	0.8	2101	1.0	2116	1.0	2130	1.0	2205	1.0	2245	1.1	2314	1.1	
9 W	0254	4.0	0313	4.5	0327	5.0	0344	5.4	0416	6.0	0445	6.6	0505	6.6	**9** W
	0853	0.6	0926	0.8	0935	0.7	0948	0.7	1021	0.8	1059	0.8	1127	0.8	
	1515	3.7	1537	4.2	1547	4.7	1604	5.1	1635	5.8	1703	6.4	1723	6.4	
	2105	0.9	2135	1.1	2149	1.1	2200	1.1	2231	1.2	2311	1.2	2341	1.2	
10 TH	0328	3.8	0347	4.3	0359	4.8	0416	5.2	0447	5.9	0516	6.4	0537	6.4	**10** TH
	0925	0.7	0958	1.0	1004	0.9	1013	0.9	1042	0.9	1121	1.0	1150	1.0	
	1551	3.6	1612	4.1	1623	4.6	1639	5.0	1709	5.6	1737	6.2	1758	6.1	
	2144	1.0	2214	1.3	2224	1.2	2231	1.2	2259	1.3	2334	1.4			
11 F ☽	0407	3.7	0426	4.2	0438	4.6	0455	5.0	0525	5.7	0554	6.2	0008	1.4	**11** F ☽
	1004	0.9	1038	1.2	1040	1.1	1044	1.1	1111	1.1	1147	1.2	0615	6.2	
	1636	3.5	1655	3.9	1707	4.4	1723	4.8	1752	5.4	1819	5.9	1219	1.1	
	2235	1.1	2305	1.4	2312	1.4	2315	1.4	2339	1.5			1839	5.9	
12 SA	0458	3.5	0518	4.0	0530	4.4	0546	4.8	0615	5.4	0011	1.5	0044	1.5	**12** SA
	1100	1.1	1136	1.4	1132	1.4	1133	1.4	1157	1.4	0642	5.9	0703	5.9	
	1738	3.3	1753	3.8	1807	4.2	1822	4.6	1851	5.2	1230	1.4	1300	1.3	
	2351	1.3									1915	5.7	1933	5.6	
13 **SU**	0607	3.3	0019	1.5	0023	1.5	0025	1.6	0044	1.7	0109	1.7	0136	1.6	**13** **SU**
	1234	1.2	0627	3.8	0638	4.2	0655	4.6	0725	5.2	0750	5.7	0807	5.7	
	1858	3.3	1301	1.5	1258	1.5	1254	1.6	1309	1.6	1337	1.7	1400	1.6	
			1918	3.7	1927	4.1	1943	4.5	2010	5.1	2040	5.6	2057	5.5	
14 M	0136	1.2	0159	1.4	0205	1.5	0214	1.5	0227	1.7	0243	1.8	0301	1.8	**14** M
	0734	3.3	0759	3.8	0807	4.2	0823	4.6	0850	5.3	0923	5.8	0943	5.7	
	1408	1.2	1432	1.4	1436	1.5	1447	1.5	1504	1.6	1525	1.8	1552	1.7	
	2022	3.4	2049	3.9	2058	4.3	2109	4.7	2136	5.2	2205	5.8	2228	5.7	
15 TU	0249	0.9	0318	1.2	0331	1.2	0342	1.2	0407	1.3	0433	1.5	0459	1.4	**15** TU
	0856	3.5	0920	4.1	0930	4.5	0941	4.9	1011	5.6	1040	6.2	1104	6.1	
	1514	1.0	1541	1.2	1550	1.2	1606	1.3	1629	1.4	1655	1.5	1720	1.4	
	2133	3.6	2156	4.2	2208	4.6	2221	5.0	2254	5.6	2318	6.2	2343	6.1	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 W	0350	0.7	0420	0.9	0433	0.8	0449	0.8	0520	0.9	0547	1.0	0613	1.0	**16** W
	0958	3.8	1025	4.3	1033	4.8	1045	5.3	1119	6.0	1147	6.6	1209	6.6	
	1608	0.9	1636	1.0	1647	1.0	1706	1.0	1736	1.1	1804	1.2	1833	1.2	
	2229	3.9	2249	4.4	2303	4.9	2319	5.3	2352	6.0					
17 TH	0443	0.4	0514	0.6	0527	0.5	0547	0.5	0623	0.5	0020	6.6	0043	6.6	**17** TH
	1049	4.1	1117	4.6	1126	5.1	1139	5.7	1213	6.3	0654	0.6	0726	0.6	
	1655	0.7	1724	0.9	1736	0.8	1758	0.8	1835	0.9	1244	7.0	1305	7.0	
	2316	4.1	2335	4.6	2350	5.2					1909	1.0	1945	1.0	
18 F O	0531	0.2	0603	0.4	0616	0.2	0007	5.7	0041	6.3	0112	6.9	0134	6.9	**18** F O
	1136	4.3	1204	4.8	1212	5.3	0638	0.2	0718	0.3	0755	0.3	0826	0.3	
	1739	0.6	1808	0.8	1822	0.7	1227	5.9	1302	6.6	1334	7.3	1355	7.2	
							1846	0.7	1927	0.8	2008	0.8	2042	0.8	
19 SA	0001	4.3	0018	4.8	0033	5.4	0052	5.9	0126	6.6	0158	7.2	0219	7.1	**19** SA
	0616	0.1	0647	0.3	0701	0.1	0726	0.1	0807	0.1	0847	0.1	0917	0.1	
	1221	4.4	1250	4.9	1257	5.5	1312	6.1	1347	6.8	1419	7.5	1441	7.4	
	1821	0.6	1850	0.7	1906	0.6	1932	0.6	2015	0.7	2058	0.7	2130	0.7	
20 SU	0045	4.5	0101	5.0	0116	5.6	0135	6.1	0208	6.8	0241	7.4	0302	7.3	**20** SU
	0700	0.0	0729	0.2	0744	0.0	0810	-0.1	0851	0.0	0932	-0.1	1002	-0.1	
	1305	4.5	1335	4.9	1340	5.6	1357	6.2	1430	6.9	1503	7.6	1524	7.5	
	1903	0.5	1932	0.6	1949	0.5	2016	0.5	2059	0.6	2142	0.6	2214	0.6	
21 M	0127	4.6	0144	5.1	0157	5.7	0216	6.2	0250	6.9	0323	7.5	0342	7.4	**21** M
	0742	0.0	0810	0.2	0824	0.0	0851	-0.1	0931	-0.1	1012	-0.1	1042	-0.1	
	1349	4.5	1419	4.9	1423	5.5	1440	6.1	1514	6.8	1546	7.5	1606	7.4	
	1946	0.5	2014	0.6	2031	0.5	2058	0.5	2139	0.6	2221	0.6	2252	0.5	
22 TU	0208	4.6	0227	5.1	0238	5.7	0258	6.2	0331	6.9	0403	7.5	0422	7.4	**22** TU
	0821	0.1	0848	0.3	0902	0.1	0928	0.0	1006	0.1	1047	0.0	1117	0.0	
	1433	4.3	1459	4.7	1505	5.4	1523	5.9	1556	6.6	1628	7.2	1648	7.2	
	2028	0.6	2055	0.7	2112	0.6	2136	0.6	2216	0.7	2256	0.6	2327	0.6	

23	0250	4.5	0308	5.0	0320	5.6	0339	6.1	0412	6.7	0444	7.3	0502	7.2	**23**
W	0901	0.2	0926	0.4	0939	0.3	1002	0.3	1037	0.3	1117	0.3	1147	0.3	W
	1517	4.1	1538	4.6	1548	5.1	1606	5.6	1638	6.3	1709	6.9	1729	6.8	
	2112	0.7	2137	0.8	2154	0.7	2214	0.7	2250	0.8	2328	0.8			
24	0333	4.3	0352	4.8	0404	5.3	0422	5.8	0455	6.4	0525	7.0	0000	0.8	**24**
TH	0944	0.5	1007	0.7	1018	0.6	1035	0.6	1108	0.6	1145	0.6	0544	7.0	TH
☾	1604	3.8	1620	4.3	1633	4.9	1651	5.3	1723	5.9	1752	6.5	1216	0.6	☾
	2202	0.8	2224	1.0	2239	0.9	2255	0.9	2327	1.0			1813	6.5	
25	0423	4.0	0443	4.5	0455	5.0	0511	5.4	0544	6.1	0001	1.0	0034	1.0	**25**
F	1037	0.8	1057	1.0	1105	1.0	1118	1.0	1146	1.0	0611	6.6	0632	6.6	F
	1658	3.6	1713	4.1	1727	4.6	1744	4.9	1814	5.6	1219	1.0	1251	1.0	
	2303	0.9	2326	1.2	2336	1.1	2349	1.2			1841	6.1	1902	6.1	
26	0528	3.7	0550	4.2	0600	4.6	0615	5.0	0015	1.2	0043	1.3	0117	1.3	**26**
SA	1143	1.0	1208	1.3	1210	1.3	1222	1.3	0646	5.7	0712	6.2	0731	6.2	SA
	1807	3.4	1831	3.9	1838	4.3	1854	4.6	1245	1.4	1311	1.5	1343	1.4	
									1919	5.3	1948	5.8	2005	5.8	
27	0021	1.0	0054	1.3	0055	1.3	0106	1.4	0125	1.5	0148	1.6	0222	1.6	**27**
SU	0654	3.5	0716	4.0	0722	4.4	0737	4.8	0804	5.4	0830	5.9	0848	5.9	**SU**
	1304	1.2	1336	1.5	1336	1.5	1345	1.5	1404	1.6	1435	1.8	1501	1.7	
	1935	3.3	1957	3.9	2006	4.2	2022	4.5	2045	5.1	2109	5.6	2126	5.6	
28	0203	1.0	0231	1.3	0233	1.3	0239	1.4	0257	1.5	0326	1.7	0350	1.6	**28**
M	0822	3.5	0848	4.0	0853	4.4	0907	4.8	0932	5.4	0956	5.9	1015	5.8	M
	1436	1.2	1500	1.4	1505	1.5	1512	1.5	1535	1.6	1603	1.7	1627	1.7	
	2059	3.5	2116	4.0	2128	4.4	2146	4.7	2214	5.3	2238	5.8	2259	5.7	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 TU	0331	0.8	0359	1.0	0403	1.1	0418	1.1	0446	1.3	0512	1.4	0534	1.3	**1** TU
	0932	3.7	1003	4.2	1007	4.7	1022	5.1	1051	5.7	1118	6.2	1136	6.1	
	1546	1.1	1610	1.3	1615	1.4	1629	1.3	1659	1.4	1727	1.5	1756	1.4	
	2158	3.7	2220	4.2	2232	4.7	2249	5.1	2320	5.7	2347	6.2			
2 W	0427	0.6	0458	0.8	0503	0.8	0522	0.8	0552	0.9	0622	1.0	0007	6.1	**2** W
	1024	3.9	1057	4.4	1101	4.9	1117	5.3	1147	6.0	1216	6.6	0646	0.9	
	1632	1.0	1659	1.2	1704	1.2	1723	1.2	1754	1.2	1827	1.2	1236	6.5	
	2244	3.9	2308	4.4	2319	4.9	2337	5.3					1855	1.2	
3 TH	0509	0.5	0540	0.7	0546	0.7	0607	0.6	0009	5.9	0037	6.5	0058	6.5	**3** TH
	1105	3.9	1139	4.4	1143	5.0	1159	5.5	0638	0.7	0710	0.7	0735	0.7	
	1708	0.9	1734	1.0	1743	1.1	1804	1.0	1232	6.1	1301	6.8	1321	6.7	
	2322	4.0	2344	4.5	2357	5.0			1838	1.1	1912	1.1	1941	1.0	
4 F ●	0542	0.4	0611	0.6	0620	0.6	0014	5.4	0048	6.1	0118	6.7	0139	6.6	**4** F ●
	1140	4.0	1212	4.5	1218	5.1	0642	0.6	0716	0.6	0750	0.6	0816	0.6	
	1739	0.8	1804	0.9	1818	0.9	1234	5.5	1308	6.2	1338	6.9	1400	6.8	
	2355	4.1					1838	0.9	1915	1.0	1951	1.0	2022	1.0	
5 SA	0609	0.4	0013	4.6	0029	5.1	0047	5.6	0121	6.2	0153	6.8	0214	6.7	**5** SA
	1213	4.0	0636	0.6	0649	0.5	0711	0.5	0747	0.6	0822	0.6	0850	0.7	
	1810	0.7	1240	4.5	1249	5.1	1305	5.6	1340	6.2	1411	6.9	1433	6.8	
			1834	0.9	1850	0.9	1910	0.8	1949	0.9	2024	1.0	2058	1.0	
6 **SU**	0025	4.1	0041	4.7	0058	5.2	0116	5.7	0151	6.3	0224	6.9	0244	6.8	**6** **SU**
	0635	0.4	0701	0.6	0716	0.5	0735	0.5	0813	0.6	0847	0.6	0921	0.7	
	1244	4.0	1305	4.5	1317	5.1	1335	5.6	1408	6.3	1441	6.9	1502	6.8	
	1840	0.7	1905	0.8	1921	0.8	1939	0.8	2019	0.9	2054	0.9	2129	0.9	
7 M	0055	4.2	0112	4.7	0128	5.3	0146	5.7	0219	6.4	0252	7.0	0312	6.9	**7** M
	0702	0.4	0728	0.5	0742	0.5	0800	0.5	0837	0.5	0910	0.6	0946	0.7	
	1315	4.0	1334	4.5	1345	5.1	1404	5.6	1437	6.3	1508	6.9	1527	6.8	
	1909	0.6	1936	0.8	1951	0.8	2009	0.7	2047	0.8	2124	0.8	2157	0.9	

8 TU	0124	4.2	0144	4.7	0158	5.3	0216	5.7	0249	6.4	0320	7.0	0339	6.9	**8** TU
	0727	0.4	0755	0.6	0808	0.6	0826	0.5	0901	0.5	0936	0.5	1010	0.6	
	1344	4.0	1405	4.5	1414	5.1	1433	5.5	1505	6.2	1535	6.8	1553	6.8	
	1937	0.7	2006	0.8	2021	0.8	2038	0.8	2115	0.8	2154	0.8	2225	0.9	
9 W	0155	4.1	0216	4.6	0227	5.2	0246	5.6	0319	6.3	0348	6.9	0408	6.9	**9** W
	0752	0.5	0822	0.6	0834	0.7	0851	0.6	0925	0.6	1004	0.6	1034	0.7	
	1412	3.9	1435	4.4	1443	5.0	1502	5.4	1534	6.1	1603	6.7	1622	6.7	
	2006	0.7	2036	0.9	2051	0.9	2107	0.8	2142	0.9	2223	0.9	2252	0.9	
10 TH	0225	4.0	0246	4.5	0257	5.1	0316	5.5	0348	6.2	0418	6.8	0438	6.7	**10** TH
	0817	0.6	0850	0.8	0900	0.8	0913	0.7	0947	0.7	1027	0.8	1057	0.8	
	1443	3.8	1504	4.3	1513	4.8	1531	5.2	1603	5.9	1632	6.5	1653	6.5	
	2038	0.7	2108	1.0	2121	1.0	2133	0.9	2205	1.0	2245	1.1	2317	1.1	
11 F	0258	3.9	0316	4.4	0327	4.9	0347	5.3	0418	6.0	0449	6.6	0511	6.5	**11** F
	0847	0.7	0921	0.9	0927	0.9	0936	0.9	1007	0.9	1047	0.9	1120	0.9	
	1518	3.7	1534	4.2	1546	4.7	1604	5.1	1635	5.7	1705	6.3	1727	6.2	
	2114	0.8	2143	1.1	2153	1.1	2201	1.1	2229	1.1	2307	1.2	2341	1.2	
12 SA ☽	0336	3.8	0353	4.2	0404	4.8	0423	5.2	0455	5.8	0525	6.4	0548	6.3	**12** SA ☽
	0925	0.9	0958	1.1	1001	1.1	1006	1.0	1035	1.1	1114	1.1	1148	1.0	
	1600	3.6	1616	4.0	1629	4.5	1646	4.9	1716	5.5	1745	6.0	1806	6.0	
	2200	0.9	2231	1.2	2237	1.2	2241	1.2	2306	1.3	2341	1.3			
13 **SU**	0424	3.6	0445	4.0	0454	4.5	0512	5.0	0542	5.6	0612	6.1	0013	1.2	**13** **SU**
	1018	1.1	1054	1.3	1052	1.4	1054	1.3	1119	1.3	1155	1.3	0634	6.1	
	1657	3.4	1716	3.9	1727	4.3	1742	4.7	1812	5.3	1838	5.8	1227	1.2	
	2309	1.1	2342	1.3	2343	1.4	2345	1.4					1858	5.7	
14 M	0529	3.4	0556	3.9	0603	4.3	0618	4.7	0004	1.4	0034	1.5	0102	1.4	**14** M
	1147	1.3	1219	1.5	1214	1.6	1213	1.6	0647	5.4	0714	5.9	0734	5.9	
	1815	3.3	1835	3.8	1847	4.2	1902	4.5	1228	1.6	1259	1.7	1324	1.5	
									1929	5.1	1955	5.6	2012	5.5	
15 TU	0058	1.1	0123	1.3	0124	1.4	0133	1.4	0143	1.6	0156	1.6	0217	1.6	**15** TU
	0656	3.4	0727	3.8	0734	4.3	0747	4.7	0814	5.3	0845	5.9	0905	5.8	
	1335	1.2	1358	1.4	1359	1.6	1411	1.6	1430	1.7	1450	1.8	1511	1.8	
	1946	3.3	2013	3.9	2023	4.3	2034	4.6	2059	5.2	2129	5.8	2151	5.7	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 W	0220	0.8	0248	1.1	0259	1.1	0309	1.1	0333	1.3	0358	1.4	0425	1.4	**16** W
	0829	3.6	0856	4.1	0904	4.5	0912	5.0	0941	5.6	1009	6.2	1033	6.1	
	1445	1.0	1514	1.2	1522	1.3	1535	1.3	1600	1.4	1627	1.5	1652	1.5	
	2105	3.6	2126	4.2	2139	4.6	2152	5.0	2222	5.6	2246	6.2	2312	6.1	
17 TH	0323	0.6	0354	0.8	0406	0.7	0421	0.7	0450	0.8	0517	0.9	0544	0.9	**17** TH
	0935	3.9	1003	4.4	1011	4.9	1021	5.4	1053	6.0	1119	6.7	1143	6.6	
	1542	0.8	1612	1.0	1622	1.0	1639	1.0	1710	1.0	1738	1.1	1807	1.2	
	2203	3.9	2223	4.4	2237	5.0	2252	5.4	2325	6.0	2351	6.6			
18 F	0418	0.3	0450	0.5	0502	0.4	0521	0.4	0556	0.4	0627	0.5	0015	6.6	**18** F
	1027	4.1	1056	4.6	1104	5.2	1117	5.7	1150	6.4	1219	7.0	0702	0.6	
	1631	0.7	1701	0.8	1713	0.8	1734	0.8	1812	0.8	1845	0.9	1241	7.0	
	2251	4.2	2311	4.7	2325	5.3	2342	5.7					1922	0.9	
19 SA	0507	0.1	0538	0.3	0551	0.2	0614	0.2	0015	6.4	0045	7.0	0107	7.0	**19** SA
	1114	4.3	1143	4.8	1150	5.4	1205	6.0	0653	0.2	0731	0.2	0804	0.3	
O	1716	0.6	1746	0.7	1800	0.7	1826	0.6	1239	6.7	1310	7.3	1331	7.2	O
	2336	4.4	2355	4.9					1907	0.7	1947	0.8	2020	0.8	
20 SU	0552	0.0	0622	0.2	0008	5.5	0026	6.0	0100	6.7	0132	7.3	0153	7.2	**20** SU
	1158	4.4	1228	4.9	0635	0.1	0702	0.0	0742	0.0	0823	0.1	0854	0.1	
	1801	0.5	1830	0.6	1234	5.5	1250	6.1	1323	6.8	1356	7.5	1417	7.4	
					1846	0.6	1914	0.5	1957	0.6	2039	0.6	2110	0.6	
21 M	0019	4.6	0038	5.0	0050	5.7	0110	6.2	0142	6.9	0215	7.5	0236	7.4	**21** M
	0635	0.0	0704	0.2	0718	0.0	0745	0.0	0826	0.0	0908	0.0	0939	0.0	
	1243	4.5	1312	4.9	1316	5.5	1334	6.2	1407	6.9	1439	7.5	1501	7.4	
	1844	0.4	1913	0.5	1930	0.5	1959	0.5	2042	0.5	2123	0.5	2154	0.5	
22 TU	0102	4.6	0123	5.1	0132	5.8	0152	6.3	0225	7.0	0258	7.6	0318	7.5	**22** TU
	0716	0.0	0743	0.2	0758	0.1	0825	0.0	0905	0.1	0947	0.1	1018	0.1	
	1326	4.4	1354	4.8	1359	5.5	1417	6.1	1450	6.8	1522	7.4	1542	7.3	
	1927	0.4	1956	0.5	2013	0.5	2041	0.4	2122	0.5	2203	0.5	2233	0.5	

23 W	0144	4.6	0208	5.1	0215	5.7	0234	6.3	0307	7.0	0340	7.6	0359	7.5	**23** W
	0755	0.2	0821	0.3	0835	0.2	0901	0.2	0939	0.2	1020	0.2	1051	0.3	
	1409	4.3	1434	4.7	1441	5.3	1459	5.9	1532	6.6	1604	7.2	1623	7.1	
	2010	0.5	2038	0.6	2054	0.5	2119	0.5	2159	0.6	2238	0.6	2307	0.5	
24 TH	0227	4.5	0251	4.9	0258	5.6	0317	6.1	0350	6.8	0422	7.4	0440	7.3	**24** TH
	0833	0.4	0858	0.5	0911	0.5	0932	0.5	1007	0.5	1047	0.5	1118	0.5	
	1452	4.1	1512	4.5	1522	5.1	1541	5.6	1613	6.2	1645	6.8	1704	6.7	
	2054	0.5	2120	0.7	2134	0.7	2155	0.7	2231	0.7	2308	0.8	2338	0.7	
25 F	0311	4.2	0336	4.7	0344	5.3	0401	5.8	0434	6.4	0504	7.0	0523	7.0	**25** F
	0916	0.7	0938	0.8	0949	0.8	1004	0.8	1035	0.8	1113	0.9	1145	0.8	
	1538	3.8	1553	4.3	1607	4.8	1625	5.2	1656	5.9	1726	6.4	1746	6.4	
	2142	0.7	2207	0.9	2218	0.8	2233	0.9	2303	0.9	2337	1.0			
26 SA ☾	0402	3.9	0426	4.4	0435	5.0	0451	5.4	0523	6.0	0551	6.6	0009	0.9	**26** SA ☾
	1007	0.9	1028	1.1	1035	1.2	1046	1.1	1114	1.2	1147	1.2	0611	6.6	
	1631	3.6	1645	4.1	1659	4.5	1716	4.9	1745	5.5	1812	6.0	1220	1.2	
	2240	0.8	2309	1.1	2312	1.1	2323	1.1	2347	1.2			1832	6.0	
27 **SU**	0507	3.6	0531	4.1	0539	4.6	0554	5.0	0624	5.6	0016	1.2	0049	1.2	**27** **SU**
	1111	1.2	1137	1.4	1138	1.5	1147	1.5	1211	1.5	0648	6.2	0708	6.1	
	1738	3.4	1759	3.9	1808	4.3	1824	4.6	1850	5.2	1239	1.6	1310	1.6	
	2357	1.0									1914	5.7	1931	5.7	
28 M	0631	3.4	0033	1.2	0029	1.3	0037	1.3	0053	1.4	0116	1.5	0149	1.5	**28** M
	1234	1.3	0657	3.9	0700	4.4	0714	4.7	0739	5.3	0804	5.8	0822	5.8	
	1902	3.3	1309	1.6	1305	1.7	1312	1.7	1332	1.8	1401	1.9	1428	1.8	
			1926	3.8	1935	4.2	1951	4.5	2010	5.1	2037	5.6	2051	5.5	
29 TU	0139	1.0	0207	1.2	0208	1.3	0213	1.3	0228	1.5	0256	1.6	0318	1.6	**29** TU
	0756	3.5	0825	3.9	0828	4.4	0841	4.7	0904	5.3	0928	5.8	0946	5.8	
	1406	1.3	1434	1.5	1437	1.6	1440	1.6	1504	1.7	1533	1.8	1555	1.8	
	2026	3.4	2042	3.9	2056	4.4	2113	4.7	2139	5.3	2202	5.7	2222	5.7	
30 W	0306	0.8	0330	1.0	0337	1.1	0349	1.1	0410	1.3	0430	1.4	0450	1.4	**30** W
	0907	3.6	0935	4.1	0940	4.6	0954	5.0	1023	5.6	1047	6.2	1106	6.0	
	1517	1.2	1541	1.3	1546	1.4	1557	1.4	1624	1.5	1651	1.5	1717	1.5	
	2128	3.6	2146	4.1	2159	4.6	2216	5.0	2248	5.6	2313	6.1	2334	6.0	
31 TH	0401	0.6	0427	0.8	0434	0.9	0451	0.9	0517	1.0	0543	1.1	0608	1.0	**31** TH
	0958	3.8	1028	4.3	1033	4.8	1048	5.3	1120	5.9	1146	6.5	1207	6.4	
	1604	1.0	1629	1.2	1635	1.3	1652	1.2	1720	1.2	1750	1.3	1819	1.2	
	2214	3.8	2235	4.3	2246	4.8	2305	5.2	2338	5.9					

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 F	0439	0.6	0506	0.7	0513	0.8	0533	0.7	0601	0.8	0005	6.5	0025	6.4	**1** F
	1038	3.9	1109	4.4	1114	5.0	1130	5.4	1203	6.1	0630	0.8	0657	0.8	
	1640	0.9	1705	1.0	1715	1.1	1733	1.0	1805	1.1	1231	6.7	1252	6.6	
	2252	3.9	2312	4.4	2325	5.0	2343	5.4			1837	1.1	1907	1.1	
2 SA	0509	0.5	0534	0.7	0544	0.7	0604	0.7	0017	6.0	0047	6.7	0107	6.6	**2** SA
	1113	3.9	1141	4.4	1149	5.0	1205	5.5	0635	0.7	0709	0.8	0737	0.8	
	1712	0.8	1737	0.9	1750	1.0	1809	0.9	1239	6.1	1308	6.8	1330	6.7	
	2324	4.0	2343	4.5	2358	5.1			1844	1.0	1919	1.0	1949	1.0	
3 SU ●	0535	0.5	0601	0.6	0613	0.7	0016	5.5	0050	6.2	0122	6.8	0142	6.7	**3** SU ●
	1144	4.0	1207	4.5	1219	5.1	0632	0.6	0706	0.7	0741	0.7	0812	0.7	
	1743	0.7	1810	0.8	1825	0.9	1236	5.5	1309	6.2	1341	6.8	1402	6.7	
	2354	4.1					1843	0.8	1920	0.9	1956	0.9	2027	0.9	
4 M	0602	0.4	0012	4.6	0028	5.2	0046	5.6	0120	6.3	0153	6.9	0213	6.8	**4** M
	1215	4.0	0628	0.6	0642	0.6	0659	0.6	0735	0.6	0810	0.7	0843	0.7	
	1814	0.6	1234	4.5	1247	5.1	1305	5.6	1337	6.2	1410	6.8	1430	6.7	
			1841	0.7	1857	0.8	1915	0.7	1953	0.8	2029	0.8	2101	0.9	
5 TU	0024	4.2	0044	4.6	0059	5.3	0117	5.7	0150	6.4	0223	7.0	0242	6.9	**5** TU
	0629	0.4	0657	0.6	0710	0.6	0727	0.5	0802	0.6	0838	0.6	0912	0.7	
	1245	4.0	1304	4.5	1315	5.1	1333	5.6	1407	6.3	1438	6.9	1456	6.8	
	1844	0.6	1913	0.7	1928	0.7	1946	0.7	2023	0.8	2102	0.8	2133	0.8	
6 W	0056	4.2	0118	4.6	0130	5.3	0148	5.7	0221	6.4	0252	7.0	0311	7.0	**6** W
	0655	0.5	0724	0.6	0738	0.7	0754	0.6	0828	0.6	0906	0.6	0938	0.7	
	1315	4.0	1337	4.5	1345	5.1	1404	5.6	1437	6.2	1506	6.8	1524	6.8	
	1915	0.6	1944	0.7	1959	0.7	2017	0.7	2053	0.8	2133	0.8	2203	0.8	
7 TH	0128	4.1	0152	4.6	0201	5.2	0220	5.7	0253	6.4	0322	7.0	0342	6.9	**7** TH
	0721	0.5	0753	0.7	0804	0.7	0819	0.6	0853	0.7	0933	0.7	1004	0.7	
	1346	3.9	1409	4.4	1416	5.0	1435	5.4	1508	6.1	1536	6.7	1556	6.7	
	1945	0.6	2016	0.8	2029	0.8	2046	0.7	2121	0.8	2201	0.8	2231	0.8	

8 F	0200	4.1	0224	4.5	0232	5.1	0252	5.6	0324	6.2	0354	6.8	0415	6.8	**8** F
	0748	0.6	0823	0.8	0831	0.8	0844	0.7	0918	0.8	0958	0.8	1029	0.8	
	1418	3.9	1439	4.3	1448	4.9	1507	5.3	1539	5.9	1608	6.5	1629	6.5	
	2018	0.6	2049	0.8	2100	0.9	2115	0.8	2147	0.9	2225	0.9	2257	0.9	
9 SA	0235	4.0	0256	4.4	0306	5.0	0325	5.4	0358	6.1	0428	6.7	0450	6.7	**9** SA
	0822	0.7	0856	0.9	0902	0.9	0912	0.9	0944	0.9	1025	0.9	1056	0.9	
	1455	3.7	1510	4.2	1523	4.8	1541	5.2	1613	5.8	1642	6.3	1704	6.3	
	2055	0.7	2127	0.9	2135	0.9	2146	0.9	2215	1.0	2251	1.0	2322	1.0	
10 **SU**	0316	3.9	0336	4.2	0346	4.8	0405	5.3	0436	6.0	0506	6.5	0529	6.5	**10** **SU**
	0903	0.9	0938	1.1	0941	1.1	0948	1.1	1017	1.1	1057	1.1	1128	1.0	
	1538	3.6	1555	4.1	1607	4.6	1624	5.0	1655	5.6	1723	6.1	1744	6.1	
	2142	0.8	2216	1.0	2220	1.1	2227	1.0	2252	1.1	2328	1.1	2356	1.0	
11 M ☽	0405	3.7	0429	4.1	0437	4.7	0454	5.1	0525	5.8	0554	6.3	0617	6.3	**11** M ☽
	0959	1.1	1034	1.2	1034	1.3	1039	1.3	1103	1.3	1141	1.3	1209	1.2	
	1634	3.5	1654	4.0	1705	4.4	1720	4.8	1750	5.4	1816	5.9	1837	5.9	
	2251	0.9	2325	1.1	2325	1.2	2329	1.2	2347	1.2					
12 TU	0509	3.6	0538	4.0	0545	4.5	0559	4.9	0629	5.6	0018	1.2	0044	1.2	**12** TU
	1125	1.2	1154	1.4	1152	1.5	1157	1.5	1211	1.6	0656	6.1	0717	6.1	
	1748	3.4	1807	3.9	1820	4.3	1835	4.7	1903	5.3	1244	1.6	1307	1.5	
											1929	5.8	1947	5.7	
13 W	0029	0.9	0056	1.1	0057	1.2	0106	1.2	0119	1.3	0134	1.4	0157	1.4	**13** W
	0630	3.5	0703	4.0	0709	4.5	0721	4.9	0750	5.6	0820	6.1	0841	6.0	
	1302	1.2	1326	1.3	1328	1.5	1341	1.5	1404	1.6	1424	1.7	1449	1.7	
	1913	3.4	1937	4.0	1948	4.4	2002	4.8	2028	5.4	2058	5.9	2118	5.8	
14 TH	0149	0.7	0218	0.9	0226	1.0	0238	1.0	0301	1.1	0326	1.2	0355	1.2	**14** TH
	0758	3.7	0828	4.1	0833	4.7	0843	5.1	0912	5.8	0941	6.4	1004	6.3	
	1413	1.0	1443	1.1	1449	1.3	1502	1.2	1529	1.3	1557	1.4	1623	1.4	
	2031	3.7	2051	4.2	2105	4.7	2119	5.1	2147	5.7	2214	6.3	2238	6.2	
15 F	0253	0.5	0325	0.6	0334	0.7	0349	0.6	0416	0.7	0443	0.8	0511	0.8	**15** F
	0906	3.9	0934	4.4	0941	5.0	0953	5.4	1024	6.1	1050	6.7	1113	6.7	
	1512	0.8	1543	0.9	1553	1.1	1608	1.0	1639	1.0	1707	1.1	1737	1.1	
	2132	3.9	2150	4.5	2205	5.0	2221	5.4	2252	6.1	2319	6.7	2342	6.6	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 SA	0349	0.3	0420	0.4	0431	0.4	0450	0.4	0523	0.4	0551	0.5	0628	0.5	**16** SA
	1001	4.1	1029	4.6	1036	5.2	1050	5.7	1123	6.4	1151	7.0	1213	7.0	
	1603	0.7	1634	0.8	1647	0.9	1707	0.8	1743	0.8	1815	0.9	1852	0.9	
	2223	4.2	2241	4.7	2255	5.3	2313	5.8	2345	6.4					
17 SU	0439	0.1	0509	0.3	0521	0.3	0544	0.2	0622	0.3	0014	7.0	0037	7.0	**17** SU
	1049	4.3	1117	4.7	1124	5.3	1140	5.9	1213	6.6	0657	0.3	0733	0.3	
	1652	0.6	1721	0.7	1737	0.7	1801	0.6	1842	0.7	1243	7.2	1305	7.1	
	2309	4.4	2328	4.9	2340	5.5	2359	6.0			1920	0.8	1954	0.8	
18 M O	0525	0.1	0554	0.3	0608	0.2	0633	0.1	0032	6.7	0104	7.3	0125	7.2	**18** M O
	1135	4.3	1201	4.8	1209	5.4	1225	6.0	0713	0.2	0753	0.3	0825	0.2	
	1740	0.5	1808	0.6	1825	0.6	1853	0.5	1259	6.7	1330	7.3	1352	7.2	
	2354	4.5							1935	0.6	2015	0.6	2046	0.6	
19 TU	0609	0.1	0014	5.0	0024	5.7	0044	6.2	0117	6.9	0149	7.5	0210	7.4	**19** TU
	1219	4.4	0636	0.3	0651	0.2	0718	0.2	0758	0.2	0839	0.3	0911	0.3	
	1827	0.4	1245	4.8	1252	5.4	1310	6.0	1343	6.7	1415	7.3	1436	7.2	
			1855	0.5	1911	0.5	1940	0.4	2022	0.5	2102	0.5	2131	0.5	
20 W	0038	4.6	0102	5.0	0109	5.7	0128	6.3	0201	7.0	0234	7.6	0254	7.5	**20** W
	0651	0.2	0717	0.3	0732	0.3	0758	0.3	0838	0.3	0918	0.4	0950	0.4	
	1304	4.3	1328	4.8	1336	5.4	1354	6.0	1427	6.7	1459	7.3	1519	7.1	
	1912	0.4	1941	0.5	1956	0.4	2024	0.4	2105	0.5	2143	0.5	2212	0.4	
21 TH	0122	4.5	0150	5.0	0154	5.7	0213	6.2	0246	7.0	0318	7.6	0338	7.5	**21** TH
	0732	0.4	0757	0.5	0811	0.5	0834	0.4	0912	0.5	0951	0.5	1024	0.5	
	1348	4.2	1409	4.7	1419	5.3	1438	5.8	1510	6.5	1542	7.1	1601	7.0	
	1957	0.4	2025	0.5	2039	0.5	2104	0.5	2143	0.5	2219	0.6	2248	0.5	
22 F	0207	4.4	0236	4.8	0241	5.5	0259	6.0	0331	6.7	0403	7.4	0421	7.3	**22** F
	0812	0.6	0836	0.7	0848	0.7	0907	0.7	0941	0.7	1018	0.8	1052	0.8	
	1431	4.0	1450	4.5	1501	5.1	1521	5.6	1552	6.2	1624	6.8	1642	6.7	
	2041	0.5	2109	0.6	2120	0.6	2140	0.6	2215	0.7	2250	0.7	2318	0.7	

23	0253	4.2	0322	4.6	0328	5.2	0345	5.7	0417	6.4	0447	7.0	0506	6.9						**23**
	0854	0.8	0916	0.9	0927	1.0	0940	0.9	1011	1.0	1047	1.0	1120	1.0						
SA	1517	3.8	1532	4.4	1546	4.9	1605	5.3	1635	5.9	1706	6.4	1724	6.3						SA
	2128	0.6	2156	0.8	2202	0.8	2217	0.8	2245	0.9	2319	0.9	2348	0.9						
24	0344	3.9	0411	4.3	0419	4.9	0435	5.3	0507	6.0	0534	6.6	0553	6.5						**24**
	0941	1.0	1004	1.2	1011	1.3	1021	1.2	1050	1.3	1124	1.3	1156	1.3						
SU	1607	3.6	1621	4.1	1636	4.6	1654	5.0	1723	5.6	1750	6.1	1809	6.0						**SU**
	2221	0.7	2253	1.0	2252	1.0	2301	1.0	2325	1.1	2356	1.1								
25	0446	3.6	0510	4.1	0517	4.6	0534	5.0	0604	5.6	0628	6.2	0026	1.1						**25**
	1040	1.2	1104	1.4	1108	1.5	1116	1.5	1142	1.5	1213	1.6	0647	6.1						
M	1709	3.5	1725	4.0	1738	4.4	1755	4.7	1822	5.3	1845	5.8	1243	1.6						M
☾	2329	0.9											1903	5.8						☾
26	0559	3.5	0005	1.1	0000	1.2	0005	1.2	0022	1.3	0049	1.4	0120	1.3						**26**
	1153	1.3	0627	3.9	0628	4.4	0644	4.8	0709	5.4	0735	5.9	0753	5.9						
TU	1820	3.4	1227	1.6	1222	1.7	1230	1.7	1253	1.8	1321	1.9	1350	1.8						TU
			1846	3.9	1854	4.3	1910	4.6	1932	5.2	1959	5.7	2014	5.6						
27	0054	0.9	0126	1.1	0125	1.3	0129	1.3	0145	1.4	0212	1.5	0239	1.4						**27**
	0714	3.5	0744	3.9	0747	4.4	0800	4.7	0821	5.4	0849	5.9	0905	5.8						
W	1317	1.3	1351	1.5	1350	1.7	1353	1.7	1417	1.8	1449	1.9	1513	1.8						W
	1935	3.4	1957	3.9	2010	4.3	2025	4.7	2047	5.3	2116	5.8	2132	5.7						
28	0215	0.9	0237	1.1	0243	1.2	0248	1.2	0307	1.3	0335	1.4	0357	1.3						**28**
	0824	3.6	0849	4.0	0856	4.5	0910	4.9	0936	5.5	1001	6.0	1017	5.9						
TH	1429	1.2	1457	1.4	1502	1.5	1508	1.5	1534	1.6	1604	1.6	1628	1.6						TH
	2042	3.5	2057	4.1	2112	4.5	2129	4.9	2158	5.5	2224	6.0	2243	5.9						
29	0315	0.8	0332	0.9	0341	1.1	0353	1.0	0414	1.1	0441	1.2	0502	1.1						**29**
	0919	3.7	0942	4.1	0951	4.7	1006	5.1	1037	5.7	1102	6.3	1122	6.2						
F	1523	1.1	1548	1.2	1556	1.3	1607	1.3	1635	1.3	1705	1.4	1730	1.3						F
	2132	3.7	2148	4.2	2203	4.7	2221	5.1	2253	5.8	2321	6.3	2341	6.2						
30	0356	0.7	0415	0.8	0424	0.9	0439	0.9	0505	1.0	0535	1.0	0558	1.0						**30**
	1002	3.8	1026	4.3	1035	4.8	1052	5.2	1124	5.9	1151	6.5	1212	6.4						
SA	1605	0.9	1630	1.0	1640	1.1	1655	1.1	1725	1.1	1757	1.1	1824	1.1						SA
	2213	3.8	2231	4.3	2246	4.9	2304	5.3	2337	6.0										

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1	0429	0.6	0451	0.8	0501	0.8	0518	0.8	0547	0.9	0007	6.6	0027	6.5	**1**
SU	1039	3.9	1102	4.3	1113	4.9	1130	5.3	1202	6.0	0619	0.9	0645	0.9	**SU**
	1642	0.8	1708	0.9	1720	1.0	1737	0.9	1810	1.0	1232	6.6	1253	6.5	
	2248	3.9	2308	4.4	2323	5.0	2341	5.5			1843	1.0	1911	1.0	
2	0500	0.6	0525	0.7	0536	0.8	0553	0.7	0014	6.1	0047	6.7	0107	6.7	**2**
M	1113	3.9	1133	4.4	1146	5.0	1203	5.4	0625	0.8	0658	0.8	0728	0.8	M
	1717	0.7	1744	0.8	1758	0.9	1816	0.8	1236	6.1	1307	6.7	1327	6.6	
	2322	4.0	2343	4.5	2357	5.1			1850	0.9	1925	0.9	1953	0.9	
3	0531	0.6	0558	0.7	0610	0.8	0014	5.6	0049	6.3	0122	6.9	0141	6.8	**3**
TU	1145	4.0	1204	4.5	1217	5.0	0627	0.7	0659	0.8	0734	0.8	0806	0.8	TU
●	1750	0.6	1819	0.7	1833	0.8	1235	5.5	1308	6.2	1340	6.8	1359	6.7	●
	2356	4.1					1851	0.7	1927	0.8	2003	0.8	2033	0.8	
4	0600	0.6	0017	4.5	0030	5.2	0048	5.7	0122	6.4	0154	7.0	0214	6.9	**4**
W	1218	4.0	0628	0.7	0641	0.8	0658	0.7	0730	0.7	0807	0.8	0839	0.8	W
	1823	0.5	1237	4.5	1249	5.1	1307	5.5	1341	6.2	1411	6.8	1430	6.7	
			1853	0.7	1907	0.7	1926	0.7	2001	0.7	2040	0.7	2109	0.7	
5	0031	4.1	0054	4.6	0105	5.2	0123	5.7	0157	6.4	0227	7.0	0246	6.9	**5**
TH	0628	0.6	0658	0.7	0710	0.8	0726	0.7	0758	0.7	0838	0.8	0910	0.8	TH
	1252	4.0	1313	4.5	1322	5.1	1341	5.5	1415	6.2	1444	6.8	1502	6.7	
	1856	0.5	1927	0.6	1940	0.7	1958	0.6	2034	0.7	2114	0.7	2144	0.7	
6	0106	4.1	0131	4.6	0140	5.2	0158	5.7	0232	6.4	0301	7.0	0321	6.9	**6**
F	0657	0.6	0730	0.7	0740	0.8	0754	0.7	0827	0.7	0908	0.8	0939	0.8	F
	1327	4.0	1348	4.5	1358	5.1	1416	5.5	1450	6.1	1518	6.7	1537	6.6	
	1931	0.5	2002	0.6	2013	0.7	2031	0.6	2106	0.7	2145	0.7	2216	0.7	
7	0142	4.1	0210	4.5	0216	5.2	0235	5.6	0307	6.3	0337	6.9	0357	6.9	**7**
SA	0730	0.7	0804	0.8	0812	0.8	0826	0.8	0859	0.8	0939	0.8	1010	0.8	SA
	1404	3.9	1424	4.4	1434	5.0	1453	5.4	1525	6.0	1553	6.5	1613	6.5	
	2008	0.5	2039	0.7	2048	0.7	2106	0.7	2139	0.7	2214	0.8	2245	0.7	

8	0221	4.0	0249	4.4	0255	5.1	0313	5.5	0345	6.2	0415	6.8	0436	6.8	**8**
SU	0808	0.8	0843	0.9	0849	0.9	0902	0.9	0934	0.9	1013	0.9	1043	0.9	**SU**
	1443	3.8	1502	4.3	1513	4.9	1531	5.2	1603	5.8	1631	6.4	1651	6.3	
	2049	0.6	2122	0.7	2128	0.8	2143	0.7	2213	0.8	2245	0.8	2316	0.8	
9	0305	3.9	0332	4.3	0339	5.0	0356	5.4	0428	6.1	0457	6.7	0518	6.6	**9**
M	0855	0.9	0929	1.0	0934	1.1	0945	1.0	1014	1.1	1053	1.1	1121	1.0	M
	1528	3.7	1547	4.2	1559	4.7	1616	5.1	1646	5.7	1714	6.2	1734	6.2	
	2139	0.6	2213	0.8	2217	0.8	2227	0.8	2254	0.9	2325	0.9	2353	0.8	
10	0355	3.8	0423	4.2	0432	4.8	0447	5.3	0518	6.0	0546	6.5	0608	6.5	**10**
TU	0954	1.0	1025	1.1	1029	1.3	1038	1.2	1103	1.3	1140	1.3	1205	1.2	TU
☽	1623	3.6	1641	4.1	1654	4.6	1710	5.0	1740	5.6	1806	6.1	1827	6.1	☽
	2246	0.7	2317	0.9	2319	0.9	2326	0.9	2348	1.0					
11	0456	3.7	0525	4.1	0534	4.7	0548	5.2	0620	5.8	0015	1.0	0041	1.0	**11**
W	1109	1.1	1135	1.2	1139	1.4	1149	1.4	1211	1.4	0645	6.4	0707	6.3	W
	1729	3.6	1745	4.1	1800	4.6	1817	4.9	1847	5.6	1241	1.5	1305	1.4	
											1912	6.1	1931	6.0	
12	0006	0.7	0032	0.8	0036	0.9	0047	0.9	0108	1.0	0125	1.1	0154	1.1	**12**
TH	0609	3.7	0639	4.1	0646	4.7	0700	5.1	0731	5.8	0800	6.4	0822	6.3	TH
	1229	1.1	1253	1.2	1258	1.4	1313	1.4	1340	1.5	1403	1.5	1432	1.5	
	1843	3.6	1902	4.1	1915	4.6	1932	5.0	2001	5.6	2032	6.2	2051	6.1	
13	0118	0.5	0147	0.7	0153	0.8	0207	0.8	0230	0.9	0256	1.0	0326	0.9	**13**
F	0727	3.8	0757	4.2	0801	4.8	0814	5.2	0844	5.9	0914	6.5	0937	6.4	F
	1340	1.0	1409	1.1	1415	1.3	1429	1.2	1457	1.3	1527	1.4	1555	1.3	
	1957	3.8	2015	4.3	2028	4.8	2045	5.2	2114	5.8	2144	6.4	2206	6.3	
14	0221	0.4	0253	0.6	0300	0.7	0315	0.6	0340	0.7	0409	0.8	0438	0.7	**14**
SA	0836	3.9	0903	4.4	0909	4.9	0923	5.4	0953	6.1	1021	6.7	1044	6.6	SA
	1441	0.9	1512	1.0	1521	1.1	1536	1.0	1607	1.1	1637	1.2	1707	1.1	
	2101	4.0	2117	4.5	2131	5.0	2150	5.5	2220	6.1	2248	6.7	2311	6.6	
15	0318	0.3	0350	0.5	0359	0.5	0417	0.5	0446	0.6	0514	0.6	0549	0.6	**15**
SU	0935	4.0	1000	4.5	1008	5.1	1023	5.6	1056	6.2	1123	6.8	1145	6.8	**SU**
	1538	0.7	1608	0.8	1621	0.9	1639	0.8	1715	0.9	1745	1.0	1822	1.0	
	2156	4.2	2213	4.6	2226	5.2	2246	5.7	2318	6.4	2346	7.0			

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 M	0411	0.3	0440	0.4	0452	0.5	0513	0.4	0548	0.5	0620	0.6	0009	6.9	**16** M
	1026	4.1	1051	4.6	1100	5.2	1116	5.7	1149	6.4	1218	7.0	0659	0.5	
	1631	0.6	1659	0.7	1715	0.7	1738	0.7	1818	0.8	1853	0.8	1240	6.9	
	2245	4.3	2305	4.8	2316	5.4	2336	5.9					1927	0.8	
17 TU O	0500	0.3	0527	0.4	0541	0.4	0605	0.4	0008	6.6	0039	7.2	0101	7.1	**17** TU O
	1114	4.2	1137	4.6	1148	5.3	1204	5.8	0643	0.5	0720	0.6	0756	0.5	
	1723	0.5	1750	0.6	1807	0.6	1833	0.5	1238	6.4	1308	7.0	1330	6.9	
	2332	4.4	2356	4.9					1914	0.6	1952	0.7	2022	0.6	
18 W	0547	0.4	0613	0.5	0004	5.5	0023	6.1	0056	6.7	0128	7.4	0149	7.3	**18** W
	1200	4.2	1222	4.7	0627	0.5	0652	0.4	0732	0.5	0811	0.6	0843	0.5	
	1813	0.4	1841	0.5	1233	5.3	1251	5.8	1324	6.5	1355	7.1	1416	7.0	
					1857	0.5	1924	0.4	2004	0.5	2043	0.5	2111	0.5	
19 TH	0018	4.5	0046	4.9	0052	5.6	0110	6.1	0143	6.8	0215	7.5	0236	7.3	**19** TH
	0632	0.5	0656	0.5	0711	0.6	0735	0.5	0815	0.6	0852	0.7	0926	0.6	
	1246	4.2	1306	4.7	1318	5.3	1336	5.8	1409	6.5	1440	7.1	1501	7.0	
	1902	0.3	1930	0.5	1944	0.4	2011	0.4	2050	0.4	2127	0.5	2154	0.4	
20 F	0105	4.4	0135	4.8	0140	5.5	0157	6.1	0230	6.8	0302	7.4	0321	7.3	**20** F
	0715	0.6	0738	0.6	0753	0.7	0814	0.7	0852	0.7	0927	0.8	1002	0.8	
	1330	4.2	1350	4.6	1402	5.2	1421	5.7	1453	6.4	1525	7.0	1544	6.9	
	1948	0.4	2017	0.5	2029	0.5	2054	0.5	2131	0.5	2206	0.6	2233	0.5	
21 SA	0151	4.3	0222	4.7	0227	5.4	0244	5.9	0317	6.6	0348	7.3	0407	7.1	**21** SA
	0756	0.7	0819	0.8	0832	0.9	0849	0.8	0924	0.9	0958	1.0	1033	0.9	
	1414	4.1	1432	4.5	1445	5.1	1505	5.6	1537	6.2	1608	6.8	1626	6.7	
	2032	0.4	2101	0.6	2111	0.6	2131	0.6	2205	0.7	2239	0.7	2306	0.6	
22 SU	0238	4.1	0307	4.5	0314	5.2	0331	5.7	0404	6.4	0433	7.0	0452	6.9	**22** SU
	0836	0.9	0858	1.0	0911	1.1	0923	1.0	0955	1.1	1029	1.1	1103	1.1	
	1459	3.9	1513	4.4	1529	4.9	1548	5.4	1619	5.9	1649	6.5	1707	6.4	
	2115	0.5	2144	0.7	2151	0.7	2205	0.7	2234	0.8	2308	0.9	2335	0.8	

23	0327	3.9	0353	4.3	0401	4.9	0419	5.4	0451	6.0	0518	6.6	0537	6.5	**23**
M	0918	1.0	0941	1.1	0951	1.2	1001	1.2	1032	1.2	1106	1.3	1138	1.2	M
	1545	3.8	1558	4.3	1615	4.8	1633	5.1	1703	5.7	1730	6.2	1749	6.2	
	2200	0.6	2231	0.8	2233	0.9	2242	0.9	2308	1.0	2341	1.0			
24	0421	3.7	0443	4.1	0452	4.7	0510	5.1	0541	5.7	0605	6.3	0009	1.0	**24**
TU	1006	1.2	1029	1.3	1038	1.4	1047	1.3	1117	1.4	1150	1.5	0625	6.2	TU
☾	1637	3.6	1649	4.1	1706	4.6	1724	4.9	1753	5.5	1816	6.0	1220	1.4	☾
	2253	0.7	2326	1.0	2324	1.0	2330	1.0	2353	1.1			1835	6.0	
25	0521	3.6	0545	3.9	0549	4.5	0607	4.9	0635	5.5	0025	1.2	0053	1.1	**25**
W	1105	1.3	1129	1.5	1134	1.6	1143	1.5	1211	1.6	0659	6.1	0719	6.0	W
	1735	3.5	1755	4.0	1806	4.4	1824	4.8	1851	5.4	1244	1.7	1311	1.6	
	2358	0.8									1914	5.9	1933	5.8	
26	0623	3.5	0032	1.1	0027	1.2	0032	1.1	0052	1.2	0121	1.3	0151	1.2	**26**
TH	1220	1.3	0653	3.9	0653	4.4	0709	4.8	0733	5.4	0802	5.9	0820	5.9	TH
	1836	3.5	1249	1.5	1244	1.7	1253	1.6	1318	1.7	1348	1.8	1416	1.7	
			1905	4.0	1913	4.4	1929	4.8	1954	5.4	2025	5.9	2042	5.8	
27	0106	0.9	0139	1.1	0137	1.2	0143	1.2	0204	1.3	0231	1.4	0302	1.3	**27**
F	0725	3.5	0755	3.9	0759	4.4	0813	4.8	0835	5.4	0906	5.9	0922	5.9	F
	1333	1.3	1405	1.4	1405	1.6	1409	1.6	1434	1.6	1505	1.7	1531	1.6	
	1938	3.5	2006	4.0	2017	4.4	2033	4.8	2059	5.5	2131	6.0	2148	5.9	
28	0208	0.9	0237	1.0	0240	1.2	0248	1.1	0311	1.2	0340	1.3	0406	1.2	**28**
SA	0825	3.6	0849	4.0	0859	4.5	0912	4.9	0938	5.5	1007	6.1	1023	6.0	SA
	1435	1.1	1503	1.3	1510	1.4	1517	1.4	1543	1.5	1615	1.5	1639	1.5	
	2038	3.6	2100	4.1	2114	4.6	2130	5.0	2200	5.6	2230	6.2	2249	6.1	
29	0301	0.8	0326	1.0	0333	1.1	0345	1.0	0409	1.1	0439	1.2	0503	1.1	**29**
SU	0917	3.7	0938	4.1	0949	4.6	1005	5.0	1034	5.7	1102	6.3	1120	6.1	**SU**
	1526	1.0	1552	1.1	1602	1.2	1614	1.2	1642	1.2	1714	1.3	1737	1.2	
	2128	3.7	2150	4.2	2204	4.7	2220	5.2	2252	5.8	2323	6.4	2343	6.3	
30	0346	0.8	0411	0.9	0420	1.0	0435	0.9	0501	1.0	0531	1.1	0556	1.0	**30**
M	1001	3.8	1022	4.2	1034	4.8	1050	5.2	1121	5.9	1151	6.4	1210	6.3	M
	1611	0.8	1637	1.0	1649	1.0	1704	1.0	1734	1.0	1806	1.1	1831	1.0	
	2212	3.9	2234	4.3	2248	4.9	2304	5.3	2338	6.0					
31	0427	0.7	0452	0.8	0503	0.9	0519	0.9	0547	1.0	0009	6.6	0029	6.6	**31**
TU	1041	3.9	1101	4.3	1114	4.9	1130	5.3	1203	6.0	0618	1.0	0646	0.9	TU
	1651	0.7	1719	0.8	1732	0.9	1749	0.8	1821	0.9	1234	6.6	1253	6.5	
	2252	4.0	2315	4.4	2328	5.0	2344	5.5			1853	0.9	1920	0.9	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 W ●	0503	0.7	0530	0.8	0542	0.9	0559	0.8	0019	6.2	0051	6.8	0111	6.7	**1** W ●
	1119	3.9	1138	4.4	1151	5.0	1208	5.4	0628	0.9	0701	1.0	0732	0.9	
	1729	0.6	1759	0.7	1812	0.8	1831	0.7	1243	6.1	1314	6.7	1333	6.6	
	2331	4.0	2354	4.5					1904	0.8	1938	0.8	2006	0.7	
2 TH	0536	0.7	0605	0.8	0006	5.1	0023	5.6	0058	6.3	0130	6.9	0150	6.8	**2** TH
	1157	4.0	1214	4.5	0617	0.9	0634	0.8	0704	0.9	0741	1.0	0813	0.9	
	1806	0.5	1837	0.7	1229	5.1	1246	5.5	1322	6.2	1352	6.7	1411	6.7	
					1849	0.7	1909	0.6	1944	0.7	2021	0.7	2050	0.6	
3 F	0010	4.1	0033	4.5	0045	5.2	0102	5.7	0137	6.4	0208	7.0	0228	6.9	**3** F
	0608	0.7	0638	0.8	0651	0.8	0706	0.8	0737	0.9	0818	0.9	0850	0.9	
	1236	4.1	1253	4.5	1307	5.1	1325	5.6	1401	6.2	1430	6.8	1449	6.7	
	1843	0.5	1914	0.6	1926	0.6	1946	0.6	2022	0.6	2101	0.6	2131	0.6	
4 SA	0050	4.2	0115	4.6	0125	5.2	0142	5.7	0217	6.4	0247	7.0	0307	7.0	**4** SA
	0643	0.7	0714	0.7	0725	0.8	0739	0.8	0811	0.8	0853	0.9	0926	0.9	
	1316	4.1	1332	4.5	1347	5.2	1405	5.6	1440	6.2	1508	6.7	1527	6.7	
	1923	0.4	1953	0.5	2004	0.5	2024	0.5	2100	0.6	2139	0.6	2210	0.5	
5 SU	0131	4.2	0158	4.6	0207	5.3	0224	5.8	0257	6.4	0327	7.1	0347	7.0	**5** SU
	0721	0.7	0753	0.8	0803	0.8	0817	0.8	0850	0.8	0930	0.8	1004	0.8	
	1356	4.0	1412	4.5	1427	5.1	1446	5.5	1519	6.1	1547	6.7	1606	6.6	
	2005	0.4	2034	0.5	2045	0.5	2103	0.5	2139	0.5	2215	0.5	2248	0.5	
6 M	0213	4.2	0242	4.5	0250	5.2	0306	5.7	0339	6.4	0408	7.0	0428	7.0	**6** M
	0804	0.8	0836	0.8	0845	0.9	0900	0.8	0933	0.9	1010	0.9	1043	0.9	
	1438	4.0	1454	4.5	1508	5.0	1527	5.4	1559	6.0	1627	6.6	1646	6.6	
	2049	0.4	2119	0.6	2128	0.5	2146	0.5	2220	0.6	2251	0.6	2324	0.5	
7 TU	0258	4.1	0327	4.5	0335	5.1	0351	5.6	0423	6.3	0452	6.9	0513	6.9	**7** TU
	0852	0.9	0923	0.9	0933	1.0	0946	0.9	1019	1.0	1054	1.0	1125	0.9	
	1523	3.9	1538	4.4	1553	5.0	1611	5.4	1642	6.0	1709	6.5	1729	6.5	
	2139	0.5	2209	0.6	2216	0.6	2231	0.6	2304	0.6	2331	0.6			

8	0347	4.0	0415	4.4	0425	5.0	0440	5.5	0512	6.2	0539	6.8	0002	0.6	**8**
W	0946	1.0	1015	1.0	1025	1.1	1038	1.1	1110	1.1	1142	1.1	0601	6.7	W
	1613	3.9	1627	4.4	1643	4.9	1701	5.3	1732	5.9	1757	6.4	1212	1.1	
	2236	0.5	2304	0.6	2311	0.7	2324	0.7	2353	0.7			1817	6.4	
9	0443	3.9	0510	4.3	0521	4.9	0535	5.4	0608	6.0	0018	0.7	0049	0.7	**9**
TH	1048	1.0	1114	1.1	1123	1.2	1136	1.2	1207	1.3	0633	6.6	0657	6.5	TH
☽	1710	3.8	1723	4.3	1741	4.8	1758	5.2	1829	5.9	1236	1.3	1306	1.2	☽
	2340	0.5									1854	6.4	1915	6.3	
10	0547	3.8	0006	0.7	0013	0.7	0026	0.7	0052	0.8	0116	0.8	0148	0.8	**10**
F	1157	1.1	0613	4.2	0622	4.8	0637	5.3	0710	5.9	0739	6.5	0802	6.4	F
	1815	3.8	1220	1.1	1230	1.3	1245	1.2	1315	1.3	1342	1.4	1413	1.3	
			1830	4.3	1845	4.8	1903	5.2	1935	5.9	2005	6.4	2025	6.3	
11	0046	0.5	0114	0.7	0120	0.7	0135	0.7	0158	0.8	0226	0.9	0257	0.8	**11**
SA	0656	3.8	0725	4.2	0730	4.8	0745	5.2	0816	5.9	0848	6.5	0910	6.4	SA
	1307	1.0	1334	1.1	1342	1.3	1357	1.2	1425	1.3	1456	1.4	1526	1.3	
	1925	3.8	1942	4.3	1954	4.9	2014	5.3	2044	5.9	2116	6.5	2137	6.4	
12	0150	0.5	0221	0.7	0226	0.7	0241	0.7	0304	0.8	0336	0.9	0405	0.8	**12**
SU	0806	3.8	0832	4.2	0839	4.8	0854	5.2	0925	5.9	0954	6.5	1016	6.4	**SU**
	1413	0.9	1444	1.0	1452	1.2	1507	1.1	1537	1.2	1609	1.3	1640	1.2	
	2033	3.9	2049	4.4	2102	5.0	2122	5.4	2152	6.0	2221	6.6	2243	6.5	
13	0250	0.5	0321	0.7	0328	0.7	0345	0.7	0411	0.8	0441	0.8	0514	0.8	**13**
M	0911	3.9	0934	4.3	0943	4.9	1000	5.3	1032	6.0	1058	6.6	1120	6.5	M
	1516	0.8	1546	0.9	1558	1.0	1615	0.9	1650	1.0	1720	1.1	1755	1.0	
	2134	4.1	2152	4.5	2204	5.1	2224	5.6	2256	6.2	2324	6.8	2346	6.7	
14	0348	0.6	0417	0.7	0427	0.7	0446	0.7	0518	0.8	0548	0.8	0627	0.8	**14**
TU	1009	4.0	1031	4.4	1042	5.0	1059	5.4	1131	6.1	1159	6.7	1221	6.6	TU
	1617	0.6	1645	0.8	1700	0.8	1721	0.8	1759	0.8	1833	0.9	1905	0.8	
	2228	4.2	2252	4.6	2301	5.2	2319	5.7	2352	6.4					
15	0443	0.6	0508	0.7	0521	0.7	0543	0.7	0620	0.8	0022	7.0	0043	6.9	**15**
W	1100	4.1	1121	4.5	1134	5.1	1151	5.6	1223	6.2	0654	0.9	0730	0.8	W
O	1713	0.5	1741	0.6	1756	0.6	1820	0.6	1859	0.6	1254	6.8	1315	6.7	O
	2318	4.3	2346	4.7	2354	5.3					1936	0.7	2003	0.6	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 TH	0532	0.6	0556	0.7	0612	0.7	0010	5.9	0044	6.5	0115	7.1	0136	7.0	**16** TH
	1147	4.1	1207	4.6	1222	5.2	0633	0.7	0712	0.8	0750	0.9	0822	0.8	
	1806	0.4	1834	0.5	1849	0.5	1239	5.6	1312	6.3	1342	6.9	1404	6.8	
							1914	0.5	1952	0.5	2029	0.5	2055	0.4	
17 F	0006	4.3	0036	4.7	0043	5.4	0059	5.9	0133	6.6	0204	7.2	0224	7.1	**17** F
	0618	0.7	0641	0.7	0658	0.8	0719	0.7	0759	0.8	0836	0.9	0907	0.8	
	1233	4.2	1251	4.6	1307	5.2	1324	5.7	1357	6.3	1428	6.9	1449	6.8	
	1854	0.3	1922	0.5	1938	0.4	2002	0.4	2040	0.5	2116	0.5	2141	0.4	
18 SA	0052	4.3	0123	4.7	0129	5.4	0145	5.9	0219	6.6	0251	7.3	0311	7.2	**18** SA
	0701	0.7	0723	0.8	0740	0.9	0800	0.8	0839	0.9	0914	1.0	0947	0.9	
	1317	4.2	1333	4.6	1349	5.2	1408	5.7	1440	6.3	1512	6.9	1532	6.8	
	1939	0.3	2006	0.5	2022	0.5	2045	0.4	2122	0.5	2156	0.5	2223	0.4	
19 SU	0137	4.2	0207	4.6	0214	5.3	0231	5.9	0305	6.6	0336	7.2	0355	7.1	**19** SU
	0741	0.8	0802	0.9	0819	0.9	0836	0.9	0914	1.0	0946	1.1	1022	1.0	
	1359	4.1	1414	4.6	1430	5.2	1449	5.6	1522	6.2	1553	6.8	1612	6.7	
	2020	0.4	2046	0.6	2102	0.6	2121	0.5	2157	0.6	2230	0.7	2258	0.6	
20 M	0221	4.1	0249	4.5	0257	5.2	0314	5.7	0349	6.4	0418	7.0	0437	6.9	**20** M
	0817	0.9	0839	1.0	0855	1.0	0908	1.0	0944	1.1	1017	1.1	1051	1.1	
	1439	4.1	1453	4.5	1510	5.1	1529	5.5	1602	6.1	1632	6.7	1650	6.6	
	2057	0.5	2123	0.7	2135	0.7	2150	0.6	2224	0.7	2256	0.8	2325	0.7	
21 TU	0305	4.0	0329	4.4	0339	5.0	0357	5.5	0430	6.1	0458	6.7	0517	6.6	**21** TU
	0853	1.0	0916	1.1	0930	1.1	0942	1.1	1016	1.1	1051	1.2	1122	1.2	
	1519	4.0	1532	4.4	1549	5.0	1609	5.4	1640	5.9	1707	6.5	1727	6.4	
	2133	0.6	2200	0.8	2208	0.8	2219	0.7	2250	0.8	2323	0.8	2351	0.8	
22 W	0350	3.8	0409	4.2	0421	4.8	0439	5.2	0512	5.9	0536	6.4	0557	6.4	**22** W
	0930	1.1	0956	1.2	1008	1.2	1019	1.2	1053	1.2	1128	1.3	1157	1.2	
	1602	3.8	1612	4.3	1631	4.8	1650	5.2	1720	5.8	1744	6.3	1805	6.3	
	2212	0.7	2240	0.9	2245	0.9	2254	0.8	2324	0.9	2357	0.9			

23	0438	3.7	0452	4.1	0505	4.6	0524	5.0	0554	5.7	0617	6.2	0024	0.9	**23**
TH	1015	1.2	1041	1.3	1051	1.4	1102	1.3	1135	1.4	1209	1.4	0638	6.2	TH
☾	1650	3.7	1658	4.2	1717	4.6	1736	5.0	1806	5.6	1827	6.1	1236	1.4	☾
	2259	0.8	2328	1.0	2330	1.0	2338	1.0					1848	6.1	
24	0530	3.5	0544	3.9	0554	4.4	0613	4.8	0005	1.1	0037	1.1	0103	1.0	**24**
F	1111	1.3	1134	1.4	1143	1.5	1153	1.5	0642	5.5	0705	6.0	0726	6.0	F
	1743	3.6	1753	4.0	1810	4.5	1830	4.9	1224	1.5	1256	1.6	1322	1.5	
									1859	5.5	1923	6.0	1944	5.9	
25	0000	0.9	0027	1.1	0026	1.2	0032	1.2	0056	1.2	0126	1.3	0151	1.2	**25**
SA	0624	3.5	0651	3.8	0650	4.3	0709	4.7	0736	5.4	0804	5.9	0824	5.8	SA
	1228	1.3	1245	1.5	1248	1.6	1258	1.6	1323	1.7	1353	1.7	1418	1.7	
	1841	3.5	1903	3.9	1912	4.4	1932	4.8	2001	5.4	2031	5.9	2052	5.8	
26	0108	1.0	0137	1.2	0135	1.3	0143	1.3	0200	1.4	0225	1.4	0255	1.4	**26**
SU	0723	3.5	0755	3.9	0756	4.3	0811	4.7	0836	5.3	0907	5.8	0926	5.8	**SU**
	1342	1.2	1410	1.4	1412	1.5	1420	1.5	1440	1.6	1507	1.7	1537	1.7	
	1943	3.5	2009	4.0	2020	4.4	2036	4.8	2105	5.5	2137	6.0	2157	5.9	
27	0210	1.0	0239	1.2	0244	1.3	0255	1.3	0313	1.4	0335	1.5	0409	1.4	**27**
M	0824	3.5	0853	4.0	0900	4.4	0913	4.8	0940	5.5	1010	6.0	1027	5.9	M
	1444	1.1	1513	1.3	1522	1.3	1532	1.3	1556	1.4	1627	1.5	1651	1.4	
	2044	3.6	2108	4.1	2121	4.5	2136	5.0	2207	5.6	2237	6.2	2258	6.1	
28	0307	1.0	0334	1.1	0343	1.2	0356	1.2	0418	1.3	0444	1.3	0512	1.2	**28**
TU	0921	3.7	0945	4.1	0956	4.6	1010	5.0	1041	5.7	1109	6.2	1128	6.1	TU
	1538	0.9	1606	1.1	1617	1.1	1632	1.1	1659	1.2	1729	1.2	1752	1.1	
	2138	3.7	2202	4.2	2214	4.7	2229	5.2	2303	5.8	2333	6.4	2354	6.4	
29	0357	0.9	0422	1.0	0434	1.1	0450	1.1	0514	1.2	0542	1.2	0608	1.1	**29**
W	1011	3.8	1033	4.3	1045	4.8	1101	5.2	1134	5.9	1203	6.4	1222	6.4	W
	1626	0.8	1654	0.9	1707	0.9	1724	0.9	1754	0.9	1824	1.0	1849	0.9	
	2226	3.9	2250	4.3	2302	4.9	2318	5.4	2352	6.0					
30	0440	0.9	0506	1.0	0519	1.0	0537	1.0	0604	1.1	0023	6.7	0044	6.6	**30**
TH	1056	3.9	1116	4.4	1130	4.9	1146	5.4	1221	6.0	0633	1.1	0702	1.0	TH
	1710	0.6	1739	0.8	1752	0.7	1811	0.7	1844	0.8	1251	6.6	1311	6.6	
	2311	4.0	2334	4.4	2346	5.0					1916	0.8	1943	0.7	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1	0519	0.8	0546	0.9	0600	0.9	0002	5.5	0038	6.2	0109	6.9	0130	6.8	**1**
F	1139	4.0	1156	4.5	1212	5.1	0617	0.9	0648	1.0	0721	1.1	0753	1.0	F
●	1751	0.5	1821	0.7	1835	0.6	1230	5.5	1305	6.2	1336	6.8	1356	6.7	●
	2354	4.1					1854	0.6	1931	0.7	2005	0.6	2034	0.6	
2	0555	0.8	0017	4.6	0029	5.2	0046	5.7	0121	6.4	0153	7.0	0213	7.0	**2**
SA	1222	4.1	0624	0.8	0637	0.9	0655	0.9	0728	1.0	0807	1.0	0841	1.0	SA
	1832	0.4	1236	4.6	1254	5.2	1312	5.6	1348	6.3	1418	6.8	1438	6.8	
			1902	0.5	1916	0.5	1937	0.5	2015	0.5	2052	0.5	2122	0.4	
3	0036	4.3	0101	4.7	0113	5.3	0129	5.9	0204	6.5	0235	7.2	0256	7.1	**3**
SU	0633	0.7	0703	0.8	0716	0.8	0733	0.8	0808	0.9	0851	0.9	0927	0.9	**SU**
	1304	4.2	1317	4.7	1335	5.3	1355	5.7	1429	6.3	1500	6.9	1519	6.9	
	1914	0.3	1944	0.4	1958	0.4	2019	0.3	2057	0.4	2136	0.4	2208	0.3	
4	0120	4.3	0146	4.7	0156	5.4	0212	5.9	0247	6.6	0318	7.3	0338	7.2	**4**
M	0714	0.7	0744	0.7	0758	0.8	0814	0.7	0851	0.8	0933	0.8	1011	0.8	M
	1347	4.2	1359	4.7	1417	5.3	1436	5.8	1510	6.4	1540	6.9	1559	6.9	
	1957	0.3	2026	0.4	2040	0.3	2101	0.3	2139	0.3	2218	0.3	2250	0.2	
5	0203	4.3	0232	4.7	0240	5.4	0256	5.9	0330	6.6	0400	7.3	0420	7.2	**5**
TU	0757	0.7	0827	0.7	0841	0.8	0858	0.7	0936	0.8	1016	0.8	1052	0.7	TU
	1428	4.2	1442	4.7	1458	5.3	1518	5.7	1550	6.4	1619	6.9	1638	6.9	
	2041	0.3	2110	0.4	2123	0.3	2144	0.3	2221	0.3	2258	0.3	2329	0.2	
6	0248	4.2	0317	4.6	0325	5.3	0340	5.8	0414	6.5	0443	7.1	0503	7.1	**6**
W	0842	0.8	0911	0.8	0926	0.9	0944	0.8	1021	0.9	1058	0.9	1132	0.8	W
	1511	4.2	1524	4.7	1541	5.2	1600	5.7	1632	6.3	1659	6.9	1719	6.8	
	2126	0.3	2155	0.4	2207	0.4	2226	0.4	2302	0.4	2336	0.4			
7	0334	4.1	0401	4.5	0411	5.2	0426	5.7	0459	6.3	0527	7.0	0006	0.3	**7**
TH	0930	0.9	0958	0.9	1013	1.0	1029	0.9	1106	1.0	1140	1.0	0549	6.9	TH
	1556	4.1	1609	4.6	1626	5.2	1644	5.6	1716	6.2	1742	6.8	1213	0.9	
	2216	0.4	2243	0.5	2254	0.5	2310	0.5	2343	0.5			1803	6.7	

8	0425	4.0	0449	4.4	0501	5.0	0516	5.5	0549	6.1	0013	0.5	0044	0.5	**8**
F	1025	1.0	1049	1.0	1104	1.1	1119	1.1	1154	1.1	0615	6.7	0639	6.6	F
☽	1646	4.0	1700	4.5	1717	5.1	1735	5.5	1807	6.1	1226	1.2	1257	1.1	☽
	2312	0.5	2336	0.7	2346	0.7					1832	6.6	1854	6.6	
9	0523	3.8	0545	4.2	0557	4.8	0000	0.7	0029	0.7	0058	0.7	0129	0.7	**9**
SA	1127	1.0	1148	1.1	1202	1.2	0612	5.3	0644	5.9	0713	6.5	0737	6.4	SA
	1746	3.9	1801	4.4	1817	4.9	1218	1.2	1249	1.3	1319	1.3	1350	1.3	
							1835	5.3	1907	6.0	1936	6.5	1956	6.4	
10	0015	0.6	0040	0.8	0047	0.8	0102	0.8	0125	0.9	0155	0.9	0226	0.9	**10**
SU	0628	3.7	0653	4.1	0701	4.7	0717	5.1	0748	5.8	0820	6.3	0842	6.3	**SU**
	1238	1.0	1303	1.2	1313	1.3	1328	1.2	1355	1.3	1427	1.4	1457	1.4	
	1857	3.8	1914	4.3	1926	4.8	1946	5.2	2017	5.9	2049	6.4	2108	6.4	
11	0121	0.7	0151	0.9	0155	1.0	0209	0.9	0231	1.0	0304	1.1	0333	1.0	**11**
M	0741	3.7	0805	4.1	0813	4.6	0829	5.0	0859	5.7	0928	6.2	0949	6.2	M
	1351	1.0	1421	1.2	1429	1.2	1443	1.2	1510	1.3	1542	1.4	1612	1.3	
	2013	3.8	2029	4.3	2041	4.8	2100	5.2	2130	5.9	2159	6.4	2220	6.4	
12	0229	0.8	0259	1.0	0305	1.0	0319	1.0	0342	1.1	0415	1.2	0444	1.1	**12**
TU	0855	3.7	0915	4.2	0926	4.7	0943	5.1	1013	5.7	1038	6.3	1100	6.2	TU
	1504	0.9	1533	1.0	1544	1.1	1559	1.1	1632	1.2	1700	1.2	1732	1.1	
	2121	3.9	2143	4.4	2152	4.9	2210	5.3	2242	6.0	2309	6.5	2330	6.5	
13	0335	0.9	0402	1.0	0413	1.1	0428	1.0	0500	1.1	0529	1.2	0603	1.1	**13**
W	0959	3.9	1019	4.3	1032	4.8	1049	5.2	1120	5.9	1148	6.4	1209	6.3	W
	1613	0.7	1641	0.9	1654	0.9	1713	0.8	1748	0.9	1822	1.0	1849	0.9	
	2220	4.1	2248	4.5	2256	5.1	2312	5.5	2345	6.2					
14	0434	0.9	0458	0.9	0512	1.0	0531	1.0	0606	1.0	0015	6.8	0035	6.7	**14**
TH	1052	4.0	1114	4.4	1128	5.0	1145	5.4	1216	6.0	0641	1.1	0711	1.0	TH
	1712	0.5	1740	0.7	1753	0.7	1815	0.6	1850	0.7	1247	6.6	1307	6.5	
	2311	4.2	2342	4.6	2350	5.2					1926	0.7	1950	0.6	
15	0523	0.8	0546	0.9	0603	1.0	0005	5.7	0038	6.4	0110	7.0	0130	6.9	**15**
F	1139	4.1	1159	4.5	1215	5.1	0623	0.9	0700	1.0	0737	1.0	0806	0.9	F
O	1801	0.4	1829	0.6	1844	0.5	1232	5.6	1304	6.2	1336	6.8	1356	6.7	O
	2357	4.2					1906	0.5	1942	0.5	2018	0.5	2042	0.4	

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TIME ZONE UT(GMT)

	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 SA	0606	0.8	0028	4.6	0036	5.3	0051	5.8	0125	6.5	0157	7.1	0218	7.0	**16** SA
	1222	4.2	0627	0.9	0647	0.9	0708	0.9	0747	1.0	0824	1.0	0852	0.9	
	1845	0.3	1239	4.6	1256	5.2	1314	5.7	1347	6.3	1418	6.9	1439	6.8	
			1911	0.5	1928	0.5	1951	0.4	2028	0.5	2104	0.5	2128	0.4	
17 SU	0040	4.2	0111	4.6	0117	5.3	0134	5.8	0208	6.5	0240	7.2	0301	7.1	**17** SU
	0644	0.8	0705	0.9	0726	0.9	0747	0.9	0827	1.0	0903	1.0	0934	0.9	
	1302	4.2	1316	4.7	1333	5.2	1352	5.7	1426	6.3	1458	6.9	1519	6.9	
	1924	0.4	1949	0.5	2008	0.5	2030	0.4	2107	0.5	2142	0.5	2209	0.4	
18 M	0121	4.2	0149	4.6	0156	5.3	0214	5.8	0249	6.5	0320	7.1	0341	7.0	**18** M
	0721	0.8	0741	0.9	0802	1.0	0821	0.9	0901	1.0	0934	1.1	1009	1.0	
	1339	4.2	1353	4.7	1409	5.3	1429	5.7	1503	6.3	1535	6.9	1554	6.9	
	1958	0.4	2022	0.6	2041	0.6	2101	0.5	2138	0.6	2212	0.6	2242	0.5	
19 TU	0200	4.1	0225	4.5	0234	5.2	0252	5.7	0327	6.4	0357	7.0	0417	6.9	**19** TU
	0754	0.9	0815	0.9	0834	1.0	0851	0.9	0930	1.0	1002	1.1	1038	1.0	
	1414	4.2	1428	4.7	1445	5.2	1505	5.7	1538	6.3	1608	6.8	1627	6.8	
	2029	0.5	2053	0.6	2109	0.6	2125	0.6	2202	0.6	2234	0.7	2306	0.6	
20 W	0237	4.0	0258	4.4	0310	5.0	0329	5.6	0402	6.2	0431	6.8	0450	6.7	**20** W
	0825	0.9	0849	1.0	0905	1.0	0920	1.0	0958	1.0	1032	1.1	1104	1.0	
	1448	4.1	1503	4.6	1520	5.1	1539	5.6	1611	6.2	1640	6.7	1659	6.7	
	2058	0.5	2124	0.7	2136	0.7	2150	0.6	2225	0.7	2257	0.7	2327	0.7	
21 TH	0314	3.9	0331	4.3	0346	4.9	0404	5.4	0435	6.0	0502	6.6	0522	6.5	**21** TH
	0856	0.9	0923	1.1	0938	1.1	0952	1.0	1028	1.1	1104	1.1	1132	1.1	
	1524	4.0	1537	4.5	1555	5.0	1613	5.4	1643	6.0	1711	6.6	1731	6.5	
	2128	0.6	2157	0.8	2206	0.8	2219	0.8	2252	0.8	2326	0.8	2352	0.8	
22 F	0352	3.7	0405	4.2	0421	4.7	0439	5.1	0509	5.8	0534	6.3	0554	6.3	**22** F
	0932	1.0	1001	1.2	1015	1.2	1027	1.2	1101	1.2	1138	1.3	1204	1.2	
	1603	3.8	1615	4.4	1633	4.8	1650	5.2	1719	5.8	1745	6.4	1805	6.3	
	2203	0.8	2234	1.0	2241	1.0	2251	0.9	2322	1.0	2357	1.0			

23	0433	3.6	0444	4.0	0500	4.5	0518	4.9	0547	5.6	0610	6.1	0020	1.0	**23**
SA	1016	1.1	1044	1.3	1056	1.4	1106	1.3	1138	1.4	1213	1.5	0629	6.0	SA
☾	1649	3.7	1658	4.2	1716	4.6	1734	5.0	1802	5.6	1826	6.1	1238	1.4	☾
	2249	1.0	2320	1.2	2323	1.2	2329	1.2	2357	1.2			1845	6.0	
24	0524	3.5	0531	3.9	0547	4.3	0605	4.7	0634	5.3	0031	1.3	0053	1.2	**24**
SU	1114	1.3	1139	1.5	1148	1.5	1156	1.5	1225	1.6	0654	5.9	0714	5.8	**SU**
	1745	3.5	1751	4.0	1810	4.4	1829	4.8	1858	5.4	1256	1.7	1319	1.6	
	2357	1.1									1920	5.9	1937	5.8	
25	0625	3.4	0021	1.4	0021	1.4	0021	1.4	0046	1.5	0116	1.5	0136	1.4	**25**
M	1241	1.3	0636	3.8	0647	4.2	0706	4.6	0734	5.2	0757	5.7	0818	5.6	M
	1852	3.4	1257	1.5	1302	1.6	1310	1.7	1330	1.8	1355	1.9	1416	1.8	
			1902	3.9	1918	4.3	1938	4.7	2007	5.3	2036	5.7	2057	5.7	
26	0121	1.2	0143	1.4	0145	1.5	0148	1.6	0200	1.7	0223	1.7	0242	1.6	**26**
TU	0732	3.4	0801	3.8	0805	4.2	0819	4.6	0845	5.2	0916	5.7	0937	5.6	TU
	1401	1.2	1427	1.4	1436	1.5	1446	1.5	1504	1.7	1528	1.8	1559	1.7	
	2002	3.5	2022	3.9	2036	4.4	2051	4.8	2120	5.4	2151	5.9	2214	5.8	
27	0231	1.2	0256	1.3	0305	1.4	0318	1.5	0332	1.6	0353	1.7	0425	1.6	**27**
W	0842	3.5	0909	4.0	0919	4.4	0931	4.8	1001	5.4	1027	5.9	1049	5.9	W
	1505	1.0	1533	1.2	1546	1.2	1559	1.2	1625	1.4	1653	1.4	1715	1.3	
	2108	3.6	2130	4.1	2143	4.6	2156	5.0	2229	5.6	2257	6.2	2320	6.2	
28	0330	1.1	0354	1.2	0407	1.3	0423	1.3	0445	1.4	0509	1.4	0534	1.3	**28**
TH	0944	3.7	1006	4.2	1018	4.7	1033	5.1	1106	5.7	1132	6.3	1154	6.2	TH
	1601	0.8	1629	1.0	1642	0.9	1659	0.9	1728	1.0	1756	1.0	1819	0.9	
	2204	3.8	2227	4.3	2239	4.8	2253	5.3	2327	6.0	2356	6.6			
29	0419	1.0	0444	1.1	0457	1.1	0516	1.1	0544	1.2	0610	1.2	0018	6.5	**29**
F	1034	3.9	1054	4.4	1109	4.9	1125	5.3	1159	6.0	1228	6.6	0636	1.1	F
	1649	0.6	1718	0.8	1732	0.7	1751	0.7	1825	0.7	1854	0.8	1249	6.5	
	2252	4.0	2316	4.5	2328	5.0	2342	5.6					1921	0.7	
30	0501	0.9	0528	0.9	0542	1.0	0602	1.0	0017	6.2	0048	6.9	0109	6.8	**30**
SA	1120	4.1	1137	4.6	1154	5.1	1211	5.6	0635	1.1	0705	1.1	0737	1.0	SA
●	1733	0.5	1803	0.6	1818	0.5	1839	0.5	1246	6.2	1317	6.8	1337	6.8	●
	2336	4.2							1916	0.6	1949	0.5	2019	0.5	
31	0540	0.8	0001	4.7	0012	5.2	0028	5.8	0103	6.5	0135	7.1	0156	7.1	**31**
SU	1203	4.2	0608	0.8	0623	0.9	0644	0.9	0722	1.0	0758	1.0	0833	0.9	**SU**
	1816	0.3	1219	4.7	1237	5.3	1255	5.7	1329	6.4	1401	7.0	1422	6.9	
			1846	0.5	1901	0.4	1924	0.3	2004	0.4	2040	0.4	2110	0.3	

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TIME ZONE UT(GMT)

	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 M	0020	4.4	0045	4.8	0056	5.4	0112	6.0	0147	6.7	0219	7.3	0240	7.3	**1** M
	0619	0.7	0648	0.7	0705	0.8	0727	0.8	0807	0.9	0847	0.9	0922	0.8	
	1246	4.4	1300	4.8	1318	5.4	1337	5.9	1411	6.5	1442	7.1	1503	7.1	
	1858	0.2	1928	0.4	1944	0.2	2008	0.2	2048	0.3	2127	0.2	2157	0.1	
2 TU	0104	4.5	0130	4.9	0140	5.5	0156	6.1	0230	6.8	0302	7.4	0323	7.4	**2** TU
	0700	0.6	0730	0.7	0747	0.7	0809	0.7	0851	0.8	0933	0.8	1007	0.7	
	1328	4.5	1342	4.9	1359	5.5	1418	6.0	1451	6.6	1523	7.2	1543	7.2	
	1941	0.2	2010	0.3	2026	0.2	2050	0.1	2129	0.2	2209	0.1	2240	0.0	
3 W	0147	4.5	0215	4.8	0223	5.5	0239	6.1	0313	6.8	0344	7.4	0405	7.3	**3** W
	0742	0.7	0812	0.7	0830	0.7	0852	0.7	0933	0.7	1014	0.7	1048	0.6	
	1409	4.5	1424	4.9	1439	5.5	1459	6.0	1531	6.7	1602	7.2	1622	7.2	
	2022	0.2	2051	0.3	2106	0.2	2130	0.2	2208	0.2	2248	0.1	2318	0.0	
4 TH	0230	4.4	0258	4.8	0306	5.4	0322	6.0	0355	6.6	0426	7.3	0446	7.2	**4** TH
	0825	0.7	0854	0.8	0913	0.8	0934	0.7	1014	0.8	1053	0.8	1125	0.7	
	1451	4.4	1506	4.9	1520	5.5	1539	6.0	1612	6.6	1641	7.2	1701	7.1	
	2104	0.3	2131	0.4	2146	0.3	2208	0.3	2245	0.3	2323	0.3	2352	0.2	
5 F	0315	4.2	0340	4.6	0350	5.2	0406	5.7	0439	6.4	0507	7.0	0529	6.9	**5** F
	0910	0.8	0937	0.9	0956	0.9	1015	0.8	1054	0.9	1131	0.9	1201	0.8	
	1533	4.3	1549	4.8	1604	5.3	1622	5.8	1654	6.4	1722	7.0	1743	6.9	
	2149	0.4	2214	0.6	2228	0.5	2246	0.5	2321	0.6	2356	0.5			
6 SA ☽	0402	4.0	0422	4.4	0436	5.0	0452	5.5	0524	6.1	0552	6.7	0024	0.5	**6** SA ☽
	1001	0.9	1024	1.0	1042	1.0	1059	1.0	1135	1.1	1209	1.1	0614	6.6	
	1621	4.1	1637	4.6	1652	5.2	1709	5.6	1741	6.2	1808	6.8	1239	1.0	
	2241	0.6	2303	0.8	2315	0.8	2330	0.8					1829	6.7	
7 SU	0456	3.8	0514	4.2	0529	4.8	0545	5.2	0000	0.8	0032	0.8	0101	0.8	**7** SU
	1100	1.0	1121	1.1	1138	1.2	1153	1.2	0615	5.8	0643	6.4	0707	6.3	
	1720	3.9	1738	4.4	1751	4.9	1808	5.3	1224	1.3	1255	1.3	1325	1.2	
	2344	0.8							1839	6.0	1906	6.5	1928	6.4	

8	0602	3.6	0008	1.0	0016	1.1	0029	1.1	0053	1.1	0123	1.2	0152	1.1	**8**
M	1212	1.0	0623	4.1	0633	4.5	0650	4.9	0719	5.6	0749	6.1	0810	6.0	M
	1837	3.8	1239	1.3	1250	1.3	1303	1.3	1329	1.4	1358	1.5	1427	1.4	
			1855	4.2	1905	4.7	1923	5.1	1953	5.7	2023	6.3	2041	6.2	
9	0057	1.0	0128	1.2	0131	1.3	0143	1.3	0203	1.4	0236	1.5	0303	1.4	**9**
TU	0721	3.5	0744	4.0	0753	4.5	0809	4.8	0835	5.4	0904	6.0	0923	5.9	TU
	1335	1.0	1407	1.2	1414	1.3	1425	1.3	1448	1.4	1520	1.5	1547	1.4	
	2000	3.7	2020	4.2	2029	4.7	2046	5.1	2114	5.7	2141	6.2	2201	6.1	
10	0215	1.1	0245	1.3	0252	1.4	0302	1.3	0323	1.5	0355	1.5	0421	1.4	**10**
W	0844	3.6	0903	4.1	0914	4.5	0931	4.9	1000	5.5	1024	6.0	1045	6.0	W
	1503	0.9	1531	1.1	1540	1.1	1553	1.1	1624	1.3	1650	1.3	1716	1.2	
	2114	3.9	2142	4.3	2149	4.8	2204	5.2	2234	5.9	2301	6.4	2320	6.3	
11	0331	1.1	0355	1.2	0407	1.3	0420	1.3	0452	1.4	0520	1.4	0548	1.3	**11**
TH	0950	3.8	1012	4.3	1024	4.8	1042	5.2	1112	5.8	1140	6.3	1159	6.2	TH
	1615	0.7	1643	0.9	1653	0.9	1711	0.9	1743	0.9	1815	0.9	1839	0.9	
	2214	4.0	2247	4.5	2252	5.0	2308	5.5	2339	6.1					
12	0428	1.0	0452	1.1	0506	1.2	0522	1.1	0556	1.2	0009	6.7	0027	6.6	**12**
F	1043	4.0	1106	4.5	1118	5.0	1136	5.4	1207	6.0	0629	1.2	0656	1.1	F
	1707	0.5	1736	0.7	1748	0.7	1807	0.6	1841	0.7	1238	6.6	1257	6.6	
	2303	4.1	2336	4.6	2342	5.2	2358	5.7			1914	0.6	1937	0.5	
13	0512	0.9	0535	1.0	0552	1.1	0611	1.0	0030	6.3	0101	7.0	0121	6.9	**13**
SA	1126	4.1	1149	4.6	1202	5.1	1220	5.6	0647	1.1	0722	1.0	0749	0.9	SA
O	1750	0.4	1818	0.6	1832	0.6	1853	0.5	1253	6.2	1323	6.8	1343	6.8	O
	2344	4.2							1928	0.5	2002	0.5	2026	0.4	
14	0549	0.9	0017	4.6	0023	5.3	0039	5.8	0113	6.4	0144	7.1	0205	7.0	**14**
SU	1205	4.2	0610	1.0	0630	1.0	0652	0.9	0730	1.0	0806	1.0	0834	0.9	**SU**
	1826	0.4	1224	4.7	1239	5.2	1257	5.7	1330	6.3	1402	6.9	1423	6.9	
			1852	0.6	1909	0.5	1932	0.4	2008	0.5	2043	0.5	2108	0.4	
15	0022	4.2	0053	4.6	0059	5.3	0116	5.8	0151	6.5	0222	7.1	0244	7.0	**15**
M	0623	0.8	0644	0.9	0706	0.9	0728	0.9	0808	1.0	0843	1.0	0914	0.9	M
	1240	4.2	1255	4.7	1312	5.3	1331	5.8	1405	6.4	1437	7.0	1458	6.9	
	1857	0.4	1921	0.6	1941	0.5	2004	0.5	2041	0.5	2116	0.6	2144	0.5	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 TU	0058	4.2	0123	4.6	0133	5.2	0150	5.8	0225	6.4	0257	7.1	0319	7.0	**16** TU
	0656	0.8	0717	0.9	0739	0.9	0759	0.9	0840	1.0	0913	1.0	0948	1.0	
	1313	4.3	1326	4.8	1343	5.3	1403	5.8	1437	6.4	1509	7.0	1529	7.0	
	1927	0.4	1950	0.6	2009	0.6	2030	0.5	2108	0.6	2141	0.6	2213	0.6	
17 W	0132	4.1	0153	4.6	0205	5.2	0224	5.7	0258	6.4	0328	7.0	0349	6.9	**17** W
	0728	0.8	0750	0.9	0810	1.0	0828	0.9	0909	1.0	0940	1.0	1016	1.0	
	1344	4.2	1359	4.7	1415	5.3	1435	5.8	1508	6.4	1539	7.0	1559	6.9	
	1955	0.5	2018	0.6	2034	0.7	2052	0.6	2130	0.6	2201	0.6	2236	0.6	
18 TH	0205	4.1	0223	4.5	0237	5.1	0256	5.6	0328	6.3	0358	6.9	0417	6.8	**18** TH
	0757	0.8	0822	0.9	0839	1.0	0857	0.9	0935	1.0	1009	1.0	1040	1.0	
	1415	4.2	1432	4.7	1447	5.2	1506	5.7	1538	6.3	1608	6.9	1627	6.9	
	2020	0.6	2047	0.7	2100	0.7	2117	0.7	2153	0.7	2225	0.7	2255	0.7	
19 F	0236	3.9	0254	4.4	0308	5.0	0326	5.4	0357	6.1	0426	6.7	0444	6.6	**19** F
	0825	0.9	0853	1.0	0910	1.1	0926	1.0	1003	1.1	1039	1.1	1107	1.0	
	1446	4.1	1505	4.6	1519	5.1	1537	5.5	1608	6.2	1637	6.7	1657	6.7	
	2045	0.7	2116	0.9	2127	0.9	2142	0.8	2216	0.9	2252	0.8	2318	0.8	
20 SA	0307	3.8	0326	4.3	0339	4.8	0356	5.2	0426	5.9	0454	6.5	0513	6.4	**20** SA
	0858	0.9	0926	1.1	0941	1.2	0956	1.1	1030	1.2	1108	1.2	1134	1.2	
	1520	3.9	1539	4.4	1552	4.9	1609	5.3	1638	5.9	1708	6.5	1728	6.4	
	2114	0.8	2147	1.0	2156	1.1	2207	1.0	2238	1.1	2315	1.1	2341	1.0	
21 SU ☾	0340	3.7	0400	4.2	0413	4.6	0428	5.0	0457	5.7	0525	6.2	0545	6.1	**21** SU ☾
	0936	1.0	1003	1.2	1016	1.3	1028	1.3	1058	1.4	1132	1.4	1200	1.3	
	1558	3.8	1618	4.2	1630	4.7	1646	5.1	1714	5.7	1743	6.2	1804	6.2	
	2151	1.0	2226	1.2	2228	1.3	2236	1.2	2304	1.3	2337	1.3			
22 M	0423	3.5	0442	4.0	0455	4.4	0509	4.8	0536	5.4	0603	5.9	0007	1.2	**22** M
	1023	1.2	1051	1.4	1058	1.5	1108	1.5	1133	1.6	1202	1.6	0623	5.9	
	1646	3.6	1707	4.0	1718	4.4	1733	4.8	1801	5.4	1828	6.0	1231	1.5	
	2243	1.2	2320	1.5	2315	1.5	2320	1.5	2343	1.6			1847	5.9	

23 TU	0522	3.4	0537	3.8	0551	4.2	0605	4.6	0632	5.2	0013	1.5	0042	1.4	**23** TU
	1135	1.3	1200	1.5	1203	1.6	1209	1.6	1230	1.7	0654	5.7	0713	5.6	
	1752	3.4	1811	3.9	1824	4.3	1840	4.6	1907	5.2	1252	1.8	1317	1.7	
											1931	5.7	1947	5.7	
24 W	0018	1.4	0041	1.6	0036	1.7	0031	1.7	0049	1.8	0113	1.8	0136	1.7	**24** W
	0639	3.3	0656	3.8	0709	4.1	0723	4.5	0749	5.1	0814	5.5	0831	5.4	
	1317	1.3	1338	1.5	1344	1.6	1353	1.7	1404	1.8	1417	1.9	1435	1.8	
	1919	3.4	1937	3.9	1949	4.2	2005	4.6	2031	5.2	2101	5.7	2122	5.6	
25 TH	0155	1.3	0215	1.5	0222	1.7	0231	1.7	0241	1.9	0257	2.0	0323	1.9	**25** TH
	0802	3.4	0829	3.9	0840	4.3	0850	4.7	0917	5.2	0943	5.7	1008	5.6	
	1431	1.0	1459	1.3	1512	1.3	1524	1.4	1547	1.5	1615	1.6	1638	1.5	
	2038	3.6	2100	4.1	2112	4.5	2122	4.9	2152	5.5	2219	6.1	2244	6.0	
26 F	0300	1.2	0326	1.3	0338	1.4	0352	1.4	0412	1.6	0437	1.6	0459	1.5	**26** F
	0913	3.7	0936	4.2	0949	4.6	1002	5.0	1034	5.6	1058	6.1	1122	6.1	
	1531	0.8	1601	1.0	1614	1.0	1630	1.0	1659	1.1	1725	1.1	1748	1.0	
	2139	3.9	2204	4.4	2214	4.8	2226	5.3	2259	5.9	2326	6.5	2349	6.5	
27 SA	0353	1.0	0420	1.1	0433	1.2	0450	1.2	0519	1.2	0543	1.3	0608	1.2	**27** SA
	1008	3.9	1030	4.4	1043	4.9	1059	5.3	1132	6.0	1159	6.6	1222	6.5	
	1623	0.6	1654	0.7	1707	0.7	1726	0.7	1800	0.7	1828	0.7	1857	0.7	
	2229	4.1	2256	4.6	2305	5.1	2319	5.6	2353	6.3					
28 **SU**	0437	0.8	0506	0.9	0519	1.0	0540	1.0	0615	1.0	0022	7.0	0044	6.9	**28** **SU**
	1055	4.1	1114	4.6	1130	5.2	1147	5.6	1220	6.3	0643	1.1	0716	1.0	
	1709	0.4	1740	0.5	1754	0.5	1816	0.4	1855	0.4	1250	6.9	1312	6.9	
	2314	4.3	2341	4.8	2351	5.3					1927	0.4	1959	0.4	
29 M ●	0518	0.7	0548	0.8	0603	0.8	0005	5.9	0040	6.6	0111	7.2	0133	7.2	**29** M ●
	1139	4.3	1155	4.8	1212	5.4	0626	0.8	0706	0.9	0741	0.9	0816	0.9	
	1753	0.2	1824	0.4	1839	0.3	1230	5.9	1304	6.5	1335	7.1	1357	7.1	
	2358	4.5					1903	0.3	1943	0.3	2021	0.3	2051	0.2	
30 TU	0600	0.7	0024	4.9	0034	5.5	0050	6.1	0124	6.8	0156	7.4	0218	7.4	**30** TU
	1221	4.5	0629	0.7	0646	0.7	0711	0.7	0754	0.8	0834	0.8	0906	0.8	
	1836	0.1	1237	5.0	1253	5.5	1312	6.1	1345	6.7	1417	7.3	1439	7.3	
			1905	0.3	1921	0.2	1947	0.1	2028	0.2	2108	0.1	2138	0.1	
31 W	0041	4.5	0108	4.9	0116	5.6	0133	6.2	0207	6.9	0239	7.5	0301	7.4	**31** W
	0641	0.6	0710	0.7	0729	0.7	0756	0.7	0839	0.7	0920	0.7	0952	0.7	
	1303	4.6	1319	5.1	1333	5.7	1353	6.2	1426	6.9	1458	7.5	1519	7.4	
	1916	0.1	1945	0.3	2002	0.2	2028	0.1	2109	0.1	2150	0.1	2220	0.0	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1	0125	4.5	0152	4.9	0159	5.6	0216	6.2	0249	6.9	0321	7.5	0343	7.4	**1**
TH	0723	0.6	0752	0.7	0812	0.6	0838	0.6	0921	0.7	1001	0.6	1033	0.6	TH
	1345	4.6	1402	5.1	1414	5.7	1434	6.2	1507	6.9	1538	7.5	1559	7.4	
	1957	0.2	2024	0.3	2041	0.2	2107	0.2	2147	0.2	2227	0.2	2257	0.1	
2	0208	4.4	0233	4.8	0241	5.4	0259	6.0	0332	6.7	0403	7.3	0424	7.2	**2**
F	0806	0.6	0834	0.7	0854	0.7	0919	0.7	1000	0.7	1039	0.7	1110	0.6	F
	1426	4.6	1445	5.0	1455	5.6	1515	6.1	1548	6.8	1619	7.4	1638	7.3	
	2036	0.4	2103	0.5	2119	0.4	2143	0.4	2220	0.4	2300	0.4	2329	0.4	
3	0251	4.2	0313	4.6	0324	5.2	0341	5.8	0413	6.4	0444	7.0	0504	6.9	**3**
SA	0850	0.7	0916	0.8	0936	0.8	0958	0.8	1037	0.9	1115	0.8	1143	0.8	SA
	1509	4.4	1529	4.9	1539	5.4	1558	5.9	1630	6.6	1700	7.1	1720	7.0	
	2119	0.6	2143	0.7	2158	0.7	2218	0.7	2252	0.7	2330	0.7	2358	0.7	
4	0337	4.0	0355	4.4	0409	5.0	0426	5.4	0457	6.1	0526	6.6	0547	6.5	**4**
SU	0939	0.8	1002	0.9	1021	1.0	1040	1.0	1115	1.0	1149	1.1	1217	1.0	**SU**
☽	1558	4.2	1619	4.6	1629	5.2	1646	5.6	1717	6.2	1746	6.8	1807	6.7	☽
	2211	0.8	2232	1.0	2244	1.0	2259	1.0	2329	1.1					
5	0430	3.7	0446	4.2	0501	4.7	0517	5.1	0546	5.7	0003	1.1	0031	1.0	**5**
M	1038	0.9	1101	1.1	1116	1.1	1131	1.2	1201	1.3	0614	6.2	0636	6.2	M
	1659	3.9	1721	4.4	1730	4.8	1746	5.2	1817	5.9	1231	1.3	1259	1.2	
	2317	1.1	2340	1.3	2347	1.4	2359	1.4			1842	6.4	1903	6.4	
6	0537	3.5	0556	4.0	0608	4.4	0624	4.8	0023	1.4	0052	1.5	0120	1.4	**6**
TU	1153	1.0	1223	1.3	1230	1.3	1242	1.3	0651	5.4	0718	5.9	0738	5.9	TU
	1821	3.7	1842	4.1	1849	4.6	1906	5.0	1305	1.4	1333	1.5	1359	1.5	
									1933	5.6	2000	6.1	2018	6.1	
7	0036	1.3	0107	1.5	0110	1.6	0119	1.6	0139	1.7	0210	1.8	0234	1.7	**7**
W	0702	3.4	0724	3.9	0734	4.3	0750	4.7	0813	5.3	0840	5.8	0858	5.7	W
	1326	1.0	1356	1.3	1402	1.3	1411	1.3	1431	1.5	1500	1.6	1524	1.5	
	1949	3.7	2015	4.1	2019	4.6	2034	5.0	2100	5.6	2124	6.1	2143	6.0	

8	0203	1.3	0233	1.5	0239	1.6	0246	1.6	0308	1.7	0337	1.8	0359	1.7	**8**
TH	0828	3.6	0847	4.1	0858	4.5	0916	4.9	0944	5.4	1006	5.9	1026	5.8	TH
	1457	0.9	1526	1.1	1533	1.1	1547	1.1	1616	1.3	1638	1.3	1700	1.3	
	2104	3.9	2135	4.3	2139	4.8	2154	5.2	2223	5.8	2248	6.4	2306	6.3	
9	0319	1.2	0345	1.3	0354	1.4	0407	1.4	0437	1.5	0503	1.5	0528	1.4	**9**
F	0934	3.8	0955	4.3	1006	4.8	1025	5.2	1055	5.8	1122	6.3	1141	6.2	F
	1603	0.7	1632	0.8	1641	0.9	1659	0.8	1730	0.9	1757	0.9	1822	0.8	
	2201	4.0	2234	4.5	2238	5.1	2254	5.5	2325	6.2	2353	6.8			
10	0412	1.1	0439	1.2	0449	1.2	0506	1.2	0537	1.2	0607	1.2	0011	6.7	**10**
SA	1024	4.0	1048	4.5	1058	5.0	1117	5.5	1149	6.1	1217	6.7	0634	1.1	SA
	1650	0.5	1719	0.7	1729	0.7	1749	0.6	1822	0.7	1851	0.6	1237	6.6	
	2246	4.1	2320	4.6	2324	5.2	2341	5.7					1916	0.6	
11	0452	1.0	0517	1.1	0531	1.1	0551	1.1	0013	6.4	0041	7.0	0102	6.9	**11**
SU	1105	4.1	1128	4.6	1139	5.1	1158	5.6	0624	1.1	0656	1.0	0725	1.0	**SU**
	1727	0.5	1755	0.7	1807	0.6	1829	0.6	1231	6.2	1301	6.9	1321	6.8	
	2324	4.2	2357	4.6					1902	0.6	1934	0.6	2000	0.5	
12	0526	0.9	0549	1.0	0001	5.2	0018	5.7	0052	6.4	0122	7.1	0143	7.0	**12**
M	1140	4.2	1159	4.7	0606	1.0	0628	1.0	0705	1.0	0739	1.0	0808	0.9	M
O	1757	0.5	1822	0.6	1213	5.2	1232	5.7	1306	6.3	1337	6.9	1358	6.9	O
	2358	4.2			1837	0.6	1901	0.6	1936	0.6	2010	0.6	2038	0.5	
13	0558	0.8	0025	4.6	0034	5.2	0052	5.7	0126	6.4	0157	7.0	0219	6.9	**13**
TU	1211	4.2	0620	0.9	0640	0.9	0702	0.9	0741	1.0	0815	1.0	0846	0.9	TU
	1825	0.5	1227	4.7	1243	5.3	1303	5.8	1337	6.4	1409	7.0	1430	6.9	
			1847	0.6	1905	0.6	1928	0.6	2005	0.6	2039	0.7	2110	0.6	
14	0030	4.2	0051	4.6	0104	5.2	0122	5.7	0156	6.4	0228	7.0	0250	6.9	**14**
W	0629	0.7	0652	0.8	0713	0.9	0733	0.9	0814	0.9	0846	0.9	0919	0.9	W
	1242	4.3	1257	4.8	1313	5.4	1332	5.8	1406	6.5	1438	7.1	1459	7.0	
	1852	0.5	1915	0.6	1932	0.7	1952	0.6	2031	0.6	2102	0.7	2137	0.7	
15	0101	4.2	0118	4.6	0133	5.2	0151	5.7	0224	6.4	0256	7.0	0316	6.9	**15**
TH	0701	0.7	0725	0.8	0744	0.9	0803	0.8	0843	0.9	0914	0.9	0948	0.9	TH
	1311	4.3	1330	4.8	1344	5.3	1403	5.8	1436	6.5	1507	7.1	1527	7.0	
	1918	0.6	1943	0.7	1958	0.7	2016	0.7	2054	0.7	2125	0.7	2159	0.7	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 F	0131	4.1	0149	4.6	0202	5.2	0220	5.6	0253	6.3	0323	6.9	0342	6.8	**16** F
	0730	0.7	0756	0.8	0813	0.9	0832	0.9	0911	0.9	0944	0.9	1014	0.9	
	1342	4.2	1403	4.7	1414	5.3	1433	5.7	1506	6.4	1536	7.0	1556	7.0	
	1942	0.6	2011	0.8	2024	0.8	2041	0.7	2117	0.8	2151	0.7	2220	0.8	
17 SA	0200	4.0	0220	4.5	0231	5.0	0249	5.5	0322	6.2	0350	6.8	0409	6.7	**17** SA
	0758	0.8	0826	0.9	0843	1.0	0900	0.9	0937	1.0	1013	1.0	1041	1.0	
	1413	4.1	1436	4.6	1445	5.1	1504	5.6	1536	6.3	1605	6.9	1626	6.8	
	2006	0.8	2038	0.9	2050	1.0	2105	0.9	2139	0.9	2216	0.9	2244	0.9	
18 SU	0229	3.9	0251	4.4	0302	4.9	0318	5.3	0350	6.0	0419	6.6	0439	6.5	**18** SU
	0829	0.8	0857	1.0	0912	1.1	0928	1.1	1002	1.2	1038	1.2	1106	1.1	
	1445	4.0	1508	4.4	1517	5.0	1535	5.4	1606	6.1	1636	6.6	1657	6.6	
	2034	0.9	2108	1.1	2116	1.1	2127	1.1	2158	1.1	2236	1.1	2306	1.0	
19 M	0302	3.8	0322	4.2	0334	4.7	0349	5.1	0420	5.8	0449	6.3	0510	6.3	**19** M
	0903	0.9	0932	1.1	0942	1.2	0956	1.2	1024	1.3	1058	1.3	1129	1.2	
	1521	3.8	1544	4.3	1552	4.8	1609	5.2	1640	5.8	1711	6.4	1732	6.3	
	2109	1.0	2144	1.3	2147	1.3	2155	1.3	2221	1.3	2258	1.3	2331	1.2	
20 TU ☾	0341	3.6	0401	4.1	0413	4.5	0426	4.9	0456	5.5	0525	6.1	0546	6.0	**20** TU ☾
	0946	1.0	1016	1.3	1021	1.3	1031	1.3	1054	1.4	1125	1.4	1156	1.3	
	1606	3.7	1632	4.1	1638	4.5	1654	5.0	1723	5.6	1753	6.1	1815	6.1	
	2157	1.2	2235	1.5	2231	1.5	2237	1.5	2300	1.5	2335	1.5			
21 W	0433	3.5	0456	3.9	0506	4.3	0518	4.7	0547	5.3	0614	5.8	0005	1.3	**21** W
	1048	1.2	1121	1.4	1120	1.5	1127	1.5	1144	1.6	1211	1.6	0632	5.7	
	1706	3.5	1736	3.9	1742	4.3	1755	4.8	1824	5.4	1850	5.9	1238	1.4	
	2314	1.4	2353	1.6	2344	1.7	2345	1.8					1909	5.8	
22 TH	0548	3.3	0608	3.8	0621	4.2	0633	4.6	0000	1.8	0030	1.8	0056	1.6	**22** TH
	1232	1.2	1255	1.4	1256	1.5	1301	1.6	0659	5.1	0722	5.6	0737	5.5	
	1830	3.4	1859	3.9	1907	4.3	1920	4.7	1311	1.7	1320	1.8	1342	1.6	
									1947	5.3	2014	5.8	2031	5.7	

23 F	0112	1.4	0131	1.6	0132	1.8	0139	1.8	0153	1.9	0200	2.0	0217	1.9	**23** F
	0719	3.4	0743	3.9	0755	4.3	0806	4.6	0830	5.2	0858	5.7	0918	5.6	
	1355	1.0	1422	1.2	1434	1.3	1445	1.3	1505	1.5	1531	1.6	1557	1.5	
	2003	3.6	2027	4.1	2035	4.5	2045	5.0	2113	5.6	2140	6.1	2205	6.0	
24 SA	0225	1.2	0252	1.4	0300	1.5	0313	1.5	0333	1.7	0400	1.7	0423	1.7	**24** SA
	0837	3.6	0900	4.2	0913	4.6	0924	5.0	0954	5.6	1017	6.1	1043	6.0	
	1458	0.7	1529	0.9	1541	0.9	1556	0.9	1624	1.0	1650	1.1	1713	1.0	
	2109	3.9	2136	4.4	2143	4.9	2154	5.3	2226	6.0	2251	6.6	2315	6.5	
25 **SU**	0320	1.0	0350	1.1	0401	1.2	0417	1.2	0445	1.3	0511	1.3	0534	1.3	**25** **SU**
	0936	3.9	0957	4.5	1011	4.9	1026	5.4	1058	6.0	1122	6.6	1147	6.5	
	1552	0.5	1624	0.6	1636	0.6	1655	0.6	1728	0.6	1754	0.7	1823	0.7	
	2202	4.2	2229	4.7	2237	5.2	2250	5.7	2324	6.4	2351	7.0			
26 M	0408	0.8	0439	0.9	0451	1.0	0511	1.0	0546	1.0	0613	1.0	0013	7.0	**26** M
	1025	4.2	1045	4.7	1059	5.2	1116	5.7	1149	6.4	1217	7.0	0645	1.0	
	1640	0.3	1712	0.5	1724	0.4	1747	0.4	1824	0.4	1857	0.4	1240	6.9	
	2248	4.4	2315	4.8	2323	5.4	2338	6.0					1930	0.4	
27 TU ●	0452	0.7	0523	0.8	0537	0.8	0601	0.8	0013	6.7	0042	7.3	0104	7.2	**27** TU ●
	1110	4.4	1127	4.9	1142	5.4	1200	6.0	0641	0.9	0715	0.9	0750	0.9	
	1725	0.2	1756	0.4	1809	0.3	1835	0.2	1234	6.6	1305	7.3	1327	7.2	
	2332	4.5	2358	4.9					1915	0.3	1953	0.3	2025	0.2	
28 W	0536	0.6	0606	0.7	0006	5.5	0023	6.1	0058	6.8	0129	7.5	0151	7.4	**28** W
	1153	4.6	1209	5.0	0622	0.7	0649	0.7	0733	0.8	0811	0.8	0843	0.8	
	1808	0.2	1837	0.3	1224	5.6	1243	6.2	1317	6.9	1349	7.5	1411	7.4	
					1852	0.2	1920	0.2	2001	0.2	2042	0.2	2112	0.2	
29 TH	0016	4.5	0040	5.0	0049	5.6	0107	6.2	0141	6.9	0213	7.5	0235	7.4	**29** TH
	0620	0.5	0649	0.6	0707	0.6	0736	0.6	0820	0.7	0900	0.7	0930	0.6	
	1236	4.7	1254	5.1	1305	5.7	1326	6.3	1359	7.0	1431	7.6	1453	7.5	
	1849	0.2	1917	0.3	1933	0.2	2002	0.2	2043	0.3	2124	0.2	2155	0.2	
30 F	0100	4.5	0123	4.9	0132	5.5	0151	6.2	0224	6.8	0256	7.5	0318	7.3	**30** F
	0704	0.5	0733	0.6	0752	0.6	0820	0.6	0903	0.6	0942	0.6	1012	0.6	
	1319	4.7	1340	5.1	1348	5.7	1409	6.3	1442	7.0	1514	7.6	1535	7.5	
	1930	0.3	1957	0.4	2013	0.4	2040	0.4	2120	0.4	2200	0.4	2231	0.4	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 SA	0144	4.4	0205	4.8	0215	5.4	0234	6.0	0307	6.7	0339	7.3	0359	7.2	**1** SA
	0748	0.5	0816	0.6	0835	0.6	0902	0.6	0943	0.7	1021	0.6	1050	0.6	
	1403	4.6	1427	5.0	1432	5.6	1452	6.2	1525	6.9	1557	7.5	1617	7.4	
	2010	0.5	2036	0.6	2051	0.6	2115	0.6	2153	0.6	2232	0.6	2302	0.6	
2 SU	0228	4.2	0246	4.7	0258	5.2	0317	5.7	0349	6.4	0421	7.0	0441	6.8	**2** SU
	0834	0.6	0900	0.7	0917	0.7	0942	0.7	1020	0.8	1056	0.8	1124	0.7	
	1448	4.4	1514	4.8	1519	5.4	1538	5.9	1610	6.6	1641	7.2	1700	7.1	
	2054	0.8	2117	0.9	2131	0.9	2150	0.9	2224	1.0	2301	1.0	2330	0.9	
3 M	0314	4.0	0330	4.5	0343	5.0	0402	5.4	0433	6.0	0504	6.6	0523	6.5	**3** M
	0923	0.7	0948	0.9	1003	0.9	1022	0.9	1056	1.0	1130	1.0	1156	0.9	
	1538	4.1	1605	4.6	1610	5.1	1628	5.6	1659	6.2	1728	6.8	1748	6.7	
	2146	1.0	2206	1.2	2218	1.2	2232	1.2	2302	1.3	2335	1.3			
4 TU ☽	0406	3.7	0421	4.2	0435	4.7	0453	5.1	0521	5.7	0550	6.2	0003	1.2	**4** TU ☽
	1021	0.8	1048	1.1	1057	1.1	1112	1.1	1140	1.2	1209	1.2	0610	6.1	
	1641	3.8	1706	4.3	1712	4.8	1729	5.2	1759	5.8	1824	6.4	1235	1.2	
	2250	1.3	2313	1.5	2320	1.5	2330	1.5	2356	1.6			1844	6.3	
5 W	0513	3.5	0530	4.0	0542	4.4	0559	4.8	0625	5.4	0024	1.7	0051	1.6	**5** W
	1135	0.9	1207	1.2	1211	1.2	1222	1.3	1242	1.4	0650	5.9	0709	5.8	
	1803	3.6	1828	4.1	1830	4.5	1848	4.9	1913	5.5	1309	1.5	1333	1.4	
											1938	6.1	1957	6.0	
6 TH	0009	1.4	0042	1.6	0043	1.7	0050	1.7	0112	1.8	0141	1.9	0204	1.8	**6** TH
	0635	3.4	0658	3.9	0707	4.3	0725	4.7	0745	5.2	0811	5.7	0828	5.7	
	1307	1.0	1337	1.2	1341	1.3	1350	1.3	1408	1.5	1436	1.6	1458	1.5	
	1927	3.7	1956	4.1	1958	4.6	2013	4.9	2035	5.5	2100	6.0	2117	6.0	
7 F	0135	1.4	0209	1.6	0213	1.7	0217	1.7	0240	1.8	0309	1.9	0331	1.8	**7** F
	0758	3.5	0817	4.1	0829	4.5	0847	4.8	0912	5.4	0935	5.9	0954	5.8	
	1433	0.8	1500	1.0	1507	1.1	1521	1.2	1544	1.3	1604	1.3	1626	1.3	
	2040	3.8	2110	4.3	2114	4.8	2128	5.2	2157	5.8	2220	6.3	2237	6.2	

8	0251	1.3	0319	1.4	0326	1.5	0337	1.5	0403	1.6	0428	1.6	0453	1.5	**8**
SA	0905	3.8	0923	4.3	0935	4.7	0954	5.1	1025	5.7	1049	6.2	1108	6.1	SA
	1536	0.7	1603	0.9	1611	0.9	1630	0.9	1657	1.0	1719	1.0	1746	1.0	
	2136	4.0	2207	4.5	2210	5.0	2227	5.4	2258	6.1	2324	6.7	2343	6.5	
9	0345	1.1	0411	1.2	0419	1.3	0436	1.3	0505	1.3	0531	1.3	0600	1.2	**9**
SU	0955	3.9	1015	4.4	1026	4.9	1045	5.4	1118	6.0	1145	6.6	1205	6.5	**SU**
	1621	0.6	1647	0.8	1656	0.8	1717	0.8	1746	0.8	1812	0.8	1841	0.8	
	2219	4.1	2252	4.5	2255	5.1	2312	5.6	2345	6.3					
10	0425	1.0	0450	1.1	0501	1.1	0521	1.1	0552	1.1	0012	6.9	0033	6.8	**10**
M	1035	4.0	1056	4.5	1107	5.1	1127	5.5	1200	6.2	0621	1.1	0651	1.1	M
	1655	0.6	1719	0.7	1729	0.8	1753	0.7	1824	0.8	1229	6.8	1250	6.7	
	2256	4.1	2326	4.6	2331	5.1	2350	5.6			1852	0.7	1922	0.7	
11	0458	0.9	0523	1.0	0537	1.0	0558	1.0	0023	6.3	0053	6.9	0114	6.8	**11**
TU	1109	4.1	1127	4.6	1141	5.2	1201	5.6	0633	1.0	0704	1.0	0734	1.0	TU
	1723	0.6	1746	0.7	1759	0.7	1822	0.7	1235	6.3	1306	6.9	1326	6.8	
	2329	4.1	2352	4.6					1855	0.8	1927	0.7	1957	0.7	
12	0531	0.8	0556	0.9	0003	5.2	0021	5.7	0055	6.3	0126	6.9	0148	6.8	**12**
W	1139	4.2	1157	4.7	0612	0.9	0633	0.9	0710	0.9	0742	0.9	0813	0.9	W
O	1750	0.6	1814	0.7	1212	5.2	1231	5.7	1305	6.4	1337	7.0	1359	6.9	O
					1828	0.7	1848	0.7	1925	0.7	1957	0.8	2029	0.8	
13	0000	4.2	0016	4.6	0032	5.2	0050	5.7	0124	6.3	0156	6.9	0217	6.8	**13**
TH	0603	0.7	0629	0.8	0646	0.8	0706	0.8	0745	0.9	0816	0.9	0847	0.9	TH
	1210	4.2	1228	4.7	1243	5.3	1301	5.8	1335	6.5	1407	7.1	1428	7.0	
	1817	0.6	1843	0.7	1857	0.7	1916	0.7	1952	0.8	2024	0.8	2057	0.8	
14	0030	4.2	0046	4.7	0100	5.2	0119	5.7	0152	6.4	0223	7.0	0243	6.9	**14**
F	0635	0.7	0701	0.8	0718	0.8	0737	0.8	0816	0.9	0848	0.8	0919	0.8	F
	1241	4.2	1302	4.7	1313	5.3	1332	5.8	1406	6.5	1436	7.1	1457	7.0	
	1844	0.6	1911	0.7	1925	0.8	1942	0.8	2017	0.8	2051	0.8	2122	0.8	
15	0100	4.1	0118	4.6	0130	5.2	0148	5.7	0222	6.3	0251	6.9	0310	6.8	**15**
SA	0705	0.7	0733	0.8	0748	0.8	0807	0.8	0845	0.9	0919	0.8	0949	0.8	SA
	1313	4.2	1337	4.7	1345	5.3	1404	5.7	1437	6.4	1507	7.1	1527	7.0	
	1908	0.7	1939	0.8	1951	0.9	2007	0.8	2041	0.9	2118	0.8	2147	0.8	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16	0130	4.1	0151	4.6	0201	5.1	0218	5.6	0252	6.2	0320	6.8	0340	6.8	**16**
SU	0735	0.7	0803	0.8	0818	0.9	0837	0.9	0913	0.9	0948	0.9	1016	0.9	**SU**
	1345	4.1	1411	4.6	1417	5.1	1436	5.6	1509	6.3	1538	6.9	1559	6.9	
	1934	0.8	2008	0.9	2017	1.0	2031	1.0	2105	1.0	2143	1.0	2212	0.9	
17	0201	4.0	0222	4.4	0233	5.0	0249	5.4	0323	6.0	0351	6.6	0411	6.6	**17**
M	0806	0.7	0836	0.9	0848	1.0	0906	1.0	0939	1.0	1013	1.0	1042	1.0	M
	1419	4.0	1445	4.4	1450	5.0	1509	5.5	1542	6.1	1612	6.7	1633	6.7	
	2004	0.9	2040	1.1	2047	1.1	2058	1.1	2129	1.1	2207	1.1	2239	1.0	
18	0235	3.9	0252	4.3	0306	4.8	0322	5.2	0354	5.9	0424	6.4	0444	6.4	**18**
TU	0841	0.8	0912	1.0	0920	1.0	0935	1.1	1003	1.1	1036	1.1	1106	1.1	TU
	1457	3.9	1522	4.3	1528	4.8	1546	5.3	1618	6.0	1648	6.6	1710	6.5	
	2042	1.0	2118	1.2	2122	1.2	2130	1.3	2158	1.3	2237	1.2	2308	1.1	
19	0314	3.7	0332	4.2	0345	4.6	0400	5.1	0431	5.7	0501	6.2	0520	6.1	**19**
W	0924	0.9	0957	1.1	1001	1.2	1011	1.2	1035	1.2	1107	1.2	1136	1.1	W
	1542	3.8	1610	4.1	1614	4.7	1631	5.1	1702	5.8	1731	6.4	1753	6.3	
	2132	1.2	2209	1.4	2209	1.4	2214	1.5	2238	1.5	2316	1.4	2345	1.3	
20	0405	3.6	0426	4.0	0437	4.5	0450	4.9	0520	5.5	0548	6.0	0607	5.9	**20**
TH	1023	1.0	1057	1.2	1057	1.3	1103	1.3	1122	1.4	1151	1.3	1217	1.2	TH
☾	1640	3.6	1711	4.0	1715	4.5	1729	5.0	1759	5.6	1826	6.2	1847	6.1	☾
	2243	1.4	2320	1.5	2317	1.6	2320	1.7	2336	1.7					
21	0512	3.5	0533	3.9	0546	4.3	0558	4.7	0626	5.3	0009	1.7	0034	1.5	**21**
F	1153	1.0	1219	1.2	1220	1.3	1226	1.4	1236	1.5	0650	5.8	0708	5.7	F
	1754	3.6	1826	4.0	1832	4.5	1845	4.9	1915	5.5	1253	1.5	1317	1.4	
											1941	6.1	1959	6.0	
22	0024	1.4	0048	1.5	0049	1.7	0058	1.8	0115	1.8	0127	1.9	0149	1.8	**22**
SA	0635	3.5	0656	4.0	0709	4.4	0722	4.8	0749	5.3	0817	5.8	0833	5.7	SA
	1317	0.8	1343	1.1	1353	1.1	1404	1.2	1425	1.3	1443	1.4	1512	1.4	
	1921	3.7	1952	4.2	1955	4.6	2007	5.1	2036	5.7	2105	6.3	2128	6.2	

23	0144	1.2	0212	1.4	0217	1.5	0230	1.5	0253	1.6	0319	1.7	0345	1.7	**23**
SU	0756	3.7	0818	4.2	0830	4.6	0843	5.0	0911	5.6	0938	6.2	1002	6.1	**SU**
	1422	0.6	1453	0.8	1503	0.9	1517	0.9	1543	1.0	1610	1.0	1635	1.0	
	2033	3.9	2101	4.4	2106	4.9	2118	5.4	2149	6.0	2215	6.6	2239	6.6	
24	0244	1.0	0316	1.1	0324	1.2	0339	1.2	0407	1.3	0435	1.4	0500	1.3	**24**
M	0900	3.9	0919	4.4	0933	4.9	0948	5.4	1019	6.0	1044	6.6	1109	6.5	M
	1518	0.4	1550	0.6	1600	0.6	1618	0.6	1648	0.6	1715	0.7	1743	0.7	
	2130	4.2	2158	4.6	2204	5.2	2218	5.7	2251	6.3	2317	7.0	2340	6.9	
25	0337	0.8	0409	0.9	0420	1.0	0438	1.0	0513	1.0	0540	1.1	0611	1.1	**25**
TU	0953	4.2	1011	4.7	1025	5.2	1043	5.7	1115	6.4	1142	7.0	1206	6.9	TU
	1608	0.3	1640	0.5	1651	0.4	1713	0.4	1748	0.5	1817	0.5	1854	0.5	
	2220	4.3	2246	4.8	2254	5.3	2310	5.9	2344	6.6					
26	0426	0.7	0457	0.8	0511	0.8	0533	0.8	0614	0.9	0012	7.2	0034	7.1	**26**
W	1041	4.4	1058	4.9	1111	5.4	1131	6.0	1204	6.7	0645	0.9	0720	0.9	W
●	1656	0.3	1726	0.4	1738	0.3	1804	0.3	1843	0.4	1234	7.3	1257	7.2	●
	2307	4.4	2330	4.9	2339	5.4	2357	6.0			1919	0.4	1954	0.4	
27	0514	0.6	0543	0.7	0600	0.6	0626	0.7	0031	6.7	0102	7.3	0124	7.2	**27**
TH	1127	4.6	1144	5.0	1156	5.6	1216	6.2	0709	0.7	0746	0.8	0817	0.7	TH
	1741	0.3	1809	0.4	1823	0.3	1852	0.3	1250	6.9	1322	7.5	1344	7.4	
	2352	4.5							1932	0.4	2011	0.4	2044	0.4	
28	0602	0.5	0013	4.9	0024	5.5	0042	6.1	0117	6.8	0148	7.4	0210	7.3	**28**
F	1212	4.7	0630	0.6	0647	0.5	0716	0.6	0800	0.6	0838	0.6	0907	0.6	F
	1825	0.3	1233	5.1	1241	5.7	1302	6.3	1335	7.0	1407	7.6	1429	7.5	
			1851	0.5	1906	0.4	1935	0.4	2017	0.5	2056	0.5	2128	0.5	
29	0038	4.5	0057	4.9	0108	5.5	0128	6.1	0202	6.8	0234	7.4	0255	7.2	**29**
SA	0649	0.4	0717	0.5	0734	0.5	0803	0.5	0846	0.6	0923	0.5	0952	0.5	SA
	1258	4.7	1323	5.1	1328	5.7	1348	6.3	1421	7.0	1453	7.6	1514	7.5	
	1908	0.5	1933	0.6	1948	0.5	2015	0.6	2056	0.6	2134	0.6	2206	0.6	
30	0123	4.4	0141	4.8	0153	5.4	0213	6.0	0246	6.6	0318	7.2	0338	7.1	**30**
SU	0736	0.4	0804	0.6	0819	0.5	0847	0.5	0928	0.6	1004	0.6	1032	0.5	**SU**
	1343	4.5	1412	5.0	1415	5.6	1434	6.2	1508	6.9	1539	7.5	1559	7.4	
	1951	0.7	2015	0.8	2029	0.7	2052	0.8	2130	0.8	2206	0.9	2239	0.8	
31	0208	4.2	0225	4.7	0238	5.2	0258	5.7	0330	6.4	0403	6.9	0421	6.8	**31**
M	0823	0.5	0851	0.6	0904	0.6	0929	0.6	1007	0.7	1040	0.7	1107	0.7	M
	1431	4.3	1501	4.8	1504	5.3	1522	5.9	1555	6.6	1625	7.2	1645	7.1	
	2035	0.9	2057	1.0	2111	1.0	2128	1.0	2202	1.1	2237	1.1	2308	1.1	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 TU	0254	4.0	0310	4.5	0324	5.0	0343	5.5	0415	6.1	0446	6.6	0505	6.5	**1** TU
	0912	0.6	0939	0.8	0949	0.7	1009	0.8	1042	0.9	1115	0.9	1139	0.8	
	1522	4.1	1551	4.5	1556	5.1	1613	5.6	1645	6.2	1713	6.8	1733	6.7	
	2124	1.1	2145	1.3	2156	1.3	2209	1.3	2240	1.3	2313	1.4	2342	1.3	
2 W ☽	0345	3.8	0400	4.3	0415	4.7	0433	5.2	0503	5.7	0532	6.3	0551	6.2	**2** W ☽
	1006	0.7	1035	0.9	1040	0.9	1055	1.0	1122	1.1	1153	1.1	1216	1.1	
	1623	3.8	1649	4.3	1653	4.8	1711	5.2	1742	5.8	1807	6.4	1827	6.3	
	2221	1.3	2244	1.5	2252	1.5	2301	1.5	2330	1.6					
3 TH	0446	3.6	0501	4.1	0515	4.5	0533	4.9	0600	5.5	0000	1.7	0027	1.6	**3** TH
	1112	0.8	1143	1.1	1145	1.1	1155	1.2	1216	1.2	0624	6.0	0643	5.9	
	1735	3.6	1803	4.1	1802	4.5	1821	5.0	1847	5.6	1245	1.3	1307	1.3	
	2331	1.4									1911	6.1	1931	6.1	
4 F	0557	3.5	0002	1.6	0002	1.7	0010	1.7	0035	1.8	0103	1.9	0129	1.8	**4** F
	1229	0.9	0621	4.0	0628	4.4	0647	4.7	0709	5.3	0735	5.8	0752	5.8	
	1849	3.6	1300	1.1	1303	1.2	1311	1.2	1331	1.4	1359	1.5	1422	1.4	
			1920	4.1	1919	4.5	1936	4.9	1957	5.5	2024	6.0	2041	6.0	
5 SA	0051	1.4	0127	1.6	0127	1.7	0130	1.8	0155	1.8	0225	1.9	0249	1.9	**5** SA
	0712	3.5	0734	4.0	0745	4.4	0803	4.8	0824	5.4	0852	5.9	0909	5.8	
	1346	0.9	1413	1.1	1419	1.2	1428	1.2	1447	1.3	1516	1.4	1538	1.3	
	2000	3.7	2027	4.2	2031	4.6	2047	5.0	2112	5.6	2136	6.1	2152	6.0	
6 SU	0205	1.3	0236	1.5	0241	1.6	0247	1.6	0312	1.7	0342	1.7	0406	1.7	**6** SU
	0821	3.6	0836	4.1	0851	4.6	0909	5.0	0937	5.5	1001	6.1	1020	6.0	
	1452	0.8	1512	1.0	1520	1.1	1535	1.1	1556	1.2	1622	1.2	1643	1.2	
	2059	3.8	2124	4.3	2129	4.7	2146	5.2	2217	5.8	2240	6.4	2300	6.2	
7 M	0305	1.2	0331	1.3	0339	1.4	0351	1.4	0418	1.5	0446	1.5	0511	1.4	**7** M
	0915	3.8	0930	4.3	0944	4.7	1003	5.2	1035	5.8	1101	6.3	1121	6.2	
	1540	0.8	1558	0.9	1607	1.0	1626	1.0	1650	1.0	1716	1.0	1741	1.0	
	2145	3.9	2210	4.4	2216	4.9	2235	5.4	2307	6.0	2333	6.6	2354	6.4	

8	0351	1.0	0416	1.1	0425	1.2	0442	1.2	0511	1.2	0539	1.2	0607	1.2	**8**
TU	0958	3.9	1015	4.4	1028	4.9	1048	5.4	1121	6.0	1149	6.6	1210	6.5	TU
	1615	0.7	1635	0.9	1645	0.9	1704	0.9	1733	1.0	1802	0.9	1829	0.9	
	2224	4.0	2247	4.5	2255	5.0	2315	5.4	2347	6.1					
9	0429	0.9	0455	1.0	0506	1.0	0524	1.0	0557	1.1	0016	6.7	0037	6.6	**9**
W	1034	4.0	1053	4.5	1107	5.0	1126	5.5	1159	6.1	0626	1.0	0654	1.0	W
	1647	0.7	1710	0.8	1720	0.8	1740	0.9	1811	0.9	1230	6.8	1251	6.7	
	2258	4.1	2318	4.5	2330	5.0	2349	5.5			1842	0.9	1911	0.9	
10	0505	0.8	0532	0.9	0545	0.9	0604	0.9	0021	6.2	0053	6.8	0114	6.7	**10**
TH	1107	4.1	1128	4.5	1141	5.1	1159	5.6	0639	0.9	0709	0.9	0738	0.9	TH
O	1718	0.7	1744	0.8	1755	0.8	1814	0.8	1234	6.3	1306	6.9	1327	6.8	O
	2330	4.1	2347	4.6					1846	0.9	1919	0.9	1950	0.9	
11	0539	0.7	0607	0.8	0001	5.1	0020	5.6	0054	6.2	0126	6.8	0146	6.7	**11**
F	1141	4.1	1202	4.6	0621	0.8	0640	0.8	0717	0.9	0748	0.8	0817	0.8	F
	1748	0.7	1815	0.8	1215	5.2	1233	5.7	1307	6.4	1339	7.0	1400	6.9	
					1827	0.8	1845	0.8	1918	0.9	1951	0.9	2024	0.9	
12	0002	4.1	0019	4.6	0033	5.1	0051	5.6	0126	6.3	0156	6.9	0216	6.8	**12**
SA	0612	0.6	0641	0.7	0655	0.7	0714	0.8	0751	0.8	0824	0.8	0853	0.8	SA
	1215	4.2	1238	4.6	1248	5.2	1306	5.7	1341	6.4	1411	7.0	1431	6.9	
	1816	0.7	1844	0.8	1857	0.8	1913	0.9	1945	0.9	2022	0.9	2053	0.9	
13	0035	4.1	0053	4.6	0105	5.2	0123	5.6	0158	6.3	0227	6.9	0246	6.8	**13**
SU	0645	0.6	0714	0.7	0727	0.7	0746	0.7	0823	0.8	0858	0.8	0927	0.8	**SU**
	1249	4.2	1314	4.6	1322	5.2	1341	5.7	1415	6.4	1444	7.0	1504	7.0	
	1843	0.8	1913	0.9	1925	0.9	1939	0.9	2011	0.9	2051	0.9	2120	0.9	
14	0108	4.1	0128	4.6	0139	5.1	0157	5.6	0232	6.2	0300	6.8	0319	6.7	**14**
M	0718	0.6	0746	0.7	0759	0.7	0818	0.7	0854	0.8	0930	0.8	0959	0.8	M
	1325	4.1	1352	4.6	1357	5.1	1416	5.7	1450	6.3	1519	7.0	1539	6.9	
	1912	0.8	1946	0.9	1955	0.9	2008	0.9	2040	1.0	2120	1.0	2150	1.0	
15	0143	4.0	0203	4.5	0215	5.0	0232	5.5	0305	6.1	0334	6.7	0353	6.6	**15**
TU	0753	0.6	0822	0.8	0832	0.7	0851	0.8	0925	0.8	0959	0.8	1028	0.8	TU
	1401	4.1	1430	4.5	1434	5.1	1453	5.6	1526	6.2	1556	6.9	1616	6.8	
	1947	0.9	2023	1.0	2030	1.0	2042	1.0	2113	1.1	2151	1.0	2222	1.0	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 W	0220	3.9	0238	4.4	0251	4.9	0308	5.4	0340	6.0	0410	6.5	0428	6.5	**16** W
	0830	0.6	0901	0.8	0909	0.8	0926	0.8	0956	0.9	1026	0.9	1056	0.9	
	1442	4.0	1510	4.4	1515	4.9	1533	5.5	1605	6.1	1635	6.7	1655	6.7	
	2029	1.0	2104	1.1	2111	1.1	2121	1.2	2150	1.2	2228	1.2	2257	1.1	
17 TH	0300	3.8	0318	4.3	0331	4.8	0347	5.2	0419	5.8	0448	6.4	0507	6.3	**17** TH
	0914	0.7	0947	0.9	0952	0.9	1005	0.9	1032	1.0	1101	1.0	1129	0.9	
	1528	3.9	1556	4.3	1601	4.8	1618	5.3	1650	6.0	1719	6.6	1740	6.6	
	2119	1.1	2154	1.3	2200	1.3	2207	1.3	2232	1.4	2310	1.3	2337	1.3	
18 F ☾	0349	3.7	0407	4.2	0420	4.7	0435	5.1	0506	5.7	0534	6.2	0553	6.2	**18** F ☾
	1010	0.8	1042	1.0	1045	1.0	1054	1.0	1116	1.1	1144	1.1	1210	1.0	
	1622	3.8	1650	4.2	1657	4.7	1712	5.2	1743	5.9	1811	6.4	1833	6.4	
	2223	1.2	2256	1.4	2300	1.4	2306	1.5	2327	1.5					
19 SA	0448	3.7	0505	4.1	0520	4.6	0534	5.0	0604	5.6	0001	1.5	0026	1.4	**19** SA
	1122	0.8	1150	1.0	1153	1.0	1201	1.1	1220	1.1	0629	6.1	0649	6.0	
	1727	3.7	1756	4.1	1803	4.7	1818	5.1	1849	5.8	1240	1.2	1305	1.1	
	2342	1.3									1916	6.3	1936	6.3	
20 SU	0558	3.6	0008	1.4	0013	1.5	0024	1.6	0046	1.6	0107	1.7	0134	1.6	**20** SU
	1238	0.7	0614	4.1	0630	4.6	0645	5.0	0715	5.6	0742	6.1	0759	6.0	
	1843	3.8	1303	0.9	1312	0.9	1324	1.0	1345	1.1	1401	1.2	1430	1.2	
			1913	4.2	1915	4.7	1931	5.2	2002	5.8	2033	6.4	2054	6.3	
21 M	0101	1.2	0127	1.3	0133	1.4	0148	1.5	0213	1.6	0237	1.7	0306	1.6	**21** M
	0714	3.7	0733	4.2	0745	4.7	0802	5.1	0831	5.7	0903	6.3	0923	6.2	
	1344	0.6	1414	0.8	1422	0.8	1436	0.8	1501	0.9	1529	1.0	1557	1.0	
	1956	3.9	2025	4.4	2027	4.8	2043	5.3	2113	6.0	2143	6.6	2205	6.5	
22 TU	0208	1.0	0239	1.2	0246	1.2	0301	1.3	0329	1.4	0358	1.4	0426	1.4	**22** TU
	0824	3.9	0842	4.4	0854	4.9	0912	5.4	0942	6.0	1011	6.6	1034	6.5	
	1443	0.5	1515	0.7	1524	0.6	1539	0.7	1607	0.7	1636	0.8	1706	0.8	
	2100	4.0	2125	4.5	2131	5.0	2147	5.5	2219	6.2	2246	6.8	2309	6.7	

23 W	0307	0.9	0339	1.0	0349	1.0	0406	1.0	0440	1.1	0508	1.2	0540	1.2	**23** W
	0924	4.1	0941	4.6	0953	5.1	1012	5.6	1044	6.3	1112	6.9	1135	6.8	
	1538	0.4	1609	0.6	1619	0.5	1638	0.6	1711	0.6	1739	0.7	1816	0.7	
	2155	4.2	2219	4.6	2227	5.2	2244	5.7	2318	6.3	2345	6.9			
24 TH	0403	0.7	0433	0.8	0447	0.8	0508	0.8	0547	0.9	0617	1.0	0008	6.9	**24** TH
	1017	4.3	1035	4.8	1046	5.3	1106	5.9	1139	6.5	1208	7.1	0652	1.0	
	1630	0.4	1659	0.6	1711	0.5	1734	0.5	1812	0.6	1844	0.6	1231	7.1	
	2246	4.3	2308	4.7	2318	5.3	2336	5.8					1923	0.6	
25 F ●	0457	0.5	0525	0.7	0540	0.6	0606	0.7	0009	6.5	0039	7.1	0101	7.0	**25** F ●
	1106	4.5	1128	4.9	1136	5.5	1155	6.1	0648	0.7	0723	0.8	0754	0.7	
	1720	0.4	1746	0.6	1759	0.5	1826	0.6	1230	6.7	1300	7.3	1322	7.2	
	2334	4.4	2354	4.8					1906	0.6	1943	0.7	2017	0.6	
26 SA	0549	0.4	0617	0.6	0005	5.3	0024	5.9	0058	6.6	0129	7.2	0150	7.1	**26** SA
	1154	4.5	1220	4.9	0632	0.4	0700	0.5	0742	0.5	0819	0.6	0847	0.5	
	1808	0.5	1833	0.6	1226	5.6	1244	6.2	1318	6.9	1350	7.5	1411	7.4	
					1846	0.5	1913	0.6	1955	0.7	2032	0.7	2105	0.7	
27 **SU**	0021	4.4	0039	4.8	0053	5.4	0111	5.9	0145	6.6	0217	7.2	0238	7.1	**27** **SU**
	0639	0.4	0707	0.5	0721	0.4	0751	0.4	0832	0.5	0908	0.5	0935	0.4	
	1241	4.5	1311	4.9	1315	5.6	1333	6.2	1407	6.9	1438	7.5	1459	7.4	
	1853	0.6	1917	0.7	1931	0.7	1957	0.7	2038	0.8	2114	0.8	2147	0.8	
28 M	0107	4.3	0125	4.8	0139	5.3	0158	5.9	0231	6.5	0303	7.1	0323	7.0	**28** M
	0728	0.3	0756	0.5	0809	0.4	0837	0.4	0917	0.5	0951	0.5	1019	0.5	
	1329	4.4	1400	4.9	1404	5.5	1421	6.1	1455	6.8	1526	7.4	1546	7.3	
	1937	0.8	2000	0.9	2014	0.8	2036	0.9	2115	0.9	2149	1.0	2223	1.0	
29 TU	0153	4.2	0209	4.7	0224	5.2	0243	5.7	0316	6.4	0349	7.0	0407	6.8	**29** TU
	0816	0.4	0843	0.6	0854	0.5	0920	0.5	0958	0.6	1030	0.6	1057	0.6	
	1417	4.3	1448	4.7	1452	5.3	1509	5.9	1543	6.5	1613	7.2	1633	7.1	
	2020	0.9	2041	1.0	2055	1.0	2112	1.1	2148	1.1	2222	1.2	2255	1.1	
30 W	0238	4.1	0253	4.6	0309	5.1	0328	5.5	0401	6.1	0432	6.7	0450	6.6	**30** W
	0901	0.5	0928	0.7	0937	0.6	0959	0.7	1033	0.7	1105	0.8	1130	0.7	
	1506	4.1	1535	4.5	1540	5.1	1558	5.6	1631	6.2	1659	6.8	1719	6.8	
	2102	1.1	2124	1.2	2136	1.1	2150	1.2	2223	1.3	2256	1.3	2327	1.3	

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	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
1 TH	0325	3.9	0338	4.4	0354	4.9	0413	5.3	0445	5.9	0514	6.4	0533	6.4	**1** TH
	0947	0.6	1015	0.8	1020	0.8	1036	0.8	1106	0.9	1138	0.9	1202	0.9	
	1559	3.9	1625	4.3	1630	4.8	1648	5.3	1721	5.9	1746	6.5	1807	6.4	
	2148	1.2	2211	1.4	2221	1.3	2233	1.4	2304	1.4	2337	1.5			
2 F ☽	0415	3.8	0428	4.3	0444	4.7	0502	5.1	0533	5.7	0558	6.2	0005	1.5	**2** F ☽
	1037	0.7	1107	1.0	1108	0.9	1119	1.0	1146	1.0	1215	1.1	0617	6.1	
	1657	3.7	1724	4.1	1725	4.6	1744	5.0	1813	5.7	1837	6.2	1241	1.1	
	2243	1.3	2306	1.5	2313	1.5	2324	1.5	2354	1.6			1858	6.2	
3 SA	0512	3.6	0530	4.1	0541	4.5	0559	4.9	0628	5.5	0024	1.7	0052	1.6	**3** SA
	1136	0.8	1208	1.1	1206	1.1	1214	1.1	1238	1.2	0651	6.0	0711	5.9	
	1759	3.6	1830	4.0	1827	4.4	1846	4.9	1910	5.5	1304	1.3	1333	1.2	
	2352	1.4									1936	6.0	1956	6.0	
4 SU	0613	3.5	0021	1.6	0018	1.6	0027	1.7	0055	1.7	0122	1.8	0151	1.8	**4** SU
	1241	0.9	0641	4.0	0647	4.4	0705	4.8	0730	5.4	0758	5.9	0817	5.8	
	1902	3.5	1314	1.2	1313	1.2	1319	1.2	1342	1.3	1409	1.4	1439	1.3	
			1933	4.0	1933	4.4	1950	4.8	2011	5.4	2040	6.0	2058	5.9	
5 M	0107	1.4	0142	1.6	0140	1.6	0143	1.7	0208	1.8	0236	1.9	0305	1.8	**5** M
	0718	3.5	0745	4.0	0755	4.4	0812	4.8	0836	5.4	0906	5.9	0924	5.8	
	1344	0.9	1415	1.2	1418	1.2	1425	1.2	1448	1.3	1519	1.4	1545	1.3	
	2006	3.6	2030	4.1	2035	4.4	2052	4.9	2116	5.5	2143	6.0	2159	5.9	
6 TU	0214	1.3	0245	1.5	0250	1.5	0256	1.6	0320	1.6	0353	1.7	0417	1.7	**6** TU
	0821	3.6	0842	4.1	0855	4.5	0912	4.9	0940	5.5	1008	6.1	1027	6.0	
	1441	0.9	1508	1.1	1514	1.1	1525	1.2	1548	1.3	1621	1.3	1644	1.3	
	2101	3.7	2122	4.2	2130	4.6	2148	5.0	2216	5.6	2242	6.2	2300	6.1	
7 W	0311	1.1	0338	1.3	0346	1.3	0357	1.3	0424	1.4	0454	1.5	0518	1.4	**7** W
	0914	3.7	0934	4.2	0947	4.6	1004	5.1	1036	5.7	1104	6.3	1124	6.2	
	1530	0.9	1555	1.0	1603	1.1	1617	1.1	1643	1.2	1715	1.2	1738	1.2	
	2147	3.8	2208	4.3	2216	4.7	2235	5.2	2306	5.8	2334	6.4	2353	6.3	

8 TH	0358	0.9	0425	1.1	0434	1.0	0450	1.1	0519	1.2	0548	1.2	0613	1.2	**8** TH
	0958	3.8	1021	4.3	1033	4.8	1050	5.3	1123	5.9	1153	6.5	1214	6.4	
	1613	0.9	1638	1.0	1647	1.0	1704	1.0	1732	1.1	1803	1.1	1829	1.1	
	2227	3.9	2248	4.4	2258	4.9	2317	5.3	2349	6.0					
9 F	0440	0.8	0508	0.9	0518	0.9	0536	0.9	0608	1.0	0019	6.6	0039	6.5	**9** F
	1038	3.9	1103	4.4	1114	4.9	1131	5.4	1205	6.1	0637	1.0	0703	1.0	
	1651	0.8	1717	1.0	1728	0.9	1746	1.0	1815	1.0	1236	6.7	1257	6.6	
	2304	4.0	2324	4.5	2336	5.0	2354	5.4			1846	1.1	1916	1.0	
10 SA O	0518	0.7	0547	0.8	0559	0.7	0618	0.8	0028	6.1	0059	6.7	0119	6.6	**10** SA O
	1117	4.0	1141	4.5	1152	5.0	1208	5.5	0651	0.8	0722	0.8	0750	0.8	
	1725	0.8	1752	0.9	1804	0.9	1822	1.0	1244	6.2	1315	6.8	1336	6.8	
	2341	4.1	2358	4.6					1852	1.0	1926	1.1	1958	1.0	
11 **SU**	0554	0.6	0624	0.7	0012	5.1	0030	5.5	0106	6.2	0136	6.8	0156	6.7	**11** **SU**
	1154	4.1	1218	4.5	0636	0.6	0655	0.7	0731	0.8	0803	0.8	0832	0.8	
	1756	0.8	1824	0.9	1229	5.1	1246	5.6	1321	6.3	1352	6.9	1413	6.8	
					1836	0.9	1852	0.9	1923	1.0	2001	1.0	2034	1.1	
12 M	0017	4.1	0033	4.6	0049	5.1	0107	5.6	0143	6.2	0212	6.8	0232	6.7	**12** M
	0629	0.5	0658	0.7	0711	0.6	0730	0.6	0807	0.7	0842	0.7	0913	0.7	
	1233	4.1	1257	4.6	1306	5.2	1323	5.7	1358	6.4	1429	7.0	1449	6.9	
	1826	0.8	1856	0.9	1907	0.8	1921	0.9	1953	1.0	2034	1.0	2107	1.0	
13 TU	0055	4.1	0111	4.6	0126	5.2	0144	5.6	0220	6.2	0249	6.8	0308	6.7	**13** TU
	0705	0.5	0734	0.6	0746	0.5	0805	0.6	0842	0.6	0919	0.6	0951	0.6	
	1311	4.2	1337	4.6	1344	5.2	1402	5.7	1436	6.4	1507	7.0	1526	7.0	
	1900	0.8	1932	0.9	1942	0.8	1955	0.9	2027	0.9	2108	0.9	2141	1.0	
14 W	0133	4.1	0148	4.6	0204	5.2	0222	5.6	0256	6.2	0325	6.8	0344	6.7	**14** W
	0743	0.4	0812	0.6	0823	0.5	0842	0.5	0919	0.6	0955	0.6	1027	0.6	
	1350	4.2	1418	4.6	1424	5.2	1442	5.7	1515	6.4	1545	7.0	1605	7.0	
	1939	0.8	2011	0.9	2021	0.8	2034	0.9	2107	0.9	2145	0.9	2218	1.0	
15 TH	0212	4.1	0227	4.6	0242	5.1	0300	5.5	0333	6.1	0402	6.7	0421	6.7	**15** TH
	0824	0.4	0853	0.6	0903	0.5	0921	0.6	0957	0.6	1029	0.6	1101	0.6	
	1431	4.1	1500	4.5	1506	5.1	1523	5.6	1556	6.3	1626	7.0	1646	6.9	
	2022	0.9	2054	1.0	2104	0.9	2117	1.0	2150	1.0	2225	1.0	2258	1.0	

DECEMBER 2011

TIME ZONE UT(GMT)

	WALTON-ON-THE-NAZE		MARGATE		SHIVERING SAND		SOUTHEND-ON-SEA		TILBURY		NORTH WOOLWICH		LONDON BRIDGE (TOWER PIER)		
	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	Time	m	
16 F	0252	4.0	0306	4.5	0322	5.0	0340	5.4	0412	6.0	0441	6.6	0500	6.6	**16** F
	0907	0.5	0937	0.7	0945	0.6	1002	0.6	1035	0.7	1103	0.7	1133	0.7	
	1516	4.0	1543	4.4	1550	5.0	1607	5.5	1639	6.2	1708	6.8	1729	6.8	
	2109	1.0	2141	1.1	2151	1.1	2203	1.1	2233	1.1	2308	1.1	2339	1.1	
17 SA	0336	3.9	0350	4.4	0406	4.9	0423	5.4	0455	6.0	0523	6.5	0542	6.5	**17** SA
	0956	0.5	1025	0.7	1032	0.7	1046	0.7	1116	0.8	1141	0.8	1211	0.8	
	1605	3.9	1630	4.3	1640	4.9	1656	5.4	1728	6.1	1756	6.7	1818	6.6	
	2204	1.1	2233	1.2	2243	1.2	2253	1.3	2321	1.3	2354	1.3			
18 SU ☾	0426	3.9	0441	4.4	0457	4.8	0513	5.3	0544	5.9	0611	6.4	0024	1.3	**18** SU ☾
	1053	0.6	1120	0.8	1127	0.7	1138	0.8	1204	0.9	1228	0.9	0631	6.4	
	1702	3.8	1725	4.2	1736	4.8	1752	5.3	1824	5.9	1852	6.5	1257	0.9	
	2308	1.1	2333	1.3	2343	1.3	2354	1.4					1914	6.4	
19 M	0526	3.8	0540	4.3	0557	4.8	0613	5.2	0021	1.4	0048	1.5	0119	1.5	**19** M
	1159	0.6	1223	0.8	1232	0.8	1244	0.9	0644	5.8	0710	6.3	0730	6.3	
	1809	3.8	1833	4.2	1841	4.7	1857	5.2	1307	0.9	1328	1.0	1358	1.0	
									1929	5.8	2000	6.4	2022	6.3	
20 TU	0021	1.1	0044	1.3	0053	1.3	0109	1.4	0135	1.5	0159	1.6	0230	1.6	**20** TU
	0635	3.8	0652	4.3	0706	4.7	0723	5.2	0755	5.8	0827	6.3	0846	6.2	
	1308	0.6	1334	0.8	1342	0.8	1356	0.9	1419	1.0	1448	1.0	1517	1.1	
	1921	3.8	1948	4.2	1951	4.7	2009	5.2	2039	5.8	2112	6.4	2133	6.3	
21 W	0135	1.0	0203	1.2	0211	1.2	0226	1.3	0253	1.4	0323	1.5	0353	1.5	**21** W
	0751	3.8	0809	4.3	0819	4.8	0839	5.2	0909	5.9	0940	6.4	1002	6.4	
	1412	0.6	1443	0.8	1450	0.8	1504	0.8	1529	0.9	1601	1.0	1631	1.0	
	2032	3.8	2057	4.3	2102	4.8	2120	5.2	2150	5.9	2219	6.5	2241	6.4	
22 TH	0243	0.9	0313	1.1	0323	1.1	0338	1.1	0410	1.2	0440	1.3	0512	1.3	**22** TH
	0900	4.0	0918	4.5	0928	4.9	0948	5.4	1019	6.0	1047	6.6	1110	6.6	
	1514	0.6	1544	0.8	1553	0.8	1609	0.8	1639	0.9	1710	0.9	1745	1.0	
	2137	4.0	2159	4.4	2207	4.9	2225	5.4	2257	6.0	2324	6.6	2346	6.5	

23 F	0346	0.7	0416	0.9	0429	0.8	0448	0.9	0526	1.0	0556	1.0	0630	1.0	**23** F
	1000	4.1	1023	4.6	1031	5.1	1049	5.6	1122	6.3	1150	6.9	1213	6.8	
	1612	0.6	1640	0.8	1651	0.7	1712	0.8	1749	0.8	1821	0.9	1859	0.9	
	2233	4.1	2254	4.6	2305	5.1	2323	5.5	2356	6.2					
24 SA ●	0447	0.5	0516	0.7	0529	0.6	0553	0.7	0632	0.7	0024	6.7	0045	6.7	**24** SA ●
	1053	4.3	1121	4.7	1127	5.3	1144	5.8	1218	6.5	0708	0.8	0736	0.7	
	1707	0.6	1732	0.8	1745	0.7	1809	0.8	1849	0.8	1248	7.1	1310	7.0	
	2323	4.2	2343	4.7	2357	5.2					1926	0.9	1958	0.8	
25 SU	0542	0.4	0612	0.6	0624	0.4	0014	5.7	0047	6.3	0118	6.9	0139	6.8	**25** SU
	1143	4.4	1213	4.8	1219	5.4	0650	0.5	0729	0.5	0807	0.5	0832	0.5	
	1756	0.7	1820	0.8	1834	0.7	1235	6.0	1309	6.6	1340	7.3	1401	7.1	
							1859	0.8	1940	0.8	2018	0.9	2049	0.8	
26 M	0010	4.3	0029	4.7	0044	5.3	0102	5.8	0135	6.4	0206	7.0	0227	6.9	**26** M
	0633	0.3	0702	0.5	0714	0.3	0742	0.4	0821	0.4	0857	0.4	0923	0.4	
	1231	4.4	1303	4.8	1308	5.4	1323	6.0	1358	6.7	1429	7.3	1450	7.2	
	1841	0.7	1904	0.8	1919	0.7	1945	0.8	2026	0.8	2103	0.9	2134	0.9	
27 TU	0056	4.3	0113	4.8	0129	5.3	0146	5.8	0220	6.5	0252	7.1	0313	7.0	**27** TU
	0720	0.3	0748	0.5	0801	0.3	0829	0.3	0907	0.4	0942	0.4	1008	0.4	
	1317	4.3	1349	4.8	1353	5.4	1410	6.0	1444	6.7	1515	7.3	1536	7.2	
	1923	0.8	1945	0.9	2000	0.8	2024	0.9	2105	0.9	2140	1.0	2213	1.0	
28 W	0139	4.3	0155	4.7	0211	5.3	0229	5.8	0303	6.4	0335	7.0	0355	6.9	**28** W
	0804	0.3	0830	0.5	0843	0.4	0909	0.4	0947	0.4	1021	0.5	1048	0.5	
	1402	4.2	1433	4.7	1437	5.2	1454	5.8	1529	6.5	1559	7.2	1620	7.1	
	2002	0.9	2023	1.0	2038	0.9	2058	1.0	2137	1.0	2211	1.1	2246	1.1	
29 TH	0220	4.2	0235	4.7	0251	5.2	0310	5.7	0344	6.3	0416	6.9	0434	6.8	**29** TH
	0843	0.4	0908	0.6	0919	0.5	0942	0.5	1019	0.6	1052	0.6	1120	0.6	
	1446	4.1	1514	4.5	1519	5.1	1537	5.6	1612	6.3	1640	6.9	1701	6.8	
	2038	0.9	2100	1.1	2114	1.0	2130	1.1	2206	1.1	2240	1.2	2314	1.2	
30 F	0300	4.1	0314	4.6	0331	5.1	0349	5.5	0423	6.1	0453	6.7	0511	6.6	**30** F
	0919	0.5	0944	0.7	0952	0.6	1009	0.6	1044	0.7	1116	0.8	1144	0.8	
	1530	3.9	1553	4.3	1600	4.9	1619	5.4	1652	6.0	1719	6.6	1740	6.6	
	2114	1.0	2138	1.2	2151	1.1	2204	1.2	2238	1.2	2313	1.3	2343	1.3	
31 SA	0340	3.9	0353	4.4	0411	4.9	0428	5.3	0501	5.9	0528	6.5	0548	6.4	**31** SA
	0955	0.6	1021	0.8	1026	0.7	1039	0.8	1111	0.8	1142	0.9	1210	0.9	
	1615	3.7	1633	4.2	1642	4.7	1701	5.1	1733	5.8	1757	6.3	1819	6.3	
	2154	1.1	2220	1.3	2231	1.2	2243	1.3	2315	1.3	2349	1.4			

2011 Sunrise and Sunset times for London

Times in GMT Latitude 51° 30′ N Longitude 0° 10′ W

JANUARY				FEBRUARY				MARCH				APRIL			
	RISE	SET			RISE	SET			RISE	SET			RISE	SET	
	h m	h m			h m	h m			h m	h m			h m	h m	
1	08 06	16 02	16	1	07 40	16 50	16	1	06 47	17 40	16	1	05 37	18 33	16
2	08 06	16 03	17	2	07 38	16 51	17	2	06 45	17 42	17	2	05 35	18 35	17
3	08 06	16 04	18	3	07 36	16 53	18	3	06 42	17 44	18	3	05 33	18 37	18
4	08 06	16 05	19	4	07 35	16 55	19	4	06 40	17 46	19	4	05 30	18 38	19
5	08 06	16 07	20	5	07 33	16 57	20	5	06 38	17 47	20	5	05 28	18 40	20
6	08 05	16 08	21	6	07 32	16 59	21	6	06 36	17 49	21	6	05 26	18 42	21
7	08 05	16 09	22	7	07 30	17 00	22	7	06 34	17 51	22	7	05 24	18 43	22
8	08 04	16 10	23	8	07 28	17 02	23	8	06 31	17 53	23	8	05 21	18 45	23
9	08 04	16 12	24	9	07 26	17 04	24	9	06 29	17 54	24	9	05 19	18 47	24
10	08 03	16 13	25	10	07 25	17 06	25	10	06 27	17 56	25	10	05 17	18 48	25
11	08 03	16 15	26	11	07 23	17 08	26	11	06 25	17 58	26	11	05 15	18 50	26
12	08 02	16 16	27	12	07 21	17 10	27	12	06 23	17 59	27	12	05 13	18 52	27
13	08 01	16 17	28	13	07 19	17 11	28	13	06 20	18 01	28	13	05 10	18 53	28
14	08 01	16 19	29	14	07 17	17 13		14	06 18	18 03	29	14	05 08	18 55	29
15	08 00	16 20	30	15	07 15	17 15		15	06 16	18 05	30	15	05 06	18 57	30
			31								31				
	07 41	16 48							05 39	18 32			04 35	19 22	

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2011 Sunrise and Sunset times for London

Times in GMT Latitude 51° 30′ N Longitude 0° 10′ W

MAY				JUNE				JULY				AUGUST			
	RISE	SET			RISE	SET			RISE	SET			RISE	SET	
	h m	h m			h m	h m			h m	h m			h m	h m	
1	04 33	19 23	16	1	03 50	20 08	16	1	03 48	20 21	16	1	04 24	19 49	16
2	04 32	19 25	17	2	03 49	20 09	17	2	03 48	20 21	17	2	04 25	19 48	17
3	04 30	19 27	18	3	03 48	20 10	18	3	03 49	20 20	18	3	04 27	19 46	18
4	04 28	19 28	19	4	03 47	20 11	19	4	03 50	20 20	19	4	04 28	19 44	19
5	04 26	19 30	20	5	03 47	20 12	20	5	03 51	20 19	20	5	04 30	19 43	20
6	04 24	19 31	21	6	03 46	20 13	21	6	03 51	20 19	21	6	04 31	19 41	21
7	04 23	19 33	22	7	03 46	20 14	22	7	03 52	20 18	22	7	04 33	19 39	22
8	04 21	19 35	23	8	03 45	20 15	23	8	03 53	20 18	23	8	04 34	19 37	23
9	04 19	19 36	24	9	03 45	20 16	24	9	03 54	20 17	24	9	04 36	19 35	24
10	04 17	19 38	25	10	03 44	20 16	25	10	03 55	20 16	25	10	04 38	19 34	25
11	04 16	19 39	26	11	03 44	20 17	26	11	03 56	20 16	26	11	04 39	19 32	26
12	04 14	19 41	27	12	03 44	20 18	27	12	03 57	20 15	27	12	04 41	19 30	27
13	04 13	19 42	28	13	03 43	20 18	28	13	03 58	20 14	28	13	04 42	19 28	28
14	04 11	19 44	29	14	03 43	20 19	29	14	03 59	20 13	29	14	04 44	19 26	29
15	04 10	19 46	30	15	03 43	20 19	30	15	04 01	20 12	30	15	04 45	19 24	30
			31								31				31
	03 50	20 07							04 22	19 51			05 11	18 50	

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2011 Sunrise and Sunset times for London

Times in GMT Latitude 51° 30′ N Longitude 0° 10′ W

SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER			
	RISE	SET			RISE	SET			RISE	SET			RISE	SET	
	h m	h m			h m	h m			h m	h m			h m	h m	
1	05 13	18 48	16	1	06 01	17 39	16	1	06 53	16 34	16	1	07 43	15 55	16
2	05 14	18 46	17	2	06 02	17 37	17	2	06 55	16 33	17	2	07 45	15 55	17
3	05 16	18 43	18	3	06 04	17 35	18	3	06 57	16 31	18	3	07 46	15 54	18
4	05 17	18 41	19	4	06 06	17 33	19	4	06 59	16 29	19	4	07 47	15 54	19
5	05 19	18 39	20	5	06 07	17 30	20	5	07 01	16 27	20	5	07 49	15 53	20
6	05 21	18 37	21	6	06 09	17 28	21	6	07 02	16 26	21	6	07 50	15 53	21
7	05 22	18 34	22	7	06 10	17 26	22	7	07 04	16 24	22	7	07 51	15 53	22
8	05 24	18 32	23	8	06 12	17 24	23	8	07 06	16 22	23	8	07 52	15 52	23
9	05 25	18 30	24	9	06 14	17 21	24	9	07 08	16 21	24	9	07 54	15 52	24
10	05 27	18 28	25	10	06 15	17 19	25	10	07 09	16 19	25	10	07 55	15 52	25
11	05 28	18 25	26	11	06 17	17 17	26	11	07 11	16 18	26	11	07 56	15 52	26
12	05 30	18 23	27	12	06 19	17 15	27	12	07 13	16 16	27	12	07 57	15 52	27
13	05 32	18 21	28	13	06 21	17 13	28	13	07 15	16 15	28	13	07 58	15 52	28
14	05 33	18 18	29	14	06 22	17 10	29	14	07 16	16 13	29	14	07 59	15 52	29
15	05 35	18 16	30	15	06 24	17 08	30	15	07 18	16 12	30	15	07 59	15 52	30
							31								31
					06 52	16 36							08 06	16 01	

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2011 Moonrise and Moonset times for London

Times in GMT Latitude 51° 30′ N Longitude 0° 10′ W

JANUARY				FEBRUARY				MARCH				APRIL			
	RISE		SET		RISE		SET		RISE		SET		RISE		SET
	h m		h m		h m		h m		h m		h m		h m		h m
1	05 29	13	20	16	12 47	04	59	1	06 38	15	22	16	15 09	05	53
2	06 33	14	13	17	13 45	05	58	2	07 04	16	32	17	16 36	06	21
3	07 25	15	15	18	14 57	06	47	3	07 24	17	42	18	18 03	06	45
4	08 05	16	24	19	16 18	07	26	4	07 42	18	51	19	19 31	07	06
5	08 36	17	36	20	17 43	07	57	5	07 58	19	58	20	20 58	07	27
6	08 59	18	47	21	19 09	08	22	6	08 13	21	04	21	22 24	07	49
7	09 19	19	57	22	20 35	08	43	7	08 29	22	11	22	23 48	08	13
8	09 36	21	04	23	21 59	09	03	8	08 46	23	18	23	**	**	08 43
9	09 51	22	11	24	23 23	09	23	9	09 05	**	**	24	01 07	09	20
10	10 06	23	18	25	**	**	09 45	10	09 28	00	26	25	02 18	10	06
11	10 22	**	**	26	00 45	10	10	11	09 58	01	34	26	03 17	11	01
12	10 39	00	25	27	02 05	10	40	12	10 37	02	41	27	04 04	12	05
13	11 00	01	34	28	03 20	11	19	13	11 28	03	42	28	04 40	13	13
14	11 27	02	43	29	04 26	12	07	14	12 31	04	34				
15	12 01	03	53	30	05 21	13	06	15	13 46	05	18				
				31	06 04	14	12								

MARCH				APRIL			
	RISE		SET		RISE		SET
	h m		h m		h m		h m
1	05 08	14	22	16	14 02	04	18
2	05 30	15	32	17	15 28	04	43
3	05 49	16	40	18	16 55	05	06
4	06 06	17	47	19	18 23	05	27
5	06 21	18	54	20	19 52	05	49
6	06 37	20	00	21	21 20	06	13
7	06 53	21	07	22	22 44	06	42
8	07 12	22	14	23	**	**	07 17
9	07 34	23	22	24	00 01	08	01
10	08 01	**	**	25	01 07	08	55
11	08 36	00	27	26	02 00	09	57
12	09 20	01	29	27	02 40	11	05
13	10 16	02	24	28	03 11	12	14
14	11 24	03	10	29	03 35	13	23
15	12 40	03	47	30	03 55	14	32
				31	04 12	15	38

APRIL							
	RISE			SET			
	h m			h m			
1	04 28	16	45	16	17 16	03	49
2	04 44	17	51	17	18 44	04	12
3	05 00	18	58	18	20 12	04	38
4	05 19	20	05	19	21 35	05	10
5	05 40	21	12	20	22 48	05	51
6	06 06	22	18	21	23 49	06	42
7	06 38	23	21	22	**	**	07 43
8	07 19	**	**	23	00 35	08	51
9	08 11	00	17	24	01 10	10	02
10	09 13	01	05	25	01 38	11	13
11	10 23	01	45	26	01 59	12	22
12	11 40	02	17	27	02 18	13	29
13	13 01	02	43	28	02 34	14	35
14	14 24	03	06	29	02 50	15	41
15	15 49	03	28	30	03 07	16	48

** ** indicates that the phenomenon does not occur.

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2011 Moonrise and Moonset times for London

Times in GMT Latitude 51° 30′ N Longitude 0° 10′ W

MAY				JUNE				JULY				AUGUST			
	RISE	SET			RISE	SET			RISE	SET			RISE	SET	
	h m	h m			h m	h m			h m	h m			h m	h m	
1	03 24	17 55	16	1	03 16	20 05	16	1	03 51	20 21	16	1	06 43	20 09	16
2	03 45	19 02	17	2	04 02	20 59	17	2	05 04	20 53	17	2	08 06	20 30	17
3	04 09	20 10	18	3	04 59	21 45	18	3	06 21	21 20	18	3	09 29	20 51	18
4	04 40	21 14	19	4	06 05	22 21	19	4	07 41	21 43	19	4	10 52	21 14	19
5	05 19	22 13	20	5	07 19	22 50	20	5	09 02	22 03	20	5	12 14	21 42	20
6	06 08	23 03	21	6	08 36	23 15	21	6	10 22	22 24	21	6	13 34	22 15	21
7	07 07	23 45	22	7	09 54	23 36	22	7	11 43	22 45	22	7	14 49	22 57	22
8	08 15	** **	23	8	11 14	23 57	23	8	13 05	23 09	23	8	15 55	23 50	23
9	09 29	00 19	24	9	12 34	** **	24	9	14 26	23 37	24	9	16 50	** **	24
10	10 46	00 46	25	10	13 56	00 17	25	10	15 45	** **	25	10	17 33	00 51	25
11	12 06	01 10	26	11	15 18	00 39	26	11	16 59	00 13	26	11	18 06	02 00	26
12	13 27	01 31	27	12	16 41	01 04	27	12	18 02	00 59	27	12	18 33	03 12	27
13	14 50	01 51	28	13	18 01	01 36	28	13	18 54	01 56	28	13	18 54	04 24	28
14	16 14	02 12	29	14	19 13	02 16	29	14	19 34	03 02	29	14	19 13	05 35	29
15	17 40	02 36	30	15	20 13	03 08	30	15	20 05	04 14	30	15	19 30	06 44	30
			31								31				31
													03 59	19 22	
													05 20	19 47	
													07 04	18 55	
													08 30	19 18	

** ** indicates that the phenomenon does not occur.

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2011 Moonrise and Moonset times for London

Times in GMT Latitude 51° 30′ N Longitude 0° 10′ W

SEPTEMBER				OCTOBER				NOVEMBER				DECEMBER			
	RISE	SET			RISE	SET			RISE	SET			RISE	SET	
	h m	h m			h m	h m			h m	h m			h m	h m	
1	09 55	19 45	16	1	11 33	19 42	16	1	12 40	21 54	16	1	11 54	23 10	16
2	11 19	20 18	17	2	12 37	20 39	17	2	13 07	23 05	17	2	12 12	** **	17
3	12 37	20 58	18	3	13 29	21 45	18	3	13 30	** **	18	3	12 30	00 18	18
4	13 47	21 47	19	4	14 09	22 55	19	4	13 49	00 15	19	4	12 47	01 24	19
5	14 46	22 46	20	5	14 40	** **	20	5	14 07	01 23	20	5	13 06	02 30	20
6	15 32	23 52	21	6	15 04	00 06	21	6	14 24	02 29	21	6	13 28	03 36	21
7	16 08	** **	22	7	15 25	01 16	22	7	14 42	03 35	22	7	13 53	04 41	22
8	16 36	01 03	23	8	15 43	02 24	23	8	15 02	04 41	23	8	14 25	05 46	23
9	17 00	02 14	24	9	16 01	03 32	24	9	15 24	05 47	24	9	15 03	06 48	24
10	17 19	03 24	25	10	16 18	04 38	25	10	15 52	06 52	25	10	15 51	07 44	25
11	17 37	04 33	26	11	16 36	05 44	26	11	16 25	07 56	26	11	16 48	08 33	26
12	17 54	05 40	27	12	16 57	06 50	27	12	17 06	08 56	27	12	17 53	09 15	27
13	18 11	06 47	28	13	17 20	07 56	28	13	17 57	09 49	28	13	19 03	09 49	28
14	18 30	07 54	29	14	17 49	09 01	29	14	18 55	10 35	29	14	20 16	10 17	29
15	18 51	09 00	30	15	18 24	10 03	30	15	20 01	11 14	30	15	21 32	10 41	30
							31								31
					12 05	20 41							10 53	** **	

** ** indicates that the phenomenon does not occur.

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CONVERSION TABLE, FEET TO METRES

Feet	Metres	Feet	Metres	Feet	Metres	Feet	Metres
5' 0"	1·52	17' 0"	5·18	29' 0"	8·84	41' 0"	12·50
3"	1·60	3"	5·26	3"	8·92	3"	12·57
6"	1·68	6"	5·33	6"	8·99	6"	12·65
9"	1·75	9"	5·41	9"	9·07	9"	12·73
6' 0"	1·83	18' 0"	5·49	30' 0"	9·14	42' 0"	12·80
3"	1·91	3"	5·56	3"	9·22	3"	12·88
6"	1·98	6"	5·64	6"	9·30	6"	12·95
9"	2·06	9"	5·71	9"	9·37	9"	13·03
7' 0"	2·13	19' 0"	5·79	31' 0"	9·45	43' 0"	13·11
3"	2·21	3"	5·87	3"	9·52	3"	13·18
6"	2·29	6"	5·94	6"	9·60	6"	13·26
9"	2·36	9"	6·02	9"	9·68	9"	13·33
8' 0"	2·44	20' 0"	6·10	32' 0"	9·75	44' 0"	13·41
3"	2·51	3"	6·17	3"	9·83	3"	13·49
6"	2·59	6"	6·25	6"	9·91	6"	13·56
9"	2·67	9"	6·32	9"	9·98	9"	13·64
9' 0"	2·74	21' 0"	6·40	33' 0"	10·06	45' 0"	13·72
3"	2·82	3"	6·48	3"	10·13	3"	13·79
6"	2·90	6"	6·55	6"	10·21	6"	13·87
9"	2·97	9"	6·63	9"	10·29	9"	13·94
10' 0"	3·05	22' 0"	6·71	34' 0"	10·36	46' 0"	14·02
3"	3·12	3"	6·78	3"	10·44	3"	14·10
6"	3·20	6"	6·86	6"	10·52	6"	14·17
9"	3·28	9"	6·93	9"	10·59	9"	14·25
11' 0"	3·35	23' 0"	7·01	35' 0"	10·67	47' 0"	14·33
3"	3·43	3"	7·09	3"	10·74	3"	14·40
6"	3·51	6"	7·16	6"	10·82	6"	14·48
9"	3·58	9"	7·24	9"	10·90	9"	14·55
12' 0"	3·66	24' 0"	7·32	36' 0"	10·97	48' 0"	14·63
3"	3·73	3"	7·39	3"	11·05	3"	14·71
6"	3·81	6"	7·47	6"	11·13	6"	14·78
9"	3·89	9"	7·54	9"	11·20	9"	14·86
13' 0"	3·96	25' 0"	7·62	37' 0"	11·28	49' 0"	14·93
3"	4·04	3"	7·70	3"	11·35	3"	15·01
6"	4·11	6"	7·77	6"	11·43	6"	15·09
9"	4·19	9"	7·85	9"	11.51	9"	15·16
14' 0"	4·27	26' 0"	7·92	38' 0"	11·58	50' 0"	15·24
3"	4·34	3"	8·00	3"	11·66	3"	15·32
6"	4·42	6"	8·08	6"	11·73	6"	15·39
9"	4·50	9"	8·15	9"	11·81	9"	15·47
15' 0"	4·57	27' 0"	8·23	39' 0"	11·89	51' 0"	15·54
3"	4·65	3"	8·31	3"	11·96	3"	15·62
6"	4·72	6"	8·38	6"	12·04	6"	15·70
9"	4·80	9"	8·46	9"	12·12	9"	15·77
16' 0"	4·88	28' 0"	8·53	40' 0"	12·19	52' 0"	15·85
3"	4·95	3"	8·61	3"	12·27	3"	15·93
6"	5·03	6"	8·69	6"	12·34	6"	16·00
9"	5·11	9"	8·76	9"	12·42	9"	16·08

Metric to Imperial Conversion
Kilowatts to Horsepower

1	*	1.341
Kilowatts		Horsepower
200	=	268.2
300	=	402.3
400	=	536.4
500	=	670.5
600	=	804.6
700	=	938.7
800	=	1,072,8
900	=	1,206.9
1000	=	1,341.0
2000	=	2,682.0
3000	=	4,023.0

Imperial to Metric Conversion
Horsepower to Kilowatt

1	/	1.341
Horsepower		Kilowatts
200	=	149.1
300	=	223.7
400	=	298.3
500	=	372.9
600	=	447.4
700	=	522.0
800	=	596.6
900	=	671.1
1000	=	745.7
2000	=	1,491.4
3000	=	2,237.1

The Port of London Authority (PLA) employs nine commercially qualified divers who support many aspects of the work undertaken by PLA Marine Services, particularly hydrographic and salvage operations.

Using their own fully equipped support craft, conveniently named 'PLA Diver', they are in demand for many different tasks, including investigating underwater obstacles and potential archaeological items, and surveying underwater operational structures such as jetties and navigational aids.

In support of the PLA's own operations, the divers are involved in salvage work, clearing fouled propellers, maintenance of tide gauges, inspection of lock gates, sluices and flood barriers, as well as helping in the removal of old jetty structures. They also carry out damage inspection of vessels, searching for lost propellers and other items lost overboard, and slinging yachts ready for loading onto ships.

As part of the PLA Marine Services team, the divers are available for third-party work in any part of the tidal Thames within the jurisdiction of the PLA, when not carrying out their routine duties.

Diving Services
For information on third-party services, contact:
Geoff Buckby or Jim Denby on
01474 562444
or e-mail: geoff.buckby@pla.co.uk
or jim.denby@pla.co.uk

PORT OF LONDON AUTHORITY

MARINE SURVEYORS

The Port of London Authority (PLA) has a statutory responsibility to inspect and license commercially operated vessels on the tidal Thames from Teddington to the Estuary Limits. To undertake this duty the PLA has the only in-house marine survey capability of any port in the UK, and employs two fully qualified marine surveyors who currently survey over 550 commercially operated vessels in the region.

In addition to the PLA's statutory work, our marine surveyors are available to undertake a variety of services for third parties, on both commercial and leisure vessels, which include:

- Insurance / Pre-Purchase Surveys
- New Build Consultancy Services
- Certification to National MCA Standards

Surveys may be undertaken anywhere in the UK and Europe and can usually be completed within one week of receiving instruction.

For more information on third party services, please contact:

Tim Prior or Jason Rudd on
01474 562365
or email: licensingenquiry@pla.co.uk

PORT OF LONDON AUTHORITY

PLA Marine Services

The Marine Services base at Denton Wharf, Gravesend provides a purpose built facility to undertake a wide range of marine operations both in support of the PLA's own requirements and also for third parties.

Fully equipped with a 40 tonne heavy lift crane and a 50 tonne road mobile, the jetty can be used for the load out of materials bound for river based projects such as jetty construction and maintenance projects. There is also a dockway that is independently served by a 70 tonne boatlift and a self propelled boat mover so that craft can be lifted out of the water and moved to adjacent ground for maintenance and or short term storage.

For information on the lift out facility and use of the jetty for load out or project support, contact:
Jetty, Yard & Pier Manager 01474 562462
or email michael.russell@pla.co.uk

For PLA Moorings contact: 01474 562421
or email: barbara.jewiss@pla.co.uk

PORT OF LONDON AUTHORITY

Making the most of the Thames

COMING TO THAMES FOR THE FIRST TIME, OR JUST LOOKING TO BRUSH UP ON YOUR LOCAL KNOWLEDGE?

THE PLA NOW HAS A WEBSITE DEDICATED TO THE RECREATIONAL BOATER. WHETHER A PADDLER OR A CRUISER ALL THE INFORMATION YOU NEED CAN BE FOUND AT:

www.boatingonthethames.co.uk

PORT OF LONDON AUTHORITY

Notes

Notes

Notes

Van Oord

Water Injection Dredger - Jetsed

Van Oord UK Ltd is a subsidiary of Van Oord nv, one of the world's largest Dredging and Marine Contractors. Within our group we employ 4,000 well-trained professionals and own a comprehensive fleet of dredging equipment, which includes a range of Water Injection Dredgers to meet the varying maintenance requirements of our Thames clients.

Van Oord UK Ltd
Lockside Place
Mill Lane, Newbury
Berks RG14 5QS United Kingdom

T +44 1635 529101
F +44 1635 521548
E infogb@vanoord.com
I **www.vanoord.com**

PORT OF LONDON
AUTHORITY

Published by:
The Port of London Authority

London River House
Royal Pier Road
Gravesend DA12 2BG
Telephone +44 (0) 1474 562200
Fax +44 1474 562281

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