

TIDE TABLES AND PORT INFORMATION 2020



PORT OF
LONDON
AUTHORITY

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PORT OF LONDON AUTHORITY

Handbook of Tide Tables and Port Information

2020

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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 more than 300 skilled staff within the organisation and our Hydrographic department, which prepares these tide tables annually, is renowned as a centre of excellence in the UK ports industry.

We operate two Vessel Traffic Services (VTS) Centres at Gravesend and adjacent to the Thames Barrier. We also crew survey vessels, harbour patrol launches and salvage craft.

Our Priorities

The River Thames is by some margin the UK's busiest waterway for passengers and freight. It is one of the main arteries that feeds our capital city and the south east, supporting trade, travel, leisure and sporting activities.

As custodians of the tidal Thames, everything we do is designed to ensure that the river is, and remains, at its best. Our mission is to maintain a safe river to support London and the south east in a wide range of activities, at work, rest and play.

We work closely with many valued partners and stakeholders to ensure the river plays the maximum possible part in generating jobs and wealth for the country. We pay the same high level of attention to helping maintain the Thames environment and the wildlife it supports, for the benefit and enjoyment of many generations to come.

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.

MAKING THE MOST OF THE THAMES



Visiting the tidal Thames or brushing-up your local knowledge? Visit the Port of London Authority's dedicated website for recreational boaters first. Whether you're a paddler or a cruiser, all the information you'll need is at:

**PORT OF
LONDON**
AUTHORITY

www.boatingonthethames.co.uk

www.pla.co.uk

**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 29 March 2020 to 0100 25 October 2020.

The DATUM or zero of the predictions for tidal information in this publication 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 publication, predictions are also available on the PLA Website (pla.co.uk) in a user customisable format.

The tidal predictions (including sun and moon data) are © Crown Copyright and/or subject to database rights. Reproduced by permission of the Controller of Her Majesty's Stationery Office and the UK Hydrographic Office (www.gov.uk/hydro).

The information in this publication is correct at the time of going to press (October 2019). The PLA does not accept responsibility in law for the information in these tables.

Further information can be obtained from
www.pla.co.uk/hydrohomepage

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.

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PORT OF LONDON AUTHORITY

Chief Executive Robin Mortimer

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Marine Surveyor	Tom Parham	01474 562441

PRINCIPAL OFFICES

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London EC3R 8HL
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Chief Executive
Harbour Master Upper District

London River House

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Gravesend
Kent DA12 2BG
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Fax: 01474 562281

Chief Harbour Master
Harbour Master Lower District
Hydrographic Services
Navigation Systems
Civil Engineering
Planning & Environment
Corporate Affairs
Finance & Human Resources

Marine House

Mark Lane
Gravesend
Kent DA12 2PL
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Fax: 01474 562403

Marine Services
Marine Engineering
Marine Stores
Vessel Survey

London VTS (Crayfordness to the Eastern Limits of the VTS Area)

Royal Pier Road
Gravesend
Kent DA12 2BG
Tel: 01474 560311
Fax: 01474 352996
VHF: See Port Communications page.

Vessel Traffic Services

London VTS (Crayfordness to Teddington)

34 Bowater Road
SE18 5TF
Tel: 0203 2607711
VHF: See Port Communications page.

Vessel Traffic Services London

Communication with VTS via VHF and telephone, as well as AIS and RADAR data, is recorded to support the Harbour Master in carrying out statutory functions and for the purpose of promoting maritime safety, crime prevention and public safety.

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. London VTs has a comprehensive Traffic Image of the entire VTs Area based on radar from the seaward limits of the VTs Area to Greenwich and AIS coverage throughout the area.

MARINE SAFETY MANAGEMENT SYSTEM

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

Information about the Marine 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 safetymanagement@pla.co.uk

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

- Port of London Act 1968 (*as amended*)
- General Directions for Navigation in the Port of London
- Port of London Pilotage Directions
- Port of London Thames Byelaws
- Port of London Vessel Licensing Byelaws
- Dangerous Substances in Bulk Byelaws
- Permanent Notices to Mariners
- Notices to Mariners (*as promulgated*)
- Notices to Agents, Berth and Ship Operators (*as promulgated*)
- Safety Bulletins (*as promulgated*)
- Code of Practice for Ship Towage Operations on the Thames
- Code of Practice for the Safe Mooring of Vessels on the Thames
- Code of Practice for Craft Towage on the Thames
- Code of Practice for Passenger Vessel Operations on the Thames
- Code of Practice for the Management and Operation of Commercial Vessels on the Thames
- Tidal Thames Recreational Users Guide
- The Tideway Code
- Guidance to Berth Operators on the Thames
- Mariners Guide to Bridges on the Tidal Thames
- Houseboat Mooring Guidance

Some of the above documents are published, but all are free to download from the PLA's website – with the exception of the Bridges Guide.

PORT COMMUNICATIONS

"Sunk VTS" (Sunk Inner Precautionary Area & TSS) Run by the MCA from CNIS Dover
V.H.F. Channels 14*, 9

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

V.H.F. Channels 69*, 18
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
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
Tidal Information Silvertown, Charlton & Tower Pier
Telephone: 0203 260 7711

"Medway VTS" (River Medway and approaches)

Run by Medway Ports from Sheerness

V.H.F. Channels 73, 74*, 16 & 22
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 and for requesting pilots are to be found in the current General Directions for Navigation in the Port of London or Pilotage directions as appropriate.

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. Notifications should be sent using the port's on-line booking service (PISCES).
- 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 an ETA for 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 an updated ETA for Knock John No 1 Buoy.

Ships requiring Pilots:

- a) A request for a pilot, including ETA at the pilot station should be passed to the PCC (Shipcon), with the 24 hours notice of arrival.
- b) A **CONFIRMED** order for a pilot must be given at least 8 hours before arrival at the Sunk Pilot Station or 6 hours before arrival at the NE Spit or Warp pilot 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. Notifications should be sent using the port's on-line booking service (PISCES).
- 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 and request permission to proceed.
- 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 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 or a ULCS vessel is involved. (See GD 25 and 38), 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 should navigate outside the buoy line without restrictions, but should ensure that other traffic and London VTS are informed.

Princes Channel

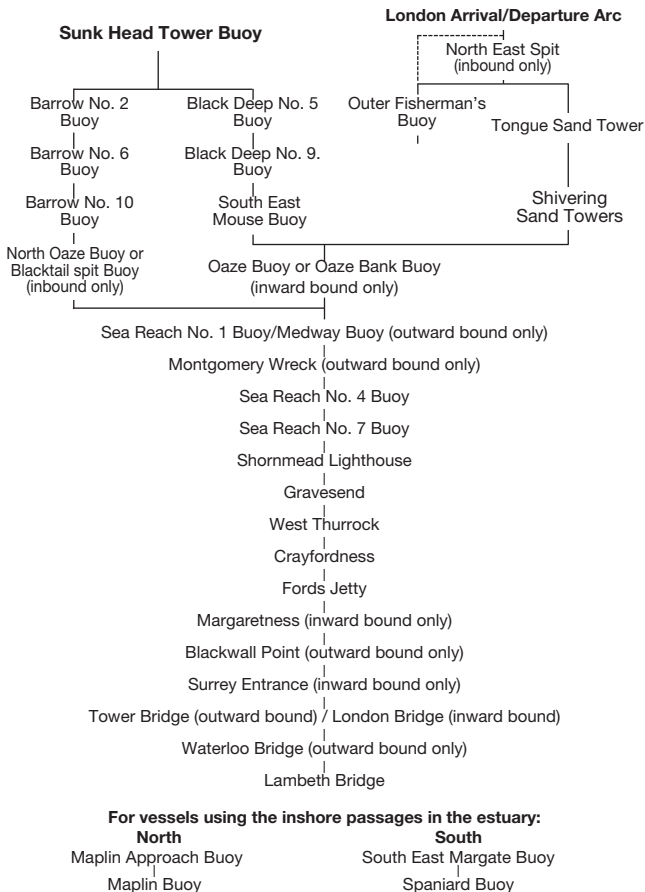
Reporting Vessels navigating in the Princes Channel are subject to the following traffic management procedures as per GD 15:

- 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 with the 24 hours notice of departure is given.
- b) A **CONFIRMED** order for a pilot must be given to PCC at least 6 hours before departure or movement (unless the services of a River Pilot only is required as far as Gravesend or Sea Reach 1 when 4 hours notice is required.

REPORTING POINTS (WAYPOINTS)



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.

Dover Coastguard

Dover Coastguard 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 of all SAR 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 watch 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 frequency 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 mindful 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 (Recording Tide Gauge)	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	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	15.61
7.76	Thames Refinery Inner/ Outer (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	Margarettness 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	Vopak 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 (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
28.67	West Blyth Buoy	5.54
29.20	London Gateway (L/end) (Recording Tide Gauge)	6.07
30.50	Coryton No. 5 Jetty	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
33.72	Sea Reach No. 7 Buoy (North)	10.54
34.29	East Blyth Buoy	11.16
35.55	Sea Reach No. 6 Buoy (North)	12.42
36.08	Crowstone — London Stone Line	12.95
36.55	Sea Reach No. 5 Buoy (North)	13.42
37.57	Southend Pier Head (Recording Tide Gauge)	14.44
38.29	Sea Reach No. 4 Buoy (North)	15.16
40.00	Sea Reach No. 3 Buoy (North)	16.87
41.85	Sea Reach No. 2 Buoy (North)	18.72
43.67	Sea Reach No. 1 Buoy (North) — PLA former seaward limit	20.54

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 Outer 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
Barking Creek Entrance	North Side Barking Reach	2 hours
Thamesmead	South Side Barking Reach	4 hours
Halfway	South Side Halfway 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 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	} Administered 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 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)
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From Phoenix Unit

A	51° 30.367	0° 44.471	1.67	8.2	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	12.4	199.5	0.49
D	51° 29.968	0° 46.236	1.67	11.9	161	0.53
E	51° 29.950	0° 46.789	1.67	11.5	135	0.73
F	51° 29.928	0° 47.329	1.67	11.8	122.5	1.01

From Shoebury Beacon

Z1	51° 29.742	0° 47.715	1.67	14.1	240	1.11
Z2	51° 29.731	0° 48.349	2.00	12.9	225	0.80
Z3	51° 29.777	0° 49.155	2.50	12.1	183	0.54
Z4	51° 29.841	0° 49.998	1.67	11.1	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	11.0	103	1.21
Z7	51° 30.084	0° 51.722	1.67	10.6	098	1.56
Z8	51° 30.180	0° 52.238	1.67	11.0	093.5	1.87

From Blacktail Bn W

Z9	51° 30.240	0° 52.864	1.67	10.9	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	13.8	144	0.73
W2	51° 31.193	0° 57.123	2.50	14.3	102.5	1.23

From S.S. North Tower

K3	51° 30.360	1° 04.000	2.60	12.6	310.0	0.63
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GREAT NORE

Refer to Medway Ports Authority

RIVER THAMES – DESIGNATED ANCHORAGE BERTHS Cont'd

- Notes 1. W1 & 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 visibility as per the Pilotage Direction. Usable in clear visibility 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 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 particular, 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, Reporting Vessels are permitted to wait for a berth in the Thames only:
 - a) at a mooring allocated to the vessel by the 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 the 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

- j) *"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;
- l) *"Fairway"* means a regular course or track of shipping, comprising all marked and/or charted navigable channels within the Thames and includes the following areas:
 - i) The Fisherman's Gat;
 - ii) The Princes Channel from the Tongue Sand Towers to the Oaze Precautionary Area;
 - iii) The Black Deep and Knock John Channels from the seaward limit to the Oaze Precautionary Area;
 - iv) The Barrow Deep and Mouse Channels from the seaward limit to the Warp;
 - v) The East and West Swin Channels from the seaward limit to the Warp;
 - vi) The Warp;
 - vii) The Oaze Precautionary Area; and
 - viii) The Thames to the west of Sea Reach No. 1 Buoy.

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.	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

Latest Depth Information

<i>Name of Mooring</i>	<i>Ship Length (m)</i>	<i>Date of Survey</i>	<i>Ruling Depth</i>
Tower Bridge Upper Mooring	158	19/12/18	5.7m
George's Stairs Tier	65/75/120	19/12/18	5.3m /5.2m
Greenwich Tier	128/208	21/11/17	8.1m
E. Woolwich Upper Tier	113	26/09/18	7.2m
Thamesmead Tier	100	19/07/18	5.8m
Erith Swing Mooring	95	12/10/18	4.9m
Erith Tier	122	12/10/18	7.0m
Greenhithe Swing Mooring	94	06/08/19	6.5m
Denton Small Ship Mooring	82	11/09/18	5.6m

Port of London Authority

Hydrographic Service

www.pla.co.uk/hydrohomepage

www.pla.co.uk/chartproducts

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.

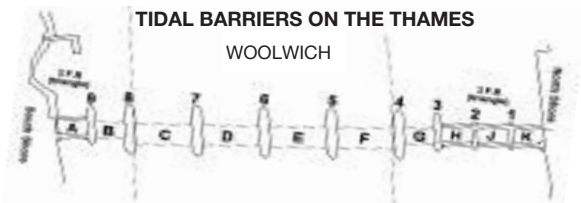
3. More precise information can be obtained by direct reference to the Port of Tilbury Harbour Master, Tel: Tilbury (01375) 852447.

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 navigational procedures in the **TBCZ** are contained in **General Direction 27 and Appendix** for Navigation in the Port of London.

The availability of spans for navigation are marked as follows
 Red St. Andrew's Crosses (Lt) from Piers = Barrier or Span Closed.
 Green Arrows (Lt) from Piers = Span Open.

In low visibility, high-intensity directional fixed white lights operate on either side of spans C, D, E and F in conjunction with the green arrows. The intensity of these lights is variable and may be adjusted on request to London VTS at TBNC

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 Royal Wharf unless intending to pass through the Barrier.

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 the span marked by Green Arrows furthest to the starboard side of the channel.

Vessels fitted with a working engine should use motor power to navigate through the Thames Barrier.

BARKING CREEK	MHWS clearance 33.3m	} Creek Barriers show F.I.R. when closed.
DARTFORD CREEK	MHWS clearance 12.0m	
EASTHAVEN CREEK	MHWS clearance 3.2m	
FOBBING CREEK	MHWS clearance 9.2m	
BENFLEET CREEK	MHWS clearance 1.5m	

THAMES BRIDGE CLEARANCES

Minimum Headway of NAVIGABLE ARCH in METRES above:

Bridge Name (Quoted Arch)	Chart Datum	MHWS	MHWN	MLWN	MLWS	HAT
Snapper (1)	5.4	2.9	3.9	5.4*	5.4*	2.1
Richmond (3)	7.9	5.5	6.5	7.9*	7.9*	4.7
Richmond Railway (2)	8.0	5.5	6.5	8.0*	8.0*	4.8
Twickenham (2)	8.5	6.1	7.1	8.5*	8.5*	5.3
Richmond Foot** (2)	10.5	5.7	6.7	10.2	10.4	5.0
Lots Ait Footbridge	9.0	3.9	4.9	8.6	8.8	3.2
Kew (2)	10.4	5.2	6.3	10.0	10.2	4.6
Kew Railway (4)	10.9	5.5	6.6	10.3	10.6	4.9
Chiswick (2)	12.0	6.6	7.7	11.5	11.8	6.0
Barnes Railway (2)	10.9	5.4	6.5	10.3	10.7	4.8
Hammersmith (South) (2)	9.3	3.5	4.6	8.6	9.0	2.9
Putney (3)	11.3	5.2	6.3	10.4	10.9	4.7
Fulham Railway (3)	12.7	6.6	7.8	11.9	12.4	6.1
Wandsworth (2)	11.8	5.7	6.8	11.0	11.5	5.1
Battersea Railway (3)	12.1	5.9	7.1	11.3	11.9	5.4
Battersea (3)	11.8	5.4	6.6	10.9	11.4	5.0
Albert (2)	11.5	5.2	6.4	10.6	11.2	4.7
Chelsea (2)	12.9	6.4	7.6	12.0	12.6	6.0
Victoria Railway (2)	12.4	5.9	7.1	11.4	12.0	5.4
Vauxhall (3)	12.2	5.6	6.8	11.2	11.9	5.1
Lambeth (3)	13.0	6.3	7.5	11.8	12.6	5.8
Westminster (4)	12.2	5.3	6.5	10.9	11.7	4.8
Charing Cross Railway (3)	13.8	6.9	8.1	12.5	13.3	6.4
Waterloo (3)	15.4	8.5	9.7	14.1	14.9	8.0
Blackfriars (3)	14.0	6.9	8.2	12.6	13.4	6.5
Blackfriars Railway (3)	14.0	6.9	8.2	12.6	13.4	6.5
Millennium Foot (2)	15.8	8.8	10.0	14.4	15.3	8.3
Southwark (3)	14.2	7.2	8.4	12.8	13.7	6.7
Cannon Street Railway (3)	14.1	7.1	8.3	12.7	13.6	6.6
London Bridge (2)	15.8	8.6	9.9	14.3	15.2	8.1
Tower (Closed) (2)	15.6	8.5	9.7	14.1	15.1	8.0
Tower (Open) (2)	49.6	42.4	43.7	48.1	49.0	41.9
London Cable Car	67.6	60.4	61.6	66.0	66.9	59.8
QE2 (5)	60.7	53.9	55.1	59.1	60.0	53.4

BOW CREEK BRIDGE CLEARANCES

Minimum Headway of NAVIGABLE ARCH in METRES above:

Bridge Name (Quoted Arch)	Chart					
	Datum	MHWS	MHWN	MLWN	MLWS	HAT
Lower Lea Crossing	16.5	9.2	10.5	14.8	15.8	8.7
Leamouth Lifting						
Footbridge (Lowered)	12.3	5.0	6.3	10.6	11.6	4.5
Leamouth Lifting						
Footbridge (Raised)	16.5	9.2	10.5	14.8	15.8	8.7
Docklands Light Railway	16.2	8.9	10.2	14.5	15.5	8.4
Canning Town Old Railway	12.1	4.8	6.1	10.4	11.4	4.3
Dock Road Foot	13.3	6.0	7.3	11.6	12.6	5.5
Canning Town Road	12.3	5.0	6.3	10.6	11.6	4.5
Barge Dock Foot	16.8	9.5	10.8	15.1	16.1	9.0
Alisa Wharf	12.5	5.2	6.5	10.8	11.8	4.7
Twelve Trees Road	12.1	4.8	6.1	10.4	11.4	4.3
Bow Locks Foot	12.2	4.9	6.2	10.5	11.5	4.4
District Line Rail	10.3	3.0	4.3	8.6	9.6	2.5
Hammersmith & City Rail	10.3	3.0	4.3	8.6	9.6	2.5
Channelsea Island Foot	10.4	3.1	4.4	8.7	9.7	2.6

DEPTFORD CREEK BRIDGE CLEARANCES

Minimum Headway of NAVIGABLE ARCH in METRES above:

Bridge Name	Chart					
	Datum	MHWS	MHWN	MLWN	MLWS	HAT
Deptford Swing (Closed)	10.2	2.9	4.2	8.6	9.5	2.4
Deptford Creek Lifting (Cl)	9.9	2.6	3.9	8.2	9.2	2.1
Deptford Rail	12.3	5.0	6.3	10.6	11.6	4.5
Deptford Creek Foot	10.1	2.8	4.1	8.4	9.4	2.3
Docklands Light Railway (x3)	12.5	5.2	6.5	10.8	11.8	4.7

* 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 34.

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** and in the PLA "Mariner's 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 MLWS	Mean Low Water Neaps MLWN	Mean High Water Neaps MHWN	Mean High Water Springs MHWS	Highest Astronomical Tide (HAT)
WALTON	2.16	0.5	1.1	3.5	4.3	4.7
MARGATE	2.50	0.6	1.3	4.0	4.8	5.1
SHIVERING SAND	-	0.6	1.4	4.4	5.4	5.7
SOUTHEND	2.90	0.6	1.4	4.8	5.9	6.3
CANVEY	2.97	0.6	1.4	5.0	6.1	6.6
CORYTON	3.05	0.6	1.5	5.1	6.2	6.7
TILBURY	3.12	0.6	1.5	5.4	6.6	7.0
GREENHITHE	3.20	0.6	1.6	5.6	6.7	7.2
DAGENHAM	3.28	0.6	1.6	5.8	7.0	7.5
NORTH WOOLWICH	3.35	0.6	1.6	5.9	7.2	7.7
TOWER	3.20	0.5	1.5	5.9	7.1	7.6
BLACKFRIARS	3.05	0.5	1.4	5.8	7.0	7.5
WESTMINSTER	2.90	0.5	1.3	5.7	6.9	7.4
VAUXHALL	2.59	0.3	1.0	5.4	6.6	7.1
VICTORIA RAIL	2.44	0.3	0.9	5.3	6.5	6.9
ALBERT BRIDGE	2.29	0.3	0.9	5.1	6.3	6.8
WANDSWORTH	2.13	0.3	0.9	5.0	6.2	6.7
PUTNEY	1.98	0.3	0.8	4.9	6.1	6.6
HAMMERSMITH	1.68	0.3	0.7	4.7	5.8	6.4
BARNES	1.37	0.2	0.6	4.4	5.5	6.1
CHISWICK	1.22	0.2	0.5	4.3	5.3	6.0
KEW	1.07	0.2	0.5	4.2	5.2	5.9
BRENTFORD	0.91	0.1	0.4	4.0	5.0	5.7
RICHMOND	0.61	0.1	0.2	3.8	4.8	5.5
TWICKENHAM	Note 3	-		1.5	2.5	3.2

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.

RICHMOND LOCK & WEIR

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 charge. This information can also be found in the PLA Charges book, or on the LED screen at Richmond Lock. Predicted times and heights of high and low waters are available for Richmond Lock at www.pla.co.uk

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
Westminster Bridge	add 0 10	add 0 30
Greenland Dock Entrance	sub 0 9	sub 0 14

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

DRYING OUT FACILITIES IN THE UPPER DISTRICT



The PLA has two drying out facilities in the Upper District; Strand-on-the-Green Grid and Isleworth Drawdock

Isleworth Drawdock is a stretch of vertical river wall with regularly spaced piles and a riverbed suitable for taking the ground (for appropriate vessels), that is directly accessible by road. Isleworth is practically unlimited in the size of vessel it can accommodate.

The Drawdock is available as either a full length or half-length berth (suitable for vessels up to 18m in length). Vessels using one half of Isleworth Drawdock will be charged **£40** per 24 hours or part thereof. Vessels wishing to use either the full length of the drawdock or who moor across the centre line dividing the berths will be charged **£60** per 24 hours or part thereof.

Strand-on-the-Green grid is a timber grid suitable for smaller vessels, but without road access. The grid is limited to flat bottomed vessels of 25m length, 9m beam and a displacement of 200 tons.

All vessels, regardless of size, draught or displacement, will be charged **£60** per 24 hours or part thereof to use Strand on the Green Grid.

Locations of our drying out facilities can be found on our website under About Us \ Moorings, or using our interactive map on **www.boatingonthethames.co.uk**



To book call the Harbour Service Upper crew who may be contacted 7 days a week between 0700 and 1700 on **07711 640 095**.
www.pla.co.uk

PLA Tide Tables

including
Sunrise & Sunset



Moonrise & Moonset
for 2020

on pages 38 - 91

8
W

0332 1.0
0933 3.8
1551 0.8
2207 3.9

0403 1.2
0959 4.2
1620 1.0
2232 4.4

0413 1.1
1007 4.7
1629 1.0
2241 4.8

0428 1.2
1024 5.2
1646 1.0
2256 5.3

0456 1.3
1056 5.8
1713 1.1
2329 5.9

0524 1.4
1127 6.4
1741 1.1
2358 6.5

0551 1.3
1149 6.4
1809 1.1

8
W

9
TH

0420 0.8
1023 3.9
1635 0.8
2254 4.0

0452 1.0
1048 4.4
1705 0.9
2316 4.5

0503 0.9
1057 4.9
1715 0.9
2328 5.0

0521 1.0
1113 5.4
1733 0.9
2344 5.4

0552 1.0
1148 6.1
1803 1.0

0623 1.1
1219 6.7
1833 1.0

0019 6.5
0649 1.0
1241 6.7
1904 1.0

9
TH

10
F O

0506 0.6
1109 4.1
1717 0.7
2340 4.1

0538 0.8
1134 4.5
1747 0.9
2358 4.6

0550 0.7
1143 5.1
1758 0.8

0609 0.8
1200 5.6
1815 0.9

0019 6.1
0644 0.8
1236 6.3
1847 0.9

0048 6.7
0716 0.8
1307 7.0
1921 1.0

0110 6.7
0745 0.8
1329 7.0
1958 0.9

10
F O

11
SA

0551 0.5
1155 4.3
1758 0.7

0622 0.7
1219 4.7
1828 0.8

0013 5.1
0634 0.5
1230 5.2
1839 0.7

0030 5.6
0655 0.6
1247 5.8
1855 0.8

0106 6.3
0733 0.6
1322 6.5
1929 0.9

0136 6.9
0807 0.7
1354 7.2
2007 0.9

0156 6.8
0839 0.6
1415 7.1
2050 0.9

11
SA

12
SU

0025 4.2
0636 0.4
1241 4.4
1840 0.7

0039 4.7
0706 0.5
1306 4.8
1909 0.8

0057 5.2
0719 0.4
1316 5.4
1922 0.7

0115 5.7
0741 0.5
1332 6.0
1937 0.8

0150 6.4
0820 0.5
1408 6.7
2012 0.8

0222 7.0
0856 0.5
1439 7.3
2053 0.9

0241 6.9
0930 0.4
1500 7.3
2139 0.8

12
SU

13
M

0110 4.3
0722 0.3
1326 4.4
1923 0.7

0123 4.7
0750 0.4
1354 4.8
1953 0.8

0141 5.3
0804 0.3
1402 5.4
2006 0.7

0200 5.8
0826 0.3
1418 6.0
2021 0.8

0234 6.4
0906 0.4
1453 6.8
2058 0.8

0306 7.0
0943 0.3
1525 7.4
2138 0.8

0325 7.0
1018 0.3
1545 7.3
2224 0.8

13
M

14
TU

0154 4.3
0808 0.2
1413 4.4
2009 0.7

0207 4.8
0836 0.4
1442 4.8
2037 0.8

0225 5.3
0850 0.2
1449 5.4
2052 0.8

0244 5.8
0911 0.3
1505 6.0
2107 0.8

0318 6.4
0950 0.3
1540 6.7
2145 0.8

0349 7.0
1027 0.3
1610 7.4
2223 0.8

0407 7.0
1102 0.2
1630 7.3
2305 0.8

14
TU

15
W

0239 4.2
0855 0.2
1501 4.3
2057 0.8

0252 4.7
0923 0.4
1530 4.7
2124 0.9

0309 5.2
0935 0.3
1537 5.3
2139 0.9

0327 5.7
0956 0.3
1552 5.8
2155 0.9

0402 6.4
1034 0.3
1627 6.6
2232 0.9

0432 6.9
1108 0.3
1657 7.2
2307 0.9

0449 6.9
1142 0.2
1716 7.1
2345 0.8

15
W

JANUARY 2020

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 TH	0325	4.1	0338	4.6	0354	5.1	0412	5.6	0447	6.2	0516	6.8	0533	6.8
	0945	0.3	1012	0.5	1022	0.4	1042	0.4	1118	0.4	1148	0.4	1221	0.3
	1551	4.1	1620	4.5	1627	5.1	1642	5.6	1717	6.3	1746	7.0	1805	6.9
	2148	0.9	2213	1.0	2227	1.0	2244	1.0	2320	1.0	2353	1.0		
17 F C	0414	4.0	0427	4.5	0443	5.0	0500	5.5	0535	6.1	0603	6.7	0626	1.0
	1040	0.4	1105	0.6	1112	0.5	1131	0.5	1204	0.5	1232	0.5	0620	6.7
	1647	3.9	1714	4.4	1721	4.9	1737	5.4	1811	6.1	1839	6.7	1303	0.4
	2246	1.0	2309	1.2	2321	1.1	2338	1.2					1859	6.7
18 SA	0509	3.9	0524	4.4	0538	4.9	0556	5.3	0611	1.2	0643	1.2	0114	1.2
	1139	0.5	1205	0.7	1209	0.6	1227	0.7	0630	6.0	0657	6.5	0715	6.5
	1749	3.8	1818	4.2	1821	4.7	1838	5.2	1256	0.7	1325	0.7	1352	0.7
	2351	1.1							1909	5.9	1939	6.5	2000	6.5
19 SU	0614	3.8	0616	1.3	0624	1.3	0641	1.3	0111	1.3	0142	1.4	0211	1.3
	1243	0.6	0632	4.3	0642	4.8	0702	5.2	0733	5.8	0801	6.4	0821	6.4
	1858	3.7	1311	0.8	1315	0.8	1329	0.8	1355	0.9	1426	0.9	1452	0.9
			1927	4.2	1929	4.6	1945	5.1	2014	5.7	2043	6.3	2104	6.3
20 M	0102	1.1	0133	1.3	0139	1.3	0151	1.3	0219	1.4	0252	1.5	0320	1.4
	0727	3.7	0745	4.3	0754	4.7	0814	5.1	0843	5.7	0912	6.3	0931	6.4
	1348	0.7	1418	0.9	1422	0.9	1434	0.9	1459	1.0	1533	1.1	1558	1.0
	2010	3.7	2035	4.2	2042	4.6	2057	5.0	2126	5.7	2153	6.2	2211	6.3
21 TU	0215	1.0	0246	1.2	0254	1.2	0304	1.3	0333	1.4	0407	1.5	0435	1.4
	0838	3.8	0857	4.3	0907	4.7	0926	5.1	0955	5.8	1023	6.3	1041	6.4
	1455	0.8	1522	1.0	1528	1.0	1542	1.0	1609	1.0	1641	1.1	1708	1.1
	2118	3.8	2141	4.2	2150	4.7	2207	5.1	2237	5.8	2305	6.3	2322	6.3
22 W	0326	0.9	0356	1.1	0404	1.0	0420	1.1	0453	1.2	0524	1.3	0554	1.2
	0940	3.9	1005	4.4	1013	4.8	1031	5.3	1102	5.9	1131	6.5	1149	6.5
	1557	0.8	1621	1.0	1629	0.9	1646	1.0	1719	1.0	1751	1.1	1823	1.0
	2215	3.9	2238	4.4	2249	4.8	2306	5.3	2337	5.9				

23 TH	0429 0.7 1034 4.0 1649 0.8 2303 4.0	0459 0.9 1103 4.5 1713 1.0 2325 4.5	0507 0.8 1110 5.0 1721 0.9 2338 5.0	0526 0.9 1126 5.4 1741 1.0 2355 5.4	0601 0.9 1158 6.1 1816 1.0	0007 6.5 0633 1.0 1229 6.7 1850 1.0	23 TH	0026 6.5 0702 0.9 1249 6.7 1922 0.9
24 F •	0521 0.6 1120 4.1 1732 0.8 2345 4.1	0551 0.7 1150 4.5 1755 0.9	0559 0.6 1157 5.1 1806 0.9	0621 0.7 1213 5.6 1827 0.9	0027 6.0 0656 0.7 1246 6.2 1903 1.0	0059 6.6 0730 0.8 1318 6.9 1939 1.0	24 F •	0119 6.6 0758 0.7 1339 6.9 2010 0.9
25 SA	0605 0.4 1202 4.1 1810 0.8	0005 4.5 0634 0.6 1232 4.6 1832 0.9	0020 5.0 0644 0.5 1239 5.1 1846 0.9	0037 5.5 0708 0.6 1255 5.7 1906 0.9	0110 6.1 0744 0.6 1329 6.3 1944 0.9	0143 6.7 0819 0.7 1401 7.0 2020 1.0	25 SA	0204 6.7 0846 0.6 1423 7.0 2053 0.9
26 SU	0024 4.1 0645 0.4 1241 4.1 1845 0.8	0040 4.6 0712 0.6 1310 4.6 1907 0.9	0057 5.1 0724 0.5 1317 5.2 1922 0.9	0115 5.6 0738 0.5 1334 5.7 1941 0.9	0149 6.2 0825 0.6 1409 6.4 2019 1.0	0222 6.8 0900 0.7 1440 7.0 2053 1.1	26 SU	0243 6.8 0928 0.5 1503 7.0 2130 1.0
27 M	0101 4.1 0720 0.4 1319 4.1 1918 0.8	0114 4.6 0747 0.6 1345 4.5 1940 0.9	0132 5.1 0759 0.5 1354 5.1 1955 0.9	0150 5.6 0822 0.5 1411 5.7 2011 0.9	0225 6.2 0859 0.6 1447 6.3 2049 1.0	0257 6.8 0932 0.7 1517 7.0 2122 1.1	27 M	0318 6.8 1004 0.6 1539 6.9 2202 1.0
28 TU	0135 4.1 0751 0.4 1355 4.0 1947 0.8	0149 4.6 0817 0.6 1420 4.5 2012 1.0	0206 5.1 0829 0.6 1430 5.0 2026 0.9	0225 5.6 0847 0.6 1447 5.6 2040 1.0	0259 6.2 0925 0.6 1522 6.2 2117 1.0	0330 6.8 0955 0.7 1551 6.9 2152 1.0	28 TU	0350 6.8 1033 0.6 1611 6.8 2229 1.0
29 W	0207 4.1 0820 0.5 1430 3.9 2016 0.9	0224 4.6 0847 0.7 1453 4.4 2044 1.0	0240 5.1 0857 0.6 1505 4.9 2058 1.0	0258 5.5 0912 0.6 1522 5.4 2111 1.0	0331 6.1 0949 0.7 1555 6.1 2148 1.0	0401 6.7 1020 0.7 1623 6.7 2224 1.1	29 W	0420 6.7 1055 0.7 1642 6.7 2257 1.0
30 TH	0240 4.0 0848 0.5 1505 3.8 2049 0.9	0258 4.5 0917 0.7 1527 4.3 2119 1.1	0314 5.0 0927 0.7 1539 4.8 2132 1.1	0331 5.4 0941 0.7 1555 5.2 2144 1.1	0402 6.0 1016 0.7 1627 5.9 2219 1.1	0432 6.6 1049 0.7 1654 6.5 2256 1.2	30 TH	0451 6.6 1119 0.7 1713 6.5 2327 1.1
31 F	0314 3.9 0919 0.6 1540 3.7 2125 1.0	0332 4.4 0950 0.8 1601 4.1 2156 1.2	0347 4.9 0959 0.8 1614 4.6 2208 1.2	0403 5.2 1011 0.8 1629 5.0 2218 1.2	0433 5.9 1044 0.8 1700 5.7 2249 1.3	0503 6.5 1117 0.9 1726 6.3 2327 1.3	31 F	0522 6.5 1145 0.8 1745 6.3 2357 1.3

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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 SA	0350 3.8 0956 0.7 1619 3.5 2208 1.1	0408 4.3 1028 1.0 1639 4.0 2239 1.4	0422 4.7 1034 0.9 1652 4.5 2249 1.4	0437 5.1 1043 0.9 1706 4.9 2255 1.4	0507 5.7 1111 1.0 1737 5.5 2323 1.4	0555 6.3 1212 1.0 1821 6.1
2 SU	0433 3.6 1041 0.9 1708 3.4 2303 1.3	0450 4.1 1114 1.1 1724 3.9 2333 1.5	0503 4.5 1116 1.1 1738 4.3 2340 1.5	0519 4.9 1119 1.1 1753 4.7 2342 1.6	0548 5.5 1144 1.2 1824 5.3	0615 6.1 1215 1.2 1847 5.9
3 M	0527 3.5 1144 1.0 1813 3.4	0541 4.0 1214 1.3 1824 3.8	0555 4.4 1214 1.3 1838 4.2	0612 4.7 1210 1.3 1853 4.6	0642 5.4 1233 1.4 1925 5.2	0721 5.9 1327 1.3 2002 5.7
4 TU	0637 3.4 1312 1.1 1924 3.4	0648 3.9 1331 1.3 1950 3.8	0702 4.3 1337 1.4 1953 4.2	0721 4.6 1334 1.5 2007 4.6	0753 5.3 1346 1.5 2037 5.2	0830 5.7 1429 1.5 2129 5.7
5 W	0153 1.2 0752 3.4 1424 1.0 2036 3.5	0214 1.5 0814 3.9 1448 1.3 2106 4.0	0222 1.5 0821 4.3 1456 1.3 2112 4.4	0232 1.6 0839 4.7 1508 1.4 2123 4.8	0247 1.7 0909 5.4 1526 1.5 2152 5.4	0327 1.8 1004 5.8 1616 1.5 2245 5.9
6 TH	0259 1.0 0902 3.6 1524 0.9 2142 3.7	0327 1.3 0927 4.1 1551 1.1 2207 4.2	0337 1.2 0935 4.5 1601 1.1 2216 4.7	0351 1.3 0950 5.0 1615 1.2 2229 5.1	0417 1.4 1020 5.6 1641 1.3 2302 5.7	0510 1.5 1115 6.2 1733 1.3 2352 6.3
7 F	0356 0.8 1001 3.8 1616 0.8 2236 3.9	0427 1.0 1027 4.3 1644 1.0 2258 4.4	0438 0.9 1036 4.8 1655 1.0 2310 4.9	0454 1.0 1050 5.3 1712 1.0 2326 5.3	0525 1.0 1124 6.0 1743 1.1	0620 1.1 1216 6.6 1841 1.1

8 SA	0448 1053 1703 2325	0.6 4.1 0.7 4.1	0520 1120 1732 2344	0.8 4.5 0.9 4.6	0532 1128 1744 2358	0.7 5.1 0.8 5.1	0551 1144 1803 2389	0.7 5.6 0.9 0.9	0000 0626 1219 1839	6.0 0.7 6.3 0.9	0030 0657 1250 1911	6.6 0.8 7.0 1.0	8 SA	0050 0727 1311 1947	6.6 0.7 7.0 0.9
9 SU O	0537 1141 1747	0.4 4.3 0.6	0609 1209 1817	0.6 4.7 0.8	0622 1217 1830	0.4 5.3 0.7	0016 0643 1233 1850	5.6 0.5 5.9 0.8	0050 0722 1308 1931	6.2 0.5 6.6 0.8	0122 0757 1340 2009	6.9 0.5 7.2 0.9	9 SU O	0141 0828 1401 2046	6.9 0.4 7.2 0.8
10 M	0011 0624 1228 1831	4.2 0.2 4.4 0.6	0028 0855 1257 1900	4.7 0.4 4.8 0.7	0044 0708 1304 1915	5.3 0.2 5.5 0.6	0103 0732 1320 1936	5.8 0.3 6.1 0.7	0136 0813 1355 2019	6.5 0.3 6.8 0.7	0209 0851 1428 2100	7.1 0.3 7.5 0.8	10 M	0227 0922 1447 2136	7.0 0.2 7.4 0.7
11 TU	0056 0710 1314 1914	4.4 0.1 4.5 0.6	0113 0740 1345 1943	4.8 0.3 4.9 0.7	0128 0754 1350 1959	5.4 0.1 5.5 0.6	0147 0818 1407 2021	5.9 0.1 6.2 0.6	0220 0900 1441 2104	6.6 0.1 6.9 0.7	0253 0939 1513 2145	7.2 0.1 7.6 0.7	11 TU	0311 1010 1532 2221	7.2 -0.1 7.5 0.5
12 W	0140 0755 1400 1958	4.4 0.0 4.5 0.6	0157 0824 1431 2026	4.9 0.2 4.9 0.7	0211 0837 1436 2042	5.5 0.0 5.5 0.6	0230 0902 1452 2104	6.0 0.0 6.1 0.6	0304 0942 1526 2145	6.7 0.0 6.9 0.6	0336 1021 1558 2226	7.3 0.0 7.5 0.6	12 W	0353 1053 1617 2301	7.3 -0.2 7.5 0.5
13 TH	0223 0839 1446 2041	4.4 0.1 4.3 0.7	0240 0907 1516 2108	4.9 0.2 4.8 0.8	0254 0919 1521 2125	5.5 0.1 5.4 0.7	0313 0943 1537 2146	6.0 0.1 6.0 0.7	0347 1022 1612 2225	6.7 0.0 6.7 0.7	0418 1059 1642 2304	7.3 0.0 7.3 0.7	13 TH	0435 1131 1700 2338	7.3 -0.1 7.3 0.6
14 F	0306 0923 1532 2127	4.4 0.2 4.2 0.8	0322 0949 1559 2152	4.8 0.4 4.6 0.9	0337 1000 1607 2208	5.4 0.2 5.2 0.8	0355 1022 1633 2227	5.9 0.2 5.7 0.8	0429 1058 1657 2304	6.6 0.2 6.4 0.9	0459 1133 1727 2341	7.2 0.2 7.1 0.8	14 F	0516 1205 1745	7.2 0.1 7.0
15 SA C	0351 1009 1622 2218	4.2 0.3 3.9 0.9	0406 1033 1645 2240	4.7 0.5 4.4 1.0	0421 1042 1656 2255	5.3 0.4 4.9 1.0	0438 1101 1711 2312	5.7 0.4 5.4 1.0	0513 1134 1745 2345	6.4 0.4 6.1 1.0	0542 1207 1814	7.0 0.4 6.7	15 SA C	0013 0559 1238 1833	0.8 7.0 0.4 6.7

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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 SU	0441 4.0 1102 0.5 1718 3.7 2317 1.0	0456 4.5 1125 0.8 1740 4.2 2340 1.2	0511 5.0 1131 0.7 1750 4.7 2351 1.2	0528 5.4 1147 0.7 1806 5.1	0602 6.1 1216 0.7 1838 5.8	16 SU 0051 1.0 0648 6.7 1318 0.7 1927 6.4
17 M	0541 3.8 1205 0.8 1824 3.5	0600 4.3 1231 1.0 1852 4.0	0611 4.8 1234 1.0 1857 4.4	0006 1.2 0628 5.2 1247 1.0 1912 4.8	0035 1.2 0700 5.8 1311 1.1 1940 5.5	17 M 0138 1.2 0748 6.5 1411 1.1 2030 6.1
18 TU	0029 1.1 0659 3.6 1317 0.9 1944 3.4	0059 1.3 0719 4.1 1347 1.2 2008 4.0	0105 1.3 0726 4.6 1350 1.2 2016 4.4	0116 1.3 0744 4.9 1359 1.2 2030 4.7	0212 1.5 0838 6.2 1454 1.4 2121 5.9	18 TU 0242 1.4 0859 6.2 1519 1.3 2141 5.9
19 W	0153 1.0 0821 3.6 1438 1.0 2103 3.5	0225 1.3 0842 4.1 1504 1.2 2123 4.1	0230 1.3 0850 4.5 1507 1.3 2134 4.5	0238 1.4 0905 4.9 1517 1.3 2150 4.8	0333 1.6 0959 6.1 1610 1.5 2246 6.0	19 W 0400 1.5 1017 6.1 1636 1.4 2302 6.0
20 TH	0322 0.9 0930 3.7 1549 1.0 2203 3.7	0352 1.1 0959 4.2 1641 1.2 2227 4.2	0354 1.1 1005 4.7 1617 1.2 2238 4.7	0407 1.2 1021 5.1 1631 1.2 2255 5.1	0500 1.4 1118 6.3 1730 1.4 2355 6.3	20 TH 0529 1.3 1135 6.3 1800 1.3
21 F	0427 0.7 1026 3.9 1640 0.9 2252 3.9	0457 0.9 1059 4.4 1707 1.1 2317 4.4	0502 0.9 1104 4.9 1711 1.1 2328 4.9	0519 0.9 1119 5.3 1728 1.1 2345 5.3	0622 1.1 1219 6.6 1835 1.2	21 F 0013 6.3 0648 0.9 1239 6.6 1903 1.1
22 SA	0514 0.5 1111 4.0 1719 0.9 2333 4.0	0545 0.7 1145 4.5 1746 1.0 2355 4.5	0552 0.7 1150 5.0 1754 1.0	0612 0.7 1205 5.5 1813 1.0	0047 6.5 0718 0.8 1308 6.8 1924 1.1	22 SA 0107 6.5 0743 0.7 1328 6.8 1952 0.9

23 SU	0553 1150 1753	0.4 4.0 0.8	0623 1222 1818	0.6 4.5 1.0	0008 0632 1228 1830	5.0 0.6 5.1 0.9	0025 0653 1243 1851	5.4 0.6 5.6 0.9	0058 0728 1317 1928	6.1 0.6 6.3 1.0	0130 0728 1349 2004	6.7 0.7 6.9 1.0	23 SU	0150 0828 1410 2034	6.7 0.5 6.9 0.9
24 M	0009 0626 1226 1825	4.1 0.4 4.1 0.8	0026 0655 1302 1848	4.5 0.6 4.5 0.9	0042 0706 1302 1904	5.1 0.5 5.1 0.9	0100 0728 1318 1923	5.5 0.5 5.6 0.9	0134 0805 1353 2003	6.2 0.6 6.3 0.9	0207 0840 1425 2038	6.8 0.5 6.9 1.0	24 M	0228 0907 1447 2112	6.8 0.5 6.9 0.9
25 TU	0042 0656 1259 1856	4.1 0.4 4.1 0.7	0056 0723 1324 1919	4.6 0.6 4.5 0.9	0113 0735 1334 1935	5.2 0.5 5.1 0.8	0132 0756 1351 1953	5.6 0.5 5.6 0.9	0207 0834 1426 2032	6.2 0.6 6.3 0.9	0239 0908 1457 2108	6.8 0.5 6.9 1.0	25 TU	0300 0940 1519 2144	6.8 0.5 6.9 0.9
26 W	0113 0724 1332 1925	4.1 0.4 4.0 0.7	0128 0750 1354 1950	4.7 0.6 4.5 0.9	0145 0802 1406 2005	5.2 0.5 5.1 0.8	0203 0820 1423 2021	5.7 0.5 5.6 0.8	0238 0858 1457 2100	6.3 0.5 6.3 0.9	0309 0932 1527 2137	6.9 0.5 6.8 0.9	26 W	0329 1008 1547 2212	6.9 0.5 6.8 0.9
27 TH	0143 0750 1403 1952	4.1 0.4 4.0 0.7	0201 0817 1425 2021	4.6 0.6 4.5 0.9	0216 0829 1437 2036	5.2 0.5 5.0 0.9	0235 0845 1454 2051	5.6 0.5 5.5 0.8	0308 0923 1527 2129	6.3 0.5 6.2 0.9	0338 0957 1555 2207	6.9 0.5 6.8 0.9	27 TH	0357 1031 1614 2239	6.9 0.5 6.8 0.9
28 F	0213 0815 1433 2022	4.1 0.5 3.9 0.8	0234 0845 1456 2052	4.6 0.7 4.4 1.0	0247 0856 1507 2107	5.1 0.6 4.9 0.9	0305 0912 1524 2121	5.5 0.6 5.3 0.9	0337 0948 1555 2157	6.2 0.6 6.0 1.0	0407 1024 1624 2237	6.8 0.6 6.6 1.0	28 F	0426 1054 1642 2307	6.8 0.6 6.6 1.0
29 SA	0243 0841 1503 2054	4.0 0.5 3.8 0.9	0305 0914 1527 2124	4.5 0.8 4.2 1.1	0317 0924 1537 2138	5.0 0.7 4.7 1.0	0334 0938 1553 2150	5.4 0.7 5.2 1.0	0405 1012 1653 2223	6.1 0.7 5.8 1.1	0436 1049 1653 2303	6.7 0.8 6.4 1.2	29 SA	0455 1117 1712 2333	6.7 0.7 6.4 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 SU	0315 3.9 0911 0.7 1538 3.6 2131 1.0	0335 4.3 0945 0.9 1559 4.1 2200 1.2	0347 4.9 0953 0.9 1609 4.6 2211 1.2	0404 5.3 1002 0.9 1625 5.0 2219 1.2	0435 5.9 1032 0.9 1656 5.7 2247 1.3	0506 6.5 1109 0.9 1726 6.2 2326 1.3	0526 6.5 1139 0.9 1745 6.2 2358 1.3
2 M	0352 3.7 0948 0.8 1620 3.5 2216 1.1	0411 4.2 1023 1.1 1639 4.0 2246 1.3	0422 4.7 1026 1.1 1651 4.4 2254 1.3	0440 5.1 1030 1.0 1707 4.8 2257 1.3	0510 5.7 1057 1.1 1736 5.5 2323 1.4	0541 6.3 1134 1.1 1805 6.0 2359 1.5	0601 6.3 1206 1.0 1824 6.0
3 TU	0439 3.6 1040 1.0 1717 3.4 2324 1.2	0459 4.0 1116 1.3 1733 3.8 2353 1.5	0510 4.5 1113 1.3 1747 4.2 2358 1.5	0527 4.9 1114 1.3 1802 4.6 2358 1.5	0556 5.5 1138 1.3 1831 5.2	0626 6.1 1213 1.3 1857 5.8	0030 1.4 0645 6.1 1244 1.2 1914 5.7
4 W	0543 3.4 1207 1.2 1834 3.3	0602 3.9 1236 1.4 1850 3.7	0615 4.3 1234 1.5 1904 4.1	0630 4.7 1224 1.5 1917 4.5	0021 1.6 0659 5.3 1244 1.6 1946 5.1	0050 1.6 0725 5.9 1311 1.6 2011 5.6	0118 1.6 0742 5.8 1339 1.5 2030 5.5
5 TH	0108 1.2 0706 3.4 1349 1.1 1959 3.3	0128 1.5 0730 3.8 1410 1.4 2029 3.8	0133 1.5 0738 4.3 1416 1.5 2035 4.2	0139 1.6 0755 4.7 1424 1.6 2046 4.6	0152 1.7 0825 5.3 1437 1.7 2113 5.2	0209 1.8 0851 5.8 1451 1.8 2142 5.7	0230 1.7 0915 5.8 1518 1.7 2207 5.7
6 F	0229 1.0 0834 3.5 1458 1.0 2117 3.6	0256 1.2 0859 4.0 1525 1.2 2141 4.1	0304 1.3 0907 4.5 1534 1.3 2152 4.5	0317 1.3 0919 4.9 1547 1.3 2204 4.9	0341 1.4 0948 5.5 1612 1.4 2235 5.5	0406 1.6 1019 6.1 1638 1.5 2303 6.1	0433 1.5 1043 6.1 1703 1.4 2324 6.1
7 SA	0333 0.7 0942 3.8 1555 0.8 2216 3.8	0404 0.9 1009 4.3 1625 1.0 2238 4.4	0414 0.9 1016 4.8 1636 1.0 2250 4.9	0429 0.9 1029 5.3 1651 1.0 2306 5.3	0459 1.0 1101 5.9 1724 1.1 2339 5.9	0527 1.1 1131 6.6 1751 1.2	0552 1.0 1152 6.6 1819 1.1

8 SU	0429 0.4 1036 4.1 1645 0.7 2306 4.1	0501 0.7 1105 4.6 1715 0.8 2327 4.6	0512 0.6 1112 5.1 1728 0.8 2339 5.1	0531 0.6 1126 5.6 1747 0.8 2357 5.6	0607 0.6 1200 6.3 1826 0.9	0008 6.5 0638 0.7 1231 7.0 1859 1.0	0027 6.5 0710 0.6 1251 7.0 1934 0.9	8 SU
9 MO	0519 0.2 1125 4.3 1730 0.6 2351 4.3	0551 0.4 1155 4.8 1801 0.7	0604 0.3 1201 5.4 1815 0.7	0626 0.3 1216 5.9 1838 0.7	0030 6.3 0705 0.3 1251 6.7 1920 0.7	0102 6.9 0743 0.4 1322 7.3 1959 0.8	0120 6.9 0813 0.3 1342 7.3 2032 0.7	9 MO
10 TU	0606 0.1 1210 4.5 1815 0.5	0012 4.8 0637 0.3 1242 4.9 1844 0.6	0024 5.4 0650 0.1 1247 5.5 1900 0.6	0043 5.9 0715 0.1 1303 6.1 1925 0.6	0116 6.5 0757 0.1 1337 6.9 2009 0.6	0149 7.2 0837 0.1 1409 7.5 2050 0.7	0207 7.2 0906 0.0 1429 7.5 2122 0.5	10 TU
11 W	0035 4.5 0651 0.0 1256 4.5 1857 0.5	0056 4.9 0721 0.2 1328 4.9 1927 0.6	0108 5.6 0734 0.0 1332 5.6 1943 0.5	0127 6.1 0800 0.0 1348 6.2 2010 0.5	0159 6.8 0842 0.0 1422 7.0 2053 0.6	0232 7.4 0923 -0.1 1454 7.6 2135 0.6	0250 7.4 0952 -0.2 1513 7.5 2206 0.4	11 W
12 TH	0118 4.6 0733 -0.1 1340 4.5 1940 0.5	0139 5.0 0803 0.1 1412 4.9 2008 0.6	0150 5.7 0816 0.0 1416 5.6 2026 0.5	0209 6.2 0842 -0.1 1432 6.2 2051 0.5	0242 6.9 0923 -0.1 1506 6.9 2134 0.5	0314 7.5 1003 -0.1 1537 7.6 2214 0.5	0332 7.5 1034 -0.3 1556 7.5 2246 0.4	12 TH
13 F	0200 4.6 0814 0.0 1424 4.4 2022 0.5	0222 5.0 0842 0.2 1454 4.8 2049 0.7	0232 5.7 0855 0.1 1500 5.4 2106 0.6	0250 6.2 0920 0.0 1515 6.0 2131 0.6	0324 6.9 0959 0.0 1549 6.7 2210 0.6	0355 7.5 1038 0.0 1619 7.4 2249 0.6	0413 7.5 1109 -0.1 1639 7.3 2321 0.5	13 F
14 SA	0242 4.5 0854 0.2 1509 4.2 2105 0.6	0303 4.9 0920 0.4 1533 4.6 2130 0.8	0314 5.6 0932 0.3 1542 5.2 2147 0.7	0331 6.1 0954 0.2 1558 5.7 2208 0.7	0405 6.8 1030 0.3 1632 6.4 2244 0.8	0436 7.4 1107 0.2 1701 7.0 2322 0.7	0454 7.4 1140 0.2 1721 7.0 2353 0.7	14 SA
15 SU	0325 4.3 0936 0.4 1555 3.9 2152 0.7	0344 4.8 0959 0.6 1613 4.4 2215 0.9	0357 5.4 1010 0.6 1627 4.9 2230 0.9	0413 5.8 1027 0.5 1643 5.4 2247 0.9	0448 6.5 1059 0.6 1715 6.0 2319 1.0	0517 7.1 1135 0.6 1744 6.6 2355 1.0	0536 7.1 1207 0.5 1805 6.6	15 SU

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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 ☾	0413	4.0	0432	4.5	0445	5.1	0501	5.5	0534	6.1	0602	6.8	0625	0.9	16 M ☾
	1025	0.7	1046	0.9	1055	0.9	1107	0.9	1135	0.9	1208	1.0	0623	6.8	
	1647	3.6	1703	4.1	1718	4.6	1733	5.0	1804	5.6	1831	6.2	1241	0.9	
	2248	0.9	2313	1.1	2322	1.1	2335	1.1					1853	6.2	
17 TU	0513	3.7	0534	4.2	0545	4.7	0600	5.1	0603	1.2	0634	1.2	0106	1.2	17 TU
	1127	1.0	1152	1.2	1155	1.3	1204	1.3	0631	5.8	0656	6.4	0719	6.4	
	1751	3.4	1815	3.9	1824	4.3	1838	4.7	1229	1.3	1257	1.4	1329	1.3	
	2359	1.0							1905	5.3	1929	5.9	1952	5.9	
18 W	0634	3.5	0632	1.3	0635	1.3	0643	1.3	0106	1.4	0133	1.5	0204	1.4	18 W
	1244	1.2	0857	4.0	0703	4.4	0717	4.8	0744	5.5	0808	6.0	0830	6.0	
	1915	3.3	1318	1.4	1318	1.5	1324	1.5	1345	1.6	1415	1.7	1442	1.6	
			1939	3.8	1948	4.2	2001	4.5	2024	5.1	2046	5.6	2108	5.7	
19 TH	0133	1.0	0207	1.3	0208	1.3	0213	1.4	0230	1.5	0300	1.6	0327	1.5	19 TH
	0802	3.5	0827	4.0	0833	4.4	0845	4.8	0910	5.4	0934	5.9	0952	5.9	
	1417	1.2	1445	1.4	1445	1.5	1452	1.5	1513	1.7	1542	1.8	1605	1.7	
	2040	3.4	2058	3.9	2111	4.3	2127	4.7	2154	5.3	2220	5.7	2236	5.7	
20 F	0312	0.9	0339	1.1	0341	1.1	0352	1.2	0416	1.4	0434	1.5	0459	1.4	20 F
	0916	3.7	0946	4.2	0951	4.6	1004	5.0	1032	5.6	1059	6.2	1116	6.1	
	1534	1.1	1558	1.3	1600	1.4	1612	1.4	1642	1.5	1705	1.5	1732	1.4	
	2144	3.6	2206	4.1	2216	4.6	2234	5.0	2304	5.6	2333	6.1	2351	6.1	
21 SA	0413	0.6	0441	0.9	0448	0.9	0503	0.9	0533	1.0	0600	1.1	0627	1.0	21 SA
	1011	3.8	1044	4.3	1048	4.9	1102	5.3	1132	6.0	1201	6.6	1220	6.5	
	1622	1.0	1649	1.2	1653	1.2	1708	1.2	1741	1.2	1810	1.3	1837	1.1	
	2231	3.8	2256	4.3	2306	4.8	2323	5.2	2355	5.9					
22 SU	0456	0.5	0526	0.7	0533	0.7	0551	0.7	0623	0.8	0625	6.5	0644	6.4	22 SU
	1053	3.9	1128	4.4	1131	5.0	1146	5.5	1218	6.2	0653	0.8	0719	0.7	
	1658	0.9	1726	1.0	1734	1.1	1751	1.0	1826	1.1	1248	6.8	1308	6.8	
	2311	3.9	2334	4.4	2344	5.0					1858	1.1	1926	1.0	

23 ^M	0530 1129 1729 2344	0.4 4.0 0.8 4.0	0559 1203 1756	0.6 4.5 0.9	0608 1207 1808	0.6 5.1 1.0	0002 0627 1222 1827	5.4 0.6 5.5 0.9	0036 0701 1256 1904	6.0 0.7 6.2 1.0	0107 0734 1327 1939	6.7 0.7 6.9 1.0	0127 0800 1348 2008	6.6 0.6 6.8 0.9	23 ^M
24 ^{TU} ●	0558 1202 1801	0.4 4.0 0.7	0004 0626 1231 1826	4.5 0.6 4.5 0.9	0017 0637 1238 1841	5.1 0.6 5.1 0.9	0035 0657 1254 1900	5.5 0.5 5.6 0.9	0110 0733 1329 1939	6.2 0.6 6.3 0.9	0142 0807 1401 2014	6.8 0.7 6.9 1.0	0202 0836 1422 2045	6.8 0.6 6.8 0.9	24 ^{TU} ●
25 ^W	0015 0625 1234 1831	4.1 0.4 4.1 0.7	0032 0652 1257 1857	4.6 0.5 4.5 0.8	0048 0704 1308 1912	5.2 0.5 5.1 0.8	0106 0723 1325 1930	5.6 0.5 5.6 0.8	0141 0800 1359 2010	6.3 0.6 6.3 0.9	0213 0835 1430 2045	6.9 0.6 6.8 0.9	0234 0907 1451 2118	6.9 0.6 6.8 0.8	25 ^W
26 TH	0045 0652 1305 1900	4.2 0.4 4.1 0.6	0102 0719 1325 1928	4.7 0.5 4.5 0.8	0118 0731 1338 1942	5.3 0.5 5.1 0.8	0137 0748 1355 2000	5.7 0.5 5.6 0.8	0211 0826 1428 2039	6.4 0.5 6.3 0.8	0241 0901 1457 2116	7.0 0.6 6.9 0.8	0302 0935 1517 2149	6.9 0.5 6.8 0.8	26 TH
27 ^F	0115 0717 1334 1929	4.2 0.4 4.0 0.6	0136 0746 1356 1959	4.7 0.6 4.5 0.8	0149 0758 1407 2013	5.3 0.5 5.1 0.8	0207 0814 1424 2030	5.7 0.5 5.5 0.8	0240 0851 1457 2108	6.4 0.5 6.2 0.8	0310 0928 1525 2147	7.0 0.5 6.9 0.8	0330 1001 1544 2218	7.0 0.5 6.8 0.8	27 ^F
28 ^{SA}	0145 0741 1403 1958	4.1 0.5 3.9 0.7	0208 0813 1428 2029	4.6 0.6 4.4 0.8	0219 0825 1436 2043	5.2 0.6 5.0 0.8	0237 0841 1453 2059	5.6 0.6 5.4 0.8	0310 0917 1525 2136	6.3 0.6 6.1 0.9	0339 0955 1554 2216	7.0 0.6 6.7 0.9	0359 1025 1612 2246	6.9 0.6 6.7 0.9	28 ^{SA}
29 ^{SU}	0215 0807 1433 2029	4.0 0.5 3.8 0.7	0239 0841 1457 2100	4.5 0.7 4.3 0.9	0248 0851 1504 2113	5.1 0.8 4.8 0.9	0306 0905 1522 2127	5.5 0.7 5.3 0.9	0338 0939 1554 2201	6.2 0.7 5.9 1.0	0410 1018 1624 2240	6.8 0.7 6.5 1.1	0429 1047 1643 2310	6.8 0.7 6.5 1.0	29 ^{SU}
30 ^M	0247 0836 1507 2104	3.9 0.7 3.7 0.8	0307 0911 1525 2134	4.4 0.9 4.2 1.0	0318 0918 1536 2144	4.9 0.9 4.7 1.0	0336 0928 1554 2154	5.4 0.8 5.1 1.0	0409 0959 1625 2224	6.0 0.9 5.7 1.1	0441 1038 1656 2302	6.6 0.9 6.3 1.2	0501 1110 1716 2334	6.6 0.9 6.3 1.1	30 ^M
31 ^{TU}	0324 0912 1548 2147	3.8 0.8 3.6 0.9	0341 0947 1603 2218	4.2 1.0 4.0 1.2	0353 0951 1616 2225	4.8 1.1 4.5 1.2	0412 0956 1633 2231	5.2 1.0 4.9 1.2	0443 1025 1703 2257	5.9 1.0 5.6 1.2	0516 1105 1733 2334	6.4 1.1 6.1 1.3	0536 1138 1754	6.4 1.0 6.1	31 ^{TU}

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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	0410	3.7	0429	4.1	0440	4.6	0458	5.0	0528	5.7	0559	6.2	0005	1.2	1
W	1002	1.0	1038	1.2	1037	1.3	1039	1.3	1106	1.3	1144	1.3	0619	6.2	W
2	1641	3.4	1659	3.9	1712	4.3	1727	4.7	1755	5.3	1823	5.8	1216	1.1	2
TH	2251	1.0	2323	1.3	2326	1.3	2328	1.3	2350	1.4			1842	5.8	TH
3	0511	3.5	0535	3.9	0545	4.4	0559	4.8	0629	5.5	0022	1.4	0051	1.3	3
TH	1125	1.2	1158	1.4	1154	1.5	1150	1.5	1208	1.6	0657	6.0	0716	6.0	TH
4	1755	3.3	1815	3.7	1828	4.2	1841	4.5	1909	5.1	1240	1.6	1309	1.5	4
5	0033	1.0	0058	1.3	0059	1.4	0105	1.4	0117	1.5	1934	5.6	1952	5.6	5
F	0633	3.4	0704	3.9	0710	4.3	0723	4.7	0753	5.4	0135	1.6	0159	1.5	F
6	1316	1.2	1338	1.4	1341	1.6	1350	1.6	1405	1.7	0820	5.9	0842	5.9	6
7	1926	3.3	1954	3.8	2000	4.2	2013	4.6	2039	5.2	1415	1.9	1441	1.7	7
8	0200	0.9	0229	1.1	0235	1.2	0247	1.2	0310	1.3	2108	5.7	2131	5.6	8
SA	0808	3.6	0835	4.1	0841	4.5	0853	4.9	0921	5.6	0337	1.5	0401	1.4	SA
9	1431	1.0	1500	1.2	1507	1.3	1518	1.3	1543	1.4	0951	6.2	1013	6.1	9
10	2049	3.5	2111	4.1	2123	4.5	2136	4.9	2206	5.5	1612	1.6	1634	1.5	10
11	0307	0.6	0339	0.8	0348	0.8	0402	0.8	0431	0.9	2233	6.1	2253	6.1	11
SU	0919	3.8	0947	4.4	0954	4.9	1006	5.3	1037	6.0	0500	1.0	0523	0.9	SU
12	1530	0.8	1601	1.0	1611	1.1	1625	1.0	1658	1.1	1105	6.6	1125	6.6	12
13	2150	3.8	2211	4.4	2224	4.9	2240	5.3	2312	6.0	1726	1.2	1753	1.1	13
14	0405	0.3	0437	0.5	0447	0.5	0506	0.5	0541	0.5	2341	6.6	2359	6.5	14
M	1015	4.1	1044	4.6	1050	5.2	1104	5.7	1137	6.4	0613	0.6	0645	0.5	M
15	1620	0.7	1652	0.8	1705	0.8	1723	0.8	1802	0.9	1206	7.1	1226	7.0	15
16	2241	4.1	2302	4.6	2314	5.2	2332	5.7			1836	0.9	1910	0.9	16
17	0455	0.1	0527	0.3	0539	0.3	0602	0.2	0004	6.3	0035	7.0	0053	6.9	17
TU	1103	4.3	1133	4.8	1139	5.4	1154	6.0	0640	0.2	0719	0.3	0750	0.2	TU
18	1707	0.6	1738	0.7	1753	0.7	1816	0.7	1828	6.7	1258	7.4	1318	7.3	18
19	2326	4.3	2347	4.8	2358	5.4			1858	0.7	1937	0.8	2009	0.7	19

8 W O	0542 0.0 1148 4.4 1752 0.5	0612 0.2 1219 4.9 1822 0.6	0626 0.1 1224 5.5 1839 0.6	0017 5.9 0651 0.1 1240 6.1 1905 0.6	0050 6.6 0731 0.1 1314 6.9 1948 0.6	0122 7.3 0812 0.1 1345 7.5 2029 0.6	0141 7.2 0842 0.0 1405 7.4 2059 0.5	8 W O
9 TH	0009 4.5 0625 0.0 1233 4.5 1836 0.4	0031 5.0 0654 0.1 1304 4.9 1906 0.5	0041 5.6 0708 0.0 1308 5.6 1923 0.5	0101 6.1 0736 0.0 1325 6.2 1951 0.5	0133 6.9 0817 0.0 1358 6.9 2034 0.5	0206 7.5 0858 0.0 1429 7.6 2114 0.5	0224 7.5 0927 -0.1 1429 7.5 2144 0.4	9 TH
10 F	0053 4.6 0707 0.0 1317 4.5 1920 0.4	0116 5.0 0735 0.2 1347 4.9 1949 0.5	0124 5.7 0749 0.1 1352 5.5 2006 0.5	0143 6.3 0816 0.0 1408 6.1 2033 0.5	0216 7.0 0857 0.0 1441 6.9 2115 0.5	0248 7.7 0937 0.0 1512 7.5 2154 0.5	0307 7.6 1008 -0.1 1532 7.4 2225 0.3	10 F
11 SA	0135 4.6 0747 0.1 1400 4.3 2003 0.4	0200 5.0 0814 0.3 1428 4.7 2031 0.6	0207 5.7 0827 0.2 1435 5.4 2047 0.5	0225 6.3 0853 0.2 1451 5.9 2113 0.5	0258 7.0 0931 0.2 1524 6.7 2152 0.6	0330 7.7 1010 0.2 1554 7.3 2229 0.5	0349 7.6 1042 0.1 1614 7.2 2300 0.4	11 SA
12 SU	0218 4.5 0825 0.4 1444 4.1 2046 0.5	0243 4.9 0851 0.5 1506 4.6 2112 0.7	0250 5.6 0903 0.5 1516 5.2 2127 0.6	0307 6.1 0925 0.4 1533 5.6 2149 0.6	0341 6.8 0959 0.5 1606 6.3 2225 0.7	0411 7.5 1036 0.5 1635 6.9 2300 0.7	0431 7.5 1110 0.4 1656 6.9 2331 0.6	12 SU
13 M	0301 4.3 0905 0.6 1528 3.9 2131 0.6	0326 4.7 0929 0.7 1545 4.4 2157 0.8	0334 5.3 0940 0.8 1559 4.9 2208 0.8	0351 5.8 0955 0.7 1615 5.3 2224 0.8	0424 6.5 1026 0.8 1647 6.0 2255 0.9	0454 7.2 1102 0.8 1717 6.5 2330 0.9	0514 7.1 1135 0.7 1737 6.5	13 M
14 TU C	0349 4.0 0952 0.9 1618 3.6 2224 0.8	0414 4.5 1014 1.1 1632 1.0 2252 1.0	0423 5.0 1023 1.1 1648 4.6 2258 1.0	0438 5.4 1033 1.1 1703 5.0 2308 1.0	0511 6.1 1101 1.1 1733 5.6 2335 1.1	0539 6.7 1135 1.2 1801 6.1	0600 0.8 1208 1.1 1822 6.1	14 TU C
15 W	0449 3.7 1051 1.1 1720 3.4 2331 0.9	0513 4.1 1116 1.4 1739 3.9	0522 4.7 1120 1.4 1750 4.3	0536 5.0 1126 1.4 1805 4.6	0607 5.7 1152 1.5 1832 5.3	0632 6.3 1222 1.6 1855 5.8	0653 6.3 1253 1.5 1916 5.7	15 W

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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	0608 3.5 1207 1.3 1838 3.3	0008 1.2 0634 3.9 1243 1.6 1905 3.8	0007 1.3 0637 4.4 1242 1.7 1912 4.2	0012 1.3 0650 4.7 1245 1.7 1926 4.5	0033 1.4 0717 5.4 1307 1.8 1947 5.1	16 TH 0130 1.4 0802 5.9 1403 1.8 2030 5.5
17 F	0103 1.0 0732 3.5 1338 1.3 2003 3.3	0139 1.2 0800 3.9 1413 1.5 2021 3.9	0139 1.3 0804 4.4 1412 1.7 2034 4.3	0142 1.4 0815 4.7 1416 1.7 2049 4.6	0157 1.5 0838 5.3 1436 1.8 2114 5.2	17 F 0253 1.5 0920 5.8 1531 1.8 2155 5.6
18 SA	0240 0.9 0846 3.6 1459 1.2 2109 3.5	0304 1.1 0915 4.1 1524 1.4 2127 4.1	0307 1.2 0920 4.6 1527 1.5 2140 4.5	0316 1.2 0932 4.9 1535 1.5 2157 4.9	0333 1.4 1000 5.6 1602 1.6 2227 5.5	18 SA 0417 1.3 1040 6.0 1650 1.5 2312 5.9
19 SU	0343 0.7 0942 3.8 1550 1.0 2159 3.7	0405 0.9 1012 4.3 1615 1.2 2219 4.2	0412 1.0 1017 4.8 1621 1.3 2230 4.7	0426 1.0 1030 5.2 1633 1.3 2248 5.1	0512 1.2 1129 6.4 1732 1.4 2350 6.4	19 SU 0534 1.1 1147 6.3 1756 1.3
20 M	0424 0.6 1024 3.9 1627 0.9 2238 3.9	0448 0.8 1056 4.4 1653 1.1 2259 4.4	0456 0.8 1100 4.9 1703 1.1 2310 4.9	0513 0.8 1114 5.4 1718 1.1 2328 5.3	0608 0.9 1216 6.7 1822 1.1	20 M 0009 6.3 0633 0.8 1237 6.6 1848 1.0
21 TU	0455 0.5 1100 4.0 1700 0.8 2312 4.0	0520 0.7 1130 4.4 1727 0.9 2331 4.5	0530 0.7 1136 5.0 1739 1.0 2344 5.1	0548 0.7 1151 5.5 1756 0.9	0608 0.9 1216 6.7 1822 1.1	21 TU 0053 6.5 0717 0.7 1316 6.7 1933 0.9
22 W	0523 0.5 1133 4.0 1733 0.7 2343 4.1	0550 0.6 1158 4.4 1800 0.8	0600 0.6 1208 5.1 1814 0.9	0603 5.5 0618 0.6 1224 5.5 1831 0.8	0109 6.8 0726 0.7 1329 6.8 1943 0.9	22 W 0129 6.7 0755 0.6 1350 6.7 2012 0.9

23 TH	0552 1204 1805	0.4 4.0 0.6	0001 0819 1224 1833	4.6 0.6 4.5 0.8	0016 0829 1238 1846	5.2 0.6 5.1 0.8	0035 0847 1254 1905	5.6 0.6 5.6 0.8	0110 0722 1328 1943	6.3 0.6 6.3 0.8	0141 0758 1358 2018	6.9 0.7 6.9 0.9	0202 0829 1419 2049	6.9 0.6 6.8 0.8	23 TH
24 F	0014 0619 1235 1836	4.1 0.4 4.1 0.6	0034 0848 1255 1905	4.6 0.6 4.5 0.7	0049 0859 1308 1919	5.2 0.6 5.1 0.7	0106 0716 1324 1937	5.7 0.5 5.6 0.7	0141 0751 1358 2015	6.4 0.6 6.3 0.8	0211 0828 1426 2052	7.0 0.6 6.9 0.8	0232 0900 1447 2122	7.0 0.6 6.8 0.7	24 F
25 SA	0046 0645 1306 1906	4.2 0.5 4.0 0.6	0108 0716 1328 1937	4.6 0.6 4.5 0.7	0121 0728 1339 1950	5.3 0.6 5.1 0.7	0138 0743 1355 2008	5.7 0.6 5.6 0.7	0212 0818 1429 2046	6.4 0.6 6.3 0.8	0241 0857 1456 2124	7.1 0.6 6.9 0.8	0302 0929 1515 2155	7.0 0.6 6.8 0.7	25 SA
26 SU	0118 0711 1337 1937	4.1 0.5 4.0 0.6	0143 0744 1401 2009	4.6 0.6 4.5 0.8	0153 0755 1410 2022	5.2 0.7 5.0 0.8	0210 0810 1426 2039	5.7 0.6 5.5 0.8	0243 0845 1459 2116	6.4 0.7 6.1 0.8	0313 0924 1528 2155	7.0 0.7 6.8 0.8	0332 0955 1547 2225	7.0 0.7 6.7 0.8	26 SU
27 M	0151 0739 1410 2010	4.1 0.6 3.9 0.6	0216 0815 1432 2043	4.5 0.7 4.4 0.8	0224 0823 1441 2054	5.1 0.8 4.9 0.8	0243 0836 1458 2110	5.6 0.7 5.3 0.8	0315 0910 1531 2144	6.3 0.8 6.0 0.9	0346 0949 1601 2221	6.9 0.8 6.6 0.9	0405 1020 1620 2252	6.9 0.8 6.5 0.9	27 M
28 TU	0226 0812 1446 2047	4.0 0.7 3.8 0.7	0249 0848 1504 2120	4.4 0.9 4.2 0.9	0258 0854 1515 2129	5.0 0.9 4.8 0.9	0316 0905 1533 2142	5.4 0.9 5.2 0.9	0349 0937 1605 2212	6.1 0.9 5.8 1.0	0420 1016 1635 2248	6.7 0.9 6.4 1.0	0440 1047 1655 2318	6.7 0.9 6.3 0.9	28 TU
29 W	0305 0852 1528 2133	3.9 0.9 3.7 0.8	0326 0928 1546 2207	4.3 1.0 4.1 1.0	0337 0932 1558 2213	4.9 1.1 4.6 1.0	0355 0939 1614 2221	5.3 1.0 5.0 1.0	0427 1009 1645 2248	6.0 1.1 5.6 1.1	0459 1049 1714 2322	6.6 1.1 6.1 1.1	0519 1120 1734 2352	6.6 1.0 6.1 1.0	29 W
30 TH	0354 0946 1622 2239	3.8 1.0 3.5 0.9	0418 1023 1642 2312	4.1 1.2 4.0 1.1	0427 1023 1653 2314	4.7 1.3 4.4 1.1	0443 1027 1708 2319	5.1 1.3 4.8 1.2	0514 1053 1737 2341	5.8 1.3 5.4 1.2	0545 1130 1805 1825	6.4 1.3 5.9 5.9	0605 1201 1825 1825	6.4 1.2 5.9 5.9	30 TH

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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	0455	3.6	0524	4.0	0532	4.5	0545	5.0	0615	5.7	0011	1.2	0038	1.1	1 F
	1108	1.2	1137	1.4	1138	1.5	1140	1.5	1158	1.5	0644	6.2	0703	6.2	
	1733	3.4	1753	3.9	1806	4.3	1820	4.7	1848	5.3	1228	1.6	1256	1.5	
											1914	5.8	1932	5.7	
2 SA	0012	0.8	0038	1.1	0041	1.2	0050	1.2	0108	1.3	0122	1.4	0147	1.3	2 SA
	0613	3.6	0846	4.0	0851	4.5	0704	4.9	0735	5.6	0803	6.2	0824	6.1	
	1245	1.2	1309	1.4	1313	1.5	1324	1.5	1346	1.6	1402	1.8	1428	1.7	
	1858	3.4	1922	3.9	1930	4.4	1946	4.7	2013	5.3	2041	5.9	2102	5.8	
3 SU	0134	0.7	0203	0.9	0209	1.0	0221	1.0	0245	1.1	0313	1.2	0335	1.1	3 SU
	0742	3.7	0811	4.2	0814	4.7	0827	5.1	0856	5.8	0925	6.4	0947	6.3	
	1359	1.0	1430	1.2	1436	1.3	1447	1.3	1513	1.4	1544	1.5	1605	1.4	
	2017	3.6	2038	4.2	2050	4.6	2105	5.0	2134	5.6	2202	6.2	2221	6.2	
4 M	0239	0.5	0311	0.6	0319	0.7	0333	0.7	0400	0.8	0431	0.8	0453	0.8	4 M
	0852	3.9	0920	4.4	0926	4.9	0939	5.4	1010	6.1	1037	6.7	1056	6.7	
	1500	0.9	1532	1.0	1542	1.1	1554	1.0	1626	1.1	1657	1.2	1721	1.2	
	2120	3.9	2139	4.4	2153	4.9	2210	5.4	2241	6.0	2309	6.6	2327	6.6	
5 TU	0337	0.3	0408	0.4	0418	0.5	0436	0.4	0508	0.5	0541	0.5	0610	0.5	5 TU
	0949	4.1	1018	4.6	1024	5.2	1038	5.7	1111	6.4	1139	7.0	1158	7.0	
	1553	0.7	1624	0.8	1638	0.9	1655	0.8	1732	0.9	1806	1.0	1838	0.9	
	2212	4.1	2231	4.6	2244	5.2	2303	5.7	2335	6.4					
6 W	0428	0.2	0458	0.3	0510	0.3	0532	0.3	0609	0.3	0005	7.0	0023	7.0	6 W
	1039	4.3	1107	4.7	1114	5.3	1130	5.9	1202	6.6	0646	0.3	0718	0.3	
	1642	0.6	1712	0.7	1728	0.7	1750	0.7	1831	0.7	1910	0.8	1941	0.7	
	2259	4.4	2319	4.8	2331	5.5	2350	5.9							
7 TH	0515	0.1	0543	0.2	0557	0.2	0623	0.2	0022	6.6	0054	7.3	0113	7.3	7 TH
	1125	4.4	1153	4.8	1200	5.4	1216	6.0	0701	0.2	0742	0.2	0812	0.1	
	1730	0.5	1759	0.6	1817	0.6	1842	0.6	1949	6.7	1320	7.4	1340	7.3	
	2344	4.5							1924	0.6	2004	0.6	2033	0.5	7 O

8 F	0600 1209 1817	0.1 4.4 0.4	0005 0826 1238 1845	4.9 0.2 4.8 0.5	0015 0641 1245 1903	5.6 0.2 5.5 0.5	0034 0708 1301 1930	6.1 0.2 6.0 0.5	0107 0747 1333 2012	6.9 0.2 6.7 0.5	0139 0828 1405 2051	7.5 0.1 7.3 0.4	8 F
9 SA	0027 0642 1254 1903	4.6 0.2 4.4 0.4	0053 0708 1321 1931	5.0 0.3 4.8 0.5	0100 0722 1328 1948	5.7 0.3 5.4 0.5	0118 0749 1344 2015	6.2 0.3 6.0 0.4	0151 0828 1417 2056	7.0 0.3 6.7 0.5	0223 0908 1448 2133	7.6 0.2 7.2 0.4	9 SA
10 SU	0112 0723 1338 1947	4.6 0.4 4.3 0.4	0140 0748 1321 2016	5.0 0.4 4.7 0.5	0145 0802 1411 2031	5.7 0.5 5.1 0.5	0202 0826 1428 2056	6.2 0.4 5.8 0.5	0235 0903 1500 2134	7.0 0.5 6.5 0.5	0307 0941 1531 2209	7.6 0.4 7.1 0.4	10 SU
11 M	0156 0802 1421 2031	4.4 0.6 4.1 0.5	0225 0827 1442 2059	4.8 0.6 4.6 0.6	0230 0839 1453 2112	5.5 0.7 5.1 0.6	0247 0858 1510 2132	6.0 0.7 5.6 0.6	0320 0932 1542 2208	6.8 0.7 6.3 0.7	0350 1007 1613 2240	7.5 0.7 6.9 0.7	11 M
12 TU	0241 0841 1505 2115	4.2 0.8 3.9 0.6	0310 0905 1522 2143	4.6 0.9 4.4 0.8	0316 0917 1536 2153	5.3 1.0 4.9 0.8	0332 0929 1553 2206	5.7 0.9 5.3 0.8	0405 0959 1624 2237	6.5 0.9 5.9 0.9	0434 1036 1654 2310	7.1 1.0 6.5 0.9	12 TU
13 W	0329 0925 1553 2204	3.9 1.0 3.7 0.7	0356 0948 1606 2235	4.4 1.1 4.2 1.0	0405 0958 1622 2239	5.0 1.2 4.6 1.0	0420 1006 1638 2246	5.4 1.2 5.0 1.0	0452 1036 1708 2313	6.1 1.2 5.6 1.1	0520 1111 1736 2345	6.7 1.3 6.1 1.1	13 W
14 TH	0427 1019 1650 2304	3.7 1.2 3.5 0.8	0451 1042 1703 2340	4.1 1.4 4.0 1.1	0500 1049 1718 2339	4.6 1.5 4.4 1.2	0514 1055 1734 2341	5.0 1.4 4.7 1.2	0546 1124 1801 2341	5.7 1.5 5.3 1.2	0610 1155 1825 2345	6.3 1.6 5.8 1.1	14 TH
15 F	0537 1125 1756	3.5 1.3 3.4	0603 1156 1821	3.9 1.6 3.8	0606 1157 1828	4.4 1.7 4.2	0620 1201 1844	4.8 1.7 4.6	0648 1227 1908	5.4 1.7 5.2	0711 1256 1930	5.9 1.7 5.7	15 F

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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
0021 0.9	0059 1.2	0057 1.2	0100 1.3	0117 1.4	0143 1.5	0212 1.4
0649 3.5	0720 3.9	0721 4.3	0734 4.7	0756 5.3	0822 5.9	0840 5.8
1246 1.4	1326 1.6	1323 1.7	1326 1.7	1346 1.8	1417 2.0	1443 1.8
1908 3.4	1935 3.9	1944 4.3	2000 4.6	2021 5.2	2047 5.7	2105 5.6
0141 0.9	0212 1.1	0214 1.2	0220 1.2	0238 1.3	0307 1.4	0331 1.3
0759 3.5	0834 4.0	0834 4.4	0845 4.8	0908 5.4	0933 6.0	0950 5.9
1403 1.3	1436 1.5	1438 1.6	1444 1.6	1507 1.7	1539 1.8	1602 1.7
2017 3.5	2036 4.0	2050 4.4	2106 4.8	2133 5.4	2200 5.9	2216 5.8
0248 0.8	0310 1.0	0315 1.1	0326 1.1	0348 1.2	0415 1.2	0436 1.1
0859 3.7	0923 4.1	0932 4.6	0944 5.0	1014 5.7	1039 6.2	1055 6.1
1503 1.1	1530 1.3	1537 1.4	1546 1.4	1614 1.5	1644 1.5	1707 1.4
2112 3.6	2129 4.1	2144 4.6	2201 5.0	2232 5.7	2301 6.2	2318 6.1
0336 0.7	0356 0.8	0404 0.9	0417 0.9	0443 1.0	0512 1.0	0532 0.9
0945 3.8	1009 4.2	1019 4.8	1033 5.2	1104 5.9	1133 6.5	1151 6.3
1548 1.0	1615 1.1	1625 1.2	1637 1.2	1708 1.2	1739 1.3	1802 1.2
2156 3.8	2214 4.3	2228 4.8	2246 5.2	2320 5.9	2350 6.5	
0413 0.6	0436 0.8	0445 0.8	0500 0.8	0529 0.8	0600 0.9	0008 6.4
1024 3.9	1048 4.3	1058 4.9	1113 5.3	1146 6.0	1216 6.6	0623 0.8
1628 0.8	1655 1.0	1706 1.0	1721 1.0	1754 1.0	1827 1.1	1236 6.5
2233 3.9	2253 4.4	2308 5.0	2325 5.4			1851 1.0
0446 0.6	0512 0.7	0522 0.8	0538 0.7	0000 6.1	0031 6.7	0051 6.7
1100 4.0	1121 4.4	1134 5.0	1149 5.4	0609 0.8	0643 0.8	0709 0.7
1704 0.7	1732 0.9	1745 0.9	1802 0.9	1223 6.1	1253 6.7	1313 6.6
2309 4.0	2330 4.5	2344 5.1		1836 0.9	1910 1.0	1936 0.9
0519 0.6	0547 0.7	0557 0.7	0001 5.5	0036 6.3	0107 6.9	0128 6.8
1134 4.0	1153 4.5	1207 5.1	0614 0.7	0645 0.7	0721 0.8	0750 0.7
1739 0.7	1809 0.8	1821 0.8	1223 5.5	1257 6.2	1327 6.8	1347 6.7
2344 4.1			1839 0.8	1915 0.8	1950 0.9	2018 0.8

23 SA	0550 0.6 1208 4.1 1814 0.6	0006 4.6 0618 0.7 1227 4.5 1844 0.7	0019 5.2 0630 0.7 1241 5.1 1856 0.7	0037 5.6 0646 0.7 1257 5.5 1915 0.7	0111 6.4 0718 0.7 1331 6.2 1951 0.8	0141 7.0 0755 0.8 1359 6.8 2028 0.8	0203 6.9 0827 0.7 1420 6.8 2057 0.7	23 SA
24 SU	0020 4.2 0619 0.6 1243 4.1 1848 0.6	0043 4.6 0649 0.7 1303 4.5 1919 0.7	0055 5.2 0701 0.7 1316 5.1 1931 0.7	0112 5.7 0715 0.7 1332 5.5 1949 0.7	0146 6.4 0748 0.7 1406 6.2 2026 0.8	0215 7.1 0827 0.8 1434 6.8 2104 0.7	0237 7.0 0900 0.8 1454 6.8 2134 0.7	24 SU
25 M	0056 4.2 0648 0.6 1319 4.0 1923 0.6	0121 4.6 0722 0.7 1340 4.5 1954 0.7	0131 5.2 0732 0.8 1351 5.1 2007 0.7	0148 5.7 0745 0.7 1408 5.5 2024 0.7	0222 6.4 0818 0.8 1442 6.2 2100 0.7	0251 7.1 0858 0.8 1510 6.7 2138 0.7	0312 7.0 0931 0.8 1529 6.7 2209 0.6	25 M
26 TU	0133 4.1 0721 0.7 1356 4.0 2001 0.6	0200 4.5 0757 0.8 1417 4.4 2033 0.7	0208 5.2 0805 0.8 1428 5.0 2043 0.7	0225 5.6 0817 0.8 1445 5.4 2100 0.7	0258 6.4 0850 0.8 1518 6.0 2135 0.8	0328 7.0 0929 0.8 1547 6.6 2210 0.8	0348 6.9 1002 0.8 1605 6.6 2242 0.7	26 TU
27 W	0212 4.1 0759 0.8 1436 3.9 2042 0.6	0240 4.4 0836 0.9 1455 4.3 2115 0.8	0248 5.1 0842 0.9 1507 4.9 2124 0.8	0304 5.6 0854 0.9 1524 5.2 2139 0.8	0337 6.3 0926 0.9 1556 5.9 2211 0.8	0408 6.9 1004 0.9 1625 6.4 2243 0.8	0427 6.8 1036 0.9 1644 6.4 2314 0.7	27 W
28 TH	0255 4.0 0845 0.9 1520 3.8 2133 0.6	0324 4.3 0921 1.0 1539 4.2 2206 0.8	0332 5.0 0926 1.1 1552 4.8 2213 0.9	0348 5.4 0936 1.0 1608 5.1 2224 0.8	0420 6.1 1007 1.1 1639 5.7 2254 0.9	0450 6.7 1044 1.1 1708 6.3 2302 0.9	0510 6.7 1115 1.0 1727 6.2 2352 0.8	28 TH
29 F	0346 3.9 0943 1.0 1614 3.7 2238 0.7	0415 4.2 1015 1.1 1632 4.2 2308 0.8	0424 4.8 1021 1.3 1646 4.6 2313 0.9	0438 5.3 1029 1.2 1701 5.0 2322 0.9	0509 6.0 1057 1.2 1731 5.6 2349 1.0	0539 6.6 1130 1.3 1759 6.1	0559 6.5 1200 1.2 1817 6.1	29 F
30 SA	0446 3.8 1055 1.1 1719 3.6 2355 0.6	0516 4.2 1121 1.2 1736 4.1	0525 4.7 1128 1.4 1751 4.6	0538 5.2 1137 1.4 1806 4.9	0609 5.9 1203 1.4 1836 5.5	0638 6.5 1229 1.5 1903 6.1	0640 0.9 0657 6.4 1258 1.4 1919 6.0	30 SA
31 SU	0558 3.7 1214 1.1 1832 3.6	0628 4.1 1240 1.3 1851 4.1	0634 4.7 1246 1.4 1902 4.6	0648 5.1 1259 1.4 1920 5.0	0719 5.8 1327 1.5 1950 5.6	0748 6.4 1351 1.6 2019 6.1	0809 6.3 1417 1.5 2037 6.1	31 SU

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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 M	0107 0.5 0714 3.8 1326 1.0 1945 3.8	0136 0.7 0744 4.2 1357 1.2 2003 4.3	0155 0.8 0801 5.2 1415 1.3 2034 5.1	0220 0.9 0832 5.9 1443 1.4 2103 5.8	0249 1.0 0901 6.5 1515 1.4 2132 6.4	1 M 0312 0.9 0922 6.4 1538 1.4 2151 6.3
2 TU	0210 0.4 0823 3.9 1429 0.9 2049 3.9	0241 0.6 0851 4.4 1502 1.0 2106 4.4	0302 0.6 0911 5.4 1523 1.1 2139 5.4	0329 0.7 0941 6.1 1554 1.2 2209 6.0	0401 0.7 1009 6.7 1627 1.2 2239 6.6	2 TU 0423 0.7 1029 6.6 1652 1.2 2256 6.6
3 W	0308 0.3 0924 4.1 1527 0.8 2145 4.1	0338 0.5 0950 4.5 1557 0.9 2202 4.6	0404 0.5 1012 5.5 1626 0.9 2235 5.6	0434 0.5 1045 6.2 1702 1.0 2307 6.3	0506 0.6 1112 6.9 1736 1.0 2337 6.9	3 W 0532 0.5 1131 6.8 1807 1.0 2355 6.9
4 TH	0402 0.3 1016 4.2 1621 0.7 2235 4.3	0429 0.4 1042 4.6 1649 0.7 2255 4.7	0502 0.4 1107 5.7 1726 0.8 2326 5.8	0536 0.5 1139 6.4 1806 0.8 2358 6.5	0612 0.5 1208 7.0 1842 0.9	4 TH 0644 0.4 1228 6.9 1913 0.8
5 F	0452 0.3 1104 4.2 1712 0.5 2322 4.4	0517 0.4 1129 4.6 1740 0.6 2345 4.8	0554 0.4 1155 5.8 1822 0.6	0631 0.5 1228 6.4 1902 0.7	0029 7.2 0710 0.5 1259 7.1 1939 0.7	5 F 0048 7.1 0741 0.4 1319 7.0 2009 0.6
6 SA	0538 0.4 1150 4.3 1803 0.4	0602 0.5 1214 4.7 1830 0.5	0013 6.0 0642 0.4 1241 5.8 1912 0.5	0046 6.7 0720 0.5 1314 6.5 1953 0.5	0117 7.3 0800 0.5 1345 7.1 2030 0.6	6 SA 0138 7.3 0831 0.4 1406 7.1 2058 0.4
7 SU	0008 4.5 0623 0.5 1236 4.3 1851 0.4	0035 4.9 0646 0.5 1258 4.7 1919 0.5	0059 6.1 0725 0.5 1326 5.8 2000 0.5	0132 6.8 0804 0.6 1358 6.5 2039 0.5	0203 7.5 0842 0.6 1429 7.1 2115 0.5	7 SU 0224 7.4 0914 0.5 1450 7.0 2144 0.4

8
M0053 4.4
0705 0.6
1319 4.2
1937 0.40123 4.8
0728 0.6
1340 4.6
2005 0.50129 5.5
0743 0.7
1353 5.2
2019 0.50145 6.1
0804 0.7
1410 5.7
2043 0.50218 6.8
0842 0.7
1442 6.4
2121 0.60249 7.5
0917 0.8
1513 7.0
2155 0.60310 7.4
0952 0.7
1534 6.9
2224 0.5**8**
M**9**
TU0138 4.3
0745 0.7
1403 4.1
2020 0.50209 4.7
0808 0.8
1421 4.5
2048 0.60215 5.4
0822 0.9
1435 5.1
2101 0.60231 5.9
0839 0.8
1452 5.5
2121 0.60304 6.7
0914 0.9
1525 6.2
2157 0.70334 7.3
0947 0.9
1555 6.8
2228 0.70355 7.2
1024 0.9
1615 6.7
2259 0.6**9**
TU**10**
W0224 4.2
0823 0.9
1445 3.9
2101 0.60254 4.6
0846 1.0
1501 4.4
2130 0.70301 5.2
0900 1.0
1517 5.0
2141 0.80316 5.7
0911 1.0
1534 5.3
2154 0.80350 6.4
0944 1.1
1606 6.0
2226 0.80419 7.0
1018 1.1
1636 6.5
2257 0.90440 6.9
1052 1.0
1655 6.4
2328 0.8**10**
W**11**
TH0311 3.9
0903 1.0
1530 3.8
2144 0.60338 4.4
0926 1.1
1543 4.3
2214 0.90347 5.0
0939 1.2
1600 4.8
2221 0.90402 5.4
0947 1.2
1617 5.1
2228 0.90436 6.1
1019 1.2
1647 5.7
2257 1.00503 6.7
1053 1.3
1715 6.3
2329 1.00523 6.6
1125 1.2
1734 6.2
2358 0.9**11**
TH**12**
F0403 3.7
0947 1.1
1619 3.7
2233 0.70425 4.2
1011 1.3
1629 4.1
2305 1.00435 4.7
1022 1.4
1647 4.6
2307 1.00451 5.1
1029 1.3
1704 4.9
2312 1.00523 5.8
1101 1.4
1732 5.5
2339 1.10548 6.3
1134 1.5
1758 6.00608 6.3
1204 1.4
1816 6.0**12**
F**13**
SA
C0500 3.6
1041 1.3
1713 3.6
2333 0.80521 4.0
1105 1.5
1726 4.00528 4.5
1113 1.5
1741 4.40545 4.9
1120 1.5
1759 4.80615 5.5
1151 1.6
1827 5.40609 1.2
1238 6.1
1850 5.90637 1.0
1250 1.6
1906 5.8**13**
SA
C**14**
SU0600 3.5
1148 1.4
1812 3.50606 1.1
1228 3.9
1838 3.90605 1.1
1216 1.7
1844 4.30609 1.1
1225 1.6
1903 4.70633 1.2
1251 1.7
1929 5.30736 5.9
1320 1.8
1955 5.80754 5.8
1346 1.7
2013 5.7**14**
SU**15**
M0639 0.9
0700 3.5
1304 1.3
1912 3.50615 1.1
0732 3.9
1338 1.5
1943 4.00613 1.2
0734 4.3
1335 1.7
1951 4.40619 1.2
0748 4.7
1341 1.6
2008 4.70639 1.3
0811 5.4
1402 1.7
2033 5.40736 5.9
1430 1.8
2102 5.90856 5.8
1458 1.7
2122 5.8**15**
M

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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	0143 0.9 0800 3.5 1409 1.2 2012 3.6	0216 1.1 0829 4.0 1442 1.4 2039 4.1	0226 1.1 0848 4.8 1453 1.5 2107 4.9	0247 1.2 0912 5.5 1516 1.6 2136 5.5	0316 1.3 0940 6.0 1546 1.7 2205 6.1	16 TU 0342 1.2 0957 5.9 1613 1.6 2224 6.0
17 W	0238 0.8 0856 3.6 1505 1.1 2107 3.7	0308 1.0 0920 4.1 1534 1.2 2130 4.2	0324 1.0 0943 5.0 1553 1.3 2200 5.1	0348 1.1 1011 5.6 1619 1.4 2232 5.8	0418 1.2 1039 6.2 1651 1.5 2302 6.3	17 W 0441 1.1 1056 6.1 1714 1.3 2321 6.3
18 TH	0328 0.8 0944 3.8 1553 0.9 2154 3.8	0355 0.9 1006 4.2 1621 1.1 2217 4.3	0416 0.9 1032 5.1 1646 1.1 2247 5.3	0442 1.0 1103 5.8 1714 1.2 2321 6.0	0513 1.1 1131 6.4 1747 1.2 2351 6.6	18 TH 0535 1.0 1150 6.3 1810 1.1
19 F	0411 0.7 1026 3.9 1636 0.8 2237 4.0	0438 0.9 1048 4.3 1705 0.9 2300 4.4	0503 0.9 1115 5.3 1733 0.9 2330 5.4	0530 0.9 1148 6.0 1804 1.0	0603 1.0 1217 6.6 1837 1.0	19 F 0012 6.6 0626 0.9 1238 6.5 1901 0.9
20 SA	0451 0.7 1106 4.0 1716 0.7 2318 4.1	0518 0.8 1126 4.4 1746 0.8 2341 4.5	0546 0.8 1156 5.4 1817 0.8	0004 6.2 0614 0.9 1230 6.1 1850 0.9	0034 6.8 0648 0.9 1259 6.7 1923 0.9	20 SA 0057 6.8 0715 0.8 1320 6.7 1950 0.7
21 SU	0527 0.7 1146 4.0 1755 0.6 2359 4.1	0555 0.8 1204 4.5 1826 0.7	0010 5.6 0623 0.8 1236 5.5 1857 0.7	0046 6.3 0653 0.9 1311 6.2 1933 0.8	0116 6.9 0729 0.9 1340 6.8 2007 0.8	21 SU 0138 6.9 0800 0.8 1401 6.8 2036 0.6
22 M	0601 0.7 1226 4.1 1835 0.5	0021 4.6 0630 0.8 1243 4.5 1905 0.7	0051 5.7 0657 0.8 1316 5.6 1937 0.6	0126 6.4 0728 0.9 1351 6.2 2014 0.7	0156 7.0 0806 0.9 1420 6.8 2049 0.7	22 M 0218 7.0 0842 0.9 1440 6.8 2120 0.5

23 TU	0039 4.2 0636 0.7 1307 4.1 1915 0.5	0104 4.6 0706 0.8 1324 4.6 1945 0.6	0116 5.2 0718 0.8 1340 5.2 1958 0.6	0132 5.7 0730 0.8 1357 5.6 2016 0.6	0207 6.5 0803 0.9 1431 6.2 2054 0.6	0237 7.1 0843 0.9 1500 6.8 2130 0.6	0258 7.0 0922 0.8 1520 6.8 2204 0.5	23 TU
24 W	0121 4.2 0714 0.7 1349 4.1 1958 0.4	0148 4.6 0746 0.8 1405 4.6 2027 0.6	0158 5.3 0757 0.9 1421 5.1 2040 0.6	0214 5.8 0809 0.8 1439 5.5 2058 0.5	0248 6.5 0842 0.8 1512 6.2 2135 0.6	0318 7.1 0922 0.9 1541 6.7 2210 0.5	0339 7.1 1001 0.8 1600 6.7 2245 0.4	24 W
25 TH	0204 4.2 0756 0.8 1432 4.0 2043 0.4	0233 4.6 0829 0.8 1448 4.5 2112 0.6	0242 5.2 0840 0.9 1503 5.1 2125 0.6	0258 5.7 0852 0.9 1521 5.5 2141 0.5	0331 6.5 0927 0.9 1553 6.1 2218 0.6	0401 7.1 1003 0.9 1622 6.8 2250 0.5	0421 7.0 1042 0.8 1640 6.6 2324 0.4	25 TH
26 F	0250 4.1 0844 0.9 1516 4.0 2133 0.5	0320 4.5 0915 0.9 1532 4.5 2202 0.6	0328 5.1 0927 1.0 1547 5.0 2213 0.6	0343 5.6 0938 1.0 1605 5.4 2229 0.6	0416 6.4 1014 1.0 1637 6.0 2304 0.6	0446 7.0 1048 1.0 1706 6.5 2332 0.6	0505 6.9 1123 0.9 1723 6.5	26 F
27 SA	0339 4.0 0937 1.0 1606 3.9 2230 0.5	0409 4.4 1006 1.0 1620 4.4 2257 0.6	0418 5.0 1018 1.1 1637 4.9 2306 0.7	0432 5.5 1030 1.1 1653 5.3 2321 0.6	0505 6.2 1105 1.1 1726 5.9 2354 0.7	0534 6.8 1136 1.1 1754 6.5	0004 0.5 0552 6.8 1209 1.0 1809 6.4	27 SA
28 SU	0435 3.9 1037 1.0 1701 3.9 2333 0.5	0504 4.3 1103 1.1 1716 4.4 2359 0.7	0513 4.9 1114 1.2 1732 4.8	0527 5.4 1128 1.2 1749 5.2	0600 6.1 1201 1.3 1821 5.8	0018 0.7 0628 6.7 1230 1.3 1849 6.4	0049 0.6 0647 6.6 1300 1.2 1904 6.3	28 SU
29 M	0538 3.8 1144 1.1 1805 3.8	0606 4.3 1209 1.2 1821 4.3	0005 0.7 0612 4.8 1218 1.3 1834 4.8	0021 0.7 0628 5.3 1234 1.3 1853 5.2	0050 0.7 0701 6.0 1925 5.8	0116 0.8 0730 6.6 1304 1.4 1954 6.4	0143 0.7 0750 6.5 1401 1.3 2012 6.3	29 M
30 TU	0038 0.5 0646 3.8 1254 1.1 1913 3.9	0105 0.7 0715 4.2 1323 1.2 1930 4.3	0111 0.7 0719 4.8 1329 1.3 1942 4.9	0126 0.7 0735 5.2 1343 1.3 2002 5.2	0152 0.8 0806 5.9 1413 1.3 2033 5.9	0222 0.8 0836 6.5 1446 1.4 2103 6.4	0246 0.7 0857 6.4 1510 1.3 2122 6.4	30 TU

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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	0141 0.5 0755 3.8 1401 1.0 2021 3.9	0211 0.7 0822 4.3 1432 1.1 2037 4.4	0230 0.7 0843 5.2 1452 1.2 2110 5.3	0256 0.8 0914 5.9 1523 1.3 2141 6.0	0329 0.8 0942 6.5 1558 1.3 2210 6.6	1 W 0352 0.7 1002 6.5 1624 1.2 2228 6.6
2 TH	0242 0.5 0901 3.9 1505 0.9 2123 4.1	0311 0.7 0934 4.4 1535 1.0 2141 4.5	0333 0.7 0949 5.3 1601 1.0 2212 5.5	0401 0.8 1021 6.0 1636 1.1 2244 6.1	0434 0.8 1048 6.6 1709 1.2 2314 6.7	2 TH 0459 0.7 1107 6.6 1738 1.1 2332 6.7
3 F	0340 0.6 0959 4.0 1606 0.7 2218 4.2	0406 0.7 1022 4.4 1634 0.9 2241 4.6	0435 0.7 1049 5.4 1708 0.9 2309 5.6	0507 0.8 1121 6.1 1745 0.9 2341 6.3	0541 0.8 1149 6.7 1819 0.9	3 F 0611 0.7 1209 6.7 1850 0.8
4 SA	0435 0.6 1051 4.1 1703 0.6 2308 4.3	0458 0.7 1113 4.5 1730 0.7 2334 4.7	0532 0.7 1142 5.5 1808 0.7	0608 0.8 1214 6.2 1846 0.7	0011 6.9 0644 0.8 1244 6.8 1921 0.7	4 SA 0031 6.9 0716 0.7 1305 6.8 1949 0.6
5 SU	0524 0.6 1138 4.1 1755 0.5 2355 4.3	0547 0.7 1159 4.6 1823 0.6	0000 5.8 0623 0.7 1230 5.6 1901 0.5	0033 6.5 0701 0.8 1302 6.3 1939 0.6	0104 7.1 0738 0.8 1354 6.9 2015 0.6	5 SU 0125 7.1 0809 0.7 1354 6.8 2042 0.4
6 M	0610 0.7 1222 4.2 1844 0.4	0024 4.7 0631 0.8 1242 4.6 1911 0.5	0048 5.9 0709 0.8 1314 5.6 1950 0.5	0121 6.6 0748 0.8 1346 6.3 2028 0.5	0152 7.2 0825 0.9 1418 6.9 2104 0.5	6 M 0214 7.2 0856 0.8 1418 6.9 2130 0.4
7 TU	0040 4.3 0651 0.7 1306 4.2 1928 0.4	0110 4.7 0713 0.8 1322 4.6 1955 0.5	0133 5.9 0750 0.8 1356 5.6 2033 0.5	0207 6.6 0829 0.9 1429 6.3 2111 0.5	0238 7.3 0905 1.0 1501 6.9 2146 0.6	7 TU 0300 7.2 0938 0.8 1522 6.8 2214 0.4

8

W

0124
0730
1346
20084.3
0.8
4.1
0.40154
0751
1402
20344.6
0.9
4.6
0.60201
0809
1418
20505.3
1.0
5.2
0.60217
0826
1436
21105.8
0.9
5.6
0.6**8**

W

0344
1014
1601
22517.1
0.9
6.7
0.5**9**

TH

0207
0805
1426
20444.1
0.9
4.1
0.50235
0827
1440
21114.5
1.0
4.5
0.70244
0844
1457
21245.2
1.1
5.1
0.70300
0857
1515
21395.7
1.0
5.5
0.7**9**

TH

0404
1008
1618
22487.0
1.1
6.7
0.8**10**

F

0250
0839
1504
21184.0
1.0
4.0
0.60315
0903
1518
21464.4
1.1
4.5
0.80325
0918
1535
21565.0
1.1
5.0
0.80342
0929
1553
22075.5
1.1
5.3
0.8**10**

F

0416
1005
1625
22416.1
1.2
5.9
0.8**11**

SA

0333
0915
1544
21553.8
1.1
3.9
0.70406
0954
1615
22314.8
1.2
4.8
0.90423
1004
1632
22405.2
1.2
5.2
0.90505
1044
1632
22405.0
1.3
5.0
0.9**11**

SA

0522
1114
1729
23436.5
1.3
6.3
1.0**12**

SU

0418
0956
1629
22403.7
1.2
3.7
0.80433
1023
1638
23084.1
1.3
4.2
1.00505
1044
1714
23205.0
1.3
5.0
1.00601
1152
1809
23506.2
1.4
6.1
1.1**12**

SU

0618
1220
18256.2
1.3
6.1**13**

M

0508
1047
1720
23363.5
1.3
3.6
0.90534
1121
17464.4
1.5
4.50621
1202
18345.5
1.6
5.50621
1202
18341.0
6.0
1.5
5.9**13**

M

0047
0701
1300
19131.0
6.0
1.5
6.0**14**

TU

0602
1154
18173.5
1.4
3.50604
1213
18271.2
1.6
4.00621
1202
18341.2
5.8
5.80128
0755
1348
19191.2
5.8
1.7
5.8**14**

TU

0103
0737
1325
19591.3
5.9
1.8
5.8**15**

W

0043
0659
1313
19171.0
3.4
1.3
3.50110
0729
1337
19501.3
4.3
1.7
4.40135
0810
1406
20371.4
5.8
1.8
5.90158
0839
1429
21081.3
5.7
1.8
5.8**15**

W

0222
0859
1454
21311.3
5.7
1.8
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
16 TH	0148 1.0 0800 3.5 1420 1.2 2020 3.6	0217 1.2 0831 3.9 1450 1.4 2045 4.0	0221 1.3 0837 4.4 1455 1.5 2056 4.5	0231 1.3 0848 4.7 1506 1.5 2112 4.9	0249 1.4 0914 5.4 1528 1.6 2142 5.5	16 TH 0340 1.4 1004 5.8 1623 1.6 2235 6.0
17 F	0247 1.0 0901 3.6 1518 1.0 2118 3.7	0315 1.1 0927 4.1 1547 1.2 2142 4.2	0323 1.2 0938 4.5 1557 1.3 2155 4.7	0336 1.2 0949 4.9 1611 1.3 2210 5.1	0358 1.3 1018 5.6 1637 1.3 2242 5.8	17 F 0450 1.3 1107 6.1 1730 1.3 2335 6.3
18 SA	0341 0.9 0955 3.8 1609 0.9 2210 3.9	0406 1.1 1018 4.3 1638 1.0 2234 4.3	0418 1.1 1030 4.8 1650 1.0 2246 4.9	0433 1.1 1044 5.1 1706 1.0 2301 5.3	0458 1.2 1116 5.8 1735 1.1 2336 6.0	18 SA 0549 1.1 1206 6.4 1829 1.0
19 SU	0427 0.9 1043 3.9 1655 0.7 2257 4.0	0453 1.0 1104 4.4 1726 0.9 2321 4.5	0506 1.0 1118 4.9 1738 0.9 2333 5.0	0523 1.0 1133 5.3 1756 0.8 2349 5.5	0551 1.1 1207 6.0 1829 0.9	19 SU 0628 6.6 1258 6.6 1925 0.7
20 M	0509 0.8 1128 4.1 1739 0.6 2342 4.2	0535 0.9 1146 4.5 1810 0.7	0549 1.0 1202 5.1 1823 0.7	0607 1.0 1218 5.5 1843 0.7	0624 6.2 0638 1.0 1253 6.2 1919 0.7	20 M 0117 6.9 0741 0.9 1344 6.8 2020 0.6
21 TU	0548 0.8 1212 4.2 1823 0.5	0605 4.6 0615 0.9 1227 4.6 1852 0.6	0618 5.2 0630 0.9 1245 5.2 1907 0.5	0634 5.7 0647 0.9 1303 5.6 1928 0.5	0649 6.4 0722 1.0 1337 6.3 2006 0.6	21 TU 0202 7.0 0833 0.9 1428 6.9 2111 0.4
22 W	0626 4.3 0627 0.7 1255 4.2 1906 0.4	0650 4.7 0655 0.8 1310 4.7 1935 0.5	0702 5.3 0711 0.9 1328 5.3 1951 0.4	0719 5.9 0727 0.8 1346 5.7 2012 0.4	0733 6.6 0804 0.9 1420 6.4 2051 0.4	22 W 0246 7.2 0922 0.8 1510 6.9 2200 0.2

23 TH	0110 0708 1338 1951	4.4 0.7 4.3 0.3	0137 0737 1353 2019	4.8 0.8 4.7 0.4	0147 0753 1410 2034	5.4 0.8 5.3 0.3	0203 0809 1429 2055	6.0 0.8 5.8 0.3	0237 0848 1502 2135	6.7 0.8 6.4 0.3	0309 0927 1531 2212	7.3 0.9 7.0 0.3	23 TH	0329 1008 1551 2244	7.3 0.7 7.0 0.1
24 F	0155 0751 1421 2035	4.4 0.7 4.3 0.3	0223 0820 1436 2103	4.8 0.8 4.7 0.4	0232 0837 1452 2118	5.4 0.8 5.3 0.3	0248 0853 1511 2139	6.0 0.8 5.7 0.3	0322 0932 1544 2217	6.7 0.8 6.4 0.3	0352 1011 1614 2253	7.3 0.8 7.0 0.2	24 F	0412 1050 1631 2325	7.3 0.7 6.9 0.0
25 SA	0240 0835 1504 2121	4.3 0.8 4.2 0.3	0310 0904 1519 2149	4.7 0.8 4.7 0.4	0317 0921 1534 2201	5.3 0.9 5.3 0.4	0333 0938 1553 2221	5.9 0.9 5.7 0.4	0407 1017 1626 2258	6.6 0.9 6.3 0.4	0436 1053 1655 2332	7.2 0.8 6.9 0.3	25 SA	0455 1129 1711 2392	7.2 0.7 6.9 0.1
26 SU	0327 0922 1549 2210	4.2 0.9 4.2 0.4	0355 0949 1603 2236	4.6 0.9 4.6 0.5	0404 1006 1619 2246	5.2 1.0 5.2 0.5	0419 1023 1637 2305	5.7 1.0 5.6 0.5	0453 1101 1710 2340	6.4 1.0 6.2 0.5	0521 1135 1738 2392	7.0 1.0 6.8 0.5	26 SU	0539 1208 1754 2425	6.9 0.8 8.0 0.5
27 M D	0417 1014 1638 2304	4.0 1.0 4.1 0.5	0443 1039 1652 2329	4.4 1.1 4.6 0.7	0453 1054 1708 2337	5.0 1.1 5.1 0.7	0508 1111 1726 2354	5.5 1.1 5.5 0.6	0542 1147 1759 2403	6.2 1.1 6.1 0.6	0610 1220 1826 2431	6.8 1.1 6.7 0.6	27 M D	0629 1249 1843 2464	6.7 1.0 6.6 0.6
28 TU	0513 1114 1735	3.9 1.1 4.0	0538 1137 1750	4.3 1.2 4.5	0548 1150 1805	4.8 1.2 4.9	0604 1207 1824	5.3 1.2 5.3	0625 1240 1856	6.0 1.3 6.0	0654 1311 1924	6.5 1.3 6.5	28 TU	0725 1338 1942	6.5 1.2 6.5
29 W	0606 1223 1844	0.6 3.7 1.1 3.9	0631 1249 1900	0.8 4.2 4.3	0637 1258 1913	0.8 4.7 4.8	0651 1313 1932	0.8 5.1 5.2	0718 1342 2003	0.9 5.8 5.9	0748 1415 2031	0.9 6.4 6.4	29 W	0824 1441 2052	0.8 6.3 6.4
30 TH	0712 1336 1959	0.7 3.7 3.8	0740 1355 2015	0.9 4.1 4.3	0745 1350 2028	1.0 4.6 4.8	0757 1426 2046	1.0 5.0 5.2	0821 1454 2116	1.0 5.7 5.8	0851 1528 2144	1.1 6.2 6.4	30 TH	0935 1555 2203	6.2 1.3 6.4
31 F	0819 1444 2109	0.8 3.7 3.9	0848 1450 2130	1.0 4.2 4.4	0854 1500 2142	1.1 4.7 4.9	0907 1543 2158	1.0 5.0 5.3	0931 1614 2229	1.1 5.7 5.9	1001 1645 2257	1.2 6.2 6.5	31 F	1046 1714 2315	6.2 1.2 6.5

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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	
1 SA	0328	0.9	0353	1.0	0402	1.1	0418	1.1	0448	1.1	0518	1.2	0547	1.1	1 SA
	0949	3.8	1010	4.3	1022	4.8	1039	5.2	1109	5.8	1138	6.4	1157	6.4	
	1602	0.8	1631	1.0	1642	1.0	1659	1.0	1733	1.0	1805	1.0	1834	0.9	
	2209	4.1	2237	4.5	2246	5.0	2302	5.5	2333	6.1					
2 SU	0427	0.9	0451	1.0	0503	1.0	0520	1.0	0555	1.1	0603	6.7	0622	6.7	2 SU
	1043	4.0	1105	4.4	1118	5.0	1136	5.4	1206	6.0	0628	1.1	0658	1.0	
	1702	0.6	1731	0.8	1742	0.8	1802	0.7	1837	0.8	1237	6.6	1257	6.6	
	2301	4.2	2332	4.6	2340	5.2	2355	5.6			1910	0.8	1937	0.6	
3 M O	0516	0.8	0539	1.0	0554	1.0	0613	1.0	0627	6.3	0658	6.9	0719	6.9	3 M O
	1130	4.1	1150	4.5	1205	5.1	1222	5.5	0649	1.0	0725	1.0	0753	0.9	
	1751	0.5	1819	0.6	1833	0.6	1854	0.6	1254	6.2	1326	6.7	1346	6.7	
	2347	4.2							1930	0.6	2005	0.6	2030	0.4	
4 TU	0558	0.8	0618	4.6	0625	5.3	0641	5.7	0714	6.4	0746	7.1	0757	7.0	4 TU
	1211	4.1	0820	0.9	0837	1.0	0857	0.9	0736	1.0	0813	1.0	0841	0.9	
	1834	0.4	1229	4.6	1246	5.2	1303	5.6	1336	6.2	1409	6.8	1430	6.8	
			1901	0.6	1917	0.5	1939	0.5	2016	0.5	2052	0.5	2117	0.4	
5 W	0628	4.2	0659	4.6	0706	5.3	0722	5.8	0757	6.5	0828	7.1	0850	7.1	5 W
	0635	0.8	0856	0.9	0716	1.0	0737	0.9	0817	1.0	0853	1.0	0923	0.9	
	1251	4.2	1305	4.6	1322	5.2	1341	5.6	1415	6.3	1447	6.9	1508	6.9	
	1913	0.4	1938	0.6	1955	0.5	2018	0.5	2056	0.5	2132	0.6	2158	0.4	
6 TH	0108	4.2	0136	4.6	0145	5.2	0201	5.8	0236	6.5	0308	7.1	0329	7.0	6 TH
	0710	0.8	0731	0.9	0752	1.0	0811	1.0	0851	1.0	0927	1.1	1000	0.9	
	1327	4.2	1340	4.7	1357	5.2	1416	5.7	1451	6.3	1522	6.9	1543	6.9	
	1947	0.4	2011	0.6	2029	0.6	2050	0.6	2127	0.6	2202	0.6	2232	0.5	
7 F	0146	4.1	0211	4.5	0222	5.2	0239	5.7	0314	6.4	0344	7.0	0405	6.9	7 F
	0743	0.9	0805	1.0	0824	1.0	0840	1.0	0920	1.0	0955	1.1	1030	1.0	
	1401	4.2	1415	4.6	1432	5.2	1451	5.6	1525	6.2	1555	6.8	1615	6.8	
	2017	0.5	2042	0.7	2057	0.7	2114	0.6	2152	0.7	2224	0.7	2258	0.6	

8 SA	0223 4.0 0813 0.9 1434 4.1 2044 0.6	0245 4.5 0837 1.0 1450 4.6 2111 0.7	0258 5.1 0855 1.1 1507 5.1 2124 0.7	0315 5.5 0909 1.0 1525 5.5 2138 0.7	0349 6.2 0948 1.1 1557 6.1 2215 0.7	0418 6.8 1023 1.1 1627 6.7 2247 0.7	0437 6.8 1056 1.0 1646 6.7 2318 0.6	8 SA
9 SU	0259 3.9 0843 1.0 1508 4.0 2113 0.7	0317 4.3 0911 1.1 1524 4.5 2142 0.9	0332 4.9 0926 1.1 1541 5.0 2153 0.8	0349 5.4 0940 1.1 1558 5.4 2205 0.8	0422 6.0 1017 1.1 1628 6.0 2240 0.8	0449 6.6 1052 1.2 1658 6.6 2313 0.8	0508 6.6 1122 1.1 1716 6.5 2341 0.8	9 SU
10 M	0334 3.8 0917 1.0 1544 3.9 2146 0.8	0350 4.2 0946 1.2 1559 4.4 2217 1.0	0407 4.7 1000 1.3 1616 4.8 2225 1.0	0423 5.1 1012 1.2 1632 5.2 2235 1.0	0454 5.8 1047 1.3 1701 5.8 2307 1.0	0520 6.4 1123 1.3 1729 6.4 2340 1.0	0538 6.3 1151 1.2 1748 6.3	10 M
11 TU C	0412 3.6 0958 1.2 1625 3.7 2227 1.0	0427 4.1 1026 1.4 1639 4.2 2259 1.2	0443 4.5 1038 1.4 1655 4.7 2303 1.2	0458 4.9 1048 1.4 1711 5.0 2309 1.2	0528 5.6 1120 1.5 1739 5.6 2337 1.2	0553 6.1 1155 1.5 1805 6.1	0606 0.9 0610 6.1 1222 1.4 1824 6.1	11 TU C
12 W	0457 3.5 1049 1.3 1716 3.6 2327 1.1	0510 3.9 1115 1.5 1727 4.0 2354 1.4	0526 4.4 1125 1.6 1744 4.5 2356 1.4	0541 4.7 1132 1.6 1800 4.8 2354 1.4	0611 5.4 1200 1.6 1830 5.4	0633 5.9 1232 1.7 1852 5.9	0649 5.8 1257 1.6 1909 5.9	12 W
13 TH	0557 3.4 1204 1.4 1822 3.5	0606 3.8 1223 1.6 1830 3.9	0622 4.2 1229 1.7 1847 4.3	0637 4.6 1234 1.7 1906 4.7	0611 1.5 0707 5.2 1936 5.3	0646 1.5 0728 5.7 1324 1.9 1958 5.7	0112 1.4 0743 5.6 1345 1.8 2014 5.7	13 TH
14 F	0055 1.2 0706 3.4 1334 1.3 1935 3.5	0111 1.5 0729 3.8 1356 1.6 1952 3.9	0115 1.6 0735 4.2 1400 1.7 2005 4.3	0110 1.6 0749 4.5 1412 1.7 2022 4.7	0125 1.7 0817 5.2 2051 5.3	0144 1.7 0845 5.6 1426 1.9 2122 5.8	0207 1.6 0907 5.5 1507 1.8 2146 5.7	14 F
15 SA	0210 1.2 0819 3.5 1443 1.1 2046 3.6	0233 1.4 0848 3.9 1512 1.4 2108 4.1	0242 1.5 0857 4.3 1522 1.4 2121 4.5	0254 1.6 0906 4.7 1535 1.4 2134 4.9	0306 1.7 0934 5.3 1559 1.5 2204 5.6	0324 1.8 1003 5.8 1624 1.6 2235 6.1	0354 1.7 1026 5.8 1651 1.5 2258 6.1	15 SA

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WALTON-ON-THE-NAZE	MARGATE	SHIVERING SAND	SOUTHEAST-ON-SEA	TILBURY	NORTH WOOLWICH	LONDON BRIDGE (TOWER PIER)
Time m	Time m	Time m	Time m	Time m	Time m	Time m
16 SU 0313 1.1 0926 3.7 1543 0.9 2147 3.8 0406 1.0 1021 3.9 1634 0.7 2238 4.0	0337 1.3 0950 4.2 1612 1.1 2211 4.3 0431 1.1 1042 4.4 1705 0.9 2303 4.5	0350 1.3 1002 4.6 1624 1.1 2222 4.8 0445 1.2 1056 4.9 1718 0.8 2314 5.0	0405 1.4 1014 5.0 1640 1.1 2235 5.2 0502 1.2 1111 5.3 1736 0.8 2328 5.5	0427 1.5 1046 5.6 1709 1.2 2308 5.9 0531 1.2 1144 5.9 1809 0.8	0451 1.6 1114 6.2 1736 1.2 2338 6.5 0556 1.3 1213 6.5 1838 0.9	0515 1.4 1136 6.1 1759 1.1 0620 1.2 1234 6.5 1904 0.7
17 M 0451 0.9 1109 4.1 1721 0.5 2325 4.2	0518 1.0 1128 4.5 1752 0.7 2350 4.7	0532 1.0 1143 5.1 1806 0.6	0551 1.0 1200 5.5 1827 0.6	0603 6.2 0625 1.1 1234 6.2 1904 0.6	0633 6.9 0655 1.1 1304 6.8 1937 0.6	0655 6.9 0725 1.0 1324 6.8 2005 0.5
18 TU 0533 0.8 1153 4.2 1806 0.3	0600 0.9 1210 4.7 1837 0.5	0616 0.9 1227 5.3 1851 0.4	0636 0.9 1245 5.7 1914 0.4	0651 6.5 0716 1.0 1318 6.4 1955 0.4	0722 7.2 0750 1.0 1350 7.0 2031 0.4	0743 7.1 0824 0.9 1409 7.0 2100 0.2
19 W 0009 4.4 0613 0.7 1237 4.4 1850 0.2	0035 4.8 0641 0.8 1252 4.8 1919 0.4	0046 5.4 0659 0.8 1309 5.4 1935 0.3	0102 6.0 0720 0.8 1328 5.9 1959 0.2	0136 6.7 0803 0.9 1401 6.5 2041 0.3	0208 7.4 0841 0.9 1433 7.2 2119 0.2	0228 7.3 0915 0.7 1452 7.1 2148 0.0
20 TH 0054 4.5 0655 0.7 1319 4.5 1933 0.2	0121 4.9 0723 0.7 1335 4.9 2002 0.3	0130 5.6 0742 0.8 1350 5.5 2018 0.2	0146 6.1 0804 0.7 1410 6.0 2042 0.2	0220 6.8 0847 0.8 1442 6.7 2123 0.1	0252 7.5 0927 0.8 1513 7.3 2202 0.1	0312 7.4 1001 0.6 1533 7.2 2232 -0.1
21 F 0138 4.5 0736 0.7 1401 4.5 2015 0.2	0207 4.9 0804 0.7 1417 4.9 2043 0.3	0214 5.6 0824 0.7 1432 5.6 2058 0.2	0230 6.1 0846 0.7 1451 6.0 2123 0.2	0304 6.9 0929 0.8 1523 6.7 2202 0.2	0335 7.5 1008 0.7 1555 7.3 2241 0.1	0355 7.4 1042 0.6 1612 7.2 2311 -0.1
22 SA	0215 0.2	0215 0.2	0215 0.2	0215 0.2	0215 0.2	0215 0.2

23 SU	0222 4.4 0818 0.7 1442 4.4 2057 0.3	0251 4.8 0846 0.8 1458 4.9 2124 0.4	0258 5.5 0906 0.8 1513 5.5 2138 0.3	0314 6.0 0928 0.8 1531 6.0 2201 0.3	0347 6.7 1008 0.8 1604 6.6 2239 0.3	0418 7.4 1047 0.7 1634 7.2 2315 0.2	0437 7.3 1120 0.6 1651 7.2 2345 0.1
24 M	0306 4.3 0902 0.8 1525 4.3 2140 0.4	0333 4.7 0928 0.9 1540 4.8 2205 0.6	0342 5.3 0947 0.9 1555 5.4 2218 0.5	0358 5.8 1008 0.9 1613 5.8 2238 0.5	0431 6.5 1047 0.9 1646 6.5 2313 0.5	0500 7.1 1123 0.9 1715 7.0 2347 0.5	0519 7.0 1154 0.8 1733 7.0
25 TU D	0353 4.1 0950 0.9 1611 4.2 2230 0.6	0415 4.5 1013 1.0 1626 4.7 2253 0.8	0428 5.0 1032 1.0 1642 5.2 2303 0.8	0443 5.5 1051 1.0 1658 5.6 2320 0.8	0516 6.2 1127 1.1 1731 6.2 2351 0.8	0545 6.8 1201 1.1 1800 6.8	0604 6.7 1230 1.0 1818 6.8
26 W	0445 3.8 1046 1.0 1707 4.0 2331 0.9	0505 4.3 1107 1.2 1723 4.5 2355 1.1	0519 4.8 1123 1.2 1738 4.9	0534 5.2 1140 1.2 1754 5.3	0606 5.8 1212 1.3 1826 6.0	0622 0.8 0634 6.4 1244 1.3 1853 6.5	0655 6.3 1312 1.2 1913 6.5
27 TH	0548 3.6 1155 1.1 1820 3.8	0611 4.1 1221 1.3 1838 4.3	0621 4.6 1232 1.3 1849 4.7	0637 4.9 1245 1.3 1906 5.1	0640 1.1 0705 5.6 1313 1.4 1935 5.7	0709 1.2 0733 6.1 1343 1.5 2001 6.3	0756 6.1 1409 1.4 2024 6.3
28 F	0643 1.0 0706 3.5 1317 1.1 1945 3.7	0112 1.3 0731 4.0 1348 1.3 2004 4.2	0117 1.3 0739 4.4 1355 1.4 2014 4.6	0127 1.3 0754 4.8 1405 1.4 2029 5.0	0148 1.4 0820 5.4 1429 1.5 2056 5.6	0220 1.5 0845 5.9 1501 1.6 2122 6.2	0245 1.4 0908 5.9 1527 1.5 2143 6.2
29 SA	0203 1.1 0831 3.6 1446 1.0 2101 3.8	0234 1.3 0850 4.1 1518 1.2 2129 4.3	0237 1.4 0902 4.5 1522 1.2 2136 4.8	0248 1.4 0918 4.8 1535 1.3 2151 5.2	0309 1.5 0945 5.4 1602 1.4 2219 5.8	0340 1.6 1010 5.9 1627 1.4 2246 6.3	0403 1.5 1028 5.9 1654 1.3 2303 6.3
30 SU	0322 1.1 0940 3.8 1603 0.8 2204 4.0	0348 1.3 1001 4.2 1632 1.0 2236 4.5	0355 1.3 1012 4.7 1640 1.0 2242 5.0	0408 1.3 1031 5.1 1656 1.0 2257 5.4	0439 1.4 1100 5.7 1728 1.0 2327 6.1	0503 1.5 1128 6.2 1757 1.1 2356 6.7	0531 1.4 1145 6.2 1825 0.9
31 M	0421 1.0 1033 3.9 1656 0.6 2253 4.1	0447 1.2 1057 4.4 1725 0.8 2327 4.6	0456 1.2 1108 4.9 1737 0.7 2333 5.2	0512 1.2 1156 5.3 1755 0.7 2348 5.6	0546 1.2 1156 6.0 1828 0.7	0616 1.2 1227 6.6 1901 0.7	066 6.6 0643 1.1 1245 6.5 1925 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	
1 TU	0504	1.0	0530	1.1	0543	1.1	0601	1.1	0019	6.3	0049	6.9	0109	6.9	1 TU
	1117	4.1	1140	4.5	1152	5.1	1210	5.5	0636	1.1	0710	1.1	0737	0.9	
	1739	0.5	1807	0.6	1821	0.6	1841	0.6	1242	6.1	1313	6.8	1333	6.7	
	2335	4.2							1916	0.6	1950	0.6	2014	0.4	
2 W O	0541	0.9	0609	4.6	0613	5.2	0629	5.7	0102	6.4	0133	7.1	0153	7.0	2 W O
	1154	4.2	0804	1.0	0821	1.0	0841	1.0	0720	1.0	0755	1.0	0822	0.9	
	1815	0.4	1244	4.7	1258	5.2	1247	5.6	1320	6.2	1352	6.9	1412	6.8	
			1841	0.6	1857	0.6	1920	0.5	1956	0.5	2031	0.5	2056	0.4	
3 TH	0011	4.2	0043	4.6	0049	5.2	0105	5.7	0140	6.4	0211	7.1	0233	7.0	3 TH
	0614	0.8	0636	1.0	0656	1.0	0717	1.0	0757	1.0	0833	1.0	0902	0.9	
	1229	4.2	1244	4.7	1300	5.2	1319	5.7	1354	6.3	1426	6.9	1447	6.9	
	1847	0.4	1912	0.6	1929	0.6	1952	0.5	2030	0.6	2105	0.6	2132	0.4	
4 F	0046	4.2	0112	4.6	0122	5.2	0138	5.7	0214	6.4	0245	7.1	0307	7.0	4 F
	0646	0.8	0708	0.9	0729	1.0	0749	0.9	0830	1.0	0905	1.0	0937	0.9	
	1301	4.2	1314	4.7	1331	5.3	1351	5.7	1425	6.4	1457	7.0	1518	6.9	
	1916	0.5	1940	0.6	1957	0.6	2018	0.6	2056	0.6	2130	0.6	2202	0.5	
5 SA	0120	4.2	0141	4.6	0154	5.2	0211	5.7	0246	6.4	0316	7.0	0338	6.9	5 SA
	0717	0.8	0740	0.9	0800	1.0	0818	0.9	0859	1.0	0933	1.0	1007	0.9	
	1331	4.2	1347	4.7	1403	5.3	1422	5.7	1456	6.4	1526	7.0	1547	6.9	
	1942	0.5	2008	0.7	2022	0.7	2040	0.6	2119	0.6	2151	0.7	2225	0.6	
6 SU	0152	4.1	0211	4.5	0226	5.1	0243	5.6	0316	6.3	0345	6.9	0405	6.8	6 SU
	0746	0.8	0811	0.9	0829	1.0	0846	1.0	0926	1.0	1000	1.0	1032	0.9	
	1401	4.2	1420	4.7	1435	5.2	1453	5.6	1526	6.3	1555	6.9	1615	6.9	
	2007	0.6	2035	0.8	2048	0.8	2104	0.7	2141	0.7	2215	0.7	2245	0.7	
7 M	0222	4.0	0242	4.4	0256	5.0	0313	5.4	0345	6.1	0413	6.7	0432	6.6	7 M
	0814	0.9	0842	1.0	0859	1.1	0915	1.0	0953	1.1	1029	1.1	1058	1.0	
	1432	4.1	1453	4.6	1506	5.1	1523	5.5	1555	6.1	1625	6.7	1644	6.7	
	2031	0.7	2102	0.9	2114	0.9	2128	0.8	2204	0.9	2239	0.9	2307	0.8	

8 TU	0251 3.8 0845 1.0 1504 4.0 2058 0.8	0313 4.3 0913 1.1 1525 4.4 2131 1.0	0326 4.8 0929 1.2 1536 4.9 2140 1.1	0341 5.2 0943 1.2 1553 5.3 2152 1.0	0413 5.9 1019 1.2 1624 5.9 2224 1.1	0441 6.5 1055 1.3 1654 6.5 2300 1.1	0500 6.4 1124 1.2 1714 6.5 2328 1.0	8 TU
9 W	0323 3.7 0919 1.1 1538 3.8 2131 1.0	0345 4.2 0947 1.3 1600 4.3 2206 1.2	0357 4.6 1000 1.3 1610 4.7 2210 1.3	0411 5.0 1012 1.3 1626 5.1 2217 1.2	0442 5.7 1043 1.4 1656 5.7 2244 1.3	0510 6.2 1119 1.5 1727 6.3 2320 1.3	0530 6.2 1148 1.3 1747 6.3 2351 1.2	9 W
10 TH C	0401 3.6 1002 1.2 1622 3.6 2216 1.2	0423 4.0 1030 1.4 1645 4.1 2255 1.4	0434 4.4 1039 1.5 1654 4.5 2252 1.5	0448 4.8 1047 1.5 1709 4.9 2255 1.5	0517 5.4 1112 1.6 1738 5.5 2318 1.5	0545 6.0 1145 1.6 1807 6.1 2352 1.5	0605 5.9 1215 1.5 1828 6.0	10 TH C
11 F	0453 3.4 1103 1.3 1722 3.5 2336 1.4	0513 3.9 1131 1.6 1744 3.9	0527 4.2 1136 1.6 1755 4.3	0538 4.6 1140 1.7 1809 4.7 2357 1.8	0606 5.2 1202 1.7 1838 5.3	0632 5.7 1228 1.8 1903 5.8	0722 1.4 1355 5.7 1455 1.6 1920 5.7	11 F
12 SA	0609 3.3 1246 1.3 1846 3.4	0625 3.7 1304 1.6 1906 3.8	0640 4.1 1307 1.7 1916 4.2	0651 4.5 1313 1.8 1932 4.6	0719 5.0 1326 1.9 2001 5.2	0740 5.5 1339 1.9 2025 5.7	0755 5.4 1358 1.8 2044 5.6	12 SA
13 SU	0132 1.4 0737 3.3 1409 1.1 2015 3.5	0149 1.6 0805 3.8 1436 1.4 2036 4.0	0154 1.8 0813 4.2 1446 1.5 2046 4.4	0159 1.8 0823 4.5 1458 1.5 2058 4.8	0203 2.0 0848 5.1 1519 1.7 2126 5.4	0207 2.1 0917 5.6 1544 1.8 2156 6.0	0228 1.9 0940 5.5 1611 1.7 2219 5.9	13 SU
14 M	0244 1.2 0855 3.6 1514 0.9 2122 3.8	0309 1.4 0920 4.1 1545 1.1 2147 4.3	0320 1.5 0931 4.5 1556 1.1 2157 4.8	0333 1.6 0943 4.9 1611 1.1 2208 5.2	0353 1.7 1013 5.4 1640 1.2 2240 5.9	0417 1.8 1040 6.0 1706 1.3 2309 6.5	0440 1.7 1102 5.9 1728 1.2 2330 6.4	14 M
15 TU	0340 1.0 0955 3.8 1609 0.6 2216 4.1	0408 1.2 1017 4.4 1640 0.8 2243 4.6	0420 1.3 1029 4.8 1652 0.8 2251 5.1	0436 1.3 1045 5.2 1711 0.8 2305 5.6	0506 1.4 1117 5.9 1745 0.8 2338 6.3	0530 1.4 1145 6.5 1813 0.8	0553 1.3 1205 6.4 1840 0.7	15 TU

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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	0427	0.9	0456	1.0	0510	1.0	0529	1.0	0606	1.1	0008	6.9	0028	6.9
	1044	4.1	1104	4.6	1117	5.1	1135	5.6	1208	6.2	0633	1.1	0705	1.0
	1657	0.4	1729	0.6	1742	0.5	1804	0.5	1842	0.5	1238	6.8	1258	6.8
	2303	4.3	2330	4.8	2338	5.4	2354	5.9			1915	0.5	1945	0.4
17 TH ●	0510	0.8	0539	0.8	0555	0.9	0617	0.9	0028	6.6	0059	7.3	0119	7.2
	1128	4.3	1147	4.8	1201	5.4	1220	5.8	0658	0.9	0733	1.0	0805	0.9
	1742	0.2	1813	0.4	1828	0.3	1853	0.3	1253	6.5	1325	7.1	1344	7.1
	2347	4.5							1933	0.3	2010	0.3	2039	0.1
18 F	0552	0.7	0014	4.9	0022	5.5	0039	6.1	0113	6.8	0145	7.5	0205	7.4
	1211	4.5	0821	0.8	0838	0.8	0703	0.8	0747	0.8	0825	0.8	0857	0.7
	1826	0.1	1228	4.9	1242	5.5	1302	6.0	1335	6.7	1407	7.3	1426	7.3
			1855	0.3	1911	0.2	1937	0.2	2019	0.2	2058	0.1	2127	0.0
19 SA	0031	4.6	0059	5.0	0106	5.6	0123	6.2	0157	6.9	0229	7.6	0249	7.5
	0633	0.6	0702	0.7	0721	0.7	0747	0.7	0832	0.7	0911	0.7	0943	0.6
	1253	4.6	1310	5.0	1324	5.7	1343	6.2	1416	6.9	1448	7.5	1507	7.4
	1908	0.1	1936	0.3	1952	0.2	2019	0.1	2101	0.1	2140	0.1	2210	-0.1
20 SU	0115	4.6	0142	5.0	0149	5.6	0206	6.2	0240	6.9	0311	7.6	0331	7.4
	0715	0.6	0744	0.7	0804	0.7	0830	0.7	0914	0.7	0953	0.7	1024	0.5
	1335	4.6	1352	5.1	1405	5.7	1424	6.2	1457	6.9	1529	7.5	1547	7.5
	1948	0.2	2015	0.3	2031	0.2	2058	0.2	2138	0.2	2217	0.1	2248	0.0
21 M	0158	4.5	0225	4.9	0232	5.5	0249	6.1	0322	6.8	0353	7.4	0413	7.3
	0758	0.6	0825	0.7	0845	0.7	0911	0.7	0952	0.7	1030	0.7	1101	0.6
	1416	4.6	1435	5.0	1446	5.6	1505	6.1	1538	6.8	1609	7.4	1628	7.4
	2027	0.3	2053	0.5	2108	0.4	2133	0.4	2211	0.4	2248	0.4	2320	0.3
22 TU	0241	4.3	0304	4.7	0315	5.3	0331	5.8	0405	6.5	0434	7.1	0454	7.0
	0841	0.7	0906	0.8	0926	0.8	0949	0.8	1028	0.9	1104	0.8	1135	0.7
	1459	4.4	1518	4.9	1529	5.5	1547	5.9	1620	6.6	1650	7.2	1709	7.2
	2108	0.6	2132	0.7	2146	0.7	2207	0.7	2241	0.7	2315	0.7	2347	0.6

23 W	0326 0927 1545 2156	4.0 0.8 4.2 0.8	0345 0950 1605 2218	4.5 1.0 4.7 1.0	0359 1009 1616 2229	5.0 1.0 5.2 1.0	0415 1029 1633 2244	5.5 1.0 5.6 1.0	0447 1705 2314	6.1 1.0 6.3 1.1	0516 1138 1734 2346	6.7 1.0 6.9 1.1	0537 1207 1755	23 W
24 TH D	0417 1022 1642 2258	3.8 0.9 3.9 1.1	0432 1037 1703 2320	4.2 1.1 4.4 1.3	0449 1059 1714 2327	4.7 1.1 4.9 1.4	0504 1115 1729 2338	5.1 1.2 5.3 1.4	0534 1146 1800	5.7 1.2 5.9	0602 1216 1827	6.3 1.3 6.5	0624 1245 1848	24 TH D
25 F	0520 1131 1801	3.5 1.0 3.7	0539 1201 1823	4.0 1.3 4.1	0552 1208 1830	4.4 1.3 4.6	0607 1220 1845	4.8 1.4 5.0	0604 1246 1913	1.5 1.5 5.6	0630 1312 1936	1.5 1.5 6.1	0722 1339 2000	25 F
26 SA	0015 0642 1300 1931	1.3 3.4 1.1 3.7	0046 0707 1334 1956	1.5 3.9 1.3 4.1	0050 0715 1339 2002	1.6 4.3 1.4 4.5	0056 0731 1347 2014	1.7 4.6 1.4 4.9	0118 0753 1407 2038	1.8 5.2 1.6 5.5	0146 0816 1436 2102	1.9 5.7 1.7 6.0	0211 0840 1500 2123	26 SA
27 SU	0145 0812 1438 2049	1.4 3.5 0.9 3.8	0220 0830 1509 2121	1.6 4.0 1.2 4.3	0220 0842 1512 2125	1.7 4.4 1.2 4.7	0229 0900 1525 2138	1.7 4.7 1.3 5.1	0247 0926 1550 2206	1.8 5.3 1.4 5.7	0317 0949 1609 2230	1.9 5.7 1.5 6.3	0338 1006 1633 2246	27 SU
28 M	0309 0921 1550 2149	1.3 3.7 0.7 4.0	0336 0942 1617 2223	1.4 4.2 0.9 4.5	0341 0953 1626 2231	1.5 4.6 0.9 5.0	0353 1011 1642 2241	1.5 5.0 1.0 5.4	0422 1041 1713 2311	1.6 5.6 1.0 6.1	0443 1108 1740 2338	1.7 6.1 1.1 6.7	0509 1125 1806 2356	28 M
29 TU	0404 1012 1638 2235	1.1 3.9 0.6 4.1	0431 1037 1706 2311	1.2 4.4 0.7 4.6	0439 1046 1717 2314	1.3 4.9 0.7 5.2	0454 1105 1736 2329	1.3 5.3 0.7 5.6	0526 1136 1808	1.3 5.9 0.8	0553 1205 1838	1.3 6.5 0.7	0620 1223 1903	29 TU
30 W	0443 1054 1716 2313	1.0 4.0 0.5 4.2	0510 1119 1743 2348	1.1 4.5 0.7 4.6	0521 1128 1755 2351	1.2 5.1 0.7 5.2	0539 1146 1816	1.1 5.5 0.6	0613 1220 1850	6.3 1.1 0.6	0629 0644 1250 1922	7.0 1.1 6.8 0.6	0648 0711 1309 1947	30 W

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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 O	0516	0.9	0542	1.0	0557	1.1	0007	5.7	0041	6.4	0111	7.1	0131	7.0
2 F	1129	4.1	1150	4.6	1201	5.2	0617	1.0	0654	1.0	0727	1.0	0755	0.9
	1746	0.5	1812	0.7	1826	0.6	1221	5.6	1255	6.2	1326	6.9	1347	6.8
	2347	4.2					1849	0.6	1924	0.6	1957	0.6	2024	0.5
3 SA	0548	0.8	0017	4.6	0023	5.2	0040	5.7	0114	6.4	0146	7.0	0207	6.9
	1200	4.2	0612	0.9	0630	1.0	0651	1.0	0730	1.0	0804	1.0	0833	0.9
	1814	0.5	1216	4.7	1231	5.2	1251	5.7	1326	6.3	1358	6.9	1419	6.9
4 SU			1838	0.6	1853	0.6	1916	0.6	1953	0.7	2027	0.7	2056	0.6
	0018	4.2	0041	4.6	0053	5.2	0110	5.7	0145	6.4	0216	7.0	0238	6.9
	0619	0.8	0643	0.9	0702	0.9	0722	0.9	0803	0.9	0836	1.0	0907	0.9
5 M	1230	4.2	1245	4.7	1301	5.3	1320	5.8	1355	6.4	1426	7.0	1448	7.0
	1841	0.5	1906	0.7	1920	0.6	1940	0.6	2018	0.7	2051	0.7	2123	0.6
	0049	4.2	0106	4.6	0122	5.2	0139	5.7	0213	6.4	0244	7.0	0305	6.9
6 TU	0650	0.8	0715	0.9	0733	0.9	0752	0.9	0833	0.9	0906	0.9	0937	0.9
	1259	4.3	1317	4.7	1332	5.3	1351	5.8	1424	6.5	1454	7.1	1516	7.0
	1906	0.6	1933	0.7	1946	0.7	2004	0.7	2042	0.7	2115	0.7	2147	0.7
7 W	0119	4.1	0136	4.6	0151	5.2	0208	5.6	0242	6.3	0310	6.9	0330	6.8
	0719	0.8	0746	0.9	0802	0.9	0821	0.9	0900	1.0	0934	0.9	1005	0.9
	1329	4.2	1351	4.7	1403	5.3	1421	5.7	1454	6.4	1523	7.0	1544	7.0
8 TH	1929	0.7	1959	0.8	2012	0.8	2028	0.8	2105	0.8	2140	0.8	2210	0.7
	0147	4.0	0208	4.5	0220	5.0	0236	5.5	0310	6.2	0338	6.8	0357	6.7
	0747	0.8	0816	0.9	0832	1.0	0849	1.0	0927	1.0	1003	1.0	1032	1.0
9 F	1359	4.1	1423	4.6	1433	5.1	1451	5.6	1523	6.2	1553	6.9	1613	6.8
	1952	0.8	2025	0.9	2037	0.9	2051	0.9	2127	0.9	2203	0.9	2232	0.9
	0216	3.9	0238	4.4	0248	4.9	0304	5.3	0338	6.0	0407	6.6	0426	6.5
10 SA	0817	0.9	0846	1.0	0900	1.1	0917	1.1	0952	1.2	1028	1.2	1057	1.1
	1430	4.0	1454	4.4	1503	5.0	1520	5.4	1553	6.1	1624	6.7	1644	6.6
	2019	0.9	2054	1.1	2101	1.1	2113	1.1	2144	1.1	2222	1.1	2253	1.0

8 TH	0247 0849 1505 2051	3.8 0.9 3.9 1.0	0306 0919 1526 2127	4.3 1.1 4.3 1.2	0318 0930 1536 2131	4.7 1.2 4.8 1.3	0333 0944 1553 2138	5.2 1.2 5.2 1.3	0406 1012 1625 2206	5.8 1.3 5.9 1.3	0436 1048 1657 2245	6.3 1.3 6.5 1.3	0456 1119 1718 2317	6.3 1.2 6.4 1.2	8 TH
9 F	0323 0929 1548 2135	3.7 1.0 3.7 1.2	0340 1000 1611 2214	4.1 1.3 4.1 1.5	0354 1006 1619 2212	4.5 1.3 4.6 1.5	0409 1016 1635 2216	5.0 1.4 5.0 1.5	0440 1039 1706 2241	5.6 1.4 5.7 1.5	0509 1114 1737 2319	6.1 1.4 6.2 1.5	0530 1144 1758 2350	6.1 1.3 6.2 1.3	9 F
10 SA C	0411 1025 1644 2243	3.5 1.2 3.6 1.4	0432 1058 1713 2326	3.9 1.4 4.0 1.7	0444 1100 1719 2318	4.3 1.5 4.4 1.7	0457 1105 1733 2317	4.7 1.5 4.8 1.8	0526 1124 1802 2335	5.3 1.6 5.5 1.8	0553 1155 1830 1945	5.8 1.6 6.0 5.8	0613 1223 1850 2003	5.8 1.4 5.9 5.8	10 SA C
11 SU	0521 1201 1802	3.3 1.2 3.5	0543 1226 1834	3.8 1.5 3.9	0556 1226 1840	4.2 1.6 4.3	0605 1230 1852	4.5 1.6 4.7	0633 1240 1921	5.1 1.7 5.3	0609 1258 1945	1.7 5.6 5.8	0036 0713 1320 2003	1.6 5.5 1.6 5.8	11 SU
12 M	0045 0653 1334 1940	1.5 3.3 1.0 3.6	0106 0720 1401 2005	1.7 3.8 1.3 4.1	0106 0727 1409 2010	1.8 4.2 1.4 4.5	0107 0739 1421 2022	1.9 4.5 1.4 4.9	0112 0804 1441 2050	2.0 5.1 1.6 5.5	0124 0829 1501 2119	2.1 5.5 1.7 6.1	0146 0848 1525 2140	1.9 5.4 1.7 6.0	12 M
13 TU	0208 0819 1441 2052	1.3 3.5 0.8 3.9	0236 0843 1513 2119	1.5 4.0 1.0 4.4	0242 0854 1523 2125	1.6 4.5 1.0 4.8	0254 0907 1537 2137	1.7 4.8 1.1 5.3	0313 0934 1604 2207	1.8 5.4 1.1 5.9	0339 1001 1632 2235	1.9 5.9 1.2 6.5	0400 1021 1653 2255	1.8 5.8 1.2 6.5	13 TU
14 W	0307 0922 1538 2148	1.1 3.8 0.5 4.2	0338 0944 1610 2216	1.2 4.4 0.7 4.7	0348 0956 1621 2222	1.3 4.8 0.7 5.2	0402 1012 1639 2236	1.3 5.2 0.7 5.7	0430 1043 1712 2309	1.4 5.8 0.7 6.4	0456 1111 1740 2337	1.5 6.4 0.7 7.0	0518 1129 1805 2356	1.4 6.3 0.7 6.9	14 W
15 TH	0356 1013 1627 2236	0.9 4.1 0.3 4.4	0428 1033 1659 2304	1.0 4.6 0.5 4.8	0440 1046 1712 2311	1.0 5.1 0.4 5.4	0458 1104 1734 2326	1.0 5.6 0.4 6.0	0534 1136 1811	1.1 6.3 0.4	0602 1206 1844	1.1 6.9 0.4	0632 1224 1915	1.1 6.8 0.4	15 TH

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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 ●	0442 0.7 1058 4.4 1713 0.2 2321 4.5	0513 0.8 1117 4.8 1744 0.4 2347 4.9	0528 0.9 1130 5.4 1758 0.3 2355 5.5	0550 0.9 1149 5.9 1823 0.3	0613 0.7 1212 5.6 1841 0.2	0638 0.8 1233 6.1 1909 0.2	0646 6.8 1222 0.8 1903 0.3	067 1222 6.6 1903 0.3	067 1222 6.6 1903 0.3	0029 7.3 0704 0.9 1254 7.2 1941 0.3	0029 7.3 0704 0.9 1254 7.2 1941 0.3	0049 7.2 0737 0.9 1313 7.2 2011 0.2	16 F ●
17 SA	0526 0.6 1142 4.6 1757 0.1	0556 0.7 1158 5.0 1826 0.3	0613 0.7 1212 5.6 1841 0.2	0638 0.8 1233 6.1 1909 0.2	0656 6.2 1225 0.7 1841 0.2	0672 5.7 1315 6.3 1951 0.2	069 1305 6.8 1950 0.2	069 1305 6.8 1950 0.2	069 1305 6.8 1950 0.2	0117 7.5 0800 0.8 1338 7.5 2030 0.2	0117 7.5 0800 0.8 1338 7.5 2030 0.2	0137 7.4 0831 0.7 1357 7.4 2059 0.1	17 SA
18 SU	0005 4.6 0610 0.6 1225 4.7 1839 0.2	0030 5.0 0639 0.6 1242 5.1 1907 0.3	0038 5.6 0658 0.6 1254 5.7 1922 0.2	0056 6.2 0725 0.7 1315 6.3 1951 0.2	0056 6.2 0725 0.7 1315 6.3 1951 0.2	0056 6.2 0725 0.7 1315 6.3 1951 0.2	0056 6.2 0725 0.7 1315 6.3 1951 0.2	0056 6.2 0725 0.7 1315 6.3 1951 0.2	0056 6.2 0725 0.7 1315 6.3 1951 0.2	0202 7.6 0848 0.7 1420 7.6 2112 0.2	0202 7.6 0848 0.7 1420 7.6 2112 0.2	0222 7.5 0918 0.6 1440 7.6 2142 0.1	18 SU
19 M	0049 4.6 0654 0.5 1308 4.7 1920 0.3	0113 5.0 0722 0.6 1328 5.1 1946 0.4	0122 5.6 0741 0.6 1337 5.8 2002 0.3	0140 6.2 0810 0.6 1430 7.1 2029 0.4	0140 6.2 0810 0.6 1430 7.1 2029 0.4	0140 6.2 0810 0.6 1430 7.1 2029 0.4	0130 6.9 0809 0.7 1348 7.0 2032 0.2	0130 6.9 0809 0.7 1348 7.0 2032 0.2	0130 6.9 0809 0.7 1348 7.0 2032 0.2	0245 7.5 0931 0.6 1502 7.7 2148 0.4	0245 7.5 0931 0.6 1502 7.7 2148 0.4	0305 7.4 1001 0.5 1522 7.6 2220 0.3	19 M
20 TU	0133 4.5 0738 0.5 1351 4.6 1959 0.5	0155 4.9 0805 0.6 1414 5.0 2025 0.6	0205 5.4 0824 0.6 1421 5.7 2039 0.6	0223 6.0 0852 0.6 1440 6.2 2104 0.6	0223 6.0 0852 0.6 1440 6.2 2104 0.6	0223 6.0 0852 0.6 1440 6.2 2104 0.6	0256 6.7 0933 0.7 1514 6.9 2141 0.6	0256 6.7 0933 0.7 1514 6.9 2141 0.6	0256 6.7 0933 0.7 1514 6.9 2141 0.6	0328 7.3 1009 0.7 1545 7.6 2217 0.6	0328 7.3 1009 0.7 1545 7.6 2217 0.6	0348 7.2 1040 0.6 1605 7.5 2251 0.6	20 TU
21 W	0217 4.3 0823 0.6 1435 4.4 2041 0.7	0236 4.7 0848 0.7 1500 4.9 2104 0.9	0248 5.2 0906 0.7 1507 5.4 2117 0.9	0305 5.8 0931 0.7 1524 6.0 2136 0.9	0305 5.8 0931 0.7 1524 6.0 2136 0.9	0305 5.8 0931 0.7 1524 6.0 2136 0.9	0339 6.4 1009 0.8 1558 6.6 2209 0.9	0339 6.4 1009 0.8 1558 6.6 2209 0.9	0339 6.4 1009 0.8 1558 6.6 2209 0.9	0409 7.0 1043 0.8 1628 7.3 2243 0.9	0409 7.0 1043 0.8 1628 7.3 2243 0.9	0430 6.9 1113 0.7 1648 7.2 2317 0.9	21 W
22 TH	0301 4.0 0910 0.7 1523 4.2 2128 1.0	0318 4.5 0934 0.9 1549 4.6 2149 1.2	0332 5.0 0949 0.9 1557 5.1 2201 1.2	0349 5.4 1009 0.9 1612 5.6 2214 1.2	0349 5.4 1009 0.9 1612 5.6 2214 1.2	0349 5.4 1009 0.9 1612 5.6 2214 1.2	0421 6.1 1044 1.0 1645 6.3 2243 1.3	0421 6.1 1044 1.0 1645 6.3 2243 1.3	0421 6.1 1044 1.0 1645 6.3 2243 1.3	0451 6.6 1115 1.0 1714 6.9 2315 1.3	0451 6.6 1115 1.0 1714 6.9 2315 1.3	0512 6.5 1144 0.9 1735 6.8 2349 1.2	22 TH

23 F D	0350 1003 1622 2227	3.7 0.8 3.9 1.3	0405 1029 1647 2249	4.2 1.1 4.3 1.5	0421 1039 1655 2257	4.7 1.1 4.8 1.5	0436 1054 1709 2305	5.1 1.1 5.2 1.6	0506 1123 1741 2332	5.7 1.2 5.8 1.6	0535 1151 1807	6.2 1.2 6.4	0557 1220 1829	6.1 1.1 6.4	23 F D
24 SA	0452 1741 2342	3.5 0.9 3.6 1.5	0508 1142 1806	4.0 1.2 4.1	0523 1147 1809	4.4 1.2 4.5	0537 1155 1824	4.7 1.3 4.9	0604 1219 1852	5.3 1.4 5.5	0600 1244 1914	1.7 1.5 6.1	0631 1311 1936	1.6 1.4 6.0	24 SA
25 SU	0612 1237 1906	3.4 1.0 3.6	0615 1236 1935	1.7 1.3 4.1	0617 1236 1937	1.8 1.3 4.5	0621 1236 1950	1.8 4.5 4.8	0644 1340 2011	1.9 1.5 5.4	0644 1340 2011	2.0 1.6 6.0	0637 1431 2055	1.9 1.5 5.9	25 SU
26 M	0111 0738 1409 2023	1.5 3.4 0.9 3.8	0151 0757 1439 2053	1.7 3.9 1.1 4.2	0150 0810 1443 2057	1.8 4.3 1.2 4.7	0155 0827 1455 2110	1.9 4.6 1.3 5.1	0213 0849 1515 2136	2.0 5.2 1.5 5.6	0244 0913 1537 2158	2.1 5.6 1.5 6.2	0305 0930 1558 2213	2.0 5.5 1.4 6.0	26 M
27 TU	0235 0848 1520 2121	1.4 3.6 0.8 3.9	0305 0906 1544 2153	1.5 4.1 0.9 4.4	0308 0919 1552 2157	1.6 4.5 1.0 4.9	0318 0937 1609 2211	1.7 4.9 1.0 5.3	0342 1006 1636 2241	1.8 5.5 1.1 6.0	0407 1032 1656 2307	1.8 6.0 1.2 6.5	0430 1048 1720 2324	1.7 5.8 1.1 6.4	27 TU
28 W	0333 0940 1607 2206	1.2 3.8 0.6 4.1	0359 1001 1630 2239	1.3 4.3 0.8 4.5	0406 1012 1640 2242	1.4 4.8 0.8 5.0	0420 1030 1700 2258	1.4 5.2 0.9 5.5	0449 1103 1729 2330	1.5 5.8 0.9 6.2	0514 1131 1755 2358	1.5 6.4 0.9 6.8	0540 1149 1821	1.4 6.2 0.8	28 W
29 TH	0413 1022 1642 2244	1.1 4.0 0.6 4.1	0439 1043 1705 2315	1.2 4.4 0.8 4.6	0449 1053 1716 2319	1.2 4.9 0.8 5.1	0506 1112 1737 2336	1.2 5.4 0.8 5.6	0539 1146 1808	1.2 6.0 0.8	0607 1216 1837	1.2 6.6 0.8	0617 1235 1904	6.7 1.2 6.5 0.7	29 TH
30 F	0447 1056 1710 2317	0.9 4.1 0.6 4.1	0512 1115 1734 2342	1.0 4.5 0.7 4.6	0526 1127 1746 2351	1.1 5.1 0.7 5.1	0545 1147 1807	1.1 5.5 0.7	0619 1222 1841	1.1 6.2 0.8	0650 1253 1912	1.1 6.8 0.8	0659 1313 1940	6.8 1.0 6.7	30 F
31 SA O	0519 1127 1738 2348	0.8 4.1 0.6 4.2	0546 1145 1804	0.9 4.6 0.7	0601 1159 1816	0.9 5.2 0.7	0608 1219 1835	5.6 5.6 0.7	0643 1253 1910	6.3 6.3 0.7	0657 1253 1910	1.0 6.9 0.8	0718 1346 2013	0.9 6.9 0.7	31 SA O

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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 SU	0552	0.7	0006	4.6	0021	5.2	0038	5.6	0112	6.3	0143	6.9	0205	6.8
	1157	4.2	0818	0.8	0834	0.9	0654	0.9	0732	0.9	0804	0.9	0833	0.9
	1807	0.6	1216	4.7	1230	5.3	1249	5.7	1323	6.4	1354	7.0	1416	7.0
			1833	0.7	1845	0.7	1903	0.7	1938	0.8	2011	0.8	2043	0.7
2 M	0018	4.2	0034	4.6	0050	5.2	0107	5.7	0141	6.4	0211	7.0	0232	6.8
	0624	0.7	0851	0.8	0706	0.8	0725	0.9	0804	0.9	0837	0.9	0906	0.8
	1228	4.2	1249	4.7	1302	5.3	1320	5.8	1354	6.5	1424	7.1	1445	7.0
	1832	0.7	1901	0.8	1913	0.8	1929	0.8	2004	0.8	2039	0.8	2111	0.8
3 TU	0048	4.2	0106	4.6	0120	5.2	0136	5.6	0211	6.3	0239	6.9	0259	6.8
	0654	0.7	0723	0.8	0737	0.8	0756	0.9	0834	0.9	0908	0.9	0938	0.8
	1300	4.2	1324	4.6	1334	5.2	1352	5.7	1425	6.4	1455	7.1	1515	7.0
	1856	0.7	1928	0.8	1939	0.8	1954	0.9	2029	0.9	2105	0.9	2137	0.9
4 W	0118	4.1	0139	4.6	0150	5.1	0206	5.5	0241	6.2	0309	6.8	0328	6.8
	0724	0.7	0754	0.9	0807	0.9	0826	0.9	0903	0.9	0937	0.9	1007	0.9
	1332	4.1	1358	4.6	1406	5.1	1424	5.6	1457	6.3	1527	7.0	1547	6.9
	1921	0.8	1956	0.9	2005	1.0	2018	1.0	2052	1.0	2130	1.0	2201	0.9
5 TH	0149	4.0	0209	4.5	0221	5.0	0237	5.4	0311	6.0	0341	6.6	0400	6.6
	0755	0.8	0826	0.9	0838	0.9	0856	1.0	0929	1.0	1004	1.0	1034	1.0
	1406	4.1	1431	4.4	1439	5.0	1456	5.5	1530	6.2	1601	6.8	1621	6.7
	1951	0.9	2028	1.1	2034	1.1	2045	1.1	2116	1.1	2155	1.1	2227	1.0
6 F	0222	3.9	0238	4.3	0253	4.8	0309	5.2	0343	5.9	0413	6.4	0432	6.4
	0830	0.8	0901	1.0	0910	1.0	0926	1.1	0954	1.1	1028	1.1	1058	1.1
	1443	3.9	1507	4.3	1515	4.9	1533	5.3	1606	6.0	1637	6.6	1658	6.6
	2028	1.0	2105	1.2	2109	1.2	2116	1.3	2145	1.2	2225	1.2	2256	1.2
7 SA	0300	3.8	0315	4.2	0331	4.6	0346	5.1	0419	5.7	0447	6.2	0508	6.2
	0911	0.9	0944	1.1	0950	1.1	1001	1.2	1025	1.2	1058	1.2	1128	1.1
	1528	3.8	1553	4.2	1601	4.7	1617	5.2	1649	5.8	1719	6.4	1740	6.4
	2115	1.2	2154	1.4	2154	1.4	2159	1.5	2225	1.4	2303	1.4	2333	1.3

8 SU ☾	0348	3.6	0408	4.0	0420	4.5	0434	4.9	0505	5.5	0531	6.0	0552	5.9
	1008	1.0	1042	1.2	1044	1.2	1051	1.3	1110	1.3	1141	1.3	1207	1.2
	1623	3.7	1654	4.1	1659	4.6	1713	5.0	1744	5.7	1813	6.2	1832	6.2
	2222	1.4	2301	1.6	2259	1.6	2300	1.7	2319	1.7	2353	1.7		
9 M	0453	3.4	0514	3.9	0527	4.3	0538	4.7	0607	5.3	0632	5.8	0649	5.7
	1132	1.0	1159	1.2	1200	1.3	1208	1.4	1220	1.4	1240	1.5	1303	1.4
	1735	3.6	1809	4.0	1813	4.5	1826	4.9	1856	5.6	1923	6.1	1940	6.0
10 TU	0000	1.4	0026	1.6	0028	1.7	0034	1.8	0047	1.9	0104	1.9	0128	1.8
	0615	3.4	0637	3.9	0648	4.3	0701	4.7	0729	5.2	0754	5.7	0809	5.6
	1259	0.9	1326	1.1	1333	1.2	1346	1.2	1407	1.3	1421	1.5	1445	1.4
	1902	3.7	1933	4.1	1934	4.6	1948	5.0	2018	5.7	2047	6.3	2107	6.1
11 W	0126	1.3	0155	1.5	0159	1.6	0211	1.6	0233	1.7	0258	1.8	0320	1.8
	0738	3.6	0802	4.1	0810	4.5	0826	4.9	0853	5.5	0922	6.0	0941	5.9
	1406	0.6	1438	0.9	1446	0.9	1500	0.9	1526	1.0	1555	1.1	1616	1.1
	2017	3.9	2046	4.4	2049	4.8	2102	5.3	2132	6.0	2201	6.6	2220	6.5
12 TH	0230	1.1	0303	1.2	0309	1.3	0322	1.3	0350	1.4	0419	1.5	0441	1.5
	0845	3.8	0906	4.4	0917	4.8	0934	5.2	1004	5.9	1033	6.4	1051	6.4
	1504	0.4	1537	0.6	1546	0.6	1602	0.6	1632	0.7	1702	0.7	1725	0.7
	2117	4.1	2144	4.6	2150	5.1	2204	5.6	2236	6.3	2304	7.0	2323	6.9
13 F	0324	0.9	0357	1.0	0407	1.0	0423	1.1	0457	1.1	0527	1.2	0554	1.2
	0940	4.1	0959	4.6	1012	5.1	1030	5.6	1102	6.2	1132	6.9	1150	6.8
	1556	0.3	1627	0.5	1638	0.4	1659	0.4	1733	0.5	1805	0.5	1836	0.5
	2208	4.3	2234	4.8	2242	5.3	2258	5.9	2331	6.6				
14 SA	0413	0.7	0445	0.8	0459	0.8	0520	0.9	0558	0.9	0600	7.2	0019	7.1
	1029	4.4	1046	4.8	1059	5.4	1119	5.9	1151	6.6	0632	1.0	0704	1.0
	1644	0.2	1713	0.4	1726	0.3	1751	0.4	1828	0.4	1223	7.2	1242	7.2
	2256	4.4	2320	4.9	2329	5.4	2346	6.0			1905	0.4	1938	0.4
15 SU ●	0502	0.6	0531	0.7	0548	0.7	0613	0.7	0019	6.7	0050	7.4	0110	7.3
	1115	4.5	1132	5.0	1144	5.6	1204	6.1	0654	0.8	0732	0.8	0802	0.8
	1730	0.3	1757	0.4	1812	0.3	1839	0.4	1238	6.8	1310	7.5	1330	7.4
	2341	4.5							1918	0.4	1957	0.4	2029	0.3

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WALTON-ON-THE-NAZE	MARGATE	SHIVERING SAND	SOUTHEAST-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	0550 0.5 1200 4.7 1814 0.3	0003 4.9 0618 0.6 1220 5.1 1840 0.5	0014 5.5 0635 0.6 1230 5.7 1855 0.4	0031 6.1 0703 0.6 1250 6.3 1923 0.4	0105 6.8 0746 0.7 1323 7.0 2003 0.4	0157 7.3 0853 0.6 1415 7.6 2114 0.4
17 TU	0026 4.5 0637 0.5 1245 4.7 1857 0.5	0048 4.9 0705 0.6 1310 5.1 1922 0.6	0059 5.5 0722 0.5 1316 5.7 1936 0.5	0116 6.0 0751 0.6 1335 6.3 2003 0.6	0222 7.4 0910 0.6 1441 7.7 2119 0.6	0242 7.2 0939 0.5 1501 7.6 2153 0.6
18 W	0111 4.4 0724 0.5 1331 4.6 1939 0.7	0131 4.8 0751 0.6 1358 5.0 2003 0.8	0143 5.4 0807 0.5 1404 5.6 2017 0.7	0201 5.9 0835 0.6 1421 6.2 2039 0.8	0306 7.2 0950 0.6 1526 7.5 2149 0.8	0326 7.1 1020 0.5 1546 7.4 2227 0.8
19 TH	0156 4.2 0810 0.5 1417 4.4 2022 0.9	0214 4.7 0837 0.7 1447 4.8 2044 1.0	0227 5.2 0852 0.6 1452 5.4 2057 1.0	0245 5.7 0916 0.7 1508 5.9 2113 1.0	0350 6.9 1025 0.7 1612 7.2 2218 1.1	0410 6.8 1056 0.7 1632 7.1 2255 1.1
20 F	0241 4.0 0857 0.6 1507 4.1 2107 1.1	0257 4.5 0924 0.8 1535 4.5 2128 1.3	0312 5.0 0936 0.7 1542 5.1 2140 1.3	0329 5.4 0955 0.8 1557 5.6 2151 1.3	0432 6.6 1057 0.9 1659 6.8 2254 1.4	0453 6.5 1128 0.9 1720 6.8 2328 1.3
21 SA	0329 3.8 0947 0.7 1604 3.8 2159 1.3	0343 4.3 1016 1.0 1630 4.3 2221 1.5	0359 4.7 1024 0.9 1637 4.8 2231 1.5	0415 5.1 1036 1.0 1652 5.2 2238 1.6	0515 6.2 1132 1.1 1750 6.4 2337 1.7	0536 6.1 1203 1.1 1811 6.4
22 SU	0426 3.6 1047 0.8 1713 3.6 2303 1.5	0438 4.1 1119 1.1 1740 4.1 2330 1.7	0454 4.5 1123 1.1 1742 4.5 2336 1.7	0510 4.8 1130 1.2 1757 4.9 2340 1.8	0604 5.9 1219 1.3 1850 6.1	0609 1.6 0623 5.8 1248 1.3 1910 6.0

0533	3.4	0555	3.9	0603	4.3	0620	4.6	0007	1.8	0034	1.9	0103	1.9	23 M
1200	0.9	1235	1.2	1237	1.2	1244	1.3	0644	5.2	0706	5.7	0725	5.6	
1826	3.6	1858	4.0	1857	4.4	1912	4.8	1933	5.4	1959	5.9	1355	1.4	
0021	1.5	0101	1.8	0058	1.8	0101	1.9	0123	2.0	0151	2.1	0219	2.0	24 TU
0646	3.4	0712	3.9	0720	4.2	0738	4.6	0758	5.2	0824	5.6	0842	5.5	
1318	0.9	1350	1.2	1352	1.2	1402	1.3	1421	1.4	1449	1.5	1512	1.4	
1937	3.6	2006	4.1	2011	4.5	2024	4.9	2045	5.5	2110	6.0	2126	5.9	
0139	1.5	0216	1.6	0218	1.7	0223	1.8	0244	1.9	0316	2.0	0340	1.9	25 W
0758	3.5	0816	4.0	0829	4.4	0847	4.8	0911	5.3	0938	5.8	0953	5.7	
1427	0.8	1451	1.1	1457	1.1	1509	1.2	1530	1.2	1557	1.3	1617	1.2	
2040	3.7	2105	4.2	2112	4.6	2126	5.1	2154	5.7	2218	6.2	2233	6.1	
0244	1.3	0313	1.5	0320	1.5	0329	1.6	0354	1.6	0424	1.7	0447	1.6	26 TH
0856	3.6	0911	4.2	0926	4.6	0943	5.0	1014	5.6	1042	6.1	1057	6.0	
1519	0.8	1539	1.0	1548	1.0	1602	1.0	1627	1.1	1654	1.1	1715	1.0	
2129	3.9	2153	4.3	2201	4.8	2216	5.2	2247	5.9	2315	6.4	2332	6.3	
0333	1.1	0400	1.3	0410	1.3	0422	1.3	0451	1.4	0521	1.4	0545	1.4	27 F
0941	3.8	0958	4.3	1012	4.7	1030	5.2	1103	5.8	1132	6.4	1150	6.3	
1558	0.7	1620	0.9	1629	0.9	1645	0.9	1713	1.0	1743	1.0	1806	0.9	
2209	3.9	2233	4.4	2242	4.9	2258	5.4	2330	6.0					
0414	1.0	0440	1.1	0452	1.1	0508	1.1	0539	1.2	0000	6.6	0019	6.5	28 SA
1019	3.9	1038	4.4	1051	4.9	1109	5.4	1144	6.0	0610	1.2	0634	1.2	
1632	0.7	1657	0.9	1707	0.8	1723	0.9	1753	0.9	1215	6.6	1235	6.6	
2245	4.0	2306	4.5	2317	5.0	2334	5.4			1825	0.9	1851	0.9	
0451	0.8	0519	1.0	0531	0.9	0549	1.0	0007	6.1	0038	6.7	0058	6.6	29 SU
1054	4.0	1115	4.5	1127	5.0	1145	5.5	0621	1.0	0653	1.0	0719	1.0	
1705	0.7	1732	0.8	1742	0.8	1759	0.8	1220	6.2	1251	6.8	1313	6.8	
2318	4.1	2336	4.5	2350	5.0			1830	0.9	1904	0.9	1932	0.8	
0527	0.7	0555	0.9	0608	0.8	0007	5.5	0042	6.2	0112	6.8	0133	6.7	30 M
1128	4.1	1150	4.6	1202	5.1	0826	0.9	0701	0.9	0733	0.9	0800	0.9	
1737	0.7	1804	0.8	1816	0.8	1220	5.6	1255	6.3	1325	6.9	1347	6.9	
2351	4.1					1832	0.9	1903	0.9	1938	0.9	2009	0.9	30 O

DECEMBER 2020

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	0601 0.7 1202 4.2 1806 0.7	0008 4.6 0630 0.8 1226 4.6 1834 0.9	0023 5.1 0642 0.8 1237 5.2 1846 0.8	0040 5.6 0701 0.8 1234 5.7 1900 0.9	0115 6.2 0737 0.9 1329 6.4 1933 0.9	0144 6.9 0810 0.9 1358 7.0 2008 0.9	0205 6.8 0839 0.8 1420 6.9 2042 0.9
2 W	0024 4.1 0634 0.6 1238 4.2 1832 0.8	0042 4.6 0704 0.8 1302 4.6 1904 0.9	0056 5.1 0716 0.7 1312 5.2 1915 0.9	0113 5.6 0735 0.8 1329 5.7 1927 0.9	0148 6.3 0811 0.8 1403 6.4 2000 0.9	0216 6.9 0844 0.8 1432 7.0 2037 0.9	0236 6.8 0915 0.8 1454 6.9 2112 1.0
3 TH	0058 4.1 0708 0.6 1314 4.1 1901 0.8	0117 4.6 0737 0.8 1340 4.6 1937 0.9	0131 5.1 0750 0.7 1348 5.1 1945 0.9	0147 5.5 0808 0.8 1405 5.6 1956 1.0	0222 6.2 0844 0.8 1439 6.3 2028 1.0	0250 6.8 0918 0.8 1508 7.0 2107 1.0	0310 6.7 0950 0.8 1529 6.9 2141 1.0
4 F	0133 4.0 0743 0.6 1351 4.1 1937 0.9	0152 4.5 0813 0.8 1419 4.5 2014 1.0	0206 5.0 0824 0.7 1425 5.1 2020 1.0	0222 5.5 0842 0.8 1442 5.6 2030 1.0	0257 6.1 0916 0.8 1516 6.3 2102 1.0	0325 6.7 0949 0.8 1546 6.9 2141 1.0	0344 6.6 1022 0.8 1606 6.8 2213 1.0
5 SA	0210 3.9 0821 0.6 1431 4.0 2018 1.0	0228 4.4 0853 0.8 1500 4.4 2055 1.1	0242 4.9 0902 0.8 1506 5.0 2100 1.1	0259 5.3 0918 0.8 1523 5.5 2110 1.2	0332 5.9 0950 0.9 1556 6.2 2140 1.1	0401 6.5 1021 0.9 1626 6.8 2218 1.1	0420 6.5 1053 0.8 1646 6.7 2249 1.1
6 SU	0251 3.8 0906 0.7 1517 3.9 2108 1.1	0308 4.3 0938 0.9 1546 4.3 2144 1.3	0322 4.8 0946 0.9 1553 4.8 2149 1.3	0338 5.2 0959 0.9 1608 5.3 2156 1.3	0411 5.8 1027 1.0 1641 6.0 2224 1.3	0440 6.3 1056 0.9 1711 6.6 2300 1.3	0459 6.3 1126 0.9 1731 6.6 2330 1.2
7 M	0338 3.7 1001 0.7 1611 3.8 2210 1.2	0356 4.2 1032 0.9 1641 4.2 2242 1.4	0410 4.6 1037 0.9 1647 4.7 2248 1.4	0425 5.0 1048 1.0 1702 5.2 2253 1.5	0457 5.7 1113 1.0 1734 5.9 2318 1.5	0525 6.2 1139 1.0 1803 6.5 2350 1.5	0544 6.1 1207 1.0 1821 6.4 2350 1.5

8
TU

0435 3.6
1110 0.7
1714 3.8
2325 1.3

0453 4.1
1137 1.0
1744 4.2
2351 1.4

0508 4.5
1141 1.0
1751 4.7
2357 1.5

0521 4.9
1153 1.0
1805 5.1

0552 5.5
1216 1.1
1837 5.8

0620 6.1
1234 1.1
1905 6.4

0019 1.4
0636 6.0
1300 1.1
1922 6.3

8
TU

9
W

0544 3.6
1224 0.7
1828 3.8

0601 4.1
1250 0.9
1859 4.2

0615 4.5
1256 0.9
1901 4.7

0008 1.6
0629 4.9
1311 1.0
1916 5.1

0031 1.6
0700 5.5
1336 1.1
1948 5.8

0054 1.7
0727 6.0
1352 1.2
2017 6.4

0122 1.6
0742 6.0
1418 1.1
2037 6.3

9
W

10
TH

0042 1.2
0658 3.7
1331 0.6
1941 3.9

0110 1.4
0718 4.2
1401 0.8
2010 4.3

0115 1.4
0727 4.6
1407 0.8
2012 4.8

0129 1.5
0746 5.0
1421 0.8
2028 5.3

0156 1.6
0816 5.6
1448 0.9
2058 5.9

0220 1.7
0845 6.2
1517 1.0
2128 6.5

0245 1.7
0903 6.1
1539 1.0
2148 6.5

10
TH

11
F

0152 1.1
0809 3.9
1431 0.5
2046 4.0

0224 1.2
0827 4.3
1502 0.7
2113 4.5

0230 1.3
0837 4.8
1509 0.6
2118 5.0

0242 1.3
0857 5.2
1524 0.7
2134 5.4

0311 1.4
0926 5.8
1553 0.7
2205 6.1

0342 1.5
0957 6.4
1625 0.8
2233 6.7

0406 1.5
1015 6.4
1648 0.8
2252 6.7

11
F

12
SA

0253 0.9
0910 4.1
1526 0.4
2144 4.1

0325 1.1
0927 4.5
1556 0.6
2208 4.6

0335 1.1
0939 5.0
1606 0.5
2216 5.1

0349 1.1
0959 5.5
1624 0.6
2232 5.6

0422 1.2
1030 6.1
1656 0.6
2305 6.3

0454 1.3
1100 6.7
1729 0.7
2333 6.9

0521 1.3
1118 6.7
1758 0.7
2353 6.8

12
SA

13
SU

0349 0.8
1004 4.3
1619 0.4
2235 4.2

0419 0.9
1023 4.7
1647 0.6
2258 4.7

0433 0.9
1034 5.3
1659 0.5
2266 5.2

0452 0.9
1054 5.7
1720 0.5
2325 5.7

0530 1.0
1126 6.4
1756 0.6
2358 6.4

0603 1.1
1157 7.0
1832 0.6

0635 1.0
1216 7.0
1906 0.6

13
SU

14
M

0443 0.6
1054 4.4
1709 0.4
2323 4.3

0512 0.8
1116 4.8
1735 0.6
2345 4.7

0528 0.7
1125 5.4
1748 0.5
2357 5.3

0551 0.8
1144 5.9
1813 0.6

0631 0.8
1217 6.6
1851 0.6

0028 7.0
0707 0.8
1249 7.3
1929 0.6

0048 7.0
0738 0.8
1309 7.2
2002 0.6

14
M

15
TU

0536 0.5
1142 4.5
1757 0.5

0604 0.6
1207 4.9
1822 0.6

0620 0.5
1215 5.5
1835 0.6

0013 5.8
0646 0.6
1232 6.1
1900 0.6

0047 6.5
0727 0.6
1306 6.8
1940 0.6

0118 7.1
0803 0.7
1338 7.4
2018 0.7

0139 7.0
0832 0.6
1359 7.3
2051 0.7

15
TU

DECEMBER 2020

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 W	0010 4.3 0627 0.4 1230 4.5 1843 0.6	0030 4.8 0855 0.6 1258 4.9 1906 0.7	0043 5.3 0709 0.4 1304 5.5 1920 0.7	0100 5.8 0737 0.5 1320 6.1 1944 0.7	0134 6.5 0817 0.5 1354 6.8 2024 0.8	0206 7.1 0853 0.6 1426 7.5 2100 0.8	0226 7.0 0922 0.5 1447 7.4 2134 0.8	16 W					
17 TH	0056 4.3 0716 0.4 1316 4.4 1926 0.8	0115 4.7 0744 0.5 1347 4.8 1949 0.9	0129 5.3 0757 0.4 1352 5.4 2003 0.8	0146 5.8 0824 0.5 1408 6.0 2024 0.9	0220 6.5 0904 0.5 1442 6.7 2102 0.9	0252 7.1 0938 0.6 1513 7.4 2135 1.0	0313 7.0 1007 0.5 1535 7.3 2213 0.9	17 TH					
18 F	0141 4.2 0803 0.4 1403 4.3 2007 0.9	0158 4.7 0830 0.6 1434 4.7 2029 1.0	0213 5.2 0843 0.5 1440 5.3 2044 1.0	0231 5.7 0907 0.6 1455 5.8 2059 1.1	0305 6.3 0945 0.6 1530 6.5 2135 1.1	0337 6.9 1017 0.7 1600 7.2 2207 1.2	0357 6.8 1048 0.6 1621 7.1 2246 1.1	18 F					
19 SA	0225 4.0 0847 0.5 1452 4.1 2048 1.1	0240 4.5 0914 0.7 1520 4.5 2110 1.2	0257 5.0 0926 0.6 1527 5.0 2123 1.2	0314 5.5 0945 0.7 1543 5.5 2134 1.2	0348 6.1 1021 0.8 1617 6.2 2208 1.3	0419 6.6 1049 0.8 1646 6.8 2241 1.3	0439 6.6 1123 0.8 1706 6.8 2317 1.3	19 SA					
20 SU	0310 3.9 0930 0.6 1543 3.8 2130 1.2	0323 4.4 0959 0.8 1608 4.3 2153 1.4	0340 4.8 1007 0.7 1615 4.8 2205 1.3	0357 5.2 1021 0.8 1631 5.3 2213 1.4	0431 5.8 1053 0.9 1705 5.9 2246 1.4	0500 6.4 1120 1.0 1732 6.5 2319 1.5	0519 6.3 1154 0.9 1752 6.5 2352 1.5	20 SU					
21 M	0357 3.7 1017 0.7 1638 3.7 2219 1.3	0408 4.2 1047 1.0 1701 4.1 2243 1.5	0426 4.7 1051 0.9 1707 4.6 2253 1.5	0442 5.0 1100 1.0 1723 5.0 2300 1.6	0514 5.6 1129 1.0 1755 5.6 2332 1.6	0541 6.1 1156 1.1 1820 6.2	0600 6.1 1228 1.1 1839 6.2	21 M					
22 TU	0450 3.6 1112 0.8 1737 3.5 2320 1.4	0502 4.1 1143 1.1 1806 4.0 2344 1.7	0518 4.5 1143 1.0 1804 4.4 2350 1.7	0534 4.8 1150 1.1 1822 4.8 2358 1.7	0605 5.4 1216 1.2 1849 5.4	0627 5.9 1242 1.3 1914 6.0	0645 5.9 1312 1.2 1932 5.9	22 TU					

2020 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	RISE	SET	RISE	SET	RISE	SET	RISE	SET
h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
1	08 06	16 02	16 07	59	16 22	1	07 40	16 49	16 07	14 17	17	1	05 35	18 35	16 05
2	08 06	16 03	17 07	58	16 23	2	07 38	16 51	17 07	12 17	18	2	05 33	18 36	17 05
3	08 06	16 04	18 07	57	16 25	3	07 37	16 53	18 07	10 17	20	3	05 31	18 38	18 04
4	08 06	16 05	19 07	56	16 27	4	07 35	16 55	19 07	08 17	22	4	05 28	18 40	19 04
5	08 06	16 06	20 07	55	16 28	5	07 33	16 56	20 07	06 17	24	5	05 26	18 41	20 04
6	08 05	16 08	21 07	54	16 30	6	07 32	16 58	21 07	04 17	26	6	05 24	18 43	21 04
7	08 05	16 09	22 07	53	16 32	7	07 30	17 00	22 07	02 17	27	7	05 22	18 45	22 04
8	08 04	16 10	23 07	52	16 33	8	07 28	17 02	23 07	00 17	29	8	05 19	18 46	23 04
9	08 04	16 11	24 07	51	16 35	9	07 27	17 04	24 06	58 17	31	9	05 17	18 48	24 04
10	08 03	16 13	25 07	50	16 37	10	07 25	17 06	25 06	56 17	33	10	05 15	18 50	25 04
11	08 03	16 14	26 07	48	16 38	11	07 23	17 07	26 06	54 17	35	11	05 13	18 51	26 04
12	08 02	16 16	27 07	47	16 40	12	07 21	17 09	27 06	51 17	36	12	05 11	18 53	27 04
13	08 02	16 17	28 07	46	16 42	13	07 19	17 11	28 06	49 17	38	13	05 09	18 55	28 04
14	08 01	16 19	29 07	44	16 44	14	07 18	17 13	29 06	47 17	40	14	05 06	18 56	29 04
15	08 00	16 20	30 07	43	16 46	15	07 16	17 15				15	05 04	18 58	30 04
			31	07 41	16 47							31	05 37	18 33	

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2020 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	RISE SET	RISE SET	RISE SET	RISE SET	RISE SET	RISE SET	RISE SET
h m	h m	h m h m	h m h m	h m h m	h m h m	h m h m	h m h m	h m h m	h m h m	h m h m	h m h m
1 04	32 19 25	16 04 07 19 48	1 03	49 20 09	16 03 43 20 20	1 03	48 20 21	16 04 03 20 10	1 04	25 19 48	16 04 48 19 20
2 04	30 19 26	17 04 05 19 50	2 03	48 20 10	17 03 43 20 21	2 03	48 20 20	17 04 04 20 09	2 04	26 19 46	17 04 50 19 18
3 04	28 19 28	18 04 04 19 51	3 03	47 20 11	18 03 43 20 21	3 03	50 20 20	18 04 05 20 08	3 04	28 19 45	18 04 51 19 16
4 04	26 19 30	19 04 03 19 53	4 03	47 20 12	19 03 43 20 21	4 03	50 20 20	19 04 07 20 07	4 04	30 19 43	19 04 53 19 14
5 04	25 19 31	20 04 01 19 54	5 03	46 20 13	20 03 43 20 22	5 03	51 20 19	20 04 08 20 05	5 04	31 19 41	20 04 55 19 12
6 04	23 19 33	21 04 00 19 55	6 03	46 20 14	21 03 43 20 22	6 03	52 20 18	21 04 09 20 04	6 04	33 19 39	21 04 56 19 10
7 04	21 19 34	22 03 59 19 57	7 03	45 20 15	22 03 44 20 22	7 03	53 20 18	22 04 11 20 03	7 04	34 19 38	22 04 58 19 08
8 04	19 19 36	23 03 58 19 58	8 03	45 20 15	23 03 44 20 22	8 03	54 20 17	23 04 12 20 02	8 04	36 19 36	23 04 59 19 06
9 04	18 19 37	24 03 57 19 59	9 03	44 20 16	24 03 44 20 22	9 03	55 20 16	24 04 13 20 00	9 04	37 19 34	24 05 01 19 04
10 04	16 19 39	25 03 55 20 01	10 03	44 20 17	25 03 45 20 22	10 03	56 20 16	25 04 15 19 59	10 04	39 19 32	25 05 03 19 01
11 04	14 19 41	26 03 54 20 02	11 03	44 20 18	26 03 45 20 22	11 03	57 20 15	26 04 16 19 57	11 04	40 19 30	26 05 04 18 59
12 04	13 19 42	27 03 53 20 03	12 03	43 20 18	27 03 46 20 22	12 03	58 20 14	27 04 18 19 56	12 04	42 19 28	27 05 06 18 57
13 04	11 19 44	28 03 52 20 04	13 03	43 20 19	28 03 46 20 22	13 03	59 20 13	28 04 19 19 54	13 04	44 19 26	28 05 07 18 55
14 04	10 19 45	29 03 51 20 06	14 03	43 20 19	29 03 47 20 21	14 04	00 20 12	29 04 20 19 53	14 04	45 19 24	29 05 09 18 53
15 04	08 19 47	30 03 51 20 07	15 03	43 20 20	30 03 47 20 21	15 04	02 20 11	30 04 22 19 51	15 04	47 19 22	30 05 11 18 51
		31 03 50 20 08						31 04 23 19 50			31 05 12 18 48

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2020 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	h m	h m	h m	h m
1 05 14	18 46	16 05 38 18 12	1 06 02	17 37	16 06 27 17 04	1 06 55	16 33	16 07 21 16 09	1 07 44	15 55	16 08 01 15 52
2 05 15	18 44	17 05 39 18 10	2 06 04	17 35	17 06 29 17 02	2 06 57	16 31	17 07 23 16 08	2 07 46	15 54	17 08 02 15 52
3 05 17	18 42	18 05 41 18 07	3 06 05	17 33	18 06 30 17 00	3 06 58	16 29	18 07 24 16 07	3 07 47	15 54	18 08 02 15 53
4 05 19	18 39	19 05 42 18 05	4 06 07	17 31	19 06 32 16 58	4 07 00	16 28	19 07 26 16 06	4 07 48	15 53	19 08 03 15 53
5 05 20	18 37	20 05 44 18 03	5 06 08	17 28	20 06 34 16 56	5 07 02	16 26	20 07 28 16 05	5 07 50	15 53	20 08 04 15 53
6 05 22	18 35	21 05 46 18 00	6 06 10	17 26	21 06 36 16 54	6 07 04	16 24	21 07 29 16 03	6 07 51	15 53	21 08 04 15 54
7 05 23	18 33	22 05 47 17 58	7 06 12	17 24	22 06 37 16 52	7 07 05	16 23	22 07 31 16 02	7 07 52	15 52	22 08 05 15 54
8 05 25	18 30	23 05 49 17 56	8 06 13	17 22	23 06 39 16 50	8 07 07	16 21	23 07 33 16 01	8 07 53	15 52	23 08 05 15 55
9 05 27	18 28	24 05 51 17 53	9 06 15	17 20	24 06 41 16 48	9 07 09	16 19	24 07 34 16 00	9 07 54	15 52	24 08 05 15 56
10 05 28	18 26	25 05 52 17 51	10 06 17	17 17	25 06 43 16 46	10 07 11	16 18	25 07 36 15 59	10 07 55	15 52	25 08 06 15 56
11 05 30	18 23	26 05 54 17 49	11 06 18	17 15	26 06 44 16 44	11 07 12	16 16	26 07 37 15 59	11 07 56	15 52	26 08 06 15 57
12 05 31	18 21	27 05 55 17 47	12 06 20	17 13	27 06 46 16 42	12 07 14	16 15	27 07 39 15 58	12 07 57	15 52	27 08 06 15 58
13 05 33	18 19	28 05 57 17 44	13 06 22	17 11	28 06 48 16 40	13 07 16	16 14	28 07 40 15 57	13 07 58	15 52	28 08 06 15 59
14 05 34	18 17	29 05 59 17 42	14 06 24	17 09	29 06 50 16 38	14 07 18	16 12	29 07 42 15 56	14 07 59	15 52	29 08 06 16 00
15 05 36	18 14	30 06 00 17 40	15 06 25	17 07	30 06 51 16 37	15 07 19	16 11	30 07 43 15 56	15 08 00	15 52	30 08 06 16 01
					31 06 53 16 35						31 08 06 16 02

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2020 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	h m	h m	h m	h m				
1 11	37 22 45	16 23 50	1 10	49 **	16 01 37	10 48	1 09	33 **	16 01 54	10 00	1 09	59 02 07	16 03 10	11 44	
2 11	54 23 51	17 **	11 31	2 11	09 00 57	17 02 52	11 22	2 10	00 01 01	17 02 58	10 48	2 11	01 03 01	17 03 38	12 52
3 12	10 **	18 01 10	11 52	3 11	33 02 06	18 04 01	12 03	3 10	33 02 10	18 03 51	11 45	3 12	14 03 45	18 04 00	14 00
4 12	27 00 58	19 02 29	12 17	4 12	02 03 16	19 05 01	12 54	4 11	17 03 16	19 04 33	12 48	4 13	35 04 20	19 04 19	15 07
5 12	46 02 05	20 03 46	12 46	5 12	41 04 26	20 05 51	13 52	5 12	13 04 16	20 05 06	13 55	5 15	00 04 49	20 04 36	16 14
6 13	08 03 15	21 05 00	13 22	6 13	32 05 32	21 06 30	14 57	6 13	22 05 07	21 05 32	15 02	6 16	28 05 14	21 04 51	17 20
7 13	34 04 26	22 06 07	14 06	7 14	36 06 30	22 07 01	16 04	7 14	42 05 49	22 05 53	16 10	7 17	56 05 36	22 05 07	18 27
8 14	09 05 38	23 07 05	15 00	8 15	53 07 18	23 07 26	17 12	8 16	08 06 22	23 06 11	17 17	8 19	24 05 57	23 05 24	19 35
9 14	54 06 48	24 07 52	16 01	9 17	16 07 56	24 07 47	18 20	9 17	36 06 50	24 06 28	18 23	9 20	51 06 20	24 05 42	20 43
10 15	52 07 51	25 08 29	17 08	10 18	43 08 26	25 08 05	19 26	10 19	04 07 14	25 06 44	19 29	10 22	17 06 45	25 06 04	21 53
11 17	02 08 44	26 08 58	18 16	11 20	09 08 52	26 08 21	20 32	11 20	31 07 36	26 07 00	20 36	11 23	37 07 15	26 06 32	23 00
12 18	21 09 26	27 09 22	19 24	12 21	33 09 14	27 08 37	21 38	12 21	56 07 58	27 07 17	21 43	12 **	** 07 53	27 07 07	** **
13 19	44 10 00	28 09 42	20 31	13 22	56 09 35	28 08 54	22 45	13 23	20 08 21	28 07 37	22 52	13 00	48 08 39	28 07 53	00 03
14 21	07 10 27	29 09 59	21 37	14 **	** 09 57	29 09 12	23 52	14 **	** 08 48	29 08 01	** **	14 01	47 09 34	29 08 50	00 58
15 22	29 10 49	30 10 16	22 43	15 00	17 10 20			15 00	40 09 20	30 08 31	00 00	15 02	34 10 37	30 09 57	01 44
		31 10 32	23 49							31 09 09	01 06				

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

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2020 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	h m	h m	h m	h m
1 19 03	03 52	16 03	04 18 20	1 18 00	05 10	16 05	31 17 23	1 17 12	07 31	16 08	52 17 09
2 19 22	05 03	17 05	11 18 42	2 18 15	06 18	17 07	01 17 44	2 17 34	08 39	17 10	13 17 55
3 19 38	06 13	18 06	38 19 02	3 18 30	07 25	18 08	30 18 09	3 18 03	09 48	18 11	22 18 53
4 19 53	07 21	19 08	06 19 22	4 18 47	08 32	19 09	59 18 40	4 18 39	10 53	19 12	14 20 01
5 20 08	08 28	20 09	33 19 45	5 19 07	09 40	20 11	22 19 19	5 19 27	11 53	20 12	53 21 14
6 20 24	09 35	21 10	59 20 12	6 19 31	10 48	21 12	35 20 10	6 20 25	12 44	21 13	22 22 28
7 20 42	10 42	22 12	22 20 45	7 20 02	11 55	22 13	33 21 10	7 21 34	13 25	22 13	44 23 40
8 21 04	11 50	23 13	38 21 27	8 20 42	12 59	23 14	18 22 19	8 22 50	13 58	23 14	02 **
9 21 31	12 58	24 14	43 22 20	9 21 34	13 56	24 14	51 23 30	9 **	** 14 24	24 14	17 00 49
10 22 06	14 05	25 15	36 23 22	10 22 38	14 45	25 15	17 **	10 00	10 14	46 25	14 31 01 57
11 22 51	15 08	26 16	16 **	11 23 52	15 24	26 15	37 00 42	11 01	33 15	06 26	14 45 03 05
12 23 49	16 03	27 16	46 00 30	12 **	** 15 56	27 15	54 01 52	12 02	57 15	25 27	15 01 04 12
13 **	** 16 49	28 17	10 01 41	13 01	12 16	21 28	16 09 03 01	13 04	24 15	44 28	15 18 05 20
14 01 00	17 26	29 17	29 02 52	14 02	37 16	43 29	16 23 04 08	14 05	53 16	06 29	15 39 06 29
15 02 19	17 56	30 17	45 04 02	15 04	03 17	03 30	16 38 05 15	15 07	23 16	34 30	16 05 07 38
							31 16 54 06 23				
											31 17 14 09 25

** 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

PLA MARINE SERVICES



PLA's dedicated Marine Services team provides essential support to commercial and leisure users of the river. Salvage, mooring maintenance, diving, underwater inspections, driftwood and rubbish clearance and pollution response: all of these, and more, are the responsibility of the Marine Services team along the 95-mile stretch of the river Thames.

Marine Services crews maintain more than 60 aids to navigation, including buoys and inspect and overhaul more than 230 moorings along the river. They are also involved in laying temporary moorings for project work plus prestigious, annual events such as the University Boat Race and the New Year's Eve fireworks display in London.

For more information please contact:



Michael Russell on **01474 562415**
or e-mail **michael.russell@pla.co.uk**

www.pla.co.uk

PLA DENTON WHARF



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 and also for third parties.

Fully equipped with a 30 tonne heavy lift crane the jetty can be used for the load out of materials bound for river based projects. There is also a dockway that is independently served by two boatlifts – one with a capacity of 70 tonnes and the other 35 tonnes as well as a self propelled boat mover.

The PLA has invested more than £10 million in Denton Wharf over the last ten years including the jetty development, construction of Marine House and progressive strengthening of the quay to allow larger lifts to be handled.

For information on the lift out facility and use of the jetty for load out or project support contact Daniel Marsh on **01474 562462** or e-mail **daniel.marsh@pla.co.uk**



For PLA moorings: Barbara Jewiss on
01474 562421

or e-mail **barbara.jewiss@pla.co.uk**

www.pla.co.uk



MARINE SURVEYORS

How can we be of service?

The PLA's Marine Surveyors survey over 730 commercially operated vessels annually. In addition to the PLA's statutory work, our Marine Surveyors are able to undertake a variety of services for third parties on commercial vessels which include:

- Insurance
- New Build Consultancy Services
- Inland Waterways Certification

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



For further information contact
Tom Parham on **01474 562441** or
e-mail **tom.parham@pla.co.uk**

www.pla.co.uk



RECREATIONAL RIVER USERS JOIN THE FREE NAVIGATORS' CLUB

Members will receive:

- Regular up-dated river safety information tailored to your type of activity
- Tide Tables and Port Information handbook
- PLA Recreational Users' Guide
- Tidal Thames e-Newsletter
- Early notification of PLA Events, such as Seminars, Briefings and River Trips
- Members Online Forum

You will be able to tell the PLA about the activities you undertake on the river and the areas of the tidal Thames you regularly use.

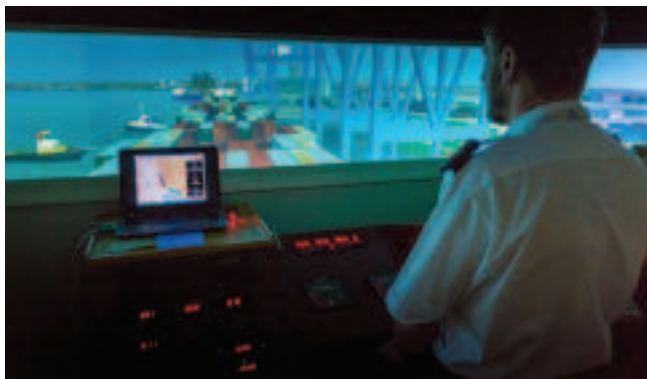
As a boat owner it will also give you the increased security of knowing that the Harbour Master can get in touch with you very easily should anything happen to your boat whilst you are ashore.



Join via the PLA's dedicated recreational users' web-site:

www.boatingonthethames.co.uk

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For details contact
George Goody:
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george.goody@pla.co.uk

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Van Oord is one of the UK's leading dredging and marine contractors. We specialise in capital and maintenance dredging, land reclamation, coastal defences and port developments.

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- Terminal and harbour towage services
- Heavy lifting, subsea services and marine towage
- Detection and removal of unexploded marine ordnance
- Salvage

Key Minimum Sizes

All undersized marine organisms shall
be returned immediately to the sea*

*except commercial fishing for species subject
to Landing Obligation



Bass 42cm (recreational
restrictions apply, see website)



Cod 35cm



Whiting 27cm



Plaice 27cm



Sole 24cm



Mullet 30cm



N. Sea Mackerel 30cm

Other Mackerel 20cm



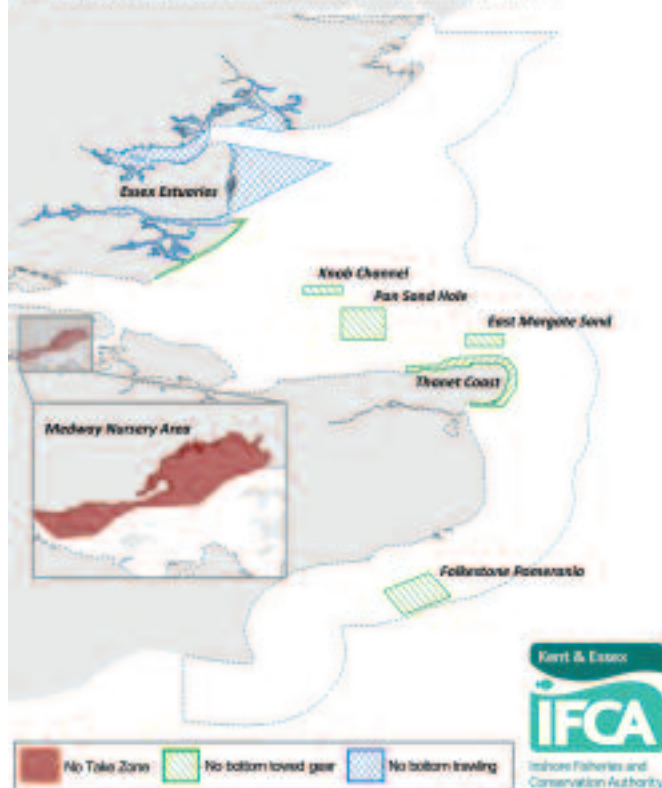
Skates and Rays 40cm

For further information on legislation and species visit:

www.kentandessex-ifca.gov.uk

Marine Protected Area Management

To meet Marine Protected Area (MPA) conservation objectives, Kent and Essex IFCA have introduced a range of fisheries management measures, protecting species and habitats of national and international importance.



SVITZER



SVITZER: YOUR TOWAGE PROVIDER ON THE RIVER THAMES

With 10 tugs on the river from Tower Bridge to the Havens and the Port of Sheerness to Chatham, Svitzer are available 24/7 365 days a year. Based in Gravesend at Denton Wharf our tugs are manned by professional crews with over 30 years experience on the river.

Svitzer operate a fleet of more than 500 vessels in over 40 countries worldwide. Throughout its history of more than 175 years experience, Svitzer has been at the forefront of specialised marine activities including Harbour/ Coastal/Ocean Towing/ LNG Terminal Towing as well as Salvage operations and Standby - rescue services. With a diverse fleet built to the highest standards, Svitzer stands ready to serve you on the River Thames and worldwide.

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