

TOWAGE GUIDELINES



CONTENTS

	Preface
Section 1	Administration
Section 2	Towage Operations
Annex 1	Tug Allocation Tables
Annex 2	Escort Towage Requirement
Annex 3	Bollard Pull Verification
Annex 4	Bollard Pull Displacement



AMENDMENTS

NUMBER	PAGE/SECTION	AMENDMENT	BY	DATE
1	10	Section deleted and superceded by MOP 2.16	S. BIRT	30/6/2022
2	5 / 2	Tugs and Tug Operator's approval process reviewed and amended. Operating company standards reviewed and amended.	S. BIRT	29/11/2022



PREFACE

The Statutory Harbour Authority (SHA) complying with the requirements of the Port Marine Safety Code (PMSC) has identified towage as a mitigating factor to reduce the risk of certain shipping operations. As such the SHA requires an adequate number of tugs to be available to safely support ship operations within the harbour area. These tugs must be 'fit for purpose', with the crews adequately trained and qualified for the tasks they are likely to perform.

Accordingly, the information in this document lays down the criteria that towage operations, their management and towage users should meet. There are two main parts to the guidelines, the first deals with the administrative process and the second addresses the physical aspects of towage.

There will be circumstances and conditions that may require operating outside of these guidelines. Deviation from the guidelines must only occur after consultation with all relevant parties, and with the sanction of the Harbour Master or Deputy Harbour Master (Shipping Operations).

The Harbour Authority frequently reviews towage requirements in consultation with pilots and the tug company, and in conjunction with the examination of reports received through the Marine Reporting System. A vital tool in the process of reviewing towage requirements is the ability to access historical data in the port's Operations Database.



Section 1 – Administration

Tug approval

Towage companies wishing to undertake ship handling operations at the Port of Bristol are required to have their tugs approved by the SHA. To gain approval they must operate their tugs to the required national standards. The operating company must also utilise a safety management system. Tugs must only be used in operations for which they are suited and are certificated for by their flag state.

The following evidence is required to gain approval to operate harbour tugs at the Port of Bristol:

- Tug data sheet (stating type of tug & dimensions as a minimum).
- Proof of bollard pull (not more than 5 years old).
- Certificate of Class.
- Flag state certificate (safety certificate / coded certificate).
- **Either** ISM certificate and DOC (if tug is ISM certified) **OR** IMCA CMID/MISW within the last 12 months.

Prior to undertaking towage operations, all the above documents must be forwarded to the Harbour Master for review. Once approval is gained, this will be confirmed via email immediately, with a certificate of approval valid for 5 years being issued at the first convenient opportunity.

Where tugs are coming in to operate at the port for a short period (typically less than 1 month), a certificate of approval may not be issued and the email confirmation will be sufficient for the period.

Where an operator has more than one tug, the certificate of approval will list all the tugs approved. During the period of operation the above documents **MUST** be maintained in date. In the case of expiry of the underlying documentation above, the operator is to inform the Harbour Master and not undertake any towage operations in port with that tug until the documents are revalidated/re-issued in date.

Tug Crew

National certification standards of tugs crews are set by the Maritime and Coastguard Agency. All crew members must meet these requirements and the tugs must be safely and adequately manned. At present there is no requirement for Tug Masters to hold an MCA Voluntary Towage Endorsement.

Operating Company Standards

Towage companies operating at Bristol should operate to ISO 9001 standards and/or national/international legislation. Additionally, audits may be carried out by The Bristol Port Company as part of the approval process.

Availability of tugs

The ability to plan and execute tidal plans depends on accurate information regarding tug availability. Early reporting of tug defects that may affect operational capability, or tug absences from the port or area, is essential. This information should be shown in the Marine Information section of Operations Database as 'Tug Status'.

Tug Allocation

Tugs should normally be allocated, for the purpose of tide planning, in line with the



recommendations in tug allocation tables (Annex 1). Any deviation from the recommendations must be sanctioned by the pilot or master, and the SHA.

The allocation of tugs should be displayed on the Operations Database by 1500 each day, Monday to Friday, by the Duty Tug Controller.

The allocation should then be amended and finalised by 1630 after consultation with the nominated Pilot, Duty Assistant Haven Master and Duty Tug Controller. This will include positioning of the tugs on the vessel, whether on the bow, stern or pushing. Changing positions of allocated tugs at short notice may impact other planned shipping movements. Consideration to crew rota's will be taken into account where possible. After the allocation has been finalised, a particular pilot may have reasons to request changes in tug allocation due to weather, tide and/or vessel manoeuvring characteristics. The specific positioning of tugs is at the discretion of the pilot and he should endeavour to give as much notice as possible if any changes are required. The tug, tug operator or VTS should not pressurise unduly the pilot to accept a less ideal configuration.

The Tug Allocation Tables have been produced to reflect vessels navigating in the harbour area require tugs under normal conditions in conditions up to 15 knots. If wind speeds are greater, then an additional tug may be required. If wind speeds are less the pilot, in consultation with the DAHM may reduce the number of tugs required.

Interpretation of Tug Allocation Tables

The tug allocation tables (Annex 1) have been developed by the SHA over a long period of time, in consultation with shipowners, tug companies and pilots. Its contents are to be considered as a requirement under normal conditions. It is principally designed for vessels that are visiting the port for the first time.

Vessels that have visited the port previously will have confirmed requirements that are viewable in the 'history' section of the Operations Database, and this will give a more accurate requirement. When vessel particulars change due to modifications, or restrictions on machinery usage (such as bow thrusters) then the tug requirement will default to that stated in the tug allocation tables. Where a need arises for a reduction or increase in the number of tugs then this will be after consultation with interested parties. Consideration will also be given to increase the recommended towage for ebb dockings and reduced requirements for slack water dockings are most likely amendments.

The table assumes tugs have a bollard pull of 40 tons. Where this is not the case the mean Bollard Pull of the tugs must not be less than 40 tons. Where a tug of 80 tons bollard pull or more is used a reduction of the total number of tugs will be considered in consultation with the pilot and VTS. The SWL on the ship must be considered at this time.

The Tug Allocation Tables consider the bow thruster power of a vessel. Where a vessel has reported a defect reducing the available power this must be taken into account, a vessel with a 1500HP bow thruster but only capable of delivering 60% must be considered as having a 900HP bow thruster.

The total bollard pull of the allocated tugs should be verified in Bollard Pull Verification



Tables (Annex 3). Where this figure is not met additional towage, or improvements in weather conditions, will be required prior to the movement of the vessel takes place.

Special Directions

There may be cases where the Master of a vessel does not wish to follow the towage guidelines, against the advice of the Pilot or VTS. In such circumstances the HM or DHM (SO) should be consulted regarding the issue of a Special Direction. This Direction will instruct the vessel to either take the required number of tugs or wait for more favourable conditions.

For the avoidance of doubt the Duty Assistant Harbour Master (DAHM) has the delegated authority of the Harbour Master to issue Special Directions.

Local Conventions

Specific requirements for escorting and rendezvous points are contained within planning documentation issued by The Bristol Port Company. These requirements are set out in Annex 2.

Operations Database

Data Input

Authorised users, including the tug company Svitzer, that can input tug data into the Operations Database, indicating a tug order (restricted to the tugs name, number of tugs allocated and their disposition: Bow, Stern, Push).

This can be done via Tide Plan, Tide Tracker or Forward Movements screens.

All tug orders will be in the following format:

2+1 indicates 2 tugs on the first movement and 1 tug on the subsequent movement.

Applying the above example to an arrival would indicate 2 tugs working the ship from King Road to the Lock and 1 tug working the ship from the lock to the berth.

There is a prefix letter that appears when orders have been confirmed or entered by the tug company; **S3+2** indicates an order confirmed/entered by Svitzer for 3 tugs for the first movement and two for the subsequent movement.

For ships moving between docks tug allocation will be in the following format:

2+1/3+2 The first group is for the departure port, the second group is for the arrival port.

If it is known from tug allocation tables that no tugs are normally required for a vessel then the Operations database should be, in the tug column, blank or show **0**.

If the tug company are advised by the master or agent that no tugs are required for a vessel then the Operations database should show **S0**.



Section 2 – Towage Operations

Planning and co-ordination

This section seeks to offer guidance on towage operations based on nationally accepted standards for towage and local procedures specific to the Port of Bristol SHA area of jurisdiction. Before commencing towage operations, a comprehensive plan of action should be prepared by the Master/Pilot taking into account all relevant factors including weather/tidal conditions, the berth operator's requirements and the size/ configuration of the vessel.

Pilot / Vessel Master exchange:

In addition to the standard information passed to the Pilot, it is recommended that the master provide the Pilot with a deck General Arrangement showing the layout and safe working load (SWL) of the mooring fittings, where known, and inform him:

- which fairleads, chocks, bollards and strong points can be used for towing.
- the SWL of this equipment (to be noted on the passage plan form).
- areas of hull strengthened or suitable for pushing and relevant identification marks employed.
- using ships' mooring lines as towlines is not permitted except in an emergency (see below).
- Any special features (controllable pitch propellers, thrusters etc.).

The Pilot should advise the Master:

- the tug rendezvous times and positions.
- the number of tugs and the mode of towage.
- the type of tugs to be used and their bollard pull(s).
- if escorting, the maximum towline forces that the tug may generate at escort speeds.
- maximum planned speed for the passage.
- the method by which the ship's crew should take on board and release the tug's tow line.
- the use of appropriately weighted heaving lines.
- that on release, the tug's gear should be lowered back always under control.
- areas of the transit posing particular risks with respect to the possible use of the tug.
- intentions with regard to use and positioning of the tug(s)
- primary and secondary VHF channels for use in the operation.

Pilot / Tug master Exchange:

- The Pilot and Tug master should, as a minimum, discuss the following issues:
- the SWL of the vessel's equipment used for towing.
- the tug hook up point, taking into account the prevailing weather and sea conditions, for escorting operation (if appropriate) and berthing;
- if active escorting, the start point of the escorted passage.
- the maximum speed of the tug.
- passage details in their entirety while accompanied by the tug(s), particularly details of any swing manoeuvre, release position and sequence of release.
- berthing details in their entirety, including tug positioning around the vessel's hull and the vessels required position on the berth.
- emergency use of ships anchors.
- any unusual items regarding the particular vessel as gleaned from the Master/Pilot exchange; any failure or reduction in the tug's ability to manoeuvre or deliver.



Towage Operation Communications

VHF communications are a vital component of safe towage operations. It is essential that those onboard the ship, the tug(s), mooring boats (where appropriate), and those on the berth or lock side are able to communicate promptly throughout the towage operation, should the need arise. Towage operations are carried out on the dedicated tug working VHF Channels 8, 10 or 72. The Pilot must confirm which channel he intends to use with Bristol VTS and establish communication with each tug prior to commencing the towage operation. Bristol VTS will monitor this working channel so that they may be fully aware of the towage operation in progress. Deviation from these recorded VHF channels is now permitted.

Instructions given to a tug by the Pilot should be clear, concise and follow convention (tugs names must be used when giving orders). Instructions should be acknowledged and repeated by the Tug Master. The Tug Master should be kept informed of significant engine movements, helm orders, proposed use of thrusters and anchors on the towed vessel.

*For further information see Marine Operations Procedure '2.1 Control of Vessel Movements'.

Conduct of Vessel being towed

Most ship towage manoeuvres should be carried out with the appropriate way on the ship. Exercise caution when using the engines while the tugs are working. The after tug will be affected by the wash and every tug will be affected by the change of speed either up or down, and a rapid change in speed is all the worse. If the situation dictates the use of the engines, the minimum that the situation allows should be used and the tugs should be informed of what the ship is about to do as it will affect their own actions.

Use of ships mooring lines

Ships mooring lines must not be used for towing operations except in an emergency and only when a proper risk assessment has been carried out extreme caution should be taken to ensure that the size and condition of the line is suitable and that it is kept slack and under control when lowering to the tug and making fast.

Escort towage

At Bristol, escorting has been practised routinely on deep draught vessels entering and sailing from the port. In addition, both active and passive escorting has been conducted on ships that have suffered a reduction in their ability to manoeuvre. The objective of escorting is to provide a tug that can, at all times, assist a vessel in sufficient time to prevent a navigational incident.

Indirect towing

Where a tug works indirect a force exceeding the tugs bollard pull is likely to be exerted. The SWL of the line, fairleads, chocks, bollards and strong points being used for towing.

Towage in restricted visibility

*See Marine Operations Procedure '1.9 Vessel movements in restricted visibility'.



Special Transport Towage Operations

Refer to Marine Operations Procedures 2.16 -Tug and Barge Operations.



Annex 1 - Tug Allocation Tables

Arrival												
		No Aids	With bow thruster maximum power of:			High lift rudder or stern thruster with a bow thruster max power of:					Twin screw, single rudder & bow thruster ≤1000hp	Twin screw or Azipod & suitable bow thruster/s
			Up to 999hp	1000hp To 1499	1500hp To 2000+	Up to 499hp	500hp To 999	1000hp To 1499	1500hp To 2500	Over 2500 hp		
<100m	Avonmouth	1+1	-	-	-	-	-	-	-	-	-	-
	Portbury	-	-	-	-	-	-	-	-	-	-	-
100m - 125m	Avonmouth	1+1	1+1	1+1	1+1	1+1	-	-	-	-	-	-
	Portbury	1+1	1+1	1+1	1+1	1+1	-	-	-	-	-	-
125m - 150m	Avonmouth	2+2	2+2	1+1	1+1	2+2	2+2	1+0	1+0	1+0	2+2	-
	Portbury	2+2	2+2	1+1	1+1	2+2	2+2	1+0	1+0	1+0	2+2	-
150m - 175m	Avonmouth	3+3	3+3	3+2	3+2	3+3	2+2	2+1	2+1	2+1	2+2	-
	Portbury	3+3	3+3	3+2	3+2	3+3	2+2	2+1	2+1	2+1	2+2	-
175m - 225m	Avonmouth	3+3	3+3	3+3	3+2	3+3	3+3	2+1	2+1	2+1	2+2	1+0
	Portbury	3+3	3+3	3+3	3+2	3+3	3+3	2+1	2+1	2+1	2+2	1+0
225m – 250m & Panamax Bulk Carriers	Avonmouth	-	-	-	-	-	-	-	-	-	-	-
	Portbury	4+3*	4+3*	4+3*	4+3	✘ 3+3	✘ 3+3	✘ 3+2	✘ 3+2	2+2	3+3	1+0
250m & Post Panamax Bulk Carriers	Avonmouth	-	-	-	-	-	-	-	-	-	-	-
	Portbury	● 5+3	● 5+3	● 5+3	● 5+3	◆ 4+3	◆ 4+3	◆ 4+3	◆ 4+3	3+2	4+3	2+0

UKC required 2m

✘ = If over 12m draught + 1 Tug outside.

● = minus 1 Tug outside if under 10m draught

◆ = minus 1 Tug outside if under 12m draught

Departure												
		No Aids	With bowthrustrer maximum power of:			High lift rudder or stern thruster with a bow thruster max power of:					Twin screw, single rudder & bowthrustrer ≤1000hp	Twin screw or Azipod and suitable bowthrustrer/s
			Up to 999hp	1000hp To 1499	1500hp To 2000+	Up to 499hp	500hp To 999	1000hp To 1499	1500hp To 2500+	Over 2500 hp		
<100m	Avonmouth	1+0	-	-	-	-	-	-	-	-	-	-
	Portbury	-	-	-	-	-	-	-	-	-	-	-
100m - 125m	Avonmouth	1+1	1+1	1+1	1+1	1+1	-	-	-	-	-	-
	Portbury	1+1	1+1	1+1	1+1	1+1	-	-	-	-	-	-
125m - 150m	Avonmouth	2+1	2+1	1+1	1+1	2+1	2+1	1+0	1+0	1+0	2+2	-
	Portbury	2+1	2+1	1+1	1+1	2+1	2+1	1+0	1+0	1+0	2+2	-
150m - 175m	Avonmouth	3+2	3+2	2+2	2+2	3+2	2+1	2+1	1+0	1+0	2+2	-
	Portbury	3+2	3+2	2+2	2+2	3+2	2+1	2+1	1+0	1+0	2+2	-
175m - 225m	Avonmouth	3+2	3+2	3+2	3+2	3+2	3+2	2+1	1+0	1+0	2+2	-
	Portbury	3+2	3+2	3+2	3+2	3+2	3+2	2+1	1+0	1+0	2+2	-
225m – 250m & Panamax Bulk Carriers	Avonmouth	-	-	-	-	-	-	-	-	-	-	-
	Portbury	3+2	3+2	3+2	3+2	3+2	3+2	3+2	2+1	2+1	3+2	-
250m & Post Panamax Bulk Carriers	Avonmouth	-	-	-	-	-	-	-	-	-	-	-
	Portbury	4+2	4+2	4+2	3+2	4+2	4+2	4+2	3+2	3+2	3+2	-

Notes

- This table is based on **average wind conditions of 15 knots**. If wind speeds are greater, an additional tug may be required. If wind speeds are less, and in consultation with VTS, the Pilot may reduce the number of tugs required.
- A tug is assumed to have a minimum Bollard Pull of **40 tons**. Where this is not the case the mean bollard pull of the tugs must not be less than 40 tons on ships under 225m.
- Historical information, contained in Operations Database, for the use of tugs will be reviewed and assist in the planning of a vessel movement. If a vessel does not clearly meet any of the above criteria tug allocation will be determined in consultation with a Senior Pilot.

Annex 2 – Escort Towage Requirement

This is a requirement not an option unless sanctioned by the Haven Master or DHM (SO) under special circumstances.

Tug escorting and rendezvous points

INWARDS

<i>Vessel type</i>	<i>At English and Welsh buoy</i>	<i>At Welsh Hook buoy</i>	<i>Prior to passing Portishead Point</i>
Vessels over 13m draught	Stern tug	Stern tug + 1tug	Remaining tugs
Large Kerosene Vessels (LKV) 12.5m draught and over docking from the west	Stern tug	Stern tug + 1tug	Remaining tugs
LKV less than 12.5m draught	0	Stern tug	Remaining tugs

Tugs for all other vessels should rendezvous at Portishead Point or as required by the pilot.

OUTWARDS

<i>Vessel type</i>	<i>Portishead Point</i>	<i>Welsh Hook</i>	<i>English and Welsh</i>
All vessels over 13m draught	All lock-to-sea tugs	0	1
Large Kerosene Vessels (LKV) 12.5m draught and over	1	0	0
LKV less than 12.5m draught	0	0	0



Annex 3 – Bollard Pull Verification (surface area)

Determine lateral surface area . . .

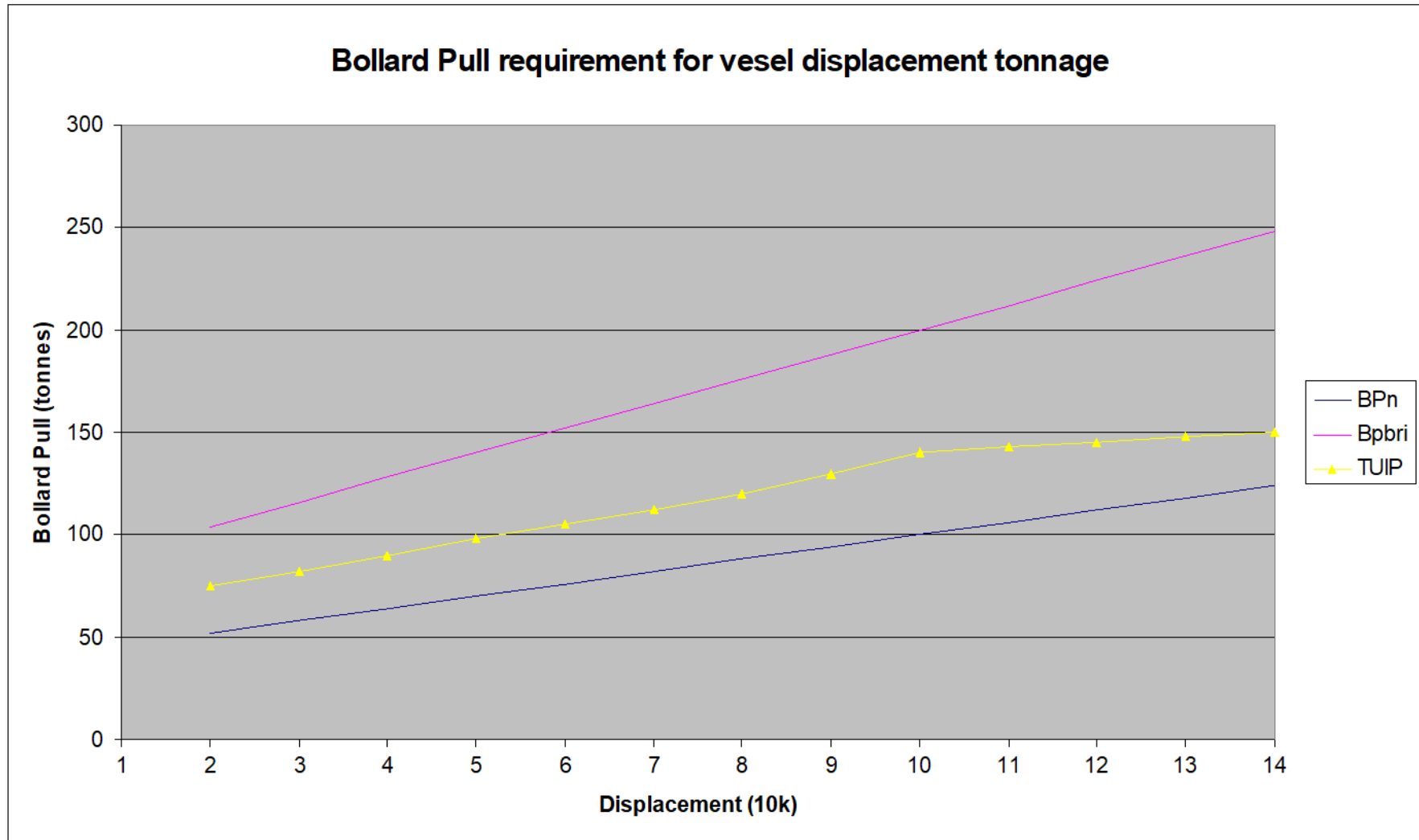
	Vessel Height in Metres														
LOA	5	7.5	10	12.5	15	17.5	20	22.5	25	27.5	30	32.5	35	37.5	40
50	250	375	500	625	750	875	1000	1125	1250	1375	1500	1625	1750	1875	2000
75	375	563	750	938	1125	1313	1500	1688	1875	2063	2250	2438	2625	2813	3000
100	500	750	1000	1250	1500	1750	2000	2250	2500	2750	3000	3250	3500	3750	4000
125	625	938	1250	1563	1875	2188	2500	2813	3125	3438	3750	4063	4375	4688	5000
150	750	1125	1500	1875	2250	2625	3000	3375	3750	4125	4500	4875	5250	5625	6000
175	875	1313	1750	2188	2625	3063	3500	3938	4375	4813	5250	5688	6125	6563	7000
200	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500	8000
225	1125	1688	2250	2813	3375	3938	4500	5063	5625	6188	6750	7313	7875	8438	9000
250	1250	1875	2500	3125	3750	4375	5000	5625	6250	6875	7500	8125	8750	9375	10000
275	1375	2063	2750	3438	4125	4813	5500	6188	6875	7563	8250	8938	9625	10313	11000
300	1500	2250	3000	3750	4500	5250	6000	6750	7500	8250	9000	9750	10500	11250	12000

. . . then determine Bollard Pull requirement.

	Wind speed in knots										
Lateral Surface Area (m2)	5	10	15	20	25	30	35	40	45	50	
0	0	1	2	4	6	9	12	16	20	25	
1000	1	2	5	8	13	18	25	32	41	50	
1500	1	3	7	12	19	27	37	48	61	75	
2000	1	4	9	16	25	36	49	64	81	100	
2500	1	5	11	20	31	45	61	80	101	125	
3000	2	6	14	24	38	54	74	96	122	150	
3500	2	7	16	28	44	63	86	112	142	175	
4000	2	8	18	32	50	72	98	128	162	200	
4500	2	9	20	36	56	81	110	144	182	225	
5000	3	10	23	40	63	90	123	160	203	250	
5500	3	11	25	44	69	99	135	176	223	275	
6000	3	12	27	48	75	108	147	192	243	300	
6500	3	13	29	52	81	117	159	208	263	325	
7000	4	14	32	56	88	126	172	224	284	350	
7500	4	15	34	60	94	135	184	240	304	375	
8000	4	16	36	64	100	144	196	256	324	400	
8500	4	17	38	68	106	153	208	272	344	425	
9000	5	18	41	72	113	162	221	288	365	450	
9500	5	19	43	76	119	171	233	304	385	475	
10000	5	20	45	80	125	180	245	320	405	500	
10500	5	21	47	84	131	189	257	336	425	525	
11000	6	22	50	88	138	198	270	352	446	550	
11500	6	23	52	92	144	207	282	368	466	575	
12000	6	24	54	96	150	216	294	384	486	600	



Annex 4 – Bollard Pull Verification (Displacement)



BPn = Bollard pull for most ports **BPbris** = Bollard pull for Bristol **TUIP** = Bollard pull extracted from publication "Tug Use in Ports".

Based on formulae $BPn = ((Disp \times 100,000) \times 60) + 40$ $BPBri = ((Disp \times 100,000) \times 120) + 80$

