PEEL PORTS
GREAT YARMOUTH

Towage Guidelines

Great Yarmouth

Lead Marine Compliance Manager

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TOWAGE GUIDELINES

FOR THE PORT OF GREAT YARMOUTH

Document Information

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Contents

Introduction

These guidelines have been produced by Peel Ports Great Yarmouth in consultation with Pilots, Tug master's and Port Users and reflect the content of the Guide to Good Practice on Port Marine Operations.

The purpose of these guidelines is to enhance the safety of towage operations with the Port of Great Yarmouth by providing a supporting framework to enhance the communications and teamwork between towage operators, tug masters, pilots, and the Harbour Authority.

The Port of Great Yarmouth does not have an organic Port Tug Service due to the nature of the trade using the port and infrequent requirement for towage services. Consequently, all towage operations are currently classified as 'non-Routine' and will be considered and approved on an individual 'case by case' basis.

A Non-Routine Towage Operation is defined as any towage operation involving or likely to include a combination of two or more towing and/or pushing vessels in an arrangement not previously risked assessed and reviewed by the Harbourmaster. Unusual project tows, such as the towage of large dead-ship vessels will also be considered as a Non-Routine Towage Operation.

The Operator or Tow Master of such a towage operation is required to provide the Harbourmaster with at least 5 working days advanced notice of the operation, where possible.

Where a Vessel Operator is in any doubt as to whether his planned towage operation should be classed as a Non-Routine Towage Operation, he must consult the Harbourmaster without delay, and at least 5 working days before any such towage operation is commenced. The Harbourmaster will decide whether a towage operation is to be classed as a Non-Routine Towage Operation and his decision is final.

Where operational availability allows, at the discretion of the Harbourmaster a shorter notification period may be permitted, provided the documentation is of an acceptable standard.

The provision of tugs for vessel or barge movements is therefore the responsibility of the shipping company or agent utilising their preferred contractor, in consultation with the Port Authority. Peel Ports Great Yarmouth retain the right to direct the minimum number, type, and capabilities of the tugs to be used for a movement.

Towage Governance

The Port Marine Safety Code requires ports to develop a method and criteria to approve tugs, workboats and operators working within their jurisdiction. Statutory Harbour Authorities must be satisfied that Tugs operating within their jurisdiction are able to do so safely. SHAs facilitate this requirement through a Compliance Check, which t is designed to assess the operational safety and support systems, including risk assessment, training, plans and procedures, operated by such organisations. This Compliance Check is designed to be

simple and relevant to the operations carried out by each organisation and is intended to satisfy the requirements placed on the Statutory Harbour Authority by the Port Marine Safety Code. However, the Compliance Check in no way absolves the towage providers of their responsibilities to operate safely and in compliance with industry best practice and relevant rules, regulations, and standards.

Licensing Requirements

Tugs must as a minimum be registered with the Port of Great Yarmouth in accordance with GYPA Navigation Byelaws 1997 and MSMS SOP 9.1.

Further guidance and advice can be found in the following publications:

- Tug Use in Port: A Practical Guide – Nautical Institute.
- Port Marine Safety Code
- Recommendations for Ships' Fittings for use with Tugs – OCIMF.
- The Ship handlers' Guide – Nautical Institute.
- Current relevant Merchant Shipping Notices.
- Code of Safe Working Practices for Merchant Seamen.
- Management of Health & Safety at Work Reg

The details of which tugs are currently licensed by the port to undertake ship towage operations are available from Great Yarmouth Harbour Office.

They should only be used in assisting ship manoeuvring and berthing/unberthing operations for which they have the capacity and are licensed.

Acceptance of non-routine towage operations

In situations where a proposed tow, either within or into or out of the Port is identified as a Non-Routine Towage[1] Operation, the following procedure shall be adhered to:

The Vessel Operator must:

1. Advise the Harbourmaster, at least 5 days in advance, of the intended operation.

2. Appoint a Tow Master; and

3. Provide all necessary resources and support to the Tow Master to allow him to meet his responsibilities - see Section 1.3.

The Tow Master must:

1. Submit a comprehensive operational risk assessment for the entire operation to the Harbourmaster.

[1] MCGA-Port_Marine_Guide_to_Good_Practice_NEW-links.pdf (publishing.service.gov.uk)

2. Submit an appropriate passage plan and details of the towing configuration to the Harbourmaster at least 5 days in advance of the operation; and

3. Ensure that a proper record and audit trail of the planning and approval process, and the operation itself, is maintained.

Where a Tow Master, following submission of the required documents, is unable to complete the proposed tow, an alternative duly qualified Tow Master may be substituted. In such cases, the alternative Tow Master must undertake a full review of the submitted documentation or otherwise amend and re-submit the documentation to the Harbourmaster for acceptance.

Items 1 and 2 above may be submitted by persons other than the Tow Master provided the appointed Tow Master then complies with requirements in respect of reviewing and if necessary, resubmitting the documentation.

The Harbourmaster will:

1. consider the submitted operational risk assessment and may state requirements for change.

2. discuss the pilotage requirements with the Pilotage Department, including, where appropriate and/or feasible, the early allocation of a pilot or pilots to undertake the pilotage act.

3. consider the associated passage plan and may state requirements for change.

4. if necessary, identify and require the need for one or more trials or simulations of the planned towage operation.

5. as and when content, indicate his acceptance of the documentation to the document submitter; and

6. involve and advise LPS of the towage operation, as necessary.

CHAPTER 1

1.0 Towage Recommendations

1.1 Requirement

As guidance for vessel and vessel owners considering the need for towage within the Port of Great Yarmouth, the following is a list of situations and circumstances for which tugs will be required:

- Dumb barges irrespective of size, shape, or category.
- Submerged or semi-submerged equipment, objects, or facilities.

- Dead ship or vessel.
- Any vessel with a defect on engines, control systems or rudders such that manoeuvrability is severely restricted or impeded compared to the design parameters. This condition is irrespective of vessel size.
- Any vessel with an LOA of over 70m in length and has no bow thruster, whilst manoeuvring stern first in the River Port.

The following are examples of situations when the Port may require tugs:

- Any vessel with an LOA of over 95m within the River Port.
- Outer harbour requires a bulk vessel in ballast over 120 meters with no or poor Bow Thruster to have a Tug and over 180m to have tug/s. A bulk vessel loaded over 120 meters with no or poor Bow Thruster to have a Tug and over 150m to have tug/s.

The towing matrix for Great Yarmouth sets a baseline guide for minimum towage for vessels by LOA bound for specific locations within the Outer Harbour and River Port. The Matrix is derived from risk assessment. Specific maximum length and beam of different towage configurations as well as minimum propulsion requirements have been considered. These requirements have been incorporated into the Matrix which should be complied with for all tugs and tows routinely operating in the area unless excepted from the requirements by application to the Harbour Authority.

Deviation from the Towing Matrix

Due to the considerable variations in vessel size, shape, condition, and degree of manoeuvring capability the recommended number of tugs from the matrix given may be more than what is the safe minimum number of tugs for a particular vessel. As a consequence the master of any visiting ship may order the recommended number of tugs as per the towage matrix contained within this document or opt to consult with an authorised Pilot where both marine professionals may agree to deviate from the Tug Matrix contained within this document by use of their own professional judgment to set a safe and appropriate level of tug provision for a particular vessel. Likewise, that tug provision may exceed the guidelines in exceptional circumstances, or when directed by the Harbour Master under his statutory powers.

Such consultation can be arranged by the master of any vessel through his Agent who will then contact the appropriated Pilot to consider the Master's request. In assessing any variation from the Towage Matrix, the following points will be taken into consideration, namely:

- The complexity of the manoeuvre
- The Length of the vessel
- The draught of the vessel
- The windage area of the vessel
- The minimum under keel clearance during the planned passage transit
- Range of the tide on the date in question – springs or neaps
- Expected wind conditions.
- Disposition of other vessels and port infrastructure
- The forecast weather conditions, including visibility.
- Manoeuvring aids – thrusters, size, and number

- Type of propulsion system – controllable pitch, fixed pitch, or azimuth
- Type of steering system – single or twin rudders, high-lift, or standard
- The Gross Registered Tonnage (GRT) in relation to the vessel's principal dimensions
- Unusual design of vessel
- Any reported defects to the vessel
- Type of main engine – air start, diesel electric, gearbox
- Availability of boatmen and line handling vessels

Peel Ports Great Yarmouth reserve the right to direct the minimum number, type, and capabilities of the tugs to be used for any movement. The final decision rests with the Head of Marine Services SE Cluster, or his appointed deputy.

1.2 Decision to take tugs.

Outside of the above circumstances the decision to take a tug or tugs remains at the discretion of the individual vessel Master. However, it is strongly recommended when considering the use of tugs within the port that the Port Authority and Pilots be involved in such deliberations at the earliest point as possible in the planning stage.

1.3 Considerations

When assessing the requirement for towage the following points should be taken into consideration:

- The dimensions of the vessel, barge, or object to be moved. Specifically:
    - Length and beam, including any projections above or below the waterline.
    - Gross tonnage.
    - Wind, particularly its rate and direction compared to the vessels dimensions.
    - The draught in relation to available water and under keel clearance.
    - Significant wave height for safe working.
    - The effect of tidal stream and prop wash on the submerged section of the vessel, barge, or object.
    - The visibility of the tug or tugs, as well as port infrastructure, from potential pilotage positions during the manoeuvre.
    - The destination or departure point within the harbour. Specifically:
    - The available manoeuvring room for the tug or tugs during the berthing, unberthing or manoeuvring operations.
    - Potential choke points or restrictions within the harbour during the move. Especially when changing tug positions, picking up, or dropping off the tow.
- The direction of travel of the vessel, barge, or object.
- Is the transit to be conducted bow or stern first?
- The manoeuvrability of the vessel, barge, or object. Specifically:

- Is the object able to assist in the manoeuvring?
- Is it a 'Dead Ship' tow?
- Does the object/tow have a shorter turning circle in one direction?
- What is the predicted stopping distance?

- The predicted or prevailing environmental conditions. Specifically:

  - Wind speed and direction throughout the move.
  - The predicted and actual tidal stream, both direction and strength.
  - The height of tide and available under keel clearance.
  - The presence of any freshwater run-off.
  - Tidal surges or tide under predicted heights.

- The available tugs. Specifically:

  - Their power. Do they, as a whole and individually, have sufficient power and reserve of power to safely conduct the move?
  - The type of drive, determining the manoeuvrability and the risk of girting.
  - The physical size of the tug in relation to the available manoeuvring room, depth of the berth, length of tow line.
  - The age of the tug, which will affect the remaining available power from classification.
  - The familiarity of the crew with the port. Specifically:

    - Have they been to the port before?
    - Have they worked with the pilots before?
    - Are they comfortable with the tow orders used by the pilots?

1.4 Qualifications

When considering a towage provider, a Master or Agent should also consider the certification of the proposed tug as well as the qualifications held by the crew. The Maritime and Coastguard Agency in accordance with the Port Marine Safety Code[2] and The Guide to Good Practice[3] set the minimum standards that need to be met.

Prior to the proposed towage operation, the Port Authority will need to be assured that the selected towing operator is sufficiently competent to conduct the operation. As a minimum the Master should hold a Certificate of Competency (CoC) to STCW standards with an MCA.

Operators of registered tugs shall ensure that their crews are trained with a sound understanding of the tugs they operate, relevant towage techniques and the area in which

[2] Port Marine Safety Code (publishing.service.gov.uk)

[3] MCGA-Port_Marine_Guide_to_Good_Practice_NEW-links.pdf (publishing.service.gov.uk)

they operate. The Harbour Authority must be satisfied that the towage provider crews operating within the port are also trained with a sound understanding of the tugs they operate & towage techniques and the area in which they operate.

Failure to provide such proof will result in the tug not being approved to operate within the harbour limits and the towing operation not being authorised.

All tug crew members must be properly rested in line with the recommendations of national and international legislation. Please see HSE Working Time Directive[4].

1.5 Pilot Training and PEC Holders

As per National and international training standards, Pilots MUST be able to demonstrate several criteria to work with tugs and become acquainted with the characteristics and limitations of the specific tugs operating within the port prior to any operation involving towage.

Pilot Exemption Certificate (PEC) holders are not permitted to conduct pilotage with tugs and must take a Pilot for any move requiring a tug either as standby or attached.

CHAPTER 2

2.0 Planning for Towage Operations

2.1 Planning and Coordination

A comprehensive plan should be agreed by all parties prior to the commencement of any towing operations. This should be reviewed considering the prevailing conditions and agreed again by the Master and Pilot prior to conducting the pilotage. Both the Pilot and Master should ensure the tugs are suitable for the task ahead and so positioned on the tow to ensure safe operation. The Pilot should have a sound knowledge of the tugs capabilities and limitations. Both Pilot and Master must be in total agreement before the towage operations begins.

The hiring of tugs and co-ordination of towage operations lies with the Master or Owner of the vessel, barge or object being towed. Once within the port limits the conduct of the tow lies with the Pilot, and as such all communication with the tugs during the operation will be through the Pilot. At all times it remains the overriding duty of the Master and Pilot to ensure the safe operation of the vessel, barge or tow, and the safety of all involved.

Tug manning will vary depending on the operation being conducted. The proposed manning of the tugs should be highlighted in the towing plan, should be adequate, and sufficient to ensure individuals are not exposed to undue risk, whilst ensuring the operation can be conducted safely and efficiently.

[4] EUR-Lex - 31999L0063 - EN - EUR-Lex (europa.eu)

It is the duty of all involved in towage operations to ensure that individuals are not exposed to unnecessary risk. They should follow safe working practices, wear the correct PPE, and ensure associated equipment is in date, tested and fit for purpose prior to use. They should also ensure they have been properly briefed on the operation, and their specific duties about that operation. If at any time they are uncertain or in doubt as to the safety of a specific manoeuvre they should raise their concern immediately.

2.2 Approval

As discussed in the introduction all towage operations within the Port of Great Yarmouth are considered as 'non-routine.' Consequently, all towage operations must be notified in advance and be subject to a formal assessment by the port prior to approval being issued and the operation being undertaken.

A Towage Assessment form[5], must be submitted to the Port at least 24 hours in advance of the proposed operation to allow the plan to be reviewed and approved. Where required short notice assessments can be undertaken but will incur and additional cost. Ship-owners, towage contractors, Tug Masters, project managers and agents are advised that the person responsible for the safety, planning and coordination of the proposed operation (and thereby acting as Towing Master) must be clearly identified and is responsible for the production of risk assessments, method statements and passage plans. All of which must be discussed and agreed with the harbour Authority prior to conduct of the operation.

Dead Tows/Non-Routine Towage

DEAD tow Applications and dead tow method statement must be submitted by the responsible person/organisation to the Port for approval. All dead tows are subject to a consultation.

'The Guide' now requires Harbour Authorities to give special consideration to tows involving dead-ships or unusual objects and towage events of a non-routine nature.[6] A dead ship is defined as a vessel in a condition under which the main propulsion plant, boilers and auxiliaries are not in operation due to the absence of power. Towing barges and dead ships by their nature requires careful consideration.

Ship-owners, towage contractors, tug masters, project managers and agents are further advised that the person responsible for the safety and planning of the manoeuvre (and thereby acting as the Towing/Barge Master) must be clearly identified and be responsible for the production of risk assessments, method statements and passage plans which must be discussed and agreed in advance with the Harbour Authority. Once agreed, and before towing commences, a toolbox talk must be organised for all parties to discuss the operation and as a minimum include the tug master, barge master and pilot.

Unless otherwise agreed with the port authority, a barge/dead ship operation is to have a Tow Master (responsible person) to be in charge on board the barge/dead ship; this must not be the pilot. The Tow Master shall be suitably competent and experienced in barge operations

[5] Marine Information | Gr---eat Yarmouth | Peel Ports

[6] MCGA-Port_Marine_Guide_to_Good_Practice_NEW-links.pdf (publishing.service.gov.uk)

and will have overall responsibility for the safety of the towage operation; the Pilot will have the conduct of the passage. The Tow Master must also be satisfied that all appropriate risk assessments are in place. The Tow Master will board the barge on arrival/departure (in the absence of an embarked individual) and will act as Tow Master who will always remain responsible for the safety of the barge.

Dead tow training should be included within the Pilots training.

Testing and Inspection of towing equipment

Towing hooks and alarm bells, where fitted, should be inspected regularly, preferably daily. The emergency-release mechanisms on towing hooks and winches should be tested, both locally and where fitted remotely, at frequent intervals as dictated by the towage operator to ensure correct operation.

All fixed and running gear including ropes shall be carefully maintained, tested, certified, and regularly inspected against wear, damage, and corrosion. Particular attention is drawn to the need to ensure that fairleads, lead bollards, mooring bitts etc. are used appropriately and within their design capabilities. All towing equipment in use should be inspected for damage before undertaking and after completing a tow. This is especially important with gob/gog ropes. Tug masters shall ensure they are fit for purpose and in good working order to ensure reliability. It is safety critical and will save your life.

Winch brake test should be carried out once the tug(s) have been connected, and the tow line run out to the required length.

Mooring winches and other equipment shall be maintained to the manufacturers' specifications and be properly serviced. Equipment such as heaving lines and messengers should be of appropriate length and strength. All equipment shall be checked before the start of each operation**.**

2.3 Timing

When an agent or ship owner orders tugs to be in attendance the following timings are recommended:

- Entry:
  - At High Water Slack – Predicted High Water +1 hour 30 minutes.
  - At Low Water Slack – Predicted Low Water + 1 Hour 30 minutes.

- Departure:
  - At High Water Slack – Predicted High Water + 1 Hour 30 minutes.
  - At Low Water Slack – Predicted Low Water + 1 hour 30 minutes.

Outside of the slack water periods it is recommended that tugs are in attendance at least 20 minutes prior to the planned move.

2.4 Pilot/Vessel Master Exchange

For towage operations a comprehensive Pilot/Master exchange must be conducted prior to the commencement of the towage operation. It should be enhanced to include specifics of the operation and cover all the relevant factors, including the state of the tide, wind, visibility, ship/tow, tug type and characteristics, tow connection points, changes of tug position if required and specific berth requirements.

It is strongly recommended that the Master provide the Pilot with a general deck arrangement showing the layout and safe working load (SWL) of the mooring fittings, where known, and inform him about:

- Fairleads, chock, bollards, and strong points that can be used for the towing operation.
- Areas of hull strengthened or suitable for pushing by tugs and relevant identification marks employed.
- Any specific features such as controllable pitch propellers, thrusters, Azimuths etc.
- All bollards should be marked with the SWL, and a mooring equipment plan be available on request

It is recognised that providing a deck arrangement plan formally is not always practicable. Pilots and Masters shall verbally exchange that information at the earliest opportunity and pass that information to the tug master where relevant.

Note: Using ships' mooring lines as towlines is not recommended. Towage providers should not operate with ships' lines unless an emergency. If so, the Pilot and Master should confirm that the strength of the mooring line is in accordance with the tug's towing forces. If this is not the case, then the tug's power must be limited to ensure the line does not part.

The Pilot should advise the Master about:

- The Tug rendezvous time and position.
- The number of tugs and the mode of towage to be employed throughout the manoeuvre/evolution.
- The planned optimum ship speed when connecting and throughout the transit.
- The type of tug/tugs to be used and their rated bollard pull.
- The prohibition on the use of weighted heaving lines.
- High risk areas for the transit, with possible uses for the tugs.
- The use and positioning of the tugs for berthing and unberthing.
- The primary tug working channel (VHF Channel 11) and the secondary (VHF Channel 12 – Great Yarmouth Port Control).
- Maximum acceptable visibility.
- Tug positions must be on the Pilot/Master exchange Plan.

2.5 Pilot/PEC Holder/Tug Master Exchange

The Pilot and Tug Master should, as a minimum, discuss the following:

- That the SWL of the vessel's chocks, bollards, and strong points to be used in the operation and that they are fit for purpose.
- Method of communications.
- The tug hook up point, considering the prevailing weather & sea conditions.
- The planned (optimum) ship speed, when connecting to the tug.
- The maximum speed of the tug.
- Passage details in their entirety while accompanied by the tugs, 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.
- Intended and emergency use of ships anchors.
- Any further information deemed pertinent that has arisen from the Pilot/Master Exchange.
- If appropriate, any shallow water or tide effect areas where significant surges may be experienced, that might add to the tug's load.
- The Tug Master should advise the Pilot Immediately if there are any issues related to failures or impairment of function.

2.6 Towlines

Wherever possible a dedicated towline should be used for towing operations within the Port. Where it is intended to use a ship's line, both the Pilot and Master should confirm both the state and strength of the proposed line before it is used.

2.7 Preparations Aboard the Tug

Tug Masters are to ensure that all onboard pre-departure checks are completed before getting underway, all crew are fit and appropriately rested, adequately trained for the operation, and wearing the correct PPE.

Mooring and towing operations inflict immense loads upon ropes or wires, gear, and equipment. As a result, sudden failure in any part of the system may cause death or serious injury to personnel. During towing operations, Tug Masters shall employ a clear decks policy. Should the need arise for a crew member to go out onto the deck where there is no other alternative and/or for the sole purpose of the safety of the tug and its crew, then the tension on the line should be reduced to the absolute minimum for the duration of that activity.

Prior to commencing any towage operation within the Port, the Tug Master should check and then confirm verbally to the Pilot that they are in a fit state, to conduct the tow. Confirmation of ready to tow implies that:

- The crew are competent, trained, briefed on the operation being undertaken, understand their specific duties and are wearing the correct PPE. Personnel on exposed decks are to always wear appropriate personal protective equipment ("PPE"), including hazardous duty (working) lifejackets, in line with the tug operator's current

risk assessment. It is the Tug Master's responsibility to enforce the wearing and use of PPE[7].

- The vessel is in the correct watertight integrity state in accordance with company/vessel orders for the operation being undertaken.
- That all equipment to be used is in date, tested and fit for purpose for the proposed towage operation.
- That the tugs engines, propulsion systems and steering gear is functional, free of defects and configured in the state required to conduct the proposed operation.

That all towing hooks, emergency release systems and alarms have been tested, inspected for damage and are in fit state to conduct the proposed operation.

Watertight Integrity

The watertight integrity of a tug should be always maintained. When the tug is engaged on any towage operation, all watertight openings should be securely fastened. The tug crew should avoid working below the waterline at this time.

All watertight openings should be marked with a sign stating that they are to remain closed during towage operations. Any such openings used whilst moving about the tug during a towage operation should be re-secured immediately after use. The pilot / Master is to inform the tug if they observe any exterior openings on the tug that are not closed, and which may affect the tugs' watertight integrity.

If entry is required through a hatch or door during towage operations, the Tug Master must be informed, and the hatch or door closed immediately after use. Watertight doors are not to be left open, even if access is required for a short period of time.

2.8 Tug Selection

The correct tug selection is an important part of towage operations. In addition to bollard pull and physical size, the drive employed by the tug makes a significant impact on both manoeuvrability and utility. Whilst not all tug types may be available for use the below diagram highlights the potential operational envelopes for differing drive type.

Conventional tugs are fitted with a standard propulsion system. There are variances of these types of tugs being single or twin screw, with fixed nozzle and steerable rudder or

steerable nozzle and with fixed pitch or variable pitch propeller. Conventional tugs connected at the stern of the vessel being assisted will have to work in the traditional way. This requires a lot of skill and experience from the tug Master and is the most inherently dangerous towing method for such a tug, due to the high risk of being pulled over sideways, which is called "girting." Conventional tugs deliver the highest bollard pull in the forward direction and will mostly be used as a bow tug on a hawser. When connected at the stern of the vessel being assisted, they will effectively be working in the "conventional" mode, also referred to as "stern

[7] Code of Safe Working Practices for Merchant Seafarers, 2015 edition – Incorporating Amendment 3, October 2018, Para 30.6.1 – 6.4

to stern." The "towing point" will be moved further aft from the towing hook by using a Gob-line and a "stopper" block. The use of the Gob-line is especially important to avoid girting of the tug.

Azimuth Stern Drive (ASD) tugs are fitted with two (2) thrusters at the stern. The thrusters can be rotated independently through 360° (hence "azimuth") thus the propeller thrust can be directed in any direction. Azimuth thrusters can have either fixed pitch propellers or variable pitch propellers with the latter providing for reversing of the propeller thrust. Azimuth stern drive tugs are fitted with a harbour towing winch which is located on the foredeck and a towing staple which is fitted forward of the winch for assisting at the stern ("bow to stern") or at the bow ("bow to bow") and/or a stern winch for assisting "stern to bow" in the conventional mode. This type of propulsion system provides for high manoeuvrability particularly during transit sailing; however, it does have some limitations when combining thrust and direction resulting in a lower bollard pull.

Azimuth Tractor Drive tugs are fitted with two (2) azimuth thrusters at the bow (forward of midship) which have the same characteristics as the azimuth thrusters fitted on azimuth stern drive tugs. These tugs are fitted with a harbour towing winch which is located on the aft deck and a towing staple which is fitted aft of the winch. The stern and/or bow area is normally also heavily fendered, designed for push/pull operations.

Tug operators shall be responsible for drawing up, putting into operation, and monitoring an operation policy including safety standards covering all their vessels and operations within Peel Ports' SHAs. Such standards shall not be less than set out as follows in this document.

Nothing in these standards shall supersede any more stringent requirements imposed by local installations, including oil terminals. Tug operators shall provide, and crew shall be familiar with all such requirements.

Certification and Documentation

All Tugs must have the following certification, maintained in date: Employees Liability Certificate[8]

- Radio Licence Disc
- SUR 183 (Lifesaving appliances)
- Load line Certificate.
- Deviation Card
- Document of Compliance and Safety Management Certificate (ISM or equivalent)

[8] MCGA-Port_Marine_Guide_to_Good_Practice_NEW-links.pdf (publishing.service.gov.uk)

Publication or equivalent procedural manuals covering the following topics shall be maintained aboard for the use of the tug crew: -

- IMO – SOLAS Manual
- Company Marine Operations Manual
- Local Tide Tables
- Machinery operating instructions
- Spare Parts manuals
- Code of Safe Working practices for Merchant Seamen
- Marine Safety Notices
- Marine Guidance notes
- Approved stability book
- Chart Folio appropriate to local area.
- Nautical Almanac
- Local Notices to Mariners
- Admiralty Notices to Mariners Ship Captain Medical Guide Red Cross First Aid Manual
- Oil Record Book
- Equipment Manufacturers Manuals and operating instructions
- Merchant Ship Search and Rescue Manual
- Guidance notes for Safety Officials
- Local Towage Guidelines
- Tug use in Port.
- Company Contingency Plan Company Salvage Manual
- Collision Regulations
- Port byelaws.
- Port Pilotage Directions

Chapter 3

Communications

3.1 VHF Communication

Communication is a vital component of safe towage operations. It is essential that all parties involved in the operation can communicate promptly and effectively throughout the operation. VHF is the main means for conducting this communication and as such, should be tested and proved correct prior to the commencement of any towage operation.

Communications via VHF should be clear, concise, and unambiguous. On completion of the initial VHF communication check, transmissions should be kept to the absolute minimum to conduct the operation. All parties should continue to monitor both the working and secondary channels for the period of the operation to maintain an appreciation of the progress of the operation and in case of emergency.

VHF communications equipment should be fully charged and/or powered, tested regularly, and be fit for purpose.

3.2 VHF Channels

The Primary channel for towage operations and working tugs in VHF Channel 11.

The Secondary channel is VHF Channel 12, which is also the main Port Operation Channel.

As Great Yarmouth runs a Local Port Service (LPS) the Pilot is to communicate with Port Radio (VHF Channel 12) on commencement and completion of any towing operation.

Tug master's should maintain a listening watch on both the designated working channel and VHF Channel 12 throughout the operation.

3.3 Tug Control Instructions

It is important that any control instructions issued to tugs are clear, concise, specific, consistent, and easily understood. To avoid any confusion within the Port of Great Yarmouth Pilots will use the following power and directional orders as laid out below:

Required Power

10% - Minimum

25% -

50% -

75% -

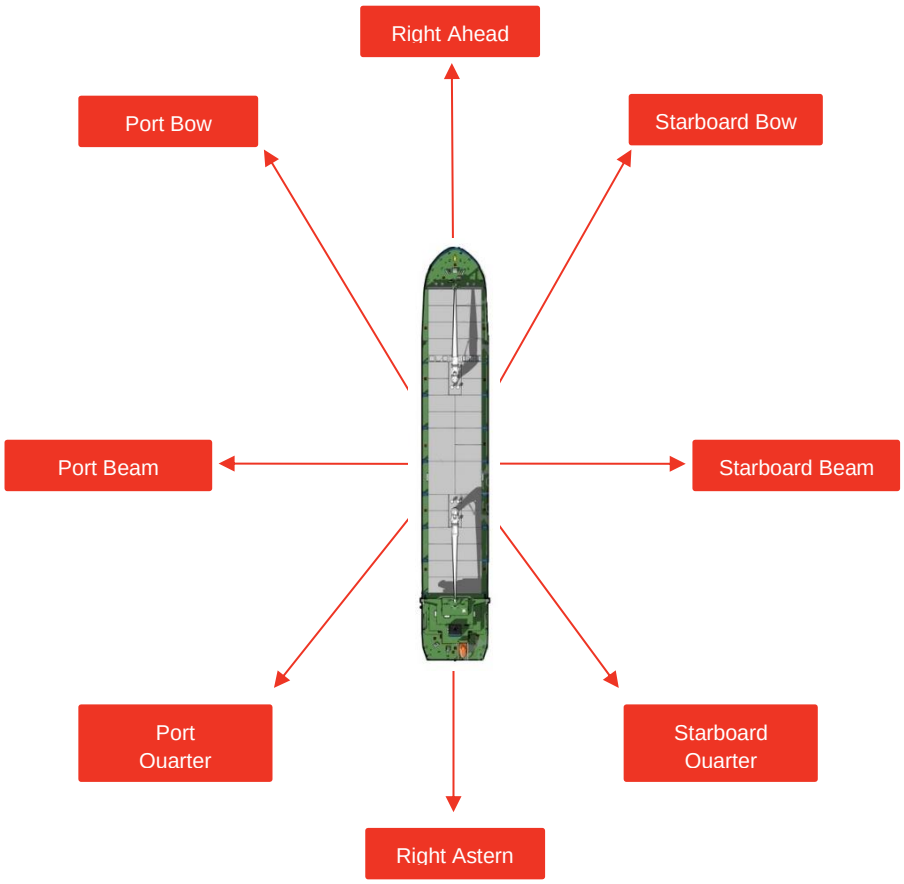
100% - Maximum

Other Terms

Easy – Minimum weight required to put tension into the tow.

No Weight – No weight or tension on the tow.

Lean On – Minimum power required to keep the tug in position against the hull/object.



CHAPTER 4

Preparing for Towage Operations

4.1 Connection and Disconnecting Towing Gear

Prior to commencing a towage operation, the Master, in consultation with the Pilot and Tug Master have predetermined which towing gear is suitable for the intended operation and instructed the crew accordingly.

When using heavy lines, care should be taken in passing them to and from the tug to ensure the tug crew are clear to reduce the risk of injury should the line slip. If heaving lines are used to transfer the main tug line, the crew should stand clear of the throwing target area to reduce the risk of being hit by the 'monkey's fist' or weighted bag. The use of dangerously weighted lines is not approved and should be reported to the Port Authority immediately.

When connecting lines, the tug crew should ensure that the towing gear is clear of obstructions and able to run freely. The paying out of the tow line should be done in a controlled, deliberate manner.

During disconnection care should be taken to ensure all tension and weight has been removed from the line, before towing gear is released. Gear should be returned in a controlled, deliberate manner. Specific attention should be paid to ensure the line is kept clear of the water to prevent fouling of the tug or tows rudders, propellers, superstructure or fendering. It should be always monitored to ensure it does not snag, catch, or tighten unexpectedly during the process.

4.2 Tow Quick Release

Emergency quick release mechanisms on towing winches and towing hooks should be tested both locally and remotely where fitted, prior to the towage operation. All methods of 'tripping' and 'run out' operation is to be tested. Under no circumstances is towing equipment to be connected to any winch or hook that has a suspect or damaged release mechanism.

4.3 Common Towage Hand Signals

Communication between the tug and mooring deck/position is important, and it is advisable to use standard hand gestures in addition to VHF radio communications. These are particularly useful in passing securing information and determining towline length. The following are standard hand signals in common use.

4.4 Girting (Girding)

Everyone involved in towage operations, be that Masters, Pilots or Tug master's must have a clear understanding of girting and its consequences. They should be able to recognise the conditions when girting may potentially occur, and aware of the speed at which an incident may occur. Whenever operating tugs, they should be vigilant to ensure such conditions do not arise.

Girting occurs when a towline is secured amidships off a tug and leads off the beam. Should the line come under tension, this will exert a heeling moment on the tug, and should the force of that moment be sufficiently powerful can overcome the tug's righting lever causing it to girt and potentially capsize. Due to the rapid nature of these incidents, it cannot be assumed that the winch will pay out or that the towline part prior to a capsize incident.

Conventional tugs are particularly vulnerable to girting, and due to their relative lack of manoeuvrability, it may be impossible to extract them from a problematic situation[9].

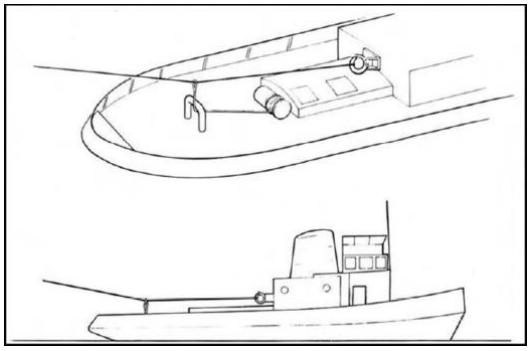
Common causes of girting are:

- The assisted vessel turns abruptly and without warning away from the tug.
- The speed of the vessel is too high.
- The tug is too far astern of its intended position, compared to the speed of the vessel.

4.5 Use of Gob (Gog) Rope

It is at the discretion of the Tug Master/Operator as to whether a Gob/Gog rope is used during an operation. Should it be used then it should be inspected prior to the operation, be in good order and fit for purpose. The use of a Gob/Gog rope is compulsory for conventional tugs.

Conventional tugs deliver the highest bollard pull in the forward direction and will mostly be used as a bow tug on a hawser. When connected at the stern of the vessel being assisted, they will effectively be working in the “conventional” mode, also referred to as “stern to stern”. The “towing point” will be moved further aft from the towing hook by using a Gob-line and a “stopper” block. The use of the Gob-line is especially important to avoid girting of the tug. Shown in below diagram.



4.6 Seafarer Safety

Once the towline has been connected, both on the tug and the tow, this should be communicated to the Master, Tug Master, and Pilot. Seafarers should then clear the area. Should it be necessary for a seafarer to remain on deck then they should stand in a safe area, clear of the line of recoil of the towing gear and their exposure time kept to an absolute minimum. The Pilot must be made aware of the requirement for seafarers to remain on deck prior to the operation commencing.

[9] https://www.westpandi.com/getattachment/ef5ba94b-c981-4ffb-8b26-f156522c2c68/the-risk-of-tugs-capsizing-due-to-girting.pdf

The tug, towing gear, associated tow equipment and exposed personnel must be continuously monitored for the duration of the operation and any changes in the circumstances or condition of these should be relayed to the Master and Pilot immediately.

4.7 Emergency Release

For the duration of the towing operation the crew should be aware of the requirement to release towing equipment in an emergency. They should be aware of the procedures and be able to do so safely and efficiently with little or no warning.

The emergency release mechanisms on winches and towing hooks should be tested both locally and where fitted remotely. Towing winch and towing hook release mechanisms are to be frequently tested for correct operation. All methods of "tripping" or "run out" are to be tested (Pneumatic, manual pull, lever or knock out etc). Consideration should be given to testing under load.

Release mechanisms are also to be tested at other times if a fault is suspected or an exceptional shock loading has been experienced.

Records of testing the emergency release mechanisms should be kept and made available to the Harbour Authority on request. Under no circumstances is towing equipment to be connected to any winch or hook that has a suspect release mechanism. Correct maintenance and operation are essential.

4.8 Safe Speed – Conventional Tugs

When making fast and letting go a conventional tug, speed and the orientation of the tug are critical factors. The Pilot is to ensure that speed is through the water **NOT** speed over the ground. It is accepted that 2 to 4 knots are appropriate for conventional tugs, but the pilot should check with the tug master on a case-by-case basis. The pilot needs to ensure the vessel's speed is steady and caution must be exercised when using the engines whilst the tugs are working. The stern 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.

In strong tidal conditions a high percentage of the tug's power may be utilised in maintaining position on the vessel before applying thrust to the vessel. If the tugs are made fast alongside, they are at their most effective with a minimal ship speed through the water.

4.9 – Safe Speed – ASD Tugs

The following ASD tug connecting speeds should be adhered to unless the circumstances of the case deem otherwise and only with the tug Master's consent.

- Bow tug - <5kts
- Side tug - <6kts
- Stern ASD tug - <7-8kts

It remains the responsibility of both the Master, Pilot and Tug Masters to ensure the operation is conducted at a safe speed for all participating vessels throughout the operation.

4.9 Interaction

Interaction is a powerful force, when vessels are operating near one another, this is especially true in towing operations. Pilots, master's, and Tug masters are reminded that the effect increase exponentially as a vessels speed increase, or the flow of water around the larger object increases. This is particularly important in the final moments before a tug comes alongside, and all concerned should be mindful that a tug may need to use a greater portion of its available power to maintain position when near the assisted vessel.

4.10 Tow Line Length

Tow line length should be carefully considered prior to commencing any towage operation. The benefits of opting for a long or short towline should be weighed against their hazards, against all parts of the transit. It is possible that tow line length may need to be adjusted, along with tug positioning during each stage of the transit through the harbour. If adjustments are required then, where these are to be done should also be planned to minimise delay but also maximise the safety of all concerned.

When towing on a line a tug master determines the length based on his insight and experience. The towline length when towing on a line depends on factors such as type and length of tug, size, and deck height of the ship to be assisted, environmental conditions and available manoeuvring space for the tug. Ship's speed is also important.

Where tow line length is short, Pilots, master's and Tug master's should pay particular attention to vessel speed, due to the reduction in available time available for the Tug master to react to changes in course and speed of the assisted vessel.

Again, safety is paramount and tug masters should carefully consider the towline length for a forward tug assisting a ship under speed. When using a short towline, the distance between the forward tug and ship's bow is very small. Consequently, the time available for a tug master to react is limited. The tug master should constantly and closely observe course and speed changes. Pilots must ensure that they are careful with engine and rudder movements and keep the tug master well informed about intended manoeuvres.

4.11 Static and Dynamic forces in short and long tow lines.

A tug sometimes must work with a steep towline angle, for instance when a ship must enter a dry dock. Up to a vertical towline angle of 40 degrees the influence on the force in the towline is not so large. However, when the vertical towline angle further increases, the force in the towline increases very rapidly. At a vertical towline angle of 60 degrees the force is already twice the exerted towing force of the tug. A vertical towline angle of 45 – 50 degrees for tugs secured at the ship's side is not too large but when towing on a line it is a large angle, although it does happen. In this case the static force in the towline is already 1,5 times as high as the towing force of the tug.

There is not always a direct relationship between the forces in a towline and the towing force exerted by the tug. Tugs operating in the indirect towing method, particularly at high speeds as is the case with escort tugs, experience very high towline loads mainly due to the high lift forces generated by the tug's underwater body and skeg, if fitted. However, the main factors for the maximum static forces in the towline during normal harbour operations are the tug's bollard pull and the towline angle.

In addition to static forces, dynamic forces can occur in a towline and can reach high values. They are generated by sudden accelerations of the tug, wrong tug manoeuvres, waves, swell, and so on, creating shock loads in the towline. Horizontal tug accelerations can be kept under control by careful manoeuvring, but this is not the case with vertical accelerations due to waves and swell. It is obvious that these vertical accelerations, which can even be created by waves of passing ships, have a large effect on the forces in a towline, especially in the case of short and steep towlines. The longer a towline and the higher the elasticity, the better dynamic forces can be absorbed and the lower the peak values of the towline loads will be. That is why much attention must be paid to strength and elasticity of a towline especially when tugs must work in wave and/or swell conditions with short towlines.

Assuming again a vertical towing angle of 45 – 50 degrees , towline forces certainly reach higher values than the previously mentioned 1.5 times bollard pull, due to the dynamic forces generated. How large the dynamic forces are will depend, amongst other things, on length, type, and/or composition of the towline. But towline forces more than two times the bollard pull of the tug are not uncommon, particularly when towlines with little stretch, such as steel wire and the modern fibre towlines, are used. When the brake holding power of the towing winch is less than this value the brake of the winch may slip. This is, of course, only when the minimum breaking strength of the towline is sufficient to cope with the dynamic forces.

It is also worth noting that a short towline means the ship and tug are closer together and this will impact on interaction between both vessels and subsequently impacting tug safety and effectiveness of the towing operation.

4.12 Escort Towage

Passive Escorting, whereby a tug shadows the progress of a ship during the transit, is undertaken at Master's / Pilot's discretion.

Escorting as a regular operation is becoming common within the port towage industry. This type of operation is carried out in the 'passive' and 'active' modes: passive when running free in close attendance, and active when fast to the tow. If active escort is being undertaken the form of towage can be 'direct' or 'indirect', depending on the speed of the tow. When made fast, all those involved should be aware that increased loads can be applied to towing gear, especially when operating in the indirect mode.

As with all towage within the port of Great Yarmouth, towage is arranged through Ship Agents.

CHAPTER 5

Restricted visibility

5.1 Restricted Visibility During an Operation

Should visibility reduce to a level that it becomes restricted during a towage operation the Pilot, in consultation with the Master and Tug master will discuss the situation and agree a course of action to ensure the safety of all persons and vessels involved, given the location of the tow, and the prevailing environmental and vessel traffic conditions.

The Pilot will immediately inform Great Yarmouth Radio of the circumstances and the decisions made. They will then keep them updated of any further operational developments as well as any improvement or degradation of the visibility.

Some potential courses of action are:

- Let go the forward tug, or any other assisting tug and take the vessel to anchor.
- Use the tugs to turn the vessel, let go the tugs and the vessel proceeds outside the Port Limits.
- Let go the forward tug, or any assisting tug and have the tug assist in a pushing mode.
- Allow the tug to manoeuvre the vessel under the Pilot/master's instructions. This may include using the tug to maintain the vessels position at a safe location in the Port.

Depending on location and traffic, the safest course of action may

The Tug Master should immediately inform the Pilot and Master and Port Control of any concerns he may have as to the safety of his tug and crew. If necessary, the operation should be aborted as soon as it is safe to do so.

5.2 Restricted Visibility Exists or is Expected

Should restricted visibility exist or is expected to exist, the planned towage operation will be cancelled. The operation will be rescheduled for the first suitable period when visibility has improved, sufficiently to conduct the tow safely for the duration of the proposed operation.

Each SHA is to promulgate its procedures and limitations for the conduct of operations within their area in restricted visibility, where restricted visibility is forecast or where visibility falls unexpectedly during an operation.

The minimum visibility for any towage operations is 400metres or the assisted vessels length if greater and in all cases the Master/Pilot/Tig Master can see other vessels bridge.

These procedures should outline the Pilot/Master/Tug Master Exchange as part of the passage planning and associated risk assessment process. The process should include

consideration of the dangers associated with towing in restricted visibility and the control measures appropriate. These considerations should include:

- Type of tug, propulsion method, towing from winch or hook and location of winch/hook.
- Proposed method of towing.
- Operational status of navigational aids and equipment.
- Minimum speed to maintain steerage of vessel to be assisted.
- Movement of other vessels in area.
- Navigational characteristics of the area of the port including the use of information from LPS.
- Contingency plan should visibility deteriorate after the tow has commenced and/or if the tug must disengage at any stage of the operation.

The Port Authority retains the right to make a final decision on when visibility has improved sufficient for the operation to proceed.

Restricted Visibility During an Operation

Should visibility reduce to a level that it becomes restricted during a towage operation the Pilot, in consultation with the Master and Tug master will discuss the situation and agree a course of action to ensure the safety of all persons and vessels involved, given the location of the tow, and the prevailing environmental and vessel traffic conditions. The Pilot will immediately inform LPS of the circumstances and the decisions made. They will then keep them updated of any further operational developments as well as any improvement or degradation of the visibility.

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- Let go the forward tug, or any other assisting tug and take the vessel to anchor.
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- Allow the tug to manoeuvre the vessel under the Pilot/Masters instructions. This may include using the tug to maintain the vessels position at a safe location in the Port.

Depending on location and traffic, the safest course of action should be taken. The Tug Master should immediately inform the Pilot and Master and Port Control of any concerns he may have as to the safety of his tug and crew. If necessary, the operation should be aborted as soon as it is safe to do so.

The Port Authority retains the right to make a final decision on when visibility has improved sufficient for the operation to proceed.

CHAPTER 6

Further guidance and advice

6.1 Towing matrix

Further guidance and advice for the conduct of towing operations within the Port of Great Yarmouth can be obtained from the Harbour Office and Pilots.

6.2 Tug & Tow notification process

6.3 Critical Tug positions

6.4 Further Guidance and links

Further information on towage can be found at:

General:

http://eurotugowners.com/guidelines-for-safe-harbour-towage-operations/

Tug Use in Port – NEW 4th edition 2021 (Henk Hensen) - Marine-Pilots.com

http://www.workboatassociation.org/news/nwa-towage-good-practice-guide--published-december-2016/

Girting:

http://www.westpandi.com/globalassets/loss-prevention/loss-prevention-bulletins/west-of-england-pandi---the-risk-of-tugs-capsizing-due-to-girting.pdf

https://www.gov.uk/maib-reports/girting-and-capsize-of-tug-flying-phantom-while-towing-bulk-carrier-red-jasmine-on-river-clyde-scotland-resulting-in-1-person-injured-and-loss-of-3-lives

Girting and capsize of tug Biter with the loss of two lives while assisting passenger vessel Hebridean Princess - GOV.UK

Towage Matrix

	Vessel LOA (m)	Tugs & Bollard Pull	Comments
River Port (Head in)	95>	1 x > 10 Tonnes	Vessels with high lift Rudder and bow thrust would not normally require a Tug.
River Port (Stern first) Above berth 9	85>	2 x > 10 Tonnes	Vessels with high lift Rudder and bow thrust would not normally require a Tug
River Port (stern first) up to berth 9	85>	1 x > 10 Tonnes	Vessels with high lift Rudder and bow thrust would not normally require a Tug

Outer Harbour	>100-140	1 x >15 Tonnes	Vessels with high lift Rudder and bow thrust would not normally require a Tug
	>140-170	2 x >20 Tonnes	Vessels with high lift Rudder and Bow thruster after assessment may be exempt from this requirement.
	>170-200	2 x > 30 Tonnes	Vessels with high lift Rudder and Bow thruster after assessment may be exempt from this requirement.
	>200+	1 x 40 & 1 x 60 T	Vessels with high lift Rudder and Bow thruster after assessment may be exempt from this requirement.

Notwithstanding these guidelines, circumstances may arise that dictate a departure from these guidelines. A Pilot may require more tugs than the Operational Rules and Guidelines suggest, which may be the result of particular tidal, weather or traffic concerns. Equally, Pilots may use their discretion to alter the Guidelines if circumstances permit. In the rare case of disagreement, the Statutory Harbour Authority will be the arbiter.

Additional Notes:

1KW = 1.35BHP

BHP ÷ 100 = BP (Bollard Pull) Conventional type Tugs.

BHP ÷ 85 = BP (") Nozzle type Tugs.

Towage Notification Process

ALL TOWAGE OPERATIONS (except ship assist harbour towage) IN GREAT YARMOUTH PORT REQUIRE APPROVAL OF THE HARBOUR OFFICE PRIOR TO THE TOW COMMENCING WITHIN OR BEFORE ENTERING THE PORT

INSTRUCTIONS

1. Applicant(s) require to ensure Towage Notification (TN) form is FULLY completed. The form requires documented support is provided including a calculation of the minimum bollard pull for the proposed Towage Operation plus Method Statement and Risk Assessment.
2. The TN form must be signed by the Responsible Person (or representative/agent) and submitted to greatyarmouthharbouroffice@peelports.com for approval
3. Deadline for receipt of TN form:
   a. For non-Pilot barge/dead ship moves: the form must be submitted by 12:00 on the preceding working day, Monday to Friday, and by 12:00 on Fridays for weekend moves up to 12:00 on the Monday, or Tuesday if there is a Bank Holiday Monday.
   b. For moves requiring Pilot support: the form must be submitted 48 hours in advance of the move Monday to Friday, and by 16:00 on Thursdays for weekend moves up to 12:00 on the Monday, or Tuesday if there is a Bank Holiday Monday.
4. Port Authority will review the proposed towage and revert to the Applicant advising decision
5. The Tow is NOT approved until the TN form has been signed by all parties.
6. Pilotage requirements are detailed in General Port and Pilotage Information, Towage Guidelines and Pilotage Directions

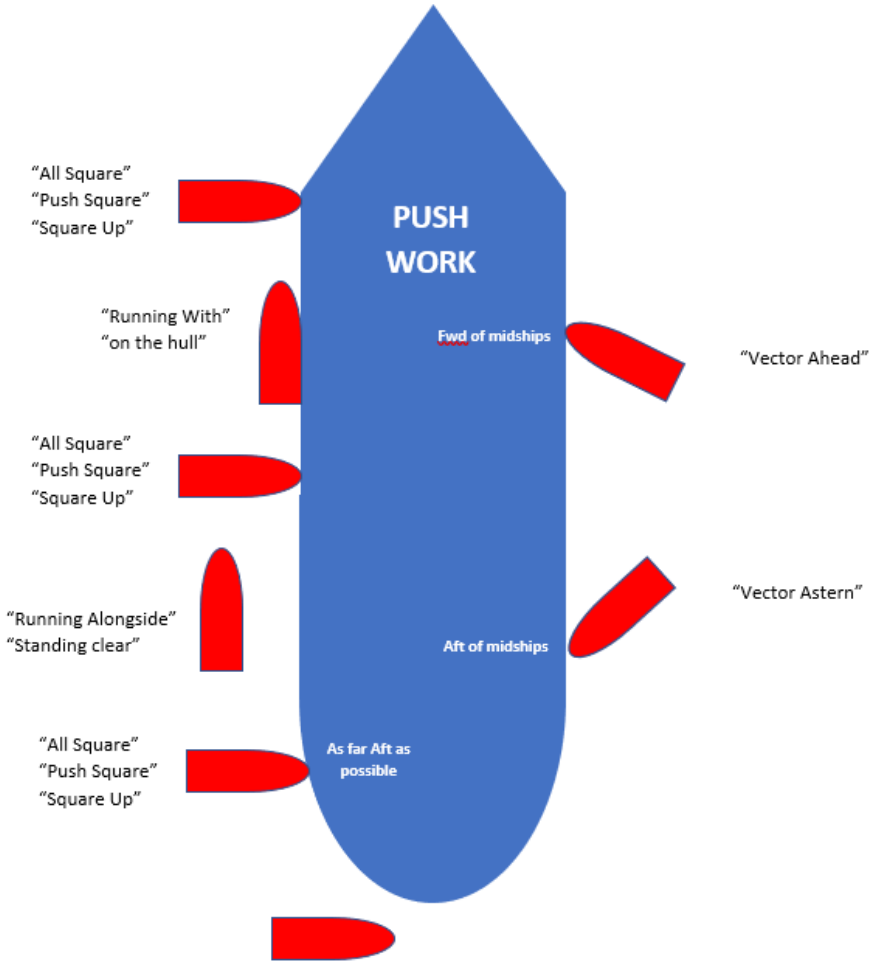
NOTE:

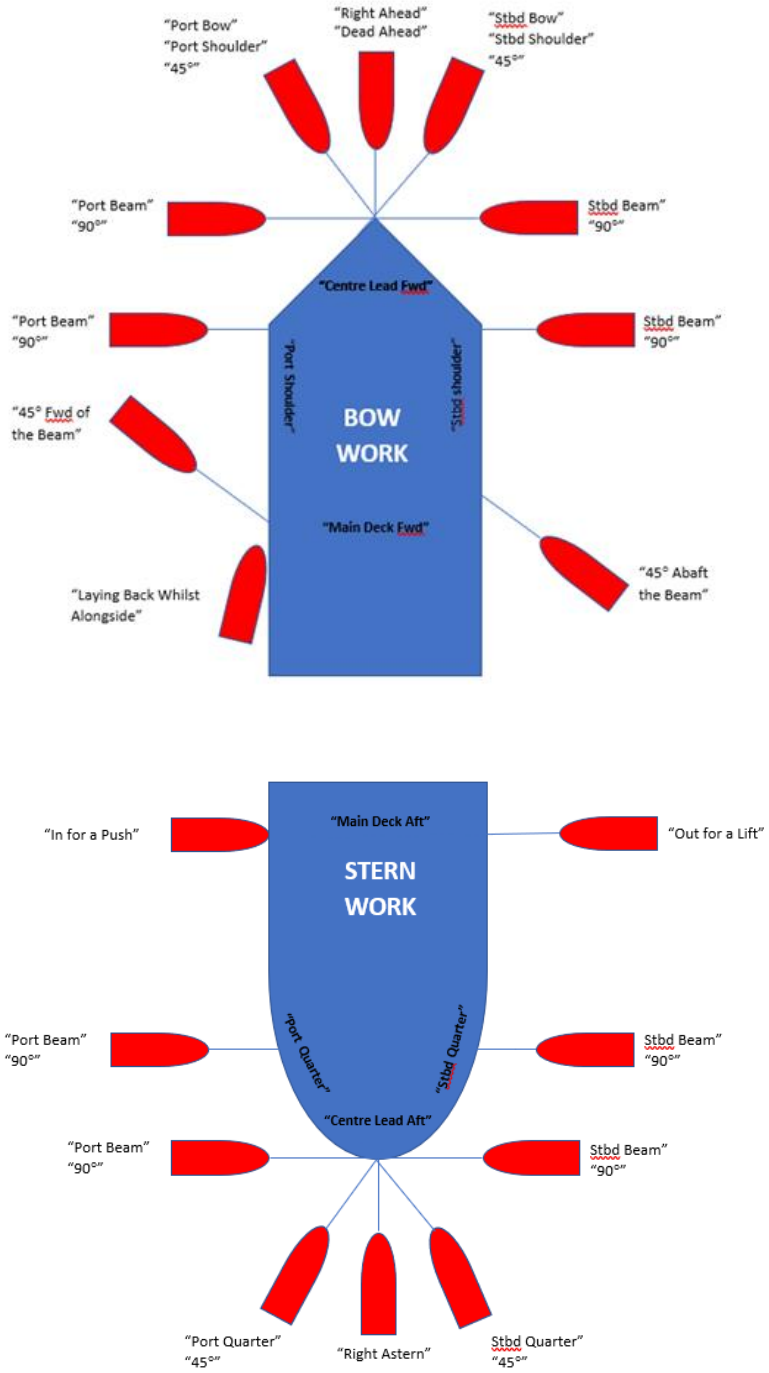
THIS NOTIFICATION MUST BE COMPLETED IN FULL BEFORE SUBMISSION.

THE TOW WILL NOT BE APPROVED UNTIL THIS FORM HAS BEEN COMPLETED IN FULL AND HAS BEEN SUBMITTED FOR CONSIDERATION.

Link to Towage Notification Form;

Critical Tug Positions




"Port Bow"
"Port Shoulder"
"45°"
"Right Ahead"
"Dead Ahead"
"Stbd Bow"
"Stbd Shoulder"
"45°"
"Port Beam"
"90°"
Stbd Beam"
"90°"
"Centre Lead Fwd"
"Port Beam"
"90°"
Stbd Beam"
"90°"
"Port Shoulder"
"Stbd shoulder"
"45° Fwd of the Beam"
BOW WORK
"Main Deck Fwd"
"45° Abaft the Beam"
"Laying Back Whilst Alongside"
"In for a Push"
"Main Deck Aft"
"Out for a Lift"
STERN WORK
"Port Beam"
"90°"
"Port Quarter"
"Stbd Quarter"
Stbd Beam"
"90°"
"Centre Lead Aft"
"Port Beam"
"90°"
Stbd Beam"
"90°"
"Port Quarter"
"45°"
"Right Astern"
Stbd Quarter"
"45°"