Historic England

Maritime and Naval Buildings

Listing Selection Guide

Summary

Historic England's twenty listing selection guides help to define which historic buildings are likely to meet the relevant tests for national designation and be included on the National Heritage List for England. Listing has been in place since 1947 and operates under the Planning (Listed Buildings and Conservation Areas) Act 1990. If a building is felt to meet the necessary standards, it is added to the List. This decision is taken by the Government's Department for Digital, Culture, Media and Sport (DCMS). These selection guides were originally produced by English Heritage in 2011: slightly revised versions are now being published by its successor body, Historic England.

The DCMS' *Principles of Selection for Listing Buildings* set out the over-arching criteria of special architectural or historic interest required for listing and the guides provide more detail of relevant considerations for determining such interest for particular building types. See https://www.gov.uk/government/publications/principles-of-selection-for-listing-buildings.

Each guide falls into two halves. The first defines the types of structures included in it, before going on to give a brisk overview of their characteristics and how these developed through time, with notice of the main architects and representative examples of buildings. The second half of the guide sets out the particular tests in terms of its architectural or historic interest a building has to meet if it is to be listed. A select bibliography gives suggestions for further reading.

England has the longest coastline in relation to its land mass in Europe: nowhere is very far from the sea. Its island status has been a highly significant factor in the defence of the nation, and the country's Merchant and Royal Navies were key to the development of the British Empire. This selection guide covers buildings and structures on land that are associated with the sea, in particular infrastructure developed to serve, regulate and protect ship-borne trade and other vessels which exploited marine resources (principally via fishing). They are found in docks and dockyards, including those of the Royal Navy; shipbuilding and maintenance yards; harbours; and around the coast and in estuaries where customs houses, Coastguard stations, lighthouses and lifeboat stations all attest to the country's seagoing heritage.

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Front cover
No. 3 Slip Cover, Chatham Dockyard, Kent (listed Grade I).
Built in 1838 to give cover to timber warships under repair.

Contents

Introduction

England has the longest coastline in relation to its land mass in Europe: nowhere is very far from the sea. Its island status has been a highly significant factor in the defence of the nation. The country's Merchant and Royal Navies were key to the development of the British Empire from the sixteenth century onwards. Historically, its fishing industry provided a significant proportion of the nation's food. Coastal trade and transport was especially important during the long period when road communications remained poorly developed. Just how important shipping was for the economy in the nineteenth century is evidenced by the fact that by the early nineteenth century Royal Navy Dockyards were by far the largest industrial complexes in the country, if not the world; that mid-nineteenth century British ports handled over 25 per cent of total world trade; and that in1890 Britain owned half of the world's tonnage of merchant ships. Our maritime heritage is thus of great importance. It is becoming of ever-greater topical interest as climate change and other factors such as the development of new port facilities and the redundancy of historic port infrastructure focus attention on coastal and marine management, and the impact of such changes on heritage assets. English Heritage's Rapid Coastal Zone Assessments have systematically added to our knowledge of coastal sites through identification and characterisation.

This selection guide covers buildings and structures on land that are associated with the sea, in particular infrastructure developed to serve, regulate and protect ship-borne trade and other vessels which exploited marine resources (principally via fishing). There is some crossover with other categories and selection guides: canals are dealt with in Infrastructure: Transport; warehouses fall under Industrial Buildings; seaside pleasure buildings such as piers are discussed in Culture and Entertainment Buildings. For military structures along the coast built for defence against attack or invasion see the selection guide on Military Structures

Guidance on historic vessels is provided in the Ships and Boats: Prehistory to Present selection guide. Historic ships may be included in the National Register of Historic Vessels administered by National Historic Ships, and generally are not covered by listing. Historic wreck sites are separately designated, either through designation under the Protection of Wrecks Act (1973) for wrecked vessels, or exceptionally through scheduling which includes land-based remains and those lying out to sea to a twelve-mile limit. Military wreck sites (and all military aircraft) may be designated as military maritime graves.

1 Historical Summary

1.1 Trade and transport

Docks and harbours

These range from very small harbours of refuge to very large installations designed to service international trade. The earliest surviving structures to facilitate mooring and protect boats against the elements are quays and breakwaters: some survive from before about 1700 but will have been substantially renewed or enlarged; some early structures are known to survive within later enlargements, as is the case with the pier at Penzance harbour. Dry docks for the maintenance of vessels existed in the medieval period although these survive only archaeologically. The first wet docks – where lock gates enclosed and maintained artificial expanses of water – were constructed for repairs by the East India Company at Blackwall, London, in 1614. Major complexes for the fitting-out and securing

Figure 1
Lansallos, Polperro, Cornwall. The harbour walls, quays and piers (listed Grade II) were built incrementally between the late seventeenth and late nineteenth centuries, with massive stone walls founded on wooden piles.

Figure 2
Seaham Harbour, County Durham (listed Grade II). Built about 1828-35 by William Chapman with revisions by John Rennie and Thomas Telford, the walls are of large blocks of Penshaw sandstone up to 2.5m in length.

of vessels within an artificial dock date from the end of the seventeenth century (that is, the Howland Great Wet Dock at Rotherhithe, London Borough of Southwark, of 1697-99), while the first successful commercial docks to facilitate loading were constructed at Liverpool from 1715. There was a rapid expansion of docks from the 1770s facilitated by key developments in construction and engineering such as those pioneered by John Smeaton (1724-92) and John Rennie (1761-1821) including the use of hydraulic cement which sets underwater, and inverted brick arches used to form dock floors to resist pressure from upwelling mud, or Samuel Bentham's development of about 1800 of caisson gates and then free-floating caissons – hollow structures that are filled with water to sink them into position to create a seal and are then pumped out to float them out of the way. In 1775 the only commercial docks, enclosing under 6 hectares of water, were in Liverpool, but by 1830 England's commercial dockyards were pre-eminent among the home nations, with some 150 hectares, around 40 per cent of which was in London. By 1830, Liverpool was rivalling London as the leading port in terms of tonnage handled, but even after further dock building by 1841, over half of tonnage nationally was dealt with without using docks, often employing boats known as lighters to ferry goods between ships anchored in deep water and the quayside. The Industrial Revolution led to the creation of some entirely new Channel ports such as Seaham in Co. Durham (1828, to handle coal; Fig 2), Charlestown in Cornwall (1801, to handle china clay), and Goole in the East Riding of Yorkshire (1826, a transhipment port between inland traffic on the Aire and Calder Navigation and seagoing vessels on the Humber).

The prosperity of individual ports frequently varied as a result of outside influences. London and the channel ports generally prospered in

Figure 3
Many places which lie on navigable waterways were ports or places of transhipment, and this is reflected – among other things – in their building stock. Wisbech (Cambridgeshire), on the River Nene, flourished as a port in the eighteenth century. Here, merchants' houses line the North Brink; warehouses stand a little lower on the river.

times of peace in continental Europe; conversely, trade switched to west coast ports during the Napoleonic wars. Trading across the Atlantic and the development of the slave trade saw Liverpool and Bristol prosper in the eighteenth century; the ending of the slave trade in the early nineteenth century perhaps hit Bristol harder than Liverpool, despite the latter's greater involvement. London benefited more than other ports from the granting of charters and trade monopolies by the Crown, cornering around 90 per cent of the nation's overseas trade in the seventeenth century, although it should be remembered that because of the difficulties of overland transport other coastal ports transhipped much of this trade to and from London. Companies holding monopolies such as the East India Company continued to be a great influence through the eighteenth century. By the nineteenth century it was Britain's expanding empire that was a major driver in the expansion of ports, especially London.

The ever-expanding volume of trade in the nineteenth century (increasing fourfold in the 70 years after 1840) was made possible by increases in the numbers and sizes of vessels. The British merchant fleet numbered over 18,000 ships in 1803 (average110 tons). By 1863 there were over 26,000 merchant sailing ships (average 180 tons) with 850 steamships (mainly paddle steamers, average 110 tons). This led to a major expansion of port facilities including alterations to allow for larger ships and the different shape of steamship hulls compared to those of sailing vessels, as well as new developments in warehousing and goods handling; the rise of the iron vessel from around 1820 onwards had a major effect on places of shipbuilding too (see below). Consequently a degree of alteration is invariably to be expected in dockyard infrastructure. From the mid-nineteenth century, investment by the railway companies became increasingly significant and this led to greater integration of facilities for both goods and passengers in the age of the ocean liner.

Figure 4
Warehouse D in Liverpool's Albert Dock (listed Grade I). An iron-framed building by J Hartley of 1841-5, standing five storeys high.

Roll-on, roll-off car ferries, the first coming into full operation at Dover in 1953 (after experimentation elsewhere from 1946) were developed from the landing craft of the Second World War; facilities for handling this increasingly important market are a major element of many ports. Still later, in the 1960s, the development of container ports introduced new types of dock environments – cranes and tarmac. Their success meant earlier harbours and dock facilities often fell into decline or closed altogether. English hovercraft services began in 1968 from a terminal at Dover, and ceased in 2000. The terminal was assessed for listing in 2009 but was deemed to lack sufficient special interest.

Warehousing

The history and selection criteria for warehouses may be found in the Industrial Buildings selection guide but several additional points specific to ports are provided here.

Pre-industrial warehousing was often provided within or to the rear of merchants' houses and may not be adjacent to the waterfront; undercrofts too were sometimes constructed as part of medieval houses for storage purposes (for instance, Winchelsea, East Sussex). Examples of attached, subterranean and free-standing medieval warehouses associated with mercantile trade can all be found in the Hanseatic port of King's Lynn, Norfolk. When identified, such warehousing can be of great historical interest by showing the early commercial development of the port. Warehouses in the dock area tended to be set back from the quayside so goods had to be moved twice, from ship to quay, then quay to warehouse, sometimes via transit warehouses to aid sorting. The nineteenth century saw rapid development towards fully integrated docks, especially in London and Liverpool (Fig 4). St Katharine Dock, London (1828-9; Thomas Telford, engineer, and Philip Hardwick, architect) enabled large numbers of ships to be unloaded at the same time with direct and very swift transfer

between the ships and the warehouses, which were built right up to the waterfront. Shipping companies' offices, such as those built in 1893 for the former American Line in Canute Road, Southampton (listed Grade II), were often built to impress. Perimeter walls secured docks against theft, while bonded warehouses (in existence for tobacco by the early eighteenth century; extended to other commodities by the 1803 Warehousing Act) enabled goods to be stored safely and free of customs duty. The dock's security perimeter thus acted as a customs wall too. Jesse Hartley's Liverpool dock wall of the 1830s to 1850s (sections listed Grade II) with castellated entrance piers and lodges is a supreme example.

Integration reached its peak in the second half of the nineteenth century when goods were moved from ship to rail either direct or, towards the end of the century, via single-storey transit sheds that lack extensive warehousing, to be transported to smaller warehouses and markets spread across the country. Cargo handling became increasingly mechanised and specialised from the late nineteenth century. Suction was used to unload grain from 1904; and overhead rail systems and conveyors were developed from the 1920s for goods such as animal carcasses, coal and bananas. Specialised oil facilities were also developed, often with oil tankers discharging their cargoes at jetties extending out into deep water rather than using docks. Important early concrete storage tanks for edible oils dating from 1916 are to be found at Erith, in the London Borough of Bexley. Another specialist loading feature, associated with the north-east coal industry, is the coal staithe, a projecting jetty from which wagons tipped coal directly into ships' holds: these are now extremely rare survivors. Container freight has increasingly replaced crated cargo, which has had an inevitable effect on older crane and warehouse-based arrangements in ports.

Cranes and hydraulic power systems

Those pre-dating the late nineteenth century are rare. Wharf-side cranes were wooden, sometimes strengthened with iron tension framing, and powered by treadmill; iron and later steel cranes were introduced from the 1840s.

Overhead traveller cranes were developed in the eighteenth century and were in wide use by the mid-nineteenth century in civil dock workshops where heavy materials such as boiler and engine parts needed to be moved about. However, goods in ships were typically placed in containers small enough to be manhandled and there was little use of cranes until powered cranes were developed from the 1840s onwards. These were typically jib cranes (that is, cranes with a movable arm) rather than the beam cranes more commonly found in engineering works. Cranes were either steam or hydraulically powered, and a number of specialist crane manufactures were established by the 1860s; the Bath firm of Stothert and Pitt exported cranes around the globe. Hydraulic cranes, patented by Armstrong of Newcastle upon Tyne

Figure 5
A Fairburn steam crane of 1875 (listed Grade II*) at Wapping Wharf on Bristol's Floating Harbour. By Stothert and Pitt and manufactured in 1875, a rectangular shell encloses engine, boiler and winding gear.

in 1847, were of particular significance for ports, many of which developed centralised hydraulic systems powering dock gates, swing bridges and conveyor belts, as well as cranes. The earliest hydraulically powered docks were developed in the 1850s. The first electric dockside cranes in England were installed at Southampton in 1893, a portent of the widespread shift away from steam power then under way. Fourteen cranes of varying dates from the 1920s to the 1960s are listed at the Royal Victoria Dock (London Borough of Newham).

Buildings of transit

Normally, passengers did not require specialised handling facilities until the late nineteenth century when the size of ships increased to such an extent that they needed deeper water. By around 1900, passenger liners were in excess of 10,000 tons and might carry nearly 3,000 passengers. Southampton, with its double high water at each tide and easy access from London, became the principal port of the Cunard line, and challenged Liverpool for its position as the premier Atlantic port. Passenger liners continued to expand in size through the early twentieth century with increasing numbers of American tourists making up for the falling numbers of European emigrants, with services only declining following the first transatlantic jet airliner flights from 1957. With the increasing importance of immigration from within the Commonwealth to more recent history, passenger termini such as the imposing Baggage Hall for the Port of London Authority at Tilbury (designed by Sir Edwin Cooper and opened in 1930; listed Grade II*) have an extra significance beyond that of their architectural appearance alone: it was here that immigrants from the Caribbean landed from the SS *Windrush* in 1948, an event that has come to symbolise the start of the most recent chapter in the story of the Afro-Caribbean community in Britain. Other phases of migration have left their mark on the built fabric of ports and harbours, such as the former emigrant waiting room at Paragon Railway Station, Hull of 1871 (listed Grade II) which is strongly linked to Jewish emigration from eastern Europe in the nineteenth century.

1.2 Control and rescue

Customs

The control of seafaring activities and the collection of customs dues have left hardly any physical remains prior to the seventeenth century. The Navigation Acts (not generally repealed until the mid nineteenth century) sought to protect national commerce and (after 1651) required imports to be carried by English owned ships or ships owned by the nation of origin of the cargo. Much of the regulation was enforced at sea by naval ships or, from the late eighteenth century, by ships operated by the Customs Service, but a number of building types emerged where business was conducted on land. Most striking is the customs house, at which Revenue Officers collected customs duties, impounded illegal goods and combated smuggling. These were mainly situated in the principal ports and had wide jurisdiction; their outward forms reflected the importance of customs dues to government revenue, and the importance attached to the regulation of trade by mercantile communities themselves. Some lesser ports and havens were sometimes provided with simple customs posts. Earlier customs houses are architecturally imposing (Exeter, Devon, 1680, Fig 6; King's Lynn, Norfolk,1683: both listed Grade I) but those built in the nineteenth century are normally more modest, not least because the growth of free trade led to the abandonment of many customs duties. From the eighteenth century onwards, administration at certain ports and harbours by commissioners or trustees, often employing officials such as harbour masters, led to the erection of purpose built administrative offices for the supervision of harbour activities and the collection of harbour dues. Sir Robert Smirke's Grade I listed Custom House in the City of London (remodelling of an earlier building, 1825-27) is of outstanding note both for its national role as the principal customs house in the country, for its pioneering cast iron construction and concrete foundations, and for its notable neo-classical elevations and grand interior. The former Custom House in Barrow-in-Furness, Cumbria, of about 1870 (listed Grade II) is more representative of the imposing civic statements that these buildings could assume.

Figure 6
Custom House, Exeter (listed Grade I), built in 1680-1 to cater for the expansion of Exeter's port facilities which followed the growth of the wool trade after the end of the Civil Wars. It is the earliest purpose-built custom house in England.

Smuggling was widespread well into the nineteenth century. Between 1710 and 1745 it is estimated that only a quarter of the tea drunk nationally was legally imported. But the activity has left few upstanding remains. While smuggling was mainly combated via interception at sea, some lookouts and coastguard posts were established at points around the coast, mainly from the late eighteenth century. Overall its built testaments are few and far between.

Coastguard

The Coastguard was established in the 1820s to combat smuggling and provide a watch around the coast, but developed a role in life-saving too. While the Coastguard operated some long boats, for inspection as well as rescue purposes, it was mainly issued with shore-based life-saving apparatus and rockets (the 'Manby Mortar') that could carry ropes to ships beached just off the coast. From 1831 the Coastguard formed a reserve for the Royal Navy until the 1925 Coastguard Act prioritised the service as a de-militarised coast watch and a life-saving communication organisation. The most numerous Coastguard-related structures are cottages, which were specially built throughout the nineteenth century, often as terraces with a view of the coast; often designed in a distinctive Admiralty house style, they included larger houses for commanding officers, and related rocket and longboat houses. After the First World War the number of coastguards began to be reduced, and from the 1930s the increased use of radio lessened the need for fully-manned stations leading to some being decommissioned or converted to residential or other uses.

Lifeboat services

These were provided on a voluntary basis. Liverpool is thought to have been the first place to provide a dedicated lifeboat, and the earliest purpose-built vessel was the 1790 *Original* at South Shields, Tyne and Wear. Some structures relating to independent organisations survive (and are listed in their own right), such as the South Shields and Tynemouth and Volunteer Life Brigade Houses of 1867 and 1886 respectively.

The National Institution for the Preservation of Life from Shipwreck was founded with royal patronage in 1824; the name changed to Royal National Lifeboat Institution (RNLI) in 1854 and continued to take over lifeboat services from a number of local humane and shipwreck institutions nationally. Always reliant on donations and volunteers, purpose-built lifeboat stations were slow to appear and were frequently quite simple structures; they have often undergone modernisation or even wholesale replacement, but some examples remain such as the Grade II listed Watch Tower Studio at Looe, Cornwall, of about 1860. In general, purpose-built stations of the mid-nineteenth century are therefore early and of interest.

Many of the surviving lifeboat houses, or stations, date from the last decades of the nineteenth century. These are key buildings of coastal and seafaring communities, usually endowed with considerable historic interest and communal value. Some are also architecturally proud compositions, built with funds raised through public subscription and materials like granite to instill confidence in the communities they served. Sometimes noted architects were involved, such as George Devey at Dover Harbour, Kent (1866; listed Grade II), resulting in imaginative compositions. However, many lifeboat stations are architecturally fairly modest, comprising

Figure 7
The lifeboat house and slipway, Weston Super Mare, Somerset (listed Grade II). Dated 1902, the stone lifeboat house has a slipway, presumably modified over the years, with concrete columns and girder bracing. This is included in the listing.

a wide-gabled structure with some decorative treatment, built to house the lifeboat and work accommodation for the crew. Features to look for are the employment of local materials, the wide opening on the seaward side for launching the craft, a slipway, lookout towers or bay windows to facilitate a watch on the sea, and inscribed foundation stones.

Sometimes , as modern stations were built to house bigger lifeboats, the predecessor lifeboat houses have been converted to other uses; if the exterior remains intact this would not necessarily preclude listing. In other cases, successive stations may also be of interest, such as in Hythe, Kent, where the 1934 corrugated iron-clad building is listed in addition to the brick station of 1893.

The treacherous conditions of lifeboat rescues have resulted in significant loss of life, and communities have historically commemorated the heroism of local crew in monuments on the sea front. These memorials, which sometimes use boat imagery, are rich with historic interest and would normally be listed; proximity to a lifeboat station could strengthen the case for group value. Additionally, the lifeboat station itself may become a memorial, as in the case of the Grade II listed Mary Stanford station in Rye, East Sussex, built in 1882 of a shingle-based concrete and latterly named after the boat launched from here in 1928 which sank with the loss of 17 crew.

Welfare buildings

Buildings devoted to the welfare of seamen also warrant consideration. These range from institutes and reading rooms (as at Southwold, Suffolk, dating from 1864; listed Grade II) to larger philanthropic institutions intended to serve the transitory populations of ships' crews, and to afford secure, affordable and morally reliable accommodation while on shore leave or following rescue from shipwreck; one example is the former Sunderland Missions to Seamen, adapted from the former Exchange of 1814. The Seamen's Hospital at Whitby, North Yorkshire (listed Grade II; founded in 1670, present buildings by G G Scott of 1842), is one of a select group of maritime almshouses. Some places of worship, such as the Swedish Seamen's Church in Liverpool of 1883-4 by W D Caröe (listed Grade II*), have specific connections with maritime activity, and are testaments to the international character of England's major ports and their prominent role in the story of European migration.

1.3 Aids to navigation

From the earliest times, mariners have made reference to features ashore, both natural and man-made, as aids to navigation. Amongst the earliest bespoke structures are those that support a light to mark the position of a hazard at night. An exceptional survivor is the Roman lighthouse or *pharos* at Dover, Kent, which is both listed and scheduled. It owes its survival to its use as a church tower in the Middle Ages and there are medieval records suggesting that church towers in coastal locations were adapted to show lights visible from offshore. Most surviving aids to navigation are sixteenth century and later, and the range of such structures is enormous, extending from the simple metal post surmounted by a triangle marking a reef close to a harbour mouth to the soaring lighthouse towers of the great engineers of the late eighteenth and nineteenth centuries.

Seamarks

These may be divided into three broad groups: buoys, beacons and leading marks. Buoys, being floating devices simply tethered to the seabed, are not listable. Beacons are relatively simple structures of wood, metal, brick or stone designed to mark a hazard or, when erected in pairs, to provide a transit by which a vessel may fix its position, examples of the latter use being shown on sixteenth-century charts of the south coast and the approaches to King's Lynn, Norfolk. Leading marks are similar to beacons, but are specifically designed to indicate, when aligned, the direction of a safe passage between hazards. Usually they are erected at different elevations and are distinctively marked. Some consist of no more than a wooden post or metal pole bearing a top mark and/

Figure 8
The daymark at St Levan, Porthgwarra, Cornwall (listed Grade II). This was erected in 1821 to mark an alignment with the Runnel Stone Reef.

or a light, while others may be substantial structures very similar to lighthouses (Fig 8).

Lighthouses

Before the early nineteenth century, responsibility for ensuring the safety of mariners was shouldered by quasi-ecclesiastical or charitable bodies such as the various Trinity Houses (of which Deptford, Kingston-upon-Hull and Newcastle upon Tyne are the best known). However, with a few exceptions, the construction of purpose-built lighthouses, from the late seventeenth century, was undertaken by private individuals such as Sir John Clayton who built primitive lighthouse towers on the Farne Islands (Northumberland; a conversion of about 1674 of a former chapel), Flamborough Head (Yorkshire East Riding, 1674; listed Grade II*) and elsewhere and who sought to meet his costs and make a profit by charging dues from passing shipping. The first lighthouse to be built to mark an offshore hazard was Henry Winstanley's Eddystone lighthouse of 1696, the first of four to be erected on that reef to the south of Plymouth. Although not a commercial success, the value of such structures in saving life and protecting commerce was immediately apparent. The following two-and-half centuries saw the construction of numerous lighthouses around the shores of mainland Britain and on many offshore reefs. An Act of Parliament in 1836 abolished the private ownership of lighthouses and vested control throughout England and Wales in the hands of Trinity House.

Most lighthouse towers were built of stone. The great figures of the 'heroic' age of lighthouse building (from the mid-eighteenth century down to the end of the nineteenth) were innovators in the field of construction. John Smeaton (1724-92) experimented with the use of hydraulic cement

in the construction of his tower on the Eddystone reef, where he also developed the system of dovetail jointing for the stonework. Other materials were also employed in some cases, including brick and cast iron and (after 1853) concrete. In the twentieth century reinforced concrete was employed in the construction of the new lighthouse built at Dungeness, Kent (to the east of the Old Lighthouse), in 1959-60 (Ronald Ward and Partners, Grade II*).

Early towers burned coal in an open brazier and a variety of oil lamps were used throughout the eighteenth century. Kerosene became standard after 1845. The use of gas was rare. The lighthouse at Souter Point (1871: listed Grade II*), north of Sunderland, was the first to use electricity from the outset. Reflectors are first documented at Liverpool in 1767 and a combination of reflection and refraction via lenses and prisms became normal following the breakthrough in optics pioneered by Augustin Fresnel. Revolving lights appeared first in France in the 1790s. In many cases, these arrangements have in turn been replaced by modern optics. In recent years, there has been an increasing use of electricity generated by solar power. Lighthouses are frequently served by small complexes of housing built by Trinity House to accommodate keepers and their families: many examples were built in a distinctive stucco-fronted Tudorbethan style, typified by the 1838 quarters built in Niton to serve the Grade II listed lighthouse on St Catherine's Point on the Isle of Wight.

1.4 Shipbuilding and maintenance

Civil shipbuilding and maintenance yards were widespread around the coast until the mid-nineteenth century, with the Thames and East Anglia being the leading areas of activity in the

Figure 9
The Old Lighthouse, Lydd, Kent. When this lighthouse was built in 1904 the previous lighthouse, built in 1792 to a design by Samuel Wyatt, was lowered to two storeys and converted to additional lighthouse keepers' accommodation alongside the two pavilion-like dwellings erected in the early nineteenth century. Lighthouse and all dwellings are listed Grade II.

Figure 10
Chatham Dockyard, Kent: the former storehouse and rigging store of 1793-6 (listed Grade I), part of the largest warehouse range in Britain and one of the most significant examples of industrial warehousing in Europe.

early seventeenth century. Yards were rarely sited within harbours, being squeezed out by competition for space: instead they normally developed on the margins of ports, spreading to nearby beaches, waterfronts, riverside or canalside sites. For shipbuilding purposes, slipways were normally cheaper than dry docks to construct and maintain. Slipways launched ships either bow- or stern-first or (especially with yards on canals or on narrow rivers) broadside on. A yard would normally have at least two slips to allow for continuity in workflow and for timber frames to season before being planked. Slipways were built of timber long after stone was being used for dry docks, and stone was probably adopted only at the time of the switch to metal shipbuilding. Some early and small-scale settlements, such as Buckler's Hard in Hampshire, were laid out around the all-important slipway, with shipbuilders' housing flanking the place of construction.

Much shipbuilding and maintenance shifted to the north-east during the eighteenth century, the trend accelerating in the early nineteenth century when it came to be concentrated on the rivers Tyne and Wear. Complex, industrial-scale, shipbuilding yards developed, especially as iron was slowly adopted in ship construction. Initially iron was used to replace structural timbers. Then, in 1843, Brunel's SS *Great Britain* showed that iron could be used on a much more extensive scale. The Thames shipbuilding industry played a key role in the development of steam-powered and iron ships (such as the Royal Navy's first ironclad, HMS *Warrior*, 1859), but it was not until the 1870s

that shipbuilding had largely switched from timber to iron. New shipbuilding yards opened on more extensive sites with space for engineering workshops and better access to raw materials. This switch - from wood to iron and from south to north - forms a distinct watershed in the commercial shipbuilding industry. Some southern yards survived for repair and maintenance, but few could compete with the well-capitalised and skilled yards on the Tyne, Wear, and on the Clyde, in Scotland.

Royal Navy Dockyards

Although the commercial shipbuilding industry maintained overall economic dominance nationally, individual civilian yards were dwarfed by the Royal Navy Dockyards, especially in the eighteenth and early nineteenth century. In 1804, the Royal Dockyards employed a third of Britain's 5,100 shipwrights, mainly at Chatham (Kent; Fig 10), Portsmouth (Hampshire; Figs 11-12) and Devonport (Plymouth, Devon) at a time when the very biggest civilian yard employed only 119 shipwrights; these three dockyards in particular constitute outstanding survivals. The Royal Dockyards were largely self-contained, forming complex integrated manufacturing units that were by far the largest industrial establishments in Europe until at least the mid-nineteenth century. The dockyards were designed as both shipbuilding and maintenance facilities to keep as much of the navy available for active service as possible (see cover photograph). The Royal Dockyards constructed the navy's largest warships until the advent of the ironclad from 1859 when commercial yards played an increasingly major role. Naval dockyards led the way in the development of shipbuilding facilities, with the construction of a wide range of specialised buildings and structures; they were also witnesses to important developments in manufacturing production, such as Sir Marc Brunel's pioneering Grade I listed block mill of 1803-7 at Portsmouth, generally regarded as the world's first factory in the modern sense of the word: a place of powered, mechanised, mass production. For none of the Great Powers of continental Europe was the strategic benefit weighted so heavily toward naval as opposed to military strength as it was in Britain. The close

Figure 11
Number 6 Boathouse, Portsmouth Dockyard. A slipway to the front drops into the mast pond. Boathouse and slipway listed Grade II*.

Figure 12
Number 6 Boathouse, Portsmouth Dockyard, interior. Built in 1845 to a design by Capt R S Beatson, RE, the building has an iron frame; boats could be lifted internally to the upper floors. Listed Grade II.

working relationship between the Royal Yards and civilian manufacturers and engineers – reflected in the layout and engineering of the steam factories developed at Portsmouth and Devonport from the 1830s – underpinned Britain's lead in so many aspects of industrial technology and the effectiveness of the British battle fleet as a deterrent. Highly innovative early iron roofs built over covered slips at Woolwich (Royal Borough of Greenwich), Sheerness and Chatham (both north Kent) from the 1840s are further reminders of the technological importance of the Royal Dockyards.

1.5 Fishing and whaling

Fishing

Generally, small-scale sea fishing was practised from beaches, inlets and local harbours, typically with the catch processed without the need for elaborate specialised buildings. Larger-scale commercial fishing operations were constrained by unhelpful government measures such as the high duty on salt that restricted fish curing. Where fishing prospered, specialised buildings developed. Examples include Cornish pilchard fishing, (exploiting large summer catches) which required look-out posts to locate shoals, and fish cellars where fish was cured by salting and then pressed to extract the oil (for use in oil lamps) before being packed for export, mainly to Spain and Italy (Fig 13). Another example is the herring industry, which from the late eighteenth century was increasingly dominated by the east coast fisheries which exploited the regular migration of large herring shoals that moved southwards from Northumberland in mid summer to East Anglia by early autumn. The east

Figure 13
Fish cellars, perhaps early eighteenth century, at Maker-with-Rame, Caradon, Cornwall (listed Grade II). Standing on the foreshore overlooking Plymouth Sound, these buildings associated with the pilchard industry are built of red volcanic stone rubble. This was excavated from in front of them to form a slipway and pool.

coast herring yards had open fronted utilitarian sheds where fish were gutted, cured with salt and packed into wooden barrels – mainly for export to northern Europe. Herring, a staple for the poor, was later smoked either whole (as bloaters) or split (as kippers); it is believed that the world's first kipper was produced accidentally in Seahouses (Northumberland) in 1843, and consequentially many herring sheds were converted to smokehouses in the years which followed. Purpose-built, industrial-scale smoke houses were developed in the late nineteenth and early twentieth centuries in ports such as Grimsby (Lincolnshire) and Hull (East Riding of Yorkshire). That said, the trade in both pilchards and herring declined in the later nineteenth and earlier twentieth century due to a variety of factors including over-fishing, changes in the migration patterns of fish, alterations to the public diet, and the closure of the Soviet market for herring.

In the second half of the nineteenth century increasing industrialisation and large-scale investment in both port facilities and fishing vessels, particularly by railway companies, changed the face of the industry. Investment by railway companies was concentrated at a handful of ports such as Fleetwood (Lancashire), Grimsby and Hull and this encouraged the expansion of deep sea trawling for cod and other white fish, especially after the introduction of the steam trawler in the 1880s. The success of these fishing ports rested on the development of wholesale markets linked by rail to the rest of the country, with rail transporting 1,514 tons of Grimsby fish in 1856, increasing to 44,376 tons in 1877. From the last quarter of the nineteenth century to the First World War there was continued growth in the fishing industry supported by the expansion of the market for fish both at home (such as the rise of the fish and chip shop from the 1870s) and abroad. Underpinning change in the industry was the development of refrigeration, used commercially from the 1850s, then on a massive scale after the invention of the ammonia compression machine in 1876, which paved the way for the frozen food industry established by Clarence Birdseye in the early 1920s.

Whaling

The first English whaling expedition is believed to have been in 1610 to Spitsbergen, Norway. This prompted a rapid development in the trade by the London-based Muscovy Company and whalers from other ports such as Hull. However, the whale carcasses were mainly processed at whaling stations established close to the hunting grounds rather than at English ports. This trade declined from the mid-seventeenth century in the face of competition from the Dutch. From the mid-eighteenth century a system of Government bounties (grants) encouraged a new English industry with hunting off Greenland from many ports, especially London, Whitby and Hull. Whale rendering plants were established at both Sea Mills Dock, downstream from Bristol on the Avon, and at Rotherhithe on the Thames. The trade was particularly active in the first quarter of the nineteenth century until coal gas started to be used for lighting in preference to train oil produced from whale blubber.

English whaling continued through the nineteenth century although by this time the international trade was dominated by the Americans. The slow decline of the English whaling trade supported the growth of the deep sea fishing industry by supplying well-seasoned sailors used to working in harsh polar seas, although there was a renewal of activity in the late nineteenth and early twentieth centuries using steam powered vessels and the harpoon gun, introduced by the Norwegians in the 1860s.

2 Specific Considerations

Because the development of many maritime complexes is inter-connected with the Industrial Revolution, the special considerations relating to industrial buildings apply, and reference should be made to the Industrial Buildings selection guide, where these are presented in detail. (These concern the importance of setting and of integrated sites; the relationship of industrial process to architectural form; the significance of machinery and technological innovation; and the importance of recognising significant change, in the sense that later alteration can sometimes add to the interest of a structure, rather than invariably detract from it.) In addition, because many specialised maritime buildings (such as navigational aids) are subject to exceptionally high levels of weathering, or are modest and vernacular in character (for instance, fishermen's huts), it is important to establish the authenticity of fabric: extensive or total replacement of fabric can be an issue inhibiting designation. Historical associations can be significant, but need to be reflected in built form: the connection between buildings and ephemeral activities such as smuggling, for instance, need to be securely documented.

Individual buildings must be assessed on their own merits. However, it is important to consider the wider context and where a building forms part of a functional group with one or more listed (or listable) structures this is likely to add to its own interest. Key considerations are the relative dates of the structures, and the degree to which they were functionally inter-dependent when in their original uses.

2.1 Trade and transport

Docks and harbour walls

Those pre-dating 1850 generally form the most impressive engineering structures of their date. Even where they have received alteration, as nearly all have, most will merit serious consideration for designation, with those displaying an early date, technical innovation or association with major developments in shipbuilding and trade possibly warranting a high grade. Consideration should also be given to associated structures such as warehousing, dock offices and boundary walls. Road and jetty surfaces, where part of the intrinsic structure, should be noted too, as should steps, bollards and the facings of basins and piers.

Because of the greater survival of dock and port facilities from the mid-nineteenth century onwards, and because of more standardised techniques and materials, greater selection should be exercised for examples of that date. The selection criteria are again similar to those for industrial buildings. These include

buildings that were innovative in design; are well preserved; or display alterations that illustrate the technology of accommodating larger ships. Where several original or near contemporary associated structures survive together or where a group of structures displays the evolution of port facilities in one significant place, then the case for designation will be all the stronger. Even where the dock itself is not well preserved, auxiliary structures such as lifting or swing bridges, locks and loading facilities (including cranes) may merit designation in their own right for technological interest, and for their eloquence as testaments to the harbour's historical development. The case for designation will be strengthened where structures attracted favourable comment in the technical journals of the day and in subsequent critical literature.

Slipways

Wood was widely used for these until in the late nineteenth century, but surviving examples even of this late date are believed to be rare. Slipways used for building purposes are normally distinguished by having a centre line of keel blocks, and more rarely post settings for scaffolding. Slips with rails are known as patent slips. These were developed for ship maintenance with the rails guiding a wheeled support cradle, allowing boats to be winched out of the water for hull repairs without the need for a dry dock. Examples, even without a surviving cradle, may merit consideration, currently listed examples (all at Grade II) including Nelson Dock, Bermondsey (London Borough of Southwark); Underfall Yard, Bristol; and that at Ramsgate (Kent).

Dock company warehouses

These were often built to a high standard, with money invested in architectural design and quality materials to attract business. These are impressive and most are already protected, for instance Albert Dock, Liverpool (1842-7, by Jesse Hartley; listed Grade I), the outstanding classical buildings of which form a major element of the World Heritage Site. In contrast, warehouses owned by companies for their own stock were normally designed to cut costs to the bone unless they were used as salerooms as well; more utilitarian warehouses may be of special interest where they are substantially intact (retaining features such as hoists), display technological innovation (such as fireproofing) or form part of a well-preserved ensemble such as those along the banks of the River Lune at Lancaster.

Cranes

Large examples embody cargo handling and especially shipbuilding, and are frequently valued as iconic structures in the same way as mining pithead wheels. As with other loading facilities they were often designed for a relatively short lifespan and have been subject to modernisation and replacement. All survivors from before about 1850 will be rare and significant. Some, such as treadmill-powered cranes, are of international importance. Pre-First World War cranes that retain their association with listed docks or other structures and any surviving hydraulic or steam powered cranes that have not been converted to other power sources are very rare and may merit listing at high grade. Although electric-powered cranes became the commonest form in the twentieth century, early examples pre-dating the First World War are now rare and may merit protection as will remains of hydraulic power systems at docks. Later cranes can also possess special interest on grounds of rarity, group value or because of their importance as witnesses to a lost age of labour-intensive cargo handling before the era of containerisation.

2.2 Control and rescue

Custom houses

These and other buildings connected with the administration of ports that pre-date the repeal of the Navigation Acts in 1849 will always be of note and will often possess a high order of architectural and historic interest, warranting listing in a higher grade.

Many buildings in this category are modest and sometimes easily overlooked. Physical evidence of the illegal side of the maritime economy is

rare: buildings with firmly documented smuggling connections where there are surviving features, such as hides, may be of sufficient historic interest to be listed and could tip the balance in otherwise marginal cases. Eighteenth- or early nineteenth-century lookouts and coastguard posts will normally merit designation for historic interest where there is solid evidence to support the connection, even where they are little more than simple huts. Complete terraces of Coastguard cottages may be eligible where they are not too altered, and retain their distinctive character. Similar considerations apply for Coastguard stations, lookout towers, visual signalling posts, rocket stores and other equipment sheds, and mortuaries for washed-up bodies like the Grade II examples at Saltburn (Redcar and Cleveland) and Cullercoats (Tyne and Wear).

Lifeboat stations

These are among the most evocative reminders of charitable and altruistic activity and any surviving nineteenth-century examples should be considered, their historical significance outweighing their often utilitarian design. All are likely to have been modernised to some extent: changes to accommodate larger boats or new launch mechanisms will not necessarily make a station unlistable. As fundraising was such a key factor with the lifeboat service, nineteenth-century collecting boxes may also merit designation. Defused sea mines, adapted as collecting boxes by the Shipwrecked Mariners' Society after 1951, are more numerous but may sometimes warrant careful consideration especially where they have a close relationship with designated maritime or seaside structures such as piers and promenades.

2.3 Aids to navigation

Seamarks and lighthouses

The growth of maritime commerce in the sixteenth and seventeenth centuries provided the initial stimulus for setting up navigational aids, but the widespread provision of seamarks and lighthouses in turn greatly facilitated the expansion of trade as a concomitant of the Industrial Revolution: their national importance in this context should be recognised, as should their architectural and technical interest. Some lighthouses and many seamarks functioned as part of a group and should be considered together; so too should lighthouse keepers' accommodation. Nineteenth and twentieth century lighthouses in particular will often have the architectural prominence, material quality and historic interest to merit listing. Grading should be carefully considered where one or more of these factors is particularly strong.

The exposed situations occupied by some of the smaller features such as beacons and leading marks together with their often relatively insubstantial nature has led, over the years, to a need for constant repair and replacement. Some have needed to be moved from time to time owing to the movement of the sandbanks they marked. Consequently, few early examples survive but those that do are worthy of consideration. Special care is necessary to confirm authenticity.

2.4 Shipbuilding and maintenance

The Royal Navy Dockyards

These have been the subject of intensive reviews for purposes of designation and it is not possible here to provide detailed guidance for listing; some key structures have also been scheduled. Certain specialised buildings present in the Royal Navy Yards – for instance, slipways, dry docks, mould and sail lofts, mast ponds, saw mills, rope works, forges, smithies, lead mills and paint works as well as various workshops for producing all the items used on ships together with a wide range of storage facilities – may survive elsewhere, albeit rarely, in commercial contexts where survival tends to be fragmentary at best. Given their general historical importance as part of the nation's maritime heritage, some allowance should be made for the fact that no commercial docks will compare with the better-preserved Royal Navy Dockyard; individual buildings within the commercial sector need to be assessed in the

context of the survival rate within the commercial sector. Where they are encountered, they may therefore be good candidates for designation. By the mid-twentieth century shipyard buildings tended to be standardised steel framed structures, as used throughout manufacturing industry, and are unlikely to be of special interest.

2.5 Fishing and whaling

Very few fishing-related buildings (other than markets) pre-date the eighteenth century. Prior to the nineteenth century, local conditions determined their shape and scale. Many smoke houses of varying design survive around the coast. Well-preserved early examples – the chronology of local fishing industries differs markedly – may merit designation. The same is true of net and tackle stores; a group of 39 at Hastings (East Sussex) is listed at Grade II*.

New forms of structure developed with long-haul industrial-scale fishing towards the end of the nineteenth century: ice-making plants after 1876, larger scale smokehouses such as those developed from the 1890s in Grimsby and Hull, and coaling stations serving steam-powered vessels and sailing boats with steam-powered capstans used for hauling nets. The First World War seriously disrupted the industry and forms a distinct watershed: after this time the scale of fishing activity fluctuated but did not result in any significant innovations in terms of building type.

Structural relics of the whaling industry in England are rare, despite the fact it was economically important to several ports. Most whales were processed at whaling stations overseas with the oil, bone and other products being shipped back as trade goods. By-products of the English whaling trade include the hundreds of whale jawbones erected as arches, especially in the nineteenth century. By the mid 1990s only around 80 were thought to still be standing. Consequently all surviving examples will be candidates for listing.

2.6 Miscellaneous maritime items

As well as the whalebones mentioned above, miscellaneous items such as figureheads and other maritime relics may occasionally warrant consideration for designation. For instance, there are a considerable number of commemorative maritime monuments such the Memorial to the Heroes of the Marine Engine Room of 1916 on the Liverpool Pier Head by the eminent sculptor William Goscombe John (listed Grade II*). The loss of so many men at sea made commemoration on land all the more desirable. More detailed coverage is provided by the Commemorative Structures selection guide.

As mentioned at the outset, ships are not normally designated by Historic England through listing. Some historic wrecks have, in the past, been scheduled, and reforms are currently under way to consider future approaches to known marine sites. Some vessels have been adapted for use as dwellings or fishermen's stores, as on Holy Island, Northumberland. In other instances, ships' timbers have been re-used in buildings. In those exceptional cases where this can be documented, this will strengthen the case for listing the building on the grounds of maritime interest. One striking example of this is the Grade II* listed Chesapeake Mill, Wickham, Hampshire, erected in 1820 using timbers from the USS *Chesapeake*, the loser in a notable naval engagement with HMS *Shannon* in 1813 and subsequently broken up.

2.7 Historical associations

National connections with trade and empire; huge changes in transport; the decline of fishing fleets; the decline of passenger traffic; the modernisation of sea-borne cargo – these are just some of the reasons why maritime structures are of particular resonance. When assessing them for designation, due account should be taken of their significance – in both national and community terms. They are some of the most international of structures as well, and may possess meaning to a very wide

audience. Nevertheless, considerations such as authenticity of fabric need to be borne in mind, and a distinction drawn between national and local levels of significance.

2.8 Alterations

Harbours and docks, as intensively used complexes sometimes subject to major alteration brought about by changes in ships and cargo handling, have often undergone significant change. Due account should be taken of such alterations, while being realistic about the special interest of what remains. Earlier fabric can sometimes survive within or beneath later structures; that can add an element of archaeological importance to the site both for its intrinsic structural interest and because large amounts of contemporary rubbish were sometimes dumped to reclaim land being won from the sea. Repair and replacement is inevitable, so allowance should be made for the impact of this on earlier fabric.

2.9 Extent of listing

Amendment to the Planning (Listed Buildings and Conservation Areas) Act 1990 provides two potential ways to be more precise about what is listed.

The empowerments, found in section 1 (5A) (a) and (b) of the 1990 Act, allow the List entry to say definitively whether attached or curtilage structures are protected; and/or to exclude from the listing specified objects fixed to the building, features or parts of the structure. These changes do not apply retrospectively, but New listings and substantial amendments from 2013 will provide this clarification when appropriate.

Clarification on the extent of listing for older lists may be obtained through the Local Planning Authority or through the Historic England's Enhanced Advisory Service, see www.HistoricEngland.org.uk/EAS.

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