



PDHonline Course D151 (15 PDH)

**Brooklyn Navy Yard: Cradle of the
Navy**

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2021

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Part 1

Overview

Widely Known

3

4



"The chief naval depot of the United States is widely known as the Brooklyn Navy Yard; but few have any adequate idea of its importance or the many objects of interest to be seen there. It is one of the most delightful as well as instructive spots in the vicinity of New York..."

Scientific American, August 9, 1879
 Caption: "Brooklyn Navy Yard, ca. 1898"

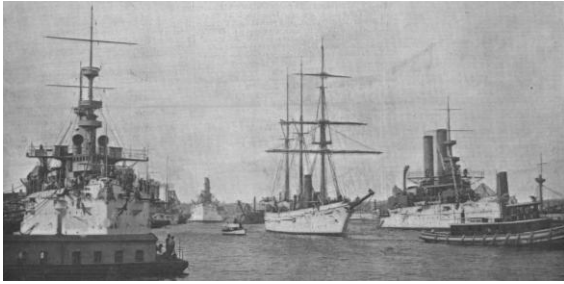
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"...Its huge workshops, its great dry dock, built at a cost of over \$2,000,000, and the enormous amount of machinery and material attract attention; while the ships lying at the wharves repairing, or anchored off the yard in commission, and the enormous guns on the ordnance wharf, give one an idea of the means by which Fort Fisher, New Orleans, and Mobile were taken..."

Scientific American, August 9, 1879

RE: on the eve of WWII, the *Brooklyn Navy Yard* contained more than five miles of paved streets, four dry docks (ranging in length from 326- to 700-feet), two steel shipways and six pontoons and cylindrical floats (for salvage work), barracks for marines, a power plant, a large radio station, a railroad spur as well as foundries, machine shops and warehouses. In 1938, the yard employed about 10K men.

6



Caption: "It is not often that the photographer is able to include within the field of his camera such a notable and representative group of our ships as is shown in the front page engraving of this issue. The view was taken at the Brooklyn Navy Yard at the time when the North Atlantic squadron was completing its last refit before setting out for southern waters. All the ships had just received their new coat of white paint, and it must be confessed that their peace-time color is infinitely more picturesque than the dull, leaden gray under which they are carrying out the grim duties of war." (*Scientific American*, May 14, 1898)

7

Worth a Visit

8



"...The museum in the building in which the Commandant's office is situated contains curiosities from every part of the world where our vessels have cruised and our flag has floated, with historical relics of the Navy, and of itself is well worth a visit."

Caption: "Commandant's Office, Brooklyn Navy Yard, N.Y." (ca. 1910)

9



Above: closed in 1966 and dormant for decades, the 300-acre, 200 year-old Brooklyn Navy Yard has renewed life as an industrial park with sustainable design and construction as its operating principle. One of the premier projects was the "Brooklyn Navy Yard Center at Building 92," the adaptive reuse of and addition to the 1857 Marine Commandant's house, now housing a museum, leasable space for non-profit organizations and public amenities.

10



BLDG 92, the Brooklyn Navy Yard Center is a LEED, adaptively reused 1857 building

11



Above: at present, Building 92 is home to the visitor center, museum and employment center for the Brooklyn Navy Yard and it's the starting point for all Brooklyn Navy Yard tours. Housed inside the 1857 Marine Commandant's residence, the "Past, Present, and Future" exhibit spans three floors that explores the history and contemporary development of the Navy Yard. Admission to the museum is free and a host of public programs are offered to the public.

12



Step into the museum and the 22,500 pound anchor of the USS *Arizona* makes a grand statement 13



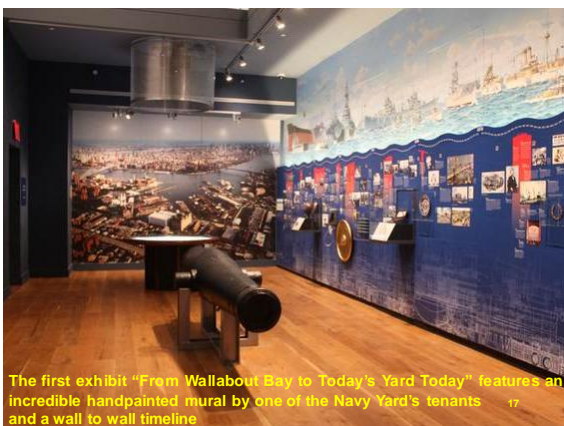
Artifacts from ships adorn the entrance 14



The Age of Wood and Steel 15



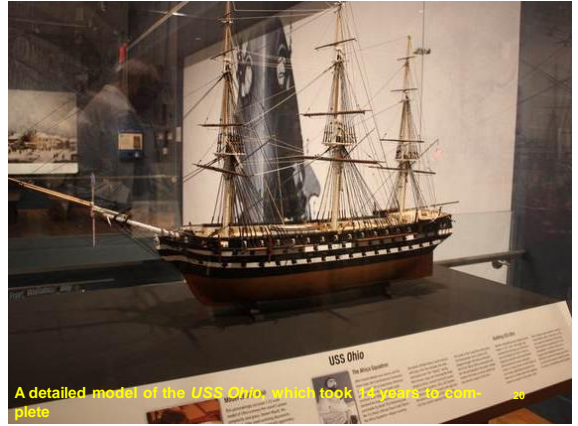
A piece of the USS *Arizona* rescued from Pearl Harbor 16



The first exhibit "From Wallabout Bay to Today's Yard Today" features an incredible handpainted mural by one of the Navy Yard's tenants and a wall to wall timeline 17



18



A detailed model of the USS Ohio, which took 14 years to complete



"The Age of Iron and Steam" room features a model of the USS Monitor with a cross section view of the cabins below



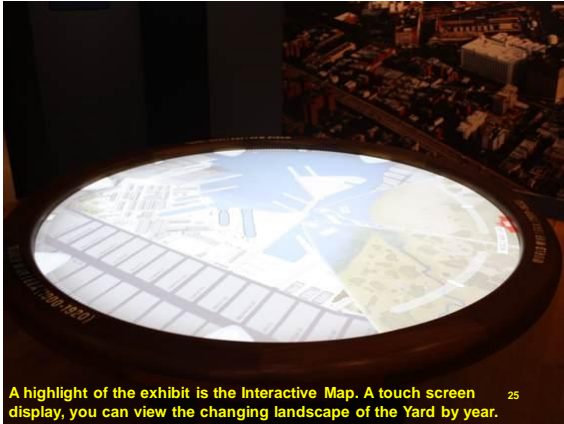
In the "Yardwork: People and Products" room you can get a glimpse of products from the yard and the various people who work it



A rotating display dedicated to products that are currently produced in the Brooklyn Navy Yard



A rotating display dedicated to products that are currently produced in the Brooklyn Navy Yard



A highlight of the exhibit is the Interactive Map. A touch screen display, you can view the changing landscape of the Yard by year. 25



Various shipbuilding facts are on display 26



"Reinventing the Yard" creatively uses newspaper clippings and photos to tell the story of the Navy Yard's transformation from WWII until now 27

The Brooklyn Navy Yard
 Scientific American
 September 21, 1889

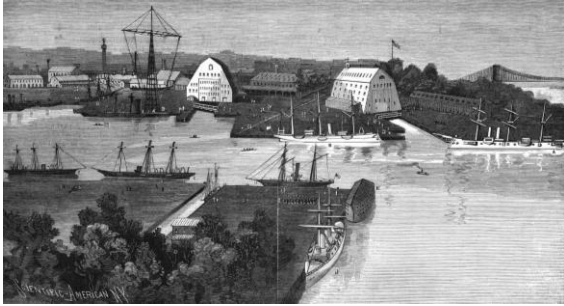
28

THE Brooklyn Navy Yard is the repairing station for all the government ships of the North Atlantic Squadron. It has a receiving ship for enlisting sailors, a barracks for Marines, a thousand workmen turning out war material, ships bristling with guns ready for instant action, and a large ship building establishment..

The cries of officers to their men, the grind of great hawsers through swaying blocks, of stout-linked chains through hawse-pipes, the clank-clank-clank of lagging pawls around a windlass, the shrill piping of a boatswain in the tops, the blare of a bugle, and the never-ceasing rap-bang, rap-bang of hammer and sledge – such sounds assail the ear at every hand.

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30



The approach to the Navy Yard by water is easy and pleasant, with clean-cut, well-kept passages to left and right. The approach on the land side is through narrow and uninviting streets, the entrance being about half-a-mile east of the Brooklyn end of the great bridge connecting that city with New York.

31 **Caption:** "General view - A, Chicago; B, Yorktown; C, monitor, D, dry dock; E, monitors; J, Boston; K, Vermont"

At the gate is a Sergeant of Marines, and sentries are pacing to and fro. Every entering stranger is stopped, passes being given to those who appear to be respectable visitors, while the loiterer or those who would smuggle spirits aboard ships to the crews are turned away.

32

On an elevated plateau to the left of the entrance are the house and grounds of the Commodore-Commandant. The building is a modest wooden structure built before the war, and surrounded by elms, cottonwood, maples, and towering hedge. Here also are pear and apple trees, a finely trimmed lawn, and an old-fashioned garden.

33

The most prominent object in sight as you walk down the road from the entrance is an enormous hulk that looms up on the water line. It is the receiving ship *Vermont*, lying at Cob Dock. A little flat-bottomed boat, that works its way back and forth across the stream by means of a hawser stretched from shore-to-shore, ferries you across to a platform, when it is only a few steps to the *Vermont*. Captain Beardsley commands the *Vermont*, receiving the crews of incoming ships when they are not needed aboard and organizing new companies for ships newly put in commission.

34



35 Built in the Boston Navy Yard from 1818 to 1825, the U.S.S. Vermont was one of nine 74-gun warships commissioned by Congress. The Vermont was not commissioned until 1862, during the Civil War, by which time it was obsolete (it never had its mast and rigging installed). It was sent to serve as a storage boat and receiving ship in South Carolina but was severely damaged in a storm en route. Thereafter, the Vermont served the South Atlantic Blockading Squadron as an ordnance, hospital, receiving and store ship. In 1864, the Vermont was sent to the Brooklyn Navy Yard, where her upper level was enclosed. There, she would serve as a storage and receiving ship with numerous amenities including church services, recruiting office, mess hall and captain's quarters. In 1901, the Vermont was condemned by the USN and sold the following year.

36 **Caption:** "USS Vermont (left) and USS New Orleans (right) at Brooklyn Navy Yard in 1898"



36



37



Top floor of USS Vermont at Brooklyn Navy Yard during a church service

38

At the northeastern end of the Cob Dock is the Ordnance Dock. Here is an enormous crane for lifting guns out of and lowering them into a ship's battery. Nearby are rows of big guns resting upon rollers. Some are old-fashioned 9-inch smooth bores, others are 15-inch in caliber, with rifled cylinders set within – an old-time makeshift; and again there are new steel rifles, 30-feet-long, with 8-inch bores, and, when set-up on the ship's decks, each having a great steel curtain or hood to protect the gunners from an enemy's fire. The gun projecting through.

39

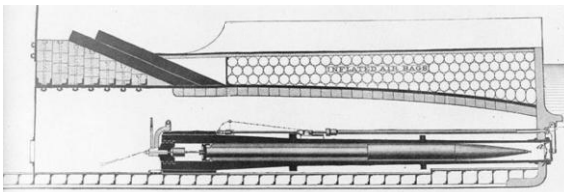


A fleet of old-fashioned, worn-out, or dismantled craft lie about the eastern side of the Cob Dock. Ericsson's *Destroyer*, her terrible submarine torpedo lashed upon her forward deck, creaks and frets at her hawsers, as though impatient to be off at her work of destruction. A monster submarine boat, lying upon a greasy bank. Looks like the egg of some antediluvian reptile waiting to be hatched. Its inventor proved practically to the naval authorities that his boat could navigate in the sub-current, and then, the government showing no disposition to buy, left this massive monument to unrewarded skill and forgot to call for it.

Left: caption: "The low-riding Destroyer with a round coming out of the underwater rifle"

Right: caption: "A view inside the hull of the watertight cannon with a shell ready to load"

40



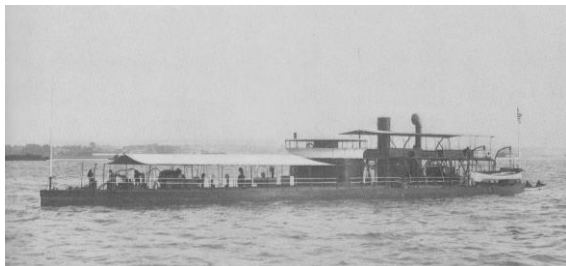
In the 1880s, *John Ericsson* – inventor of the *U.S.S. Monitor*, developed a warship that was fast, armored, low in the water and fired an "underwater rifle." Calling his ship the "Destroyer," he claimed it could take on any ship. *Destroyer* was never accepted by the USN, largely because the underwater rifle had to be aimed by pointing the ship in the direction of the target and the shell was not self-propelled thus, it had a limited range. Ericsson later developed a self-propelled and guidable torpedo. Although able to change direction and depth, it was bulky and unable to compete against the much faster *Whitehead* torpedo. Ericsson also helped *John Holland* with his revolutionary work on submarines.

Caption: "A cut-away view of the Destroyer's hull and underwater cannon"

41



42



Then there's the *Alam*, a long, narrow, sharp-stemmed, rakish-looking craft, for which great things were promised but little realized. There's the old monitor *Nantucket*, her half-submerged decks surrounded by vagrant logs drifting to and fro against her, though once, with full steam up, she burst a boom of logs and chains and, passing a nest of belching forts, made the open sea. Perhaps the most curious sight in the yard are two ships partly built and then suffered to rot and rust away, the appropriation failing.

Caption: "The *USS Nantucket*, photographed ca. the 1880s"

43

44

Those familiar with the history of that war will remember that our small fleet, which many thought should be sunk to escape from capture by the enormous fleets of the British, was, instead of this, taken out and fought for what it was worth. They will remember that the handiness of the ships and their superiority to those of the British was quite as much a surprise at home as abroad.

45

In the moulding loft are kept the patterns of all ships that have been built here for the Navy for many years; indeed, here are the plans of some of those famous wooden ships that were built immediately after the close of the naval war of 1812-13, and patterned after those great warriors.

The plumbers' shop has more work than it can do just now, and doubtless will soon be much enlarged. Secretary Tracy having included it in his estimate of needed appropriations. Here are made the repairs to the network of pipework on the new ships. There are the pump connections with the various apartments, the boiler and heat and pressure connections between engine and fire and boiler rooms and engineer's room, besides scores of other uses for which pipes and electrical wiring is required.

46

Over by the Marine barracks, near the southern gate, is an interesting study of anchors; a hundred or more of these, all of mammoth size, being strung up on anchor racks. There is to be seen the bower anchor with its stationary flukes, the great kedje with its bar pushed through the shank and neatly lashed, the sheet anchor with its ponderous limbs, and the mushroom for securing a permanent buoy, thus enabling a ship to have an easy and quick means of making fast to, and casting of from, a permanent holding, on station.

47

This being the repair and refitting yard of the North Atlantic squadron – the Boston yard has now become only an equipment center, where naval supplies, such as chains, anchors, rope, etc., are made – there is a large force of workmen kept busy at all times, the number on the books just now approaching one-thousand.

48

Ships remain on a station three years, cruising being part of the duty. Sometimes they remain still longer away from home – the *Lancaster*, for instance, which arrived at the yard recently, has been absent for eight years, having been the flagship of the European Squadron. When a ship is put "out-of-commission," her crew are discharged; that is to say, those of them whose enlistment has not expired are sent to the receiving ship, her officers assigned to duty elsewhere, and the ship handed over to the officers of the yard, who proceed to make a survey of her condition.

49



If ship-rigged, like the *Lancaster*, her royal masts, top-gallant masts, and top-masts are sent down, the yards going with them, and everything, even to the anchors and chains, being taken out, "dismantling," it is called. If the estimate for the repairs to the hull amounts to more than 20 per cent of the total cost of the ship, an Act of Congress forbids the expenditure – if she is a wooden ship. In the case of an iron or steel vessel, it is not yet decided what the limit of expense shall be for repairs. In refitting, every part of a ship's rigging or furnishings that is badly worn or strained, or likely to give out, is renewed, so that, when again she sets out, she is, practically speaking, a new ship.
 Caption: "Ships' anchor chains on dock, Brooklyn Navy Yard - workshops at right, in background, ca. 1890" 50

There is one dry dock at the yard, a stone one, or rather there are two, for another, a great wooden one, 500-feet-long, is almost completed. In its present stage it looks like the pictures of the Theater Maximus, somewhat fore-shortened, there being series upon series of steps and lookouts from the top copings of the deep sunken pit where the workmen look like pygmies. In this the larger ships will be able to come, the stone dock having been completed as long ago as 1833, when ships were very much smaller than at present.

51

A movement is now afoot to greatly enlarge the scope and capacity of the yard, Secretary of the Navy Tracy having determined to remodel many departments. He has appointed as a Board of Permanent Improvement, Admiral Braine, Henry S. Craven, C.E., and P.C. Asserson, C.E. This board has now been sitting nearly three months and its report will soon be ready.

52

In this it is recommended that all parts of the refitting and manufacturing plant now in the yard shops which is not of the newest and most improved patterns be discarded and modern apparatus be set-up in its place. The determination of the Secretary to make this a first-class yard will also necessitate a very considerable increase in plant. Likely enough it will be doubled, notably the foundry and machine shop capacity, which, for a long time, has been felt to be much too small and incapable of doing its part.

53

The New York Navy Yard, Brooklyn
 Scientific American
 March 3, 1900

54

ONE of the most evident facts demonstrated by our late conflict with Spain was the important part which must always be played by the Navy Yards of the country in the successful prosecution of a war – a fact too little understood or too long overlooked by Congress. Only those who were *au courant* with our deficiency in dry docks and other essential facilities knew to what straits we might have been brought by the sudden crippling of half-a-dozen of our deep-draught ships, and the consequent demand for instant docking. Happily, however, Congress seems now to have awakened to the importance of this question, and our various yards will soon be suitably equipped to meet the needs of an ever growing Navy.

55

By far the most important of the Navy Yards of the United States is that known as the Navy Yard, New York, and popularly as the Brooklyn Navy Yard. It bears the same relation to our Navy as Portsmouth and Chatham to the British Navy, and Brest and Toulon to the Navy of France, and some idea of its capacity may be gathered from the fact that in the course of a single year as many as 120 vessels have visited the yard for repairs or alterations, 50 of these being vessels of the regular service and 70 of them being vessels on which considerable structural change were necessary in transforming them to suit the needs of naval service. In the same period 66 vessels were docked and painted.

56

Location and History of the Yard



If the reader will take up a map of New York he will notice that the East River for the first mile-and-a-half of its course from the northern end of Manhattan Island, runs in an easterly direction and then turns sharply to the north, making a bend of about 90-degrees. The outer angle of the bend forms what is known as Wallabout Bay in which is situated and island, separated (save for a narrow causeway) from the mainland by the Wallabout Channel. The island, the channel and most of the adjoining land encompassing the channel, go to form the 213 acres enclosed within the boundaries of the New York Navy Yard.

57

58

Historically the site will always possess a mournful interest owing to the fact that during the Revolutionary War the British prison ships were moored in the Wallabout Channel, and that on board of these vessels thousands of American patriots perished. They were buried right in the mud flats of the bay upon which stands the present dry docks and buildings of the Navy Yard, and during the excavations for various new structures, portions of skeletons have frequently been exhumed. This has occurred as recently as February of this year, when in excavating near the clothing factory, fragments of several skeletons were brought to light.

59

At the **Battle of Long Island** (fought in Brooklyn), Americans patriots suffered 1K casualties to the British loss of 400 men. Militarily, the British were now in control of NYC. During their occupation, British forces captured or arrested thousands of soldiers and civilians, some after battles fought around NYC and some for simply refusing to swear allegiance to the **British Crown**. Additionally, the Continental Government had authorized a number of privately owned, armed ships to serve on behalf of the American cause thus, some 55K American seamen eventually served as merchant mariners or privateers. Whenever the British captured these seamen, they gave them the choice of joining the **Royal Navy** or go to prison. Most ended up in prison.

60

In 1775, *King George III* declared American forces to be traitors, which denied them prisoner-of-war status. However, British strategy early in the conflict included the pursuit of a negotiated settlement, allowing officials to decline to try and/or hang prisoners (the usual procedure for those charged with treason) to avoid putting at risk any sympathy the British might have sustained from the colonists. American prisoners tended to be gathered at large sites that the British were able to occupy for long periods of time. NYC, Philadelphia and Charleston were all major cities used to detain American prisoners. However, facilities at these sites were limited. Some American prisoners were confined in other parts of the *British Empire* (i.e. Nova Scotia). By late 1782, England and Ireland housed +1K American prisoners.

61



63

Because space in British jails quickly became overcrowded, the British began housing prisoners aboard the abandoned or decommissioned warships anchored in *Wallabout Bay* - located along the northwest shore of Brooklyn (between the present-day *Williamsburg* and *Manhattan Bridge*/s). As a result, the most horrific struggle of the *American Revolution* occurred just 100-yards off the Brooklyn shore, where more men and boys died aboard a rotting prison ship than were lost to combat during the entire *Revolutionary War*. The first ships used by the British to hold prisoners were originally transports in which cattle and other stores were transported to the American colonies. The most infamous of the prison ships was the *HMS Jersey*, which was an old, converted, sixty-four-gun *Man-of-War*, stripped of all its fittings except for its flag-staff.

62

Every three days, rations would be given out to a six-man mess. On certain days, men were not allowed to cook fires and had to wait another twenty-four hours or consume their meat raw. Having no fruit or fresh vegetables, scurvy was one of the diseases that afflicted the prisoners. The *Jersey* had on board anywhere from 400 to 1,200 prisoners at any one time. With no toilets, excrement accumulated as thousands of men and boys were packed into the ship's dark, dank interior. Occasionally, groups of prisoners would escape overboard, only to be recaptured on British-held Long Island. As the years passed, life on the *Jersey* became unbearable. Unable to wash except with salt water, their skin turned sallow and hung over their decaying skeletal bodies.

64



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By 1780, prisoners were dying aboard the *Jersey* at a rate of roughly ten per-day. Corpses were brought up to the top deck as they were discovered and left there until morning when they were piled onto a wooden plank and lowered over the ship's side to be buried in shallow pits on the sandy banks of *Wallabout Bay*. Sometimes, bodies would go weeks before being discovered, so dark were the prisoners' quarters (the air was reportedly so foul that no flame would stay lit). No records were kept of the dead; they were unceremoniously dumped into their shallow burial pits on the sandy shore.

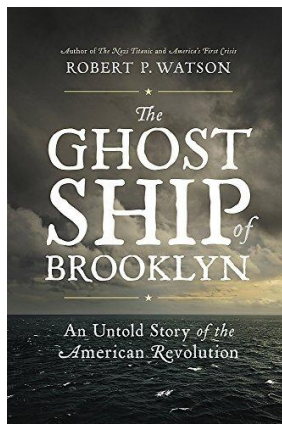
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“...In the Wallabout Bay, about which the Navy Yard is situated, were moored the prison ships, the ‘Jersey’ and others of the Revolution. On the ‘Jersey’ alone, 11,000 patriots perished...”

The Illustrated Buffalo Express, June 6, 1897

RE: at war’s end, there were only 1,400 survivors among the inmates of the entire prison ship fleet. At least 11K men and boys died aboard the ships from 1776 to 1783 - more than were lost to combat (6,800) during the entire war. Most prisoners who perished remain nameless. They died from small pox, dysentery, typhoid and yellow fever, starvation and torture.

67



“It is to the prisons that the historian must go if he is to make a sane judgment of a people’s moral state”
 French Prison Inspector, 1837

RE: even after the British surrender at Yorktown in late 1781, prisoners were kept aboard the *Jersey* and other ships until the war formally ended in 1783. Throughout the colonies, the mere mention of the ship sparked fear and loathing of the British. It also sparked a backlash of outrage as newspapers everywhere described the horrors on board the hulk. Much like the better-known *Boston Massacre*, it ended up rallying public support for the war – exactly what the British didn’t want.

Left: in his book “The Ghost Ship of Brooklyn: An Untold Story of the American Revolution,” author *Robert P. Watson* describes the notorious practice of using derelict British warships (a/k/a “hulks”) as prisons during the *Revolutionary War*

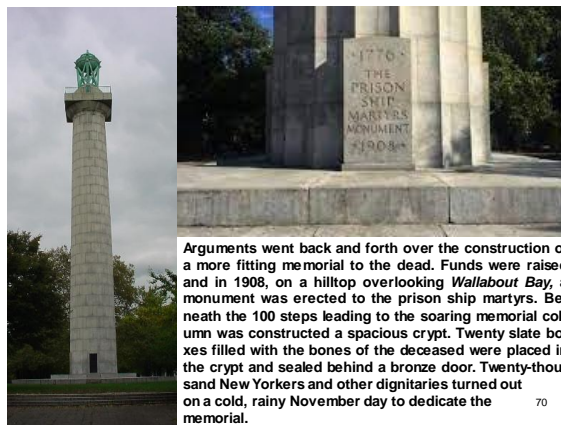
68

“...For years and years after the Revolution, the bones were washed up on the banks. Even as late as 1878 workmen of the Navy Yard dug up two skeletons, and made merry with the skulls, playing at duck on the rock with them. Their sport cost them their jobs, and the bones were laid with others in Fort Greene Park...”

The Illustrated Buffalo Express, June 6, 1897

RE: in the ensuing years, daily tides uncovered what seemed to be an endless number of skeletons on the shores surrounding *Wallabout Bay*. Skulls were said to litter the beaches as thick as a pumpkin patch and children would kick them about like a ball. As Brooklynites collected more and more of the bones, there was a clarion call for a more respectful and honorable resting place for these martyred Patriots. As a result, in 1808 a crypt was constructed near the bay for the unidentified skeletal remains. There they would rest in relative peace for another century.

69



Arguments went back and forth over the construction of a more fitting memorial to the dead. Funds were raised and in 1908, on a hilltop overlooking *Wallabout Bay*, a monument was erected to the prison ship martyrs. Beneath the 100 steps leading to the soaring memorial column was constructed a spacious crypt. Twenty slate boxes filled with the bones of the deceased were placed in the crypt and sealed behind a bronze door. Twenty-thousand New Yorkers and other dignitaries turned out on a cold, rainy November day to dedicate the memorial.

70



71



For the origin of the New York Navy Yard we must go back to the year 1801, when the Chief Executive of the United States, John Adams, having exhausted every argument to induce Congress to appropriate the necessary money, purchased on his own responsibility the sites for six Navy Yards. Among the yards thus secured was the “Waalbought,” Brooklyn, now corrupted into “Wallabout.” Subsequent additions were made in 1824, 1848, and 1867, and at a later date two sections were sold to the City of Brooklyn, one of which is occupied by the well-known Wallabout Market.

Caption: “Wallabout Market (part of Navy Yard in the future), borough of Brooklyn, City of New York, 1896”

72

The present value of the yard, with its docks, buildings and plant, is estimated at about \$19,000,000. The extent of quay wall available for the berthing of vessels is approximately one-and-a-quarter miles. The boundary limits are on an average about one-quarter-of-a-mile from the water front and the yard including the island known as Cob Dock, contains as we have said, some 213 acres. The greater part of the buildings were erected prior to the reconstruction period of the Navy, which dates from about the year 1883, at which time the buildings and machinery were entirely inadequate to the requirements of a modern Navy Yard. Subsequently to the date mentioned, and particularly during the last decade, the more generous appropriations and the advent of vigorous and competent officials to the yard, have resulted in a great improvement of its capacity for every kind of naval work.

73

Many old and unsuitable buildings have been torn down, and replaced by modern structures, fully equipped for the necessities of the new Navy. Complete arrangements have been made for receiving and disposing the vast quantities of naval stores of all descriptions which pass through this principal supply depot of the Navy. Complete electrical plants, both for lighting and power, have been installed, and elaborate hydraulic and pneumatic plants have been laid down.

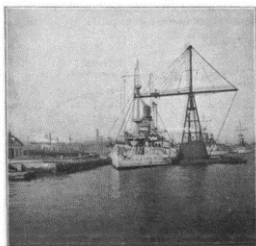
74

The quay walls have been extended, and, by dredging, have been made available for vessels of great draught of water. At the commencement of the era referred to the yard possessed but one dry dock, the old stone dock, with a length of only 370-feet. Since then two large docks, one 500-feet in length, and the other 670-feet have been constructed, and the 500-foot dock is now being largely rebuilt in concrete.

75

An important feature in connection with the arrangement of the docks is the system of double-track railways which encircles each dry dock and by means of connecting branches unites them with the boiler shop. On this system there are two large 40-ton locomotive cranes which have a reach of about 60-feet. The arrangement of the tracks is such that it is possible for the crane to pick-up a boiler in the boiler shop, carry it to any one of the dry docks, and lower it directly into the hold of the vessel. These cranes are also of the greatest service in handling guns, gun carriages, and the heavier pieces of machinery and ship's framing and fittings. One of our illustrations on the front pages shows the yard floating derrick which has a capacity of 75 tons at the end of a 65-foot boom. One advantageous feature of this derrick is that the boom is capable of rotation about the mast.

76

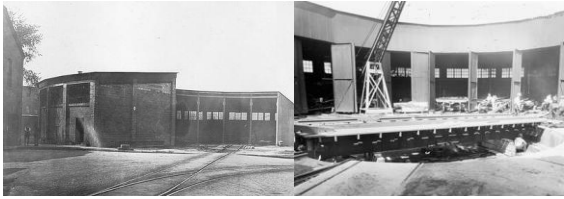


75-ton Floating Derrick Alongside the "Texas."

The floating derrick and the large locomotive cranes just referred to make it possible to handle the heaviest weights with ease and dispatch. There is also an elaborate system of single-track railway, as indicated by the single line on the accompanying plan of the yard. It will be seen that the tracks extend down the whole waterfront and through the main streets of the yard, short branches being run from the streets into the various shops.

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78



By 1916, the *Brooklyn Navy Yard* comprised +255 acres and would come to have +30 miles of railroad track, including both 18 and 37-foot-gauge trackage for the large cranes (that wound there way around the berths and dry docks) and standard-gauge (4'-8.5") trackage. Much of the trackage was within streets and driveways and therefore flush with the ground surface. Trackage was upgraded and expanded throughout the years as needed. Images from the WWI expansion show dual-gauge trackage (only contract and construction work was performed by the 36-inch gauge locomotive - daily operations of the yard was standard-gauge).

Above L&R: caption: "Rail operations of the Brooklyn Navy Yard were sufficiently large and extensive enough to have necessitated the construction of a roundhouse with a turntable" 79

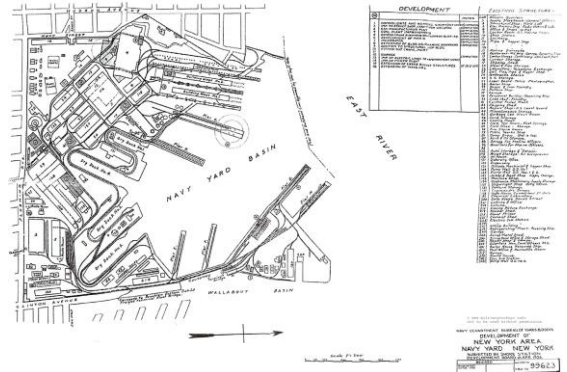


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60-TON FIRELESS LOCOMOTIVE BUILT BY H. K. PORTER COMPANY ON TIMKEN BEARINGS FOR U. S. NAVY YARD. R-302

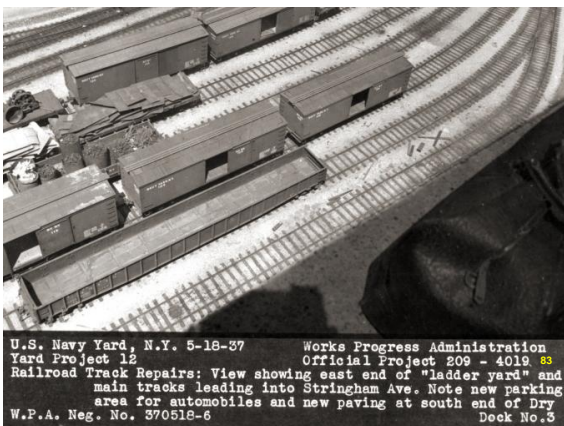
80



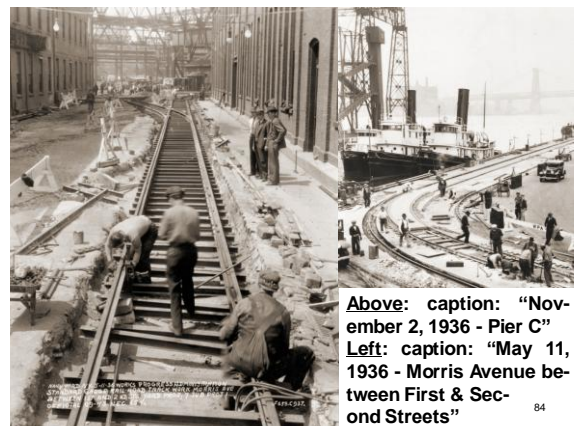
81



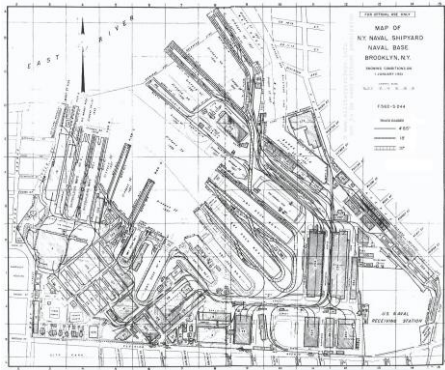
Caption: "Facility map from 1938. This map is significant as it shows the layout of the Navy Yard and trackage prior to the Navy Yards expansion into the Wallabout Terminal and the original location of the float bridge." 82



U.S. Navy Yard, N.Y. 5-18-37 Works Progress Administration
Yard Project 12 Official Project 209 - 4019 83
Railroad Track Repairs: View showing east end of "ladder yard" and main tracks leading into Stringham Ave. Note new parking area for automobiles and new paving at south end of Dry
W.P.A. Neg. No. 37051c-6 Dock No. 3



Above: caption: "November 2, 1936 - Pier C"
Left: caption: "May 11, 1936 - Morris Avenue between First & Second Streets" 84



85
Caption: "Facility Map of the New York Naval Shipyard dated 1961, with track layout for: 4'- 8.5" (standard-gauge) railroad, 18' gauge and 37' gauge crane trackage, and list of buildings corresponding to number keys on map"

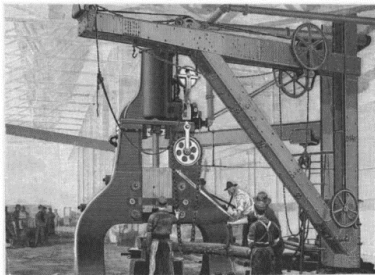


Buildings

The buildings of the yard are commodious and of a very substantial character. The older structures have been largely rebuilt and refitted and there are several entirely new structures that have either just been completed or are in process of erection. The largest building is the smithery, which measures 300 x 200-feet. The foundry is 350 x 110-feet, and the main machine shop of the Steam Engineering Department measures 350 x 100 feet with a wing 210 x 95-feet. The general storehouse measures 200 x 200-feet, and the joiner and paint shop is contained in a fine granite building which is over half-a-century old, in which is also the Construction and Repair Electrical Plant.

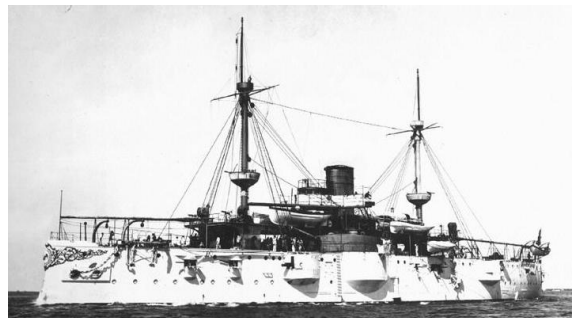
87

88



The Smithery—Forging an 8-inch Davit.

89



90
On the summit of the hill, in the northwestern corner of the yard, is situated the commandant's house, now occupied by Rear Admiral J.V. Philip, well known as the commanding officer of the "Texas" during the Spanish-American war. It will interest our readers to know that the first commandant of the yard was Lieutenant Jonathan Thorne, the hero of Washington Irving's "Astoria."
Caption: "The USS Texas was built at the Norfolk Naval Shipyard"



Above L&R: completed in 1807, this house served as the *Brooklyn Navy Yard* Commandant's home until the 1940s. In August 1872, a *Brooklyn Daily Eagle* reporter noted that Quarters A: "...with its lawns, terraces and teeming gardens, is a conspicuous object . . . a look that makes one feel that it must be a pleasant thing to be the Commandant..." The elegant interior featured Federal-style mantels, door casings and an oval dining room.

Left: caption: "The Federal-style Commandant's house"

91

Right: caption: "Commandant's House close-up"



Exterior view of the house, looking northwest, ca. 1905

92



Above: caption: "The first floor hall in 1914"

Upper Left: caption: "The parlor in 1914"

Lower Left: caption: "The oval dining room in 1914"

93



Above: caption: "The northeast room on the first floor in 1914"

Upper Left: caption: "The northwest bedroom in 1914"

Lower Left: caption: "The southwest bedroom in 1914"

94



95

96

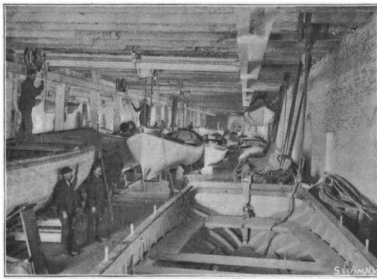
The Department of Construction and Repair

The work undertaken at the Government Navy Yard is so complex as to necessitate its division under various departments. The most important of these is the Department of Construction and Repair, which has charge of all work connected with the hull proper of all vessels. It has charge of the important work of docking, painting and undocking; it installs and supervises all piping in connection with the drainage, water, and ventilation systems; it looks after the necessary work in fitting-up the quarters and receiving spaces of ships, and provides the necessary furniture and various details essential to life aboard ship; it has under its supervision the steering machinery and that for the hoisting of anchors and handling of the many boats which all naval vessels are supplied.

It also has charge of building the boats themselves, and in this connection it should be mentioned that a large three-story boat storehouse has been planned which will be erected on the spot indicated in the accompanying map of the yard. Electric traveling cranes, running from one end of the building, where they will be lowered on to suitable trucks on the yard railway and carried to the water.

97

98

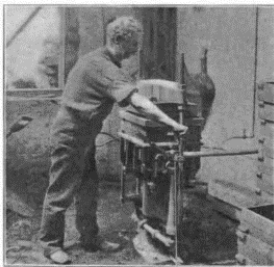


The Boat Storehouse, Showing Boat Being Moved by Overhead Trolley.

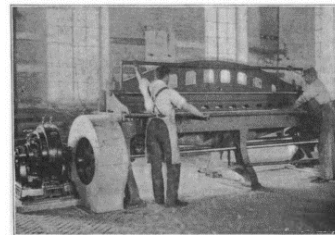
There are thirteen buildings connected with this department, and in addition to these a large steel storehouse is in process of erection. Several of the illustrations on the first page of this issue show the interior of these buildings and the various improved tools and appliances in the shops.

99

100



Pneumatic Molding Machine.

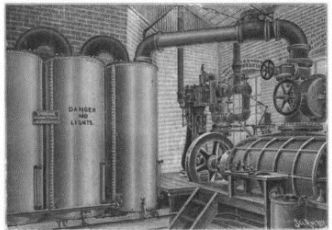


Direct-Connected, Electrically-Driven Shears.

101

102

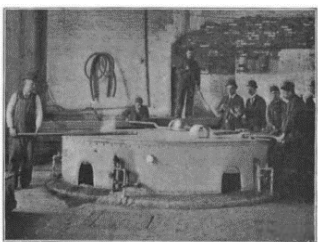
Limitations of space prevent any very detailed description, but we draw particular attention to the gas plant which furnishes the necessary fuel for the various forges for the plate-bending sheds and smitheries. It consists of a Root blower which delivers air at a pressure of 2 pounds-to-the-square-inch. A part of this air passes through the large tanks of gasoline shown in the illustration, and the gas thus formed is piped to the different forges and bending furnaces. The other part of the air is carried through an air main to the various shops, and by means of an air pipe and a gas pipe at each forge the mixture is regulated according to the work to be done.



The Gas Plant.

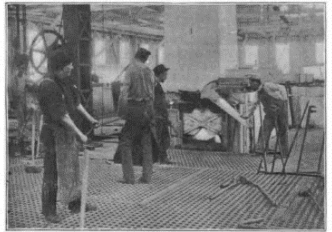
103

104



Gas-fired Coppersmith's Forge.

105



Furnace for Bending and Beveling Angle Iron.

106

A comparatively new feature of this department is the compressed air plant, whose mains are carried to the different shops and are also extended to and around each of the dry docks. The mains at the docks are located a few feet back from the curb, and are provided at intervals with connections from which the air is piped through flexible hose to the various portable machines used for drilling, chipping and caulking both on the inside and outside of the vessel. Among the uses of air in the shops is that of wood boring in the boat shop, brass polishing, hoisting in the blacksmith and machine shops, machine molding in the foundry, and for tests of all auxiliary machinery where steam may not happen to be available.

The Department of Steam Engineering

107

108

As the name indicates, the Department of Steam Engineering has charge of all work connected with the engines and boilers of the ships, and such auxiliary machinery as is not under the direction of the Construction Department.

109

The Department of Yards and Docks

110

The Department of Yards and Docks has charge of the erection and maintenance of all yard buildings; attends to the lighting, heating, and furnishing of these buildings, and keeps in repair the dry docks, quay walls and slips, streets and tracks.

111

The Equipment Department

112

The Equipment Department has charge of all matters relating to the rigging of the ships; furnishes all electrical appliances and the instruments connected with the navigation of the ships, and installs the complicated system of electric wiring which is now such an important item in the vessels of our Navy.

113

The Department of Supplies and Accounts

114

The Department of Supplies and Accounts has charge of the accounts of the officers and employees of the yard and the purchase of all material for the use of the various departments. It keeps a general storehouse supplied with naval stores for the use of all the vessels in the navy and in many cases it supplies the other Navy Yards as well.

115

The Ordnance Department

116

The Ordnance Department has charge of all matters relating to the ordnance of vessels, their guns, torpedoes, and ammunition. It has to see that the vessels are fully supplied with the ammunition and various stores connected with ordnance. The efficiency of this department was displayed conspicuously during the recent war when our vessels, not merely in Cuban waters, but in the Far East, were never in danger at any time of running short of ammunition.

117



Caption: "Naval guns for battleship *New Mexico*, Brooklyn Navy Yard, 1917"

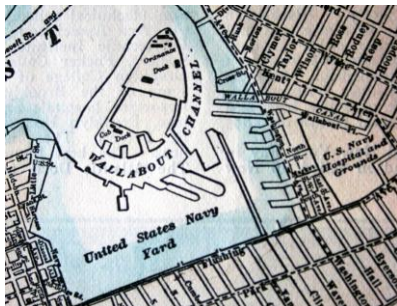
118

Proposed Improvements

Although the New York Navy Yard has made such a good record in respect of its ability to turn out a large amount of work, it is a fact that much of the repairs, etc., undertaken at this yard, is done at a great disadvantage, owing to the lack of proper berthing space and the impossibility of placing the ships at wharves reasonably accessible to the shops. The trouble is due to the existence of the Wallabout Channel and the fact that on the Navy Yard side of the Channel there are, at present, berths available for not more than five ships, and that of these only two are suitable for large or long vessels.

119

120



121

This necessitates the berthing of some of the ships that come to the yard at the Cob Dock, communication with which is only possible by a slow and inadequate rope ferry, which is subject to constant interruption from passing tugs and barges. Moreover, all materials and stores for ships on the Cob Dock have to be hauled fully a mile by teams over poor roads extending around the dry docks and over the causeway.

122

“...The old chain ferry was a puzzle for later-day engineers. The chain ferry ran straight across Wallabout Channel carrying passengers from the Navy Yard to Cob Rock, and vice versa, for over a quarter-of-a-century. It was constructed about the time that Commodore George H. Cooper, U.S.N., took charge as commandant in 1880. Commandant Cooper was 22d in line in charge of the Navy Yard...”

The Brooklyn Daily Eagle, December 9, 1940

RE: beginning in 1637, Wallabout Bay served as the landing site of the first ferry across the East River from lower Manhattan. Cornelis Dirksen, the ferryman, farmed plots on both sides (near to where the Brooklyn Bridge now spans) to best employ his time on either bank of the river.

123

“...At the beginning the ferry was simply a wide open scow, unprotected from wind and weather. It ran very much on the same principle as ferries run today, except that then they used man-power instead of steam to make it go. There was a windlass in the scow and sailors turned it by means of cranks and so controlled the chain which pulled it to and fro. Sometimes the chain caught on the keel of a passing tug and snapped...”

The Brooklyn Daily Eagle, December 9, 1940

124

“...While the repair work was done an alternate ferry was used. The trip across the water took only two minutes, and the landing was simplicity itself. The scow just bumped head-on into the shore. They landed this way to save time. After a while an engine was substituted for the windlass and the sailors. In its day the old chain ferry served hundreds of notables of the Navy as well as thousands of everyday people...”

The Brooklyn Daily Eagle, December 9, 1940

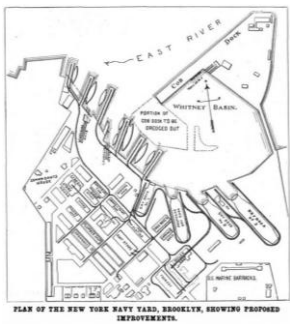
125



The accompanying plan shows the scheme of alterations, drawn up by Naval Constructor Bowles, with a view to remedying this serious defect by providing ample berthing space in close proximity to the shops. The plan, which has every probability of being carried out, contemplates the removal of the southern end of the Cob Dock and the building out into the enlarged channel thus formed of six long piers and one shorter one, all projecting from the Brooklyn shore as shown.

Caption: "Francis T. Bowles, U.S.N., Chief Naval Constructor of the new York Navy Yard"

126



127



By abolishing the Cob Dock for berthing purposes, the enlarged berthing space thus afforded on the Brooklyn shore would be sufficient to accommodate at any one time eleven of the largest and two smaller vessels, while there are the added advantages of an ample and unobstructed channel for the passage of ships from the East River to the dry docks, and that the vessels in taking up their berths at the new piers would be out of the heavy tideway which at present sets up and down the Cob Dock. The plan of reconstruction also provides for two covered marine railways on the Cob Dock for hauling and storing torpedo boats. At present the boats are hauled out on temporary ways on the Brooklyn side, where the work of painting and repairs is often seriously delayed by the weather. The New York Navy Yard, as thus reconstructed, will compare favorably with the best of the European Navy Yards.

Caption: "The New York Navy Yard, Brooklyn. Torpedo boats drawn out on temporary ways on the Brooklyn side."

128

Too Close for Comfort

On the evening of Friday, November 7, the tanker ship *Rainbow Quest* collided with the Brooklyn Bridge. The collision was minor, as the ship's light tower just scraped the underside of the roadway.

turnstiletoours.com, November 20, 2014

RE: introduction to an article entitled: "The Brooklyn Bridge and the Brooklyn Navy Yard: Too Close for Comfort"

129

130

"WHILE the accident caused a minor sensation – and quite a few traffic delays, though no discernible damage – close encounters between ships and the Brooklyn Bridge are nothing new, and its relatively low clearance has been the subject of vicious political battles for nearly 150 years..."

turnstiletoours.com, November 20, 2014

"...The National Oceanographic and Atmospheric Administration considers the center of the Brooklyn Bridge's span to be 127-feet above the East River's mean high-tide. According to the ship's statistics filed on eFleetWatch, 'Rainbow Quest' ranges from 112-feet to 144-feet above the water, depending on her load – well within the range to strike the bridge. We still don't know what exactly caused the miscalculation, but they weren't the first, and they won't be the last to make that mistake. According to the Coast Guard Maritime Information Exchange, this was the third 'allision' (a fancy maritime word for when a vessel hits a stationary object) with the Brooklyn Bridge since 2002..."

turnstiletoours.com, November 20, 2014

RE: the Brooklyn Navy Yard, located on Wallabout Basin (less than two miles north of the Battery – the southern tip of Manhattan Island), is accessed by the East River, which separates Manhattan and Long Island (Brooklyn is at the west-end of LI). The channel is 40-feet-deep to the south and 35-feet-deep to the north. Access from the south requires passing under both the Brooklyn and Manhattan Bridge/s, which have vertical clearances of 135-feet (nominal) and 127-feet (actual).

131

132



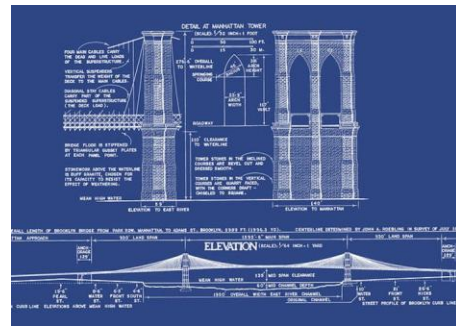
133



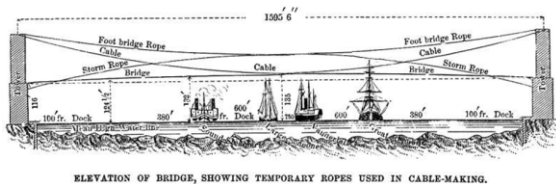
134

“...Almost from the moment a bridge connecting Manhattan and Brooklyn was proposed, people feared that any such project would be an impediment to navigation, stifling commerce in the nation’s busiest port, and threatening national security by limiting access to one of our most prized military and industrial assets, the Brooklyn Navy Yard. After the design was completed and construction began in 1869, for a bridge with a center span height of 135-feet (NOAA uses a more conservative estimate of the bridge height, or ‘air draft,’ than is commonly cited for the bridge), many lawsuits were filed against the bridge’s designers, builders, and financiers...”
 turnstiletoours.com, November 20, 2014

135



136



ELEVATION OF BRIDGE, SHOWING TEMPORARY ROPES USED IN CABLE-MAKING.

“...Many ships of the day had masts well over 135-feet, but the bridge’s builders felt that, given the already enormous engineering challenges of building the world’s longest suspension bridge, this height would offer safe passage to most vessels, while ship’s that were too tall could remove their topmasts, or find berths elsewhere in the harbor...”

turnstiletoours.com, November 20, 2014
 Caption: “Three points in the air line of the bridge are also determined: the central altitude of 135-feet above mean high-water required by the United States government, and the two terminal elevations, in New York and Brooklyn respectively, of 38.27 and 61.32-feet above high-water mark. The rise from these two to the central altitude gives the line of the bridge a gentle upward curve from either end to the center, where it will be 15-feet higher than at the towers, and 46-feet higher than at the anchorages.”

137

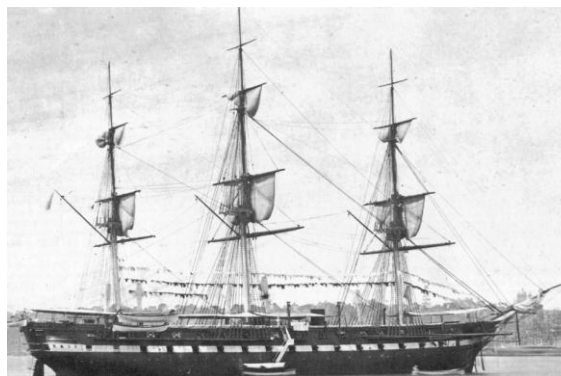
“...Yet a law suit filed in 1876, led by warehouse magnate Abraham Miller and co-signed by no less than 32 other shipping, trading, and dock companies, claimed that the ‘bridge shall be so constructed and built as not to obstruct, impair, or injuriously modify the navigation of the river,’ and they demanded its immediate removal. The City of New York also tried to withhold money from the bridge project, leaving the then independent City of Brooklyn holding the bag, claiming that the bridge was too expensive and was too large an impediment to commerce. But the bridge eventually prevailed; by 1879, these suits were thrown out, and New York City had to pony up the cash to finish the bridge...”
 turnstiletoours.com, November 20, 2014

138

"...But the bridge's critics weren't entirely wrong. The first recorded collision of a ship with the Brooklyn Bridge was actually long before the bridge was even completed. On May 11, 1878, the U.S. Navy training ship 'USS Minnesota' struck one of the suspension cables strung between the bridge towers..."

turnstiletours.com, November 20, 2014

139



Caption: "USS Minnesota, first ship to hit the Brooklyn Bridge"

140

"...Apparently the sailors knew that the ship would not clear the wires, so they had already lowered their topmast in preparation for their scheduled passage from the Brooklyn Navy Yard to the west side of Manhattan. Unfortunately, according to a report in the New York Daily Tribune, 'but having to change her course to pass another vessel under the bridge, the tip of her main top-gallant mast caught in one of the storm wires and broke off.' No injuries were reported, and 'Minnesota' required only minor repairs..."

turnstiletours.com, November 20, 2014

141

"...On September 29, 1882, by which point the bridge was nearing completion, the merchant ship 'Undaunted' struck the center of the roadway, knocking out her topmast and a small section of the bridge. Luckily no one was hurt, and the New York Times described the damage to the bridge as 'trivial,' adding, 'One of the officers who was upon the structure at the time of the collision says that the shock was no greater than that which occurs when a plank is thrown down'..."

turnstiletours.com, November 20, 2014

142



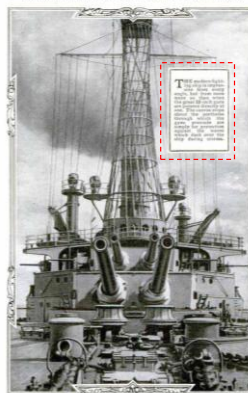
"...From the perspective of the Navy Yard, the Brooklyn Bridge was designed in the era of steam-powered sailing frigates, but by the time it was completed, steel-hulled cruisers and battleships were entering the Navy, and the exponential rise in the size and firepower of ships in the following decades would make the bridge's once-adequate headroom a tight fit..."

turnstiletours.com, November 20, 2014

Caption: "USS West Virginia Passing under Brooklyn Bridge"

143

GUNS OF THE U. S. BATTLESHIP "DELAWARE"



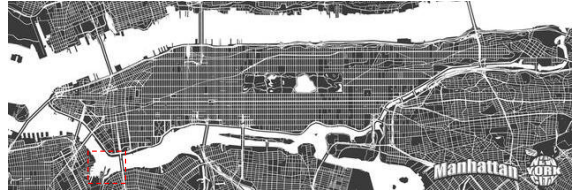
"...In 1915, the former Secretary of the Navy George Meyer complained that 'the Brooklyn Navy Yard . . . is located where a modern Navy should not under any circumstances be located,' in large measure, he argued, because 'the height of fire controls in our navy is governed by the height of the Brooklyn Bridge' (he was referring to the then-new fire control masts, also called lattice or cage masts, which allowed spotters to direct the ship's guns by sight, before the era of radar and naval aviation)..."

turnstiletours.com, November 20, 2014

Caption: "The modern fighting ship is impressive from every angle, but from none more so than when the great 12-inch guns are pointed directly at one. The canvas stops about the portholes through which the guns protrude are simply for protection against the waves which dash over the ship during storms. Behind the gun turrets is the latticed 'cage mast,' upon which spotters are stationed to relay the fall-of-shot to the fire-control officer, who, in turn directs the guns on to their target."

(Popular Mechanics, August 1914)

144



“...New York City’s bridges would play a central role in the country’s preparations for World War II. In 1939, the War Department quashed Robert Moses’ grand plan to build a suspension bridge from Lower Manhattan to Brooklyn. They claimed that two bridges (Brooklyn and Manhattan) blocking access from the Navy Yard to the sea were bad enough; adding a third, much larger bridge would only increase the danger of the yard being cut-off in wartime if one were to be destroyed (and if you thought ships could then just come from the north via Long Island Sound, in that direction there are six bridges with comparable clearance as the Brooklyn Bridge)...”

turnstiletours.com, November 20, 2014
 Above: upstream from Wallabout Bay (highlighted) are the Williamsburg Bridge (1903); Queensboro Bridge (1909); Triborough (renamed RFK) Bridge (1936); Hell Gate Arch (1917); Whitestone Bridge (1939) and Throg’s Neck Bridge (1961). Note: White-stone and Throg’s Neck Bridge/s are out-of-view on the map. 146



“...Eventually the bridge project was replaced with the Brooklyn-Battery Tunnel...”

turnstiletours.com, November 20, 2014
 Caption: “Robert Moses’ grand plan: The Brooklyn-Battery Bridge” 147



“...By the outbreak of World War II, the Brooklyn Bridge had become a major impediment, and many of the Navy’s largest ships – especially aircraft carriers – could not squeeze into the East River...” 148
 turnstiletours.com, November 20, 2014



“...In 1941, the Navy began constructing the Brooklyn Navy Yard Annex in Bayonne, NJ, which would include an enormous 1,092-foot dry dock, the same size as the two other new dry docks being constructed at the main shipyard. This would give the Navy a facility to repair ships without having to worry about the low bridges, but the annex could also be used to remove radio masts and stacks from ships, allowing them to fit under the bridge and have their primary work done at the much larger and better equipped yard; when the work was completed, the process would be reversed, as ships would return to Bayonne to have their masts replaced...” 150
 turnstiletours.com, November 20, 2014

“...In the post-war period, with the development of the new class of ‘supercarriers,’ the Navy would have to find a way to fit these enormous vessels under the bridge. The solution to this problem was found by engineers at the Brooklyn Navy Yard, who were working on designs for the Forrestal-class ships...”

turnstiletours.com, November 20, 2014

151

Design Ingenuity Permits CVA-60 Passage Under Brooklyn Bridge



CVA-60 Saratoga

“...While the Navy had considered making the carrier’s ‘Island’ (the structure that juts up from the flight deck and contains the ship’s bridge and control tower) fully retractable to make it flush with the flight deck, this proved far too complicated. Instead, the yard’s engineers decided to design hinges for the radar masts and communications antennae so that they could be folded down, thus lowering the ship’s overall height by more than 60-feet. This ingenious design was then passed along to Newport News Shipbuilding, which was constructing the lead ship of the Forrestal-class, and was then employed on the Brooklyn-built carriers USS Saratoga, Independence and Constellation...”

turnstiletours.com, November 20, 2014

Caption: “Thanks to the shipyard ingenuity the SARATOGA will have no difficulty passing under the Brooklyn Bridge as photo shows...”

152



“...When the Independence sailed under the Brooklyn Bridge for the first time, LIFE magazine reported that there was only seven feet of clearance above the ship, and only five feet between the ship’s keel and the riverbed...”

turnstiletours.com, Nov. 20, 2014

Caption: “The USS Independence, a member of the Forrestal-class, heads up the East River towards the Brooklyn Navy Yard in 1959, dipping her 130-foot mast to clear the Manhattan and Brooklyn bridges down-river”

153



“...While the reasons for the closure of the Brooklyn Navy Yard in 1966 are varied and complex, there’s little doubt that the obstacle posed by the East River bridges at least entered into the Pentagon’s thinking. Vessels still visit the Brooklyn Navy Yard today for repair work at the GMD shipyard (presumably what the ‘Rainbow Quest’ was doing there, though we haven’t been able to confirm this), but GMD also operates the former Bayonne Annex, allowing them to work on ships that cannot fit under the bridge, just as the Navy intended...”

154



“...Today the bridge is much less of an impediment to the Navy or to maritime commerce, as the former has left the harbor entirely, and the latter has largely relocated to facilities on the New Jersey side...”

turnstiletours.com, November 20, 2014

Caption: “Ship passing under the Brooklyn Bridge”

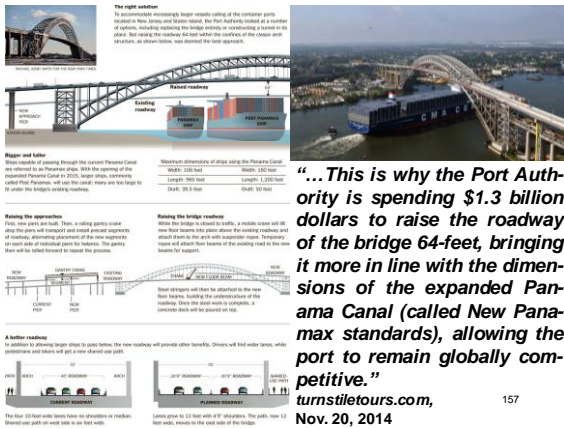
155



“...And on the west side of the harbor, there is a far more important obstacle to consider: the Bayonne Bridge. Standing just 151-feet above the water, this steel arch bridge hinders access to the container ports in Newark Bay. Because it spans one of the busiest shipping lanes in the country, plied by enormous container ships, allisions are far more common (at least 10 since 2002)...”

156

turnstiletours.com, November 20, 2014



“...This is why the Port Authority is spending \$1.3 billion dollars to raise the roadway of the bridge 64-feet, bringing it more in line with the dimensions of the expanded Panama Canal (called New Panama standards), allowing the port to remain globally competitive.”
turnstiletoours.com, Nov. 20, 2014

Part 2

Brooklyn Born

157

158

Sesquicentennial

One-hundred and fifty years ago today the United States Navy stepped out of its swaddling clothes and decided to go into the shipbuilding business
The Brooklyn Daily Eagle, February 23, 1951
 RE: introduction to an article entitled: “Brooklyn Navy Yard Celebrates its 150th Anniversary”

159

160

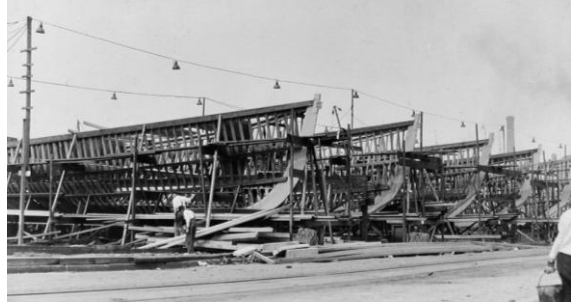
On the Shores of Wallabout Bay

“AFTER looking over various sites for the ‘Cradle of the Navy,’ the U.S. plunked down \$40,000 and took over Brooklynite John Jackson’s 42-acre shipyard on the shores of Wallabout Bay...”
The Brooklyn Daily Eagle, February 23, 1951

161

162

A Vista of Teeming Industry



"If John Jackson, that pioneer resident of Brooklyn could look today upon the twenty-three acres of ground he sold to the United States Government in 1801 for \$40,000, for the purpose of establishing the Brooklyn Navy Yard, what a vista of teeming industry and bustling humanity would greet his eye..."
The Brooklyn Daily Eagle, December 15, 1918
Caption: "SC-1-class submarine chasers being built at the Brooklyn Navy Yard in 1917"

163

164



165



166

Walloon's Cove

"...Brodhead makes a curious mistake in speaking of the distribution of the colonists. He says: 'Another portion of the colonists, who came out in the *New Netherland*, consisting chiefly of Walloons, soon settled themselves at a 'bogh't' or small bay on the west shore of Long Island, nearly opposite to Nechtank or Corker's Hook on Manhattan. This settlement, which was just north of Marech-kawiek or Brooklyn, before long became familiarly known as the Waalboght, or Walloon's Cove. The colonists thrrove apace. Other immigrants followed the first adventurers from Holland; and here, in the month of June, 1625, Sarah Rapelje was born, the first ascertained offspring of European parentage in the province of New Netherland. These early colonists are not to be confounded with the Waldenses, who subsequently emigrated from Amsterdam. The descendants of the Walloons soon spread themselves over the country in the vicinity of the 'Waalboght'; and the names of many of the most respectable families on Long Island to this day attest their French and Belgian origin.' There is, however, no documentary evidence that either the Walloons or any other colonists settled at the Waalboght as early as 1623..."
RE: excerpt from *Manhattan in 1628* (1904), by *Jonas Michaelius*

167

168

"...Several years later Walloons, as well as Dutch, settled there, but there is no reason to believe that the name was derived from the Walloons, or *Waelen* [*Walen*] as they are called in Dutch. Mr. Brodhead was evidently led into the error by the name given to this *Waalboght* (Wallabout). The name meant an inner bay. The matter has been explained by the Hon. Theodore M. Banta, in a chapter headed 'Who founded New York?' in the *Year Book of the Holland Society of New York* for 1895. On page 125 he says: 'While 'Waal' is Dutch for Walloon, it had for centuries been used to designate that arm of the Rhine which flows through the Netherlands between the Rhine and the Maas - an inner water; and the dictionaries give, as the primary signification of the word, 'an inner harbor.' It would seem most likely, therefore, that the term was applied to that little bay on the Brooklyn shore because it was an 'inner harbor' rather than because of the proximity of the Walloons whose presence is assumed to account for the name. It was for a long time believed that Sarah Rapelye was born at the Wallabout, and the supposition that the Walloons were there as early as 1625 helped to foster the idea of this origin of the name; but it is now known that her parents did not remove to Long Island till 'many years' after her birth..."

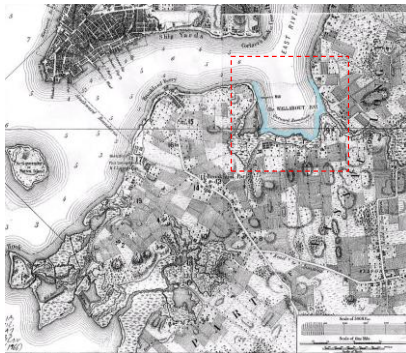
RE: excerpt from *Manhattan in 1628* (1904), by *Jonas Michaelius*

169

WALLABOUT BAY and the FARMING COMMUNITY in 1766



170



Wallabout Bay is the southerly lobe of water outlined in light blue in the upper right hand quadrant of this 1766 "Ratzer Map" of Brooklyn

171



"...The land which John Jackson sold to the early Government was largely a waste of mud flats and creeks, and Wallabout Bay, where the site was selected, was a quiet and unassuming inlet that had hitherto attracted no attention from shipping men of the day. It was 1827 before the first attempt was made to enclose the property..."

The Brooklyn Daily Eagle,
December 15, 1918

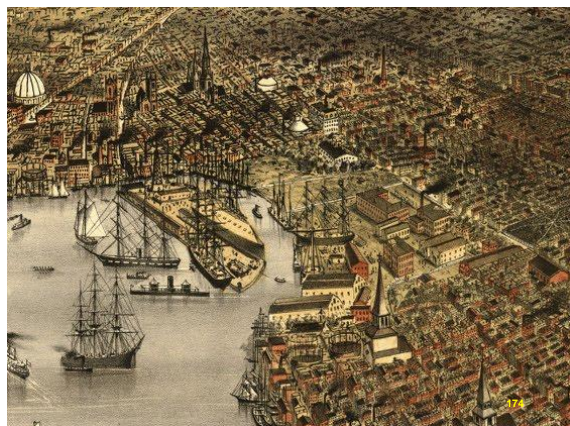
Left: caption: "This map was surveyed by Charles Loss in 1810 and shows the newly created Navy Yard. The map also features marshlands and areas bare at low water."

172

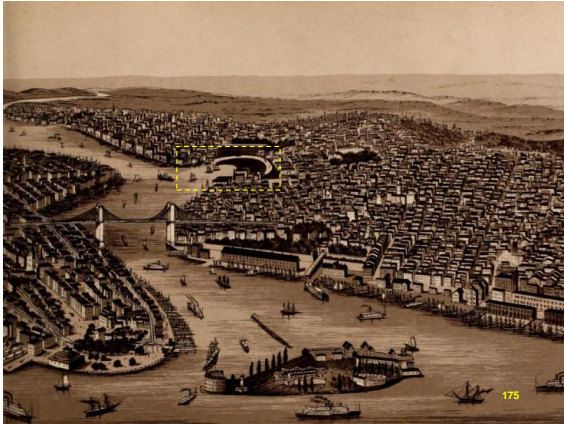


Caption: "Detail of the Navy Yard from Hooker's map of the village of Brooklyn in 1827. Note the development of the area as compared to the previous map, specifically, the construction of the Navy Hospital and the U.S. Powder Houses."

173



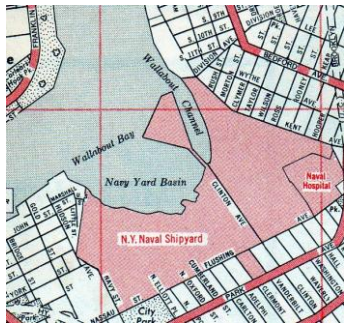
174



“...This backwater is called Wallabout Bay on charts; the men on the dredges call it Potter’s Field. The eddy sweeps driftwood into the backwater. Also, it sweeps drowned bodies into there. As a rule, people that drown in the harbor in winter stay down until spring. When the water begins to get warm, gas forms in them and that makes them buoyant and they rise to the surface. Every year, without fail, on or about the fifteenth of April, bodies start showing up, and more of them show up in Potter’s Field than any other place. In a couple of weeks or so, the Harbor Police always finds ten to two dozen over there – suicides, bastard babies, old barge captains that lost their balance out on a sleety night attending to tow-ropes, now and then some gangster or other. The police launch that runs out of Pier A on the Battery – Launch One – goes over and takes them out of the water with a kind of dip-net contraption that the Police Department blacksmith made out of tire chains...”

RE: excerpt from writer Joseph Mitchell’s article entitled: “The Bottom of the Harbor,” published in *The New Yorker* in 1951. The bay was nicknamed “Potter’s Field” among sailors in the 19th and 20th century/s because so many dead bodies would float into the bay during slack tide. The bay eventually became the site of the *Brooklyn Navy Yard* (parts of the bay were filled in to expand the yard). In the late 19th century, fill created a small island (as depicted in the *Taylor Map of New York*) and later fill joined it to the mainland.

176



A Thousand Fold

177

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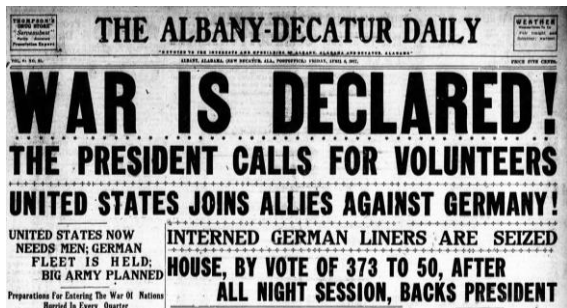
“...The original twenty-three acres have expanded into more than 197 acres and now, in the last few days word has come from Washington that Secretary Daniels in his report has advocated a further enlargement, and the Government’s original \$40,000 investment has grown into one conservatively estimated at over \$40,000,000...”

The Brooklyn Daily Eagle, December 15, 1918

Five Wars Later

179

180



“...When grim, red, stark, ominous war has rolled down upon the country – then the Brooklyn Navy Yard has leaped forward with boundless energy, and since the day when the United States declared a State-of-War existed with Imperial Germany this energy has in truth been unconfined...”
 The Brooklyn Daily Eagle, December 15, 1918
 Caption: “The Albany-Decatur Daily, April 6, 1917”

181

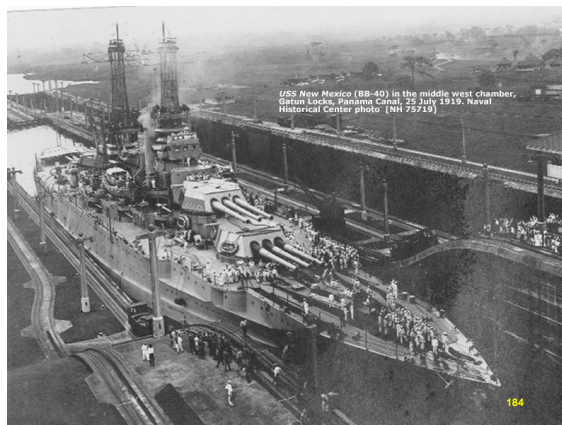
182

“...This development and improvement which is still to be continued even now that the piping times of peace are fast approaching, combined with its unparalleled usefulness and its demonstration of worth and efficiency during the conflict, have undoubtedly stilled for all time those small and narrow voices which were occasionally heard under the dome of the capitol in Washington crying for the yard’s abolition...”
 The Brooklyn Daily Eagle, December 15, 1918



“...Up to the time the war broke out almost one-hundred vessels had been built there or were under construction and these included the first steam frigate the ‘Fulton,’ built there in 1815, to the mammoth electrically driven super-dreadnaught New Mexico, on the ways when war was declared...”
 The Brooklyn Daily Eagle, Dec. 15, 1918
 Caption: “A view of the giant bow of the New Mexico, just as the huge warship was released and started to slide down the ways at the Brooklyn Navy Yard. The inset is a photograph of Miss Margaret De Baca, daughter of the late governor of New Mexico, who sponsored the vessel. The spectators were confined to officials and the party of 300 which accompanied the governor of New Mexico.”

183

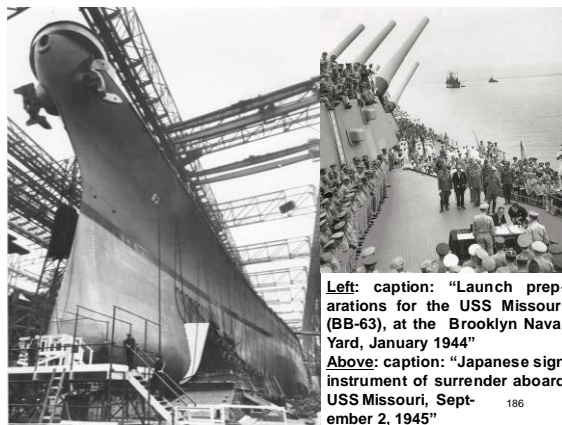


184



“...Today, five wars later, the 42 acres have grown to more than 288, and the Brooklyn Navy Yard, celebrating its sesquicentennial, is one of the world’s finest and largest shipyards...”
 The Brooklyn Daily Eagle, February 23, 1951
 Caption (L&R): “As it appeared in 1851, left, and, at right, as it may be seen in one of its many aspects today. Established Feb. 23, 1801, on a 42-acre plot which had a sail loft as its major facility, the yard has now expanded to a size that encompasses 300 concrete and steel buildings, seven docks and two huge building ways, connected by more than 30 miles of narrow and standard-gauge railway lines. Largest constructed, by displacement, was the U.S.S. Missouri, now in Korean waters.”

185



Left: caption: “Launch preparations for the USS Missouri (BB-63), at the Brooklyn Naval Yard, January 1944”
 Above: caption: “Japanese sign instrument of surrender aboard USS Missouri, September 2, 1945”

186

WAR COMES TO END

ABOARD THE U. S. S. MISSOURI in Tokyo Bay, Sunday, Sept. 2—Japan surrendered formally and unconditionally to the Allies today in a twenty-minute ceremony which ended just as the sun burst through low-hanging clouds as a shining symbol to a ravaged world now done with war.

[A United Press dispatch said the leading Japanese delegates signed the articles at 9:03 A. M. Sunday, Tokyo time, and that General MacArthur signed them at 9:07 A. M.]

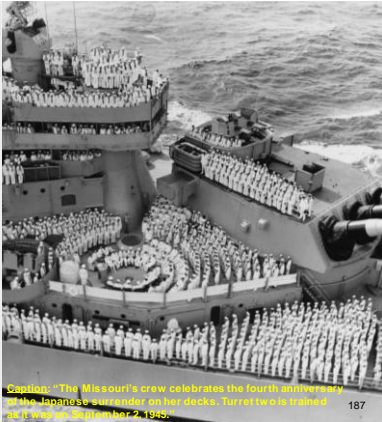
Twelve signatures, requiring only a few minutes to inscribe on the articles of surrender, ended the bloody Pacific conflict.

On behalf of Emperor Hirohito, Foreign Minister Mamoru Shigemitsu signed for the Government and Gen. Yoshijiro Umezu for the Imperial General Staff.

MacArthur Votes Peace Hope

Gen. Douglas MacArthur then accepted in behalf of the United Nations, declaring:

"It is my earnest hope and indeed the hope of all mankind that from this solemn occasion a better world shall emerge out of the blood and carnage of the past."



Caption: "The Missouri's crew celebrates the fourth anniversary of the Japanese surrender in 1945. Part of crew is shown in the photo, September 2, 1945." 187



Caption: "The battleship U.S.S. Missouri bombs Chong Ji, Korea, with 16-inch guns in October 1950" 188



189

An Even Tenor

190



"...Its development has been consistent, if not always continuous, and with the exception of those sporadic occasions when someone advocated the abandonment of the yard it has wended the even tenor of its way..."
The Brooklyn Daily Eagle,
 December 15, 1918 191



192

Even Better

Improvements to be made at Brooklyn Navy Yard

The Brooklyn Daily Eagle, December 9, 1918
RE: introduction to an article entitled: "Navy Yard Will Build Bigger Ships, says Sec'y. Daniels"

193

194

Lebensraum

"Washington, December 9 - 'More land must be acquired for the Brooklyn Navy Yard.' Secretary of the Navy Daniels, in his report to the President, declares that it is imperative that the Brooklyn Navy Yard be enlarged and that Congress should, as soon as possible, authorize the purchase of the property west of the present yard..."

The Brooklyn Daily Eagle, December 9, 1918

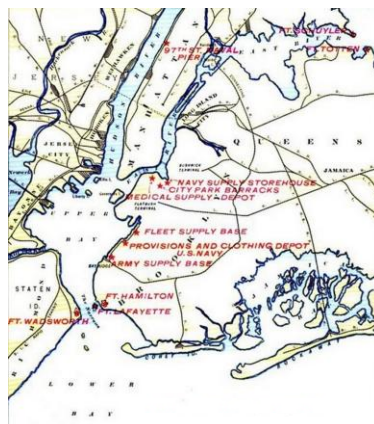
195

196

"...The Brooklyn Navy Yard,' says the Secretary, 'is badly cramped on account of lack of space, and if this is to continue to be one of the large repair and shipbuilding yards of our Navy more land must be acquired. After careful consideration it has been determined that the yard should be expanded to the westward to include all land and waterfront as far as Hudson Ave. Congress has been asked for authority to purchase this land, and it should be acquired at the earliest opportunity in order that the simultaneous construction of two battleships may be proceeded with expeditiously and economically. Every expedient has been resorted to in order to move from the yard non-essential activities in order that there may be more room for those that are necessary'..."

The Brooklyn Daily Eagle, December 9, 1918

197



"...The marine barracks and the clothing factory have been removed, and a large part of the stores which were originally carried there have been taken to the supply base at South Brooklyn; but even these expedients have failed to provide the necessary space, and the additional land referred to above is deemed necessary for expansion and development'..."

The Brooklyn Daily Eagle, December 9, 1918
Caption: "Map showing auxiliary naval facilities in the vicinity of Brooklyn"

198

“...With the signing of the Armistice and the practical ending of the war, it is the hope of Secretary Daniels that more speed can be made toward the completion of the improvements under way at the Brooklyn and other Navy Yards. Secretary Daniels wants the improvements at Brooklyn completed during this coming year...”

The Brooklyn Daily Eagle, December 9, 1918

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“...One of the important improvements he speaks of is the lengthening of the present building ways in order that the yard may be able to construct future capital ships, the sizes of which have been increased on the dreadnaughts which have been built by the Brooklyn Navy Yard during recent years. ‘The Navy’s policy is that in its own plants it should be able to construct every type of ship and every character of munition required,’ declares the Secretary, in dealing with the building of ships in Navy Yards. ‘Until recently at only one Navy Yard – Brooklyn – could the Navy build a dreadnaught, and the increased size of these capital ships has made it necessary to lengthen the ways there and to add facilities for such construction’...”

The Brooklyn Daily Eagle, December 9, 1918

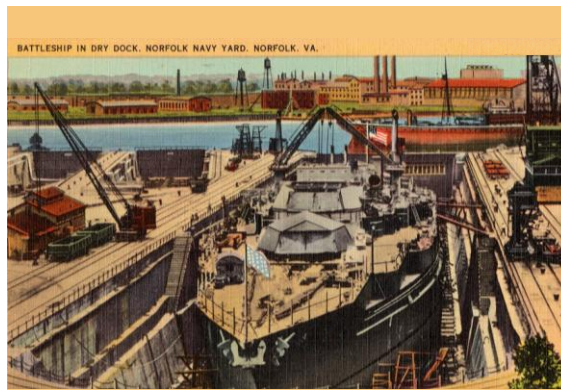
200



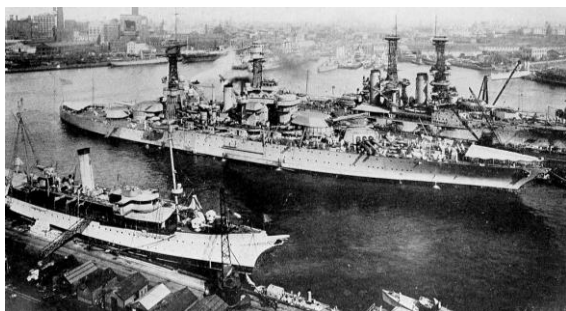
“...Three Navy Yards, at Brooklyn, Philadelphia and Norfolk, on the Atlantic Coast; and one, Mare Island, on the Pacific Coast, are being made ready to build battle cruisers and dreadnaughts...”

The Brooklyn Daily Eagle, December 9, 1918

201
Caption: “An aerial view of the battleship USS IOWA (BB-61) in dry dock No. 4 at the Norfolk Naval Shipyard”



202
Above: this pre-WWI postcard shows use of a dry dock at Norfolk Naval Shipyard for capital ship repair/construction



“...As soon as the Brooklyn Yard completes construction of the battleship Tennessee so that it may be launched, Secretary Daniels will authorize the immediate construction of two additional battleships...”

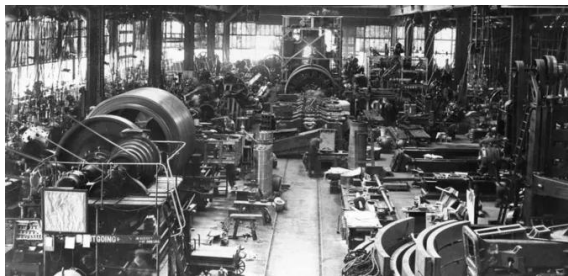
The Brooklyn Daily Eagle, December 9, 1918

203
RE: damaged in the Pearl Harbor attack, USS TENNESSEE was repaired and modernized and saw extensive action in the Pacific theater-of-operations during WWII
Caption: “Tennessee in the Brooklyn Navy Yard in 1921”



204
USS Tennessee bombarding Okinawa

204



"...In speaking of the improvements made at the Brooklyn Yard during the last fiscal year which ended on July 1, Secretary Daniels says: 'A second set of shipbuilding ways has been constructed; a large structural shop, 2,008-feet by 576-feet, will soon be completed; an extension of the present machine shop has been completed'..."

The Brooklyn Daily Eagle, December 9, 1918

Above: Building 128 was built in 1904 as a shipbuilding machine shop. 205 It was extended as part of the Secretary Daniels' expansion program.



206

"...The plan submitted to Congress by Secretary Daniels contemplates the purchase of the ground adjoining the present boundaries of the Navy Yard on the west. This does not include \$3,000,000 which the Department has already authorized for improvements in the yard. Just a year ago \$10,000,000 was authorized for work at Navy Yards and Brooklyn is to receive almost one-third of this huge amount, which should indicate the high opinion of the value of the yard to the Navy which the experts of the Department hold..."

The Brooklyn Daily Eagle, December 15, 1918

207



"...The most important improvement now under contemplation is the enlargement of the building ways upon which the dreadnaught 'Tennessee' is being constructed. This vessel is expected to be launched early in the spring. Until that time the ways will stay as they are. New ways, authorized some time ago, have been under construction for some time, but owing to the press of other work not much progress has actually been made. A new six-story machine shop to cost \$9,000,000 has been ordered and the power plant is to be enlarged..."

The Brooklyn Daily Eagle, December 15, 1918

208
Caption: "Vinegar Hill power plant, at the western-end of the Brooklyn Navy Yard"

Dodging the Bullet

"...This has not always been the case, however, and several times efforts have been made to abolish the yard altogether. This might seem incomprehensible to the average resident of these parts, but only as late as 1912, during the regime of George von L. Meyer, as Secretary of the Navy, that official made strenuous efforts to close the yard for all time..."

The Brooklyn Daily Eagle, December 15, 1918

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210



"...Meyer was a great champion of a large yard at Guantanamo, Cuba, where it seemed most illogical to locate such a plant in that, in that our communication with it might have been interrupted. The German submarine warfare has doubtless pointed out the danger of such an undertaking, which would be dependent upon ocean carriers for all its supplies..."

The Brooklyn Daily Eagle, December 15, 1918
 Left: WWI USN recruitment poster showing the ravages of unrestricted submarine warfare conducted by Germany

211



212

"...Meyer contemplated having yards only at Guantanamo, Norfolk, and Narragansett Pier, R.I. At that time the Secretary had several conferences with then Mayor Gaynor, to whom he proposed selling the site of the Navy Yard to the City of New York. It was the argument of Mr. Meyer that the yard could not be expanded cheaply and just because he could not acquire more ground at a low price he proposed abandoning the whole investment of the Government, worth millions upon millions of dollars. Naturally such a proposition failed for lack of merit. It is not believed it will ever be revived..."

The Brooklyn Daily Eagle, December 15, 1918

213

Celebration

214

"...Mushrooming expansion of the activities of the borough yard, which has been designated the top base for the recommissioning of aircraft carriers, is holding the anniversary celebration to a minimum. Three carriers, the Tarawa, Wasp and Bennington, are now being whipped into shape..."

The Brooklyn Daily Eagle, February 23, 1951



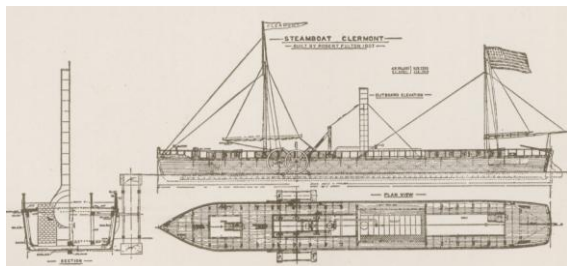
215

216

“...At the 106th Infantry Armory, Bedford and Atlantic Aves., tonight the 14,000 civilian employees of the Brooklyn Navy Yard will be joined by civic, industrial and political leaders at an anniversary dance. Rear Admiral Paul B. Nibecker, commander of the installation, will speak and a plaque depicting the history of the yard will be revealed...”

The Brooklyn Daily Eagle, February 23, 1951

217



“...The Brooklyn Navy Yard came into its own during the War of 1812, when it fitted out more than 100 vessels. Three years later the 2,000-ton steamship ‘Clermont,’ designed by Robert Fulton and the first steamship built by any nation, was built at the yard...”

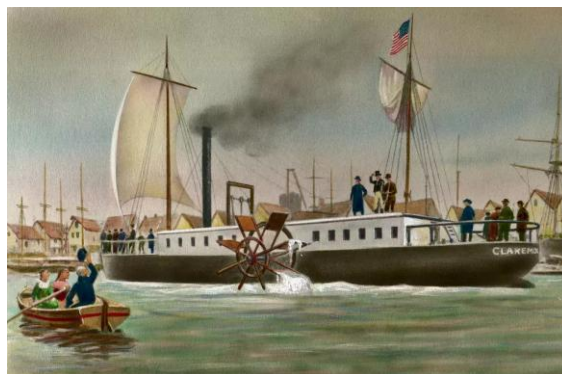
The Brooklyn Daily Eagle, February 23, 1951

Caption: “The Steamboat *Clermont*, built by Robert Fulton in 1807”

219

Coming Into its Own

218



Caption: “*Clermont*, the first steam ship, designed by Robert Fulton, 1807”

220

A Splendid Ship

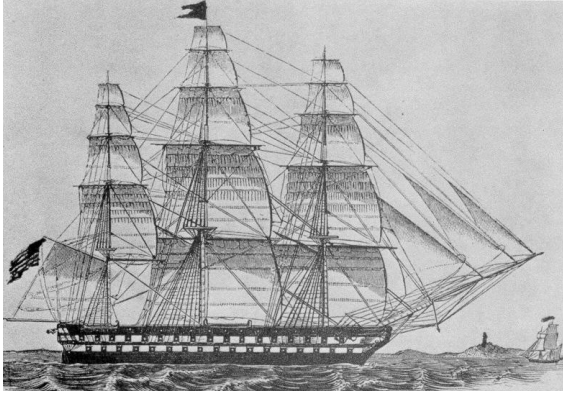
“...In 1820, the 74-gun frigate ‘Ohio,’ first naval vessel built in Brooklyn, was launched...”

The Brooklyn Daily Eagle, February 23, 1951

RE: the U.S.S. *Ohio* was the first launched of a new class of *Ship-of-the-Line* designed by naval constructor *William Doughty*. She was one of nine ships to rate not less than 74-guns each, authorized by *Congress* on April 29, 1816. Her keel was laid in November 1817 and she was launched at the *Brooklyn Navy Yard* on May 30, 1820. “A more splendid ship I never beheld,” said an English naval officer who visited *Ohio* in 1826. However, she was not completely fitted-out until 1837, when she was transferred to the *Boston Navy Yard*. She was commissioned on October 11, 1838 and sailed back to Brooklyn on October 17, 1838 to be armed. *Ohio* was built by naval constructor *Henry Eckford*. She was nearly identical to her sister ships of the *North Carolina-class*: *Alabama* (renamed *New Hampshire*); *Delaware*, *New York*, *North Carolina*, *Vermont* and *Virginia*. *Ohio* was a handsome ship and it was said of her that she handled like a frigate, so splendid were her sailing qualities. The flagship of *Commodore Isaac Hull*, *Ohio* departed Brooklyn on December 6, 1838. Under the command of *Captain Joseph Smith*, she made passage through rough seas to Gibraltar in just 21 days with an average speed of about 12 knots.

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Ship-of-the-Line USS Ohio

223

224

Setting the Town on End

One of the earliest ships built at the Brooklyn Navy Yard was the battleship Ohio, 186-foot-long “with 2,500 tons burthen”

The Brooklyn Daily Eagle, December 9, 1940

RE: introduction to an article entitled: “Launching of Ohio at Brooklyn Navy Yard Set the Town on End, ‘Way Back in 1820’”

225

A Tavern With a View

“BACK in 1820 there was a mist convenient grog house on the hill in the rear of Little St. where village leaders could play shuffle board undisturbed on the second floor. But the second story windows looked right out on the scene of the building of the then huge ship and the men used to stand for hours looking out, fascinated, instead of playing...”

The Brooklyn Daily Eagle, December 9, 1940

227

“...On May 24, the tavern proprietor inserted an alluring advertisement in the paper. It read:

“The subscriber most respectfully informs his friends and particularly the citizens of Brooklyn that he has made arrangements to accommodate a select number of ladies and gentlemen on the top of his house at the launching of that splendid ship now on the stocks of the Navy Yard. He presumes to say that there is no house in the vicinity that affords so good a prospect as his; he has opened a subscription list, and respectfully suggest to those who intend honoring him with their patronage to call immediately and get their tickets, as he understands the launch will take place in a few days. Those who apply first will have the preference of seats. Tickets, 50 cents, to be had at the bar.

“The subscriber with confidence assets his Liquors and refreshments are not inferior to any in the United States. He also has prepared Salvages, Confectionery and other Nick Nacks for the occasion and hopes all who purchase will find them palatable. With the renewed assurance that it is his most positive determination to spare neither pains nor expense to accommodate all who visit his house to the fullest extent, he subscribes himself the public’s most humble servant.

THOMAS WARD”

The Brooklyn Daily Eagle, December 9, 1940

228

A Jubilee De Luxe

"...The 'Ohio' 'was launched into its destined element,' as the newspaper put it, on May 29. Salutes were fired from sloops of war in the harbor and detachments of artillery stationed on the shore. Steamboats, team ferry boats, schooners, sloops and smaller craft were crowded with hysterical spectators, as were the adjacent New York, Brooklyn and Bushwick shores. A recorder estimated 100,000 people present at the launching. One reporter, overwhelmed by the magnificence of the celebration wrote: 'The tout ensemble of the scene was superb – almost beyond description.' For all Brooklyn the day was jubilee de luxe..."

The Brooklyn Daily Eagle, December 9, 1940

229

230

Sleeping on the Job

"...It was for the whole countryside, except for two gentlemen from Suffolk. These two walked all night long along the rough country roads, so that they might tell their grandchildren that they were present at the launching of the great battleship 'Ohio'..."

The Brooklyn Daily Eagle, December 9, 1940

231

232

"...They made good time. Mile-after-mile, they trudged through the dark, making the village shortly after sunrise. There wasn't anything doing yet. It was too early and they were plain tuckered out. No reason in the world why they shouldn't catch themselves 40 winks under that big tree. Stretched out on the soft grass, they slept..."

The Brooklyn Daily Eagle, December 9, 1940

"...Later they awoke with a start. They thought they heard cannon booming. They did. The unfortunate wretches realized that the celebration must be more than half over. They had missed the launching..."

The Brooklyn Daily Eagle, December 9, 1940

233

234

"...As you may have guessed, the Star published an account of their plight the following week. And, although the article was sympathetic, we doubt if the gentlemen who had hiked that long hike found much consolation in it."
The Brooklyn Daily Eagle, December 9, 1940

Trophy Park

235

236

"...When, on October 25, 1812, Decatur, with the frigate 'United States' defeated the British frigate 'Macedonian,' the latter ship was brought to New York, and refitted as an American Man-of-War. Her guns were taken to the Brooklyn Navy Yard, and there the 32-pound cannonades still are. They are placed in a little triangular green called 'Trophy Park.' Here is all that is left of what was once the finest naval museum in the country..."
The Illustrated Buffalo Express, June 6, 1897



"...In the center of the park is a marble column commemorating the deeds of twelve American seamen who fell at the capture of the Barrier forts on the Canton River, China, in 1856. It was erected by their ship-mates of the 'San Jacinto,' 'Portsmouth' and 'Levant.' Side-by-side with the Macedonian's guns is the iron prow of the Confederate ram, 'Mississippi.' The museum was sent to the Naval Academy in 1890..."
The Illustrated Buffalo Express, June 6, 1897
Caption: "Monument to the Officers and Marines who fell at Barrier Forts, Canton R. China"

237

238

War Footing



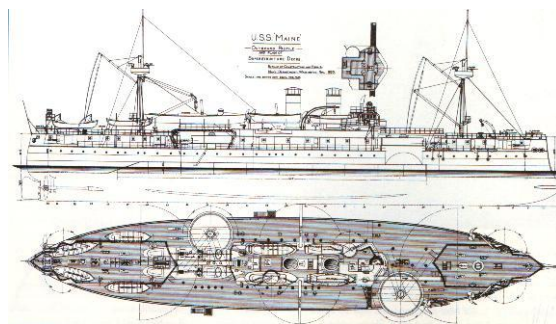
"...Reverting to the construction record of the yard, it may be interesting to recall that the 'San Jacinto,' which was built here, was the ship that stopped the British 'Trent' on the high seas in 1861 and took from her the Confederate Commissioners Mason and Slidell, who were on a mission to England for the Confederate Government. This nearly precipitated a war between the Union and Great Britain..."
The Brooklyn Daily Eagle, Dec. 15, 1918
RE: Mason and Slidell were heading to Europe to arbitrate agreements in support of the Confederate war effort. The USS San Jacinto intercepted the two on board the British mail steamer Trent, taking Mason, Slidell and their secretaries back to Boston. The seizure of diplomats aboard a neutral ship - a violation of international law - nearly started a war between the U.S. and Great Britain. After an apology by Secretary of State William H. Seward, Mason and Slidell were released two months later, in Jan. 1862.
Caption: "USS San Jacinto stops the RMS Trent"

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240

"...The 'Iroquois' was the last vessel built at the yard before the Civil War and fought gallantly under Admiral Farragut at New Orleans and Vicksburg. The 'Madawaska,' later renamed the 'Florida,' was built there. She won fame in the war with Mexico in 1849 and the 'Savannah,' which was the flagship of the squadron which captured Monterey, Cal., July 6, 1846, was also constructed there. The Sloops-of-War 'Vincennes' and 'Peacock,' both of whom participated in the Wilkes Antarctic expedition, also came from these ways."
The Brooklyn Daily Eagle, Dec. 15, 1918

241



"...Sixteen fighting vessels were built and 416 other ships were fitted-out at the yard during the Civil War, when Brooklyn became practically the headquarters of naval supply and construction. New impetus was given by the Spanish-American War precipitated by the sinking of the 'Maine,' another 'Brooklyn-born' ship..."
The Brooklyn Daily Eagle, February 23, 1951
 Caption: "Floor deck plan of the Maine, showing its turret placement"

242



243



244

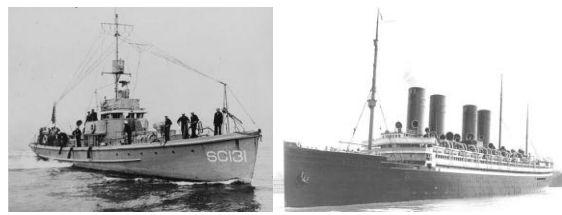


Left T&B: Top - the Battleship Maine Memorial (Everhart Museum in background) in Scranton, Penn. It was erected in 1918. Bottom - inscription on brass plaque reads:



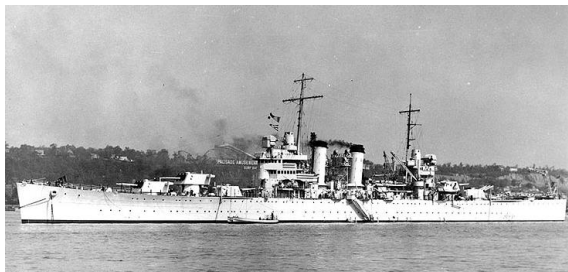
This ten inch shell and bronze port cover recovered from the wreck of **The Battleship Maine** after having been submerged fourteen years in the waters of Havana harbor are here mounted as a memorial to the brave officers and seamen who lost their lives on the night of February 15, 1898 as they slept awaiting the call-to-duty Presented by the U.S. Government to the Admiral Dahlgren Section Navy League U S Dedicated to the City of Scranton on Memorial Day 1918

245



"...In World War I, the U-boat menace was answered by 40 submarine chasers built in a short time in the borough yard, while many of the 18,000 workers concentrated on reconditioning many German ships seized from the enemy..."
The Brooklyn Daily Eagle, February 23, 1951
 Left: caption "USN SC-1 class submarine chasers performed significant services that became an integral part of the Allied effort to win WWI at sea"
 Right: caption: "Captured in New York City on April 6, 1917, the same day as her siblings, *Kaiser Wilhelm II* was renamed *USS Kaiser Wilhelm II* (ID-3004) then *Agamemnon* and became a troop transport. As *Agamemnon*, she made nine voyages between September and August 1919, carrying nearly 42,000 service personnel"

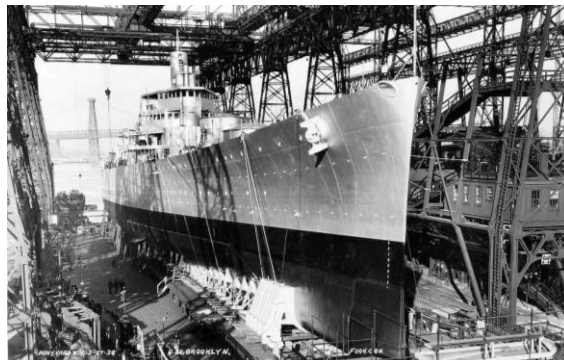
246



"...For a decade after the war no ships were built, but between 1929 and 1936 four cruisers, including the Brooklyn, and several destroyers and Coast Guard cutters sailed out into the East River..."

The Brooklyn Daily Eagle, February 23, 1951

Caption: "The U.S. Navy light cruiser *USS Brooklyn* (CL-40) in the Hudson River, off New York City, in 1939" 247



Caption: "The famous Brooklyn Navy Yard built and repaired some of the world's most renowned military vessels. Above, the *USS Brooklyn* is constructed in the yard in 1936." 248

"...In 1937, the 35,000-ton battleship North Carolina came down the ways..."

The Brooklyn Daily Eagle, February 23, 1951

RE: the *North Carolina*-class battleships were superior to their contemporaries in their anti-aircraft armament as well as their electronics, radar and fire direction suites which were all continuously upgraded throughout WWII. The construction of the ships was slow due to material shortages. A design change to 16-inch guns not only increased the duration of their construction but also raised their cost from \$50 million to \$60 million each.

249

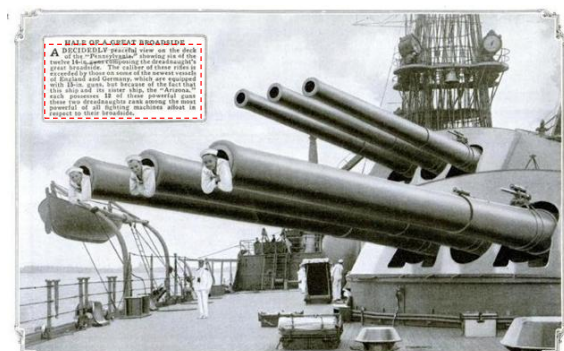


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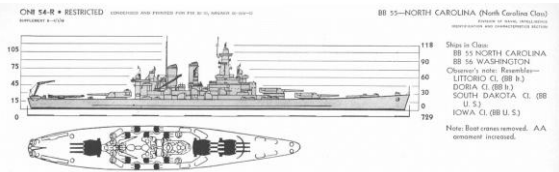
"...And all ships may be classified as either warships or merchant ships. There is no fundamental difference between the two, but the building of large warships is tremendously complicated by the special equipment – armor slabs, Big guns, and power and communication lines – which must be crammed into the hull..."

Popular Science, September 1942

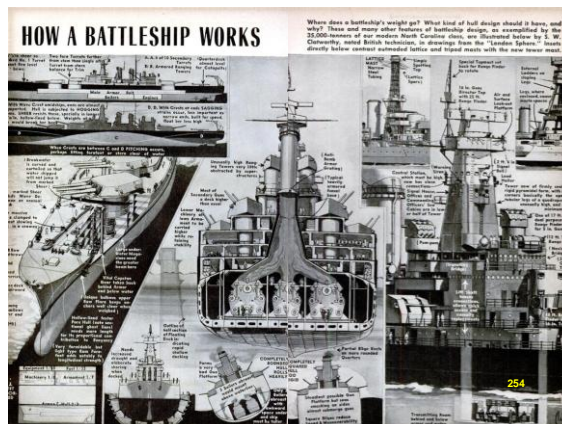
251



A DECIDEDLY peaceful view on the deck of the "Pennsylvania" showing six of the twelve 14-in. guns composing the dreadnaught's great broadside. The caliber of these rifles is exceeded by those on some of the newest vessels of England and Germany, which are equipped with 15-in. guns, but because of the fact the ship and its sister ship, the "Arizona," each possesses 12 of these powerful guns these two dreadnaughts rank among the most powerful of all fighting machines afloat in respect to their broadside. (*Popular Mechanics*, Jan. 1917) 252



In 1944, the USN launched the first *Iowa-class* battleship, which would be the last of the nation's battleships (aircraft carriers replaced battleships, but both were used effectively during WWII). On the home front, the public was curious as to how battleships worked thus, in the October 1943 issue of *Popular Science* magazine an "infographic" of the *North Carolina-class* of battleships was published. The North Carolina-class was primarily armed with three turrets, each containing three 16-inch guns. These guns could fire two explosive or armor-piercing rounds-per-minute at enemies up to 22 miles distant. Despite its mighty guns, the battleship's limitations in the new age of carrier warfare relegated it to a support role (mainly bombardment and/or aerial defense). Large crew sizes (the North Carolina-class typically had a crew of 2,339) was another reason for the battleship's eventual retirement.



Brooklyn Life

It has been a distinct part of Brooklyn life, employing thousands and spending millions
The Brooklyn Daily Eagle, December 9, 1940
 RE: introduction to an article entitled: "For Past Century Our Navy Yard Has Played Mighty Defense Role"

255

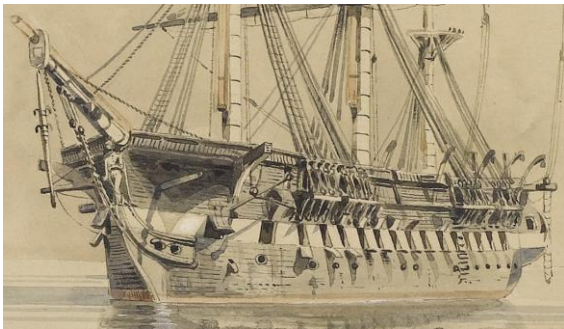
256

Forward-Looking

"WHEN our forward-looking government took over a quiet, unassuming inlet on 'Wahl Boght' Bay, almost a century and-a-half ago, it looked like they had mostly a waste of mud flats and creeks on their hands. Of course, John Jachom (we know him better as John Jackson), from whom they bought it, for \$40,000, did have a little old ship building concern going already on it..."
The Brooklyn Daily Eagle, December 9, 1940

257

258



"...He mostly fitted-out American merchant ships, and in 1797 he was commissioned by the government to build the frigate 'Adams'..."

The Brooklyn Daily Eagle, December 9, 1940

RE: the USS Adams was a 28-gun sailing frigate of the USN. She was laid-down

in 1797 by John Jackson and William Sheffield and launched on June 8, 1799.

259
Caption: "The Frigate John Adams, 1799-1829"

Commandant

"...Come 1801, the government decided to acquire Jackson's holdings outright, his whole 23 acres, so they bought it and took full possession. More acres were bought up later on and today the New York Navy Yard's land and buildings in Brooklyn are worth millions of dollars..."

The Brooklyn Daily Eagle, December 9, 1940

RE: in 1801, the USN took over an existing yard at Norfolk, Va., which had originally been built by the British prior to the Revolution and was subsequently leased to the Federal Government by the Commonwealth of Virginia. The Philadelphia Navy Yard, also created in 1801, was moved in 1875 from its original site, in southeast Philadelphia, to the present League Island site, which had been acquired and developed during the four preceding years. In 1854, the Navy Yard, Mare Island, Calif., was established to provide support for the naval defense of the Pacific coast. In 1891, a second Pacific coast yard was established at Bremerton, on Puget Sound, Wash., (designated "Navy Yard, Puget Sound"). In 1901, a new Navy Yard was established at Charleston, S.C., replacing an earlier yard at Port Royal, S.C. The Navy Yard, Washington, D.C., which had been one of the four original yards created in 1800, had subsequently become primarily a naval gun factory and performed the functions of ship-building/repair only to a minor degree. 260

"...Almost in an unbroken line the commandants of the Navy Yard have been famous sea fighters, and both Lt. Jonathan Thorne, its first commandant, and Rear Admiral Nathaniel R. Usher, its present commandant, have especially brilliant records as executives in addition to their reputations as Men-o-Wars-men..."

The Brooklyn Daily Eagle, December 15, 1918

261

262

"...Lt. Jonathan Thorn took charge as commandant June 1, 1806, the day the Navy Yard was opened. And from that time on there has been an almost unbroken line of commandants famous as sea fighters, with brilliant records as executives in addition..."

The Brooklyn Daily Eagle, December 9, 1940

"...Commandant Thorn himself met an untimely and cruel death in 1810. He went on a peace-time voyage on his ship 'Tonquin,' which John Jacob Astor had outfitted, up along the northwestern coast of America. While the boat was lying at anchor in the harbor savages swarmed aboard and clubbed the gallant captain to death. Washington Irving has written the story of this tragic voyage..."

The Brooklyn Daily Eagle, December 9, 1940

RE: Captain Thorn, trading for the first time with Indians, lost patience and ended an attempt to bargain with an important chief by "rubbing his face with the skins that the latter had brought to trade, thus insulting him mightily and causing him to swear vengeance." After lulling their intended victims by peaceful behavior, Indians carrying concealed weapons boarded the *Tonquin* and seized the ship. The next day, when the native Indians swarmed on board seeking plunder, the ship blew-up, killing or maiming many. Some accounts claim that a wounded crew member, who had managed to remain hidden, avenged his comrades in this way. The only survivor of the entire incident was the interpreter; *George Ramsay*, son of an English sailor and an Indian mother. *Washington Irving*, who remembered Thorn, "in early life, as a companion in pleasant scenes and joyous hours," characterized him in *Astoria, or Anecdotes of an Enterprise Beyond the Rocky Mountains*, as, "an honest, straightforward, but somewhat dry and dictatorial commander, who, having been nurtured in the system and discipline of a Ship-of-War... was disposed to be absolute lord and master on board of his ship." A strict disciplinarian, Thorn was suited neither by temperament nor by experience to command such an expedition. 264

263

264



LIEUTENANT JONATHAN THORN, USN
(1779-1811)

265

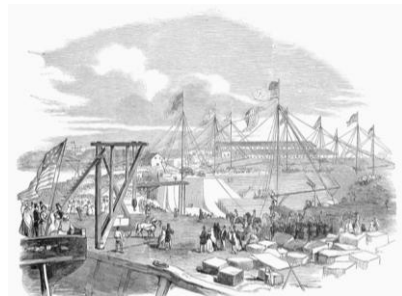
Draining the Swamp

266

"...When the Navy started to build the first dry dock in 1841 the swamps all over the place presented a terrific problem. But build it they did and, when it was finished, after 10 years' hard labor, it was considered one of the most remarkable civil and mechanical engineering accomplishments in the entire country..."

The Brooklyn Daily Eagle, December 9, 1940

RE: the site was first surveyed in 1826, with construction beginning in 1841. It was completed in 1851 at a cost of \$2,146,255.36. Though modest in size by today's standards, at the time it was a major engineering triumph.



The Dry Dock Works, United States Navy Yard, New York

267

268



269

Granite Dock No.1

270

“...They had built a main chamber 286-feet in length, 35-feet-wide at the bottom – and the upper part was 370-feet-long by 98-feet-broad. They had built granite walls (granite, mind you, not cement or concrete), 36-feet-deep and the piles on which the masonry of the foundation was set were driven 40-feet into the earth. Much of this earth turned out to be quicksand and caused no end of trouble later. However, they always managed to repair the damage...”

The Brooklyn Daily Eagle, December 9, 1940

RE: Dry Dock No. 1 was constructed from 23K cubic-yards of hand-cut and hand-sanded blocks of granite excavated from quarries in Connecticut, Maine, Staten Island and upstate New York. Over the 20 years it took to construct, the project ran through three Chief Engineers and had to contend with a variety of setbacks, including 75-foot-deep quicksand, underground springs and a faulty dam design which flooded the worksite.

271

272

“...Some say they drove 7,000 piles to support the masonry – some say 9,000. Anyway, this job alone took a year, then the space within was filled with concrete to a depth of two-feet. That, you might say, was only the beginning...”

The Brooklyn Daily Eagle, December 9, 1940

“...Next came ‘courses of timber and concrete, surmounted by flagging and cut granite,’ which formed the floor of this engineering marvel of its day. With the crude appliances then available it required over four-and-a-half hours to pump it out. The dock was known as ‘Granite Dock No. 1’...”

The Brooklyn Daily Eagle, December 9, 1940

“Fashioned entirely from massive, hand-cut and hand-sanded blocks of granite excavated from a quarries in Maine, Connecticut, Staten Island and upstate New York, its size, form, and general aesthetic bring to mind a Roman ruin”

Brendan Coburn, Architect

RE: finished in 1851, it took 20 years to complete *Granite Dock No. 1*. It is the third oldest dry dock in the U.S. The first dry dock in the U.S. was started in June 1827 at the *Charlestown Navy Yard*. It was built of Quincy granite and cost \$972,000. Prior to its completion in March 1834, the frigate *USS Constitution* was docked on June 24, 1833. Enlarged once, the dry dock is still in use. Ships that were built in the Brooklyn Navy Yard's Granite Dock No. 1 during the 19th century include the *Niagara* (1867) - the ship that laid the first successful transatlantic cable, *Halstead's Folly* or *The Intelligent Whale* (1872) - the prototype of the first submarines ever built and the battleship *USS Maine* (1897), which sparked the *Spanish-American War* in 1898 when it exploded in *Havana Harbor*. The dock was declared a NYC Landmark in 1975.

273

274



275



276



Presently, there are six dry docks in the Brooklyn Navy Yard that allow for ship maintenance and repair. Ships enter these rectangular basins when the water level is full (above). A large door (a/k/a "Caisson") on the front of the basin (upper left) can be closed after a ship enters and pumps remove the water, rendering the sunken dock dry (lower left). 277

"...In its construction many of the engineering methods employed were 'firsts.' For example, it was the first very big job on which a pile driver operated by steam was used. And it was on this work the value of heavy hammers was demonstrated satisfactorily, it being found that the best work could be done with a hammer-weight of from 4,000 to 4,500 pounds..."

The Brooklyn Daily Eagle, December 9, 1940

278

"...This dock had the first set of iron turning gates ever constructed, and also the first pontoon, or floating vessel, wholly made of iron, ever built in this country. The floating gate was 68-feet-long, 16-feet-beam and the weight, exclusive of ballast, was 217 tons..."

The Brooklyn Daily Eagle, December 9, 1940

279

"...The largest pumping engine in the country was made for this dock. The engine operated two double-acting vertical pumps. This use of the double-acting pumps was almost the first departure from the English practice of single-acting pumps in connection with the Corliss engines. The independent steam pump used at this time in connection with the boilers was invented by Henry R. Worthington of Brooklyn..."

The Brooklyn Daily Eagle, December 9, 1940

280

"...For the protection of the engine there was a truly remarkable departure – the first strictly fireproof building on the American continent. It was 300-feet in length, 60-feet in breadth, four stories high. The walls were of the finest granite and the roof spanned by 60-foot iron trusses, supporting wrought iron purlins, and covered with heavy copper sheets. The doors and windows were of iron, too, and the floors of the engine and boiler rooms were entirely made of cast-iron plates. The total weight of the metal in the building was 490 tons..."

The Brooklyn Daily Eagle, December 9, 1940

281

"...The amount of detail work and careful study involved in applying new material to such an important piece of work can hardly be realized today, and too much credit cannot be given to the engineers who accomplished it. The men largely responsible and to whom we owe much credit are: Gen. William Gibbs McNeil, Chief Engineer from 1845 to 1846; William J. McAlpine, Chief Engineer from 1846 to 1849 and Charles B. Stuart, Chief Engineer from 1849 to 1851..."

The Brooklyn Daily Eagle, December 9, 1940

RE: Dry Docks No. 5 and 6 were the last to be built and used a new construction method that significantly reduced the time for construction. This innovation did not require the site to be pumped-out and excavated before the concrete was poured. Instead, the area was dredged to the desired depth and more than 12K piles were driven in the water to support the dock structure. These supports were driven down 70-feet into the riverbed to bedrock. Next, gravel was laid and graded underwater to form a bed for the dock and a special mix of concrete was poured into submerged forms through a "tremie" pipe. Dry Docks 5 and 6 could actually be used to fix ships even before they were fully completed. Both docks were completed in 1942. They measure 1,092-ft.-long and 150-ft.-wide. 282

In the Wet

Major dry docks are being built for the Navy almost completely under water in strategic areas where the soil is too unstable for big excavations in which the construction can be done "in the dry"

Popular Science, May 1943

RE: introduction to an article entitled: "Underwater Construction Speeds Naval Dry Docks." Contributed by *Capt. W. Mack Angas*, Civil Engineer Corps, U.S.N.

283

284

The Tremie Method

"THIS startlingly new type of naval building is known to engineers as the 'tremie' method - or pouring large quantities of high-grade concrete under water through pipes called 'tremies.' It is providing the Navy with new graving docks for repair and overhaul of fighting ships that must be sent with dispatch to rejoin the fleet. And it gives the Navy these bases where they are most needed - no matter how difficult the site - without the long delay required for erecting big cofferdams that would otherwise be needed to keep water out of the excavations in which the locks are built..."

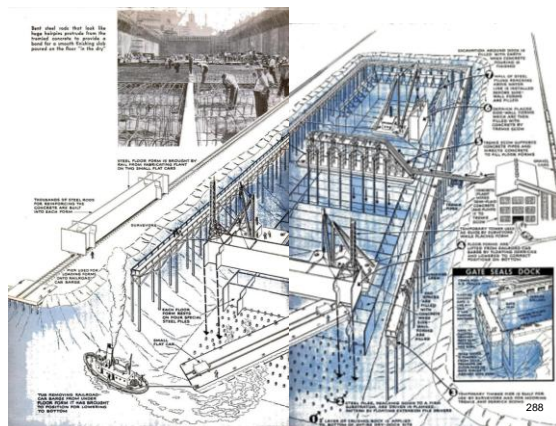
Popular Science, May 1943

285

286

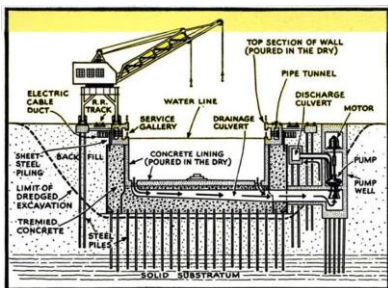
"...Now a site is simply dredged to the desired depth, then leveled by barge controlled drags, and construction begins. First come the steel foundation piles, driven down to a firm substratum by a floating pile driver equipped with extension leads and a steam or compressed-air hammer capable of working under water. They must fit a pattern in both line and grade, and those that cannot be driven down far enough are cut-off by divers using underwater torches..."

Popular Science, May 1943



287

288



“...On certain of these piles are laid huge floor forms having neither top nor bottom, each watched carefully by two teams of surveyors to be sure it goes down accurately. Meanwhile the tremie scow sets to work, filling forms with concrete. Side walls are next aid and filled...”

Popular Science, May 1943

289 **Caption:** “Tremie concrete encases the main body of the dock, shown in cross-section above. It is poured under water into big steel forms for floor and side walls.”



“...A steel cofferdam, sealing the opening, is then put up to provide a dry space for building the gate seat, and the dock is pumped dry. After this, installations are completed.”

Popular Science, May 1943

290 **Caption:** “Its underwater construction completed, the graving dock above has been pumped dry for the laying of a smooth inner surface of concrete. A gate seat is built in the cofferdam in the background.”



The two shipbuilding dry docks were built in an area at the east-end of the yard, partly within the earlier yard limits and partly on an acquired tract, which was previously a marine terminal and municipal market. The Brooklyn Eastern District Terminal contained a freight yard, car float transfer bridge and freight houses.

Above: caption: “Gate for access to the Brooklyn Navy Yard as part of the City of NYC contract to Brooklyn Eastern District Terminal for service to the Wallabout Market Terminal, April 1936”

Left: caption: “Brooklyn Eastern District Terminal car float transfer bridge” 291



Above: the second Brooklyn Navy Yard float transfer bridge was installed ca. 1941, upon the completion of the Wallabout Basin expansion. It was an electrically powered overhead suspension “French Patent” type. This float bridge was modified in 1983, when the overhead supported dual spans (seen in the image above) were replaced with two pontoon supported float bridges. 292



Also located on the Marine Channel were four freight piers operated by various railroads and a municipal refuse pier. The Marine Channel was separated from the yard basin by a causeway of heavy masonry construction which connected the Cob Dock area with the main yard. Two cruiser piers projected into the yard basin from the causeway. 293

Caption: “Unloading railroad float at terminal bridge – Brooklyn Navy Yard, April 1919”



The location and orientation of the new docks was fixed within narrow limits by considerations of direct access, and by the requirements that the approach to old Dry Dock No. 4 (which lay at right angles to the new docks) be kept clear. The situation necessitated extensive dredging of existing land, filling of water areas and removal of the causeway, the two cruiser piers and all the structures on the Marine Channel. 294

Caption: “Excavation of Dry Dock No. 4, April 1910”

It was imperative that full access be maintained to the *Cob Dock*, which was in full use for fitting-out, repairing and servicing ships. As soon as possession was obtained of the *Wallabout Market* area (by condemnation and declaration of taking), the structures west of *Washington Avenue* were demolished and temporary tracks, roads and utilities installed around the construction site and contractor's working area and across a new timber causeway built across the *Marine Channel*.

295

Pile supports were required under the entire dock structures. More than 12K steel H-piles weighing 74 pounds-per-foot, from 30 to 70-feet-long, were driven under water to 37.5-ton minimum bearing from floating drivers. Extremely accurate positioning was required to avoid interference with tremie forms. In some cases, clearances were less than six-inches. Long, telescopic leads, taut holding lines and careful plumbing of leads were necessary to insure the precision required.

297

Concrete was mixed at a central mixing plant, served by belt-conveyor bridge from aggregate bins on the east side of Cob Dock. Cement was delivered in bulk and blown to the storage bins. Peak daily requirements were fourteen 800-ton barges of aggregates and two 5,000-barrel barges of bulk cement. Concrete was delivered by pumping through a system of eight-inch pipes (with booster pumps where needed) for a maximum distance of 1,100-feet to the tremie barges where it was discharged through hoppers into eight tremie pipes which could be raised and/or lowered as required. The concrete in a form, aggregating 1,660 cubic-yards, was placed in a continuous pour at a controlled rate in nine hours. More than 500K cubic-yards of tremie concrete was placed.

299

Dredging began simultaneously in the *Navy Yard Basin* and was carried through the causeway and into the market area as soon as these connections were in service. Six dredges were used to remove 2.3 million cubic-yards of material, at a maximum rate of 25K cubic-yards per-day (to a general depth of 63-feet and a maximum depth of 72-feet) below mean low-water. For the dry docks, a 2-foot layer of crushed rock was deposited and carefully leveled with a heavy drag.

296

Tremie forms were used for the floors and lower side walls. The floor forms were 14-feet-wide, 20-feet-high, and 190-feet-long, open top and bottom and were prefabricated steel box trusses with corrugated steel sheathing and with the required reinforcement built-in. The wall forms were similar but smaller and included built-in frames to which steel piling could be attached to complete the sidewall cofferdam. It was impossible to allocate sufficient space in the yard for the fabrication of these forms thus, a tract of land on the New Jersey waterfront was leased and the completed forms brought to the yard on car floats. The forms were placed by an improvised rig, consisting of two 100-ton stiff-leg derricks mounted on three 60-by-90-foot sections of an old timber floating dry dock. Floor forms were required only for alternate blocks since these blocks could be used as forms for the intervening spaces.

298

The outer ends of the docks were built within sheet pile cofferdams. Temporary cofferdams were built across the dock, about 700-feet from the head wall, to permit starting ship construction before the outer ends were completed. After the lower sidewalls were complete, the steel piling was mounted on preset framing, sealed into the concrete and the docks pumped down. The finished floor and sidewall lining were then placed in the dry. Backfill around the docks required 1.6 million cubic-yards of material, delivered by truck from borrow pits on Long Island. Crane tracks around the docks were supported on steel H-piles.

300

An Industrial Enterprise



“...The Navy Yard is the largest single industrial enterprise in Brooklyn, and perhaps the largest in all of the greater city. It is likewise the chief of the Navy Department’s plants, and already before the war the greatest Navy storehouses were located there...”

**The Brooklyn Daily Eagle, December 15, 1918
Caption: “Warehouse adjoining Dry Dock No. 4”**

301

302



303



304

“...Since that time a mammoth storehouse in addition has been constructed that stands out of the yard and pokes its nose as high into the air as many skyscrapers in the smaller cities of the country...”

The Brooklyn Daily Eagle, December 15, 1918

RE: the Brooklyn Navy Yard’s eleven-story supply storehouse (Building No. 3), located east of Building 92 (the former U.S. Marine Commandant’s quarters, built in 1857 and now a museum) was the first reinforced-concrete building constructed at the yard. Built in the neo-classical style, the nine stories above the one-story base contain columns of wide rectangular windows, organized into bays. Each bay is separated by concrete piers and each window contains a concrete sill below it. There are cornices at the top of the tenth and eleventh floors. A contract for \$1.2 million was made in April 1917 and work began four days after the contract was signed. Completed in September 1917, the structure contained 712K square-feet of floor space when the USN moved in on October 1, 1917. During WWII, the building was outfitted with radio and radar laboratories and footbridges were constructed to Buildings Nos. 5 and 77 (since demolished).

305



306



REAR VIEW OF STOREHOUSE, WITH CONCRETE LOADING PLATFORMS AND CONCRETE BRIDGES OVER TRACKS

"DETAILS given out last night by the Navy Department in Washington show that the great storage building at the Brooklyn Navy Yard is practically completed, a \$1,200,000 structure of eleven stories, with 700,000 square-feet of space, fireproof, finished within five months. The money was not made available till March 29..."
The Brooklyn Daily Eagle, October 8, 1917

307

308

"...We think congratulations are due to the department, to Engineer Leonard M. Cox, U.S.A., who drew the plans, and to the Turner Construction Company, which did the work. If this is a sample of what is going to be done in this Navy Yard toward the completion of the \$100,000,000 building program, the people of the United States will not complain. What we all want is quick action, as much dispatch as is compatible with honest, lasting work. The Government and the contractors it trusts have to struggle with the same conditions in the labor market as other employers. They have less delay in getting materials, of course, which is a very important advantage."
The Brooklyn Daily Eagle, October 8, 1917



309

"...In addition there has been constructed the huge medical supply building, which, while it is outside of the Navy Yard, yet it is a part of the operations of the yard and under the direction of the yard's medical officer..."

The Brooklyn Daily Eagle, December 15, 1918

RE: ca. 1917, the U.S. entry into WWI necessitated further expansion of the *Brooklyn Naval Hospital*. The original hospital building's capacity was doubled to 600 with the construction of a new wing and the supply depot was moved to *Sands Street* in order that the former supply depot building be converted into additional facilities for patients. The medical supply depot (*Building RD*) was based on a design by architect *Ernest Flagg*. The design was similar to that of the naval hospital at the *United States Naval Academy* (which Flagg also designed), with a brick facade, hip roof and classical-style elements.

310



311

No. 20

312



"...Much of the new work in the Brooklyn Navy Yard is now being done by the yard officials instead of by contract. The new 60 by 300-foot oil house is being built by Civil Engineer Asserson. He will save the Government over \$7,000 on this contract alone. It will be ready for use within five months. Naphtha, lubricating oils and varnish will be stored in the building, which will be known as No. 20. It is located at the eastern end of the Navy Yard and will cost \$46,000. It is being built of shell and brick and will be fireproof..."

The Brooklyn Daily Eagle, August 4, 1899

Caption: "Building 20"

313



314



315

Making an Entrance

316

Plans were completed yesterday for the new gate house and entrance to the Brooklyn Navy Yard, which is to be built at the foot of Sands street and which will supplant the present gate at York street. Work will be begun at once.

New York Herald, May 28, 1893

RE: introduction to an article entitled: "New Navy Yard Entrance - A Structure to be Built in Sands Street to Replace the Present One in York Street"

317



"THE new gate house will cost about \$50,000, and it is said it will be the handsomest government building of this nature in the country. The style is Romanesque, and the details called for in the designs are elaborate and striking. The building will be of granite. It will have a frontage in Sands street of eighty feet and will be forty-feet-deep. There will be four stories and a small attic. A striking feature of the building will be four round towers, 8-feet in diameter, supported by polished granite columns. Columns of polished granite will also support the main arches, front and rear, and the corbelled turrets, and will ornament the mullions of the third story windows..."

New York Herald, May 28, 1893

Caption: "The new entrance"

318

“...The interior appointments will be on an order commensurate with the elaborate exterior. In the basement will be the kitchen and boiler room. The first story will consist of the watchroom and guardroom and the quarters for the non-commissioned officers and the officer-of-the-day. The mess-room will be on the second story and the third and fourth stories will be given up to dormitories. The gates will be 20 feet wide and of heavy ornamental iron...”

New York Herald, May 28, 1893

319

“...It is said at the Navy Yard that the elevated road will build a station at the corner of Sands Street and Hudson Avenue when the gate is finished for the convenience of Navy Yard officials and employees. This will be within a stone’s throw of the new entrance...”

New York Herald, May 28, 1893

320

“...When the scheme to remove the entrance from York to Sands street was broached about a year ago it aroused the liveliest opposition from property owners and saloon keepers of York street. The saloon keepers depended mainly on the patronage of the sailors. They sent a petition to the Navy Yard authorities. It is thought the saloon keepers of York street will repeat these tactics, but such opposition, it is believed, will have no weight with the present administration...”

New York Herald, May 28, 1893

321

“...When the new gate is finished the old York Street Gate and barracks will be torn down. The change from York to Sands Street will be a welcome one to the officers and employees of the yard, because York street is not so desirable a neighborhood as Sands Street.”

New York Herald, May 28, 1893

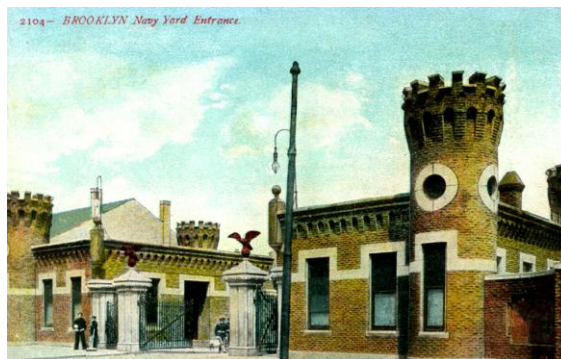
RE: as originally proposed in 1893, the gatehouse was supposed to be an ornate four-story structure. However, because the proposal was too expensive, it was downsized. The Sands Street Gate was to replace another gate on nearby York Street. Fearing a loss of business, saloon keepers on York Street protested against the Sands Street Gate’s construction, but to no avail. The main entrance to the yard in the early 20th century, it’s located at the intersection of Sands Street and Navy Street, close to Admiral’s Row. Costing \$24K, the gate commenced construction in 1895 and opened one year later. The new Sands Street Gate was not only closer to the trolley lines on Flushing Avenue, but also avoided the dirty and “malodorous” vicinity around the York Street Gate.

322



The gate at Sands Street, on the yard’s western border, consisted of a one-story medieval-style gatehouse reminiscent of a castle, with plinths, turrets and posts with eagles on top

323



A 1906 postcard of the Sands Street entrance

324



“... One of the greatest changes in the appearance of the yard in recent years was the closing of the old York Street Gate, and the opening of a new one at Sands Street. The old gate was historic, and in time the new one may become so...”
The Illustrated Buffalo Express, June 6, 1897
Caption: “The Sands Street entrance in 1904”

325



326



Above: the Sand Street Gatehouse has undergone modifications throughout the years, including the addition of second and third floors (since removed) and the removal of the turrets. After the Brooklyn Navy Yard was decommissioned in 1966, the Sands Street Gate became the entrance to the NYPD’s Brooklyn tow pound and by 2004, there were plans to refurbish the gate. The gatehouse was restored to its original condition in 2012 and since 2015, it has housed the Kings County Distillery’s tasting room.

327

328

Moonshine and Moonlight

NAVY YARD - Kings County Distillery is launching its new outdoor garden next week - offering patrons a rare chance to sip moonshine from inside the Brooklyn Navy Yard
dnainfo.com, May 18, 2015
RE: introduction to an article entitled: “Brooklyn Distillery’s New Garden Offers Chance to Drink Inside Navy Yard”

“TO kick off the new space, the distillery’s hosting a series called ‘Whiskey in the Garden’ on Friday and Saturday nights beginning May 22 - serving juleps, Manhattans and moonshine alongside food prepared by visiting chefs from such restaurants as Hill Country BBQ and Vinegar Hill House, organizers said. The menu will change nightly...”
dnainfo.com, May 18, 2015

329

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“...The distillery is located in the 115-year-old Paymaster Building, where Kings County distillers make moonshine and bourbon from grains, corn and barley grown on an onsite farm. The garden area will be decorated with strung lights and picnic tables...”

dnainfo.com, May 18, 2015

331
Caption: “You can drink Whiskey in the garden at Kings County Distillery on Friday and Saturday nights this summer”

“...To enter the site, customers should show their IDs at the Sands Street Gate and tell the guard that they’re headed to the distillery, organizers said....”

dnainfo.com, May 18, 2015

332

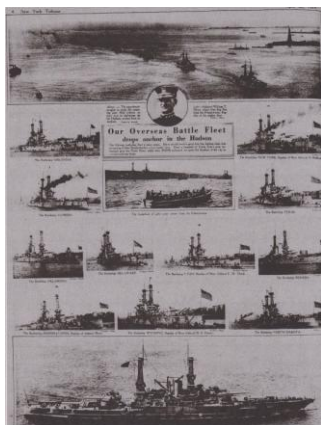
“...Founded in 2010, Kings County Distillery is the city’s oldest distillery and is located steps from the historic site of the Brooklyn Whiskey Wars in the 1860s. They host tours every Saturday from 1 to 4 p.m. The garden will be open from 4 to 10 p.m. on Fridays and 2 to 10 p.m. on Saturdays through Sept. 5. Check the distillery’s event page for updates.”

dnainfo.com, May 18, 2015

One-Stop Shopping

333

334



“...This yard is the largest assembling and distributing point for all sorts of equipment in the Navy, and here the largest number of warships come for overhauling and repairing, to replenish their bunkers, secure further provisions, ammunition and other innumerable articles that go to make up a fighting ship’s complete armament...”

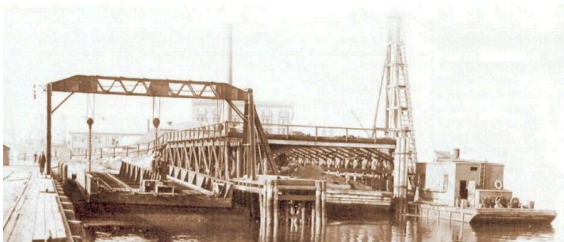
Brooklyn Daily Eagle, Dec. 15, 1918

335
Caption: “The Atlantic battleship fleet is home: again. Here are the twelve great first-line fighting ships that are paying Father Knickerbocker a two weeks’ visit. Over a hundred of Uncle Sam’s grim sea warriors gray the North River, while their 30,000 sailor-men are given the freedom of the city in a royal welcome home. The battleship *Mississippi* leading the fleet into the harbor, as photographed from an airplane. Note the airplanes atop the forward and aft turrets. 20

“...Though the Brooklyn Navy Yard is the storehouse for everything used in the Navy, yet explosives are not kept in large quantities there. Even in times of peace there is an enormous amount of powder and shot used. The battleship ‘Massachusetts,’ for instance, takes 500 tons of fixed ammunition with her upon every cruise, and uses it all up in target practice, too. Down at Fort Wadsworth a continual supply of 700 tons is kept, while at Dover, N.J., a powder depot for the Army and Navy both, another large supply is kept...”

The Illustrated Buffalo Express, June 6, 1897

336



The *Brooklyn Navy Yard* received shipbuilding supplies and coal as well as general freight via carfloat. It was responsible not only for the hull construction of a vessel, but all the interior spaces as well. Vessels requiring repair and/or refit were required to first offload their munitions prior to entering the yard. Munitions would be offloaded at *Iona Island Naval Ammunition Depot* and *Earle Naval Ammunition Depot/Naval Weapons Station Earle*. Newly commissioned vessels had their munitions brought on board at these locations prior to deployment.

Caption: "Brooklyn Navy Yard float bridge, ca. 1916"

337

338

The Immensity of the Business

"...An idea of the immensity of the business carried on at the yard can be gained from some statistics of the year before the World War started..."

The Brooklyn Daily Eagle, December 15, 1918

339

"...In the fiscal year ending June 30, 1913, stores to the value of \$11,899,366.64 were received into the yard from various sources. Last year, it is estimated, that almost five times this amount passed through the yard gates. Of the figures cited for 1913, \$1,439,521.13 represented the value of the stores manufactured in the yard itself..."

The Brooklyn Daily Eagle, December 15, 1918

340



"...These latter figures strikingly illustrate the industrial activities of the yard of this nature, although naturally the main part of the yard's work is devoted not to the manufacture of equipment but to the utilization of the equipment which it makes and comes to it from other sources..."

The Brooklyn Daily Eagle, December 15, 1918

341

342

"...For buildings and in repairs the sum of \$3,077,952.58 was expended, and \$2,615,171.19 was put into shipbuilding. The Government's payroll that year, when overtime was not the rule and the workmen receiving wages far under those received during the war, was \$4,605,098.88; of this amount \$1,500,000 was the approximate amount paid-out solely on ship construction..."

The Brooklyn Daily Eagle, December 15, 1918



Claim-to-Fame

344

“...From Granite Dock No. 1 some of the most famous American ships have been launched. The old ‘Niagara’ was built here. Her claim-to-fame is that she laid the first Atlantic cable. There was the ‘Somers,’ from whose yard arm Midshipman Spencer was swung for attempting to incite mutiny on board. Two enlisted men of the crew were hanged at the same time. These executions created intense excitement through-out the United States as the justice of the sentences was questioned by many...”

The Brooklyn Daily Eagle, December 9, 1940

345

“...Other well-known ships were the *Fulton*, THE FIRST AMERICAN STEAM-PROPELLED SHIP; the ‘Oneida,’ a steam sloop sunk in the Bay of Yedo, Japan, in a collision; the ‘Trenton,’ wrecked by a storm in Apia Harbor, Samoa; the ‘Maine,’ sunk in Havana Harbor in 1898, one of the most famous incidents of the Spanish-American War; then came modern first-class battleships...”

The Brooklyn Daily Eagle, December 9, 1940

RE: two bronze “Markers” (plaques) on the Brooklyn Bridge commemorate the history of the Brooklyn Navy Yard. The Markers mention several of the notable ships that were built at the yard over the many years it was in operation.

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Panorama of Brooklyn South of the Brooklyn Bridge Marker United States Navy Yard

The U.S. Navy Yard was established in 1801 on the site of a small local shipyard. Over the years it was expanded to 291 acres, comprising six dry docks, many miles of railroad tracks, lumber yards, warehouses, a hospital and officer’s housing. Ninety-three ships were built at the Navy Yard and several hundreds were refitted for battle in the Civil War, World War I and World War II. Some of the important ships launched at the Navy Yard were the “Ohio” (1820), the “Maine” (1890), and the “Missouri” (1944). The “Duluth,” the last ship to be built at the Navy Yard, was launched in 1965, a year before the Navy Yard closed.

Caption: “The ‘Maine’ being launched”.

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Panorama of Brooklyn South of the Brooklyn Bridge Marker (view of various ships launched at the United States Navy Yard)
 Captions: "Niagara 1858; Oriskany 1945; Ohio 1820; Cincinnati 1892; U.S. Navy Yard, Brooklyn, Empire Stores; Connecticut 1904; Duluth 1965"
 Edward I. Koch, Mayor of the City of New York
 Howard Golden, Borough President of Brooklyn
 Andrew J. Stein, Borough President of Manhattan
 The 1983 Brooklyn Bridge Centennial Commission
 The New York City Department of Transportation

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Waging War

"...In each war not only have ships been built but an important part of the service of the Navy Yard has been the refitting of merchant ships. During the Civil War, for instance, 416 merchant vessels were converted for naval purposes..."
The Brooklyn Daily Eagle, December 9, 1940

351

"...In the last war the activities of the yard were not confined to the site around Wallabout Bay, but extended to outlying private shipyards where ships were made into transports and otherwise converted for use by the Government..."
The Brooklyn Daily Eagle, December 9, 1940

352

"...The yard had a part in protecting the city from submarines through nets across the Narrows, across the entrance to the yard and other wartime precautions. Training camps were out up at City Park and Bay Ridge. Included in the program was the immense undertaking which forwarded supplies to France through the Supply Division..."
The Brooklyn Daily Eagle, December 9, 1940

353

Semper Fidelis

354



"...Mention should not be forgotten of the Marine Corps, which maintains an enlisted strength at the yard of 500 men. It is the police force of the yard, as it is of the ships at sea..."

The Illustrated Buffalo Express, June 6, 1897
Caption: "The original Building 92 (right), built in 1857 and designed by Thomas Ustick Walter, is the former U.S. Marine Commandant's quarters" 355

"...Every little while talk bobs up of abolishing the Marine Corps, but it comes to naught. The marines are useful, even if their original excuse for existence, to check a mutiny among the crew, no longer is mentioned. In action they man the rapid-fire guns and become sharpshooters. They are a spruce, well set-up lot of fellows, and their barracks, next to the Men-of-War, themselves, is the object of attention in the Navy Yard."

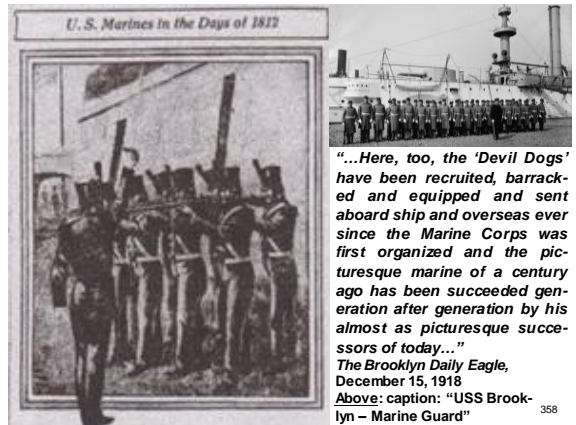
The Illustrated Buffalo Express, June 6, 1897

356



Marines at Brooklyn Navy Yard, ca. 1890

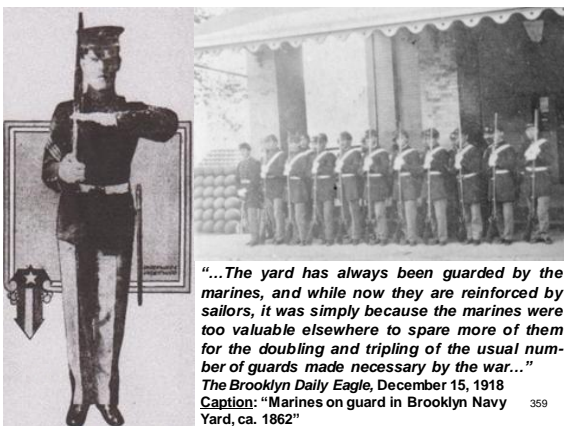
357



"...Here, too, the 'Devil Dogs' have been recruited, barracked and equipped and sent aboard ship and overseas ever since the Marine Corps was first organized and the picturesque marine of a century ago has been succeeded generation after generation by his almost as picturesque successors of today..."

The Brooklyn Daily Eagle, December 15, 1918

Above caption: "USS Brooklyn - Marine Guard" 358



"...The yard has always been guarded by the marines, and while now they are reinforced by sailors, it was simply because the marines were too valuable elsewhere to spare more of them for the doubling and tripling of the usual number of guards made necessary by the war..."

The Brooklyn Daily Eagle, December 15, 1918

Caption: "Marines on guard in Brooklyn Navy Yard, ca. 1862" 359

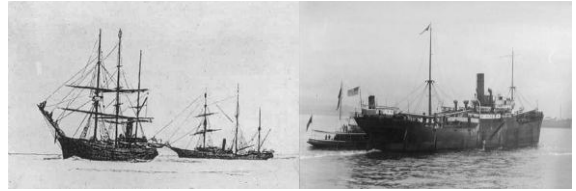
Fitting-Out

360

"...In addition to the share the Navy Yard has had in waging war for the United States. It has also made contributions to the scientific and exploratory expeditions conducted by Navy officers..."

The Brooklyn Daily Eagle, December 9, 1940

361

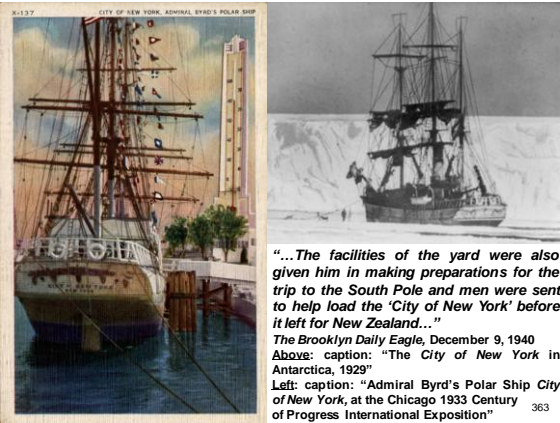


"...The Brooklyn Navy Yard fitted-out the 'Bear,' 'Thetis,' and 'Alert,' which were sent to the relief of the Greely Arctic expedition of 1884-1885. When Commander Richard Byrd made his plane flight to the North Pole and return in May, 1926, the ship 'Chantier' had been fitted-out before departure in this Navy Yard..."

The Brooklyn Daily Eagle, December 9, 1940

Left: caption: "Greely relief ships *Thetis* and *Bear*"

Right: caption: Steamship *Chantier* arrives in New York Harbor, Lieutenant Commander Richard E. Byrd, USN, and the North Pole Expedition on board, 23 June 1926" 362



"...The facilities of the yard were also given him in making preparations for the trip to the South Pole and men were sent to help load the 'City of New York' before it left for New Zealand..."

The Brooklyn Daily Eagle, December 9, 1940

Above: caption: "The *City of New York* in Antarctica, 1929"

Left: caption: "Admiral Byrd's Polar Ship *City of New York*, at the Chicago 1933 Century of Progress International Exposition" 363

364

The Welfare of the Nation

"...These are only a few of the helpful contributions the Brooklyn Navy Yard has made to the welfare of the nation. It has been a distinct part of the life of the City of Brooklyn, providing employment for thousands of its citizens and spending millions of dollars in its markets..."

The Brooklyn Daily Eagle, December 9, 1940

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Birthplace of Battleships

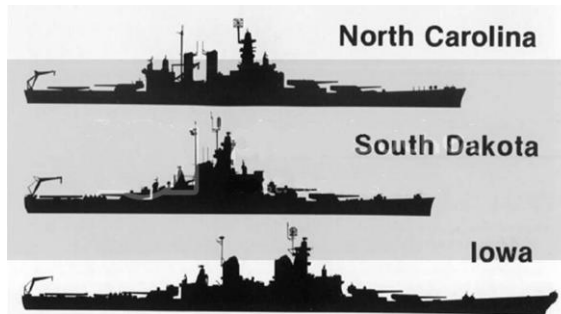
366

“...Now the yard employs approximately 18,000 men – more than ever before – and this huge force will be kept busy until ‘45, completing the battleship ‘Iowa,’ already started, and the ‘Missouri,’ and two more super-dreadnaughts which have been assigned to Brooklyn under the defense appropriation and which will be larger than anything afloat...”

The Brooklyn Daily Eagle, December 9, 1940

RE: the *Iowa-class* battleships were, arguably, the finest battleships ever built and certainly the best U.S. battleships of WWII. Design studies began in January 1938 and took full advantage of the “escalator clauses” of the naval disarmament treaties, which permitted 45K-ton battleships armed with 16-inch (406mm) guns. An additional constraint on their design was the requirement that they be capable of transiting the *Panama Canal*. This drove the decision to use internal armor belts, since there was little possibility of designing a ship with adequate external belts that could fit through the Canal. The previous *North Carolina* and *South Dakota*-classes had been designed to take advantage of the 16-inch gun escalator clause, but not the 45K-ton displacement escalator clause. In the case of the *Iowa-class*, the question before the USN designers was how make best use of the extra 10K-tons.

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Above: the previous *North Carolina* and *South Dakota*-class battleships had been designed to take advantage of the 16-inch gun escalator clause, but not the 45K-ton displacement escalator clause. The USN had been remarkably successful in meeting its design goals on a 35K-ton displacement, particularly in the case of the *South Dakota*-class, which were, perhaps, the most cost-effective battleships ever built.

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The *Iowa-class* battleships were designed to be the biggest warship able to pass through the *Panama Canal*. At up to 57,500-tons, they were the second heaviest battleships ever built (the Japanese super-battleship *Yamato*, at 72K-tons, was the heaviest). The *Iowa*-class were 108-feet-wide, whereas the canal’s locks are just 110-feet-wide. Ordinary vessels may only pass at up to 106-feet-wide, making the *Iowa*-class the widest ships to pass the canal prior to the 2016 reconstruction.

Caption: “USS *Missouri* – an *Iowa*-class battleship - passes through the locks of the *Panama Canal* in 1945”

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A Proud Heritage

“...Upon Brooklyn and the Navy Yard therefore a large part of the country’s defense will rest and the Navy Yard, in carrying out its role vigorously, will only be following its own precedents.”

The Brooklyn Daily Eagle, December 9, 1940

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Part 3

The Debate

Short, Shallow and Lopsided

373

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"...The faulty dry docks have attracted unpleasant attention to the Navy Yard lately. This year had hardly opened when it was discovered that Dock No. 3, built, as it was supposed, big enough to take in the largest of the new Men-of-War, was short, shallow and lopsided. Through some error in the measurements it was found not to be long enough within two feet, and it lacked four-inches of the required depth..."

The Illustrated Buffalo Express, June 6, 1897

RE: periodically, repairs to the underwater portion of a ship's hull are required. Such repairs may include renewal of the sacrificial anodes, refit of the propellers, overhauling of the propulsion shaft/s, repair of rudder/s, underwater hull blasting to remove fouling, etc. In order to carry out these repairs, the underwater portion of the hull needs to be made accessible, which a dry dock makes possible. A dry dock is a narrow, deep basin wherein ships enter, a caisson (water-tight gate) is closed and the water inside the basin is pumped out, leaving the ship standing on blocks. This allows workers to inspect, paint and/or service the areas of the ship that would normally be submerged. Once the work is complete, the caisson is removed; the basin flooded and the ship becomes buoyant and can leave the dry dock under its own power.

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"...The job was a bungle at the start, and all the way through. Crowding close upon this exposure came the news of the leaking of the dock. The outer sheet piling at the end of the slip was damaged by a dredging machine, and through the holes water poured in in great quantities. The injury was done by the contractor, but that didn't prevent the acceptance of his unfinished work by the Navy Department..."

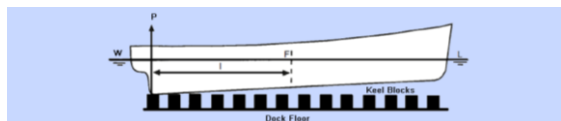
The Illustrated Buffalo Express, June 6, 1897

RE: a dry dock is typically kept dry; the lock gates are shut and the water pumped out. They're designed for shipbuilding and/or repair (it's common practice for larger shipyards to build their ships in a dry dock). A newly built ship can be gradually floated when the lock gates are opened and the tide comes in whereas a ship that requires repair is brought in on the tide and settles gradually as the tide goes down and water is pumped out. Then, workmen can get at the sides of the hull "in the dry." When the stern of the ship takes the blocks, it's fixed to the shore (sides of the dock). This is carried out from aft to forward so that by the time the entire ship takes the blocks, it is fixed to the shore. When the ship is completely borne by the blocks, water is pumped out quickly from the dock.

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378

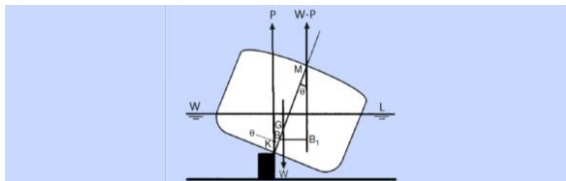
When a ship enters a dry dock, it must have a positive *Metacentric Height* and is usually trimmed by stern. The floor of the dry dock is lined with keel blocks, which are so arranged such that they can bear the weight of the ship. When the ship enters the dry dock, her centerline is first brought in line with the centerline of the keel blocks by using a combination of plum lines and *Theodolite*. The dock gates are then closed and the water is pumped out of the dock in stages. Since the ship has a *trim by stern*, the stern of the ship will first sit on the keel blocks. The rate of pumping out water is reduced as the stern is about to touch the keel blocks. The reason being that it is from this stage of the docking procedure when the stability of the ship becomes critical. The interval of time from when the stern takes the blocks to the moment when the entire ship's weight is borne by the blocks is called the "Critical Period."



When the ship's stern just touches the keel blocks, part of the ship's weight is being borne by the keel blocks. The contact between the stern and the keel block creates a normal reaction (a/k/a "Upthrust"). The magnitude of this upward normal reaction increases as the water level in the dry dock reduces. It is this *Upthrust* that creates a virtual reduction in the *Metacentric Height* of the ship. Thus, it is critical to maintain sufficient positive *Metacentric Height* before docking, lacking which, the ship may heel over to either side or even slip off the keel blocks and capsize. Hence, it's important to calculate the *Metacentric Height* of the ship at different stages of the docking process and ensure that it does not fall below the safe limit. The figure above shows a ship that has just touched the keel block by its stern. The location of the *Center-of-Floatation* (F) is known from the hydrostatic curves at the given displacement. Since the location of the stern is a known point, its distance from the *Center-of-Floatation* (I) can be readily calculated.

Caption: "Longitudinal view (elevation) of a ship during dry docking"

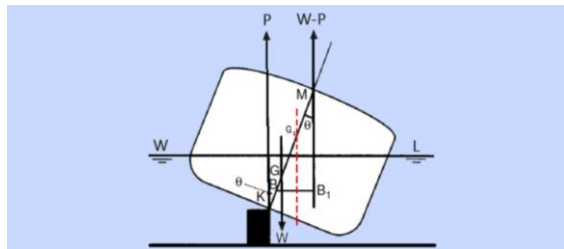
378



The moment to change trim by 1 cm (MCTc) is a hydrostatic parameter that's obtained from the hydrostatic curves. Thus, for a known value of trim, the following equation is applied:

$$\text{Upthrust at stern (P)} = \frac{\text{MCTc} \times \text{Trim}}{l}$$

The figure above shows the transverse view of a ship in the *Critical Period*, which has been inclined by an external force to an angle theta (θ). The weight of the ship (W) acts vertically down through the *Center-of-Gravity* (G). The upward reaction force (P) acts vertically upwards through the keel of the ship. This is a normal reaction force and is equal to the portion of the weight of the ship being borne by the keel blocks. For equilibrium, the remaining portion of the weight of the ship (W-P) will be supported by the buoyancy, which will act through the initial ³⁷⁹ *Metacentric Height* of the ship (M).



There are three vertical parallel forces acting on the ship:

- *Weight (W)* - acting downward.
- *Keel block Upthrust (P)* - acting upward.
- *Buoyancy (W-P)* - acting upward.

The *Upthrust Force (P)* can be considered to have an effect similar to that of removal of a weight from the ship. This has the virtual effect of rising the *Center-of-Gravity* of the ship from the point "G" to "G1." The *Metacentric Height* therefore reduces from GM to G1M, as shown ³⁸⁰ in the diagram above.

The virtual reduction in *Metacentric Height* at any stage of the docking process can be calculated by the formula:

$$\text{Virtual Loss of Metacentric Height (GG1)} = \frac{P \times KG}{W - P}$$

This calculation must be carried out for the condition when the ship has just touched the keel blocks throughout its length. It is at this point that the keel block *Upthrust* is maximum and the risk of tipping over or slipping from keel blocks is most likely if the metacentric height is too low or negative.

381

382

You Get What You Pay For

"...It is the opinion of some of the officers of the yard that Uncle Sam hedges too much in the matter of expense when it comes to building a dock. This dock cost less than \$1,000,000, and these critics point to the granite dock at Mere Island, which, though it took years and nearly \$3,000,000 to build, is good for two centuries at least..."

The Illustrated Buffalo Express, June 6, 1897

RE: *Dry Dock No. 1* is, arguably, the most important single structure at *Mare Island*, whether considered from an historical and/or architectural perspective. Functionally, the structure was the *raison d'etre* (reason-for-being) of the 19th century shipyard. From the standpoint of engineering, it's one of the most remarkable examples of stone masonry construction anywhere in the U.S. It took nearly two decades to complete the massive granite block structure, reflecting to some degree the ambiguities of financing the project, but to a much greater degree the enormous challenges of construction. Standing nearly completely unchanged from its appearance in 1891, *Dry Dock No.1* remains at the core of the *Mare Island Historic District*.

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Caption: "Mare Island Naval Shipyard, Dry Dock No. 1, California Avenue, east side near Ninth Street, Vallejo, Solano County, CA" ³⁸⁴



“...The Brooklyn dock is of wood, and, moreover, is built on made land. It is noticeable that the timber docks at Puget Sound and Port Royal have proven as defective as this one. On the other hand, there are many timber docks, private, however, which have given satisfaction, notably, one at Boston, which has been in use 43 years, and is as good now as when built...”

The Illustrated Buffalo Express, June 6, 1897

RE: closed in 1974, the Charlestown Navy Yard (Boston) served the USN for 174 years (1800-1974). An essential component of Boston Harbor, the yard, a/k/a “Boston Navy Yard” (until 1945) and “Boston Naval Shipyard” (1945-1974), produced +200 wooden and iron warships and repaired and/or serviced +10K vessels during its long service life. Recent redevelopment of portions of the former yard revealed an historic “timber pond” where hundreds of unfinished naval-quality ship timbers were intentionally sunk and remained buried until 2008.

Left: caption: “Map of Charlestown Navy Yard (1874) with timber ponds

Right: caption: “Timber pond where hundreds of unfinished, naval-quality ship timbers were intentionally sunk for preservation while awaiting use, were subsequently buried and remained so until 2008”

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Mea Culpa

Mistake of the Government in building timber docks – influences which led to it – what it has cost

The New York Daily Tribune, November 21, 1898

RE: introduction to an article entitled: “The Naval Dry Docks: Great Advantage of Stone Over Wood Shown by Experience”

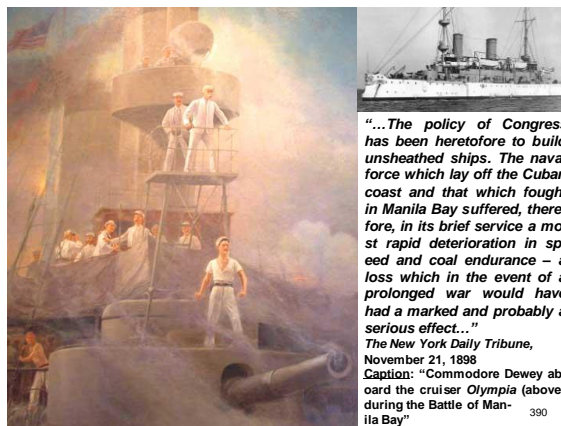
387

Hand-in-Hand

Washington, Nov. 20 (Special) – In order that the ‘fleet-in-being’ – the fleet on guard at sea – may be preserved in a condition of maximum efficiency, a cardinal requirement is that the ships shall have clean hulls. A foul bottom injures a vessel’s usefulness in two vital ways; first, by affecting its speed, and second, by reducing its steaming radius...”

The New York Daily Tribune, November 21, 1898

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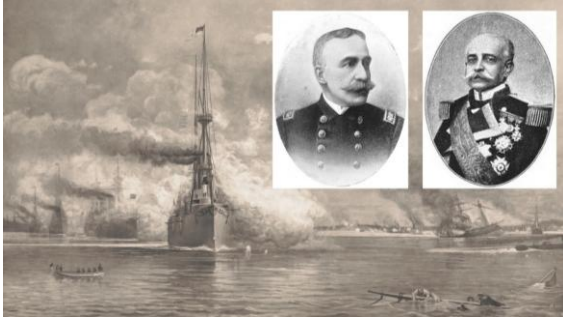


“...The policy of Congress has been heretofore to build unsheathed ships. The naval force which lay off the Cuban coast and that which fought in Manila Bay suffered, therefore, in its brief service a most rapid deterioration in speed and coal endurance – a loss which in the event of a prolonged war would have had a marked and probably a serious effect...”

The New York Daily Tribune, November 21, 1898

Caption: “Commodore Dewey aboard the cruiser Olympia (above) during the Battle of Manila Bay”

390



Above: during the *Spanish-American War*, the U.S.N.'s *Asiatic Squadron*, under *Commodore George Dewey* (left inset), engaged and destroyed the *Spanish Pacific Squadron*, led by *Admiral Patricio Montojo* (right inset), on May 1, 1898, at the *Battle of Manila Bay*. It was the first major engagement of the war and was one of the most decisive battles in naval history, marking the end of Spanish colonial rule of the archipelago and America's rise as a naval power. ³⁹¹

“...All ships, with or without sheathing, require periodical decking for examination, cleansing and repair. As a general principle, then, it may be stated that the growth of the fleet and the expansion of the system of dry docks should go hand-in-hand...”

The New York Daily Tribune, November 21, 1898

392

Found Wanting

“...The Government of the United States is far behind the other first-class powers of the world not only in number, but in the character, of its dry docks. Out of the eleven which it now controls and operates only four are of masonry...”

The New York Daily Tribune, November 21, 1898

393

394

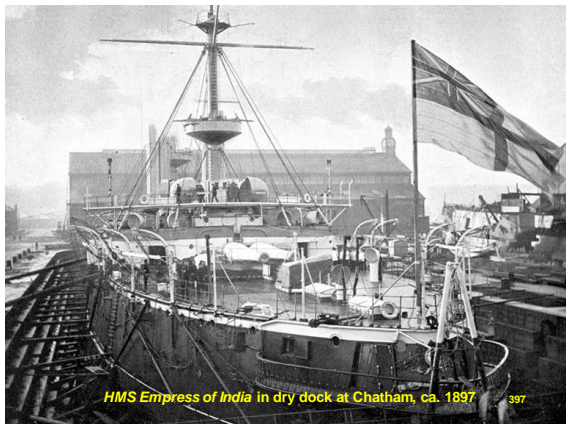
A Most Permanent Character

“...In the other Navies of the world dry docks are of the most permanent character, and are almost invariably constructed of masonry. In fact, no single instance is now recalled in which any nation has constructed a graving dock for its Navy of any other material...”

The New York Daily Tribune, November 21, 1898

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HMS Empress of India in dry dock at Chatham, ca. 1897 397

Gateway to the Seven Seas

398

Liverpool, Great Britain's premier port for exports, has contributed largely to the progress of British overseas trade, and her name is woven into the pattern of maritime history
Shipping Wonders of the World, ca. 1937
 RE: introduction to an article entitled: "A Home of British Shipping"

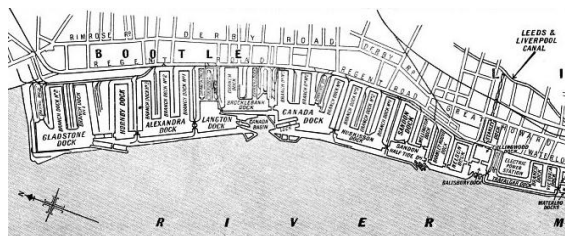
399

"ALTHOUGH Liverpool and its port are essentially English, one cannot go there and fail to realize that it is the gateway to the Seven Seas. It stretches its fingers to the other great ports of the world. Big ships and little ships link Liverpool with Canada, Australia and South Africa; with the tropical regions of West Africa; with India, the United States and many of the large South American republics; with Mexico, Spain and Portugal; with Russia, Egypt and the Mediterranean. Liverpool has direct services with all these distant places..."
Shipping Wonders of the World, ca. 1937

400

"...In 1715 the Pool was opened as a wet dock, with flood-gates to keep the vessels floating during the recess of the tide. The dock was opened in 1715, but was not completed until five years later. It was the first commercial wet dock constructed in England and the forerunner of the wonderful dock system of today. But it was in 1824 that Liverpool made what was perhaps its most important step forward, when one Jesse Hartley was appointed engineer. He did more than anyone else to build the system of docks..."
Shipping Wonders of the World, ca. 1937

401



"...The most recent docks are Gladstone Docks at the northern end of Liverpool. They were opened by H.M. George V on July 19, 1927..."
Shipping Wonders of the World, ca. 1937

Caption: "THE LIVERPOOL DOCK SYSTEM, extending along the waterfront from Bottle to Dingle. The distance from Gladstone Graving Dock on the left of the above plan) to Heracleum Dock (on the right of the plan below) is about six and a half miles. The area enclosed by the docks and basins is about 477 acres. There are twenty-nine miles of quays. Gladstone Dock, with its two branch docks, is used by the largest ships trading with Liverpool, including liners sailing to the U.S.A., Canada, the Far East and Australia. The Central Docks are used for the coasting trade. The other docks are used by ships trading to the Mediterranean, the Baltic, the East Indies, North and South America, South Africa and many other parts of the world."

402

“...Although the entire Gladstone Docks system was not completed until 1927, the famous Gladstone Graving Dock was opened by H.M. George V in July, 1913. This dock cost nearly £500,000, and was then the largest dry dock in Europe. It is used also as a wet dock, the water area being 3 acres 2,585 square-yards. The width at the entrance is 120-feet and the length 1,050 ft. 4 in. This dock, built to accommodate the largest ships, proved invaluable during the war of 1914-18...”
Shipping Wonders of the World, ca. 1937

403



404
Caption: “OVER HALF A CENTURY AGO. Liverpool ship-repairing docks about 1883. At the present day there are twenty-one graving docks at Liverpool and Birkenhead. The largest of these, the famous Gladstone Graving Dock, was, at the time of its opening by King George V in July, 1913, the largest dry dock in Europe. The width at the entrance is 120 feet and the length 1,050 ft. 4 in.”

A Marked Preference

“...The German Government was recently about to subsidize such a dock, to be built in that country and to be capable of accommodating the largest vessels of its fleet. When, however, the dock company prepared to use timber as the material. Government aid was refused the enterprise, and it was only upon condition that the dock be of masonry that the subsidy was finally granted...”

The New York Daily Tribune, November 21, 1898

405

406

“...The preference for masonry docks abroad extends largely to private corporations. In England all great modern works of this character now building are so constructed. Those already completed upon the Thames and other rivers, in which wood is used to some extent, are old and of moderate size, and the timber is only one feature of the dock, and not a particularly distinctive one. Such docks almost invariably embody in their structure large amounts of masonry, concrete or brickwork, and the timber is used, to a greater or less extent, for lining only...”

The New York Daily Tribune, November 21, 1898

407



From the late 17th century well into the mid-19th century, ships were being built in small docks all around London's Rotherhithe Peninsula (and also on slipways). The Stanford Map of 1862 shows twelve docks around the peninsula (there were two more in Bermondsey: Fountain Dock and Fore and Aft Dock (these show up on old Ordnance Survey maps). At Fore and Aft Dock, there was both a dry and a wet dock (the latter were intended for ships to shelter in, do minor repairs and/or for fitting them out – much like a harbor).

408
Caption: “River Thames with the docks from Woolwich to the Tower, 1882. This map shows all of the main upstream London docks except the King George V Dock (1933), which had not yet been built.”

Ex Parte Reasoning

“...Efforts have been made persistently from time-to-time before congressional committees to show that the timber dock is the only proper type for this Government to build, that it is cheaper in first cost and in maintenance thereafter, and that it has superior merits in use – the final conclusion from this particular and ex parte reasoning being that the Nation should never again construct a dock of masonry, a conclusion which the experience of the Government with timber docks in respect to stability, safety and cost of repairs would seem to expose as wholly fallacious...”

The New York Daily Tribune, November 21, 1898

409

410

ex par-te

eks □pārdē

LAW

adjective

done with respect to or in the interests of one side only or of an interested outside party. “The owners made an ex parte application to the High Court for a stay on the decision”

adverb

with respect to or in the interests of one side only or of an interested outside party. “Lawyers are forbidden to meet with a judge ex parte, or outside the presence of opposing counsel”

411

412

Apples and Oranges

“...With regard to the relative cost of repair, tables have been presented by the persons interested in the building of timber docks to prove what would seem to be a manifest absurdity, namely, that the cost of repairs to stone docks is much greater than to those of timber. Analyses of these tables show that although their constituent items are correct the arrangement of these items is such as to lead to a deceptive conclusion. The expenditures upon the stone docks, which are included, have covered a long term of years, and have been not only upon repairs, but upon caissons, modern pumping plants and many other accessories the repairs proper to the distinctive feature of the docks – i.e., the stone or concrete masonry – not having been considerable, excepting in a single case...”

The New York Daily Tribune, November 21, 1898

413

“...This exception is the stone dock at the Navy Yard, New York, which when about forty years old received an outlay of approximately \$100,000 - which outlay included, however, the relaying of a large portion of the masonry at the entrance and also considerable work upon the pumping plant. On the other hand, the stone docks at Boston and Norfolk, which were completed sixty-five years ago have had only the slightest repairs to their masonry; and the Mere Island dock, which was opened for use in 1891, such repairs have amounted to practically nothing, although in the table released to, which was presented to the naval committees of the two houses, an endeavor was made to show that repairs upon this dock were most extraordinary in extent, considering the length of service...”

The New York Daily Tribune, November 21, 1898

414

“...It may be noted further, that at the time these tabular comparisons were made not one of the similar dry docks of the Navy had reached the age of ten years, and that therefore their service had been too short to determine, even approximately, the extent and cost of repairs for the future...”

The New York Daily Tribune, November 21, 1898

415

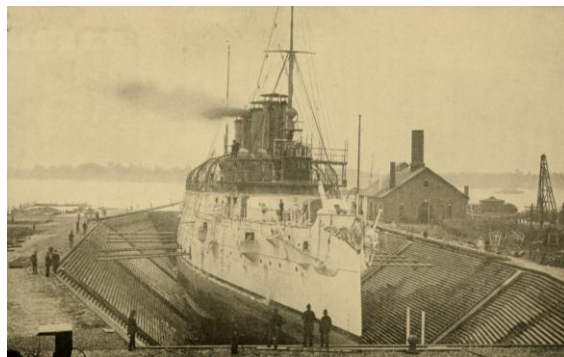
Lessons Learned

416

“...The Government has learned and to its cost is learning daily the great expense of maintaining in safe condition these timber dry docks. The outlay of \$170,000 upon Dry Dock No. 3, at New York, within a year after its completion; the expenditure of \$300,000 upon Dry Dock No. 2, also at New York, when only eight years old, the outlay of \$40,000 or \$50,000 upon the timber dry dock at Norfolk before it is ten years old, and of a still greater sum upon that at League Island - these may fairly be taken as examples of the bills which the Nation must foot as a penalty for its unwisdom in constructing docks of wood...”

The New York Daily Tribune, November 21, 1898

417



Cruiser USS Columbia in dry dock, League Island

418

Defying Logic

“...It should be remembered, further, that the timber docks have not yet reached the age when their caissons must be renewed, and when their pumping plants have so far deteriorated as to require extensive repairs or replacement by more modern machinery. When this stage in the history of the wooden docks is reached, and these large items are entered under the head of 'Repairs,' the makers of the comparative tables referred to will find it impossible to explain the logic of their figures and somewhat difficult to give the motive for their formulation...”

The New York Daily Tribune, November 21, 1898

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420

Lines of Reasoning

"...The repairs to docks belonging to private corporations have been cited frequently as examples of the small expenditure to which the Government would be subjected in the maintenance of wooden docks. As to this line of reasoning, it may be said that it is exceedingly difficult to ascertain the cost of repairs to such private docks, although it is known as to some - notably those at Boston and Brooklyn - that the aggregate amount has reached a very large sum. Moreover, these docks are not maintained in as good and safe condition as naval docks are or will be kept..."

The New York Daily Tribune, November 21, 1898

421

422

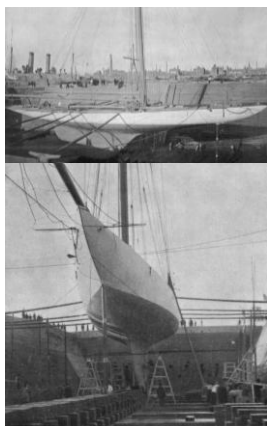
The Element of Instability

"...Finally, there is a structural difference of vital importance between the docks referred to and those now building for the Government, in that because of the great draught of naval vessels. National docks are much deeper, as a rule, than those for private corporations. Every foot of depth in the case of a timber dock means a great increase in the element of instability..."

The New York Daily Tribune, November 21, 1898

423

424



"...Stone docks have not been built for private use in this country because of their comparatively large first cost, because the depth so far required is moderate, and because timber is plentiful and cheap. With a proper growth in the amount of merchant shipping and in the size of merchant steamers, the disappearance of the timber dock for private use is only a question of time..."

The New York Daily Tribune, November 21, 1898

Top: caption: "Racing yacht Columbia at the Brooklyn Navy Yard"

Bottom: "Bow view of Columbia showing her deep keel"

425

426

Advantage: Masonry

“...With regard to stability and safety, the advantage lies unquestionably with the dock of masonry. For its stability the structure depends upon its weight; stone or concrete gives it that weight, and since these materials when properly embodied will last for centuries that weight can never be lost. Such docks are most substantial and durable, there is no danger of disastrous leaks or sudden irruptions endangering their contents, and ships placed in them can be regarded as wholly secure, both as to themselves and as to mechanics at work upon them...”

The New York Daily Tribune, November 21, 1898

427



“...With the wooden dock the case is different. For stability and safety it does not rely upon its weight to preserve its form and to prevent the waters of the harbor from breaking through. Such a dock has a thin veneering, the size of the excavation, held down by piles driven into the soil, to which piles the timbers are bolted. Cases frequently occur in which this interior lining to a greater or less extent is forced loose from its fastenings and large bodies of water enter. At such a time the only safety lies in an immediate flooding of the dock, that the passage of the water may be stepped and great damage to the structure prevented...”

The New York Daily Tribune, November 21, 1898

429

“...Furthermore, as has been shown, the increase in depth of a timber dock brings with it an element of grave danger, since from the design and construction it is not well adapted to resist the hydrostatic pressure of the water, a pressure which tends to collapse it or start leaks in the interior. This has been shown recently in a notable and disastrous way by the leak which started in the timber Dry Dock No. 3 at New York, which is very deep...”

The New York Daily Tribune, November 21, 1898

RE: water weighs slightly more than 60 lbs. per-cubic-foot thus, the pressure it exerts against a surface it comes in contact with is known as “Hydrostatic Pressure.” This pressure can be excessive and under thousands of pounds of pressure, water will find its way through the tiniest crack.

430



431

A Brief History

432

“...It may be of interest, to review briefly the history of the docks of earlier years, when for such uses so cheap and metricious a material as timber had not been dreamed of for construction...”

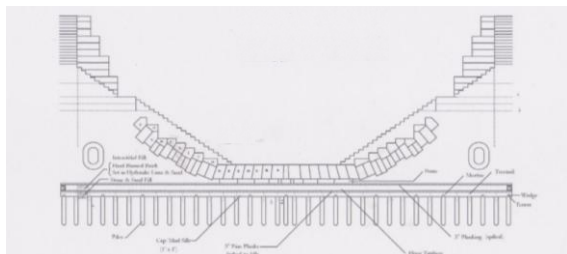
The New York Daily Tribune, November 21, 1898

433

“...In the early twenties ships had attained a size which made it advisable to seek some other means of docking than that of hauling them up on slipways or railways. By authority of Congress the Government called into its service Colonel Loamm Baldwin, of Boston, an eminent civil engineer of his day, who had prepared himself especially for work of this character by personal examination of the best examples of dry dock construction abroad...”

The New York Daily Tribune, November 21, 1898

434

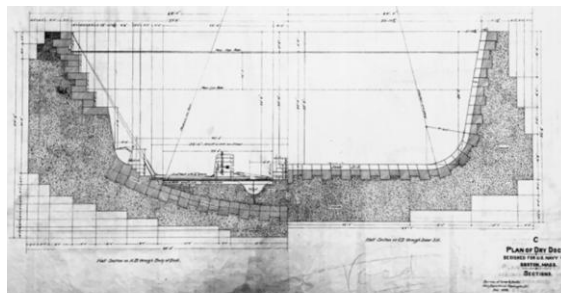


“...Colonel Baldwin was instructed to prepare plans for two docks, one to be located at the Navy Yard in Boston, the other at the Norfolk Navy Yard. He fixed upon designs which provided for structures of the finest class of granite masonry and of the most substantial and permanent character. These docks were begun in 1833 and 1834 respectively...”

The New York Daily Tribune, November 21, 1898

RE: in March 1827, Congress authorized the construction of dry docks at the Charlestown and Norfolk Navy Yard/s

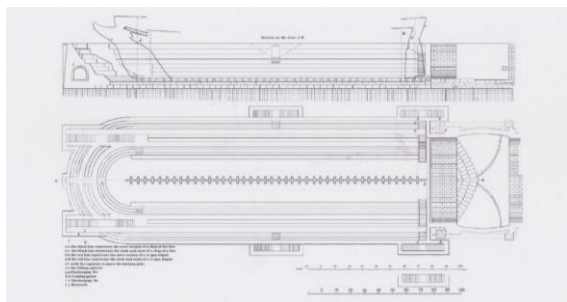
435
Caption: “Cross-section of Dry Dock No.1, Charlestown Navy Yard”



“...They stand today splendid and enduring examples of masonry construction, of the skill of their designer and builder, and of the Navy Department in calling him to its service and approving his recommendations...”

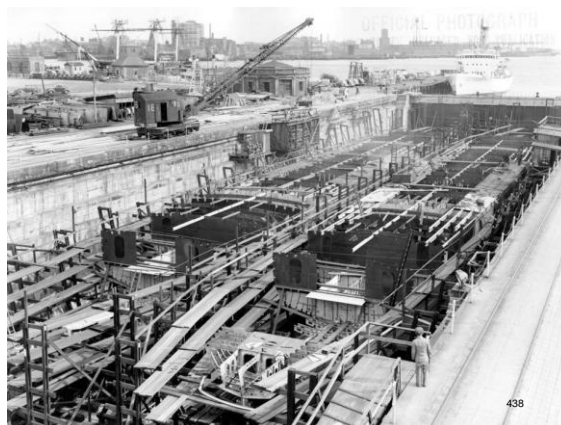
The New York Daily Tribune, November 21, 1898

436
Caption: “Dry Dock No. 2 – Boston Navy Yard, Transverse Section”

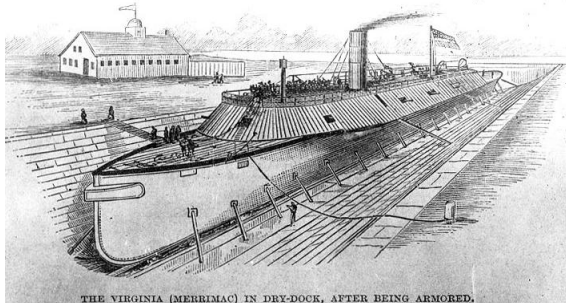


Baldwin’s design, which called for a substantial masonry dry docks (the first of their kind to be built in America), received the enthusiastic endorsement of the Secretary of the Navy. Much of Baldwin’s initial work for the USN focused on the construction of the dry dock at the Charlestown Navy Yard, Boston. The cost of the Charlestown dock amounted to \$677,089, substantially more than Baldwin’s initial estimate of \$280K, which he presented in January 1825.

437
Caption: “Plan and section of Dry Dock No. 1, Charlestown Navy Yard”



438



THE VIRGINIA (MERRIMAC) IN DRY-DOCK, AFTER BEING ARMORED.

Began in 1827 and completed in 1834, Dry Dock No. 1 at the Norfolk Naval Shipyard is still in use today. In June 1833, before the dock was completed the USS Delaware – a 74-gun Ship-of-the-Line became the first vessel to ever dry dock in the Western Hemisphere. In 1861, the burnt hull of the USS Merrimac began her restoration, eventually becoming CSS Virginia, the first steam-powered ironclad warship built by the Confederate States' Navy. In 1972, Dry Dock No. 1 was designated a Registered National Historic Landmark by the Department of the Interior.

439

“...Although now sixty-five years old, they are still in constant use, have had repairs to the docks of but slight extent, and at moderate expense for work now necessary they give promise of endurance and usefulness for centuries to come. The Government of that day in these noble structures builded better than it knew...”

The New York Daily Tribune, November 21, 1898

440



441

“...These docks were followed by one of granite, completed in the Brooklyn Navy Yard in 1851...”

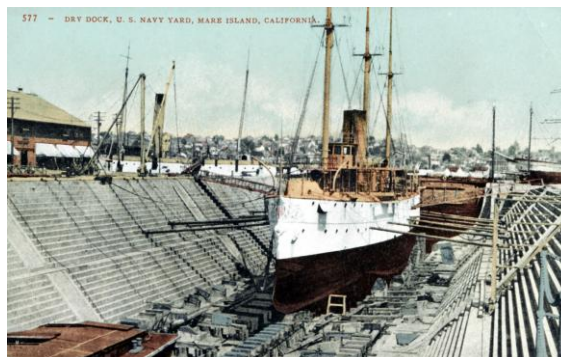
The New York Daily Tribune, November 21, 1898

RE: the Brooklyn Navy Yard's Dry Dock No. 1 is the third-oldest dry dock in the U.S., being completed in 1851, well after the dry docks at Charlestown and Norfolk. The first permanent dry dock in NYC built at a cost of \$2 million, Dry Dock No.1 is the smallest of the Brooklyn Navy Yard's dry docks. Dry Dock No.1's masonry superstructure used 23K cubic yards of granite, mainly from Maine and Connecticut. The dock's stone floor is 30-foot-wide and curves in an inverted arch shape toward the edges of the sides and the landward (southwest) end. The center of the floor is mostly flat, with a 1-foot groove. Steps lead down the sides of the dock. At the seaward end is a gate that floats open without the use of hinges. A Harper's magazine article from 1871 stated that Dry Dock No. 1 had a capacity of 610K U.S. gallons and could be emptied within two hours and ten minutes. The dock was 66-foot-wide and 36-foot-deep and when filled at high-tide, the depth of the water was 26-feet. In 1918, The Brooklyn Daily Eagle described the main chamber of the dry dock as being 286-feet-long by 35-foot-wide (on the bottom) and the top part being 370-foot-long by 98-foot-wide. At one time, the pumping engine built for this dry dock was the largest in the U.S.

442



443



“...Another dry dock of masonry was constructed at the Mare Island Navy Yard, and finished sufficiently for service in 1881...”

The New York Daily Tribune, November 21, 1898

444

Caption: “USS Bennington in dry dock at the Mare Island Navy Yard, Calif., ca. 1898”

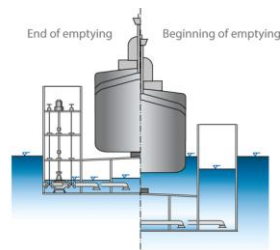
“...This structure is not entirely of granite or other stone, concrete entering largely into its construction...”
The New York Daily Tribune, November 21, 1898

445



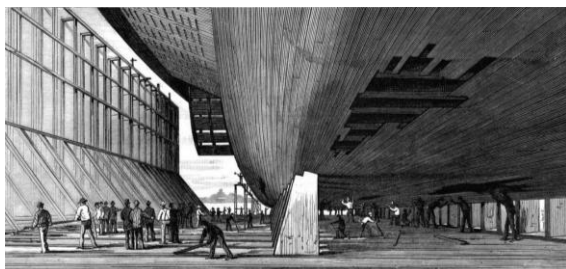
“...In the interval which elapsed between the completion of the first stone docks and that at Mare Island the Navy Department favored to some extent floating dry docks of wood, but as their material was not permanent, as they involved more risk than graving docks, and as, in the end they were not regarded as valuable for naval purposes, they were not replaced when they decayed and became unserviceable...”
The New York Daily Tribune, November 21, 1898

447



Above: a Floating Dry Dock is divided into chambers, which can be flooded individually. When the dock is submerged (flooded), the pumps and drive shafts are also submerged. In a Floating Dry Dock, the bilge pumps are installed in one of the legs of the U-shaped structure. Each chamber is equipped with its own suction line, which is connected to the corresponding bilge pump via a shut-off valve. The pumps and shut-off valves can be operated from a Control Station from where the levels of each chamber (as well as the longitudinal and transverse inclination of the dock) can be monitored. To lift the dock and the docked vessel, the amounts of water which are pumped out of the individual chambers may vary to accommodate the weight distribution.

448



“THE ‘Massachusetts,’ a new steamer plying on Long Island Sound between New York and Providence, recently ran upon a rocky beach . . . While the ship was being cleared of water, steam was got up in two boilers, which enabled the Massachusetts to leave her rocky bed and to proceed to the New York floating dry dock under her own steam, where, at the time of writing, she is, and where the damage done has been fully ascertained and examined, and the necessary repairs are being made. The illustration represents the ‘Massachusetts’ in this dry dock, and ship-carpenters repairing the extensive break already described...”
Scientific American, November 17, 1877

449



“...Had the Government continued the policy begun in 1824 its later history would not have been marked by lavish expenditures for repairs to docks, by disaster and financial scandals in dock-building and by such incidents as the enforced docking of the battleship ‘Indiana’ on foreign territory. All of these have followed in the wake of the timber dry dock, which when the need of more docks appeared, was pressed upon the attention of the Government...”

The New York Daily Tribune, November 21, 1898

RE: the Indiana-class was a class of three (USS *Indiana*, *Massachusetts* and *Oregon*) pre-Dreadnaught battleships launched in 1893. They were the first battleships built by the USN that were comparable to those of European Navies. All three served in the Spanish-American War.

Upper Left: caption: “*Indiana* – the lead ship of the class”



Lower Left: caption: “The forecabin of *Indiana*, showing its fore 13-inch turret and one of the 8-inch turrets”

450

Simpson & Co.

"...All docks of this material built on the Atlantic coast were constructed by the firm of Simpson & Co., which firm, since it controlled certain patents covering improvements in such docks on the seaboard, comprised the only persons who had an active, personal interest in inducing the Government to build its future docks of wood..."

The New York Daily Tribune, November 21, 1898

RE: engineer *James E. Simpson (1813-1897)* founded the *Simpson Dry Dock Company* to build his patented timber dry docks

451

452



453

454

Erie Basin which, at one time, was dubbed "The busiest place in the Port of New York," is a large man-made, protected harbor near the southern point of Red Hook, Brooklyn. Its U-shaped breakwater, well over half-a-mile long, encloses a large area of water. The basin was originally a major center of the world-wide grain trade and then, later, of shipbuilding and repair. In 1881, the *Simpson Dry Dock Co.* was contracted to enlarge and rebuild Brooklyn's Erie Basin dry docks. At the time, they were the largest in the U.S.



Above: the dry dock at the *Erie Basin* was a type of *Simpson Dry Dock Co.* timber dry dock that James E. Simpson patented in 1854

455

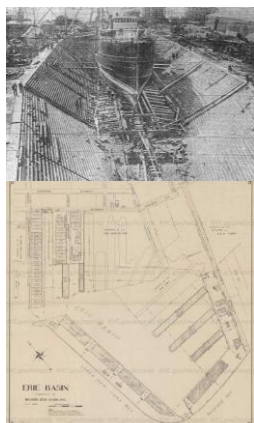


Caption: "The racing yacht *Shamrock* at the Erie Basin, Brooklyn"

456

In the 1850s, Irish immigrant *William Beard* purchased land in Red Hook, Brooklyn (named for *Fort Defiance*, built by American patriots at the tip of the *Valentino Pier*) and using land reclamation from the ballast of ships and building ruins, stretched a new hook into the harbor, forming *Erie Basin*. During the *Civil War*, the basin was the busiest ship repair facility on the East Coast and remained so well into the early 20th century. As a cargo port, two-thirds of the goods brought to NYC passed through Erie Basin.

457



By the end of WWI, the Erie Basin's *Todd Shipyard* was the largest in the *Port of New York* and remained so through WWII. A key feature of the shipyard was "Graving Dock One." Completed in 1866, the 730-foot-long dry dock was used by *Robins Dry Dock Co.* until 1916 and then by their successor, the *Todd Shipyard Corp.*, until 1986. Following WWII, the port fell into decline as larger container ships docked at the deeper and larger docks at *Port Newark*. Nowadays, the *Erie Basin Hook* is occupied by warehouses, a bus depot and an NYPD tow pound. Leased to other companies, *Graving Dock One* remained in use until 2005, when *Ikea* bought the property and paved over the graving dock to make room for a parking lot.
Top: caption: "Robins has two graving docks and three floating docks in Erie Basin"
Bottom: caption: "Map of Erie Basin"

459



460

The New Dry Dock, Brooklyn Navy Yard

Scientific American
November 30, 1889

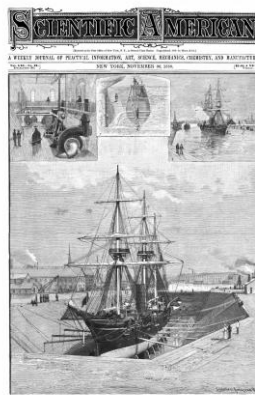
THE pioneer in the building of timber graving docks was Mr. J.E. Simpson, the senior member of the firm of J.E. Simpson & Co., of this city. For many years he upheld the superiority of wood over stone for these structures. The points made in their favor are numerous. Their original cost is comparatively low. They resist the action of frost much better than do stone docks, whose members are apt to be dislodged by successive winters. Hence the repairs required are less than for stone structures. From the standpoint of practical working they possess valuable features, when constructed upon Mr. Simpson's system. The material is safer and better for the workmen than is stone. The steps are so low that they can easily be mounted. As they entirely surround the dock, no choice of a place to go to or from work is needed. In severe weather ice is not so liable to form and remain upon wood as on stone.

461

462

Thus it is clear that many practical points of merit can be cited. At first sight they would appear of a more temporary character than stone, yet this does not seem confirmed on examination. The first dock of this type was built in Boston in 1853 and 1854. It is still in use and in fair condition. Less than two years later a second dock was completed there. After constant service for twenty years with but slight repairs, part of the woodwork was rebuilt. But this rebuilding only refers to the alters or facing pieces, as the original piles, floor timbers, and abutments are still in use

463



The Brooklyn Navy Yard dock, which we illustrate, is one of three contracted for the government by this firm. Hitherto the United States naval authorities have favored stone as the material for graving docks. When they began to consider the expediency of erecting wooden docks, boards of inspectors were appointed by the Secretary of the Navy, to examine existing timber docks, and to report upon the advisability of building such structures for the Navy Yards. In accordance with the recommendations of these investigators, timber docks were started at three Navy Yards, at Portsmouth, Va., League Island, Pa., and Brooklyn, N.Y.

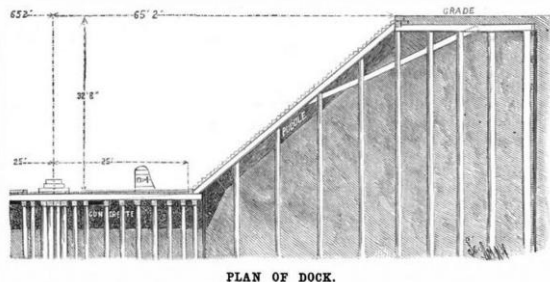
464
Caption: "The new Simpson timber dry dock at the Brooklyn, N.Y. Navy Yard"

The dock represents an excavated basin or slip lined throughout with Georgia pine timber, with sides and inner end sloping to the floor. The outer end is open, and is provided with heavy sill and abutment timbers. An iron caisson fits this opening and acts as a gate. The general dimensions are as follows: Length overall on coping, 530-feet; length over all inside of caisson, 500-feet; width on top amidship, 130-feet 4-inches; width on floor amidship, 50-feet; width on floor at entrance, 53-feet; width on top at entrance, 85-feet; depth of gate sill below coping, 30-feet 6-inches; depth of gate sill below high water, 35-feet 6-inches; depth at center, 33-feet 8-inches.

465

It will be seen that the sides at the ends are brought together, thus economizing pumping. The general outline conforms in some degree to the outline of a ship. The visible part of the dock is by no means all of it. A great part of the structure is hidden away underground, the whole being surrounded by close sheet piling that lies twenty-six feet back from the coping.

466



The structural features are shown in cross-section in the cut, one-half only of the dock being included. At the bottom is the floor, fifty-feet-wide by four-hundred and sixty-feet-long. Around the periphery of this area eight-inch tongued and grooved sheet piling is driven. In good ground the practice has been to drive this down seven-and-one-half feet. But on account of quicksand, it was driven down forty-five-feet in the present instance.

467

The area included within this sheet piling contains round piles, driven in rows, three feet between centers transversely, and four feet in the direction of the length of the dock. Each row of piles carries a longitudinal square timber of Georgia pine. Upon these rest cross timbers three feet between centers, and the planking for the bottom is spiked or bolted to these. This planking is three-inches-thick. Special rows of piles are driven to carry the keel blocks; a space ten-feet-wide beneath the center of the dock contains extra closely spaced piling for this purpose. The timber used is in general about one-foot square, and the piling twelve inches in diameter.

468

Under the floor and surrounding the heads of the piles is a bed of Portland cement concrete, five-feet-thick at the center, and rising toward each side between the transverse timbers to the height of one-foot, giving a maximum thickness of six-feet. Any water which may find its way thereto runs down to the central axis of the dock, owing to this slope.

469



CROSS SECTION OF ALTERS.

These pieces are termed alters. They are of Georgia pine. They are bolted to side brace timbers that rise, following the same slope from the edge of the flooring. Where the alters cross these timbers, the bolts are driven; one bolt passes through the center of the timber vertically, a second one is driven through the face of the alter diagonally, so as to enter the brace timber perpendicularly. The lower ends of the brace timbers abut upon the floor timbers and also against square longitudinal timbers bolted to the floor and representing the bottom alter. Four piles support each brace timber at equidistant points of its length. A mass of concrete rises six-feet up the side, back of the alters, running from two- to five-feet in thickness. Above this the space back of the alters is rammed with clay, so as to be filled with a compact and almost impervious puddle. Upon every
471
third floor timber oak bearers are bolted, upon which the bilge blocks slide.

The dock is closed by a floating caisson. This is an iron vessel with sloping stem pieces that exactly fits the dock entrance. A heavy India rubber packing is carried around the entrance sills and abutments against which the caisson bears. No grooves are used, the working of the dock being thus greatly facilitated. Two sills are provided, an outer and inner one. This is to enable repairs of the inner or main sill to be attended to, as this is the one most used. The caisson can close the dock from either sill.

473

From each side of the floor the sides rise in steps with a slope of eight upon ten, or about 39-degrees. They are lined with pieces of ten-inch plank, eleven-inches in greatest height, but chamfered off at their rear and lower corner, so that their vertical rear face is only three-inches-high. They run horizontally around the dock, forming steps eight-inches-high and ten inches wide upon the parallel sides.

470

From the interior lines of coping the dock, as stated, is one hundred and thirty-foot four-inches-wide, and twenty-six feet back from this coping line tongued and grooved sheet piling is driven well below the floor level of the dock, so as to completely surround it. This gives a total width of one-hundred and eighty-two-foot four-inches. Four rows of piling with cross caps are driven within this area between sheet piling and coping, and diagonal braces are carried from the center of these caps to the center of the cross brace timbers that carry the alters.

472

Very powerful pumping machinery is provided for emptying the dock. It consists of two centrifugal pumps of 42 in. diameter, driven by two vertical engines 38 in. diameter of cylinder by 34 in. stroke. Three Scotch steel boilers 13 ft. in diameter by 11 ft. long supply steam. The Southwark Foundry and Machine Co., of Philadelphia, supply the pumping plant. The pumps have a capacity of 80,000 gallons-a-minute, and can empty the dock in ninety minutes when no vessel is in it.

474

If a ship is docked, the time required will be proportionately less. Open sluiceways are provided that are made in the concrete under the floor timbers on each side of the keel way. These lead to a drainage culvert and pumping well near the front of the dock on one side. The suction pipes run thence to the pumps. This supplies means for emptying the dock. The filling is done through the caisson. Culverts, with valves, run through its body transversely. Several flood gates 23 in. in diameter are provided, operated by hand wheels. Thus the filling can be extremely rapid.

475

Opening of the New Dry Dock at the Brooklyn Navy Yard

Scientific American
May 17, 1890

The caisson is raised and lowered by pumping out or admitting water ballast, a small boiler, engine, and rotary pump being contained within it. The same engine works a capstan on its deck. Work was begun upon the dock about Dec. 16, 1887, possession of the ground having been acquired one month earlier. It is hoped that it will be completed by Feb. 1, 1890.

476

THE Simpson dry dock, which has already been described and illustrated by us (see SCIENTIFIC AMERICAN, November 30, 1889) was formally opened on Friday, May 9, in the presence of a number of spectators, including many visitors and invited guests from Washington, Baltimore, and Philadelphia, as well as representative naval officers, engineers, and others of the vicinity. Promptly at 10:30 A.M. the dock was flooded, and in one-hour and five-minutes was full. The caisson was then lightened by the ejection of some of its water ballast and floated to one side. The U.S. monitor *Puritan* was next placed in the dock, the caisson was replaced and the large pumps started, emptying the dock and leaving the ship upon the keel and bilge blocks. A very elegant collation was then tendered the visitors. In all respects the occasion may be termed a success, and the officials of the Brooklyn Navy Yard are to be congratulated on this last addition to their plant.

477

The Timber Dry Docks at the Brooklyn Navy Yard

Scientific American
February 20, 1897

AS we go to press the last few yards of excavation are being taken out preparatory to opening the great timber dry dock at the Brooklyn Navy Yard, known as No. 3, to the river, and by the time this issue is in the hands of our readers the dock will be completed and ready for the entrance of warships. In its general construction it is similar to No. 2, a timber dock lying parallel with it which was opened a few years ago; but its capacity, as will be seen from the accompanying table, is considerably greater.

| | Length on Coping. | Breadth on Coping. | Depth of Water on Sill. | Material. |
|-------------------------|-------------------|--------------------|-------------------------|-----------|
| Dry dock No. 2, | 500 ft. | 130 ft. | 25½ ft. | Timber |
| Dry dock No. 3, | 670 ft. | 151 ft. | 29 ft. | " |

479

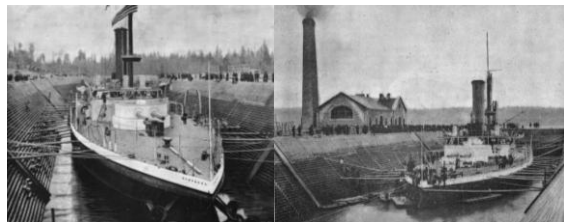
In some of its dimensions the new dock is the largest of its kind in the United States, its nearest competitor being the great Port Orchard dry dock on Puget Sound, an illustrated description of which appeared in the Scientific American of October 3, 1896.

480

"...The new dock, which is 675-feet-long by 130-feet-wide on coping, and 579-feet-long by 67-feet-wide on the bot-tom, is the largest on the Pacific coast, and is at present the largest in the United States (the Brooklyn dock when completed will be 20-feet longer, but will have 2-feet less water over the sill) and it takes rank as one of the big docks of the world. It will give this government pre-eminence in Pacific waters, as it alone can dock any vessel now afloat, avoiding a visit to Atlantic waters. In point of size it is considerably larger than its nearest competitors on the Pacific coast, being about 140-feet longer than the Mare Island dock, and 200-feet longer than the Esquimault dock (near Victoria, B.C.), while as to cost, it was but about \$600,000, as compared with \$3,000,000 for each of the others...The dock is built entirely of wood, save the concrete in the floor foundation and the concrete and masonry entrance. The entrance sill is of green sandstone, with a dressed granite gate seat facing of the massive masonry type, upon a concrete foundation of monolithic form resting on a pile and stringer grillage. The clear opening of the entrance is 92-feet-wide, with 30-feet depth of water over the sill at mean high water. The bottom of the dock rests on about 8,000 piles, driven in a solid cluster down the center of the dock, where the keel blocks rest; and in rows 4-feet between centers laterally and 3-feet between centers longitudinally over all the remainder of the bot-tom..."

Scientific American, October 3, 1896

481



"...When a vessel is docked, this caisson is hauled into position by means of the steam windlass; its draught is then regulated by means of the water ballasting, and when the pumps begin to lower the water inside the dock, the pressure of the external water forces it to a seat against the granite masonry facing, the rubber strip acting as a packing and making a perfectly watertight joint. When a vessel is ready to come out of dock, the twelve 80-inch gates are opened and water pours into the dock through the pipes. When the water inside the dock has risen to the level of that outside, the small centrifugal on the caisson pumps out a portion of the water ballast until the caisson floats up from the seat. It is then swung clear and leaves the entrance of the dock entirely unobstructed..."

Scientific American, October 3, 1896

Left: caption: "The United States Steamer Monterey in the new dry dock on Puget Sound" 482
Right: caption: "The Puget Sound dry dock and pumping plant"

"...The boiler and pumping plant are located on the right hand side of the dock entrance. They are in- stalled in a brick building, with stone trimmings, founded upon pile and concrete grillage. The boiler plant consists of six horizontal, eighty 4-inch tube boilers, 6-feet in diameter by 16-feet in length. The pumping plant consists of three 48-inch centrifugal pumps 14-feet-high, each operated independently by a 34 by 28-inch vertical engine of the marine type, and an auxiliary 10-inch centrifugal, having its own independent engine, used for keeping the dock dry when empty. These pumps all stand in a pump well, having its floor about 15-feet below mean high water or 18-feet above the bottom of the dock, making the extreme suction of the pumps about 30-feet. The total capacity of the pumps is sufficient to empty the dock, which holds 13,500,000 gallons at mean high water, in two hours..."

Scientific American, October 3, 1896

483

The latter dock is 5-feet longer and has 1-foot greater depth of water on the sill, but it is not so wide. These two docks are among the largest in the world, and they are likely to meet all the needs of our Navy and Merchant Marine for many years to come.

484

The use of timber for dry dock construction is comparatively modern, all the earlier docks having been built of stone. The first timber docks in the United States were constructed over forty years ago, and experience has shown that they are thoroughly reliable. It is true that in those waters which are infested with the teredo the entrances are liable to be eaten away; but the difficulty can be overcome by building these parts of masonry or concrete.

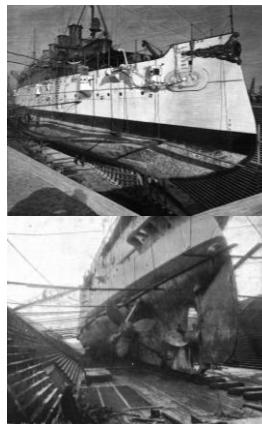
485

There are advantages of increased light and working space in a timber dock, due to the easier slope of the side walls; but the main advantage lies in the rapidity with which it can be constructed and the fact that it is much cheaper to build. This is shown by a comparison of this dock with the stone dry dock at Mare Island, San Francisco. The new dock will have cost about \$600,000, whereas the stone dock at Mare Island cost about \$3,000,000 complete, although it is over 140-feet shorter and the depth and width are smaller in proportion.

486



The illustrations which accompany this article will give a clear impression of the construction of these dry docks and the manner in which a warship is carried upon the keel blocks and shored up by struts which rest upon the altars and are wedged snugly against the hull. One of the views shows the cruiser *Columbia* entering dock No. 2, the caisson gate having been floated away from the entrance, as will be explained later. ⁴⁸⁷
 Caption: "The Cruiser *Columbia* entering Dry Dock No. 2 at the Brooklyn Navy Yard"



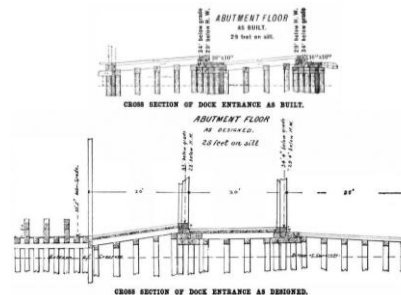
Two other cuts show a bow and stern view of the same ship in the dock after the water has been pumped out. It will be remembered that the *Columbia* and her sister ship the *Minneapolis* are the two fastest cruisers of their size (7,475 tons) afloat today, the former having a record of 22.8 knots-per-hour and the latter having slightly over 23 knots to her credit. They are also remarkable for their arrangement of triple screws. It only requires a glance at the long, easy sweep of the lines of this ship as shown in the illustration, remembering the fact that within her hull are engines and boilers of 21,500 horsepower, to understand how this phenomenal speed was maintained on a four hours' trial.

Top caption: "The U.S. Cruiser *Columbia* in Dry Dock No.2, Brooklyn Navy Yard"

Bottom caption: "*Columbia* in Dry Dock No. 2, showing arrangement of triple screws" ⁴⁸⁸

Before entering into the detailed description of the new dock No. 3, it will be well to refer to the sensational rumors which have appeared in the daily press to the effect that the dock is several inches shallower on the sill and shorter in total length than the contract calls for. If the dock is a few inches short in a length of nearly seven hundred feet, it is a small matter; but if the available depth of water on the sill is four-inches less than was designed, it is a matter of most serious moment.

489



By reference to the two drawings showing the work as first designed and as now built, it will be seen that it was at first intended to have a depth of 29-feet 4-inches over the outer sill and 28-feet over the inner sill. Before the contract was let it was decided that the 12- by 16-inch timber which forms the outer edge of the sill and takes the thrust of the caisson gate was not deep enough, and its depth was increased to 16-inches. The difference - 4-inches - was deducted from the total depth, leaving it 29-feet ⁴⁹⁰
 in place of 29-feet 4-inches.

This change did not affect the capacity of the entrance, as this was determined by the inner sill, which was now one-foot higher than the outer sill. It was subsequently arranged to lower the inner sill one-foot, as shown in the plan, thereby giving a clear depth over both sills of 29-feet, or one-foot more instead of four-inches less than the original design.

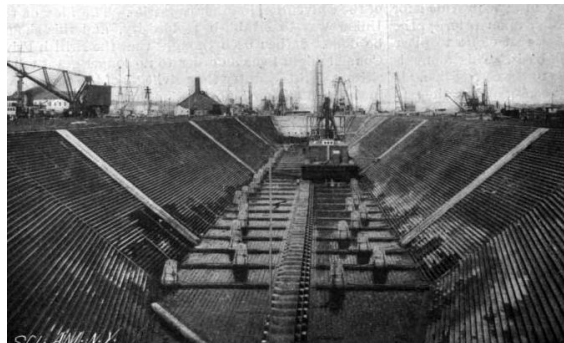
491

The value of this additional foot of depth is incalculable. It would mean that in time of war a crippled and sinking ship would have just that much better chance of crawling into dock before she sank. It is true the present sills are one-foot lower than the top keel blocks; but these could be removed and working space could be obtained by taking up the planking on the floor of the dock - an expedient which could easily be carried out and would give 15-inches more head room.

492

As regards the shortage of 20-inches in the length, it may be said that since the work was begun the dock has been lengthened 70-feet and has been moved bodily inshore 64-feet. The piling upon which the structure is built is spaced 4-feet apart longitudinally. The present difference in length is caused by the fact that, when the dock was lengthened, it was built to an even multiple of 4-feet.

493



The plan of the dock approximates to the form of a ship, the sides tapering toward the ends and sloping toward the floor.

Caption: "Dry Dock No. 3 – Length: 670-feet; Breadth at Coping: 151-
feet; Depth of Water on Sill: 29-feet" 494

The inner end is formed by a transverse wall which has the same slope as the side walls and the outer end is closed by a hollow steel caisson of a general boat-like form, whose keel and stems conform exactly to the cross-section of the dock entrance and fit against a bottom sill and side abutments, a watertight joint being secured by means of a rubber gasket. The problem in building such a dock is to provide a deep, watertight basin which shall be able to withstand the pressure of the water when it is full, and to carry the concentrated weight of the ship and prevent seepage of water from without when it is empty.

495

The floor of the dock, which is 626-feet 8-inches-long by 64-feet 4-inches-wide, is carried upon 12-inch spruce piles 45 to 50-feet-long. They are spaced 4-feet between centers except beneath the keelway, where eight piles are driven close together to take the enormous weight which is concentrated on the keel of the ship. After the piles had been cut-off to the same level they were capped with 12 x 12-inch longitudinal timbers, drift-bolted to the piles, and above these over each row of piles are lateral timbers extending across the full width of the floor. Above this is laid the floor of 3-inch planking.

496

To render the floor watertight a complete bed of concrete 4-feet-thick is laid beneath it, its surface being level with the top of the longitudinal piles. Within the concrete is formed a system of drains leading to the pump well. To render the floor thoroughly secure against leakage, a complete wall of sheet piling formed of 8 x 12 timbers, tongued and grooved, was driven entirely around the outer edge of the floor. This extends 35-feet below the floor level, and the concrete beneath the floor is finished-off carefully against it.

497

The sloping side walls are carried upon brace piles which are driven 6-1/2-feet from center-to-center laterally, and 4-feet between centers longitudinally. Securely notched and drifted to these are the sloping timbers forming the altar supports, which butt at their lower end against the transverse floor timbers before mentioned. Directly upon these are bolted the 8 x 13-inch stringers which form the "altars," as the steps of the side walls are termed.

498

To prevent leakage through the side walls, over 3-feet of puddled clay are carefully tamped in around the piles and up to the underside of the altars. Back of the coping there are driven five rows of coping piles, and 26-feet back from the coping of the side walls is driven a second wall of sheet piling. This extends 50-feet below grade, and completely encircles the dock, the bottom edge of this outer wall being 15-feet below the dock floor. This is done to prevent seepage of water through the side walls, and it is assisted in this by several transverse walls of sheet piling.

499

That this work has been well done is proved by the fact that the leakage into the dock was only 3-inches in twenty-four hours. This leakage was due to the fact that the trench for the suction pipe was open for alterations, and when this trench is closed the dock will be perfectly dry.

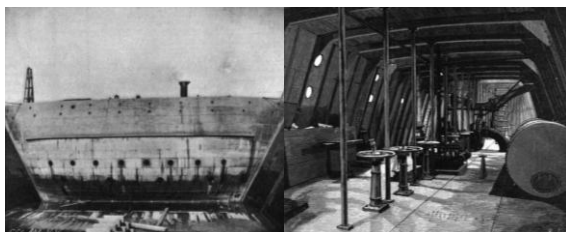
500

The methods adopted by the contractors, T&A Walsh, of New York, in excavating this great dock were entirely novel, and are of considerable interest. Excavation was begun at the inshore end, and the work of excavating and pile driving was carried out in sections. As each section was being excavated it was enclosed by sheet piling and flooded with water. This enabled floating pile drivers and excavators to be used, and the trouble and expense of continually shifting the land pile drivers avoided. After a section had been excavated and the piles driven, it was pumped out and finished off, the plant being moved to a new section.

501

The steel caisson which forms the gate to the dock is of special interest. It is the largest in the world, exceeding that at the entrance to Puget Sound dock. It is shaped like a double-ended boat, its length on deck being 108-feet 8-inches; depth, keel to deck, 35-feet 4-inches; length on keel, 71-feet 1-1/2-inches; and greatest breadth, 25-feet. The keel is 24-inches-wide by 17-inches-deep, and on each side of it and on each side of stems are strips of plank, to which are fastened rubber gaskets 1-1/2-inches-thick by 6-inches-wide. These bear against the side abutments and the bottom sill, and under the enormous pressure of the water make a tight joint. The framing consists of 4 x 4-inch angles, spaced 2-feet apart, and the plating varies from 3/4-inch at the garboards to 3/8-inch at the sheer strake.

502



The caisson is strengthened by longitudinal stringers from 20- to 24-inches-deep, which are riveted to the frames. Twelve-feet above the keel is the lower deck, which consists of 8-inch deck beams, riveted to every other frame, and tied together by longitudinal stringers of 5/8 by 24-inch plate. Each beam is tied to the bottom framing by three 3-inch stanchions. Twelve-feet above the lower deck is the main deck, which is the one shown in our accompanying view of the interior of the caisson. It is covered with plating 1/2-inch and 5/8-inch-thick. Above this is a top deck of wood, which is level with the coping of the dock.

Left: caption: "The Floating Caisson in-place closing the dock" ⁵⁰³
Right: "Dry Dock No. 3 at the Brooklyn Navy Yard - interior of Caisson"

In the bottom are placed 200-tons of concrete ballast, to give the caisson stability when it is floated away from the abutments. The space below the main deck is utilized for water ballast which is taken in for regulating the draught. Water is admitted by two 16-inch gate valves, one at each end of the caisson, and it is removed by the 12-inch centrifugal pump seen in the engraving of the interior. The donkey engine in the center of the deck operates a capstan on the upper deck which serves for warping the gate into position.

504

Arranged down the center of the deck are twelve hand wheels which operate as many large gate valves for admitting water to the dock when a vessel is ready to leave. The valves are placed midway in a dozen pipes, which pass clear through the caisson. They are in two rows, the lower pipes being 24-inches and the upper row 20-inches in diameter. The large tank seen in the foreground holds 20,000 gallons of fresh water for the boiler, which is located on the main deck. The caisson was built by T.S. Marvel & Company, of Newburg, N.Y.

505

The pumping machinery for emptying the dock is located in a building near the dock entrance. It was put in when dock No. 2 was built and will now be doing double duty. It consists of two 42-inch centrifugal pumps driven by two vertical engines with cylinders 28-inch diameter by 24-inch stroke. The plant was built by the Southwark Foundry and Machine Company, of Philadelphia, and the pumps have shown a service capacity of 95,000 gallons-per-minute. There is also a 15-inch pump with a capacity of 7,000 gallons-per-minute for drainage.

506

The figures of the total quantities are necessarily large for a dock of this size. They are as follows:

| | |
|----------------------------------|-----------------|
| Twelve inch spruce piles..... | 18,000 |
| Twelve inch oak piles..... | 290 |
| Yellow pine timber..... | 2,893,446 B. M. |
| White pine timber..... | 115,000 " |
| Oak timber..... | 128,000 " |
| Screw bolts and drift bolts..... | 657,000 pounds. |
| Cast iron suction pipe..... | 290,000 " |
| Barrels of cement..... | 8,600 |

The total cost of the dock including the track around the coping and pile foundation was about \$600,000. We are indebted for our particulars to the courtesy of Mr. C.M. Bird, the engineer for the contractors.

507

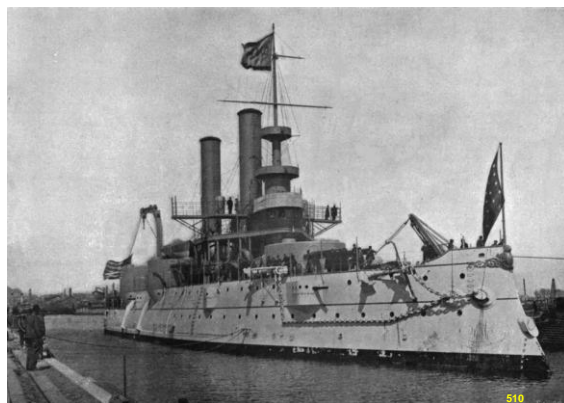
The United States First-Class Sea-Going Battleship *Iowa*

Scientific American
April 10, 1897

508

We present a handsome engraving of the first modern first-class sea-going battleship built for the United States Navy - the *Iowa*. It is reproduced from a photograph of this noble vessel which was taken immediately upon her arrival from Cramp's shipyard on the Delaware and just as she was floated into the new Dry Dock, No. 3, at the Brooklyn Navy Yard.

509



The United States First-Class Sea-Going Battleship *Iowa* in the New Dry Dock No. 3 at the Brooklyn Navy Yard

510

Our readers will remember that we gave a full illustration and description of this dry dock in our issue of February 20, and from the record of its dimensions they will understand that it is fully equal to the task of accommodating a vessel of the size of the *Iowa*, in spite of the fact of her great draught and her loaded displacement of between 11,000- and 12,000-tons. The *Iowa* is 360-feet-long, 72-feet in beam.

511

At the time that our photograph was taken this splendid ship had just come up from the shipyard of her builders, whose flag will be noticed flying at the mast-head. The *Iowa* was approved by an Act of Congress July 19, 1893, and the contract was awarded to William Cramp & Sons, of Philadelphia, Pa., the contract price for ship and machinery being \$3,010,000.

512

The visit to the dry dock was made for the purpose of having her hull thoroughly scraped and painted and everything possible done to increase her speed at the official trial. Our readers will realize how thoroughly this work is done when they bear in mind that, by the terms of the contract, \$25,000 is paid to her builders as a bonus for every quarter knot of speed which she realizes in excess of the contract requirements.

513

The Leak in the New Dry Dock, Brooklyn Navy Yard

Scientific American
May 22, 1897

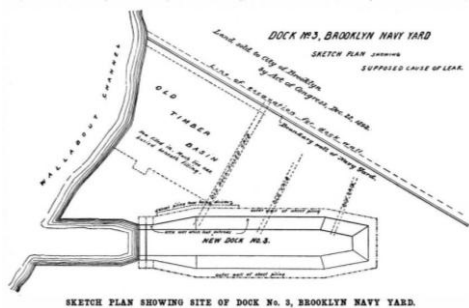
514

THE large dry dock at the Brooklyn Navy Yard, known as No. 3, which was completed early in the present year, has developed a leak which is so serious as to necessitate the temporary closing of the dock while measures are being taken to locate and remedy the defect. The leak first showed itself when the *Massachusetts* was in the dock, the water coming in at the joints of the side altars or steps. The flow increased so rapidly that the work on the ship was hastened, and water was let into the dock as early as possible.

515

The area over which the water comes in is quite extensive. It commences at a point about 40-feet from the caisson and extends for 350-feet on the north side, all the altar joints leaking from the 20-foot level to the bottom of the dock. The inflow of water is largest near the caisson and at a point where the old timber and stone bulkhead of a former dock line was dredged out during the excavation of the dry dock. It is naturally supposed that the water is working its way in behind the walls of the dock by way of this buried bulkhead.

516



SKETCH PLAN SHOWING SITE OF DOCK No. 2, BROOKLYN NAVY YARD.

If our readers refer to the *SCIENTIFIC AMERICAN* of February 20, they will find a full description of this dry dock, in which the means adopted for preventing seepage of the water through the sides of the dock are explained at full length. In addition to the puddled clay which was worked in immediately behind the altars, a complete wall of sheet piling, as shown in the accompanying sketch, was driven around the dock, completely encircling the sides and inner end. 517

518

The site upon which the dock is built was originally a swampy piece of ground, which from time immemorial had been used as the general dumping ground of the navy yard. There is reason to believe that three successive crib bulkheads had been built across it parallel with the river front, and the space behind them filled in with miscellaneous material. The ground thus made extended from midway between dock No. 2 and the present dock out in a northerly direction for several hundred yards; and it will thus be seen that the new dock was excavated partly from made ground and partly from the original bottom of the swamp. The axis of the dock lies approximately at right angles to the line of the old bulkheads.

519

The sheet piles were tongued and grooved, and were driven to the depth of 45-feet, wherever it was practicable. If this wall had been everywhere driven down to hard material, and if the joints had been compactly made, it would be impossible for the amount of water that is entering the dock to pass through. The present heavy leakage makes it almost certain that the wall is defective.

The timber and the rock filling of these structures was unearthed by the contractors during the course of the excavation and as much of them as intersected the dock was removed. The outer wall of sheet piling on the north side would naturally intersect the bulkheads, and it is feared that the rocks and timber of which they are built form a break in the continuity of the piling. This does not seem to have affected the dock during the two or three months during which it has been open; but recently dredging operations have been carried on by the city at the northern side of the made ground, where excavation for concrete bulkhead walls is now being carried on.

520

The leak appeared when the dredge was working on the line of the old bulkhead above mentioned, and it is naturally supposed that as the wall of mud was removed the water flowed through the rock filling of the crib, passed through the wall of sheet piling and accumulated behind the altars of the new dock. By reference to the accompanying sketch it will be seen that the southeast corner of the old timber basin abuts on the wall of sheet piling in close proximity to the present leak. This basin is full of live oak timber which lay there in the days of wooden shipbuilding and was never removed when the basin was filled up. It is quite possible that the water also finds its way from the Wallabout Channel through this timber to the weak spot in the sheet piling.

521

The authorities are endeavoring to stop the leak by driving a second wall of sheet piling ten feet back from the old wall for a distance of two-hundred and fifty-feet. The new work will be closed by cross walls which will be driven to a watertight connection with the old structure. This will form a kind of three-sided box which will enclose the faulty portion of the work.

522

It takes no expert to understand that this line of buried cribwork, leading directly up to the dock, is a serious menace to its safety. As long as it lies there it will act as an underground conduit for the water, which might flow in considerable volume through the rock with which the crib is filled. It would surely be good economy to remove these cribs bodily for some distance back from the dock and replace them with more impervious material.

523

It will be understood that the above statement of the case is based upon the ascertainable facts at the time of our going to press. A special board is now making a thorough investigation of both this dock and dock No. 2, which shows indications of a slight leak on the northern side. We shall hope to give the findings of this board in an early issue.

524

Origin of Leak in the Dry Dock, Brooklyn Navy Yard

Scientific American
May 29, 1897

RECENT developments in the investigation of the leaking dry dock at the Brooklyn Navy Yard have turned the attention of the engineers in an entirely new direction in their search for the exact location of the leak.

525

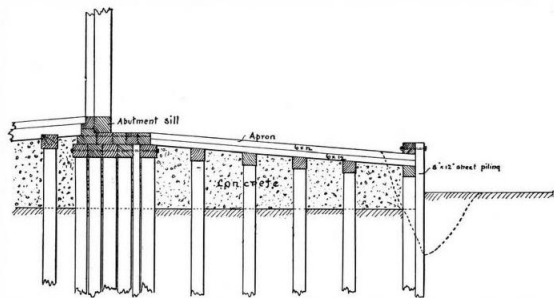
526

There is now good reason to believe that, whatever seepage may be taking place from the old timber basin and buried cribs on the northern side of the dock, the bulk of the water is passing into the dock beneath the apron which extends from the outer sill into the entrance channel. This is rendered probable by the behavior of the water when the dock was pumped dry for examination, and several of the altar timbers on the north side were wrenched from their seating by the great hydraulic pressure and thrown into the dock. The sudden relief thus presented allowed all the water behind the altars to empty itself into the dock, and it was noticed that not only did the larger leaks on the north side stop running, but the streams of water were lowered on all sides of the dock at once, thus proving that the bulk of the water came from some particular quarter in the vicinity of the entrance.

527

A diver was sent down to examine the apron on the outside of the caisson gate, and he found that a hole had been torn open at the outer edge of the apron, exposing the underlying bed of concrete, and that a large hole had been formed in the bottom mud of the channel around the damaged structure.

528



SECTIONAL VIEW OF APRON AT ENTRANCE TO DOCK NO. 3.

Dotted lines show damaged portion of apron and hole washed out in mud bottom.

By referring to the accompanying diagram it will be seen that the dock could not have been damaged in a more vital spot. The cut represents a sectional view of the entrance to the dock and shows the manner of finishing-off the structure to a connection with the natural mud bottom of the entrance channel.

The foundation of the apron is somewhat similar to that of the whole floor of the dock. It is carried on piles which are capped with 13-inch by 12-inch timbers. A solid bed of concrete from 3-1/2 to 5-feet in thickness is worked in around the heads of the piles and finished-off flush with the top of the caps. The flooring of the apron consists of two layers of 6- by 13-inch timbers laid to break joints, the outer edge of the floor being flush with the cap of the outer line of piles. A wall of 8- by 12-inch sheet piling is driven across the entrance in snug contact with the edge of the apron, each pile being bolted to a 12 by 13 stringer on top of the apron.

530

The construction of the dock was carried on from the inshore end toward the channel, and the apron was built while there was yet a couple of hundred feet of solid ground between it and the Wallabout channel. The removal of this material was done by a floating steam dredge, and it is supposed that, in excavating the channel near the apron, the bucket caught the edge of the apron, tearing up the sheet piling and breaking away a portion of the concrete and the timber flooring. The water was now free to enter beneath the concrete floor and work its way along the sides of the dock. Under the great head of from 26- to 29-feet, the pressure upon the structure would be enormous, and would easily account for the bursting in of the walls on the occasion already referred to.

If, as is reasonably supposed, this is the cause of the leak, the dock can be rendered serviceable for a much smaller sum of money than has been named in the daily press, even if it should be necessary to go to the expense of building a temporary dam across the mouth of the entrance channel.

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Repairs to Dry Dock No. 3 at the Brooklyn Navy Yard

Scientific American
August 28, 1897

GREAT interest attaches to the repairs which are being carried out on the new dry dock, known as No. 3, at the Brooklyn Navy Yard. Judged from the engineering standpoint, the problem is an entirely new one, and as there is no case just like it on record, the engineers will have to act entirely on their own initiative. For this reason the plans will, of course, be somewhat experimental and liable to modification as work proceeds.

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In reply to our request for the detailed drawings of this work, the Assistant Secretary of the Navy, Mr. Theodore Roosevelt, informs us that the Department does not wish to publish the drawings of the proposed work at the present stage, especially in view of the experimental nature of the work, as above referred to.

535

Dry Dock No. 3, it will be remembered, is the one which subsequently to its opening developed a serious leak along one side near the entrance, which an examination by a diver showed to result from injury to the outside apron. The floor and sheet piling at the edge of the apron were found to be broken, and it was supposed that the dredge which was used in opening the entrance from the East River had struck the apron and injured it sufficiently to allow entrance of water within the sheet piling.

536

The depth of water (thirty-feet) and the nature of the repairs rendered it impossible that the latter should be carried out under water, and accordingly the engineers are making provision for laying bare the bottom of the entrance for a distance of ninety-feet back from the caisson gate. This will enable a thorough inspection to be made, not only of the broken apron but also of the side walls, back of the abutments, and of the various walls of wing piling which run out transversely to meet the great enclosing wall of sheet piling which encircles the whole dock.

537

In carrying out this plan the engineers are building a massive cofferdam across the dock entrance, which will have sufficient strength to hold back the waters of the East River until the investigation and repairs are completed. The cofferdam consists of three lines of heavy sheet piling, which extend in a curved form clear across the entrance from wall-to-wall. The inner wall will be about 90-feet from the caisson; 13-feet in front of this will be another wall, and 13-feet beyond this a third wall. The curve will, of course, be convex to the thrust of the water, to which it will present an arch effect, though not much reliance will be placed upon the latter in estimating the strength of the dam. The three walls will be strongly braced in the direction of the thrust of the water, and the whole interior space will be filled to above the water line with carefully rammed puddled clay.

538

The dam will possess considerable strength on account of its arched form and the interior trussing, and it will be further reinforced and rendered watertight by two embankments of clay and gravel, which will start at the water line and slope away to the bed of the river on the river side of the entrance, and on the inner side will finish against a fourth wall of sheet piling, which will be driven across the entrance about 30-feet from the toe of the apron.

539

In making a junction with the sides of the entrance it has been necessary to cut into the concrete walls (which are carried upon piling), so as to allow the sheet piling of the cofferdam to be driven up to a snug connection with the sheet piling of the entrance.

540

From the above general description, it will be seen that in cross-section the proposed cofferdam is not unlike the familiar earth dam used in reservoir construction. When it is completed and the water has been pumped out of the dock, a full examination can be made of the origin and extent of the leak.

Repairing the Leak at Dry Dock No. 3, Brooklyn Navy Yard
Scientific American
December 25, 1897

541

542

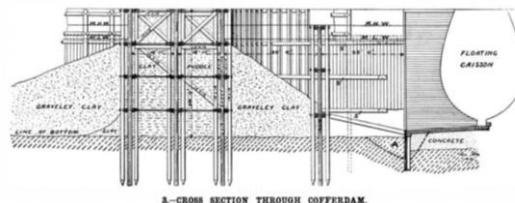
THE large wooden dry dock at the Brooklyn Navy Yard, officially known as No. 3, is just now the scene of a costly and difficult engineering work of a kind which has rarely been undertaken before.

It will be remembered that this structure is the latest and largest wooden dock constructed in this country. It was built to accommodate the large battleships and cruisers which have recently been added to the Navy, and it was more than anything else the necessity of having dry dock accommodation at the earliest possible moment which led to the dock being built of wood instead of the more lasting and reliable stone.

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A detailed description of the dock was given in our issue of February 20 of this year, about the time of its opening. The length over all is 670-feet, breadth 151-feet, and the depth on sill 29-feet. The site consisted largely of made ground, and in preparing the designs special care was taken to prevent the seepage of water by providing several complete lines of sheet piling - continuous walls of heavy, square piles, which are tongued and grooved, and driven in close contact - which completely encircle the dock. There is one of these around the edge of the floor and another 26-feet back from the coping of the dock. They connect at the entrance of the dock with wing walls, of sheet piling, which are driven at right angles to the axis of the dock at each of the two sills and at the outer edge of the apron.



3.-CROSS SECTION THROUGH COFFERDAM.

The new dock had not been many months in use before a serious leak developed, the water showing itself at the joints of the altar steps, near the caisson gate. It was at first supposed that water was making its way in by way of an old bulkhead which intersected the site of the dock on the north side. By sending a diver down on the outside of the caisson gate, however, and distributing coloring matter near the bed of the entrance channel, it was proved that the water was working its way in at that point, as the discoloration shortly appeared on the inside of the dock. This was rendered yet more probable by the discovery of a large hole which had been washed out just in front of the apron at the point marked A in the accompanying diagram, Fig. 3. The broken appearance of the sheet piling at the outer edge of the apron suggested that it had been accidentally torn-up by the bucket of the dredge which had been used to cut-out the channel from the river to the dock.

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In order to examine the break and make the needed repairs it was necessary to build a huge cofferdam across the entrance channel and pump out the water. The magnitude of the task may be judged from the fact that the channel is 156-feet-wide and the depth of the water is 34-feet, measured from mean high water mark. This gives a total hydrostatic pressure of 2,885-tons, which had to be withstood by the cofferdam.

547

The construction of the dam is clearly shown in the accompanying photographs, and in the sectional diagram, for which we are indebted to Naval Constructor Bowles, of the Brooklyn Navy Yard. The dam consists of a central wall of clay puddle contained within three lines of sheet piling, backed up by two embankments of gravelly clay, the toe of the inner embankment being held by a fourth wall of sheet piling as shown.

548



By reference to the large engraving, Fig. 4, it will be seen that the cofferdam is curved, presenting a convex face toward the river, or, to speak more strictly, it is built with five plane faces, those on the river side corresponding to the chords of a circle of 125-foot radius. This is done to secure an arch effect and cause the pressure of the water to be transferred to the walls of the channel, the latter acting as abutments. The lateral pressure thus set-up is supposed to compress the lines of sheet piling and assist in keeping the joints watertight.

Caption: "4. Cofferdam across entrance channel – Dry Dock No. 3, Brooklyn Navy Yard"

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Owing to the yielding nature of the sides of the channel, however, and the difficulty of driving the piles at the angles with a snug fit, it is a question whether a straight dam would not have been preferable. It would certainly have been cheaper, for it often took as long to fit and drive the angle piles as to drive the whole of one bent between them.

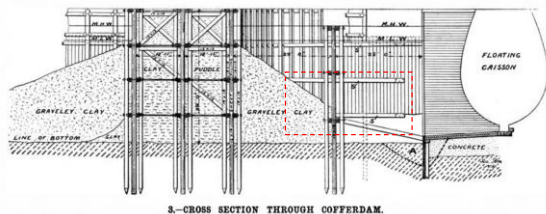
550

Soon after the commencement of operations, Naval Constructor Bowles was placed in absolute charge of the work, with instructions to push through the repairs with all possible speed. Contracts were at once let for the 600,000-feet of timber required; a temporary electric light plant was installed, and six pile drivers were put to work. Sticks of the size and quality required for the piling are not kept in stock, and when the contracts were let the 600,000 B.M. was yet standing in the Georgia pine forests. This had to be cut, dressed, hauled to a Southern port, and brought up to New York. Delays due to the non-delivery of the timber were frequent, and it was only by unflagging attention that the work has been brought to the present stage.

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The first operation was to drive eight lines of 14- by 14-inch guide piles, in pairs. Then the guide wales (horizontal lines of timbers to keep the sheet piles in line) were bolted in place. As three of these lines on each set were under water, they had to be adjusted by divers. This was slow and laborious work. Where the guide piles were out of line, blocking had to be inserted or notches cut in the guide wales and the piles drawn up to the wales by U-shaped yokes and bolted.

552



The sheet piling is 13- by 14-inches and tongued and grooved. It is driven 16-feet into the mud, and in the four walls there are 1,109 separate sticks 56-feet in length. The sheet piling was carried well into the banks of the channel, the concrete coping of the dock being blasted out for this purpose. The three walls of piling were then braced by a system of 1-1/2-inch tie bolts and 12 by 12-inch braces, the latter being notched onto the guide wales and well spiked both to the wales and the guide piles. The structure was also braced at each end against the sides of the dock with heavy sticks of timber, S, S (Fig. 3), and 7/8-inch iron chains were carried back from the top of the cofferdam to the mooring-posts on the dock, and drawn taut by means of turnbuckles.

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The dock was emptied by the regular dock pumps, and, as the water fell, the cofferdam proved to be a remarkably tight job, practically no water coming through. Our illustrations, Figs. 1 and 2, show the pumped-out space between the dam and the caisson gate. The gate is resting on the inner sill, and the line of the outer sill can be traced by the drop in the level of the mud. About twenty-feet beyond this is the edge of the apron, where the sheet piling was torn-up by the dredge, as already explained. The water is seen standing in the holes which have been washed-out around the vicinity of the leak.

Left: caption: "1. Removing mud from apron in front of caisson gate."

Right: caption: "2. Bottom of dock entrance between cofferdam and caisson, showing location of leak."

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To make the dock thoroughly secure against further trouble, two lines of sheet piling will be driven, one in front of the damaged piling and another at the outer sill, on which the caisson gate is shown in the accompanying diagram. The new piles will be heavier - 12- by 12-inch, in place of 8 by 12 - and they will be 35-feet in length and driven as deep as they will go in the mud. The new piling will be driven up the slopes at the sides of the entrance, and carried out to a junction with the outside wall of piling which surrounds the entire dock.

557

The cheapest bid that could be obtained for supplying the material for filling the cofferdam was \$1.75 per-cubic-yard, and 80 cents-per-yard was asked for digging up the clayey soil in the neighborhood of the dock. Finally a lump contract at 40 cents-per-yard was closed for supplying the 18,000-yards required by using the mud excavated for the adjoining Wallabout dock extension. This was brought round in scows and unloaded by dredges at the dam. This mud has answered admirably for the purpose and proved quite impervious to water. The saving in this direction has fairly well offset the costly delays due to the failure of contractors to supply the timber.

A day or two after our photographs were taken, the lowering of the water showed that the whole line of piling had been more or less battered up and torn away by the dredge bucket. It is little to be wondered at that the dock was leaking.

The present floor of the apron will be ripped-up, the three or four feet of concrete which underlies it taken out and fresh concrete filled in to as great a depth as can be conveniently excavated. The flooring will then be relaid in two courses with broken joints, with its outer edge finished off in snug contact with the new line of piling.

558

The fact that no water is now entering the dock proves that the leak must all have taken place at the damaged apron; and it is safe to say that when the present repairs are completed, Naval Constructor Bowles will place a perfectly sound dock at the service of the Navy Yard.

Tour-of-Inspection

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"...The apparent merits of wooden docks were first pressed upon the Government by requests to the Navy Department, through persons of influence, that boards of naval officers be organized to visit and report upon the docks of Simpson & Co. The first of these boards examined the Simpson dry docks at Baltimore. It consisted of Civil Engineer Sanger, Chief Engineer Stewart, Naval Constructor Hichborn, Naval Constructor Mintonye and Civil Engineer Prindle, all of the Navy..."
The New York Daily Tribune, November 21, 1898

"...Its first report stated in conclusion: 'The solid and secure foundations of this structure, together with the very substantial manner in which it is being constructed, warrant the belief that when completed it will safely dock and sustain any vessel that is capable of receiving'..."
The New York Daily Tribune, November 21, 1898

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"...Upon the completion of the dock this Board made a final report (Civil Engineer Craven serving in place of Constructor Mintonye) which stated: 'The dock itself is a wooden structure throughout, built principally of yellow pine or white oak, with a substantial pile foundation, well braced and otherwise secure. It is so designed and constructed as to afford strength, dryness, air, light and easy access'..."
The New York Daily Tribune, November 21, 1898

"...The second of these boards, appointed in 1882 by the Secretary of the Navy, examined the Simpson dry docks at Brooklyn and Boston. Its report was favorable, and would be regarded as in advocacy of the construction of similar docks for the Navy..."
The New York Daily Tribune, November 21, 1898

563

564



"...The third Naval Board reported very favorably in 1884 on a timber dry dock constructed by Simpson & Co. at St. John's, Newfoundland..."

The New York Daily Tribune, November 21, 1898

RE: J.E. Simpson & Sons operated the St. John's dry dock under a 10-year lease, however, in 1892 they went bankrupt. Thereafter, it was leased several times until 1923, when the Newfoundland Government took control. In 1924, after 40 years of service, the timber design was deemed unsafe and, in 1925, was replaced by concrete. It was completed in 1926 at a cost of \$1,104,000.

Top caption: "Wooden dry dock in St. John's Harbor"

Bottom caption: "Replacing the wooden dry dock with concrete" 565



"...To the literature upon the subject of Simpson dry docks furnished by the reports above noted there were added numerous testimonials in support of this type of dock, which were obtained from Naval Constructor Hichborn, Civil Engineer Prindle and Naval Constructor Wilson. These reports and letters were printed by the firm referred to, and in the public press and upon committees of Congress the merits of the Simpson docks were presses almost constantly..."

The New York Daily Tribune, November 21, 1898

566

Indefatigable Enterprise

"...While up to this point the action of the civilian promoters of this dock may be, perhaps, as only the result of legitimate business enterprise, the same lenient judgment cannot be extended to the efforts which would seem to have been made, and with success, to obtain special legislation in their favor. There seems to be little doubt that the law providing for the construction of two of these timber dry docks, one at New York and one at Norfolk, in 1886, was largely if not entirely due to the indefatigable enterprise of the patentees..."

The New York Daily Tribune, November 21, 1898

567

568

"...The act of Congress authorized the construction of timber docks; the Bureau of Yards and Docks issued an advertised invitation for bids, which was addressed to 'dry dock builders' only, so that, under the strict terms of this advertisement, only 'dry dock builders' could expect to have their proposals considered; and, finally, as Simpson & Co. were the only timber 'dry dock builders,' it would seem that the Government advertisement limited the proposals for these docks and their construction to this firm only..."

The New York Daily Tribune, November 21, 1898

"...As a matter of fact, there was only one other bid presented, that of O'Connell & Coffey; and the contract was awarded to Simpson & Co. upon the report of a board convened to consider the proposals, and consisting of Naval Constructor Hichborn, Civil Engineer Menocal and Draughtsman (now Civil Engineer) Mackay..."

The New York Daily Tribune, November 21, 1898

569

570

"...These docks were constructed and are now in operation. At the next session of Congress the same influences, in the same fashion, would appear to have brought about an appropriation for a timber dry dock at the League Island Navy Yard. The invitations for proposals again called for bids from 'dry dock builders,' and, accordingly, Simpson & Co. were the only bidders. They received the contract, have completed the dock, and it is now in service..."

The New York Daily Tribune, November 21, 1898

571

Weakness After Weakness

572

"...As to the three timber docks which have been referred to, it may be said that while they have without doubt performed useful service, every one of them is either now in a condition needing extensive and expensive repairs or has recently been in that condition and has received large outlays to place it in efficient shape again; and yet none of them are ten years old..."

The New York Daily Tribune, November 21, 1898

573

"...Thus, while the dry dock at New York, which is only about eight years old, has as yet received no very considerable repairs, its entrance works have deteriorated greatly and a board of experts, which examined it this year, estimated that it would cost \$300,000 to put the dock in good condition. Congress has appropriated this sum, and the work is to be taken in hand as soon as the dock can be spared from its present pressing service..."

The New York Daily Tribune, November 21, 1898

574

"...The League Island dock has proved to be leaky - so much so that it has been necessary to add another drainage pump to free it from water while in service. The entrance works show signs of weakness, and portions of the interior have deteriorated extensively. Congress has appropriated \$64,000 to place this dock in good condition..."

The New York Daily Tribune, November 21, 1898

575

"...The dock at Norfolk has fared somewhat better in the cost of maintenance; but the entrance works have been seriously attacked by the marine worm and extensive renewals and repairs have been made to them as well as to the interior. Special sums for this purpose have been appropriated by Congress during the last two years, aggregating about \$35,000, and a further sum is necessary to complete the work..."

The New York Daily Tribune, November 21, 1898

576

"...It will seem that the Simpson dry docks erected thus far for the Navy have been a somewhat expensive luxury. While yet in their youth, the repairs to these structures, in expenditures or appropriations therefore, have amounted to \$300,000, with the assurance of more to follow shortly..."

The New York Daily Tribune, November 21, 1898

577

"...When it was determined to build other dry docks the same influences were brought to bear to fix upon wood as the material for their construction, and Congress authorized the building of the timber dry dock at Port Royal, S.C. The advertisements did not, however, limit the invitations to 'dry dock builders,' and several bids for it were received. Since its completion this dock has been a source of continual anxiety and expense, developing weakness after weakness..."

The New York Daily Tribune, November 21, 1898

578

"...Another timber dry dock has been constructed at the Brooklyn Navy Yard, whose disastrous history is too well known to need recounting here. It will suffice to say that, as stated in part elsewhere, directly after acceptance of this notorious 'Dry Dock No. 3,' it developed serious leaks under the entrance works, gravely endangering the battleship 'Massachusetts,' which was within it, and involving an expenditure of \$170,000 to fit it again for use..."

The New York Daily Tribune, November 21, 1898

579



U.S.S. Massachusetts in dry dock

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A Question of Time

"...The timber influence seems also to have presided over the birth of the dock at Puget Sound. The Act of Congress required a structure of the largest size, but it limited the appropriation so much that it was impossible to build a masonry or concrete dock, and, to keep within the financial limit thus set, it became necessary to construct the interior of wood. The entrance works are of concrete and stone, and are of the most substantial character. It is, however, only a question of time when the timber work of the interior will require extensive and costly repairs..."

The New York Daily Tribune, November 21, 1898

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Dry Dock No. 1 - the first major structure at the *Puget Sound Naval Shipyard*, was designed by the USN's *Bureau of Docks and Yards*. *Byron, Barlow and Co.* of Tacoma, Wash., was awarded the contract to build the dock on Oct. 29, 1892 for \$491,465. Ground was broken on Dec. 10, 1892. Construction of the dock, which took +3 years, was completed on April 22, 1896. It was 650-feet-long, 130-feet-wide and 39-feet-deep. On April 11, 1897, the *USS Oregon* became the first battleship to use the dock.

Caption: "USS Oregon in dry dock, Puget Sound Naval Shipyard" 583

Winning the Day

584

"...At the last session of Congress, when the subject of new dry docks was before the Naval Committees and their type was under discussion, Simpson & Co. again appeared and made their timeworn arguments and comparisons against stone and in favor of timber, despite the lamentable record of the later material. They were supported in this by certain officers of the Navy, all of whom, however, did not appear in person, although it is well understood that their work was brought, indirectly, before the committee. One high officer of the Navy, who has advocated, in the press and in his official reports, another patented articles of wood, was conspicuous in this..."

The New York Daily Tribune, November 21, 1898

585

"...While there was a large amount of testimony, both oral and written, introduced in favor of timber construction, there was little brought in on the opposite side, and that little was not effective. Wood won the day..."

The New York Daily Tribune, November 21, 1898

586

The Advocate

"...When the matter reached the Senate Naval Committees that body, on the advice of the Secretary of the Navy - who was supported in this by some of his most competent officers - amended the provision in such a way as to allow the Secretary, in his discretion, to build any, or all, of these docks of stone or concrete and stone. The bill thus amended was acted upon favorably in the Senate; but, in conference, wood again conquered, and the present law providing for four timber dry docks, one of which may, in the discretion of the Secretary of the Navy, be built of stone or concrete and stone..."

The New York Daily Tribune, November 21, 1898

587

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"...A most remarkable stage of the argument before one of these committees was reached when the Secretary of the Navy, in his strong advocacy of enduring docks of stone, found himself openly opposed by one of his own Bureau Chiefs, an officer having no official cognizance of the matter, whose name appears conspicuously in reports and letters favorable to the work of Simpson & Co..."

The New York Daily Tribune, November 21, 1898

Conclusions

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"...In reviewing the history of the timber dry docks of the Navy, several conclusions seem apparent. First, the testimony of all seems to prove that in the building of timber docks the Government has embarked upon a policy wholly discredited abroad and by the best practice of civil engineers here, now and in the past. Second, this policy has led already to an excessive outlay for repairs; and, with the extension of the system, is sure to entail the expenditure of enormous amounts for this purpose. Third, it would appear that the introduction of this policy is due to the efforts of a single firm which was, in the beginning, the only one interested financially in these structures, and which seems to have exercised a powerful influence upon legislation..."

The New York Daily Tribune, November 21, 1898

"...And, finally, that the argumentative labors of this firm seem to have been supplemented by the active endeavors of certain naval officers – who, it is pleasant to note, are few in number - who have been quite as strong in their advocacy of the Simpson dock as the Simpsons themselves..."

The New York Daily Tribune, November 21, 1898

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"...It is evident that the whole subject – with respect to its past history, the persons interested therein, and the Government's future policy – requires the prompt and vigorous action of Congress."

The New York Daily Tribune, November 21, 1898

Part 4

A First-Class Basin

593

594

Made Anew

Orders from Washington: the timber structure which caved-in will be made a first-class basin. The dock will be enlarged by increasing its width at the bottom to 72-feet.

The Brooklyn Daily Eagle, August 4, 1899

RE: introduction to an article entitled: "To Rebuild in Stone Naval Dry Dock No. 2"

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Night and Day

"IN compliance with an order from Washington, Civil Engineer Asserson of the Brooklyn Navy Yard today issued an order for the rebuilding of timber Dry Dock No. 2, with concrete and masonry, thus converting the now useless basin into a stone dock. Work has begun and as soon as material can be secured the gangs will be kept busy day and night..."

The Brooklyn Daily Eagle, August 4, 1899

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598

Cave-in

"...Dry Dock No. 2 was built eleven years ago, at a cost of \$572,000. It was constructed of wood and some weeks ago, after a heavy rain, the right side caved in. This was due to the rotten conditions of the timbers and also to a quicksand which has been bothering the naval authorities for some time. The entrance to the dock has been weakened and shore timbers had to be placed in position to prevent a more serious accident, the breaking in of the caissons..."

The Brooklyn Daily Eagle, August 4, 1899

599

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All-in-Agreement

“...Assistant Secretary of the Navy Allen inspected the dry docks while on his recent visit to the Brooklyn Navy Yard and favored the rebuilding of the timber dry docks with concrete and masonry when repairs were needed. Civil Engineer Asserson thought this the only way to make a substantial job of the damaged dry dock and their Navy Department at Washington endorsed his views by instructing him to go ahead with the rebuilding along his plans...”

The Brooklyn Daily Eagle, August 4, 1899

601

602

Bigger is Better

“...The dock is 500-feet-long, but only 52-feet-wide at the bottom. This is not large enough to receive the biggest war vessels. Accordingly the bottom of the big basin will be widened to 72-feet...”

The Brooklyn Daily Eagle, August 4, 1899

603

604

Out With the Old, in With the New

“...The excavating will be started as soon as the old timbers have been removed. The work will be done under the personal supervision and control of Civil Engineer Asserson. He will do the rebuilding at a cost of \$75 per-lineal-foot. Heretofore the Government paid contractors at the rate of \$99-a-foot for this work...”

The Brooklyn Daily Eagle, August 4, 1899

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Role Model

“...The sides or lining of the dock will be of concrete and stone, several feet thick and when completed it will be one of the best docks owned by the United States Government. The quay walls will be of modern workmanship and even stronger than the walls of Dry Dock No. 1, which has been giving such good satisfaction since Civil Engineer Asserson rebuilt it in 1887 and 1888. Not a dollar has been spent on this dock for repairs since...”

The Brooklyn Daily Eagle, August 4, 1899

607

608

Labor and Material

“...An appropriation of \$300,000 is now available and it is believed that most of the work can be done with this sum of money. Several hundred men will be kept at work day and night until the dock is finished, as soon as the materials arrive. The big dry basin is needed by the Government and must be ready as soon as possible, although it will be many months before a ship will again enter Dry Dock No. 2...”

The Brooklyn Daily Eagle, August 4, 1899

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For Safety's Sake

“...Dry Dock No. 3, which is also a timber structure, still contains 19-feet of water. This dock was flooded soon after the accident to No. 2. It is uncommon for naval dry docks to be flooded, save for the entrance or egress of ships...”

The Brooklyn Daily Eagle, August 4, 1899

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Masonry and Timber Dry Docks

Scientific American
December 30, 1899

IF we are quick to learn the lessons of the past, there will be no more timber dry docks built in this country, at least for the uses of the Navy.

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Between a masonry and timber structure the advantages urged in favor of the latter are, or rather have been, rapidity of construction and small first cost. To these considerations alone is due the fact that so many of these objectionable structures are to be found in our Navy Yards.

The objections to the timber dry dock are many and serious, and do not diminish with the lapse of time. On the other hand, the advantages are by no means so great today as they were forty or fifty years ago.

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Up to a recent date it has been customary for the advocates of timber structures to quote the cost of the stone docks at Mare Island and New York, in contrast with the relatively low cost of timber docks. Those two docks cost respectively \$2,000,000 and \$2,750,000, whereas timber docks have been built for about \$600,000. As a matter of fact, however, the New York and Mare Island docks were built by the government by day labor, and we well know that work of this kind has never been conspicuous for its economy.

The contracts for the two new stone docks to be built at Boston and Portsmouth were let at \$1,013,400 and \$1,089,000, respectively, although these will be larger and more important structures. The reduction of the cost as compared with older structures is over 50 per cent. At the same time it must be remembered that the contract price for two new timber docks to be built at League Island and Mare Island was respectively \$729,000 and \$782,600; from which comparisons we see that all the advantages of a masonry structure may be gained at an increase in cost of from 25 to 30 per cent.

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The question arises as to whether this increased cost is not completely offset by the greater durability of the masonry structure. Experience proves beyond all question that it is; for the history of timber docks in the Navy has been a history of failure. Not only have they been a source of constant anxiety to the officials in charge, but they have been frightfully extravagant in the cost of repairs and renewals. Moreover, on more than one occasion the failure of the wooden docks has brought the ships of the Navy within measurable distance of disaster.

619

The chief drawbacks to the timber structure are that it is liable to rapid and hidden decay, and that seepage of water from the outside channel, or the existence of concealed springs at the back of the dock, may at any time wreck it by bursting in the sides. A notable instance of this was the failure of the two timber dry docks at the New York Navy Yard, Brooklyn.

620

The big dock, known as No. 3, commenced to leak immediately after it was completed, and repairs were necessitated which lasted for eighteen months and involved an expenditure of \$170,000. The timber Dry Dock No. 2 of the same Navy Yard was wrecked during a heavy rain storm in July last, when the hydrostatic pressure due to accumulation of water behind the altars was sufficient to burst in the side of the dock. In this case a structure which originally cost \$500,000 has so completely failed within nine years of the date of completion as to necessitate the expenditure of 60 per cent of its first cost to put it again in serviceable condition.

621

The timber dock completed at League Island, Philadelphia, in 1891, is already so far decayed that shores of timber have had to be placed at certain points which showed signs of weakness, to prevent collapse, and when the dock was uncovered for repairs, it was found that the tops of the piles were in some places entirely rotted away.

622

The timber dock completed at Port Royal station, which was finished just before the Spanish war, is reported by Admiral Endicott as having experienced a series of accidents in the way of failure of portions of the structure, and, indeed, it is in such a perilous condition that \$500,000 is recommended by the Admiral for its immediate rebuilding.

623

In view of these facts we trust that Congress will disregard the solicitations of the interested parties who may desire to see timber dry dock construction continued in the Navy, and that they will heartily support the recommendation of Admiral Endicott, the Chief of the Bureau of Yards and Docks, that stone be substituted for timber in constructing the two docks which are about to be started at the League Island and Mare Island yards.

624

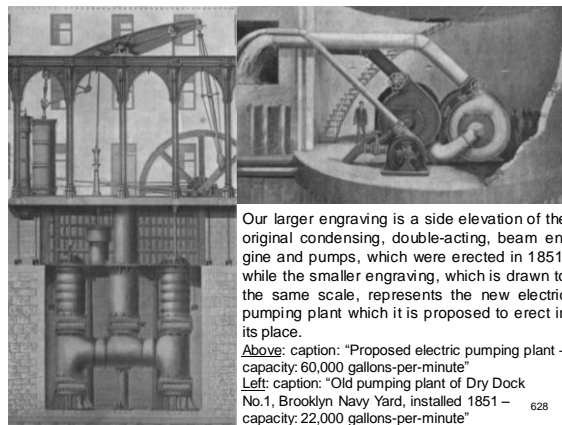
The subsequent repairs to timber docks, as we have seen, bring the ultimate cost far beyond that of a reliable and durable stone structure, and on the question of facility of erection it is enough to say that the contractors for the new masonry docks at League Island and Mare Island undertake to build them in the same time that is allowed for the construction of the two timber docks at those yards.

**The Old and New Pumping Engines
of Dry Dock No. 1,
Brooklyn Navy Yard**
Scientific American
March 24, 1900

625

626

THE reconstruction of the pumping plant of Dry Dock No. 1, which will shortly take place at the Brooklyn Navy Yard, will afford a striking evidence of the advance which has been made during the past half-century in the construction and economy of operation of pumping machinery.



Our larger engraving is a side elevation of the original condensing, double-acting, beam engine and pumps, which were erected in 1851; while the smaller engraving, which is drawn to the same scale, represents the new electric pumping plant which it is proposed to erect in its place.

Above: caption: "Proposed electric pumping plant - capacity: 60,000 gallons-per-minute"

Left: caption: "Old pumping plant of Dry Dock No. 1, Brooklyn Navy Yard, installed 1851 - capacity: 22,000 gallons-per-minute"

627

628

The drawings being made to the same scale, the contrast between the elaborate and cumbersome design of the old, walking-beam engine, and the compact arrangement of the electrically-driven centrifugal pumps, is evident at a glance, particularly when it is stated that the pumping capacity of the smaller is nearly three times as great as that of the larger plant.

At the same time we must be careful, in our modern self-sufficiency, lest we claim more credit than is warranted by the enormous advantage accruing from over half-a-century's experience in the construction and handling of pumping machinery; and it is questionable in view of our end-of-the-century advantages, whether the magnificent old engine which may still be seen in its spacious engine house at the Navy Yard, is not even more creditable to its designers than its up-to-date successor.

629

630

In the description of the plant written by Mr. Charles B. Stuart, Engineer-in-Chief of the United States Navy, it is stated that at the time the plans were matured and adopted it was deemed important by the engineer-in-charge, Mr. McAlpine "that the machinery for exhausting the water from the dock should be of the most perfect kind and of great power and capacity also." This gentleman put in plans and specifications which after discussion by a special board, were adopted with some modifications.

631

The engine stands in a lofty room which is about 54-feet square. The frame consists of an entablature of cast-iron, supported on double lines of Gothic columns and arches, which extend from end-to-end of the engine room. To modern eyes, the effect of the Gothic columns and arches, is exceedingly ecclesiastical and strongly suggestive of the nave of a cathedral. Howbeit these Gothic ornamentations, incongruous as they look today, were fashionable half-a-century ago, and they were characteristic of the stately steamboat engines, after the pattern of which we are told the engine is largely modeled.

632

Our illustration is reproduced from a beautiful steel engraving in a volume by Chief Engineer Stuart, on the "Naval Dry Docks of the United States." The author draws attention to the fact that it "shows very beautifully the style of ornamentation that has been given to the whole work, care having been taken to have all the parts in keeping with each other."

633

Coming now to details, the cylinder is 50-inches in diameter by 13-feet stroke ; the walking beam is of cast-iron and measures 31-feet between the end centers and weighs over 15-tons. The piston rod is attached to the beam by the old parallel motion, first designed by the celebrated Watts. The main pump and the air pump rods are connected to the walking beam by double rods and links, while the air pump cross-head works in slides attached to the columns of the engine frame.

634

The engine has a trussed connecting rod the tension rods of which are adjustable by screws and nuts. The cast-iron balance wheel is 24-feet in diameter and the crank and shaft are of wrought-iron. The engine is provided with an independent adjustable extension gear, which is so arranged that as the load upon the engine is increased by the lowering of the water in the dock, an increased amount of steam is admitted to the cylinder. This is effected by means of a cam wheel on the main shaft, against which a cam roller, connected with the expansion valve stems is made to revolve, and along which it can be made to travel at any speed desired.

635

A curious feature of the construction of the engine was the use of eight 1-1/2-inch iron rods extending from the engine frame to the rear of the large granite chimney "to secure as far as possible the frame from longitudinal motion or vibration, to steady the engine, and relieve the walls of the building."

636

The latter object was assisted by placing two inches of India rubber between the masonry and the iron entablature and pilasters, and also by placing India rubber washers between the bolt-heads and the exterior parts of the walls. No feed pumps were attached to the engines, the boilers being fed from the rain-water system beneath them by direct acting steam pumps built by Worthington & Baker. The steam was supplied by three boilers 26-feet in length, 7-feet in diameter in the waist, of the single return drop flue type.

637

In the well, below the foundation plate of the engines were two lifting pumps, each 36-inches in diameter with an 8-foot stroke. In addition to the usual suction valve near the bottom of the pump chamber, there are two suction valves placed near the bottom of the suction pipes. The valve seats are of a composition metal. The suction pipes connect with an air chamber, placed centrally between the pumps, which reaches to the bottom of the engine bedplate. The total weight of the metal in the engine is 267 tons and the total cost of the engine was \$90,341.39.

638

The new pumping plant, as planned by Capt. P.C. Asserson, Civil Engineer, of the Brooklyn Navy Yard, will be placed in a circular sunken chamber below the surface of the ground. It will consist of two 30-inch direct-connected, electrically driven centrifugal pumps, with a combined capacity of 60,000 gallons-per-minute. There will also be a 13-inch electrically driven centrifugal drainage pump as shown in the drawing. The ceiling of the subterranean engine room will consist of I-beams covered with 6-inches of concrete and one inch of cosmocrete. The cosmocrete finish will be at the general grade of the Navy Yard, and entrance will be had to the pumps by means of a hatch opening onto a spiral stairway.

639

**Reconstruction in Concrete
of Dry Dock No. 2,
New York Navy Yard**
Scientific American
October 20, 1900

640

THE reconstruction of Dry Dock No. 3 of the New York Navy Yard, Brooklyn, affords a striking object lesson as to the defects of wood and the advantages of masonry in this kind of structure. The choice of timber in dry dock construction was determined entirely by considerations of cheap first cost; for not even the most sanguine advocate of wooden dry docks has suggested that they would compare in economy of maintenance and repairs with the stone docks.

641

Dry dock No. 3 was built in 1890, and after a useful life of only nine years, it has failed so completely as to render its entire reconstruction desirable. Compare this with the record of the adjoining dry dock No. 1, a granite structure, which is just as good today as when it was opened over half-a-century ago. On more than one occasion we have described the constructive features of wooden dry docks, and the reader is referred to the illustrated article in our issue of February 30, 1897, describing the big dry dock officially known as No. 3.

642

Apart from the serious objections to wooden dry docks on the score of their rapid decay and the need of constant renewal, either in part or in whole, their construction is such that they are but poorly adapted to withstand the heavy hydrostatic pressure to which they are subjected when dry. The floor and walls of the wooden dry dock are nothing more than a comparatively thin shell of wood, bolted down upon a mass of piling which has been driven over the whole area of the dock; and while they are fully able to withstand the outward pressure due to the weight of a ship when the dock is empty, or of water when it is full, they are entirely unsuited to withstand the inward thrust of water which may get in behind the altars and beneath the floor when the dock is pumped dry.

643

In the case of a large dock 30-feet in depth, the hydrostatic pressure tending to burst in the floor and lower walls will approximate one ton to the square-foot. Such a disaster is guarded against by driving several walls of sheet-piling entirely around the dock; but it frequently happens that carelessness in driving the piles, or the presence of obstructions underground, will cause a break in the continuity of the sheet-piling, and permit the accumulation of water behind the altars.

644



In the case of the dock now under consideration, it seems that during a heavy and prolonged rain storm last year, the culverts proving insufficient to carry-off the storm water, it flowed over the surface of the Navy Yard and collected behind the walls of the dock, which proved unequal to the strain upon them, and bulged out at the point shown in one of our first page illustrations, to the extent of several feet, breaking off the 12 x 12 caps, and generally wrecking the structure over a considerable portion of its area. It was decided that the most satisfactory way to repair the damage would be to reconstruct the walls of the dock in concrete.

645

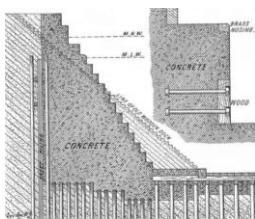
645
Caption: "Spot at which side of dock was burst in"



In carrying out the repairs, the steps, or "altars," as they are called, were first stripped to the level of the lower guide-wales of the sheet-piling, as shown in the lower engraving of our first page, and the backing was excavated to the same level. The wall of sheet-piling was then driven, the piles penetrating to a depth of 54-feet from the ground level. The stripping-off of the timber structure and the excavation of the backing was then carried down until it was possible to put in position the shoring timbers, which will be noticed extending from the longitudinal wales to the old sill or bottom altar at the floor of the dock.

646

646
Caption: "View showing portion of old wooden dock and the excavation of new concrete structure"



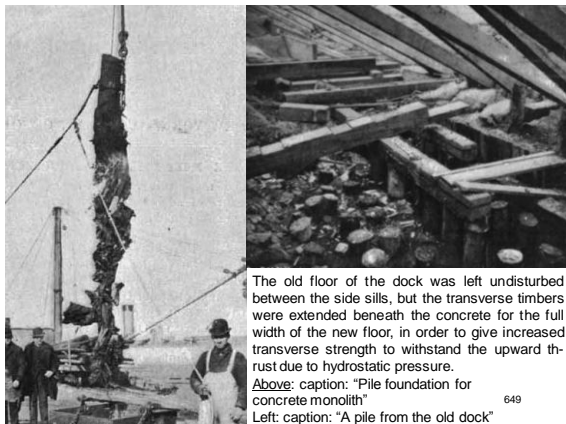
The excavation was then carried down to the floor level and round piles were driven over the whole surface, the distance from center-to-center of the piling being 2-feet. The piles were then cut off about 6-inches above the ground, as shown in the accompanying transverse section of the dock. On this foundation, as thus formed, was built up the concrete monolith, its outer face abutting against the wall of the sheet-piling and its inner face being stepped into altars. It was originally intended to build the altars of granite; but to avoid the delay that would be caused by waiting for the delivery of the granite, it was decided to build them of concrete. To protect the altars, 1-1/2 by 2-1/4-inch brass nosing-strips were laid along their edges, and 3 by 12-inch pine fender-strips were let into the risers, as shown in the accompanying drawing.

647

647
Caption: "Cross-section through side wall of old and new dock, and detail of altar protection"

It will be noticed that the slope of the side walls of the concrete dock is considerably steeper than that of the old structure, the two being in the ratio respectively of 3 to 3 and about 1 to 1. The result is that the new dock has a form which is very much better adapted to the docking of ships, inasmuch as it gives more room (22-feet on the floor) where it is greatly needed, and brings the upper edges of the dock closer to the sides of the ship - advantages which greatly facilitate the handling of material and the general operations connected with dry dock repairs.

648



The old floor of the dock was left undisturbed between the side sills, but the transverse timbers were extended beneath the concrete for the full width of the new floor, in order to give increased transverse strength to withstand the upward thrust due to hydrostatic pressure.

Above: caption: "Pile foundation for concrete monolith" 649
Left: caption: "A pile from the old dock"



The concrete monolith will be extended entirely around the dock to the inner of the two grooves provided for receiving the caisson gate. Here the timber groove will be replaced by one in granite. It is fortunate for these repairs that the dock was designed with outer and inner grooves, since by placing the caisson at the outer groove and shoring it from the floor of the dock, as shown in one of our first page illustrations, it was possible to build the new granite groove without any further preparation.

Caption: "View showing one-half of dock reconstructed in concrete. Width of floor of old dock, 50-feet; of new dock, 72-feet." 650

Had it not been for this circumstance, it would be necessary to build a heavy cofferdam across the entrance channel, whose cost would have added greatly to the total cost of the reconstruction. Advantage has been taken of the opportunity offered by the construction of the new groove to build a new caisson and enlarge the entrance to the dock, the enlarged caisson affording an entrance 73-feet wide on the bottom as against 53-feet, while a gain in width of 5-feet has been made at the coping, and a gain of 6-inches in the depth over the sill. The result of these changes is that the reconstructed dock will be capable of accommodating any ship in the United States Navy.

651

When it is stated that the cost of these repairs will be about \$600,000, it might seem that the advantages which we have outlined above were purchased at a rather dear figure; but when we consider the relative cost for repairs of masonry and timber docks already in existence in the United States Navy, it will be realized that the more durable structures are, in the long run, the more economical. The figures furnished by the Bureau of Yards and Docks show that during the seven years from 1893 to 1899, the repairs on the three stone docks at Boston, New York and Norfolk amounted to only \$4,543, whereas the repairs on the three timber docks at New York, League Island and Norfolk amounted during the same period to no less than \$436,073.

652

The reconstruction of the dock has been carried out under Capt. P.C. Asserson, C.E., to whom we are indebted for courtesies extended in the preparation of this article.

653

Something Must be Done!

654

None on Atlantic coast can accommodate latest dreadnaughts. That is why No. 4 at the Brooklyn Navy Yard is so badly needed. Cost no object.

The Brooklyn Daily Eagle, July 21, 1909

RE: introduction to an article entitled: "Dry Docks too Small"

The Orphan Dreadnaughts

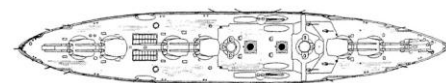
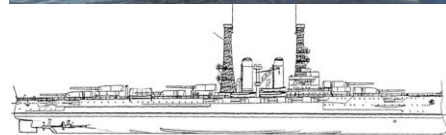
655

656

"Washington, July 21 – There is not a single dry dock on the Atlantic coast capable of receiving either of the battleships of the Wyoming-class, the latest American dreadnaughts to be laid down. That is the chief reason that the Navy Department is bending every energy toward the completion of the ill-fated Dry Dock No. 4 at the Brooklyn Navy Yard. It will be finished regardless of expense and trouble..."

The Brooklyn Daily Eagle, July 21, 1909

RE: the Wyoming-class was a pair of dreadnaught battleships authorized in early 1909 and built between 1910 and 1912



657

658

Hell or High Water

"...The Navy Department has authorized the commandant of the Brooklyn Navy Yard to adopt any general measures he may deem to be necessary in order to push the work on the dry dock. 'No matter what the cost is, build the dock.' That, in brief, represents the attitude of the Department. The big basin will be constructed even if it is necessary to pull down all the buildings in the immediate vicinity..."

The Brooklyn Daily Eagle, July 21, 1909

659

660

A Military Necessity

"...The handicap of quicksand must be overcome irrespective of the expense involved. It is a military necessity that the dock be made available as soon as possible, and all other considerations will be overlooked. If the contractor who has the job of building the dock weakens on it the government will take up the work. It is the hope that the basin will be ready by the time the 'Wyoming' is commissioned..."
The Brooklyn Daily Eagle, July 21, 1909

661

662

Wyoming-class



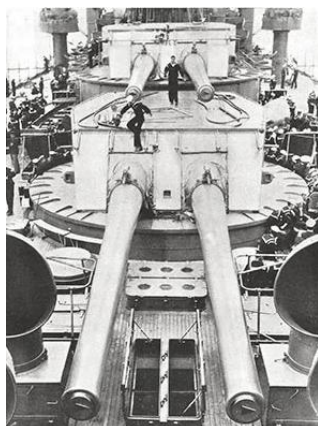
"...It will doubtless startle a great many persons when they realize that of the thirteen naval docks on this coast not one is capable of receiving a vessel of this latest dreadnaught class..."
The Brooklyn Daily Eagle, July 21, 1909

RE: the U.S.S. Wyoming and sister ship; U.S.S. Arkansas, were America's fourth entry in the international race to build dreadnaught-class battleships. Wyoming was authorized in 1909, laid-down in 1910, launched in 1911 and commissioned in 1912. So rapid was the pace of battleship evolution that the Wyoming may well have been obsolete by the time it sailed on its maiden voyage. Wyoming and Arkansas were the fourth dreadnaught design of the USN, but represented only an incremental improvement over the preceding Florida-class. They were the last USN battleships to use 12-inch guns (they were completed before the Royal Navy revealed their first 13.5-inch guns).

Caption: "USS Wyoming ca. 1912, fresh from the yard"

663

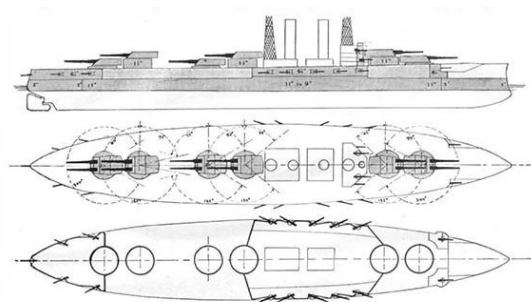
664



The Wyoming's main battery of twelve 12-inch guns were no match for an opponent armed with fewer, but more powerful and longer-range guns (i.e. 13.5 or 15-inch guns). Also, the Wyoming's turrets were all on the centerline of the ship thus, the center two turrets could only fire broadside, making them useless for firing ahead or astern.

Caption: "Sailors clamber over the U.S.S. Wyoming's two front turrets: each mounting two impressive but underpowered 12-inch main guns"

665



Displacement, 23,298 tons. Speed, 20.5 knots. Maximum coal supply, 4,200 tons; 400 tons oil. Armor: Deck, 11 inches to 5 inches; turret, 11 inches. Armament: Twelve 12-inch; twenty-one 5-inch. Torpedo tubes, two 21-inch.

UNITED STATES " WYOMING "

Secondary armament was arranged in an outmoded way, with guns below decks, well-secured behind armored casements. However, they couldn't fire upward. Smaller, rapid-fire guns were needed for use against aircraft thus, they were much more useful on top of the deck.

666



Oil-soaked coal used to fire the boilers (in an age when Navies were converting over to oil, which was a much more efficient fuel) produced vast clouds of smoke pouring from her funnels. However, the propulsion system followed the modern trend of steam turbines (paradoxically, the USN went back to reciprocating engines on its next class of battleships). During WWI, the *Wyoming* served dutifully on patrols. In 1931, the ship was converted into a gunnery training ship, with all of the gun mounts proving very useful in providing platforms to train naval gunners.
 Caption: "Bird's-eye view of the deck of the U.S.S. Wyoming, showing the fighting mast crowded with sailors and the two turrets amidships, photographed from a tower of the Manhattan Bridge, New York City." 668



Inverse Proportion

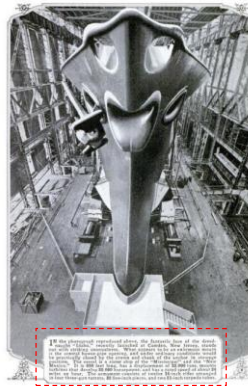
670

"...The rapid development of battleships of enormous tonnage has had the effect of lessening the value of the Navy's docks, and in some instances has rendered them obsolete. It is like the race between the manufacturers of guns and the manufacturers of armor. A new rifle of great power would be produced and immediately the armor on battleships would be reduced 50 per cent in effectiveness. Then a new process of manufacturing armor would produce a tougher piece of steel which would at once minimize the importance of the rifle. The Navy has not been building dry docks as fast as battleships..."

The Brooklyn Daily Eagle, July 21, 1909

671

MASSIVE STEEL FIGHTER TAKES MAIDEN PLUNGE



IN the photograph reproduced above, the fantastic face of the dreadnaught "Idaho," recently launched at Camden, New Jersey, stands out strikingly unusualness. What appears to be an enormous mouth is the central hawse-pipe opening, and under ordinary conditions would be practically closed by the crown and shank of the anchor in stowage position. The vessel is a sister ship of the "Mississippi" and the "New Mexico." It is 600-foot-long, has a displacement of 32,000-tons, mounts turbines that develop 32,000 horsepower, and has a rated speed of about 24 miles-an-hour. The armament consists of twelve 14-inch rifles arranged in four three-gun turrets. 22 five-inch pieces, and two 21-inch torpedo tubes. (*Popular Mechanics*, September 1917)

672

Room to Spare

673



"...When the Department made a new contract for Dock No. 4 with the Williams Construction Company, it enlarged the plans of the old basin. The dock, when completed, will be 601-feet-long. At the entrance it will have a width of 106-feet and in the body of the dock it will measure 110-feet from side-to-side. This will give ample room for the admission of the 25,000-ton 'Wyoming.' The greatest width of this vessel is 95-feet..."
The Brooklyn Daily Eagle, July 21, 1909
Caption: "USS Wyoming in Dry Dock No. 4, New York Navy Yard. November 18, 1912." 674



675

676

Broader in the Beam

"...It is stated at the Navy Department that neither of the comparatively new docks at Portsmouth and Boston is large enough to receive the 'Wyoming.' They measure 101-feet at the entrance, but this is held by naval authorities to be too close to admit risking a \$10,000,000 battleship. It seems that the 'Wyoming' will be much wider on the beam than any of her predecessors. It is in this direction that new battleships are spreading out rather than in length..."
The Brooklyn Daily Eagle, July 21, 1909

677



678

Coast-to-Coast

"...The naval docks on the Atlantic coast are located as follows: One at Portsmouth, two at Boston, four at Brooklyn, two at League Island, three at Norfolk and one at Charleston. On the Pacific coast the Navy is in better shape. Although there are only two docks on the coast, they are both modern basins, and one of them will receive the 'Wyoming' without the slightest difficulty. Both the docks are located at Puget Sound, Wash..."

The Brooklyn Daily Eagle, July 21, 1909

679

680

One Size Fits All

"...It is learned that the Navy Department proposes to convert Dry Dock No. 3 at the Brooklyn Navy Yard into a large and modern basin as soon as Dock No. 4 is finished. It is proposed to lengthen this dock to 800-feet and increase the width in proportion. It will then be able to dock the Luisitania or any other ocean greyhound as well as any battleship that is likely to be planned by that time..."

The Brooklyn Daily Eagle, July 21, 1909

681

682

"...Dry Dock No. 3 is a wooden one and is 668-feet-long and 105-feet in width. The Department officials state that there will be no difficulty in enlarging the dock providing Congress gives the funds necessary. In view of the alarming condition of the docking facilities on this coast it is not like that Congress will offer serious objection to the proposed enlargement of No. 3..."

The Brooklyn Daily Eagle, July 21, 1909

On the Other Side of the Pond

683

684

"...Other Navies are having trouble with their docks. The British Government is just finishing a dock which has almost been as vexatious as No. 4 at the Brooklyn Navy Yard. It has taken five years to complete the English basin and it is now found that it is not serviceable for the largest vessels. Keen disappointment was expressed over this matter during a recent session of Parliament..."

The Brooklyn Daily Eagle, July 21, 1909

685

Floating Steel Dry Docks

686

"...It was voted to construct two floating steel dry docks. This was decided upon because of the lack of proper docking facilities and because steel docks can be constructed in a comparatively brief period of time. The two that were authorized will be finished in eighteen months. They will be large enough to receive the new British dreadnaughts..."

The Brooklyn Daily Eagle, July 21, 1909

687



Caption: "The British battleship *HMS Erin* in a floating dry dock, ca. 1918. In the left foreground are several old warships employed as barracks."

688

Remarkable progress has been made in the design of great floating docks - hospitals for giant ships - in recent times, particularly since the coming of the mammoth liner has brought special problems of rapid overhaul

Shipping Wonders of the World, ca. 1936

RE: introduction to an article entitled: "Floating Docks"

689

"IN recent years, ships have increased considerably in size. It has therefore been necessary to build larger docks in which the giant ships may undergo repairs. Of the two kinds of dock, the graving, or dry dock, and the floating dock, many people prefer the floating dock because it is more flexible..."

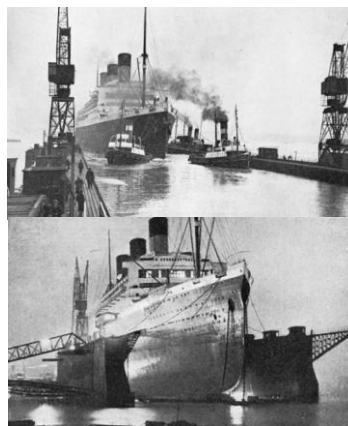
Shipping Wonders of the World, ca. 1936

690

"...A modern floating dock is nothing more than a huge trough-shaped raft formed of a hollow bottom and two hollow sides. To raise a ship, water is let into the bottom and part of the sides of the raft until the bottom has sunk below the level of the ship's keel; then the ship is manoeuvred over the raft by hawsers until the ship's keel and the raft's keel blocks are exactly in line. Finally the water is pumped out and the raft lifts to the surface, carrying the ship with it..."

Shipping Wonders of the World, ca. 1936

691



Top: caption: "WHEN ENTERING THE FLOATING DOCK a liner needs the assistance of powerful tugs. The White Star liner *Majestic*, at one time the largest liner in the world, 56,599 tons gross, is entering the floating dock at Southampton for her annual overhaul. The *Majestic* was 915 ft. 6 in. long, with a beam of 100 ft. 1 in. and a depth of 58 ft. 2 in. She was taken out of commission in February 1936."

Bottom: caption: "TO RAISE A GIANT LINER above the level of the water the enormous dock can exert a maximum lift of 60,000 tons. In the photograph the *Majestic* is shown docked at night in the world's largest floating dock at Southampton. A large liner must be overhauled rapidly, and often more than 1,000 men work on her day and night while she is in the dock."

692

"...Where there is a considerable difference between high tide level and low tide level, a small ship can be floated close inshore at high tide, and will then be left high and dry when the tide goes out. But in waters where the difference between the high and low tide levels is only slight, it is necessary, before repairs can be done to the submerged part of the hull, to find some artificial method of getting the ship clear of the water..."

Shipping Wonders of the World, ca. 1936

693

"...According to tradition, the earliest known form of floating dock was invented by an English sea-captain in the harbour of Kronstadt, in the Gulf of Finland, during the reign of Peter the Great. The English captain wished to repair the copper sheathing of his ship, and as there was no slipway or masonry dock available, he bought an old hulk called the 'Camel.' This he gutted completely, removing the stern and fitting a water-tight gate in its place. He then warped his own ship inside the hollow shell thus formed, closed the gate and pumped out the water, thus leaving the underwater surfaces of his ship high and dry..."

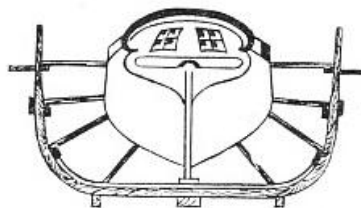
Shipping Wonders of the World, ca. 1936

694

"...A dock of almost exactly the same type was still in use at Wivenhoe, Essex, in 1936, and another similar dock at Rochester, Kent, is used for yachts. The first floating dock built and used in Great Britain was one built in 1776 by a shipwright named Aldersly..."

Shipping Wonders of the World, ca. 1936

695



"...Then came Christopher Watson's dock, built in 1785 and put into use at Rotherhithe on the River Thames. A print is extant showing the dock there in 1800, lifting the brig 'Mercury'..."

Shipping Wonders of the World, ca. 1936

Caption: "CHRISTOPHER WATSON'S DOCK was built at Rotherhithe on the Thames in 1785. This drawing, taken from a contemporary print, shows a stern view of the brig *Mercury* in the dock. The first floating dock in Great Britain was built in 1776."

696

"...It is uncertain whether Watson used an old ship or whether he specially built his dock, but the principle of these early docks was the same. They were simply shells provided with a gate at one end, into which the vessel was warped; the gate was then closed and the water was pumped out of the confined pound. Their useful life was surprisingly long. Watson's dock is known to have been in active use for forty-four years, and probably its working life continued for several years more..."

Shipping Wonders of the World, ca. 1936

697

"...In 1809, Richard Trevithick and Robert Dickinson patented a design for a dock which they described as a caisson, to be built of wrought-iron plating half-an-inch thick and internally resembling a ship. The shell was to be 220-feet-long, 54-feet-wide and 30-feet-deep, with a large flange 6-foot-wide extending outwards horizontally for the workmen to stand on and for additional strength. It was to be surrounded by semi-cylindrical water-tight chambers; and the raising was to be effected by a pump worked by a 12-horse-power engine in a barge alongside. A similar design was patented by G.W. Lennox in 1834; but neither of these designs was ever put into practice..."

Shipping Wonders of the World, ca. 1936

699

"...So far, iron had not come into general use for the building of floating docks. Several designs for iron docks had been patented, notably one by James Taylor of Birkenhead in 1852. In this design the floor was divided into four separate compartments. Pipes from these compartments led to pumps separately controlled, the trim being maintained by further compartments in the side-walls..."

Shipping Wonders of the World, ca. 1936

701

"...The first improvement in the design of the floating dock was to make the walls and bottom hollow and thus buoyant. This gave two advantages. First, the heavy water-tight gate at the end, which was essential to the 'pound' system, was eliminated; secondly, the stability of the dock was greatly improved..."

Shipping Wonders of the World, ca. 1936

698

"...The Americans were the first to put into practice a design for a hollow dock. They built their earlier docks of timber. The first of any note was that built for the Navy Yard at Portsmouth, New Hampshire, in 1848. Hollow-walled wooden docks continued to be built for some years, and were of large size. One at Rangoon, built in 1866, was more than 300-feet-long..."

Shipping Wonders of the World, ca. 1936

700

"...But it was not until Edwin Clark, in the early 1850s, designed the hydraulic lift dock that iron began to be freely used. The design was a departure from previous practice, since the rectangular iron pontoons of which the dock was formed depended for their lift, not upon pumps, but upon a range of hydraulic rams embedded in immensely heavy foundations at the bottom of the harbour..."

Shipping Wonders of the World, ca. 1936

702

“...The method of working was first to admit water to the pontoon so that it sank on to the ram heads, then to float the ship over it, lift pontoon and ship high enough to allow the water to run out of the pontoon, close the pontoon valves, and finally release the rams, leaving the pontoon floating with the ship on top of it. The disadvantages of the arrangement were the high initial cost and the relatively small capacity. The hydraulic gear had to be provided with foundations nearly equal in strength to those of a masonry or graving dock. Docks of this type - now obsolete - were installed at Malta in 1871 and also at Bombay in 1872, but the best-known example was the Victoria Dock, London, built in 1857...”

Shipping Wonders of the World, ca. 1936

703

“...The first Bermuda dock, built to the order of the Admiralty in 1868 for use by the West Indies Squadron, is an interesting example of a hollow-walled iron dock depending for part of its lift upon the pumping dry of compartments contained within the walls themselves. The walls contained twenty-four watertight chambers which could be emptied by eight steam-driven pumps mounted on top of the dock walls, and these when empty exerted a lift of 3,000 tons. An additional lift was obtained by the time-honoured device of a pound formed by closing the ends of the dock with gates...”

Shipping Wonders of the World, ca. 1936

704



Caption: “THE FIRST BERMUDA DOCK was a hollow-walled iron dock built in 1868. Twenty-four compartments in the walls were pumped dry by eight steam-driven pumps to give the dock a lift of 3,000 tons. To tilt the dock for cleaning purposes, one wall was pumped free of water and the other wall was kept filled. This practice had to be abandoned because there was grave danger of the dock’s capsizing.”

705

“...In the Bermuda dock it was hoped that the U-shaped design would solve this problem by enabling the dock to be carened. The compartments on one side would be pumped dry and those on the other kept filled until the dock was canted sufficiently to show its bottom clear of the water. When the exposed half had been attended to, the process would be reversed. To get at the bottom, however, the dock had to be canted so far that there was grave danger of its capsizing. As this had nearly happened once at a trial in Portsmouth Harbour, no further attempt was made. Eventually the dock became so foul owing to the impossibility of cleaning, that it was decided to fill in the floor and part of the walls with concrete and to use the dock as an ordinary graving dock...”

Shipping Wonders of the World, ca. 1936

706



FIG. 1

“...The difficulty experienced in cleaning the underwater surfaces of floating docks led to the introduction of the self-docking principle. The first and simplest method of carrying this out, which was based on the system adopted for the early timber sectional docks of America, was to build the dock in several small sections. The length of each section was less than the clear width between the side walls, so that any section could be turned end-on and lifted on to the others (see Fig. 1 in the diagram above)...”

Shipping Wonders of the World, ca. 1936

Caption: “SELF-DOCKING. Each figure illustrates the process of self-docking a section or pontoon of a floating dock. In Fig. 1 a section is turned end-on and lifted on to the others.”

707

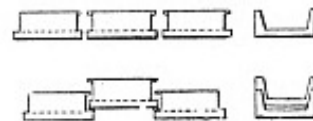


FIG. 2

“...In a variation, the sections were made of any convenient length provided that there were at least three sections in the whole dock. Every section had its pontoon portion somewhat longer than the walls so that the deck formed a ledge at either end. When it was required to lift a section, two others were sunk and the section to be lifted was floated over these ledges; as the submerged sections were pumped out they lifted the middle one clear of the water (see Fig. 2, above).”

Shipping Wonders of the World, ca. 1936

Caption: “In Fig. 2 the overlapping pontoon sections form ledges on to which the required section is floated”

708

"...The great disadvantage of these sectional docks was their lack of rigidity. The sections were joined together merely by lashings or timber-bolts or by some more or less flexible form of coupling, so that the dock was not a rigid whole, but was built up of separate units loosely coupled together. It follows, therefore, that there were risks, first of straining the ship through uneven pumping, and secondly, of the connexions breaking. Many accidents have been due to the end pontoon bodily slipping from under the vessel's forefoot. In one instance, this almost caused the destruction of the dock, an old timber one. When the section slipped out, the extra weight thrown on the next section was sufficient to cause it to collapse, and the vessel then launched itself end-on, smashing most of the remaining sections as it did so..."

Shipping Wonders of the World, ca. 1936

709



FIG. 3

"...A great improvement on the early sectional docks was introduced by the great engineer Bennie in his Cartagena Dock, built in 1859. In this form, classified as the sectional pontoon dock, only the pontoons forming the floor of the dock are in sections, the side walls being continuous. The side walls rest on the upper surfaces of the pontoons, to which they are attached by heavy fishplate joints, lugs and taper pins. In self-docking, any pontoon requiring repair is unpinned from underneath the side walls and sunk sufficiently to enable it to be withdrawn. Then the remainder of the dock is sunk, the section turned half-round and floated in and the whole raised (see Fig. 3, above)..."

Shipping Wonders of the World, ca. 1936

Caption: "In Fig. 3 only the pontoons are in sections, the side-walls being continuous"

710

"...Although the longitudinal rigidity of the sectional pontoon is vastly superior to that of the old sectional docks, yet it is not sufficient to obviate entirely the risk of accident. Since the pontoons are not connected in any way the whole resistance to bending must be taken by the walls alone. These docks have often had their decks buckled while lifting short and heavy vessels or they have been badly damaged through working in a seaway. In the summer of 1903 a dock of this type, of about 8,000 tons lifting capacity and 436-feet-long, had its back almost broken through during a gale in the English Channel, and the pontoons were permanently altered in shape..."

Shipping Wonders of the World, ca. 1936

711

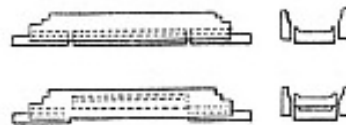


FIG. 4

"...For many further improvements which have taken place in the design of floating docks during the last fifty years, Clark and Standfield, the Westminster firm of consulting engineers, have been almost entirely responsible. In 1895 they greatly increased the longitudinal strength of floating docks by their 'Havana' design. In this type of dock the pontoons, besides being attached to the side walls, are themselves fastened together by means of fishplate joints. The depth of the walls is extended to the full depth of the pontoons, and the walls are attached, not to the upper, but to the outer surfaces of the pontoons (see Fig. 4, above)..."

Shipping Wonders of the World, ca. 1936

Caption: "In Fig. 4 the pontoons, besides being attached to the side-walls, are themselves joined together"

712

"...For self-docking the walls, the dock is merely heeled over to one side or the other, only a slight angle of heel being needed to expose either wall completely. For docking the pontoons, the fishplates are disconnected and the pontoon to be lifted is allowed to float free. Then the remainder of the dock is sunk to a certain depth, the detached pontoon is re-attached to the side-walls at a higher level and, on the dock being pumped out, the pontoon is lifted clear..."

Shipping Wonders of the World, ca. 1936

713

"...Of this Havana type the best-known example is the second Bermuda dock built by Swan, Hunter and Wigham Richardson of Wallsend-on-Tyne in 1902 to replace the old U-shaped dock of 1868. The new dock is 545-feet-long and has a width of 100-feet. It affords also a good illustration of the tendency towards increased use of the pontoons and the decline of the pound for lifting purposes. The lift given by the pontoons was 15,500 tons, but the additional lift provided by the pound was only 2,000 tons. From this time forward, gates at the ends of the dock were seldom fitted..."

Shipping Wonders of the World, ca. 1936

714

“...Rigid as the Havana type proved itself to be, the demand for a still more rigid form of dock has been made. This led Clark and Standfield to design the bolted sectional or sectional box dock. This is a reversion to the old type of sectional dock. The difference in the new type is that the sections are rigidly bolted together, thus forming a continuous trough-shaped girder of enormous strength. The two terminal sections have pointed ends...”

Shipping Wonders of the World, ca. 1936

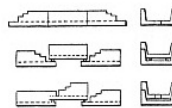
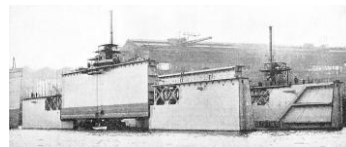


FIG. 5



“...In self-docking any one of the centre sections, that section is unbolted. The two remaining parts of the dock are turned round and sunk and their pointed ends are drawn underneath the centre section as far as they will go. Then they are pumped dry and the centre section is lifted on the pointed ends (see Fig. 5, above)...”

Shipping Wonders of the World, ca. 1936

Left: caption: “Fig. 5 illustrates the principle operating in the photograph at right”

Right: caption: “CLEANING AND REPAIRING A FLOATING DOCK. The side-walls of this type are built in sections. The section to be cleaned is detached and the two adjacent sections of the dock are turned round and sunk. The outer sections are then drawn closer together so that when they are lifted again the centre section rests on the projecting ledges of the outer sections and is lifted above the water.”

715

716

“...When a terminal section (which is pointed) is lifted, the dock is divided into three and the pointed portion of one lifting section is passed under the square portion of the lifted section. The rectangular central section is then lowered and backed in, so that the pointed portion of the lifted section enters between its walls. This method of self-docking has certainly not the simplicity of the operations required for the sectional pontoon or the Havana types; but self-docking does not often have to be undertaken, so that a longer period may well be allowed for the operation if more important advantages are thereby gained...”

Shipping Wonders of the World, ca. 1936

“...The Southampton dock, built to this design by Armstrong, Whitworth for the Southern Railway, is the largest floating dock in the world. It has a lifting power of 60,000 tons. The length is 960-feet, the overall width 170-feet, the clear width inside 130 ft. 6 in. and the depth of the floor 20-feet. The draught over the keel blocks, with the top of the side walls 6 ft. 6 in. out of the water, is 38-feet. The complete weight, including fittings and machinery, comes to about 19,000 tons. The total area of the floor is about 3½ acres...”

Shipping Wonders of the World, ca. 1936

717

718



Caption: “WORLD’S LARGEST FLOATING DOCK in the final stages of completion. Built in 1922 by Armstrong, Whitworth, for the Southern Railway, the Southampton floating dock has a lifting capacity of 60,000 tons. It is 960-feet-long, with an overall width of 170 feet and a clear width inside of 130 ft. 6 in. The total floor area of the dock is about 3½ acres.”

719

720

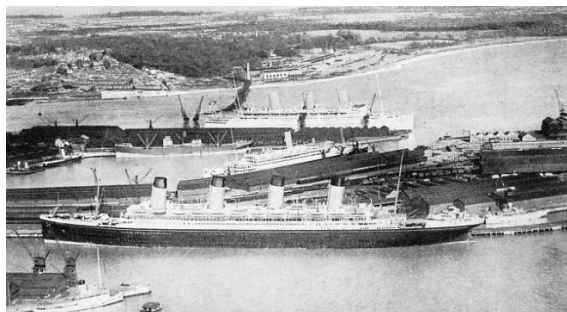
“...Some 3¼ million rivets have been put into the dock, and approximately 7½ million rivet holes have been either drilled or punched. The dock is in seven sections and each section is provided with its own pumping machinery. A centrifugal pump at the bottom of the dock, operated through vertical shafting by an electric motor situated in a house on the top deck, is installed on either side of each section, so that there are fourteen main pumps and as many motors. The control of these various units is completely centralized. The valves and pumping motors are operated electrically by means of a push-button system in a single valve-house situated on top of one of the walls. Gauges record there the depth of water in the different compartments of the dock while flooding or pumping is taking place...”

Shipping Wonders of the World, ca. 1936

"...The various apparatus for the control of the dock is installed on two tables, about twenty feet long, placed in the valve-house. These tables form together a model of the dock, and the control apparatus corresponding to each section of the dock is mounted in its appropriate position on the tables. An electrical device indicates with lamps when the ship's keel lies centrally on the keel blocks, and similar devices installed in the valve-house or near it enable the dockmaster to observe the deflection of the dock and its inclination in either direction. A complete telephone service connects this house with every motor-house on the dock..."

Shipping Wonders of the World, ca. 1936

721



"...At the official trial, this dock lifted the 'Olympic,' of 46,439 tons gross, in three hours fifty-two minutes. Some 80,000 tons of water were discharged from the dock's compartments during the operation..."

Shipping Wonders of the World, ca. 1936

Caption: "TWO FAMOUS LINERS, the Olympic, in the foreground, and the Empress of Britain, in the background, at Southampton docks"

723

"...Interesting developments of the floating dock are the 'off-shore' and 'depositing' docks. The off-shore type was intended for use in fixed positions near the shore. The advantage is that the outer wall can be dispensed with, for stability is assured by mooring the inner wall to the shore by pivoted girders which allow the dock to rise and fall while it is kept in a horizontal position..."

Shipping Wonders of the World, ca. 1936

725

"...There is thus concentrated in the valve-house all the necessary gear to enable the dockmaster to exercise complete control over the dock's machinery during the operation of sinking and raising the dock. He can observe from the instruments under his eye exactly what is occurring and can readily make the needful adjustments..."

Shipping Wonders of the World, ca. 1936

722



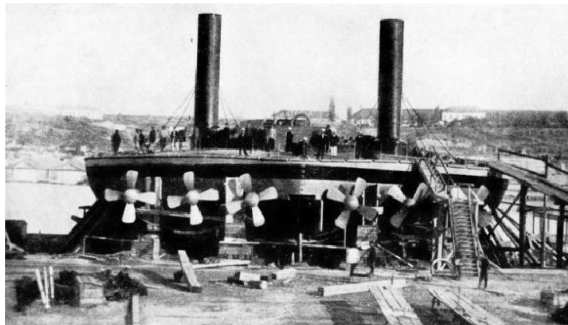
Caption: "TOWING OUT OF A FLOATING DOCK. Southampton saw the world's largest liners in the world's largest floating dock before the advent of the new graving dock. Above is the Empress of Britain, a famous Canadian Pacific quadruple-screw liner with a gross tonnage of 42,348."

724

"...The depositing dock was developed by Clark and Standfield in 1876 for the purpose of docking Admiral Popoff's circular ironclads in the Black Sea. These vessels, one of which is illustrated in the chapter 'Novelties in Ship Design,' were so wide that no conventional dock could accommodate them. The dock consists of a series of long hollow fingers connected to a hollow wall. Along the shore a staging or gridiron was built, the spacing between the grids corresponding with the spacing between the fingers of the dock..."

Shipping Wonders of the World, ca. 1936

726



727
Caption: "A CIRCULAR SHIP. The Vice-Admiral Popoff was named after her designer, who was a Vice-Admiral in the Russian Navy. The vessel was launched in 1875. She was propelled by six screws driven by six compound steam engines, which gave a total indicated horse-power of 2,400. The six screws caused her to spin round in the water, and the maximum speed attained was only seven knots. The Vice-Admiral Popoff, 3,590 tons, was 120-ft. in dia., with a depth of 13 ft. 6 in. She was armed with two 40-pounder guns.

728

"...The method of working was to lift the ship in the usual way, tow the dock with the ship in it sideways to the staging so that the fingers of the dock and the grids of the staging interlaced, and then to sink and withdraw the dock, leaving the ship deposited on the staging. The advantage was that, besides accommodating ships of unusual width, the same dock could be used to deposit any number of ships on further lengths of staging..."

Shipping Wonders of the World, ca. 1936

"...Examples of these depositing docks are still to be found at Nikolayev and Vladivostok, in Russia, at Barcelona, in Spain, and at Kobe, in Japan. The dock at Kobe was built chiefly for the purpose of dealing with gigantic monoliths of reinforced concrete, weighing up to 6,000 tons, of which the quay wall was being built..."

Shipping Wonders of the World, ca. 1936

729

"...One of the most valuable characteristics of the modern floating dock is its mobility. It can be built at the cheapest place and moved to the scene of its intended operation. The earlier docks were shipped out in pieces and the final assembly was done on the spot. L. Smit and Company's Internationale Sleepdienst, of Rotterdam, has the greatest number of these passages to its credit. Its tug 'Zwarte Zee,' 793 tons gross, is one of the most powerful tugs in the world..."

Shipping Wonders of the World, ca. 1936

730

"...The towing gear generally used is extra superior Manila rope of 18 to 20 in. circumference, with a bridle of 6-in. Bullivant steel wire on either end to take the chafe on the bollards. Yet, even with gear as strong as this, the enormous area which the sides of a floating dock present to the wind makes towing in heavy weather impossible. The dock has to be cast adrift to look after itself, while the tugs stand by it until the weather moderates. During the voyage of the Durban dock in 1903, bad weather encountered in the South Atlantic made towing impossible for two days, and the dock drifted for eighty miles before the tugs could attempt to take it in hand again..."

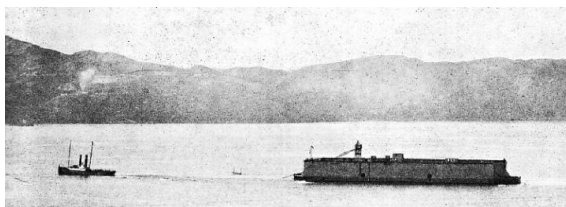
Shipping Wonders of the World, ca. 1936

731

"...The largest dock ever towed a long distance is the 50,000-ton dock built by Swan, Hunter and Wigham Richardson for the British Naval Base at Singapore. The dock was towed out 8,500 miles by L. Smit and Company in 1928. Seven tugs took the dock out in two sections. Beyond a slight straining of the dock's end plates due to heavy pounding in the Indian Ocean during the monsoon, no accident occurred..."

Shipping Wonders of the World, ca. 1936

732



"...The longest tow of this kind was that performed by the tugs 'Zwarte Zee' and 'Witte Zee' in 1931, when they took a 17,000-tons dock from the Tyne to Wellington, New Zealand. This wonderful voyage of more than 12,000 miles occupied only 166 days. The 'Zivarte Zee' of 1931 was replaced in 1933 by a new motor tug of the same name, referred to above." *Shipping Wonders of the World*, ca. 1936

Caption: "END OF A 12,000-MILES TOW at the entrance to the harbour of Wellington, New Zealand. The 17,000-tons floating dock was towed from the Tyne to Wellington in 1931 by the tugs *Zwarte Zee* and *Witte Zee*. The voyage occupied 166 days, and was one of the longest tows on record. The *Zwarte Zee*, which in 1933 was replaced by a more powerful motor tug of the same name, had an indicated horse-power of 1,503." 733

"...The objection to the steel dock is that its life is only about forty years under the most favorable circumstances. The cost of maintenance is much greater than in the case of a graving dock. Being constructed of steel, rust and decay cause rapid deterioration and the repair bills are constant and large..." *The Brooklyn Daily Eagle*, July 21, 1909

RE: between 1920 and 1930, the *Bureau of Yards and Docks* made numerous studies of various types of mobile docks of both unit and sectional types. In 1933, funds were finally obtained for one 2,200-ton dock and the Bureau designed and built the "ARD (*Auxiliary Repair Dock*)-1." This dock was of revolutionary design; it was a one-piece dock, ship-shaped in form, with a molded closed bow and a faired stern (best described as U-shaped in both plan and cross-section). The stern was closed by a bottom-hinged flap gate, operated by hydraulic rams. This gate was lowered to permit entrance of a ship into the submerged dock and then closed. The dock was then raised by pumping water from the ballast compartments and also from the main basin. This dock was equipped with its own diesel-electric power plant, pumping plant, repair shops and crew accommodations. It was the first dry dock in any Navy which was sufficiently self-sustaining to accompany a fleet into remote waters. 735

It had long been recognized that in the event of another World War the fleet would be required to operate in remote waters and that ships were going to suffer hard usage and serious battle damage. It was obvious that many crippled ships would be lost, or at least would be out-of-action for months while returning to home ports for repairs unless mobile floating dry docks could be provided that could trail the fleet wherever it went. It was the *Bureau of Yards and Docks* responsibility to meet this need. To that end, in 1935, the Bureau obtained \$10 million for a one-piece mobile dock, similar to *ARD-1*, capable of lifting any naval vessel afloat. Complete plans and specifications were prepared by the Bureau for this dock which was to be 1,027-foot-long, 165-foot wide and 75-foot molded depth. Designated as the "ARD-3," bids received for this enormous dry dock exceeded the appropriation thus, the project was abandoned when the additional funds were not forthcoming. 737

"...The policy of our Navy Department is against building floating docks. We have three of these affairs, two of which were built by the Department and the third was bought from the Spanish Government. One is in the Philippines, another at New Orleans and the third at Pensacola. There is no proposition now pending to build another..." *The Brooklyn Daily Eagle*, July 21, 1909

RE: floating dry docks have been used for overhaul and repair of ships for many years, featuring many ingenious designs. One of the most interesting was the *Adamson* dock, patented in 1816. The USN apparently built several wooden sectional docks at various Navy Yards ca. 1850, but little is known of their history. Around 1900, two new steel floating dry docks were built for the USN. However, neither of these docks was suitable for mobile operation. The first of these, of 18K-tons lifting capacity, was built in 1899-1902 at Sparrow's Point, Md., and towed to the Naval Station, Algiers, La., where it was kept in intermittent service for many years. In 1940, it was towed via the *Panama Canal* to *Pearl Harbor* to supplement the inadequate docking facilities there. Since the dock was wider than the canal locks, it was necessary to disassemble it at Cristobal (Atlantic-side) and reassemble it at Balboa (Pacific-side). Although both the dock and the ship in it were damaged during the Japanese attack on *Pearl Harbor* on December 7, 1941, the dock was not lost, but was quickly repaired and subsequently performed invaluable service both in the salvaging of vessels damaged in that attack and in the support of the Pacific fleet. 734

The *ARD-1* was towed to *Pearl Harbor*, where it was used successfully throughout WWII. Thirty docks of this type, somewhat larger and incorporating many improvements adopted as a result of operational experience with this experimental dock, were constructed and deployed throughout the world during the war. The fleet of floating dry docks built by the *Bureau of Yards and Docks* during WWII was a significant factor in the USN's success in waging a global war.

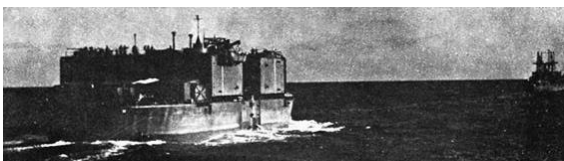
At the same time, plans were prepared for "ARD-2" - an improved and enlarged model of the *ARD-1*. However, it was not until November 1940 that funds were obtained for its construction and the project placed under contract. The *ARD-2* and an additional dock, *ARD-5*, were completed in the spring of 1942. Additional docks of this type were built in rapid succession and were delivered during 1943 and 1944 at an average rate of more than one-a-month. 738

The problem of providing floating dry docks capable of moving to advanced operational areas in the wake of the fleet; of sustaining themselves in full operation without support from shore and of sufficient size and lifting capacity to dock all capital ships had been under study by the *Bureau of Yards and Docks* for many years. The *ARD-3* was one solution to this problem. It was recognized that a unit dock of this size possessed certain disadvantages, i.e. it required a special basin of enormous size for its initial construction. It was necessary to retain this basin supported on the prepared blocking as the dock was dewatered in reserve or provide an equivalent basin elsewhere, for the periodic docking of the hull, since it was not self-docking. The towing of a craft of this size presented an operational problem of unprecedented magnitude. Provision for stresses during storms at sea required heavy reinforcement of the dock. There was concern over the possibility of losing the unit dock as a result of enemy action while en route.

739

When war was declared, it was readily apparent that a number of mobile capital-ship floating dry docks would have to be constructed immediately. The project was authorized and funds made available early in 1942. Studies in connection with the preparation of plans and specifications led to the proposal of a sectional type of dock, with field-welded joints, designed for a strength materially below that previously specified by the *Bureau of Ships*. This reduction was accepted, and the sectional type adopted.

741



At maximum submergence, the 10-section docks had a depth over the blocks of 46-feet, with a freeboard of almost 6-feet. The 7-section docks had a corresponding depth of 40-feet and a freeboard of almost 5-feet. For both sizes, the sections were faired fore and aft to a truncated bow and stern and could be towed at a speed of 6 to 8 knots without excessive power. In the assembled docks, the flat bows and sterns formed interrupted berths alongside to which barges and vessels could be readily moored.

Caption: "A Section of an Advance Base Sectional Dock in Tow. Wing-walls are down to reduce wind resistance. Repair equipment is stowed on deck."

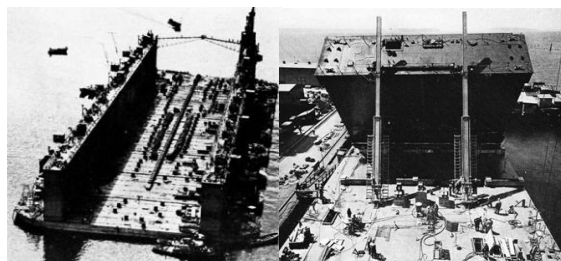
743

Studies had been carried on concurrently by the *Bureau of Yards and Docks* on various types of sectional docks, which would be designed with faired hulls for ease of towing and with joint details which would permit rapid assembly in forward areas under adverse conditions. However, these schemes were not carried to a final conclusion, primarily because the requirements of the *Bureau of Ships* for the longitudinal strength and stiffness of the assembled dock could not be met by a practicable form of joint.

740

Designated "Advance Base Sectional Dock" (ABSD), these docks were of two different sizes. For battleships, aircraft carriers and the largest auxiliaries (i.e. cruisers), the docks consisted of ten sections, each 256-foot-long and 80-foot-wide with a nominal lifting capacity of 10K-tons. When assembled to form the dock, these sections were placed transversely, with 50-foot outrigger platforms at either end of the assembly, making the dock 927-foot-long and 256-foot-wide overall, with an effective length of 827-feet; a clear width inside wing walls of 133-feet and a lifting capacity of 90K-tons. The smaller docks consisted of seven sections, each 240-foot-long and 101-foot-wide, with a lifting capacity of 8K-tons. The assembled dock had an effective length of 725-feet; an overall length of 825-feet; a width of 240-feet; a clear width inside wing walls of 120-feet and a lifting capacity of 55K-tons.

742



The sections consisted of the bottom pontoon and two wing walls, which were hinged at the bottom so that they could be folded inboard for towing, the purpose being to reduce the presentation to the wind and to lower the center-of-gravity as compared to fixed standing wing walls.

Left: caption: "Advance Base Sectional Dock in the South Pacific. View shows keel blocks and bilge blocks set to accommodate a ship."

Right: caption: "Raising the Wingwalls of an Advance Base Sectional Dock with Hydraulic Jacks. Crews on top of wingwalls change position of the pins in the beams alternatively."

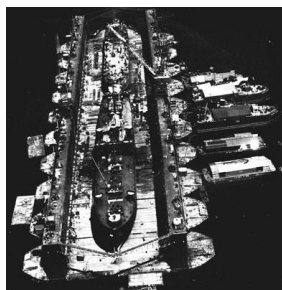
744

Each bottom pontoon of the battleship dock was 28-feet-deep and was subdivided by two watertight bulkheads running lengthwise and four watertight bulkheads athwart the section to form twelve water ballast compartments and a central buoyancy compartment, 36-feet by 80-feet. This buoyancy compartment contained two decks, the upper deck being used for crew quarters and the lower deck, for the machinery compartment. The double bottom was subdivided to form fuel-oil and fresh water tanks. Access to the usable compartments was provided by passageways under the upper pontoon deck which connected to stair trunks in the wing walls.

745

The wing walls were 20-feet-wide and 55-feet-high and were subdivided by a safety deck set 14-feet below the top deck to form dry compartments above and three water ballast compartments below. The dry compartments were completely utilized for shops, storage, and similar facilities. Quarters and galleys were in the dry compartments in the bottom pontoons. Each section was equipped with two 525-h.p. diesel engines directly connected to 350-k.w. generators and with pumps evaporators, compressors, and heating and ventilating apparatus. No propulsion machinery was provided. The smaller docks were similar, except that the bottom pontoons were 23-1/2-feet-deep and the wing walls were 18-feet-wide and 49-feet-high.

746



Each dock was equipped with two portal jib cranes having a lifting capacity of 15-tons at a radius of 85-feet, traveling on rails on the top deck of the wing walls. In the case of the smaller dock, the cranes were set back from the inner face of the wing walls to provide clearance for overhanging superstructures of carriers, and the outer rail was supported on steel framing erected on the outboard portion of the pontoon deck.
Caption: "Ten-Section ABSD (Advance Base Sectional Dock) in Service. Two ships received simultaneous service in a dock capable of servicing the largest vessel afloat. The small barges moored to the side are additional service units."

747



Upper Left: caption: "Cruiser in an ABSD. Showing the ship secured in position so that it will be supported on the prepared blocking as the dock is dewatered."
Lower Left: caption: "Dewatering an ABSD. Water is pumped out of the bottom pontoons and wing-wall compartments to raise the ship out of the water."

748

The wartime program of floating dry docks included a wide variety of types to meet the varying service requirements for which they were designed. The principal categories were as follows:

ABSD - Advance Base Sectional Dock. Mobile, military, steel dock, either (a) of ten sections of 10,000 tons lifting capacity each, or (b) of seven sections of 8000 tons lifting capacity, for battleships, carriers, cruisers, and large auxiliaries.

ARD - Auxiliary Repair Dock. Mobile, military, steel unit dock, ship-form hull, with a normal lifting capacity of 3500 tons, for destroyers, submarines, and small auxiliaries.

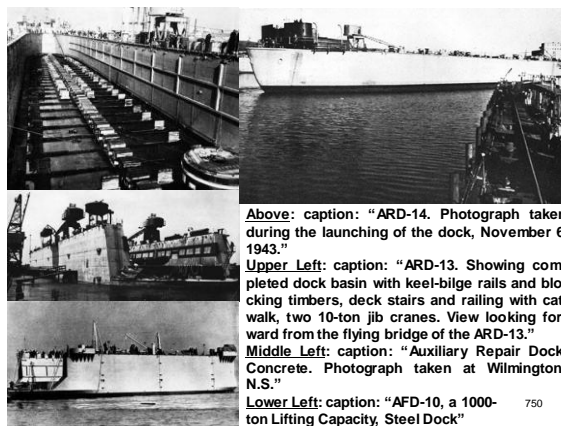
ARDC - Auxiliary Repair Dock, Concrete. Mobile, military concrete trough type, unit dock with faired bow and stern, 2800 tons lifting capacity.

AFD - Auxiliary Floating Dock. Mobile, military, steel trough type, unit dock, with faired bow and stern, of 1000 tons lifting capacity.

AFDL - Auxiliary Floating Dock, Lengthened. Mobile, steel trough type, unit dock, similar to AFD's, but lengthened and enlarged to provide 1900 tons lifting capacity.

YFD - Yard Floating Dock. This category included a wide variety of types, designed generally for yard or harbor use, with services supplied from shore. Among the principal types were 400-ton concrete trough docks; 1000-ton, 3000-ton and 5000-ton one-piece timber trough docks; sectional timber docks ranging from 7000 to 20,000 tons lifting capacity; and three-piece self-docking steel sectional docks of 14,000 to 18,000 tons lifting capacity.

749



Above: caption: "ARD-14. Photograph taken during the launching of the dock, November 6, 1943."
Upper Left: caption: "ARD-13. Showing completed dock basin with keel-bilge rails and blocking timbers, deck stairs and railing with catwalk, two 10-ton jib cranes. View looking forward from the flying bridge of the ARD-13."
Middle Left: caption: "Auxiliary Repair Dock, Concrete. Photograph taken at Wilmington, N.S."
Lower Left: caption: "AFD-10, a 1000-ton Lifting Capacity, Steel Dock"

750



Left: caption: "First Ships in YFD-16 Jacksonville, February 1943. Most YFDs were maintained tied up to a wharf or bulkhead, fitted into a notch that would allow vertical movement but would keep the dock in position."

Right: caption: "YFD-6 being prepared for passage through the Panama Canal. One of the most interesting operations was the transfer of two docks; YFD-3 and YFD-6, from the Atlantic to Balboa, on the Pacific-side of the Panama Canal, was necessary to increase docking facilities on the Pacific-side of the canal and to make it unnecessary for tankers to transit the canal for repairs." 751

These classifications were modified in 1946 in order to make the standard nomenclature of floating dry docks consistent and more descriptive. Four class designations were established, as follows:

AFDB - Auxiliary Floating Drydock Big (30,000 tons and larger).

AFDM - Auxiliary Floating Drydock Medium.(10,000 to 30,000 tons).

AFDL - Auxiliary Floating Drydock Little (less than 10,000 tons).

AFDL(C) - Auxiliary Floating Drydock Little (Concrete).

Under this modification, the ABSDs were re-designated AFDBs; the ARDs became AFDLs; the ARDCs became AFDL(C)s; the AFDs became AFDMs; and the YFDs became AFDMs. 752

The *Bureau of Yards and Docks* also provided several docks of special types and varying capacity for specific objectives. The largest of these docks was a *Rennie-type* dock, consisting of steel wing walls beneath which seven timber pontoons were independently bolted. The pontoons were each 77-foot wide and 120-foot-long and provided a total lifting capacity of 16K-tons. Self-docking was accomplished by withdrawing one pontoon at a time and docking it on the remaining units. Another unusual type was the 400-ton concrete dock designed by the Bureau for use in repairing small patrol craft. The success of these docks for this purpose was a factor in the adoption of concrete for the ARDCs.

753

"...The steel dock in the Philippines is anchored at the naval station at Olongapo. It has done good work and has proved a splendid investment. It has a lifting capacity of 16,000 tons and the 'Connecticut' was docked in it when the Atlantic fleet visited Manila..."

The Brooklyn Daily Eagle, July 21, 1909

RE: the "Dewey" was a 16K-ton dock, built in three sections and capable of docking itself. It was constructed in 1903-1905, also at Sparrow's Point, Md., and was towed via the *Suez Canal* to the Philippines. The *Dewey* was still in service at Olongapo when the Japanese invaded the Philippines early in 1942. It was scuttled by American naval forces before they abandoned the station.

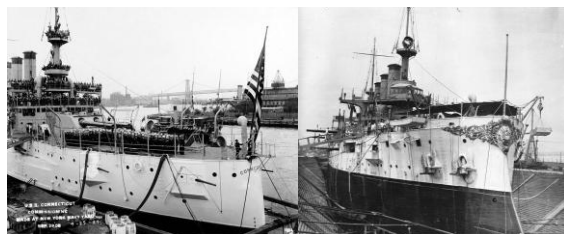
754



"ON September 29, eighteen months after the laying of her keel, the United States battleship 'Connecticut,' which shares with the British battleships of the King Edward-class the distinction of being the largest yet constructed, was launched at the New York Navy Yard, Brooklyn . . . The Connecticut,' and her sister ship 'Louisiana,' which was launched a month ago at Newport News yard, were authorized by act of Congress on July 1, 1902..."

Scientific American, October 1, 1904

Caption: "USS Nebraska (left) and USS Connecticut (right) at the Brooklyn Navy Yard, ca. 1909" 755



"...'Connecticut' was launched from the very spot at which the old prison ship 'Jersey' was beached, after she had performed her notorious duties during the Revolutionary War; and when the piling was being driven for the building ways, no little difficulty was experienced in getting it down through the remains of the sunken vessel..."

Scientific American, October 1, 1904

Left: caption: Commissioning of USS Connecticut, 29 Sept. 1906" 756

Right: caption: Connecticut in dry dock at the Brooklyn Navy Yard, March 1909"

756

Expediting the Enterprise

“...One reason the Department has decided to push Dry Dock No. 4 to completion without regard to the cost involved is the urgent recommendation of the general board that no effort be spared to expedite this enterprise...”
The Brooklyn Daily Eagle, July 21, 1909

757

758

The Next Naval War

“...The strategists of the Navy are greatly concerned over the inadequate docking facilities now available. It is pointed out that submarines and torpedo boats will doubtless play an important part in the next naval war. It is expected that vessels will receive more injuries under water than in past encounters...”
The Brooklyn Daily Eagle, July 21, 1909

759

760

“...In all probability the result of such a war will be determined on the basis of the first sea fight. If this should be the case the nation having the best facilities for repairing its damaged fleet will stand the best chance of ultimate victory. In view of this reasoning on the part of our naval strategists the desirability of having docks big enough to receive battle-ships will be realized at once...”
The Brooklyn Daily Eagle, July 21, 1909

Part 5

A Feat of Engineering

761

762

World's Largest

An enormous feat of engineering was involved by the building of the largest graving dock in world, at Southampton on a site reclaimed from the sea. Named the King George V Dock, it is large enough to accommodate a vessel of 100,000 tons. *Wonders of World Engineering*, June 29, 1937
 RE: introduction to an article entitled: "World's Largest Graving Dock"

763

764

"ADMITTEDLY the proper place for a ship is floating in the water; but she may not remain floating indefinitely. Collisions and groundings cause damage below the waterline, great gales play havoc with plating and rudders, and propellers often become damaged through striking submerged wreckage. Again, a quadruple-screw liner undertaking a cruise may dispense with two of her propellers for the sake of economy..."
Wonders of World Engineering, June 29, 1937

765

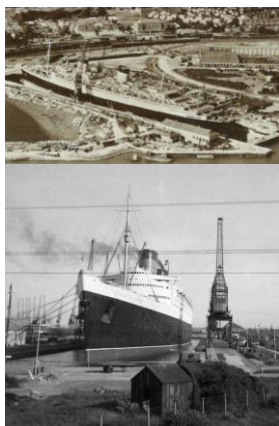


"...Last, but not least, barnacles akin to those that fastened to the hull of Drake's Golden Hind pay their attentions to plates of great liners such as the Cunard White Star 'Queen Mary.' Barnacles mean less speed or more horse-power..."
Wonders of World Engineering, June 29, 1937

Left: the front page of *The Sphere* shows RMS Majestic becoming the first liner to use the King George V Graving Dock

Caption: "56,621-ton White Star Liner 'Magestic' Enters the World's Largest Graving Dock at Southampton"

766



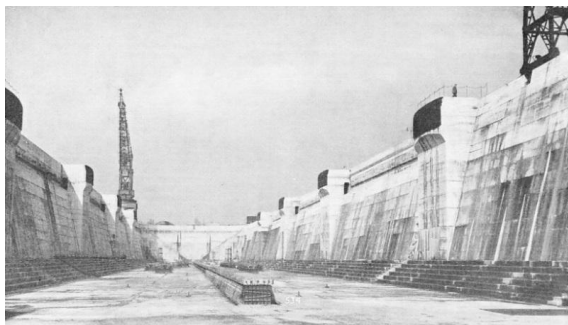
"...Plating, rudders, propellers and barnacles cannot be dealt with under water. The ship, even the 'Queen Mary,' must be landed high and dry: hence the graving (or scraping) dock. Its operation is simple: the dry dock is flooded, the ship enters and the dock gates are closed. Then the water is pumped out again and the vessel is left poised on a long line of keel blocks..."

Wonders of World Engineering, June 29, 1937
Caption: "Two views of the liner Queen Elizabeth in Southampton's George V dry dock"

767

"...There are thousands of graving docks spread throughout the ports and harbours of the world, but the greatest of them all is at Great Britain's south coast port, Southampton. The King George V Graving Dock at Southampton is capable of accommodating a vessel of 100,000 tons; the Queen Mary has a gross tonnage of 80,773, so that a handsome margin has been allowed for development in shipbuilding. The dock is 1,200-foot-long, 135-foot-wide at the entrance and between buttresses, and 59½-foot-high from floor to 'cope' - the engineering name for the brim of this vast receptacle..."
Wonders of World Engineering, June 29, 1937

768



Caption: "KING GEORGE V GRAVING DOCK with keel blocks in position. Vessels of up to 100,000-tons may use this graving dock, which is 1,200-feet-long, 135-feet-wide at the entrance and between buttresses, and 59 ft. 6-in. deep. In four hours the dock, which contains 58,000,000 gallons of water, can be pumped dry. Four 54-in centrifugal pumps are used for this purpose. There are, in addition, three 16-in. pumps for dealing with rain water. 769

"...The main portion of the dock is wider than its entrance, and measures 165-feet across at cope level. The keel blocks, which are carefully placed in position before the dock is flooded, are 4½-feet-high and at high water (neap tides) there is a depth of 45-feet of water over the blocks..."
Wonders of World Engineering, June 29, 1937

770



"...The dock, without a ship inside, contains 260,000 tons, or 58,000,000 gallons of water, and this can be pumped out in four hours..."

Wonders of World Engineering, June 29, 1937
Caption: "The King George V Graving Dock" 771

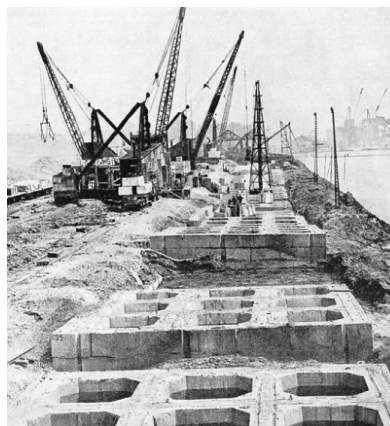
"...The King George V Dock was intended to complete the Southern Railway's vast dock scheme at Southampton. This scheme comprised a 7,000-foot deep-water quay, fronting more than 400 acres of reclaimed land. The building of the quay wall was in itself a magnificent feat of engineering. First of all a long embankment was raised to mark the line of the quay wall and the seaward front of the area to be reclaimed..."
Wonders of World Engineering, June 29, 1937

772

"...To form a foundation for the quay wall, 146 immense concrete monoliths were sunk into the embankment. At the base of each monolith was fitted a steel cutting shoe so that the monoliths could cut their own way into the embankment. Nine vertical shafts were put in each monolith so that excavating grabs could take away the soil beneath the monoliths to help them sink under their own weight. The new quay wall gives accommodation for eight of the largest liners at any state of the tide. At the western end of the quay wall the graving dock was built..."

Wonders of World Engineering, June 29, 1937

773



Caption: "THE NEW QUAY WALL at Southampton reclaimed a large area from the sea. At the western end of this area the graving dock was built. Foundations for the wall consisted of huge concrete monoliths which were sunk by their own weight and by the operation of grabs which worked in the shafts that were left open in the monoliths." 774

774

“...The site of the world’s largest graving dock was once a mud flat, swept for centuries by the tides of Southampton water. The first task confronting the engineers was to win back the land from the sea. The whole area of the dock site was enclosed by an embankment of gravel and chalk. The gravel was obtained during the dredging of the deep-water channel leading to the dock. The first layer of the river bed was found to be soft clayey mud and this was loaded by the dredger buckets into ‘bottom-door’ barges and dumped out at sea...”

Wonders of World Engineering, June 29, 1937

775

“...Below the mud, however, was good gravel and, with this material on board, the bottom-door barges were manoeuvred over the line of the embankment. Load after load of gravel was shot in this manner from the barge doors to raise the level of the underwater embankment. Finally the top of the embankment made its appearance regularly at low tide and a special floating transporter was used to unload the barges and place the gravel where it was needed...”

Wonders of World Engineering, June 29, 1937

776

“...The transporter, appropriately named the ‘Bankwell,’ was a strange looking craft and comprised two pontoons joined together by an overhead framework carrying bucket dredger gear. Between the pontoons there was enough room to accommodate a barge loaded with material. The barge was unloaded by the buckets of the dredger gear and the gravel was deposited on a travelling endless belt which was carried on a long steel boom. The arm projected over the side of the ‘Bankwell’ so that at all states of the tide it was possible to drop gravel on to the ever-growing embankment...”

Wonders of World Engineering, June 29, 1937

777



Caption: “THE TRANSPORTER which deposited dredged material to form the wall enclosing the area reclaimed at Southampton. The vessel, named the *Bankwell*, consisted of two pontoons connected by an overhead framework carrying bucket dredger gear. Between the pontoons was room for a barge-load of material, which was scooped-out by the buckets and carried on a travelling endless belt along a steel boom to the embankment.”

778

“...The chalk used, in addition to the gravel, for building the embankment was obtained from the Southern Railway’s quarry at Micheldever (Hants)...”

Wonders of World Engineering, June 29, 1937

779

“...To protect the embankment from the action of the tides, the seaward slope was covered with a temporary layer of brushwood made up in bundles known as fascines. A gravel and chalk embankment will not render an enclosed area proof against the tides, as some water is bound to seep through...”

Wonders of World Engineering, June 29, 1937

780

"...To overcome this difficulty a continuous sheet of steel plate piling was driven deep down along the centre line of the earthwork. During the building of the embankment, however, it was necessary to allow the tides to ebb and flow over the enclosed area. Special sluices were therefore left in the piling, but these, on completion of the embankment, were closed by timber doors..."

Wonders of World Engineering, June 29, 1937

Problem of Artesian Water

781

782

"...By June 1931 the great earthen wall was completed and the engineers turned their attention to getting rid of the water covering the enclosed land. For this purpose several float pumps were installed on the embankment. Each power-driven centrifugal pump was provided with a long suction pipe, the end of which was buoyed up by a float resting on the surface of the water inside the embankment. The pumps discharged on the seaward side of the earthwork..."

Wonders of World Engineering, June 29, 1937

"...With these pumps, automatically adjusting themselves to varying water levels, the dock site was pumped dry in ten days. The water pumped amounted to 50,000,000 gallons. This, however, was only surface water. The really troublesome water lay deep underground and energetic measures had to be adopted to deal with it..."

Wonders of World Engineering, June 29, 1937

783

784



Caption: "BEHIND AN EARTHEN EMBANKMENT the reclaimed area was pumped dry and the huge graving dock built. When the dock was completed the embankment which covered the entrance to the dock was dredged away and the dock was open to the sea."

785

786

"...The top layer of soft alluvial mud was removed by steam navvies and a sump was made at the south end of the dock to drain off seepage water. Once excavation had begun the problem of the underground water had to be tackled. It was discovered that below the dock site there existed a bed of sand charged with artesian water at high pressure..."

Wonders of World Engineering, June 29, 1937

“...To relieve this pressure, and to prevent the water from bursting through an upper level of clay into the excavations, numerous tube wells were sunk into the sand. Inside the wells were placed pipes, perforated at their lower ends. The perforations were covered with copper gauze filters which permitted the passage of water but excluded the sand...”

Wonders of World Engineering, June 29, 1937

787

“...Pumps, driven by special electric motors capable of working under water, were lowered down the pipes, and the water was thus extracted from the sand. The pressure head of the artesian water was reduced by 90-feet...”

Wonders of World Engineering, June 29, 1937

788

“...After the removal of the mud, and with precautions duly taken against inroads of water from below, the mechanical excavators made a combined onslaught against the vast mass of soil and gravel. The great walls of the dock were sunk in trenches measuring 43-feet-wide and 53-feet-deep. About 1,258,000 cubic-yards of material were excavated from the dock site...”

Wonders of World Engineering, June 29, 1937

789



Caption: “WORK IN PROGRESS on the huge basin of the King George V Dock at Southampton. From the site of the dock about 1,258,000 cubic-yards of material were removed. The material was composed mainly of gravel which was used in making the concrete walls and floor of the dock.”

790

“...The gravel excavated proved of immense value for making the concrete used in building the walls and floor of the dock. Special plant was devised for washing the gravel, as well as for mixing it into concrete. This concrete-making plant was set up at the north end of the dock and to it was brought the gravel as it was excavated...”

Wonders of World Engineering, June 29, 1937

791

“...Gravel for concrete making must be clean and free from soil. The excavated material was therefore washed in two huge revolving drums, and the clean gravel was transferred by an inclined conveyer belt to storage bins above the concrete mixer. The mixed concrete was loaded into bottom-door boxes and carried in wagons running along rails to various positions in the dock. In this way the excavated gravel was put to good use...”

Wonders of World Engineering, June 29, 1937

792

“...The remainder of the spoil from the excavations was loaded by the mechanical navvies into railway trucks and tipped where required over the reclaimed area to raise the level of the ground. The quantity, of concrete placed in the walls and floor of the dock amounted to 456,000 cubic-yards. As much as 10,000 cubic-yards of concrete a week were required at one stage of the work...”

Wonders of World Engineering, June 29, 1937

793

“...The concrete floor of the dock is 25-feet-thick. This gigantic slab of concrete, 200-feet-wide outside the walls and 1,200-feet-long, serves the double purpose of carrying the world's largest liners on its upper surface and of holding down the great pressure of the artesian water below. The relief wells referred to above were not filled in as the walls rose. The pumps were removed, one by one, and the wells were connected by horizontal drains to the dock, discharging at a distance of 40-feet below the quay...”

Wonders of World Engineering, June 29, 1937

794

“...At the shore end the dock wall is rounded in an impressive curve which, with its terraced steps, or offsets, as they are called, gives a vivid impression as of some ancient arena. Down the face of this great concrete cliff run two opposed flights of stairs, over which tower from time to time the bows of the world's greatest ships...”

Wonders of World Engineering, June 29, 1937

795

“...The outward sloping walls of the graving dock recall medieval ramparts. At intervals of 200-feet along the dock sides are vertical buttresses resembling watch-towers and having for their object the prevention of contact of the bilge keels of vessels with the foot of the wall...”

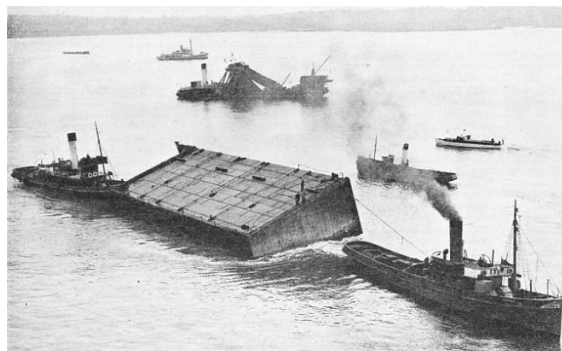
Wonders of World Engineering, June 29, 1937

796

“...To seal the great dock against the sea it was decided to use a huge steel wall. This took the form of a caisson, an immense rectangular steel box, built ship fashion and divided into a number of separate compartments. The caisson, which is 138 ft. 6-in. long, 58 ft. 6-in. deep and 29-feet-wide, was built on the River Tees and towed to Southampton. This voyage took over a week at a steady two knots...”

Wonders of World Engineering, June 29, 1937

797



Caption: “TOWING THE GIGANTIC CAISSON which forms the gate of the King George V Dock, Southampton. The caisson was built on the River Tees and towed round the coast to Southampton Water. The caisson is 138 ft. 6-in.-long, 58 ft. 6-in.-deep and 29-feet-wide.”

798

“...The caisson has five decks. Above the bottom deck (or keel plating) is a water ballast tank. The deck next above contains auxiliary air chambers that give buoyancy. Above this deck are another air chamber and additional ballast tanks. The top compartment is ‘free-flooding;’ it is 15-feet-deep and is partly open at either end. The top of the caisson provides a roadway for light traffic across the entrance to the dock...”
Wonders of World Engineering, June 29, 1937

799

“...To accommodate this enormous gate, a cavity or ‘camber’ was excavated at the eastern side of the dock entrance. The caisson is drawn out of the camber across the entrance to close the dock, and the meeting faces are of greenheart, a hard West Indian wood. If required, the caisson can be floated out of the camber, away from the entrance, and placed against a granite stop outside its usual position. It is then possible to repair the caisson or the other inner stops. An electrically-driven winch, operating massive steel chains, is used to draw the caisson along the steel sliding ways leading from the camber across the dock entrance...”
Wonders of World Engineering, June 29, 1937

801

“...The machines capable of pumping out the contents of the dock in four hours are four 54-in. centrifugal pumps with spindles arranged vertically and with double inlet pipes. Each pump is driven by a 1,250 horse-power electric motor running at over 270 revolutions-a-minute. In addition to the main dock pumps there are three 16-in high-speed centrifugal pumps driven by 200 horse-power motors for dealing with rain water. All these vertical pumps are equipped with the Michell thrust bearing...”
Wonders of World Engineering, June 29, 1937

803

“...The total weight of the caisson, including the water ballast (except that in the free-flooding compartment), is 4,600 tons. The caisson is built to withstand the pressure of water imprisoned inside the dock and the pressure of the tides outside...”

Wonders of World Engineering, June 29, 1937

800



Caption: “THE CAISSON ‘CAMBER,’ or cavity, of the King George V Graving Dock, at Southampton, was excavated at the eastern side of the dock entrance. The dock is closed by a huge steel caisson. To open the dock the caisson is moved into the camber along steel runways. In the background is the line of the new quay wall and embankment which has reclaimed a considerable area from the sea and has added nearly 7,500-feet to the length of quays at Southampton.”

802

“...Ships in dry dock cannot draw water from the sea to operate their auxiliary condensers, and at the King George V Dock the difficulty has been overcome by providing three special electric pumps in the pumping station. For similar reasons the pumping station is equipped with turbine fire pumps to deal with any outbreak on board a ship deprived temporarily of her own fire-fighting appliances...”
Wonders of World Engineering, June 29, 1937

804

“...The pumping plant is all housed in a pump room on the west side of the dock close to the entrance. In addition to this station there is also a smaller pump room at the eastern end of the dock estate for getting rid of storm water...”

Wonders of World Engineering, June 29, 1937

805

“...All pumps are fitted with special valves so that they may be isolated for repairs or for overhaul. The discharge sluice valve of every main pump closes automatically should the pump stop for any reason...”

Wonders of World Engineering, June 29, 1937

806

“...The main pumping culverts set within the concrete walls of the dock are 10-feet in diameter, and the storm water culverts measure 6 ft. 6-in. diameter. The culverts are fitted with valves arranged in concrete pits covered with watertight decks. There are eleven valves of 10-feet, six of 6 ft. 6-in. and five of 3-foot diameter. The valves comprise wedge-shaped doors that rise or fall vertically in guides across the culverts. The main 10-foot valves are operated by 35 horse-power electric motors. The whole of the complicated system of pumps and valves is controlled by push buttons by one operator at a central control desk...”

Wonders of World Engineering, June 29, 1937

807

“...This desk is 12-feet-long and is divided into six panels. Four panels contain the equipment that controls the four main pump motors with their relative suction and discharge valves. The fifth panel controls the gear that operates the main sluice valves and the remaining panel carries the controls of two electrically-driven reciprocating exhausters. The electric exhausters are of the four-cylinder type, driven by 30 horse-power motors at 950 revolutions-a-minute. Their function is to ‘prime’ or create a partial vacuum in the centrifugal pumps. Additional electric pumps are provided to remove any water that may leak into the valve pits or the pump room...”

Wonders of World Engineering, June 29, 1937

808

“...The valve control panel is equipped with a selector relay system that enables whole groups of valves to be ‘set’ for any given pumping operation by the throwing of only one switch...”

Wonders of World Engineering, June 29, 1937

809

“...The selector relay system of the valve control panel is provided with special interlocking gear which obviates any possibility of an accidental switching by the operator at the desk...”

Wonders of World Engineering, June 29, 1937

810

"...In the control room is also a large indicator board equipped with coloured lights so that the operator at the control desk can tell at a glance exactly which pumps are working and whether the sluice valves are open, shut or in motion. Each of the main valves is represented on the indicator board by a group of four lamps arranged in a vertical line. The upper two lamps are red, the lower pair green. When a valve is fully open the red lamps glow brightly, but immediately the valve begins its downward journey in closing the sluice the top red lamp goes out. Next, as the huge valve sinks lower, the second red lamp goes dim, and at the same time the uppermost of the green lamps begin to glow..."

Wonders of World Engineering, June 29, 1937

811

Marvels of the Control Room

812

"...As the valve lowering is continued, the top green light gains in intensity and the light of the lower red lamp is simultaneously diminished. Then, when the valve has been driven home and the sluice is shut off, the lower red lamp is extinguished and the lower green lamp is automatically switched on. Two green lamps thus remain alight to indicate that the valve is shut. A reverse indication is given when the valve is opened..."

Wonders of World Engineering, June 29, 1937

813

"...There are three 7-foot diameter culverts east of the dock. Two of these huge pipes deal with the condenser water for the Southampton Corporation Electricity Station, situated about half-a-mile inland. The third culvert is for the drainage of storm water which would ordinarily flow away by gravity. In an emergency, however, this action can be assisted by the pumps at the eastern station where the plant comprises a set of three 42-in. electric centrifugal pumps with a capacity of 270 cubic-feet of water-a-second..."

Wonders of World Engineering, June 29, 1937

814

"...The dock is equipped with two electric travelling cranes on either side. On the west side of the dock the crane has a capacity of 50-tons, with two auxiliary hoists each capable of lifting 10-tons. The 50-tons load of this crane can be handled at a radius of 110-feet, that is 8-feet beyond the centre line of the dock. The east side crane can lift a load of 10-tons at a radius of 60-feet. In addition to the cranes a 30-tons warping capstan is provided at the head of the dock and at either side are two electrically-driven capstans of 10-tons capacity..."

Wonders of World Engineering, June 29, 1937

815

"...When the labours of 1,000 men for twenty-one months drew to a close, the final linking with the sea was accomplished by dredging away the embankment in front of the dock entrance. On July 26, 1933, the world's largest graving dock was opened by King George V."

Wonders of World Engineering, June 29, 1937

RE: the King George V Dock was actually completed in 1934, but it was formally opened by King George V and Queen Mary on July 26, 1933. Through the haze and heat, the royal yacht *Victoria and Albert* came into view. The public sought vantage points and cheers went up all along the royal yacht's voyage following Southampton's shoreline, but as she grew ever closer to the entrance of the new dock and its symbolic ribbon, the crowd became silent. Filled with anticipation, they watched as the royal yacht glided into the dock. As her bow cut the ribbon, a great chorus of cheering and applause ensued. Both King George V and Queen Mary were on the deck, alongside the *Duke and Duchess of York* (the future King George VI and Queen Elizabeth II), as the ship was berthed in the world's greatest dry dock.

816



Caption: "The royal yacht entering the King George V Graving Dock on 26 July 1933. The temporary stands can be seen on either side of the dock, and at the end is the covered stand where the king and queen would sit." 817

"The Queen and I have accepted with much pleasure the invitation to be present at today's ceremony. The association of my family with the great docks in Southampton Water is a long one, and I personally have a vivid recollection of that day in August, 1895, when I accompanied my father at the opening of the Prince of Wales Dock, the largest in existence at that time. It affords me, therefore, special satisfaction to inaugurate to-day this splendid addition to the dock system of the port. From the early days of our overseas trade Southampton has held a foremost place in the commercial life of this country. This position it has retained as the result of wise and continuous development, and its record as a port of embarkation during the years of the Great War will never be forgotten. It is as true today as ever that the welfare of this country is largely bound up with the prosperity of its seaborne traffic. Realising the vital need for efficiency in our ports, as in all other requirements of our Merchant Navy, I look upon the opening of this, the largest graving dock in the world, as a good augury for the future of Southampton. I must express my admiration for the enterprise displayed by the Board of the Southern Railway in undertaking this great work in such difficult times. I congratulate the contracting firms and the engineers on their success in carrying it out, and I rejoice to think that the building of this dock has given the blessing of employment to many who would otherwise have been without it. I have much pleasure in declaring the dock open for use and in naming it 'The King George V Graving Dock.' And I pray by God's blessing it may serve to foster and increase the commerce of Southampton."

King George V 818
RE: HRH's speech was widely reported in newspapers throughout Great Britain



819

820

Part 6

On the Waterfront

Last Holdout

It's a strange feeling to be standing in the mud 40-feet below the East River without getting wet. Even stranger is having a 119-foot-tall ship above your head, its 12,000 tons balanced out on a few concrete blocks around you. So it goes every day in the dry docks of the GMD Shipyard, Brooklyn's last ship repair facility.

ny.curbed.com, May 3, 2018
RE: introduction to an article written by Nathan Kensinger entitled: "Exploring Brooklyn's Last Remaining Dry Docks"

821

822

Boom & Bust

"OVER the past decade, Brooklyn's industrial waterfront has slowly been erased, with residential towers replacing sugar refineries, oil depots, and piers. But at the GMD Shipyard Corp., business is booming. During a recent visit to this facility, located inside the Brooklyn Navy Yard campus, its three dry docks were filled to capacity with an array of barges, ferries, and ships, keeping its 150 employees working non-stop..."

ny.curbed.com, May 3, 2018

823

824

Business as Usual



"...Inside historic Dry Dock No. 1, a New York City landmark that has been in service since 1850, two small barges were being prepped for repairs, while in the enormous graving docks of Dry Docks Nos. 5 and 6, workers were sandblasting a training ship and painting a local ferry..."

825

826

ny.curbed.com, May 3, 2018

Where it All Began



"...Up and down the coast of the East River, the last vestiges of the working waterfront are disappearing, but down in the GMD Shipyard, it is clear that the Port of New York and New Jersey is still an important destination..."

ny.curbed.com, May 3, 2018

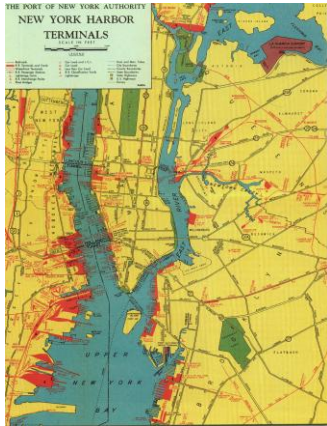
RE: the East River (a salt-water tidal estuary) connects Upper New York Bay (south), to Long Island Sound (north)

Above: caption: "A bird's-eye view of NYC from 1859; Wallabout Bay and the East River are in the foreground, the Hudson River and New York Bay in the background"

827

828

Left: caption: "The East River in red"



Up until the 1920s, NYC planned on turning *Jamaica Bay* into an expansive industrial harbor and even drew up plans for a canal through Queens. Dredging took place, but it was the *Port of New York Authority* (now the *Port authority of New York and New Jersey*) who decided to develop *Port Newark* (in Elizabeth, N.J.) instead because of its superior train and highway access. This led to the decline of the harbor terminals on the NYC side as container shipping became much more efficient. The only vestige is *Canarsie Pier*, on Jamaica Bay (now used for recreation).
 Left: caption: "Port of New York Authority - New York Harbor Terminals (ca. 1940): railroad yards, waterfront terminals, passenger stations, float bridges, car load delivery points, Hudson and Manhattan tubes, ferries, etc."
 829



Manhattan's Lower West-Side piers and West-Side Highway, ca. 1940s (now Battery Park City) 830



831



832

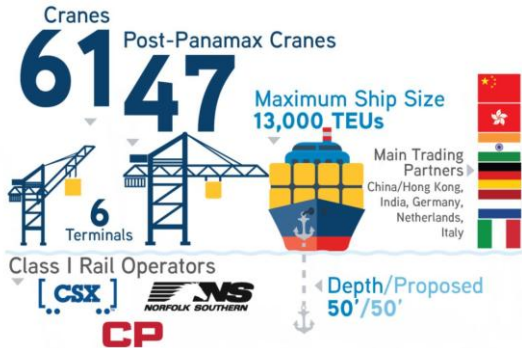


833

"The Port of New York and New Jersey is where containerization first began with the sailing of the 'Ideal X' from New Jersey to Houston in 1956. In Northern New Jersey, port-related users and e-commerce companies looking for same-day delivery to the New York City area have helped keep vacancy rates at historical lows, particularly in submarkets near the Port of New York and New Jersey. As New Jersey continues to set new port volume records, demand for new construction has surged, evidenced by the 12.9 million square-feet of industrial product under construction - up from 4 million square-feet during this time last year. The Port of New York and New Jersey continues to invest in its operations in order to handle larger container ships and to improve operations. New Jersey's industrial market has responded well, recording historically high leasing activity, rental growth and construction starts along with increased investor demand."

Michael Markey, Executive Managing Director – PANYNJ (May 2017)

834



The Port of New York and New Jersey has a harbor depth of 50-feet, deep enough to handle vessels capable of holding up to 13K TEUs. The port contains six container terminals and 61 cranes - with 47 cranes able to handle Post-Panamax vessels (6K TEUs). 835



Once Upon a Time



"...Not all that long ago, Brooklyn's waterfront was lined with a wealth of shipyards, dry docks, piers, and other maritime support facilities. 'When I first got into this, there were ship docks all around Brooklyn. There were coffee piers, there were banana piers, and ships constantly coming and going out of the harbor,' says Michael Sanborn, the General Manager of the GMD Shipyard, who started working on the waterfront in 1984 as a machinist apprentice in Red Hook. 'In the late '80s, I could probably name 25 shipyards in the area. But now, there's maybe half a dozen'..."

ny.curbed.com, May 3, 2018
Left: caption: "Brooklyn (right) and Manhattan (left) shorelines looking up the East River, May 1960"

Right: caption: "Brooklyn waterfront near base of the Brooklyn tower of the Brooklyn Bridge, November 1961"

839

840

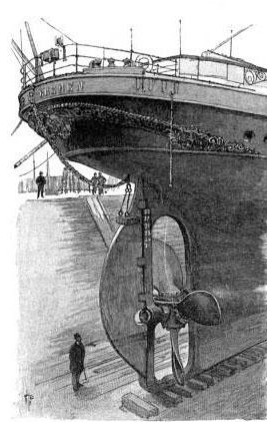


Above: caption: "Taken from the Hotel St. George in Brooklyn Heights showing the piers on the Brooklyn shore jutting into the East River with views of lower Manhattan and Brooklyn/Manhattan Bridges"



Upper Left: caption: "Skyline from Columbia Heights. Lower Manhattan waterfront in background. New York Dock Company piers foreground. Brooklyn Bridge in background"

Lower Left: caption: "Atlantic Avenue, Brooklyn, September 1956" 841



"...After the demolition of Red Hook's Todd Shipyard in 2006, where the graving dock was filled in to create an Ikea parking lot, the GMD Shipyard became the last remaining dry dock facility in Brooklyn..." ny.curbed.com, May 3, 2018

Above: caption: "Steamship NEW YORK cut and lengthened by 34-feet at John N. Robins Co. yard, Erie Basin, Brooklyn, NY, 1897" Left: caption: "The North German Lloyd Steamer HAVEL at Handren & Robbins's Erie Basin Dry Docks, Brooklyn. A fast screw steamer, the HAVEL, weighed 6,963 tons with 11,500 horse-power." 842



"...Today, it is one of just a handful of marine maintenance businesses in New York City, including the 115-year-old Cad-dell Dry Dock and Repair Company in Staten Island, which operates seven floating dry docks on the Kill Van Kull..." ny.curbed.com, May 3, 2018 843



"...In the Port of New York and New Jersey, which is 'the third largest port in the United States,' there are only a few large dry dock facilities still open for business, and the changing waterfront may soon claim another victim. The future of the century-old Union Dry Dock in Hoboken, New Jersey, is now being debated, with the city's mayor advocating for expanded city parkland, and NJ Transit and NY Waterway hoping to create a much-needed ferry repair facility..." ny.curbed.com, May 3, 2018

Caption: "Aerial photograph of northern waterfront looking west - southwest, Hoboken, NJ, Jan. 21, 1955" 845



846

Gentrification



"...As more and more residents move to the post-industrial shorelines of the East River and the Hudson River, the demand for waterfront property has skyrocketed. 'The real estate value has closed up a lot of the repairing people,' says Sanborn. 'The dry dock companies close up, and the high-rises go up.' These changes are visible just next door to the GMD Shipyard, where a new 17-story WeWork office is being completed on a narrow strip of land at Dock 72..."

847

848

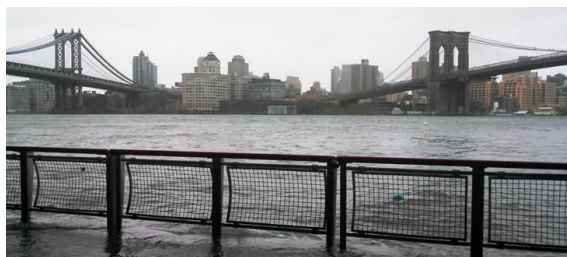
"...Despite the current building boom happening on the region's waterfront, the future of the New York harbor - and the GMD Shipyard - will increasingly be shaped by storms and sea-level rise. This was made clear during a recent conference organized by The Brooklyn Waterfront Research Center (BWRC), titled 'Brooklyn Waters: Sea-Level Rise, Sustainability, and Resilience Along the Brooklyn Waterfront.' Throughout a day of panels and presentations, a host of scientists, engineers, and architects spoke out about the difficult challenges that New York City will soon face, with sea levels expected to rise up to six feet (or more) by the end of this century..."

ny.curbed.com, May 3, 2018

In Harm's Way

849

850

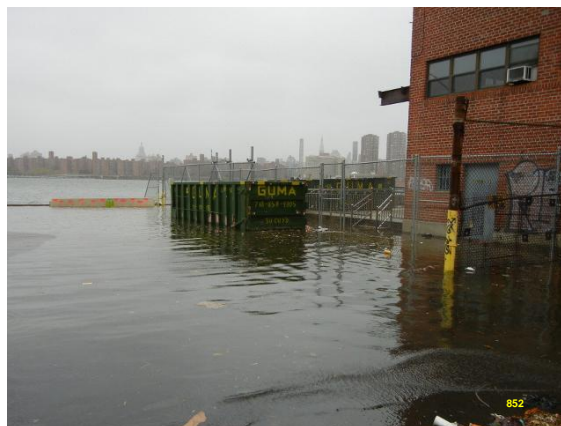


"...The facilities of the GMD Shipyard, which are essentially located in and below the East River, are at the front line of these coming changes. The shipyard got a glimpse of the future during Hurricane Sandy, when an enormous storm surge pushed up the East River and into the Brooklyn Navy Yard. 'We lost most of the electrical infrastructure in the place. Every pump and motor that runs the dry docks was lost,' remembers Sanborn. 'The water was four or five feet above the dry dock. It was just water everywhere'..."

ny.curbed.com, May 3, 2018

Caption: "October 2012: high water on the Manhattan-side of the East River, between the Brooklyn and Manhattan Bridges"

851



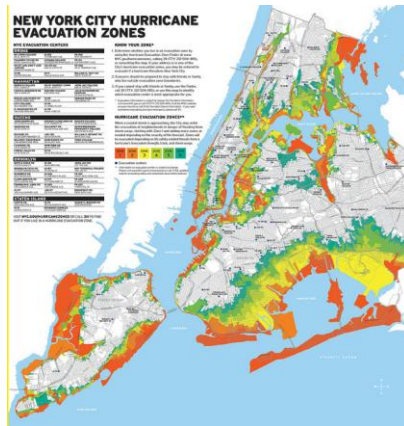
852

Of the 275 businesses in the Brooklyn Navy Yard industrial park, more than 95 percent now have electricity, although many still don't have heat

brooklyneagle.com, November 6, 2012

RE: introduction to an article entitled "Brooklyn Navy Yard Recovers From Storm"

853



"THE Navy Yard, built within part of the former Brooklyn installation of the U.S. Navy, was within 'Zone A' during Hurricane Sandy, meaning that the employees were asked to stay away during the storm..."

brooklyneagle.com, Nov. 6, 2012

854



"...There was some water damage, but crews are still assessing its extent, according to a spokesperson for the Brooklyn Navy Yard Local Development Corporation..."

brooklyneagle.com, November 6, 2012

Caption: "The Statue of Liberty, October 28, 2012, Live Feed - 12:12 p.m."

855



856



857



"...The largest and best-known business in the yard, Steiner Studios, escaped with very little damage. 'We made it through the hurricane unscathed. We have all power, were not flooded and will re-open for our productions tomorrow,' Douglas Steiner, head of the movie and TV production and support facility, said last Wednesday..."

brooklyneagle.com, November 6, 2012

Caption: "During the evening of Oct. 29, 2012, most of Red Hook flooded, including this stretch of Dwight Street. Nearly six-feet of water completely submerged some cars and electricity went out."

858

“...The Brooklyn Navy Yard Museum in Building 92 is likewise up and running, said the spokesperson, although still without heat yesterday. The museum focuses on the history of the site from the Revolutionary War until today and the technological innovations that were pioneered here...”

brooklyneagle.com, November 6, 2012

859

“...The spokesman didn't know the post-storm status of the Yard's four working dry docks. One of these, Dry Dock No. 1, dates from the 1850s...”

brooklyneagle.com, November 6, 2012

860



Caption: “Brooklyn Navy Yard gradually sees improvement after storm”

861



“...A recent article in the Daily News said that Cumberland Packing Company, which occupies some buildings within the Yard and some just outside of it, was badly flooded. The article describes employees of the company, best known for making Sweet 'N Low, filling '30 to 40 dumpsters a day' with the familiar pink packets, ruined by storm water. This newspaper was unable to contact Cumberland by press time.”

brooklyneagle.com, November 6, 2012

Caption: “The Cumberland Packing Corp. headquarters”

862

“...The Brooklyn Navy Yard suffered almost \$100 million of infrastructural damage during Hurricane Sandy, and is now working towards a more comprehensive plan for future floods. ‘There is no way there won't be another Hurricane Sandy. There is no way we are not going to end up underwater again,’ Clare Newman, the executive vice president of the Brooklyn Navy Yard Development Corporation (BNYDC), said during a presentation at the recent BWRC conference. And yet, she noted, ‘there is no way to dry-proof the Navy Yard’...”

ny.curbed.com, May 3, 2018

863

“...‘What we want to do over the next couple years is to go building by building, starting with the most vulnerable . . . and think about how can we best make that individual building and the businesses within it more resilient to a storm,’ said Newman. ‘There are certain parts along the waterfront in the yard where we have thought about doing berming, mostly to mitigate any wave action impact, but the focus for us is really about making sure that the businesses and all of their valuable equipment come up out of the floodplain’...”

ny.curbed.com, May 3, 2018

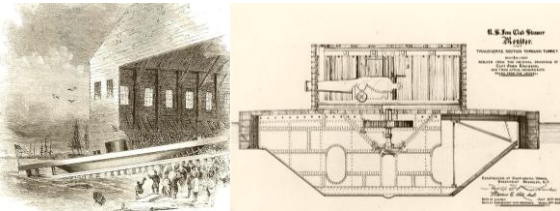
864

“...At the GMD Shipyard, storms surges and real estate pressure are all part of doing business on the waterfront, and work will continue in the dry docks much as it has for the past 168 years, no matter what the future brings. ‘We’ve been through a lot of nor’easters, which weren’t as bad as Sandy, but we’ve seen water rush in here. You prepare for it as best you can and keep going right after it,’ says Sanborn. ‘It’s a beautiful place to work, and it’s very busy, so that helps’...”
ny.curbed.com, May 3, 2018

Landmarked

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866



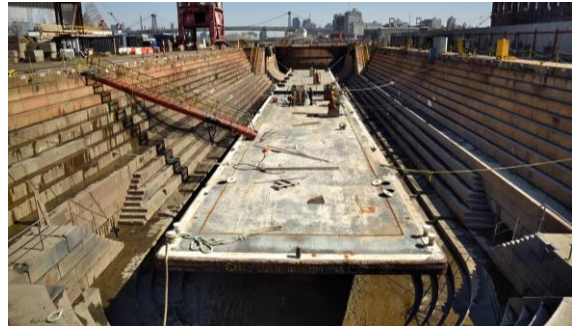
“...Dry Dock No. 1, which was declared a city Landmark in 1975, was constructed between 1840 and 1851, at a cost of over \$2 million at the time. During its early years, the dry dock helped service the ‘USS Monitor’...”
ny.curbed.com, May 3, 2018

RE: the Monitor’s keel was laid on October 25, 1861 at the Continental Iron Works at Bushwick Inlet (Greenpoint, Brooklyn). The turret was built and assembled at the Novelty Iron Works, in Manhattan, disassembled and shipped to Bushwick Inlet where it was reassembled. Even before *Monitor* was commissioned, she ran an unsuccessful set of sea trials on February 19, 1862. Valve problems with the main engine and one of the fan engines prevented her from reaching the *Brooklyn Navy Yard* from Bushwick Inlet and she had to be towed there the next day.

Left: caption: “Launch of USS Monitor, 1862”

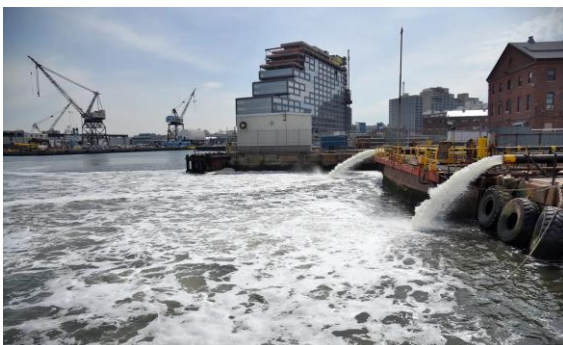
867

Right: caption: “Transverse hull section through the turret”



“...The dry dock is now operated by the GMD Shipyard Corp., which began leasing space from the Brooklyn Navy Yard Development Corporation in 1986. In its early years, GMD focused exclusively on repairing Navy vessels...”
ny.curbed.com, May 3, 2018

868



“...After bringing in a new boat for repairs, Dry Dock 1 is drained by pumping its water out into the Wallabout Bay. There are six dry docks located inside the Navy Yard, but only three are currently active...”
ny.curbed.com, May 3, 2018

869



870

New Neighbor

"...The two larger dry docks operated by the GMD Shipyard Corp. are located just up the coastline of the bay, and are situated adjacent to the Brooklyn Navy Yard's newest addition, a 17-story office building located at Dock 72..."
ny.curbed.com, May 3, 2018

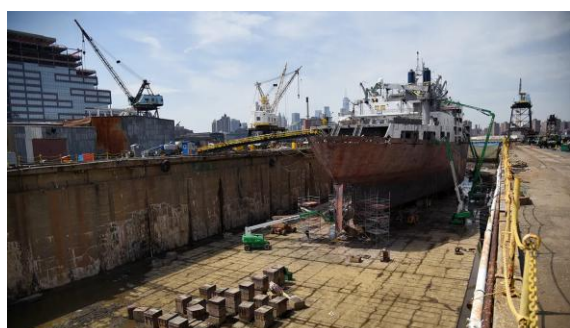
871

872



"...This new office tower, which topped out last October, will house a 220,000 square-foot WeWork facility. It's built out onto a narrow dock located between Dry Docks 2 and 3, which are controlled by the BNYDC, and currently flooded and inactive..."
ny.curbed.com, May 3, 2018

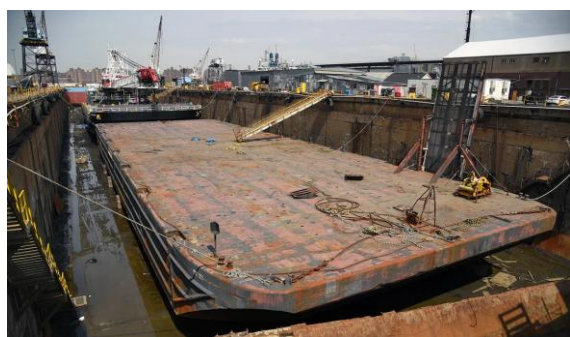
873



"...When completed, the WeWork offices will look out onto the active ship repairing facilities in Dry Docks 5 and 6. The GMD Shipyard will make for an interesting neighbor: Its iconic cranes can operate 24/7, as workers sandblast, weld, and paint ships..."
ny.curbed.com, May 3, 2018

874

One Size Fits All



"...Inside Dry Dock 5, a barge, ship, and ferry all fit in for repairs at once. This impressive structure is 1,092-feet-long and 150-feet-wide..."
ny.curbed.com, May 3, 2018

875

876



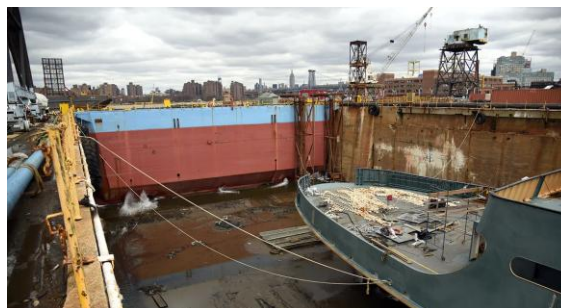
“...In its earlier years, the Brooklyn Navy Yard was an important ship building facility - the ‘USS Ohio’ was built and launched here in the 1820s...”

ny.curbed.com, May 3, 2018

RE: designed by Henry Eckford, the U.S.S. Ohio was laid-down in 1817 and launched three years later, in 1820. It was immediately placed “in ordinary” (reserve). Eighteen years passed before the ship was commissioned (after an extensive rebuild) and officially entered USN service. Since half-a-dozen other ships built at the Brooklyn Navy Yard were commissioned before Ohio, the ship’s status as the first Brooklyn Navy Yard ship is debatable.

878

Sealed Tight



“...At the head of each dry dock is a hollow structure called a caisson, which is floated into position and used to seal off the graving dock from the East River. The caissons are replaceable parts. They are like ships,” notes Sanborn. They are 50-feet-high, 150-feet-wide, and about 12-feet in thickness’...”

ny.curbed.com, May 3, 2018

879

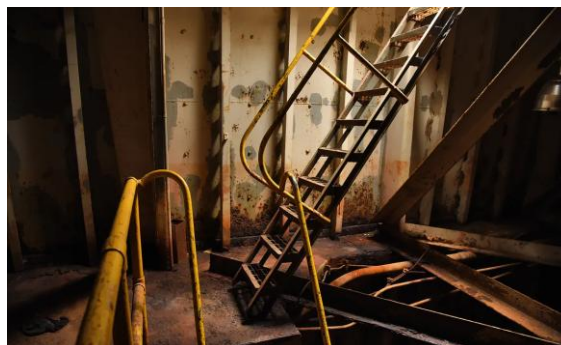
880



“...Standing inside the dry dock, it can be disconcerting to think that this hollow, floating structure is all that holds the seawater back. They are actually like a floating vessel; once we pump the water out, they become buoyant,” explains Sanborn...”

881

ny.curbed.com, May 3, 2018



“...In the hollow core of the caisson, a series of gangways and ladders lead down to the lower levels. Each caisson has its own pump station inside to remove water...”

882

ny.curbed.com, May 3, 2018



"...The lower depths of the caisson have been flooded with water to settle it into place. 'You could compare them to a sailboat, because they have a concrete bottom to keep them buoyant. Otherwise, they would just flip over,' says Sanborn..."

883
ny.curbed.com, May 3, 2018

Lift-on-Demand

884



"...The docks of the shipyard are lined with a system of enormous cranes that have the capacity to lift 15 to 200 tons. The cranes can be used to lower the dry dock blocks down into the graving docks. These concrete blocks weigh three to five tons, and are used to support ships when water is pumped out of the dry dock..."

885
ny.curbed.com, May 3, 2018

Jacks of All Trades

886



"...A series of warehouses and workspaces also line the docks, which house the yard's machine shop, pipe shop, and other facilities. 'We have around 150 employees of all different trades,' says Sanborn, including ironworkers, fitters and welders, carpenters, line handlers, and machinists. 'It's just about full time, as long as we are keeping busy'..."

887
ny.curbed.com, May 3, 2018



"...The carpentry shop, surrounded by wooden shims, which used to help support ships resting on the dry dock blocks..."

888
ny.curbed.com, May 3, 2018

The Beehive



"...During World War II, the Brooklyn Navy Yard was 'the world's busiest shipyard,' according to Turnstile Tours, the yard's official tour company, and 70,000 workers were employed here 'building battleships and aircraft carriers, repairing over 5,000 ships'..."
ny.curbed.com, May 3, 2018

889

890

The Saga of the *Franklin*

On October 15, 1944, the aircraft carrier *U.S.S. Franklin* was struck by a Japanese kamikaze attack off the Philippines. The pilot slammed into the ship's flight deck at 400 mph, opening up a 40-foot hole and killing 56 crewmen. But the *Franklin* survived and headed to *Puget Sound Naval Shipyard* to be laid-up for two months of repairs. However, it was the second attack on the *Franklin* that solidified its unsinkable reputation. Returned-to-action in February 1945, on March 19, 1945 she was just 50 miles off the coast of the Japanese home islands, launching daily sorties against the mainland. Early that morning, with dozens of planes fully fueled and loaded for missions, a lone Japanese dive bomber penetrated the *Franklin's* air defenses and dropped a 550 lb. bomb on the rear of the flight deck.

891

892



893

The direct hit plowed into the hanger deck below and exploded, setting-off a chain reaction as aviation fuel and munitions ignited. A firestorm quickly erupted throughout the bowels of the ship and hundreds of crewmen who were below decks having their breakfast found themselves trapped. Confusion reigned as the *Franklin* lost radio communication. Crewmen who were able to rushed to the flight deck to fight the fires and tend to the wounded. Many who could not reach the deck ran to the fantail, at the stern, where they leaped overboard. Other ships quickly rushed to the *Franklin's* aid, plucking sailors out of the water and spraying water on the fires, which caused the *Franklin* to list to starboard 13-degrees.

894



The *Franklin* seemed destined for *Davey Jones' Locker*, but miraculously, ten hours after the attack the fires were mostly contained. When a muster was called, only 275 of the ship's 3,400 men were counted – the rest were either dead, in the water, on board other ships or still trapped below decks.
 Caption: "USS *Franklin's* after 5/38 twin gun mount burning, as her crew tried to control fires on 19 March 1945. Photographed from USS *Santa Fe*." 896



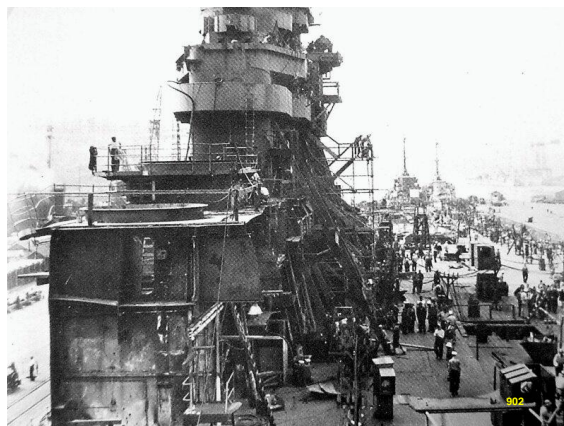
The *Franklin* was eventually towed to *Pearl Harbor*, however, due to the extent of the damage and the lack of capacity at the already strained Pacific coast shipyards, the ship was to go to the *Brooklyn Navy Yard* for repairs. Battle-damaged and with a skeleton crew, *Franklin* steamed 12K miles, under her own power, through the *Panama Canal* and up to *New York Harbor*, still listing sharply to starboard. When she arrived at the *Brooklyn Navy Yard* in late April 1945, many of the workers came out to greet the battered ship. It was not until May 17, 1945, that the public knew anything of the attack or the ship's epic journey (wartime censorship kept its plight out of the newspapers).



897
 898
 Caption: "USS *Franklin*, CV-13, on the East River, heading to the Brooklyn Navy Yard for repairs of bomb damage, 28 April 1945" 900



901
Caption: "The U.S. Navy aircraft carrier *USS Franklin* (CV-13) under repair New York Naval Shipyard on 27 October 1945. The entire flight deck and supporting upper hull was removed and rebuilt because of the extensive damage caused by two Japanese bombs that penetrated the flight deck on 19 March 1945, 901 exploding on the hangar deck, igniting fuel and ordnance from the aircraft below decks."



The Navy Yard's weekly newspaper; *The Shipworker*, asked in its October 30, 1945 issue: "What was your most inspiring experience during the war years in the Navy Yard?" *Stephen J. Hudson* responded:

"Witnessing the return of the battle scarred carrier FRANKLIN. In the course of my work I had the opportunity to board the FRANKLIN and observe the terrific damage sustained. Words, regardless of how eloquently or descriptively uttered by a speaker, could not portray more realistically the scenes I witnessed. Only then, could one visualize the sacrifices made by her gallant crew and the insignificant role played by us at home."

On Navy Day 1945, 20K Brooklyn Navy Yard workers visited the *Franklin*.

903



904
Caption: "The U.S.S. *Franklin* issued an invitation to all yard employees to bring their families aboard on Navy Day. Here are a few of the thousands who responded. They visited every part of the giant carrier and saw motion pictures of the dramatic battle of the "Big Ben" and her crew against the flames that swept her after the attack by Jap planes" (*The Shipworker*, November 6, 1945)

Fall From Grace

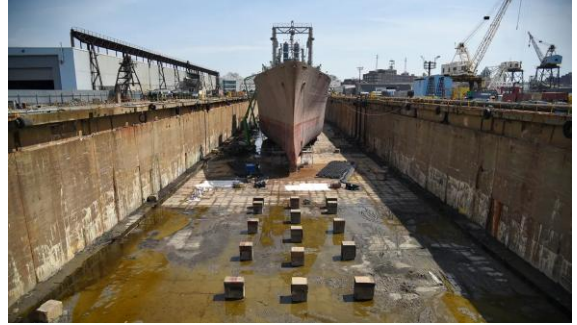


906
"...After World War II, New York City continued to be a hub for boat building and repair. 'More than 40,000 people still worked in the city's shipyards in 1960,' according to the *New York Times*. However, during the 1970s, the industrial waterfront and the newly decommissioned Brooklyn Navy Yard entered into a long period of decline..."
ny.curbed.com, May 3, 2018

905

906

On a Grand Scale



"...At Dry Dock 6, a 540-foot-long training ship barely takes up half the space. This dock is also 1,092-feet-long and 150-feet-wide. It is difficult to gain a sense of perspective, but this former cargo ship is 119-feet-tall, while the dry dock is 50-feet-tall..."
ny.curbed.com, May 3, 2018

907

908

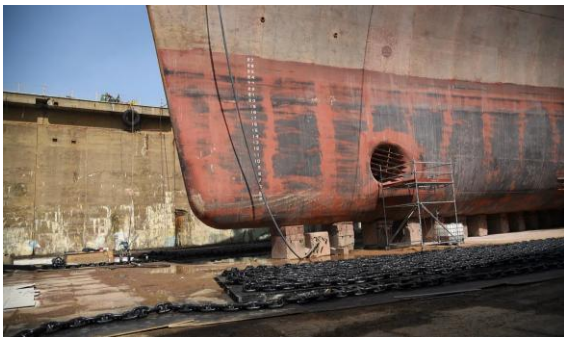


"...Down inside the dry dock, the ship looms high overhead..."
ny.curbed.com, May 3, 2018

909

910

Competition is a Sin



"...Despite the limited number of shipyards now remaining in the New York City area, competition for clients is fierce. 'We don't have a monopoly on it, that's for sure,' says Sanborn. 'There is competition out there, and we compete for everything that's in here'..."
ny.curbed.com, May 3, 2018

911



"...Regular inspections, maintenance, and repairs are required for most ships on the water today, leading to a steady stream of customers. 'Most of the vessels you see out there that are doing any kind of commercial work are regulated, and they have to get into a dry dock facility every two years to 30 months,' says Sanborn..."
ny.curbed.com, May 3, 2018

912



“...Although it seems precarious, the entire weight of this 12,892-ton vessel is supported by a carefully arranged set of dry dock blocks. ‘Our barges are a little bit easier to dock, because they are square and flat,’ explains Sanborn. ‘Our Coast Guard vessels and our ships are a little bit more difficult’...”
ny.curbed.com, May 3, 2018

913



“...Down underneath this 11-story ship. ‘The blocks are concrete, and they have wood caps,’ explains Sanborn. ‘The wood caps are to protect the vessel, so it’s not just steel sitting on the concrete’...”
ny.curbed.com, May 3, 2018

914



“...A set of blocks waiting for the next customer, as sand blasting debris are cleared away. ‘It’s been very busy, which is good. The busier we are, the more efficient we are,’ says Sanborn. ‘We go through peaks and valleys. I’ve been in this industry for a long time, and we are sort of waiting for it to drop out again. We hope it doesn’t.’”
ny.curbed.com, May 3, 2018

915

916

Part 7

Heavy Lifting

The New Steel Floating Derrick at the Brooklyn Navy Yard

Scientific American
March 21, 1891

WE illustrate herewith a new steel derrick of great lifting power, recently constructed for the United States Navy Yard, Brooklyn, N.Y. It was built by the Pusey & Jones Ship Building Company. Its calculated and allowed lifting power is 75-tons, making it rank among the most powerful of the floating derricks in this harbor.

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The structure is carried upon a pontoon, rectangular in shape, 60-feet-wide by 63-feet-long. The pontoon is divided into compartments, access to which is had through hatches or manholes, and is ballasted with 22-tons of cement ballast; the steel weighs in itself 70-tons. The superstructure is placed upon the long axis of the pontoon, and is a little advanced toward its front edge, in order to give the boom a greater reach. At its rear end there are five tanks for water ballast, and since its completion two auxiliary water tanks have been put in on each side. The object of these tanks is to afford a counter-ballast during heavy lifting operations. In the pontoon is established a powerful pump with 6- and 8-inch connections, that can empty all the five main ballast tanks in half-an-hour. A couple of fire hose connections are provided, so that the pump can be used in an emergency as an auxiliary fire engine.

919

The back boom is a box girder made up of plates and angle irons, and is 2-feet square, weighing 6-4/10 tons. The two members of the front boom are 16-1/2-inch I-beams, spaced far enough apart for the sheaves and tackle to work between. The object of the back boom is simply to afford a point of attachment with advantageous leverage for the back stays. These may be fastened at one of two points.

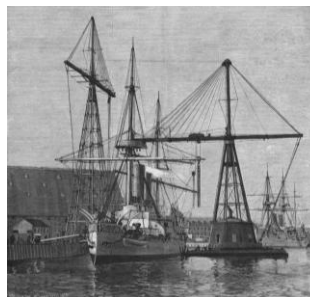
921

The upper surface of the members of the main boom has planed upon it sliding ways for the carriage which supports the sheaves. This carriage bears two lifting tackles. One is a gantline or single fall, for light work; the other is a 16-fold purchase, for heavy lifting. At the end of the boom stationary sheaves are secured, and tackle is provided for drawing the sliding carriage in and out, according to requirements. In order to rotate the beam, a single line of steel rope is carried around the base ring bearing against a number of rollers set vertically. The ends of the rope are secured to the ball carriages at the end of the back stay. These ropes enter the engine room, and are carried to a windlass drum, and being pulled one way or the other draw the ball carriages around the base ring and cause the boom to swing as desired.

923

The tower is built of steel I-beams and rods and contains 63-tons of metal. The base ring on which it stands rises 4-feet from the deck. Measured on the slope of the main struts, the length is 58-feet 8-inches to the first platform, termed the crow's nest, upon which the base of the king post rests. The struts continue above this until they reach the crown casting. The king post is 65-feet-high; 14-feet 7-inches from its base it passes through the crown casting. Just above the crown casting the front and back booms are connected to it.

920



As shown in the drawing, they are attached to what is known as the ball carriages, that work upon a circular railroad that runs around the base ring. When thus connected the boom can be swung around, the ball carriages traveling around the base also. For very heavy lifting the back stays are disconnected from the ball carriages and are secured upon turn buckles placed upon the after edge of the pontoon, thus increasing their power, but at the same time preventing the boom from being swung.

922

All tackle is carried to one main hoisting engine placed upon the deck of the pontoon in the engine house. This engine has two cylinders 8- by 14-inches, and by a system of worm gearing and clutches actuates any of the different windlass drums required. To give some idea of the size of the parts, it may be mentioned that the hoisting gear alone weighs 13-1/2 tons; that the lower main hoisting block, with its eight sheaves, each 26-inches in diameter and working on a 2-1/2-inch steel pin, and receiving 1-1/8-inch steel wire rope, weighs 2,000 pounds.

924

As regards bearings, ball bearings are used at three pieces. One, as just mentioned, at the foot of the back stay, another at the foot of the king post, and another upon the crown casting directly under the booms. The sheaves in all blocks have plain brass bearings.

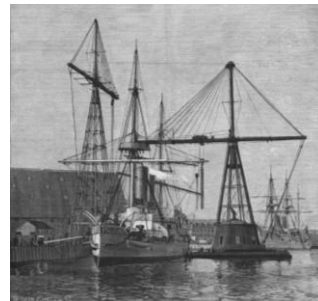
925

Two windlasses are established upon the deck of the pontoon outside the house, and are driven by a Man-ton steam-capstan engine. These are useful in moving the pontoon and in many operations on shore or on a ship's deck.

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The load limit is as follows: With the back stay secured to the after edge of the pontoon, 75-tons can be lifted with the sliding carriage at two-thirds the length of the boom, and at full boom length 50-tons can be lifted. With the back stay brought into the ball carriages at the base of the tower, 30-tons can be lifted at two-thirds boom length and 30-tons at full boom length.

927



The derrick is in constant use putting in and taking out boilers and machinery in general. The engraving shows it in position for working upon the United States steamer *Boston*. In the background, to the left of the picture, is seen the old stationary derrick, now little used. This had a capacity of 60-tons, and in its day was one of the great derricks of the country. The new system favors a less lofty superstructure, in order to secure greater strength.

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Caption: "The new steel floating derrick at the Brooklyn Navy Yard"

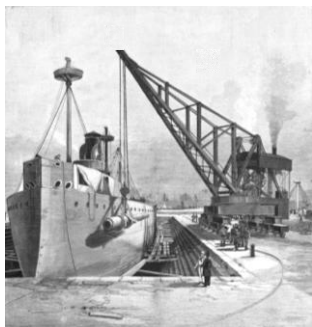
Traveling Cranes at the Brooklyn Navy Yard

Scientific American
June 10, 1893

929

AMONG the improvements recently adopted by the Navy Department for handling the heavy armor plates and guns for our new navy are the new traveling cranes illustrated in this issue, being the greatest advance in Navy Yard appliances made since the building of the present dry docks, each of the Brooklyn dry docks now having one of the largest traveling power cranes in the world. They are of the capacity of 40-tons at a distance of 56-feet from their centers. At the old stone dock, this distance nearly covers the entire vessel. At the new dock, it covers the sides and gun carriages.

930



Our illustration represents the new armored cruiser *Maine* in the dock, and the crane handling a 10-inch gun. The placing of the protective armor will be done while the vessel is in the dry dock, the plates of which, weighing from 25 to 30-tons each, will be handled by the new crane.

Caption: "The new traveling crane at the Brooklyn Navy Yard"

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It is of the balanced type, running on an 18-foot gauge track on the sides and around the head of the dock. It is a massive structure resting upon 16 wheels, double flanged, in 8 track trucks of 2 wheels each, swiveled; each pair of track trucks is connected by a swiveling beam under the main frame. Two of the wheels in each combination truck, or 8 in all, are driving wheels geared through a compensating gear train with the main engine, to enable the crane to be moved on the short curve around the head of the dock without strain or undue friction.

The power for all work is derived from a pair of engines with cylinders 10-inches by 12-inches, geared to an iron grooved drum 30-inches diameter, 8-feet-long. Shifting clutches operated by levers on the floor of the frame are the devices for transferring the power between hoisting, swinging and truck motion with a lever and link to control the speed in the engine. These are placed at a commanding position on the floor of the frame.

The lift is three part, using a 1-1/2-inch chain. The boiler is vertical, of 75 h.p., carrying 100 lb. steam pressure, placed over the counterweight, which is ballasted with 75-tons of iron. The total weight of each crane is 192-tons. They were built by Wm. Sellers & Co., Philadelphia.

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Fighting Masts Hoisted On-to Ships by Crane

IF he has ever given the matter thought at all, the average person has doubtless assumed that the big steel fighting masts, towering above the decks of our dreadnaughts, were put together piece-by-piece in the positions in which they stand. The contrary is the case, however. The framework is lifted into place by a crane after being fabricated. Grippled near the top, one is swung aboard a vessel and set upright as easily as if it were merely a light wastebasket of interlaced wire. The crane that does this work is electrically propelled and under the control of a single operator. (*Popular Mechanics*, February 1917)

Huge Electric Crane in the Shipyards At Newport News, Virginia, Setting a Big Steel Fighting Mast in Place Aboard a Battleship

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Hundred-Ton Naval Floating Crane

Scientific American
November 28, 1903

IN the work of a great naval dockyard like that of the New York Navy Yard at Brooklyn, there is a constant effort to reduce the handling of heavy material to a minimum – a most important consideration where such heavy weights as boilers, guns, and gun emplacements have to be handled. In past years this Navy Yard has suffered for want of adequate accommodation for the many ships that frequent it annually for repairs and refitting; and it has long been felt by the officers in charge of the various departments, particularly that of Construction and Repair, that a remodeling of the yard and the plant would mean a great saving of time and cost of work that is done there.

937

Several years ago an exhaustive plan for the reconstruction of the yard was presented, and after the usual exasperating delay on the part of Congress, the changes were authorized and are now being carried out. These include the construction of a series of parallel docks, some of them extending from Cob dock into the East River, and others extending from the mainland into the channel between the Brooklyn shore and the Cob dock. At the same time large additions were made to the plant on shore, many new buildings were erected, and up-to-date appliances for the transporting and handling of material installed.

938

One of the most important machines which has recently been put in service is the large 100-ton floating crane which is illustrated on the front page of this issue. The crane is designed for the special work of handling turrets, heavy guns, armor, or other massive pieces of material which may have to put in position on warships or removed therefrom during the course of repairs.

939



We illustrated a few weeks ago a large crane designed for this purpose, and erected at a German shipbuilding establishment. That crane was of the fixed type, being located at the edge of one of the docks, and, of course, if any ship is to avail itself of its services, it must be warped into proper position alongside the crane.

Caption: "Electrically operated wharf crane lowering a marine boiler into position"

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The new crane at our Navy Yard has been built upon a floating pontoon, with the special object of securing mobility, so that it may be brought alongside of a vessel, and the time lost in moving the ship be saved.

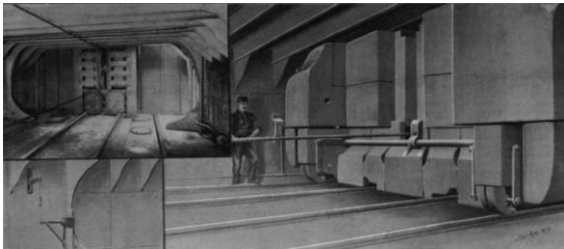
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The structure consists of a steel pontoon which measures 100-feet in length by 60-feet in breadth and 11-feet 3-inches. Above the pontoon and parallel with its longitudinal axis is carried, at a height sufficient to give a lift of 45-feet and a reach of 45-feet beyond each edge of the pontoon, a pair of trusses which form the runway for a traveling crane trolley. The runway is carried upon massive latticed posts and struts, whose position and functions will be seen in our engraving.

Caption: "New one-hundred ton floating crane"

942



The pontoon is divided into three compartments by two longitudinal bulkheads. The compartment is given over to a 300-ton movable counterweight, the two outer compartments containing, one the hoisting and racking engines, and the other the boilers and coal bunkers. The counterweight moves over four lines of 100 pound steel rail, and it is operated by means of an endless wire cable, which passes from the trolley to sheaves located at either end of the pontoon, and from them is led to the drum of the racking engine.

Insets (left T&B): caption: "End view of counterweight compartment, and detail of levers for controlling counterweight"

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Right: caption: "Below decks of pontoon, showing movable 300-ton counterweight"

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The mechanism is so arranged that the movement of the counterweight may be automatic, or it may be directly controlled from the engineer's platform. Its action is such that when a heavy load is being lifted, the counterweight is drawn back toward the opposite end of the pontoon, to a position in which equilibrium will be maintained and the pontoon kept on a level keel.

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The hoisting ropes are of 1-1/2-inch plowed steel, there being eight parts to each block. The hoisting engine cylinders are 12-inches in diameter by 15-inches stroke, and they run at a speed of 200 revolutions-per-minute. The counterweight engine cylinders are 11- x 18-inches and the speed of hoisting with a full load of 100-tons is 8 feet-per-minute; while the speed with a light load is 25 feet-per-minute.

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At each end of the pontoon is located a tank containing a non-freezable liquid, and each of these has a floating valve which rises and falls with any alteration of the level of the pontoon. The valve is connected to a longitudinal rod, which passes along the wall of the longitudinal bulkhead and serves by its movement to control the racking engine.

An ingenious safety clutch is provided, as shown in our illustration. This consists of a pair of heavy wedges at each end of the counterweight, which are normally held clear of the counterweight by the pull of the wire rope by which the counterweight is moved. The wedges are keyed to a horizontal shaft carried at the front of the counterweight, which has a horizontal projecting arm at its center, to which the racking cable is securely attached. Ordinarily the pull of the cable keeps the wedges lifted clear of the car; but should the cable carry away, the wedges will swing down with their own weight and become engaged between the car and the floor of the pontoon, preventing any further movement.

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Part 8

Remember the *Maine*

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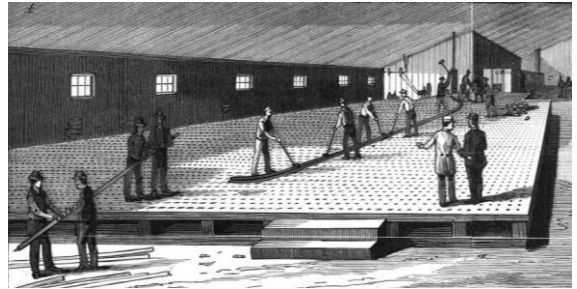
The Brooklyn Navy Yard
Scientific American
September 21, 1889

There are two ship houses in the yard. One contains a fleet of ships' long boats, cutters, gigs, and dingies, the other the growing skeleton of the armored steel cruiser *Maine*. When completed this ship will be of 6,618-tons displacement, have twin screws and carry a battery of ten guns. A description of the work of construction of this ship is left for a future article, only the work of the yard shops as illustrated by the preparation of the parts for fitting to such a construction being here touched upon.

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The work on the bending of slabs is highly interesting, showing as it does how, even in so ponderous a construction as a steel cruiser, every plate and angle iron must be fashioned in exact accordance with the lines, exaggerated, of course, of a model which a man can carry under his arms; how, indeed, every curve is known and calculated long in advance, the drawings so perfect that the artisan has little or no thinking to do, and only to follow the lines as they are furnished.



In the forge and furnace house, the angle irons that are to be employed to steady, and in some cases to support, the frames are heated over an immense grate, being then fetched upon a series of cast-iron bending slabs (see Fig. 4). These slabs are solid and smooth, being put together with great care, for, when uneven, the ill effect, though barely apparent in some cases, increases the labor of putting together materially, often requiring much refitting and a deal of filing and extra hammering.

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Along these bending slabs there are a series of holes running up and down and criss-cross, so that, when the curve that it is desired to give a piece of heated iron be chalked out, it will be sure to intercept a number of holes in which the steel pins are placed to brace the piece requiring bending, for here they are to get their corrected shape.

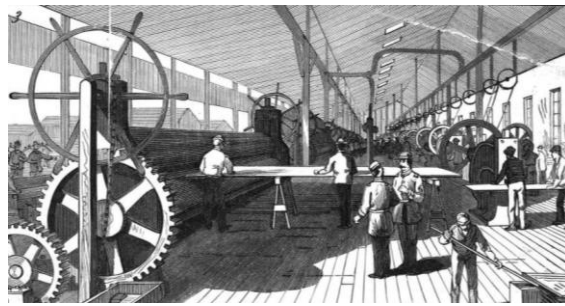
Long before this, chalk lines and curves have been marked out, and the wooden moulds cut-out in compliance with the drawings of the original plan. Along the chalk lines, and following them closely, steel pins are inserted in the slab, the same being perforated to suit any design. Levers and sledge hammers are used and the frame forced around until it is in exact agreement with the chalk line already referred to. The keel plates are heated in the same manner.

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In Fig. 5, four men are bending an angle bar on the slab, a work requiring a quick eye and a ready hand, for, as is immediately obvious, the quicker the bar is bent the easier, because it stiffens as it cools. As will be seen, two men are prying with a lever, a third one hammering the piece into place, while, as the shank answers to the force, a fourth man puts in the restraining pins ⁹⁵⁵ along the chalk line already marked.



In the roller house (see Fig. 3) the great plates, before they are punched for rivets, are smoothed out, being run through two enormous iron rollers resembling not a little two ponderous road rollers put together and revolving both in the same direction, one over the other, with a long broad plate of steel between them. These are stopped or set moving by a shut-off wheel, easily worked back and forth by a single movement of the hand. In Fig. 3, a plate is being straightened in the rolls after passing once through. It will ⁹⁵⁶ be passed back again to make sure work of any elastic knobs that may exist.

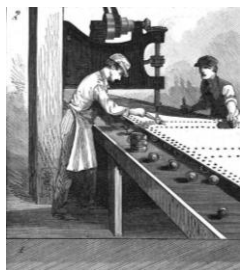


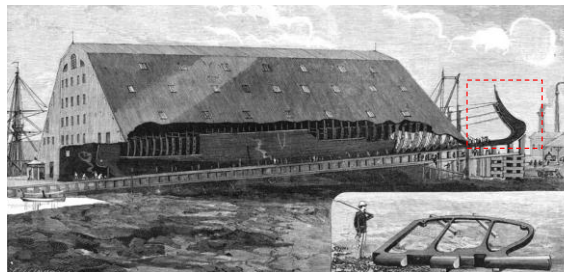
Fig. 2 represents the work of punching the plates for riveting, one requiring more care than would seem at first sight, for it is absolutely necessary that the punching be true and the subsequent riveting perpendicular to the plates. A carefully trained hand operates the punch, while another keeps the oiler going. Then comes countersinking, as will be seen in the illustration – a work that follows punching. The plates are seen resting upon cannon balls, and, because of this ingenious contrivance, can be moved readily by one man, al- ⁹⁵⁷ though some of them weigh several tons each.

Perhaps the most interesting point in the Navy Yard is the moulding loft. Here, after a miniature wooden ship has been fashioned to correspond with the lines of the one to be built, these lines, exaggerated to the proper dimensions, are then drawn off the floor. Very careful work this must be, and very nice calculations, for wooden moulds must be prepared from these, giving the exact size and shape of the angle irons (frames) and plates for the iron and steel workers to use in preparing for actual construction.

The work of fitting these patterns also requires cunning skill. First the outline of the keel, or rather the two keels, for steel ships have now two bottoms instead of one, so that they can scrape and break once on the rocks and still run off dry. After the lower strakes midship section, after section, stern-post, then forward, starboard, port, fore-foot, bows. That is about the order they come in, remembering, of course, that the angle irons, that is to say, the frames, come first and the plates afterward.

Building the Armored Cruiser *Maine*
 Scientific American
 October 5, 1889

THE building of a steel ship resembles in its first stages the building of a wooden one. First comes the keel, then the ribs. The frames are set-up, the bends and curves following the desired lines with mathematical accuracy. Practically speaking, the result is a girder. The skeleton ship could be made to rest on its foot and heel, or poise upon its center, and the deviation from a straight line would be slight. The steel cruiser *Maine*, in course of construction at the Brooklyn Navy Yard, is now in the skeleton condition, most of the frames being up. When completed, she will be the largest vessel ever built for the United States Navy, being of 6,648 tons displacement.

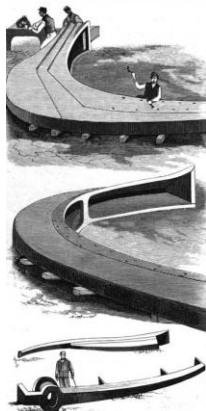


The mammoth shed where the work is in progress was erected during the Civil War, and is situated at that point of the water line of the Brooklyn Navy Yard where a small flat-bottomed ferryboat plies back and forth along a rope connecting the Cob Dock with the mainland. Doubtless, to its constructors, the dimensions of this shed seemed sufficient for the longest craft that was likely to be built. Yet the prow of the *Maine*, with its steel ram and spur, extends many yards into the open. Inside this shed nearly three hundred men are now at work.

Left T&B: caption: "Shed where the new war ship *Maine* is being constructed at the Brooklyn Navy Yard, New York"

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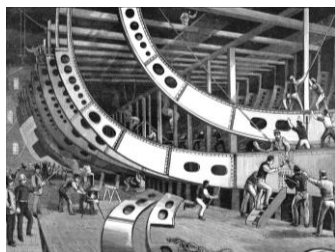
Steel ship building is now become a science, the constructors of the *Maine* working over charts and drawing boards, and poring over long lines of figures in the second story of a big granite building, instead of directing the shaping of the hull on the spot, as in the old days of wooden ship building. Then the shipwright moulded the bends and knees by rule-of-thumb, shaving this a little, or sawing and chopping that one to make it fit; a few inches this way or that was of no consequence. But now, every frame, every brace, every girder, indeed every plate, is fashioned in wooden strips in the moulding loft from figures furnished by the designer; the length and breadth, and even the curvature, of the part being closely looked to in the rolling shop or upon the cast-iron slabs of another department, before it comes to the building shed.

Caption: "Castings for bow ram and sternpost of the *Maine*"

About a year ago the keel plates of the *Maine* arrived at the yard, and the work was begun of laying the keel. The plates are laid in an unbroken line from stem-to-stern, some of them being flat, some vertical; 40-feet-deep in the midship section, and 35 where free from the second hull, the keel line being scarfed at the stern post and the forefoot.

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After the keel was laid the transverse frames were raised - lowered would be a better term, as they are slung from cranes, each frame being in two parts, because of the weight and unwieldiness. There are eighty-four of these below the protective deck, made of angle bar 5 by 3-inches and weighing 10 pounds-per-foot, the reverse bars being 4 by 4-inches. They are braced by longitudinal frames extending also between the protective deck and the keel blocks, the weight and strength of these being increased forward and abaft the double bottom. The longitudinal frames run uninterruptedly from stem-to-stern, and have been designed and set with the purpose of supporting the shock of ramming as well as keeping the structure intact.

Caption: "Transverse frames being lowered into position"

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It was found necessary to erect a house in the yard in which to store the various parts of the *Maine* as they arrived from the steel works. This house is called the plate rack, and is 191-feet-long by 31-wide. In it the plates for the hull are laid out or set-up on end in regular order and numbered so that a master workman can tell at a glance where each belongs. The contract with the steel works in Pennsylvania where the work is being done calls simply for so many pieces of this or that size or shape. The contours, bends, curves, and rivet-holing are all done in the Navy Yard shops.

The frames or plates, as they are needed, are first shaped so as to exactly correspond with patterns that have been made in the moulding loft. These patterns are made of thin strips of wood affixed together so as to follow the exact lines of each piece. A plate, for example, first goes to the roller shop, where it is smoothed out between two great iron rollers, being passed backward and forward and given its proper inclination, thence to the punching shop, where it is punched for riveting on the hull, also a work of great care, for unless the holes be exactly in place they will not correspond with their mates in the frames.

967

A feature of the work on the *Maine* is the use of electricity as a driving and forcing power in putting the parts together on the structure itself; the first time, be it said, in the history of ship building, that it has thus been employed, and so far, for it has only recently been introduced, gives good promise. "The subdivision of power aboard a ship under construction, for use by the workmen at different parts of the frame-work, would," says Assistant Constructor Woodward, "be possible in several ways, either in sending it aboard the ship by a wire rope in transmission from a steam engine on the dock, the rope turning a system of shafting and belting, or by using hydraulic pipes to drive light and portable engines. The first is costly in time and labor to establish, the second is impracticable, because in the winter the water freezes in the pipes. As to electricity, the only trouble has been in finding a motor that will bear the rough use and exposure. After some experiment we found that several of the established electrical companies possess such motors. In the present method of utilization, the dynamos for generating are set-up in the tool shop, being operated from the main line of shafting there long since established. A secondary battery of 50 cells is used as a regulator to allow for variation of speed in the main shafting. The current is conducted to the building ship by ordinary conductors and distributed so as to energize the various motors in use."

969

At last comes the operation of countersinking, taking off the bulging edge about the holes and countersinking the orifices to receive the heads of the rivets. The frames are first taken to the furnace house and the forge, being then hurried upon the bending slabs, a great raised flooring of heavy steel plates perforated with holes. The wanted shape having already been laid-out in chalk, the piece is bent this way and that by means of pries and levers in the hands of the workmen; one putting in a pin here to keep the curve secured, and others still pressing and tugging away to bend still more. Thus, when at last a piece arrives at the shed, the workmen have only to raise it and drive the rivets home through the corresponding holes in plate and frame, the foreman having shown them by reference to his drawings exactly how it is to fit.

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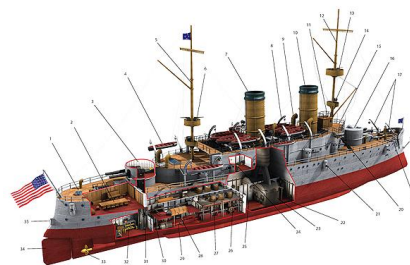


The *Maine* has two bottoms or skins, braced stoutly one over the other, so that in case she strikes upon a rock and tears the under hull or skin, the only effect will be to admit the water between the two hulls and give her a lower set in the water for the loss of buoyancy, but remaining staunch and seaworthy. It may be said, in passing, however, that the precaution of double hulls would not save her if she were run upon a torpedo properly placed; though even then, unless the hull were badly shattered, the watertight compartments which divide her hull into isolated sections might serve to keep her afloat.

970

Each compartment of the double hull is complete, having a separate section, and may be flooded or emptied by means of powerful pumps and ejectors, these being connected as well with the various and separate compartments between the protective deck and the false bottom, the number of each being set in an indicator in the engine room and requiring but the pressure upon a valve to do their work. In the watertight compartments below the water line, and above the false bottom, are the magazine, shell room, and military stores room.

971

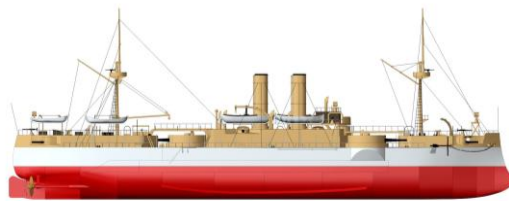


- 1. Skylight
- 2. Officer's washroom
- 3. All 8-inch gun barrel
- 4. Port 12-foot windlass
- 5. Mainmast
- 6. Fighting top with two 3-pounder quick-firing guns
- 7. All funnel
- 8. Ship's boats
- 9. Coal room
- 10. Forward funnel
- 11. Turret pilot-house
- 12. Foremast
- 13. Fighting top with 1-pounder quick-firing gun
- 14. Searchlight
- 15. Forward bridge deck
- 16. Forward 6-inch gun turret
- 17. Anchor davits
- 18. Bow mooring bitts
- 19. Anchor
- 20. Coaming tower
- 21. Orlop-Schmutzdecke 6-pounder quick-firing gun
- 22. Coal bunker
- 23. Double steam boiler
- 24. 5-inch gun
- 25. Fire room
- 26. Engine controls
- 27. Engine cylinder head
- 28. Condenser
- 29. Propeller shaft
- 30. Longitudinal hull keel, driving shaft and stationary engine and boiler rooms
- 31. 8-inch ammunition hoist within armored tube
- 32. 8-inch air magazine
- 33. Starboard propeller
- 34. Rudder
- 35. 16-inch torpedo tube

972

Not until after the *Maine* is launched will the great steel armor belt be fitted that is designed to protect her water line from hostile bolts. The reason for this is the great weight it will add, and consequently greater difficulty of launching. This belt will be made up of solid steel pieces, 13-inches-thick, the first tier resting upon what is called the armor shelf, which will be seen by reference to the frontispiece immediately atop the girders where the perforated beams end. These slabs of the armor belt will be backed by about four feet of solid oak and, at certain points, be still further supported by enormous coal bunkers. The protective deck, which covers all, will have a maximum inclination of four feet, the plane of it being 3-inches, and the slope 4-1/2.

973



Looking at the model of the *Maine* up in the designer's room, she is seen to be, when complete, a bark-rigged vessel, her bow sheering into a formidable ram just below the water line, the stern coming inboard instead of going outward at the quarter rail, with consequently no overhang and nothing above the water line to indicate that she possesses a sternpost or a rudder, for the latter are deeply submerged. With brace and stretching piece, the flanges of the sternpost will be held, the same being used as supports for the end of the propeller shafts. Both stern and stem posts are of cast-steel, rabbeted for the bottom plating to get a stout inset and powerful clamping; the under ends scarfed to the plates of the keel with canting-frame strengthenings to increase the backing of the ram.

974

The engines and boilers are being made in a private works, and will be put aboard when the ship is launched. The engines will be of the vertical triple-expansion type, having eight boilers and three furnaces. The screws will have three blades, with a diameter of 15-feet each. There will be a coal capacity of about 800 tons, and, if the promise made for her should be realized, will be good for 17 knots under full headway, and at 10 knots headway be good for a voyage of 7,000 miles. Her battery will consist of four 10-inch breech-loading rifles, mounted two and two in echeloned turrets; six 6-inch breech-loading rifles; and a secondary battery of rapid-firing small guns, some below, some on the main deck, and a full battery of them atop each of the military masts.

975



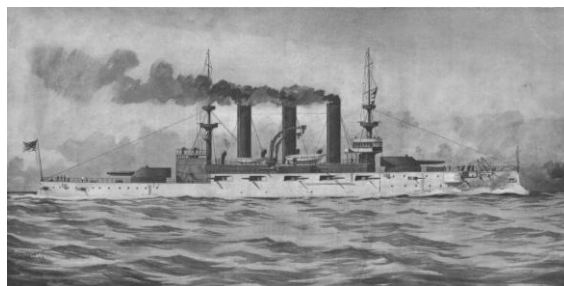
Besides these, there will be seven torpedo-launching tubes or guns, four of these being on the berth deck, and three below the water line. There will be a bolt of 500 pounds weight fired from the 10-inch guns, the charge being 250 pounds of powder, the maximum range, 9 miles. Both in the fore and after battery there will be a total weight of 2,200 pounds of solid metal that can be thrown at one discharge, and from either broadside about 100 pounds more than this. She will spread 7,185 square-feet of canvas with everything clapped on, and carry a crew of about 850 officers and men.

RE: the U.S.S. *Maine* was commissioned in September 1895 at the Brooklyn Navy Yard

976

Caption: "The Battleship 'Maine' passes under the Brooklyn Bridge"

The First-Class Battleship *Maine*
 Scientific American
 December 3, 1898



ON the accompanying page we present our readers with the first accurate engraving that has yet been made of the new battleship *Maine*. The illustrations of this ship that have already appeared in several illustrated journals are based upon the original designs for an eighteen-knot vessel of inferior armament. The accompanying engraving is made from the latest amended designs, and includes the two additional 6-inch rapid-firers in the main deck battery, the substitution of two boat cranes for four, and other changes of a minor character.

977

Caption: "Unites States First-Class Battleship 'MAINE'"

978

In the three battleships of this type, the *Maine*, *Ohio*, and *Missouri*, we shall have fighting ships at once the equals of anything abroad and reflecting credit upon our naval advancement. To the persistent stand of Engineer-in-Chief Melville on the vital question of speed is the betterment of these ships over their predecessors, the *Illinois* and type, in the main due, and the increase of armament followed as a natural consequence upon the expansion of the original displacement of 11,525 tons. The principal dimensions and general features are:

| | |
|--|---------------|
| Length on load water line..... | 388 ft 00 in. |
| Beam, extreme | 72 " 2-5 " |
| Draught, at normal displacement..... | 33 " 6 " |
| Displacement, normal..... | 12,500 tons. |
| Indicated horse power..... | 16,000 |
| Speed, maximum | 18 knots. |
| Coal bunker capacity | 2,000 tons. |
| Complement, officers, seamen, and marines, about | 600 |

979

The hulls of the ships are substantially similar to the *Illinois* type refined by the added length of twenty feet amidships. The inner bottom extends fore and aft throughout the major length of the vessels and reaches from the keel up to the lower edge of the armor belt, four feet below the normal load water line of 23-feet 6-inches. This double bottom space is divided into the usual watertight subdivisions and is under the reasonable control of powerful pumps. The interior of the vessels is also well cut-up by the usual watertight sub-divisioning, which is likewise under thorough pumpage and drainage control.

980

The ships have a freeboard forward of nineteen feet and a freeboard aft of eleven. The upper deck reaches from the stem aft to the after turret, and at the bow is flared out to a considerable extent. The main purpose is to make the ships drier in a head sea, but incidentally it affords ampler deck room for various purposes and more space on the deck beneath.

981



982

The details of the armor have not yet been finally determined, even though it has been decided that the armor shall be treated by the Krupp process, but there is every reason to believe it will remain practically as follows: The side waterline belt will be of armor having a maximum thickness of 12-inches for a depth of 4-feet, thence tapering to 8-inches at the armor shelf 3-1/2-feet below. This maximum thickness will reach from a line nearly abreast the forward end of the after turret to a point just abreast the after end of the forward turret, and thence will taper to 4-inches at the stem. The protective deck will rest flatly on the inner ledge of this waterline belt throughout the engine, boiler and magazine spaces, and will be 2-3/4-inches-thick, in two courses.

983

Forward and aft of this region it will slope to the bow and to the stern. At the sides, aft, the deck will be 3-inches-thick, amidships 1-3/4-inches-thick, and forward the side slopes will be 2-inches-thick, the armor of the waterline belt without making a greater thickness needless. The diagonal athwartship bulkheads at the extremities of the thickest part of the side armor will be 10-inches-thick. The side armor above the armor belt and about the amidship battery of 6-inch guns will be of 5-1/2-inches backed by two courses of half-inch hull plating. The casemate armor on the upper deck and the protection about the two 6-inch guns on the main deck way forward will also be of 5-1/2-inch armor.

984

The turrets and barbetstes will have a maximum thickness of 14-inches. The original design submitted contemplated a distribution and thickness of armor similar to that on the *Illinois* type, and the present reduction is due to the superior defensive qualities of the plating treated by the Krupp process. A very considerable reduction in weight is thus secured, and it is not yet certain that more widespread protection will not be given to the hull just above the waterline belt.

985

The ships will be propelled by two sets of triple expansion engines actuating twin screws. These engines will be put in separate watertight compartments. They will be of the three cylinder, vertical, inverted cylinder, direct-acting type, and the cylinders will be of 38-1/2, 59, and 92-inches in diameter, with a common stroke of 42-inches. The high pressure cylinders will be forward and the low pressure cylinders aft. The collective indicated horse-power of the propelling, air-pump and circulating pump engines will be 16,000 when the main engines are making in the neighborhood of 126 revolutions-a-minute.

987

The armament will consist of four 12-inch breech-loading rifles, sixteen 6-inch rapid-fire rifles, twenty 6-pounder and four 3-pounder guns, and a couple of smaller pieces. The 12-inch guns, which will be of 40 calibers, will be of the new high powered type designed to use smokeless powder, and with a muzzle velocity of 3,000-feet-per-second, and firing an 850-pound shell, it will have the enormous energy of 48,000 foot-tons, equal to the penetration of 4-feet of solid iron at the muzzle.

989

A coffer dam about 36-inches-wide extends forward and aft to the bow and to the stern from the athwartship armor bulkheads in the space between the protective and the berth decks. It will be filled with briquettes of corn-pith cellulose. On the berth deck there will be another coffer dam so filled and of like thickness. The efficacy of this cellulose belt has already been well established in actual conflict.

986

Steam will be supplied by twenty-four boilers of the Niclausse water tube type, constructed for a working pressure of 250 pounds-to-the-square-inch, reduced to 200 pounds on the steam pipes at the high pressure cylinders. The boilers will be placed in four watertight compartments, and there will be four fire rooms, two double and two single. The boilers will be arranged in groups of eight. There will be three smokestacks, the tops of which will be practically 100-feet above the grate bars. Blowers will be fitted for forced draught. The coal bunker capacity of 2,000-tons promises a considerable radius of action in conjunction with the wholesale use of the more economical water tube boiler; and at a cruising speed of 10 knots the ships will have an exceptionally fine reach of action.

988

There will be a considerable saving in weight. These guns will be mounted in two elliptical, balanced barbette turrets, and will have arcs of fire of 280 degrees. The sixteen 6-inch rapid-fire guns will be distributed four on the upper deck and twelve on the main deck. All will have wide arcs of fire, will carry heavy shields, and will be separated, one from the other, by splinter bulkheads 1-3/4-inches-thick. Two of the 6-pounders will be mounted on the main deck just abaft the two bow 6-inch guns, four will be placed way aft on the berth deck, and the remaining ones up on the bridges and in the superstructure. The 3-pounders and the Gatlings will be mounted in the tops. There will be two torpedo tubes of an underwater type, and they will be located where they will be practically beyond the ordinary reach of shot or shell. The ammunition supply will be a large one.

990

Electricity will constitute the motive energy for many of the auxiliary engines. It will run the ventilating blowers, it will hoist ammunition, turn and control the turrets, besides furnishing light within the craft and light without in the form of four searchlights and a double set of Ardois night signals.

991

There will be a dense air refrigerating plant with a daily output equivalent to the cooling qualities of two tons of ice. There will be a distilling plant, consisting of four evaporators and two distillers, with their accessories, having a combined capacity of 8,000 gallons of potable water daily.

992

Wood will be used but sparingly, and, with the exceptions of the main deck without the superstructure, the upper deck, and the bridges, the decks will be covered with linoleum, rubber tiling, wire mats, or cement. Such wood, other than decking, will be carefully fireproofed, but wherever possible, light metal work will supplant wood altogether, unless in the shape of gratings and such things easily removed and thrown overboard before going into action.

993

It has been suggested that a comparison of the British *Magnificent* with these new ships might be interesting. The *Magnificent* is of 14,900 tons displacement, and has a battery of four 12-inch, twelve 6-inch, eighteen 12-pounders, twelve 3-pounders, and eight machine guns. The weight of our four additional 6-inch guns is somewhat accounted for in the *Magnificent* in the extremely powerful force of 12- and 3-pounder guns and their ammunition, which is an item of moment. At the same time, the armament of the *Maine* is unquestionably the heavier. The waterline armor of the British ship is only 9-inches-thick, but it reaches up the sides to a height of 18-feet, and extends fore and aft for a distance of 220-feet. The *Maine*, however, has a decided advantage in the fact that the waterline belt is continuous up to the stem. The casemate armor about the 6-inch guns of the *Magnificent* is 6-inches-thick. The protective deck is 2-1/2 to 4-inches-thick, the athwartship bulkheads are 14-inches-thick, maximum. The conning tower is 14-inches-thick, while the barbets and barbette shields are 14 and 10-inches respectively.

994



HMS Magnificent

995

The coal supply is lighter by 156-tons, but the crew is composed of 757 persons, and the stores for the additional force are heavier. The ship makes about half-a-knot less speed than our ships, and, being a bulkier craft, to make that, her engines are heavier. Her boilers, too, of the Scotch type, are correspondingly weightier, and some of the structural accompaniments are of proportionate weight.

996

The comparison shows how the most recent practices and our own system of hull protection yield certain savings of weight, which permit the weight of the defensive and offensive elements of the ship to be augmented to that extent. The contract price for the *Maine* and her sister ships was \$2,885,000, based upon the Cramps' bid.

997

"Miss Wilmerding will have the precious quart bottle secured to her wrist by a short bunch of ribbons, which will serve the same purpose as a sword knot. It is of the utmost importance that the bottle be broken on the first throw, for the blue-jackets will declare the vessel is unmanageable if she is permitted to get into the water without first being christened. It is consequently a matter of deep interest to the old 'shellbacks' to learn that Miss Wilmerding has performed her task successfully."

RE: the Christening of the *USS Maine*

RE: when the USN's new battlecruiser, *Maine*, was christened at the *Brooklyn Navy Yard* in 1890, enormous crowds turned out. A November 18, 1890 article that appeared in the *New York Times* on the morning of the ship's launching described what was to happen. It stressed the responsibility weighing on 16yo *Alice Tracy Wilmerding*, the granddaughter of the *Secretary of the Navy*.

998



Successful Test of 6-1/4-in. Krupp Process Plate by 8-in. Gun

Scientific American
December 3, 1898

By Lieut. Q.L. Carden, Ordnance Officer, *U.S.S. Manning*

1000

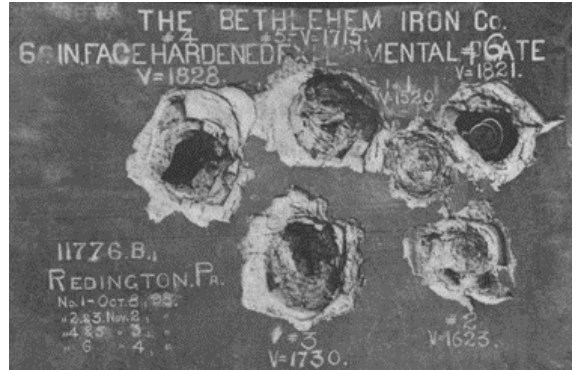
A 6-3/4-inch Krupp process plate holds, to date, the armor record in the United States. In ordnance circles the plate is referred to as the "Champion." It was recently fabricated by the Bethlehem Iron Works, of South Bethlehem, Pa., and was tested during November on the Redington proving grounds.

1001

The records show that the new plate has exceeded the requirements demanded of a 10-inch Harvey plate when attacked by an 8-inch gun. Six shots in all were fired at the Krupp plate, 8-inch armor-piercing projectiles being employed. The velocities recorded were 1,530, 1,623, 1,715, 1,730, 1,821, and 1,828 foot-seconds. The projectile fired at 1,828 foot-seconds velocity succeeded in partly getting through, while none of the others reached the backing. The 1,821 foot-seconds shell was welded into the plate, but it did not succeed in piercing the target. The other projectiles were broken up on impact.

1002

The Navy Department requirements, at present, for a standard 10-inch Harvey plate, when attacked by an 8-inch gun, call for two shots at 1,491 and 1,786 foot-seconds velocity. The 1,491 foot-seconds shell must neither crack nor perforate the plate, while that at 1,786 foot-seconds must not perforate, but may crack the plate. The accompanying illustration shows the new plate after its final attack on the proving grounds. The absence of cracks is a noticeable feature in the result.



1003
Caption: "Test of a Bethlehem, Krupp-process armor plate. From a photograph of plate after attack by six 8-inch armor-piercing projectiles. Thickness of plate, 6-1/4-inches. Striking velocities 1,530, 1,623, 1,715, 1,730, 1,821 and 1,828 feet-per-second." 1004

It is now learned on the best of authority that the specifications for the new battleships will call for Krupp process plates, with the usual proviso that the plates be fabricated in the United States. The superior resisting qualities of this armor will render it unnecessary in the future to place such massive plates upon the sides, barbettes and turrets of our battleships, and the modifying effect of the improved quality of armor is clearly shown in a comparison of the new battleship *Maine* with the *Oregon* and ships of her class. The superior quality of Krupp armor enables us to reduce the thickness of the belt from 18-inches in the *Oregon* to 12-inches in the *Maine*, and a proportionate reduction is made in turret and barrette armor.

1005
1006
It is gratifying to realize that the latest product of our own armor-plate establishments is of such excellent quality as to maintain our high position in this industry.

Public vs. Private

Warship Construction in Government Yards

Scientific American
October 1, 1904

The fact that the first large battleship to be constructed in a government yard has been built in the same time as that required to construct a sister ship in what is probably the best equipped private yard in the United States, is a matter that is giving the Navy Department no little satisfaction; for it has disposed effectually of the popular belief that warship construction in a government yard was necessarily tedious, costly, and poorly done.

1009

How it has come about that such an impression exists is a question that takes us back to the day of the building of the *Maine* and the *Texas*. Both of these vessels were long in construction, the cost of which was very high; but this is explained by the fact that when they were built, our Navy Yards were suffering from very serious political interference, and were burdened with a large number of employees who had gained their entrance to the yards through political influence, and regarded their positions as of that kind in which a minimum amount of work is to be done for a maximum amount of pay.

1010

To turn out efficient work under such circumstances, especially in the difficult art of warship construction, was a simple impossibility – as the various naval constructors soon found out to their sorrow. Moreover, when the *Maine* and the *Texas* were built, steel warship construction was in its infancy in this country, and the Navy Yards were poorly equipped for this task, much of the plant being quite out-of-date.

1011

Today, however, we have changed all that. Thanks largely to the energy and courage of the late Chief Naval Constructor, our Navy Yards have been entirely emancipated from political control, new dry docks, buildings, and plants have been built and installed, until today our best yards, and notably that at Brooklyn, are in first-class condition, and capable of turning out the very best work.

1012

The Bureau of Construction and Repair, as soon as it felt that it was in condition to handle warship construction to advantage, began to urge strongly upon the Secretary of the Navy the advantage of constructing some of our new ships in government yards. The principal arguments in favor of such a course were, first, that the private builders, who were showing a great lack of diligence in the prosecution of their contracts for new ships, would be stimulated to greater activity if they knew that ships were being built in government yards, and a new standard of expeditious work thereby set up.

1013

Another, and not less important object aimed at, was to ensure that the full working staff of the Navy Yard would be constantly employed at all seasons of the year. Hitherto the Navy Yards had labored under the great disadvantage that when the regular repair work was completed, it became necessary to discharge a large proportion of the working force. The mechanics thus set free scattered in search of work, and in the following season, when repair work became active, it was necessary to gather a new force, which had to become acquainted with the plant and the general working of the Navy Yard before the best results could be secured. Now, it was judged that by having one or more new ships always on the stocks, the necessity for discharging any of the force, when repair work slackened, would be removed, inasmuch as it could be transferred to new construction.

1014

It is now nearly two years since the new regulations were put in force, and it was decided to put them to a searching test by ordering the construction at the Brooklyn Navy Yard of one of the largest battleships ever built for any Navy. At the same time, the contract for a sister ship was placed at the private yard of the Newport News Shipbuilding Company, one of the most completely equipped plants in the world.

1015

The results have exceeded the most sanguine expectation of the Navy Department, for, in spite of the disadvantages under which the Brooklyn Navy Yard labored, owing to the fact it had to build entirely new ways and erect a large cantilever traveling crane before the keel of the vessel could be laid, the *Connecticut* has been built in about the same time, namely eighteen months, as was the *Louisiana*, while both the time of construction and the cost of the vessel have been considerably less than was estimated at the time the order for the vessel was given – and this in spite of the fact that the hours of labor are shorter, and the pay is higher in government than it is in private shipyards.

1016

The SCIENTIFIC AMERICAN has always been a strong advocate of the policy of building some of our new warships at government yards, and therefore it gives us particular pleasure to congratulate the naval constructors on the excellent results that have been achieved in the case of the *Connecticut*. The effect of the new policy on the private shipbuilding firms of the country has been everything that could be desired.

1017

There has been a notable acceleration in the rate of construction, the *Louisiana* having been launched in eighteen months from the date of the laying of the keel, no less than 7,000 tons of steel being worked into her hull at that period. This is the great improvement on any previous work, the best record previous to this for a battleship being about two years' time, and this for a vessel of smaller size and less importance than the *Louisiana*.

1018

It is hoped that the good results that have been attained will encourage Congress to allot a certain portion of every shipbuilding programme to government yards, and that not only New York, but League Island, Boston, and other leading government yards will be given their share of the work.

1019

Part 9

Between the Wars

1020

New Role

1021



"...Secretary of the Navy Daniels, in his annual report, stated: 'Navies will be needed as an international police force to compel compliance with the decree of an international tribunal which will be set-up to decide differences between nations. Naval vessels will have large peace tasks of survey and discovery and protection in addition to police duty of an international as well as of a national character'..."

The Brooklyn Daily Eagle, December 9, 1918

Caption: "U.S. Secretary of the Navy Josephus Daniels at the keel laying ceremony of battleship *California* New York Navy Yard, Brooklyn, New York, 14 October 1915" 1022

Burden of the Taxpayers

1023

"...He continued, 'I have recommended to this Congress the adoption of another three-year program substantially like the one authorized in 1915. But the victory of the Allies and the United States should, and will, I sincerely trust, within a few years make it no longer necessary for any nation under whip and spur to burden its taxpayers to undertake to build, in competitive construction, bigger fighting ships and more of them than any other nation can construct'..."

The Brooklyn Daily Eagle, December 9, 1918

1024

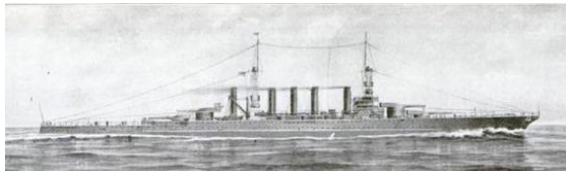
"...Mr. Daniels shows that the new \$60,000,000 three-year building program he has proposed will provide the additional naval ships, ten of them dreadnaughts and six battle-cruisers, and the others to be in such distribution of approved types as the Department may deem best..."

The Brooklyn Daily Eagle, December 9, 1918

The Luxury of a Rich Power

1025

1026



Battle-Cruiser Designs are Completed

Designs for the new battle-cruisers of the United States Navy were completed recently and indicate that they will indeed be magnificent craft. Four of them were appropriated for in the naval bill for 1917 and six in all will be laid-down under the three-year building program for the Navy. They will be larger and more expensive than the latest battleships, having a length of 850 ft. and an enormous horsepower, calculated to give them a speed of 40.3 miles-an-hour, or about 16 miles-an-hour faster than the battleships. (*Popular Mechanics*, March 1917)

Caption: "How the new Battle Cruisers of the U.S. Navy will look when completed. Ships of this type have been called 'The Luxury of a Rich Power.' They are larger and much faster than Battleships. Mount guns almost as heavy and cost more. Four of them are included in the Naval Building Program for this year." 1027



Above: "The Battle-Cruiser USS Colorado in harbor, ca. 1916"

Upper Left: caption: "New armored cruiser 'Colorado' in dry dock at the Brooklyn Navy Yard. Her successful trial trip over the Cape Ann course, in which the vessel averaged 22.24 knots-an-hour, marks this vessel as the fastest armored warship in the Navy. Previously, the armored cruiser 'Brooklyn' was the fastest vessel carrying side armor "



Lower Left: caption: "Stern view of armored cruiser 'Colorado' in dry dock" 1028

Over There

"...As concrete evidence of what was accomplished, the report shows that on October 1 there were 338 United States naval ships abroad with 5,000 officers and 70,000 enlisted men, or a greater force than the total strength of the Navy when war was declared; while the American fighting craft had steamed an average of 626,000 miles per month in the war zone. This did not include the cruisers and battleships on escort duty. Of the first destroyers to go over the 'Porter' steamed 64,473 miles, the 'Connyngham,' 63,952, and the 'Davis,' 63,015..."

The Brooklyn Daily Eagle, December 9, 1918

1029

1030

< Half Finished

What will be done with those two monster wardogs of the sea, which are lying on the ways, less than half finished, at the Brooklyn Navy Yard?

The Brooklyn Daily Eagle, February 6, 1922

RE: introduction to an article entitled: "Brooklyn Yard May Get Job Scraping Two Battleships: *South Dakota* and *Indiana*, Now on Ways, Among Doomed Vessels"

1031

1032

Potential Dreadnaughts



"THE 'South Dakota' and the 'Indiana' are scheduled under the Limitations of the Armament Treaty to be scrapped. Over \$60,000,000 worth of battleships, if they had been completed, that will never feel the rush of the North River along their keels..."

The Brooklyn Daily Eagle, February 6, 1922

RE: the *South Dakota*-class battleships were authorized in 1917, but work was postponed so that the USN could incorporate information gained from the WWI *Battle of Jutland* (fought in mid-1916) in their design. Work was further postponed to give destroyers and other, smaller naval vessels priority as they were needed urgently to counter the U-boat threat in the *North Atlantic*. Construction on the class began in 1920. The *Washington Naval Treaty of 1922* restricted total battleship tonnage allowed and limited individual ship size to 36K-tons.

Caption: "South Dakota-class battleship (BB 49-54)"

1033

1034

"...According to authorities at the Navy Yard, these two potential dreadnaughts can never be used for peaceful purposes as a whole. The honeycomb interior construction of a modern battleship, with its heavy armor plate, projectile-proof hull below the water line is not suitable for cargo-carriers..."

The Brooklyn Daily Eagle, February 6, 1922

Spreading the Wealth

1035

1036

"...The big ships are not the only ones which, in all probability, will be scrapped at the Brooklyn Navy Yard. A large number of vessels are due to go, aside from those under construction. These will undoubtedly be distributed for salvaging among the various Navy Yards of the Navy Department and the local yard will get its share..."

The Brooklyn Daily Eagle, February 6, 1922

"...Senator Calder personally had this in mind when, Friday, he suggested to the Secretary of the Navy that instead of laying-off and discharging the employees of the naval shipyards, the men be given indefinite furloughs so that they may be ready at the call to return to their jobs when the time comes to dismantle the battleships. This will also be a job which will take nearly as much and in some cases more labor than the building and assembling processes did..."

The Brooklyn Daily Eagle, February 6, 1922

1037

1038

Adaptive Reuse

1039



"...According to naval officials the salvaging of these big boats will be a tremendous job, and the intention is to get as much of monetary value out of them as is possible. It has suggested that the huge 150-foot to 200-foot 'basket' be used at various points on the coastline of the United States and its possessions as wireless aerial towers. They would be well suited for this purpose. The engines will be dismantled and used wherever possible. These were, of course, designed for battleship purposes, but with minor changes can be used in any vessel..."

The Brooklyn Daily Eagle, Feb. 6, 1922

Caption: "Sailors atop 'cage mast' of USS Wyoming"

1040

Second Life

1041

"...It is thought that much of the marine equipment from the scrapped naval vessels will be appropriated by or transferred to the Shipping Board for their use in repair and upkeep of the vessels in their care. Such articles as anchor chains, windlasses, compasses, other navigating instruments and mechanical units can be used for this purpose..."

The Brooklyn Daily Eagle, February 6, 1922

RE: construction on USS Indiana was halted in early 1922 when the ship was 34.7% complete. The unfinished hull was scrapped the following year. The guns were transferred to the U.S. Army and her boilers and armor were used to modernize older battleships.

1042

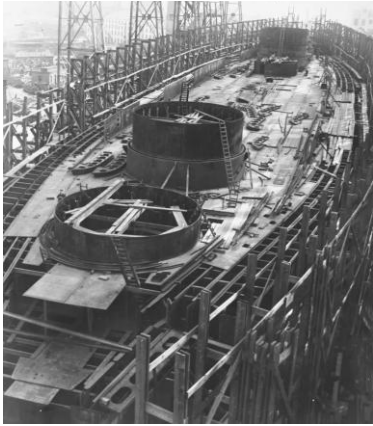
"...Some of the material salvaged from the scrapped warships may, according to one suggestion, be transferred to the United States Coast Guard service. The huge battleship searchlights with their accompanying equipment of dynamos might prove extremely useful to this little-heard-of but efficient branch of the Department of Commerce. Lifeboats, life rings and signal apparatus may also go this way..."

The Brooklyn Daily Eagle, February 6, 1922

Cutting Costs

1043

1044



"...Contracts for materials intended for ships like the 'South Dakota' and the 'Indiana,' which will never be completed and which has not been delivered, probably will be canceled. This will mean a financial loss in the way of cancellation fees, but the total sum will be small compared to the great cost of their purchase had the treaty not been signed..."

The Brooklyn Daily Eagle, February 6, 1922
 Caption: "View of the Indiana (BB-50) from aft looking forward New York Navy Yard, Brooklyn, New York"
 1045

Cost Effective

1046

"...Taken as a whole, the loss in actual cash of the scrapping of these ships will be small compared to the future saving from the elimination of their upkeep. Many of these vessels are at least ten years old and, according to maritime figures, are appraised at half of their original cost, while a large percentage of the material in them is salvageable..."

The Brooklyn Daily Eagle, February 6, 1922

Peaceful Purposes

1047

1048



"...One feature which must be kept in mind is the fact that none of the material taken from the scrapped warships can be used for military or naval purposes. They must all go the way of peacetime uses..."

The Brooklyn Daily Eagle, February 6, 1922

1049
 Caption: "Signing of the Washington Naval Treaty, February 6, 1922"

On the Bright Side

1050

"...When the tremendous expense of keeping a battleship in trim is considered, the expense and loss incident in the scrapping of the vessels to be discarded will be small. The cost of overhead, the care and payroll of the personnel, mechanical upkeep, fuel bills and the thousand and one minor expenses of a large battleship will be saved and in a short time will have made up the present loss."

The Brooklyn Daily Eagle, February 6, 1922

Civilian Service

1051

1052

Civilian employees well organized and with scientific brains, too

The Brooklyn Daily Eagle, January 19, 1935

RE: introduction to an article written by O.R. Pilat entitled: "Navy Yard"

Just Supposing

1053

1054



"SUPPOSE the sheet metal shop at the Brooklyn Navy Yard was unbearably chilly today (it isn't, we're just supposing). Imagine tools slipping from shivering fingers, men grumbling about catching cold. The tocsin sounds for the shop committee, really a grievance committee of one or two men elected by majority vote of the workers themselves at stated intervals. The committee for more heat first to the master-in-charge. If he shrugs his shoulders, it goes next to the naval office who is shop superintendent. If he looks blank, it can keep going until it reaches Capt. C.A. Dunn, who has been industrial manager of the yard since March..."

The Brooklyn Daily Eagle, January 19, 1935
Caption: "Capt. C.A. Dunn, who as manager of the Brooklyn Navy Yard is in charge of the civilian working force"

1055

"...Continuing an example perfectly silly, suppose all the shops lacked heat, and the management refused to become concerned. The shop committee could appeal directly to the Navy Department in Washington, or it could exert pressure through agencies like the American Federation of Labor..."

The Brooklyn Daily Eagle, January 19, 1935

1056

A Weapon of the Past

"...A strike is usually out of the question. The last strike was in the boat shop during the war, and it lasted only one hour. The varieties of conference and conciliation are so great that strikes are almost a weapon of the past..."
The Brooklyn Daily Eagle, January 19, 1935

1057

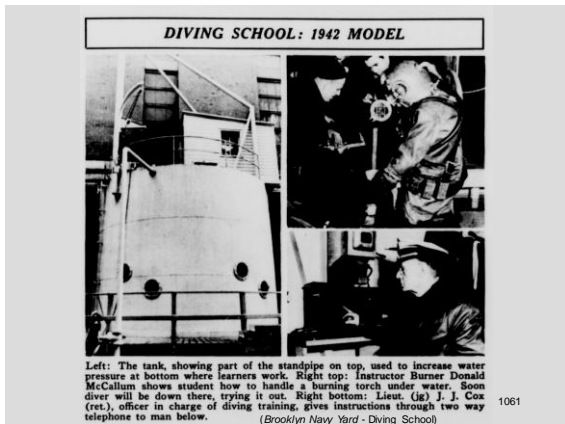
1058

To the Last Cent

"...There is no reason for a strike, really. Wages are fixed to the last cent at each yard in accordance with the prevailing scale outside the yard. They range from divers, who get \$1.90 an hour (there are only two of them at the yard), and heavy forgers (who work with steel rather than pen) at \$1.36 an hour, down to drillers at 75 cents-an-hour, and common laborers at \$4.48 a day. The Navy regulations even go so far as to award an extra five cents-an-hour for specially dirty work..."
The Brooklyn Daily Eagle, January 19, 1935

1059

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Six for Five

"...Hours are also fixed, eight-a-day, five days-a-week. It happens that every one at the yard on a five-day week now gets paid as if on a six-day week. Labor solidity at this and other yards undoubtedly helped to win this and other concessions..."

The Brooklyn Daily Eagle, January 19, 1935

1063

Every Which Way

1064

"...The 4,400 civil employees at the local yard (including clerks and draftsmen) are organized up and down, horizontally, vertically and criss-cross, in ways interesting and influential..."

The Brooklyn Daily Eagle, January 19, 1935

1065

"...Begin with the shop committees. These men are the primary representatives of the yard labor force. For the present year they include Thomas J. Mahoney, James L. McKenna, Charles Lowery, D. Hanley, M. Schoolfield, S. Townsend, H. Scutt, E. Brown, E. O'Connell, A.V. Pettine, M.E. Foster, George Wallace, Frank Erker, R. Stout, W.H. Bell, E.N.C. Rogers, J.P. Castellano, Frank Smith, Robert H. Hutton, Emanuel Lefkowitz, William T. Loughlin, Ernest P. Clancy, William W.D. McHugh, C. Smith, J. Flanagan, John H. Reynold, Edward Abair, Carl Anderson and T.F. Gibbons..."

The Brooklyn Daily Eagle, January 19, 1935

1066

"...More aggressive in general matters affecting the Navy Yard is the Metal Trades Council, which has a direct American Federation of Labor tie-up, and whose local officers are Philip Engel, president, George Morrison, treasurer, and Leslie Lively, secretary..."

The Brooklyn Daily Eagle, January 19, 1935

1067

Claim to Fame

1068

"...At the moment Brooklyn Navy Yard claims to be the scientific brains of the Navy, but labor leaders at the yard say they deserve some of the credit for that claim..."

The Brooklyn Daily Eagle, January 19, 1935

"...Here's the story: Five or six years ago most of the plans for new warships came from the Marine Engineering Corporation of Philadelphia. Civilians at the local yard began to raise some dust in the matter, claiming the men at work for that company were in part aliens, and that serious danger of leakage of secrets to foreign countries existed..."

The Brooklyn Daily Eagle, January 19, 1935

1069

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"...Partly as a result of that agitation most ships in American naval yards are today planned by what is known as the central drafting office at the Brooklyn Navy Yard. Starting with a handful of men in March, 1930, it now has 300 employees and is about to move to larger quarters..."

1071

1072

Getting the Job



"...Another story: the first treaty cruiser built at the Brooklyn Navy Yard was the 'Pensacola,' launched five years ago. It has never been revealed, up to now, how close Brooklyn came to losing that particular job. What happened was that word came to officials of the Metal Trades Council at the yard that high-pressure methods were being used by Philadelphia to get the job, and that something would have to be done to balance that pressure..."

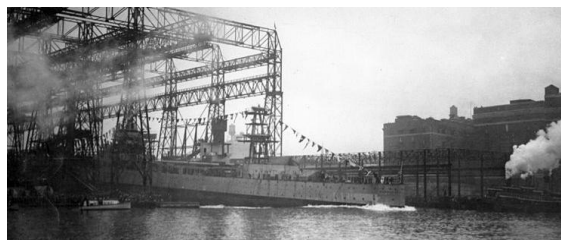
The Brooklyn Daily Eagle, January 19, 1935

RE: the USS Pensacola was in service from 1929-1945. She was laid-down at the Brooklyn Navy Yard on October 27, 1926 and launched on April 25, 1929. She was the lead ship of the Pensacola-class, which the USN classified (starting in 1931) as "Heavy" cruisers. During WWII, Tokyo Rose nicknamed her the "Grey Ghost." She received thirteen battle stars for her exemplary service in the war.

Top: caption: "USS Pensacola (CA-24), underway at sea, September 1935"

Bottom: caption: "Sister ships Salt Lake City and Pensacola, with New Orleans (L-to-R), at Pearl Harbor in 1943"

1073



"DESPITE a steady drizzle that could not dampen the enthusiasm of more than 500 invited guests, many of them women in flimsy spring clothes, the 'U.S.S. Pensacola' was launched at Brooklyn Navy Yard this morning, adding one more name to Uncle Sam's greyhounds of the sea. The 10,000 ton 'treaty' cruiser - so called because she is the largest vessel of her type which can be built according to the Washington Disarmament Conference regulations - moved down the ways at exactly 10:22. It was the first such vessel to be launched in Brooklyn since 1919..."

The Brooklyn Daily Eagle, April 26, 1929

Caption: "The U.S. Navy heavy cruiser USS Pensacola (CA-24) slides down the ways during her launching at the Brooklyn Navy Yard on 25 April 1929"

1074



“...Naval officers at the yard could protest until red in the face, but that would not balance things. What was needed was civic backing. The civilians quietly went to the Brooklyn Chamber of Commerce, which started a letter-writing campaign, passed resolutions by the dozens, sent delegations hot-footing to Washington. P.S. – Brooklyn got the job...”

The Brooklyn Daily Eagle, January 19, 1935

Economies of Scale

1075

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“...Brooklyn Navy Yard has twin building ways today, a great advantage because of the economy involved in building a pair of ships from the same plans. The second of these ways was only constructed after a bitter campaign years ago by civilian workers at the yard...”

The Brooklyn Daily Eagle, January 19, 1935

Agents of Influence

1077

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“...An organization of influence at the yard is the American Federation of Government Employees, affiliated with the American Federation of Labor. Its president is Edward S. Mills of the naval clothing depot, at 39th St. Its first vice president is C. Grant Frick, its second vice president is Joseph Sorrentino and its vice president for the local yard is Emanuel Lefkowitz...”

The Brooklyn Daily Eagle, January 19, 1935

“...Individual civilians at the Navy Yard have rendered their fellows great service. Take Francis Black, for example. He is still secretary of the Brooklyn Navy Yard Retirement Organization, though he retired four years ago at the age of 60. The answer is that no one else knows quite so much about this subject as himself...”

The Brooklyn Daily Eagle, January 19, 1935

1079

1080

"...Black was a machinist. When he started agitation 34 years ago for some provision for men whose working days were over, he met with every possible obstacle. It was not until 1926 that his efforts at Washington bore fruit in the Sterling-Lehlback bill that provided that a Government employee would receive \$720-a-year if he retired at 60, after 30 years of service, having paid into a fund 2-1/2 percent of his salary meanwhile. Nowadays a retiring civilian at the yard gets \$1,200-a-year, after 30 years of service, having put into a fund 3-1/2 percent of his salary during that time..."

The Brooklyn Daily Eagle, January 19, 1935

1081

"...Besides Black, officers of the retirement group are now John Hanna, president, William J. Oswald, vice president, Henry Herrman, treasurer, and William Hennes, Sergeant-at-Arms, with George Geyer, William Powers and Joseph Kennedy acting as trustees..."

The Brooklyn Daily Eagle, January 19, 1935

1082

"...It is almost impossible to give all the internal workings of the Navy Yard workers. An interesting one is called the Brooklyn Navy Yard Employees Credit Union. It is a financial institution chartered by the State Banking Department two years ago, the idea being to promote thrift and to make loans to its members at reasonable rates. It has made about 100 loans in the last two years, loans protected in the usual form of co-maker and also covered by insurance of the maker of the loan. It has been successful enough to declare dividends of 6 percent yearly and now has a working capital of about \$2,500. Its president is Thomas Miranda..."

The Brooklyn Daily Eagle, January 19, 1935

1083

"...Another organization is the Mutual Relief Society of the Navy Yard, with John C. Pungler president. It collects dues of \$1-a-year and in return pays benefits of \$2-a-day up to eight weeks, as well as declaring a dividend at the end of the year, which amounts to \$7 or more. Still another organization called the Navy Department Beneficial Association, grants to its members life insurance at low cost under a group plan..."

The Brooklyn Daily Eagle, January 19, 1935

1084

Gainful Employment

"...The favorable labor conditions at the yard are partly the cause for the terrific influx of applicants for jobs as apprentices (the depression being another cause). At the present time there are 82 boys at the yard, learning 17 trades. In July, 1934, 5,000 youngsters filed applications for jobs as apprentices, 3,500 took exams in the Customs House and 3,200 got on the eligible lists. No less than 41 taking the examination carried 100 percent and only 26 of those got jobs, starting to work Oct. 2..."

The Brooklyn Daily Eagle, January 19, 1935

1085

1086

"...An apprentice works four years in that capacity, stepping up in grade from year-to-year, provided his work is satisfactory and his marks (he goes to school several hours-a-day, as part of his work, the instruction being furnished by the New York City Board of Education right in the yard) are satisfactory..."

The Brooklyn Daily Eagle, January 19, 1935

1087

"...As a matter of general information to youngsters who think of starting in at the Navy Yard at the bottom of the ladder, it is worth mentioning that no new examinations for apprentices is likely within a year. Prospective applicants should go to the district civil service headquarters at 641 Washington St. Manhattan for information and to get their names in, so they will be notified when an examination does take place."

The Brooklyn Daily Eagle, January 19, 1935

1088

Honoring the Fleet

Dignitaries to officiate as first rivets are set in *North Carolina*, third ships so named. Exercises to highlight Boro's observance of day set apart to do honor to U.S. Fleet.

The Brooklyn Daily Eagle, October 27, 1937

RE: introduction to an article entitled: "Brooklyn Navy Yard Ceremonies Mark Start of \$62,000,000 Project"

1089

1090

The Big Day

"CROWDS began streaming into the Navy Yard today to see the laying of the keel of the newly authorized United States \$62,000,000 battleship 'North Carolina' in addition to the customary Navy Day exercises. The yard prepared to receive 30,000 guests during the day..."

The Brooklyn Daily Eagle, October 27, 1937

1091

1092



"...The program calls for the keel laying a little after noon in the presence of Charles Edison, Assistant Secretary of the Navy; Rear Admiral Clark H. Woodward, Commandant of the Third Naval District; Lt. Gov. William P. Horton of North Carolina, and other distinguished visitors. Mr. Edison was due at the Sands St. gate of the Navy Yard at noon and was to be received with a 17-gun salute and a marine guard of honor. He will be escorted to Building Ways No. 1 where preparations for the keel-laying have been completed..."

The Brooklyn Daily Eagle,

October 27, 1937

Caption: "Charles A. Edison"

1093

1094

The Big Show

"...The yard will be open to the public until 4:30 p.m. The public will be admitted only at the Cumberland St. gate, where guides will be available to show the visitors about..."

The Brooklyn Daily Eagle, October 27, 1937

"...At 10:15 a.m. Dry Dock No. 1 was to be flooded and a barge floated out to demonstrate the operations of the dock. At 1, 2, 3 and 4 p.m. there will be diving exhibitions to this dock: at 1:30 a program of fire drills, at 3 a fire and rescue drill aboard the destroyer 'Dunlap' at Pier D. Throughout the day there will be shop exhibitions on Chauncey Ave. between 2d and 3d Sts. Visitors will not be permitted to enter the shops. Naval officials explaining that it is dangerous for outsiders to pass through the moving machinery..."

The Brooklyn Daily Eagle, October 27, 1937

1095

1096

"...There will be exhibits showing the work of the various branches of the naval service. The Marine Corps will have exhibits on 2d St. near the Sands St. gate and the Medical Corps will have a first aid station and medical exhibit at the Sands St. gate. Motion pictures of naval activities will be shown in Building 14 from 1:30 to 4 p.m..."

The Brooklyn Daily Eagle, October 27, 1937

Making History

1097

1098



From Two-gun Schooner to 60,000-Ton Constellation

Shipped in 1811 under Armstrong & Co. of New York. Shipped to the Navy in 1812. She was the first US Navy ship to be built in the United States. She was the first US Navy ship to be built in the United States. She was the first US Navy ship to be built in the United States.

| Ship | Type | Launched | Displacement | Notes |
|--------------------------|------------------|----------|--------------|---|
| USS Constellation (1790) | Two-gun schooner | 1790 | 100 tons | First US Navy ship built in the US |
| USS Constellation (1854) | Steam sloop | 1854 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1855) | Steam sloop | 1855 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1856) | Steam sloop | 1856 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1857) | Steam sloop | 1857 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1858) | Steam sloop | 1858 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1859) | Steam sloop | 1859 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1860) | Steam sloop | 1860 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1861) | Steam sloop | 1861 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1862) | Steam sloop | 1862 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1863) | Steam sloop | 1863 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1864) | Steam sloop | 1864 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1865) | Steam sloop | 1865 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1866) | Steam sloop | 1866 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1867) | Steam sloop | 1867 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1868) | Steam sloop | 1868 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1869) | Steam sloop | 1869 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1870) | Steam sloop | 1870 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1871) | Steam sloop | 1871 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1872) | Steam sloop | 1872 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1873) | Steam sloop | 1873 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1874) | Steam sloop | 1874 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1875) | Steam sloop | 1875 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1876) | Steam sloop | 1876 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1877) | Steam sloop | 1877 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1878) | Steam sloop | 1878 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1879) | Steam sloop | 1879 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1880) | Steam sloop | 1880 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1881) | Steam sloop | 1881 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1882) | Steam sloop | 1882 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1883) | Steam sloop | 1883 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1884) | Steam sloop | 1884 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1885) | Steam sloop | 1885 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1886) | Steam sloop | 1886 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1887) | Steam sloop | 1887 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1888) | Steam sloop | 1888 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1889) | Steam sloop | 1889 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1890) | Steam sloop | 1890 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1891) | Steam sloop | 1891 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1892) | Steam sloop | 1892 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1893) | Steam sloop | 1893 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1894) | Steam sloop | 1894 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1895) | Steam sloop | 1895 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1896) | Steam sloop | 1896 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1897) | Steam sloop | 1897 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1898) | Steam sloop | 1898 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1899) | Steam sloop | 1899 | 1,000 tons | First US Navy ship with a screw propeller |
| USS Constellation (1900) | Steam sloop | 1900 | 1,000 tons | First US Navy ship with a screw propeller |

“...When the first rivet began to shape the keel of the newest battleship history was made as surely as it was in 1801 when the Brooklyn Navy Yard was officially opened and L. Jonathan Thorn took charge as Commandant of a small and leisurely plant. What a parade of great war craft has since slipped out of the ways of this now immense industrial establishment employing 7,000 workers!...”

The Brooklyn Daily Eagle, October 27, 1937

Left: list of the 93 ships that were constructed at the Brooklyn Navy Yard between 1801 and 1965, ranging in size from the two-gun schooner *USS Pilot* to the 60K-ton super-carrier *USS Constellation*. The last USN ship built at the yard was the *USS Duluth*.

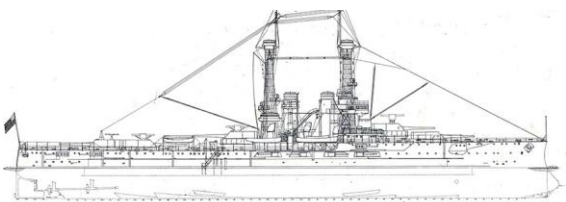
“...The first great war monster to float away from the plant was the ‘Ohio,’ with 74 guns ‘on-the-line.’ She was completed in 1820 and was a proud mistress of the sea with portholes framing her gun muzzles and her great hulk of wood rising high above the water...”

The Brooklyn Daily Eagle, October 27, 1937

RE: a ship-of-the-line launched in 1820 at the Brooklyn Navy Yard, U.S.S. *Ohio* was the second USN warship named “U.S.S. Ohio.” From 1838 to 1840, the *Ohio* was the flagship of Commodore *Isaac Hull*, serving in the *Mediterranean Squadron*, protecting commerce and suppressing the slave trade off the African coast. From 1841 to 1846, she served as receiving ship in Boston. The *Ohio* was recommissioned for service in the *Mexican-American War*. In 1847 she was assigned to the *Pacific Squadron* and spent two years patrolling the Pacific, returning to Boston in 1850 where she was used as a receiving ship until 1875. She was sold in 1883 and burned in 1884.



Queen of the Seas



“...The first modern battleship built at the Brooklyn Navy Yard was the ‘Florida,’ the keel of which was laid in March 1909. She was launched in 1910 and commissioned in 1911. Her life of service was just 20 years for she was scrapped in 1931...”

The Brooklyn Daily Eagle, October 27, 1937

RE: U.S.S. *Florida* (BB-30) was the lead ship of the *Florida-class* of dreadnaught battleships of the USN. She had one sister ship; U.S.S. *Utah*. The *Florida* was laid-down at the *Brooklyn Navy Yard* in March 1909; launched in May 1910 and commissioned into the USN in September 1911. She was armed with a main battery of ten 12-inch guns and was very similar in design to the preceding *Delaware-class* of battleships.

1103

Caption: “*Florida* profile updated to show ship configuration in 1923”

When the great battleship *Florida* slid down the ways for her first dip in the bay today every warship now afloat was forced to bow to her as the Queen of the Seas

The Brooklyn Daily Eagle, May 12, 1910

RE: introduction to an article entitled: “Battleship *Florida*, Launched Today, is Undisputed Queen of the Seas”



"THE 'Florida,' when completed, will be more powerful in speed, in guns and in resistance than any fighting machine on the sea, not excepting, naval men say, even the super-Dreadnaught of the British Navy, the 'Colossus,' which is longer, but not provided with as heavy an armament. Before today the 'North Dakota' was the largest, most heavily gunned and fastest of the great United States battleships. The 'Florida' was built in government yards. She is the fifth to be built under and by national officers and workmen..."

The Brooklyn Daily Eagle, May 12, 1910

Caption: "Florida, as she will appear when fully completed"

1105

1106



"...Fourteen months have elapsed since the keel was laid and today, when the giant bulk slipped into the waters of Wallabout Bay, she was 68 per cent completed. This is quick work, and, taken all in all, the record of the Brooklyn Navy Yard in the construction of the 'Florida' is another convincing proof of the efficiency of government battleship construction as compared with the work done in private yards..."

The Brooklyn Daily Eagle, May 12, 1910

Left: caption: "Florida, during fitting-out work in 1911"

Right: caption: "Florida, seen at the Brooklyn Navy Yard"

1107

1108

"...At just about this time Congressman William M. Calder had a chance to prove his loyalty to the Brooklyn Navy Yard in connection with the building of the 'Florida,' and he rose to his opportunity..."

The Brooklyn Daily Eagle, May 12, 1910

1109

"...It was on March 9, 1909, the anniversary of the battle between the 'Monitor' and the 'Merrimac,' that Gladys Goodrich, daughter of the then Commandant of the Brooklyn Navy Yard, assisted by a bevy of little girls and boys, drove the first nail and tightened the first bolt of the 'Florida.' The marine band played 'The Star Spangled Banner,' the Navy Yard whistles shrieked for five minutes and the great destructive monster of the seas had begun to take shape..."

The Brooklyn Daily Eagle, May 12, 1910

"...The plans for the vessel were received in the yard on September 4, 1908. They were only rough drafts, and Chief Draughtsman Hargen and his corps of assistants at once began the work of completing them and making the working drawings. The ways for the new ship were already completed when the plans arrived. On November 8, 1908, contracts for furnishing the steel plates and shapes for the 'Florida' were awarded to R.C. Hoffman & Co. of Baltimore, Md. The contracts called for the delivery of 1,500 tons of steel..."

The Brooklyn Daily Eagle, May 12, 1910

"...It was proposed in Washington by some of the authorities there to award the contract for the building of the Florida's machinery to a private concern. When Congressman Calder heard of this proposal he lost no time in making an energetic protest to the President and to the Secretary of the Navy against the award of the contract to a private firm..."

The Brooklyn Daily Eagle, May 12, 1910

1110

"...His contention was that since Congress had voted to give the work of building the 'Florida' to the Brooklyn yard it would not be right to take away from the yard a part of the work which involved the expenditure of from one to one-and-a-half million dollars..."

The Brooklyn Daily Eagle, May 12, 1910

1111

"...The answer from the Navy Department was that the department wanted to install turbine engines in the 'Florida,' and that it was doubtful if the turbine owners would grant the shop rights to the Brooklyn Navy Yard. A further objection to letting the Navy Yard do the work was the higher cost. But investigation proved these to be specious arguments, and as a result of the vigorous action of Congressmen Calder and Fitzgerald, Acting Secretary of the Navy Newberry, on November 21, 1908, announced that he would approve the recommendations of the Board of Construction which had reported against awarding the machinery contracts to a private firm..."

The Brooklyn Daily Eagle, May 12, 1910

1112

"...Another row over the material to be used in the 'Florida' was caused by the award of the contract for the boilers to the Babcock & Wilcox Co., commonly designated as the boiler trust. The bid from this firm was higher than that of several other boiler concerns, but the Navy Department justified its award of the contract to the highest bidder on the ground of safety. In a six-million dollar ship, it was urged, the government could not take chances on installing boilers that might not be able to do the work. The shut-out companies offered guarantees, but were unable to convince the Navy Department that their boilers would be satisfactory..."

The Brooklyn Daily Eagle, May 12, 1910

1113

"...On April 27, 1909, fire was discovered under the Florida's ways. It had broken out on a cradle supporting the ways beneath the bow of the ship. Prompt work on the part of the Navy Yard fire brigade quenched the blaze before any damage had been done to the steel work on the hull..."

The Brooklyn Daily Eagle, May 12, 1910

1114

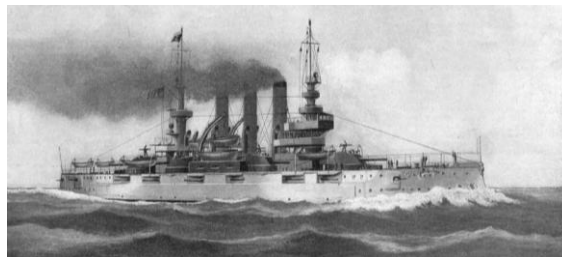


"...The 'Utah,' the sister ship of the 'Florida,' is being built at a private yard, and as work on the two vessels was begun at about the same time, there was much interest in watching the relative progress on the two ships. While the 'Utah' was launched some months ago, she was not nearly as far completed at that time as the 'Florida' is today, the private yards made a great effort to get her into the water as early as possible..."

The Brooklyn Daily Eagle, May 12, 1910

Above L&R: caption: "Navy Yard, New York, 5-9-12, Dry Dock No. 4, first vessel docked - U.S.S. Utah"

1115



"...At the beginning of June of last year the 'Utah' was 20 per cent completed, while the 'Florida' was only 16.4 per cent completed. But this was expected, as in the race between the 'Louisiana,' which was built at Newport News and the 'Connecticut,' which was built at the Brooklyn yard, the private yard led in the early stages of the construction, whereas the government yard gained rapidly later on..."

The Brooklyn Daily Eagle, May 12, 1910

Caption: "The battleship Connecticut, launched September 29, 1904 at the Brooklyn Navy Yard"

1116

"...The desire to do as much of the work as possible in the local yard has been influential in retarding construction since many of the parts of the battleship could have been cast in quicker time in a plant especially equipped for doing specialized work..."

The Brooklyn Daily Eagle, May 12, 1910

1117

"...About six-hundred men of the Navy Yard force, sometimes more, and more often less, have been constantly at work upon this big ship since its giant skeleton began to take shape last summer. Of course, many more than this have been doing work in the different yard shops on various parts for the vessel, and counting these, several thousand men have been giving their entire time to the completion of the work..."

The Brooklyn Daily Eagle, May 12, 1910

1118



"...During the fall and winter of 1909 the New York Shipbuilding Company, which is building the 'Utah' at Camden, N.J., gradually gained on the Brooklyn yard, until it had a lead of about 12 per cent. This is readily explained by the fact that at a government Navy Yard there is a great deal of repair work to be done, and very often new construction must be allowed to lag in order that necessary repairs to ships already in commission may be completed without delay..."

The Brooklyn Daily Eagle, May 12, 1910

Caption: "Florida in 1911, shortly after her completion"

1119

"...But even as it is the 'Florida' represents a new record for speed in battleship construction. It used to take from five to six years to build vessels, involving the expenditure of less than one-half the six-million dollars the 'Florida' will cost..."

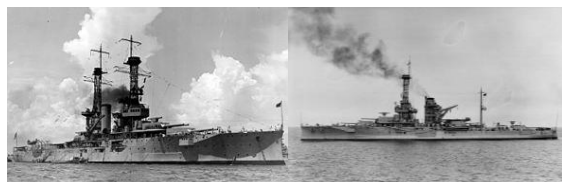
The Brooklyn Daily Eagle, May 12, 1910

1120

"...The Act of May 13, 1908, gave Congressional sanction to the construction of the vessel. Less than a year later the keel was laid, and just two years from the time Congress appropriated the money for her construction, the 'Florida' is in the water, 68 per cent completed. By January 1, 1912, she will be ready to go into commission..."

The Brooklyn Daily Eagle, May 12, 1910

1121



"...Persons who witness the launching of the battleship 'Florida' today will probably believe that that ship is one of the few naval craft that have been built at the Brooklyn Navy Yard. Not so. The 'Florida' is the fiftieth craft of importance to be constructed, ranging over a period of nearly a century . . . The 'Florida' is the second ship of that name to be built at the yard. The other was the 'Madawaska,' later called the 'Florida'..."

The Brooklyn Daily Eagle, May 12, 1910

Left: caption: "Florida, ca. 1921"

Right: caption: "Florida in Hampton Roads, October 1929"

1122

Evolutionary Tendencies

"...Battleship building in the American Navy has undergone changes more radical than can generally be understood. And in no period perhaps has this evolutionary tendency been so marked as during the past ten years..."
The Brooklyn Daily Eagle, May 12, 1910

1123

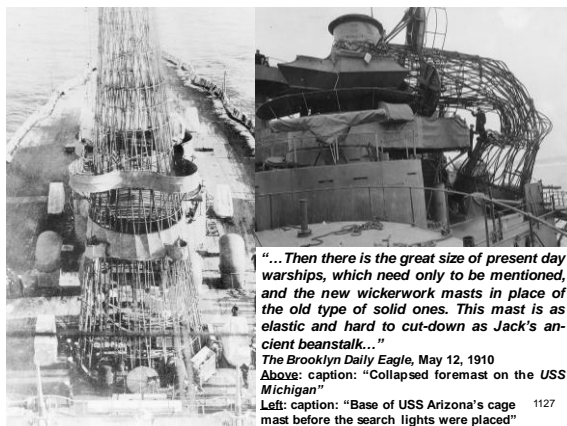
1124

"...A decade ago practically all the ships of the Navy were painted white, probably more for ocular effect than for other reason. White was clean, pretty and inspiring. Now there are climatic considerations. Naval officers have learned that white vessels can be seen far under certain conditions..."
The Brooklyn Daily Eagle, May 12, 1910

"...Slate colored vessels are turned out for northern waters, so that in ordinary seas the color effect will harmonize with that of the water. Tropical squadrons are painted white because of the glaring sunlight in warmer climes..."
The Brooklyn Daily Eagle, May 12, 1910

1125

1126



"... Then there is the great size of present day warships, which need only to be mentioned, and the new wickerwork masts in place of the old type of solid ones. This mast is as elastic and hard to cut-down as Jack's ancient beanstalk..."
The Brooklyn Daily Eagle, May 12, 1910
Above: caption: "Collapsed foremast on the USS Michigan"
Left: caption: "Base of USS Arizona's cage mast before the search lights were placed"

1127

1128

"...The authorities are also preserving greater secrecy as to the details of construction of ships. Nobody tell anymore the thickness of the armor of any vessel. Therefore the public must be content to guess that the 'Florida' is protected by something like a foot of plate. Photographing of ships and objects in the Navy Yards has also been largely done away with in pursuance of the new policy..."
The Brooklyn Daily Eagle, May 12, 1910

OVERHAULING DREADNAUGHT AFTER SHAM BATTLE

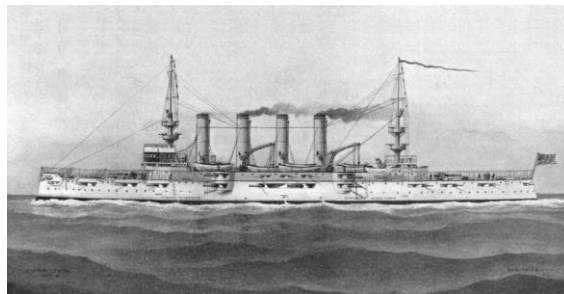


"...Guns are made larger to keep pace with the Dreadnaught types. The ten 12-inch rifles of the 'Florida' weigh 123,000 pounds apiece and are 45-feet-long..."

The Brooklyn Daily Eagle, May 12, 1910

Caption: "Dreadnaught Florida in dry dock at New York Navy Yard following its participation in the recent naval maneuvers off the East Coast. The sailors are engaged in cleaning bottom and sides of the great hull." (Popular Mechanics, August 1915)

1129



"...Battleships are now being named after the states of the Union, while the cruisers are taking the names of cities. About half of those built at the local yard have Indian names..."

The Brooklyn Daily Eagle, May 12, 1910

Caption: "Protected cruiser 'Milwaukee,' launched September 10, 1904 at Union Iron Works, San Francisco"

1130

Job Insecurity

"...There is some fear among the thousand men who have labored in building the 'Florida' that action by Congress may deprive the Brooklyn yard of contracts for more ships and that the workmen who are well organized and identified as the fashioners of the 'Florida' will be discharged to scatter to the four winds. Result – the necessity of getting a new set of men together on the occasion of the next attempt at building a ship. Conditions at present, however, seem to indicate that one or both of this year's battleships will be built here rather than at private shipyards..."

The Brooklyn Daily Eagle, May 12, 1910

1131

1132

"...At one of these private yards, that of the New York Ship-building Company, the Florida's sister ship, the 'Utah,' was built and she was prepared for launching somewhat quicker than the 'Florida.' The latter ship is about 6 per cent, behind. The 'Utah' was launched some months ago. The 'Wyoming' and the 'Arkansas,' 26,000-ton ships, are also under construction..."

The Brooklyn Daily Eagle, May 12, 1910

Rendezvous With Destiny

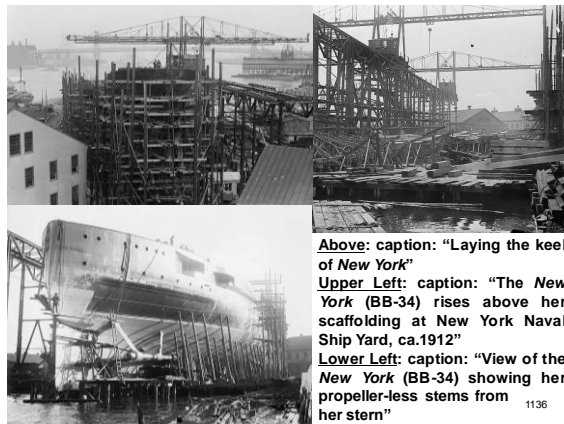
1133

1134



“...Then, in imposing order, came the construction in Brooklyn of the ‘New York,’ keel laid in 1911 and commissioned in 1914; the ‘Arizona,’ keel laid in 1914; commissioned in 1916; the ‘New Mexico,’ keel laid in 1915, commissioned in 1918; the ‘Tennessee,’ keel laid in 1917, commissioned in 1920...”

The Brooklyn Daily Eagle, October 27, 1937
Caption: “Navy Yard, NY, 6-15-15. View of waterfront looking North from top of Building No. 6, U.S.S. Arizona.” 1135



Above: caption: “Laying the keel of New York”

Upper Left: caption: “The New York (BB-34) rises above her scaffolding at New York Naval Ship Yard, ca.1912”

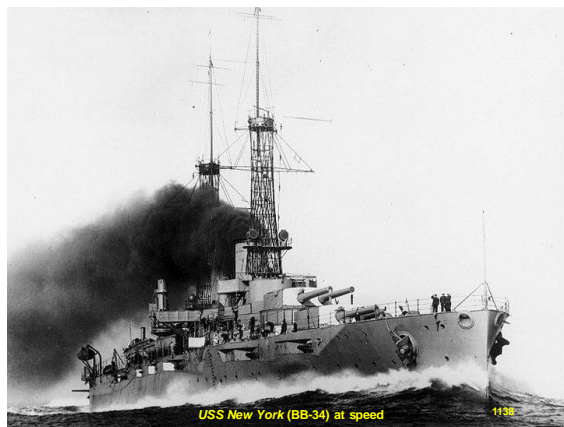
Lower Left: caption: “View of the New York (BB-34) showing her propeller-less stems from her stern” 1136



Above: caption: “New York (BB-34) before launch”

Upper Left: caption: “Commissioning ceremonies for New York, 15 April 1914, at the Brooklyn Navy Yard”

Lower Left: caption: “New York (BB-34) sits pier side nine days after being commissioned, 24 April 1914” 1137



USS New York (BB-34) at speed 1138



BEFORE throngs of cheering people the U.S.S. Arizona, the sister ship of the Pennsylvania, was launched in East River at the New York Navy Yard, June 19. When it is complete the dreadnaught will be one of the largest and most powerful war vessels afloat. It measures 608 ft. in length, has a 97-ft. beam and will be equipped with oil-burning engines. Its main battery will consist of twelve 14-in. guns and the secondary battery of twenty-two 5-in. rapid-fire pieces. The Arizona was christened not only with champagne, but also with a bottle of water – the first to flow through the Roosevelt Dam spillway. This was preserved at the time the dam was finished and saved for the recent ceremonies. The christening party, consisting of the Secretary of the Navy, the Governor of the State, and others, occupied the official stand, while the ship's sponsor, an Arizona young woman, broke the bottle over the bow of the vessel, naming it “Arizona.” (*Popular Mechanics*, August 1915)
Above: caption: “Deck view of the Arizona. Vessel was towed to a dock after its plunge into river.”
Left: “Releasing the Arizona from the ways” 1139

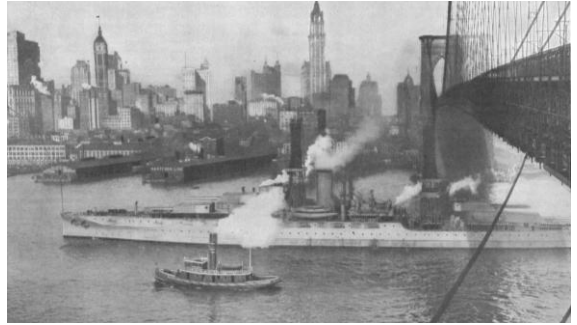
The ceremony of christening new ships began in the distant past (i.e. the Romans, Greeks and Egyptians all held ceremonies to ask the gods to protect their sailors). By the 1800s, christening of ships began to follow a familiar pattern; a “Christening Fluid” (not necessarily wine or champagne) would be poured against the bow of the ship (there are accounts in USN records of 19th century warships being Christened with water from major American rivers). The christening of ships became major public events, with large crowds assembled to witness the ceremony. As the apex of wines, it became standard for champagne to be used for the christening ceremony. The tradition developed that a female would do the honors and be named the “sponsor” of the ship. Maritime superstition held that a ship that wasn’t properly christened would be considered unlucky. In particular, a champagne bottle that didn’t break was considered to be a bad omen.

1140



Left: caption: "USS Arizona, Arrival of Sponsor, Brooklyn Navy Yard, New York, in 1915" Above: caption: "Launch of USS Arizona at the New York shipyards in June, 1915"

1141



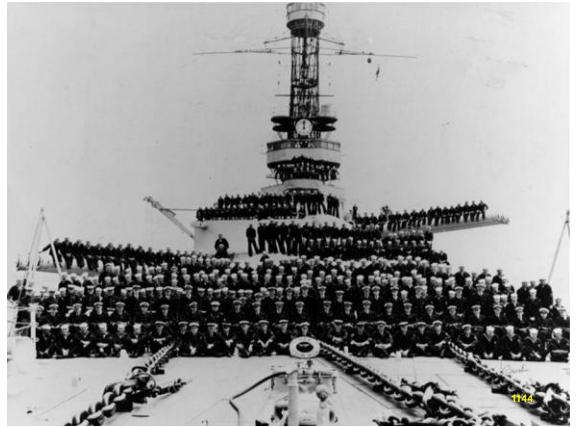
Caption: "USS Arizona: This 'Super-Dreadnaught' battleship (shown leaving the Brooklyn Navy Yard after being commissioned in 1916) was the U.S. Navy's largest and most modern warship. The ship served in American waters in WWI, and was sunk in Pearl Harbor at the beginning of WWII."

1142



NEW United States dreadnaught "Arizona" passing down East River from the New York Navy Yard on its first voyage into the Atlantic. The ship is one of the most formidable war vessels afloat and has been in commission only a few weeks. It was launched in June, 1915, and christened with a bottle of water—the first to flow through the spillway of the Roosevelt Dam. The "Arizona" is 608-feet in length and mounts twelve 14-inch rifles. Inset shows one of its bombproof fighting tops, an innovation for which the offensive use of air craft in modern naval engagements is responsible. (Popular Mechanics, January 1917)

1143



1144



1145

New York Herald Tribune LATE CITY EDITION MONDAY, DECEMBER 8, 1941. Japan Declares War on U.S., Bombs Hawaii, Philippines, Guam; Congress to Act Today; Tokio Troops Invade Malaya and Thailand. Pacific Fleet Strikes Back at Enemy Off Honolulu. President Fears U.S. Losses at Hawaii Base Are Heavy. Japanese Declaration of War Is Directed at Britain as Well. Japan Lands Troops, Opens War in Malaya. On War Footing. LaGuardia's Hall Brands Japanese Answer Congress-U.S. City's Defense. Te Term's Infamous Falseness. U.S. Call-Right, World Will Attack Together. U.S. Call-Right, World Will Attack Together. U.S. Call-Right, World Will Attack Together.





1153



1154

False Start

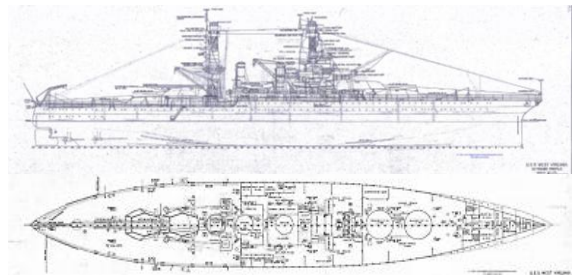
“...Following the ‘Tennessee,’ work was started here on the ‘South Dakota’ and the ‘Indiana.’ Keels of both were laid in 1920. The ‘South Dakota’ was scrapped in 1922, after the Washington International Arms Conference, and the ‘Indiana’ was junked the following year. Each was a third completed when work was stopped...”

The Brooklyn Daily Eagle, October 27, 1937

1155

1156

Almost Heaven



“...The last big battleship built in the United States was the West Virginia, the keel of which was laid in 1920. She was commissioned in 1923...”

The Brooklyn Daily Eagle, October 27, 1937

RE: U.S.S. West Virginia (BB-48) was the fourth dreadnaught battleship of the Colorado-class. However, because the U.S.S. Washington was cancelled, she was the third and last member of the class to be completed. The Colorado-class proved to be the culmination of the standard-type battleship series built for the USN in the 1910s and '20s. The ships were essentially repeats of the earlier U.S.S. Tennessee design, but with a significantly more powerful main battery of eight 16-inch guns in twin-gun turrets.

1157

1158

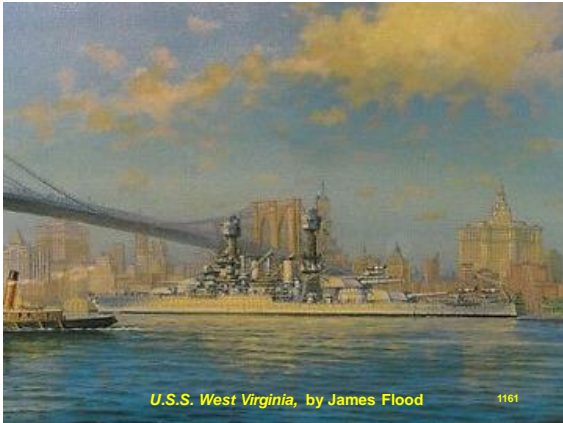
NAMES SELECTED FOR NEW DREADNAUGHTS

The four new battleships to be constructed under the building program of the United States Navy for 1917 will be named respectively after the states of Maryland, Colorado, West Virginia, and Washington. These names are now borne by four cruisers, which will be renamed. The cruiser "Maryland" will hereafter be known as the "Frederick," the "Colorado" as the "Pueblo," the "West Virginia" as the "Huntington," and the "Washington" as the "Seattle." Contracts for the four dreadnaughts were let recently. The "Maryland" and the "West Virginia" will be built at Newport News, the "Colorado" and the "Washington," at Camden, N. J., and all will be pushed to completion.

Popular Mechanics, March 1917

1159

1160



U.S.S. West Virginia, by James Flood

1161



Above: on December 7, 1941 the USS West Virginia was struck by torpedoes launched from a midget submarine and immediately began sinking. As it sank, it listed to port and each subsequent torpedo strike hit the ship further and further up its hull. At least seven torpedoes struck the ship and two bombs pierced the outer hull but failed to detonate. Knowing the ship was sinking, the captain and crew counter-flooded the starboard side of the ship so that it would go down on its keel instead of capsizing. An oil fire raged through the ship for the next 30 hours, buckling the metal. The captain and many members of the crew died during the attack. For his heroic actions on that fateful day, Capt. Merwyn S. Bennion received a posthumous Medal of Honor.

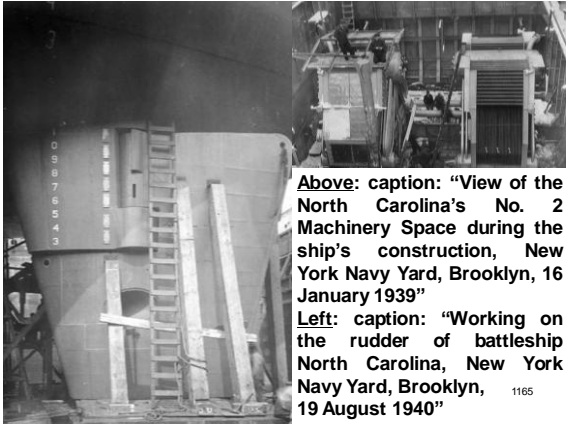
1162

First-Class

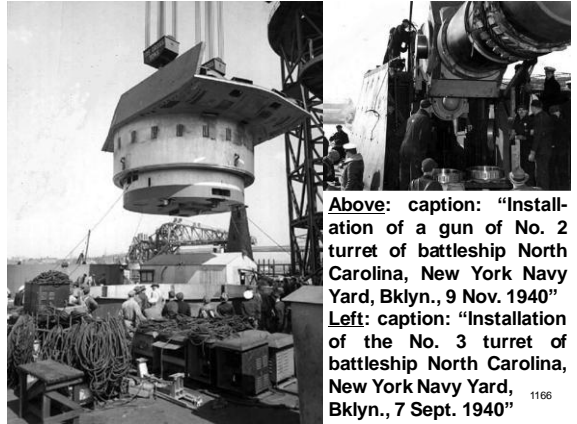
*"...So today's ceremonies mark the first laying of the keel for a first-class battleship in this country in 17 years."
The Brooklyn Daily Eagle, October 27, 1937*

1163

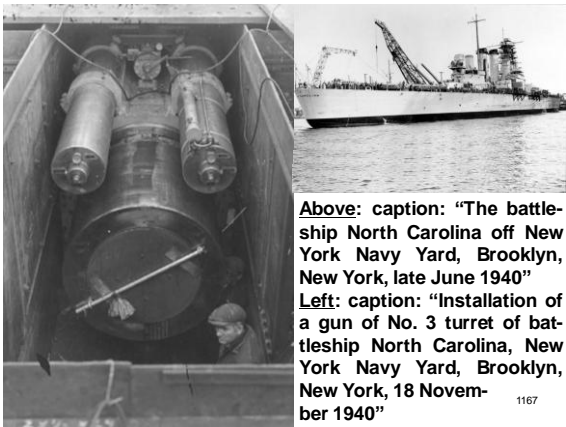
1164



Above: caption: "View of the North Carolina's No. 2 Machinery Space during the ship's construction, New York Navy Yard, Brooklyn, 16 January 1939"
Left: caption: "Working on the rudder of battleship North Carolina, New York Navy Yard, Brooklyn, 19 August 1940" 1165



Above: caption: "Installation of a gun of No. 2 turret of battleship North Carolina, New York Navy Yard, Bklyn., 9 Nov. 1940"
Left: caption: "Installation of the No. 3 turret of battleship North Carolina, New York Navy Yard, Bklyn., 7 Sept. 1940" 1166



Above: caption: "The battleship North Carolina off New York Navy Yard, Brooklyn, New York, late June 1940"
Left: caption: "Installation of a gun of No. 3 turret of battleship North Carolina, New York Navy Yard, Brooklyn, New York, 18 November 1940" 1167



Above & Left: caption: "North Carolina fitting-out at New York Navy Yard, Brooklyn, 17 April 1941" 1168



Above: caption: "Launching ceremony of battleship North Carolina, New York Navy Yard, Brklyn., 13 June 1940"
Left: caption: "Battleship North Carolina at New York Navy Yard, Brooklyn, New York 1941" 1169

Expansion

1170

Expansion of Navy Yards to meet the requirements of the enlarged fleet preceded the declaration of an emergency, in 1938, shortly after *Congress* authorized an increase in the fleet by about 20%. At that time, there were eight Navy Yards in operation for the primary function of construction and repair of naval vessels. Three of these; at Portsmouth, N.H., Boston, Mass. and Brooklyn, N.Y. - had been established in 1800, two years after the *Department of the Navy* was created as an independent organization. In the period between 1920 and 1938, only a moderate amount of important construction was accomplished at Navy Yards. In 1934, a large machine shop was built at Puget Sound; in 1936, a sheet metal and electrical shop was built at Norfolk and in 1937, a graving dock was built at Mare Island. However, a considerable amount of work of lesser magnitude was accomplished during this period, partly under naval public work appropriations, but principally through allocations from *National Industrial Recovery Administration* (NIRA), *Civil Works Administration* (CWA), *Works Progress Administration* (WPA), and *Public Works Administration* (PWA) appropriations for unemployment relief during the *Great Depression*. This proved to be a constructive and effective use of relief funds. Without the rehabilitation, modernization and improvements that were accomplished prior to America's formal entry into WWII in December 1941, the Navy Yards would have been unprepared for the "Big Show" that was WWII. 1172

The Program

Between 1938 and 1945, a total of \$590 million was expended for construction and improvements at Navy Yards. The program was initiated by an appropriation of \$20,045,000 for public works at Navy Yards in the *Naval Appropriation Act of 1938*. These funds were earmarked by *Congress* for specific projects to overcome recognized deficiencies and to meet, in part, the enhanced needs of the *Vinson Fleet Expansion Bill of 1938*. In the fall of 1938, the *Chief of the Bureau of Yards and Docks* prepared a comprehensive plan for the improvement of the naval shore establishment, based on a survey of overall requirements for these purposes. This plan, issued on January 1, 1939, contemplated total expenditures of \$330 million. Of this total amount, \$75 million was proposed for correction of accumulated deficiencies at Navy Yards and \$70 million additional was proposed for yard improvements needed in connection with the Vinson program. Projects at Navy Yards thus represented 44% of the whole program. 1173

During fiscal years 1939 and 1940, \$116 million was provided by *Congress* (under the appropriation "Public Works, Navy") for Navy Yard projects. By mid-1940, with the 1939 plan barely half financed, the USN was faced with a further expansion of unprecedented proportions. The *Two-Ocean Navy Bill*, passed in July 1940 (shortly after the fall of France) superimposed an expansion of 70% in the fleet (on top of the previous 20% Vinson expansion of 1938) and an additional 11% expansion (authorized earlier in 1940). Money for the ships of this two-ocean Navy was appropriated to the *Bureau of Ships*, which, in turn, allotted funds to the *Bureau of Yards and Docks* for the construction of facilities needed to build and repair the supplemental vessels. 1174

Between July 1940 and December 1941, the *Bureau of Ships* transferred +\$250 million of its "Two-Ocean Navy" money to the *Bureau of Yards and Docks* for work at Navy Yards. In the same period, only about \$33 million was appropriated directly to the *Bureau of Yards and Docks* for Navy Yard work. Of this latter amount, \$10 million was allocated for an annex to the *Brooklyn Navy Yard*, to be established on recently filled land at Bayonne, N.J. 1175

While the USN was gathering its added momentum, a board headed by *Rear Admiral John W. Greenslade* was re-evaluating the basic needs of the shore establishment. The board's report, dated January 6, 1941, reiterated the *Hepburn Board* recommendation that the shore establishment on each coast should be able to maintain the entire Navy, i.e. the authorized two-ocean Navy. This objective could be attained by setting up a shore strength capable of maintaining 60% of the Navy on a single-shift working basis or 100% of the Navy on a three-shift basis. In July 1940, when the two-ocean Navy was authorized, the fleet had 1,058 ships in commission, including some ships of the 20% program, already completed. The new program contemplated an ultimate deployment, by 1946, of more than 2K ships. 1176

A large part of the new shipbuilding and most of the additional repair and overhaul work entailed by these programs devolved to the Navy Yards. The public works program at these yards during the last eighteen months of peace was concentrated on providing, asap, the expansion of facilities. When war finally came, substantial progress had been made by the *Bureau of Yards and Docks* and its field forces in the execution of this expansion, for which more than \$350 million had been made available. Many individual projects were substantially complete by December 7, 1941, well ahead of schedule. Their early availability contributed significantly to the rapid mobilization of the fleet and the speedy conversion of merchant vessels taken over by the USN.

1177

However, actual war demanded ships in numbers far greater than the USN had planned for its two-ocean strategy. The anti-submarine campaign required many novel classes of ships, i.e. destroyer escorts, corvettes, frigates and escort carriers. The long-range strategic plans called for a vast fleet of vessels of entirely new types (i.e. landing ships and craft of every description for amphibious operations). By mid-1945, there were more than 10K ships in active commission (exclusive of small landing craft). Much of the construction and some of the repair of these combatant and auxiliary vessels was performed at private shipyards, or at new emergency shipyards financed in part or in whole by the USN. Nevertheless, the volume of work imposed on the Navy Yards continued to increase to proportions undreamt of prior to the war. It was necessary, repeatedly, to revise upward the estimates of requirements which, when first submitted, had seemed extravagant to those in authority.

1178

The bulk of the USN's new ship construction was accomplished in East Coast yards. Repair facilities were generally adequate for the needs of the Vinson program, due to the small proportion of the fleet operating in the Atlantic, but extensive increases of the shipbuilding facilities were mandatory. The authorization of the two-ocean Navy, in 1940, involved both radical increases in the scope of the public works program at Navy Yards and new concepts in shipbuilding practice as applied to capital ships. By way of major reconstruction, involving extensions and strengthening of the groundways and overhead crane structures, it was possible to build the new battleships of the *North Carolina* and *Iowa* classes, assigned to the East Coast shipbuilding Navy Yards, on existing inclined shipways.

1179

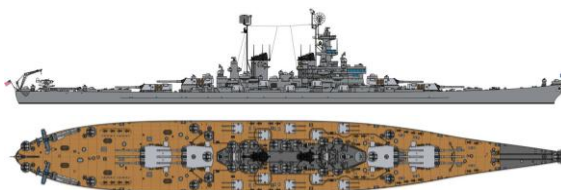
Many unprecedented problems were encountered and solved on these projects. The *Iowa-class* battleships had a nominal displacement of 45K-tons, based on *London Treaty* standards, but an actual displacement of +55K-tons. To permit safe launching of these vessels, with a launching weight of more than 32K-tons, it was necessary to provide quadruple launching ways, 6K-ton triggers and substructures at the pivoting points capable of supporting 18K-tons instantaneous pivoting pressure. These were the heaviest ships ever launched from inclined ways.

1180



Launching of USS Iowa, August 27, 1942

1181



The new expansion program included five battleships of the *Montana-class*, with a *London Treaty* displacement of approximately 58K-tons and a true displacement of nearly 70K-tons. These ships, whose dimensions were predicated on the availability of the third set of *Panama Canal* locks, had a beam greater than the clear space between the crane supports of the existing shipways. It was necessary to provide either new shipways or shipbuilding dry docks. The latter was selected first, to avoid the problems and hazards involved in launching ships of such unprecedented size and, second, to gain the advantages in ease of access, facility of construction and simplification of weight-handling operations inherent in the use of dry docks.

1182

Caption: "Montana-class battleship"



The *Montana-class* battleships, authorized under the *Two Ocean Navy* building program and funded in fiscal Year 1941, would be the last of the kind ever ordered by the USN. The ships were nearly one-third larger than the preceding *Iowa-class* and at 920-foot-long; beam of 121-feet and a displacement of 60,500-tons they would have been even larger than *HMS Vanguard* (left), the last battleship ever to be built.

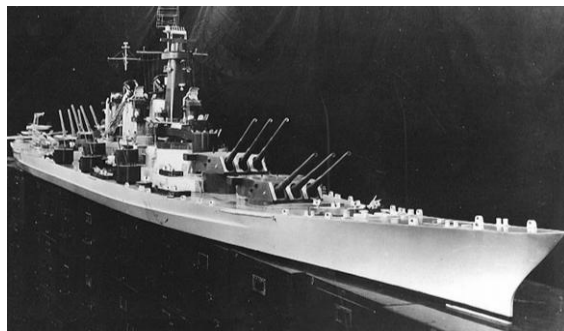
Above: caption: "HMS *Vanguard* in 1953. The increased sheer forward is clear. This made her much dryer than previous British battleships – and *USS Iowa*" 1183

A total of five *Montana-class* battleships were ordered, with *Montana*, the lead in her class (BB-67) to be built at the *Philadelphia Navy Yard* along with *Ohio* (BB-68). *Maine* (BB-69) and *New Hampshire* (BB-70) were to be constructed at the *Brooklyn Navy Yard* and *Louisiana* (BB-71) built at the *Norfolk Navy Yard*. Had they been built, they would have required a crew of at least 2,355 personnel, up to as many as 2,780 (if operated as a flagship). Each of the five ships was to carry twelve 16-inch guns, three more than the *Iowa-class*, but its massive size, increased armor and added firepower came at a cost. First, the *Montana-class* battleships were not fast enough to escort carriers (but fast enough to operate in the battle line). Given the threat of enemy aircraft, the slower speed was an issue. There's the argument that the class was really meant to be a "Yamato killer," capable of taking on the Imperial Japanese Navy's super-battleship. However, the USN didn't know about the Yamato's 18-inch guns until 1944, well after the class was conceived. 1184



USS Yamato

1185



Before construction began, the impact the aircraft carrier had in pushing back the Japanese made it clear that the USN's need for more aircraft carriers, amphibious and anti-submarine vessels resulted in a suspension of the program in May 1942, before a single keel had been laid. Just over a year later, when it was clear that the "Age of the Battleship" was at an end, on July 21, 1943, the program was formally canceled. 1186
Caption: "Montana-class model"

Construction was begun on the first two "Superdocks," at Norfolk and Philadelphia, in June 1940. These docks were 1,092-feet-long and 150-feet-wide. In 1941, a second ship-building dock was started at Philadelphia and two similar docks were undertaken at the *Brooklyn Navy Yard*. All these docks were built by the "Tremie Method" and were completed, ready for laying of keels, in from 17 to 21 months, as compared with prior times of three to eight years.

1187



The progress of the war dictated the later abandonment of the program for building super-battleships and, instead, the construction of aircraft carriers of the *Midway-class*. A large number of carriers and other smaller vessels were built in these docks in time to play a significant part in the USN's fleet operations in the last two years of the war.

Caption: "USS *Midway* underway soon after commissioning, 1946" 1188



In August 1940, the first of two important moves was made to provide adequate ship repair facilities on the West Coast when work was started on the new repair facility at *Terminal Island*, San Pedro, Calif. On the East Coast, ship repair facilities were augmented by the development of a new repair base at Bayonne, N.J., immediately adjacent to the *Bayonne Supply Depot*. This base was developed to a well-integrated small repair facility by the addition of quay walls, shops and utilities and ultimately became the *Bayonne Annex of the Brooklyn Navy Yard*.

Caption: "Structural and Machine Shop, Bayonne Annex of the Brooklyn Navy Yard" 1189

The *Brooklyn Navy Yard* was greatly expanded by the acquisition of four successive parcels of highly developed and expensive urban property which increased its land area from 120 to 195 acres and by the construction of a large number of shops, storehouses, piers and other facilities, which converted a congested and antiquated yard into a modern, well-equipped and exceptionally efficient plant.

1191



This project included a 1092-foot-long dry dock, initially conceived for the repair and overhaul of transatlantic liners entering New York harbor, for which there were no existing facilities. 1190

Caption: "Crane, Drydock and Sheet Metal Shop, Bayonne Annex of the Brooklyn Navy Yard"

Located on the Brooklyn-side of the *East River*, between the *Manhattan* and the *Williamsburg Bridge's*, the *Brooklyn Navy Yard* has undergone more major alterations during its history than any other major shore establishment, particularly in the *Cob Dock* area, due in part to the changing size and character of vessels and partly to the irregular site located in a congested metropolitan area. The improvements made during the pre-war emergency period and during the war years constituted the most comprehensive and complex reconstruction program undertaken at any yard and in many ways, involved the most difficult engineering problems; particularly in regards to foundations and to not disturbing productive operations.

1192

Prior to 1938, there were four dry docks, ranging from a small 349-foot *Dock No. 1* to the 695-foot *Dock No. 4*. The latter was noteworthy because of the unique methods used in its construction (after conventional methods had repeatedly failed). The entire perimeter was composed of rectangular concrete wall caissons, sunk by the pneumatic method. The floor was also supported on pneumatic caissons. The assignment of the contract for the building of the battleship *U.S.S. North Carolina* to the *Brooklyn Navy Yard* necessitated the lengthening of this dock by 32-feet, in order that the ship could be docked, if necessary, after launching or during outfitting.

1193

A V-notch extension, authorized in 1938, was successfully completed despite the many difficulties encountered, mainly due to difficult site conditions and the proximity of the central power plant. The entire extension was sunk as a unit using compressed air methods. The structural shop was extended by the addition of two shop bays for the fabrication of specially treated steel armor, one of which was surmounted by an additional mold loft.

1194



Work was also begun on construction of a new 350-ton hammerhead crane for installing turrets and guns aboard the new super-battle-ships.
 Caption: "Hammerhead crane in the Brooklyn Navy Yard" 1195



This crane, like its counterpart at Norfolk, was of the turntable type (rather than a *pintle* crane).
 Caption: "Hammerhead Crane, Norfolk Navy Yard. This crane was built to provide a 350-ton lifting capacity at a 115-foot radius" 1196

The crane was provided with two main 175-ton trolleys, arranged in tandem on a single track, which could be operated independently or jointly; an auxiliary 50-ton trolley, with a reach of 190-feet and an auxiliary crane of 15-ton capacity traveling on top of the main rotor or hammerhead. These installations gave these cranes a capacity of 350-tons at 115-foot reach, 175-tons at 150-foot reach, 50-tons at 190-foot reach and 15-tons at an extreme reach of 240-feet.

1197



1198



1199

Completed in 1940, in 1939 work commenced on a new *Turret and Erection Shop*, located at the extreme west-end of the *Brooklyn Navy Yard*. This project involved the acquisition of some additional land and extensive demolition and site preparation. The building was a single bay structure; 800-feet-long, 100-feet-wide, and 105-feet-high.

1200



The southern half was equipped with welding facilities and with a mold loft while the northern half was provided with two 175-ton bridge cranes for handling turrets. The crane runway was extended outside the building over a turret barge slip (the end of the building being closed by a unique group of mechanically operated doors providing nearly full opening of the end of the building).

1201

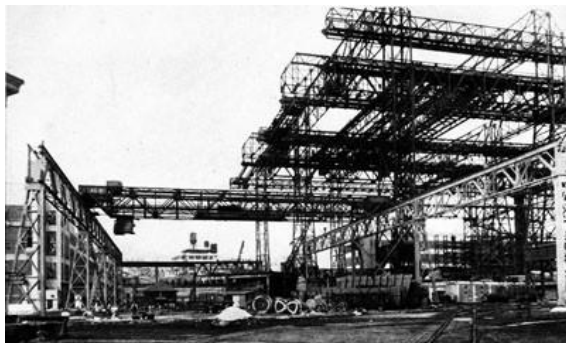
Caption: "Turret and Erection Building (Interior), Brooklyn Navy Yard"



Shipways No. 2, which had been completely re-constructed (partly by the WPA and partly by contract) to accommodate the **U.S.S. North Carolina**, was further strengthened and extended to handle the 45K-ton battleship **U.S.S. Iowa**.

Caption: "USS Iowa being prepared for launching from Shipways No. 2 at the Brooklyn Navy Yard, August 1942"

1202



The shipways crane structure was extended and the old 40-ton bridge cranes were replaced by new 50-ton cranes, specially designed to avoid significant increases in the loads on the structure.

1203

Caption: "Transverse Crane Runway, Brooklyn Navy Yard"

In July 1940, improvement of *Shipways No. 1* began and two small sub-assembly shops were built between the Shipways and *Dry Dock No. 1*. Improvements to the power plant were also undertaken, including a 150K-pound-per-hour boiler, two 5K-cfm compressors and alterations to the building.

1204

Also in July 1940, work began on a 16-story office and storage structure. This building was of reinforced-concrete construction, the storage floors being of flat slab design and the office floors of beam and girder type. The storage floors were windowless, with mechanical ventilation. This exceptionally heavy structure was supported on drilled-in piles, consisting of 30-inch steel cylinders sunk to rock (which varied from 120 to 140-feet below the surface). Cores were drilled into the rock for distances of 5 to 10-feet, and the shafts were filled with concrete encasing heavy H-columns. Exceptional progress was made on the construction of the superstructure.

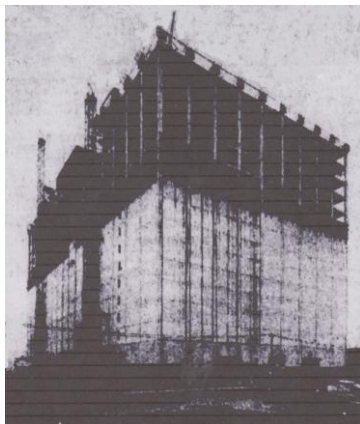
1205

Unusual speed has marked the erection of the new 16-story storehouse and office building at the Brooklyn Navy Yard, with the construction of more than 21 acres of floor space in 48 working days, it was reported today

The Brooklyn Daily Eagle, September 2, 1941

RE: introduction to an article entitled: "Navy Building Rises 1 Floor Every 3 Days." In 1941, the *Brooklyn Navy Yard* was frantic with activity in anticipation of America becoming involved in the World War that was then raging in Europe and the Far East. Thus, it took only five months to construct *Building 77* - a 16-story, one-million-square-foot command and supply center running operations for the entire North Atlantic fleet. Constructed of reinforced cast-in-place concrete, the massive structure housed supplies in the bottom, windowless two-thirds. The top third, which did have windows, served as offices. Two five-ton gantry-fed rail lines ran along the east-west axis of the building and trains would roll in, load-up, and continue on to waiting ships.

1206



Caption: "NEW NAVY BUILDING - This new concrete storehouse and office building being erected in the Brooklyn Navy Yard by the Turner Construction Company will be completed early in December. The 16-story building has been constructed with great speed. Since the second floor was completed on June 24, 21 acres of floor area have been produced in 48 working days at the rate of one entire floor every three days."

1207

1208

"THE building is being constructed by the Turner Construction Company, under plans furnished by the Bureau of Yards and Docks of the United States Navy. One entire floor with its supporting columns has been built every three days. During each of these three-day periods, 200 tons of reinforcing steel were set, 2,100 cubic-yards of concrete were poured, 61,000 square-feet of floor finish was applied and all incidental mechanical and installation work was performed..."

The Brooklyn Daily Eagle, September 2, 1941

"...The foundation work was completed on June 9 after unusually difficult sub-surface conditions were discovered, making it necessary for the excavators to go down 150-feet to rock. A new type of 30-inch steel pipe caisson was socketed into the rock for six to eight feet and filled with concrete and a structural steel core."

The Brooklyn Daily Eagle, September 2, 1941

1209



Simultaneously, work began on a new receiving barracks for ships' crews. Because of limited space, one whole city block, across Flushing Avenue from the yard, was acquired by condemnation and a six-story fireproof, reinforced-concrete structure; 200 by 350-feet, with six dormitory wings on either side of the central spine, was constructed. This structure, which had a nominal capacity of 2,500 and a peak capacity of 4K, contained under one roof all the accessory facilities required for a complete receiving station.

Caption: "Receiving Barracks and Dental Clinic (right) at the Brooklyn Navy Yard"

1210

In April 1941, a cost-plus-fixed-fee contract was let for the two shipbuilding dry docks, together with a new *Sub-Assembly Shop*. This project was located at the east-end of the yard and involved the reacquisition (by condemnation) of the *Wallabout Market* area. This tract, which was originally acquired by the USN early in the 19th century, had been sold ca. 1890 to the *City of New York* and a municipal market erected on the site. The displacement of this market caused considerable difficulties. Occupants were allowed to remain as long as possible under revocable permits. At one time, 182 such permits were in force.

1211



Wallabout Market, ca.1940

1212

The project included extensive site preparation, including bypass roads and tracks around the site; removal of two Navy Yard piers and the causeway between the main yard and *Cob Dock*; elimination of the *Brooklyn Eastern District* railroad terminal; removal of four piers in the *Marine Channel* and demolition of the market buildings.

1213



Sub-Assembly Shop, Brooklyn Navy Yard"

1217

The work also included the construction of *Pier/s J and K*, which were of unusually heavy construction. The substructure consisted of a 3-foot concrete slab at tide level supported on steel cylinders reinforced with three steel H-piles each and filled with concrete. The coping walls, crane-track foundations and service tunnels were erected on this slab, earth-fill placed and concrete decks laid. These piers were designed for capital ship repair work and were equipped with exceptionally heavy utilities and services. This project also included the removal of *Pier H*; the construction of quay walls between *Pier/s J and K*; the construction of a barge basin; a new railroad transfer bridge and classification yard; a scrap metal plant; a coaling plant; a 250-ton-per-day incinerator and an assembly yard runway equipped with two 25-ton cranes. Total expenditures under this contract was \$73,360,843.

The *Sub-Assembly Shop*, located at the head of the docks, was 800-feet-long, 100-feet-wide, and 105-feet-high, with an attached steel storage shed alongside; 760-feet-long, 83-feet wide and 56-feet-high. In general design, the main shop was similar to the *Turret and Erection Shop* previously constructed at the west-end of the yard.

1214

Subsequently, this contract was increased to include extensive improvements in the *Kent Avenue* area (on additional land acquired by condemnation) and in the *Cob Dock* area. The work included the construction of a huge twin-tube municipal outfall sewer; 2,630-feet-long with a waterway of 264 square-feet; the filling of the *Kent Avenue Basin* and the construction of various service facilities.

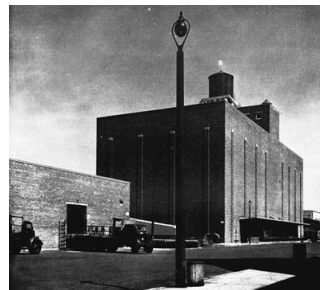
1216

A number of other major projects were executed under other contracts. The *Central Power Plant* was completely removed and replaced with a modern plant on the same site, without interrupting service, by an ingenious and complicated sequence of successive steps and a new circulating water loop provided, at a total cost of \$8,577,934.

1218

In 1941, a new foundry was erected on the Wallabout tract, and in the fall a seven-story ordnance shop; 160 by 320-feet, was begun on the site of the old foundry. A triangular six-story extension was built on the structural shop to provide adequate office and personnel facilities. Late in 1941, a six-story steel-frame brick building, 350 by 100-feet, was begun to house the material testing laboratory.

1219



- Also in 1941, seven additional buildings were constructed, including:
- a six-story paint and oil storehouse;
 - a compressed-gas storehouse;
 - a ship's superintendents' building;
 - a three-story utility building at the fitting-out pier, and;
 - a motion picture exchange.

1220

Caption: "Paint and Oil Storehouse, Brooklyn Navy Yard"

In 1942, additional projects were undertaken, including a *Welding and Fabricating Shop* (practically matching the *Sub-Assembly Shop* in size, but of timber construction) and a sawmill, joiner and *Boat Shop*; L-shaped, 290- by 440-feet, three-stories-high and also of timber construction. In 1943, the 350-ton hammerhead crane, which had started to settle, was underpinned and the quay wall strengthened and tied back to concrete deadmen.

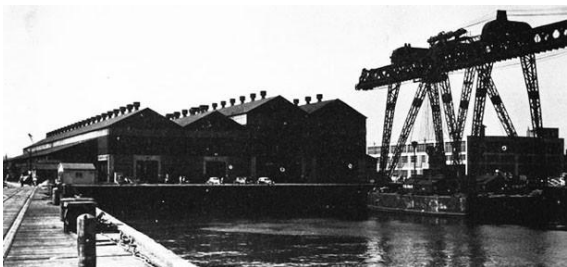
1221



Partly because the location and congestion of the yard dictated fireproof multi-story buildings and partly because the comprehensive program was planned in considerable detail (and undertaken before materials became critically scarce), the *Brooklyn Navy Yard* was fortunate in obtaining the greater portion of its new facilities of permanent, fire-resistant construction.

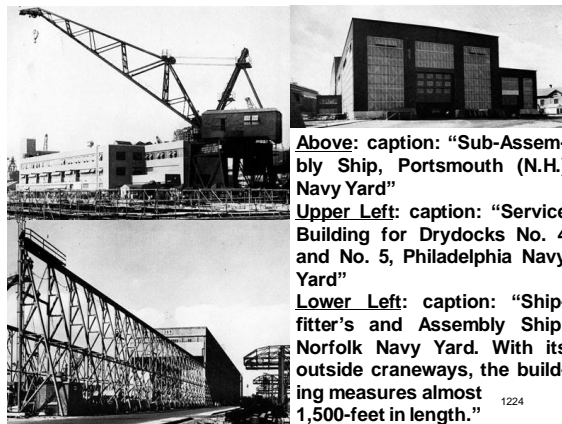
1222

Caption: "Production Utility Building, Brooklyn Navy Yard"



Similar expansions of facilities were made progressively at all the other Navy Yards on the East Coast, including additional shipbuilding docks for smaller vessels at Portsmouth and Charleston; a dock for the construction of escort vessels at Boston; a cruiser repair dock at the South Boston Annex and small docks in private yards at Savannah and Philadelphia.

Caption: "Waterfront Shops at the South Boston Navy Yard Annex" 1223



Above: caption: "Sub-Assembly Ship, Portsmouth (N.H.) Navy Yard"

Upper Left: caption: "Service Building for Drydocks No. 4 and No. 5, Philadelphia Navy Yard"

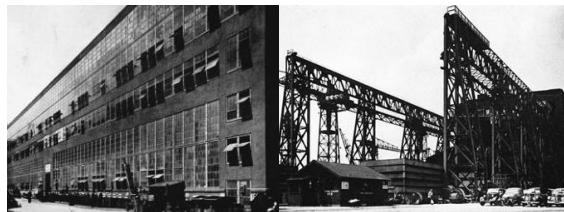
Lower Left: caption: "Ship-fitter's and Assembly Ship, Norfolk Navy Yard. With its outside cranes, the building measures almost 1,500-feet in length." 1224



Above: caption: "Machine (right) and Shipfitter's Shops, St. Helena Area of the Norfolk Navy Yard. Note the welded steel sidings"



Left: caption: "Layout Shop (Interior) at the Charleston Navy Yard. This shop is in the north yard, a/k/a Noisette Creek tract" 1225



Above: caption: "Turret Shop, Philadelphia Navy Yard. Large craneways made of 16-inch and 20-inch I-beams support the bridge crane used in moving turrets and parts in and out of the shop"



Upper Left: caption: "Turret Shop, Philadelphia Navy Yard"

Lower Left: caption: "Pattern Shop and (left background) Foundry, Philadelphia Navy Yard" 1226

Part 10

Finest Hour

Hitting its Peak

1227

1228

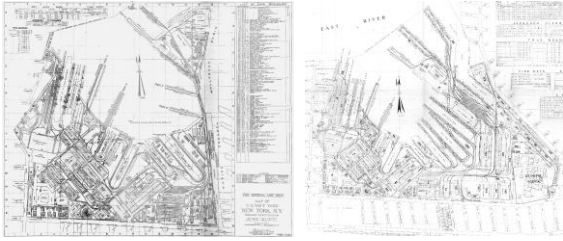


"...During World War II the Brooklyn Navy Yard hit its peak. More than 5,000 ships were repaired and 250 converted. The chief job done by the record number of 69,000 workers was the building of the battleships Iowa and Missouri, the carriers Bennington and Bon Homme Richard, Kearsage, Oriskany and the giant Franklin D. Roosevelt." The Brooklyn Daily Eagle, February 23, 1951

Top: caption: "The Brooklyn Navy Yard was at its height of activity during WWII" Bottom: caption: "Workers at the Sands Street Gate of the Brooklyn Navy Yard during WWII" 1229



The Brooklyn Navy Yard was allotted \$15 million to build two new dry docks, expand another and construct an annex and dry dock in Bayonne, NJ. This expansion would transform the yard into the busiest ship repair facility on earth during WWII, when it serviced more than 5K vessels from the Allied navies. It also built two heavy landing craft, two battleships and five aircraft carriers (the latter built in the new dry docks). Caption: "The USS Franklin D. Roosevelt sails down the East River after leaving the Brooklyn Navy Yard in 1945" 1230



In early 1940, the USN made preparations to take-over the neighboring *Wallabout Market*. This take-over didn't just involve acquiring more land, but the complete reconfiguration of the shoreline. The *Marine Channel*, which received barges and rail cars of produce for the market, was filled-in to make way for the two new dry docks. *Cob Dock*, a tidal flat in the *East River* that had grown with landfill and ballast dumped by passing ships into the yard's *Ordinance Dock* (and many other functions), was dredged and reconfigured into three new piers (G, J, and K). Most impressive about this expansion was the speed with which it was completed.

Left: caption: "New York Navy Yard, 1939"
 Right: caption: "New York Navy Yard, 1943"

1231



Largest and Greatest



"DURING World War II the Brooklyn Navy Yard grew to be the largest and greatest Navy Yard in the world..."

The Brooklyn Daily Eagle, December 9, 1945
 Caption: "Scores of thousands of New York Navy Yard workers will feel a tingle of pride run up and down their backbone today when the mighty battleship *Missouri* hits the waters of the East River for the first time. Once again, a warship of breathtaking size and complexity and beauty has been borne of our sweat and brawn and brain. The first of her history-making class – the New-York-Navy-Yard-built *USS Iowa* – was launched from the very same ways seventeen months ago..."

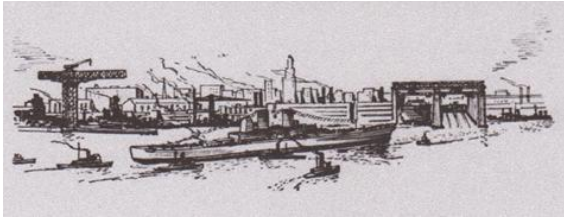
1233



Caption: "First day of work for women at the Navy Yard" (Brooklyn Daily Eagle, September 14, 1942)

Hat-in-the-Ring

1236



"...Here were built aircraft carriers, battleships, cruisers, destroyers and other war vessels that conquered the navies and air forces of our enemies and made America the new mistress of the seas. Mistress, too, of the skies above. Here were repaired, refitted and sent back into action countless ships of our own and of our Allied navies that had been bombed and torpedoed while taking part in the invasion of Normandy and the Pacific islands..."

The Brooklyn Daily Eagle, December 9, 1945

1237



Caption: "The French battleship Richelieu arrives at the Brooklyn Navy Yard in February 1943 for repairs following the Battle of Dakar"

1238



1239

Since Pearl Harbor

1240

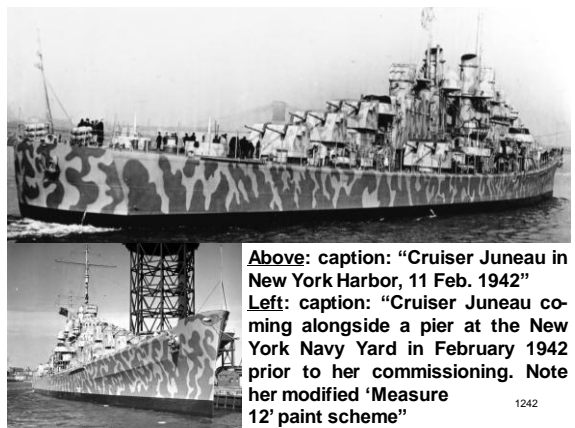


"...Since Pearl Harbor the Brooklyn Navy Yard has built 17 ships, including two huge battleships, five aircraft carriers, eight LSTs and two floating workshops. When submarine warfare was at its height the yard had as many as 67 ships under repair at one time. During 1944 alone the yard made repairs and alterations on 1,539 ships, as compared with 869 in the previous year and 345 in 1942..."

The Brooklyn Daily Eagle, December 9, 1945

Caption: "During WWII, the battleships Iowa and Missouri and aircraft carriers Bennington, Bon Homme Richard, Kearsarge, Oriskany and Franklin D. Roosevelt were built at the Brooklyn Navy Yard. Two destroyers were also built at the yard (Farragut-class Hull and Dale)."

1241



Above: caption: "Cruiser Juneau in New York Harbor, 11 Feb. 1942"

Left: caption: "Cruiser Juneau coming alongside a pier at the New York Navy Yard in February 1942 prior to her commissioning. Note her modified 'Measure 12' paint scheme"

1242



Caption: "The five Sullivan brothers aboard USS Juneau upon her commissioning at New York Navy Yard, 14 Feb 1942. Left-to-Right they are Joseph, Francis, Albert, Madison and George. All five were later lost with the ship." 1243

"...Besides this there was a staggering amount of work supervised outside by the yard's Field Production Division. This huge task, during a three-year period, involved the conversion and alteration of 11,138 transport and patrol vessels and the assembling of 3,581 landing craft. In addition, the division made tens of thousands of service calls..."
The Brooklyn Daily Eagle, December 9, 1945

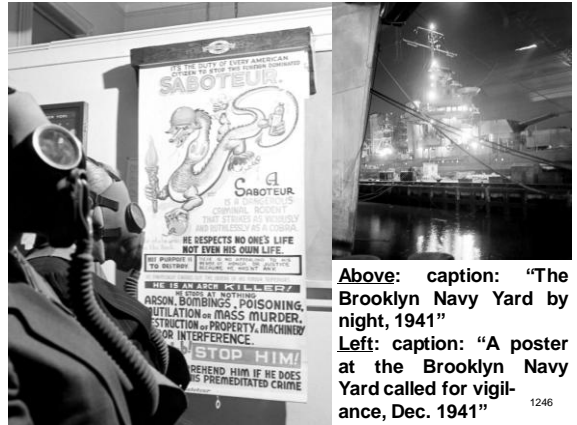
1244



"...At the peak of its activity nearly 75,000 men and women were employed by the yard and the monthly payroll ran between \$15,000,000 and \$16,000,000. The manpower requirements for the Navy Yard's wartime production schedule rose from 2,479,830 man-days in 1942 to 6,591,203 man-days in 1944. Demands in the early part of 1945 were even greater..."

The Brooklyn Daily Eagle, December 9, 1945
Top: caption: "A worker on break at the Brooklyn Navy Yard"
Bottom: caption: "A Naval officer gazes at a cruiser's propeller at the Brooklyn Navy Yard"

1245



Above: caption: "The Brooklyn Navy Yard by night, 1941"
Left: caption: "A poster at the Brooklyn Navy Yard called for vigilance, Dec. 1941"

1246



A rally at the Brooklyn Navy Yard, December 1941

1247

"E" is for Excellence

1248



"...Brooklyn Navy Yard was the first Navy Yard in the country to win the Navy 'E' emblematic of excellence in wartime production. Not long thereafter it became the first naval establishment to win a renewal of the "E" award, symbol of continued excellence..."

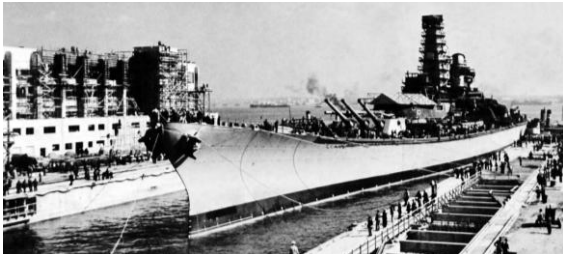
The Brooklyn Daily Eagle, December 9, 1945

RE: the Army-Navy "E" Award was an honor presented to companies during WWII whose production facilities achieved "Excellence in Production" ("E") of war equipment. The award was a/k/a the "Army-Navy Production Award." An earlier award; the Navy "E" Award, had been created in 1906. The award was created to encourage industrial mobilization and production of wartime materials.

1249

Iowa-class

1250

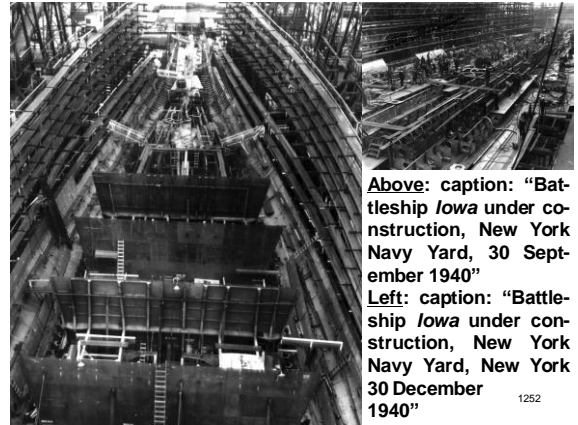


"...A sure indication of the speed and efficiency with which the Navy Yard was to work throughout the war came with the launching of the U.S.S. Iowa on August 27, 1942. The largest and most powerful battleship ever built up to that time, weighing 45,000 tons and capable of firing farther and faster than any other ship afloat, the Iowa went down the ways seven whole months ahead of schedule. She represented two years of unceasing labor and maximum cooperation among personnel..."

The Brooklyn Daily Eagle, December 9, 1945

Caption: "USS Iowa leaves the New York Navy Yard for completion at the specially built Naval Supply Base, Bayonne, New Jersey, October 20, 1942"

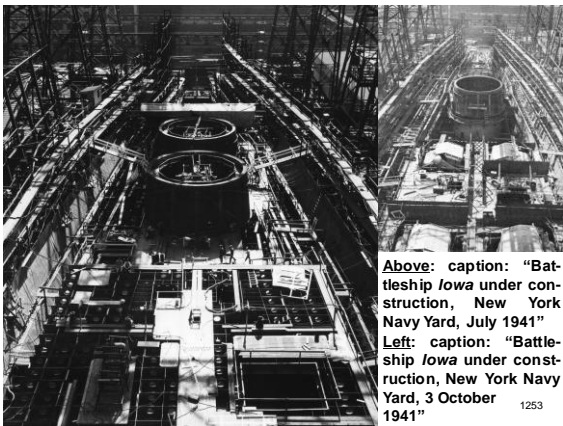
1251



Above: caption: "Battleship Iowa under construction, New York Navy Yard, 30 September 1940"

Left: caption: "Battleship Iowa under construction, New York Navy Yard, New York 30 December 1940"

1252



Above: caption: "Battleship Iowa under construction, New York Navy Yard, July 1941"

Left: caption: "Battleship Iowa under construction, New York Navy Yard, 3 October 1941"

1253



Above: caption: "USS Iowa at the New York Naval Shipyard, Brooklyn, 15 Jan 1943"

Left: caption: "USS Iowa off New York Navy Yard, 9 July 1943"

1254





Flat-Tops

1256



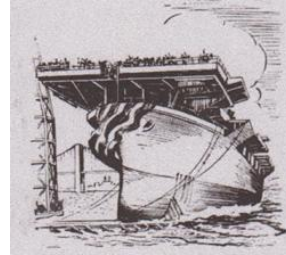
"...In May, 1945, two major aircraft carriers were launched within a week. The U.S.S. Kearsarge went down the ways six days after the dry dock launching of the U.S.S. Franklin D. Roosevelt."

The Brooklyn Daily Eagle,
December 9, 1945

Top: caption: "6/5/45 - Essex-class Aircraft carrier launched--The 27,000-ton aircraft carrier *Kearsarge* slides into the water after being christened in a U.S. Navy Yard in New York City 14 months after her keel was laid.

Bottom: caption: "6/6/45 - U.S.S. *Franklin D. Roosevelt* Launched - Water flows into the drydock in which the Roosevelt was built, as the huge aircraft carrier is floated for the first time in New York City. The 45,000-ton ship, one of a class of three of the largest U.S. warships ever built, will carry more than 80 twin-engined planes of a new type and an undisclosed but large number of anti-aircraft guns, ranging up to five inches (127 mm.) in size. The giant carrier was completed in the record time of 17 months."

1257



1258

Colossus of Brooklyn

Uncle Sam decided back in 1801 to build a Navy Yard convenient to the promising little settlement of New York. After shopping around he invested five dollars in a 42-acre piece of land on the Brooklyn waterfront. Today, colossal is the only word to describe the operations of the New York Navy Yard at Brooklyn. The 70,000 employees of this largest Navy Yard in the world form a community about as large as Schenectady, N.Y., or Topeka, Kan. The original 42 acres on the East River near Brooklyn Bridge have grown to 290. Four annexes raise this totaling 788 acres. Eighty more locations, mostly in Brooklyn, are used for such purposes as storage.

Popular Mechanics, September 1945

RE: introduction to an article entitled: "The Colossus of Brooklyn"

1259

1260

One-Stop Service

“SIXTEEN shipyards in three states operate under the Navy Yard’s jurisdiction. More than 700 companies, each with sub-contractors, some as far west as Gary, Ind., make parts for its ships. What the Navy Yard manufactures is principally trouble for the nation’s enemies. In 1944 it performed repairs, alterations and other services on 1,618 ships, 833 of which went into dry dock. In addition the field service division handled 1,517 vessels built in private yards, fitting them out or providing alterations. Also, merchant ships totaling 7,286 paid service calls at the yard...”

Popular Mechanics, September 1945

1261

1262



“...While repairing and altering at the above rate, the yard has built and sent to sea during the present expansion program the greatest warships that have ever wet their hulls. These include the 45,000-ton super-battleships ‘Missouri,’ ‘North Carolina’ and ‘Iowa’ and the 27,000-ton ‘Essex-type’ aircraft carriers ‘Bennington’ and ‘Bon Homme Richard.’ Just a few months ago, from the six-story depth of one of the yard’s huge construction dry docks emerged the greatest airplane carrier ever built the 45,000-ton ‘USS Franklin D. Roosevelt’...”

Popular Mechanics, Sept. 1945

Caption: “Launching of carrier Bon Homme Richard”

1263

Yankee Ingenuity

“...Some of the problems which the yard, under Rear Admiral Freeland A. Daubin, commandant, and Rear Admiral Sherman S. Kennedy, General Manager, has solved are examples of Yankee ingenuity on a gigantic scale...”

Popular Mechanics, September 1945

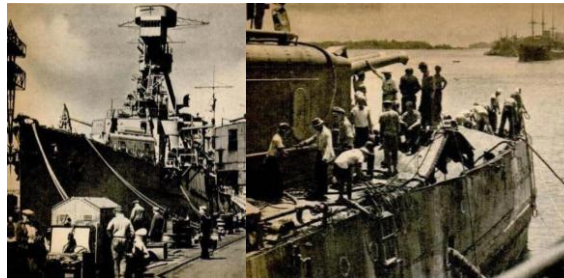
“...There was the time two 280-foot, 1,300-ton destroyer escorts limped into the yard. The stern of one was badly damaged. The midsection of the other had been blown out, but bow and stern were okay. The two vessels were set in a construction dry dock side-by-side. The two stern sections were cut from the two ships so that the good section could be transferred from the vessel damaged amidship. The 200-ton undamaged section was cradled in steel and concrete. Wooden skids were built, between the two destroyer escorts and greased. A block and tackle arrangement at the bottom of the dry dock reached to the top. A second block and tackle at this point led to a great crane. The crane lifted, the good stern edged sideways until it replaced the amputated stem...”

Popular Mechanics, September 1945

1265

1266

“...The great job, which was something like sewing a giant tip on the finger of a gargantuan glove, was completed in 21 days. The new ship, a combination of two badly damaged ones, was soon back at sea...”
Popular Mechanics, September 1945



“...Another remarkable job was performed on a destroyer which was towed in with the entire middle section damaged beyond repair. Cutting away the center of the ship, with the exception of enough deck for workmen to pass between bow and stern sections, the Navy Yard built in a new center and the nation had another seaworthy ship instead of a hopeless heap of scrap...”

Popular Mechanics, September 1945

Left: caption: “After trip half-way around the world, damaged cruiser ties-up at N.Y. Navy Yard in Brooklyn for repairs”

Right: caption: “Repair job for Navy Yard – stern of cruiser Marblehead caught a direct bomb hit in Battle of Java Sea. Note bulging afterdeck.”

1268

1267

“...One of the most difficult jobs ever tackled was to repair the stern of a warship after a collision with another vessel. The fan tail area was not only a jumble of twisted bunks and equipment, but was filled with gasoline and oil fumes, highly explosive and deadly to workmen. Quantities of powder and other explosives had been released into the damaged section by the crash. The problem was handled first by berthing the tinder box at a safe dock and calling fire fighting equipment. Powerful streams of water were hosed into the section until gasoline, oil and other explosives were washed out; Experts in diving costumes and others in gas masks tackled the wreckage by hand, using hack saws and cold chisels. Finally the ship was dry docked without hazard...”
Popular Mechanics, September 1945

Nose Job

1269

1270

“...Incredible as it seems, even in these modern days of fabrication, the yard has a stock of bows, or forward sections, for the most numerous classes of destroyers and destroyer escorts. In common with all ships which travel the sea, the bow sections are most often damaged by collision with other ships, docks and various obstructions. When a ship of this class comes in with severe damage it is often dry docked, the damaged area cut-away and a new nose is fitted on. ‘Plastic surgery’ goes to sea with the result that the damaged vessel is in lighting trim again in a couple of weeks...”
Popular Mechanics, September 1945

Construct or Repair

1271

1272

"...All jobs of this magnitude go into the repair dry docks which, along with construction dry docks, have reached the peak of efficiency in the New York Navy Yard. Great pits, lined with concrete and reinforced, they are approximately as deep as a six-story building is high and their floors are big enough for a football game with room to spare for the spectators..."

Popular Mechanics, September 1945

1273

"...On repair jobs ingenuity and the rush of activity at the yard combine to save time and put ships back at sea in record time. Whenever possible, four or five ships are lined up and floated in, the end of the dry dock is closed and water is pumped out. Repair crews numbering into the hundreds swarm onto the various vessels. Work is scheduled so all the vessels are finished about the same time..."

Popular Mechanics, September 1945

1274

"...Often several large warships, too wide to be placed parallel in a repair dry dock, are fitted in by placing the narrow bow of one alongside the narrow stern of another and continuing this pattern for the length of the dock. By such efficient use of the repair dock it is necessary only to empty them once and flood them once to handle a number of warships..."

Popular Mechanics, September 1945

1275



1276

"...The use of these gigantic concrete ditches is an advantage Uncle Sam did not have during the last war when all sizable warships were constructed on building ways which start above ground and slope into the water so a ship will slide off when launched. Although the New York Navy Yard still uses both building ways and construction dry docks, nowhere is the art of below-surface construction brought to greater efficiency than it is here in Brooklyn..."

Popular Mechanics, September 1945

1277



"...So huge are these concrete ditches that the gates which hold back the water while ships are being built are virtual ships themselves. They are steel caissons which can be floated away and moved at will by tug power. Floated into place, they are sunk into the mouth of the dock by permitting them to fill with water. Once the dock is emptied and construction is begun. When the ship is finished, the caisson is pumped dry, whereupon it floats to the surface. It is hauled off by a tug and the completed war vessel leaves the flooded dock under its own power..."

*Popular Mechanics, September 1945
Caption: "Famed 45,000-ton battleship Missouri hits the water" 1278*

1278

"...Construction dry docks cost more to construct than building ways because of the extent of excavation necessary and the reinforcement of bottom and walls. However, in the long run the method is cheaper and faster. When a ship is being designed for construction on a slanted building way, every angle under calculation must be modified to care for this slant. Construction on the horizontal bottom of a dry dock dominates these laborious calculations..."

Popular Mechanics, September 1945

1279

"...Another advantage of 'ditch' construction is that leaks can be discovered and corrected, trim and balance of a craft checked and motive power tested as soon as the dock is flooded. Any developments needing correction can be handled merely by emptying the dry dock. Still another advantage of the construction dry dock is that it serves as a repair dock instead of being out of commission on occasions when no vessels are being built..."

Popular Mechanics, September 1945

1280

Making it Look Easy

"...To move huge warship parts around the Navy Yard a network of railroad tracks supports one of the greatest collections of huge portable cranes in existence. Most of these cranes will lift 300,000 pounds with ease and place a section into the designated spot with exact precision..."

Popular Mechanics, September 1945

1281

1282



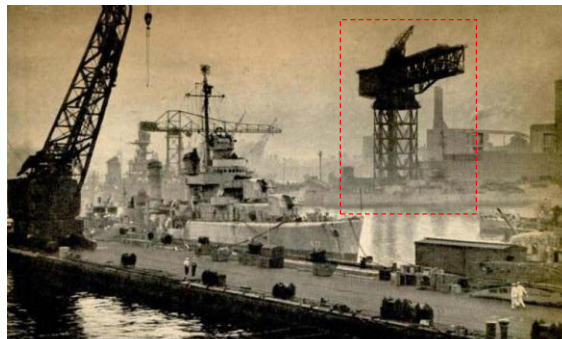
"...The cranes not only serve to move guns and fabricated parts onto ships being built, repaired or modified, but they do such odd jobs as loading 100-ton landing craft onto larger ships..."

Popular Mechanics, Sept. 1945

Top: caption: "Huge section of steel keel about to be lowered into dry dock"

Bottom: caption: "Landing craft is loaded aboard attack transport with big dockside crane"

1283



"...In addition, the yard boasts a gigantic hammerhead crane, so-called because it resembles a hammer with the vertical section simulating the handle..."

Popular Mechanics, September 1945

Caption: "Heavy dockside crane swings into position alongside destroyer; in right background is big hammerhead crane"

1284

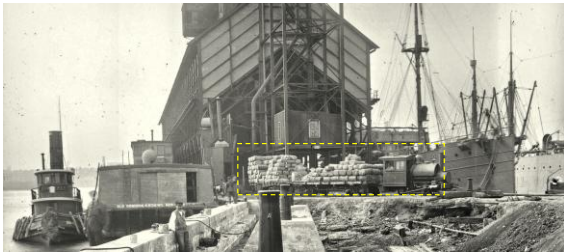


"...The crane will handle up to 900,000 pounds and it can sling a 200-ton tug, a 16-inch gun or a 150-ton turret section as a routine job..."
Popular Mechanics, September 1945
 Caption: "Workmen polish-up a 16-inch rifle before 175-ton crane hoists it aboard the 45,000-ton battleship Iowa"

1285

1286

The BNY Railroad



"...The 50 miles of railroad track which criss-cross the yard near Brooklyn Bridge do more than move cranes. They transport the 150 Navy Yard freight cars, hauled by electric and Diesel locomotives, and even include a classification yard. Despite the congested location of the yard, which has more skyscrapers within rifle shot than any other such establishment in the world, no civilian railroad connects directly with the Navy Yard railroad. ..."
Popular Mechanics, September 1945
 Caption: "Pier G (Coaling) April 27, 1911"

1287



1288



1289



1290

"...Every car which comes into the area is brought in by car float or car ferry. In addition to the huge waterborne traffic, 150,000 automobiles and trucks enter the Navy Yard every day..."

Popular Mechanics, September 1945

The Magnitude of the Operation

1291

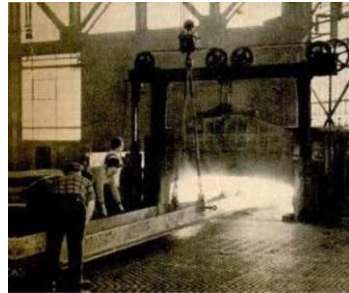
1292



"...Figures dealing with yard operation are gigantic by any measure. The stock pile of material on hand has an average value of \$180,000,000. More than 25,000 phone calls-a-day keep its 1,575 telephones busy. The monthly payroll runs \$15,000,000 and to facilitate the cashing of up to \$600,000 in payroll checks per-day a branch bank is operated within the yard. The building floor area is 6,500,000-feet. Paved roads total 22 miles. Forty restaurants do a \$3,500,000 business yearly..."

Popular Mechanics, September 1945

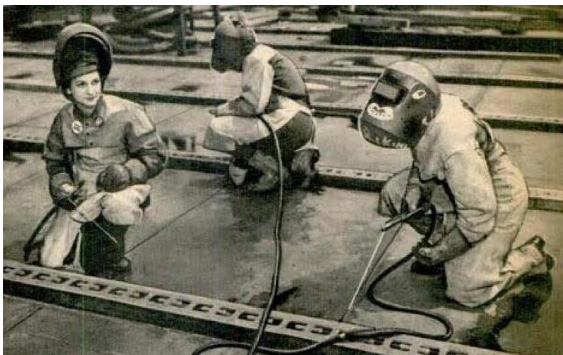
1293
Caption: "Yard officer uses gas-saving motorbike in inspection tour of sprawling N.Y. Navy Yard"



"...Salvage alone gives another idea of the magnitude of the operation. In an average year 105,400,000 pounds of iron and steel scrap are collected along with 7,656,000 pounds of non-ferrous scrap. The paper scrap item hits the 3,200,000-pound mark and 825,000 pounds of rags are collected, so that nothing valuable is wasted..."

Popular Mechanics, September 1945

1294
Caption: "One of the yard's blast furnaces receives piece of structural steel!"



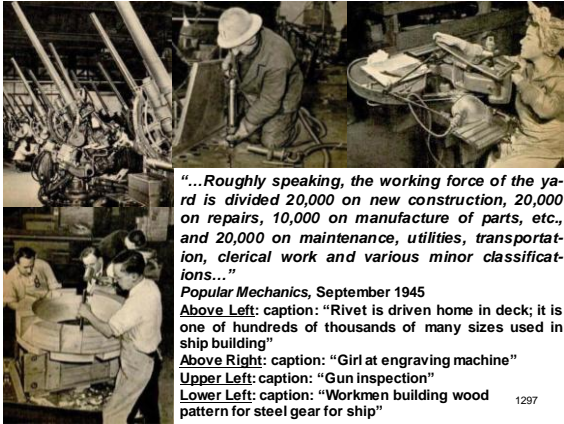
"...More than \$300,000 a year will be saved by a new oxygen carrying pipe line 10 miles in length with 700 outlets for welding and flame-cutting..."

Popular Mechanics, September 1945

1295
Caption: "Woman welders at work on a carrier's flight deck"

70K Strong

1296



"...Roughly speaking, the working force of the yard is divided 20,000 on new construction, 20,000 on repairs, 10,000 on manufacture of parts, etc., and 20,000 on maintenance, utilities, transportation, clerical work and various minor classifications..."

Popular Mechanics, September 1945
Above Left: caption: "Rivet is driven home in deck; it is one of hundreds of thousands of many sizes used in ship building"
Above Right: caption: "Girl at engraving machine"
Upper Left: caption: "Gun inspection"
Lower Left: caption: "Workmen building wood pattern for steel gear for ship" 1297



Flag-makers

1298

Making the Flags of Our Warships

Scientific American
 June 30, 1906
 By Walter L. Bradley

THROUGH the courtesy of the Commandant of the Brooklyn Navy Yard and Commander A. Ward, chief equipment officer, the writer was given special opportunities for obtaining a full series of pictures showing an interesting and comparatively little-known department in which the flags of our warships are made. The flag room is under the supervision of Mr. Thomas Malloy, officially rated as master flag-maker, and Miss M.A. Woods, quarter-woman flag-maker. Mr. Malloy favored the writer with all the main details of the flag department, which are outlined in the present narrative.

1299

1300

To furnish the many hundreds of naval vessels in commission, ranging from the large flagship and battleships and the numerous smaller class, with their regular quota of flags, the government is required to maintain an extensive plant. Few, however, realize the number of flags carried by a warship, nor the cost of all the gay bunting which flutters from mast to mast at holiday time. In addition to fleet communication, necessary during all forms of maneuvers in home waters, the ship must be equipped with an extensive array of flags stored on board for various forms of ceremonial and official occasions.

This "dress suit" outfit of bunting, therefore, consists of 250 different flags, the material and making of which costs Uncle Sam just \$2,500. Each ship is entitled to a new flag equipment every three years, though a flagship will often require a new set of signals, owing to their constant use and handling, in about a year.

1301

1302



A striking idea of the number of flags carried by a single ship may be gleaned from one of the accompanying illustrations, showing a pile 15-feet-long and nearly waist high, just finished for the new battleship *Connecticut*. About one-half of the lot is composed of foreign flags, incased in thick paper bags, with the name of the country stenciled on the bottom. The remainder, including those for ordinary use, signal sets, and the international code, etc., are not wrapped, but merely tied in round bundles. 1303
Caption: "Flag outfit for the U.S.S. *Connecticut*, 250 flags costing \$2,500"

1304

Last year for operating the flag factory the government expended \$60,000; \$43,000 of this amount was for material alone. This, however, includes a small sum for table linen and curtain fixtures; the labor amounted to \$17,000. The number of flags turned out was over 59,000. In all, 408 distinctive kinds were made. To cut-out the varied patterns and complete all these miscellaneous flags, some thirty-five skilled machine sewers and needle-women and three men are employed.



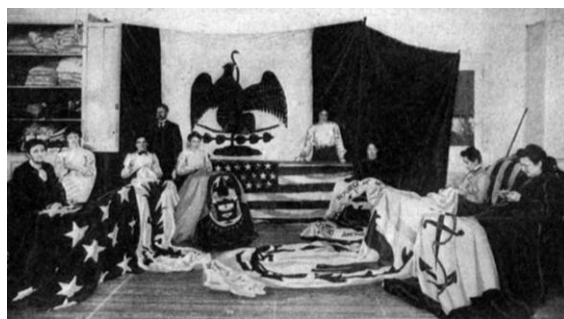
With the bright-colored, fantastic flags of all nations dangling from their machines, the long row of flag-makers present a picturesque scene. The long spacious room is literally a blaze of color. Rolls of bright bunting are heaped up waiting to be cut, while long lines of women operators are swiftly sewing the seams and putting the finishing touches to American and to forty-three foreign ensigns of different hues and patterns. 1305
Caption: "One of the main rooms of the United States Flag Factory at the Brooklyn Navy Yard"

1306

The flags are cut-out from measurements arranged on chalk lines and metal markers on the floor. Large stripes and certain designs can be more conveniently stitched in this way. Daily a section of the floor is covered at all hours with several different flags, with the men and women cutters at work. The final sewing is done on machines by the women. Each machine is run by a small electric motor of one-fourth horse-power. Owing to long service, the labor has become highly specialized, and the women are kept at work on the particular flags which they can make the best. Some excel in sewing on the stars, others in finishing certain other parts of the flag. Nearly all have been in the establishment for years. Their pay averages from \$1.20 to \$2.00 per-day.



A great deal more time and labor is required to finish certain of these flags than is generally supposed. For instance, the President's flag requires the longest time of any to make, as it takes one woman a whole month to complete it. The flag consists of a blue ground with the coat of arms of the United States in the center. The life-sized eagle, with long outstretched wings, and other emblems, are all hand-sewed and involve the most patient work. The flag is made in two sizes, 10-feet by 14-feet and 3-feet by 5-feet. The silk used on this and other designs costs \$9 a pound. The largest flag made is the United States ensign No. 1, 36-feet-long by 19-feet-wide, which costs \$40. 1307
Caption: "Quarterwoman Mary Ann Woods and flag-makers making president's flag in 1914"



The most difficult, expensive, and likewise consuming the longest time to make, are the foreign flags. This is especially true of the South American and certain others. These in most cases average 5-feet in diameter. The work is done by a half-dozen specially skilled hand device sewers, each having acquired the knack of making certain of the center designs to perfection, and continually kept on these respective flags. 1308
Caption: "The hand sewers who execute the more difficult designs"

Every battleship carries forty-three foreign flags, 25-feet by 13-wide. A smaller size is also made. The weakest in point-of-power and smallest of the Latin nations have the most gorgeous and picture-bedecked ensigns. That of San Salvador is especially so, and requires much time and patient labor to complete. The half-tone representation of this hardly brings out the wealth of detail and elaborate sewing that is expended on it. For a center piece the San Salvador has a regular marine landscape, consisting of a belching volcano and a rising sun, set in a varied design of draped banners, cactus branches, cornucopias, and a swastika on the ground of a rayed diamond, with the date of the independence of the nation inscribed on the top. One hundred different pieces are used to form the center design. It takes one woman sixteen days to complete the San Salvador ensign, which costs \$52.50.



The most expensive ensign to make is the German, which, owing to the delicate scroll work of the large imperial eagle and royal crown, necessitating delicate, slow, and careful sewing, costs \$56.50.
Caption: "Finishing the German ensign, the most expensive one made"

1309

1310



The dragon flag of China consists of two hundred separate pieces. Twelve to fourteen days are ordinarily consumed in finishing this flag, which costs \$51.75. The flag of Siam with the huge white elephant costs \$38.00. The Mexican, with its center design of a large eagle holding a serpent in its bill, cost \$39.50. The cheapest foreign flag made is the Moorish, which costs \$21.00.

Caption: "Cutting-out patterns; the flags of China and Siam above and below the table"

1311

1312

Last year 150,000 yards of bunting were used. This is all wool, 19-inches-wide. Samples of English and Italian bunting have been tested in the past to compare with the American. The former lacked in tensile strength and was overweight, and the red lost considerable color in the washing tests. The Italian filling was not up to standard, and likewise lost color. The warp and filling of the navy bunting now used has thirty-four threads to the inch, and is of light weight - a very desirable feature.

The material is given both a chemical and physical test. For the former several strips are cut from a bolt, which are soaked and washed in soap and fresh water for twenty-four hours. The next day the same process is followed, using salt water. They are then exposed to the weather for ten days, thirty hours of which must be in the bright sunlight. This is for the color test. No fading or running of colors is tolerated. For tensile strength, a strip of the warp two inches wide is placed in a testing machine, and must have a tensile strength of sixty-five pounds, while two inches of the filling must sustain a forty-five-pound test.



The many thousands of stars are cut-out by an ingenious machine, specially devised for this purpose, operated by a four-horse-power electric motor. Only a few years back the stars were cut-out by hand. The machine has a plunger fitted with steel knives, the shape and size of the star. A single down stroke cuts out from fifty to one hundred at a time. Pressing the foot on a pedal operates the machine. In all, eight different sizes of stars are used, each having a special die. Running the machine for only an hour-a-day furnishes enough stars to keep the women operators going for several days. The stars vary from fourteen inches in diameter to less than two.

Left: caption: "The star cutting machine; sewing on a halyard bend"
Right: caption: "Seamstress sews stars on American flag"

1313

1314

All completed flags are pressed by an electric ironer. A heading of flax raven canvas is sewed on, together with a distance lining of plaited hemp rope. This fiber will not kirk or twist, and is specially made for flag purposes on board the naval prison ship at Boston. Wooden toggles for catching the loop are also put on, and the border stamped with the name of the flag and date of contract.

1315

After being critically inspected and passed by master flag-maker Malloy, the flags are delivered to the general storekeeper in the yard, where they are held until needed by commissioned ships.

1316

To Serve the Fleet

"...Keeping this huge force at top speed during the war has been an inspiring and gratifying task, according to Rear Admiral Kennedy. 'The lights have never been turned off and the telephones have never stopped ringing a minute since the war started,' he says 'Nor has the fighting spirit of our huge army of workers flagged in their battle to get ships in ship-shape condition to the fighting fronts. We have hit our completion dates with 100 percent efficiency under our slogan, 'service to the fleet.'"

Popular Mechanics, September 1945

1317

1318

In the Name of Efficiency

The name of the Brooklyn Navy Yard has been changed again in the interest of 'better efficiency'

The Brooklyn Daily Eagle, December 18, 1945

RE: introduction to an article entitled: "There's A Place in Brooklyn That Won't Fit in a 3 Col. Head"

1319

1320

Fuggedaboutit

"THE new name, ordered in a telegram from Washington, is: 'The New York Naval Shipyard, Naval Base Station, Brooklyn 1, N.Y.' Seven Brooklynites picked at random and as many Manhattan men-in-the-street, asked for directions to the New York Naval Shipyard, Naval Base Station, Brooklyn 1, N.Y., responded in unison: 'I don't know, Bud, but why don't you go over to the Brooklyn Navy Yard. They ought to know'..."

The Brooklyn Daily Eagle, December 18, 1945

RE: on November 30, 1945, Secretary of the Navy *James Forrestal* decided to consolidate all the naval facilities in the metropolitan region into "United States Naval Base, New York." The headquarters of this new entity would be at the "United States Naval Shipyard, New York." This decision spark-ed a firestorm of controversy.

1321

1322



"...At the Brooklyn Navy Yard, actually, they were too busy to answer. They are too busy putting up new signs, with the new name..."

The Brooklyn Daily Eagle, December 18, 1945

RE: the name change required new signage throughout the yard; a new title flag for the shipyard newspaper and even a new name for the yard's band

Above T&B: the final issue of "The New York Navy Yard Shipworker" (T) and the first issue of "The New York Naval Shipyard Shipworker" (B)

1323

1324

"...The thousands who worked on ships at the yard called it the 'Brooklyn Navy Yard.' Gobs and officers who met in far-off Guam or Marseilles, Korea or Hawaii recalled the time they served in the Brooklyn Navy Yard. P.S. What the new official name of the Brooklyn Navy Yard will be this afternoon was not known at the time this edition went to press."

The Brooklyn Daily Eagle, December 18, 1945

RE: a few days later, Forrestal issued a new directive that the yard would be known instead as the "New York Naval Shipyard, Brooklyn, New York." However, *The New York Times* derided the new name as "ponderous."

1325



"...the Brooklyn Navy Yard will be called just that in spite of the Navy big brass..."

The Brooklyn Daily Eagle

RE: local officials, including Brooklyn's Congressional delegation, were so incensed at the name change that they threatened legislative action to force the USN to adopt "Brooklyn Navy Yard" as the official name of the facility. Ultimately, the name "New York Naval Shipyard" would stick for 21 years, until the Yard's decommissioning in 1966. It was only after NYC acquired the site that it officially got the name it had for so long been known: "Brooklyn Navy Yard."

1326



Part 11

End of an Era

1328

The Beginning of the End

Employee representatives at the U.S. Naval Shipyard, Brooklyn, have sent a wire to President Johnson protesting the Defense Department's "unfair distribution of contracts." They urged him to investigate the department's procurement procedures

New York Daily News, May 3, 1964

RE: introduction to an article entitled: "Yard Union Wires LBJ on Snub"

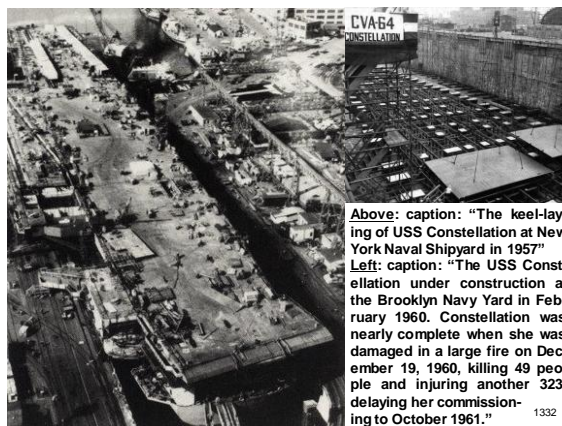
1329

1330

"THE telegram from the Brooklyn Metal Trades Council said the employees were shocked to learn that the CVA-67 – a Forrestal-class super carrier – was to be built at a private shipyard in Newport News, Va. 'It is unbelievable,' the wire said 'that the Brooklyn Navy Yard was given no consideration, despite the fact we built the three best CVA-type carriers afloat.' The reference was to the giant aircraft carrier 'Saratoga,' 'Independence' and 'Constellation'..."

New York Daily News, May 3, 1964

1331



Above: caption: "The keel-laying of USS Constellation at New York Naval Shipyard in 1957"
 Left: caption: "The USS Constellation under construction at the Brooklyn Navy Yard in February 1960. Constellation was nearly complete when she was damaged in a large fire on December 19, 1960, killing 49 people and injuring another 323, delaying her commissioning to October 1961."

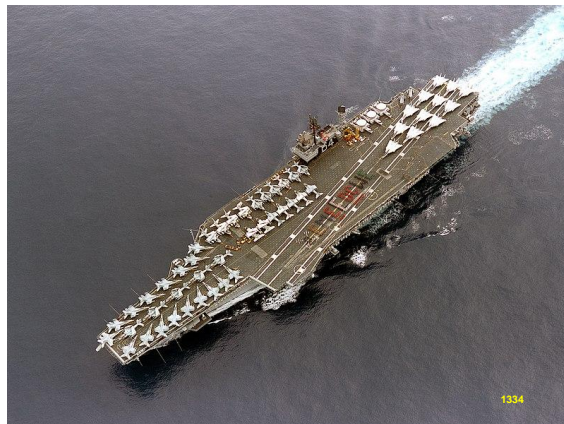
1332



"...The valve assembly was knocked out of the tank by an 1,800-pound steel plate resting on a wooden pallet. The pallet was hit by a heavy steel trash bin that had been nudged by a fork-lift truck. The fuel gushed from the tank and ran through work holes in the steel flooring to decks below, on one of which it came in contact with 'hot work' - either a welding or cutting torch or steel that was hot from such work..."

The New York Times, December 24, 1960

Above L&R: the nearly completed aircraft carrier U.S.S. *Constellation* accidentally caught fire when a forklift knocked the cap off a fuel tank. Wooden construction scaffolding accelerated the blaze and the ship appeared to start sinking as water was increasingly pumped in to combat the flames. Workers were trapped below deck in air-tight compartments for hours until firefighters could rescue them - entering from a hole cut in the hull of the ship. Most who perished suffocated from the poisonous fumes. 1333



"...*'We contend,'* the telegram stated, *'there is an unfair distribution of defense contracts and the Brooklyn Navy Yard has been grossly discriminated against. We contend also that the capabilities of the nation's defense system are being seriously impaired by the under-utilization and neglect of the Brooklyn Navy Yard.'* The wire was signed by James J. Dolan, president of the council."

New York Daily News, May 3, 1964

1335

The building of "some ships" will be allocated to the Brooklyn Navy Yard within a week to 10 days, Rep. Emanuel Celler, Brooklyn Democrat, announced late yesterday after a conference at the yard with Navy Secretary Paul Nitze

New York Daily News, October 8, 1964

RE: introduction to an article entitled: "Some Ship Jobs for B'kyn Yard"

1336

"**TALKING** to reporters outside the yard, after they had been ejected on the order of Nitze about 5 P.M., Celler said he had received assurances from the Secretary about the new construction. Celler added 'There will be no more discharges until an official study is completed' in several months. Workmen at the yard and public officials have voiced concern that the yard, where jobs have been declining steadily, may ultimately close..."

New York Daily News, October 8, 1964

1337

"...*Celler was among a group of Congressmen who met at the yard with Nitze and Republican Sens. Kenneth B. Keating and Jacob Javits. Earlier, Nitze told reporters that no decisions has been made on the fate of the huge naval installation.*"

New York Daily News, October 8, 1964

1338

Say it Ain't So

WASHINGTON, Nov. 19 - The closing of the Brooklyn Navy Yard, Fort Jay on Governors Island, the Brooklyn Army Terminal and a Navy training center on Long Island was ordered today by the Department of Defense
New York World-Telegram, November 19, 1964
 RE: introduction to an article entitled: "U.S. to Close Navy Yard; \$1 Billion Loss Seen Here"

1339

1340



"THE announcement carried no termination date for operations at the Navy Yard, but the Brooklyn Army Terminal was ordered shut by January, 1967; Fort Jay by July, 1966, and the Naval Training Device Center in Port Washington by July, 1967..."

New York World-Telegram, November 19, 1964

Caption: "The Brooklyn Army Terminal covers about 97 acres (39 ha). It includes two 8-story warehouses, three 2-story piers, several ancillary buildings and a train storage yard with capacity for 2,200 cars."

1341

1342

"...Although the department furnished no termination plan for Navy Yard operations, past experience indicates that it would take at least two years. The yard employs between 9,000 and 10,000 workers. Some 4,000 more are employed at the Brooklyn Army Terminal. The department said 18,400 persons would lose their jobs in the metropolitan area. In addition, the Defense Department announced a 10-year phase-out of the oldest yard in the nation, at Portsmouth, N.H..."

New York World-Telegram, November 19, 1964

1343



"...The shutdown of the Navy Yard will come despite the efforts of Sen.-elect Robert F. Kennedy, Mayor Robert F. Wagner and other prominent political figures to dissuade Secretary of Defense Robert McNamara, who announced plans yesterday to close 95 military installations employing 63,000 persons in 33 states..."

New York World-Telegram, November 19, 1964

Caption: "Bobby Kennedy, Navy Secretary Nitze and Mayor Wagner (l. to r.) huddle at the Brooklyn Navy Yard"

1344

"...Only two weeks ago, Kennedy appealed for continued operation of the yard in a conference with McNamara whom he talked with before the election. After the meeting, McNamara promised there would be no layoffs at the yard for the rest of the year..."

New York World-Telegram, November 19, 1964

1345

"...Rep. Emanuel Celler (D., Bklyn) issued a statement blasting the 'summary way' in which the Defense Secretary announced the closings without again conferring with Congressmen, as Celler said McNamara had promised. 'We were told that before any action was taken, we were to be given an opportunity to make comment,' Celler asserted. 'This opportunity has not been offered us'..."

New York World-Telegram, November 19, 1964

1346

"...At the same time as the closings in New York and Portsmouth were disclosed, two Virginia Congressmen said no major naval installations in Norfolk, Portsmouth, Va., or Virginia Beach were on the Defense Department list of doomed facilities."

New York World-Telegram, November 19, 1964

1347

Not Without a Fight

1348

Senator-elect Robert F. Kennedy today called for establishment of a committee "with public and private members" to review the closing of the Brooklyn Navy Yard

New York World-Telegram, November 19, 1964

RE: introduction to an article entitled: "Kennedy Calls for Yard Study"

"KENNEDY said the burden of proving that the sprawling yard should be closed 'is on those advocating this drastic step.' He added that the proposed panel could evaluate the military needs and the costs of the yard. Kennedy was also critical of the effect of the shutdown on the administration's war against poverty. He said it was foolish to discuss an anti-poverty campaign 'when he cut loose thousands of workers from their jobs..."

New York World-Telegram, November 19, 1964

1349

1350

“...Kennedy said he was ‘disturbed’ because the closing was made ‘one the basis of limited evidence.’ The former Attorney General last week discussed the Navy Yard with Defense Secretary Robert S. McNamara, Sen. Jacob K. Javits and Mayor Robert F. Wagner. In Paris, Javits said he considered the closing of the base ‘a disaster to the economy of New York.’ At City Hall, Wagner declared the city would keep fighting to save the yard...”

New York World-Telegram, November 19, 1964

1351

“...Wagner said he would arrange a meeting with the state’s congressional delegation ‘to see what steps we can take so that the yard is kept open.’ He added that he wanted an opportunity to study a report McNamara prepared on the cost to the federal government of maintaining the base. ‘They said we would have an opportunity to answer the report,’ he said. ‘We haven’t had that yet’...”

New York World-Telegram, November 19, 1964

1352

“...The Mayor said the city also was distressed by the planned shutdowns of Fort Jay and the Brooklyn Army Terminal. Brooklyn Borough President Abe Stark opposed the closing of the Navy Yard as a ‘tremendous injustice.’”

New York World-Telegram, November 19, 1964

1353

For Economy’s Sake

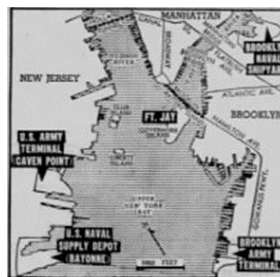
1354

Washington, Nov. 19 (News Bureau) – The Pentagon economy ax fell today on the Brooklyn Navy Yard and two other defense installations in New York City

New York Daily News, November 20, 1964

RE: introduction to an article entitled: “Closing to cost 9,625 Jobs; Fort Jay Also Doomed”

1355

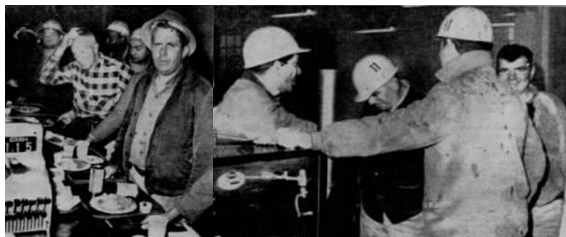


“THE shipyard, Fort Jay on Governor’s Island and the Brooklyn Army Terminal were among the 95 establishments doomed by the department’s drive to save close to \$500 million annually. The Naval Training Devices Center at Port Washington also will be closed...”

New York Daily News, November 20, 1964

1356
Caption: “The Brooklyn Navy Yard, Fort Jay and the Brooklyn Army Terminal were ordered closed by the Defense Department. Remaining open are the Bayonne Naval Supply Depot and the Army Terminal at Caven Point, N.J.”

1356



"...Closing of the shipyard alone will cost New York 9,625 jobs. About 64,000 workers are involved nationally in the cuts announced by Defense Secretary McNamara. An estimated \$18.1 million-a-year, McNamara said, would be saved by closing the Brooklyn Navy Yard alone. The 1st Army, now headquartered at Fort Jay, will be moved to Fort Meade, Md., where it will be consolidated with the 2d Army..."

New York Daily News, November 20, 1964

Above L&R: caption: "Workmen line-up for their lunch (left) at Brooklyn Navy Yard then get together in cafeteria to discuss announcement that the shipyard will be closed (right)"

1357

1358

"...McNamara appeared at a crowded press conference accompanied by the Secretaries of the Army, Navy and Air Force. His decisions, he said, 'are absolutely, unequivocally irrevocable unless there is new evidence. 'Chance of that,' he added, 'are damn small'..."

New York Daily News, November 20, 1964

1359

"...McNamara indicated that he intended to confer with Sen. Jacob Javits (R-N.Y.) and Senator-elect Robert Kennedy (D-N.Y.) on whether to close the Brooklyn yard 'in a relatively short time' – six or nine months – or in a period of about 18 months. No extension would go beyond two years, he said..."

New York Daily News, November 20, 1964

"...'President Johnson has laid on me an absolute requirement for economy and the elimination of waste and has told me he will accept any political pressure that results,' the Secretary said."

New York Daily News, November 20, 1964

1360

Unconscious Prejudice(?)

Shock, dismay, disbelief and bitterness were expressed by local public officials from Mayor Wagner on down yesterday with the announcement of Defense Department plans to close the Brooklyn Navy Yard, the Brooklyn Army Terminal and Fort Jay on Governor's Island

New York Daily News, November 20, 1964

RE: introduction to an article entitled: "News of the End Shocks Officials"

1361

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“WAGNER said that he didn’t believe that the decision on the part of Defense Secretary McNamara was final and said he would appeal the action to President Johnson and Congress. ‘I refuse to consider Secretary McNamara’s announcement as being final,’ the Mayor said in a two-page statement issued late yesterday at City Hall. ‘I consider it to be a tocsin of alarm, rather than a nail of doom.’ Stating that he wished to have the decision reviewed, Wagner said that officials of the Defense Department would have to prove that the shutdowns were ‘consistent with the needs and requirements of the national defense and security, including that of New York’...”
New York Daily News, November 20, 1964

1363

“...He said that considerations other than military ones were involved and would be brought to the attention of the President and Congress ‘as forcefully as I know how.’ He said that while he had high regard for McNamara, he did not regard his judgement or that of the Defense Department ‘to be sacrosanct or beyond the possibility of error or unconscious prejudice’...”

New York Daily News, November 20, 1964

1364

“...Also visually upset at the news was Senator-elect Robert F. Kennedy, who with Wagner and Senators. Keating and Javits had made a visit to Washington two weeks ago yesterday to confer on the matter with McNamara. Kennedy called for the creation of a committee of both public and private individuals to consider all aspects of the action. He said the Defense Department’s decision ‘cannot be accepted on the basis of the limited evidence now available. Such a committee could objectively evaluate both the military needs and the other public costs and the final decision could then be accepted with the assurance that all the factors had been carefully considered.’”

New York Daily News, November 20, 1964

1365

Domino Effect

1366

City Controller Abraham D. Beame said yesterday that closing of the Brooklyn Navy Yard would cost local businessmen \$1.25 billion and could damage the economy of the entire city
New York Daily News, November 20, 1964
 RE: introduction to an article entitled: “City Loss Put at 1-1/4 Billion”

“HE said it would start a chain reaction which would bankrupt many small businesses in Brooklyn and wipe out thousands of jobs outside the Navy Yard. The resulting unemployment will increase welfare costs and the tax load on other business firms and taxpayers, he said.”

New York Daily News, November 20, 1964

1367

1368

With Due Regard for Profit

Washington, Nov. 19 (News Bureau) – The Defense Department intends to sell the Brooklyn Navy Yard after it has been closed down, hoping for community support in this action, officials said tonight

New York Daily News, November 20, 1964

RE: introduction to an article entitled: "A Navy Yard, Anyone?"

1369

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"THE administration also hopes to sell, at a tidy profit to taxpayers, the Fort Jay and Brooklyn Army Terminal areas."

New York Daily News, November 20, 1964

It's Official

1371

1372

New York – (AP) – "Attention all hands! Attention all hands!" blared the public address system. The voice was that of Admiral James H. McQuilkin, Commandant of the 165-year-old Brooklyn Navy Yard. His grim announcement to the 9,500 workers: the yard would be closed June 30, 1966.

Press and Sun-Bulletin (Binghamton, NY), January 20, 1965

RE: introduction to an article entitled: "Grim Words at Brooklyn Navy Yard"

"THE admiral passed on the official word from Navy Secretary Paul H. Nitze yesterday. It shocked some workers, who had hoped for a five-year 'phase-out' period. Secretary of Defense Robert S. McNamara had announced the closing of the Brooklyn Navy Yard along with 94 other military facilities for economy reasons, Nov. 19..."

Press and Sun-Bulletin (Binghamton, NY), January 20, 1965

1373

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"...Emotions within the yard from long-time workers ranged yesterday from anger to resignation. New York's two Senators, Jacob K. Javits (Rep.) and Robert F. Kennedy (Dem.) issued a joint statement, saying: 'This fight is by no means concluded . . . The final decision is the President's and an appeal must be made to him to review this determination to humanitarian as well as economic and national security grounds.' The senators and other members of the New York congressional delegation had submitted a rebuttal argument to McNamara last week..."

Press and Sun-Bulletin (Binghamton, NY), January 20, 1965

1375

"...The shutdown will come in two phases. The first will cover the time needed to finish work already assigned to the yard. It is expected to last until Feb. 1, 1966 and will cut the work force to about 3,000. The final phase will consist of moving out tools, dismantling the cranes and nailing shut doors and windows of buildings. After this phase ends, the yard will be turned over to the General Services Administration for disposal."

Press and Sun-Bulletin (Binghamton, NY), January 20, 1965

1376

CLICK

The Brooklyn Navy Yard which was closed less than two weeks ago may soon re-open as an industrial park and create thousands of new jobs

Greenpoint Weekly Star, July 8, 1966

RE: introduction to an article entitled: "Lindsay Wants Industrial Park at Old Navy Yard – Will Mean Thousands of Jobs"

1377

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"THAT announcement was made late Wednesday by none other than Mayor John V. Lindsay. Reportedly, the city has entered into negotiations with the federal government to take over the 292-acre shipyard with the idea of developing a modern industrial park complex and creating 'badly-needed, high-wage, steady jobs,' said the mayor. Two years ago the Navy Yard employed close to 10,000 persons. The last of these workers lost their jobs when the yard was closed on June 25..."

Greenpoint Weekly Star, July 8, 1966

"...Mayor Lindsay's announcement followed a conference with General Lucius Clay, head of the recently formed New York City Public Development Corporation, a quasi-public corporation that would lease the land from the city. The mayor explained that the corporation of businessmen, financiers and public officials would negotiate an agreement with the Commerce, Labor and Industry Corporation of Kings County to take over direct responsibility and the job of transforming the shipyard into an industrial park..."

Greenpoint Weekly Star, July 8, 1966

1379

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"...Like the development corporation, CLICK is made up of businessmen, public officials and trade union leaders in Brooklyn. 'Constructive use of the former Navy Yard will be the first step in relieving the unemployment and poverty which affects nearly a million people in Brooklyn. It will open the door to a revitalization of business in Brooklyn and in the city in general,' said the mayor..."

Greenpoint Weekly Star, July 8, 1966

RE: "CLICK" was an acronym for "Commerce, Labor and Industry Committee of Kings"

1381

"...While no definite plans have been made, the industrial park might contain light industry, a steel fabricating complex, an apparel industry center and some residences. At the present, the site is under the jurisdiction of the disposal utilization bureau of the General Services Administration..."

Greenpoint Weekly Star, July 8, 1966

1382

"...The first step in the city take over will be for the government to send in appraisers and establish a price, so the city can start bargaining. It is expected that the city will take title to the property some time later this year..."

Greenpoint Weekly Star, July 8, 1966

1383

"...At the same time, Mayor Lindsay lauded the action of Kings County Democratic leader Assemblyman Stanley Steingut. Borough President Abe Stark and Rep. Hugh L. Carey, all Democrats, for their 'initiative and industry in this attempt to revitalize a sadly depressed area of our city.' The three are sponsors of CLICK..."

Greenpoint Weekly Star, July 8, 1966

1384

"...The Mayor said members of his staff advised him that early in the last century both the city and state deeded property at the site to the federal government. The deeding was made with the condition that property would automatically revert to New York City and state when the yard ceased to be a ship-building and repair facility. Reportedly, the state has indicated it would pass title to its property to the city so the industrial complex could be developed as a single unit."

Greenpoint Weekly Star, July 8, 1966

1385

Repurposing

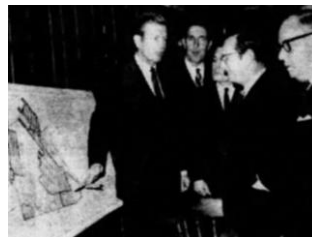
1386

The Planned industrial shipbuilding complex at the Brooklyn Navy Yard will offer 30 to 40,000 jobs to borough residents, City Administration officials said yesterday

New York Daily News, March 22, 1969

RE: introduction to an article entitled: "Navy Yard May List 40,000 Jobs." On June 25, 1966, the *Brooklyn Navy Yard* ceased operations after 165 years of "Service to the Fleet." After the Yard's closure, it was sold to the *City of New York* and reopened as an industrial park in 1969. When the yard reopened, *Seatrain Shipbuilding*, which built crude-oil supertankers, was its largest commercial tenant, employing +3,100 unionized workers.

1387



"MAYORAL aides ventured this opinion to 10 visiting Congressmen from non-urban areas following a meeting of Lindsay's cabinet at the Navy Yard. The legislators sat in on the city's weekly cabinet session. The city has an agreement with Washington to take over the former naval installation for \$23.5 million. Under the arrangement, there is a six-year moratorium on the installment payments..."

New York Daily News, March 22, 1969

Caption: "Mayor Lindsay explains Navy Yard plans to visiting Congressmen. Second left is former Secretary of the Interior Stewart Udall, now a Democratic Congressman from Utah."

1388

"...John Hilly, president of the Commerce, Labor and Industry Committee of Kings (CLICK), told the meeting a shipbuilding program will be undertaken by next spring by Seatrain, which now transports freight cars by water. CLICK is a non-profit organization which is assisting in the civilian development of the yard."

New York Daily News, March 22, 1969

1389

Part 12

The Wilderness Years

1390

The Sleeping Giant

Seatrain Lines, Inc. has closed its Brooklyn Navy Yard installation and laid-off 1,300 employees, most of whom are Black or Hispanic

Amsterdam News, June 9, 1979

RE: introduction to an article entitled: "1,300 Laid-Off at Brooklyn Navy Yard"

1391

1392

“ACCORDING to Stephen Russell, executive vice-president of the company, Seatrain plans to diversify its operations into energy-related areas. However, the company would continue to haul ocean freight and chartering ships which provides about 60 percent of its revenue...”

Amsterdam News, June 9, 1979

“...Five years ago, the company temporarily closed its shipbuilding operation in Brooklyn laying-off 3,000 employees. Part of the reason for the closing was that the building of large tankers is no longer a viable business...”

Amsterdam News, June 9, 1979

1393

1394



Caption: “The super-tanker *BROOKLYN* being built by Seatrain Shipbuilding in a dry dock at the Brooklyn Navy Yard, 1973”

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“...The massive lay-off caused economic chaos in the Fort Greene area which is predominantly Black. The closing was eventually avoided because of political pressure from Congresswoman Shirley Chisholm and Congressman Fred Richmond who obtained economic assistance. The company was able to remain in business because the Economic Development Administration of the U.S. Dept. of Commerce guaranteed re-payment of 90 percent of \$77 million of Seatrain’s bank loans in May, 1975...”

Amsterdam News, June 9, 1979

“...Seatrain began to venture out of the shipbuilding business in August, 1976, when it purchased Texas-based Pride Refining Co. for \$30 million in notes and preferred stock. The investment proved to be a key element in the company’s 112 percent earnings jump recorded in 1977. One year ago, Seatrain purchased three small mining companies in West Virginia for 1.1 million and 10 million tons of coal reserves. During the time Seatrain was making these multi-million dollar energy-related purchases, it was slowly repaying the government guaranteed loan. By the middle of last week, the \$77 million loan only had been reduced to 69.7 million, a sum which the company re-financed last week with Chase Manhattan Bank...”

Amsterdam News, June 9, 1979

“...The primary purposes of the refinancing was to extend the repayment dates on the government-guaranteed loan from 1979 to 1983. ‘The loan was originally given to make certain there were jobs in the Brooklyn Navy Yard,’ said a company spokesperson. ‘We needed additional money to complete the two supertankers then in construction and the loan was for that purpose.’ The tankers are complete and Seatrain has not received any new sizable government-guaranteed loans since 1975, according to the spokesperson...”

Amsterdam News, June 9, 1979

1397

1398



“...The closing of Seatrain Lines will increase the already high unemployment rate among Blacks in Brooklyn. Seatrain was the highest employer of minorities in the Fort Greene area and its closing will mean more hardship for a community struggling for economic stability.”

Amsterdam News, June 9, 1979

RE: *Seatrain* experienced economic problems throughout its existence and by 1981 the company declared bankruptcy and its shipbuilding operations at the *Brooklyn Navy Yard* were shut-down permanently

1400

Black and Hispanic residents of Ft. Greene, Williamsburg, and Bedford Stuyvesant in Brooklyn are blaming the Koch Administration for their crushing unemployment burden: Sixty percent of the qualified labor force have been denied jobs in the three communities

Amsterdam News, January 16, 1982

RE: introduction to an article entitled: “CLICK Didn’t Click; Jobless Ticked-off”

1401

“AT the center of controversy is the old Brooklyn Navy Yard which the Federal Government sold to the city at the close of the sixties. Almost twenty years ago a quasi-independent city agency named CLICK (Commerce, Labor, Industry of the County of Kings) was mandated by the city with developing the yard into an industrial complex to create thousands of jobs for the neighborhood. But after all these years there is no industrial complex. The Brooklyn Navy Yard is an industrial ghost town and CLICK executives are swimming in allegations of corruption...”

Amsterdam News, January 16, 1982

1402

“...The frustrated unemployed see the Yard as the ‘sleeping giant’ which could revitalize their depressed and underserved neighborhoods. The Amsterdam News has discovered, however, that there are no community residents on the senior staff of CLICK...”

Amsterdam News, January 16, 1982

1403

“...Residents are barred from attending CLICK board meetings and are only informed of ‘unimportant policy changes’ in the organization. ‘The situation is desperate down here,’ said Jim Bennings, newly elected chairman of the Brooklyn Navy Yard Coalition (BNYC). BNYC was formed after invited CLICK officials assertedly snubbed residents and community leaders at a December 17 showdown...”

Amsterdam News, January 16, 1982

1404

"...The coalition is comprised of leaders from sundry groups calling themselves variously, Black Veterans for Social Justice, the Brooklyn Chapter of Citizens Alliance, East Brooklyn Corporation, and the Sisterhood of Black Single Mothers. 'The aim of this coalition is to wrest control of the Brooklyn Navy Yard from the Koch Administration so that we can realize the hope of building the industrial park,' said Bennings. Asked what kind of action BNYC is prepared to take, Bennings replied 'Whatever is necessary. CLICK must be dissolved!'"

Amsterdam News, January 16, 1982

1405

"...Bennings described CLICK as a 'nickel and dime operation' whose only income is the low rents it charges to 'thriving companies' conducting business in the yard. There are over thirty such companies, including shipbuilding firms, machine operators, and packaging outlets. Bennings told the Amsterdam News that some companies are charged as low as from 14 cents to 21 cents per square-foot. The rents do not exceed \$165 per month, he asserted..."

Amsterdam News, January 16, 1982

1406

"...Richard Aneiro, CLICK president and a career city employee who came out of the Bronx model cities program to 'clean up CLICK, refused to comment on the agency's operations. Aneiro referred the reporter to CLICK chairman, David Lenesky, who, like Aneiro thereafter, remained perpetually 'tied-up in a meeting right now' and never responded..."

Amsterdam News, January 16, 1982

1407

"...Bennings charged that, 'CLICK, by its very nature, by the way its funded, could never build an industrial park. Furthermore, I don't think the Koch Administration or the white establishment would build this park for Blacks and Hispanics, anyway..."

Amsterdam News, January 16, 1982

1408

"...Bennings described the hiring practices of some companies in the yard as 'prejudicial and atrocious.' He said that the companies have a track record of 'overspecialization in their job requirements. Typists are required to type as many as 75 words-per-minute - far in excess of what would normally be required to fill such a position,' he said..."

Amsterdam News, January 16, 1982

1409

"...Bennings accused the 'Coastal Dry Docks' ship repair company of excluding residents from receiving jobs at the company. 'Coastal claims that they have a 2,000-man waiting list and that when they decide to hire they would hire people from off that list. I am saying that they are using that list to bar and exclude the residents from working,' he charged. The owners of Coastal Dry Docks could not be reached for comment..."

Amsterdam News, January 16, 1982

1410

"...The job market is tight on the outside but there are jobs in this community and the Brooklyn Navy Yard could provide these jobs,' Bennings added. He said that the communities' mushrooming youth population is daily growing frustrated and disgusted with the system. 'When they come out of school there is nowhere we can send them,' Bennings cried..."

Amsterdam News, January 16, 1982

1411

"...The Koch Administration apparently has its own interests in the yard. The city plans to build a waste recovery treatment plant at the Williamsburg end of the yard. This plant is expected to burn 3,000 tons of garbage per-day to provide steam for buildings in Manhattan. Residents and environmentalists are opposed to the building of the plant. 'We have got to move fast,' said Brooklyn Assemblyman, Roger Green, who is, so far, the only elected official to respond to the cries for help from BNYC and the residents. 'We must make sure that the board of directors of CLICK adopt an agenda and have the Koch Administration advance it,' he added. If that doesn't work, the Assemblyman continued: 'We will have to take direct . . . or whatever is necessary.'"

Amsterdam News, January 16, 1982

1412

NIMBY

They don't want it, and they'll do whatever it takes to keep it away. In the latest round in their ongoing fight against the proposed Brooklyn Navy Yard garbage incinerator, a few disparate grass-roots groups have banded together to file suit against the city

New York Daily News, November 26, 1995

RE: introduction to an article entitled: "Incinerator Foes Unite in Suit"

1413

"THEY are demanding that the Department of Sanitation update a 10-year-old study of how environmentally safe the trash-burning plant would be before going ahead with plans to build it. The Church of the Open Door, Ezras Cholim, El Puente, the Farragut Tenants Association, the Fort Greene Association and the Clinton Hill Society represented by the NAACP Legal Defense Fund made their demand in a suit filed in Brooklyn Supreme Court on Nov. 11..."

New York Daily News, November 26, 1995

RE: as early as 1967, a garbage incinerator was proposed at the Brooklyn Navy Yard. NYC proposed that the incinerator double as a cogeneration plant, generating both heat and electricity from the burning of garbage and supplying that heat and energy to Consolidated Edison. The incinerator would not only reduce the amount of waste being placed in the Fresh Kills Landfill (on Staten Island) and the Fountain Avenue Landfill (in eastern Brooklyn), but would also generate electricity for the city. In 1976, Mayor Abraham Beame proposed building a combined incinerator and power plant at the Brooklyn Navy Yard. A contract was awarded later that year, at which point it was estimated that the incinerator would cost

1415

\$226 million to construct.

"...The New York Public Interest Research Group is advising the groups, and is also party to the suit. The activists oppose the plant because they fear the smoky emissions caused by burning 3,000 tons of garbage-a-day will create yet another health hazard in their neighborhood. Amanda Stuart, head of the Farragut Tenants Association, said: 'There's so much going on in that Navy Yard. We've got the water-treatment plant, Con Ed has smokestacks there. We don't need another polluter'..."

New York Daily News, November 26, 1995

RE: a "temporary" cogeneration plant, which generated steam for the Navy Yard's tenants, opened in late 1982 as a stopgap until a permanent incinerator could be built

1416

"...Now, incinerator opponents have new data that they say makes the city's 1985 environmental impact statement known as an EIS obsolete. 'Over a 10-year period, a cornucopia of new information has come to light,' said Martin Brennan of NYPIRG. In June, Suzanne Mattei, senior environmental policy analyst for Public Advocate Mark Green, released a report contending that the city is required to prepare a new or 'supplemental' EIS, under the state Environmental Quality Review Act..."

New York Daily News, November 26, 1995

1417

"...Among her findings: New studies link incinerator emissions such as arsenic, cadmium and mercury with risks to reproduction and fetal development. Polychlorinated biphenyls (PCBs), which are released by incinerators, have been linked to breast cancer and other diseases. Tuberculosis cases in New York City have 'nearly doubled' in the last decade. Asthma has increased 52% since 1982. Both conditions would be aggravated by emissions. AIDS cases have doubled in the city every year since 1985. 'The proposed incinerator's emissions would effect parts of the city that have particularly high rates of AIDS,' Mattei writes. 'Persons with AIDS are at special risk to contract pneumonia and other respiratory illnesses..."

New York Daily News, November 26, 1995

1418

"...In fact, the lawsuit says, the incinerator would violate the Americans with Disabilities Act for AIDS patients. Wheelabrator Technologies, the New Hampshire-based company that won the bid more than 10 years ago to build the incinerator, stands firmly by its product. 'The original EIS was extensive and comprehensive and anticipated future changes on project,' said company spokesman Kevin Stickney..."

New York Daily News, November 26, 1995

1419

"...The incinerator project was started back in the early 19-80s, when Ed Koch was mayor. City officials, worried that Staten Island's Fresh Kills landfill would be full by the year 2015, had to come up with another way to deal with trash. Incinerators were seen as the answer. Mayor Giuliani has remained noncommittal about the project. 'The administration does not believe that a supplemental environmental impact statement is necessary,' said Giuliani spokeswoman Colleen Roche. 'The project is not budgeted until 1999. Certainly, as 1999 approaches, it will be looked at, but right now there's no need for it'..."

New York Daily News, November 26, 1995

RE: in December 1984, the NYC Board of Estimate narrowly approved the installation of the proposed incinerator in the Brooklyn Navy Yard - one of five sites to be built in the city in the ensuing years. However, New York State refused to grant a permit for constructing the plant for several years, citing that NYC had no recycling plan.

1420

"...The activists interpret Giuliani's stance as approval for the project, and have been critical. 'For the city to have the gall to say that 10-year-old information is sufficient, your antenna goes up,' said Rachel Godsil, an attorney with the NAACP Legal Defense Fund. 'How is it that they could deem to make a decision like this, particularly when that area is so densely populated? It looks like environmental racism'..."

New York Daily News, November 26, 1995

1421

"...Now, City Council members opposed to the plant have stalled a vote on the citywide solid-waste management plan, which must be updated by the Council every few years. 'A coalition of Council voters told the mayor that we want a new EIS done,' said Councilman Kenneth Fisher (D-Brooklyn). And not all the concerns are originating in Brooklyn. The United Jewish Council of the East Side, based in lower Manhattan, has joined the battle against the incinerator. 'It's less than a half-a-mile away, right across the East River,' said UJC Chairman Harold Jacob..."

New York Daily News, November 26, 1995

1422

"...The activists gladly take credit that stiff local opposition has kept the plant on the shelf for a decade. 'When you have a community able to generate a lot of exposure and excitement, people start looking,' said John Fleming, community development coordinator for El Puente. Last year, an NYPIRG study found that 192,000 pounds of PCB-contaminated waste had been spilled or stored in or around the Navy Yard in recent decades. And early this year, the State Department of Environmental Conservation put the Navy Yard on its 'Superfund' list of hazardous waste sites..."

New York Daily News, November 26, 1995

RE: investigation of the incinerator's proposed site found toxic chemicals were present in such high levels that the site qualified for a "Superfund" environmental cleanup

1423

"...Another side effect is the unusual alliance between north Brooklyn's Hasidic and Hispanic populations, two groups that have long been locked in a contentious battle over housing. Rabbi David Niederman, executive director of Ezras Cholim, said: 'We don't want it [the incinerator] in anyone's backyard.'"

New York Daily News, November 26, 1995

RE: the incinerator project generated large community opposition from the Latino and Hasidic residents of nearby Williamsburg. In 1982, NYC Mayor Ed Koch withdrew two contract offers due to objections from comptroller Goldin, who stated that the health effects of the proposed plant would be detrimental to the community. The proposed incinerator was a key issue in the 1989 mayoral election. David Dinkins, who ultimately won the election, campaigned on the stance that the *Brooklyn Navy Yard* incinerator plan should be put on hold. NYS, having denied a permit for the incinerator in 1989, stated that NYC had no plan for reducing ash emissions from the plant. Once elected, Dinkins took actions that indicated he would not oppose the construction of the incinerator. In 1993, NYS reversed its previous decision and granted a permit for the incinerator.

1424

By 1993, *Rudy Giuliani* had been elected as NYC mayor and he was opposed to the construction of the incinerator, preferring instead that NYC institute a recycling plan. In 1995, his administration delayed the incinerator's construction by three years while NYC procured a new solid-waste management plan. In November 1993, community members filed a lawsuit to block the incinerator's construction. The following year, NYC dropped plans for the construction of the incinerator altogether, instead focusing on expanding its recycling program and closing the *Fresh Kills Landfill*.

1425

Part 13

Rebirth

1426

Cogeneration

The Brooklyn Navy Yard is retooling its energy plant with a new \$400 million facility

New York Daily News, February 2, 1995

RE: introduction to an article entitled: "It'll Be a New "Generation" at Navy Yard

1427

1428

“CONSTRUCTION began last week for the new ‘Cogeneration’ Project, which is owned and operated by Brooklyn Navy Yard Cogeneration Partners, a tenant at the yard. A cogeneration system produces both electric and steam energy. ‘We have three contracts totaling 170 megawatts with Consolidated Edison, and an additional 100 megawatts for sale to third parties,’ said Greg Bafalis, Executive Director of Brooklyn Navy Yard Cogeneration Partners...”

New York Daily News, February 2, 1995

1429

“...Bafalis said the project will generate 500 construction jobs and when completed will create 30 full-time positions. More importantly, he added, it will provide low-cost energy for existing and future businesses...”

New York Daily News, February 2, 1995

1430

“...Officials said the Brooklyn Navy Yard cogeneration plant is the first in the nation licensed under the new Federal Clean Air Act, which will make it one of the most efficient, environmentally safe power generation facilities in the country. ‘Besides the economic benefits of tax revenue and jobs, our facility will produce energy in an environmentally responsible way and deliver that energy efficiently and cost-effectively,’ said Bafalis...”

New York Daily News, February 2, 1995

1431

“...The Brooklyn Navy Yard currently produces its own steam from three natural gas and oil boilers. The new cogeneration system will replace existing units, and is expected to be fully operational Nov. 30...”

New York Daily News, February 2, 1995

1432

“...The Navy Yard will be the direct beneficiary of the project. The more than 200 small businesses – with 3,500 employees – housed there will now have access to less expensive energy. Tom Montvel-Cohen, Brooklyn Navy Yard Development Corp. Senior Vice President, said he welcomes the project. ‘The fact that they are investing that kind of money, along with the plant’s environmental benefits, is great,’ said Montvel-Cohen...”

New York Daily News, February 2, 1995

1433

“...Borough President Howard Golden sees the new energy plant as an important element in attracting new commercial development to the industrial park at the Navy Yard...”

New York Daily News, February 2, 1995

1434

“...The plant, to generate steam, will use portions of the wastewater currently discharged into the East River by the Red Hook sewage treatment facility. ‘The cogeneration plant will be a state-of-the-art facility with low emissions,’ said City Environmental Protection Commissioner Marilyn Gelber. ‘This will save us money because we can shut down boilers at Red Hook as the new plant provides heat. It’s a project that has been designed with the environment in mind.’”

New York Daily News, February 2, 1995

1435



“...Tucked away in one corner of the yard is the Brooklyn Navy Yard Cogeneration (BNYC) facility – the lifeblood of this thriving complex and an important part of the New York electric and steam systems. BNYC (Fig. 1), by virtue of its strategic location across the East River from downtown Manhattan, provides steam to Consolidated Edison’s (ConEd) steam system, Brooklyn Navy Yard Development Corp. (BNYDC), and New York City’s Red Hook Wastewater Treatment Plant. Electricity is sold to ConEd under a long-term power purchase agreement...”

powermag.com, August 15, 2006

Caption: “Fig. 1 - The Brooklyn Navy Yard Cogeneration Facility provides power to the ConEd grid and steam to ConEd’s steam heat system in Manhattan, across the East River”

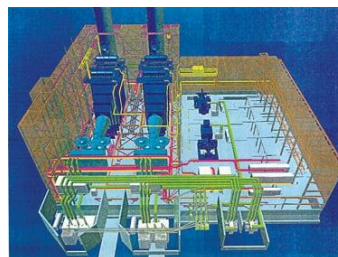
1436



“...The cogeneration plant consists of two 120-MW Siemens gas turbines, two HRSGs, and two 40-MW steam turbines. Turbine exhaust steam is sent to the steam heat system...”

powermag.com, August 15, 2006

1437



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“...In 2001, after five years of operation, circumstances forced then-owner Edison Mission Energy to consider selling the plant . . . In the spring of 2004, Delta Power and Metalmark Capital purchased a controlling stake in BNYC and developed a plan to revitalize the project with the right mix of technical talent and investment dollars. Upgrades began immediately after the deal was inked . . . In 2005, BNYC earned the distinction of being one of the few cogeneration plants accepted into the U.S. EPA National Environmental Performance Track (www.epa.gov/performance-track) and also received preliminary approval by OSHA’s Voluntary Protection Program (www.osha.gov/dcsp/vpp). These two voluntary programs recognize companies committed to environmental excellence and outstanding workplace safety...”

powermag.com, August 15, 2006

1439



1440

Hollywood East

Deal with DeNiro group dead; Giuliani signs N.J. firm to build complex

The Journal News (White Plains, NY), October 14, 1999

RE: introduction to an article entitled: "City Changes Cast-of-Characters for Studio at Brooklyn Navy Yard"

1441

1442

"NEW YORK (AP) – Five months after a celebratory press conference with Robert DeNiro and Miramax Films to trumpet a \$150 million studio complex at the Brooklyn Navy Yard, Mayor Rudolph Giuliani said yesterday that the city is doing business with someone else..."

The Journal News (White Plains, NY), October 14, 1999

"...Giuliani said the deal with the DeNiro group is dead, and instead the city has signed a deal with Steiner Equities of Roseland, N.J. and New York Studios to build a \$120 million studio complex at the Navy Yard, a former shipbuilding center that closed in 1966 and is now a gritty industrial park leased by the city. 'The Brooklyn Navy Yard board believes the (Steiner Equities) deal would bring about \$60 million more in revenue, that it was a more realistic deal, that they could start faster – meaning within the next three to four months,' Giuliani said. 'And they did not require a \$25 million (city) loan'..."

The Journal News (White Plains, NY), October 14, 1999

1443

1444

"...Mark Rosenbaum, President of the city's Brooklyn Navy Yard Development Corp., said the city had given DeNiro 'every opportunity to sign an agreement with the city. We never got a commitment from the DeNiro people,' he said. Steiner Equities officials did not immediately return a call seeking comment. Representatives for DeNiro and Miramax declined to comment..."

The Journal News (White Plains, NY), October 14, 1999

"...It was unclear whether politics was a factor. Miramax Films President Harvey Weinstein has a close relationship with first lady Hillary Rodham Clinton, the mayor's likely opponent in a race for the U.S. Senate next year. Neither Clinton nor Giuliani have declared their candidacies. A party planned at the Navy Yard this summer for the inaugural issue of 'Talk' magazine – partially owned by Miramax – was nixed by the city after Giuliani administration officials learned that Clinton was scheduled to appear on the magazine's cover..."

The Journal News (White Plains, NY), October 14, 1999

1445

1446



“...At the time of the news conference in May, Deputy Mayor Randy Levine said the DeNiro-Miramax plan was at the letter-of-intent stage. The Steiner deal calls for the construction of 12 sound stages, plus post-production facilities inside the Navy Yard’s former dry dock building and fiber-optic technology to bring live digital feeds through the internet.”

The Journal News (White Plains, NY), October 14, 1999

1447

1448
Caption: “Part of the Brooklyn Navy Yard will be converted into a movie studio”

“ON Monday Mayor Michael Bloomberg and NYC Media and Entertainment Commissioner Katherine Oliver joined Steiner Studios Chairman Doug Steiner to open five new soundstages at the complex, ensuring its status as a major entertainment production center for years to come. The new stages total 45,000 square-feet. ‘The business of film, television and commercials wants to be in New York City,’ said Steiner. ‘We have the greatest crews in the world, and now we have the facilities to match. Old media is here, new media is coming. This is manufacturing for the 21st century, and it is a business that New York does exceedingly well’...”

Brooklyn Daily Eagle, March 26, 2012

1449

BROOKLYN NAVY YARD - Mr. Popper’s Penguins, Revolutionary Road, Sex and the City, American Gangster, Spiderman 3, The Nanny Diaries and The Inside Man are just a few of the major motion pictures that were filmed, at least in part, at Steiner Studios in the Brooklyn Navy Yard – not to mention TV shows like “Boardwalk Empire” and “Damages.”

Brooklyn Daily Eagle, March 26, 2012

RE: introduction to an article entitled: “Steiner Studios, ‘Hollywood East,’ Expands Facilities”

“...‘A little over a decade ago, New York City struggled to attract the lucrative production industry to film here,’ said Bloomberg. ‘Now the city is such a popular and prosperous home to hundreds of films and television shows, we have to work hard to keep up with the demand for stages and production facilities. These new soundstages at Steiner Studios will create jobs, and expanding our workforce development programs with new grants will help the next generation of production professionals start their careers on the right track’...”

Brooklyn Daily Eagle, March 26, 2012

1450

“...‘Forget La-La Land,’ said Borough President Marty Markowitz. ‘Steiner Studios and Brooklyn are ‘Hollywood East’...”

Brooklyn Daily Eagle, March 26, 2012

1451



“...The five new stages at Steiner support heavy electrical loads, are soundproof and column-free, and possess massive silent heating, ventilating and air-conditioning units. The building also features various support spaces, offices, dressing rooms, hair and makeup rooms, and wardrobe rooms...”

Brooklyn Daily Eagle, March 26, 2012
Caption: “Steiner’s new soundstages”

1452



“...Coupled with the existing five stages, Steiner Studios now totals 355,000 square-feet, including editing suites and prop storage. Steiner Studios sits on 20 acres of the Brooklyn Navy Yard and includes on-site parking, a full commissary, a screening room, and lighting and grip services. Steiner Studios first opened for business in November 2004...”

Brooklyn Daily Eagle, March 26, 2012
Caption: “Doug Steiner poses on the roof of Steiner Studios at the Navy Yard”

1453

1454

Fortune Favors the Bold

“...Coinciding with the expansion of Steiner Studios, the ‘Made in NY’ Production Assistant Training Program, operated by Brooklyn Workforce Innovations, will be locating its activities at the Brooklyn Navy Yard’s Building 92. The program, which was developed in partnership between the Mayor’s Office of Media & Entertainment and BWI, provides free training to unemployed or underemployed New Yorkers who lack opportunities in the production industry and teaches them the skills needed for entry-level jobs on set and in production offices. Approximately 96 percent of the program graduates are people of color, and ‘Made in NY’ PAs have worked on over 2,000 productions, cumulatively earning more than \$7.5 million in wages.”

Brooklyn Daily Eagle, March 26, 2012

NEW YORK (AP) – Audrey Lyons was a \$40-a-week parts inspector at the Brooklyn Navy Yard in 1944 when Margaret Truman was invited to christen the brand-new USS Missouri. “We all took time off to see it,” recalls Lyons, now 84 and retired in Essex, Conn.

The Post-Star (Glens Falls, NY), November 13, 2008

RE: introduction to an article entitled: “Historic Brooklyn Navy Yard Gets Makeover”

1455

1456

“BUT the daughter of Senator (and soon-to-be-president) Harry S. Truman needed help to break the champagne bottle on the third try – a less than sparkling debut for the ‘Mighty Mo,’ the last truly famous warship among hundreds produced at the yard since 1801...”

The Post-Star (Glens Falls, NY), November 13, 2008



“The ‘U.S.S. Missouri,’ one of the four mightiest battleships in the world, was launched in the Brooklyn Navy Yard at 1:05 P.M. yesterday. Exactly on the minute her sponsor, Mary Margaret Truman, daughter of U.S. Senator and Mrs. Harry Truman of Missouri, smashed a metal-encased bottle of champagne on her broad, duckbill prow and the huge vessel moved with smoothly accelerating speed stern-first into the water . . . for possibly half-a-minute after the ship rode free of the ways on which she had been under construction since Jan. 6, 1941, the sun peeked forth to illuminate the flag-draped vessel in all of her grim gracefulness...”

The Brooklyn Daily Eagle, January 30, 1944

Caption: “Launch of Battleship USS Missouri (BB-63) Jan. 29, 1944”

1457

1458

“...The Pentagon closed the Brooklyn Navy Yard in 1966, an obsolete facility awash in history but torpedoed by time...”

The Post-Star (Glens Falls, NY), November 13, 2008

1459

“...Yet behind the nondescript facade visible to motorists rushing past on the Brooklyn-Queens Expressway, the 40-plus buildings of the former shipyard have become a modern beehive of activity that includes almost everything but, well, bees...”

The Post-Star (Glens Falls, NY), November 13, 2008

1460

“...Its old machine shops and warehouses hum with small entrepreneurs – makers of furniture, clothing, industrial equipment, theatrical sets and computer software – as well as medical suppliers, fashion designers, printers, carpenters and artists, altogether employing 5,000 people...”

The Post-Star (Glens Falls, NY), November 13, 2008

1461

“...Andrew Kimball, President and CEO of Brooklyn Navy Yard Development Corp., a not-for-profit that manages the city-owned site, said current plans call for spending \$250 million to add 1.3 million square-feet of space and 1,500 more jobs by 2009. In a decade, there should be 5,000 more jobs. ‘The Brooklyn Navy Yard has added another chapter to its rich history by becoming a thriving hub of industrial business,’ Kimball says...”

The Post-Star (Glens Falls, NY), November 13, 2008

1462

“...The continuing expansion will emphasize ‘green’ construction. Hospital buildings and an overgrown cemetery that once held 1,500 bodies await transformation into a 20-acre ‘media campus’ focused on entertainment, TV and graduate educational programs (the bodies were reburied in Cypress Hills cemetery)...”

The Post-Star (Glens Falls, NY), November 13, 2008

RE: the *Brooklyn Naval Hospital Cemetery* held the remains of U.S. sailors as well as others of all races and creeds. Supposedly, in 1926, all bodies interred in the cemetery were re-interred elsewhere. In 2001, NYC bought the entire Naval Hospital property from the Federal Government. The BNY-DC planned to redevelop the site as an “entertainment and media campus.”

1463

“...It is little larger than the ordinary city block, and is enclosed on the hospital side with a high brick wall, and on the other three sides with a tall iron fence, which is badly in need of a coat of paint. Outside this railing, and facing Flushing Avenue, are several foundries, machine shops, factories and stables that completely prevent a view of the cemetery from the street. The entrance is through a small street running back from Flushing Avenue, and separating the city and Government property. It is seldom traveled and never cleaned. The children in the neighborhood use the place as a playground. There are heavy chains and a stout padlock on the cemetery gate...”

The New York Times

RE: in 1897, a NYT reporter visited the *Naval Cemetery* and described the graveyard behind the *Naval Hospital*

1464



Caption: "Photograph of the Naval Cemetery taken in February 1926, a few months before remains and headstones were removed and transferred to Cypress Hills National Cemetery" 1465

"...The cemetery is rarely visited. One's first impression of it is that it receives no attention outside of keeping the grass cut and the trees trimmed . . . Scattered throughout the cemetery are tall elms. One of the things that strike the visitor most forcibly is the lack of monuments. There are no handsome stones to mark the last resting places of the men who gave their lives to their country. In fact some of the graves have no headpieces except the kind that the Government furnishes. Some of these have been broken away or lost, and it is not known who lies beneath."

The New York Times, 1897

RE: when the NYT reporter explored the cemetery in 1897, most of the graves were marked with cast-iron markers about one-foot-square, many of them rusty, worn and/or broken. They were replaced in 1899 with uniform marble headstones akin to those used in national cemeteries. Despite this improvement, there was little room remaining for additional burials by the end of the 19th century and it closed to interments in 1910. 1466

Cemeteries have been responsible for some of New York's most valued green spaces: both Washington Square Park and Bryant Park, for example, were once graveyards, said Cindy VandenBosch, a local tour guide - open lots saved from development that were later disinterred and repurposed for public use. If a few organizations in Brooklyn have their way, The Naval Hospital Cemetery might soon be added to that list.

thelmagazine.com, March 11, 2010

RE: introduction to an article entitled: "What to Do with That Old Cemetery in South Williamsburg? In 1926, the USN disinterred remains from the burial ground and reinterred them at *Cypress Hills National Cemetery*. The trees were subsequently removed from the property and the site graded to create a playing field. With the assumption that the area no longer contained bodies, the USN reused the grassy space of the former cemetery for a variety of, primarily, recreational purposes for the next fifty or so years. 1467

"LOCATED in the southeast corner of the Brooklyn Navy Yard, the Naval Hospital Cemetery site is a 1.7-acre lot along Kent Avenue, near Williamsburg Street West. It was active from 1834 to 1910, during which some 2,000 Marines and Navy men (and some civilian family members) of various ethnicities were laid to rest there. Around 1926, their bodies were moved to Cypress Hills..."

thelmagazine.com, March 11, 2010 1468

"...The Navy Yard eventually converted the spot into baseball fields until one day, 'the story goes, someone kicked a bone,' said Shani Liebowitz of the Brooklyn Navy Yard Development Corporation - because a cemetery, especially one with poorly kept records, is difficult to disinter completely..."

thelmagazine.com, March 11, 2010 1469

"...The Navy Yard removed the ball fields and allowed the site to grow wild. Today, it is a small field of overgrown grasses, trees, flowers and weeds. There are no headstones. It's tucked behind fences marked 'GOVERNMENT PROPERTY NO TRESSPASSING,' adjacent to the 'old gas station' site, across the street from an active BP station. The B.Q.E. runs parallel to its southern fence; feral cats have made it their home. Most people biking by don't even know it's there..."

thelmagazine.com, March 11, 2010 1470



“...But the Brooklyn Greenway Initiative, which is working to create 14 miles of mostly waterfront bike and pedestrian paths to connect Greenpoint to Bay Ridge, is eager to incorporate the site into their grand design - as a stop along the way, not unlike the outlooks along scenic high-ways...”
 themagazine.com, March 11, 2010

1472

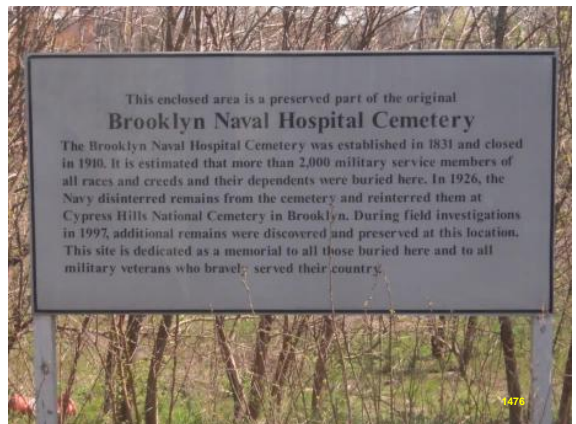
“...The B.G.I. and several design firms, working together, presented to the public on Monday evening their preliminary plan for a publicly accessible wildflower meadow, which would function as a pollinator habitat, which in turn would have a positive influence on nearby community gardens - roughly estimated to number 50 in a two-mile radius from the proposed site - and local backyards. The designers would work with many of the plants already present, pushing back against aggressive species while promoting the plants that foster biodiversity...”
 themagazine.com, March 11, 2010

1473



“...The space is unique because developing it requires ‘no ground disturbance;’ it’s still considered a sacred resting place. The plan takes this, painstakingly, into account: the native flowers require no tilling to plant; the boardwalk that would function as a perimeter path would simply sit on the ground - as opposed to being balanced on dug-in posts - but its elevated height would encourage visitors not to stray off path. ‘It keeps it sorta sacred,’ said Thomas Woltz, the project’s landscape architect. ‘People can be the spectators,’ added Milton Puryear, of the Greenway Initiative...”
 themagazine.com, March 11, 2010

1475



1476

“...Moving forward, B.G.I. and B.N.Y.D.C. will fine-tune the plan, nail down specifics, develop a cost estimate, and secure funding. Another public information session will be held some time in the future, of which The L will keep you updated!”
 themagazine.com, March 11, 2010

“THE Brooklyn Naval Hospital Cemetery was active from 1831 to 1910 and was the burial site for more than 2,000 people, primarily officers and enlisted men. In 1926, the Navy relocated remains to Cypress Hills National Cemetery. Later archival and archaeological investigations of the site concluded that numerous burials were unaccounted for and potentially remained at the site...”
 chi-atheneum.org, 2017
 RE: in the early 1830s, the USN established a burial ground on the eastern edge of the hospital campus. The two-acre Naval Cemetery was used from about 1831 to 1910.

1477

1478



“...The location is rethought as an open space along the length of the Brooklyn Greenway and reactivated as a publicly accessible landscape. The design features a wildflower meadow and sacred grove, framed by an undulating boardwalk and lifted above the hallowed ground...”
 chi-atheneum.org, 2017

1480



“...This experience evokes the histories of settlement and cultivation, life and death, while slowing the heart rate and connecting visitors with the stories of the site. The work was partly funded by a grant with a mission to reconnect urban residents with nature and histories of place...”
 chi-atheneum.org, 2017

1481

1482



"...The wildflower meadow, with more than fifty species of native plants, offers much needed cover and food for the pollinators critical to the ecological health of the region. Initially established in a strict geometric arrangement, the plantings will eventually drift across the site, creating new patterns and establishing a self-sustaining, 'open-ended' ecology intended to draw people, birds, moths and bees in a rich celebration of life..."

1483

chi-athenaeum.org, 2017



"...Sited to the east of the Naval Hospital buildings at the Naval Annex, at the grounds are a former cemetery. The project creates public access to a 1.7 acre natural area within the boundary of the Brooklyn Navy Yard, with entry from Williamsburg Street West, between Flushing Avenue and Kent Avenue..."

1484

chi-athenaeum.org, 2017



"...Because of the sensitive condition of the site, all structures are designed and engineered with minimal impact upon the landscape. A series of steps and an accessible ramp lead up to the gateway and the level of a raised, wooden walkway..."

1485

chi-athenaeum.org, 2017



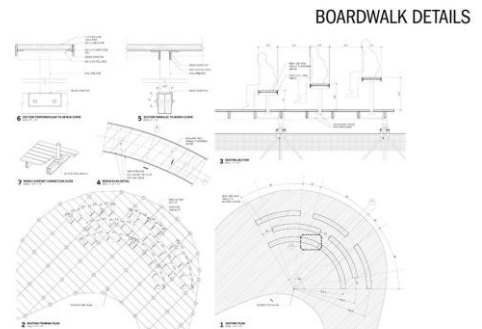
1486



"...The walkway does not use heavy footings or foundations. Instead, an array small, precast concrete piers is set onto the ground surface and secured with steel pins driven into the earth..."

1487

chi-athenaeum.org, 2017



1488



"...The raised walking path provides access around the perimeter of the site and its large central meadow. Two small seating areas for education and reflection are placed along the walkway..."
chi-athenaeum.org, 2017

1489



1490



"...The surfaces of the walkway and entrance gateway are finished with black locust wood..."
chi-athenaeum.org, 2017

1491

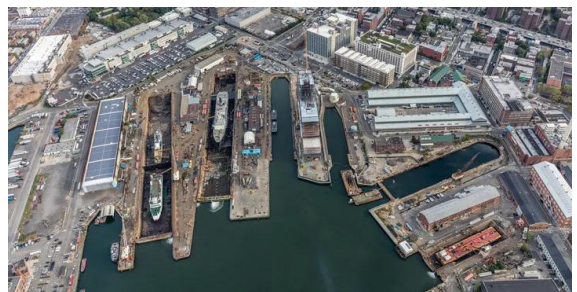


"...An entrance gateway and attendant's station faces acts as the threshold between the landscape and the street..."
chi-athenaeum.org, 2017

1492

"...The plantings of the meadow focus on establishing native plant fodder for the pollinators critical to ecological health of the region, including butterflies, honey bees, and other insects. Plants are selected for low height to retain visibility, vibrant color display during warm seasons and interesting seed pods or stem textures for winter interest."
chi-athenaeum.org, 2017

1493



"...Some of the six dry docks remain in use for maintenance. On a recent day, one held a large Singapore-based oil products tanker. The U.S. Coast Guard tug 'Sturgeon Bay' occupied another. 'Maritime is still part of what we do,' said Kimball..."
The Post-Star (Glens Falls, NY), November 13, 2008

1494



“...The yard’s biggest tenant is Steiner Studios, a Hollywood-style operation in a cavernous former machine shop with sound stages where large pieces of vessels were once assembled. It, too, is expanding...”
The Post-Star (Glens Falls, NY), November 13, 2008

1496

“...There is a fish wholesaler to fancy restaurants, a shroud-maker for Orthodox Jewish funerals and a factory producing coffee-sweetener packets. At Ferra Designs, Inc., partners Robert Ferraroni and Jeff Kahn use a powerful water jet to cut steel for custom-designed furniture and sculpture. They found space at the Navy Yard after rising rents forced a move from the nearby Williamsburg neighborhood. ‘The Navy Yard is a great resource for networking with other businesses.’ Kahn said. ‘I feel like we’re in a community here. We do business together, and it reinforces the feeling that we are in the right place’...”

The Post-Star (Glens Falls, NY), November 13, 2008

1497



“...It didn’t happen overnight. With the Navy gone, the dry docks and cranes that helped win seven wars fell into disrepair...”

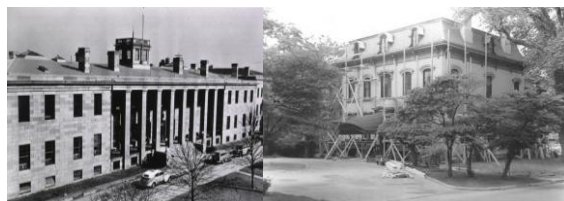
The Post-Star (Glens Falls, NY), November 13, 2008

Caption: “Dock cranes are silhouetted during sunset at the Brooklyn Navy Yard in New York”

1498



1499



“...The carved eagles-on-pillars guarding the main gate vanished, and it became a police department auto pound, where citizens pay \$200 to reclaim stolen and towed vehicles. At the old naval hospital, a marble ghost dating from 1837, the wide corridors and patient wards echo with emptiness...”

The Post-Star (Glens Falls, NY), November 13, 2008

Left: built from 1830-1838, the *U.S. Naval Hospital* (formerly the *U.S. Marine Hospital*) is a two-story, 125-bed Greek Revival structure in the shape of an “E.” It’s located north of Flushing Avenue, between Ryerson Street and N. Williamsburg Place. The refined granite building contains a recessed portico with eight classical piers of stone that reach the full height of the building.

Right: occupying the same property as the hospital, the *Surgeon’s House* follows the style of the *French Second Empire* with its low, concave mansard roof and dormer windows. It’s a two-story brick structure divided into two main sections, the house proper and a servant’s wing, together totaling sixteen rooms.

1500



1502



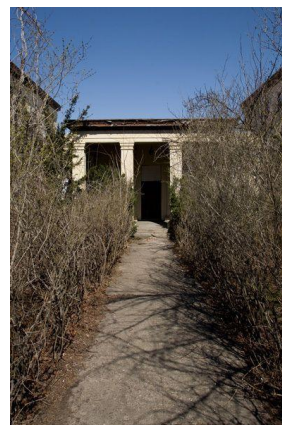
1503

Representative James J. Heffernan declared last night that if Congress is recalled for an extra session he will demand that his bill for providing for erection of a 1,000-bed Navy hospital be brought out of the House Armed Services Committee
The Brooklyn Daily Eagle, June 27, 1948
RE: introduction to an article entitled: "Heffernan Ready to Renew Fight for New Navy Hospital"

1504

"THE Naval Hospital, a 1,200-bed institution which handled 65,197 cases during World War II, is to be closed by the Navy on Tuesday, with its services transferred to the St. Albans Naval Hospital. The Navy has explained demobilization after World War II brought on a constant decrease in the number of patients..."
The Brooklyn Daily Eagle, June 27, 1948
RE: the land that the hospital was built on was sold in 1824, turning what was the *Schenck Farm* over to USN. Construction began in 1830 and by 1850, the Annex was a self-contained parcel of land, walled-in, with a gatehouse, laboratory and cemetery.

1505



"...The hospital buildings will be used by the Navy for a receiving station and for administrative offices which now are widely scattered around the city. Physicians' and nurses' homes are expected to be used as residences for flag officers – those from Commodore rank up..."
The Brooklyn Daily Eagle, June 27, 1948
Caption: "Building RG, Bachelor Officers' Quarters. Constructed 1919"

1506

“...Representative Heffernan introduced the bill several weeks ago when it became clear the Navy intended to close the Brooklyn institution. The bill does not include any appropriation for the new hospital, Mr. Heffernan explaining he had left the amount up to the House committee. He said he had been informed by the Navy planning division that a modern 1,000-bed hospital would cost from \$20,000,000 to \$25,000,000...”

The Brooklyn Daily Eagle, June 27, 1948

1507



“...The Brooklyn Naval Hospital was commissioned in 1838. Its first building cost \$19,000. In 1853 a laboratory was added, with E.R. Squibb and B.F. Bache in charge. The two built it into one of the top-ranking labs in the country. Squibb left in 1857 and a year later founded the pharmaceutical supply house of E.R. Squibb & Son in Brooklyn...”

The Brooklyn Daily Eagle, June 27, 1948

Caption: “Back of the R95 building (Naval Hospital). Constructed 1830-1838.”

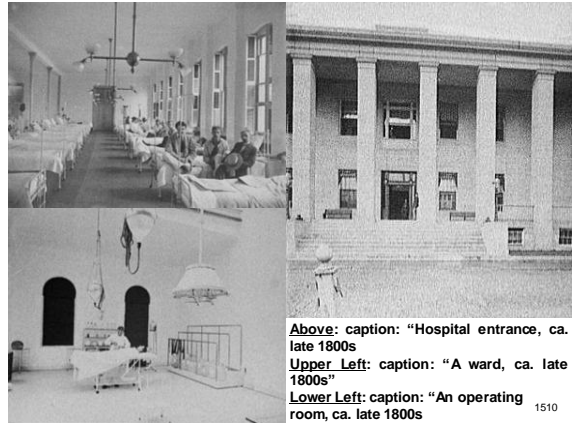
1508

“...Only two medical officers were on duty when the Civil War broke out. The hospital had facilities for 125 patients, but it handled nearly 25 percent of all Union casualties...”

The Brooklyn Daily Eagle, June 27, 1948

RE: during the Civil War, the hospital supplied over one-third of the medicine used by Union troops. The basement of the main hospital building was used to confine and treat wounded Confederate prisoners.

1509



Above: caption: “Hospital entrance, ca. late 1800s

Upper Left: caption: “A ward, ca. late 1800s”

Lower Left: caption: “An operating room, ca. late 1800s

1510



1511

“...By 1904 the hospital had been enlarged so it ranked with the finest civilian hospital in the country. All the more serious cases resulting from the expedition to Vera Cruz were being handled when World War I broke out, but by 1918 seven new buildings were added and more were under construction...”

The Brooklyn Daily Eagle, June 27, 1948

1512



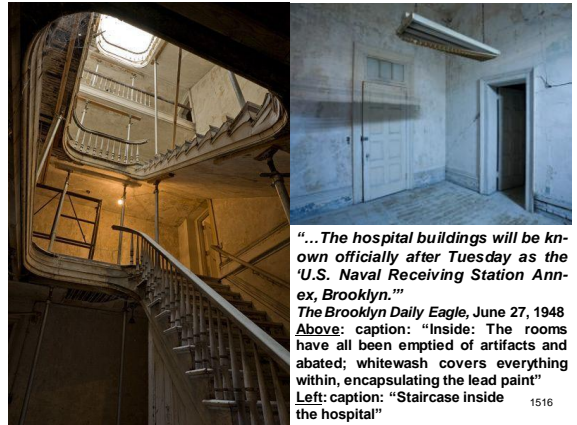
Caption: "The Naval Hospital campus and Naval Cemetery, ca.1904" 1513

1514

"...Peace years found the number of patients falling off, and many of the buildings fell into misuse, but the declaration of a national emergency in 1938 brought on a widespread rehabilitation program, and the 37 buildings were modernized..."
The Brooklyn Daily Eagle, June 27, 1948



"...The hospital then had 23 medical officers, 21 nurses and 138 corpsmen to care for 400 patients. By December, 1944, the staff consisted of 107 medical officers, 170 nurses and more than 400 corpsmen, with nearly 2,000 cases to handle..."
The Brooklyn Daily Eagle, June 27, 1948
Caption: "Nurses in ward at Naval Hospital, Brooklyn. March 1920." 1515



"...The hospital buildings will be known officially after Tuesday as the 'U.S. Naval Receiving Station Annex, Brooklyn.'"
The Brooklyn Daily Eagle, June 27, 1948
Above: caption: "inside: The rooms have all been emptied of artifacts and abated; whitewash covers everything within, encapsulating the lead paint"
Left: caption: "Staircase inside the hospital" 1516



1517

1518

In 2014, the Brooklyn Navy Yard was listed on the National Register of Historic Places as an historic district. Quarters A, the Commandant's house, is a National Historic Landmark. Dry Dock No. 1, the Naval Hospital Building and the Surgeon's Residence are designated NYC landmarks.



"THESE 10 stately residences, built between 1864 and 1901, stood on Flushing Avenue for generations, and they were among the most prominent artifacts of the Brooklyn Navy Yard's long history of shipbuilding and maritime activity. But as a final visit to the homes last summer revealed, they had also been severely damaged by decades of government neglect..."

ny.curbed.com, September 1, 2016

Above L&R: caption: "In the Brooklyn Navy Yard, the slow collapse of Admiral's Row over the past 40 years has created a unique hidden landscape, obscured behind fences and walls, covered in weeds and ivy. Used as naval officers' housing for over a century before being abandoned in the 1970s, these historic homes along Flushing Avenue have been wrapped in red tape ever since, despite the best efforts of a cohort of preservationists."

1525



Caption: "The 11 residential buildings on the Admiral's Row campus have been completely overgrown by ivy and trees. The front steps of Quarters K and L are almost unrecognizable."

1526



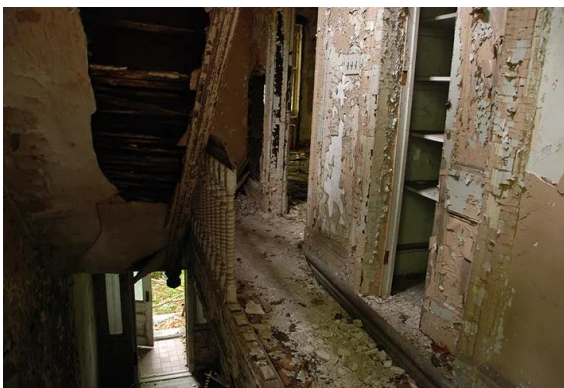
Caption: "Some building interiors are still in relatively good condition, despite being exposed to the elements for decades. The entryway of Quarters D still has stairs, floors, moldings, and windows somewhat intact."

1527



Caption: "Peeling paint, floors with holes, and crooked doorways are some of the lesser problems found inside the houses today. Feral cats, birds, and other wildlife have made them their home."

1528



Caption: "On the buildings' upper levels, entire rooms have gone missing over the years, though the exteriors of the buildings remain intact."

1529



Caption: "Snow, rain, and falling tree limbs have caused walls and windows to cave in. Vines and soil have entered the premises, blurring the boundary between interior and exterior, nature and fabrication."

1530



Caption: "The back-end of this building has sheared-off into the woods. Few pieces of graffiti can be found inside the buildings, which have largely been untouched by humans in 40 years, providing a case study in urban entropy." 1531



Caption: "'On the day after humans disappear, nature takes over and immediately begins cleaning house - or houses, that is. Cleans them right off the face of the Earth,' writes Alan Weisman in *The World Without Us*." 1532



Caption: "'Even where the glass is still intact, rain and snow mysteriously, inexorably work their way under sills,' writes Weisman. 'As the wood continues to rot, trusses start to collapse against each other.'" 1533



Caption: "'Eventually the walls lean to one side, and finally the roof falls in,' writes Weisman. 'Your house lasts maybe 50 years; 100, tops.' After 40 years of abandonment, many of the Admiral's Row homes appear to be near collapse." 1534



"...In recent weeks, four of the row's buildings have been ripped apart by backhoes and reduced to piles of rubble, and five more will soon be destroyed, to make way for retail buildings, a grocery store, and a parking lot..." 1535
ny.curbed.com, September 1, 2016

"...That is the ultimate tragedy of Admiral's Row - that those buildings got knocked down for parking. In 2016, we are knocking down 150-year-old buildings for a parking lot,' says Simeon Bankoff, the Executive Director of the Historic Districts Council. 'It is embarrassing.' Although they had been abandoned for over 40 years and left to become overgrown ruins, the officers' quarters remained an irreplaceable part of Brooklyn's history until their very end, and it is highly unlikely that the chain grocery store replacing them will become an equally important historic structure over the next century. 'This was an amenity that was publicly owned, and the government is now spending money to flatten it,' says Bankoff, who was part of an alliance of preservation groups and neighborhood activists that tried to save the buildings. 'We've got to learn from that. We can't allow that to happen.' ny.curbed.com, September 1, 2016

1536



“These were publicly owned, publicly built, protected historic properties that the government decided to get rid of. If the city wanted to save them, the city would save them. They wouldn’t need to be landmarked. And conversely, landmarking isn’t going to save them, because the city wants to demolish them.”

Simeon Bankoff, Executive Director of the Historic Districts Council
 RE: in May 2015, the BNYDC announced that nearly all of the 11 structures along *Admiral’s Row* would be replaced with a 74K-square-foot *Wegmans* grocery store; the first in NYC. For community activists, it was the end of a long, losing battle.

1538



Caption: “By the end of last week, demolition was in full gear at *Admiral’s Row*, and by the weekend, Building D, the residence in the center, would be completely leveled by a demolition crew”

1539



Caption: “Demolition crews preparing the residences at Buildings E, F, and G for destruction. Buildings H and C will also soon be torn down, leaving Building B as the only residence to be preserved”

1540



Caption: “A view of Building D and Building E, from *Flushing Avenue*, in the days before the demolition crews began taking them down. Decades of overgrowth and trees had already been removed, revealing a final view of their unique architectural details.”

1541



Caption: “*Admiral’s Row* had become an overgrown forest over the past four decades, casting a long shadow on *Flushing Avenue*, but in the days leading up to demolition, hundreds of mature trees were cut-down to make way for heavy equipment. ‘They just don’t give a damn about anything,’ lamented one neighbor, looking out over the denuded site.”

1542



1543
Caption: "This past Friday, as workers began demolishing Building D, an enormous cloud of century-old dust and debris was released over Flushing Avenue. An inspector from the NYC Department of Environmental Protection (DEP) quickly arrived on the scene to shut-down the demolition. 'You can't knock it down that fast,' he told the workers."



1544
Caption: "Employees in the Navy Yard have noted several visits from the DEP. By Sunday, however, Building D had been completely flattened. Buildings I, K, and L have already disappeared."



1545
Caption: "Building D, seen in 2015 before its demolition, was a charming three-story residence with wrought iron banisters and two attached sunrooms, surrounded by a lush forest"



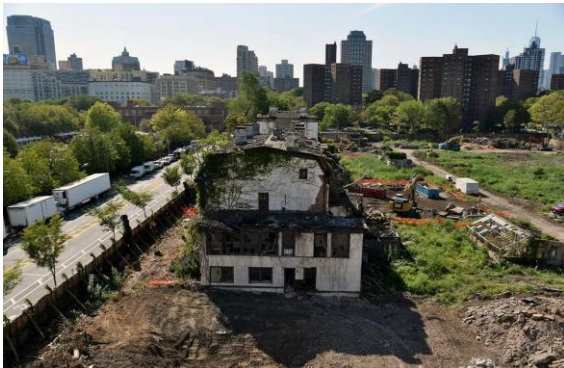
1546
Caption: "Nature had slowly taken over the insides and outsides of the buildings, but most walls, floors and ceilings remained intact"



1547
Caption: "Left abandoned and exposed to the elements, the overgrown residences had become a wild green forest, a unique sight along an avenue otherwise lined with warehouses and truck traffic"



1548
Caption: "In May, several months before demolition began, the forest of Admiral's Row almost completely obscured the historic residences hidden within. Many of the trees here would have been at least 40 years old, if not over 100."



Caption: "The same view this past weekend, revealing the extent of the clear-cutting. Most of the forested area will be replaced by a parking lot for local shoppers." 1549

In just a few months, the section of the Brooklyn Navy Yard that was once home to the stately 19th-century mansions of Admiral's Row will be open to the public once again.

ny.curbed.com, April 30, 2019

RE: introduction to an article entitled: "New Looks at Admiral's Row- Replacing Office Building at the Brooklyn Navy Yard - The Building Will Be Home to NYC's First Wegmans"

1550



"REPLACING those old buildings will be several new structures, including Building 212, a five-story hub with 130,000 square-feet of what the Brooklyn Navy Yard Development Corporation says is 'manufacturing and creative office space.' The former will take up the buildings second through fourth floors, while the fifth floor can be dedicated to offices. That space is now seeking tenants, and to coincide with that leasing launch, BNYDC has released new renderings of the building, designed by S9 Architecture...." 1551
ny.curbed.com, April 30, 2019



"...Crucially for New Yorkers, the building will also be home to New York City's first Wegmans. That grocery store - which inspires a fervor among fans who are known, apparently, as Wegmaniacs - will span 74,000 square-feet and will have a full-service bar and a cafe in addition to all the normal grocery offerings..." 1553
ny.curbed.com, April 30, 2019

"...The larger development of Admiral's Row, which is being undertaken by Doug Steiner's development firm, will also include renovating two of its historic structures - the Timber Shed, a pre-Civil War structure, and Quarters B, a circa-1872 building - and adding hundreds of parking spaces..."

ny.curbed.com, April 30, 2019

1554



1555
Caption: "The ruined Timber Shed is one of the only structures here that will be saved. Even in its current roofless condition, it is an important historic relic. 'The Timber Shed was a complete find,' said Bankoff. 'We found out it was the only remaining brick timber shed in America.'"



1556
Caption: "The interior of the shed is being supported by a forest of wooden braces. In its previous life, the structure was used to dry-out the masts of boats built in the Navy Yard."



1557
Caption: "Quarters B, with most of its interior intact, is the only other building that is scheduled to be preserved on the row. It has been recently boarded up to protect it from nature's further intrusion."

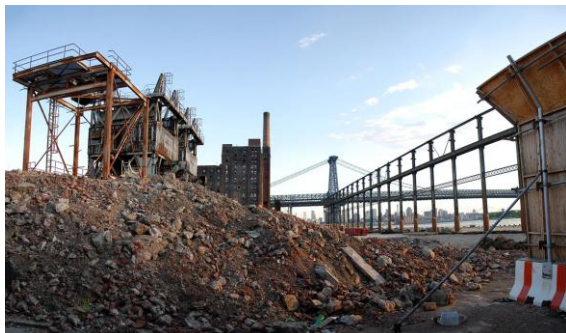


1558
Caption: "An interior view of Quarters B from 2008, revealing some of the architectural details that remained. This will be the last residential building left standing on the row."



1559
Caption: "...Last year, the Navy Yard unveiled a new master plan, which will add millions of square-feet of office and manufacturing space, along with public improvements (a NYC Ferry dock, new waterfront esplanades), to the former shipbuilding site. While Building 212 is expected to debut later this year, the larger Navy Yard redevelopment isn't expected to be complete for several more years."
ny.curbed.com, April 30, 2019

1560
Caption: "...While the demolition of Admiral's Row is a devastating loss for New York City's history, it is also part of a much larger tragedy. Almost 10 years ago, Brooklyn's entire industrial waterfront was placed at the top of the National Trust for Historic Preservation's annual list of the most endangered places in America. 'We're very concerned that there's such a rush on to demolish everything,' the president of the trust told the New York Times in 2007, announcing the designation. 'The buildings really represent an important part of Brooklyn's heritage, and it would be a tragedy to lose it'..."
ny.curbed.com, September 1, 2016



Caption: "Admiral's Row now joins the pantheon of historic structures that have been lost along Brooklyn's industrial waterfront during the past decade, including most of the Domino Sugar Refinery complex, seen here during its 2015 demolition. 'We are losing a memory of what was there,' says Bankoff. 'And what life was really like in the 19th century.'" 1561

"...Unfortunately, during the ensuing decade, many of the endangered structures along Brooklyn's waterfront were bulldozed, burned, or unrecognizably altered by development. What remains today is a shoreline almost entirely transformed, with new residential towers replacing a century of older architecture, leaving behind few reminders of the urban industrial era that helped create modern New York City..."
 ny.curbed.com, September 1, 2016

1562



Caption: "These lost historic buildings include the Revere Sugar Refinery, seen mid-demolition in 2007. By erasing the evidence of our urban industrial era, what clues will we be leaving for future generations to understand how we developed as a society? 'It's really important to understand why they built warehouses on the waterfront,' Bankoff says. 'It wasn't so that people could live in loft settings.'" 1563

"...We are losing our past. We are losing any kind of sense of continuity with the people who lived here, worked here, and built the place we are living in now,' said Bankoff, reflecting on the decade-long process of destruction that has erased Brooklyn's once-iconic landscape of dry docks, sugar refineries, and powerhouses, while razing countless silos, signs, warehouses, and workers' residences. 'When you lose a sense of the past, you actually lose a sense of the future. Because without a past, it's hard to imagine that what you are doing now will have any effect,' says Bankoff. 'It makes you think - why does anything I do matter? It is an ugly thing to live in a timeless place'..."
 ny.curbed.com, September 1, 2016

1564



Caption: "The Kent Avenue Powerhouse, as it was being destroyed in 2008. Had they been left standing, these industrial relics might have helped illustrate how our activities over the past two centuries shaped our modern society." 1565

"...As Brooklyn's formerly industrial waterfront slowly fades away from our collective memory, little will remain besides the photographs and artifacts collected by those who witnessed its disappearance."
 ny.curbed.com, September 1, 2016

1566



Caption: "The Greenpoint Terminal Warehouse, which burned in 2006, was largely demolished in 2007. 'If it wasn't a slow motion tragedy, it would be funny,' says Bankoff. 'Thinking about what the waterfront is going to look like 100 years from now, eventually we are going to have to build levees or some kind of protection against rising water, or just not have anything there.'" 1567

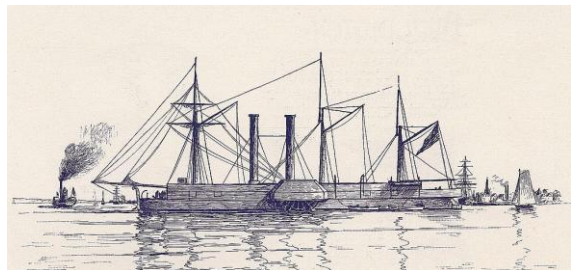


"...The first ship built there, in 1798, was the frigate 'USS Adams,' burned by its crew in 1812 to avoid British capture. The last, the amphibious transport 'USS Duluth,' slipped into the East River in 1965..."

The Post-Star (Glens Falls, NY), November 13, 2008
Left: caption: "USS Adams was laid-down on July 30, 1798 in New York. Launched: August 6, 1799, Commissioned: September 1799."
Right: caption: "On August 14, 1965, the Landing Platform Dock USS Duluth (LPD-6) floated out of Dry Dock No. 3 at the New York Naval Shipyard. In the preceding 145 years, this shipyard had witnessed the launch of 125 commissioned warships of the USN. This would be the 126th – and final – USN vessel to be built on Wallabout Bay." 1568

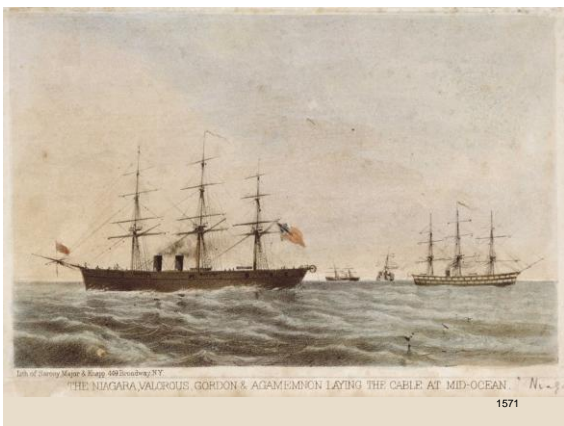


1569

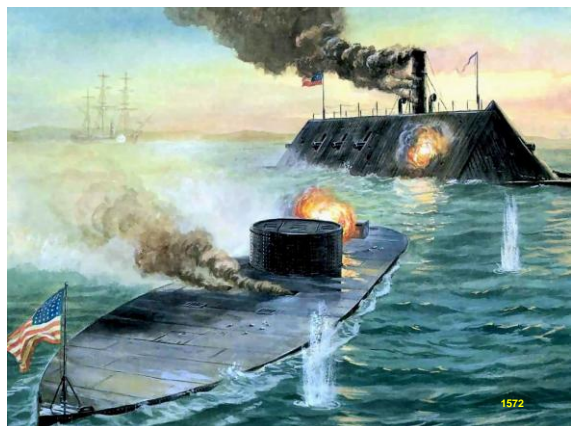


"...Other noteworthy vessels included the 'Fulton II,' the first U.S. steam-powered warship to go to sea, in 1837; 'USS Niagara,' which helped lay the first trans-Atlantic undersea cable; and 'USS Monitor,' built elsewhere but commissioned at the yard in 1862. Within weeks it faced the Confederates' 'CSS Virginia' in history's first clash of ironclads – a standoff, but a death knell for wooden ships."

The Post-Star (Glens Falls, NY), November 13, 2008
Caption: "Fulton II" 1570



Gift of George Meigs & Blagg, 499 Greenwich ST.
 "THE NIAGARA, VALCOUR, GORDON & AGAMEMNON LAYING THE CABLE AT MID-OCEAN." 1571



1572

Part 14

Déjà vu All Over Again

The “Can-Do” Spirit

1573

1574

It’s “Can-Do” all over again at the Brooklyn Navy Yard

New York Daily News, July 28, 2011

RE: introduction to an article written by *Denis Hamill* entitled: “The Navy Yard’s ‘Can-Do’ spirit Returns to Brooklyn With New Businesses.” The efforts of its 75K workers during WWII earned the *Brooklyn Navy Yard* the nickname the “Can-Do Shipyard.”

“AT its peak during WWII locals nicknamed the Brooklyn Navy Yard the ‘Can-Do Shipyard’ because with 71,000 workers - 5,000 of them gritty, patriotic ‘Rosie the Riveter’-era women employed in the war effort as welders, electricians, pipefitters, parts inspectors and truck drivers - Brooklyn built 17 battleships and carriers including the ‘USS Missouri’ upon which the Japanese would eventually surrender, retooled another 250 to battle worthiness, and repaired some 5,000 U.S. Navy vessels wounded in the Atlantic...”

New York Daily News, July 28, 2011

RE: the 356-acre *Brooklyn Navy Yard* employed +70K workers during WWII whose tireless efforts earned it the nickname the “Can-Do Shipyard.” One of the perks of working at the yard was making workers and their families eligible to move into an apartment in the newly-built *Fort Greene Houses*. The vast complex was one of the *New York City Housing Authority’s* (NYCHA) first and largest affordable housing projects, built to house the families of Navy Yard workers.

1575

1576

Company Town

Two Ft. Greene buildings to be completed unless priorities intervene

The Brooklyn Daily Eagle, August 4, 1942

RE: introduction to an article entitled: “Housing Project to Get First 120 Families Aug. 17”

1577

1578

"UNLESS war priorities prevent installation of refrigerators and various metal fixtures, 120 families will move Aug. 17 into the first two buildings completed at the \$20,806,000 Fort Greene Housing Project, it was learned today..."

The Brooklyn Daily Eagle, August 4, 1942

1579



"...The huge project, largest in the State and occupying 23 city blocks, will be confined solely to families of workers at the Brooklyn Navy Yard. It is expected that 612 additional tenants will take up residence there this month. When fully completed, the housing center will accommodate a total of 3,500 families and consists of 35 residential buildings and three store structures, as well as a community building, the erection of which has been postponed for the duration..."

The Brooklyn Daily Eagle, August 4, 1942
Caption: "View of three thirteen-story apartment towers nearing completion in housing project north of Fort Greene Park; construction equipment and debris in foreground, 1942"

1580

"...Pending construction of the community building, a temporary nursery and baby health center will be available for the children of mothers who have joined their husbands in war production work..."

The Brooklyn Daily Eagle, August 4, 1942

1581



Caption: "A sketch of the tentative plan for the Navy Yard housing project as it will appear if Parks Commissioner Robert Moses' ideas are adapted. Note how the buildings have been arranged and streets laid out in relation to the Martyrs Monument in Fort Greene Park (lower right)."

1582



Caption: "Aerial view of Brooklyn and Lower Manhattan, 1956. Fort Greene Park and Martyrs Monument is seen in lower right corner."

1583



1584



"...Work was started on the project April 14, 1941, but has been considerably delayed because of priorities. The site is bounded by Flushing Avenue, Park Ave., Tillary St., Prince St., Myrtle Ave. and Carlton Ave." 1585
The Brooklyn Daily Eagle, August 4, 1942



When the 35-tower Fort Greene Houses project opened to much fanfare in 1942, it replaced a blighted area near the Brooklyn Navy Yard that was awash in prostitution and crime *nypost.com*, September 30, 2019
 RE: introduction to an article entitled: "Brooklyn's Blight Years: From the Birth of 'The Projects' to death of Ebbets" 1586



"AT the time, the vision for the project, the first of its kind anywhere in the world, was as an 'austere array of high-rise towers set amidst a field of landscaped lawns.' Its intent was to provide low-rent housing and a strong community for more than 13,000 people..." 1587
nypost.com, September 30, 2019
 Caption: "HOUSING SHORT-AGE ENDS FOR 13,000! New York's Fort Greene Houses, a bold and big answer to the crisis in housing, supplies homes for as many people as live in Annapolis, Md. or Ypsilanti, Mich. Protecting this and other great housing developments are Barrett pitch and felt roofs."



Caption: "January 19, 1944. The grounds of the recently completed Fort Greene Houses are filled with military personnel and civilians who were employed at the nearby Brooklyn Navy Yard." 1588

"...Success was virtually assured. The project's architects had designed Rockefeller Center. Its staff included 'trained housing assistants' to solve tenant issues. The well-read *Brooklyn Eagle* newspaper called it 'comfortable housing for workmen . . . streamlined for happy home-making.' Almost immediately, similar projects were put into motion throughout the city..."

nypost.com, September 30, 2019
 RE: when the first residents moved in in 1942, the *Brooklyn Daily Eagle* dedicated an entire special section to the amenities of these revolutionary modern buildings

1589



Above: the new "Mrs. Fort Greene" had more to gloat over than the mere affordability of her new abode, wrote the *Brooklyn Daily Eagle*, namely, her kitchen. The housewife's space had "all the things that women have wanted in a kitchen" and "a lot of things they didn't even know they wanted." 1590

The Road to Hell

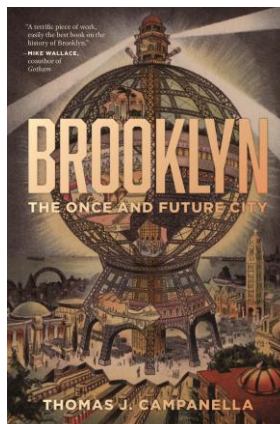
1591

"...Signs of trouble appeared as soon as 1944. A visiting reporter noted broken windows and hallways filled with trash, and that summer saw racial battles, including more than a hundred white teenagers 'descending on the project . . . armed with clubs and baseball bats' to beat up black teens..."
 nypost.com, September 30, 2019

1593

"...As families achieving a measure of success were evicted, the projects became dangerous. 'The rule incentivized inertia, and bent ambition and enterprise toward crime,' Campanella writes. 'The result, [according to New York Times writer Harrison Salisbury], was 'a human catchpool that breeds social ills and requires endless outside assistance'..."
 nypost.com, September 30, 2019

1595



"...But as Thomas J. Campanella reveals in his comprehensive new history of the borough, 'Brooklyn: The Once and Future City' (Princeton University Press), the Fort Greene Houses, doomed by ill-advised government policies, turned sour almost overnight, instead ushering in the concept of the projects - high-rise communities throughout the city that would drown for decades in violence and blight..."

nypost.com,
September 30, 2019

1592

"...Problems were exacerbated when, in 1947, the city declared that only residents making less than \$3,000 a year could live there, evicting families that approached higher income. 'Fort Greene's more prosperous families were a stabilizing force; purging them was like pulling a keystone out of an arch,' Campanella writes. 'Those are the families we need to keep,' pleaded resident activist Olivette Thompson, 'the kind we can't afford to lose'..."

nypost.com, September 30, 2019

RE: the Fort Greene Houses Project provided much needed housing for the large surge in the neighborhood's population due to the heightened activity at the Brooklyn Navy Yard during WWII. However, it wasn't until after the war that the buildings would fulfill their original purpose, which was "affordable housing."

1594

"...In 1949, after six women were victims of rape or attempted rape on the grounds, residents stormed the local police station, begging cops to take action against soaring crime. But the police could do little, since they were barred from entering the complex unless responding to specific calls. The project had its own security guards, but they were 'older and poorly trained,' and carried no guns..."

nypost.com, September 30, 2019

1596

“...The ‘projects’ became one of the worst failed experiments in the history of housing. ‘Born of good intentions but ruined by ill-considered policy,’ Campanella writes, ‘the celebrated city-in-a-city became more feared than the infamous jungle it had replaced’...”

nypost.com, September 30, 2019

1597



The *Raymond V. Ingersoll Houses* has twenty buildings; 6 and 11-stories tall with 1,823 apartments. Completed in February 1944, the 22.9-acre complex is bordered by Park and Myrtle Avenue/s and Saint Edwards and Prince Street/s. The *Whitman Houses* are located near historic *Fort Greene Park*. The development was constructed as “Fort Greene Houses” by NYCHA to address the pressing housing needs of the thousands of employees at the nearby Navy Yard. It was later renamed after author *Walt Whitman*.

1598

The Edge of the Possible

“...Nothing was impossible in America. Especially when you attacked us. The slogan of the war was ‘We Can Do It.’ And during WWII the Brooklyn Navy Yard won six E flags for Excellence from the United States Navy, and boasted a big sign over the main gates that read: ‘CAN-DO’...”

New York Daily News, July 28, 2011

1599

1600



Caption: “Another ‘Line of Defense.’ The lunchtime whistle blows and workers file from the Brooklyn Navy Yard for refueling during the daily break from building ships for our two-ocean Navy.”

1601



“...They can put the sign back up. Today, thanks to the Brooklyn Navy Yard Development Corp. (BNYDC), a nonprofit that manages this 300-acre industrial park for the City of New York, it’s once again the most successful economic pacemaker of the borough of Brooklyn with 275 industrial businesses employing 5,800 people, up from 3,600 since 2001...”

New York Daily News, July 28, 2011

Caption: “The Brooklyn Navy Yard is once again the borough’s big job-engine and industry pacemaker”

1602

"...Last week I toured the Navy Yard with Andrew Kimball, president of BNYDC and Daniella Romano, VP of archives, programs and research, and Matt Hopkins, a development and leasing associate. 'The Navy was here until 1965,' says Kimball. 'John Lindsay brokered a deal with Vice President Spiro Agnew to give the Navy Yard to the city in 1969. For years the city tried to figure out how to regain the thousands of jobs lost when the Navy left. They considered the automobile industry, a steel mill, moving the entire handbag industry here. None of them worked'..."

New York Daily News, July 28, 2011

1603

"...The Navy Yard's anchor tenants, Seatrain and Coastal, continued to do private shipbuilding. But because government grants and low interest loans dried up, and the general corruption on the waterfront, they had a hard time making it. 'Seatrain left and, in the mid-1980s, 60% of the 40 multi-purpose buildings were rented to Coastal,' Kimball says. 'Then Coastal left. Mayor Koch put in a new team, called Brooklyn Navy Yard Development Corp. The place was bankrupt, and the focus was to diversify. Figuring out a leasing model in a city where large scale manufacturing had ended. 'The idea was to cut-up the spaces really small for light industrial artisans and artists, and by the end of the late 1990s the Navy Yard was basically full, going from 39 tenants to over 200'..."

New York Daily News, July 28, 2011

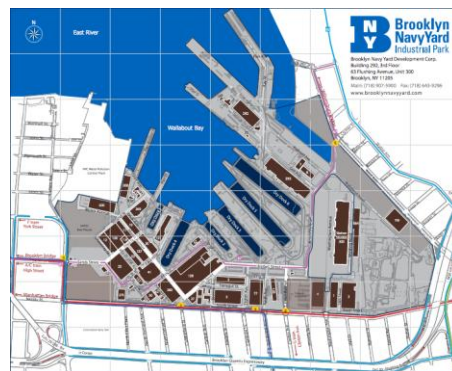
1604



"...Today there are 275 tenants in 4-1/2 million square-feet. And we have a waiting list of 100 businesses'..."

New York Daily News, July 28, 2011

1605



1606

"...The Navy Yard's biggest employers are Steiner Studios, the largest sound stages on the East Coast; Cumberland Packing, manufacturers of Sweet'N Low, Sugar in the Raw, and my favorite sweetener, Stevia in the Raw; B&H Photo & Electronics, the photo and video powerhouse; GMD Marine, ship repairers and operators of all three NYC graving dry docks; Gilt Groupe, a fast-growing e-commerce company; Shiel Medical labs, New York's largest privately owned lab..."

New York Daily News, July 28, 2011

1607

"...The city is investing \$250 million to overhaul the antiquated water, electrical and sewer lines,' says Kimball. 'We have 40 legitimate 'green' manufacturers like Icestone, which recycles glass into gorgeous high-end countertops. Bier Heccho is a young guy who turned recycled wood into tables and furniture and he's building our Exhibition Visitor's Center information desk. Duggal Visual Solutions makes really high-end printing solutions. They started here 10 years ago with 10,000 square-feet and rent 100,000 square-feet today, using green printers, eco inks, [and] recycled paper.' When BNYDC started rebuilding all their roads, Duggal designed and manufactured 90 wind/solar street lamps in the Navy Yard equipped completely off the electric grid..."

New York Daily News, July 28, 2011

1608



As part of its ongoing Green initiative, the Brooklyn Navy Yard is set to begin installing 90 wind- and solar-powered lamp posts
brownstoner.com, April 13, 2009
RE: Introduction to an article entitled: "Green Lamp Posts Coming to the Navy Yard" 1609



"WHAT makes the lamp posts even greener is the fact that they are designed and built by Navy Yard tenant Duggal Visual Solutions, which plans to convert a one-story, 30,000-square-foot building in the Yard into a two-story, 60,000 square-foot LEED Platinum certified facility for manufacturing eco-friendly products. Other fun facts: The street lights will save the BNY-DC \$600,000 dollars or so in the first year and \$11,000 a year going forward on its electricity bill."
brownstoner.com, April 13, 2009
Caption: "Baldev Duggal, best known for his film processing company, designed and manufactured a wind- and solar-powered street lamp at the Brooklyn Navy Yard" 1610

"...Kimball drives me through the labyrinth of old nautical streets, with breathtaking views of the harbor, skyline and downtown bridges, where a half-billion dollars in private investment in construction is banging away, cranes swinging against the big Brooklyn sky, steelworkers fortifying the storied docks, construction workers erecting new 'green' buildings from modular units manufactured here in the Navy Yard, and refurbishing magnificent pre-WWII buildings to their original splendor. 'And we still have 20 acres of developable land,' says Kimball. 'Brooklyn College will be creating a state-of-the-art film school here, where for \$50,000, a kid can get a film school education that would cost \$250,000 at NYU. With the largest movie studio in the city right here'..."
New York Daily News, July 28, 2011

1611

"...Steiner Studios will be building additional \$65 million sound stages just for commercials and TV shows, expanding into a renovated seven-story, 250,000-square-foot Applied Sciences Building, where all the audio equipment for the North Atlantic fleet of WWII was tested and manufactured. 'Steiner will add another 1,200 jobs with this expansion,' says Kimball..."
New York Daily News, July 28, 2011

1612



"...We proceed to a three-story landmarked building on Flushing Ave. designed by Thomas Walter, who designed the dome of the U.S. Capitol..."
New York Daily News, July 28, 2011
Caption: "Building 92 South Elevation, 1932" 1613



"...Daniella Romano says: 'By Veterans Day, Nov. 11, this will be a Navy Yard Museum and Visitors Center displaying photos, paintings, maps, plans, and memorabilia like buttons, ID badges, jewelry women made in machine shops during WWII'..."
New York Daily News, July 28, 2011
Caption: "View of the main entrance and lobby with the anchor of the USS Austin, a ship built at the Yard, prominent on view, 2018" 1614



Rendering of the Brooklyn Navy Yard Center at BLDG. 92, designed by Beyer, Blinder, Belle, 2009 1615



1616

“...Even as the economy sags, Kimball said the Brooklyn Navy Yard will add 2,000 more jobs over the next two years. Like I said, they can put the ‘Can-Do’ sign back up.”
New York Daily News, July 28, 2011

According to Plan

1617

1618

If all goes to plan, the Brooklyn Navy Yard will be home to 15,000 new manufacturing jobs by the year 2020
New York Business Journal, June 8, 2015
 RE: introduction to an article entitled: “Brooklyn’s Navy Yard Unveils Development Plans to Bring in 15,000 New Jobs”

“TO reach that number, officials plan to expand or develop four operations at the yard - The Green Manufacturing Center, Building 77, Admirals Row and Steiner Studios. It’s a microcosm for Brooklyn’s growth, opportunity and future. That’s the Brooklyn Navy Yard,” Carlo A. Scissura, president of the Brooklyn Chamber of Commerce, said at a press conference this morning...”
New York Business Journal, June 8, 2015

1619

1620

“...For Brooklyn Navy Yard Development Corporation CEO David Ehrenberg, the key to the development of the yard - not to mention Brooklyn’s overall growth and economic opportunity - lies in manufacturing...”

New York Business Journal, June 8, 2015

1621

“...Restoring the Navy Yard to its glory days is what Ehrenberg says has been the focus of his two years serving as its chief executive. Wanting to create a ‘balanced industrial ecosystem’ within the borough, Ehrenberg says it begins by preserving the heritage of the Navy Yard while continuing to innovate, looking towards the future...”

New York Business Journal, June 8, 2015

1622

“...The Navy Yard is a 300-acre city owned property along the Brooklyn waterfront that currently houses 330 businesses that collectively employ 7,000 people. With roots going back 214 years, the Navy Yard has a rich history connecting it with the manufacturing industry in Brooklyn. During the second World War, it reached a peak of employing 70,000 people, which was nearly one percent of the country’s work force at that time, according to Ehrenberg...”

New York Business Journal, June 8, 2015

1623



1624

“...To restore the Navy Yard, the Brooklyn chamber has planned a 1.3-million square-foot expansion within the next two years. Although the current economic impact is an estimated \$2 billion, the Navy Yard wants to use its expansion plans to become an economic powerhouse for the city...”

New York Business Journal, June 8, 2015

1625

“...Building 77 is slated to be the largest expansion to the Navy Yard in the past 70 years. Spanning nearly one million square-feet and reaching 17 stories high, it will house more than 3,000 permanent jobs and will offer most companies a lower-market rent. While rent ranges depending on size, Ehrenberg said two floors will be competitively priced in order to cross subsidize the lower floors at a cheaper cost. ‘We have some debt-service to pay, and the goal is to have the lower floors pay a dramatically lower rent,’ Ehrenberg said...”

New York Business Journal, June 8, 2015

RE: the USN decommissioned *Building 77* in 1966 and apart from its occasional use as a storage facility, the enormous space had been sitting empty until 2010, when the BNYDC commissioned a “first assessment” of the structure to see what could be done

1626

“...Amenities to the building include a public space at the bottom named ‘Yard Commons,’ where in addition to food manufacturing, employees can eat lunch, network or hold informal meetings. Upper floors will offer private roof top space and unobstructed panoramic views of lower Manhattan and Brooklyn...”

New York Business Journal, June 8, 2015

1627



“...The Building 77 project will cost approximately \$140 million, with funds coming from the New York City Council, BNYDC Capital, New Market Tax Credits and possibly the Regional Council as well...”

New York Business Journal, June 8, 2015

Caption: “An artist’s rendering of Building 77, which is expected to create a total of 3,000 jobs in the Brooklyn Navy Yard”

1628

“...The Green Manufacturing Center is a \$60 million adaptive re-use project of a former machine shop building. Seeking to house approximately 800 jobs in 250,000 square-feet, industries such as food, design, apparel and high-tech are welcomed along with two anchor tenants - Crye Precision and New Lab. Crye Precision, a company which produces high-tech body armor for the army, will consolidate its growing number of employees into a single wing, along with New Lab, which is a product design incubator...”

New York Business Journal, June 8, 2015

1629

“...Affordable grocery options near the Navy Yard will be met with the expansions to Admiral’s Row, the longest running project at the Brooklyn Navy Yard. Finally expected to be completed by 2018, filling out the existing 287,000 square-feet will be supermarket Wegmans as well as light industrial space with retail...”

New York Business Journal, June 8, 2015

1630

“...Steiner Studios, the third largest movie studio in the country, will also be expanding its square footage by an additional 960,000 square-feet. New sound stages and a New York City backlot will be within nine historic structures and new buildings and is projected to create 2,200 permanent jobs within Brooklyn. Although the movie industry isn’t traditionally thought of as manufacturing, Ehrenberg points to jobs such as carpentry and design that will be made with the expansion of the studios...”

New York Business Journal, June 8, 2015

1631

“...The Navy Yard chose to invest in manufacturing due to the ‘high quality jobs and a pathway to the middle class.’ Officials pointed to data that shows how the manufacturing sector pays 40 percent more than the retail service sector and offers more opportunities for advancement. ‘It’s the center of what makes Brooklyn, Brooklyn,’ said Ehrenberg, calling the Navy Yard a ‘multi-generational project’ that’s worth investing in...”

New York Business Journal, June 8, 2015

1632



“...The Navy Yard is a part of the trend of manufacturing in Brooklyn, including Andrew Kimball’s privately owned Industry City in Sunset Park. Once re-developed, it has an expected economic impact of \$6 billion.”

New York Business Journal, June 8, 2015

Above: Industry City is comprised of 16 buildings, built on 35 acres of re-purposed industrial space. A diverse mix of culture and locally-born businesses, it includes waterfront green spaces, immersive retail and public art installations.

1633



Established in the 1890s, *Industry City* began as a manufacturing and distribution hub called “Bush Terminal.” The first facility of its kind, it transformed Brooklyn into a major seaport. When urban manufacturing went into decline in the 1960s, a 50-year period of divestment and decay ensued. Beginning in the 2010s, IC has undergone a \$450 redevelopment. The new owners reinvented the complex to support an innovation economy inclusive of engineering, design, manufacturing and production. Result: a world of opportunity for local businesses that has created +7,500 new jobs.

1634



1635

A Factory Grows in Brooklyn

1636

When Situ Fabrication moved into Building 132 at the Brooklyn Navy Yard in 2013, they were so busy constructing work for clients that included Harvard University, the Brooklyn Museum, and some of the country’s biggest artists that it took them awhile to catch their breath and look around

bbc.com, June 10, 2015

RE: introduction to an article entitled: “U.S. Manufacturing: A Factory Grows in Brooklyn”

1637



1638

"BUT when they did, they noticed that the crumbling building - which had recently been used for cold storage and was covered in layers of insulation - was actually something much grander than its decaying exterior would suggest. 'There was a little opening on the south facade and we thought we should really put a gate in here,' recalls Bradley Samuels, one of the four founding partners of the architecture and fabrication firm, which was started in 2005. 'We started removing material and we just kept removing more and more until we realised, oh my god, there's this enormous door that steam engines used to come through,' he says. Built in 1905, it turned out that Building 132 was once a steam engine repair shop - and that its 'bones,' in Mr. Samuels words, were perfect for the cutting-edge 21st century manufacturing that the firm was planning to do..."

bbc.com, June 10, 2015

1639



1640



"...That a building which was purpose-built for late 19th century technology could still be useful - even ideal - for an innovation-focused firm like Situ might seem surprising, but it makes perfect sense to Mr. Samuels and others like him who have moved into the Navy Yard..."

bbc.com, June 10, 2015

Caption: "Situ employs 45 people who work at Building 132 in the Navy Yard fabricating art and architectural designs"

1641



1642



"...Today, the Navy Yard has gone from a Brooklyn eyesore that once symbolised the decline of urban manufacturing to a model for keeping production in urban centres..."

bbc.com, June 10, 2015

Caption: "Today, the Brooklyn Navy Yard is home to over 200 small and medium size manufacturers"

1643

"...At the Navy Yard's peak during the boom years of World War II, the site employed more than 70,000 people..."
bbc.com, June 10, 2015

1644



"...Even during peacetime, the premises had around 15,000 full-time employees working in the 'classic manufacturing jobs that made the American middle class,' says Brooklyn Navy Yard Development Corporation (BNYDC) president David Ehrenberg..."

bbc.com, June 10, 2015

Caption: "Battleship in dry dock. The Brooklyn Navy Yard was created by U.S. President John Adams." 1645



"...But when the Navy decided to move out in 1966, almost 12,000 people lost their jobs overnight. By the 1970s, when Mr. Ehrenberg was growing up in Brooklyn, only 100 people worked at the 300 acre (121 hectare) site..."

bbc.com, June 10, 2015

Caption: "After the Navy left in 1966, thousands of workers were laid-off from the yard overnight" 1646

"...'It was really symptomatic and [an] example of the industrial flight from New York,' says Mr. Ehrenberg. 'You could see all up and down the Brooklyn waterfront - formerly very active, dynamic manufacturing facilities going completely dormant. 'You know, I grew up hearing stories of the Dodgers moving out of Brooklyn, and that being a terrible blow to Brooklyn, but losing 20,000 middle class jobs was really a devastating hit to the borough'..."

bbc.com, June 10, 2015

1647

"...Ebbets Field, already past its expected 30-year life span, was fast becoming a maintenance liability and could barely handle the huge crowds the Dodgers were drawing. Seats were splinter-prone, bathrooms were obsolete, and parking in the surrounding neighborhood was scattered, scarce and costly..."

RE: excerpt from: "Brooklyn: The Once and Future City," by Thomas J. Campanella. In his book, Campanella includes a section about the famed desertion of Brooklyn by the Brooklyn Dodgers, which he blames on "the mass exodus of Brooklyn's middle and working classes after WWII." Campanella claims that the Dodgers' sinking attendance, even in winning years, coincided with Brooklynites' exodus to suburbia in the 1950s and that the real culprit was the disintegration of the Dodgers' fan base (Dodger attendance fell 33% from 1947 to 1956, despite the team winning four pennants and one World Series title during that time). "Not even that most elusive of dreams - a Dodger world championship, captured at long last in 1955, would stem the inexorable tide of flight," wrote Campanella. O'Malley became the most hated man in Brooklyn, considered "one of the three worst humans beings to ever live; Hitler, Stalin and Walter O'Malley." Robert Caro's 1974 book "The Power Broker" revealed that Robert Moses played a significant role in the team's leaving as well.

1648



Jackie Robinson at Fort Greene Houses in Brooklyn 1649



Left: co-owner Walter O'Malley began studying a possible new ballpark to replace the decaying Ebbets Field, the Dodgers' Flatbush home since 1913, as early as 1946. Famed industrial designer Norman Bel Geddes proposed a retractable-roof ballpark that would include "rubberized seats, vending machines on every third seat back, and an early version of Astro-turf . . . which can be painted any color." However, Bel Geddes and O'Malley never moved forward with the project. Geodesic-dome creator R. Buckminster Fuller proposed a dome-like, all-weather structure for a new Dodgers stadium, "skinned with translucent fiberglass petals opening and closing to the sky." The Ebbets Field site was too small and O'Malley couldn't afford to both buy new land and build a new stadium. He appealed to Robert Moses for urban-renewal funds to buy the land where Barclays Center is today, but Moses refused. Seeing no alternative, in 1957 O'Malley announced that the team was moving to Los Angeles.

1650

"...To revitalise the site, the BNYDC, the non-profit which now runs the property, sought to move away from big tenants - like the shipbuilders that once loomed over its piers - to a more diversified manufacturing base..."
bbc.com, June 10, 2015

1651



"...The BNYDC brought in older companies - like Cumberland, which has been packaging artificial sweeteners like Sweet 'N Low and Splenda for half a decade - as well as more cutting-edge firms, which include everything from space suit designers to a robotics builder to a motorcycle manufacturer. In doing so, they created a web of interconnected manufacturers who could lean on each other for design knowledge or fabrication help..."
bbc.com, June 10, 2015

1652



"...For instance, Mr. Samuels of Situ says the firm will often go to a welder nearby when it can't keep up with demand or when the firm has a particularly tricky bit of metal work that it needs to finish. 'We're constantly collaborating with other tenants,' he says..."
bbc.com, June 10, 2015

Caption: "Situ Fabrication manufactures products for architectural clients and artists such as Teresita Fernandez"

1653

1654

"...Today, the yard employs over 7,000 people and generates nearly \$2.35bn (£1.53bn) in economic output. It has been successful in attracting a range of tenants by promising them long-term leases - a rarity in New York City - as well as by continuing to invest all profits from the operation of the site into redeveloping its railways, docks, and power generating infrastructure..."
bbc.com, June 10, 2015



"...Since the mid-2000s, the Navy Yard has been at full-occupancy - and Mr. Ehrenberg says the site is on track to employ 12,000 people in the next five years..."
bbc.com, June 10, 2015

Caption: "David Ehrenberg says that the Navy Yard is on track to employ as many people as it did in its heyday in the 1950s"

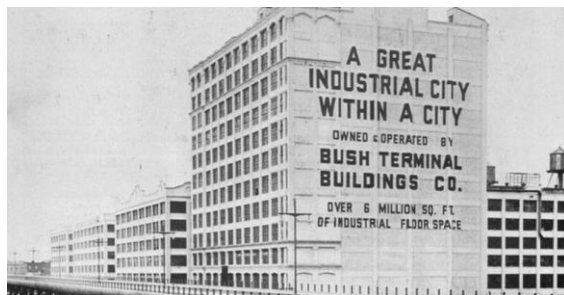
1655

1656

"...Now, the Navy Yard model is being copied by other cities across the U.S. who are looking to revitalise their manufacturing centres, with San Francisco, Philadelphia and Detroit all pushing forward with plans to create manufacturing hubs. These efforts have led to a resurgence in urban manufacturing jobs - by some measures, Los Angeles county employs nearly as many people in manufacturing as the entire state of Michigan, for instance. And New York and Philadelphia have also seen growth after years of declines. This resurgence has benefitted from trends in the industry that have once more made production in smaller spaces efficient, such as the rise of 3D printing..."
bbc.com, June 10, 2015

“...Furthermore, changing consumer habits - young urban consumers often want to know how and where their products are made - combined with the rise of social media and e-commerce have allowed niche manufacturers to flourish in urban centres, where they can easily show-off both their wares and their processes...”

bbc.com, June 10, 2015



“...‘Modern manufacturing includes a broader overlay of sectors,’ says Andrew Kimball, who used to run the Navy Yard before moving on to the helm of Industry City, one of New York City’s first privately-run manufacturing sites in the Sunset Park neighbourhood of Brooklyn...”

bbc.com, June 10, 2015

Caption: “At its peak in the early 1900s, Industry City - then known as Bush Terminal - employed 20,000 people”

1657

1658



“...‘The future, he says, ‘will be an intersection between design, technology, [and] art, with a focus on small, niche, tech-driven manufacturing’...”

bbc.com, June 10, 2015

Caption: “Industry City is a mixed-use industrial site in the Sunset Park neighbourhood of Brooklyn”

1659

1660

“...But there are of course challenges - for instance, space is an issue in New York City, where rising rents have often squeezed manufacturers. Furthermore, investing in sites like the Navy Yard is often difficult, as years of disuse have left former industrial sites in states of extreme disrepair. ‘The single biggest challenge is deferred maintenance - there was just no money put in for 50 years,’ says Mr. Kimball...”

bbc.com, June 10, 2015



“...That concern is echoed by Situ’s Mr. Samuels, who said the firm initially had difficulty getting Building 132 hooked-up to enough energy to power their more advanced machines...”

bbc.com, June 10, 2015

Caption: “Mr. Samuels said when the firm moved in the space seemed like ‘one giant refrigerator’”

1661



“...And costs, of course, are also higher in urban centres. John Grady runs the Philadelphia Navy Yard, which is, like Brooklyn’s version, a mixed use site that is primarily devoted to manufacturing. ‘It’s always cheaper in the suburbs and that’s hindered our industrial economy for its entire decline from the [1950s] to today,’ he says. ‘For cities like Philadelphia or Brooklyn, it is about finding sectors where there’s value added - where the cost of being in the urban environment can be supported by the product,’ he says...”

bbc.com, June 10, 2015

Caption: “The Navy Yard, Philadelphia, Pa.”

1662



“...While experts remain optimistic about the future of urban manufacturing, what no one doubts is that both its size and scale will remain small for the foreseeable future, with sites like the Navy Yards functioning as a sort of large-scale factory with many smaller enterprises within its walls. ‘The days of the smokestacks are gone,’ says Mr. Kimball.”
 bbc.com, June 10, 2015

Caption: “Experts say the era of big, single-use factories in urban centres – like the Domino sugar plant in Brooklyn – is over” 1663

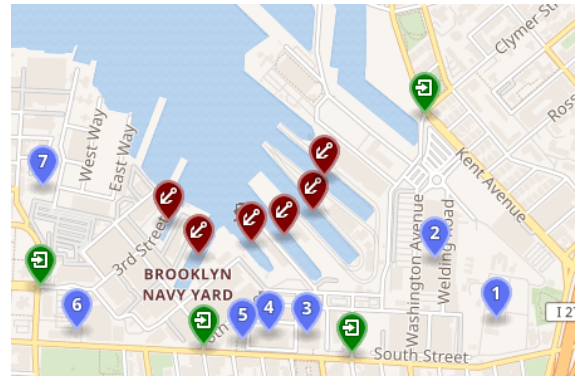
Users Guide

The Brooklyn Navy Yard is, perhaps, one of the most interesting pieces of real estate in the city. The 200-acre site sits just across the water from downtown Manhattan, and quietly, the framework for the future of the city’s tech industry is being built on the Navy Yards’ old docks.

builtinnyc.com, October 4, 2016

RE: introduction to an article entitled: “The Rebirth of the Brooklyn Navy Yard: Here’s What You Need to Know”

1665



Caption: :Map of notable buildings and structures at Brooklyn Navy Yard: (1) Brooklyn Naval Hospital; (2) Steiner Studios; (3) Building 77; (4) supply storehouse/Building 3; (5) Navy Yard Museum/Building 92; (6) Admiral’s Row redevelopment; (7) Commandant’s House” 1666



“BUT, to understand the significance of the transformation of a site that was once synonymous with American might, innovation and technical prowess, we’ll need to step back in time for a moment...”

builtinnyc.com, October 4, 2016

Caption: “The Brooklyn Navy Yard, ca. 1904”

1667

“...The site was purchased by the federal government in 1801 and used as a naval shipyard. Some of the nation’s most storied naval vessels were built there, and by the 1940s, the site boasted an astonishing level of industrialization and employed around 70,000 people around the clock. In fact, the work being done at the BNY was so important to the war effort that the pedestrian crossings of the Williamsburg and Manhattan Bridges were covered, so that spies couldn’t get an aerial view of what was going on down on the docks...”

builtinnyc.com, October 4, 2016

1668



"...The end of the war saw a decline in the Brooklyn Navy Yards' fortunes. The federal government, looking to save money, closed the shipyards down in 1964, along with 10,000 civilian jobs. The original plan was to turn the site into a car manufacturing center, but no car manufacturers were interested. Eventually, the Nixon administration sold the property back to the City of New York..."
 builtinnyc.com, October 4, 2016

1670

"...The city leased much of the site to Seatrain Lines, which used the space to build civilian oil tankers and barges. That proved short-lived, however, and the last ship to come out of the Brooklyn Navy yards launched in 1977. Seatrain Lines closed their gates by 1979. With the decline of the area's shipbuilding industry, came a period of further decay - until recently..."
 builtinnyc.com, October 4, 2016

1671



"...Today, a new economic reality is taking over in the Brooklyn Navy Yard. Over 200 businesses operate there, employing around 7,000 people. There is a 65,000 square-foot urban farm, operated by Brooklyn Grange, on the rooftop of Building 3..."
 builtinnyc.com, October 4, 2016

1672



"...Steiner Studios operates one of the largest production studios outside of Los Angeles..."
 builtinnyc.com, October 4, 2016

1673

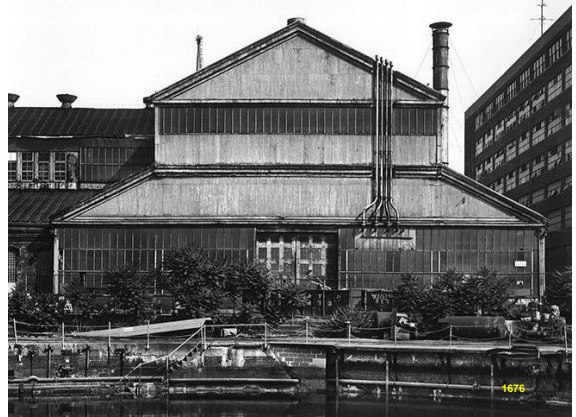


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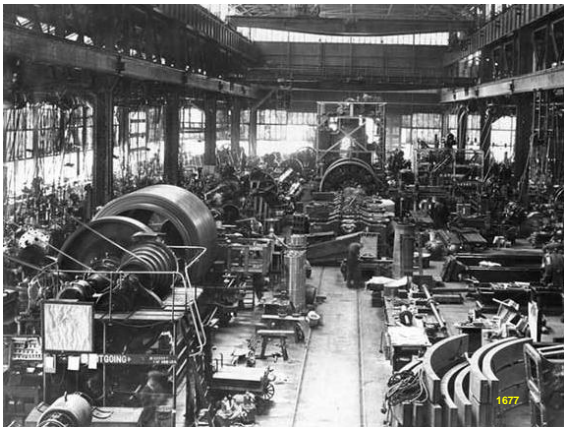
“...Manufacturing is returning as well. The New Lab is an 84,000 square-foot co-working, co-manufacturing space that opened their doors earlier this year. The space houses hardware-centric designers, engineers and entrepreneurs that are using new manufacturing technologies to create products...”
builtinnyc.com, October 4, 2016

RE: originally a machine shop for naval equipment, the Brooklyn Navy Yard's *Building 128*, was built in 1899. Encouraged by historic-restoration grants, loans and tax credits from government agencies, developer *Macro Sea* entered into a public-private partnership to convert the building into *New Lab*, a co-working community with onsite prototyping facilities for frontier-tech entrepreneurs. To bring the structure up-to-date, Macro Sea commissioned NYC-based *Marvel Architects*, who stripped the exterior back to the building's steel skeleton and restored its original historic appearance with insulated metal panels and windows. Inside, the project team preserved structural elements while inserting new elements that both refer to the building's past and met contemporary programming needs.

1675



1676



1677



Caption: “Historically accurate insulated windows and cladding replace the existing envelope to bring the building up-to-date”

1678

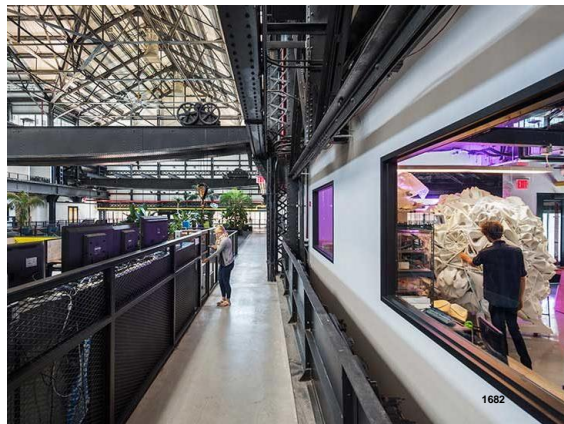
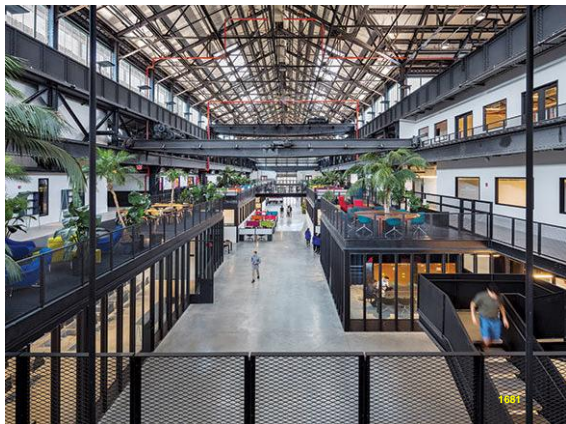


1679



“...The space, which they call a 'cathedral of manufacturing' already hosts over 50 companies. The old shipbuilding machinery is long gone, replaced with everything a new-age manufacturer could want, from 3D printers to electronic workbenches to large bed-size laser cutters. And, of course, shared workspace...”
builtinnyc.com, October 4, 2016

1680



“...But, that’s just the beginning. Earlier this year, Mayor de Blasio announced the groundbreaking on what will become one of the city’s largest tech hubs...”
 builtinnyc.com, October 4, 2016

1683



“...Dock 72, will be a 675,000-square-foot development, the largest commercial development outside of Manhattan in decades. The building will be anchored by WeWork, and is expected to create 4,000 jobs. The development sits atop an old pier, offers unparalleled views of Manhattan, rooftop conference areas, restaurants and tech-focused office space...”
 builtinnyc.com, October 4, 2016

1684

“...The Dutch startup incubator B. Amsterdam announced plans to open a 100,000 square-foot space which will be called B.NY, which will employ around 500 people. The new location is expected to help European entrepreneurs set-up shop in the city, and vice-versa...”
 builtinnyc.com, October 4, 2016

1685



“...Even 1776, the Washington D.C.-based incubator and seed fund is coming to the site and plans to take over the top floor of Building 77, which will open next year...”

builtinnyc.com, October 4, 2016
 Caption: “Building 77’s redesigned lobby”

1686

“...Their new NYC office will operate similarly to their D.C. headquarters, as both an incubator and seed-stage fund. The company specializes in working with startups in heavily regulated industries like fintech, healthtech, transportation and energy...”

builtinnyc.com, October 4, 2016

“...While the Brooklyn Navy Yard is still a long way from its heyday in the Second World War, it’s not hard to see a future where Silicon Alley is more synonymous with old docks than Flatirons.”

builtinnyc.com, October 4, 2016

1687

1688

Metamorphosis

Building 77, one of the complex’s most formidable buildings, makes its debut

ny.curbed.com, November 9, 2017

RE: introduction to an article entitled: “At the Brooklyn Navy Yard, a Hulking World War II-era Factory is Now a 21st-century Manufacturing Hub”

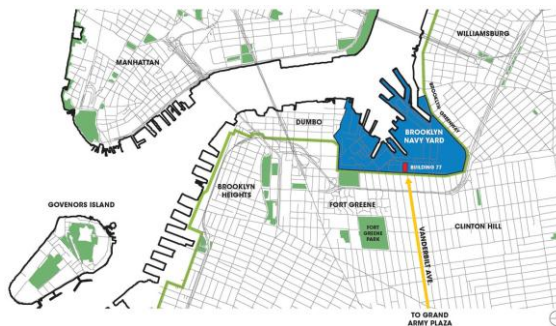
1689

1690

“THE Brooklyn Navy Yard is nearly half the size of Prospect Park, but was, until very recently, one of the least accessible areas to the general public in the borough. But with the opening of Building 77, which debuts today, the public will be welcomed for the first time into one of the complex’s most formidable buildings: a hulking 1 million-square-foot block of concrete that’s considered the heart of the entire Brooklyn Navy Yard redevelopment...”

ny.curbed.com, November 9, 2017

RE: eight years after its “first assessment,” a gut renovation (which included adding windows to the entire facade) yielded an impressive result: a combination of light manufacturing, food services, public space and a dozen floors of offices, all readily accessible from Flushing Avenue



Caption: “Reopened in 2017, Building 77 is a modern production center in the Brooklyn Navy Yard located on Flushing Avenue between the DUMBO, Williamsburg and Fort Green neighborhoods of Brooklyn”

1691

1692



"...The companies leasing space in Building 77 are poised to bring in 3,000 new jobs, setting the complex well on its path of creating 17,000 jobs by 2020. David Ehrenberg, president and CEO of the Brooklyn Navy Yard Redevelopment Corporation, the nonprofit overseeing the yard's rehabilitation, says the goal is to create the largest job expansion the Navy Yard has seen since World War II, when some 70,000 people - or .02 percent of the American workforce - labored within its confines..."

ny.curbed.com, November 9, 2017

1694



"...In its heyday, Building 77 served as a Navy storage warehouse and offices for the naval high command for the North Atlantic fleet and the commandant of the yard..."

ny.curbed.com, November 9, 2017

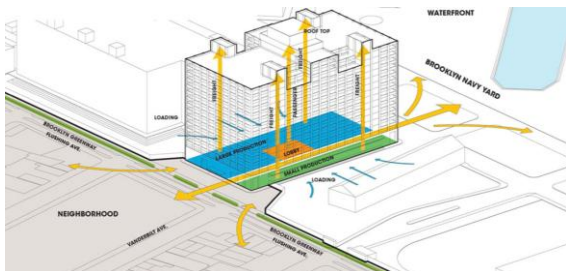
1695



"...A major part of the building's \$185 million rehab consisted of removing 3 million pounds of concrete from the building and installing 50,000 square-feet of windows. It's that act, Ehrenberg says, that transformed the building from a warehouse to an active manufacturing facility..."

ny.curbed.com, November 9, 2017

1696



Caption: "Converting the existing concrete structure into a modern production facility involved creating openings on the eleven floors with windowless facades and installing new windows and doors across the entire building. New core mechanical, electrical, plumbing, sprinkler, and fire alarm systems were installed throughout. Elevators include four refurbished and four new passenger elevators, plus the upgrade of four freight elevators at each corner of the building, connecting to two active-use loading docks, each 260-feet in length."

1697



"...Most of the jobs at Building 77 will be in light manufacturing, with food purveyors and retail space housed on the ground floor. Here, anchor tenant Russ & Daughters will churn out the bialys, bagels, and other delicacies that the 103-year-old appetizing institution is known for. The company will have a small retail space, along with a larger hub where goods will be made for the business's Manhattan satellites and nationwide shipping program..."

ny.curbed.com, November 9, 2017

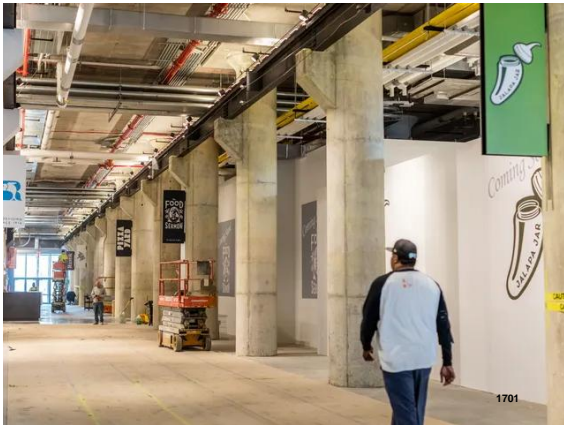
1698

“...Niki Russ Federman, a third-generation operator of Russ & Daughters, says the Navy Yard encouraged the company to use the bulk of its 14,000 square-feet for manufacturing space. ‘That was music to our ears – that’s not what you hear from most landlords,’ Russ Federman says. ‘As a business, once you get to a certain size, it’s very hard to stay and operate in the city. At the Navy Yard, we saw a base where we could grow and stay for decades’...”
 ny.curbed.com, November 9, 2017

“...Joining Russ & Daughters are Brooklyn-based salsa company Jalapa Jar, Rustik Tavern, and Transmitter Brewery, among others. Each food purveyor will have a small retail component, but Ehrenberg stresses that the ground floor of Building 77 is no food hall. Instead it’s a place where people come to work, achieving the Navy Yard’s goal of creating high-quality, middle-class, accessible Brooklyn-based jobs...”
 ny.curbed.com, November 9, 2017

1699

1700



“...On the building’s upper floors, rentable spaces range from about 2,000 square feet to up to 15,000 square-feet; tenants already in place include metal fabrication firm Situ Studio, jeweler Catbird, and furniture maker Armada NYC. The building’s top floors will house office-based tenants, such as fashion brand Lafayette 148, which is moving its New York production operations into the building from its previous Soho location...”
 ny.curbed.com, November 9, 2017

1701

1702



“...‘It was extraordinarily important to get this building right in all of its different ways,’ says Ehrenberg. ‘We tried not to make the building a nostalgic thing, and more an embrace of what goes on behind the scenes in New York.’ Ducting isn’t hidden, and spaces are finished only so much as they need to be to function for their occupants. ‘We want people to see that manufacturing still happens in Brooklyn,’ Ehrenberg continues...”
 ny.curbed.com, November 9, 2017

1703

1704

“...As of its opening day, the building is 85 percent occupied, signaling the city’s need for long-term manufacturing space. The nonprofit running the Brooklyn Navy Yard hopes to see that demand for local space, and New York-based employees, grow. The nonprofit not only works to supply the space to tenants, but also provides skill enrichment and training courses in Building 77 that it hopes will help bring jobs to the existing community...”

ny.curbed.com, November 9, 2017

1705

“...The nonprofit is partnering with the Department of Education, specifically eight nearby high schools, to provide different courses of vocational training for students that will ensure they graduate with the most current and prescient skills in manufacturing. ‘Technology is moving really quickly,’ Ehrenberg says, noting that the curriculum, informed by the building’s tenants, will help graduating students stay competitive in the job market. The nonprofit’s community outreach also extends to groups that are traditionally disenfranchised in the job market, like ex-offenders...”

ny.curbed.com, November 9, 2017

1706



“...The opening of Building 77 will give the nonprofit the opportunity to turn its focus to the 120,000 square-feet of office space that will top the Navy Yard’s vaunted incoming Wegmans, which will replace the now-demolished mansions of Admiral’s Row. Ehrenberg jokes that it’s his successor’s successor’s successor who will get to see the Navy Yard achieve the full scope of its potential, though it doesn’t seem to bother him.”

ny.curbed.com, November 9, 2017

1707

Part 15

Magnificent Ambition

1708

Room to Breathe

The Brooklyn Navy Yard will expand in a major way in the coming years with a \$2.5 billion investment, Bloomberg first reported

ny.curbed.com, January 31, 2018

RE: introduction to an article entitled: “Brooklyn Navy Yard to Double in Size with \$2.5B Investment”

1709

1710

"THE yard will get major improvements on top of its current expansion plan. Along with the ongoing revamp and expansion of the complex, this latest proposed addition will more than double the usable space at the yard..."

ny.curbed.com, January 31, 2018

1711

"...That cash infusion will add 5 million square-feet of manufacturing space, and bring an additional 10,000 jobs to the yard. That means that eventually, as many as 30,000 people could be working at the yard, as the campus undergoes a transformation into a hub for tech companies, and one of the major spaces for urban manufacturing in New York City. We are at the start of a multi-generational period of growth that in the years ahead will return employment at the yard to its highest levels since the 1940s while fueling a continued surge of manufacturing across the city," said David Ehrenberg, the president of the Brooklyn Navy Yard Development Corporation (BNYDC), the non-profit real estate developer that manages and operates the Yard on behalf of the city. Ehrenberg was referring to the yard's peak productivity as a shipyard in the early 19th century and well into the 20th century, particularly during World War II, when the yard employed 70,000 people..."

ny.curbed.com, January 31, 2018

1712

"...At present, a host of projects in various stages of development are transforming the yard. These include the manufacturing hub Building 77, the futuristic office tower Dock 72, the Green Manufacturing Center, Steiner's Admirals Row development (future home of New York's first Wegmans), and the expansion of its film and television studio empire. This new expansion will add 5 million square-feet of development to the Brooklyn Navy Yard, and will be spread out over three sites on Kent Avenue, Flushing Avenue, and Navy Street, respectively. Details on the expansion remain a bit scarce, but instead of getting outside developers to build these new structures, the BNYDC is planning to fundraise and build them itself, according to Bloomberg."

ny.curbed.com, January 31, 2018

1713

Already in the midst of a massive expansion, the Brooklyn Navy Yard is set to get even bigger

archpaper.com, February 1, 2018

RE: introduction to an article entitled: "Brooklyn Navy Yard to Double in Size After \$2.5 billion Investment"

1714

"AS first reported by Bloomberg, the Brooklyn Navy Yard Development Corporation (BNYDC), a non-profit group that manages and develops the yard, is set to reveal a \$2.5 billion expansion plan that would double the manufacturing hub's square footage..."

archpaper.com, February 1, 2018

1715

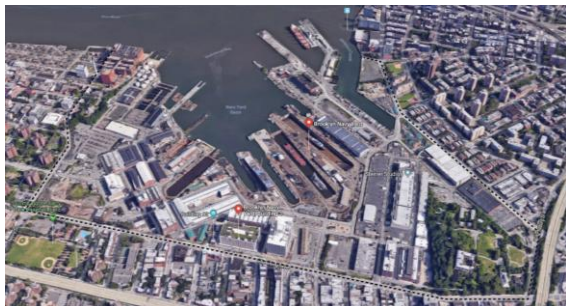


"...Space in the Navy Yard has been getting tight as of late, with an ongoing \$1 billion expansion renovating the rest of the existing buildings on the 4.8-million-square foot campus, and as WeWork's 16-story waterfront office building, designed by S9 Architecture, nears completion..."

archpaper.com, February 1, 2018

Caption: "S9 Architecture's design for the Brooklyn Navy Yard building on Dock 72 housing WeWork"

1716



"...We've reached a point where we have really finished rehabbing all of the existing buildings at the yard, and we've been over 99 percent leased for the past decade," Clare Newman, executive vice president of the BNYDC, told Bloomberg..."

archpaper.com, February 1, 2018

Caption: "The existing Brooklyn Navy Yard site"

1717

1718

"...As the BNYDC is an interim group that manages the Navy Yard for New York City, who owns the site, they've chosen to fund the \$2.5 billion plan through a combination of tenant revenue, government grants, and tax breaks..."

archpaper.com, February 1, 2018

1719

"...The new long-term plan will add an additional 5.1 million square-feet of vertical floor space to the 4.8-million-square-foot campus, and create more room for manufacturers as well as tech-oriented office space. While the Navy Yard currently employs 7,000 people in a variety of fields, from carpentry to farming, the first stage of the expansion is expected to boost that number to 20,000. The BNYDC predicts those figures will blast up to 30,000 once the long-term build-out is complete..."

archpaper.com, February 1, 2018

"...The Navy Yard's enlargement is driven in part by the Navy Yard's success in attracting traditional and high-tech manufacturers, and the campus' limited size; Newman notes that creative companies and designers often start off strong and outgrow the Navy Yard. By offering larger facilities, the BNYDC can retain this talent on-site..."

archpaper.com, February 1, 2018

1720

"...The newest expansion plan will likely kick-off with the construction of a 2.7 million-square-foot complex on top of what's currently being used as a parking lot for cars and trucks. While no timetable has been set yet, the first building will probably hold 75 percent manufacturing space and 25 percent office space for technology and creatives. The second building will likely contain the same mix of space and be built on what is currently being used as a tow lot for the New York Police Department. The third complex in the long-term plan will be built on what is now the Bureau of Prisons supply depot, the last federal tenant in the Navy Yard. The three sites in question are:

- Kent Avenue (approximately 13 acres)*
- Flushing Avenue (approximately 6.5 acres)*
- Navy Street (approximately 5 acres)..."*

archpaper.com, February 1, 2018

1721

"...Other than WeWork's Dock 72 office building, the current Navy Yard growth plan involves the conversion of Admiral's row into a Wegmans supermarket, the expansion of the Brooklyn College Barry R. Feirstein Graduate School of Cinema by Dattner, and Beyer Blinder Belle's ongoing renovation of the 1-million-square-foot Building 77."

archpaper.com, February 1, 2018

1722

399 Sands Street



Last December, YIMBY revealed the renderings for 399 Sands Street in the Brooklyn Navy Yard Industrial Park. Now, the official groundbreaking for the nine-story office building has occurred. newyorkyimby.com, June 14, 2018
RE: introduction to an article entitled: "Groundbreaking Ceremony for Steiner's 399 Sands Street, Brooklyn Navy Yard"

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Brooklyn Navy Yard's latest - a manufacturing and creative office hub - broke ground at 399 Sands Street on Wednesday. The Dattner Architects-designed building will stand nine-stories tall and be a part of Steiner NYC's ever-expanding Navy Yard empire. ny.curbed.com, June 14, 2018
RE: introduction to an article entitled: "New Looks at Brooklyn Navy Yard's Latest Manufacturing Hub"

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Caption: "Official groundbreaking for 399 Sands Street. From left, City Council Member Robert E. Cornegy Jr., Deputy Major for Housing and Economic Development Alicia Glen, developer Doug Steiner, Chairman, Steiner NYC, Brooklyn Navy Yard Development Corporation President and CEO David Herenberg, and Brooklyn Navy Yard Chairman Henry Gutman."

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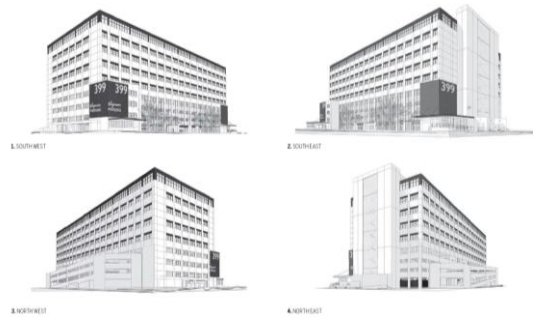
"THE structure will house between 700 to 1,000 jobs once complete. It is part of the \$1 billion redevelopment project dedicated to fueling New York City's economy with infrastructure for 10,000 new jobs in manufacturing and creative businesses. The non-profit Brooklyn Navy Yard Development Corporation (BNYDC) is realizing the project through private developers, and Steiner NYC is responsible for 399 Sands Street..."
newyorkyimby.com, June 14, 2018

"...The Deputy Mayor for Housing and Economic Development, Alicia Glen, spoke at the groundbreaking, telling the crowd, 'Thanks to the City's \$40 million New York Works investment in 399 Sands Street, the Yard will continue to fuel growth, and provide manufacturing and creative jobs for generations to come'..."
newyorkyimby.com, June 14, 2018

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“...The city has also investment \$40 million in this project, which is expected to create between 700 and 1,000 permanent jobs. ‘399 Sands Street will further cement the Brooklyn Navy Yard as a premier destination for creative and manufacturing innovation,’ said Brooklyn Borough President Eric Adams, in a statement.”
 ny.curbed.com, June 14, 2018



“...Dattner Architects will be responsible for designing 399 Sands Street. Renderings show an unimposing grey facade crowned by one floor of black steel curtain wall. The building will yield 412,030 square-feet, including 230,000 square-feet of leasable office space and a four-story, 430 car garage...”
 newyorkyimby.com, June 14, 2018

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“...Parking will be available for office tenants and customers of the BNY-DC’s Wegmans supermarket, opening in 2019. The parking portion of the building will be finished around that same time, with the rest of the space opening in 2021.”
 newyorkyimby.com, June 14, 2018

“...399 Sands Street will have parking for 430 cars on its first four floors, which will serve both tenants in the building and customers at the adjacent Wegmans supermarket, which is scheduled to open in 2019. Above the parking spots, 399 Sands Street will have manufacturing space on floors five through eight, and creative office space on the top floor. The first four floors that are dedicated to parking will open next year, whereas the manufacturing and office spaces will open in 2021...”
 ny.curbed.com, June 14, 2018

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“...Construction is already moving forward for the other structures on site. The \$100 million Building 77 is expected to open this November, bringing one million square-feet of new space to the area, with an expected capacity for 3,000 light manufacturing jobs.”
 newyorkyimby.com, June 14, 2018
 Caption: “Brooklyn Navy Yard Overview, rendering courtesy the Brooklyn Navy Yard Development Corporation”

1734

Master Plan

A new master plan and rezoning calls for three “vertical manufacturing” buildings, increased public access, and more educational programming

ny.curbed.com, September 27, 2018

RE: introduction to an article entitled: “Exclusive: The Brooklyn Navy Yard is Reinventing Architecture - and Itself”

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“FIFTY years ago, the Brooklyn Navy Yard was launching ships; today, it’s launching startups. This evolution is no clearer than from atop Building 77, a World War II-era factory in the throes of reinvention. The ground floor’s polished concrete main hall features soon-to-open eateries, each with food production facilities behind their retail stalls. New windows usher light and air into the open-plan floors (much of the 16-story building didn’t have any windows originally). Tech companies, fashion brands, architecture firms, jewelry companies, and film production studios occupy the levels above...”

ny.curbed.com, September 27, 2018

“...But take the elevator to the 16th floor, step onto the roof, and survey the panorama: You’ll spy Brooklyn Grange, a 1.5-acre rooftop farm; WeWork’s slick new headquarters in Dock 72, a 17-story, 675,000-square-foot glass office building; and a caravan of NYC ferries docked where warships once moored. Here, the new economy of New York is emerging - at least, that’s what the city and Navy Yard’s management hopes - and it’s ramping up the scale of this ambition...”

ny.curbed.com, September 27, 2018

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Caption: “Located atop Building No. 3 at the historic Brooklyn Navy Yard, is a massive 65,000 sq. ft. roof towering twelve stories over the East River. Installed in 2012, the farm is covered in 10-12-inches of Rooftite Intensive Ag blend.”

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Caption: "With a new NYC Ferry landing opening in 2019, increasing connectivity between the dock, located in the back of the Navy Yard and the street (about a five-minute walk away) is a challenge. A new skybridge is proposed in the master plan." 1743

"...This week, the Navy Yard released new renderings and an expanded master plan that shows a 30-year plan for the complex. Developed with the multidisciplinary design firm WXY, the master plan includes three new buildings totaling 5.1 million square-feet, to be constructed on three open lots adjacent to Navy Street, Kent Avenue, and Flushing Avenue. The plan also includes increased public access to the complex, including retail and open space, and improved wayfinding and circulation. The expected cost is \$2.5 billion, coming on the heels of a nearly complete \$1 billion expansion..."
 ny.curbed.com, September 27, 2018

1744

"...‘This is not a ‘dream small dreams’ master plan,’ says David Ehrenberg, president and CEO of the Brooklyn Navy Yard Development Corporation (BNYDC), the not-for-profit company that manages the 300-acre industrial site. ‘We are becoming a central business district in our own right and wanted to create a moment where we had a unifying theory on how we were doing wayfinding and lighting and all kinds of cityscape and city development [initiatives] we’ve never done before’..."
 ny.curbed.com, September 27, 2018

1745

"...With the new master plan, the Brooklyn Navy Yard is shepherding New York City’s next manufacturing economy - and potentially creating a new blueprint for urban manufacturing in America. But if BNYDC builds this, will manufacturers actually come?..."
 ny.curbed.com, September 27, 2018

1746

“...The Brooklyn Navy Yard has a long and storied history, but was most active in the period around World War II, when it employed more than 70,000 people. The Navy decommissioned the yard in 1966 and sold the land to New York City, which, in turn, intended to redevelop it into an industrial complex that would generate between 30,000 and 40,000 jobs. Through the 1970s and '80s, the Navy Yard struggled to meet its goals and employment stagnated, as New York City - and the United States as a whole - lost factory jobs and transitioned into a post-industrial economy. In the '90s, the Navy Yard embarked on a diversification plan to stimulate job growth. The master plan revealed today is a continuation and maturation of that strategy...”

ny.curbed.com, September 27, 2018

1747



Caption: “The master plan divides the 300-acre Navy Yard into districts. The west, center, and north will each receive a new vertical manufacturing building. The BNYDC also plans to add more food, open space and amenities - like a childcare center - to the Yard.” ¹⁷⁴⁸



Caption: “Increased public access is a key part of the master plan. For a site near Navy Street, the Brooklyn Navy Yard Development Corporation (BNYDC) envisions a museum explaining what type of work happens on the 300-acre site and a public plaza.” ¹⁷⁴⁹

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“...All development and programming at the Navy Yard - the renovation of existing buildings, new construction, educational partnerships, and employment outreach - is in service of creating the conditions for these businesses and potential labor force to thrive. ‘These are accessible jobs,’ Ehrenberg says, noting that 50 percent of the workforce in New York City has a high school education. ‘However, these are not the jobs of 50 years ago where you could come to the Navy Yard with limited English ability, limited education, start moving stuff around, end up welding on the Navy ship, and you were in the middle class. We still see those career ladders, but the reality is this stuff is getting mechanized, computers are an important part of our economy now and it’s just as true as manufacturing as any other part of the economy’...”

ny.curbed.com, September 27, 2018

1750

“...About 8,500 people work in the Navy Yard today, mostly in traditional manufacturing companies (like shipbuilding, printing companies, and material fabrication); so-called ‘innovative manufacturers’ that work in robotics and 3D-printing; producers, like architectural fabrication, furniture manufacturers, and food and drink manufacturers; and media, like film and television production studios...”

ny.curbed.com, September 27, 2018

1751

“...By 2020, the complex is expected to grow to 20,000 jobs with the completion of creative office space in Dock 72; food production, manufacturing, and office space in Building 77; Steiner Studio’s expansion; and a new green manufacturing building and Wegmans supermarket complex on site of former officers’ housing...”

ny.curbed.com, September 27, 2018

1752

"...While New York's industrial past is being scrubbed from its waterfront, its industrial future involves emerging, high-growth industries that are based in technology. For the next phase of growth, the Navy Yard wants to reach 30,000 jobs between 2030 and 2040, but doesn't have enough space to do it. 'The master plan isn't nostalgic - this isn't pining for the manufacturing of yesteryear,' Ehrenberg says. 'This is thinking, 'What does the next generation of high-growth manufacturers that are going to create these quality jobs need? . . . We want to stay focused on manufacturing but acknowledge that what will contribute to a healthy manufacturing cluster in New York can't turn it's back on New York's strength, which is technology, innovation, and culture'..."

ny.curbed.com, September 27, 2018

1753

"...To make room for the evolution of urban manufacturing, the BNYDC realized it couldn't just replicate the structures of the past - it had to design a new type of building..."

ny.curbed.com, September 27, 2018

1754

"...Industrialists of the past pioneered vertical integration, where a company owns its entire supply chain. The classic example is Carnegie Steel owning iron ore mines, steel factories, and the ships and railroads needed to transport its products. While today's manufacturers aren't making I-beams, many of them are scaling in a similar trajectory and controlling the design, prototyping, and manufacturing of a product - and the Navy Yard wants them to do that in New York..."

ny.curbed.com, September 27, 2018

1755



"...One example of this new generation of vertical manufacturer is Crye Precision, a maker of technical garments and one of the largest suppliers of high-tech body armor and camouflage to military and law enforcement customers. Founded in 2000 by two graduates from the Cooper Union, Crye began in a space in Chelsea Market knowing that it wasn't a long-term solution. After looking for more affordable and private space with room to grow, Crye moved into a 1,000-square-foot unit in the Navy Yard in 2002 with just a handful employees..."

ny.curbed.com, September 27, 2018

Caption: "Crye Precision's new 87K sq.-ft. headquarters is located in a landmarked industrial building at the Brooklyn Navy Yard accommodating administrative, design, manufacturing, testing, storage and showroom spaces"

1756

"...But as the company evolved from a designer of tactical gear to a prototyper and manufacturer, its footprint also grew; at one point, Crye occupied six different floors across three buildings at the Navy Yard, which added inefficiencies to its operations. 'Many years ago, we had considered relocating and expanding outside of New York completely to other states with more space, lower costs, and generally more pro-business practices,' says cofounder and executive director Gregg Thompson. 'But it comes down to the people. We all have roots here and never want to disturb that. Fortunately, unlike much of the city, the Navy Yard is one of the few places that is specifically set up to encourage and facilitate our type of manufacturing both functionally and financially. As the need to expand approached, we were able to secure more space incrementally'..."

ny.curbed.com, September 27, 2018

1757



"...It recently moved into a 90,000-square-foot space in the Navy Yard, in the recently renovated Building 128, and employs about 200 product designers, engineers, technologists, garment makers, machinists, and more. The space is a flurry of CNC machines, laser cutters, a full metal shop, a full woodworking shop, and miles upon miles of fabrics and other materials. 'Those are the kinds of companies we want to have,' Ehrenberg says..."

ny.curbed.com, September 27, 2018

1758

“...To find out what these manufacturers of the future need, WXY talked with tenants at the Navy Yard to understand their real estate needs. Along with the architecture firm ORG, WXY also researched urban manufacturing structures in the United States, Europe, and Asia. No precedents for the type of building the Navy Yard needed existed, so the architects went to the drawing board. ‘Something we kept hearing from the Navy Yard was really large production space is hard to come by,’ says Paul van der Grient, studio director at WXY and project manager for the Brooklyn Navy Yard master plan. ‘That’s the moment where companies start growing from small to medium scale, and there isn’t space to continue their growth at the Navy Yard. This [height] has to do with racking the need to store goods. And it’s tied to forklifts and moving around and racking vertically. That’s really set at a 40-foot vertical clearance’...”

ny.curbed.com, September 27, 2018

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Caption: “The multidisciplinary design firm WXY developed a new type of structure to support the master plan’s ambition to add over 10,000 jobs to the Navy Yard. The ‘vertical manufacturing’ typology includes heavy manufacturing floors, light industrial, and creative office space.”

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“...Other practical concerns for the building include adequate vertical circulation for vehicles and freight, passenger elevators, how to illuminate and ventilate the structure, and how to help share resources - like fabrication, printing, and research labs - among tenants...”

ny.curbed.com, September 27, 2018

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“...The ‘Vertical Manufacturing Building’ that emerged includes three scales of space. The ground level consists of loading docks, parking, and showrooms which act as a buffer for flooding. All of the mechanical systems - like elevator machinery and HVAC - are located on the second floor. The ‘XL’ manufacturing floors, designed for large and heavy equipment, have large footprints, few columns, and 40-foot tall ceilings (they’re also located two to three stories above the ground - a necessary intervention given the Navy Yard’s vulnerability to sea level rise - and are accessed by ramps and elevators). Above the XL floors are light-industrial spaces with 15-foot-tall ceilings. On the uppermost floors is creative office space with 12-foot-high ceilings...”

ny.curbed.com, September 27, 2018

“...BNYDC and WXY envision companies expanding from office space to leasing light-industrial and eventually XL manufacturing space. Office space generates more revenue per square-foot compared to industrial space, and having those rents will help make manufacturing space affordable - a challenge in New York...”

ny.curbed.com, September 27, 2018

“...Since the buildings are in the master plan phase only, only the footprints and programmatic needs of the structures have been decided. The ultimate form will be determined once BNYDC hires a development partner, but three new structures will likely rise in the future. ‘The Navy Yard can do things that other areas of the city can’t do because it’s city-owned land,’ says Adam Lubinsky, a partner at WXY. ‘We’re starting to see that physically with these renderings - that you can have an industrial skyline that shows to the city where things are made’...”

ny.curbed.com, September 27, 2018

“...It’s not just the Brooklyn skyline that will change with the vertical manufacturing buildings; the BNYDC is also thinking about how to better integrate the Navy Yard with its surroundings. Because of the nature of operations in the yard - lots of traffic from trucks, forklifts, and heavy machinery - it’s closed to the public. However, the master plan calls for increased public access. ‘The question is, how do you modernize the campus while still maintaining the uniqueness that excites people in the first place?’ van der Grient says...”
 ny.curbed.com, September 27, 2018

1765

“...In developing the master plan, WXY and the BNYDC consulted with tenants, local government representatives, and local neighborhood stakeholders, and received over 100 suggestions on how to improve the Yard. There was a particular emphasis on increasing connectivity within the site and to the rest of the neighborhood...”
 ny.curbed.com, September 27, 2018

1766

“...The master plan sites - an unused barge basin near Kent Avenue, an NYPD tow lot near Navy Street, and a warehouse for the Department of Justice near Flushing Avenue - border the Navy Yard, with a physical barrier between these sites and the streets. The master plan proposes removing the walls and fences and creating street-level public access and amenities - like food, beverage, open space, and retail - for the new buildings. Each structure would become the centerpiece of a mini district in which tenants wouldn’t have to walk more than five minutes to transportation, a place to buy lunch, and an outdoor space in which to eat it. Most of the Navy Yard would still be closed to the public, but security gates would be moved to allow the public to wander freely in the new public plazas...”
 ny.curbed.com, September 27, 2018

1767



Caption: “Adding more open space, like this pocket park near the waterfront, is part of the master plan”

1768

“...Taking advantage of the Kent Avenue site’s proximity to pedestrian-heavy Williamsburg, the BNYDC and WXY propose creating a plaza around a former dock and building street-level storefronts. This esplanade-like space would also offer more access to the waterfront - a popular and much-needed theme in development along the East River...”
 ny.curbed.com, September 27, 2018

1769



Caption: “On a site near Kent Avenue, the BNYDC is proposing a public waterfront esplanade. This vertical manufacturing building includes ground-floor showrooms to establish retail for Navy Yard tenants.”

1770

“...At the Flushing Avenue site, the master plan calls for a public market plus benches and greenery. This building is also near a new dock for the NYC Ferry, which is expected to open in early 2019, along with a skybridge connecting Flushing Avenue to the ferry. For Navy Street, the BNYDC envisions a museum that explains what’s happening inside the yard today and more plaza space...”

ny.curbed.com, September 27, 2018

1771



Caption: “A new building on Flushing Avenue would include a public marketplace and plaza”

1772

“...Advancing accessibility to the Navy Yard extends beyond architecture to programming what happens inside of the structures - which is where rezoning comes in. The BNYDC is requesting a special-use district designation for the entire complex that will reduce parking requirements and the number of loading docks, while allowing for educational use. The Navy Yard has partnerships with the Department of Education for public high school programs that address career and technical curriculum to help ensure that graduating students are attractive job or internship candidates. To that end, the Brooklyn S.T.E.A.M. Center will open in January 2019. Until now, the BNYDC has requested mayoral overrides to allow educational use in the complex. The rezoning, which will not seek additional building height or density, would take schooling from the exception to the rule...”

ny.curbed.com, September 27, 2018

1773

“...The BNYDC has ambitious goals and a plan to help it achieve them - but that doesn’t guarantee success. The job-growth goals in the 1960s, when the Navy Yard was decommissioned, are essentially the same as they are today. Will pouring billions of dollars into the Yard now make any difference? Will new businesses and people come?...”

ny.curbed.com, September 27, 2018

1774

“...There are a number of challenges, particularly with regard to transit - while the forthcoming NYC Ferry dock is nice, it isn’t a mass transit solution. The complex is served by scant bus service and subways are distant (it’s a 20-minute walk from Building 77 to the York Street F stop in Dumbo). The BNYDC operates shuttle buses to Atlantic Terminal and DUMBO to help increase connectivity and plans to increase service as more tenants move in. Increased bikeability and walkability are key parts of the master plan and are still under development...”

ny.curbed.com, September 27, 2018

RE: “DUMBO” is an acronym meaning “Down Under the Manhattan Bridge Overpass” (a Brooklyn neighborhood)

1775



Caption: “Improving walkability, bikeability, and circulation in the Navy Yard is another priority for future development”

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“...Ehrenberg views the BQX - a hotly debated light rail proposal, which would have stops in the Navy Yard - as a 'critical next component' of transportation accessibility. However, its future remains highly uncertain, considering its \$2.7 billion price tag and location in an area highly vulnerable to sea level rise...”

ny.curbed.com, September 27, 2018

1777

“THE Yard is set to launch a free shuttle service that will run every 10 minutes and connect to 13 nearby subway lines. ‘This transportation plan will provide the yard’s growing workforce with direct access to all corners of the city,’ David Ehrenberg, the CEO of the Brooklyn Navy Yard said in a press release. ‘With our workforce set to double in the next five years, one of the yard’s top priorities is connecting where our employees live with where they work. As the yard grows, our transportation infrastructure will be strengthened to meet tenants’ needs’...”

ny.curbed.com, February 24, 2016

1779

“...The second route, The Clinton/Washington Avenue Loop will stop at Atlantic Avenue/Barclay’s Center with access to the 2/3/4/5, B/D, and N/Q/R trains as well as the LIRR. This stop will also serve as a connector to the nearby G Train at Fulton Street and the C Train at Lafayette Avenue. In addition the shuttle will also make a stop Clinton-Washington on the G Train.”

ny.curbed.com, February 24, 2016

1781

Getting to the Brooklyn Navy Yard will no longer be the schlep it is today come spring

ny.curbed.com, February 24, 2016

RE: introduction to an article entitled: “Brooklyn Navy Yard Will Get Free Shuttle To 13 Subway Lines”

1778

“...The shuttle will run along two separate loops. The DUMBO Loop will connect the Navy Yard to the F Train at York Street and the A/C lines at High Street. This route, which has a round trip time of 24 minutes, will also include four stops within the Yard...”

ny.curbed.com, February 24, 2016

1780

“...But proximity is relative. For the architecture firm, research studio, and fabrication shop Situ, the Navy Yard offers accessibility to a community of creatives that help fuel its work - either as clients or subcontractors - and to its customers throughout Brooklyn and Manhattan. The company, which currently employs 40 people, was based in DUMBO for 14 years and found it very difficult to scale in that neighborhood. In autumn of 2017, Situ moved to Building 77 as one of the inaugural tenants. ‘The Navy Yard is an ideal spot for us,’ says Aleksey Lukyanov-Cherny, one of Situ’s co-founders. ‘There’s really nothing like it in terms of the new building, the community, the established businesses - from fabricators to artists - and the new breed of businesses, like ours, that have been popping up. We heard about the other businesses coming in - from fashion designers, makers, artists, and tech companies - and that was exciting too’...”

ny.curbed.com, September 27, 2018

1782

"...However, the appeal of working in the Navy Yard, the relative affordability of space, and the improvements to amenities might not be enough to sustain some companies given a very imminent threat: climate change..."
 ny.curbed.com, September 27, 2018

1783

"...IceStone, a manufacturer of recycled glass aggregate countertops, has been a Navy Yard tenant since 2000. When Hurricane Sandy hit in 2012, it sustained over \$2 million worth of damage. Flood waters - which went five-feet-high in IceStone's building - destroyed expensive machinery; everything had to be replaced. Owner Dal LaManga doesn't think his business could survive another catastrophic weather event as his flood insurance premiums are costly and don't offer much protection. His lease is due for renewal next year and he hopes to stay, but whether or not the Navy Yard offers more assistance for resiliency measures will impact his decision. 'The cache of being in Brooklyn as a brand - 'Made in Brooklyn' is a big deal for our marketing,' LaManga says. 'My concern is there will be a flood and we won't be ready for it. I don't have the money to raise everything two feet up [to avoid floods]'"

ny.curbed.com, September 27, 2018

1784

"...Climate change resiliency is a forever project for the Navy Yard, but dry-proofing all older buildings isn't feasible (the new buildings will have machinery floors well above flood plain). It's currently experimenting with ways to dry proof interiors using waterproof walls around machinery that can't be moved. Time will tell whether or not that will be enough to convince manufacturers to move into an area at high risk for sea level rise..."
 ny.curbed.com, September 27, 2018

1785

"...Ehrenberg believes that the Navy Yard will have a compelling enough mix of real estate, companies, workers, and people to make it a desirable place for 30,000 people to thrive. So far, his plans have been well received. Within the last year, representatives from 90 cities, around 40 or mayors, and 50 deputy mayors or heads of planning and economic development have come to the Navy Yard to learn from its example. 'What excites me most [about the master plan] is that we're really certain that there's a huge number of companies out there who want to be in New York if there's a real estate solution for them,' he says. 'And we've done the best we can at reinventing the Navy Yard to serve their needs. But this, the master plan, will be a template, not just for us, but we hope for others on how to really do [urban manufacturing] the right way.'"

ny.curbed.com, September 27, 2018

1786

The Structure at Dock 72

A number of new buildings and public spaces will debut at the Brooklyn Navy Yard in the next few weeks; as of today, one of those, Dock 72, a 16-story office building that topped out two years ago, is officially open. The building is part of the Brooklyn Navy Yard's \$1 billion expansion.
 ny.curbed.com, October 15, 2019
 RE: introduction to an article entitled: "Brooklyn Navy Yard Debuts 16-story office building at Dock 72"

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“THE 675,000 square-foot building was co-developed by Boston Properties, Rudin Development, and WeWork. That beleaguered co-working company will occupy about a third of the building’s footprint. ‘You may have heard we’ve been in the news lately, not all of it that flattering, so it’s great to be among friends, and with this beautiful building behind us,’ Sebastian Gunningham, WeWork’s co-CEO, said during the building’s opening event...”
 ny.curbed.com, October 15, 2019

“...The waterfront structure - designed by S9 Architecture, with Perkins Eastman as the architect of record, and interiors by Fogarty Finger Architecture - has its own ferry stop that debuted in May, offers stunning views of Brooklyn and the Manhattan skyline, and intends to honor the Navy Yard’s maritime history. ‘The building is an expression and a reaction to the waterfront, [it] steps back to capture views [as well as] Wallabout Bay,’ said Sital Patel, a principal at S9 Architecture...”
 ny.curbed.com, October 15, 2019

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“AS of today, the Brooklyn Navy Yard will be slightly more accessible to the public: A new NYC Ferry stop has opened at Dock 72, where a massive building soon to be occupied by WeWork is on the rise...”
 ny.curbed.com, May 20, 2019
Caption: “WeWork’s Dock 72 at the Brooklyn Navy Yard, rendering by S9 Architecture”



“...The new ferry stop is situated along the Astoria route, which connects Queens to lower Manhattan with stops in Long Island City, Roosevelt Island, and East 34th Street along the way...”
 ny.curbed.com, May 20, 2019

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“...The Navy Yard stop will make the route a bit circuitous; it’s between Wall Street (at Pier 11) and East 34th Street. But it will also provide a new, direct link between the former ship-building site and other boroughs - and, according to the head of the NYC Economic Development Corporation, it’s the ‘first ferry stop at a dedicated job center’...”
 ny.curbed.com, May 20, 2019

“...The ferry slip’s location, at Dock 72, is accessible from the Navy Yard’s entrance at Flushing and Vanderbilt avenues; the best way for people to access it from the street is through Building 77, the former manufacturing hub that now has a food hall at its base...”
 ny.curbed.com, May 20, 2019

1793

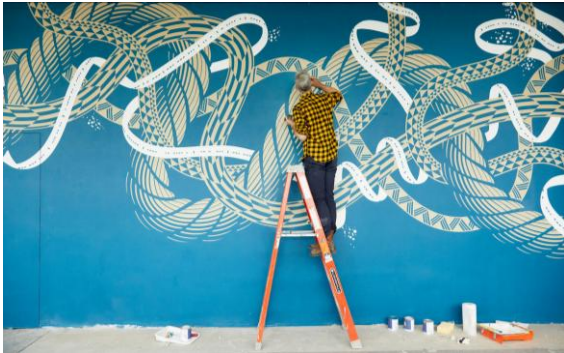
1794



"...Built on an old dry dock, the building is raised above the floodplain, Patel said. In all, the building's design, he said, intends to express 'the old grid of Brooklyn Navy Yard in a modern way'..."
 ny.curbed.com, October 15, 2019

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"...Its lobby features four hand-painted murals by NYC-based artists Dan Funderburgh, Kristin Teixeira, Greg Lamarche, and Bryce Wymer; these were selected by Fogarty Finger and inspired on the concept of water..."
 ny.curbed.com, October 15, 2019

1797



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"...The structure at Dock 72 is part of a \$1 billion Brooklyn Navy Yard expansion that includes a five-story office building home to NYC's first Wegmans at the former Admiral's Row, opening later this month; Building 303, an industrial space and nine-story parking garage that's expected to open in 2020; and a TV and film production space for Steiner Studios. Additional manufacturing buildings will also rise at the yard, as part of a \$2.5 billion master plan."
 ny.curbed.com, October 15, 2019

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