2019-2029

Yard Facilities Master Plan

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Table of Contents

Table of Figures

Table of Tables

EXECUTIVE SUMMARY

Background

In alignment with the *Ten-Year Strategy of the United States Coast Guard Yard*, this document provides an update to the 2007 Coast Guard Yard Land Use Plan. The intent of this document is to establish a realistic, executable near-term strategy in order to preserve the current infrastructure while providing the Yard with the facilities to meet future Coast Guard operations.

As one of only five remaining public shipyards in the United States, the Yard provides not only a unique capability supporting the Coast Guard but also the National Fleet, to include NOAA, the U.S. Navy, U.S. Army and several other government agencies. The primary mission of the Yard is to renovate, maintain and repair Coast Guard vessels; and therefore, most of this plan focuses on the infrastructure capabilities required to support the Coast Guard fleet of today and the next decade. In addition to its role as a shipyard, the Yard serves as a supporting base for 2,200 full-time personnel, one of the largest concentrations of Coast Guard personnel at any field unit.

The functions of the Yard's tenant commands include warehousing, administrative, foreign military sales, front-line operations, command and control, contingency response, and logistics activities. The Yard's tenants include the Surface Forces Logistics Center (SFLC), Sector Maryland National Capital Region, Asset Project Office Cutter Transition Division, Station Curtis Bay, Aids to Navigation Team Curtis Bay, PRO Baltimore, C3CEN Electronic Repair Facility, Electronics Support Detachment Baltimore, CG Civilian Human Resources Office Northeast, CG Office of Civil Rights Detachment, CG Investigative Services Baltimore, Base National Capitol Region Detachment, CGC JAMES RANKIN, CGC CHOCK, and CGC SLEDGE. Of note, the Yard hosts the largest Inventory Control Point (warehousing operation) in the Department of Homeland Security, which serves the entire Coast Guard surface fleet, as well as the Coast Guard's only U.S. Navy-certified heavy weapons overhaul facility. In addition to permanent tenant activities, the Yard hosts an average of 8 visiting Coast Guard Cutters and other government agency vessels (along with their crews) at any time, and supports the renovation and transfer of vessels and weapons systems for foreign military sale. Thus, on average, the Yard hosts approximately a thousand visiting cutter crew members, other government agency crews, and foreign military crews per year. This support includes provision of housing, medical and emergency services, human resources, morale, welfare and recreation support, and other base activities.

For the purposes of this Plan, the term "Yard" refers to the entire 113-acre campus including Lot 22, just north of the Yard's main campus. On this campus, the "Yard" is comprised of 131 structures of varying size and capacities and 95 buildings that enclose over 943,000 square feet of space.

Findings

The overall infrastructure grade for the Yard is a **D+** based upon the American Society of Civil Engineers (ASCE) eight grading criteria[1]. This grade is below the Coast Guard average of a **C-**[2] and it is projected the grade will accelerate its decline without additional resources.

The fundamental issue that the Yard faces is the rapid and wide-spread failure of critical infrastructure. The primary cause of this failure is that nearly all of the Yard waterfront and utility infrastructure was built within a four-year period during World War II (WWII), as documented in Appendix A. The reason for the current state, as that the Yard faced nearly three decades with little or no investment as the Coast Guard oscillated between whether or not to keep its own organic shipyard.

Infrastructure and facilities are failing at a rate faster than they can be maintained with current resources. This has resulted in a casualty cycle in which the Yard is repeatedly requesting large sums of centralized shore funding to repair infrastructure after it fails. Therefore, this Facility Master Plan (FMP) concentrates primarily on the preservation and recapitalization of existing facilities versus expanding capabilities or new development. The goal of this FMP is to stop this casualty cycle and elevate the Yard's infrastructure to a level where it can continue to provide valuable support to the fleet, and support the 2,200 personnel that work on the installation.

The five most prevalent themes to emerge from the planning process include: the need for waterfront repairs, utility repairs, to repair and improve industrial shops, infrastructure needs to service a modernized surface fleet, and improve the Yard's environmental posture.

Waterfront: The Yard has the largest developed waterfront in the Coast Guard with over 1.5 miles of piers, wharfs, docks, and bulkheads on the shores of Curtis Creek and Arundel Cove. Except for the ship-lift and pier 3, the industrial waterfront rests on over 10,200 timber piles, 93% of which were installed between 1939 and 1943. Currently, over 1,600 feet of the waterfront is condemned or restricted in its use. For perspective, there is more condemned waterfront area at the Yard than total pier space at Coast Guard Island in Alameda, CA. There are only three documented major investments in the waterfront since the WWII construction: the stabilization of the east wharf in 1964, major renovations to pier 1 in 1980, and the construction of the ship-lift in 1997. Outside of these major investments, only modest maintenance projects have been completed to preserve these nearly 80-year old structures.

Utilities: The Yard has 211,255 linear feet of utility lines that include electric, steam, water, wastewater, storm-water, gas, and compressed air services[3]. Similar to the waterfront structure, the Yard's utility distribution system is failing at a rate faster than current resources can address. A recent survey from the SILC's Mission Support Product Line validated the Yard's locally conducted inspections, and identified the Yard's utility systems as some of the worst in Coast Guard inventory.

Industrial Shops: The frequent casualties to the waterfront and utilities have taken priority over addressing building envelop failures. Nearly a third of the industrial buildings do not have a weatherproof building envelop and many have tarps installed to divert water on the interior and exterior. This is of particular concern as these buildings collectively house more than $0.5 billion of industrial, ordnance and electronics equipment. Moreover, many antiquated industrial shops are insufficient to accommodate the modern equipment and tooling necessary to support the Coast Guard's future fleet.

Servicing a Modern Surface Fleet: Until recently, the Yard provided the Coast Guard with the organic capacity to service every vessel in its fleet with the exception of the polar icebreakers. With the acquisition of the National Security Cutter and the projected acquisition of the Offshore Patrol Cutter, the Coast Guard is losing that organic capacity. Additionally, the Yard currently does not have the infrastructure to economically service the Fast Response Cutter (FRC). The Yard, along with SFLC, has proven the effectiveness of a Recurring Depot Availability Program (RDAP) but currently lacks the facilities to fully implement this program across the entire patrol boat fleet. In FY2019, however, the Congress provided $22.5 million to install facilities necessary to support FRC RDAP.

Environmental Performance: The Yard maintains 11 operating permits that have progressively become more stringent and restrictive with each renewal. Facility investments are required to meet the current and emerging requirements. Beyond meeting the minimum requirements to operate, the Yard seeks to at least keep pace with environmental standards at other U.S. private and public shipyards.

Master Plan

The final facility master plan consists of three development schemes with different planning horizons and assumptions. Plan A provides a 5-year resource-constrained strategy that is based upon historic funding levels as the reasonable target for each year of the plan. Plan B provides a 10+ year less-resource-constrained strategy and is based upon the Civil Engineering program's target funding levels. Finally, Plan C is based upon a 20+ year planning horizon to meet the future needs of the Coast Guard, and is largely unconstrained from a resource perspective. Plan C is meant to inform and serve as a basis for planning efforts in the event that the Yard requires to be re-constituted following a natural disaster or other "Black Swan" event. Collectively, the three development schemes produce a Facilities Master Plan which provides the ability to flex and guide investment decisions through differing budget scenarios.

Recommendations

Recognizing that underfunding of aging infrastructure is a challenge across the United States[4], the Federal Government, and the Coast Guard, the Yard serves as prime example of the risk incurred by these choices. Yard infrastructure has atrophied under funding levels that have averaged less than one percent of the plant replacement value, and infrastructure failures have resulted in personnel injuries, had environment impacts, reduced productivity, increased ultimate repair costs, and undermined the ability to conduct the primary mission of the Yard. It is recommended that the Yard and the Coast Guard use this plan as an overall vision to inform resource requests through the shore planning and resourcing processes.

INTRODUCTION

Overview

This plan builds on past planning efforts and studies, beginning with a review of recommendations from the 2007 Land Use Plan[5]. The plan also contains an updated assessment of existing facilities at the Yard. Each facility was analyzed in the context of its opportunities and constraints, including condition, mission, historic significance, space requirements, workflow efficiencies, adjacencies, and environmental impact. The plan identifies current requirements and identifies new planning factors that have arisen in the eleven years since the previous plan. The plan then recommends solutions that will allow the Yard to meet current and future functional requirements.

History confirms that the Yard has an ever-evolving role in performing its mission of "Service to the Fleet"[6]. This plan aims to accommodate the identified needs given the Yard's current role, while maintaining flexibility to accommodate possible future roles. The result of this planning effort is a suite of alternatives for the Yard that addresses identified needs within the limits of existing constraints, and positions the Yard to allocate resources more effectively in the wake of a disaster or other event that renders the installation unusable.

Planning Process

The FMP was developed over the course of 11 months with the active participation of Yard personnel and tenant commands during a series of meetings, interviews, assessments, and reviews throughout the process.

The planning process comprised three primary phases as follows:

Data Gathering

- The planning team reviewed background documentation, including previous Yard Land Use Plans, utility studies, historic and archaeological surveys, and environmental reports[7-13].
- The planning team reviewed all strategic direction documentation for the shore and surface fleet as well as the Coast Guard[14-19].
- The planning team performed a physical Facility Condition and Functionality Assessment of each building on site to determine building condition.
- The planning team met with strategic advisors within the Coast Guard to understand emerging trends and to better understand the Yard's role in supporting future operations.

Data Analysis

- The information gathered was first used to determine the American Society of Civil Engineer (ASCE) Infrastructure report card grade using the Shore Infrastructure Logistics Command's (SILC) methodology to assess the eight criteria.
- Similarly the metrics of Mission Index and Stewardship index were developed using SILC's annual report methodology to provide both a baseline for the plan and a benchmark against other Coast Guard infrastructure.
- The Condition Index was developed using both a metrics based degradation model and on site facility assessment which is explained in detail in the facility assessment section.
- The plans were refined and presented to Yard stakeholders for comments and critique.

Alternative Development

- The input from the stakeholders was incorporated into the identification of specific tactical projects and their prioritization.

- An initial draft document outlining the alternative plans was submitted to the Yard and tenant activities for review and comment.
- A realistic, executable plan to implement the different development schemes was outlined and includes a prioritized project list including:
  - Cost Estimates
  - Funding Source
  - Phasing Options
  - Execution Plans

The 2019 Facilities Master Plan distills the results of this planning process, with a focus on the preferred development scheme and a five-year execution plan of specific tactical projects.

History


Original Yard Waterfront circa 1900

The Yard was the first large permanent operating base established by the Revenue Cutter Service (a forerunner of the modern Coast Guard), and the only shipyard ever built by the Coast Guard. From 1900-1910, the Yard also served as home to the Coast Guard Academy, before it was relocated to Connecticut. The Yard was established in Curtis Bay because of its geographic location – adjacent to a protected deep-water body of water with ready access to the Chesapeake Bay, and close to the locus of Coast Guard operations. At the time of the Yard's formation, the Commandant recognized the need to establish a government-operated shipyard because the commercial sector could not keep pace with the growing maintenance and construction needs of the fleet.

Additional overviews of the Location, History, Mission, and Co-located Tennant Commands are well documented in the 2007 Land Use Plan and in the Ten Year Strategy of the United States Coast Guard Yard[7]. Therefore, this plan does not go into detail in those areas but provides an update of significant changes for reference. Major projects and notable changes since 2007 include:

- The modernization of the Coast Guard resulted in the consolidation of the Engineering Logistics Center, Maintenance and Logistics Commands Atlantic and Pacific into SFLC in order to combine and streamline surface fleet support services into one single command. This has resulted in an increased footprint in Baltimore, MD, and a reduced footprint at other locations in the Coast Guard.
- The Deepwater Acquisition Program was abandoned as the long-term strategy to recapitalize aging aircraft, cutters, and support systems. This resulted in changes to acquisition strategy which impacted the resource allocation to support new assets.
- Vessel renovations (including mid-life and service life extension projects) have become the primary business for the Yard. The Yard's business niche and competitive advantage is projects involving complex back-fit engineering and systems integration.
- The construction of the Reclaimed Energy Center (REC), which utilizes methane gas from a neighboring landfill to create energy for the Yard. Approximately 85% of the Yard's electricity is produced by the REC.
- Significant progress on addressing all nine National Priority List (commonly known as "Superfund") sites with the only remaining effort being long term monitoring of two sites.

2007 Land Use Plan Summary

The final 2007 Land Use Plan identified the most prevalent issues as: the need for consolidation, organization, and adequate provision of storage; improvements and upgrades essential for several industrial shops and waterside operations; opportunities for future Yard expansion; and improvements to parking and circulation.

The 2007 Land Use Plan developed a preferred alternative plan in the figure below which contained several project which were executed or funded.

- The Reclaimed energy Center was built in 2008.
- Building 138 and building 139 were demolished in 2009.
- The shiplift and transfer area expansion project was funded in 2016.

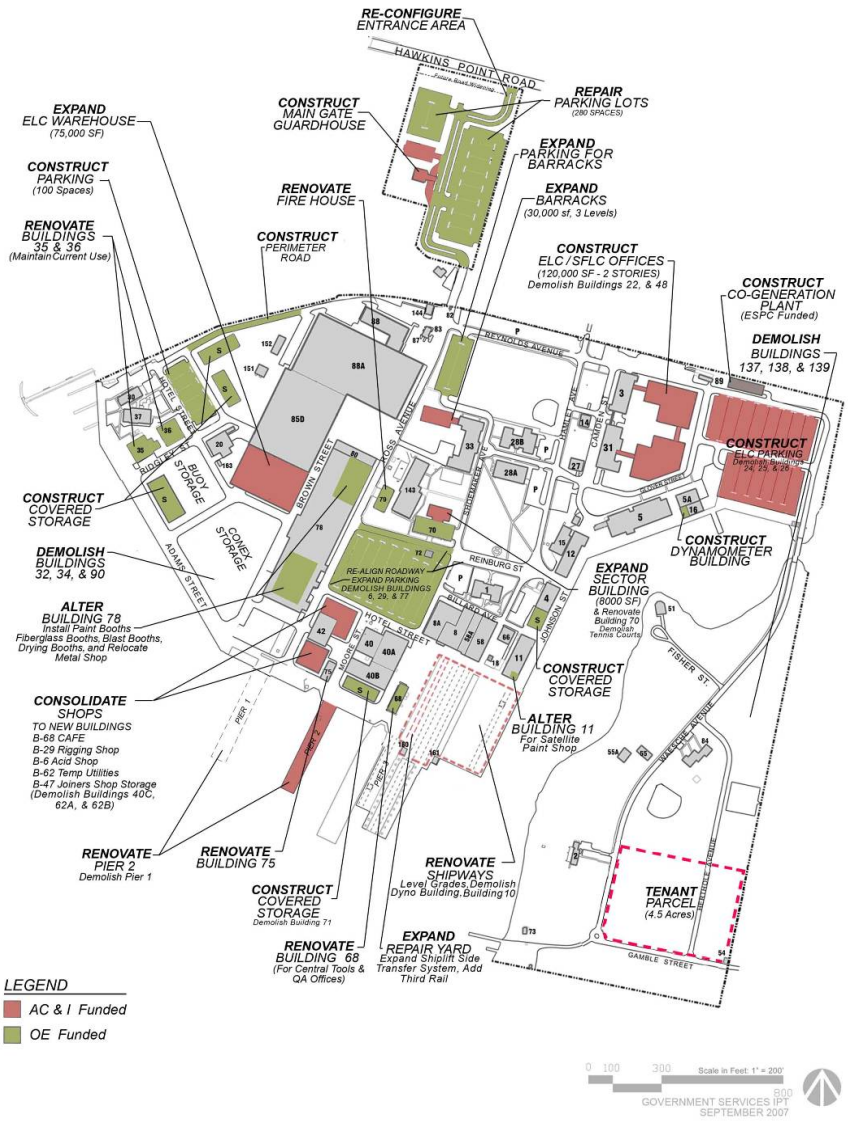


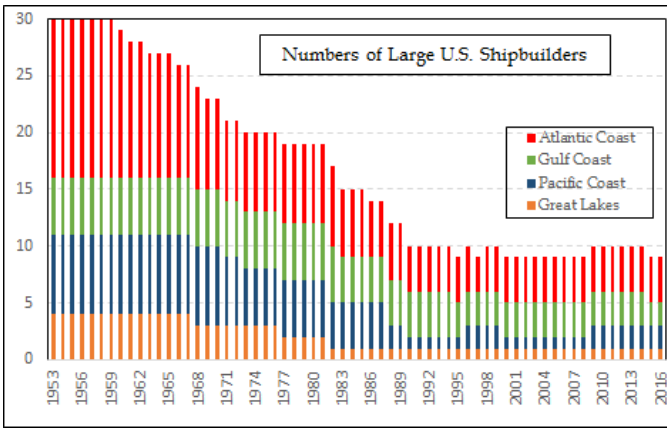
Figure 2. 2007 Land Use Plan Recommended Site Plan

Coast Guard Initiatives (Basis for Future Plans)

As the Coast Guard faces the challenges of the next decades (new mission sets, new cutters, sea level rise, contingency responses, and a tight fiscal climate) the Yard must be positioned to continue to provide effective support to the operational surface fleet.

A complete review of the Coast Guard's Strategy documents was conducted to ensure that the Yard's strategic facilities investments are aligned with the service's direction. Yard staff also met with staff from the Coast Guard's Office of Emerging Policy (DCO-X) to better understand the service direction beyond the scope of the various strategy documents. Together they informed both the priority and scope of capital investment decisions and the ability for facilities to support the needs of the Coast Guard into the future.

Shipyard Industry - Historical Context



Source: "Decline of U.S. Shipbuilding," January 21, 2016. www.shipbuildinghistory.com; Large shipbuilders are defined as those capable of constructing ships greater than 400-ft in length.

The nature of the U.S. shipyard industry has changed dramatically over the past six decades. During World War II, the United States was the undisputed shipbuilding powerhouse. For example, between 1939 and 1943 the U.S. expanded shipbuilding production by 5,200%[20]! At the end of the war there was tremendous overcapacity in U.S. shipyards, as well as an overabundance of relatively new vessels. Thus, the demand for U.S. vessel construction and repair work diminished precipitously. From the 1950s-1980s the number of U.S. commercial shipyards continued to shrink and consolidate, owing to changes in the U.S. and global economies and policies. Concurrently, the Navy closed several of its public shipyards. By the 1990s, few commercial vessels were built in U.S. shipyards, aside from those required to be built and flagged in the U.S. by the Jones Act.

Shipyard Industry Current State and Future Outlook

At present, military ship construction drives the U.S. shipyard market. Specifically, 60% of industry revenue comes from military ship construction, 22% from commercial ship construction, and 18% from ship repair[21]. The industry is also highly concentrated, with the six largest U.S. shipyards accounting for two-thirds of industry revenue and nearly 90% of all military vessel construction[22]. While the U.S. shipyard industry was a sizeable segment of the U.S. economy in the mid-20th century, it now accounts for less than 0.15% of our Gross Domestic Product (GDP)[23]. In comparison, the auto industry contributes 3.0% – 3.5% of U.S. GDP[24]. *From an international perspective, the U.S. ranks 19th in commercial shipbuilding, with only 0.35% of global new construction, despite having the largest economy in the world*[25].

Given the meager state of the industry, there is growing concern that U.S. shipyards are unable to recapitalize and maintain the U.S. military fleet[26]. In fact, a 2018 Government Accountability Office (GAO) report of Navy ship maintenance documented 18,851 lost days of surface warship availability from 2012-2018, and 8,472 lost days of submarine availability from 2008-2018 in large part due to insufficient capacity of Navy and commercial shipyards to perform scheduled maintenance on time[27]. For example, the attack submarine USS BOISE was removed from operational service for 852 days (from June 2016 – October 2018) awaiting available dry-dock space at a shipyard capable of overhauling the vessel.

The Coast Guard performs approximately 85% of its shipyard depot-level maintenance at commercial shipyards, and approximately 15% at the Coast Guard Yard. This is a higher ratio of commercial work than the

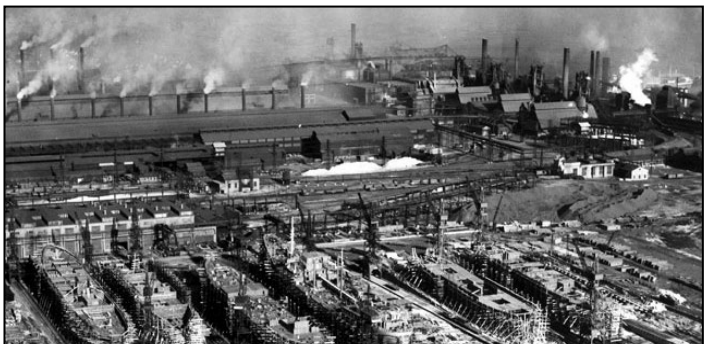
Navy, which is required by law to perform no less than 50% of its depot level maintenance in its own public shipyards[28]. Consequently, maintenance of Coast Guard cutters is impacted to a much greater extent than the Navy by changes in the commercial shipyard industry. Similar to the Navy, SFLC has already observed a steady decline in commercial repair shipyard competition and availability in certain geographic regions in support of cutter maintenance in recent years. This has increasingly resulted in "no-bids," harmful delays to cutter operational schedules, and higher than expected costs for maintenance and repairs. Given the state of the industry, these trends are expected to continue for the foreseeable future.

There are a number of significant challenges that deter significant U.S. commercial shipyard growth over the next decade. These include:

- Lack of domestic demand: A lack of domestic demand for *commercial* ship construction and repair work significantly dampens the financial incentive for industry to build more shipyards. Military construction alone is insufficient to drive industry to invest large amounts of capital and other resources to open new shipyards, particularly given the high barriers to entry. Importantly, in the long run, demand for military ship construction is unpredictable compared to other industries – because it relies on U.S. policy which often changes in response to the geo-political climate and other exogenous factors. Additionally, the Jones Act requires that only U.S.-built and flagged vessels may be employed for the carriage of goods and passengers between U.S. ports. Thus, the Jones Act guarantees a certain amount of commercial sector work for U.S. shipyards. Albeit unlikely, if the Jones Act requirements were modified, this would undoubtedly result in an even further reduction of domestic demand for U.S. shipyard capacity.

- High barriers to entry: Opening new shipyards in the U.S. is challenging, requiring investment of very large amounts of capital, acquisition of properly zoned waterfront property along a navigable waterway with ready access to the sea, an absence of encroachment from commercial and residential development, complex environmental management and regulatory considerations, and the need for quick access to airports, roads and rail for logistics support. Given that most small and medium sized shipyards have low profitability (compared with many other capital-intensive industries), this makes opening new U.S. shipyards quite unattractive from a business perspective[29]. Furthermore, entry into the U.S. shipyard industry is further complicated by the fact that the industry is now dominated by just a few large companies that are able to set prices for the market.

- Workforce constraints: Lack of a readily available trained workforce, and an aging population of U.S. shipyard craftspeople are major concerns for U.S. shipyards[30]. When shipbuilding was still a major sector of the U.S. economy, there was an abundance of trained and skilled workers in the market. Moreover, schools invested in training programs responsive to the need for shipyard labor. This is no longer the case. For example, it is rare that a high school guidance counselor today would advise a student to become a ship-fitter or boat joiner, or that a high school would have training programs for these trades.



Bethlehem Steel Sparrows Point Shipyard & Steel Mill in Baltimore, MD employed more than 45,000 people in the 1950s. When it finally closed in 2003, many of the skilled employees came to work at the Yard. Source: Baltimore Sun

Forty years ago there were *tens of thousands of such jobs at several commercial shipyards just in Baltimore*, and many schools taught students the basics of these trades. U.S. shipyards are now forced to invest large amounts of money and time recruiting and training their own workforces, making these shipyards even less responsive to changes in market demand.

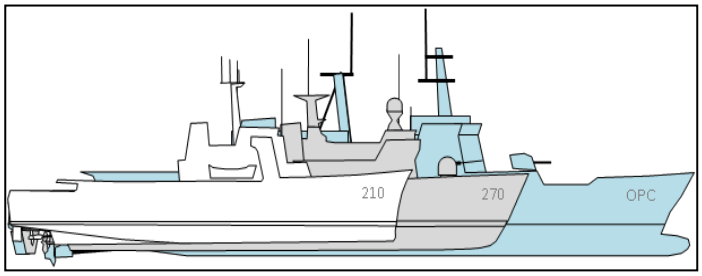
This problem is not limited to craftspeople; professional engineers with ship design experience are also in short supply. For example, within the Coast Guard, many cutters and boats were "in-house" designs 40-70 years ago. This acquisition strategy sustained high levels of technical expertise within the Service, and provided tremendous benefit as these vessels were renovated and upgraded through their service lives. Today there are only a handful of Coast Guard personnel that have actual first-hand experience performing detailed design work and building ships and ship systems. Nearly all of that organizational experience resides at the Yard

- Diminished complementary industry: In addition to diminished shipyard capacity, the production of U.S.-designed and manufactured materials and equipment used to build ships have diminished. This includes base materials such as steel, and finished components such as engines, reduction gear, navigation and control systems. Strong complementary industry is critical for shipyards in order to sustain a healthy supply chain, keep costs competitive, and sustain innovation in the production and design of ships and ship systems.

In summary, United States commercial shipyard capacity and capabilities will remain a significant challenge for the Coast Guard in the foreseeable future. As a result, the Yard must position itself to fill in where the commercial market is unable to meet the Coast Guard's needs, and adjust its capacity and capabilities as necessary to fill gaps.

Coast Guard Fleet Recapitalization – A Shift to Larger Shipyards

The Coast Guard is in the midst of recapitalizing its surface fleet. In general, the Coast Guard is replacing smaller vessels with larger, more complex assets. In many instances, these changes will require the Coast Guard to shift maintenance traditionally performed in small shipyards to larger shipyards that specialize in larger, more complex vessel repair. One challenge with this trend is that the Coast Guard will likely begin to compete directly with the Navy for shipyard capacity within the decade. Furthermore, the cost of doing work in shipyards that specialize in military vessel and larger ship repair tend to be higher than those that specialize in repair of small commercial vessels (which have lower overhead costs and tighter profit margins). While one might argue that an increase in demand for more shipyard capacity will elicit a market response to open more U.S. shipyards that are capable of servicing these larger vessels, the industry economic factors outlined previously make such a market response highly unlikely.



The new 360-foot Offshore Patrol Cutters (OPC) will replace the CG's fleet of 210-foot and 270-foot Medium Endurance Cutters (WMECs) over the next decade. Many of the shipyards that currently dry-dock WMECs do not have adequate facilities to dry-dock OPCs.

The trend of increasing size and complexity of Coast Guard cutters is likely to displace the Coast Guard from a more competitive segment of the U.S. shipyard industry (small shipyards) to a less competitive segment (larger shipyards). Furthermore, the Coast Guard is likely to face increasing constraints with regard to commercial shipyard capacity as it begins to compete with the Navy for space and time in larger shipyards.

These trends will make it increasingly important to sustain organic Coast Guard shipyard capacity to avoid shipyard "bottlenecks". This will also require the Yard to make smart investments to ensure it remain capable of dry-docking and serving the new cutter fleet, including Offshore Patrol Cutters and Fast Response Cutter.

Emerging Coast Guard Operational Focus

The Coast Guard maintains several operational strategies that provide insight into areas of emerging focus over the next decade or more. These operational strategies point to where the Yard must focus its efforts over the next ten years.

- Contingency Response: All of the recent Coast Guard Evergreen studies assessed that the U.S. is likely to experience an increase in the frequency and severity of natural disasters which impact the coastal and near-coastal zones[14]. As outlined in the 2018-2022 Coast Guard Strategic Plan, this will require the Coast Guard to continue to place emphasis on robust disaster response, improve the resiliency of its own infrastructure, and ensure the mobility and interagency operability of its assets and personnel[15].

- Western Hemisphere: Consistent with the Coast Guard's Western Hemisphere Strategy, the Coast Guard will continue to focus operations in the Western Hemisphere Transit Zone to stem the influence of transnational criminal organizations and the flow of drugs, migrants, and other illegal activity through Central America and across our southern borders[16]. A large portion of interdiction operations are performed by the Coast Guard's major cutter fleet. Furthermore, increasing pressure on fisheries stocks and other natural resources in the U.S. Exclusive Economic Zones will continue to send a strong demand signal for offshore-capable major cutters[17]. The cutters in these regions tend to operate at the far reaches of the Coast Guard support and commercial industrial networks.

- Arctic: The Coast Guard's Arctic Strategy highlights the increasing commercial maritime activity in the Arctic domain, and projects increased presence of Coast Guard assets. Given the large volume of untapped natural resources including petroleum and mineral wealth, this is an area of emerging strategic focus[18]. Of particular note, other competitor nations have built up icebreaker capacity and support infrastructure, and have increasingly asserted their presence in the region. Given the nature of this region, U.S. and allied infrastructure and bases are almost non-existent. Consequently, assets that operate in the Arctic must have high mobility and endurance, and possess very high operational reliability.

- Cybersecurity: Cybersecurity has become increasingly important to the Coast Guard and our Nation with the rapid advance of technology. The Coast Guard is responsible for helping to protect critical maritime infrastructure, as well as ensuring the resiliency of its own systems against cyber-attack[19]. Modern ship systems and industrial equipment have become increasingly automated and networked, and thus cybersecurity will continue to have increasing importance in design and maintenance of the Coast Guard's cutter fleet, and to shipyard operations.

- Navigation Technological Advances: The Coast Guard recognized as far back as 35 years ago that advances in navigation and maritime technology have the potential to reduce the reliance on certain visual aids to navigation (ATON) including floating buoys and other visual "traffic signals" in certain navigable waters. Advances in automatic identification systems (AIS), satellite navigation, electronic charting, advanced collision avoidance systems and other new technology may further reduce the need for visual aids. This is particularly important as the Coast Guard is responsible for maintaining ATON using its fleet of buoy tenders and ATON boats.

Relevance to the Yard

The emerging areas of operational focus above indicate the following trends that are of great strategic interest to the Yard:

- Increased need to provide agile and mobile support forces, particularly those that are able to support assets in inhospitable climates such as the Arctic, and in disaster-impacted regions.

- A significant focus on ensuring operational reliability of major cutters deployed far from the continental United States, away from traditional bases of support and commercial shipyards.

- A continued and sustained focus on cutter operations in the Western Hemisphere Transit Zone, far reaching Exclusive Economic Zones and increasing presence in the Arctic.

- Demand for improved resiliency of Yard infrastructure and mobility of the Yard workforce, so that these forces are able to support operations effectively in the wake of disasters.

- Improved cyber resiliency of industrial infrastructure supporting homeland and national security activities will be an area of increasing focus. This includes improved back-fit design and maintenance of cyber-resilient ship systems (platform information technology), and ensuring workforce proficiency in this new space.

- The Yard is heavily invested in maintaining the Coast Guard's large fleet of seagoing and coastal buoy tenders. Advances in technology that change buoy tender fleet requirements have direct relevance to future work performed by the Yard.

Emerging Environmental Regulations & Impact to the Yard
Regulatory oversight of heavy industrial activities is, rightly so, becoming increasingly stringent as we better understand the adverse impacts of these activities. Emerging areas of environmental regulation that are of great strategic interest to the Yard include:

- The primary source of pollution for any shipyard is storm-water runoff. This is due to the use and application of hazardous material in immediate proximity to the water. The Yard has already experienced increased regulatory controls with the issuance of new operational permits, and will need to implement new physical and operational controls to maintain these permits.

- The second primary source of pollution is through the air. Internal combustion machinery and use of materials containing volatile organic compounds are fundamental to running a shipyard. As these regulations evolve the Yard must seek alternate materials and maximize equipment efficiency.

- The Yard applied to be added to the National Priorities List (Superfund). As a Superfund site the Yard operates under increased regulatory scrutiny and review. The Comprehensive Environmental Response, Compensation, and Lability Act (CERCLA) provides a formal process to address all contamination found on site. In recent years a new site of historic contamination was found, and the presence of chemicals subject to emerging regulation were also discovered. The Yard will need to continue its engagement with the, the Environmental Protection Agency (EPA), Maryland Department of the Environment (MDE), and the public to address all contamination.

Coast Guard's Role as Environmental Regulator & Impact to the Yard
The Coast Guard is responsible for enforcement of environmental laws and regulations in the maritime domain. As one of the last remaining public shipyards, and the only Coast Guard shipyard, the Yard must

at a minimum maintain parity with industry and the other public shipyards, as well as sustain trust with the public. The Yard must continually improve its environmental posture in the following areas:

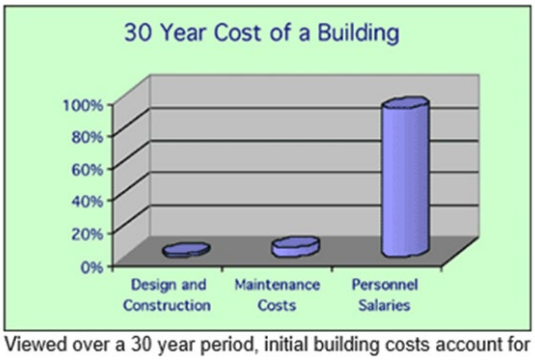
- The Yard is one of the largest consumers of energy in the Coast Guard, and therefore must continue to seek fiscally responsible alternative energy sources while simultaneously seeking to reduce consumption. Significant strides have been made in both areas, but as new technologies become more reliable and less expensive, the Yard must seek to incorporate them where possible.

- The Yard must be an active partner with not only environmental regulators but also with environmental advocacy groups. The Chesapeake Bay is one of the most iconic and important bodies of water in the United States. As such there is significant industrial and agrarian interest, particularly in contributing areas such as Curtis Bay[31]. This provides an opportunity for the Yard and the federal government to partner with civic organizations in joint restoration efforts.

Internal Operations

Workflow efficiencies

When considering capital facility investments, is it important to understand that the upfront capital investment is the smallest component of facility life cycle cost and value. The investment in labor that will work in the facility is the most important cost driver. Ensuring that the Yard has the most efficient design possible will yeild large cost savings over the life of any new facility. The Navy estimated the cost of inefficient workflow in their shipyards was $2.15M/year and caused over 400,000 miles in wasted travel. By correcting this they ultimately project they can reduce their footprint by 20% while simultaneously returning 5 operational days per ship availability back to the Fleet[32].

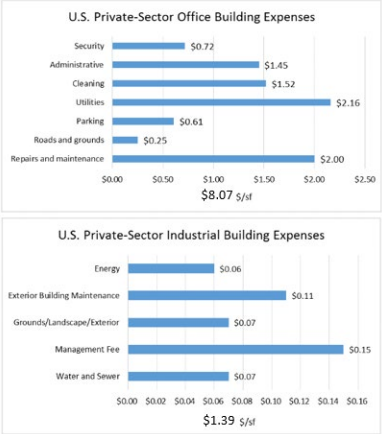


Viewed over a 30 year period, initial building costs account for approximately just 2% of the total, while operations and maintenance costs equal 6%, and personnel costs equal 92%.

Source: Whole Building Design Guide, Life Cycle Cost: National Building Sciences

Reduce footprint

The size and type of facility greatly impacts not only the acquisition cost, but also recurring maintenance costs. The Yard's industrial facilities are comprised of 57 buildings that encompass 476,791 square feet of space. One building, building 78, accounts for 121,429 or 25% of the industrial space. The average size of the remaining buildings excluding building 78 is around 6,300 square feet. This creates a very inefficient layout and workflow. Over the next 5-10 years the Yard should seek to replace old complexes of small buildings grouped together with a single more efficient building. In doing so, the Yard will not only reduce total ownership cost, but will also aid in the overall federal government initiative to reduce the footprint.



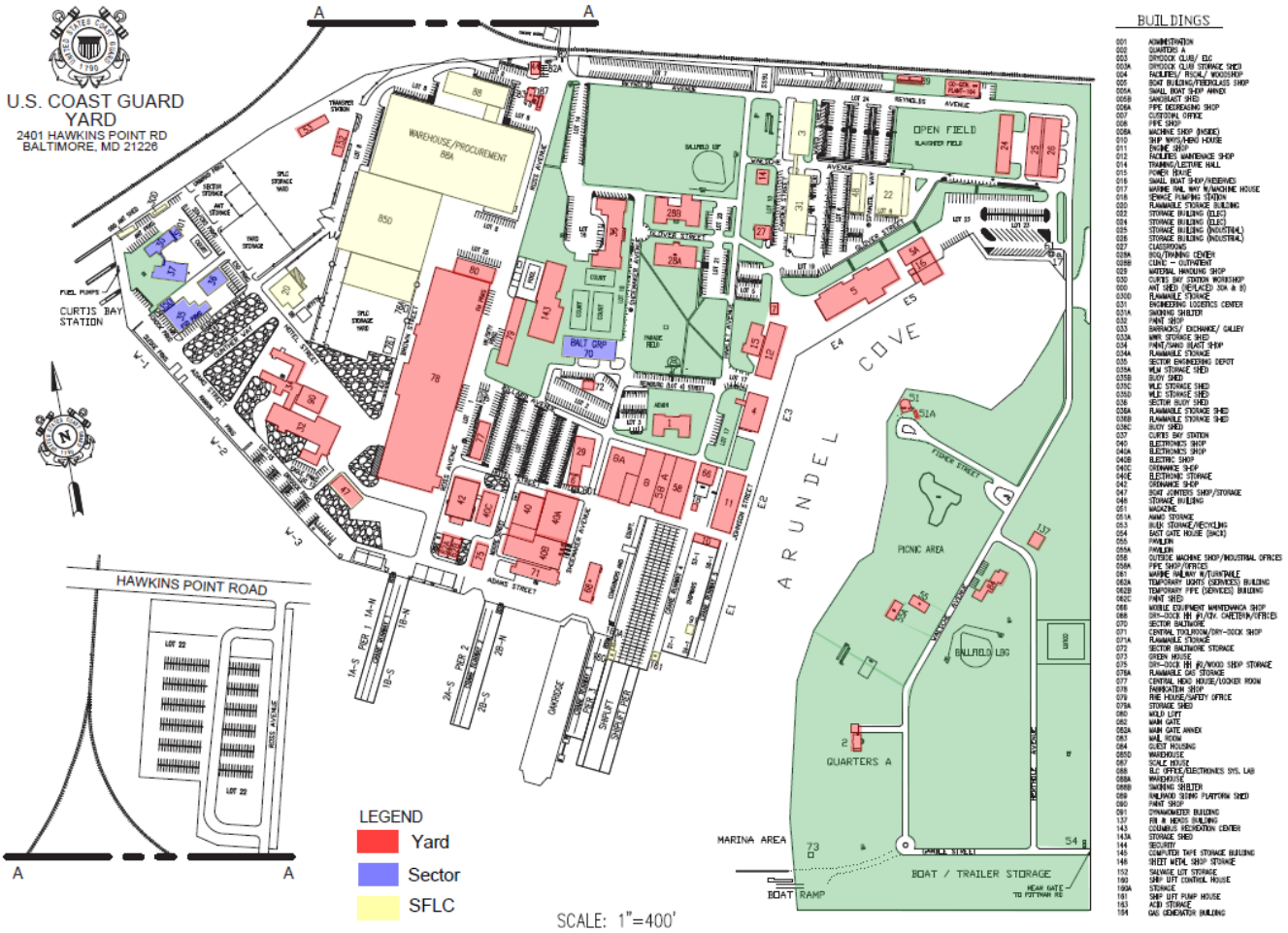
Source: Building Owners and Managers Association International Office and Industrial Benchmarking Report

SITE ANALYSIS

Site Description

The Coast Guard Yard at Curtis Bay includes 113 acres with administrative areas, industrial areas used for the repair and maintenance of Coast Guard vessels, and open space. The site is characterized primarily by industrial shops, warehousing, storage, and administrative spaces. As outlined previously, the Yard supports 14 tenant commands and approximately 2,200 full-time employees conducting all manner of front-line operations and field support. Thus, the secondary uses of the Yard include base-support activities, including unaccompanied personnel housing; a medical clinic; and Morale, Welfare and Recreation (MWR) support.

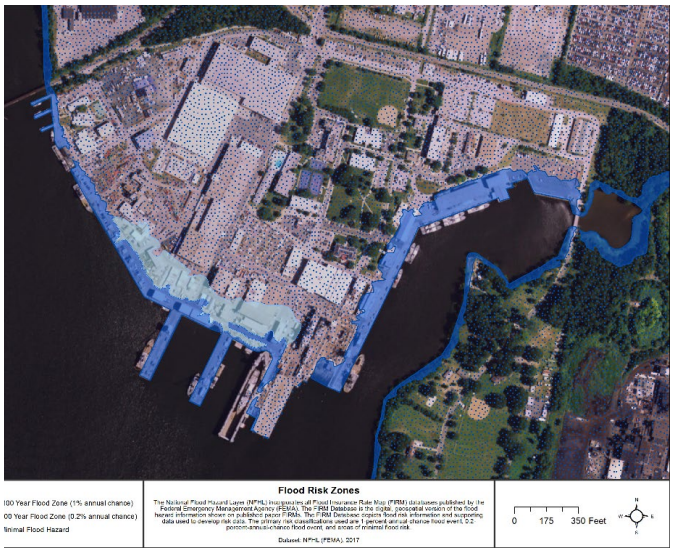
In addition to the main Yard complex, the site includes a 35-acre parcel, known as "the Grove", which is separated from the complex by the Arundel Cove inlet, and Parking Lot 22, also known as the "North Lot", located between the main gate and Hawkins Point Road. The figure below illustrates the existing land use at the Yard.



Existing Landsite Plan and Usage

Floodplains

Parts of the Yard are within the 100-year floodplain of Curtis Creek and Arundel Cove, and therefore are subject to Federal Emergency Management Agency (FEMA) flood zone regulations. Because the floodplain is more prone to potential flooding and damage, flood zone regulations limit development within the floodplain. The flood zone regulations in the Curtis Bay area are administered by Anne Arundel County. The figure shows the current infrastructure that is at risk of flooding. Historic photographs have validated this map including the photos of flooding in September of 2003 during Hurricane Isabel.



Flood Risk Zones

Chesapeake Bay Critical Area Act

The Chesapeake Bay Critical Area Act was enacted in Maryland in 1984 in an effort to better protect the water quality and wildlife habitat of the Chesapeake Bay. The act established a 1,000 foot "Critical Area" buffer zone along the Bay and its tidal tributaries, and development within this zone is subject to review and possible restrictions. All applications for re-zoning, site plans, variances, special exceptions, and subdivisions (on privately-owned parcels) must be reviewed for compliance with development standards that seek to protect natural habitats and prevent water pollution. All Anne Arundel County ordinances, land use plans, and zoning maps conform to the act. Technically the federal government is not required to comply with the act, but it has traditionally cooperated with local requirements to the greatest possible extent.

Historic and Archaeological Resources

The built features that most constrain or preclude development at the Yard are the historic structures in the Curtis Bay Historic District. While the National Historic Preservation Act (NHPA) does not require preservation in every case, it does require that federal agencies with historic properties first consider alternatives to modifying historic buildings. Additionally, Native American Archaeological sites have been identified in the Grove area of the Yard. Any major investment would require upfront consolations and assessments to ensure compliance with NHPA.

Historic and Archaeological resources are illustrated in the adjacent figure.

Historic Buildings and Archeological Sites

Environmental Concerns

Former activities at the Yard have contributed to the contamination of soils and sediments on and around the site. Within the Yard property, thirteen sites were identified as potentially contaminated in a Preliminary Assessment conducted in 1989. In accordance with the federal Comprehensive Response, Compensation Liability Act (CERCLA), monitoring wells and points were established. In 1998, supplemental information provided to the U.S. Environmental Protection Agency (EPA) by the Coast Guard indicated that nine of the thirteen sites were areas of potential contamination. Figure 10 illustrates the location of the identified contamination source sites.

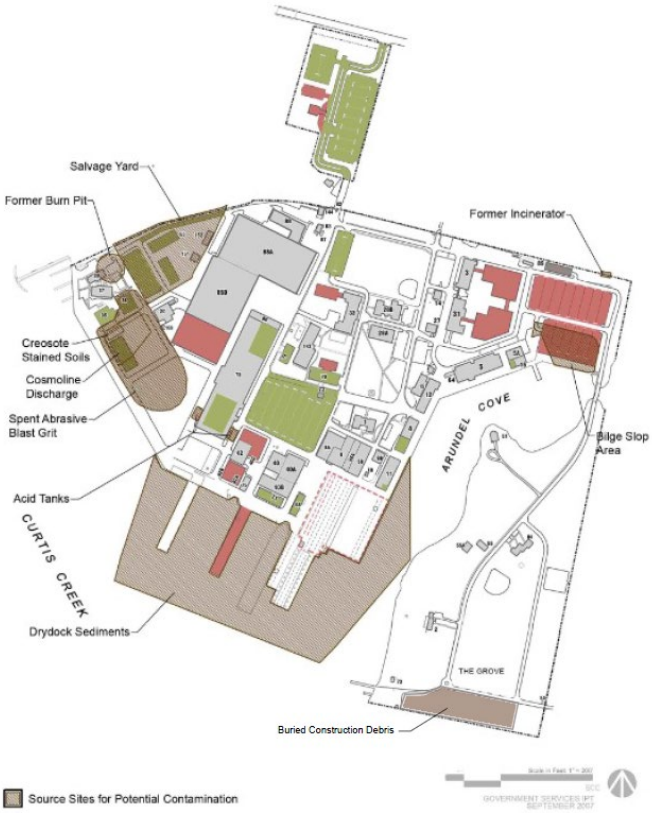
In 2000, as part of a Site Inspection by the EPA, of the nine areas of potential contamination, six areas of concern (Sites 4, 5, 7, 8, 9, and 11) were identified as contaminated with semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), metals, polychlorinated biphenyls (PCBs), pesticides, and dioxins. The sources of the chemical pollutants were not contained, therefore the hazardous substances are available to migrate into adjacent surface water, contaminating nearby fisheries. In 2002, the Yard was placed on the National Priorities List (NPL) as a known site of toxic contamination.

From 2003-2015 the Yard committed significant resources to address these sites and have completed remediation efforts at all but two sites. Site 7 and Site 9 continue to have long term monitoring requirements because there were small areas of contamination that could not be remediated due to the contamination being located under existing buildings.

In recent engagements with the EPA, they have indicated that the Yard is a candidate for partial de-listing from the NPL. The Yard is pursuing a partial de-listing.

In September 2014 heavy rains uncovered buried construction debris in the southern most portion of the Grove parcel. An initial site investigation was conducted and construction debris was discovered to be buried to a depth of six feet. The Grove was used as a recruit training center from the 1930s-1950s; after which it appears the facilities were razed and some debris was buried in the Grove. A follow on study will determine the nature and the extent of the contamination associated with this buried construction debris.

Recent groundwater testing showed the presence of Polyfluoroalkyl Substances (PFAS) in the groundwater near site 7. PFAS are a large group of chemicals that have been used in a variety of commercial products including carpets, clothing, furniture fabrics, and in the firefighting agent aqueous film forming foam. They are the subject of emerging environmental regulation and will likely be regulated in the next 5-10 years. The Yard will need to stay engaged with the EPA and MDE to determine the best way to treat these contaminates.



Sources of Environmental Contamination

Facility Assessment

The facility was analyzed using the metrics of Mission Index and Stewardship Index in alignment with SILC's annual reporting methodology. This methodology was used to enable the status of the Yard's assets to be readily compared to other Coast Guard assets, and facilitate proper prioritization of resources. The facility staff will conduct and report a revised comprehensive facility assessment in 2019 once the SILC process guide for facility assessments is approved. The Yard does not anticipate any change in the FMP or project prioritization due to this adjustment in methodology. For clarity and reporting purposes, some smaller facilities were consolidated.

Stewardship Index:

Condition Index (CI)

In alignment with SILC's annual report a degradation model was used to set an initial baseline CI for each asset. This model used age versus the expected lifespan of a facility type to set an initial CI. Then an internal engineering assessment of all buildings and major structures was conducted from 2017-2018 to refine the baseline CI based upon visual assessments and engineering judgment. To further enhance the fidelity of the CI data, key facilities were evaluated through third party engineering studies.

Building 11 was built in 1932 and remains in service today. It has a deteriorating building envelope and functionality shortfalls typical of many industrial buildings at the Yard.

Functionality Index (FI)

Functionality index was determined during the same internal assessment. For facilities where a Configuration Standard Technical Order (CSTO) or space standard existed, and therefore the deviation from the standard could be quantified, the functionality of that facility was compared objectively to the standard(s). Where a CSTO or clear space standard did not exist, the functional index (FI) was set to 100 as a default. Since most of the Yard facilities serve very unique and specific functions there are very few facilities that have a configuration standard. Many of the Yard's facilities are not utilized as originally conceived. For example, building 11 pictured above is the original machine shop but currently buildings, 5, 8, 8A, 11, 58, and 58A contain machining activities due to the continuous increase in ship complexity (and sizes) since 1932. However, as outlined below, all received an FI score of 100 since they currently accommodate the needs of the surface fleet. Moving forward, these scores will change as the surface fleet continues to get more technically complex.

Mission Index:

Mission Dependency Index (MDI)

This index was taken directly from the Shore Facility Inventory

Mission Essentiality Index (MEI)

This index was taken directly from the category code of the asset applied to the asset tiers in the Facility Engineering Management Guide.

Station Curtis Bay has a high MI as an operational unit

Table 1. Building Assessment

Asset Summary					Mission Index		Stewardship Index	
#	Building	Qty. of Assets	PRV	Asset Age	MDI	MEI Tier	CI	FI
001	YARD ADMINISTRATION BLDG	1	$7,492,867	76	74	3	59	98
002	SENIOR OFFICER HOUSING	1	$760,429	78	1	4	34	25
003	ELC OFFICES/DRYDOCK CLUB	1	$7,810,941	84	74	3	65	100
004	FACILITIES/FISCAL/WOOD SHOP	1	$1,517,236	77	74	3	75	100
005	BOAT BUILDING/FIBERGLASS SHOP	1	$12,414,824	87	85	3	48	100
005A	SMALL BOAT SHOP ANNEX	1	$3,038,757	75	74	3	51	100
006A	PIPE DEGREASING/ ACID SHOP	1	$608,994	27	85	3	74	100
008	PIPE SHOP	1	$12,870,814	76	85	3	52	100
008A	MACHINE SHOP	1	$8,787,016	23	85	3	71	100
010	SHIPWAYS HEADHOUSE	1	$521,162	75	34	3	24	25
011	MACHINE SHOP	1	$6,256,151	86	85	3	42	100
012	FACILITIES MAINTENANCE SHOPS	1	$962,999	107	85	3	54	100
014	TRAINING & LECTURE HALL	1	$507,544	83	11	3	53	100
015	POWER HOUSE	1	$1,031,808	104	85	3	40	100
016	SMALL BOATS SHOP	1	$3,018,527	86	34	3	42	100
020	FLAMMABLE STORAGE BLDG	1	$849,347	24	85	3	78	100
022	ELC STORAGE BUILDING	1	$1,228,544	41	34	3	61	100
024	ELC STORAGE BUILDING	1	$917,492	76	34	3	50	100
025	INDUSTRIAL STORAGE BUILDING	1	$1,115,124	76	34	3	51	100
026	INDUSTRIAL STORAGE BUILDING	1	$1,410,259	75	34	3	51	100
027	CLASSROOMS	1	$709,241	86	68	3	64	100
028A	BERRY HALL	1	$2,566,252	45	68	4	64	100
028B	CLINIC-OUT PATIENT	1	$4,371,698	45	85	3	65	100
029	MATERIALS HANDLING SHOP	1	$3,039,516	29	85	3	72	100
030	B30, CURTIS BAY STA WORK SHOP	1	$2,023,733	31	85	3	75	100
031	SFLC OFFICES	1	$9,501,856	79	74	3	53	100
032	PAINTED PRODUCTS	1	$8,180,134	50	85	3	59	100
033	BARRACKS/EXCHANGE/MSO	1	$14,884,655	79	34	3	53	95
034	PAINT & SANDBLAST SHOP	1	$4,774,853	59	85	3	55	100
035	CGC SLEDGE ATON STORAGE BUILDIN	1	$3,280,520	60	57	3	55	100
036	SECTOR BALT BUOY SHED	1	$1,713,384	60	57	4	56	100
037	CURTIS BAY STATION	1	$1,628,653	31	85	2	71	100
040	ELECTRICAL SHOP	1	$5,278,989	50	85	3	63	100
040A	ELECTRONICS BUILDING	1	$2,637,662	46	85	3	63	100
040B	ELECTRICAL SHOP	1	$7,416,549	45	85	3	64	100
040C	ORDNANCE/ELECTRONICS SHOP	1	$930,064	41	85	3	67	100
042	ORDNANCE BUILDING (MK75)	1	$2,454,307	28	85	3	75	100
048	ELC STORAGE BUILDING	1	$666,770	95	34	3	50	100
058	OUTSIDE MACH SHOP/INDST OFFICE	1	$10,373,030	81	85	3	41	100
058A	INFILL ALLEYWAY	1	$2,437,742	24	85	3	61	100
066	MOBILE EQUIP MAINT SHOP	1	$1,285,477	79	74	3	48	100
068	DDHH #1/CIV.CAFE	1	$1,763,694	77	11	3	52	100
070	SECTOR BALTIMORE ADMIN/OPS	1	$12,155,194	81	85	3	55	85

Asset Summary					Mission Index		Stewardship Index	
#	Building	Qty. of Assets	PRV	Asset Age	MDI	MEI Tier	CI	FI
071	CENTRAL TOOL ROOM	1	$2,795,742	50	85	3	55	100
075	DDHH #2/TEMP SERVICES	1	$1,195,279	75	57	3	46	100
077	CENTRAL LOCKER AND TOILET	1	$777,345	75	68	3	52	100
078	FABRICATING SHOP	1	$56,383,351	75	85	3	52	100
079	FIRE HOUSE/SAFETY/AUTO HOBBY	1	$3,598,004	76	85	3	45	100
080	PAINT COMPLEX ADMIN	1	$3,778,268	76	57	3	61	100
084	GUEST HOUSING	1	$1,574,618	38	34	3	69	100
090	PAINT-SPRAY BOOTH	1	$2,533,079	56	85	3	59	100
091	DYNAMOMETER BUILDING	1	$546,054	19	57	3	81	100
143	COLUMBUS RECREATION CENTER	1	$5,623,675	35	57	3	70	100
88-2	ELC OFFICES/ELECTRONICS LAB	1	$4,848,982	15	85	3	86	100
88A2	WAREHOUSE/SHIPPING & RECEIVING	1	$19,272,014	15	74	3	87	100
O85D	WAREHOUSE ADDITION-ENG. LOGIST	1	$10,040,090	35	85	3	64	100
OL06	CO-GENERATING ENERGY PLANT-BLDG	1	$931,461	10	85	3	90	100
	Buildings w/ PRV less than $500K	33	$5,018,200	33	61	3	64	95

Table 2. Structures Assessment

Asset Summary				Mission Index		Stewardship Index	
Structure	Qty. of Assets	PRV	Asset Age	MDI	MEI Tier	CI	FI
STEAM PLANT	1	$73,773,938	27	57	2	53	100
SHIPLIFT	1	$5,057,237	21	85	3	65	95
SHIPWAYS	1	$10,984,898	88	34	3	12	100
OVERHEAD CRANE - BLDG 85D	1	$6,140,027	75	85	3	34	100
ROADS/STREETS, PAVED	1	$2,342,849	112	85	3	26	100
PAVED VEHICLE PARKING	1	$2,423,216	88	85	3	28	100
PIER, 400 FOOT WESTERN	1	$9,056,713	78	85	1	24	100
WEST WHARF	1	$14,051,998	75	85	1	24	100
EAST WHARF	1	$20,161,154	54	85	1	40	100
SOUTH WHARF	1	$10,846,322	77	85	1	24	100
PIER FOR DD2 SOUTH OF BUILDING	1	$8,941,254	78	85	1	30	100
PIER FOR OAKRIDGE	1	$7,470,854	78	85	1	40	100
SUBSTATION #91	1	$2,508,061	30	85	2	52	100
SUBSTATION #105	1	$2,542,851	58	74	2	37	100
SHIP LIFT PIER	1	$6,625,289	21	85	1	69	100
MARINE BULKHEADS	1	$10,810,241	88	85	1	20	100
SHIPLIFT WORK / TRANSFER AREA	1	$40,415,027	21	74	3	68	100
UTILITY STORM DRAIN	1	$1,422,790	78	85	2	30	100
CO-GENERATING ENERGY PLANT	1	$1,906,490	9	85	2	87	100
ELEC SYSTEM, UNDERGROUND	1	$1,379,201	78	85	2	34	75
STEAM SYSTEM	1	$13,259,333	78	85	2	28	100
SEWER	1	$1,249,651	88	85	2	29	100
WATER MAIN	1	$1,210,122	88	85	2	27	100
Other Structures	107	$25,661,872	76	54	3	30	100

MASTER PLAN

Overview

The master plan is comprised of three separate plans that together provide a suite of options in order to be flexible and functional in a dynamic budget environment. The recommended plan to disrupt the current "casualty trap" and to ensure that the Yard can continue to provide value to Coast Guard operations is Plan B. At resources levels less than Plan B, the Yard will continue to maintain a largely reactionary posture where nearly all investments are directed toward repairing infrastructure that is already in a failed or failing state.

Plan A is a resource-constrained plan with a 5-year planning horizon. This plan is predicated upon the historical AFC-43 (civil engineering shore operations and support money) funding level of approximately 1% of the Plant Replacement Value (PRV), which equates to roughly $7 million annually. Additionally, this plan also includes the projection of one major capital investment project every five years. Plan B is a less resource constrained plan, and is based upon target funding levels of a 2% of the PRV recapitalization rate and operating funds consisting of 1.5% of the PRV. This equates to approximately $17.5 million annually for both PC&I & AFC-43 funding. Some of the projects are redundant between Plan A and Plan B because they address the same issue, but vary in the manner in which they are executed and funded. Ideally, many of these infrastructure issues would be addressed with smaller PC&I projects, in alignment with Civil Engineering Program goals because it would yield significant cost savings and provide better solutions. However, Plan A must take the more pragmatic approach and seek to address these large-scale issues through phasing strategies due to the current resource environment. Executing Plan B is preferred, but relies on sustained and consistent PC&I and AFC-43 funding. An example of a redundant project is the electrical distribution system is in need of recapitalization. This would preferably be done in one or a few PC&I projects to save cost and ensure the system is fully integrated, compatible, and reduces overall project lifecycle cost. Plan A provides a sustained incremental replacement over time, which costs more money but is necessary if annual funding remains at current levels.

With sea level change and the increased frequency of natural disasters, it is imperative that a waterfront facility give consideration to reconstitution following a natural disaster. Plan C is largely unconstrained from a resource perspective, and it reflects an optimal state of the Coast Guard Yard based upon supporting the needs of future operations. Plan C is intended to serve as the initial planning guidance following a disaster that renders all or significant portions of the Yard unusable.

Many of the projects beyond FY19 have undergone minimal or no scoping efforts and therefore the cost estimates are budgetary estimates only. All cost estimates are based upon Unified Facilities Criteria cost data or historical pricing, where applicable. Each project is related back to the five main planning themes of (1) waterfront repairs, (2) utility repairs, (3) repair and improve industrial shops, (4) infrastructure needs to service a modernized surface fleet, and (5) continually improving the Yard's environmental posture were applicable.

PLAN A

FY 2019

Number	Project	O&S	PC&I
1	**Tower Crane 5 Foundation Repair Phase 1** – Repair 50' section of tower crane 5 foundation to make hard point. (Theme 1)	$2,800,000	--
2	**Repair West Wharf Decking** – Replace failed decking along west wharf. (Theme 1)	$3,000,000	--
3	**Construct FRC RDAP facility** – Construct travel lift piers and RDAP enclosures. (Theme 1, 4, & 5)	--	$22,500,000
4	**Repair Building 78 Roof** – Repair leaking section of building 78 roof (Theme 3)	$500,000	--
5	**Waterfront inspections –** Complete last phase of waterfront inspections. (Theme 1)	$500,000	
6	**Alter raw water pump configuration –** Engineer and implement alteration to raw water system to meet 2020 Water Appropriations Permit requirements. (Theme 5)		$300,000*
7	**CASREP Repairs-** Annual Casualty repairs	$500,000	--
	TOTAL	**$7,300,000**	**$22,800,000**

*Permit compliance should be funded through EC&R funds

FY 2020

Number	Project	O&S	PC&I
8	**Renew/Relocated Building 15 electrical substation**– Replace failing substation and relocate it outside the 100 yard floodplain. (Theme 2)	$1,200,000	--
9	**Tower Crane 5 Foundation Repair Phase 2** – Repair 150' section of tower crane 5 foundation (Theme 1)	$3,500,000	--
10	**Steam System Repair Phase 3 – Repair steam line under Billard Ave & Glover Street. (Theme 2)**	**$1,000,000**	
11	**Pier 1 Repair Project Phase 1** – Repair and preserve underwater structure. (Theme 1)	$800,000	--
12	**Demolition –** Demolish Building 16 (5,400 SF) (Theme 1)	$140,000	--
13	**CASREP Repairs-** Annual Casualty Repairs	$500,000	
14	**OPC PC&I Planning Proposal & Execution Plan –** OPC capability at the Yard (Theme 4)	$300,000	--
	TOTAL	**$7,440,000**	**$0**

FY 2021

Number	Project	O&S	PC&I
15	**Tower Crane 5 Foundation Repair Phase 3** – Repair 150' section of tower crane 5 foundation to make hard point. (Theme 1)	$3,500,000	--
16	**Steam System Repair Phase 4 –** Repair steam lines on piers 1 and 2 and along Ridgely street. (Theme 2)	$500,000	--
17	**South Wharf Piling Repairs –** Repair and protect failing piles along South wharf. (Theme 1)	$1,500,000	--
18	**Pier 2 Repair Project –** Repair and preserve underwater structure. (Theme 1)	$800,000	--
19	**Electrical Distribution System Repairs Phase 1 –** Replace Substations 105,91, 13, & 78. (Theme 2)	$1,000,000	--
20	**Demolition** – Demolish Building 2 (4,328 SF)	$200,000	--
21	**Casualty Repairs –** Annual Casualty repairs	$500,000	--
	TOTAL	**$8,000,000**	**$0**

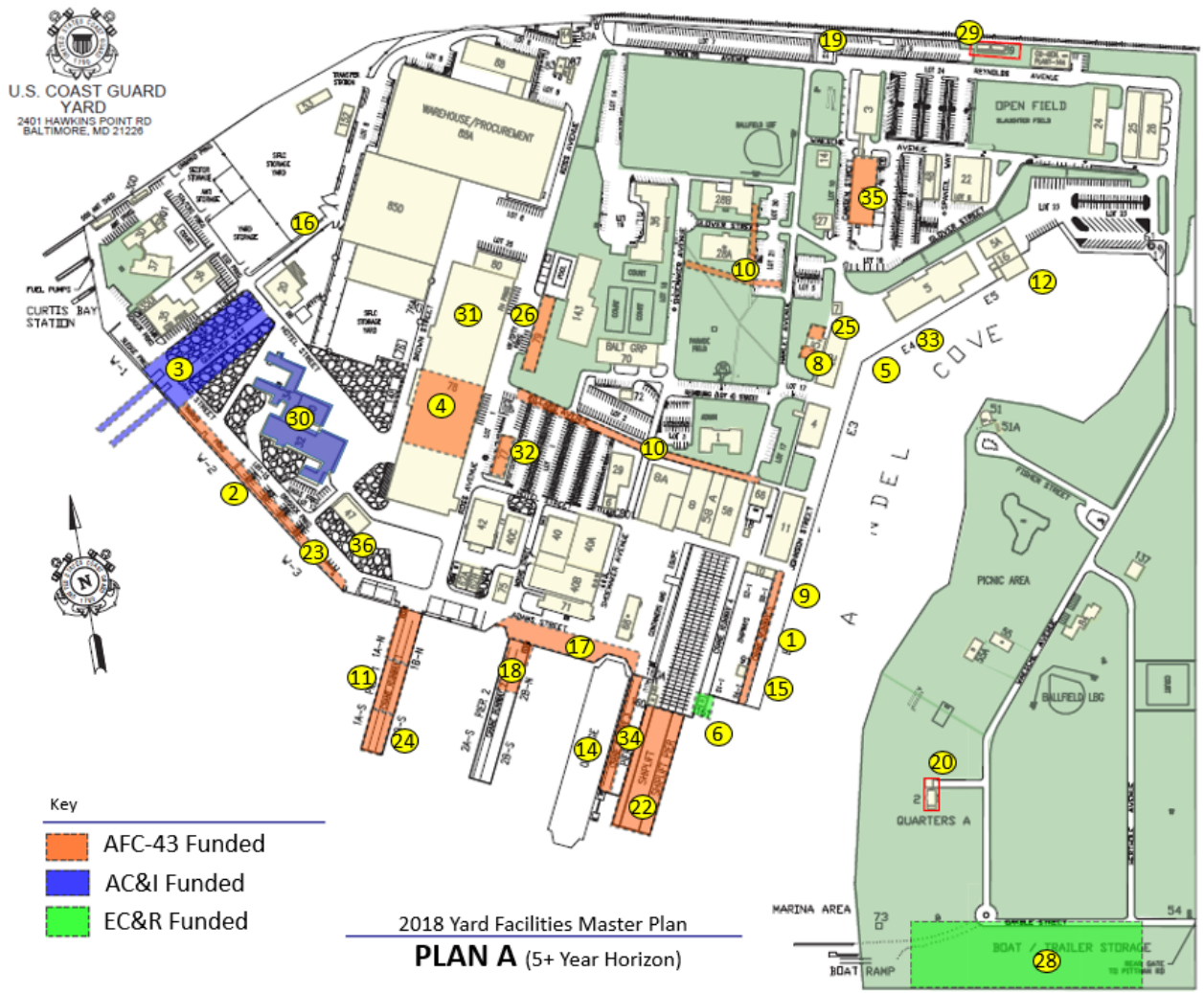
FY 2022

Number	Project	O&S	PC&I
22	**Ship Lift Mid-life Repairs** – Mid-life investment to ensure continued service. (Theme 1)	$2,000,000	--
23	**West Wharf piles** - Repair and protect failing piles along south wharf. (Theme 1)	$1,000,000	--
24	**Pier 1 Repairs Phase 2**– Repair and preserve underwater structure. (Theme 1)	$1,500,000	--
25	**Heat System Recapitalization–** Replace failing 1982 boiler plant and complete remaining steam line repairs (Theme 2)	--	$7,000,000
26	**Repair Building 79 Envelope –** Repair building envelope. (Theme 3)	$500,000	--
27	**Casualty Repairs -** Annual Casualty repairs	$500,000	--
28	**Grove Site Clean up –** Conduct environmental clean up of WWII era dump site. (Theme 5)		$5,000,000*
29	**Demolition** – Demolish Building 89 (2,300 SF)	$100,000	
	TOTAL	**$5,600,000**	**$12,000,000**

*EC&R funded

FY 2023

Number	Project	O&S	PC&I
30	**Demolish/Replace paint complex**– Replace failing disjointed paint complex buildings 32,34,& 90 (31,465 SF) w/ smaller more efficient & environmentally sound painting building (~12,000 SF). (Theme 3,4,5)	--	$3,100,000
31	**Building 78 Envelope and Ventilation Repairs** – Major repairs to building envelope and upgrade ventilation to improve working conditions. (Theme 3)	$1,500,000	--
32	**Renovate Building 77** – Improve locker room conditions for workforce and complete building envelope repairs. (Theme 3)	$500,000	--
33	**East Wharf repairs –** Repair piles and structural damage to the east wharf. (Theme 1)	$1,500,000	
34	**Pier 3 renovation to accommodate OPC dry dock –** Repairs and modifications to pier 3 to accommodate new OPC dry dock or to convert to functional service pier. (Theme 1,4)	$1,000,000	
35	**Renovate building 31 –** Renovate SFLC office spaces on second and third decks	$2,000,000	
36	**Electrical Distribution System Repairs Phase 2 –** Replace Substations 98, 92, 117, 117A, 118, 92. (Theme 2)	$1,500,000	
37	**Casualty Repairs** – Annual casualty repairs	$500,000	--
	TOTAL	**$8,500,000**	**$3,100,000**



1. **Tower Crane 5 Foundation Repair Phase 1** (theme 1)
2. **Repair West Wharf Decking** (theme 1)
3. **Construct FRC RDAP facility** (theme 4,5)
4. **Repair Building 78 Roof** (theme 3)
5. **Waterfront inspections** (theme 1)
6. **Alter raw water pump configuration** (theme 5)
8. **Renew Building 15 electrical substation** (theme 2)
9. **Tower Crane 5 Foundation Repair Phase 2** (theme 1)
10. **Steam System Repair Phase 3** (theme 2)
11. **Pier 1 Repair Project Phase 1** (theme 1)
12. **Demolition Building 16** (theme 1)
14. **OPC AC&I Planning Proposal** (theme 4)
15. **Tower Crane 5 Foundation Repair Phase 3** (theme 1)
16. **Steam System Repair Phase 4** (theme 2)
17. **West Wharf Piling Repairs** (theme 1)
18. **Pier 2 Repair Project** (theme 1)
19. **Electrical System Repairs Phase 1** (theme 2)
20. **Demolish Building 2**
22. **Ship Lift Mid-Life Repairs** (theme 1)
23. **South Wharf Pile Repairs** (theme 1)
24. **Pier 1 Repair Project Phase 2** (theme 1)
25. **Heating System Recapitalization** (theme 2)
26. **Repair Building 79 Envelope** (theme 3)
28. **Grove Dump Site Clean Up** (theme 5)
29. **Demolish Building 89**
30. **Demolish/Replace Paint Complex** (theme 3,4,5)
31. **Building 78 Envelope/Ventilation Repairs** (theme 3)
32. **Renovate Building 77** (theme 3)
33. **Repair East Wharf** (theme 1)
34. **Pier 3 Renovation to accommodate OPC** (theme 4)
35. **Renovate Building 31 Offices**
36. **Electrical System Repairs Phase 2** (theme 2)

Figure 11. Plan A Diagram

PLAN B

FY 2019

Number	Project	O&S	PC&I
1	**Tower Crane 5 Foundation Repair** – Restore entire tower crane 5 foundation to original capacity. (theme 1)	$10,500,000	--
2	**Repair West Wharf Decking** – Replace failed decking along west wharf. (theme 1)	$3,000,000	--
3	**Construct FRC RDAP facility** – Renovate North End of Building 78 to Accommodate Metal Shop (5000 SF) from South End of 78. (theme 4,5)	--	$22,500,000
4	**Repair Building 78 Roof** – Repair leaking section of building 78 roof. (theme 3)	$500,000	--
5	**CASREP Repairs-** Annual Casualty repairs	$500,000	--
6	**Waterfront inspections –** Complete last phase of waterfront inspections. (theme 1)	$500,000	
7	**Alter raw water pump configuration –** Engineer and implement alteration to raw water system to meet 2020 Water Appropriations Permit requirements. (theme 5)		$300,000*
	TOTAL	**$15,000,000**	**$22,800,000**

* Should be funded through EC&R funds.

FY 2020

Number	Project	O&S	PC&I
8	**Renew/Relocated Building 15 electrical substation**– Replace failing substation and relocate it outside the 100 yard floodplain. (theme 2)	$1,200,000	--
9	**Heat System Recapitalization–** Replace failing 1982 boiler plant and complete remaining steam line repairs (Theme 2)	--	$7,000,000
10	**Pier 1 Repair Project** – Repair and preserve underwater structure. (theme 1)	$2,500,000	--
11	**Demolition –** Demolish Building 16 (5,400 SF). (theme 1)	$140,000	--
12	**CASREP Repairs-** Annual Casualty Repairs	$500,000	
13	**PC&I Planning Proposal & Execution Plan –** OPC capability at the Yard. (theme 4)	$300,000	--
	TOTAL	**$4,640,000**	**$7,000,000**

FY 2021

Number	Project	O&S	PC&I
14	**Electrical Distribution System Repairs**– Replace all failing oil filled switches with modern air type. (theme 2)	$5,500,000	--
15	**South Wharf Piling Repairs –** Repair and protect failing piles along south wharf. (theme 1)	$3,000,000	--
16	**Demolish Building 10 –** Demolish old shipways head house. (2,924 SF) (theme 3)	$150,000	--
17	**Building 78 envelope and ventilation repairs–** Repair envelop failures and install code compliant ventilation. (theme 3)	$1,500,000	--
18	**Demolish/Replace paint complex**– Replace failing disjointed paint complex buildings 32,34,& 90 (31,465 SF) w/ smaller more efficient & environmentally sound painting building (~12,000 SF). (Theme 3,4,5)	--	$3,100,000
19	**Demolition** – Demolish Building 2 (4,328 SF)	$250,000	--
20	**Casualty Repairs –** Annual Casualty repairs	$500,000	--
	TOTAL	**$11,750,000**	**$3,100,000**

FY 2022

Number	Project	O&S	PC&I
21	**Ship Lift Mid-life Repairs** – Mid-life investment to ensure continued service. (theme 1)	$2,000,000	--
22	**West Wharf pile repairs** - Repair and protect failing piles along west wharf. (theme 1)	$3,000,000	--
23	**Demolish/Replace Building 77** – Replace and relocate failing & undersized locker room. (theme 3)	--	$1,200,000
24	**Pier 2 Repairs –** Replace and repair failed structural members on pier 2 (theme 1)	$3,000,000	--
25	**Grove Cleanup –** Clean up of buried WWII construction debris (theme 5)	--	$5,000,000*
26	**Casualty Repairs -** Annual Casualty repairs	$500,000	--
27	**Demolition** – Demolish Building 89 (2,300 SF)	$100,000	
	TOTAL	**$8,600,000**	**$6,200,000**

* Environmental cleanup should be EC&R funded

FY 2023

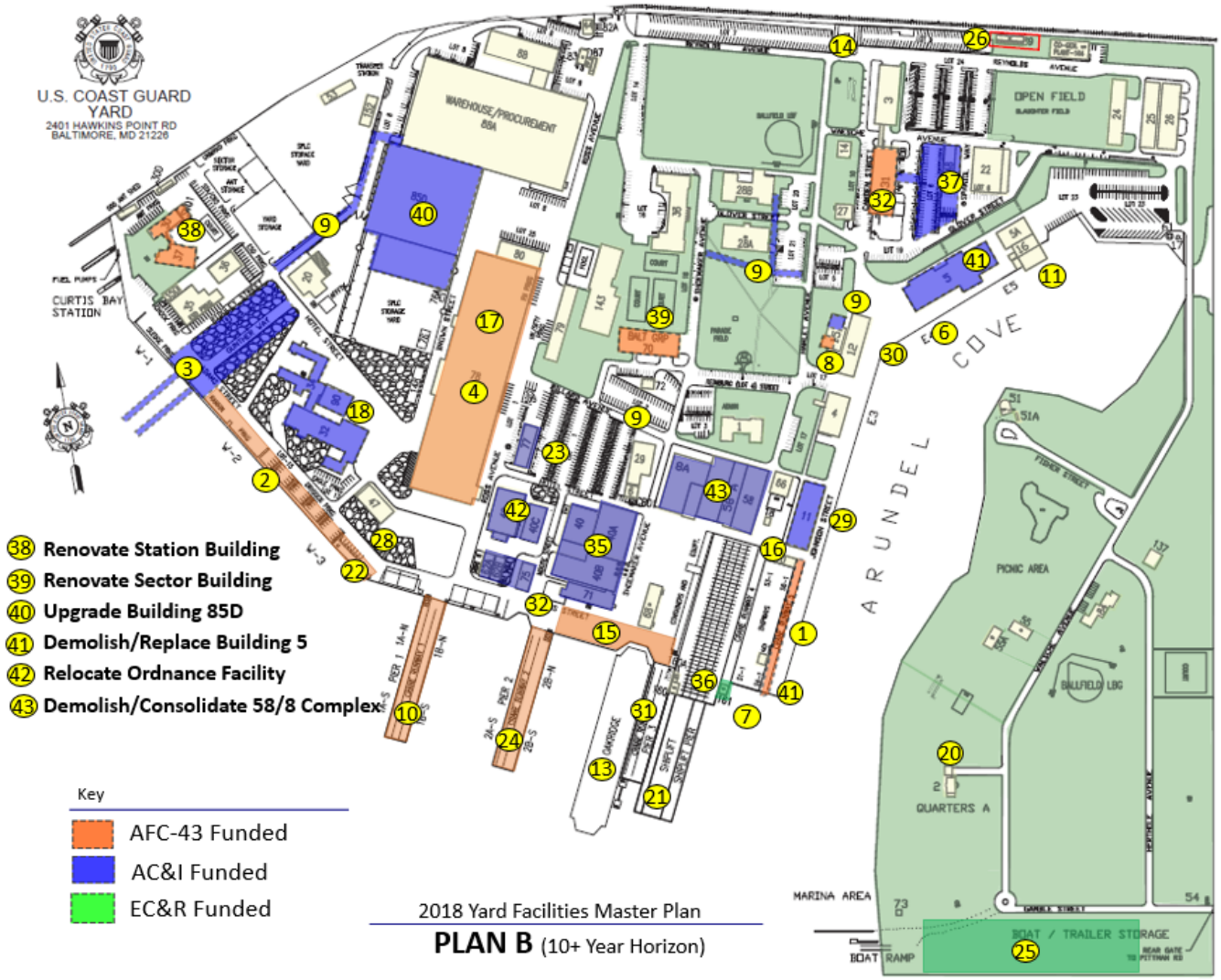
Number	Project	O&S	PC&I
28	**Electrical Distribution System Repairs –** Replace and potential reduce substations in electrical distribution loop (theme 2)	$1,000,000	--
29	**Demolish/Replace Building 11 –** Replace failing building in flood zone w/consolidated shop out of flood plain (theme 3,4,5)	--	$2,200,000
30	**East Wharf Pile Repairs –** Wrap and preserve East Wharf piles and structures (theme 1)	$2,500,000	
31	**Pier 3 Renovation to Accommodate OPC dry dock –** Repairs and modifications to pier 3 to accommodate new OPC dry dock or to convert to functional service pier (theme 1,4)	$2,000,000	
32	**Renovate building 31 –** Renovate SFLC office spaces on second and third decks	$2,000,000	
33	**Demolish/consolidate Buildings 62 A&B, 71, & 75**	--	$1,200,000
34	**Casualty Repairs** – Annual casualty repairs	$500,000	--
	TOTAL	**$8,000,000**	**$3,400,000**

FY 2024 and Beyond

Number	Project	O&S	PC&I
35	**Consolidate and Replace 40 Complex**	--	$5,600,000
36	**Renew Shiplift Fire and Raw Water Systems**	$900,000	--
37	**Construct additional space for SFLC**	--	$4,600,000
38	**Interior Renovations to Station Building**	$500,000	
39	**Interior Renovations to Sector Building**	$1,000,000	
40	**Upgrade Building 85D into modern warehouse**	--	$11,000,000
41	**Demolish/Replace Building 5 & relocate dyno**	--	$4,200,000
42	**Relocate ordnance facility**	--	$2,600,000
43	**Demolish/Consolidate 58, 58A, 8, 8A complex**	--	$13,700,000
	TOTAL	**$2,400,000**	**$41,700,000**

The primary focus with the projects slated for FY 2024 and beyond is to highlight the eventual future need for these projects and ensure space is allocated in the facilities master plan for their construction. It is not intended that funding for these project necessarily be pursued over the next five years but rather re-evaluated in future master plan updates to determine the merits of each project and whether or not they remain relevant. In addition to the specific project listed above the following items are desired goals or required actions within the 10-year horizon.

- Commence servicing OPC with either a facility solution or new floating dry dock.
- Transition the Renewable Energy Center from ESPC to a Coast Guard maintained and operated facility.
- Recapitalize the Yard waterfront, with a focus on replacing deteriorated infrastructure.
- Renew tower cranes with lighter, more modern designs to allow similar capacity while reducing stress on infrastructure, and lowering the lifecycle cost.
- Repurpose the abandoned shipways into functional space in the industrial area of the shipyard.
- Enclose part of the shiplift transfer area to facilitate painting and blasting, as well as containment of other hazardous material – to fully comply with future anticipated environmental regulations.
- Gain partial or complete removal from the National Priorities List.
- Seek to leverage the underutilized Grove parcel to the Coast Guard's advantage through enhanced use leasing, or similar authorities, further discussed in the *Ten-Year Strategy of the CG Yard*.
- Create natural buffer zones across the industrial waterfront to mitigate storm-water runoff.
- Continued reduction of impervious areas throughout the Yard installation.
- Develop green programs in concert with Chesapeake Bay organizations & MDE.
- Continue to reduce energy consumption through infrastructure repairs and technology upgrades.
- Improve security infrastructure to obtain compliance with current Coast Guard physical security policy requirements.
- Replace aging industrial building with buildings configured to support the Yard's current and future vessel renovation activities.
- Consolidate small storage spaces into larger more efficient spaces.
- Consolidate shops into fewer and more efficient facilities as part of a phased plan.



38 **Renovate Station Building**
39 **Renovate Sector Building**
40 **Upgrade Building 85D**
41 **Demolish/Replace Building 5**
42 **Relocate Ordnance Facility**
43 **Demolish/Consolidate 58/8 Complex**

1 **Tower Crane 5 Foundation Repair** (theme 1)
2 **Repair West Wharf Decking** (theme 1)
3 **Construct FRC RDAP facility** (theme 4,5)
4 **Repair Building 78 Roof** (theme 3)
6 **Waterfront inspections** (theme 1)
7 **Alter raw water pump configuration** (theme 5)
8 **Renew Building 15 electrical substation** (theme 2)
9 **Heating System Recapitalization** (theme 2)
10 **Pier 1 Repair Project** (theme 1)
11 **Demolition Building 16** (theme 1)
13 **OPC AC&I Planning Proposal** (theme 4)
14 **Electrical Distribution System Repairs** (theme 2)
15 **South Wharf Piling Repairs** (theme 1)
16 **Demolish Building 10** (theme 3)
17 **Building 78 Envelope & ventilation repairs** (theme 3)
18 **Demolish & Replace Paint Complex** (theme 3,4,5)
20 **Demolish Building 2**
21 **Ship Lift Mid-Life Repairs** (theme 1)
22 **West Wharf Pile Repairs** (theme 1)
23 **Demolish/Replace Building 77** (theme 3)
24 **Pier 2 Repairs** (theme 1)
25 **Grove Dump Site Clean Up** (theme 1)
26 **Demolish Building 89**
28 **Electrical Distribution Repairs** (theme 2)
29 **Demolish & Replace Building 11** (theme 3,4)
30 **East Wharf Repairs** (theme 1)
31 **Pier 3 Renovation to Accommodate OPC** (theme 1,4)
32 **Renovate Building 31**
33 **Demolish/Consolidate 62 A&B, 71 &75** (theme 3,4)
35 **Demolish/Consolidate 40 Complex** (theme 3,4)
36 **Renew Shiplift Fire system** (theme 2)
37 **Construct Additional Office Space for SFLC**

Figure 12. Plan B Diagram

PLAN C

As discussed above, it is imperative that any facility master plan consider reconstitution efforts in the event of a "Black Swan" event that renders parts or all of the Yard unusable. Often in the wake of a natural disasters there is quick action to rebuild damaged facilities "in-kind". This necessarily quick action leaves minimal time to consider alternatives to the existing infrastructure that might better support Coast Guard needs. The Yard leadership has committed significant time considering what the optimal facilities of the Yard would be to serve as both a guiding vision to work toward with incremental investments, and as the starting point for planning efforts following a "Black Swan" event.

If the Yard is reconstituted at the existing location one of the priorities of reconstitution would be to improve the layout of the facilities. The current layout was optimized for ship construction, which is not the current (or envisioned future) primary mission of the Yard. The optimal Yard layout for current and future operations would include the following:

- Replace all 10,200 timber piles that underlay the waterfront infrastructure with fewer & more resilient concrete piles.
- Change the type of construction for both the West and south wharfs from a relief deck on piles to a pure sheet pile bulkhead to support long term maintenance of the system.
- De-centralize the Yard's utility systems to smaller systems that service individual facilities.
- Consolidate storage areas and warehouses.
- Consolidate industrial shops.
- Strategically/centrally locate support facilities (heads, locker rooms, food services, break rooms).
- Enclose all blasting and painting operations at the Yard.
- Reduce impervious areas and incorporate more green space.
- Reduce industrial shop footprint by establishing functional vertical space (building up).
- Consolidate and improve parking.
- Improve workflow on the waterfront.

It should be noted that one of the biggest constraints that limits the type of vessels that the Yard can service are a series of bridges that must be cleared prior to entering Curtis Creek. These bridges are in short succession while having to execute a turn with 200' of horizontal clearance. Additionally there is a railroad swing bridge with a horizontal clearance of 150ft. The Coast Guard is following a general ship building industry trend of replacing aging ships with bigger and more capable ships. While the primary focus has been on the importance of being able to service the OPC, in the wake of a disaster, alternate facility sites that would allow the current workforce to service the entire fleet should be considered.

Understanding that the true irreplaceable asset is the workforce itself, and the fact that most of this workforce has lived within 10 miles of the Yard for several generations, any alternative site would have to be in the Baltimore-metro area. The first alternate site for consideration would be the former Sparrows Point Bethlehem Steel Shipyard in Baltimore. This former shipyard contains one of the largest functional graving docks on the East Coast, and is currently unused as an active shipyard.

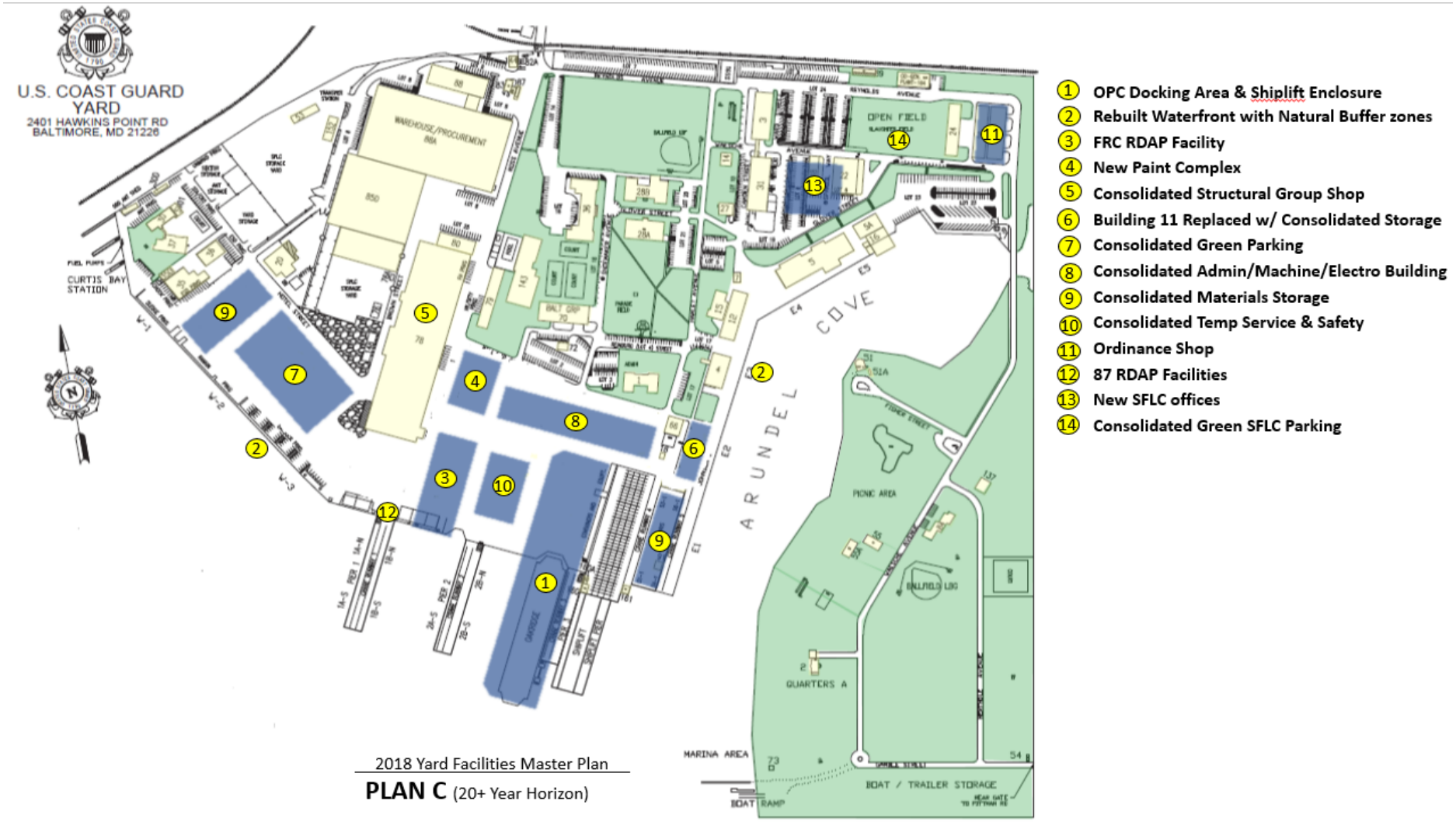


Figure 13. Plan C Diagram

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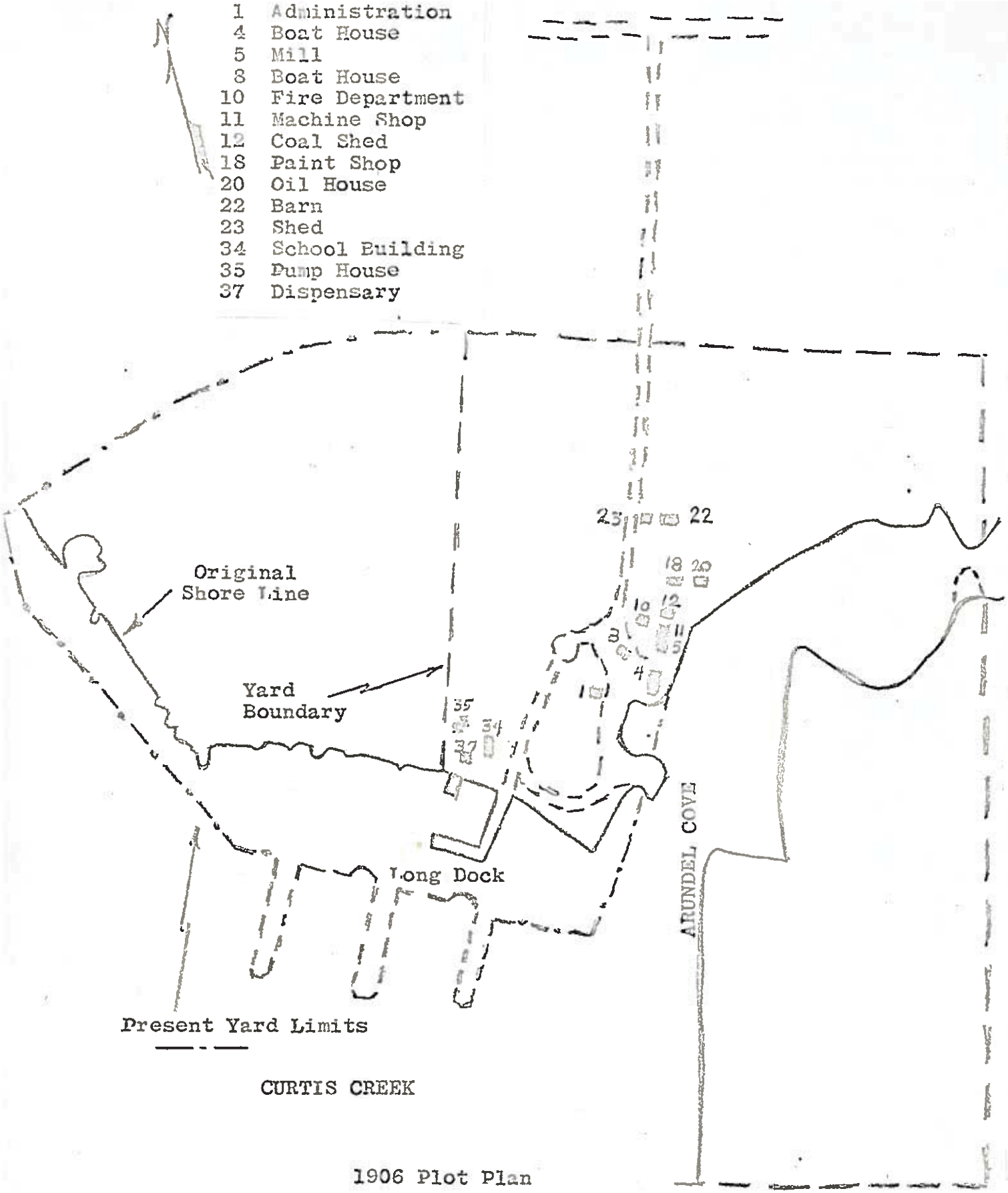
APPENDIX A:

A BIREF HISTORY OF YARD DEVELOPMENT



1906 Plot Plan

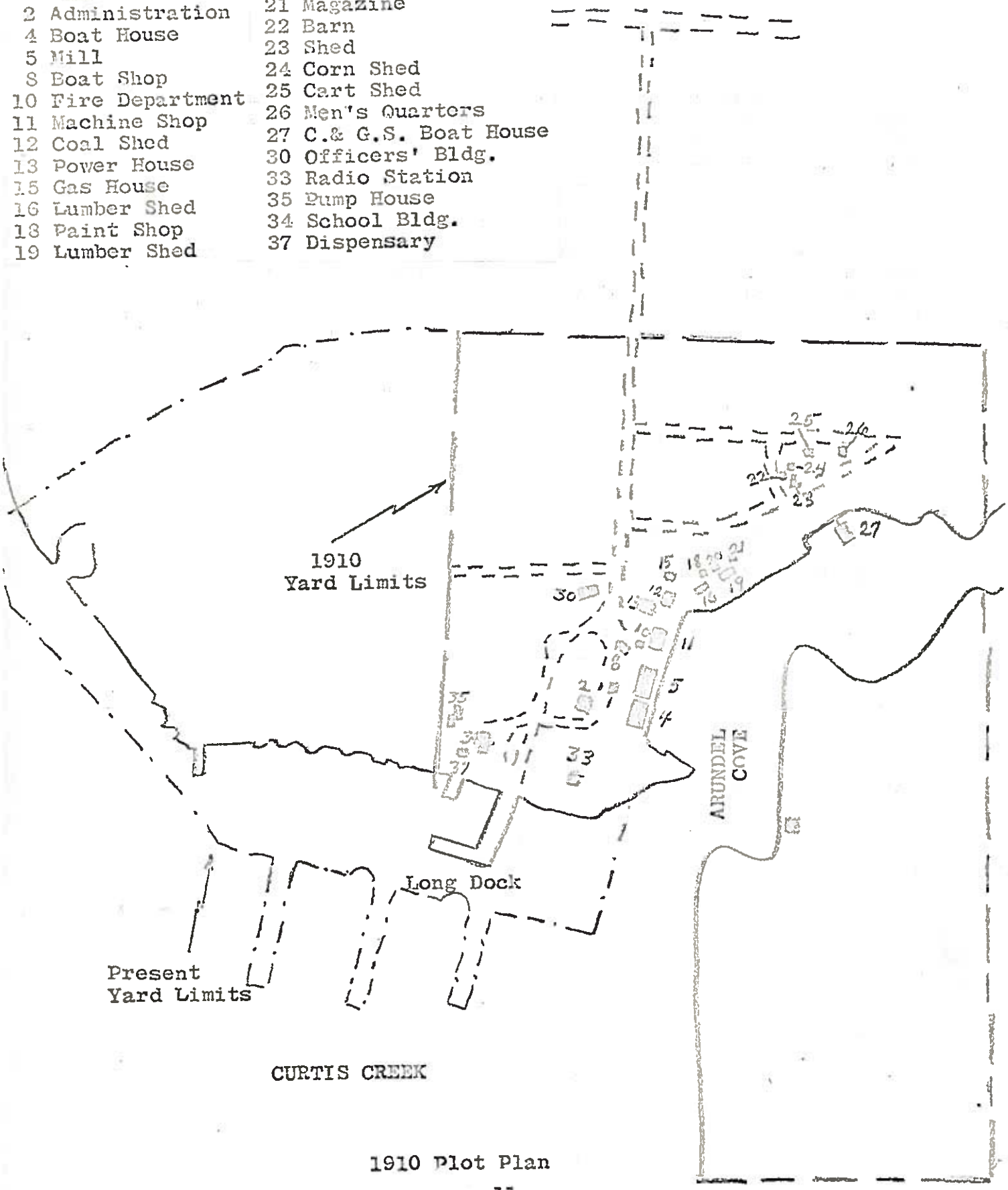
The Coast Guard, then known as the Revenue Cutter Service, leased land around Arundel Cove for the purpose of establishing a small boat repair yard. The year was 1899. Soon after, the Cadet training ship, the CHASE, established her winter quarters at Arundel Cove and set up classrooms ashore.

A modest building program was undertaken and, by 1906, when the 65 acres were purchased by the United States for $30,000, the YARD's facilities were as shown by the 1906 Plot Plan, page 9.

The buildings indicated are:

1	Administration
4	Boat House
5	Mill
8	Boat House
10	Fire Department
11	Machine Shop
12	Coal Shed
18	Paint Shop
20	Oil House
22	Barn
23	Shed
34	School Building
35	Pump House
37	Dispensary

1 Office
2 Administration
4 Boat House
5 Mill
8 Boat Shop
10 Fire Department
11 Machine Shop
12 Coal Shed
13 Power House
15 Gas House
16 Lumber Shed
18 Paint Shop
19 Lumber Shed
20 Oil House
21 Magazine
22 Barn
23 Shed
24 Corn Shed
25 Cart Shed
26 Men's Quarters
27 C.& G.S. Boat House
30 Officers' Bldg.
33 Radio Station
35 Pump House
34 School Bldg.
37 Dispensary



1910 Plot Plan

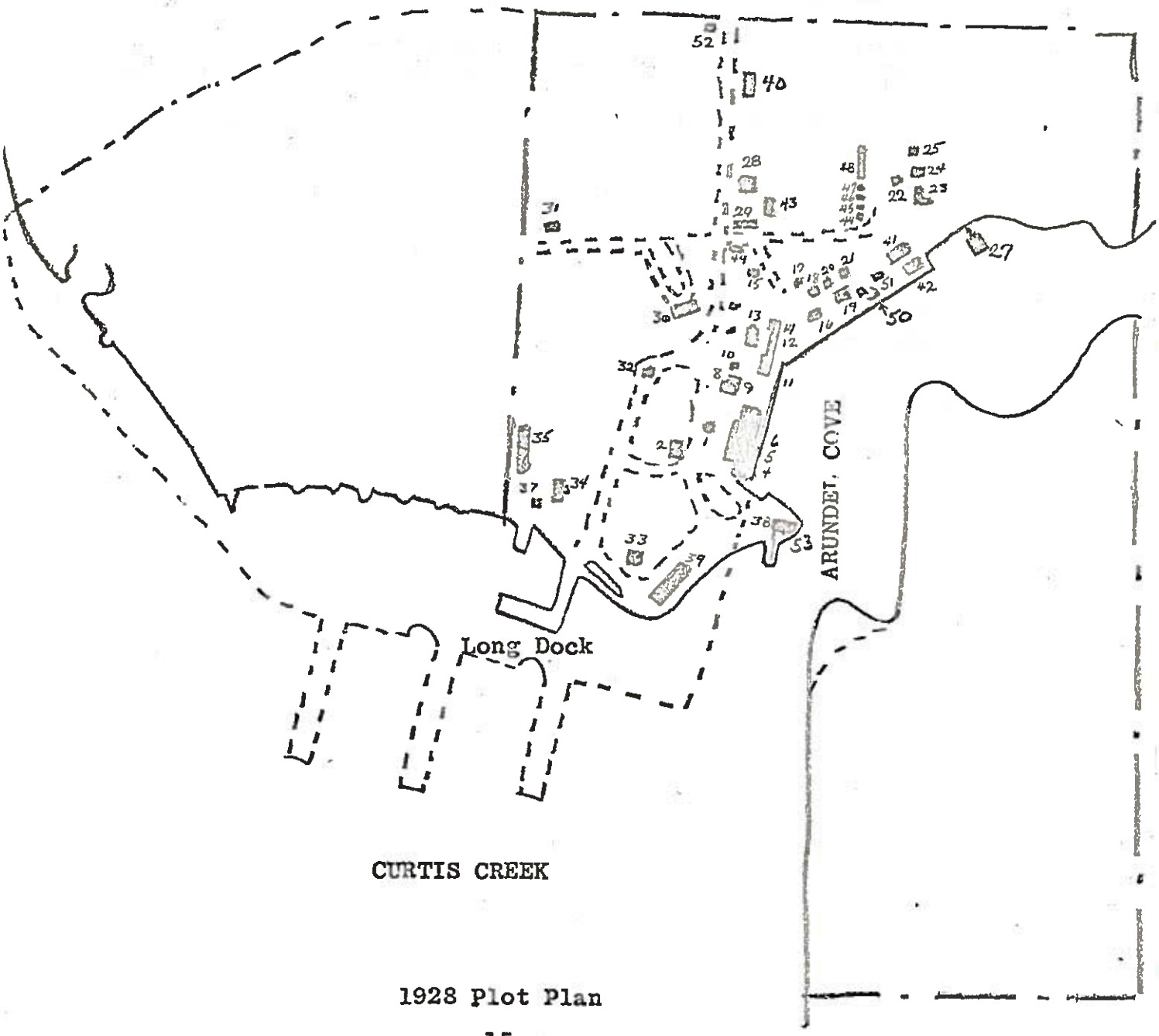
Just prior to the Cadet Training School being transferred to New London in 1910, the YARD Plot Plan was as shown on page 11.

Note the Northeast and the East Bulkheads are beginning to take shape. Watch Building No. 30, Officers' Quarters, as it will act as a locator. It still stands and is still used as quarters for officers.

Buildings added in four years were:

2	Administration Building
13	Boiler House
16	Lumber Shed No. 1
19	Lumber Shed No. 2
26	Men's Quarters
27	C. & G. S. Boat House (a tenant unit)
30	Officers' Quarters
33	Radio Station

1 Main Office
2 C.O. Quarters
3 Fire Department
4 Boat House
5 Boat Shop
6 Mill & Joiner Shop
7 Comfort Station
8 Storehouse
9 Tank House
10 Machine Shop
11 Ironworkers Shop
12 Power House
13 Foundry & Blacksmith Shop
14 Battery House
15 Lumber Shed
17 Green House
18 Paint Shop
19 Lumber Shed
20 Oil House
21 Magazine
22 Stable
23 Barn
24 Corn Crib
25 Tool Shed
26 Lumber Storage
27 Coast Survey Boat House
28 Barracks
29 Garage
30 Officers' Quarters
31 Tank House
32 Flag House
33 Radio Station
34 Officers' Quarters
35 Boat Stowage
36 Tank House
37 Officers' Quarters
38 Marine Railway
39 Boat Stowage
40 YMCA
41 throu 48 Storerooms
49 Garage
50 Electric Crane
51 Boatswain Locker
52 Sentry Box
53 Boat Repair Shop



1928 Plot Plan

The YARD continued to grow at a moderate rate during the next ten years, as indicated by the 1928 Plot Plan, page 15. Important additions and re-groupings were made. These were based on the premise that the center of industrial activity would be Arundel Cove.

The Plot Plan indicates that the YARD was enlarged by reclaiming by means of fill part of Curtis Creek, just to the east of the Long Dock.

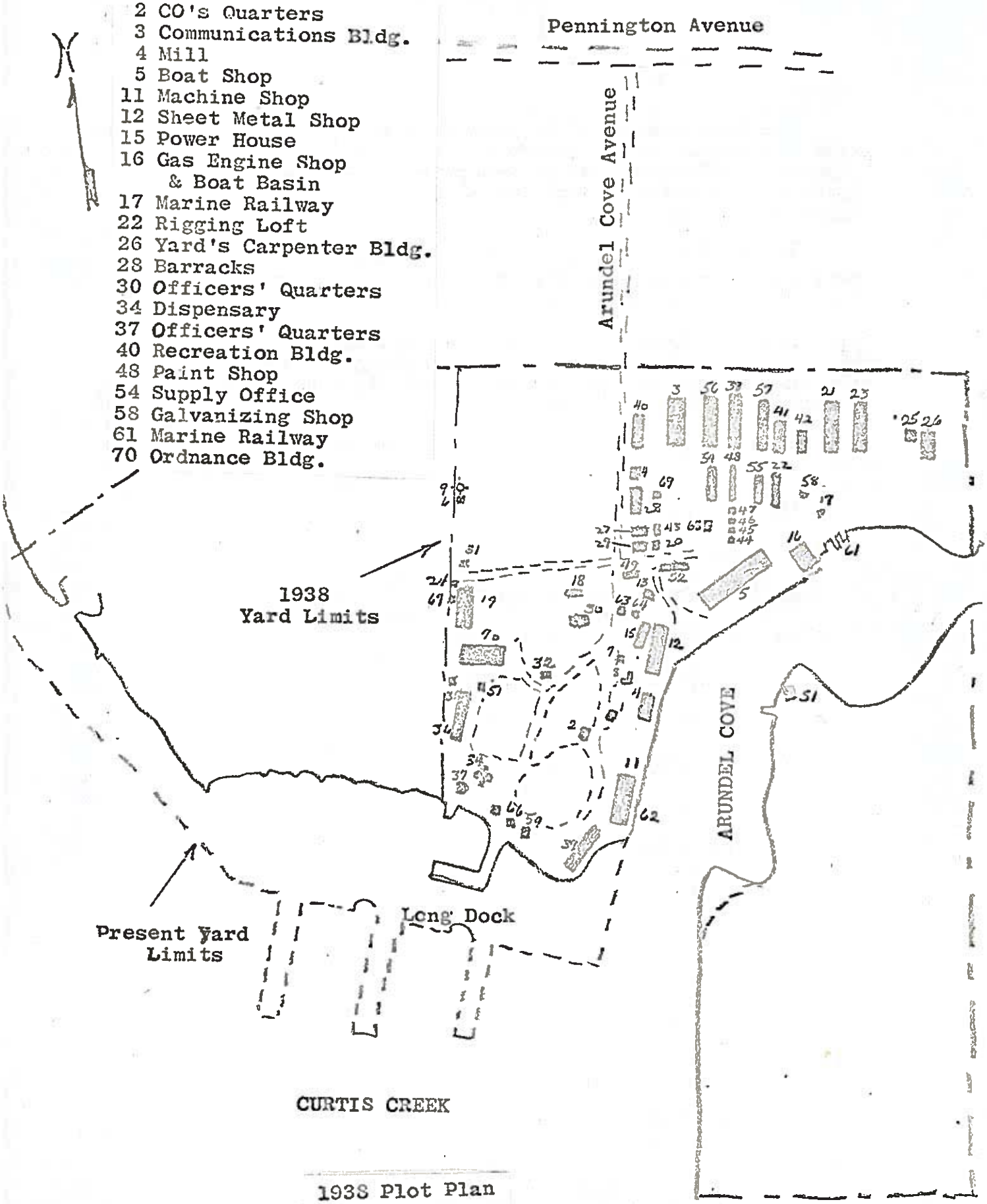
The importance of living quarters and recreational facilities as morale factors is clearly indicated by the number of quarters buildings (No. 2, 30, 34 and 37) and the Recreation Building (No. 40).

Noteworthy additions to facilities between 1918 and 1928 were:

38	Marine Railway
39	Boat Storage
40	YMCA Recreation Building
44	Storeroom for Ship Stores
45	Storeroom for Ship Stores
46	Storeroom for Ship Stores
47	Storeroom for Ship Stores
48	Storeroom for Ship Stores
50	Electric Crane
53	Boat Repair Shop

MAJOR BUILDINGS

1 Main Office
2 CO's Quarters
3 Communications Bldg.
4 Mill
5 Boat Shop
11 Machine Shop
12 Sheet Metal Shop
15 Power House
16 Gas Engine Shop & Boat Basin
17 Marine Railway
22 Rigging Loft
26 Yard's Carpenter Bldg.
28 Barracks
30 Officers' Quarters
34 Dispensary
37 Officers' Quarters
40 Recreation Bldg.
48 Paint Shop
54 Supply Office
58 Galvanizing Shop
61 Marine Railway
70 Ordnance Bldg.



1938 Plot Plan

The years between 1928 and 1938, for those who had to earn a living, were most difficult. Jobs were few and far between and money was tight. Strangely enough, these were good years for the YARD. Public funds were pumped into federal building programs. The Coast Guard obtained its share.

A comparison of the 1938 plot plan, shown on page 17, with the 1928 plot plan, on page 15, clearly indicates the changes and additions made. A number of these additions form the backbone of the YARD's present industrial plant, all now over 25 years old.

Building No. 3 - A brick Communications Building, now the Electronics Shop;

Building No. 4 - A brick Woodworking Shop

Building No. 5 - A new Boat Shop

Building No. 11- A brick Machine Shop

Building No. 12- Then the Sheet Metal Shop; now houses the Public Works Shops;

Building No. 16- Machine Shop Annex and Boat Basin;

Building No. 51- Magazine with adjacent dock;

Building No. 54- Supply Office and Pay Office;

Building No. 70- The Ordnance Shop; now houses Baltimore Group;

Building No. 61- A new 13-ton Marine Railway, still used;

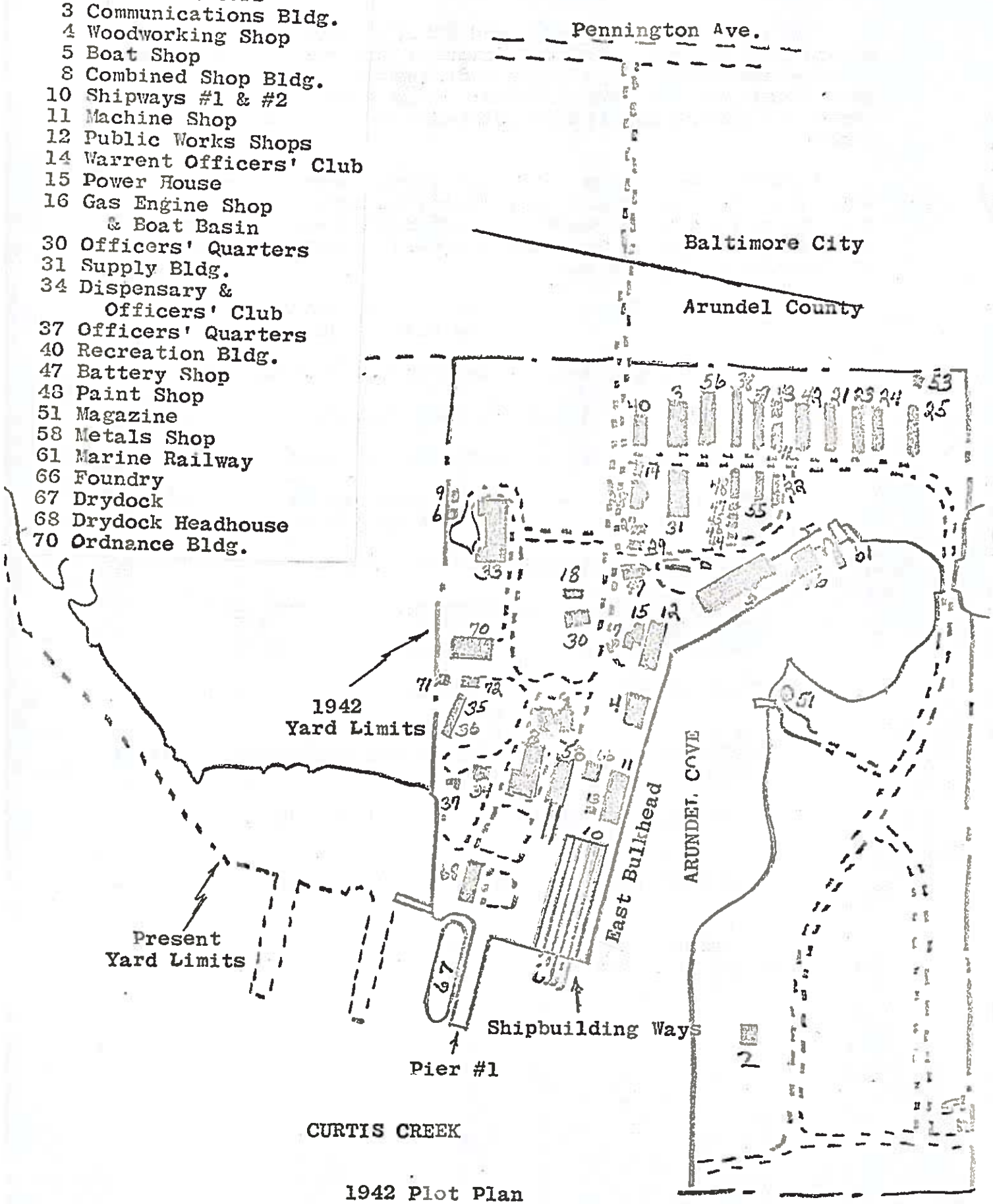
Storage Buildings: 56, 38, 57, 41, 42, 21, 22, 23 and 26

The East Bulkhead has been further straightened and extended.

Arundel Cove is definitely the center of industrial activities at the YARD.

MAJOR BUILDINGS

1 Administration Bldg.
2 C.O's Quarters
3 Communications Bldg.
4 Woodworking Shop
5 Boat Shop
8 Combined Shop Bldg.
10 Shipways #1 & #2
11 Machine Shop
12 Public Works Shops
14 Warrent Officers' Club
15 Power House
16 Gas Engine Shop & Boat Basin
30 Officers' Quarters
31 Supply Bldg.
34 Dispensary & Officers' Club
37 Officers' Quarters
40 Recreation Bldg.
47 Battery Shop
48 Paint Shop
51 Magazine
58 Metals Shop
61 Marine Railway
66 Foundry
67 Drydock
68 Drydock Headhouse
70 Ordnance Bldg.



1942 Plot Plan

Another sizable building program was undertaken between 1938 and 1942 in preparation for World War II. This program was the direct result of recommendations made by a special Congressional Committee.

The 1942 Plot Plan, page 19, shows that additional land was reclaimed from Curtis Creek to provide space for two (2) 350' shipbuilding ways and a 3000-ton floating dry dock (No. 67), with a 300' pier and Head House, Building No. 68.

The following brick buildings were added:

1 Administration Building

2 Commanding Officer's Quarters

8 Combined Shops (Pipe, Electrical and Sheet Metal)

31 Supply Building (now houses Comptroller Department and Rigging Shop)

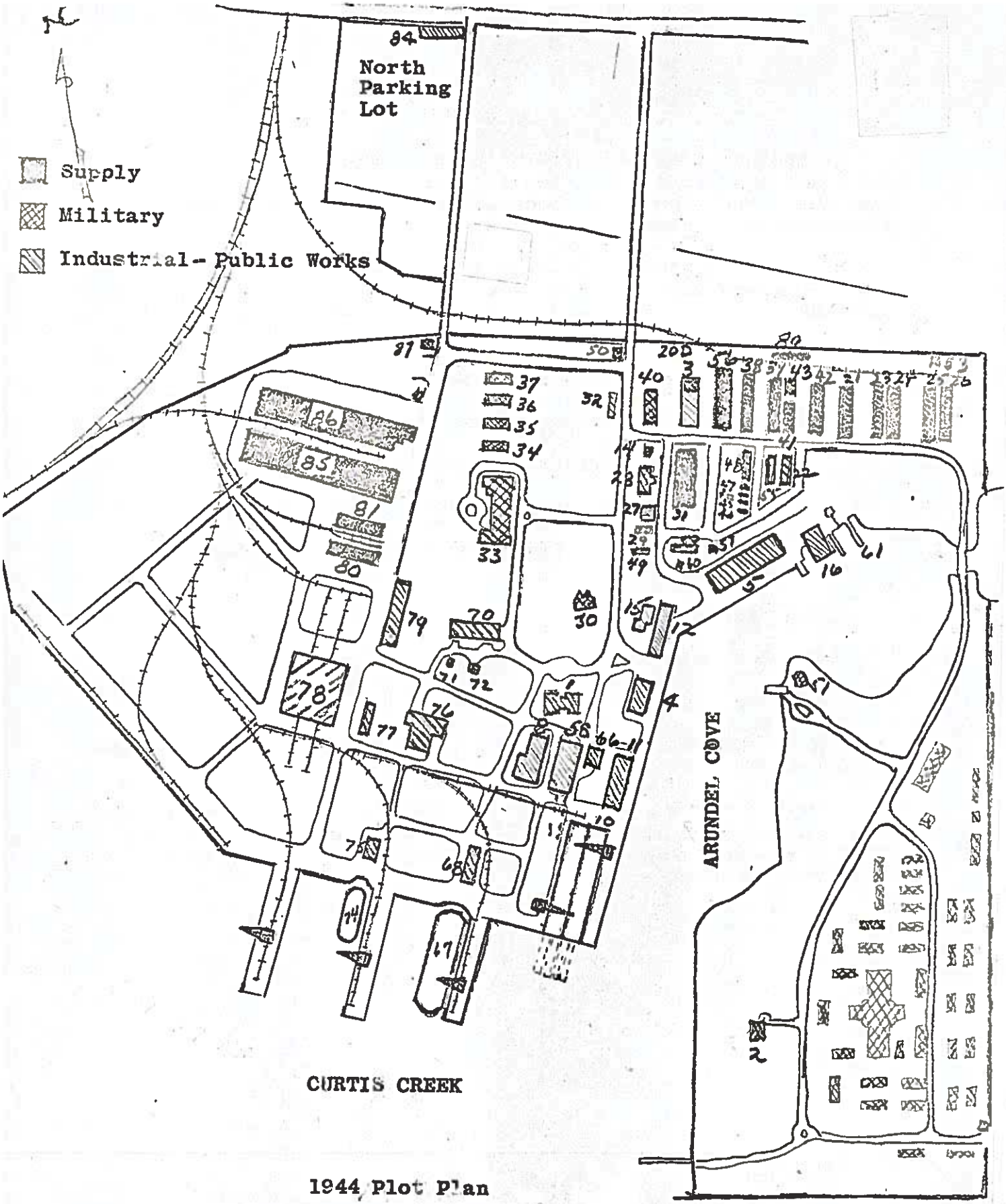
33 Barracks

58 Metals Shop

66 Foundry

A 40-ton marine railway was added next to the 13-ton marine railway (No. 61 on Plot Plan).

With all this expansion, the YARD is still a small, compact shipyard, utilizing the 1000' East Bulkhead on Arundel Cove for outfitting or repairs to ships and the Northeast Bulkhead for boats.



1944 Plot Plan

During World War II, the YARD was increased to its present 113-plus acres by purchase of adjacent land to the west and the north, and by reclaiming land from Curtis Creek. The 1944 Plot Plan, page 21, shows the YARD layout when operating at peak capacity.

Major additions during 1942 and 1943 were:

Two (2) 400' piers

A 1000-ton floating drydock

A 1000' West Bulkhead

Building No. 78 - Fabricating Shop

Supply Buildings No. 80, 81, 85 and 86

Railroad Trackage connecting with the B & O Railroad

Five (5) 25-ton capacity Gantry Cranes

Building No. 77 - Paint Shop

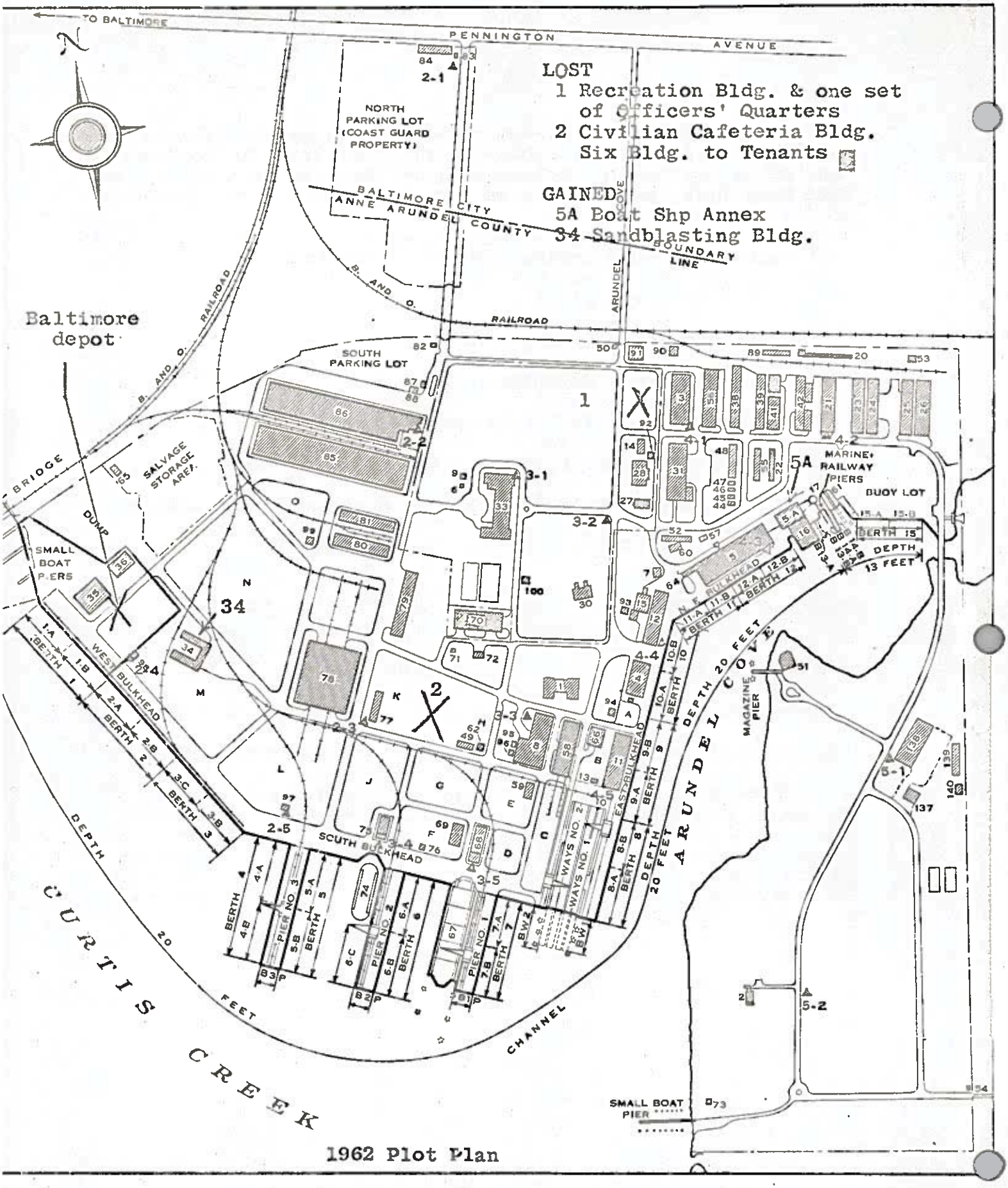
New Garage Building No. 79

Civilian Cafeteria Building No. 76

Additional wooden Barracks No. 34, 35, 36 and 37

Training Station Buildings No. 101 through 141.

These additions abruptly changed the whole complex of the YARD. In less than two years, the center of industrial activity shifted from Arundel Cove to Curtis Creek. No longer is there a small, close-knit, well laid out shipyard. In its place there is a sprawling industrial plant. By 1944 standards, it was one of the best equipped and most efficient small industrial plants in the country.



1962 Plot Plan

The continued and somewhat sporadic growth of the YARD from its modest start in 1899 to a modern, well equipped, industrial plant in 1944 has been briefly outlined. Each ten-year or less period chosen over this forty-five year period (1899-1944) has shown important additions to facilities.

What has happened in the seventeen-year period since 1944 -- a period during which other industrial plants and shipyards have invested large sums in capital improvements, continually modernizing and expanding facilities?

The 1962 Plot Plan, page 23, while it cannot show changes inside of buildings, indicates that little has been invested for capital improvements.

Disregarding removal of temporary, wartime Barracks Building and the Training Station, the YARD has lost:

a. A Recreation Building (No. 40) which contained one set of officers' quarters;

b. A Civilian Cafeteria (No. 76);

c. Building No. 70, which has been turned over to Baltimore Group;

d. Buildings No. 20, 22, 27, 43 and 53, which are occupied by Field Testing and Development Unit.

The YARD has gained:

a. Boat Shop Annex (Building No. 5-C);

b. Sand blasting and Painting facility (Bldg. No. 34).


TO BALTIMORE
PENNINGTON AVENUE
PARKING LOT (COAST GUARD PROPERTY)
BALTIMORE CITY
ANNE ARUNDEL COUNTY
BOUNDARY LINE
YEA. PARKING LOT
ARUNDEL COVE AVE
B & O RAILROAD
REYNOLDS AVENUE
PARKING LOT
SALVAGE STORAGE AREA
BRIDGE
SMALL BOAT PIERS
MARINE RAILWAY PIERS
BLOVER ST.
REINBURG ST.
BILLARD AVE
ROSS AVE
BROWN STREET
HUGHES STREET
ADAMS (WEST BULKHEAD) STREET
ADAMS (SOUTH BULKHEAD) STREET
JOHNSON STREET
EAST BULKHEAD
WAYS NO. 1
WAYS NO. 2
PIER NO. 1
PIER NO. 2
PIER NO. 3
FISHER ST.
GAMBLE ST.
SMALL BOAT PIER
PROPERTY LINE
CURTIS CREEK
ARUNDEL COVE
COAST GUARD YARD
1972

~ YARD BUILDINGS ~

1 ADMINISTRATION BUILDING
2. COMMANDING OFFICER'S QUARTERS
3. **E.M. CLUBS & WAREHOUSE**
4 WOODWORKING SHOP **GRAPHIC ARTS, REPRODUCTION, PUBLIC WORKS**
5 BOAT SHOP
5A BOAT SHOP ANNEX
6. DEGREASING BLD'G
7 YARD TOILET
8 **PIPE & MATERIAL HANDLING SHOPS**
9 **VACANT (AWAITING DISPOSITION)**
10 SHIPWAYS HEADHOUSE (WAYS NO 1 AND 2)
11 MACHINE SHOP
12 PUBLIC WORK SHOPS BLD'G
13 SHIPWAYS TRANSFORMER HOUSE
14. OFFICERS CLUB
15 POWER HOUSE
16 **SMALL BOATS, MECH. OUTFITTING**
17 MARINE RAILWAY (INCLUDING MACHINE HOUSE)
20 **VACANT (AWAITING DISPOSITION)**
21 LUMBER SHED
22 **VACANT (AWAITING DISPOSITION)**
23 STORAGE SHED
24 STORAGE SHED
25 STORAGE SHED
26 STORAGE SHED
27 **TRAINING**
28 B.O.Q.-CLOSED MESS - **SICK BAY**

31 **FISCAL, A.D.P.**
33 BARRACKS
34 SANDBLAST & PAINTING FACILITY
35 BALTO DEPOT SHOP & OFFICE
36 BALTO DEPOT BUOY SHED
38 BOAT SHED
39 BOAT SHED
41 STORAGE SHED
42 STORAGE SHED
43 **VACANT (AWAITING DISPOSITION)**
44 **STORAGE SHED**
45 STORAGE SHED
46 STORAGE SHED
47 **YARD PILOT STORES**
48 **STORAGE SHED**
49 STORAGE SHED
50 RESERVE TRAINING BLD'G
51 MAGAZINE
52 AUTO SHED
53 INCINERATOR - INACTIVE - F.T. & DU.
54 GATE HOUSE (SOUTHEAST)
55 STORAGE SHED
56 STORAGE SHED
57 AUTO SHED
58 **MARINE MACHINIST SHOP**
59 **STORAGE SHED**
60 OIL TANKS
61 MARINE RAILWAY & TURNTABLE

64 GLUE CURING CHAMBER
65 SALVAGE OFFICE
66 **MOBILE EQUIPMENT REPAIR**
67 DRYDOCK NO. 1
68 DRYDOCK HEADHOUSE NO. 1

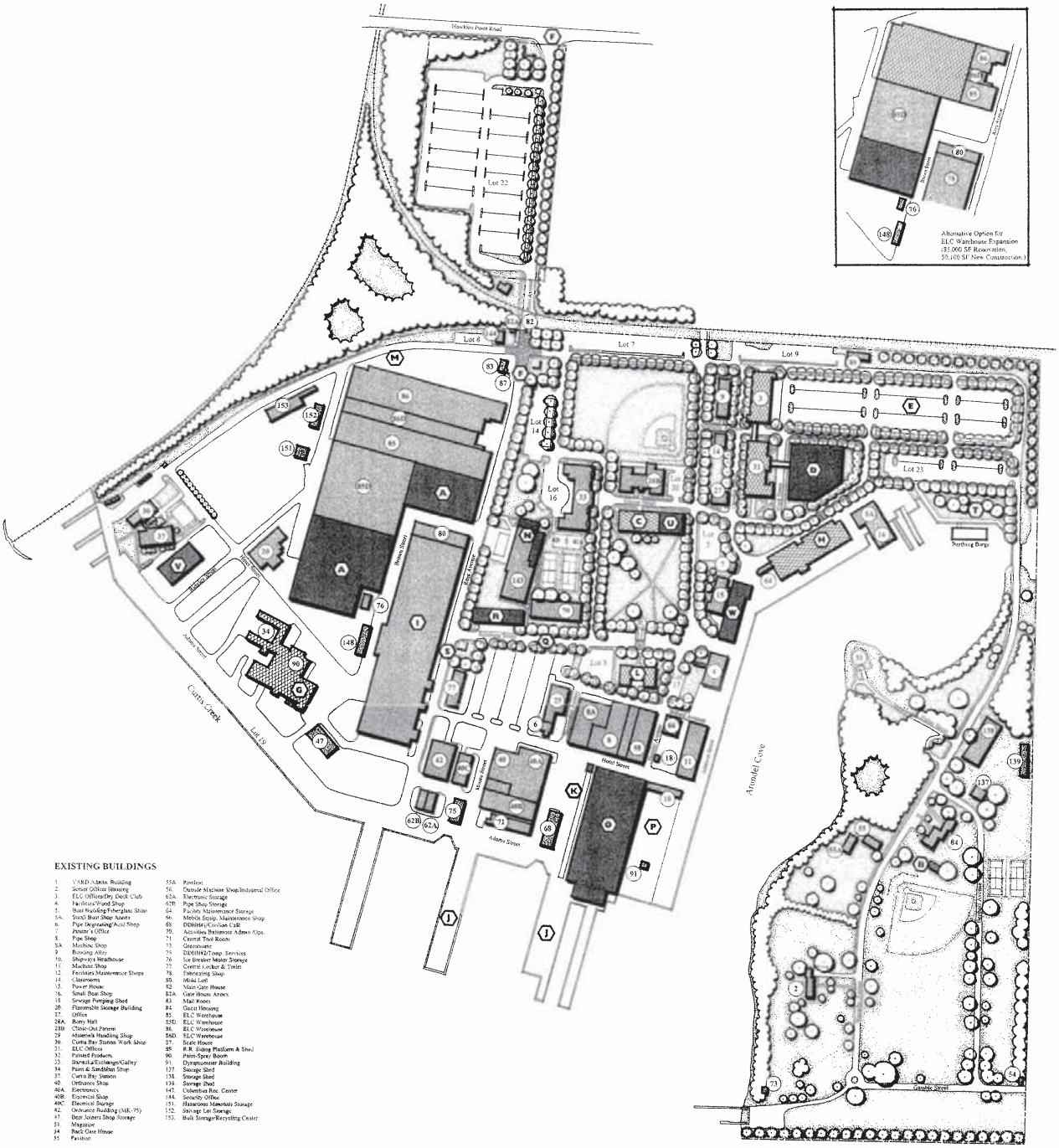
68A **BACHELOR OFFICERS QUARTERS, UNDER CONSTRUCTION**
68B **MEDICAL-DENTAL BLDG., UNDER CONSTRUCTION**
32 PAINTED PRODUCTS BLDG
37 BALTO DEPOT MOORING STORAGE
40 **ORDNANCE SHOP**
63 SWIMMING POOL
63A BATH HOUSE
18 SEWAGE PUMPING STATION
29 READY CREW BLDG (BALTO DEPOT)
[illegible]A **ELECTRONICS SHOP**
[illegible] **ELECTRIC SHOP**

70 BALTO GROUP **C.O.T.P. RESERVE TRAINING**
71 **TOOL ISSUE, BAND SAW**
72 **STORAGE BLD'G. (SMALL ARMS MAG.)**
73 STORAGE SHED
74 DRYDOCK NO 2
75 DRYDOCK HEADHOUSE NO 2
76 SANDBLAST HOPPERS (75 CU YD EACH)
77 LOCKER & TOILET FACILITIES
78 FABRICATING SHOP
79 **FIRE HOUSE, SHIPS STOREROOM**
80 STORAGE SHED
81 STORAGE SHED
82 GATE HOUSE (WEST)
83 **GAS STATION**
84 **GUEST QUARTERS**
85 **WAREHOUSE**
86 **WAREHOUSE, SUPPLY & SECURITY OFFICE**
87 SCALE HOUSE
88 STORAGE SHED - INFLAMMABLE MATERIALS
89 RAILROAD SIDING PLATFORM & SHED
90 **SANDBLAST BUILDING**
91 33/4 KV SUBSTATION
92 -10% INCL., [illegible] KV SUBSTATIONS

137 STORAGE SHED
138 STORAGE SHED
139 STORAGE SHED

T-7 STORAGE SHED

LETTERS A to O INCL. - WORK AREAS



EXISTING BUILDINGS

1.	YARD Admin. Building	55A.	Pavilion
2.	Senior Officer Housing	56.	Outside Machine Shop/Industrial Office
3.	ELC Offices/Dry Dock Club	62A.	Electronic Storage
4.	Facilities/Wood Shop	62B.	Pipe Shop Storage
5.	Boat Building/Fiberglass Shop	64.	Facility Maintenance Storage
5A.	Small Boat Shop Annex	66.	Mobile Equip. Maintenance Shop
6.	Pipe Degreasing/Acid Shop	68.	DDHHQ/Civilian Cafe
7.	Painter's Office	70.	Activities Baltimore Admin./Ops.
8.	Pipe Shop	71.	Central Tool Room
8A.	Machine Shop	73.	Greenhouse
9.	Bowling Alley	75.	DDHHQ/Temp. Services
10.	Shipways Headhouse	76.	Ice Breaker Motor Storage
11.	Machine Shop	77.	Central Locker & Toilet
12.	Facilities Maintenance Shops	78.	Fabricating Shop
14.	Classrooms	80.	Metal Lab
15.	Power House	82.	Main Gate House
16.	Small Boat Shop	82A.	Gate House Annex
18.	Sewage Pumping Shed	83.	Mail Room
20.	Flammable Storage Building	84.	Guest Housing
27.	Office	85.	ELC Warehouse
28A.	Rotry Hall	85D.	ELC Warehouse
28B	Clinic-Out Patient	86.	ELC Warehouse
29	Materials Handling Shop	86D.	ELC Warehouse
30.	Curtis Bay Station Work Shop	87.	Scale House
31.	ELC Offices	88.	R.R. Siding Platform & Shed
32.	Painted Products	90.	Paint-Spray Booth
33.	Barracks/Exchange/Galley	91.	Dynamometer Building
34.	Paint & Sandblast Shop	137.	Storage Shed
37.	Curtis Bay Station	138.	Storage Shed
40.	Ordnance Shop	139.	Storage Shed
40A.	Electronics	142.	Columbus Rec. Center
40B.	Electrical Shop	144.	Security Office
40C.	Electrical Storage	151.	Hazardous Materials Storage
42.	Ordnance Building (34R-75)	152.	Storage Lot Storage
47.	Gear Lockers Shop Storage	153.	Bulk Storage/Recycling Center
51.	Magazine		
54.	Back Gate House		
55	Pavilion		

LEGEND

- Existing Buildings
- Proposed Buildings
- Proposed Renovation
- Property Boundary
- Existing Railroad
- Bulkhead/Pier
- Special Paving
- Lawn
- Existing Trees
- Existing Woodlands
- Proposed Deciduous Trees
- Proposed Evergreen Trees

PROGRAM ELEMENTS: Short Term

A. ELC Warehouse Expansion (100,000 SF)
B. Recreation Equipment Storage/Restroom Facility
C. Conference/Training Facility: Bldg. 28A Renovation
D. ELC Administration Offices (New 46,000 SF)
E. Parking Area Upgrade and Expansion
F. YARD Entrance Improvements
G. Paint Complex Renovation
H. Building 5 Renovation
I. Building 78 Space Utilization Analysis
J. Upgrade/Widening: Piers 2 and 3
K. New Crane Runway
L. Consolidation of Fiscal Department in Building 1

PROGRAM ELEMENTS: Long Term

M. New Perimeter Road
N. Recreation Center Expansion
O. Enclosure for Land-Based Ship Handling Facility
P. Study of Shipways
Q. Billard Avenue Realignment (Reinburg Street)
R. New Fire Station
S. New Gateway to Industrial Area
T. Shoreline Conservation Area/Reconfiguring of Lot 23
U. Expansion of Bldg. 28A Conference/Training Facility
V. New ACT/MAT Shop Building
W. New Facilities Management Shop

LAND USE PLAN FIGURE 19

U.S.C.G. YARD CURTIS BAY

SCALE: 100' 0 100' 200'

September 1999

RHODESIDE HARWELL INCORPORATED

1999 Land Use Plan

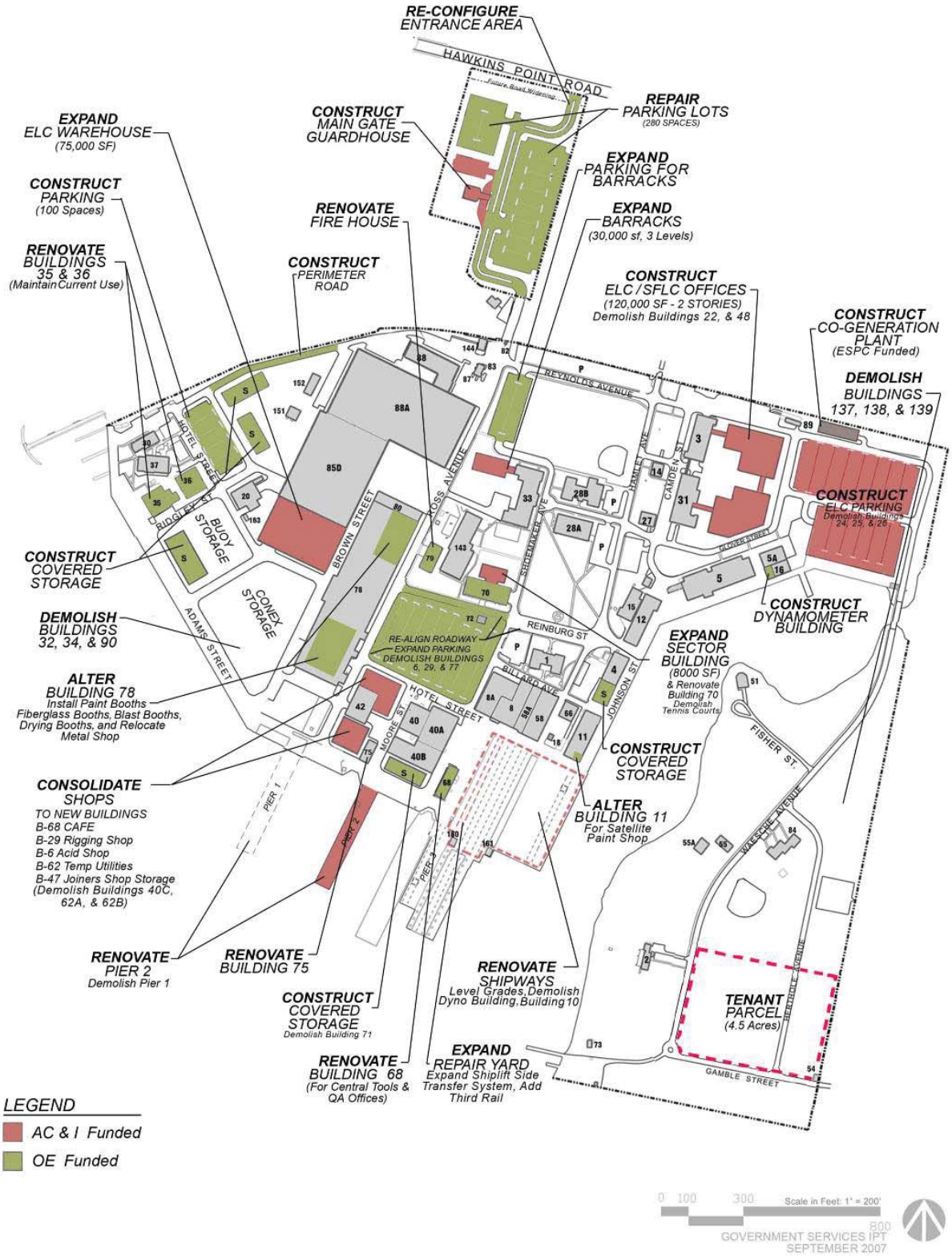


Figure ii. Recommended Site Plan