

NAVAL AMMUNITION DEPOT EARLE, PIER 3  
(Naval Weapons Station Earle, Pier 3)  
Sandy Hook Bay  
Colts Neck vicinity  
Monmouth County  
New Jersey

HAER NJ-142-B  
*HAER NJ-142-B*

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
NORTHEAST REGIONAL OFFICE  
National Park Service  
U.S. Department of the Interior  
U.S. Custom House, 3rd Floor  
200 Chestnut Street  
Philadelphia, PA 19106

HISTORIC AMERICAN ENGINEERING RECORD

NAVAL AMMUNITION DEPOT EARLE, PIER 3  
(Naval Weapons Station Earle, Pier 3)

HAER No. NJ-142-B

Location: Naval Ammunition Depot (NAD) Earle  
(currently Naval Weapons Station [NWS]  
Earle)  
Colts Neck Vicinity  
Monmouth County  
New Jersey

USGS Sandy Hook, NJ Quadrangle, 1:24,000  
UTM Coordinates: 18.580543.4478818  
18.580552.4478815  
18.580394.4478501  
18.580384.4478505

Construction Dates: 1944-45

Architect/Engineer: Shaw, Naess and Murphy, Architects/  
Engineers; Frank Grad and Sons, Architects

Contractor: J. Rich Steers, Inc.

Present Owner: Department of the Navy

Present Use: GP Berth Pier

Significance: Funded in part by the Army, Naval Ammunition  
Depot Earle was commissioned in 1943 as the  
only major ordnance transshipment depot on  
the East Coast. Its mission was to  
facilitate the movement of ordnance from  
stateside production and storage facilities  
to the Navy and Army forces, then in the  
European theater of World War II.

Project  
Information:

The Department of the Navy plans to replace Pier 2, Pier 3, Trestle 2, and Trestle 3 at NWS Earle. These structures, and many of their associated buildings, were identified as meeting National Register Criterion A during a cultural resources investigation conducted at NWS Earle in 1999. The Department of the Navy and the New Jersey State Historic Preservation Office (NJ SHPO) have not reached an agreement concerning the specific definition or boundaries of the National Register-eligible architectural resources at NWS Earle to date; however, an assumption of eligibility for Pier 2, Pier 3, Trestle 2, and Trestle 3, as well as the historic buildings associated with these structures, was made for the purposes of this project. To mitigate the adverse effect of the proposed project to the piers, trestles, and associated buildings, the Department of the Navy, the NJ SHPO, and the Advisory Council on Historic Preservation entered into a Memorandum of Agreement stipulating written, graphic, and photographic documentation of the structures. This documentation was undertaken to fulfill these stipulations.

Historians:

Elizabeth Amisson, Sarah Farley, and Robert F. Panepinto, August 2003

Part I: Historical Information

A. World War II

As approved by the Secretary of the Navy in June 1943, NAD Earle, New Jersey, was to have 5,300'-0" of trestle (at a cost of \$150 per linear foot) and a 2000'-0" x 70'-0" pier (at a cost of \$5 per square foot). Shaw, Naess and Murphy and DeLeuw, Cather & Company provided the plans and specifications for NAD Earle. These two companies were familiar with the task at hand, having provided the same services for the Naval Ammunition Depot at McAlester, Oklahoma. To expedite the process, Shaw, Naess and Murphy opened an office in the Westinghouse Building on 5<sup>th</sup> Avenue in New York City in June 1943. On August 2, the Navy issued Contract NOy-6766 to the Elmhurst Contracting Company for the construction of Pier 1, the Barge Pier, the trestle connecting the pier to the shore, and pier utilities. This was the only pier area included in the original plans for the NAD Earle. The total cost of the project was \$3,832,615.00.<sup>1</sup>

The initial plans did not include facilities for a deep-water pier. According to Captain Burton H. Green, U.S. Navy (USN), the first Commanding Officer of NAD Earle, the Bureau of Ordnance was aware of this and planned to load ships via barge or lighter in the bay. Captain Green met with the Commandant of the Third Naval District, Admiral Marquard, while visiting NAD Earle in September 1943, and the topic of a deep-water pier arose. Admiral Marquard took action to request the addition of a deep-water pier after learning that none was planned.<sup>2</sup> The Vice Chief

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<sup>1</sup> Ernest J. Benshimol, *History of U.S. Naval Ammunition Depot Earle, New Jersey*, (Subject Files [ACC No. A-12-1(1)], Loc No. R-105-6-4-5, Box 422, RG 181, National Archives and Record Administration, Northeast Branch, also on file at Naval Weapons Station Earle, Public Affairs Office), 48, 53-54, 67, 71.

<sup>2</sup> Captain Burton H. Green, U.S. Navy, "Informal History of Naval Ammunition Depot, Earle, New Jersey" (Memorandum to Captain Hutchins, U.S. Navy [Retired], Colts Neck, NJ: Naval Ammunition Depot Earle, 1944), 2.

of Naval Operations approved the request, earmarking an additional \$3.2 million for the addition.<sup>3</sup>

On January 5, 1944, the Navy Department's Bureau of Yards and Docks issued a letter of intent to J. Rich Steers, Inc. of New York, NY for the "construction of [a] ship pier and approach, including dredging railroad track, and services" at NAD Earle. The initial cost of the bid was \$2.66 million, and work was expected to begin as soon as the Navy issued a Notice to Proceed.<sup>4</sup> The contract for the project, NOy-7693, was dated February 4, 1944, and more specifically detailed the work as "Ships' Pier and Approach connecting with the Barge Pier together with a Pier Utility Building, railroad tracks, dredging and other work."<sup>5</sup>

As the Navy was moving ahead in January and early February 1944, the Army evaluated the Navy's NAD Earle project to determine its usefulness to the Army. They found the Barge Pier and Trestle in Sandy Hook Bay already functioning, and plans underway for Pier 2, the Navy Pier. At this stage, Contract NOy-7693 called for a 253'-0" extension of the 64'-0" wide barge pier; the construction of a 34'-0" x 2,772'-0" trestle; the construction of a 90'-0" x 687'-0" pier (Pier 2) with berthing for two ships; and dredging work. The Army concluded that they could not use the current barge pier to load Army cargo as it was already fully utilized and would continue to be fully utilized by the Navy, but recognized a joint project would be appropriate because facilities for ship loading could be expanded. The Army therefore recommended construction of finger piers to provide six additional 600'-0" ships' berths and bypass trackage to avoid interference with the barge pier.<sup>6</sup> Figure 1 is a general construction map of the pier complex as it was constructed in 1944.

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<sup>3</sup> "Excerpts from report of NIG-Part II" (Third Naval District Inspection Report-II, New York, NY: Headquarters of the Commandant Third Naval District, 1945), 1. Henceforth NIG-Part II.

<sup>4</sup> L. W. Lancaster, "Record Report: Contract NOy-7693 Ships Piers and Approaches" (Colts Neck, NJ: Naval Ammunition Depot Earle, 1945), ii.

<sup>5</sup> Benshimol, 68.

<sup>6</sup> *Ibid.*, 119-121, 129, 131.

Major alterations to Contract NOy-7693 resulted in a great difference in price from the original bid cost. Initially, Contract NOy-7693 only included the construction of one new pier, the Navy Pier (Pier 2); however, after the contract was issued, the Army asked to have a pier added to the complex and provided funds for its construction. J. Rich Steers won the contract for the additional work, but during negotiations for the new contract, NOy-8987, the parties involved decided to incorporate the Army Pier (Pier 3) into the original contract. Since funds had already been paid out under NOy-8987, it could not be cancelled, and a change order was issued for the contracts, amending NOy-8987 to cover the money already paid and adding the construction of Pier 3 to NOy-7693. The addition of Pier 3 required some changes to the location of the piers.<sup>7</sup> The final cost of the project was \$8,056,786.99.<sup>8</sup>

According to Ernest J. Benshimol's "History of the U.S. Naval Ammunition Depot Earle, New Jersey" (1945), the pier area consisted of the following features when construction was completed:

1. Administration and service buildings, and personnel quarters
2. A dunnage yard<sup>9</sup>
3. Trackage and roadways
4. A barricaded siding area
5. Ship and barge piers, with connecting trestle across shallow water and tidal flats to the shore
6. A dredged marine area adjacent to the piers, connected by a dredged channel to the channels of Lower New York Bay.<sup>10</sup>

Construction was completed on June 4, 1945<sup>11</sup>; however, ships began using Pier 3 in June 1944.

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<sup>7</sup> Lancaster, 5.

<sup>8</sup> *Ibid.*, 3.

<sup>9</sup> Dunnage is packing material used to cushion cargo on a ship.

<sup>10</sup> Benshimol, 42.

<sup>11</sup> Lancaster, 3.

The Record Report for Contract NOy-7693 was written at the completion of construction, and provided the Navy's analysis of the construction process and its comments about technical features of the design--plans, specifications, major changes--and unusual features encountered during construction. Overall, the design of the piers and trestles was thought to be satisfactory; however, the plans for the trestles and pier decks were modified. The trestles needed to be widened to handle a high volume of truck traffic. The need to widen the trestles was noted while construction was ongoing since the facility went into operation before it was fully completed. The pier decks were formed entirely of reinforced concrete because of a lack of suitable wood to build a more economical ". . . combination reinforced concrete slab over a laminated wood deck," as initially proposed. A request was also made "that the platforms and ramps on both the Army and Navy Pier [sic] be made sparkproof by installing a wooden deck covering over the concrete."<sup>12</sup>

The initial plans for the project were abandoned after the Navy requested a wider trestle and the addition of Pier 3. Although the new plans were prepared in a very short term by Shaw, Naess and Murphy and Frank Grad and Sons, very few changes had to be made to them during the course of construction.<sup>13</sup> The specifications for the work were thought to be reasonable and did not cause any unexpected problems. The most significant changes to the plan were the additions of Trestle 3 and Pier 3.<sup>14</sup> Figure 2 is a general plan of the pier complex, including Pier 3 and Trestle 3, as it was constructed in 1944.

The Record Report for Contract NOy-7693 describes the structures built as "fairly standard," the notable exception being the all-reinforced concrete deck constructed on the piers. This led to a greater construction cost than was initially anticipated, but it was precipitated by a wartime shortage of lumber. The addition

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<sup>12</sup> Lancaster, 13.

<sup>13</sup> Benschimol, 72: Contract NOy-8986 was issued on February 10, 1944 for \$274,075.00.

<sup>14</sup> Lancaster, 13-14.

of Pier 3 and its associated trestle required the extension of the completion time from July 3, 1944, to September 1, 1944. A hurricane on September 14, 1944, necessitated repairs to the lighting systems, pumps and intake cribs, and the fire protection system, as well as general cleanup. Severe cold weather in January 1945 caused damage to the 10" salt-water fire line, necessitating further repairs. When the project was completed, L. W. Lancaster, the senior engineer for the project and author of the Record Report, rated the contractor's overall performance on the project as outstanding.<sup>15</sup>

The Navy utilized two of the piers at NAD Earle, and the Army utilized the third. Pier 1, the Navy Barge Pier, was used for barges and ships with drafts of less than 15'-0". The East Section had berthing room for twelve destroyer escorts (DEs) or smaller vessels, and the West Section had twelve berths for smaller vessels such as Coast Guard boats and submarine chasers (PCs and SCs). Pier 2, the Navy Deepwater Pier, had room to berth two cruisers, destroyers, or merchant ships. Pier 3, the Army Deepwater Pier, could berth four merchant ships.<sup>16</sup>

The responsibility for loading and unloading ships at the pier fell upon the Navy, and the Army reimbursed the Navy for costs incurred by the loading of Army cargo. It was undecided at first who exactly would do the loading, and this question arose at a conference on July 4, 1944, at the Third Naval District Headquarters at 90 Church St. in New York. Colonel H. Otzen, U.S. Army, Deputy for Operations of the Port of New York, stated that the conception was for Earle to be run exclusively by the Navy, with Army cargo to be consigned to the Port Transport Officer for Earle delivery. A Port Ordnance Officer, a Port Transportation Officer, and a Port Supervisor, Water Division, were stationed at Earle to serve as liaisons between the Army

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<sup>15</sup> *Ibid.*, 3-4, 15-16.

<sup>16</sup> *History of U.S. Naval Ammunition Depot, Earle, New Jersey, Volume II: History of the Naval Ammunition Depot, Earle, Red Bank, New Jersey, from 1 August 1945 to 31 December 1948* (Earle, NJ: Naval Ammunition Depot Earle, n.d.). Henceforth *Hist. of USNAD Earle*, vol. II.

and Navy. All loading was to be the responsibility of the Navy and performed by Navy stevedores.<sup>17</sup>

A representative of NAD Earle answered the rhetorical question "Will stevedores be used?" by saying they would not be used to load Navy vessels.<sup>18</sup> He also projected that 4,500 blue jackets (Navy enlisted personnel) would be stationed at Earle to load Army ships. This news rankled local labor organizations and politicians because large numbers of stevedores would have been put out of work when Army ammunition loading operations moved from Caven Point, near Jersey City, to Earle. The question was ultimately settled by a test conducted on the *Charles Warfield*, the first Liberty Ship to dock at Earle. Navy personnel with no experience were given fifteen days to load the ship. The Navy personnel overcame their learning curve, getting faster with each passing day, but it ultimately took seventeen days to load the *Charles Warfield*. Based on this test, the Army decided that it would be better to have contract stevedores tend to the loading of Army cargo ships. In his history of NAD Earle, Ernest Benshimol expressed his disappointment that the blue jackets did not receive a second chance, but there was no disputing the speed of the stevedores, who could load a ship in four and one-half days.<sup>19</sup>

During the war, several hundred stevedores and their accompanying support personnel were hired to work at NAD Earle. The workforce detailed to load ammunition varied by type of ship. A combination of Navy enlisted personnel and civilian ordnancemen under the direction of the piers' Operations Officer loaded barges at Pier 1. Ships' crews, under the supervision of the Naval Planning Officer and a few civilian ordnancemen, were responsible for loading warships. Lighters, or barges, serviced the largest warships--battleships and aircraft carriers--at Gravesend Bay off Brooklyn.<sup>20</sup>

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<sup>17</sup> Benshimol, 143. The meeting was given the formal name "Conference between Appropriate Representatives of the Army and Navy Regarding the Transfer of Loading from Caven Point to Earle."

<sup>18</sup> Stevedores are workers assigned to loading and unloading ships.

<sup>19</sup> *Ibid.*, 145.

<sup>20</sup> Hist. of USNAD Earle, vol. II.

Eventually, a combination of Navy-enlisted men and stevedores, under the supervision of Navy personnel, were responsible for loading ammunition and cargo ships (AEs and AKs respectively). A reference in a Navy Inspector General's (NIG) inspection report of the Third Naval District indicates that

The use of stevedores in loading cargoes of ammunition had been very satisfactory except for the inconvenience of bringing the stevedores from a long distance, many of them from Jersey City . . . <sup>21</sup>

Following the war, civilian contract stevedores assumed more of the work at Earle as the nation demobilized.<sup>22</sup>

Initially, however, operations at Earle were hampered by a lack of personnel. In his report, the NIG recognized the difficulty in procuring civilian personnel for NAD Earle due to its location.<sup>23</sup> The same held true for Navy personnel. The NIG reported that the shortage of officers was so great at the pier area that it required the temporary transfer of eighteen officers from the Bureau of Ordnance and local commands. This brought the number of officers at the pier area to forty-nine, but was well short of the identified target of sixty-nine officers needed to support the ongoing twenty-four-hour operations. The NIG stated in his report, "Apparently the original assignment of officers to Leonardo did not contemplate working 24 hours a day."<sup>24</sup>

Civilian and Navy personnel qualified to perform their duties were in short supply. The NIG's report identified a lack of "skilled engine operators, trainmen, conductors, and yardmen" as the primary cause of problems with the rail transportation system.<sup>25</sup> In response, NAD Earle borrowed thirty-two enlisted men

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<sup>21</sup> NIG-Part II, 7.

<sup>22</sup> Hist. of USNAD Earle, vol. II.

<sup>23</sup> NIG-Part II, 6.

<sup>24</sup> *Ibid.*, 6.

<sup>25</sup> *Ibid.*, 8.

from other commands to operate locomotives, and the Third Naval District was scoured for personnel with railroad experience. On the piers themselves, inexperienced personnel operating cranes and carriers caused damage to equipment and injuries to personnel, but luckily, no major accidents that could have resulted in disaster.<sup>26</sup>

The lack of a large civilian population from which to draw staff was exacerbated by a lack of facilities for civilian employees. According the NIG, even meals posed a problem:

. . . the fact that there are not any commercial restaurants in the pier area . . . is a bothersome one, as at present time, an hour and one-half is required for meal periods.<sup>27</sup>

The same lack of facilities held true for military personnel as well. Officers had to travel back and forth to the Mainside because no Bachelor Officer's Quarters (BOQ) were provided in the Waterfront Area. Coast Guard personnel responsible for overseeing the loading of merchant vessels were housed 16 miles away in the Army Barracks at Fort Hancock on Sandy Hook.<sup>28</sup>

Despite initial problems, NAD Earle's contribution to the war effort was immediate from the departure of the first ship in February 1944. By July 1945, NAD Earle shipped over 731,000 tons of ammunition, the majority of which was sent to the European Theater of Operations.<sup>29</sup>

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<sup>26</sup> *Ibid.*, 8-9.

<sup>27</sup> *Ibid.*, 7.

<sup>28</sup> *Ibid.*, 5; Green, 2-3.

<sup>29</sup> The Cultural Resource Group, Louis Berger & Associates, Inc., "Architectural Resources Survey: Naval Weapons Station Earle, Monmouth County, New Jersey" (n.p.: The Cultural Resource Group, Louis Berger & Associates, Inc., 1999), 14-15.

B. Post-World War II

After the surrender of Japan, the process for sending ammunition to the military forces arrayed overseas was reversed. Between August 1, 1945, and May 18, 1946, over 372,000 tons of ammunition were received at NAD Earle for dispersal to inland bases, making it the largest site on the East Coast for the return of ammunition. This also necessitated changes to the dunnaging process.<sup>30</sup> Railroad cars were temporarily dunnaged on the piers to speed up the process of unloading the large volume of ammunition being returned to Earle. The cars were then moved to the dunnaging yard on the shore for more thorough dunnaging before being shipped to their final destinations.<sup>31</sup>

A major disaster was avoided on April 30, 1946, when an explosion occurred alongside Pier 1 during the unloading of torpex-loaded hedgehog depth charges from the *USS Solar* (DE-221). Although the explosion killed an officer and six enlisted men of the *Solar's* complement, a greater loss of life was avoided because the accident occurred at lunchtime for the large numbers of civilian workers at the piers.<sup>32</sup> Earlier offloading of the destroyer escort's torpedoes and much larger 650-pound depth charges further limited the severity of the explosion; however, the ship and pier still suffered severe damage. The *Solar* lost the forward third of her superstructure, and fragments from the explosions ignited a railroad car on the pier loaded with depth charges, resulting in damage to the pier.

During the second half of the 1940s and the early 1950s, various quality assurance and maintenance projects were undertaken at NAD Earle. One of the necessities of wartime was to get things done quickly; this is not to say that quality control was ignored, but that the need to get facilities built was often so urgent that it allowed for the use of substandard materials. For example, the rails used for the tracks at NAD Earle were a poor

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<sup>30</sup> *Ibid.*; Hist. of USNAD Earle, vol. II.; Dunnaging is the use of various materials, in the case of NAD Earle, wood, to protect and prevent the shifting of loads during transportation.

<sup>31</sup> Hist. of USNAD Earle, vol. II.

<sup>32</sup> *Ibid.*; Meyer Berger, "Naval Ship Disaster, Warship Blows Up at Munitions Pier in Port, Killing Five" (*The New York Times*, April 30, 1946).

grade of relayer (previously used tracks) that did not always match. Record Reports for Contracts NOy-13426 and 12862 indicate that 4.8 miles of track were replaced on the piers and trestles between December 1945 and January 1949, owing to the poor quality of the original track.<sup>33</sup>

Routine maintenance was also conducted on the piers following the war. The Navy completed resurfacing Piers 1 and 3 in July 1952 at a cost of \$821,000.00. Storm damage repairs to the piers and trestles were also completed in July of the same year, at a cost of \$312,400.00.<sup>34</sup> The following year, new saltwater pumps were ordered to replace all of the existing saltwater pumps on the pier that had begun to corrode.<sup>35</sup> Figure 3 is a plan of the piers as they appeared in 1953. Pier 4 was not yet constructed at this date.

During the 1950s, Pier 3 was the busiest pier at NAD Earle.<sup>36</sup> This was directly related to the escalating conflict in Korea. NAD Earle most likely stopped handling ammunition for the Army during the 1960s.<sup>37</sup>

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<sup>33</sup> "Record Report Lump-Sum Contract NOy-12862 Specification No. 17051" (Earle, NJ: Naval Ammunition Depot Earle, 1948, ACC No. 59A249, Box 142763A, RG 181, National Archives and Record Administration, Northeast Branch); "Record Report Lump-Sum Contract NOy-13426 Specification No. 17575 (Revised)" (Earle, NJ: Naval Ammunition Depot Earle, 1949, ACC No. 59A249, Box 142763A, RG 181, National Archives and Record Administration, Northeast Branch).

<sup>34</sup> T. A. Hartung, "Completed Public Works Portion of Standard DIG Questionnaire for Subject Inspection" (New York, NY: Headquarters of the Commandant, Third Naval District, 1952, ACC No. 59A250, Box 141174B, RG 181, National Archives and Record Administration, Northeast Branch).

<sup>35</sup> "Fire Protection Survey of USNAD, Earle, NJ; Supplement to OPNAV REPORT 11320-2" (New York, NY: District Public Works Office, Third Naval District, 1953, ACC No. 59A250, Box 141174B, RG 181, National Archives and Record Administration, Northeast Branch).

<sup>36</sup> Naval Ammunition Depot Earle, "Survey of Ammunition Handling N.A.D. Earle, New Jersey" (Colts Neck, NJ: Naval Ordnance Materials Handling Laboratory, Naval Ammunition Depot Earle, 1951), 43.

<sup>37</sup> *Ibid.*, 18.

The Navy renamed NAD Earle the NWS Earle in 1974. The internal Navy reorganization that led to the name change also added the mission of serving as the homeport for *USS Nitro*.<sup>38</sup>

### C. Recent History

There was a resurgence of activity at NWS Earle during the late 1970s. The construction of facilities to support the homeporting of additional ships was underway or about to be underway during 1977 and 1978. The Commanding Officer met with the Leonardo Taxpayers Association to brief them on the plans in May 1978. New insulated fresh water and sewage lines on the piers and trestles were put into service in August of the same year. Plans for a new pier, Pier 4, also were developed.<sup>39</sup>

By 1980, two additional ships were stationed at NWS Earle, the *USS Suribachi* and *USS Butte*, and improvements to the piers and trestles continued.<sup>40</sup> Contracts totaling \$5.5 million were awarded in Fiscal Year 1981 for improvements to the piers and utilities. During April 1981, new bumper facings were installed on the loading docks at Piers 2 and 3. During September, a tug berth was constructed on the east side of Pier 3, and construction was started to enclose the "Wye" area at the junction of Trestles 2 and 3. By November, new support pilings were installed and minor concrete patching was finished on Piers 2 and 3.<sup>41</sup>

Improvements continued through 1982. The Navy awarded contracts for the repair of the fender systems on the piers (\$1 million) and structural repairs to the piers themselves (\$2 million). In addition, the Navy designed a contract for a Phase I rehabilitation of the undersides of the concrete decks on Pier 3 and Trestle 3, which also included rehabilitation of the fire protection ramps on Pier 2. Finally, construction began on

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<sup>38</sup> The Cultural Resource Group, 18.

<sup>39</sup> Naval Weapons Station Earle, "Command History, 1978" (Colts Neck, NJ: Naval Weapons Station Earle, 1978), 7, 14, 20.

<sup>40</sup> The Cultural Resource Group, 18.

<sup>41</sup> Naval Weapons Station Earle, "Command History, 1981" (Colts Neck, NJ: Naval Weapons Station Earle, 1981), 11, 21.

general pier improvement and the utilities at the junctions of Trestles 2 and 3.<sup>42</sup>

Contracts totaling \$6 million were completed in 1983, \$4 million of which were for structural repairs to the pier. Work completed that year included:

1. renovating the expansion joints on Pier 3
2. spraying gunite and grout underneath Piers 2 and 3
3. replacing several pier pilings and string pieces
4. repairing the base of bollards (also known as bitts) on Piers 2 and 3.

Life-ring brackets and life-rings were placed on the piers and trestles. Repairs commenced on the fire main systems at Piers 2 and 3, and boilers in the pier buildings were repaired.<sup>43</sup>

By 1990, two additional ships were homeported at NWS Earle--the ammunition/oiler ships *USS Detroit* and *USS Seattle*. The homeporting of these two ships required extensive additions to the waterfront area, including 500 additional housing units and the construction of another pier, Pier 4.<sup>44</sup> Figures 4 and 5 are plans of the pier complex as it appeared in 1989, after Pier 4 was constructed. Major repairs to the railroad tracks on Trestle 2 were also undertaken. Two major improvement projects began during 1991. The first, awarded under a \$47.7 million contract to the Pile Foundation Construction, Inc. of Averne, NY, involved the construction of a new trestle, Trestle 1A. Groundbreaking for this project occurred on September 10, 1991. The second project involved over \$11 million in infrastructure repairs to NWS Earle. Approximately \$2.8 million for repairs to the piers timbers, \$2 million for repairs to the Pier 3

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<sup>42</sup> Naval Weapons Station Earle, "Command History, 1982" (Colts Neck, NJ: Naval Weapons Station Earle, 1982), 10-11, 19.

<sup>43</sup> Naval Weapons Station Earle, "Command History, 1983" (Colts Neck, NJ: Naval Weapons Station Earle, 1983), 12-13, 22-23.

<sup>44</sup> The Cultural Resource Group, 18.

railroad, and \$635,000.00 for road improvements were included in this undertaking.<sup>45</sup>

Improvements to the piers and trestles continued into the late 1990s and the new century. Figure 6 is a plan of the pier complex as it appeared in 1994. In 1998, the repair and replacement of all telephone equipment on the piers provided more lines for the homeported and visiting ships, while the opening of the new Pier Recreation Center in Building S-454, the former pier firehouse, provided sailors with the opportunity for rest and relaxation.<sup>46</sup> \$4.3 million in repair continued on Pier 2 into 2001. Concrete and rail installation was completed by November of that year. Electrical cable replacement, connection, and power-up on Pier 3 were also finished in 2001.<sup>47</sup>

#### D. Buildings

Four buildings are located on Pier 3. They include buildings 4A, 5A, 6A, and 531. Only buildings 5A and 6A date to the construction of the pier (1944). Building 5A (Ordnance Storage, Pier 3), located at the northern corner of the pier, was constructed for use as a signal tower for communicating with ships arriving or leaving the pier area, but is currently used for storage. Located at the eastern corner of Pier 3, Building 6A (also referred to as Ordnance Storage, Pier 3) has always been used for storage. Two modern buildings can be found on Pier 3. Building 4A, constructed ca. 2000 at the southern corner of the pier, replaced Pier 3's decontamination and smokehouse, which was constructed at the same location in 1944 and was identical to Building 4N on Pier 2 in form and function.<sup>48</sup>

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<sup>45</sup> Naval Weapons Station Earle, "Command History, 1991" (Colts Neck, NJ: Naval Weapons Station Earle, 1991), 6.

<sup>46</sup> Naval Weapons Station Earle, "Command History, 1998" (Colts Neck, NJ: Naval Weapons Station Earle, 1998), 8, 25.

<sup>47</sup> Naval Weapons Station Earle, "Command History, 2001" (Colts Neck, NJ: Naval Weapons Station Earle, 2001), 18-20.

<sup>48</sup> Y & D Drawing No. 279447; The Cultural Resource Group, 74; David Smith, Base Civil Engineer, 2003, conversation with authors, Naval Weapons Station Earle, Colts Neck, NJ, 2 April.

Building 4A currently functions as a powerhouse/generator and breakshop.<sup>49</sup> Building 531 (Ordnance Storage, End of Pier 3), a modern, steel frame building constructed ca. 1990, is located at the northeastern end of Pier 3 between Buildings 5A and 6A.<sup>50</sup>

#### E. Conclusion

The Trestles and Piers at NWS Earle play a critical role in the delivery of ammunition to the ships of the United States Navy. Since their construction in 1944, the structures have evolved in response to changes in their mission brought about by technological advances. In 2002, Port Operations provided berthing and hotel services for seventy-four ships. The waterfront pier complex is unique in design and offers five ship berths with a wide range of services, including twenty-four-hour a day tugboat and harbor pilots; 4,000 amp shore power; steam; potable water; cable TV; phone lines; fiber optic T-1 connectivity; and line handlers.<sup>51</sup>

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<sup>49</sup> Smith, 2003.

<sup>50</sup> Y & D Drawing No. 279447; The Cultural Resource Group, 74.

<sup>51</sup> Naval Weapons Station Earle, "Command History, 2002" (Colts Neck, NJ: Naval Weapons Station Earle, 2002), 13.

## Part II: Descriptive Information

### A. General Character and Conditions

As constructed in 1944, Pier 3 consisted of a reinforced concrete deck and four loading platforms, located along the northwestern and southeastern edges of the pier, supported on timber piles (Figures 7-9). The structure was 1287'-0" long and 136'-0" wide. A double vehicular lane ran down the middle of the deck, and three railroad tracks were imbedded in the deck on both sides of the vehicular lane. Four buildings, Buildings 3A, 4A, 5A, and 6A were constructed on the pier in 1944, and these were located at the western, southern, northern, and eastern corners, respectively.<sup>52</sup> The pier itself has changed little over time--the overall dimensions and configuration of features have not changed dramatically; however, some materials have been replaced and general maintenance performed. These alterations are explained in detail in the previous section of this report. Figure 10 is an outline plan depicting Pier 3 as it appeared in 1999. The original Building 3A is no longer extant and Building 4A was replaced ca. 2000.<sup>53</sup> Building 531, located at the outshore (northeastern) end of the pier between Buildings 5A and 6A, was constructed ca. 1990.<sup>54</sup>

### B. Substructures

Pier 3 was constructed upon creosoted timber piles.<sup>55</sup> Pile bents were spaced 9'-0" apart and longitudinal batter piles were spaced 3'-3" to 5'-6" apart. Longitudinal bracing and cross-bracing was comprised of 3" x 10", 4" x 10", and 12" x 12" timber members. Pile caps consisted of 14" x 14" members spaced 9'-0" apart (atop the pile bents).<sup>56</sup> Pile caps were depressed 7" in areas where railroad tracks imbedded in the concrete deck

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<sup>52</sup> Lancaster, 7; Y & D Drawing No. 279357.

<sup>53</sup> Smith, 2003.

<sup>54</sup> The Cultural Resource Group, 74.

<sup>55</sup> Lancaster, 7.

<sup>56</sup> Y & D Drawing No. 279378, 279379, 279380, 279381, 279382, and 279383.

crossed one another (switch areas), necessitating a dropped slab and added reinforcement.<sup>57</sup> Members throughout the superstructure were fastened with 3/4" and 1" bolts.<sup>58</sup>

The concrete slab deck was reinforced with three layers (bottom, middle, and top) of 5/8" and 7/8" steel bars spaced at intervals ranging from 6" to 20"-9" in the longitudinal direction and from 8" to 1'-6" in the transverse direction.<sup>59</sup> The concrete slab ranged in depth from 1'-10-1/2" to 2'-5-1/2" thick.<sup>60</sup> The southwestern-most expansion joint was located 240'-0" northeast of the southwestern end of the pier, the second expansion joint was located 258'-0" northeast of the first, the third was located 267'-0" northeast of the second, and the fourth was located 258'-0" northeast of the third.<sup>61</sup> Grooves were built into the deck to accommodate eighty-five-pound rails set flush with the top of the deck.<sup>62</sup> Cleat and bitt (bollard) foundations were also built into the deck under the loading platforms along the northwestern and southeastern edges of the pier, and most of these were spaced at regular intervals of 36'-0". Drains and manholes measuring 36" in diameter were spaced 54'-0" to 69'-0" apart along the center of the deck. The top of the deck was pitched 1/2" toward these openings in three locations, and leveled at an elevation of 14'-0".<sup>63</sup>

### C. Loading Platforms

All four loading platforms were constructed of reinforced concrete and measured 18'-10" wide, inclusive of 3-1/2" thick wood bumpers bolted to the inside top edges and 12" x 12" wood curbs attached to the tops of the platforms on the outer edges.

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<sup>57</sup> *Ibid.*, 279380, 279384, 279406, and 279407.

<sup>58</sup> *Ibid.*, 279378.

<sup>59</sup> *Ibid.*, 279404.

<sup>60</sup> *Ibid.*, 279380.

<sup>61</sup> *Ibid.*, 279405, 279406, 279407, 279408, 279409, and 279410.

<sup>62</sup> *Ibid.*, 279404 and 279405; Lancaster, 10.

<sup>63</sup> Y & D Drawing No. 279405, 279406, 279407, 279408, 279409, and 279410.

The platforms each measured 496'-0" long, inclusive of 50'-0" long ramps at each end. The platforms were 3'-7" tall.<sup>64</sup> A 4" deep hollow concrete block curtain wall extended the length of all four platforms under the inner edges.<sup>65</sup> The cleat and bitt foundations built into the pier deck beneath the platforms extended up through the platform decks, and concrete-filled, cast iron cleats and bits were attached to these foundations with bolts.<sup>66</sup> Manholes measuring 24" in diameter were spaced at regular intervals on the platforms.<sup>67</sup>

#### D. Fire Protection System

The fire protection system on the pier complex consisted of the following features within the Utilities Building (Building S-63), facing Trestle 3 in the "Wye" area:

- One 2,000-gallon per minute, 125-pound pressure, electrical-driven, deep well turbine pump;
- two standby 1,000-gallon per minute, 125-pound pressure gasoline engine-driven, deep well turbine pumps;
- a 700-gallon per minute, fifty-pound pressure, electrical-driven, deep well turbine pump to circulate the water in the mains to prevent freezing; and
- a 175-gallon per minute, ninety-foot head, automatic electric-driven, centrifugal pump to supply water to plumbing fixtures when no other pump was operating.<sup>68</sup>

In addition, a 10" cast iron water main extended along one side of the section of the trestle measuring 34'-0" wide and along both sides of the remainder of the trestle and the piers. This main connected with the ends of water mains on the piers to permit connection of fire boat pumpers, and cross-connected with

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<sup>64</sup> *Ibid.*, 279364, 279378, and 279412.

<sup>65</sup> *Ibid.*, 279412.

<sup>66</sup> *Ibid.*, 279387 and 279413.

<sup>67</sup> *Ibid.*, 279405, 279406, 279407, 279408, 279409, 279410, 279412, and 279413.

<sup>68</sup> Lancaster, 10.

the fire protection system on the Barge Pier (Pier 1) and Trestle 1. A total of nineteen fire hydrants were spaced at intervals of approximately 150'-0" along the mains. The hydrants were connected to open-head sprinklers spaced 8'-0" apart on each side of the fire bulkhead walls and to sprinkler systems in the Decontamination Building (Building 4N on Pier 2 and Building 4A on Pier 3). The fire bulkhead walls were of timber construction and located at the deck construction joints. They extended across the trestles and piers, and from the bottoms of the deck slabs to 2'-0" below mean low water. The sprinkler lines were controlled manually by quick opening valves.<sup>69</sup>

A complete fire alarm system was installed on Piers 2 and 3. It consisted of five "Master type" stations, five auxiliary stations, four electro-mechanical gongs, two compressed air-operated "Daphone" horn plants, one control unit, recording equipment, and "necessary accessories and wiring."<sup>70</sup>

#### E. Fender System

The fender system for the pier complex consisted of Type A and Type B fenders. Type A, used along the outshore end of Pier 2 and along Trestles 2 and 3, consisted of the following: A fender pile in line with each bent, located 4'-0" from the edge of the deck, and connected to the deck with two 4" x 10" timber members; 12" x 12", continuous timber members behind the piles and between the 4" x 10" members; and 10" x 12" chocks between the piles. Type B, used along the sides of Piers 2 and 3 and the outshore end of Pier 3, consisted of a fender pile in line with each pile bent, located along the edge of the deck, and 10" x 12" timber chocks between piles.<sup>71</sup>

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<sup>69</sup> *Ibid.*, 10-11.

<sup>70</sup> *Ibid.*, 11.

<sup>71</sup> *Ibid.*, 8.

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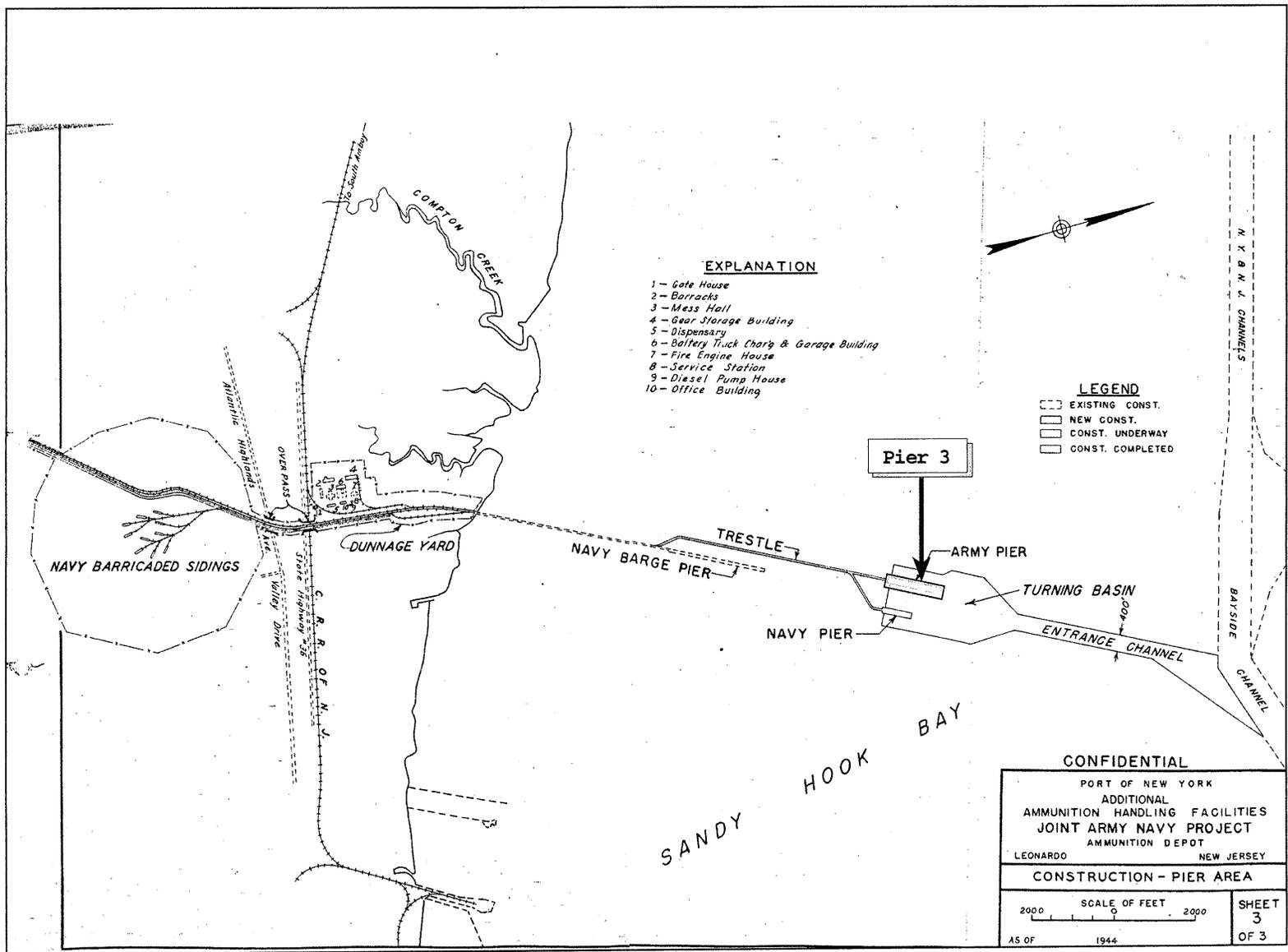
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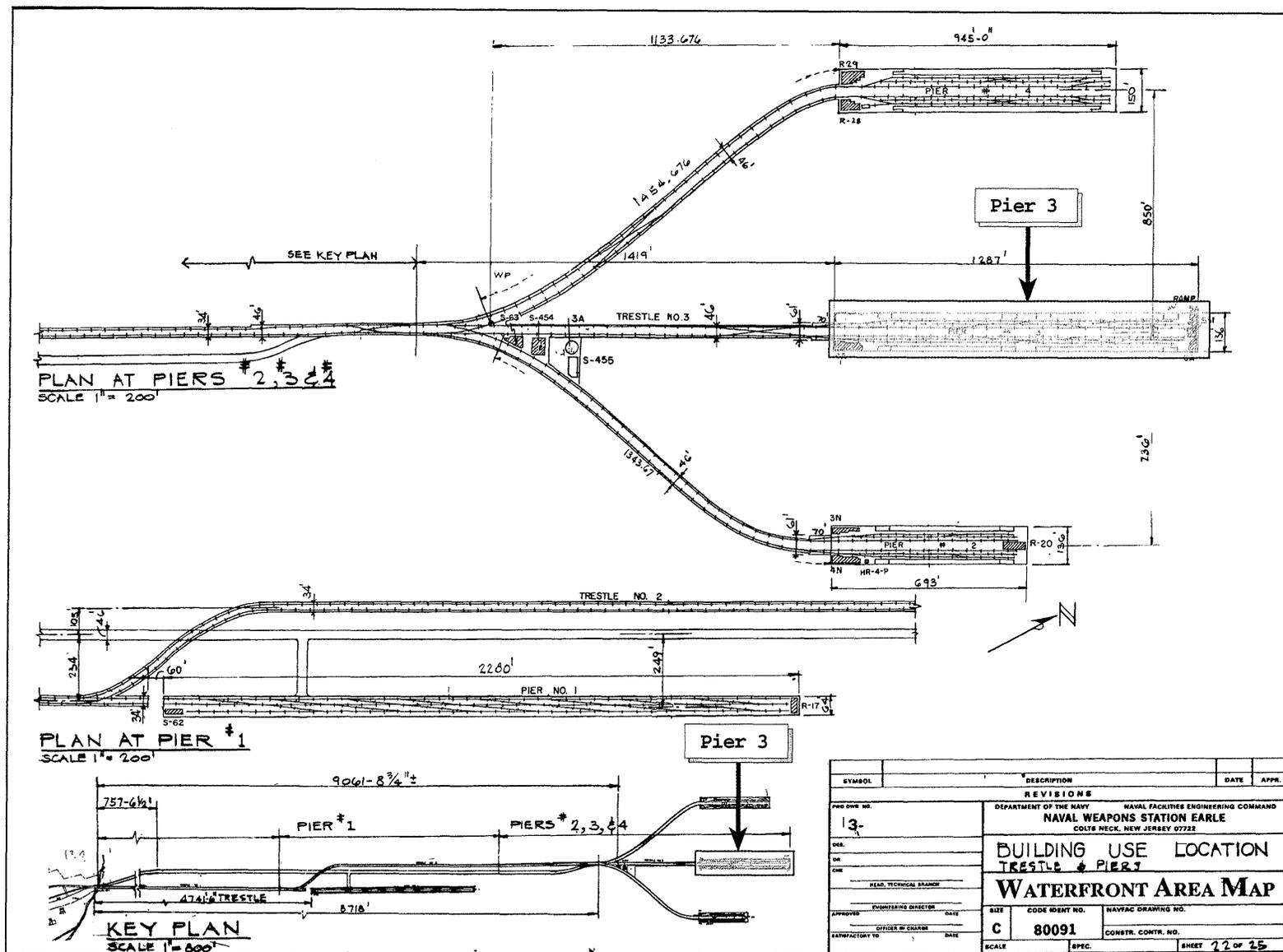
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General Construction Map, Pier Area, 1944  
 (source: Lancaster 1945)

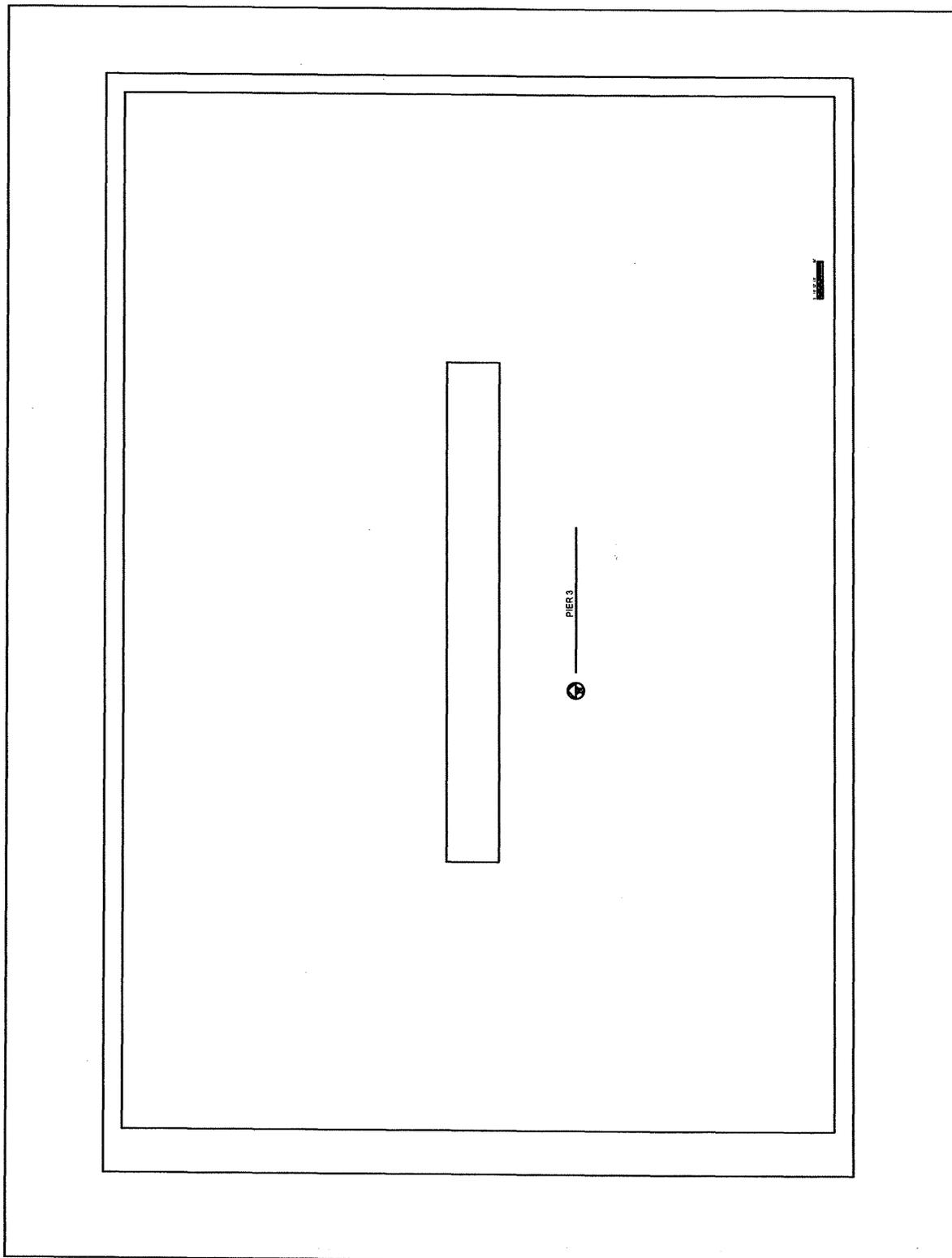
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Location Map and General Plan, Pier Area, 1994  
 (source: Naval Weapons Station Earle, Base Civil Engineering Office 1994)

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Outline Plan, Pier 3, 1999  
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