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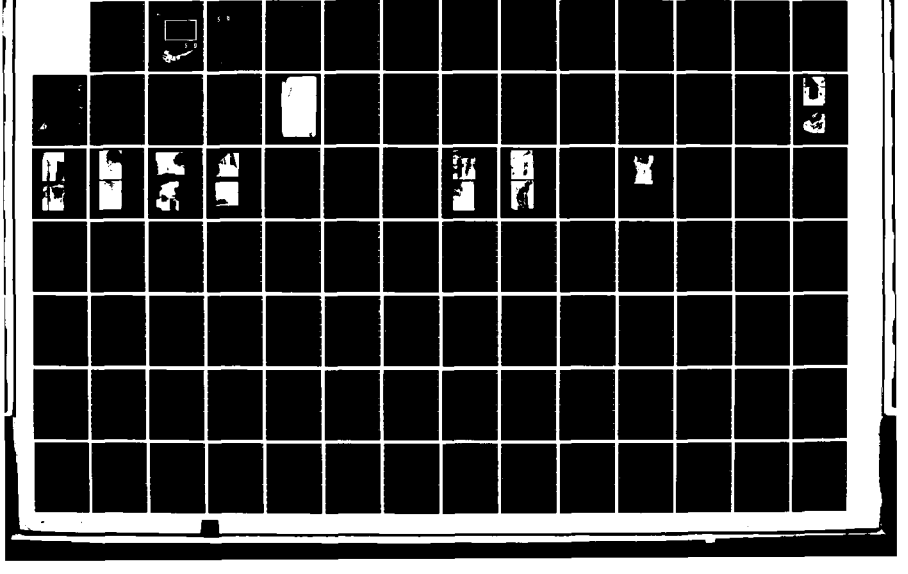

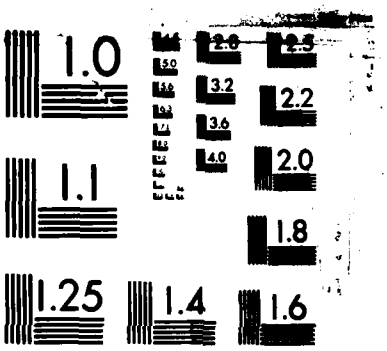

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UNDERWATER FACILITIES INSPECTIONS & ASSESSMENTS

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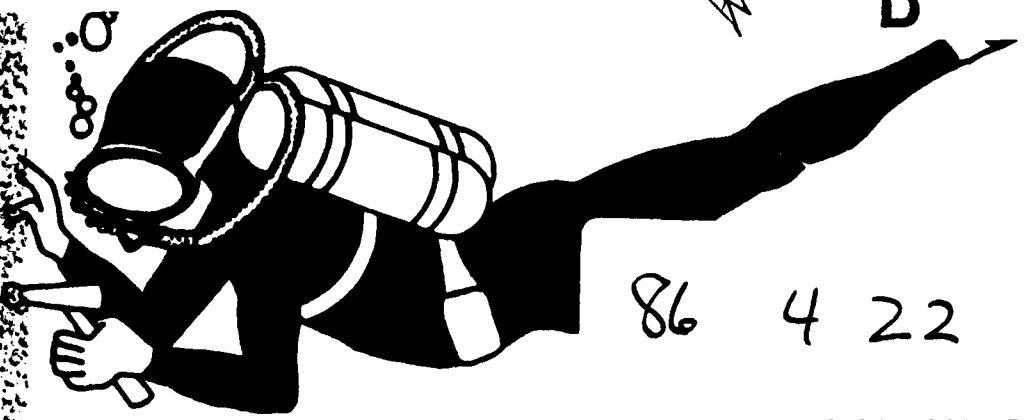
U.S. NAVAL WEAPONS STATION YORKTOWN, VA

FPO-1-80 (18) SEPTEMBER 1980



OCEAN ENGINEERING AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D.C. 20374

(1)

UNDERWATER FACILITIES INSPECTIONS AND ASSESSMENTS AT

U.S. NAVAL WEAPONS STATION YORKTOWN, VA

FPO-1-80 (18) SEPTEMBER 1980

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PERFORMED FOR:

OCEAN ENGINEERING AND CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON, D.C. 20374

UNDERWATER INSPECTION BY:

UNDERWATER CONSTRUCTION TEAM ONE (UCT-1)

REPORT PREPARED BY:

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The object of the underwater facilities assessments conducted at the U.S. Naval Weapons Station, Yorktown, Virginia, was to provide a generalized structural report and assessment of the principal berthing facility at that activity. That facility is the R3-Fleet Weapons Pier (Wharf) which is (Con't)

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FOREWORD

The scope of the inspection at the U.S. Naval Weapons Station, Yorktown, Virginia, and the detail to which it was performed and reported was tailored to the conditions at this facility. This report is not intended to be a standard for underwater inspections or reports covering other activities. Attempts are being made, however, toward establishing standards for procedures and reporting formats for underwater inspections and assessment reports. Through these standards, inspections performed by different persons or activities on different facilities under a wide range of conditions, can be effectively compared. It is expected that the inspection and assessment of the Weapons Station, Yorktown berthing facility, like previous operations mandated by the underwater portion of the Specialized Inspection Program, will contribute significantly toward achieving that objective.

The choice of the level of inspection to be conducted is dictated by an engineering judgement and the quantity of work, constrained both by time and personnel support available. Accordingly at Yorktown, VA, a Level I - General Visual Inspection, was conducted by UCT-1.

Executive Summary

The objective of the underwater facilities assessments conducted at the U.S. Naval Weapons Station, Yorktown, Virginia, was to provide a generalized structural report and assessment of the principal berthing facility at that activity. That facility is the R3-Fleet Weapons Pier (Wharf) which is the only facility used to load and unload ammunition to and from ships and lighters.

This report documents the findings of a Level I underwater inspection conducted on 8-15 September 1980 by Underwater Construction Team ONE (UCT-1), with technical guidance and direction by the Ocean Engineering and Construction Project Office (FPO-1), Chesapeake Division, Naval Facilities Engineering Command.

The inspection was limited in scope to a Level I investigation using visual and/or tactile means of examination, providing still photographic documentation where feasible. The inspection objective was to provide a general assessment of the structure's physical condition documenting any mechanical, biological, or corrosion damage, with emphasis on any advanced stages of deterioration.

Because of the huge amount of piles in this structure, over 4600, a random sampling technique was primarily employed to select and inspect about ten percent of the piles, with heavier emphasis on the older sections of the wharf.

Executive Summary (cont'd)

Overall the piles within this facility were rated as being in good condition. In general a greater number of piles within the new section (percentage wise) were rated in good condition with only 3 out of 192 piles rated as fair. The older section of the pier face and approach trestle have some piles which require immediate attention to prevent further deterioration and structural damage, as detailed in the report. These 13 and 20 piles out of 195 were rated fair and poor respectively.

No sections were observed to have advanced structural deterioration or damage such that the pier's structural capacity or function should be downgraded. In the southeast corner of the old pier face some structural damage was observed and the old approach trestle has piles, pile caps, and stringers in need of prompt repair to prevent further deterioration, erosion, and loss of structural integrity as described in a previous inspection report by Abiousness Cross and Bradshaw, Inc.

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SECTION 1 INTRODUCTION

This report is a product of the Underwater Inspection Program conducted by the Ocean Engineering and Construction Project Office (FPO-1), Chesapeake Division, Naval Facilities Engineering Command (NAVFACENGCOM) under NAVFAC's Specialized Inspection Program.

This program provides for underwater inspections of the structural portions of piers, wharfs, bulkheads and other waterfront facilities as needed or required in order to determine the total facility conditions and to report the results of such inspections, so that repairs can be scheduled and completed.

A structural facility assessment is made in those cases where the inspection indicates such need.

1.1 TASK DESCRIPTION

The scope of work required under this portion of the program provides a general structural assessment of the findings, including repairability recommendations of the underwater portions of the Fleet Weapons Pier, Structure R-3, at the Naval Weapons Station, Yorktown Va, as a result of the inspection conducted 8-15 September 1980.

1.2 REPORT CONTENT

In this report the inspection procedures, results of the inspection, recommendations and analysis of the findings are addressed. The principal berthing facility at the Naval Weapons Station is described as to its location, function, construction, and current condition as assessed by this inspection. Recommendations for further inspection and repairs are included. As supplementary information, a brief

description of the Naval Weapons Station is provided, including its history, mission, existing facilities, hydrographic, and topographic features.

SECTION 2 ACTIVITY DESCRIPTION

The purpose of this section is to provide a general description of the Naval Weapons Station, Yorktown, Virginia. Included in this section will be brief discussions of the Naval Weapons Station's location, mission, history, existing facilities, climatological and meterological data and hydrology. This information is provided to supplement the later sections of this report and to support all considerations necessary to accurately assess the structural condition of the waterfront facility inspected in this survey.

2.1 LOCATION OF ACTIVITY

The Naval Weapons Station, Yorktown, Virginia is located in Southeastern Tidewater Virginia as shown in Figure 2-1. The Weapons Station is located on the western shore of the Chesapeake Bay on a peninsula formed by the York and James Rivers. This historic peninsula contains the renowned triangle formed by Williamsburg, Jamestown, and Yorktown. At the peninsula's southern end is Newport News, known for its shipbuilding and port facilities. Adjoining Newport News is the city of Hampton. Established in 1610, Hampton is the oldest English-speaking settlement in continuous existence in America today. Langley Air Force and Fort Eustis are also on this peninsula.

The Naval Weapons Station Yorktown fronts on the York River as can be seen in Figure 2-2. The peninsula may be reached on land via Interstate 64, U.S. Routes 17 and 60, and Virginia Routes 143 and 238. The Weapons Station is approximately 80 highway miles from Richmond, the capital of Virginia, 180 miles from Washington D.C. and approximately 30 miles north of Norfolk, Virginia. The Weapons Station is located near the town of Yorktown. It is bounded on the west by the U.S. Naval

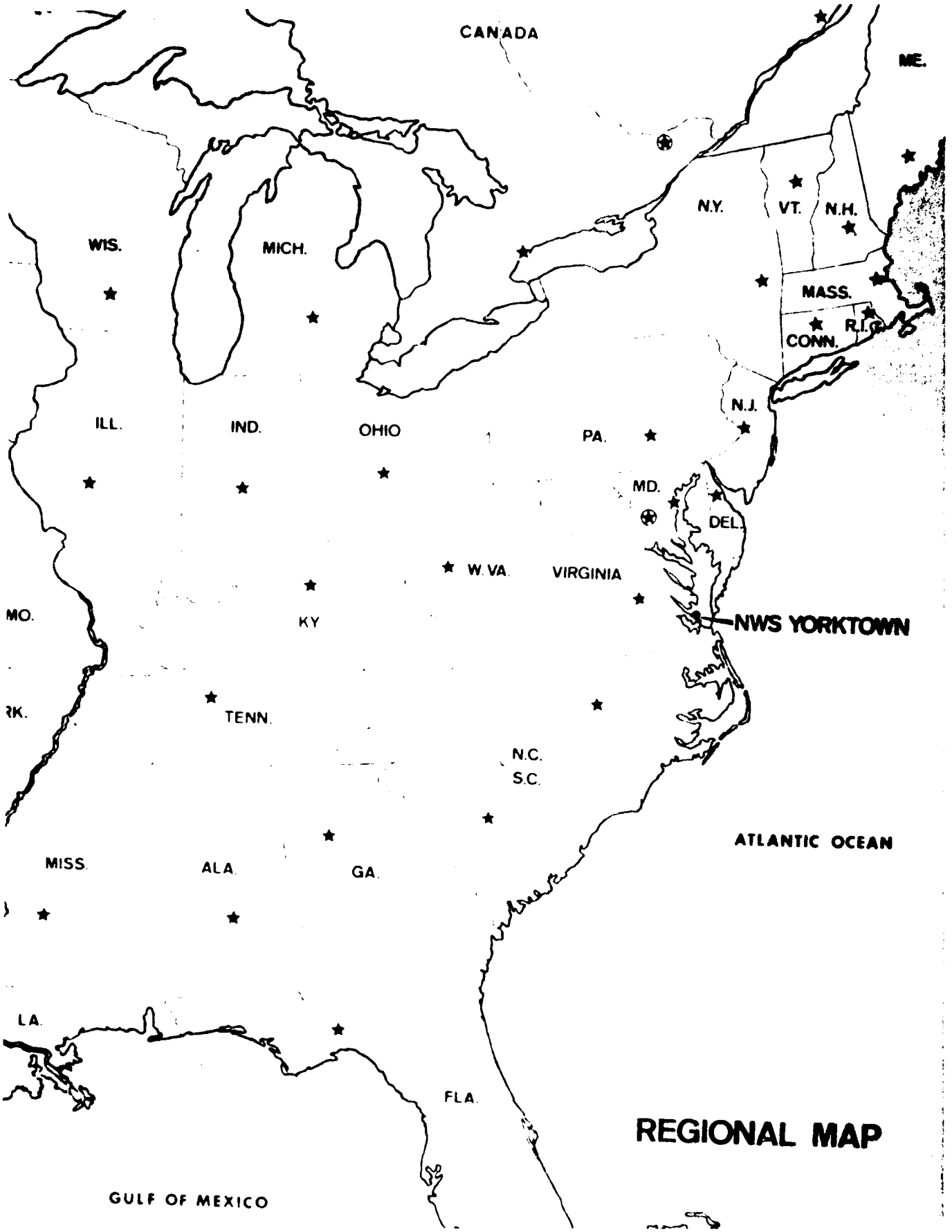


Figure 2-1. NWS Yorktown, Regional Map

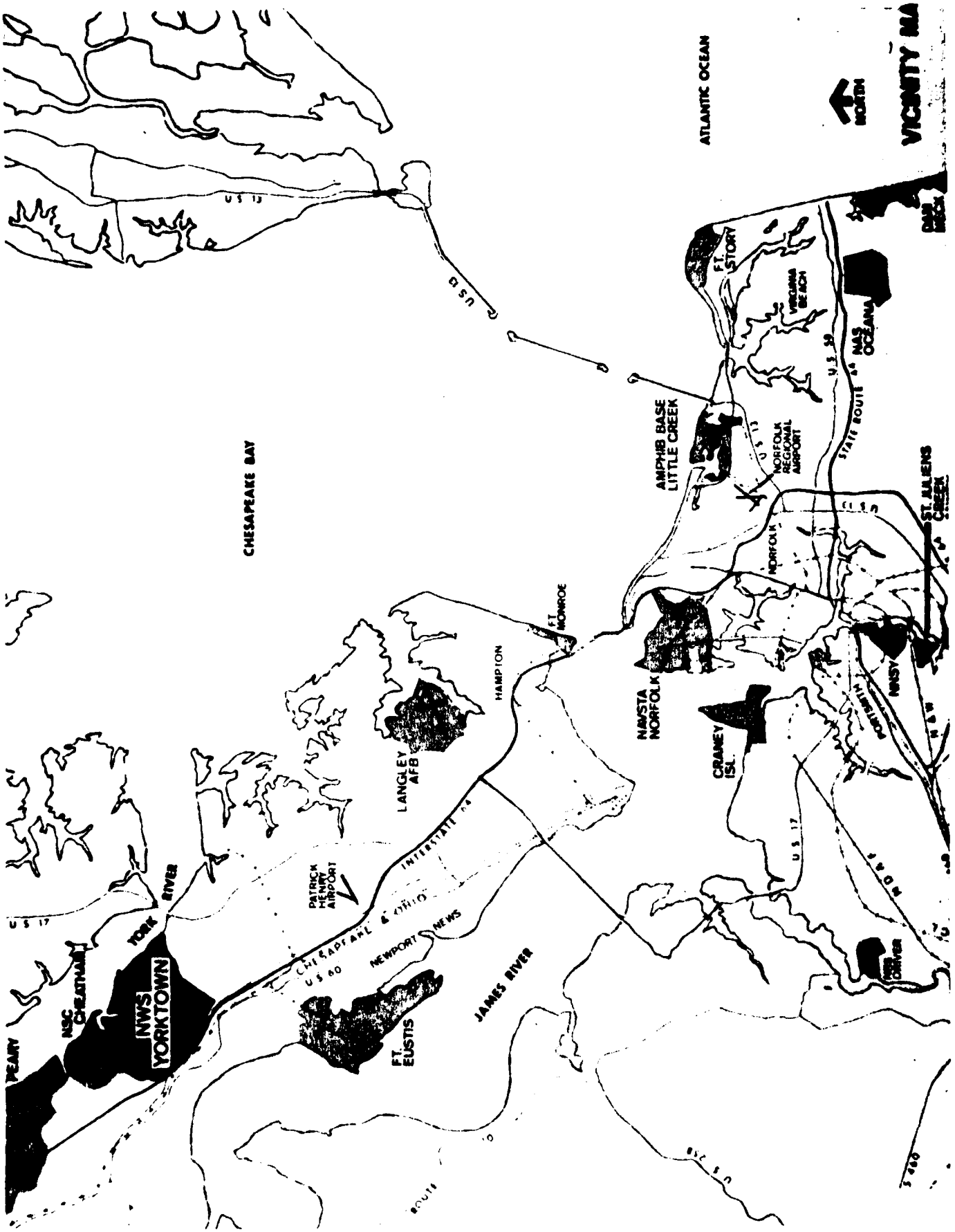


Figure 2-2. NWS Yorktown, Vicinity Map

Supply Center's Cheatham Annex, on the north by the Colonial Parkway and York River, on the east by agriculturally zoned private lands, and by Interstate Highway 64 on the south.

2.2 MISSION AND COMMAND ORGANIZATION OF NAVAL WEAPONS STATION, YORKTOWN

The mission of the Station as assigned by NAVORDINST 5450.17A of 16 January 1969 is: To receive, store, overhaul, test, modify, explosive load and accomplish such other work as necessary for the production, issuance, and maintenance of mines, torpedoes, depth charges, other underwater weapons, bomb type munitions, rockets, guided missiles, and other expendable ordnance, conduct high explosive research and development applying to production, loading, assembly, and test procedures; and to perform other weapons engineering tasks as assigned by NAVSEASYSCOM.

The Station under the command or cognizance of the Commanding Officer is structured to implement its mission with 13 departments, two special assistants, and eight component commands. Detailed functional descriptions may be found in the Station Organizational Manual.

2.3 HISTORY OF THE NAVAL WEAPONS STATION

In 1917, a search was initiated by the Naval Ordnance Command to locate, on the Atlantic Coast, a site for the establishment of a weapons handling and storage facility. The basic criteria was: (1) a sheltered inland deep waterway, (2) a sparsely populated area sufficient in size to provide quantity-distance separation for explosive materials, and (3) close to the Naval Base at Norfolk.

A site was found on the south bank of the York River about four miles upstream from Yorktown. The U.S. Mine Depot, Yorktown was commissioned on 1 July 1918 to support the laying

of mines in the North Sea during World War I. The property, with a history dating from early Colonial times, was obtained by Presidential Proclamation on 7 August 1918. During the twenty years following World War I, the depot received, reclaimed, stored, and issued mines, depth charges, and related materials. During World War II new plants were completed and torpedo overhaul facilities were added. In 1944, an ordnance research and development laboratory was established.

The U.S. Mine Depot, now designated as a U.S. Naval Weapons Station has continued to support the fleet with more modern and sophisticated weapons including special weapons, guided missiles, rockets, and bombs. The station serves as the central design agency for explosive loading, processing, and documentation for all weapons and weapon component explosive loading.

The Naval Weapons Station Yorktown currently contains 10,522.99 acres (16.44 square miles). This acreage was acquired over a period of 55 years, beginning with the original parcel of 11,433 acres. Subsequent transactions have, by acquisitions and dispositions, reduced the Station area to its present size.

2.4 WATERFRONT FACILITIES

The Naval Weapons Station fronts on the York River. The York River is formed at the confluence of the Pamunkey and Mattaponi Rivers and extends for approximately 30 miles before emptying into the Chesapeake Bay. The river averages two miles in width but narrows to half a mile at Gloucester, just before emptying into the Chesapeake Bay. The river provides an excellent and well-used commercial and pleasure waterway with a channel averaging 50 feet in depth and rising to 37 feet at its mouth. Most of the tanker and fuel barge traffic (approximately 1,200 ship operations) terminate their voyages downstream of the Weapon Station and the Coleman Memorial

Bridge. The commercial vessels utilizing the York primarily have drafts ranging up to 31 feet. In addition to the commercial river traffic, numerous pleasure craft of all sizes continually sail/motor up and down the river. The largest naval vessels which are currently accommodated at NWS Yorktown are the fast combat support ships (AOEs). Due to the restrictions of the pierside depth, capital ships are limited to designated naval anchorages east of the Coleman Memorial Bridge at Gloucester.

Support of Fleet requirements for conventional and special ordnance is accomplished by "over-the-pier" off/on loads and by barge deliveries to the explosive anchorages located near the Naval Station, Norfolk. Wharf operations are conducted from the only waterfront facility existing, the Ammunition Wharf.

The NWS Ammo Wharf extends into the York River and is located one and one-half (1 1/2) miles west of the Coleman Memorial Bridge at Yorktown. The wharf is U-shaped, of concrete construction, and has approximately 2240 feet of berthing on the outboard face. The northwestern leg of the wharf has a lift span bridge enabling barges, lighters and service craft to moor on the inboard side of the wharf. Ordnance off/on loading operations are performed by a 25-ton capacity, track mounted, mobile crane or by any of three truck-mounted, 19-ton capacity cranes. A smaller wooden pier, just east of the ammo wharf, is currently used for recreational purposes. An aerial photograph of this facility as attached as Figure 2-3.

A dredging operation was performed on the outboard face area of Pier R3 in September 1980 to a depth of 42 feet below the station low water datum. A post dredging survey completed in October 1980 confirmed the minimum depth to be greater than 42 feet along the outboard wharf face for its entire length.

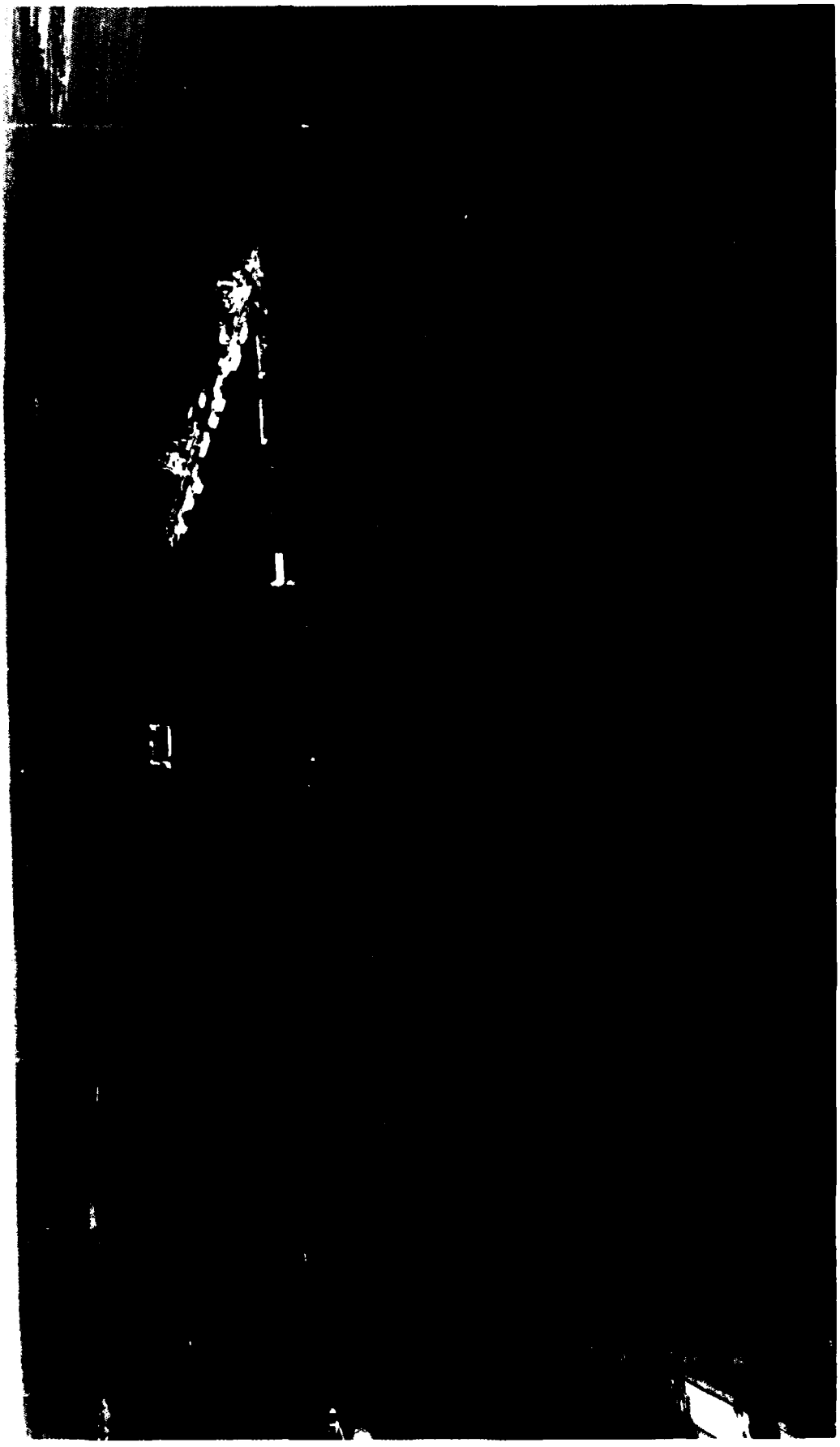


Figure 2-3. NWS Yorktown, Facility R3 Fleet Weapons Pier

2.5 CLIMATOLOGICAL AND METEOROLOGICAL DATA

The Peninsula weather is generally moderate with average temperatures ranging from 41°F in January to 79°F in July. Precipitation is well distributed throughout the year with the heaviest rains occurring during summer and early fall. Snowfall averages nine inches a year and occurs chiefly in December and January.

2.6 TOPOGRAPHY AND HYDROLOGY

NWS Yorktown is located in an area with slightly rolling hills; elevations vary from 5 to 80 feet above sea level with occasional steep slopes occurring at the river banks. The rolling terrain forms natural watershed areas, controlling and channelizing surface drainage. The soil varies from sand to clay with several inches of friable wood and leaf mold in wooded areas. Marshy wetlands occur frequently along the banks of the area's many lakes and tidal inlets.

2.7 TIDES

The tidal ranges on the York River, measured in reference to Mean Low Water (chart datum) are:

Mean tide range 2.4 feet
Spring tide range 2.9 feet

SECTION 3 INSPECTION PROCEDURE

3.1 LEVEL OF INSPECTION

From 8 through 15 September 1980, a team of divers and technician/divers from UCT-1 performed a Level I on-site underwater inspection of selected piles at the Fleet Weapons Wharf, Yorktown, Virginia, to provide a general assessment of its physical condition. Visual/tactile observations of a pile's condition at mudline, mid-depth, and splash zone levels were performed. In addition, pile caps and stringers were observed and photographed from a small boat.

3.2 DEFINITION OF LEVEL I INSPECTION

Level I underwater inspections assess the general condition of a structure utilizing visual/tactile inspection techniques. In an open-type structure, this assessment generally consists of a close inspection of all exterior vertical and batter piling (exclusive of fender piles) and some percentage of the interior piling as well as a check for gross structural deterioration on all remaining piles. For bulkhead-type structures, visual/tactile observations of the structure's condition at mudline, mid-depth, and splash zone levels are performed. This level of assessment is designed to give a general condition assessment of the structure and should identify any areas that have been mechanically damaged or are in advanced sites of deterioration. Visual documentation (utilizing underwater television and/or photography) and limited physical measurements must be sufficient for documentation of the findings.

3.3 INSPECTION PROCEDURE

Before each section of the approach trestles and piers were inspected, as built drawings were consulted and bents and pile locations were marked off. For ease of computations and

verification, the structure was divided into sections, each corresponding to an expansion joint, nominally every 30 bents. Each section was then progressively examined by divers and tender/note takers who recorded observed details for future reference and analysis. The diver, starting at a known location, reported the result of each pile inspection upon completion to the tender who verified the bent location and pile number. Direct diver to tender communication permitted simultaneous transmittal of data.

This coupled with a pneumofathometer, allowed not only the noting of any damage but the exact depth at which it occurred. Divers also noted not only depth, type, and extent of damage but also the pile face on which it occurred.

The inspection plan called for only a selected inspection of the piles in the pier. Both time and cost constraints necessitated this approach because of the huge amount of piles in this wharf structure, approximately 4627. The plan called for a random selection of both bent and pile number to be inspected within a pier section to achieve a 10% sampling of piles within the whole structure. This random selection process was completed before the inspection commenced and the diver and tender/notekeeper proceded together from a known bent/pile to the next bent/pile to be inspected using the as built drawings as guides.

The inspection covered the zone that began at the mudline, went through the submerged, tidal, and splash, zones. In addition, a team in a small boat made a cursory visual inspection of pile caps, stringers, and under deck portions of the wharf structure to verify data from a previous above water inspection report. Photographs were taken above and below water to show representative conditions. Standard underwater photography was not used because of extremely poor visibility,

however with the use of an underwater camera coupled with a clear water box, some successful photography was achieved although this equipment is still under development. All fendering systems, pier utility systems, and expansion joints were not within the scope of from this inspection, and thus excluded.

3.4 INSPECTION EQUIPMENT

Specialized equipment used during the inspection included: Nikonos underwater camera with strobe, clearwater viewing apparatus, dive lights, folding rule, chipping hammers, calipers, dive knives, Mark 1 surface supplied dive system, pneumofathometer, and a diver/surface communication system.

The only waterfront facility in use by the Fleet at the Naval Weapons Station, Yorktown, Virginia, is the Fleet Weapons Pier (Wharf), Facility R-3, which fronts on the York River. This wharf is U-shaped, of concrete construction, and has approximately 2240 feet of berthing space on the outboard face.

4.1 DESCRIPTION

A sketch of the Fleet Weapons Pier R-3 appears below as Figure 4-1

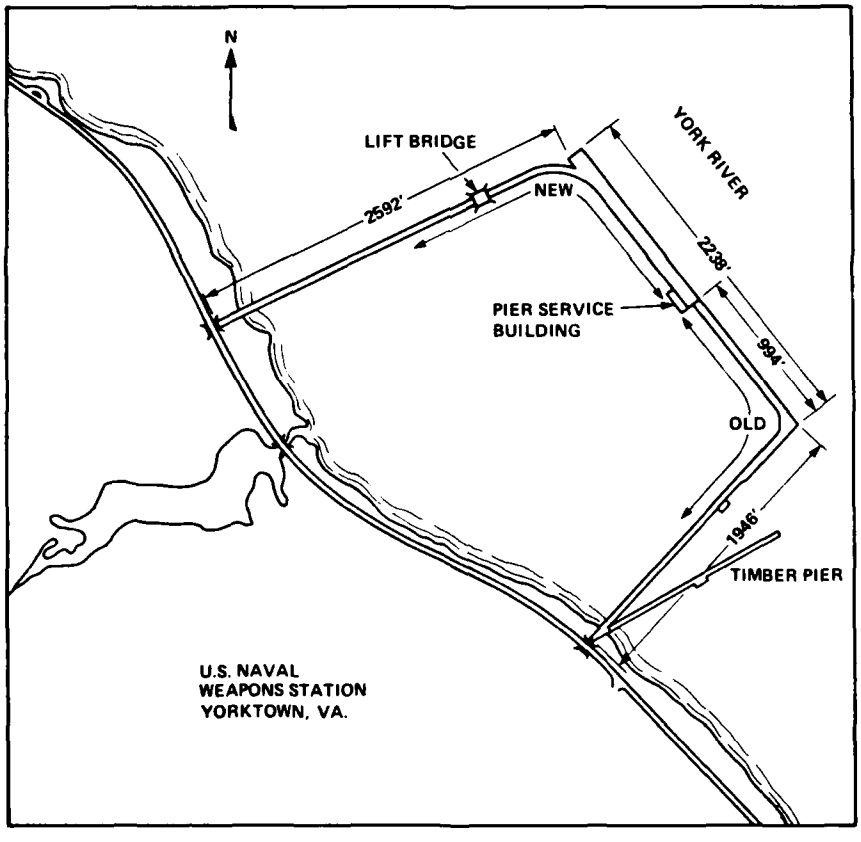


Figure 4-1

The southern approach trestle, Bents 1-163, and southern pier face section to Bent 252 were built in the 1941-1942 era. The approach trestle is 1946 feet long and 24 feet wide, widening to 33 feet in the outer third. This leads to the old pier face which runs from bents 164-252; it is 994 feet long and 42 feet wide. The northern sections consisting of an approach trestle and a wider pier face were constructed in 1964. These join the old southern section to form a U and wharf. The newer wider pier section is 1244 feet long and 93 feet wide. It extends from Bents 245-350 and contains the Pier Service Building. The northern approach trestle, containing a lift bridge is 2592 feet long and 24 feet wide. It consists of bents T1 at the outboard end to T 140 at the land end. Both approach trestles and the wharf frontage include railroad tracks on the deck.

The total wharf length, of the old and new sections joined, is 2238 feet frontage on the York River with depths alongside of 42 feet (October 1980). The wharf has a track mounted 25 ton capacity mobile crane as well as truck mounted 19 ton capacity mobile cranes.

4.2 PRIOR WATERFRONT FACILITY INSPECTION

A structural inspection was made of the Ammo Wharf, R-3 by Abiousness Cross & Bradshaw, Inc. in April 1978. This structural inspection did not include any of the underwater aspects, nor the buildings, electrical, plumbing, or railway systems on the pier. It consisted of an examination of the pier decking and below the deck above the waterline by boat.

The report is significant in that it reported prior repairs in the original segment of the pier to the pilings, pile caps, and stringers and the fact that these repairs had failed in some areas. It also reported that many of the expansion joints were in various stages of deterioration and

recommended repairs. The stringers supporting the edges and rail beds were reported as cracked in many areas. Pile caps showed moderate deterioration in many locations, including numerous cracks in areas that had been previously patched. The report also stated that some earlier repairs to the piles showed new cracks and surface deterioration.

Similar conditions to those noted above were observed during the September 1980 inspection by UCT-1 and are depicted in the attached photographs.

4.3 OBSERVED INSPECTION CONDITIONS

As discussed in Section 3.3., piles were randomly selected for inspection. Appendix A contains the pile plans for the entire Fleet Ammunition Wharf, in which inspected piles are designated by blackening the pile. The reader may refer to the pile plan for each section. The plans are labeled by Bent Number and pile number. Appendix B contains the pile inspection data sheet which contains additional data on the piles inspected. Both appendices may be referred to in order to locate the position of bent and piles referred to in the following remarks and photographs. The pile numbering and designation system used followed the same one shown on the as built drawings. Where no system was indicated an arbitrary pile designation system was set up.

4.3.1 Southern Approach Trestle (Right side), 855 Piles, Bents 13-161.

The inspection commenced on 8 September 1980 at the right approach leg. This approach trestle section, built in 1941-42, contains 161 bents and 855 piles, see pages A-3 through A6. A total of 97 piles were inspected in this section for a 12 percent sampling. The inspection commenced at Bent 13 as the lower numbered bents were on land or in the beach approach

area. This older section, because of prior repairs, contains many piles with concrete jackets surrounding the original piles and wooden forms covering the concrete jackets, (see Photograph 4-1). Overall these wood forms were structurally intact but precluded an inspection of the physical or structural integrity of the pile beneath the form which extended to the mudline. In those cases where it was possible to inspect the piling below the wooden form such as Bent 42, pile P-6, where the wood jacket stopped 2 feet above the bottom, concrete aggregate and spalling were observed on all four corners causing rounding of the pile. Similar deterioration was observed in Bent 54, BP-4, and Bent 62, BP-4 where rebar was exposed in both instances. 21 jacketed piles were inspected. In future inspections some of the wooden jackets should be removed from the piles to check conditions of the underlying concrete pile.

On the piles inspected which did not have wood forms, evidence of spalling, exposed aggregate and cracks were commonplace with hourglassing being present on several piles. (Photos 4-2, 4-3 and 4-4). Photograph 4-3 is an extreme example of loss of cross sectional area at Bent 25, P6. A good deal of the observed erosion was in the splash and tidal zones. Other similar conditions were observed underwater. Moderate marine growth was observed on many piles, in other cases the marine growth was minimal (Photos 4-5 and 4-6).

In addition to the pile inspection conducted by the divers, a visual inspection of the piles, pile caps and stringers was made by small boat. This section of the wharf had been repaired at some unknown time in the past. The inspection revealed numerous areas of cracks, exposed aggregate, exposed rebar both in the original structure and in areas which have been repaired previously. Photos 4-7, 4-8, 4-9, and 4-10 show evidence of conditions observed and is typical along this approach trestle. No serious structural

Photo 4-1

Southern approach pier, old section

Typical wooden forms over previously repaired piles

Photo 4-2

Southern approach pier bearing pile

exposed reinforcement mesh, failed repair area

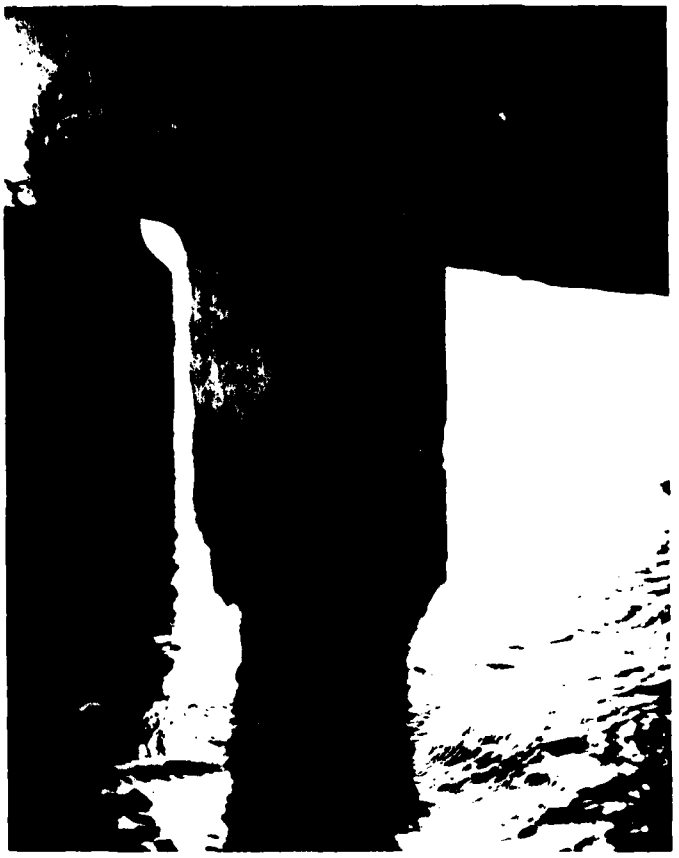


Photo 4-3

Southern approach pier

Bent 25, Pile 6, showing hourglassing, exposed rebar and aggregate.

Pile cap shows cracks in section with prior repairs

Pile 5 this bent has similar conditions underwater

Photo 4-4

Southern approach pier

Batter pile, typical, showing bleeding rust, cracks, and spalling

Photo 4-5

Southern approach pier

Bent 106, pile 7
spalling and exposed
aggregate

Photo 4-6

Southern approach pier

Bent 156, pile 8
marine growth, cracks,
spalling all faces.

Photo 4-7

Southern approach pier Cracks and bleeding rust in areas of prior repairs along pile caps. Indicative of corroding rebar which will lead to further cracking and then spalling.

Photo 4-8

Southern approach pier

Cracks in pile caps and stringers in areas of prior repairs.

Typical erosion of piles

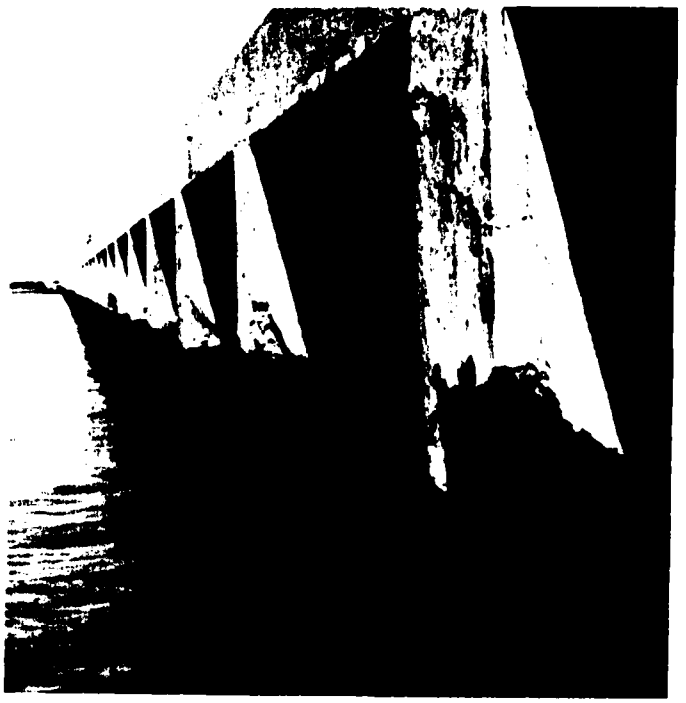


Photo 4-9

Southern approach pier

inboard side
cracked cap ends
exposed aggregate
rebar showing.

Wooden forms visible
around piling (previous
repair)

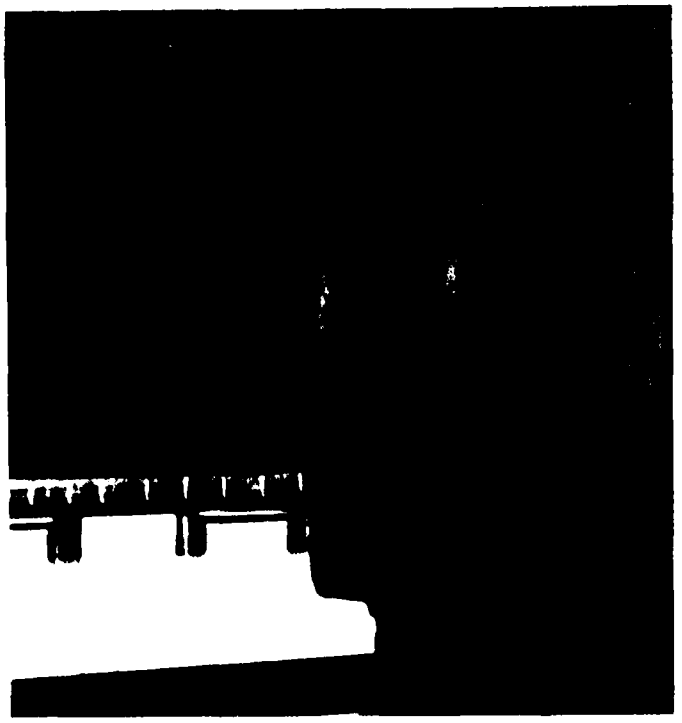


Photo 4-10

Southern approach pier

typical cracked stringer

Fishing pier visible in
background

failure areas were observed, however it is recommended that repairs be made in those areas where structural integrity would be impaired over time by further deterioration and erosion.

Of the 97 piles inspected in this section 79 or 81% were rated in good condition. Twelve (12) piles were rated as fair condition, and six (6) piles were rated as poor condition. (See Table 4-1 below)

Table 4-1

Inspection Results, Southern Approach Trestle

Fair Piles (12)

Bent 42, P6	Bent 83, P5
Bent 46, P5	Bent 89 BP7
Bent 51, BP7	Bent 91 BP4
Bent 62, BP4	Bent 106 BP7
Bent 64, P4	Bent 139 BP7
Bent 76, BP4	Bent 156 P8

Poor Piles (6)

Bent 25 P5	Bent 62, BP4
Bent 25 P6	Bent 66, P5
Bent 54 BP4	Bent 76, P6

The above piles, locations should be among the first scheduled for repair and maintenance.

4.3.2 Old Wharf Section - (South End) 823 piles, Bents 164-252.

This pierhead section is of the original construction period in 1941-1942. It is 994 feet long and 42 feet wide. (see page A-6, A-7, A-8) The underwater inspection revealed conditions typically similar to those found in the southern approach trestle. Evidence of spalling, minor cracks, abrasion, exposed aggregate, and corrosion of rebar was seen. No exposed rebar was found in this section and only moderate marine growth was observed. The worse deterioration was observed in the splash zone. Characteristically the most severe deterioration is found in this region of concrete structures.

A total of 98 piles were randomly selected and inspected in this section giving an 11.9 percent sampling size. Clearly the most critical damage was found in 12 outboard batter piles located in the first 12 bents starting from the corner identified on page A-6, as bents 164 through bent 175. Each batter pile has a crack which runs around the perimeter of the pile across all four faces. The crack is roughly 2 1/2 feet down from the pile cap and could have been caused by ship impact damage or overdriving the pile during construction. The fact that the 12 cracked piles are in adjacent bents tends to support the collision damage assessment. Photographs 4-11, 4-12, and 4-13 show examples of these cracks, their apparent penetration across the entire pile, and their location relative to the pile caps. Photo 4-14 shows an adjacent bearing pile with vertical and horizontal cracks.

It was not possible to determine the interior defects caused by these cracks which apparently run through the entire cross section almost perpendicular to the piles length. These cracks were observed by inspection via small boat and no

similar cracks were observed in adjacent bearing piles. A more complex inspection and examination of all piles in this area is recommended so that repairs can be initiated.

Of the 98 piles inspected in this section, 82 were in good condition, 1 was in fair condition and 15 were considered in poor condition (most of these are the batter piles discussed above). See Table 4-2 for a listing of observed damaged piles.

Table 4-2

Inspection Results, Old Wharf Section

Fair Piles (1)	
Bent 171, BP1	
Poor Piles (15)	
Bent 164, P1	Bent 168, BP1
Bent 178, P2	Bent 169, BP1
Bent 178, BP1	Bent 170, BP1
Bent 164, BP1	Bent 171, BP1
Bent 165, BP1	Bent 172, BP1
Bent 166, BP1	Bent 173, BP1
Bent 167, BP1	Bent 174, BP1
	Bent 175, BP1

Photo 4-11

Cracked batter pile.

Outboard corner-old section

Bents 164-175 typical

Photo 4-12

Cracked batter pile.

Typical bents 164-175 outboard corner-old section

Photo 4-13

Cracked batter pile

Outboard corner-old section

typical bents 164-175

Photo 4-14

Cracked bearing pile.

Vertical and horizontal crack, bleeding rust, exposed aggregate and spalling

4.3.3 New Wharf Section - (North End), 239 piles Bents 245-350.

This new section, constructed in the 1964 period, is approximately 1244 feet long and 93 feet wide on the deck; the width of the wharf face at the pier Service Building is 118 feet. See pages A-9 through A-14. Each bent contains at least 22 piles, two of which are batter piles. Blueprints of the wharf revealed that bents 245-252 in this section have the same numbers as bents in the old adjacent section, this numbering was adhered to in both Appendices A and B.

The inspection revealed little damage. The vast majority of piles and the underside areas of the wharf were rated as good. Of 164 piles inspected, 161 were rated as good, and 3 piles were rated as fair. Photograph 4-15 is a worse case example found in this section. The photograph shows a batter pile exhibiting cracks, exposed aggregate and spalling at the waterline. There were no piles rated as poor. Pile caps and stringers all appeared structurally sound and in good condition both by underwater inspection and a visual inspection by boat.

Table 4-3

Inspection Results, New Wharf Section

Fair Piles
Bent 245, P22
Bent 304, P22
Bent 314, P13

Photo 4-15

Northern wharf section (new). Worse case bearing pile showing cracks, exposed aggregate.

4.3.4 Northern Approach Trestle (Left Side), 558 piles, Bents T1-T140.

The newer northern approach trestle, contains railroad tracks, a lift bridge, and a curved section at the wharf side connecting to the wide newer section of the wharf face. Many of the shoreside approach bents are on dry land. The trestle has a length of approximately 2592 feet and is 24 feet wide throughout. See pages A-15 through A-20. The two left bridge piers contain 30 piles each encased in a large rectangular concrete footing. These were inspected by divers for deterioration, scouring, or any abnormalities and were found to be in good condition. Each bent consists of 4 piles, the two outboard piles are batter piles while the interior piles are bearing piles. Certain bents have a double set of piles with legs forming an A frame or inverted vee. These are shown on the bent and pile plans, Appendix A.

Inspection of piles in this section revealed no defects, all appeared in good condition. Twenty eight piles were inspected for a 5 percent sample. Bents 127-140 were not inspected as they were in mud, sand, or dry land.

4.4 SUMMARY OF INSPECTION RESULTS

A summary of the inspection efforts in terms of the numbers of piles in the various wharf sections, and the percentage inspected, is shown in Table 4-4. While the pre-inspection objective was to achieve an overall sampling of 10 percent, on-site conditions dictated a heavier sampling in the two older sections, with a concurrent reduction in sampling the newer sections. This was necessary due to time, cost, manpower and scheduling constraints.

Table 4-4

Inspection Summary, Sampling Level, Percent

Section	Bents	Piles	No. Inspected	% Inspection
Right side approach Trestle (SE)	1 - 163	855	97	11.3
Right side old wharf (South)	164 - 252*	823	98	11.9
Left side new wharf (North)	245*- 350	2391	164	6.8
Left side approach pier (NW)	T1 - T126	558	28	5.0
TOTALS		4627	387	8.3

*both old and new sections have bents numbered 245-252

The conditions of the piles inspected as a result of the underwater inspection is shown below in Table 4-5. It is noted that over 90 percent of piles inspected were rated as good.

Table 4-5

Pile Condition Summary
(Pile Condition - Inspected Piles Only)

	EX	GOOD	FAIR *	POOR *	TOTAL	REMARKS
Rt side approach T.	--	79	12	6	97	Repair as indicated.
Rt side old wharf	--	82	1	15	98	(12 Batter piles cracked)
Left side New wharf	--	161	3	--	164	
Left side approach T.	--	28	--	--	28	
Totals		350	16	21	387	

*Repair is warranted

Of the piles inspected, those rated in the poor category were all in the older two sections. The majority of the poor piles were concentrated in the southern outboard face of the old pier section where the twelve batter piles were found cracked.

4.5 RECOMMENDATIONS

The inspection results, based on the sampling of piles within the Weapons Wharf, revealed that the wharf in general is in good condition. While this rating presents a favorable picture of the facility on the whole, it must be pointed out that deterioration and degradation of piles within the structure as noted indicate the need for near term repair and maintenance.

It is recommended that batter piles within the older wharf face from bent 164 to bent 175 be repaired. Each of these piles exhibit cracks transversely across each pile face at the location from 2-3 feet below the pile cap. The cracks appear to penetrate the total cross section of the pile. These piles are listed in Table 4-2.

Repairs are also recommended for those piles identified as in poor condition within the right approach trestle. These are identified in Table 4-1, and on the pile plans in Appendix A, and the pile inspection sheets of Appendix B. Those piles with minor defects similarly identified should also be considered for repair, as should the pile caps and stringers in this section.

If repairs to this facility are omitted or delayed over the near term, pile conditions will deteriorate further. Extended delays would create the need for additional inspections to determine the extent of the progressive deterioration. Such inspections would be outside the scope of NAVFAC's specialized inspection program.

4.6 Repair Methods and Schemes.

This section is provided to recommend actions which could be taken to alleviate problems found during the inspection. There are numerous repair techniques and products on the market today, the methods mentioned here are not all inclusive.

Repair of cracks, spalling, and general disintegration of concrete piles, pile caps, and stringers as described within the previous sections should be of great concern to the station. These forms of deterioration are of varying size, shape, and degree exposing underlying concrete aggragate, and rebar. Cracks provide entrance to airborne water and water vapor whose presence will give rise to the corrosion of the embedded rebar which will cause spalling and further disintegration of the concrete.

There are several repair schemes that address these problems. Epoxy cement is typically used to repair cracks. Above water it can be readily applied by hand, and can also be pressurized to fill hard to reach voids and cracks. This type of bonding agent provides high strength and durability in the marine environment.

Repair of spalled or disintegrated concrete is usually handled the same way. Two methods commonly used are mortar patching and pneumatically applied concrete. After proper cleaning of the surface and rebar either method can be used. Mortar patching is easily accomplished when an epoxy is used. This allows ease in applying overhead, vertical, or horizontal surfaces. Pneumatically applied concrete or mortar (also called gunite or shotcrete) is used in applications where deterioration is relatively shallow. It also can be used with ease in applying overhead.

The principal technologies for repair of severely damaged concrete piles (rated poor) is to jacket the pile with reinforced concrete. This is particularly useful where damage is found underwater.

4.7 Estimated Repair Costs

Repair costs associated with the aforementioned repair techniques are order of magnitude estimates only and vary somewhat geographically. These costs are tabularized for ready reference and comparison.

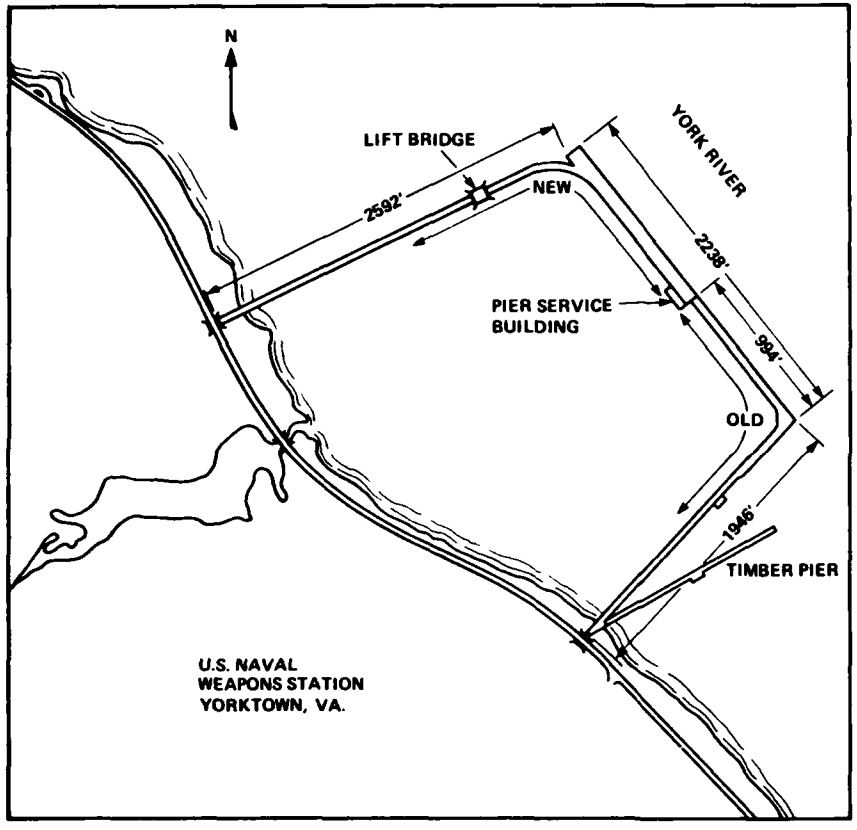
Description	Fixed Cost*	Unit Cost	Unit Installed
A. Repair of concrete pile by placing new reinforcing and formwork around the outside of the pile and filling the space between the pile and the form with concrete	Included in unit installed cost	$70/LF to $110/LF for forms and concrete; $10-$15/LF	Symons Z-Bead Fiberglass jackets - manufacturer's installed cost
B. Mortar patching of spalled concrete piles	Included in unit installed cost	$13/sq. ft.	Sikastix Epoxy Gels
C. Filling cracks in concrete piles with epoxy grout	Included in unit installed cost	$900.00/ crack	Concrete Injectomatic Systems
D. Covering damaged concrete with pneumatically projected concrete (shotcrete and gunite)	Included in unit installed cost	$10/sq. ft.	Per square foot of concrete-in-place

*Fixed costs, where given, are mobilization - demobilization costs, unless otherwise noted.

APPENDIX A
PIER PILE PLANS

FACILITY R3 FLEET WEAPONS PIER
U.S. N.W.S. YORKTOWN, VA.

NEW SECTION BUILT ≈ 1964
OLD SECTION BUILT ≈ 1941-1942

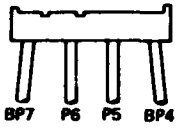


LEGEND

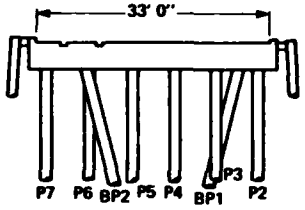
- ■ PILE U/W INSPECTED 9/80
- □ PILE NOT INSPECTED

ELEVATION VIEWS OF PIER SECTIONS

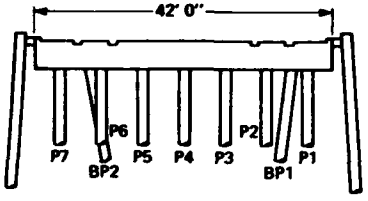
OLD SECTIONS



TYPICAL FOR BENTS 1–124

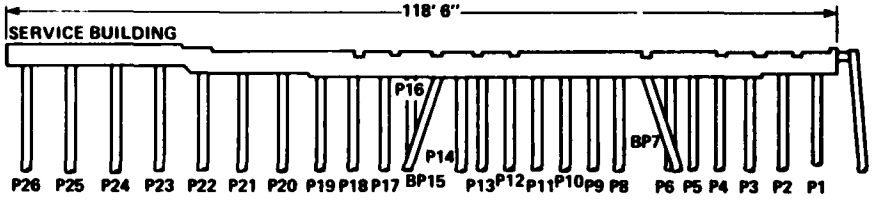


TYPICAL FOR BENTS 125–153

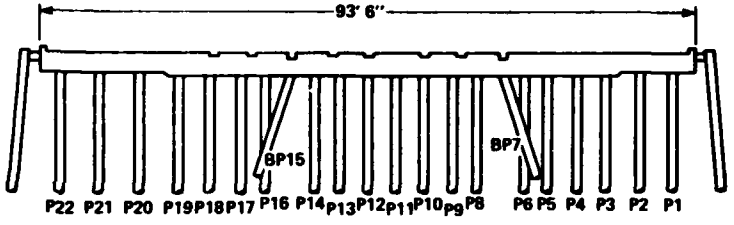


TYPICAL FOR BENTS 164–252

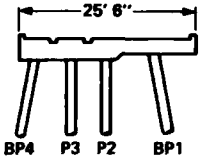
NEW SECTIONS



TYPICAL FOR BENTS 245–257
WITH SERVICE BUILDING



TYPICAL FOR BENTS 258–350

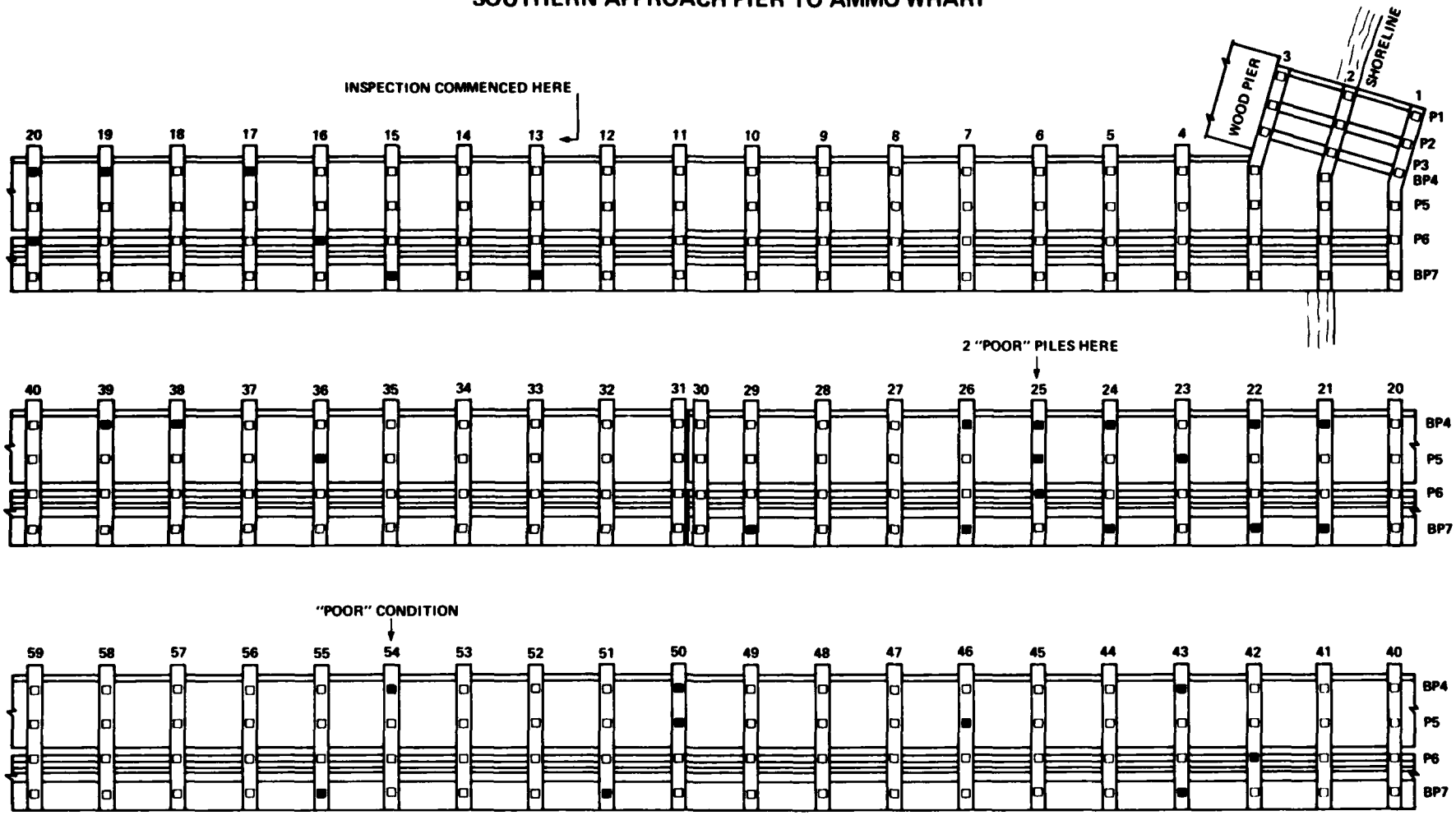


TYPICAL FOR BENTS T 1–T 140

A-2

SHEET 2 OF 20

SOUTHERN APPROACH PIER TO AMMO WHARF



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OCEAN ENGINEERING
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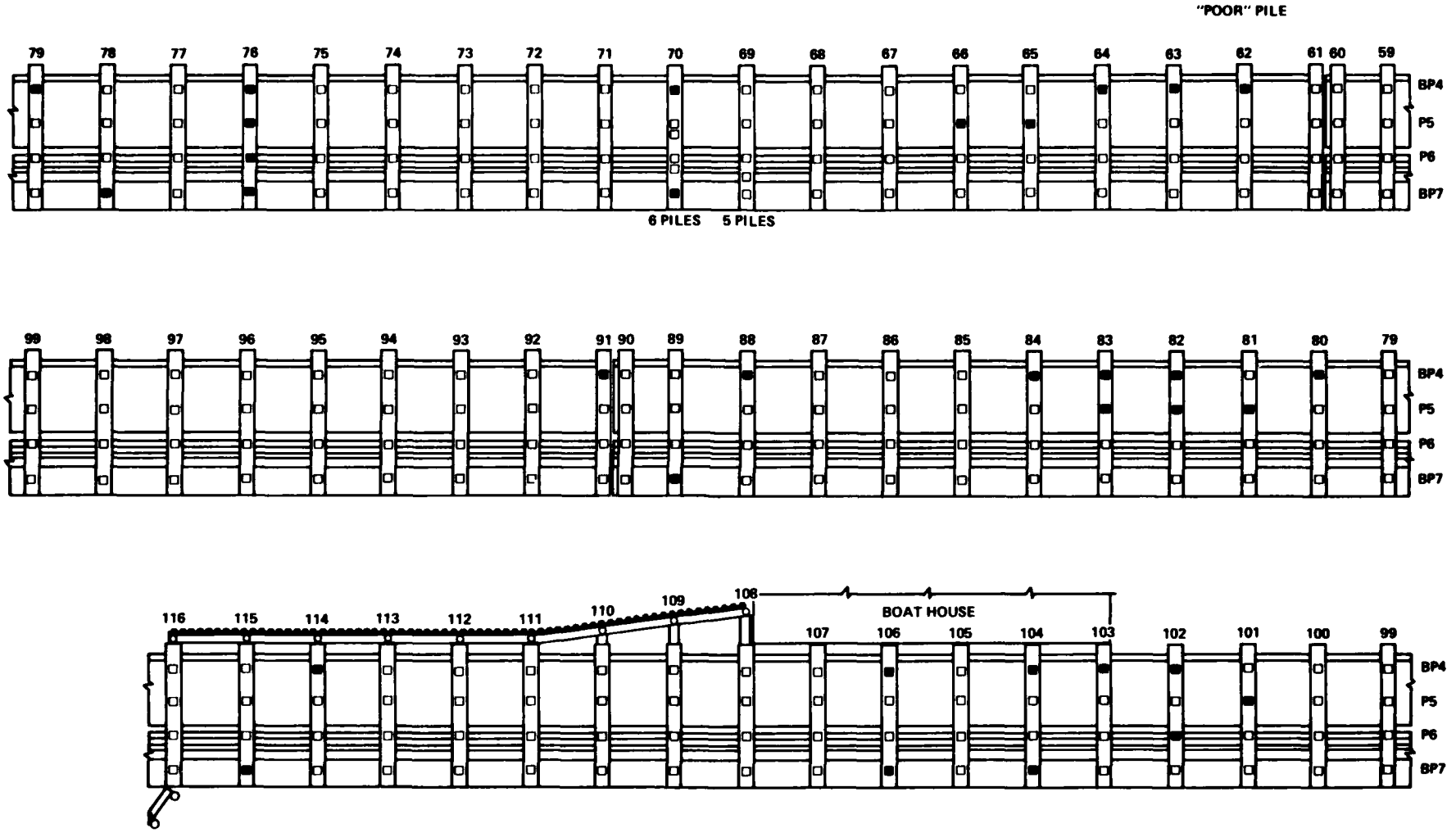
SOUTHERN APPROACH PIER TO AMMO WHARF



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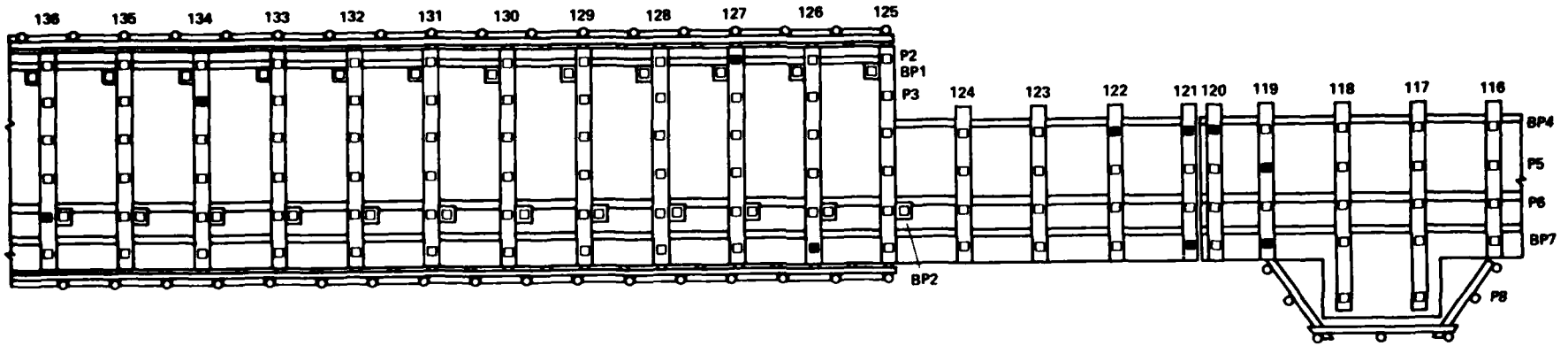
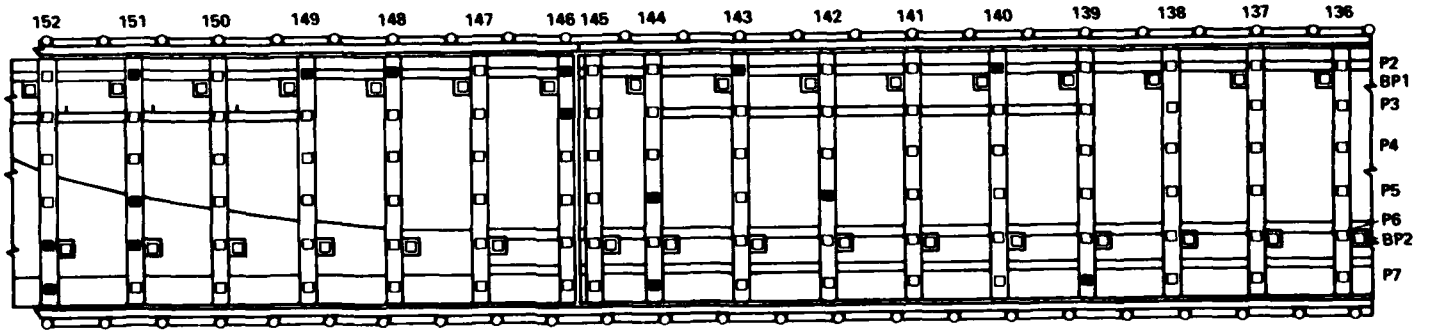
SOUTHERN APPROACH PIER TO AMMO WHARF





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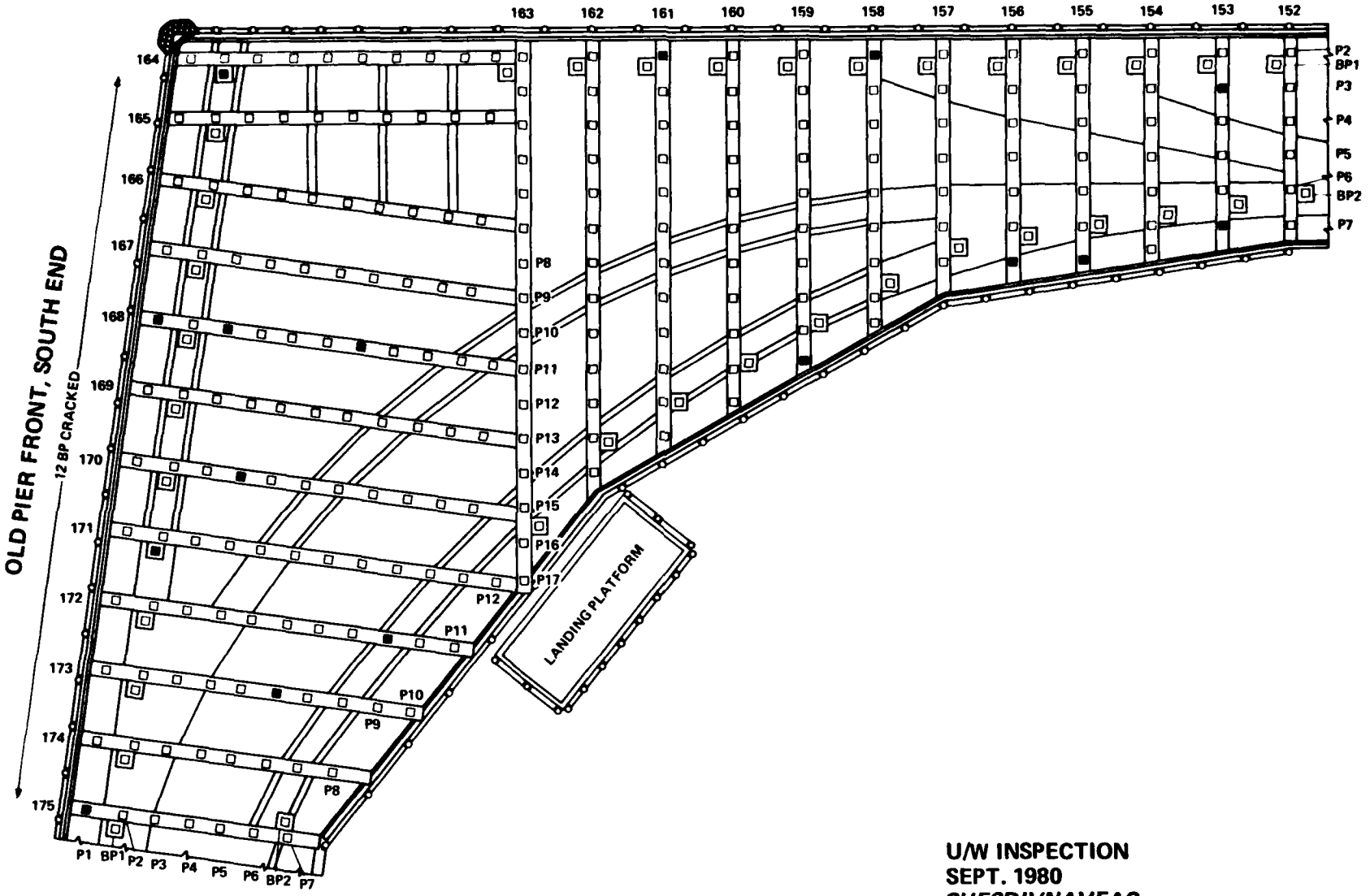
SOUTHERN APPROACH PIER TO AMMO WHARF



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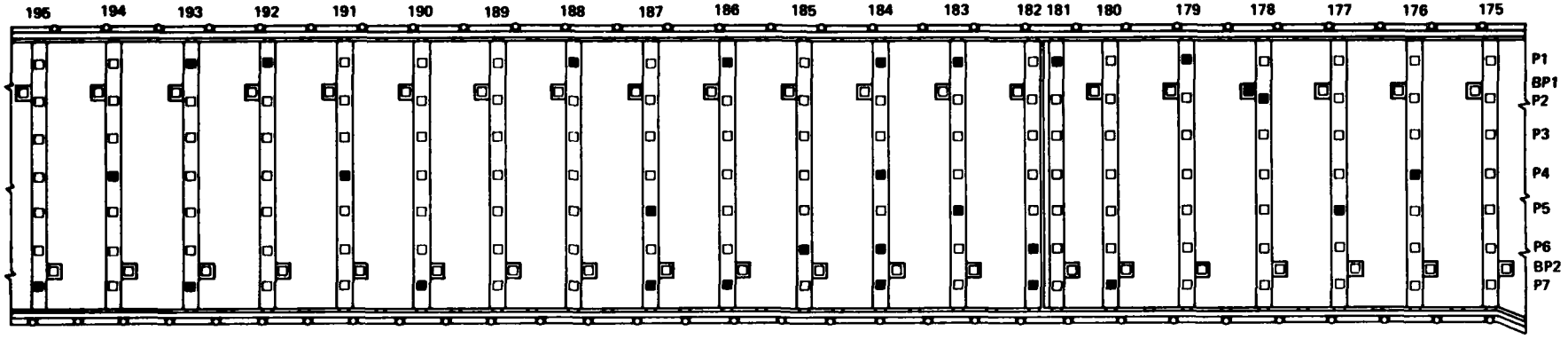
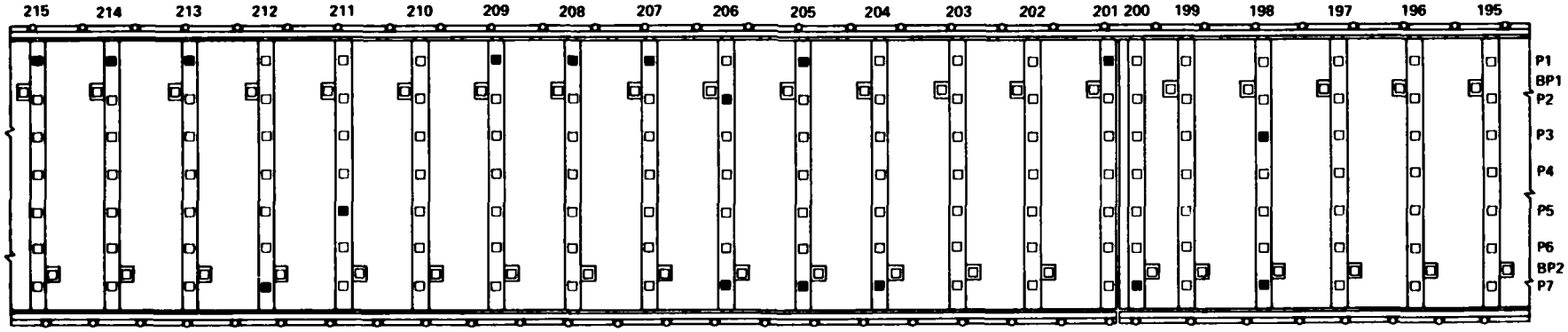
OLD PIER, FRONT SECTION





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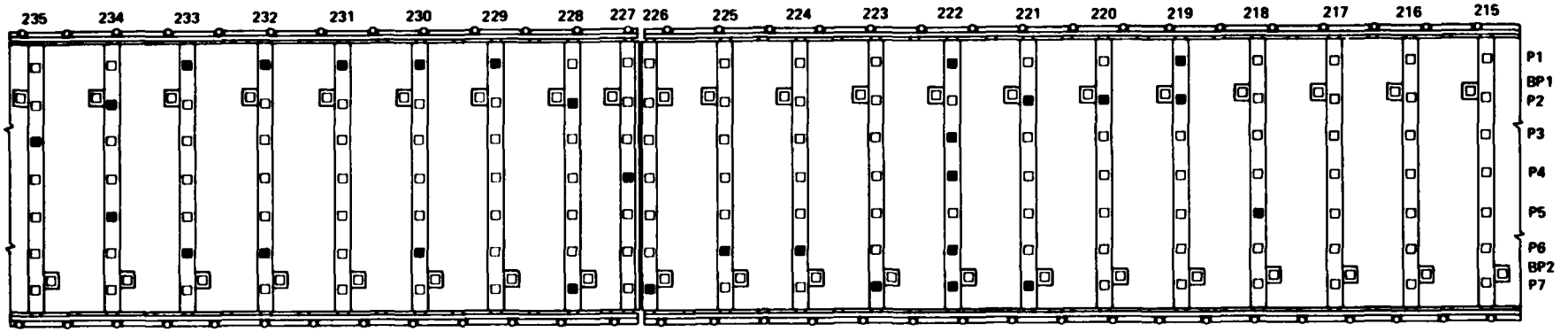
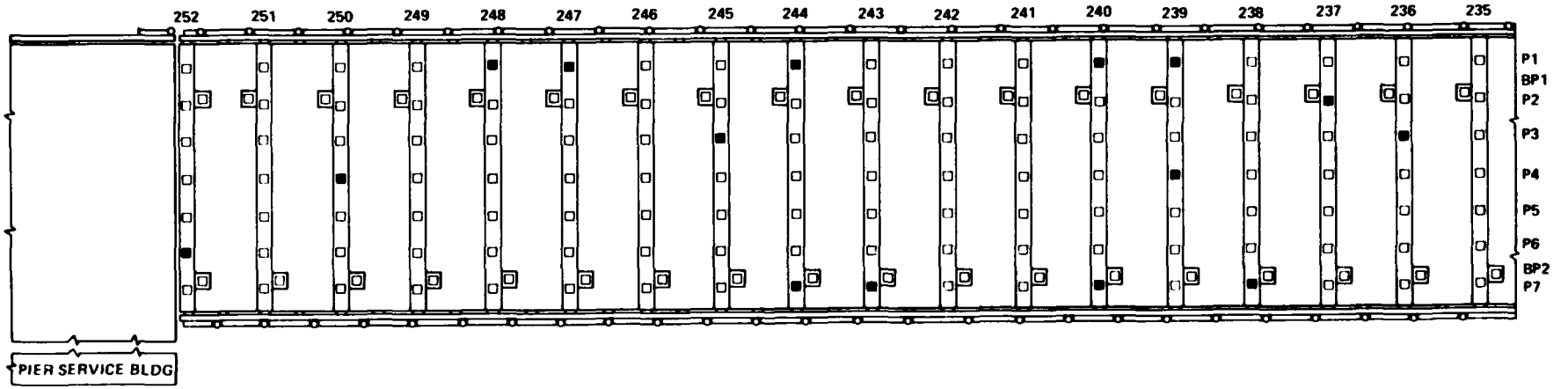
OLD PIER, FRONT SECTION





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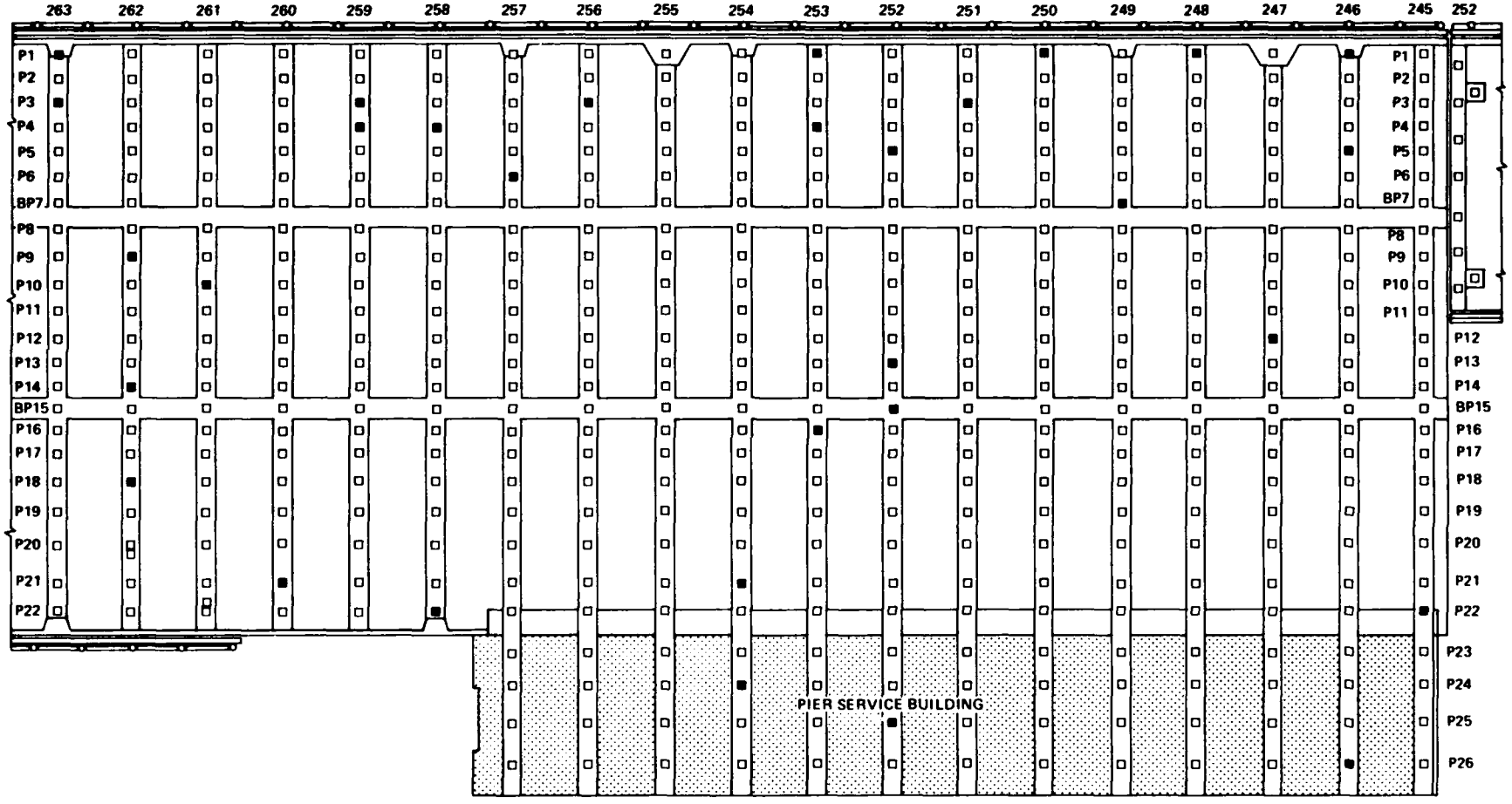
NEW PIER, FRONT SECTION



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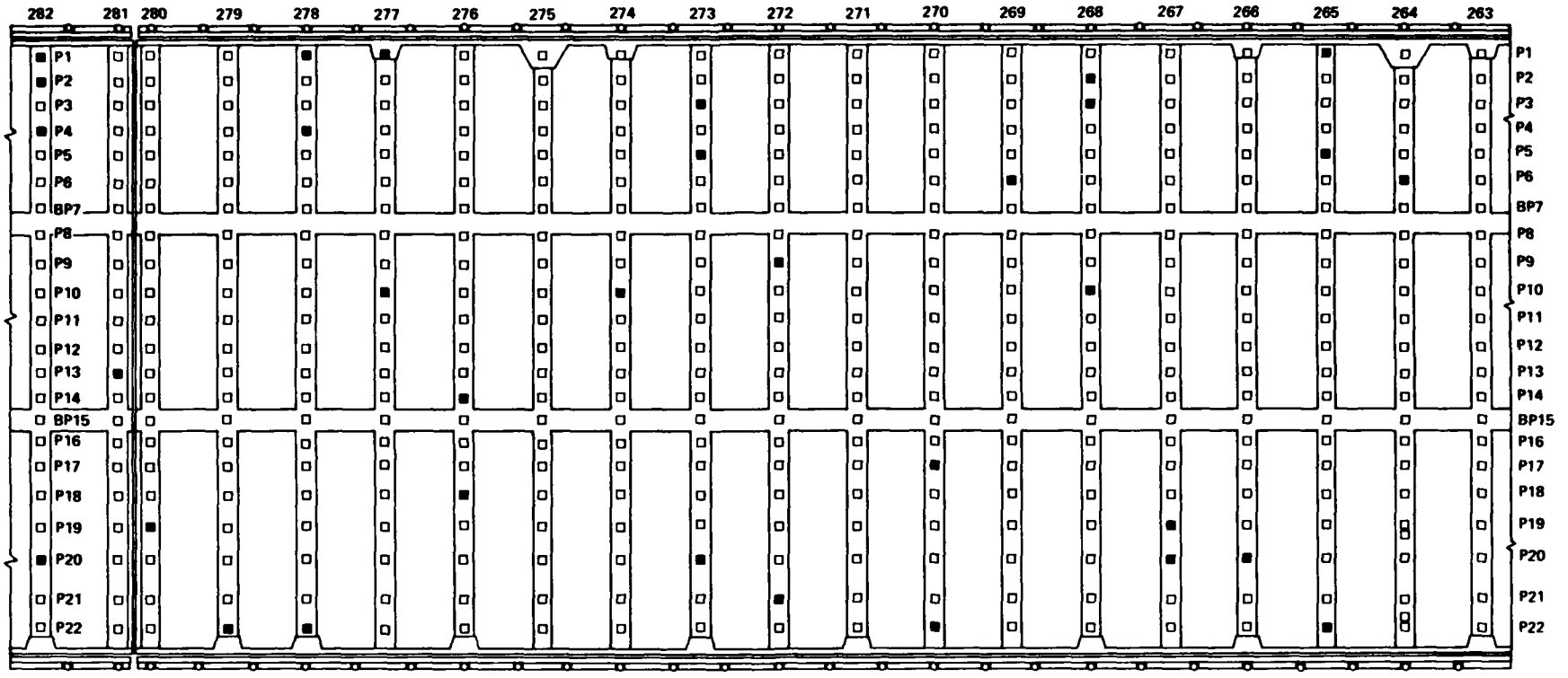
NEW PIER, FRONT SECTION



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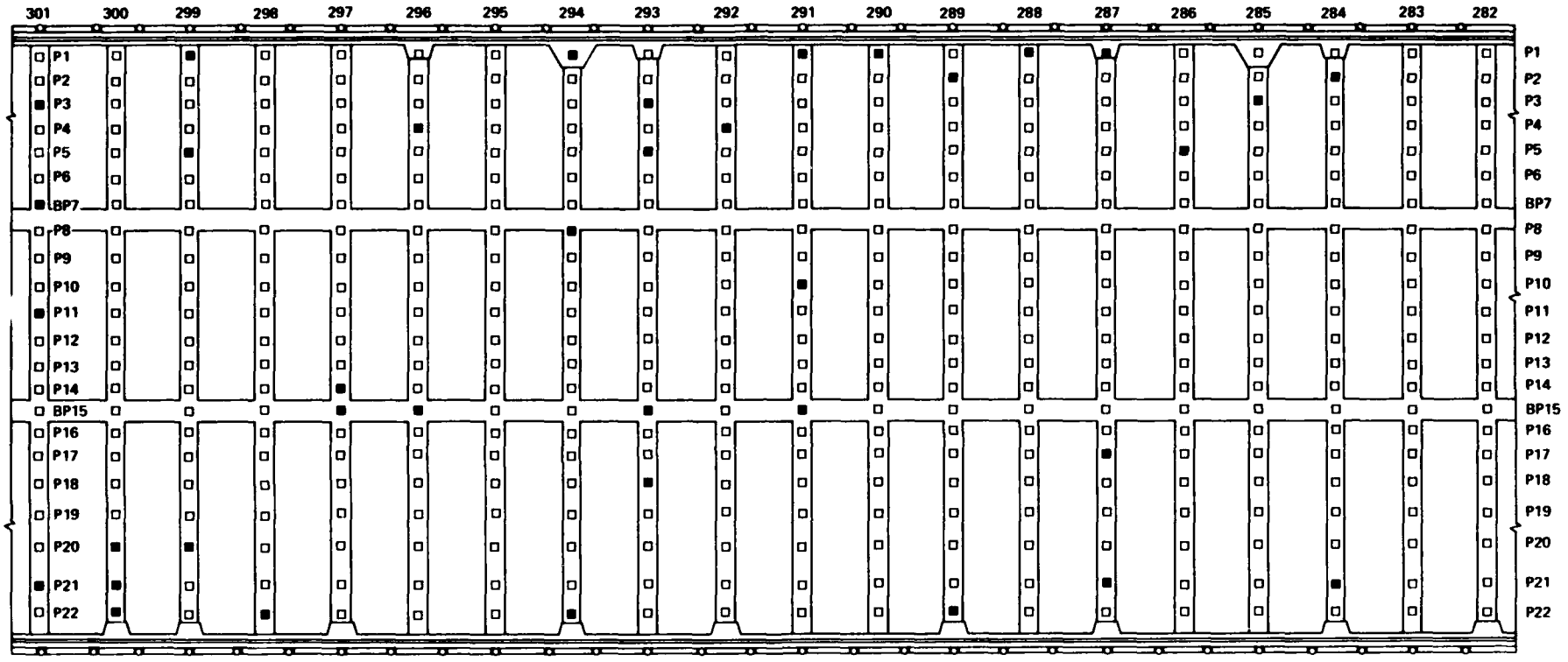

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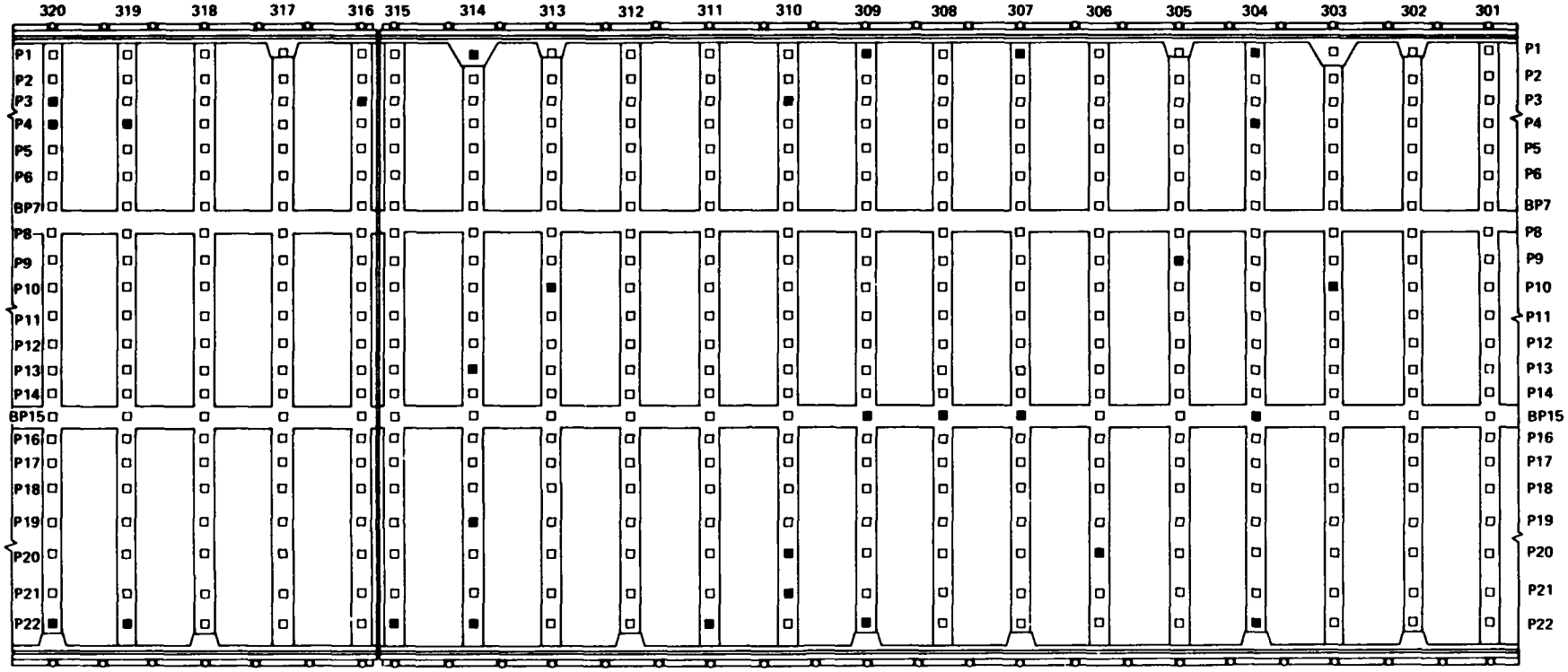

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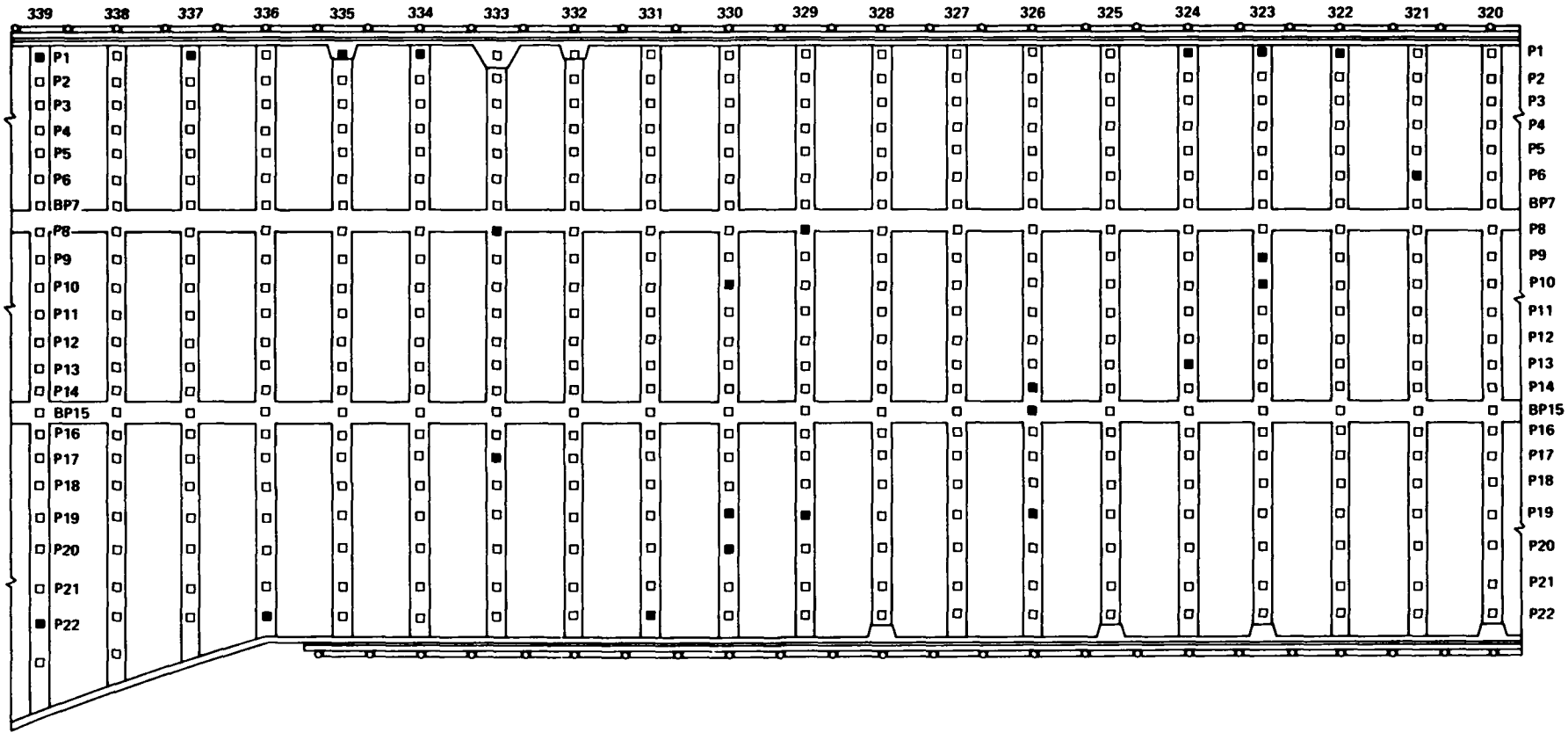
NEW PIER, FRONT SECTION



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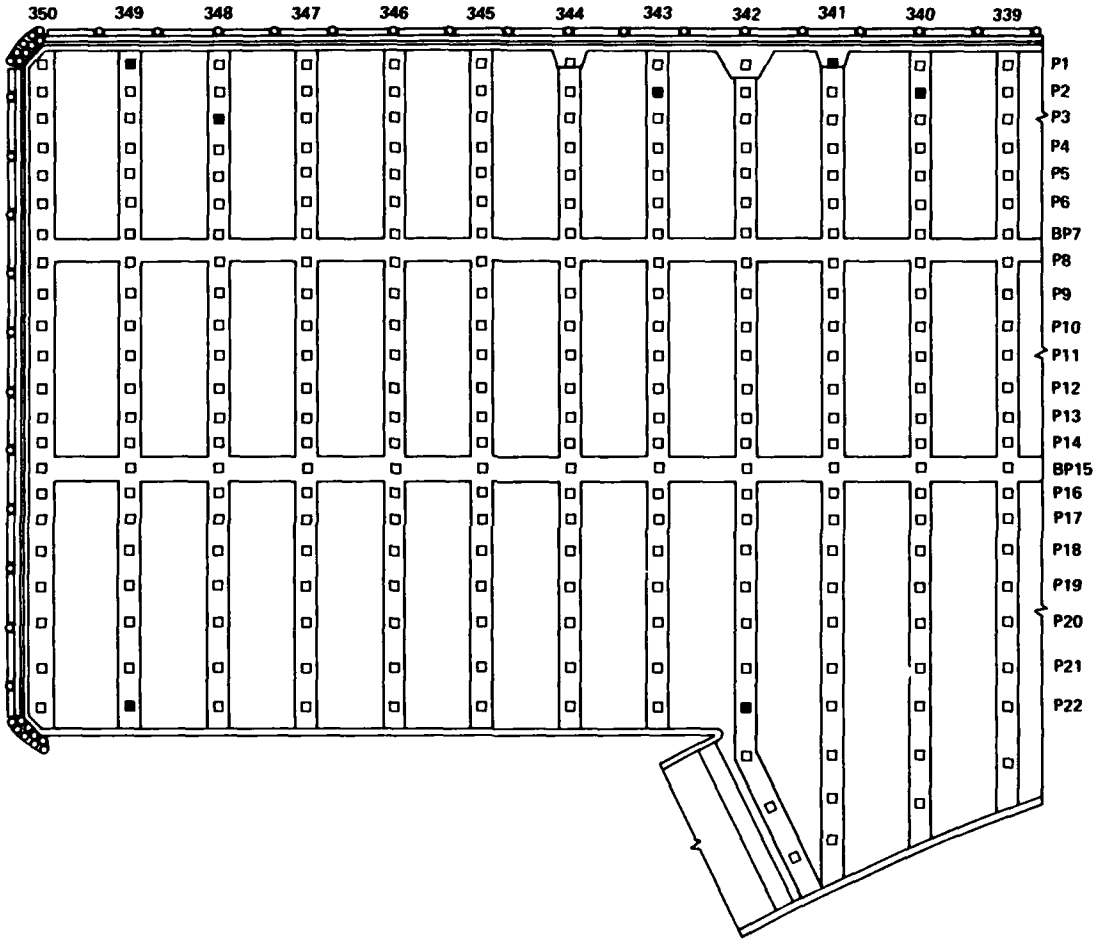
NEW PIER, FRONT SECTION, NORTH END



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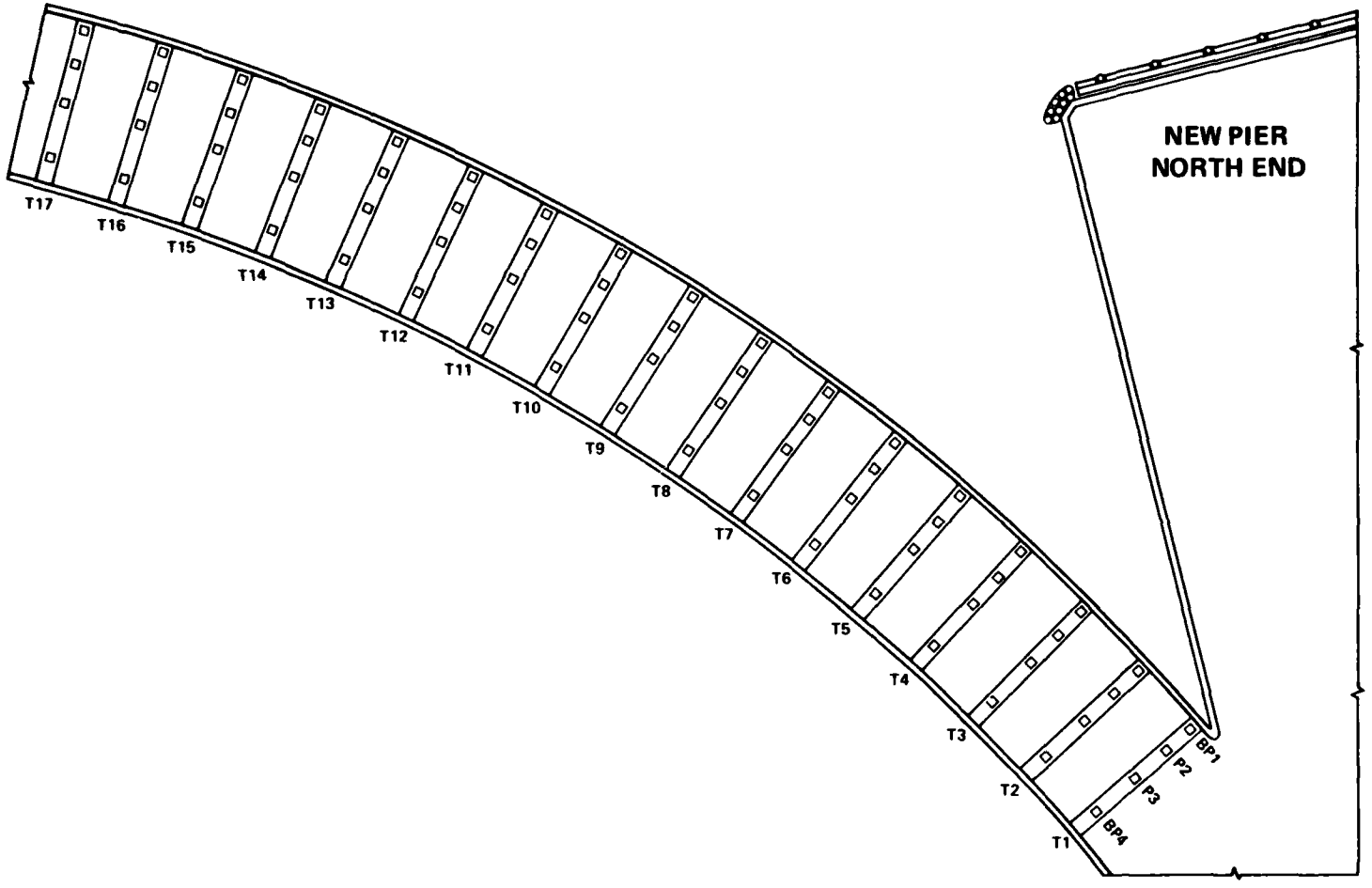
NORTHERN APPROACH TRESTLE



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SEPT. 1980
CHESDIVNAVFAC
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& CONSTRUCTION PROJECT OFFICE
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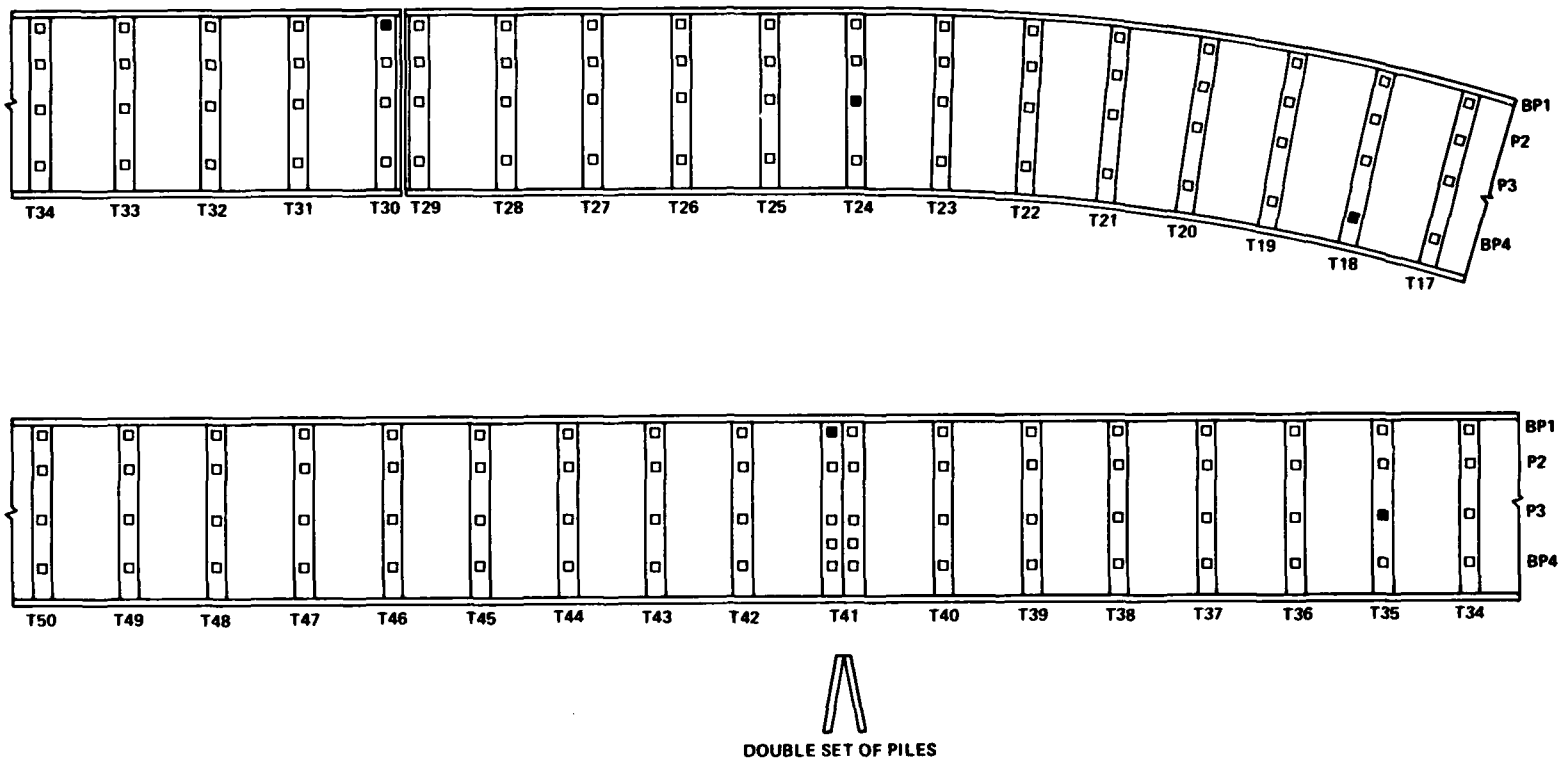
NORTHERN APPROACH TRESTLE



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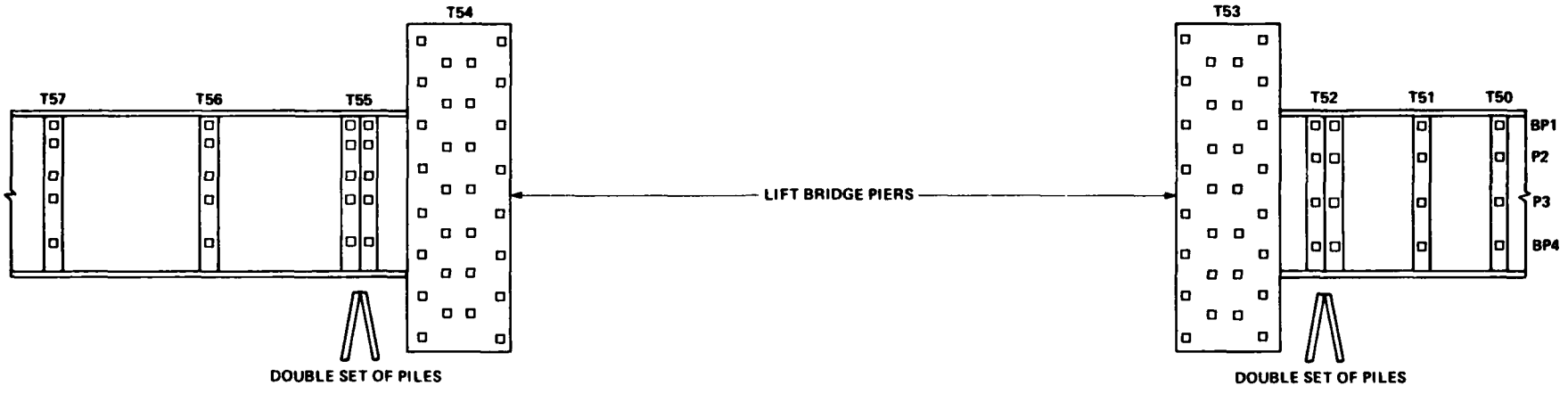
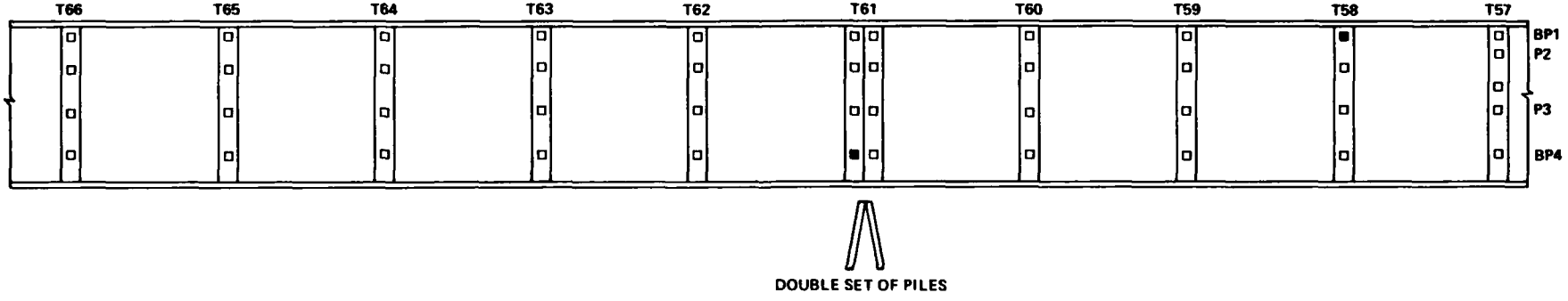
NORTHERN APPROACH TRESTLE





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U/W INSPECTION
SEPT. 1980
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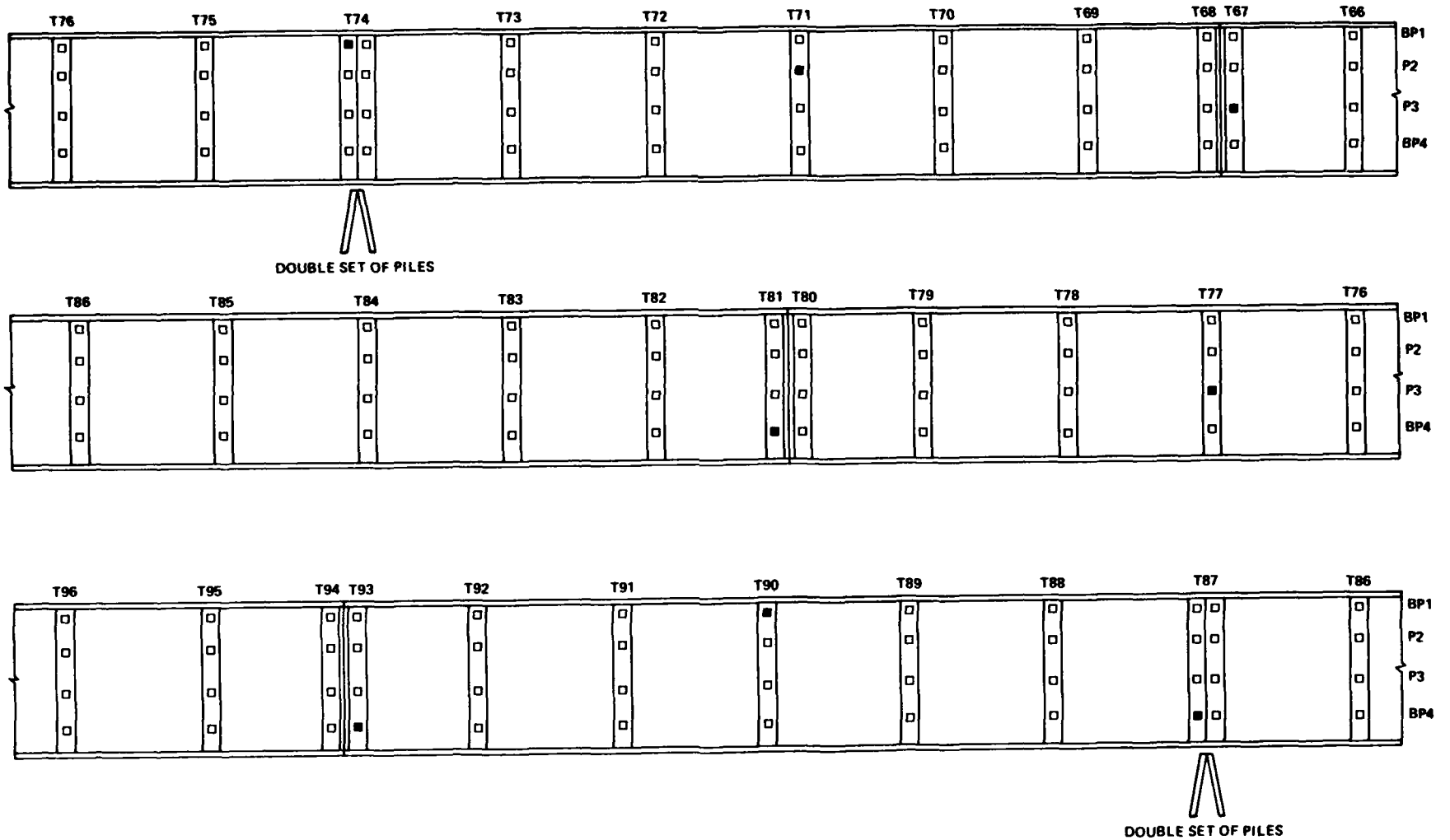
NORTHERN APPROACH TRESTLE



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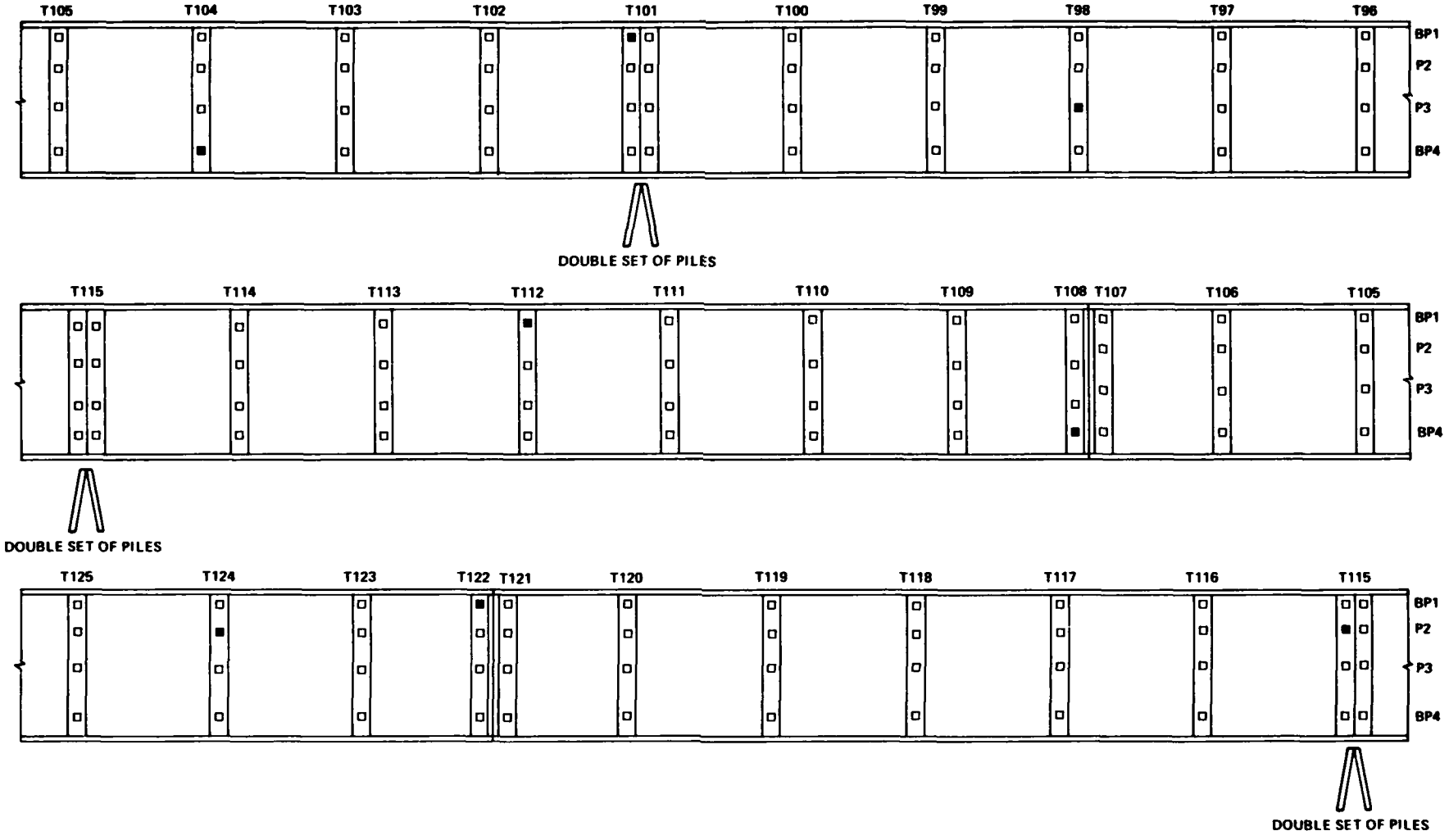
NORTHERN APPROACH TRESTLE



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SEPT. 1980
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OCEAN ENGINEERING
& CONSTRUCTION PROJECT OFFICE
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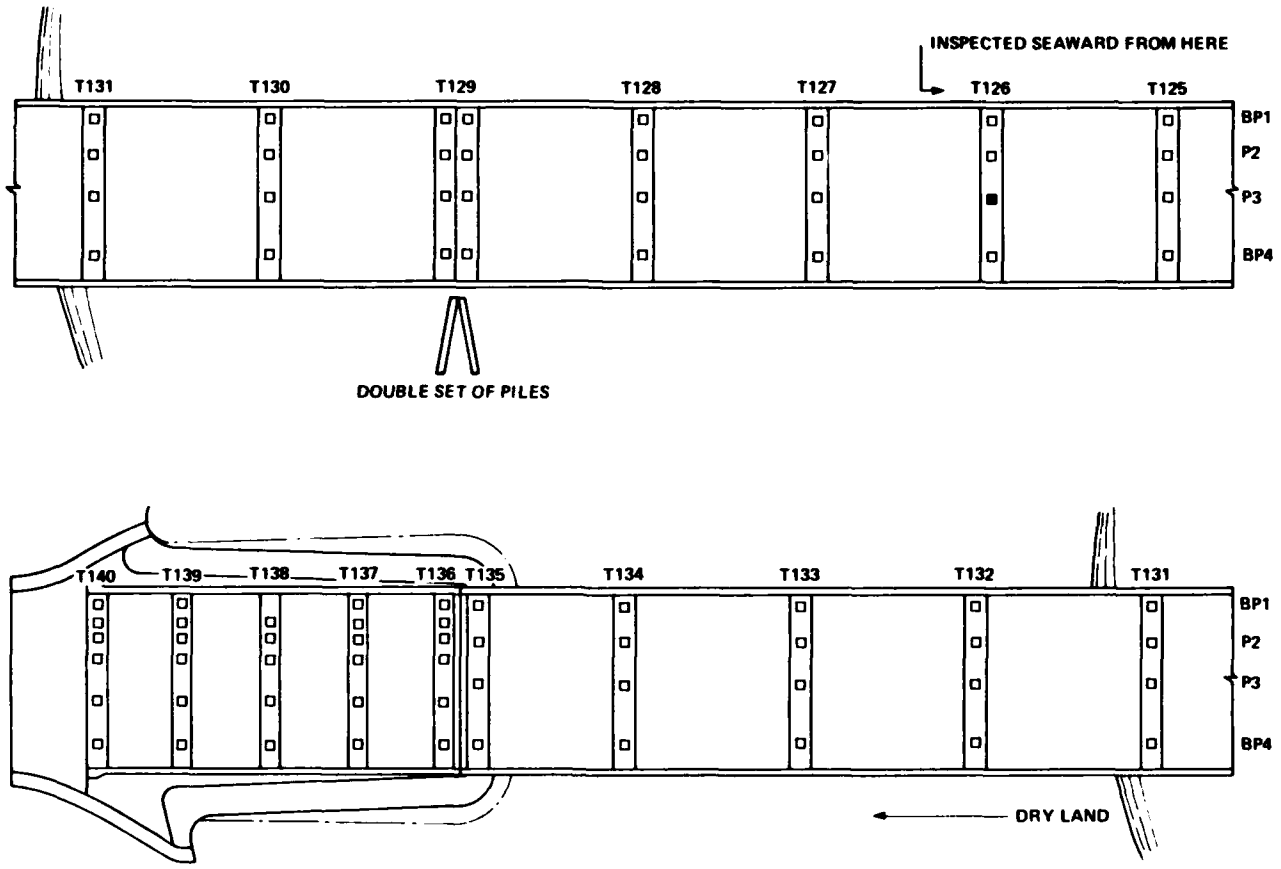
NORTHERN APPROACH TRESTLE



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U/W INSPECTION
SEPT. 1980
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FPO-1-80 (18)

U/W INSPECTION DATA SHEET

LOCATION: Weapon Station Yorktown Va DATE: 8 Sept DIVER(S): SW3(DV) Jack Reynolds RECORDER(S): W. F. Casey

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: 2'-3'

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ _____

TIME OF DAY: 1119 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

2 ☐ 3 4 (1)

BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
			E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
13	BP-7														Wooden form goes to mud line; 2 ft Depth; underlying pile cannot be examined
15	BP-7														wood form runs to mud line 3 ft Depth; visibility 3"-4" underlying pile condition
1132 16	P-6														Wood form still intact. 3 ft Depth; wood looks good underlying pile
17	BP-4														wood form intact to mud line; 3' Depth approx
19	BP-4														wood form in fair shape extends to mud line
20	BP-4														wood form looks good extends to mud line
20	P-6														wood form in fair shape & extends to mud line
21	BP-4														wood form looks good & extends to mud line
21	BP-7														wood form looks good & extends to mud line
1156 22	BP-4														Looks good; wooden form extends to mud line

FACNAME/NO: Wpns Pier Sheet 2 of 3

BENT NO	PILE NO	NI	PILE CONDITION E	G	F	P	F	TYPE DAMAGE MECH	BIO	FUNC	DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE HGT	WIDTH	PENETR	COMMENTS
22	BP-7														form looks good; extend to mud line
23	P-5			X											No wood forms or cracks
24	BP-4														wood form present. Looks good & extend to mud line
24	BP-7														wood forms extend to mud line, looks good
25	BP-4														3' Depth; forms extend to mud line; looks good
* 25	P-5					Y					8" U/W	1½ 3"			Concrete pile has hour-glassing & exposed rebar & aggregate
* 25	P-6					X					3"-4" AWL				cross section now rounded w/ 10% loss; exposed rebar; aggregate
26	BP-4														wood form extends to mud line
234 26	BP-7														wood form extends to mud-line; looks good.
29	BP-7														wood form extends to mudline; Looks good
36	P-5														wood form extends to mudline; Looks good
38	BP-4														wood form extends to mudline
39	BP-4														3½' Depth; wood form extends to mudline
42	P-6				X										wood form stops 2"-3" off bottom; conc agg.

FACNAME/NO: Wpns Pier

BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
			E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
43	BP-4														Wood form looks good & extends to mud line
43	P-6			X							AWL				No wood forms; looks good u/w, exposed aggregate above water; rounding
46	P-5				X										No wood form; aggregate exposed around perimeter of pile down to mud line
50	BP-4			X											5' Depth; wood forms extend down to 6" above bottom; Conc Good Below it.
50	P-5			X											Wood extends 14" above bottom; concrete looks good.
51	BP-7				X										Spalling - 4 corners all way to mud line no rebar, no appreciable loss
54	BP-4					X					4'-6'				Wood form present; pile rounded & exposed rebar
55	BP-7			X											Wood form ends @ 4'; 6' Depth mudline
62	BP-4					X						F1-11" F2-12" F3-9" F4-18"			Damage at base of pile Exposed rebar & damage to pile faces 3' Below load

V250

Weapon Station

U/W INSPECTION DATA SHEET

LOCATION: Yorktown, Va DATE: 9 Sept DIVER(S): EACN Marynak RECORDER(S): WF Casey

FAC NAME/NO. Float Wpns Pier R-3 PILE TYPE: BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: 1' – 12'

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ _____

TIME OF DAY: 0815 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH – TIDE

BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
			E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
12' 63	P-4			X											Heavy Marine Growth (HMG) wood form extends 1' below present water line
64	P-4				X						4'				wood forms extends 1' BWL; 20% matl loss; hour-glassing
65	P-5			X											Wood forms appear to be in poor shape; extends 5' u/w
66	P-5					X					9'-11'			Face 1 & 2 6"	wood extends 5' u/w; Damage faces 1 & 2; Severe spalling; no exposed rebar
70	P-4				X						8'				Wood extends to 6' Depth Damage 2' above mudline on Face 1 & 2 20% loss
70	BP-7			X											wood extends to 5' Depth; Good shape below form.
1' 76	BP-4				X										wood extends to 5' Depth spalling @ mudline face 2 20% loss - no rebar
76	P-5			X											wood extends to 5' Depth No spalling
76	P-6					X									Spalling Face 3 (mudline to 9') & Face 2 30% loss exposed rebar
76	BP-7			X											wood form extends to 6'

FACNAME/NO: Weapons Pier Sheet 2 of 3

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
	78	BP-7			X											wood form extend to 5' no spalling
14'	79	BP-4			X											No wood form on pile
0932	80	BP-4			X							2'				No wood; spalling Faces 2 & 3 (slight)
	81	P-5			X											wood form extends 5' U/W
	82	P-5			X											No wood form present
	82	BP-4			X											Wood form extends 5' U/W
17'	83	P-5				X						4'			1"-2"	Spalling Face 1 & 2
	83	BP-4			X											No wood form
	84	BP-4			X											No wood form
18'-19'	88	BP-4			X											No spalling
1027, 19'	89	P-7				X						2'-3'			2"-3"	Spalling F1 & F4 Rounding of Pile all corners
16'	91	P-4				X						Splash Zone		1/6"		Crack F3 6" U/W to Cap; Bleeding Rust
20'	101	P-5			X							AWL			1"-2"	Spalling F1 & F2
21	102	P-4			X							AWL			1/2"	Spalling F1 & F2

FACNAME/NO: Wpns Pier Sheet 3 of 3

BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
			E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
102	P-6			X											Crack 1' u/w to Pile Cap F-4; Crack F2
															W/L - Pile cap; Spalling 1" Penetr - Bleeding Rust?
															Core F1/4.

Sheet 1 of 2

U/W INSPECTION DATA SHEET

LOCATION: Wpn Station Yorktown Va DATE: 9 Sept DIVER(S): SW2/DV STANCATI RECORDER(S): W.F. Casey

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING [✓] BATTER [✓] FENDER [ ] SHEET [ ] WATER DEPTH: 16'-

PILE MATERIAL: WOOD [ ] STEEL [ ] CONCRETE [✓] OTHER [ ] _____

TIME OF DAY: 1230 TIDE: _____ DEPTH Or DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
16'	103	P-4			X											No cracks or spalling
	104	P-4			X											
1300	104	P-7			X											No cracks/No spalling
20'	106	P-4			X							18'	6"	4"	1"	Exposed Aggregate F-1 Spalling; No rebar
	106	P-7				X						F-2 AWL F4	4" 3"	width of pile 4"	2" 1"	F-2 Spalling, Crack & Corr Stains; F-4 Aggregate exposed
21'	114	P-4			X											
	115	P-7			X							Splash zone	12" 8"	11"	1"	Corner F1/2 Spalling Crack F1 - No Corr
	119	P-5			X											
21'	119	BP-7			X											
20' 410	120	P-4			X											

FACNAME/NO: Weapon Pier Sheet 2 of 2

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
21'	121	P-4			X							Splash Zone				Min. amt. of exposed aggr in splash zone
21'	121	P-7			X							Splash Zone	(E-3) 3	hair Line		Hair-Line Crack; Exposed Aggr; Rust Stains along Crack
21'	122	P-4			X							Splash Zone				Exposed aggregate on Faces 2 & 3

Sheet 1 of 1

U/W INSPECTION DATA SHEET

LOCATION: Weapon Station Yorktown, Va DATE: 10 Sept DIVER(S): CM3/DV SNYDER RECORDER(S): W.F. Casey

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING [✓] BATTER [✓] FENDER [ ] SHEET [ ] WATER DEPTH: _____

PILE MATERIAL: WOOD [ ] STEEL [ ] CONCRETE [✓] OTHER [ ] _____

TIME OF DAY: 0806 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
			E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
126	P-7			X							7'				exposed agg. @ 7' depth (Mud) At Mudline on F1 & 2 No exposed Rebar; 5% loss
127	P-2			X											
134	P-3			X											No exposed aggregate U/W; Exposed aggregate AWL in splash zone
0845 18' 136	P-6			X											
19' 139	BP-7				X							0'-10'	1"	½"	F2 Vertical Crack (Large) spalling in Splash zone. 3 vertical cracks; Rust Stains
22' 140	P-2			X											Little Aggregate showing in splash zone.
21' 142	P-5			X											
20' 143	P-2			X											
21' 144	P-5			X											
19' 144	BP-7			X											Gravel on Bottom

U/W INSPECTION DATA SHEET

LOCATION: Weapons Station Yorktown Va DATE: 10 Sept DIVER(S): CM3/DV Johnston RECORDER(S): W. F. Casey

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING [Y] BATTER [Y] FENDER [ ] SHEET [ ] WATER DEPTH: _____

PILE MATERIAL: WOOD [ ] STEEL [ ] CONCRETE [Y] OTHER [ ] _____

TIME OF DAY: 1119 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION E	G	F	P	S	TYPE DAMAGE MECH	BIO	FUNC	DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE HGT	WIDTH	PENETR	COMMENTS
22'	146	P-2			X											very little exposed aggr. in splash zone. Bottom composed of gravel.
20'	146	P-3			X											No cracks or spalling
19'	148	P-2			X											No cracks or spalling
19'	149	P-2			X							splash zone	6"	3"	1/8-1/4"	Abrasion on face 4 of splash zone, aggregate exposed, no stains or rust
21'	151	P-2			X							splash zone	6" 3"	6" 3"	3/8" 1/8"	Abrasion corner F 1/4 " F-4; No corr
	151	P-6			X											
	151	P-5			X											Signs of corrosion F-4; exposed aggr. & spalling
143 22'	152	P-6			X											Spalling on face 1 & 2 in splash zone; Bad patch job.
20'	152	P-7			X							splash zone	1" 6"	1" 6"	1/2" 1/2"	Spalling F 3/4 (Corrosion - stains) Crack running to cap
21'	153	P-3			X							Splash zone to cap		1/16"	1/2"	Crack; no rust; no spalling. (Cap → WL)

FACNAME/NO: Wpns Pier R-3 Sheet 2 of 3

	BENT NO	PILE NO	NI	PILE CONDITION E	G	F	P	S	TYPE DAMAGE MECH	BIO	FUNC	DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE HGT	WIDTH	PENETR	COMMENTS
21'	153	BP-7			X							Splash Zone	13"	width of Pile	1/2"	Spalling F1/2 Crack F-1 @ WL to cap 1/16" Deep (No corrosion)
21'	155	P-8			X							AWL	1'	Width of Pile	1/8"	F-2
21'	156	P-8				X						Splash Zone				cracks, spalling; corr all 4-Faces
21'	158	P-2			X							Splash Zone	2"	F3-1" F4-1"	1/2"	F3/4 Abrasion (minor)
23'	159	P-11			X							Splash Zone To Cap	2'	1/32 3" F-2	1" 1/2" 1/2"	F-1 Crack-corr (slight) F-1/2 Spalling (corner) F-2-Spalling entire F
9,23'	161	P-2			X							Splash Zone To Cap				F2 minor gouge-crack F4 crack-corrosion (minor) F1&4 (corner) spalling (min
31'	164	P 1					X					Splash Zone				Cracks in splash zone Rust Present; Spalling F3/4
1303 20'	168	P-1			X							Splash Zone	5"	6"	1/2"	F2/3 corner-spalling
22'	168	P-3			X							Splash Zone	12"	2"	1/4"	F1/2 corner-spalling; no scouring
21'	168	P-7			X							-1	4"	1" ea Face	1/2"	F3/4 Crack no rust
21'	170	P-4			X							WL→Up AWL	4"	1/2" 6"	1/4" 1/4"	F4 Crack (minor) - No corrosion F4 spalling
21'	171	BP 1				X						AWL Splash Zone	1' 8"	3" 2"	1/4" 1/2"	F4/3 Abrasion, crack around F4 & 1 (Corr) F1, F2 Spalling
23'	172	P-9			X							Splash Zone				spalling, exposed aggregate (F1&2; 3) (F2&3) all minor
24'	173	P-6			X							AWL				Spalling F-1; exposed agg; F-2, 3 corner exposed

FACNAME/NO: Upns Pier R-3 Sheet 3 of 3

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
28'	175	P-1			X							Splash Zone AWL	6" 8"	1" ½"	¼" ¼"	F-1/2 exposed agg (corner) F-2/3 exposed agg
18'	176	P-4			X							Splash Zone	1" 6"	1" 1/32	¼" 1/32"	F 2 & 3 exposed agg (corner) F 3 Crack (runs parallel to pier) minor damage
18'	177	P-5			X							Splash Zone				exposed agg, spalling all minor damage
	178	P-2					✓									
	178	BP-1					✓									
27'	179	P-1			X											
17'	180	P-7			X											
1410 27'	181	P-1			X											

Weapons Station U/W INSPECTION DATA SHEET

LOCATION: Yorktown Va DATE: _____ DIVER(S): SW2/DV STANCATI RECORDER(S): _____

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: _____

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ _____

TIME OF DAY: 1345 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
1345 17'	182	P-6			X											
13'	182	P-7			X							Splash Zone	4"	3"	1/2"	Exposed Agg F1 & 4
													8"	4"	3/4"	Spalling F1 & 4 Below Agg
28'	183	P-1			X							Splash Zone	5"	4"	1/2"	Spalling F-3
													6"	5"	3/4"	" F-4
18'	183	P-5			X											
22'	184	P-1			X											
18'	184	P-4			X											
16'	184	P-6			X											
11'	184	P-7			X											
10'	185	P-6			X											
20'	186	P-1			X											Wooden form Extends To 5'

FACNAME/NO: Wons Pier R-3 Sheet 2 of 3

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
1325 11'	186	P-7			X											
16'	187	P-5			X											
15'	187	P-7			X											
26'	188	P-1			X											Wooden form extends to 6' Below Surface
9'	190	P-7			X											
18'	191	P-4			X											
24'	192	P-1			X											Wooden form extends to 6' Below Surface
25'	193	P-1			X											
1300 11'	193	P-7			X											
12'	194	P-4			X											
14'	195	P-7			X											
14'	198	P-3			X											
15'	198	P-7			X											
12'	200	P-7			X											

FACNAME/NO: Wpns Pier R-3 Sheet 3 of 3

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
24'	201	P-1			X											
12'	204	P-7			X											
24'	205	P-1			X											
9'	205	P-7			X								4"	6"	1/4"	Exposed aggregate face
21'	206	P-2			X											
12'	206	P-7			X											
28'	207	P-1			X											
24'	208	P-1			X											
28'	209	P-1			X											

Weapons Station U/W INSPECTION DATA SHEET

LOCATION: Yorktown Va DATE: 15Sept DIVER(S): CM3/DV Johnston RECORDER(S): _____

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING [✓] BATTER [✓] FENDER [ ] SHEET [ ] WATER DEPTH: _____

PILE MATERIAL: WOOD [ ] STEEL [ ] CONCRETE [✓] OTHER [ ] _____

TIME OF DAY: 0930 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
12'	212	P-7			X											Small crack 1' u/w To pile cap; Exposed agg. corner 3¾
12	211	P-5			X											
21'	213	P-1			X											
23'	214	P-1			X											Exposed agg corner 3¾ 1' u/w.
22'	215	P-1			X											
12'	218	P-5			X											
20'	219	P-1			X											
19'	219	P-2			X											
17'	220	P-2			X											
17'	221	P-2			X											

FACNAME/NO: Wpns Pier-R-3 Sheet 2 of 4

	BENT NO	PILE NO	NI	PILE CONDITION E	G	F	P	S	TYPE DAMAGE MECH	BIO	FUNC	DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE HGT	WIDTH	PENETR	COMMENTS
13'	221	P-7			X							Splash zone				Exposed aggregate
0900 8'	222	P-7			X											
12'	222	P-6			X							AWL				Exposed agg corner F3/4 Exposed agg corner F2/3
13'	222	P-4			X											
16'	222	P-3			X											
21'	222	P-1			X											
13'	223	P-7			X											
13'	224	P-6			X											
12'	225	P-6			X											
11'	226	P-7			X							-1'				Exposed aggregate F1 & 4
13'	227	P-4			X											
17'	228	P-2			X							-1'				Exposed aggregate ALL 4 Faces
12'	228	P-7			X											
26'	229	P-1			X							-1'				Exposed agg F3 & 4

FACNAME/NO: Wpns Pier R-3 Sheet 3 of 4

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
0830 25'	230	P-1			X											
12'	230	P-6			X											
21	231	P-1			X											
22'	232	P-1			X							Splash Zone				Exposed agg F3/4
12'	232	P-6			X											
23'	233	P-1			X											
11'	233	P-6			X											
13'	234	P-2			X											
11'	234	P-5			X											
14'	235	P-3			X											
16'	236	P-3			X											
18'	237	P-2			X							Splash Zone				Exposed aggragate F3/4
11'	238	P-7			X							Splash Zone				Exposed aggragate F-4
8747	239	P-1			X											

FACNAME/NO: Wpns Pier R-3 Sheet 4 of 4

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
12'	239	P-4			X											
21'	240	P-1			X											
13'	240	P-7			X											
12'	243	P-7			X											
19'	244	P-1			X							-1'				Spalling Corner F3/4
12'	244	P-7			X							Splash Zone				Exposed aggregate F 2/3

Weapons Station U/W INSPECTION DATA SHEET

LOCATION: Yorktown Va DATE: 16 Sept DIVER(S): EACN/DV MARYNAK RECORDER(S): _____

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: _____

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ _____

TIME OF DAY: 1130 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION E	G	F	P	S	TYPE DAMAGE MECH	BIO	FUNC	DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE HGT	WIDTH	PENETR	COMMENTS
15'	245	P-3			X											
21'	247	P-1			X											
21'	248	P-1			X											
14'	250	P-4			X											
11'	252	P-6			X											Splash zone looks good
98		End of 041 beginning of new. Note piles (7) & (15) are Batter piles														
14'	245	P-22				X						splash zone	6"	6"	1"	Faces 1 & 4 Exposed Aggragate
22'	246	P-1			X											Splash zone OK
146, 13'	246	P-5			X							splash zone	2"	4"	½"	Exposed aggragate corner of 1 & 2
17'	246	P-26			X											Splash zone OK

FACNAME/NO: Wpns Pier R-3 Sheet 2 of 4

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
19'	247	P-12			X											Splash Zone OK
20'	248	P-1			X											Splash Zone OK
12'	249	BR-7			X								-			Splash Zone OK
20'	250	P-1			X											Splash Zone OK
16'	251	P-3			X											Splash Zone OK
1000 13'	252	P-5			X											Splash Zone OK
9'	252	P-13			X								2"	3"	1/2"	FACE 3/4 in tidal zone 1' Above - 2' Below water there is exposed aggregate
10'	252	P-15			X											
14'	252	P-25			X											
25'	253	P-1			X											side 1 & 2 Exposed agg.
15'	253	P-4			X											Splash zone OK
10'	253	P-16			X											Splash zone OK
945 13'	254	P-21			X											Splash zone OK
10'	254	P-24			X											Splash zone OK

FACNAME/NO: Wpns Pier R-3 Sheet 3 of 4

BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
			E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
2'	256	P-3		X								6"	1/16"	1/32	F1&2 6" AWL; Corr. F4 Depth-6'
11'	257	P-6		X											Splash Zone OK
1'	258	P-4		X											Splash Zone OK
12'	258	P-22		X											Minor spalling F1&2
3'	259	P-3		X								3"	3"	1/2	Exposed aggregate
12'	259	P-4		X											Splash Zone OK
4'	260	P-21		X											Splash Zone OK
7'	261	P-10		X											Extra pile between P-10 & P-11; Splash Zone OK
9'	262	P-9		X											Splash Zone OK
8'	262	P-14		X											Pile Between P-14 & P-15 & cut off 1' above surface; Splash Zone OK
10'	262	P-18		X											Splash Zone OK
8'	263	P-1		X											Splash Zone OK
20'	263	P-3		X				X				6" 3	3" 4	1/2"	Exposed Agg Spalling
15'	264	P-6		X											Seam @ waterline

FACNAME/NO: Wpns Pier R-3 Sheet 4 of 4

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
25'	265	P-1			X											Splash zone OK
1.	265	P-5			X											Splash zone OK
11'	265	P-22			X											Min. spalling in splash zone
10'	64	P-20			X											Splash zone OK
16'	267	P-5			X											Splash zone OK
84.5 9'	267	P-19			X											Splash zone OK
10'	267	P-20			X				X							minor abrasion splash zone OK
20'	268	P-2			X											Splash zone OK
22'	268	P-3			X											Splash zone OK
8'	268	P-10			X											Splash zone OK
11'	269	P-6			X											Splash zone OK
8'	270	P-17			X											Splash zone OK

Sheet 1 of 3

U/W INSPECTION DATA SHEET

LOCATION: Weapons Station Yorktown Va DATE: 15 Sept DIVER(S): CM3/DV SNYDER RECORDER(S): _____

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: _____

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ _____

TIME OF DAY: 1415 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
12	270	P-22			X											Splash zone looks OK
8'	272	P-9			X							BWL				splash zone OK Minor spalling F-3
10'	272	P-21			X							Splash zone	4"	4"	1/2"	Spalling F-1
21'	273	P-3			X											Splash zone looks good
10'	273	P-5			X							Splash Zone				Exposed Agg. F-3 (Minor)
11'	273	P-20			X											Splash zone OK
10'	274	P-9			X											Splash zone OK
345 23'	276	P-3			X											Splash zone looks good
8'	276	P-14			X											Splash zone OK
8'	276	P-18			X											Splash zone OK

FACNAME/NO: Wpns Pier R-3 Sheet 2 of 3

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
29'	277	P-1			X											Splash zone OK
8'	277	P-10			X											Splash zone OK
28'	278	P-1			X											Splash zone OK
20'	278	P-4			X											Splash zone OK
1330 13'	278	P-22			X											Splash zone OK
13'	279	P-22			X											Splash zone OK Ground Cable on F-1
10'	280	P-19			X											Slight spalling in Splash zone F-1
8'	281	P-13			X											Splash zone OK
32'	282	P-1			X											Exposed Agg F-3/4 @ W/L (Minor)
30'	282	P-2			X							-6'	18"	4"	1/2	Aggregate exposed F-4 Spalling corner F3 & 4
25'	282	P-4			X											Splash zone OK
300 11'	282	P-20			X											Splash zone OK
15'	284	P-2			X							Splash zone				Exposed Agg Corner F3/4.
11'	284	P-21			X											Splash zone OK

FACNAME/NO: Upns Pier R-3 Sheet 3 of 3

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
17'	285	P-3			X											Splash zone OK
20'	286	P-5			X											Minor exposed agg F-1 BWL.
24'	287	P-1			X											Splash zone OK
11'	287	P-17			X											Splash zone OK
230	287	P-21			X											Splash zone OK
26'	288	P-1			X											Splash zone OK
25'	289	P-2			X							AWL				Minor Exposed Agg Corner F3/4.
10'	289	P-22			X											Pile Repaired above WL Agg Exposed BWL on F-1
28'	290	P-1			X											Splash zone OK
	291	P-1			X											Splash zone OK
10'	291	P-10			X											Splash zone OK
215, 8'	291	P-15			X											Splash zone OK
11'	292	P-4			X											splash zone OK

Weapons station
U/W INSPECTION DATA SHEET

LOCATION: Yorktown Va DATE: ____ DIVER(S): SW3/DV Reynolds RECORDER(S): ____

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: ____

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ ____

TIME OF DAY: 1200 TIDE: ____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
21'	293	P-3			X											Some exposed aggregate on all 4-Faces
15'	293	P-5			X											Splash zone OK
8'	293	P-15			X											Splash zone OK
8'	293	P-18			X											Splash zone OK
25'	294	P-1			X											Splash zone OK
10'	294	P-8			X											Splash zone OK
9'	294	P-22			X											Splash zone OK
17'	296	P-4			X											Splash zone OK
7'	296	P-15			X											Splash zone OK
8'	297	P-14			X											Splash zone OK

FACNAME/NO: Wpns Pier R-3 Sheet 2 of 2

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
8'	297	P-15			X											Splash zone OK
6'	298	P-22			X											Splash zone OK
21'	299	P-1			X											Splash zone OK
11'	299	P-5			X											Splash zone OK
0930 6'	299	P-20			X											Splash zone OK
8'	300	P-20			X											Splash zone OK
8'	300	P-21			X											Splash zone OK
	300	P-22			X											Splash zone OK
15'	301	P-3			X											Some aggregate exposed Splash zone OK.
9'	301	P-7			X											Minor spalling corner F1/4 otherwise Splash zone OK
10'	301	P-11			X											Splash zone OK
7'	301	P-22			X											Splash zone OK

Weapons station U/W INSPECTION DATA SHEET

LOCATION: Yorktown, Va DATE: 11Sept DIVER(S): CM3/DV WALES RECORDER(S): _____

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: _____

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ _____

TIME OF DAY: 1000 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
8'	303	P-10			X											
28'	304	P-1			X							-15'	1"	1"	1/2"	Spalling
14'	304	P-4			X											
8'	304	P-15			X							Splash Zone				Corr. Stains - No cracks on F-3
12'	304	P-22				X						-7'	1"	1 1/2"	1/2"	Rebar exposed corner F1 & 4.
8'	305	P-9			X											
8'	306	P-20			X											
030 24'	307	P-1			X											
8'	307	P-15			X											
7'	308	P-15			X							Splash Zone				Rust stains & small crack < 1/2" W on F-4

FACNAME/NO: Wpns Pier R-3 Sheet 2 of 2

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
28'	309	P-1			X											
9'	309	P-15			X											
13'	309	P-22			X											
20'	310	P-3			X											
12'	310	P-20			X							Splash Zone Mudline	3"	2"	½"	Minor Spalling Spalling
12'	310	P-21			X											
13'	311	P-22			X							Splash Zone				Minor Spalling
1125	313	P-10			X							Splash Zone				Minor Spalling

Sheet 1 of 2

Weapons Station U/W INSPECTION DATA SHEET

LOCATION: Yorktown Va DATE: 11Sep DIVER(S): CE2/DV OLIVER RECORDER(S): W. F. Casey

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: BEARING [✓] BATTER [✓] FENDER [ ] SHEET [ ] WATER DEPTH: _____

PILE MATERIAL: WOOD [ ] STEEL [ ] CONCRETE [✓] OTHER [ ] _____

TIME OF DAY: 1230 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
30'	314	P-1			X											
8'	314	P-13				X						7'	6"	4"	2"	Splash zone looks good corner Face 1 ft Chunk missing
9'	314	P-19			X											
1245 12'	314	P-22			X											Splash zone OK
11'	315	P-22			X											Splash zone OK
18'	316	P-3			X											Splash zone OK
15'	319	P-4			X											Splash zone OK
13'	319	P-22			X							8'	3'	½"		Splash zone OK; vertical crack, no rust stain (F-3)
18'	320	P-3			X											Heavy Marine Growth
17'	320	P-4			X											Splash zone OK

FACNAME/NO: Wpns Pier R-3 Sheet 2 of 2

	BENT NO	PILE NO	NI	PILE CONDITION E	G	F	P	S	TYPE DAMAGE MECH	BIO	FUNC	DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE HGT	WIDTH	PENETR	COMMENTS
12'	320	P-22			X							BWL	8"	8"	1/4"	exposed agg just below water line on F-1
10'	321	P-6			X											very clean
25'	322	P-1			X							AWL	1'	across face	1/2"	exposed aggregate, small holes on F-3; splash zone OK
25'	323	P-1			X							-8'				Rust on F-3 but no cracks; splash zone looks OK.
6'	323	P-9			X											Splash zone OK
5'	323	P-10			X							AWL			1/4"	exposed aggregate w/ small holes on F3
25'	324	P-1			X											Splash zone looks OK
334 8'	324	P-13			X											Looks good in splash zone
8'	326	P-14			X											Splash zone OK
7'	326	P-15			X											Splash zone OK
8'	326	P-19			X											Splash zone OK
10'	329	P-4			X											Splash zone OK
6'	329	P-8			X											Splash zone OK
9' 359	329	P-19			X											Splash zone OK

Weapons Station
U/W INSPECTION DATA SHEET

LOCATION: Yorktown Va DATE: 12Sep DIVER(S): SW3/DV ReyNolds RECORDER(S): _____

FAC NAME/NO. Fleet Wpns Sta R-3 PILE TYPE: BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: _____

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ _____

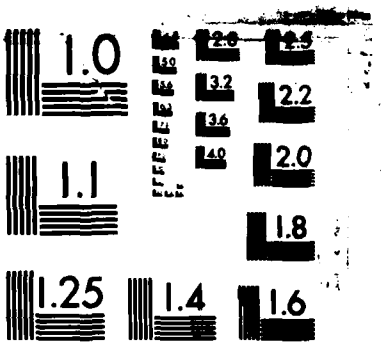
TIME OF DAY: 1359 TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION E	G	F	P	S	TYPE DAMAGE MECH	BIO	FUNC	DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE HGT	WIDTH	PENETR	COMMENTS
6	330	P-10			X											Splash zone looks good
8'	330	P-19			X							5'		6" DIA	½"	Splash zone looks good F-1 exposed aggregate No rust visible
9'	330	P-20			X											Splash zone OK
10'	331	P-22			X											Splash zone OK
9'	333	P-8			X											Splash zone OK
9'	333	P-17			X											Splash zone looks good.
28' 431	334	P-1			X							9'	6"	½"	UK	F1 ¼ (corner) crack Little Rust visible
22	335	P-1			X											Splash zone OK
11'	336	P-22			X							Splash zone.				Minor spalling F-1
19'	337	P-1			X											Splash zone OK

FACNAME/NO: Wpns Pier R-3 Sheet 2 of 2

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
18'	339	P-1			Y											Splash zone OK
17'	339	P-22			X											Splash zone OK
16'	340	P-2			X							Splash zone				Minor spalling F-1
21'	341	P-1			X											Splash zone OK
18'	342	P-22			X							Splash zone				Minor cracks on F1/4
18'	343	P-2			X											Splash zone OK
25'	348	P-3			X											Splash zone OK
32'	349	P-1			X											Splash zone OK
16' 0802	349	P-22			X											Splash zone OK

AD-A167 542 UNDERWATER FACILITIES INSPECTIONS AND ASSESSMENTS AT US 2/2
NAVAL WEAPONS STA.. (U) NAVAL FACILITIES ENGINEERING
COMMAND WASHINGTON DC CHESAPEAKE.. SEP 80
UNCLASSIFIED CHES/NAVFAC-FPO-1-80 (18) F/G 13/2 NL



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1963-A

U/W INSPECTION DATA SHEET

LOCATION: Weapon Station Yorktown Va DATE: 17 Sep DIVER(S): CM3/DV WALES RECORDER(S): EACN MARYNAK

FAC NAME/NO. Fleet Wpns Pier R-3 PILE TYPE: New Approach Trestle (LFt side) BEARING ☑ BATTER ☑ FENDER ☐ SHEET ☐ WATER DEPTH: 2-4'

PILE MATERIAL: WOOD ☐ STEEL ☐ CONCRETE ☑ OTHER ☐ _____

TIME OF DAY: _____ TIDE: _____ DEPTH OF DAMAGE FROM DATUM = GAUGE DEPTH - TIDE

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
2'	T126	P3			✓											
2'	T124	P2			X											
2'	T122	P1			X								2"	2"	1"	chip (concrete) corner Face -2 & 3
2'	T115	P6			X											
3'	T112	P1			X											
0845 3'	T108	P4			X											
3'	T104	P4			X											
3'	T101	P1			X											
4'	T98	P3			X											
4'	T93	P4			X											

FACNAME/NO: Wpns Pier R-3 Sheet 2 of 3 2 [3] 4 (1)

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
0830 9'	T90	P1			X							Splash Zone	1/2"	1/2"	1/2"	Face 2 - CHink
11'	T87	P8			X											
13'	T81	P4			X											
14'	T77	P3			X											
12'	T74	P1			X							Splash Zone	1"	1"	1/2"	Face 3 Minor Spalling
0819 15'	T71	P2			X							Splash Zone				Minor spalling ON ALL 4-Faces
17'	T67	P3			X											
15'	T61	P8			X											
19'	T58	P1			X											
6'	T54	P1			X											Bridge Foundation - No Scouring on any Bridge Piles
9'	T54	P4			X			(Inspected 9/17/90 @757 HRS)								No scouring
11'	T53	P1			X											No Scouring
10'	T53	P8			X											No Scouring
18'	T41	P1			X							@ WL	1"	1" F-1 1" F-2	1/2"	Corner Face 1 & 2 exposed

FACNAME/NO: Wpns Pier R-3 Sheet 3 of 3

	BENT NO	PILE NO	NI	PILE CONDITION					TYPE DAMAGE			DEPTH DAMAGE (gauge)	DIMENSIONS OF DAMAGE			COMMENTS
				E	G	F	P	S	MECH	BIO	FUNC		HGT	WIDTH	PENETR	
22'	T35	P3			X											
20'	T30	P1			X							ABOVE W/L		1" F-1 1" F2	1"	corner 1 & 2 spalling
24'	T24	P3			X											
24'	T18	P4			X											
29																

END

DTIC

6-86