



*Flag raising at Pendleton Air  
Base.*

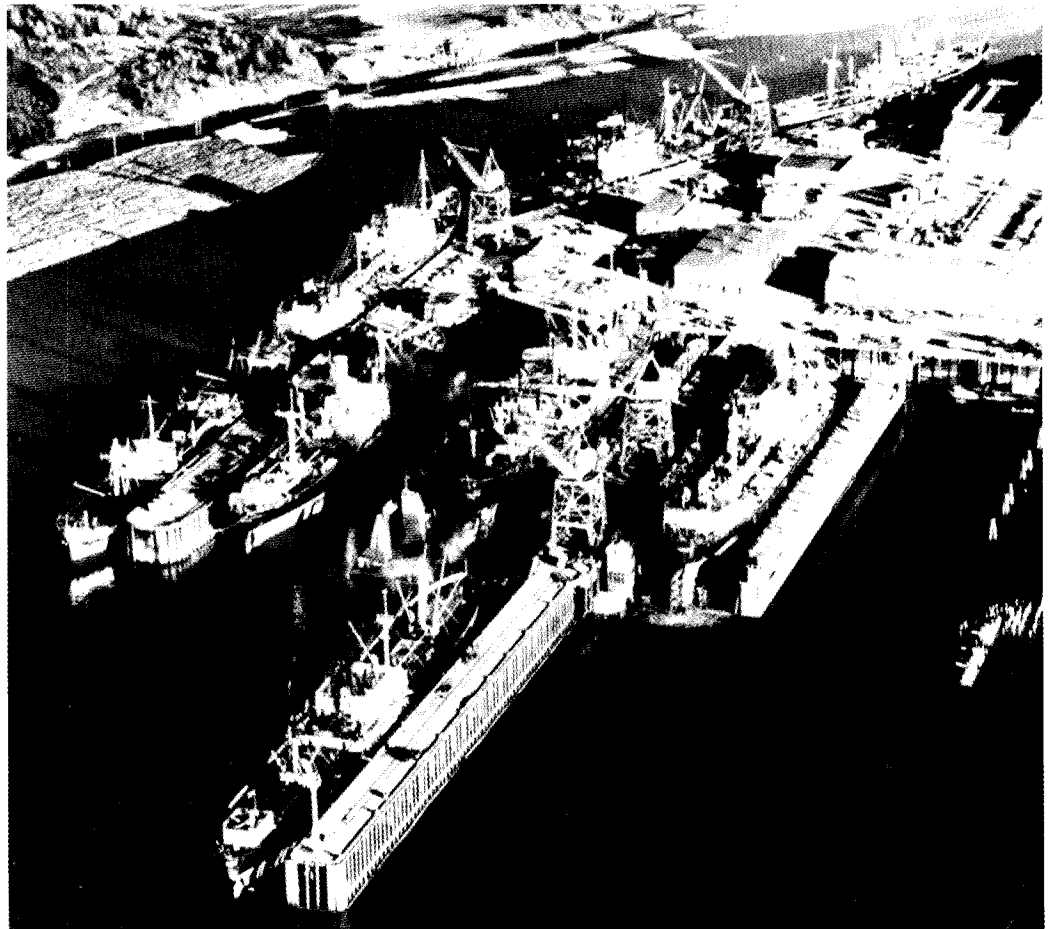
# Chapter 9 Military Work

## District World War II Construction

The Corps of Engineers is responsible for military as well as civil works construction programs. Prior to World War II, Portland District had a limited involvement in military construction. Repair, reconstruction, and maintenance work on Fort Stevens at the mouth of the Columbia constituted the main military activity of the District. During the Spanish American and First World Wars, America's enemies posed little threat to the west coast. Mobilization for World War II, however, placed a heavy demand on the resources of the Portland District.<sup>1</sup>

To assist the nation-wide mobilization effort, military planners ordered the immediate construction of huge training camps and air bases, defense installations, and logistics facilities in the Northwest. To meet this military responsibility, the Corps slowed or postponed work on civil projects except hydropower works and navigation maintenance. The army commissioned civilian engineer specialists as officers either to train enlistees or other prospective military engineer personnel. Others served overseas or directed the effort at military construction sites. Work often proceeded on a 12-hour-per-day basis. The most important projects assigned to the Portland District consisted of building training camps and air bases, providing electricity, and maintaining a coastal defense. The \$100 million cost of the three largest bases reflected the scale of the District's military construction program. By 1943, \$4 billion in war contracts had been awarded in Oregon and Washington alone.

Immediate responsibilities assumed by the District included efforts to facilitate war-use water cargo. The frenzy of activity in the Pacific immediately after Pearl Harbor to strengthen the Navy and to secure at least the western reaches of the ocean put great

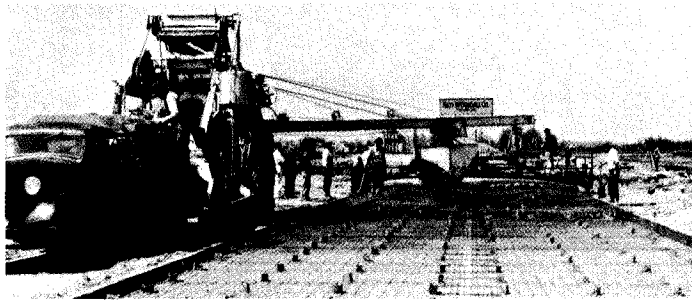


*Ship construction and repair  
in Portland for World War II  
mobilization.*

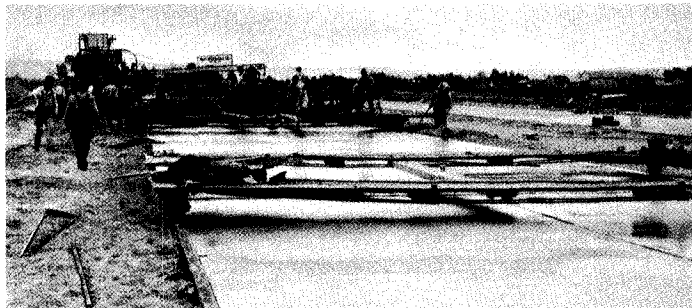
demands on ports up and down the west coast. The construction of great shipbuilding plants in the Portland-Vancouver area and the supply of materials from the Northwest to Allied forces also contributed to the burden on shipping facilities. The Portland District took over supervision of loading and scheduling of military shipments. The District requisitioned dock facilities in Portland and hired laborers. Great quantities of coal and weapons went from Portland to Australia. A giant derrick from the newly-completed Fort Peck Dam in Montana went to South Asia via Portland.

In 1940, the Corps of Engineers received a new mission. Congress now authorized the Corps to undertake a major share of the rapidly expanding military construction program. This represented the culmination of several years of bureaucratic in-fighting by the Corps to find new assignments to replace its declining civil works program. From fiscal year 1939 to 1940, civil works appropriations dropped from \$289 to \$180 million, and few new projects gained approval. In order to preserve its organization, the Corps of Engineers had to forestall the creation of a separate military construction corps and gain the transfer of existing construction work from the Quartermaster Corps. The first major shift of responsibility involved the assignment of Air Corps construction to the Corps of Engineers in November 1940. A year later, the President signed the bill moving all of the remaining construction responsibilities from the Quartermaster Corps to the Corps of Engineers. The Engineers qualifications for this immense task came from no special competence in building construction. Rather, it resided in the strength and versatility of its decentralized organization.<sup>2</sup>

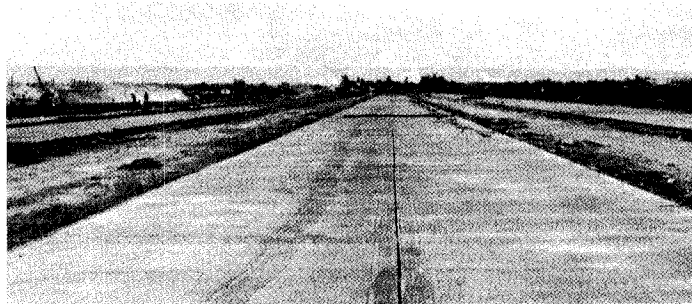
*Reinforced foundation for runway construction*



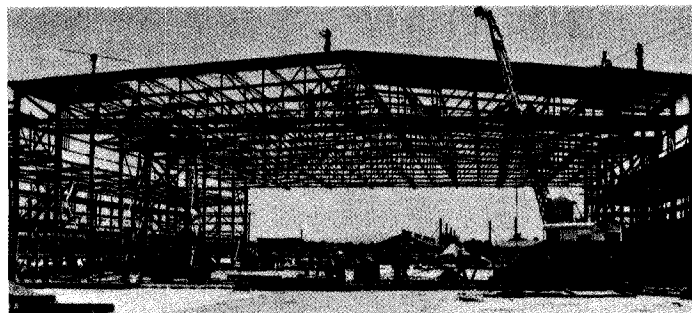
*Pouring runway concrete*



*Runways near completion*



*Hanger construction*



The earliest military work affecting the Portland District included supervision of all WPA military and civilian airport projects. The new airport for the City of Portland was one such project. Until 1940, the air field was located on Swan Island in the Willamette River. The increasing size of aircraft and volume of traffic required its removal to the present location northeast of the city. Funds provided by the WPA allowed the Corps of Engineers to fill Lake Whittaker which until then had covered much of the site. The Portland District found building runways a challenging undertaking. Textbooks on road-building plus an occasional inspector loaned from the Bureau of Public Roads proved helpful in the experiment. No sooner had the District completed the project than war in the Pacific broke out. The War Department instructed the District to construct a group-sized military aviation base at the location of the new Portland airport. First, the engineers enlarged and strengthened runways to accommodate military air traffic and then constructed other post facilities to serve the airmen stationed at the new base.<sup>3</sup>

According to the District Engineer at the time, Lieutenant Colonel Cecil Moore, the transfer of military construction from the Quartermaster to the Engineers went smoothly. The District Operations and Construction Division assumed the work and changed its name to Military Works Division. After the war, the title reverted to Operations and Construction.<sup>4</sup>

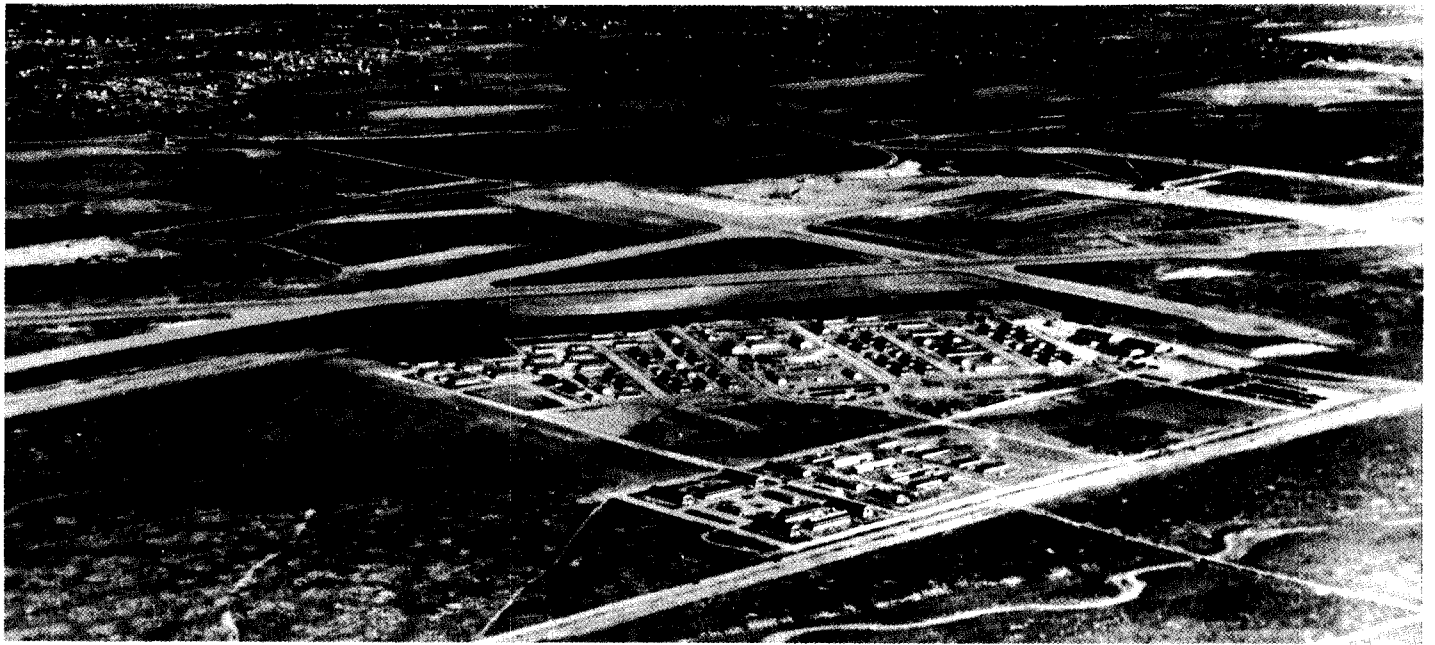
Military construction of airports and training bases proceeded on a large scale throughout the District during 1940 and 1941. The Corps either began new airports or expanded existing civil facilities. The District constructed training bases at several Oregon

*right: Portland Air Base construction.  
below: Sign on top of Portland cantonment*



*right: Civil workers typical of those who constructed Portland Air Base*



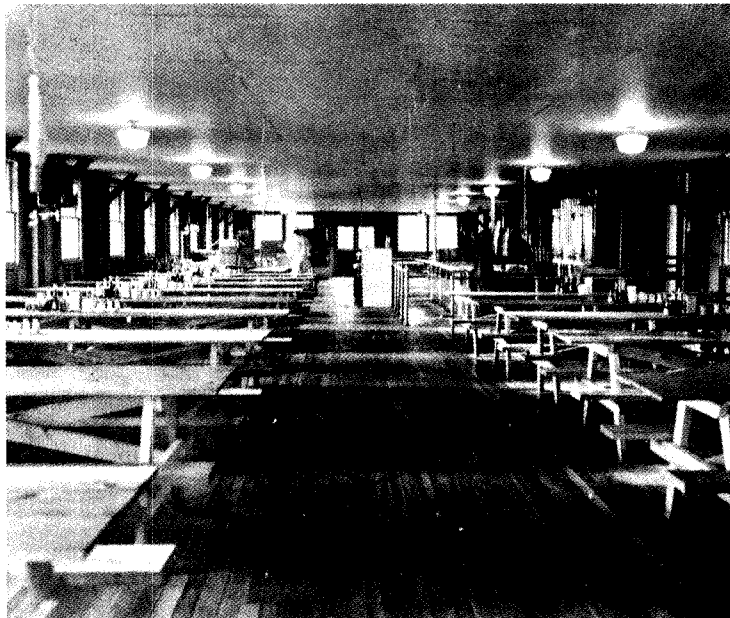


above: Boise Air Base

locations, including Camp White at Medford, Camp Abbott near Bend, and Camp Adair near Corvallis. At Walla Walla, Washington; Boise, Mountain Home, and Pocatello, Idaho; and Pendleton, Oregon, the Corps built air bases. The District also built a naval air station at Klamath Falls and numerous smaller airstrips throughout Oregon.

Camp White constituted the largest military installation built during the war by the Portland District. Work began less than two months after the attack at Pearl Harbor. When completed, Camp White, whose principal purpose involved infantry and artillery training, housed 25,000 to 30,000 men. To provide living quarters, training and recreation facilities, utilities, and other needs for such a large military camp represented the equivalent of building a medium-sized city. Before the Corps took over all military construction functions, architect-engineers or members of the quartermaster branch of the regular Army produced much of the basic structure design for military camps and bases. The District then had to adapt these plans to the terrain and conditions of particular locations. Road plans, water supply, drainage and sewage disposal proved less amenable to centralized designed than structures; of necessity, the District had to provide the local design work. Private contractors carried out the actual construction.

The substantial improvements made by the Army near Medford have continued in use since the end of the war. The sewage treatment facility built for Camp White was one of the first complete sewage treatment units in the State of Oregon. The District installed it to protect the Rogue River from pollution. The unit performed so well that the City of Medford took it over after the war. Roads put in during the war still give useful service. The



Mess hall facility at air base



*Groundbreaking for Pendleton Air Base*



*Construction at Pendleton*

former site of the camp now serves as a large industrial area and the base hospital, as a Veterans Administration Hospital.

At Camp Adair, the District set up an artillery practice range. While located apart from the camp and far outside Corvallis, precautions against stray shells proved necessary. The military told farmers to place red flags beside any ordinance which they might find in their fields. The District instructed certain personnel in the defusing of these dangerous objects, and they made many trips to the Corvallis area to aid alarmed farmers or picnickers. One Corvallis farmer tried to improve upon this procedure. In response to his call, a Corps of Engineers employee arrived only to discover that the man had hauled a live round over snowy fields on a sled and placed it in his barn—together with his livestock—for “safe keeping.” The Corps employee defused the explosive and instructed the well-intentioned farmer that in the future a red flag might be a more prudent approach.

The Portland District built Camp Abbott on the Deschutes River about 11 miles south of Bend. Completed in May 1943, it served as an Engineer replacement training center. Until the end of the war, Corps of Engineers instructors taught the 15,000 trainees military construction and engineering. The soldiers training at this important installation learned a staggering amount in a short time. Men trained, in periods ranging from five to seventeen weeks, in heavy equipment operation, fire-fighting, carpentry, demolition, tank operation and maintenance, bridge construction, infiltration, mapmaking, pipeline construction, depot storage, specialized mechanics, aerial photography, water and sewage systems, camouflage, mine detection, and bomb disarmament.

A fighter base constructed by the District at Pendleton, Oregon, in 1941 earned a special place in history. This base served as a training field for General Jimmy Doolittle’s Tokyo raiders. At this airfield, old municipal runways were extended and strengthened and new ones designed and laid out. Construction of the entire airbase serving 2,500 personnel required only six months. Like Portland, the base at Pendleton served mainly fighter-training and defense reserve functions.<sup>5</sup>

The electric power generated by the Corps of Engineers at Bonneville Dam played an invaluable role in the civilian war effort. The metals, aircraft, and shipbuilding industries in the Northwest exemplified the massive and direct involvement of the nation’s economic and productive power in World War II. The federal dams on the Columbia River provided the large amounts of energy needed for those industries. To meet this demand, the Portland

## **Hydropower for the War Effort**

District rushed to completion the full generating facilities at Bonneville. By December 1943, the project reached its planned power capacity of 514,000 kilowatts.<sup>6</sup>

The newly-created Bonneville Power Administration marketed power from federal dams on the Columbia River. The growth of the BPA reflected the need for electricity during the war. From 1939 to 1944, high-tension, 230-kilovolt transmission lines increased from zero miles to 2,500 miles; installed generating capacity increased from less than 100,000 to 1,350,000 kilowatts; and revenues advanced from about \$367,000 to \$20 million.<sup>7</sup>

The availability of large quantities of cheap electric power made possible the development of the metals industry in the Northwest during the war. Plants in the Pacific Northwest supplied one-third of the light metals required for national defense. The massive airplane construction effort demanded great quantities of aluminum. Plants making electrolytic zinc used in brassmaking for munitions, magnesium needed in aircraft, calcium carbide required in acetylene welding for ship construction also located in the region. In addition, facilities developed for producing manganese, chlorates, ferro alloys, and electrolytic manganese for non-ferrous metal alloys. In all, 16 new metal and chemical plants located in the Northwest during the war; 14 of these became large users of federal power.<sup>8</sup>

The shipbuilding operation at the Port of Portland also needed huge amounts of electric energy. The Oregon Shipbuilding Corporation of Portland and the Kaiser Corporation of Vancouver each established national records for speed and quantity of output. Portland's Swan Island Shipyards manufactured one-third of the tankers built during World War II. In 1943, the government assigned 16 percent of the nation's total shipbuilding program to the Northwest. Finally, BPA supplied power to the secret Hanford Project where scientists participated in the race to develop an atomic weapon.<sup>9</sup>

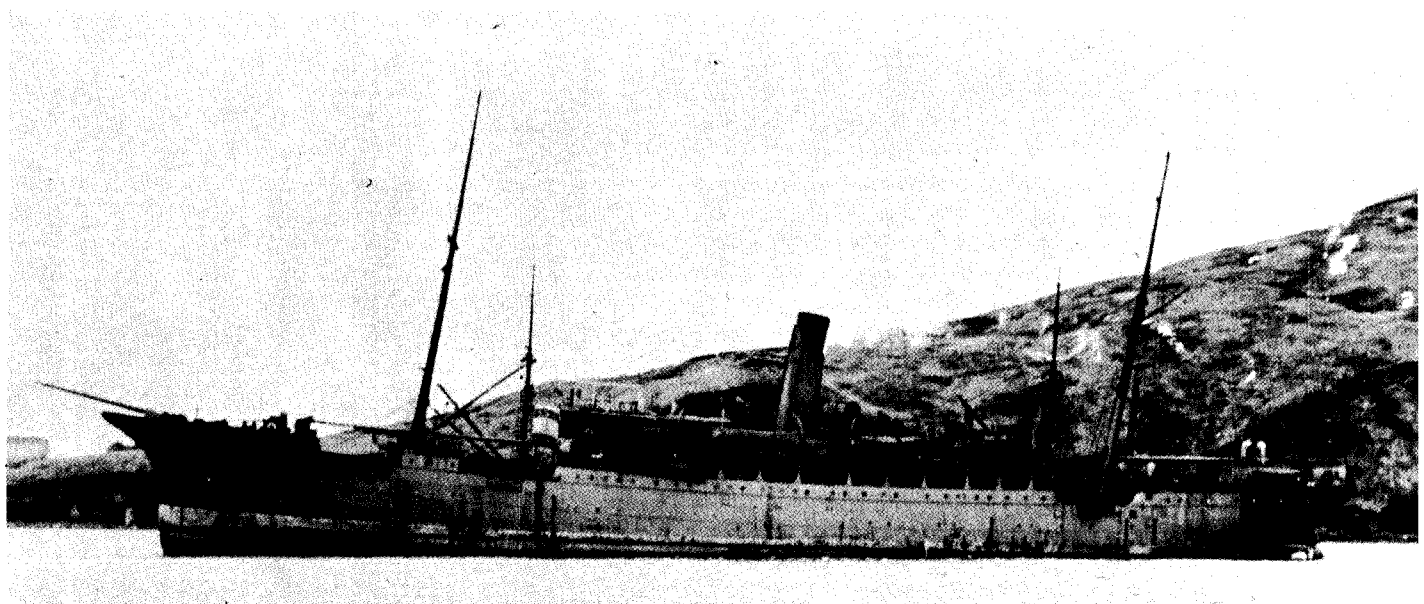
In addition to constructing camps and airbases and providing electric generating capacity, the District performed a variety of lesser work during the war. It built storage depots near Clatskanie and Umatilla, Oregon, on the Columbia River. Near the Umatilla Depot, the Corps operated a practice air bombing range, setting up targets, surveying, and constructing markers to guide pilots and keep them on the range. The District assumed this responsibility from the Quartermaster Corps.<sup>10</sup>

During the war, lendlease shipments to the Russians through the Port of Portland included locomotives, many of them manufactured in Portland. While in port to take aboard a locomotive, the Russian ship *Ilich*, a former flagship of the Russian czar, sank in the harbor, blocking traffic. Charged with maintaining the navigability of the Willamette River, the Portland District hired divers to cut the ship into sections with underwater blowtorch equipment for removal. Another vessel equipped with a large derrick pulled the sections, later sold for scrap, out of the river.

The Portland District also cooperated with the 29th Engineer Topographical Battalion stationed in Portland during World War II. The 29th transformed aerial photographs into composite maps for intelligence and bombing uses. The District provided the 29th with its working, housing, and mess facilities. The 29th also trained men in photogrammetry for overseas duty. Late in the war the group transferred to the Phillipine Islands where it served for the duration.

The vast amount of goods and men required for the war effort in the Pacific resulted in clogged railroad terminals and transfer areas. To alleviate this problems, the Corps laid

Russian ship *Ilich* aground in the Willamette River at Portland.



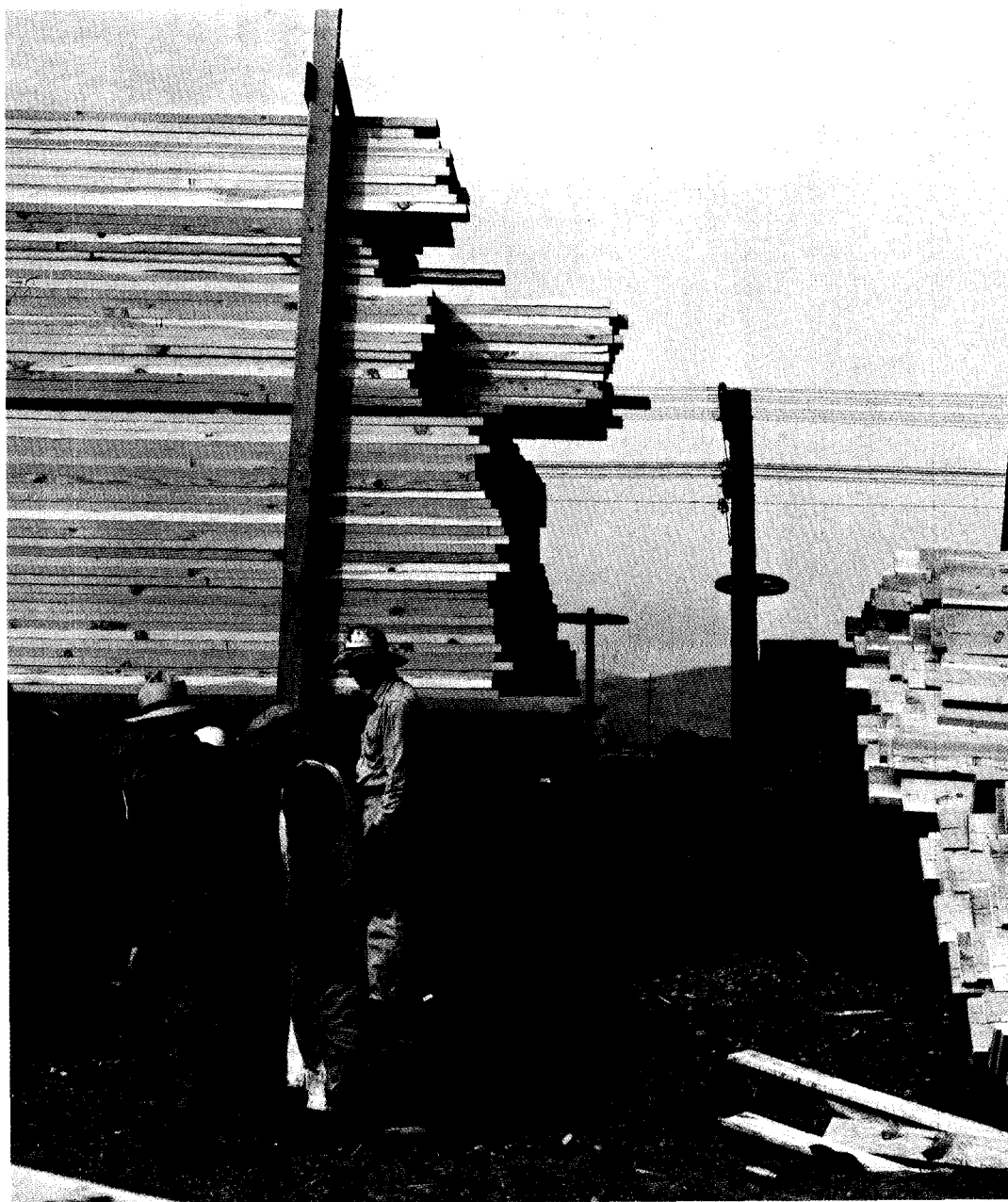
## Coastal Defense

several thousand yards of parallel track in switching yards in Southeast and North Portland. In addition to the track, the District installed switches, built transformers, and constructed warehouses. The District had a direct interest in efficient railroad operations because it facilitated the Corps' responsibility for lumber procurement for military construction both in the Northwest and in the Pacific Theater. The West Coast Lumber Office and, later, the Army-Navy Lumber Agency handled this job for the District. Finally, the District improved and expanded facilities at the Army's Vancouver Barracks and Barnes Hospital.

Wartime work of the Portland District also included the coastal defenses at the mouth of the Columbia River. Fort Stevens in Oregon served as the main fortification, with Forts Canby and Columbia in Washington playing subsidiary roles. The posts contained a variety of armaments installed by the District. Beginning early in 1942, the Corps mounted six-inch guns, radar-guided with a 360-degree traverse control and steel shields. This type of gun had a range of 17 miles.<sup>11</sup>

Another type of artillery at the Cape forts included high-arcing, 12-inch mortars. The Portland District originally installed these at Fort Stevens and Fort Canby in 1898. The mortar lobbed a deck-piercing shell high into the air onto the deck of the enemy craft; the shell passed into the hold where it released its explosive charge. The difficulty with the weapon was its short range (less than eight miles) and limited accuracy, especially against submarines.

In addition to the six-inch guns and the mortars, Battery Russell at Fort Stevens contained ten-inch guns. The batteries included plotting rooms, shell and powder storage



*Lumber stockyard of the Portland District lumber procurement office.*



compartments, and rude sleeping quarters. During the first half of the war, gunners manned the camouflaged pieces 24 hours a day. Authority to fire came from a joint command consisting of both Navy and Army officers. Late in the war, the Corps set up 90-millimeter anti-aircraft artillery at the Columbia forts. Each battery contained two guns and camps to house personnel. The Corps built the quarters of heavy timber and completely buried them in sand. To keep the sand in place, the engineers planted Holland grass, a method first used 50 years earlier at Coos Bay spit.

Before the radar-guided Barbets became operational for the Coast Artillery at either Canby or Stevens, a Japanese submarine surfaced several miles off shore in June 1942. The Japanese fired several shots at Fort Stevens, doing no damage but engendering considerable alarm. Another submarine surfaced just off North Head at the mouth of the Columbia. It did not fire at the shore installations, and an intensive search by planes and ships failed to find the vessel. Depth charges proved ineffectual in the operation.

As in World War I, the Coast Artillery mined the mouth of the Columbia River to prevent the entrance of hostile warships. The military anchored four-foot-diameter mines at the bottom of the river by steel cable and weights. They could be detonated either by contact or by electric charge. If an enemy ship were to pass into the mouth, its exact location would be plotted and the mine closest to the ship detonated. Fort Columbia served as headquarters for mine operations; but Fort Stevens, with better visual contact at the mouth, controlled the actual blast machinery. During low visibility, the soldiers set the mines for contact. American or friendly vessels were informed of the safe channels.

At war's end, the Coast Artillery and the Corps of Engineers removed most of the mines from the river. Some had to be detonated because of their inaccessibility owing to shifting silt and sand. Other mines remained on the bottom of the river, deeply covered by sand and silt and well out of the channel zone. With the passage of time, seepage eliminated any possibility of explosion, even if means of electric detonation still existed.<sup>12</sup>

The Portland District also constructed radar facilities during the war. Other branches of the Army or private contractors handled tower design and installation of control and calculating equipment, but the Corps constructed the heavy concrete housing for the equipment, as well as camps for the men who operated the radar. These camps provided water, living quarters, roads, and utilities for 100 men. Most of the early radar installations detected surface craft or submarines, but equipment placed after 1942 protected against aircraft. The Corps located the radar at numerous coastal points, including the mouth of the Columbia.

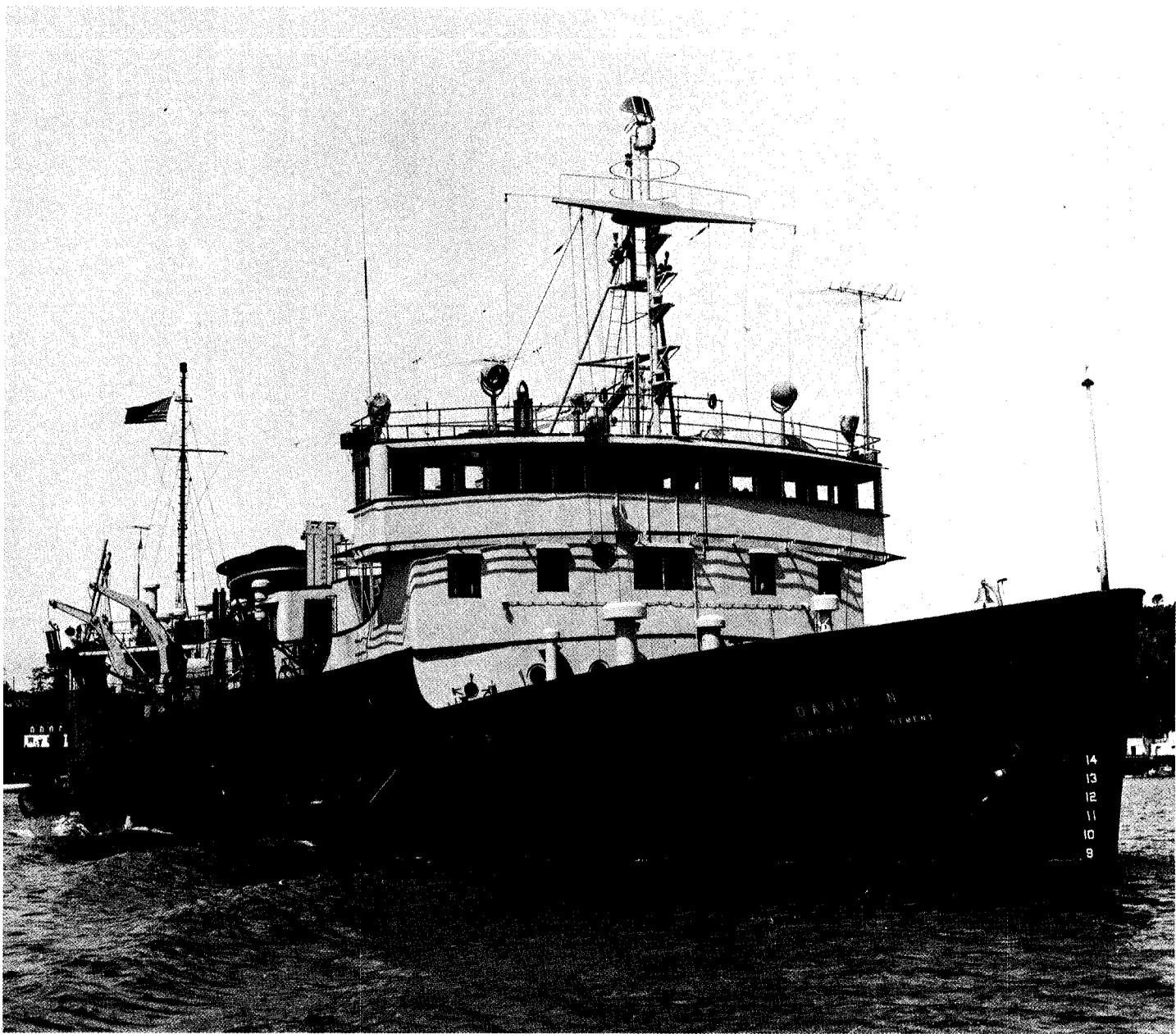
In addition to radar, the Corps constructed other defensive facilities. It set up large searchlights at the mouth of the Columbia to aid the artillery batteries and erected watch towers at several locations on the Oregon Coast. Civilian volunteers manned the watch towers, providing warnings for American fighter bases further inland. The volunteer observers had lists of all aircraft with clearance, and if they spotted an unidentified craft, fighters based at Portland scrambled to intercept.

Active coastal defenses proved necessary, for the Japanese demonstrated a good deal of imagination in devising methods for inflicting damage on the United States mainland. For instance, in Oregon, they attempted to start forest fires. Japanese submarines, each equipped with a small collapsible-wing radio-controlled aircraft on their decks, approached the coast. Out of radar range, the submarine would surface, load the plane with incendiary bombs, and direct it to the Oregon forests. Either because of weather conditions or mechanical failure, this effort met with no success in Oregon. However, such efforts produced one small fire in northern California.<sup>13</sup>

Another ingenious, almost quaint, technique used by the Japanese involved armed balloons. They made these of paper and filled them with a lighter-than-air gas. An electronic control device automatically released sandbags as the balloon lost gas in its flight over the ocean, thereby controlling altitude. Used late in the war, these balloons carried bombs. Upon receiving reports of the devices from the coastal observers, fighter pilots had standing orders to shoot them down before they reached shore. Some escaped detection and reached as far as the mountains of Idaho. One lodged itself in a tree in southern Oregon near the town of Lakeview in May 1945. A Sunday school group on a picnic outing climbed to investigate the strange object; the bomb exploded, killing and injuring several in the party. Those who manned the watch towers successfully detected most of the balloons.

In addition to erecting the lookout towers, the Portland District built camps for the beach patrols. Each camp housed 100 to 120 Coast Guard or civilian volunteers who patrolled the beaches on foot or on horseback. The Corps located such camps at Nehalem and near Coos Bay in Oregon and at Long Beach in Washington.

During the Korean War, the Portland District carried out dredging activities to facilitate the rapid movement of men and supplies in South Korean waters. The Lumber Branch, Supply Division, of the Portland District also played a noteworthy role during the



*The dredge Davison, which served time in Vietnam, moves up the Willamette River.*

Korean War. Only two of these offices existed in the United States, the other being in the Atlanta District. The Lumber Branch purchased over \$100 million worth of lumber in 1951 for use in boxes and containers, construction and maintenance of training facilities, and as dunnage in the holds of ships. Most went overseas for a variety of military uses or military assistance aid programs. Employment in the Portland Lumber Branch grew from about 20 to over 125 during the Korean War. In 1961, the Secretary of Defense transferred the Lumber Branch from the Corps of Engineers to the Defense Supply Agency. The local unit received administrative support from the Portland District until 1970.

In the Vietnam conflict, the Portland District's seagoing hopper dredge, *Davison*, served at Cam Ranh Bay from 1966 to 1972. Only one casualty resulted from the *Davison's* service in Vietnam. A cook was killed when the launch on which he was returning to the *Davison* struck a Viet Cong mine. During the *Davison's* Vietnam tour, the crew received several Navy citations for their efforts to keep shipping supply lines open under hostile conditions.<sup>14</sup>