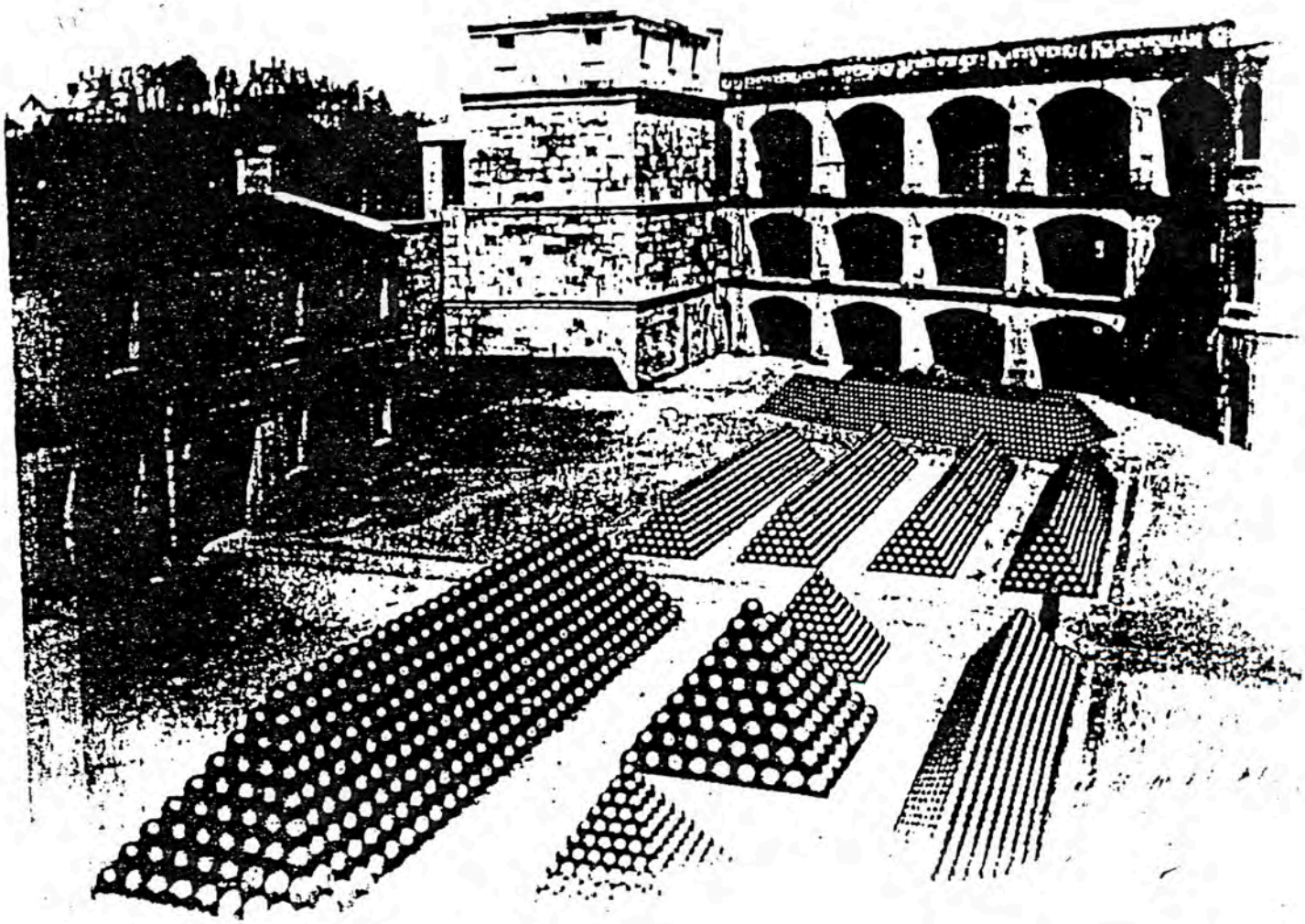
Final Exhibit Package

June 22, 1995

Gateway - NPS

Fort Wadsworth Visitor Center

Exhibit Plan



National Park Service
Division of Exhibits
Interpretive Design Center

Comprehensive Plan

All exhibit elements described in order of presentation

1 Fort Wall Replica

Model
A-01-001 Model of Totten shutters & Gun Barrel

Quotation
L-01-001

"...making the coast as far as practicable, impregnable."
President James Monroe, 1820

Title
L-01-002

BUILT TO LAST...

Primary text
L-01-003

This is a replica of the seaward wall of Battery Weed*. This four-tiered fortress has commanded the Narrows since the Civil War. When first designed, this fort was considered indestructible by enemy ships. Military engineers were confident that massive masonry walls and iron plate would withstand round shot fired from naval guns.

What the engineers failed to anticipate were several key advances in weaponry. Perhaps the most important was rifled cannon capable of firing pointed projectiles further, faster and with more accuracy than ever before. Vertical walls of granite and brick were simply no match for these guns. That Battery Weed survives intact is due largely to having never come under enemy fire.

*Battery Weed originally known as Fort Richmond

Silkscreened
Posterized line art, PMS Black 7C
G-01-004 Painting by Seth Eastman of Forts Tompkins and Wadsworth

Secondary text
L-01-004

This view of Fort Richmond* from Fort Hamilton across the Narrows shows an imposing structure of solid stone built low to the shoreline. Behind this water battery's gun ports lurk chambers outfitted with 116 heavy guns for "battering" an invading naval force.

Secondary text
L-01-005

Reflecting the stacked decks of an enemy man-o-war, Fort Richmond* arranged its guns on multiple tiers.

Title
L-01-006

TOTTEN'S CONTRIBUTION

Subtitle
L-01-007

BETTER IDEAS

Silkscreened
Line art, PMS Black 7C
G-01-007

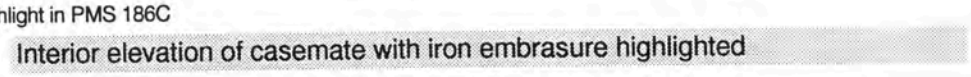


Primary text
L-01-008

Architect of the Fort

Joseph G. Totten, an 1805 graduate of West Point, designed Fort Richmond*. Like most West Pointers of his day, he admired the defensive innovations of French military engineers. Totten devoted himself to perfecting a vital part of coastal fortification—the gun port.

Silkscreened
Line art, PMS Black 7C, highlight in PMS 186C
G-01-008



Primary text
L-01-009

American Export
Called an **embrasure**, Totten's oval, cast-iron frame, when coupled with a gun mount of his design, allowed a gun crew to sweep a far wider field, from behind a far smaller opening than ever before. The greater protection afforded the crew meant that Totten's innovation was soon adopted for coastal defense in Europe.

*Battery Weed was originally known as Fort Richmond

Primary text
L-01-010

Totten Shutters
Another of Totten's inventions was the pair of thick iron shutters inserted in each of Fort Richmond's gun ports. Artillery crews could fling these open to fire and slam them shut to reload, shielding themselves from enemy sharpshooters.

Secondary text
L-01-011

Iron Beats Stone
Totten subjected many materials to a thorough pounding by artillery. He proved that iron withstood a hammering by round shot far better than stone. Iron plate might dent or deflect, but it would not shatter or explode. He chose to cast his oval embrasure as a single ring of iron, with straps to anchor it into the surrounding granite.

Silkscreened
Line art, PMS Black 7C
G-01-012

Existing line art cross section modified by addition of Rodman gun

Secondary text
L-01-012

The Totten System
So strong was Totten's influence on the design of multi-level, masonry fortifications, that American forts of this type are sometimes called the Totten System. Seven foot thick, solid stone walls, a full complement of heavy artillery and, in the case of Fort Richmond*, a moat filled by the tides, won this collection of forts another name- the Permanent System—as if to proclaim they could never be rendered obsolete.

Subtitle

L-01-012.1 **Cross-Section through Fort Richmond's Seaward Wall**

Identifier(s)

L-01-012.2

[Cross-Section Indentifiers]
Tide-filled Moat
Gun Carriage
Embrasure
Gun Port with Shutters
Casemate
Tier 1
Tier 2
Tier 3
Barbette Tier
Granite Wall

4 Life on the Base Alcove

Title
L-04-001

LIFE ON THE BASE

Primary text
L-04-002

Everyday Life

Garrisoned off and on for more than two centuries, the Fort Wadsworth reservation has fluctuated between the feverish activity associated with new construction and the threat of war, and periods of disrepair and neglect. From the low point of the mid-1830s, the base rebounded so that by the 1860s Fort Richmond (later renamed Battery Weed) was one of the nation's most heavily armed fortifications. After the Civil War and the completion of Forts Richmond and Tompkins, the base entered a long period of peace during which time quarters for officers' families were constructed and improved and opened to civilians. Just prior to World War I, the posts' garrison increased sharply to 1400 men. Though no guns were fired in battle during World War I, the men stationed here worked to keep the guns and themselves in a state of readiness, performing daily calisthenics, conducting drills, manning round-the-clock watches and attending instructional sessions in French, signaling, first aid, and military training. During World War II, Fort Wadsworth was used as a training and supply base. The base newspaper included descriptions of a blood drive, of basketball, baseball, billiards and bowling, a show written by a GI, and a ping-pong tournament, and "an active ladies' auxiliary which sews, knits, prepares surgical dressings." After World War II, Fort Wadsworth continued in a limited way to house various Army functions, including a chemical warfare training center during the Korean War, a Nike command center, an Army Chaplain School and home base for the 26th Army Band.

Silkscreen Posterized
Line art PMS 581C
G-04-003

Photo of commanding officer quarters on Mont Sec Avenue

Secondary text
L-04-003

In the late 1870s or early 1880s, ten wooden structures were erected along Mont Sec Avenue to accommodate a growing resident military population. These included a hospital, quarters for married and single officers and a residence for the post commander.

Caption
L-04-003.1

Commanding Officers Quarters

Silkscreen Posterized
Line artPMS 581C
G-04-004

Photo of north side of officers row

Secondary text
L-04-004

The great Endicott guns were only rarely fired, and such an event required ample warning to the base residents and local populace. Word would go out to open nearby windows so they would not be shattered. The post barber would take the mirrors off the wall and lay them flat on the floor of his shop.

Caption
L-04-004.1

North Side of Officers Row

Title
L-04-005

Snapshots of the Base

Color print
G-04-005.1

Photo of Orphan Home at Fort Wadsworth

Caption
L-04-005.1

Orphan Home

Color print
G-04-005.2

Photo of Main Gate and Officers Row

Caption
L-04-005.2

Main Gate and Officers Row

Color print
G-04-005.3 Photo of Fort Wadsworth Hospital

Caption
L-04-005.3 Hospital

Color print
G-04-005.4 Photo of Infantry Inspection at Fort Wadsworth

Caption
L-04-005.4 Infantry Inspection

Color print
G-04-005.5 Photo of Fort Wadsworth Marching Band

Caption
L-04-005.5 Marching Band

Bullet text
L-04-006

"Fort Wadsworth is a deceptive place; quiet on the surface, it throbs with activity. Men and women plan, work...set large operations moving. Soldiers are housed and fed and made comfortable... Supplies check in and supplies stream out... "
The Range Finder, 1944

Color Print Duotone
Black & PMS 581C
G-04-007 Photo of motor pool inspection.

Caption
L-04-007 Soldiers and their vehicles line up for a motor pool inspection, 1944.

Color print
G-04-008 Engraving of Staten Islanders watching steamers

Caption

L-04-008

A late 19th-century guidebook remarked that "Fort Wadsworth offers everything for a delightful ramble on a summer's day...It is a veritable lovers' walk. The gentle sloping requires a slow walk...and there is time to say many pretty words before the end is reached..."

Color Print Duotone
Black & PMS 477C

G-04-009

Infantry barracks at Fort Wood

Caption

L-04-009

During the 1890's, the infantry were housed in Fort Tompkins; the room was probably very similar in appearance to this shot of the barracks at Fort Wood during that period.

Color print Duotone Black & PMS 477C

G-04-010

Photo Collage of men and women of Fort Wadsworth from base newspaper

Caption

L-04-010

As indicated by this photo collage from the base newspaper, during World War II Fort Wadsworth's residents included many women and children.

Color Print Duotone
Black & PMS 540C

G-04-011

Photo of Soldier's quarters in a casemate

Caption

L-04-011

A study of living conditions reported: "The men occupy four dormitories, casemates in Fort Tompkins, averaging 10 men and beds in each. The casemates are...warmed by a large...coal stove in each, lighted by candles at night...air space ample; each occupant has 500 cubic feet..."

Color Print Duotone
Black & PMS 186C

G-04-012

Photo of an outdoor dance at Fort Tompkins

Caption

L-04-012

Fort Tompkins' parade ground (which was then referred to as "the quad") was the site of outdoor dances during World War II.

Color Print Duotone
Black & PMS 581C

G-04-013

Photo of Lawn tennis in Fort Tompkins

Caption

L-04-013

Obsolete as a military structure after the Civil War, Fort Tompkins' parade ground was for a time converted to the more peaceful ways of lawn tennis.

Color Print Duotone
Black & PMS 477C

G-04-014

Photo of Men cleaning the barbette of Battery Weed

Caption

L-04-014

Though none of the guns were mounted after the Civil War, Battery Weed's barbette tier still received periodic cleaning and maintenance.

Silkscreen
PMS Black 7C

G-04-015

Photo of cannonballs stacked in courtyard of Battery Weed

5 Fort Construction Alcove

Title
L-05-001

FORT CONSTRUCTION

Primary text
L-05-002

Building the Forts

As technologies and military strategies have evolved, so have the forms and techniques employed in the construction of fortifications on the Fort Wadsworth site. In the early period, compacted earth was the primary building material; ironically, the site's most recent fortifications, the low earthen and concrete structures known as Endicott batteries, had returned to the practice of massing earth around emplacements and using the ground to absorb the impact of projectiles. Because fortification design changed very little between the Endicott period in the 1890s and the batteries of World War II, the casual visitor is apt to mistake these century-old installations for something much more recent.

But there is no mistaking the two masonry forts that date from the mid-1800s which clearly were designed to defend against the slow bulky warships of that period. In 1884, when General Philip Sheridan visited the water-level structure now known as Battery Weed, he remarked that it had become "useless under the changes brought about in modern warfare." Yet its military capabilities were not everything to be considered; it was also, said General Sheridan, "the most beautiful masonry work I ever saw."

SilkscreenPosterized
Line art, print PMS 540C
G-05-003

Elevation drawing of Battery Weed

Secondary text
L-05-003

Battery Weed represents the highest refinement of the multi-tiered, casemated coastal fortification, and also serves as a beautiful example of masonry vaulting and the stonecutter's art.

Color Print (Silkscreen figure in center of panel) Line art, print Black PMS 7C

G-05-004 Drawing of a construction crane

Secondary text

L-05-004

Large-scale cranes were required to hoist the massive granite blocks that formed the walls and vaulted ceilings of Fort Tompkins and Battery Weed.

Silkscreen Posterized Reverse line art of background

G-05-004.1 Detail of construction gear

Color Print Duotone
Black & PMS 581C

G-05-005 Engraving of Fort Tompkins under construction

Secondary text

L-05-005

Fort Tompkins, the masonry fort on the bluff overlooking the Narrows, appears here under construction.

Bullet text

L-05-006

In fortification design, the form of the fort—its size, shape, material, position and firepower—is influenced by the type of enemy vessel it must repel.

Color print

G-05-007 Painting of Robert E. Lee

Caption

L-05-007

In 1841, Robert E. Lee, then a thirty four year old engineer stationed at Fort Hamilton across the Narrows, was charged with overseeing the modernization of Batteries Hudson and Morton on the Fort Wadsworth site.

Caption

L-05-008

Turn-of-the-century Endicott batteries were massive concrete structures half-buried under an enormous quantity of earth.

Color Print
Line art, print PMS 477C

G-05-008.1 Sections and plan of disappearing gun battery

Color Print
Line art, print PMS 540C

G-05-008.2 Plan of Battery Barry

Color Print
Line art, print PMS 540C.

G-05-009 Engraving of wharf on Ft. Wadsworth site with Battery Weed beyond.

Caption

L-05-009 Granite blocks for the construction of the masonry forts at Fort Wadsworth were floated down the Hudson River from quarries upstate, arriving at this wharf just north of Battery Weed.

Color print

G-05-010 Engraving of Battery Weed surrounded by moat

Caption

L-05-010 Though almost all traces have vanished, a 10-foot deep moat filled with 6-feet of water at high tide and nearly dry at low tide once surrounded Battery Weed.

Color Print
Duotone Black & PMS 540C

G-05-011 Engraving of Battery Weed under construction

Caption

L-05-011 This engraving of the 1850s shows Fort Richmond (now known as Battery Weed) under construction. Though construction began in 1847, the fort was not completed until c. 1864 just before the end of the Civil War.

Citation

L-05-011.1 Reprinted from *Seacoast Fortifications of the United States, An Introductory History* by E. R. Lewis

Color Print
Duotone Black & PMS 581C

G-05-012 Photo of Fort Totten under construction

Caption

L-05-012 This photo of Fort Totten in 1862 shows a granite casemated fort of the same period as Battery Weed and Fort Tompkins under construction. In this instance, the fort became obsolete before completion and only two of what were to be four tiers were raised.

Silkscreen
Use as line art, print PMS 477C

G-05-013 Plan of Fort Richmond

6 Channel Obstructions Alcove

Title

L-06-001

CHANNEL OBSTRUCTIONS

Primary text

L-06-002

Blocking the Narrows

As early as 1806, military planners had devised a way to block the mile-wide Narrows to enemy ships. This scheme called for 28 "blocks" at intervals of 60 or 80 feet with a pair of "Mr. Fulton's Torpedoes" (underwater mines) in the spaces between the blocks and gunboats anchored above. Despite charges that the scheme was "extravagant and inefficient" and produced by "engineers fond of displaying their talents," channel obstruction became an important strategy in the defense of New York harbor. During and just after the Civil War, a number of devices were proposed, including sharp pointed stakes under the water's surface and nets studded with wooden floats or barrels spanning the passage. Mines, called torpedoes before the twentieth century, became an important part of the post's arsenal in the 1890s. During World War II, a net of mines able to be detonated from shore was stretched across the Narrows.

Silkscreen
Use as line art, print PMS 540C

G-06-003 Engraving of net with mines across the Narrows

Secondary text

L-06-003

This diagram from 1892 depicts a net laced with exploding mines—then called torpedoes—stretched across the channel just downstream from the Narrows.

Color Print
Duotone Black & PMS 186C

G-06-004 B&W Photo of an army vessel laying mines in NY Harbor

Secondary text

L-06-004

A U.S. Army vessel lays mines in New York harbor, c. 1890. Mines of this period were exploded electrically from shore positions, and therefore posed no threat to friendly ship traffic.

Bullet text

L-06-005

Many schemes have been devised to span the mile-wide Narrows and thereby block entering enemy ships from the inner harbor and threatening New York City.

Color Print
Line art, print PMS Black 7C

G-06-006 Photo of spherical mines

Caption

L-06-006

World War II era mines were deployed to discourage German U-boats from entering New York harbor.

Color print

G-06-007 Engraving of spiked device

Caption

L-06-007

Though clearly designed to pierce the hulls of ships, it's unclear from these drawings how this spiked contraption (c. 1865) was to be mounted in the waters of the Narrows.

Color print

G-06-008 Drawing of spiked gate

Caption

L-06-008

This string of 40-foot square rafts of sharpened spikes was proposed in 1862 as a means of obstructing the entrance to New York harbor at the Narrows.

Color print
Use as line art, posterized, print PMS Black 7C

G-06-009 B&W Photo of Civil War era mines

Caption

L-06-009

During the Civil War, the Confederates developed and planted mines such as these in southern waters. The mines sank or damaged 43 Union vessels, including 4 ironclad Monitors. After the war, there was great interest in deploying mines across the Narrows.

Color print

G-06-010 Diagrammatic plan drawings of net with mines

Caption

L-06-010

This Civil War-era channel obstruction scheme from 1863 features floats tied together with wire rope at the water's surface moored to the channel bottom with chains attached to stone anchors.

Color print
Use as line art, print PMS 477C

G-06-011 Map drawing of Torpedo Storage building

Caption

L-06-011

Water mines were common to Endicott defenses, though they were not permanently planted. Several large structures were built in the 1890s to store torpedo mines and their miles of cable, including the 323-foot long, 42-foot wide Torpedo Storage building located next to Battery Weed.

Color Print
Line art, black and white

G-06-012 Letter from War Dept. warning of cable across Narrows

Caption

L-06-012

Between the two world wars, army engineers installed a cable for halting enemy ships across the Narrows between Fort Wadsworth and Fort Hamilton.

Silkscreen
Scan as line art, print PMS 540

G-06-013 Diagrammatic drawing of rope obstruction with "barrel" mine

Color print
G-06-014

Detail of Float

Caption
L-06-014

Each float in the plan below was constructed of fifteen 15" square wooden logs tightly bundled.

Color Print
G-06-015

Plan and section of channel obstruction

Caption
L-06-015

This channel obstruction scheme from 1869 appears to be a more rigid version of the earlier scheme to your left.

7 The Enemy Alcove

Title

L-07-001

THE ENEMY

Primary text

L-07-002

Fear of Attack

As America's financial and trade capital and its largest city, New York City has always been seen as a prime target for enemy attack. After a British force left Washington, D.C. in smoking ruins in August 1814, these fears became even greater. Images of New York on fire were convincing testimony for a policy of vigilance at all costs.

The Narrows was not New York's first line of defense against seaborne invasion, but it was usually perceived to be its best. As such, the high ground on Staten Island had been a vital lookout and point of defense against enemy ships approaching New York City since the 18th century. As enemy ships and armaments evolved, so did the nature of the fortifications on the Fort Wadsworth site.

Silkscreen
Line art, print PMS 100% PMS 477C

G-07-003 Engraving of the bombardment of Fort Fisher, 1865

Color Print
Duotone Black & PMS 540C

G-07-004 Photo of a 12" disappearing gun

Secondary text

L-07-004

This Endicott-era battery with its 12" disappearing gun defended Long Island, but is typical of the turn-of-the-century defenses at Fort Wadsworth. By the early 1900s, these fortifications were vulnerable to a new enemy ship—battleships with turrets and powerful high-angle guns capable of lobbing shells over the protective parapets of open-air Endicott defenses.

Color Print
Duotone Black & PMS 581C

G-07-005 Photo of World War I era anti-aircraft artillery

Secondary text

L-07-005

In the years leading up to World War II, airpower was perceived as a far greater threat than attack by sea, and Coast Artillery began focusing its attention on anti-aircraft armament.

Silkscreen
Line art, print 100% PMS Black 7C

G-07-006 British recognition card with German submarines

Secondary text

L-07-006

The Phantom Fleet

Though the much-feared fleet of enemy ships never appeared in New York Harbor, military planners in every period of Fort Wadsworth's history have studied enemy vessels in order to design effective defenses. This silhouette was used in recognition training during World War II and represents one of a total of 14 different classes of German submarine.

Bullet text

L-07-007

Though New York City has never come under enemy attack, in each period of its history America's commercial capital has had to fortify itself against potential aggressors.

Silkscreen
Line art, PMS 186C

G-07-008 Engraving of British warship from the War of 1812

Caption

L-07-008

This British frigate from the War of 1812 would have sailed as part of a tight formation of warships. Sailing ships tacking through the Narrows would have had to come in at close range, flanks fully exposed to Fort Richmond's 32-pound guns.

Color Print
Duotone Black & PMS 477C

G-07-009 Photo of a Confederate ironclad.

Caption

L-07-009

During the Civil War, the Confederates were the first to develop ironclads, warships with iron plates on the upper structure. These warships could not only sneak past shore batteries unscathed, but also, absorb a direct hit without becoming disabled.

Color Print
Duotone Black & PMS 540C

G-07-010

Photo of a World War I era German battleship with turret

Caption

L-07-010

The turrets equipped with powerful high-angle guns on World War I-era battleships allowed the enemy to lob shells in a high trajectory from miles away. Endicott batteries, though heavily fortified frontally, were vulnerable to fire from overhead.

Color Print
Duotone Black & PMS 581C

G-07-011

Photo of World War II German U-boat

Caption

L-07-011

During World War II, German U-boats attacked American ships just outside New York Harbor.

Full Color print

G-07-012

Poster of New York Harbor on fire

Caption

L-07-012

Images such as this World War I poster of German planes bombing New York harbor reflect the fear of the time and succeeded in galvanizing public support for the war effort.

Color print

G-07-013

Engraving of Washington, DC on fire during the War of 1812

Caption

L-07-013

During the War of 1812, the British sailed up the Potomac River and captured Washington, D.C., setting fire to many important structures including the White House. This episode, following so soon after America's War of Independence, underscored the need for a national system of coastal defense.

Silkscreen?
Line art, print 100% PMS 186C

G-07-014 Drawing of the Merrimac

Silkscreen
Line art, 100% PMS 540C

G-07-015 Line art of Confederate Caps

8 Signalling Devices Alcove

Title

L-08-001

SIGNALLING DEVICES

Primary text

L-08-002

Staten Island Lookout

Beginning during the era of the Dutch West India Company in the mid-1600's, provisions were made to signal Manhattan from "Staten Eyelandt" whenever a ship could be seen approaching from the sea. In 1711, the British governor approved plans for maintaining a beacon at "ye Narrows," and some such system—either firebrands or gunfire—was apparently in operation throughout the remainder of Colonial rule. The prominence on the west side of the Narrows—variously called Flagstaff Hill, Signal Hill, or Telegraph Hill—was an ideal lookout point because it afforded a clear view of Lower New York Bay and could be seen from the tip of Manhattan Island as well. Whether semaphores and wigwags in the 1800s or radio antennae in more recent times, the Fort Wadsworth site has always served the crucial role of providing advance news of ships, both friend and foe, approaching New York.

Silkscreen
Posterize line art, to maintain texture indicated on drawing, print PMS 581C. Drop out of backgroound

G-08-003

Photo of Man looking through a spotter scope

Secondary text

L-08-003

The Fort Wadsworth site has been a lookout post for over three centuries, from the time of settlement to World War II.

Silkscreen
Same as G-08-003

G-08-004

Photo of man using signal beacon

Secondary text

L-08-004

In its history, Fort Wadsworth has mounted many different signalling devices—including this World War II era signal beacon—to communicate with other defense sites in New York harbor.

Bullet text

L-08-005

The promontory at the Narrows, with its clear view of Manhattan and the mouth of the Bay, was recognized early on as an ideal lookout for sending advance warning of the approach of enemy ships.

Color Print
Duotone Black & PMS 540C

G-08-006 Photo of beacon mounted on Battery Weed

Caption

L-08-006

This beacon can still be seen perched on top of Battery Weed overlooking the Narrows.

Color print

G-08-007 George Washington on horseback

Caption

L-08-007

In May 1776, George Washington sent a contingent to "Signal Hill" overlooking the Narrows to watch for British warships. It was to communicate with Manhattan by hoisting black or white kegs. The news was bad: In June a large British flotilla sailed into New York harbor, initiating a sweeping plan of invasion.

Silkscreen
Scan as line art, print 100% PMS 540C

G-08-008 Diagram of signalling shutter, includes front and profile view.

Caption

L-08-008

This signalling shutter dating from 1910 was used to send coded communications to naval patrol boats.

Color print

G-08-009 Portrait photo of Albert J. Myer

Caption

L-08-009 In the late 1850s, an army surgeon named Albert J. Myer tested his wigwag system of signal flags between stations at Sandy Hook and Fort Wadsworth site. Myer was later appointed by President Lincoln to organize and command the U.S. Army Signal Corps.

Silkscreen
Scan as line art, print 100% PMS 477C

G-08-010 Engraving of signal post with movable arms

Caption

L-08-010 This signal station of the 1800s utilized ten movable arms attached to a mast, which could be arrayed at various combinations of angles to send signals to Sandy Hook or Manhattan.

Citation

L-08-010.1 Reprinted from *Seacoast Fortifications of the United States, An Introductory History* by E. R. Lewis

Color print

G-08-011 Painting of signal pole from early 1800s

Caption

L-08-011 In the early 1800s, coded information was relayed from Sandy Hook to the Fort Wadsworth site to the Merchants' Exchange on Manhattan Island using painted black and white kegs hoisted aloft in various combinations.

Silkscreen ?
Scan as line art, print 100% PMS 540. Lines are white.

G-08-012 Diagram showing location of signal service cable

Caption

L-08-012

This diagram from 1898 shows the location of underwater signal cable for communications between the outermost lookout post on Sandy Hook with the two forts at the Narrows, Fort Wadsworth and Fort Hamilton.

Color print

G-08-013

Engraving of bluff overlooking the Narrows with two signal poles.

9 Weapons Take Charge

Title
L-09-001

THE WEAPONS TAKE CHARGE

Model
A-09-001

Resin casting of a smoothbore muzzleloader

Primary text
L-09-002

The spiral grooving of a gun barrel to impart a stabilizing spin to a projectile is called *rifling*. Before the Civil War, rifling was uncommon with heavy cannon. Artillery innovators had long struggled with a classic dilemma - how to make a shell fit snugly enough in a barrel to track the rifling but loosely enough to be rammed into firing position.

The Civil war witnessed countless attempts to lick this problem. The most successful attached a soft metal cup or shoe to the base of the projectile. This soft *sabot* expanded under the pressure of firing and engaged the grooves. Such projectiles had far greater range, accuracy and penetrating power than any round shot or shell of the same caliber.

With the advent of rifling, masonry-walled forts could no longer withstand direct hits from heavy artillery. Henceforth, military planners placed far greater emphasis on the design of offensive weaponry than on defensive fortifications, a legacy that persisted through the "missile race" of the Cold War.

A-09-002

Resin casting of a rifled breechloader

Secondary text

L-09-003

THOMAS JEFFERSON RODMAN (1815-1871) graduated from West Point and devoted his life to advancing the design of heavy artillery. With wide-ranging experimentation, he proved that the shape of a gun barrel was less crucial to its strength than the way it was made.

Noting that the strength of a cast gun decreased when the iron cooled from the outside in, he devised a process for water-cooling castings from the inside out. Far bigger barrels capable of handling far heavier powder charges could now be developed. Rodman guns grew to be the largest, most powerful smoothbore cannons ever made.

Color Print
Sepia Duotone, Short range Black, full range PMS 477C

G-09-003

Portrait of Thomas Jefferson Rodman

Secondary text

L-09-004

ROBERT PARKER PARROTT (1804-1877) graduated from West Point in 1824. He resigned from the army in 1836 to supervise a foundry in New York State. There he invented a rifled, cast-iron cannon that was strengthened by shrinking hot iron hoops around the breech of the barrel.

So-called Parrott rifles were brought to bear with dreadful accuracy in the Union's siege and capture of Fort Pulaski in Georgia. This event, coupled with the destruction of Fort Sumter by shelling, rendered masonry fortifications obsolete.

Color Print
Sepia Duotone, Short range Black, full range PMS 477C

G-09-004

Portrait of Robert Parker Parrott

Secondary text

L-09-005

FORT PULASKI BREACHED

Fort Pulaski, sited on Cockspur Island near Savannah, Georgia, was a massive stone fortification that was surrendered to the Confederates in 1861. It was retaken by Union troops in early 1862. At one time regarded as impregnable, Fort Pulaski could not withstand long-range shelling by rifled Parrott guns.

Color Print
Sepia Duotone, Short range Black, full range PMS 477C

G-09-005

Fort Pulaski breached

Secondary text

L-09-006

DENTED NOT DEFEATED

In combat in Hampton Roads, Virginia, the ironclad **Monitor** took a number of direct hits from round shot. Cannonballs bounced off its armor-plated turret with a tremendous, but harmless clatter.

Military planners were now faced with an armored ship that could steam past shore batteries unscathed. The days of skipping shot across the water to smash wooden hulls or shred sails were surely over.

Color Print
Sepia Duotone, Short range Black, full range PMS 477C

G-09-006

Man standing next to dented turret of the Monitor immediately following her battle with the Merrimac during the Civil War.

Secondary text
L-09-007

A GUNNER'S IDEAL

A technological breakthrough of the late 1800's, coming shortly after rifling, was breechloading artillery. Cannon that were loaded from the rear held a real advantage over front-loading guns. No longer forced to expose themselves while sponging and ramming the barrel, the crew of a breechloader could stay behind the gun, better shielded from enemy fire.

So-called "disappearing guns" maximized this advantage. These cannon were mounted on carriages that used the gun's recoil or "kick" to lower the barrel behind a concrete wall for reloading. Huge counterweights returned the barrel to the top of the parapet for firing.

Caption
L-09-008

RIFLED BREECHLOADER

Caption
L-09-008.1

Gun tube is made of layers of machined steel

Caption
L-09-008.2

Barrel is long and tapering

Caption
L-09-008.3

Loaded from the back of the barrel

Caption
L-09-008.4

Crew protected from enemy fire

Caption
L-09-008.5

Fires long, pointed shells

Caption
L-09-008.6

Rifled barrel imparts stabilizing spin

Caption
L-09-008.7 Fires in high trajectory for long range

Caption
L-09-008.8 The rifled breechloading gun represents the standard for heavy artillery since the 1890s.

Caption
L-09-009 **SMOOTHBORE MUZZLELOADER**

Caption
L-09-009.1 Gun tube is made of solid cast iron

Caption
L-09-009.2 Barrel is short and bulbous

Caption
L-09-009.3 Loaded from the front of the barrel

Caption
L-09-009.4 Crew exposed to enemy fire

Caption
L-09-009.5 Fires round shot

Caption
L-09-009.6 Smooth barrel induces wobble

Caption
L-09-009.7 Fires in flat trajectory for limited range

Caption
L-09-009.8 The Rodman gun represents the pinnacle of smoothbore artillery.

10 Weigh In with the Big Shots

Title
L-10-001

WEIGH IN WITH THE BIG SHOTS

Model
A-10-001

A 32-pound shot cannonball, wood sabot and powder sack

Primary text
L-10-002

Compare Yourself with These Rounds

Throw weight refers to the weight of a projectile thrown a distance by artillery. Between the time of America's first coastal defenses and World War II, throw weight increased by a factor of 70. During this same period, the range also multiplied, with the biggest guns firing much heavier shells up to 30 times farther.

Model
A-10-002

A 10" columbiad shell, tongs, iron bar

Prompt
L-10-003

The scales to the right invite you to compare your weight with the weight of the projectiles fired from three different seacoast cannons.

Model
A-10-003

16" shell, four sacks of powder stacked vertically

Secondary text

L-10-004

Another Useful Comparison

A basketball and a football weigh about the same. Imagine throwing a football as far as you can to a friend. Then think of passing a basketball to the same spot. Not likely.

The football travels farther and with greater accuracy because its streamlined shape spins as it arcs through the air. The same concept applies to the round and sharp artillery rounds to the right.

Model

A-10-004 Half model of football and round ball at half-scale

Primary text

L-10-005

32-Pound Cannonball, circa 1812

This solid iron shot was meant for the **32-pound smoothbore cannon** that armed Fort Richmond during the War of 1812. This semicircular water battery preceded the structure now called Battery Weed.

Diameter: 6.4 inches
Weight of projectile: 32.6 pounds
Weight of powder charge: 8 pounds
Range: 1,922 yards (just over one mile)

Color Print
Custom Photograph, Quad Tone - Blue

G-10-005.1 A soldier in 1812-era uniform carrying a 32-pound solid shot and its powder.

Silkscreen Line art, PMS 540C

G-10-005.2 A cross-section of a 32-pound cannonball

Silkscreen PMS 540C

G-10-005.3 A silhouette of a smoothbore cannon firing a television; trajectory indicated with a dotted-line.

Primary text

L-10-006

10" Exploding Shell, circa 1860

This hollow iron sphere, filled with gunpowder, was made for a **10-inch columbiad**. Columbiads ranked among the largest guns ever mounted in Battery Weed. Though this shell is **4 times heavier than the cannonball to the right,** a columbiad fired it 3 times as far.

Diameter: 10 inches
Weight of projectile: 128 pounds
Weight of powder charge: 19 pounds
Range: 5,600 yards (just over three miles)

Custom Photograph, Quad Tone - Blue

G-10-006.1 Two men in Civil War-era uniforms hauling a 10" exploding shell with tongs.

Silkscreen Line art, PMS 540C

G-10-006.2 A cross-section of a 10" columbiad exploding shell.

Silkscreen PMS 540C

G-10-006.3 A silhouette of a 10" columbiad firing a refrigerator; trajectory indicated with dotted-line.

Secondary text

L-10-007

High-Explosive Shell for 16-inch Rifle, circa 1940

This streamlined projectile was made for **a rifled, breechloading gun** of the sort that flanked the entrance to New York Harbor during World War II. Though this shell is **20 times heavier than the round shell to the right,** a 16-inch rifle fired it 9 times as far.

Diameter: 16 inches
Weight of projectile: 2,340 pounds
Weight of Powder Charge: 870 pounds
Range: 49,100 yards (about thirty miles)

Custom Photograph Quad Tone - Blue

G-10-007.1 A soldier standing behind models of a shell and powder bags gesturing to a cut-out crane and hook above

Silkscreen Line art, PMS 540C

G-10-007.2 A cross-section of a 16" shell

Silkscreen PMS 540C

G-10-007.3 A silhouette of a 16" rifled gun firing a small car; trajectory indicated with dotted line.

Pedal Labels

L-10-008

50 lbs
100 lbs
150 lbs
200 lbs

Secondary text

L-10-010

Pounds and Inches

Why are some projectiles referred to by their weight and others by their size? Until the Civil War, cannon fired mostly spherical, solid shot made of iron. A round iron ball of a given weight like the 32-pound shot to the left—has a known diameter.

As the variety of projectiles grew to include elongated shells of steel as well as iron, weights began to vary tremendously. Order was restored by expressing the caliber of both the rounds and the guns that fired them in inches. Thus, the 16" shell to the left is fired from a 16" caliber rifle.

11 Casemate Diorama

Title
L-11-001 **ENTER THE GRANITE FORT**

Mannequin
A-11-001 Mannequins of soldiers ramming a casemated gun

Primary text
L-11-002

Just ahead is a replica of the part of a fort called a **casemate**. It is one of a series of identical casemates overlooking the Narrows from Fort Richmond's* second tier. Imagine it is the summer of 1864. The Civil War is entering its final year. The fort's full garrison is busy firing their newly-installed Rodman guns.

case'-mate - an armored compartment for protecting artillery and crew

*Now known as Battery Weed

Model
A-11-002 Models of gun, carriage and implements for casemate

Line art, Surround PMS 418C, Interior PMS 449C
G-11-003 Engraving of a series of casemates.

Citation
L-11-003

Reprinted from *Seacoast Fortifications of the United States, An Introductory History* by E. R. Lewis

Title
L-11-004 **What's inside the fort determines its outside shape**

Primary text
L-11-005

Overlapping fields of fire

An individual cannon's range, together with the *traverse* or "sweep" of its mount, dictates its *field of fire*. In designing coastal fortifications, the key is to overlap multiple fields of fire to cover a broad expanse of navigable water. In designing Fort Richmond*, Joseph Totten started by devising gun carriages that could traverse a remarkably wide arc, despite being set in confined casemates.

Given the 60 degree sweep of his guns, Totten stacked long rows of casemates into three channel-bearing walls, forming a half-hexagonal structure. Since his hexagonal plan used the same 60° angle, Totten knew that the fields of fire of over one hundred heavy guns would overlap. Any enemy fleet attempting the tricky waters of the Narrows would have to pass, not only by Fort Richmond's full armament, but through the overlapping fire from artillery posted on the opposite shore at Forts Lafayette and Hamilton.

*Totten's Fort Richmond replaced a semi-circular water battery with the same name. Fort Richmond is now known as Battery Weed.

Kodalith
Amber Gel #321
G-11-005

Line art axonometric of Fort Richmond with overlapping fields of fire

Identifier(s)
L-11-005.1

[Graphic Identifiers]
60° Field of fire
Channel-Bearing Wall
Typical Casemate (Open at the Rear)
Parade
Barbette
Typical Gun Port

Secondary text
L-11-006

Prior to concentrating on coastal fortifications, Totten spent part of his career designing coastal lighthouses. Consider how the sweep of the warning light from a lighthouse resembles the sweep of the covering fire from a fort.

4 Color transparency
G-11-007

Portrait of Joseph G. Totten

Secondary text
L-11-007

Joseph G. Totten was the Chief Engineer of the U.S. Army from 1838 until 1864. He was the principal designer of masonry fortifications across the nation, including Fort Richmond here on the west bank of the Narrows.

Secondary text
L-11-008

The drive to achieve an effective design for casemates —armored compartments for artillery—dates back to the Renaissance, as suggested by these sketches from the early 1500s.

Kodalith
Olive Gel #92 & #321
G-11-008.1

Renaissance sketches of casemated gun designs

Kodalith
Olive Gel # 92 & #321
G-11-008.2

Renaissance sketches of casemated gun designs

Kodalith
Olive Gel #92 & #321
G-11-008.3

Renaissance sketches of casemated gun designs

Kodalith
Medium Gray #98
G-11-009

Merging of existing line art drawings of a gun carriage in casemate and of a gun tube into a single image

Caption
L-11-009

A Casemated Rodman Gun "In Battery".

Identifier(s)
L-11-009.1

[Graphic Identifier]
Typical Casemate
Traversing Rails
Gun Port
Gun Carriage with Iron Tongue
"In Battery" Position (Gun Ready to Fire)
"Out of Battery" Position (Gun Recoiled and Ready to Reload)
Swivel Point
60° Sweep

Secondary text
L-11-010

The gun carriages in Fort Richmond's casemates achieved a wide traverse through simple means. Each came with an iron tongue that slotted into the granite below the gun port. An iron pin slipped through the tip of this tongue, securing the carriage to a swivel point far ahead of its front wheels. No matter how far the carriage was swung to either side, the barrel remained centered in the gun port.

Kodalith
Full Blue #3202
G-11-010

Cameo cropping/detail of Rodmans "in battery"

Title
L-11-011

Manning the Gun

Primary text
L-11-012

Manual of Arms

Each piece of coastal artillery in Fort Richmond* was manned by a crew of seven who followed a set procedure outlined in the Army's *Heavy Ordnance Manual*. Essential to effective teamwork and crew safety were precision drill and mutual trust. This drawing shows what each member of the crew is doing when the gun is "out of battery," ready to be reloaded. Exactly the same procedure would be followed throughout more than a hundred other casemates lining Fort Richmond's seaward walls.

* Now known as Battery Weed.

Kodalith
Full Blue #3202
G-11-012

Custom modification to artwork depicting soldiers loading gun

Prompt
L-11-013

Listen to the commands and commotion as the fort garrison sights in and fires their newly installed Rodman guns.

Secondary text
L-11-014

Tools of the Trade

Every member of the gun crew performed a vital role, whether wielding large implements like the rammer, sponge and handspikes, or handling far tinier tools. The gunner wore a *thumb stall* to cover the gun's vent to avoid accidental firing. Another cannoneer (the #3 man in the drill diagram opposite) wore a *tube pouch* filled with *friction primers* which, when inserted in the vent and tied to the *lanyard*, readied the gun for firing.

Caption
L-11-015

Lanyard—a sharp pull on this cord ignited the friction primer which, in turn, set off the cannon's charge.

Kodalith
Olive Gel #92 & #321
G-11-015

Line art of a lanyard and friction primer

Kodalith
Olive Gel #92 & #321

G-11-016

Illustration of tongs with shell

Caption

L-11-016

Shells had two indentations for tongs, the tools with which shells were carried to the gun for loading.

Kodalith
Olive Gel #92 & #321

G-11-017

Illustration of shell

Caption

L-11-017

Friction Primer—tugging the twisted wire threaded through this tube ignited the powder inside, which flashed down the vent to set off the main charge.

Kodalith
Olive Gel #92 & #321

G-11-018

Illustration of a Thumb stall

Caption

L-11-018

Thumb stall—a leather pad that protects the gunner's thumb when covering the vent of a hot gun barrel.

Kodalith
Olive Gel # 92 & #321

G-11-019

Illustration of a Tube Pouch

Caption

L-11-019

Tube Pouch—a leather purse that protects powder-filled primer tubes from rain and mud.

Kodalith
Amber Gel #321

G-11-020

Illustration (based on existing artwork) of gun drill for a Rodman gun.

Secondary text
L-11-020

Gunnery Drill

In the 1860s, a heavy gun crew consisted of a head gunner and six cannoneers, numbered one through six. An artillery officer oversaw the crews of two adjacent guns. Every man performed a set function, orchestrated in a lock-step sequence driven by simple one and two-word commands. A crack team could fire 20 rounds an hour, though 12 was plenty for practice.

Identifier(s)
L-11-020.1

KEY

G = Gunner
O = Officer
1 (2,3,4,5,6) = Cannoneers

Identifier(s)
L-11-020.2

Load — Sponge! Ram!
In Battery — Heave! Heave! Halt!
Point — Right! Ready!
Fire — FIRE!
Out of Battery — Take Implements!
Reload — Sponge! Ram!

Identifier(s)

L-11-020.3

Rodman Gun
Gun Carriage
Gun Port
Traversing Rails
Gunner thumbs the vent
#1 and #2 Man ram the piece
#3 Man
#4 Man
#5 Man
#6 Man
Officer
Implements on Stand

Caption

L-11-021

The View

Looking out the rear of this casemate, you can see across to where the rest of Fort Richmond's heavy guns are mounted - over a hundred emplacements throughout the fort. The top barbette is alive with artillerymen as the full garrison engages in gunnery drill.

Color mural print
Sepia Quad Tone

G-11-021

Custom photograph digitally retouched of view across Battery Weed's parade ground to casemates in opposite wall for wall mural.

Color Print
Custom Photograph, sepia Quad Tone

G-11-022

Custom photograph of cannoneers

Color Duratrans with acrylic face

G-11-023

"Views to the Narrows" Graphic at Gun Port Lightbox

12 Guarding the Gates

Title
L-12-001

GUARDING THE GATES

Model
A-12-001

Three man-o-wars

Caption
L-12-002

Dating from the mid-1800s, this nautical chart shows the shoals and currents that defense planners knew would drive sailing ships in close to the forts at Sandy Hook and the Narrows.

Silk-screened map
G-12-002

Wall-sized nautical map.

4 Color Silkscreen
G-12-003

Painting of New York Harbor, 1870

Primary text

L-12-003

Why Protect New York?

In 1790 there were only 33,000 people living on Manhattan Island. Thirty years later New York became the nation's largest city with 124,000 inhabitants. By 1860 its population topped a million, more than twice the size of Philadelphia, America's next largest city.

Besides its overwhelming size, New York has long been the nation's commercial and financial capital. "Wall Street" surely has been synonymous with America's money market. And New York has continued to be one of the nation's great manufacturing cities, preeminent in clothing, cosmetics, footwear, publishing, paints, electrical machinery, not to mention armaments manufacturing.

Of enormous strategic importance to New York was the Erie Canal, completed in 1825, which linked the Hudson River with the Great Lakes. This commercial waterway opened the city directly to the agriculture and abundant resources of the Midwest and Plains states.

Manhattan's shoreline, along with that of Brooklyn and New Jersey, offered miles of docking facilities for the world's largest ships. The Port of New York, measuring 175 square miles, rivaled the size of other world ports. By 1860, 70 percent of the nation's imports passed through New York Harbor. During daylight hours, a ship entered or departed every 10 minutes. Four out of five travelers going abroad in the late 19th century, embarked on liners leaving from New York.

Color print

G-12-004

Line art map of New York Harbor with forts and their fields of fire

Title
L-12-005

COASTAL DEFENSES OF NEW YORK

Primary text
L-12-006

The singular importance of New York City and its port prompted the development of a regional system of harbor defenses. Fortifications were placed along the shoreline of both Upper and Lower New York Bay, with Fort Wadsworth and Fort Hamilton flanking the Narrows. This map indicates how, through centuries of effort and at great expense, New York came to be the nation's best defended city. Its harbor is still ringed with significant forts, relics of nearly every phase of American coastal fortifications.

Title
L-12-007

THE HISTORIC DEVELOPMENT OF FORT DESIGN

Secondary text
L-12-008

THE FIRST AMERICAN SYSTEM OF FORTIFICATIONS, 1794-1807

Following the War of Independence, Americans felt threatened periodically by both the French and the British. In 1794 Congress authorized the first national system of coastal defense. Funding was meager and states took the lead in building defensive works. Most of New York's forts were first located on or near Manhattan, due to the limited range of artillery. Most were constructed of timbers and compacted earth, and many were replaced by later construction. None of them survive.

Line art, PMS 390C
Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13
G-12-008

Line art used to indicate 1st System forts and their time period.

Secondary text

L-12-009

THE SECOND AMERICAN SYSTEM OF FORTIFICATIONS, 1807-1816

In 1807 the aggressive stance of the British navy prompted a new national program of coastal fortification. This plan enjoyed generous federal funding and was largely planned and executed by American engineers. Sometimes earthworks, sometimes masonry, sometimes a combination of the two, these forts might be circular, semicircular, or boldly star-shaped in plan. Solid masonry forts, like Castle Williams here in New York, prompted a new era of fully enclosed, multi-level gun emplacements.

Line art, PMS 271C
Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13

G-12-009 Line art used to indicate 2nd System forts and their time period.

Secondary text

L-12-010

THE THIRD AMERICAN SYSTEM OF FORTIFICATIONS, 1817-1867

Because most British raids in the War of 1812 succeeded, Americans lost faith in their existing defenses. President Monroe inaugurated a new program of coastal defense, insisting that forts be "built to last the ages." Military engineers set out to conceive a truly integrated, national system. Their principal fort designs had solid masonry walls, densely packed casemates and projecting bastions to protect the outer walls. These massive structures were typically water batteries, erected just a few feet above high-tide to fire directly at the hulls of sailing ships.

Line art, PMS 130C
Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13

G-12-010 Line art used to indicate 3rd System forts and their time period.

Secondary text
L-12-011

THE ENDICOTT ERA, 1890-1910

A long peaceful interlude followed the Civil War, with interest in coastal defense rising again in the late 1880's. A committee headed by Secretary of War Endicott recommended a new system of seacoast fortifications at 29 critical sites. New York topped the list. Endicott's engineers returned to a reliance on earthworks which, backed up by thick concrete walls, better absorbed the impact of the latest pointed projectiles. Batteries were spread out and blended into the terrain, typically mounting only 2 to 4 heavy cannon apiece.

Line art, PMS 3258C
Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13
G-12-011

Line art used to indicate Endicott Era forts and their time period.

Secondary text
L-12-012

TWENTIETH CENTURY FORTIFICATIONS

As the effective range of naval gunnery increased, coastal defenses relied on fewer guns of higher caliber, located farther and farther from the cities they guarded. Heavy cannon were joined by a raft of other defensive weapons -- mortars, underwater mines, submarines nets and anti-aircraft emplacements. But the rise of air power and amphibious landing tactics changed warfare forever. By 1950, all of the big guns had been sold for scrap. Forts around New York were armed instead with Nike missiles which, in turn, were dismantled in the 1970s.

Line art, PMS 1785C
Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13
G-12-012

Line art used to indicate Twentieth Century fortifications and their time period.

Secondary text
L-12-013

New York was most vulnerable to naval attack from the south through the Narrows. British frigates threatened to test New York's harbor defenses during the War of 1812.

Prompt
L-12-014

Imagine yourself aboard an attacking man-o-war. Try to sail past the forts of New York.

13 New York Harbor Map & Fort Models

Model
A-13-001 A Confederate Raider

Title
L-13-001.1 **BROOKLYN (red)**

Title
L-13-001.10 **LONG ISLAND SOUND (green)**

Title
L-13-001.11 **HUDSON RIVER (green)**

Title
L-13-001.12 **EAST RIVER (green)**

Title
L-13-001.13 **UPPER N.Y. BAY (green)**

Title
L-13-001.14 **LOWER N.Y. BAY (green)**

Title
L-13-001.15 **ATLANTIC OCEAN (green)**

Title
L-13-001.2 **QUEENS (red)**

Title
L-13-001.3 **THE BRONX (red)**

Title
L-13-001.4 **THE NARROWS (green)**

Title
L-13-001.5 **MANHATTAN ISLAND (red)**

Title
L-13-001.6 **STATEN ISLAND (red)**

Title
L-13-001.7 **NEW JERSEY (red)**

Title
L-13-001.8 **ROCKAWAY (red)**

Title
L-13-001.9 **SANDY HOOK (red)**

Primary text
L-13-002

New York was most vulnerable to naval attack from the south by way of the Narrows. But an attack might come from the north via Long Island Sound. The Confederate raider *Tallahassee* lurked off shore at the end of the Civil War. The captain considered a bold run past these forts to attack the Brooklyn Navy Yard.

Model
A-13-002 Fort Hancock/Battery Potter

Prompt
L-13-003

Imagine yourself aboard a Confederate raider. Try to steam past the forts of New York.

Model
A-13-003 Navesink/Battery Lewis

Model text
L-13-004

FORT HANCOCK/BATTERY POTTER

Fort Hancock is located on Sandy Hook, a spit of land at the mouth of New York Harbor that was first fortified during the War of 1812. Its late 19th–century defenses included the nation's first concrete gun emplacements, designed to blend into the coastline for protection and camouflage. Battery Potter mounted two disappearing guns on hydraulic carriages, the only "steam-powered" artillery ever built in the U.S. Because it took so long to raise, fire, and reload these elaborate guns, the battery became obsolete once faster–acting carriages were developed.

dis´-ap-pear´-ing guns—a type of coastal artillery common in the 1890's. The carriage typically used massive counterweights to cushion the gun's recoil, translating the "kick" into a controlled glide that brought the gun down behind a parapet, where it could be reloaded out of sight of enemy ships.

Model
A-13-004

Fort Tilden/Battery Harris

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-005

Illustration of Fort Hancock/ Battery Potter

Caption
L-13-005

Primary Materials: Reinforced concrete with earth embankments
Armament: Two 12–inch rifled guns on disappearing carriages
Range: Seven to eight miles

Model
A-13-005

Fort Hamilton

Model text
L-13-006

NAVESINK/BATTERY LEWIS

Completed in 1943, Navesink was comprised of two separate batteries. One mounted 6-inch guns and was called simply Battery 219. The other was Battery Lewis, outfitted with two 16–inch rifles whose field of fire overlapped the companion pair at Fort Tilden, located across the Bay in Rockaway. With the victory of World War II and the rise of airpower, these great guns were deemed obsolete and sold for scrap in 1949. Only the massive concrete "bunker" emplacements remain at Navesink today.

Model
A-13-006

Fort Lafayette

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-007

Illustration of Navesink/ Battery Lewis

Caption
L-13-007

Primary Material: Reinforced concrete with earth embankments
Armament: Two 16–inch rifled guns
Range: 30 miles

Model
A-13-007

Fort Columbus

Model text
L-13-008

FORT TILDEN/BATTERY HARRIS

Fort Tilden was placed at the outer entrance to New York Harbor to counter the long-range guns arming the latest foreign cruisers and battleships. Battery Harris mounted two 16-inch rifled cannon, some of the few ever produced at the Army's Watervliet Arsenal. These guns were mounted in open emplacements in the 1920s, but Battery Harris was deemed vulnerable to air attack. In 1942 concrete bunkers and expansive earthworks were built to protect these huge weapons.

ri´-fled cannon—artillery using spiral grooves cut in the gun tube to impart a spin to projectiles to achieve longer range and greater accuracy.

Model
A-13-008

Castle Williams

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-009

Illustration of Fort Tilden/ Battery Harris

Caption
L-13-009

Primary Materials: Reinforced concrete with earth embankments
Armament: Two 16–inch, rifled guns
Range: 30 miles

Model
A-13-009

Fort Totten

Model text
L-13-010

FORT HAMILTON

Fort Hamilton was sited on the east side of the Narrows to overlap the fire of the original Fort Richmond on the opposite shore. While there may have been a British battery here as early as 1779, construction of the present masonry fort, the first granite structure built to defend the port, was not begun until 1825. Fort Hamilton has remained in continuous active service, the last fortification in New York harbor to enjoy this distinction.

Model
A-13-010

Fort Schuyler

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-011

Illustration of Fort Hamilton

Caption
L-13-011

Primary Materials: Granite masonry with brick interior construction
Armament: About thirty 32–pounders
Range: 1900 yards (just over a mile)

Model
A-13-011

Castle Clinton

Model text
L-13-012

FORT LAFAYETTE

Consisting of two enclosed stone tiers and an open **barbette**, Fort Lafayette was constructed during the War of 1812. Sited right in the Narrows on Hendrick's Reef, this island fort was first called Fort Diamond due to its overall shape. In 1823 it was renamed Fort Lafayette in honor of the French military hero of the American Revolution. Pressed into service as a prison during the Civil War, it soon became known as "the Brooklyn Bastille." This fortress stood until 1959, when it was replaced by one of the two huge towers supporting the Verrazano-Narrows Bridge.

bar-bette´—a platform built on top of a fort to permit firing guns over the chest-high wall known as the parapet.

Model
A-13-012

Fort Gibson

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-013

Illustration of Fort Lafayette

Caption
L-13-013

Primary Materials: Stone walls on a granite foundation
Armament: Positions for seventy–two 32–pounders
Range: 1900 yard (just over a mile)

Model
A-13-013

Fort Wood

Model text
L-13-014

FORT COLUMBUS

Construction started in the 1790s on Fort Columbus, sited about a half mile southeast of Manhattan on Governors Island. Surrounded by land on all sides, this island fort adopted the latest French designs favoring triangular **bastions**. It occupied a key position in harbor defense until the 1850s, ultimately expanding into a 100–gun fortification. Later renamed Fort Jay, it has served as the headquarters post for various commands such as the First U.S. Army.

bas´-tion—a projecting part of a fortification that allows guns within the fort to be aimed back along the outside walls to defend against infantry assault.

Model
A-13-014

Fort Tompkins

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-015

Illustration of Fort Columbus

Caption
L-13-015

Primary Materials: Brick with earth embankments
Armament: 100 guns including Rodmans, Parrott rifles and columbiads.
Range: Between 2 and 3 miles

Model
A-13-015

Battery Duane

Model text
L-13-016

CASTLE WILLIAMS

Located at the northern tip of Governors Island, and built between 1807 and 1812, Castle Williams marked the first time American military engineers stacked gun emplacements in multiple **tiers**. This vertical wall design became the prototype for all major seacoast forts built in this country prior to the Civil War. With 40-foot high masonry walls measuring 7 to 9 feet thick, Castle Williams invited reuse as a military prison after its role as an active fort came to an end. It has twice served as a penitentiary.

tiers—in fort design, refers to rows of gun emplacements placed one on top of another, often including a top, open level called the barbette tier.

Model
A-13-016

Fort Richmond

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-017

Illustration of Castle Williams

Caption
L-13-017

Primary Material: Red sandstone
Armament: Fifty-two 42– and 32–pounders on the first and second tiers, with twenty-six 50–pound columbiads on the barbette tier.
Range: 1,900 yards (just over a mile)

Model text
L-13-018

FORT TOTTEN

Intended as the sister defensive work to Fort Schuyler, Fort Totten was designed in the 1840's as a granite pentagon built into a bluff. Preliminary plans were drawn up by Captain Robert E. Lee, and called for the four-tiered, **channel-bearing scarps** to taper to two tiers as they met the bluff. Construction began in the 1850s, but Fort Totten was judged obsolete before its completion. Work was suspended and the design simplified to comprise only two tiers of casemated guns. As the primary defense for New York's "back door," Fort Totten evolved into a prototype anti–aircraft installation in the 1920s, eventually becoming a Nike missile command site.

scarp—the steep exterior walls of a fort; channel-bearing scarps are those walls mounting cannon aimed directly at the navigation channel.

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-019



Caption
L-13-019

Primary Material: Granite
Guns: Thirty–nine13-inch mortars mounted on the top tier
Range: 2 miles

Model text
L-13-020

FORT SCHUYLER

Begun in 1833 Fort Schuyler was built to guard the entrance to New York Harbor from the northeast. Sited on Throgs Neck peninsula, this stone fort countered any warships attempting to enter the East River via Long Island Sound. With two casemated tiers of firepower arrayed in a half-hexagonal layout, Fort Schuyler employed three simple bastions to protect its shore-facing walls. An unusally large **outwork** defended against infantry assault from the landward side.

out´-work—a secondary defensive position lying outside the limits of the principal fortification, usually to protect the most vulnerable part- the entrance to the fort.

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-021

Illustration of Fort Schuyler

Caption
L-13-021

Primary Materials: Granite with earth embankments
Armament: 10–inch Rodman guns mounted in the first tier in 1868
Range: 1,900 yards (just over a mile)

Model text
L-13-022

CASTLE CLINTON

Located at the foot of Manhattan, in an area still called "The **Battery**", Castle Clinton was originally an island fort connected to Manhattan by a wooden pier and drawbridge. Its semicircular front faced its companion fortification, the three-tiered Castle Williams across the mouth of the East River on Governors Island. Castle Clinton was never raised beyond a single tier, and actually remained in active service for little more than a decade, until 1821. After transfer to the City of New York, this historic structure has served diverse functions, finally becoming a National Monument in 1950.

bat´-ter-y—an emplacement for one or more pieces of artillery, usually without any barracks for stationing a round-the-clock garrison.

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-023

Illustration of Castle Clinton

Caption
L-13-023

Primary Materials: Brownstone and wood timbers
Armament: Twenty–eight 32–pounders
Range: 1,900 yards (just over a mile)

Model text
L-13-024

FORT GIBSON

Located on Ellis Island, Fort Gibson was intended to complement the other defenses ringing Upper New York Bay including Fort Wood, Fort Columbus, and Castle Clinton. Although renovated and remodeled many times over the years, Fort Gibson's semicircular design remained essentially intact. An 1807 proposal to add another brick tier in place of the existing parapet was rejected by engineers due to the spongy nature of the underlying soil. Fort Gibson managed to mount about fourteen 24-pound cannon during the War of 1812.

par´-a-pet—a chest–high wall at the top of a fort that protects defenders from enemy fire.

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-025

Illustration of Fort Gibson

Caption
L-13-025

Primary Materials: Brick on a stone foundation
Armament: Thirteen or fourteen 24–pounders during the War of 1812
Range: 1,900 yards (just over a mile)

Model text
L-13-026

FORT WOOD

Constructed on Bedloe's Island just before the War of 1812, Fort Wood is a fine example of a "star fort." This rare defensive layout without **bastions** was usually employed with island forts that were considered safe from landward attack. Repaired with slight modification in the 1840s, Fort Wood remained in service until the 1880s when it was selected as the stone pedestal upon which to set the Statue of Liberty, whose base it now forms.

bas´-tion—a projecting part of a fortification that allows guns within the fort to be aimed back along the outside walls to defend against infantry assault.

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-027

Illustration of Fort Wood

Caption
L-13-027

Primary Material: Sandstone
Armament: Thirty 24-pounders in 1811
Range: 1,900 yards (just over a mile)

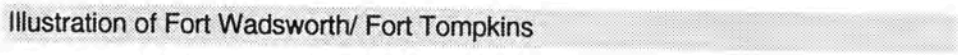
Model text
L-13-028

FORT WADSWORTH/FORT TOMPKINS

Construction of Fort Tompkins, the second fortification on the west side of the Narrows to bear this name, began in 1859. Not finished until 1876, Fort Tompkins joined a growing list of masonry forts made obsolete by the development of rifled artillery that could reduce them to rubble. Never mounting more than a single heavy gun, Fort Tompkins still remained an active military installation for over a century. Perhaps the least threatening role Army command ever asked it to fill, was when, at the end of the 1800s, Tomkins' central **parade** was transformed into an exquisite set of courts for lawn tennis.

pa-rade´—a broad open lawn or paved area that serves as a place to assemble troops for review, as in "parade ground."

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-029



Caption
L-13-029

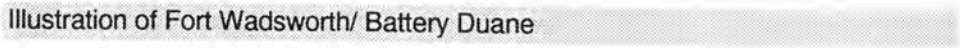
Primary Materials: Granite outer walls with brick interior construction
Armament: One 10" Smoothbore converted to an 8" rifle
Range: 3 miles (To be verified)

Model text
L-13-030

FORT WADSWORTH/BATTERY DUANE

In the decade following 1895, six new concrete batteries for high-powered artillery were built at Fort Wadsworth, including Battery Duane. These clusters of rifled cannon were aimed not at the Narrows, but at the open water of Lower New York Bay. Rapid advances in naval gunnery, including high trajectory cannon capable of showering shore batteries with plunging fire, meant these open-air emplacements were quickly outmoded. By 1915, Battery Duane's disappearing guns had been taken out of service. Only three ever saw duty again, redeployed at Fort Hancock, across the Bay on the Sandy Hook peninsula.

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-031



Caption
L-13-031

Primary Materials: Concrete, granite and brick with earth embankments
Armaments: Five 8–inch rifles on disappearing carriages
Range: 7-8 miles

Model text
L-13-032

FORT WADSWORTH/FORT RICHMOND*

Sited on the west bank of the Narrows, Fort Richmond was the second water battery built here to bear this name. Begun in 1847, it was a premier Third System fortification, with three granite tiers topped by an open, sod-covered barbette. Armored iron **embrasures**, designed by engineer Joseph Totten, permitted the casemate-enclosed artillery to sweep 60 degrees side-to-side, though the openings were less than five feet square. To further protect the gun crews from enemy fire, Totten outfitted the gun ports with thick iron shutters that could snap shut after each firing.

*Now known as Battery Weed

em-bra´-sure—an opening in a wall through which a cannon is fired; the aperture is often reinforced with extra thick surrounding walls and iron plates.

Silkscreen Vinyl ink
Line art, PMS 8420
G-13-032

Illustration of Fort Wadsworth/ Fort Richmond

Caption
L-13-033

Primary Materials: Granite with a brick and sod barbette
Armament: 116 Rodmans, Parrott rifles, and columbiads with 24 flanking howitzers
Range: 3 miles

14 Measures and Counter Measures

Sign Header
L-14-000

MEASURES <=> COUNTERMEASURES

Primary text
L-14-001

Measures and Countermeasures
Initially America held a distinct advantage in defending its cities and ports. Sailing man-o-wars were simply no match for well-armed coastal fortifications. But by the mid–1800s this balance began to shift to the potential foe.

With the advent of steam power, an invading fleet was no longer forced by winds or currents to take a course in close to shore batteries. With armor plating, enemy vessels could survive heavy shelling and steam on past. Outfitted with rifled cannon, ships could stand further offshore and blast away, out of the range of coastal artillery.

At least that is what enemy ships could do until, in a see-saw struggle to hold the "edge", the firepower of coastal guns was again increased to offset the attacking force. This game of matching measures with countermeasures continued into the Cold War, culminating in the deployment of anti-aircraft missile batteries.

Color print

G-14-002 Custom illustrated map of NY population and forts, circa 1807

Secondary text
L-14-002

The First Line of Defense

Limits on the range of artillery initially meant placing fortifications close to population centers. Dutch settlers thus fortified the tip of Manhattan. After capturing New Amsterdam, the British upgraded these fortifications. During the Revolution, the British emplaced guns on the west side of the Narrows, about 3 miles further out. They meant to intercept an enemy fleet before its guns were within range of the city. They knew that an exchange of fire would involve forces well within sight of each other.

Map Labels

L-14-002.1

[Map labels]
New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Sandy Hook
Battery
Battery
Battery
Ft. Jay
Stockhouse (?)
population density {key to population overlay}

Color Print

G-14-003 Custom illustrated map of NY population and forts, circa 1816

Secondary text
L-14-003

The Second Line of Defense

The U.S. fortified the Narrows early in the 1800s, then replaced these batteries with masonry forts. The guns at the original Fort Richmond and Tompkins had a range of about 1 mile, about equal to the width of the Narrows. Later armament, like larger caliber columbiads, could lob explosive shells onto the decks of enemy ships. With rifled artillery, the effective range of shore batteries increased to nearly 3 miles.

Map Labels

L-14-003.1

[Map labels]
New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Ft. Gibson
Ft. Wood
Ft. Tompkins
Ft. Richmond
South-West Battery
Castle Williams
Ft. Columbus
Ft. Lewis
Ft. Diamond
Ft. Gates
population density {key to population overlay}

Color Print

G-14-004

Custom illustrated map of NY population and forts, circa 1865

Secondary text
L-14-004

The Third Line of Defense

Together with rifled cannon, the development of ironclad warships rendered masonry forts obsolete. In the late 1800s, vertical stone forts were superseded by low, dispersed Endicott batteries made of concrete and sloped earth. Many were outfitted with breechloading rifles, that could fire a 1,000–lb. projectile 8 miles. Earth and concrete parapets lent protection against frontal fire, but were vulnerable to "plunging" fire from warships with high-trajectory gun turrets. Endicott batteries also became outmoded, those flanking the Narrows being largely dismantled by World War I.

Map Labels

L-14-004.1

[Map labels]
New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Ft. Gibson
Ft. Wood
Ft. Tompkins
Ft. Richmond
Castle Clinton
Castle Williams
Ft. Columbus/South Battery
Ft. Hamilton
Ft. Lafayette
Fort at Sandy Hook
Fort Schuyler
Fort at Willets Point
population density {key to population overlay}

Color Print

G-14-005

Custom illustrated map of NY population and forts, circa 1910

Secondary text
L-14-005

The Fourth Line of Defense

The increasing range of naval firepower led to the emplacement of shore batteries still further away from Manhattan. During World War II, crews of the huge coastal guns at Fort Tilden and Navesink practiced hitting targets 30 miles out at sea with shells weighing more than a ton. But strategists had to contend with far more than surface ships. Enemy submarines prompted nets and mines to be strung across the Narrows. Long-range bombers required searchlights, radar and anti-aircraft batteries. Eventually, the Coast Artillery's sole mission became defense against enemy aircraft.

Map Labels

L-14-005.1

[Map labels]
New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Ft. Gibson
Ft. Wood
Ft. Tompkins
Ft. Richmond
Castle Clinton
Castle Williams
Ft. Columbus/South Battery
Ft. Hamilton
Ft. Lafayette
Fort at Sandy Hook
Fort Schuyler
Fort at Willets Point
population density {key to population overlay}

Color Print

G-14-006

Custom illustrated map showing how many fort sites have been converted to Parks, Beaches, Historic Sites and Recreation Areas, as of 1994.

Secondary text
L-14-006

No Line of Defense

During World War II, amphibious landings played a crucial role in both Europe and the Pacific. A port might now be the last place military planners could expect invasion. But it was the development of rocketry that truly spelled the end for harbor fortifications. Intercontinental ballistic missiles made every part of the nation vulnerable to attack, not just the seacoasts. In a world where no true lines of defense can be drawn, most coastal forts, like those surrounding New York, have become historic sites and parks, as well as recreation and conservation areas.

Map Labels

L-14-006.1

New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Castle Clinton (National Monument)
Fort Wadsworth (Gateway National Recreation Area - Staten Island Unit)
Fort Hancock (Gateway National Recreation Area - Sandy Hook Unit)
Fort Tilden (Gateway National Recreation Area - Jamaica Bay Unit)
Bennet Field (Gateway National Recreation Area - Breezy Point Unit)
Fort Wood (base for Statue of Liberty National Monument)
Fort Schuyler (New York State Maritime College)

Fort Tilden (Gateway National Recreation Area - Jamaica Bay Unit)
Bennet Field (Gateway National Recreation Area - Breezy

Color Print

G-14-007

Custom illustration depicting in profile/silhouette the attacking vessels and corresponding batteries—"the measures and countermeasures".

Identifier(s)

L-14-007.1

Anti-aircraft battery, circa 1930s-1950s

Identifier(s)
L-14-007.10 WWII Submarine

Identifier(s)
L-14-007.11 WWII Submarine net with mines

Identifier(s)
L-14-007.12 Long range bombers, circa 1940s-1970s

Identifier(s)
L-14-007.13 "Skip" shot or flat trajectory

Identifier(s)
L-14-007.14 Low trajectory - frontal fire

Identifier(s)
L-14-007.15 High trajectory - plunging fire

Identifier(s)
L-14-007.16 High-altitude bombing

Identifier(s)
L-14-007.17 Water Battery, circa 1860

Identifier(s)
L-14-007.2 16-inch rifled gun battery, circa 1920s-1940s

Identifier(s)
L-14-007.3 Endicott battery with disappearing guns, circa 1890s

Identifier(s)
L-14-007.4 Nike missile site, circa 1950s-1970s

Identifier(s)
L-14-007.6 Confederate frigate, circa 1860

Identifier(s)
L-14-007.7 "Dreadnought" class battleship, circa 1910

Identifier(s)

L-14-007.8 World War I "Bismark" class battleship, circa 1940s

Artifacts & Models

Artifact/Model Schedule

Ex ID No.	Description	Source	Cat. HFC	No./ Reg.	Location	Height Ft./In.	Width Ft./In.	Depth Ft./In.	Notes
	1 Fort Wall Replica								
A-01-001	**Model** **Model of Totten shutters & Gun Barrel**	Contract model fabricator	N/A N/A		To be fabricated				See Arch. Dwgs. Sheets 4, 5, 6, 19, & Resource Package

Ex ID No.	Description	Source	Cat. HFC	No./ Reg.	Location	Height Ft./In.	Width Ft./In.	Depth Ft./In.	Notes
	[redacted] **9 Weapons Take Charge**								
A-09-001	**Model** **Resin casting of a smoothbore muzzleloader**	Contract model fabricator	N/A N/A		To be fabricated				See Arch. Dwgs. Sheets 13, 14, & Resource Package
A-09-002	**Resin casting of a rifled breechloader**	Contract model fabricator	N/A N/A		To be fabricated				See Arch. Dwgs. Sheets 13, 14, & Resource Package

Ex ID No.	Description	Source	Cat. No./ HFC Reg.	Location	Height Ft./In.	Width Ft./In.	Depth Ft./In.	Notes
	10 Weigh In with the Big Shots							
A-10-001	**Model** **A 32-pound shot cannonball, wood sabot and powder sack**	Park	N/A N/A	To be fabricated		6.4"		See Arch. Dwgs. Sheets 15, 18, & Resource Package
A-10-002	**Model** **A 10" columbiad shell, tongs, iron bar**	Park	N/A N/A	To be fabricated		10"		See Arch. Dwgs. Sheets 15, 18, and Resource Package
A-10-003	**Model** **16" shell, four sacks of powder stacked vertically**	Park	N/A N/A	To be fabricated				See Arch. Dwgs. Sheets 15, 16, 17, 18, & Resource Package
A-10-004	**Model** **Half model of football and round ball at half-scale**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheets 13 & Resource Package

Ex ID No.	Description	Source	Cat. HFC	No./ Reg.	Location	Height Ft./In.	Width Ft./In.	Depth Ft./In.	Notes
	11 Casemate Diorama								
A-11-001	**Mannequin** **Mannequins of soldiers ramming a casemated gun**	Mannequin Studio & Costume Maker	N/A N/A		To be fabricated				See Arch. Dwgs. Sheet 1 & Resource Package
A-11-002	**Model** **Models of gun, carriage and implements for casemate**	Contract model fabricator	N/A N/A		To be fabricated				See Arch. Dwgs. Sheet 1 & Resource Package

Ex ID No.	Description	Source	Cat. No./ HFC Reg.	Location	Height Ft./In.	Width Ft./In.	Depth Ft./In.	Notes
	12 Guarding the Gates							
A-12-001	**Model Three man-o-wars**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 27 & Resource Package

Ex ID No.	Description	Source	Cat. No./ HFC Reg.	Location	Height Ft./In.	Width Ft./In.	Depth Ft./In.	Notes
	13 New York Harbor Map & Fort Models							
A-13-001	**Model A Confederate Raider**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheets 27, 31, & Resource Package
A-13-002	**Model Fort Hancock/Battery Potter**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-003	**Model Navesink/Battery Lewis**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-004	**Model Fort Tilden/Battery Harris**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-005	**Model Fort Hamilton**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package

Ex ID No.	Description	Source	Cat. No./ HFC Reg.	Location	Height Ft./In.	Width Ft./In.	Depth Ft./In.	Notes
A-13-006	**Model Fort Lafayette**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-007	**Model Fort Columbus**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-008	**Model Castle Williams**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-009	**Model Fort Totten**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwg. Sheet 25 & Resource Package
A-13-010	**Model Fort Schuyler**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-011	**Model Castle Clinton**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package

Ex ID No.	Description	Source	Cat. No./ HFC Reg.	Location	Height Ft./In.	Width Ft./In.	Depth Ft./In.	Notes
A-13-012	**Model Fort Gibson**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-013	**Model Fort Wood**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-014	**Model Fort Tompkins**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-015	**Model Battery Duane**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwgs. Sheet 25 & Resource Package
A-13-016	**Model Fort Richmond**	Contract model fabricator	N/A N/A	To be fabricated				See Arch. Dwg. Sheet 25 & Resource Package

Total artifacts this report: 26

Graphics Schedule

Graphic Schedule

Graphics were acquired by the National Park Service exclusively for this exhibit. Any other use may be unauthorized.

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
	1 Fort Wall Replica						
G-01-004	**Silkscreened** **Posterized line art, PMS Black 7C** Painting by Seth Eastman of Forts Tompkins and Wadsworth	The Architect of the Capitol, (202) 228-1222, Contact: Barbara Walamin	70260	4x5 b&w transp	1' 4 1/2"	2' 8"	Knock back contrast of granite painting, feather edges of water around type if necessary to avoid hard edge line
G-01-007	**Silkscreened** **Line art, PMS Black 7C** Totten embrasure detail	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77	4x5 b&w transp	4 1/2"	4 1/2"	
G-01-008	**Silkscreened** **Line art, PMS Black 7C, highlight in PMS 186C** Interior elevation of casemate with iron embrasure highlighted	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 43 Sht 45	4x5 b&w transp	10 1/2"	11 1/2"	Highlight an outline as indicated on drawing
G-01-012	**Silkscreened** **Line art, PMS Black 7C** Existing line art cross section modified by addition of Rodman gun	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 43 Sht 26	4x5 b&w transp	9 1/2"	1' 0"	Graphic will be modified

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
	4 Life on the Base Alcove						
G-04-003	**Silkscreen Posterized Line art PMS 581C** Photo of commanding officer quarters on Mont Sec Avenue	National Archives/ Still Picture Division, Collegepark, MD 301-713-6625	92-F-72-5	4x5 b&w transp	10 1/2"	1' 8 1/2"	Bleed 2 sides, bottom & left. Overall Note for Exhibits 4,5,6,7,8- any unspecified background area prints as PMS 452C
G-04-004	**Silkscreen Posterized Line art PMS 581C** Photo of north side of officers row	National Archives/ Still Picture Division, Collegepark, MD 301-713-6625	92-F-72-6	4x5 b&w transp	1' 2"	1' 8 1/2"	Bleed 2 sides, bottom & right
G-04-005.1	**Color print** Photo of Orphan Home at Fort Wadsworth	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	FL-24 Postcard Collection	4x5" color neg	5 1/8"	8 1/2"	
G-04-005.2	**Color print** Photo of Main Gate and Officers Row	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	84.75-333 57HP	4x5" color neg	5 1/8"	8 1/2"	Overlap image
G-04-005.3	**Color print** Photo of Fort Wadsworth Hospital	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	84.75 806 57HP Postcard Collection	4x5" color neg	5 1/8"	8 1/2"	Overlap image

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
G-04-005.4	**Color print** Photo of Infantry Inspection at Fort Wadsworth	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	84.75 332 (or 331, or 321) 57HP	4x5" color neg	5 1/8"	8 1/2"	Overlap image
G-04-005.5	**Color print** Photo of Fort Wadsworth Marching Band	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	HP-L190.1 48 Postcard Collection	4x5" color neg	5 1/8"	8 1/2"	Overlap image
G-04-007	**Color Print** **Duotone** **Black & PMS 581C** Photo of motor pool inspection.	Alan Aimone, US Military Academy Library, West Point, NY. 914-938-2954 in Fort Wadsworth's *Range Finder*, Holiday Issue, 1944, page 5		4x5 b&w transp	1' 3/4"	11 1/2"	
G-04-008	**Color print** Engraving of Staten Islanders watching steamers	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135; Staten Island Sunday Advance, January 25, 1970		4x5" color neg	1' 3/4"	11 1/2"	Also used in Exhibit 3
G-04-009	**Color Print** **Duotone** **Black & PMS 477C** Infantry barracks at Fort Wood	National Archives/ Still Picture Division, Collegepark, MD 301-713-6625	RG 92-F-82-5	4x5 b&w transp	1' 3/4"	11 1/2"	
G-04-010	**Color print** **Duotone Black & PMS 477C** Photo Collage of men and women of Fort Wadsworth from base newspaper	Alan Aimone, US Military Academy Library, West Point, NY; Fort Wadsworth's *Range Finder*, Holiday Issue 1944, pg. 11		4x5 b&w transp	1' 3/4"	11 1/2"	If necessary for image clarity, treat as posterized line art, Black PMS 7C

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.		Width Ft./In.		Notes
G-04-011	**Color Print Duotone Black & PMS 540C** Photo of Soldier's quarters in a casemate	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	84.75-299 57HP	4x5 b&w transp	2'	4"	1'	5 "	Fit to circle
G-04-012	**Color Print Duotone Black & PMS 186C** Photo of an outdoor dance at Fort Tompkins	Alan Aimone, US Military Academy Library, West Point, NY; Fort Wadsworth's *Range Finder*, Holiday Issue 1944, pg 7		4x5 b&w transp		8"	1'	6"	Black PMS 7C Line print if necessary, fit to circle
G-04-013	**Color Print Duotone Black & PMS 581C** Photo of Lawn tennis in Fort Tompkins	Staten Island Historical Society, Alice Austin Photo; "Tennis court inside of Fort Wadsworth"	D-486	4x5 b&w transp	1'	7"	1'	6"	Fit to circle
G-04-014	**Color Print Duotone Black & PMS 477C** Photo of Men cleaning the barbette of Battery Weed	Harbor Defense Museum, Brooklyn, N.Y., Contact: Phil Melphi, 718-630-4349	8-1431-7/ AH-73 Photo by #SP-4 Sanders	4x5 b&w transp	1'	8"	1'	6"-8"	
G-04-015	**Silkscreen PMS Black 7C** Photo of cannonballs stacked in courtyard of Battery Weed	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	A308, Alice Austin Photo	8x10" b/w transp	3'	2 1/2"	3'	10 1/2"	Photo in hand for Wayside Exhibit

5 Fort Construction Alcove

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-05-003	**Silkscreen Posterized Line art, print PMS 540C** Elevation drawing of Battery Weed	National Archives/ New York, NY See OZ for more elaborate information.	RG 77 Entry 802	4x5 b&w transp	10 1/2"	2' 10"	Bleed bottom and left
G-05-004	**Color Print (Silkscreen figure in center of panel) Line art, print Black PMS 7C** Drawing of a construction crane	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 41 Sht 32	4x5 b&w transp	7 1/2"	11 1/2"	Bleed top. repeat detail of man hoisting pulley as line art in center panel as shown. Print PMS 477C
G-05-004.1	**Silkscreen Posterized Reverse line art of background** Detail of construction gear	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 41 Sht 32	4x5 b&w transp	6"		
G-05-005	**Color Print Duotone Black & PMS 581C** Engraving of Fort Tompkins under construction	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	See Jack Spinnler, Wayside Exhibits HFC	4x5 b&w transp	7 1/2"	1' 3"	In hand for Wayside Exhibit
G-05-007	**Color print** Painting of Robert E. Lee	Washington/Custis/Lee Collection, Wash & Lee U., 703-463-8400; News Office Contact: Julie Cline	Lee as lieut. of Engineers, painted by William E. West, 1838	4x5" color neg	1' 3/4"	11 1/2"	

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
G-05-008.1	**Color Print** **Line art, print PMS 477C** Sections and plan of disappearing gun battery	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 43 Sht 69-1	4x5 b&w transp	5"	11 1/2"	
G-05-008.2	**Color Print** **Line art, print PMS 540C** Plan of Battery Barry	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 43 Sht 84-13	4x5 b&w transp	7 1/2"	11 1/2"	Fit to circle
G-05-009	**Color Print** **Line art, print PMS 540C.** Engraving of wharf on Ft. Wadsworth site with Battery Weed beyond.	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	84-75 329 57HP	4x5 b&w transp	1' 3/4"	11 1/2"	In hand for Wayside Exhibit
G-05-010	**Color print** Engraving of Battery Weed surrounded by moat	Staten Island Institute of Arts and Sciences, Staten Island, NY, Contact: Dotty Deletto , Archives Division 718-727-1135	Print Collection	4x5" color neg	1' 3/4"	11 1/2"	Fit to circle In hand for Wayside Exhibit
G-05-011	**Color Print** **Duotone** **Black & PMS 540C** Engraving of Battery Weed under construction	Dr. E.R. Lewis 202-944-0777 See Jack Spinnler, Wayside Exhibits, to see if they have decent reproducible		4x5 b&w transp	2' 9"	1' 6"	Fit to circle In hand for Wayside Exhibit
G-05-012	**Color Print** **Duotone** **Black & PMS 581C** Photo of Fort Totten under construction	Harbor Defense Museum, Brooklyn, N.Y., Contact: Phil Melphi, 718-630-4349; "Fort Totten under construction"		4x5 b&w transp	2' 9"	1' 6"	Fit to circle

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-05-013	**Silkscreen** **Use as line art, print PMS 477C** Plan of Fort Richmond	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77, Drw 43, Sht 25	8x10" b/w transp	3' 1 1/2"	3' 10 1/2"	

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
	[redacted] 6 Channel Obstructions Alcove						
G-06-003	**Silkscreen** **Use as line art, print PMS 540C** Engraving of net with mines across the Narrows	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 159 Sht 43A	4x5 b&w transp	11 1/2"	3' 10 1/2"	Bleed to bottom and right; In hand for Wayside Exhibit
G-06-004	**Color Print** **Duotone** **Black & PMS 186C** B&W Photo of an army vessel laying mines in NY Harbor	Harbor Defense Museum, Brooklyn, N.Y., Contact: Phil Melphi, 718-630-4349 ("Army Vessel laying mines" from *Guarding the Gates*, Harbor Forts in the Defense of NY.	Book by Russell S. Gilmore, 1984	4x5 b&w transp	5"	9"	Bleed to top
G-06-006	**Color Print** **Line art, print PMS Black 7C** Photo of spherical mines	NPS brochure, Fort Moultrie	GPO: 1194-301-065/00031 reprint 1984	4x5 b&w transp	1' 3/4"	11 1/2"	
G-06-007	**Color print** Engraving of spiked device	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 117 Sht 13	4x5" color neg	1' 3/4"	11 1/2"	Crop to fit circle
G-06-008	**Color print** Drawing of spiked gate	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 117 Sht 18	4x5" color neg	1' 3/4"	11 1/2"	Crop to fit circle

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
G-06-009	**Color print** **Use as line art, posterized, print PMS Black 7C** B&W Photo of Civil War era mines	*The Civil War - The Coastal War* by Peter M. Chaitin (deceased); Time-Life Books, Alexandria, VA 1984.	Page 152-153.	4x5 b&w transp	1' 3/4"	11 1/2"	
G-06-010	**Color print** Diagrammatic plan drawings of net with mines	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 117 Sht 3	4x5" color neg	2' 7 3/4"	1' 6"	Fit to circle
G-06-011	**Color print** **Use as line art, print PMS 477C** Map drawing of Torpedo Storage building	National Archives/ New York, NYC See OZ for more elaborate information	RG 77 Entry 802	4x5 b&w transp	1' 21/2"	1' 6"	
G-06-012	**Color Print** **Line art, black and white** Letter from War Dept. warning of cable across Narrows	National Archives, New York, NYC See OZ for more elaborate information	October 18, 1929	4x5 b&w transp	1' 3"	1' 6"	Fit to circle
G-06-013	**Silkscreen** **Scan as line art, print PMS 540** Diagrammatic drawing of rope obstruction with "barrel" mine	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 117 Sht 8-1	8x10" b/w transp	2' 0"	3' 10 1/2"	Clone part of anchor chain to extend anchor and reposition as shown on drawing.
G-06-014	**Color print** Detail of Float	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 117 Sht 4	4x5" color neg	1' 6 1/2"	1' 6"	

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-06-015	**Color Print** Plan and section of channel obstruction	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 117 Sht 5	4x5" color neg	1' 6 1/2"	1' 6"	

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
	7 The Enemy Alcove						
G-07-003	**Silkscreen** **Line art, print PMS 100% PMS 477C** Engraving of the bombardment of Fort Fisher, 1865	National Archives/ Still Picture Division, Collegepark, MD 301-713-6625	ID# 79-CWC-3 F-29; Civil War File - Cab. 22, Drw 4	4x5 b&w transp	10"	3' 1 1/2"	Curve top ledge of smoke as indicated on drawing, bleed bottom and left.
G-07-004	**Color Print** **Duotone** **Black & PMS 540C** Photo of a 12" disappearing gun	National Archives - NPS has photo Contact: Terasa Vasquez	165-WW-3 88-D1 (Fort Moultrie, A/V)	4x5 b&w transp	5 1/2"	9"	Drop out of background, bleed to top.
G-07-005	**Color Print** **Duotone** **Black & PMS 581C** Photo of World War I era anti-aircraft artillery	Howard-Revis Design	AA Battery	4x5 b&w transp	5 1/2"	5"	Drop out of background, bleed to top. (Neg in hand)
G-07-006	**Silkscreen** **Line art, print 100% PMS Black 7C** British recognition card with German submarines	Naval Historical Center, Basic Collection; 202-433-2765	NH 94710	4x5 b&w transp	2 1/2"	1' 4"	Butt or merge with running head, bleed right.
G-07-008	**Silkscreen** **Line art, PMS 186C** Engraving of British warship from the War of 1812	Library of Congress/ Prints & Photographs; Wash., D.C., 202-707-6394	LC-USZ62-64020	4x5 b&w transp	1' 3/4"	11 1/2"	

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
G-07-009	**Color Print** **Duotone** **Black & PMS 477C** Photo of a Confederate ironclad.	Library of Congress/ Prints & Photographs; Wash., D.C., 202-707-6394	LC-USZ62-69114	4x5 b&w transp	1' 3/4"	1 1/2"	Crop to fit around circle
G-07-010	**Color Print** **Duotone** **Black & PMS 540C** Photo of a World War I era German battleship with turret	Naval Historical Center, Basic Collection; 202-433-2765	NH 59636	4x5 b&w transp	1' 3/4"	11 1/2"	Fit to circle
G-07-011	**Color Print** **Duotone** **Black & PMS 581C** Photo of World War II German U-boat	National Archives/ Still Picture Division, Collegepark, MD 301-713-6625	80-G-320284	4x5 b&w transp	1' 3/4"	11 1/2"	
G-07-012	**Full Color print** Poster of New York Harbor on fire	National Archives/ Still Picture Division, Collegepark, MD 301-713-6625	120-WP-65 (Rack T)	4x5" color neg	2' 9 1/2"	1' 6"	Fit to circle
G-07-013	**Color print** Engraving of Washington, DC on fire during the War of 1812	Library of Congress/ Prints & Photographs; Wash., D.C., 202-707-6394	LC-USA7-33623	4x5" color neg	2' 9 1/2"	1' 6"	Fit to circle
G-07-014	**Silkscreen?** **Line art, print 100% PMS 186C** Drawing of the Merrimac	Naval Historical Center, Basic Collection; 202-433-2765	NH 4578	8x10" b/w transp	3' 7 1/2"	3' 11"	Position as shown
G-07-015	**Silkscreen** **Line art, 100% PMS 540C** Line art of Confederate Caps	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	Poster Collection	4x5 b&w transp	1' +/-5"	+/-8"	Position as shown

Color Print 11/6/95

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.		Width Ft./In.		Notes
	[redacted] **8 Signalling Devices Alcove**								
G-08-003	**Silkscreen** Posterize line art, to maintain texture indicated on drawing, print PMS 581C. Drop out of backgroound Photo of Man looking through a spotter scope	Alan Aimone, US Military Academy Library, West Point, NY 914-938-2954; Fort Wadsworth's *Range Finder,* Holiday Issue, 1944, pg. 12		4x5 b&w transp	1'	1"	2'	3"	Clone an area to attach the two men, merge with G-08-003 as shown, bleed left, right. bottom
G-08-004	**Silkscreen** **Same as G-08-003** Photo of man using signal beacon	Alan Aimone, US Military Academy Library, West Point, NY, 914-938-2954; Fort Wadsworth's *Range Finder,* Holiday Issue, 1944, pg 12		4x5 b&w transp	1'	6"	1'	9"	Merge with G-08-003 as indicated on drawing
G-08-006	**Color Print** **Duotone** **Black & PMS 540C** Photo of beacon mounted on Battery Weed	Staten Island Historical Society; Staten Island Advance, Dec. 19, 1965; photo by Frank J. Johns		4x5 b&w transp	1'	3/4"		11 1/2"	
G-08-007	**Color print** George Washington on horseback	Library of Congress/ Prints & Photographs; Wash., D.C., 202-707-6394	USZ62-52 234	4x5" color neg	1'	3/4"		11 1/2"	Fit to circle

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
G-08-008	**Silkscreen** **Scan as line art, print 100%** **PMS 540C** Diagram of signalling shutter, includes front and profile view.	National Archives, New York	RG 77, Entry 802	4x5 b&w transp	1' 3/4"	11 1/2"	Use backgrouond, fit to circle
G-08-009	**Color print** Portrait photo of Albert J. Myer	National Archives/ Still Picture Division, Collegepark, MD 301-713-6625	ID# BA-355	4x5" color neg	1' 3/4"	11 1/2"	
G-08-010	**Silkscreen** **Scan as line art, print 100%** **PMS 477C** Engraving of signal post with movable arms	Dr. E.R. Lewis 202/ 944-0777; image from *Seacoast Fortifications of the United States, An Introductory History* by E. R. Lewis	Figure #7	4x5 b&w transp	3' 7 3/4"	1' 6"	Fit to circle; in hand for Wayside Exhibit
G-08-011	**Color print** Painting of signal pole from early 1800s	Harbor Defense Museum, Brooklyn , NY 718-630-4349	Painting in their exhibit	4x5" color neg	3' 7 3/4"	1' 6"	Fit to circle
G-08-012	**Silkscreen ?** **Scan as line art, print 100%** **PMS 540. Lines are white.** Diagram showing location of signal service cable	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 36 Sht 101	4x5 b&w transp	2' 9"	11"	Fit to circle
G-08-013	**Color print** Engraving of bluff overlooking the Narrows with two signal poles.	Harbor Defense Museum, Brooklyn, N.Y., Contact: Phil Melphi, 718-630-4349	"New York Bay from the Telegraph Station"	4x5 b&w transp	2' 9"	3' 10 1/2"	

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
	[redacted] **9 Weapons Take Charge**						
G-09-003	**Color Print Sepia Duotone Short range Black, full range PMS 477C** Portrait of Thomas Jefferson Rodman	Library of Congress/ Prints & Photographs; Wash., D.C., 202-707-6394	LC-USZ-62 -16740 Biography File	4x5 b&w transp	3 1/8"	2 1/2"	
G-09-004	**Color Print Sepia Duotone Short range Black, full range PMS 477C** Portrait of Robert Parker Parrott	U.S. Army Ordnance Center & School, Aberdeen Proving Ground, MD Contact: Capt. Mary Beth Neils, 410-298-5400	Robert Parker Parrott Portrait #56-120	4x5 b&w transp	3"	2 1/2"	
G-09-005	**Color Print Sepia Duotone Short range Black, full range PMS 477C** Fort Pulaski breached	NPS-HFC	16-7	4x5 b&w transp	4 1/2"	5 1/2"	
G-09-006	**Color Print Sepia Duotone Short range Black, full range PMS 477C** Man standing next to dented turret of the Monitor immediately following her battle with the Merrimac during the Civil War.	Navy Historical Center, Basic Collection	NH-45970	4x5 b&w transp	4 1/2"	5 1/2"	

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
G-10-005.1	**Color Print Custom Photograph, Quad Tone - Blue** A soldier in 1812-era uniform carrying a 32-pound solid shot and its powder.	Exhibit Fabricator, See Bill Brown, NPS-HFC		n/a	5' 10"	1' 4"	LIFE SIZE
G-10-005.2	**Silkscreen Line art, PMS 540C** A cross-section of a 32-pound cannonball	Exhibit Fabricator		n/a	1-1/8"	1-1/8"	Chemically etched graphic with colored ink, see drawing sheet 16. 1 1/8" Diameter
G-10-005.3	**Silkscreen PMS 540C** A silhouette of a smoothbore cannon firing a television; trajectory indicated with a dotted-line.	Exhibit Fabricator		n/a	1 1/4"	1' 8 1/4"	Chemically etched graphic with colored ink, see drawing sheet 16
G-10-006.1	**Custom Photograph, Quad Tone - Blue** Two men in Civil War-era uniforms hauling a 10" exploding shell with tongs.	Exhibit Fabricator, See Bill Brown, NPS-HFC		n/a	6' 0"	1' 6"	LIFE SIZE, see resource package
G-10-006.2	**Silkscreen Line art, PMS 540C** A cross-section of a 10" columbiad exploding shell.	Exhibit Fabricator		n/a	3" dia	3" dia	Chemically etched graphic with colored ink, see drawing sheet 16 3" Diameter

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-10-006.3	**Silkscreen PMS 540C** A silhouette of a 10" columbiad firing a refrigerator; trajectory indicated with dotted-line.	Exhibit Fabricator		n/a	2-1/4"	1' 9-3/4"	Chemically etched graphic with colored ink, see drawing sheet 16.
G-10-007.1	**Custom Photograph Quad Tone - Blue** A soldier standing behind models of a shell and powder bags gesturing to a cut-out crane and hook above	Exhibit Fabricator, See Bill Brown, NPS-HFC		n/a	6' 10"	1' 6"	See drawing, see resource package (Hook: 1'9" high x 9" wide approximately)
G-10-007.2	**Silkscreen Line art, PMS 540C** A cross-section of a 16" shell	Exhibit Fabricator		n/a	4-1/2"	1"	Chemically etched graphic with colored ink, see drawing sheet 16. See drawing, see resource package.
G-10-007.3	**Silkscreen PMS 540C** A silhouette of a 16" rifled gun firing a small car; trajectory indicated with dotted line.	Exhibit Fabricator		n/a	3-1/2"	2' 0"	Chemically etched graphic with colored ink, aee drawing sheet 16. See drawing, see resource package.

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.		Width Ft./In.		Notes
	[redacted] **11 Casemate Diorama**								
G-11-003	**Line art, Surround PMS 418C, Interior PMS 449C** Engraving of a series of casemates.	Dr. E.R. Lewis, 202-944-0777		4x5 b&w transp	1'	4"	1'	9"	
G-11-005	**Kodalith Amber Gel #321** Line art axonometric of Fort Richmond with overlapping fields of fire	Exhibit Fabricator		n/a	1'	10"	1'	7"	Will be backlit line/contour drawing
G-11-007	**4 Color transparency** Portrait of Joseph G. Totten	West Point Museum, West Point, NY Contact: David Meschutt, 914-938-7340	Joseph G. Totten Portrait	4x5" color transp		5 1/2"		4"	
G-11-008.1	**Kodalith Olive Gel #92 & #321** Renaissance sketches of casemated gun designs	From "Design Book Review, The Architect of Humanism" Fall 1994	pg. 35	4x5 b&w transp		7"		7"	See Graphic Elevation for size 2/40, drop out background to line art
G-11-008.2	**Kodalith Olive Gel # 92 & #321** Renaissance sketches of casemated gun designs	From "Design Book Review, The Architect of Humanism" Fall 1994	pg. 35	4x5 b&w transp		6-1/2"		4-1/2"	See Graphic Elevation for size 2/40, drop out background to line art
G-11-008.3	**Kodalith Olive Gel #92 & #321** Renaissance sketches of casemated gun designs	From "Design Book Review, The Architect of Humanism" Fall 1994	pg. 35	4x5 b&w transp		3-1/4"		3-3/4"	See Graphic Elevation for size 2/40, drop out background to line art

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Finish Size Width Ft./In.	Notes
G-11-009	**Kodalith Medium Gray #98** Merging of existing line art drawings of a gun carriage in casemate and of a gun tube into a single image	Exhibit Fabricator		n/a	1-3/4"	9"	See drawing, see resource package
G-11-010	**Kodalith Full Blue #3202** Cameo cropping/detail of Rodmans "in battery"	Exhibit Fabricator, Obtain from NPS-Gateway, Ft. Wadsworth. Contact: Mary Scott (Existing graphic from former Battery Weed Exhibit)		n/a	2 1/4"	8 1/4"	Scale length from graphic elevation, delete background. Line art detail
G-11-012	**Kodalith Full Blue #3202** Custom modification to artwork depicting soldiers loading gun	Exhibit Fabricator		n/a	1' 1"	1' 11"	See drawing, see resource package
G-11-015	**Kodalith Olive Gel #92 & #321** Line art of a lanyard and friction primer	See Bill Brown for copy of book. From *Round Shot and Rammers* illustrated by Peter F. Copeland, Donald W. Holst, Robert L. Klinger; authored by Harold L. Peterson.	pg 106	4x5 b&w transp	3"	11 5/8"	Line art, see resource package
G-11-016	**Kodalith Olive Gel #92 & #321** Illustration of tongs with shell	See Bill Brown for copy of book. From *Round Shot and Rammers* illustrated by Peter F. Copeland, Donald W. Holst, Robert L. Klinger; authored by Harold L. Peterson.	pg 107	4x5 b&w transp	5 1/2"	2 5/8"	See resource package

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-11-017	**Kodalith Olive Gel #92 & #321** Illustration of shell	See Bill Brown for copy of book. From *Round Shot and Rammers* illustrated by Peter F. Copeland, Donald W. Holst, Robert L. Klinger; authored by Harold L. Peterson.		4x5 b&w transp	3-3/4"	3-3/4"	See resource package
G-11-018	**Kodalith Olive Gel #92 & #321** Illustration of a Thumb stall	See Bill Brown for copy of book. From *Round Shot and Rammers* illustrated by Peter F. Copeland, Donald W. Holst, Robert L. Klinger; authored by Harold L. Peterson.	pg 106	4x5 b&w transp	4"	1 7/8"	See resource package
G-11-019	**Kodalith Olive Gel # 92 & #321** Illustration of a Tube Pouch	See Bill Brown for copy of book. From *Round Shot and Rammers* illustrated by Peter F. Copeland, Donald W. Holst, Robert L. Klinger; authored by Harold L. Peterson.	pg 106	4x5 b&w transp	2 3/8"	3 3/4"	See resource package
G-11-020	**Kodalith Amber Gel #321** Illustration (based on existing artwork) of gun drill for a Rodman gun.	Exhibit Fabricator		n/a	1' 7"	13-1/2"	Line art, see drawing
G-11-021	**Color mural print Sepia Quad Tone** Custom photograph digitally retouched of view across Battery Weed's parade ground to casemates in opposite wall for wall mural.	Exhibit Fabricator, See Bill Brown, NPS-HFC		n/a	13' 0"	14' 0"	

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-11-022	**Color Print Custom Photograph, sepia Quad Tone** Custom photograph of cannoneers	Exhibit Fabricator See Bill Brown NPS-HFC		n/a	5' 10"	varies	See resource package
G-11-023	**Color Duratrans with acrylic face** "Views to the Narrows" Graphic at Gun Port Lightbox	Exhibit Fabricator		n/a	2' 3 1/2"	1' 7 1/2"	See drawing 7/21, see resource package

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.		Width Ft./In.		Notes
	[redacted] **12 Guarding the Gates**								
G-12-002	**Silk-screened map** Wall-sized nautical map.	National Archives/ Cartographics, Collegepark, MD Contact: Trevor Plante, 301-713-7030/7040	RG 77 Drw 36 Sht 54a	8x10" b/w transp	11'	9 1/2"	9'	3"	Mural wraps around corner
G-12-003	**4 Color Silkscreen** Painting of New York Harbor, 1870	New York Historical Society, NYC,NY	43041C	4x5" color transp	1'	1 1/2"	3'	18 3/4"	$40 for print, $300 to get transparency made. Bleed on three edges
G-12-004	**Color print** Line art map of New York Harbor with forts and their fields of fire	Exhibit Fabricator		n/a	4'	2"	3'	9 1/2"	See resource package
G-12-008	**Line art, PMS 390C** Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13 Line art used to indicate 1st System forts and their time period.	Graphic/ Drawing Packages See Howard-Revis Design for original art, 202-452-1923		Print is on drawing		2" dia		2" dia	2" Diam. in Exhibit 12, 3 1/2" Diam. in Exhibit 13. Ft. Gibson receives this symbol in EX 13
G-12-009	**Line art, PMS 271C** Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13 Line art used to indicate 2nd System forts and their time period.	Graphic/ Drawing Packages See Howard-Revis Design for original art, 202-452-1923		print is on drawing		2" dia		2" dia	2" Diam. in Exhibit 12; 3 1/2" Diam. in Exhibit 13. In EX 13, Fts. Lafayette, Columbus, Wood and Castles Clinton & Williams receive this sysmbol.

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-12-010	**Line art, PMS 130C** Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13 Line art used to indicate 3rd System forts and their time period.	Graphic/ Drawing Packages See Howard-Revis Design for original art, 202-452-1923		print is on drawing	2" dia	2" dia	2" Diam. in Exhibit 12; 3 1/2" Diam. in Exhibit 13. In EX 13, FTS. Hamiliton,Totten, Schuyler, Tompkins and Richmond receive this symbol.
G-12-011	**Line art, PMS 3258C** Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13 Line art used to indicate Endicott Era forts and their time period.	Graphic/ Drawing Packages See Howard-Revis Design for original art, 202-452-1923		print is on drawing	2" dia	2" dia	2" Diam. in Exhibit 12; 3 1/2" Diam. in Exhibit 13. In EX 13 Forts Hancock and Battery Duane receive this symbol
G-12-012	**Line art, PMS 1785C** Part of G-12-004 color print at Exhibit 12, silkscreen with vinyl inks at Exhibit 13 Line art used to indicate Twentieth Century fortifications and their time period.	Graphic/ Drawing Packages See Howard-Revis Design for original art, 202-452-1923		print is on drawing	2" dia	2"dia	2" Diam in Exhibit 12; 3 1/2" Diam. in Exhibit 13. Navesink & Ft. Tilden receive this symbol in EX 13

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
	[redacted] 13 New York Harbor Map & Fort Models						
G-13-005	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Hancock/ Battery Potter	Exhibit Fabricator		n/a	3-3/4"	5-1/4"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-007	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Navesink/ Battery Lewis	Exhibit Fabricator		n/a	4-1/2"	1' 4"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-009	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Tilden/ Battery Harris	Exhibit Fabricator		n/a	4-3/4"	1' 4"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-011	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Hamilton	Exhibit Fabricator		n/a	4-1/4"	5-1/2"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-013	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Lafayette	Exhibit Fabricator		n/a	4-1/4"	4-1/2"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-015	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Columbus	Exhibit Fabricator		n/a	4-1/2"	4-1/2"	Rendered in 3 line weights and simple solid shaped. See Package.

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-13-017	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Castle Williams	Exhibit Fabricator		n/a	3-3/4"	3-1/4"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-019	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Totten	Exhibit Fabricator		n/a	4-1/4"	4-3/4"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-021	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Schuyler	Exhibit Fabricator		n/a	4-1/4"	5"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-023	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Castle Clinton	Exhibit Fabricator		n/a	7"	3-3/4"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-025	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Gibson	Exhibit Fabricator		n/a	4"	3-1/2"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-027	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Wood	Exhibit Fabricator		n/a	5"	5"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-029	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Wadsworth/ Fort Tompkins	Exhibit Fabricator		n/a	3"	6-3/4"	Rendered in 3 line weights and simple solid shaped. See Package.

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-13-031	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Wadsworth/ Battery Duane	Exhibit Fabricator		n/a	4"	11"	Rendered in 3 line weights and simple solid shaped. See Package.
G-13-032	**Silkscreen Vinyl ink Line art, PMS 8420** Illustration of Fort Wadsworth/ Fort Richmond	Exhibit Fabricator		n/a	3-1/4"	10"	Rendered in 3 line weights and simple solid shaped. See Package.

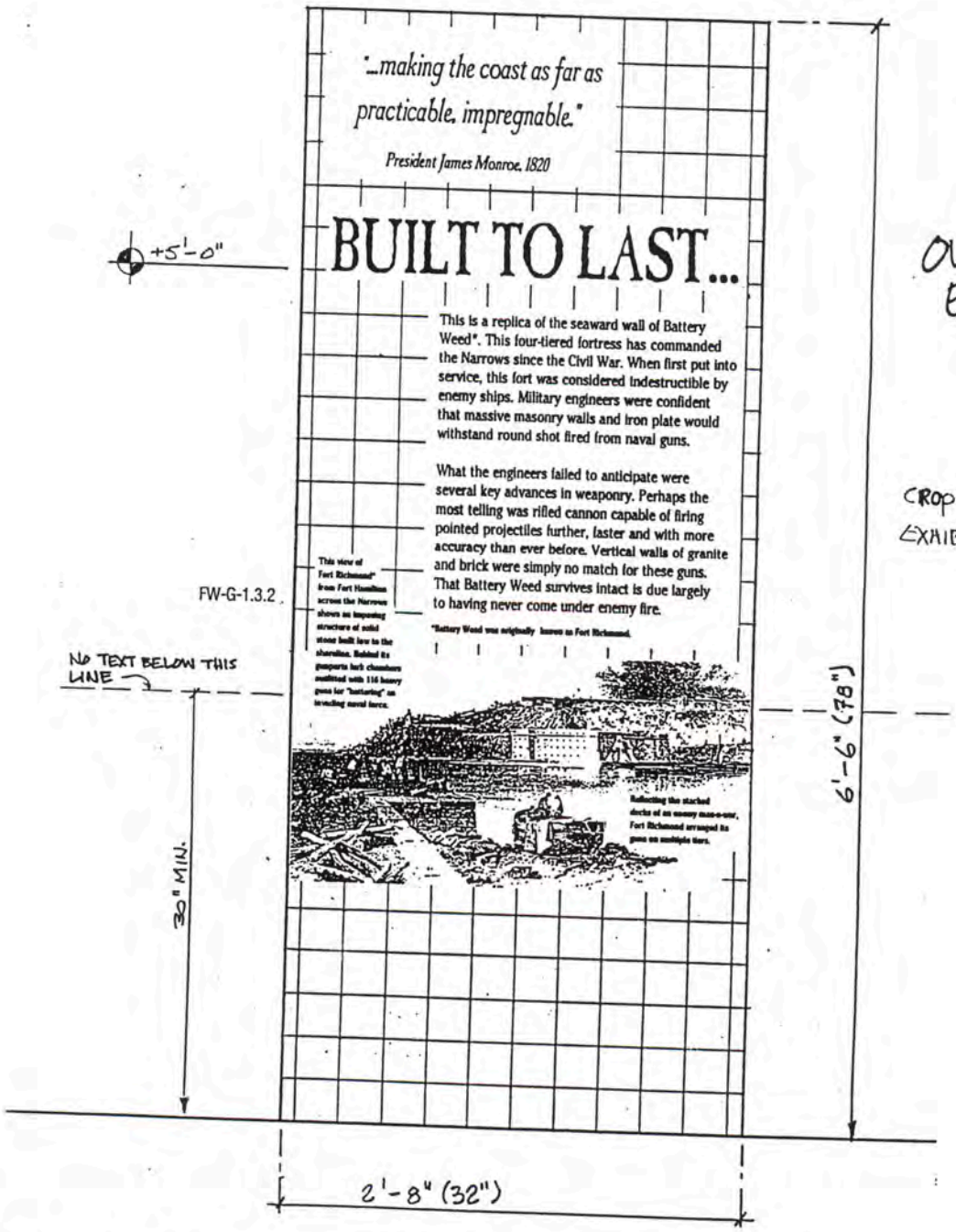
Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
	14 Measures and Counter Measures						
G-14-002	**Color print** Custom illustrated map of NY population and forts, circa 1807	Exhibit Fabricator		n/a	8"	7-1/2"	See Drawing, See Resource Package
G-14-003	**Color Print** Custom illustrated map of NY population and forts, circa 1816	Exhibit Fabricator		n/a	8"	7-1/2"	See Drawing, See Resource Package
G-14-004	**Color Print** Custom illustrated map of NY population and forts, circa 1865	Exhibit Fabricator		n/a	8"	7-1/2"	See Drawing, See Resource Package
G-14-005	**Color Print** Custom illustrated map of NY population and forts, circa 1910	Exhibit Fabricator		n/a	8"	7-1/2"	See Drawing, See Resource Package
G-14-006	**Color Print** Custom illustrated map showing how many fort sites have been converted to Parks, Beaches, Historic Sites and Recreation Areas, as of 1994.	Exhibit Fabricator		n/a	8"	7-1/2"	See Drawing, See Resource Package

Ex ID No.	Description	Source	Neg. No.	GOV Repro Furnished	Finish Size Height Ft./In.	Width Ft./In.	Notes
G-14-007	**Color Print** Custom illustration depicting in profile/silhouette the attacking vessels and corresponding batteries—"the measures and countermeasures".	Exhibit Fabricator		n/a	3' 10-1/2"	9' 9"	With white airbrush glow behind silhouettes See Drawing, See Resource Package

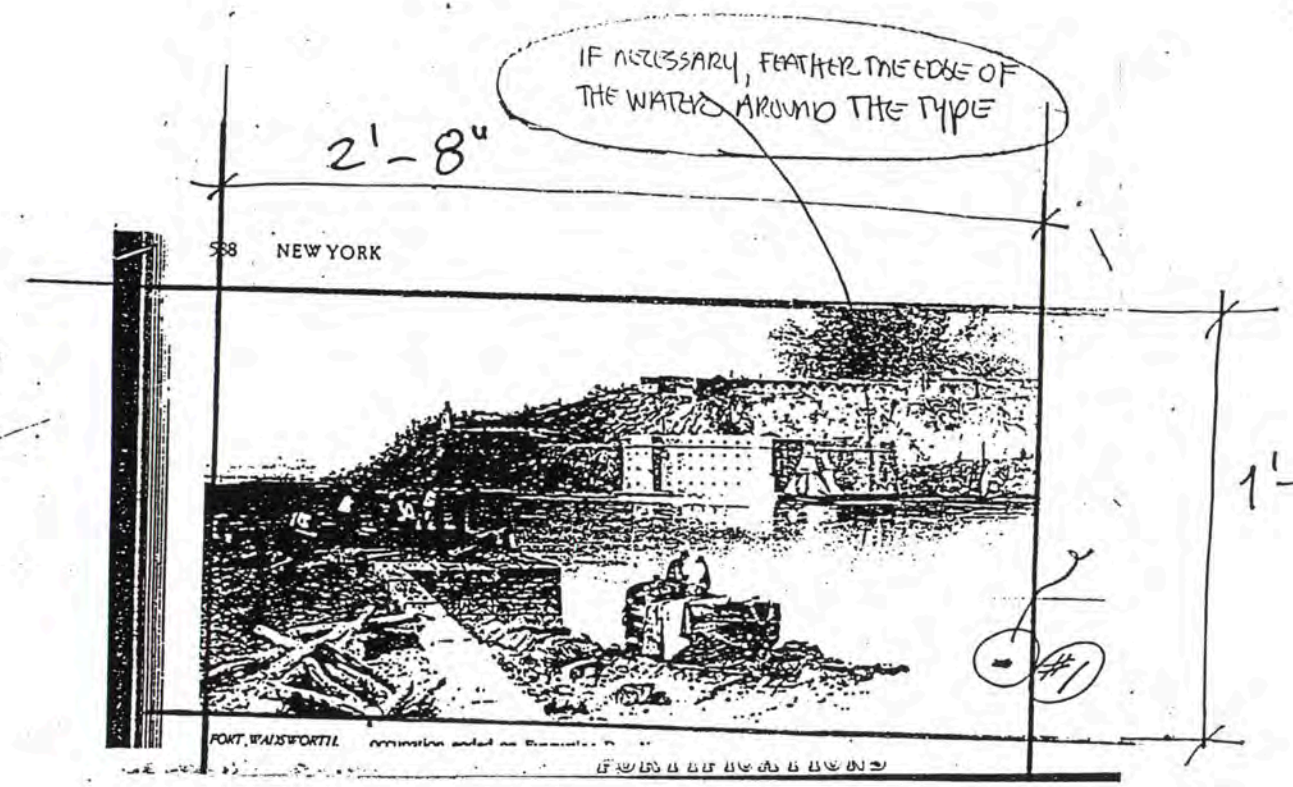
Total graphics this report: 126

Graphics Facsimiles

EXHIBIT 01
CROP GUIDE



ELEVATION - INTRO MANHATTAN [illegible]

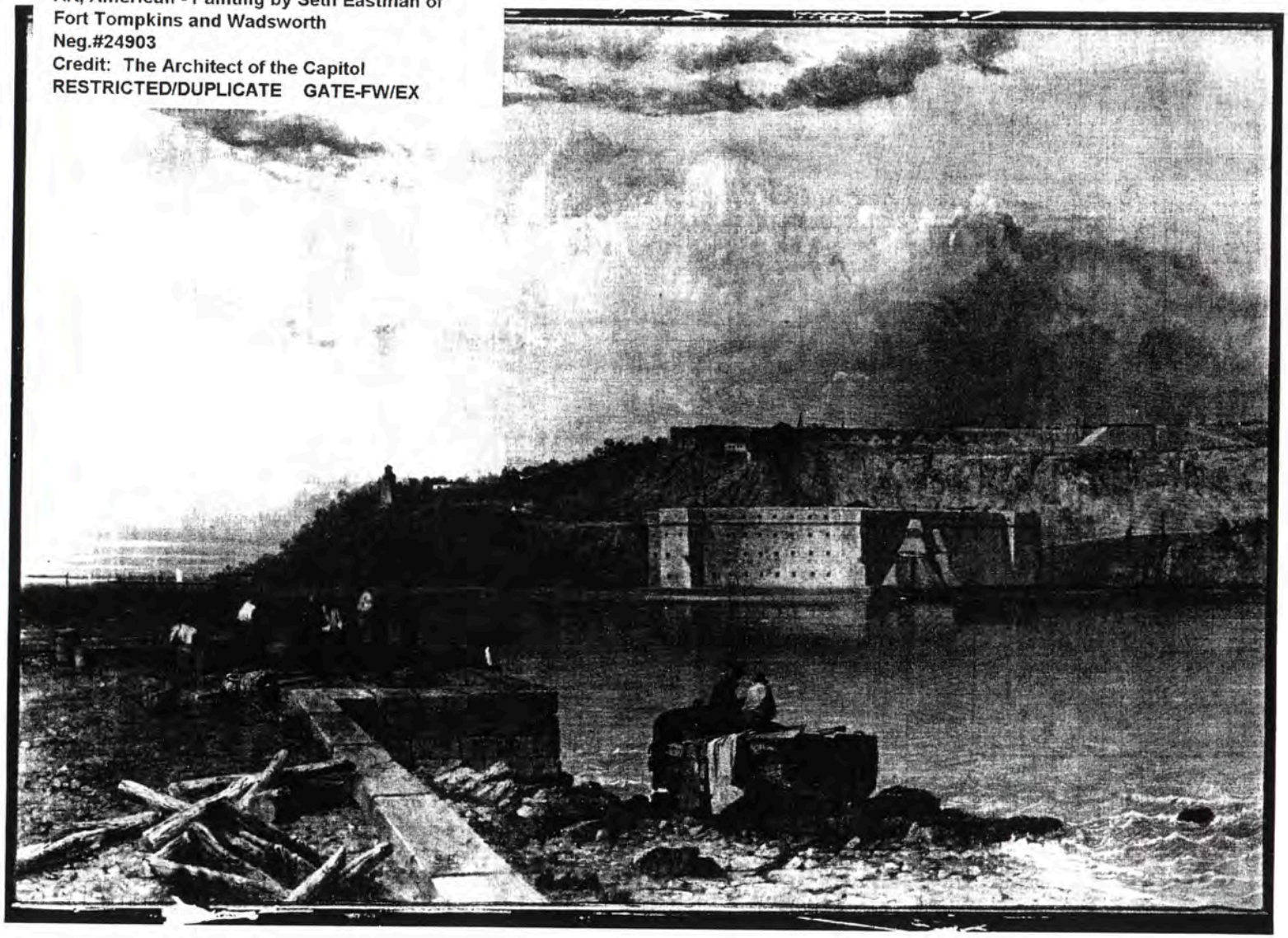


G-01-004

1'-4½" X 2'8"

G-01-004

G-01-004
Art, American - Painting by Seth Eastman of
Fort Tompkins and Wadsworth
Neg.#24903
Credit: The Architect of the Capitol
RESTRICTED/DUPLICATE GATE-FW/EX



G-01-004

EXHIBIT #1

~~6-01-0055~~

TOTTEN'S CONTRIBUTION

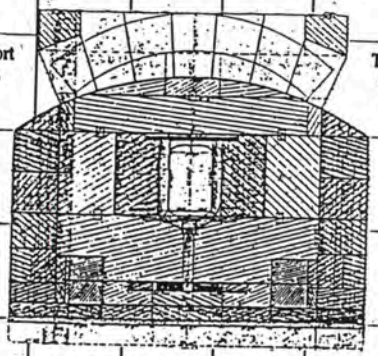
Architect of the Fort

Joseph G. Totten, an 1805 graduate of West Point, designed Fort Richmond*. Like most West Pointers of his day, he admired the defensive innovations devised by French military engineers. Totten concentrated his efforts on perfecting a vital part of coastal fortification - the gunport.

American Export

Called an embrasure, Totten's oval, cast-iron frame, when coupled with a gunmount of his design, allowed a gun crew to sweep a far wider field, from behind a far smaller opening than ever before. The greater protection afforded the crew meant that Totten's innovation soon adopted for coastal defense in Europe.

*Battery Wood was once known as Fort Richmond



Totten Shutters

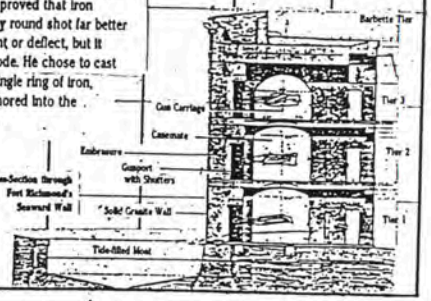
Another of Totten's inventions was the pair of thick iron shutters inserted in each of Fort Richmond's gunports. Artillery crews could fling these open to fire and slam them shut to reload, shielding themselves from enemy sharpshooters.

Iron Beats Stone

Totten subjected many materials to a thorough pounding by artillery. He proved that iron withstood a hammering by round shot far better than stone. Iron might dent or deflect, but it would not shatter or explode. He chose to cast his oval embrasure as a single ring of iron, complete with straps anchored into the surrounding granite walls.

The Totten System

So strong was Totten's influence on the design of multi-tiered, masonry fortifications, that American forts of this type are sometimes known as the Totten System. Seven foot thick, solid stone walls, a full complement of heavy artillery and, in the case of Fort Richmond, a surrounding moat filled at every high tide, won this collection of forts another name- the Permanent System - as if to proclaim they could never be rendered obsolete.



BETTER IDEAS

1'-9" (21")

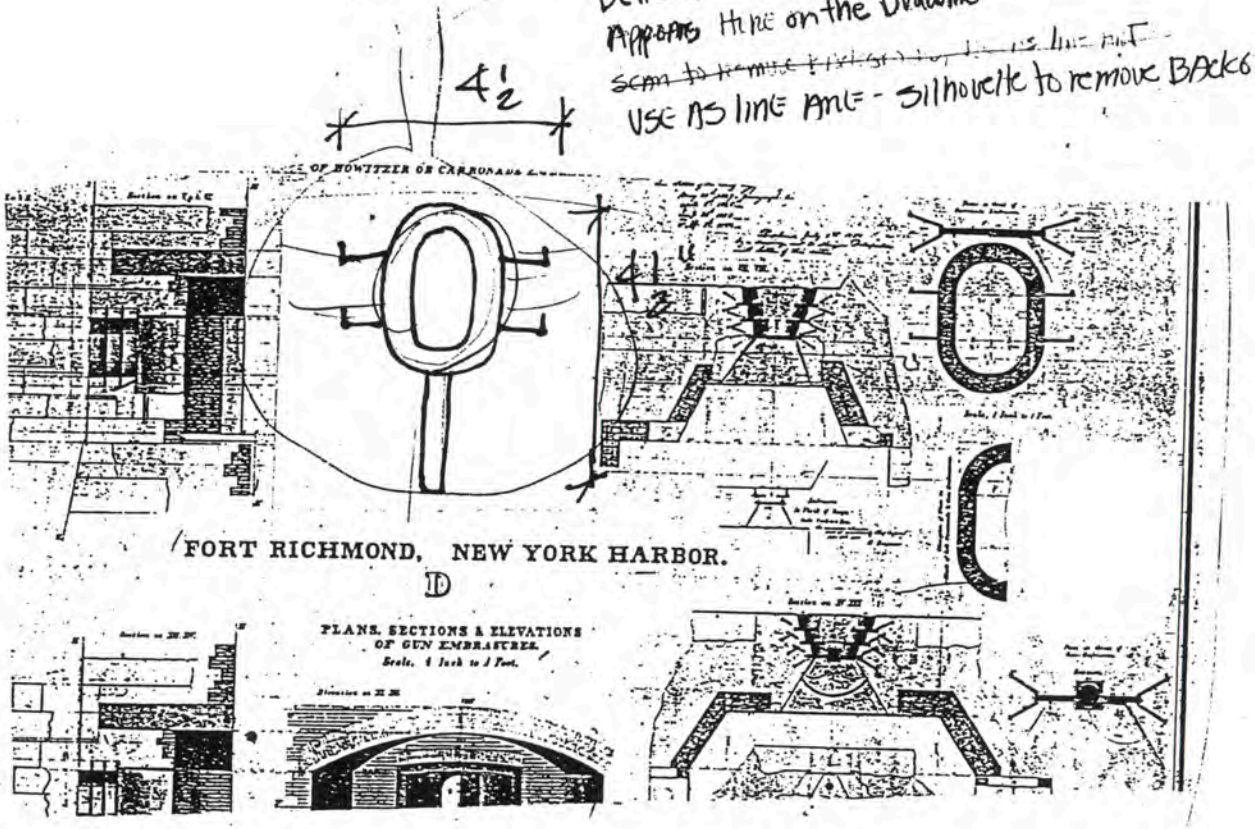
3'-6" (42")

PLAN - 'TOTTEN EMBRASURE' - PLINTHED PANEL

SCALE: 3" = 1'-0"

G-01-007 5"x 5"

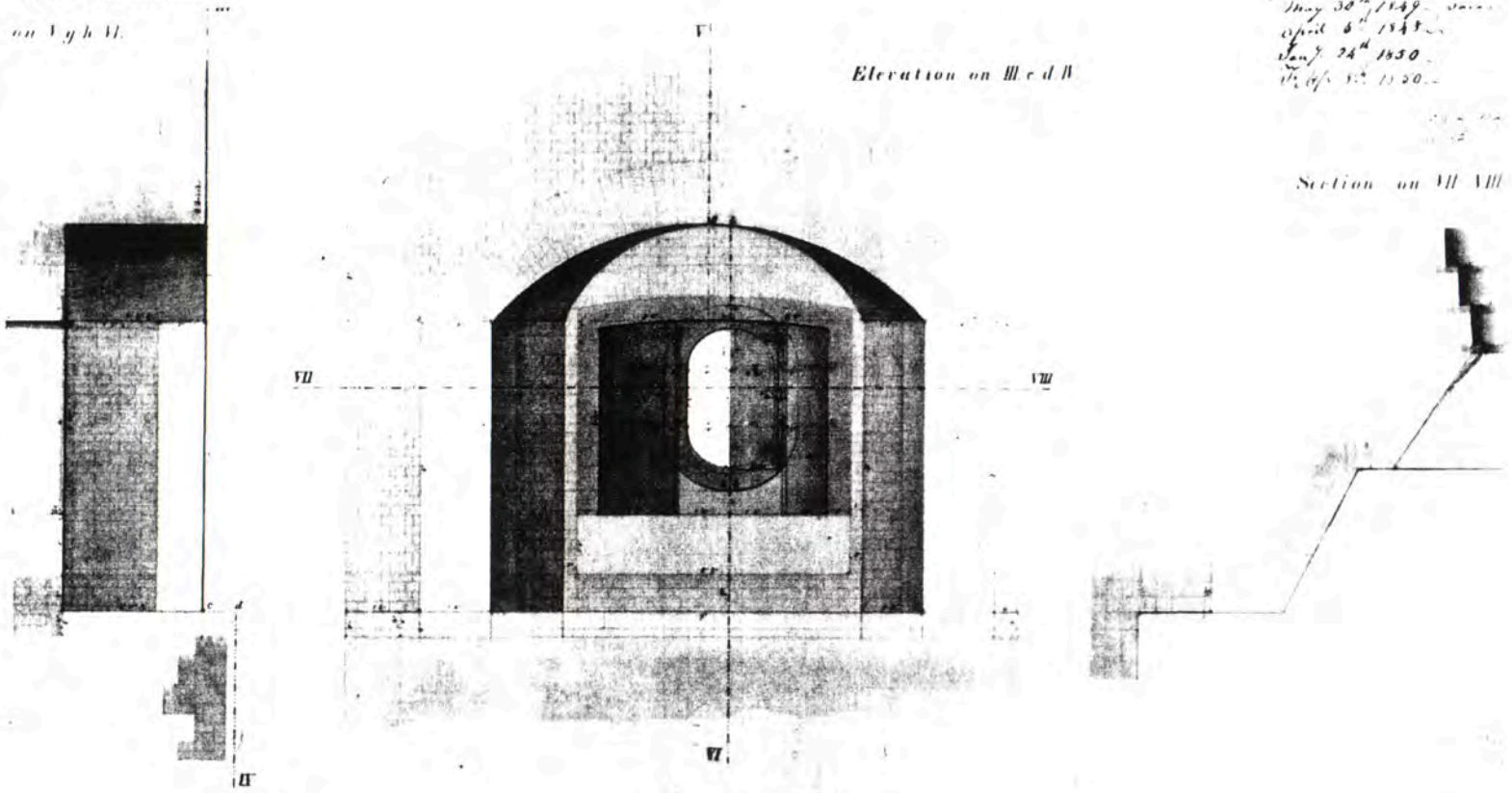
Detail of Embrasure
Appears Here on the Drawing
~~Seam to remove [illegible] line~~
Use as line art - silhouette to remove background



G-01-007

G-01-007
Fort Richmond (Wadsworth), NY Harbor - Plans and Sections and elevations of Howitzer and carbonade and embrasure
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 43, Sht. 20
GATE-Fort Wadsworth/EX 10/95

SECTIONS & ELEVATIONS
ZER OR CARRONADE EMBRASURE.

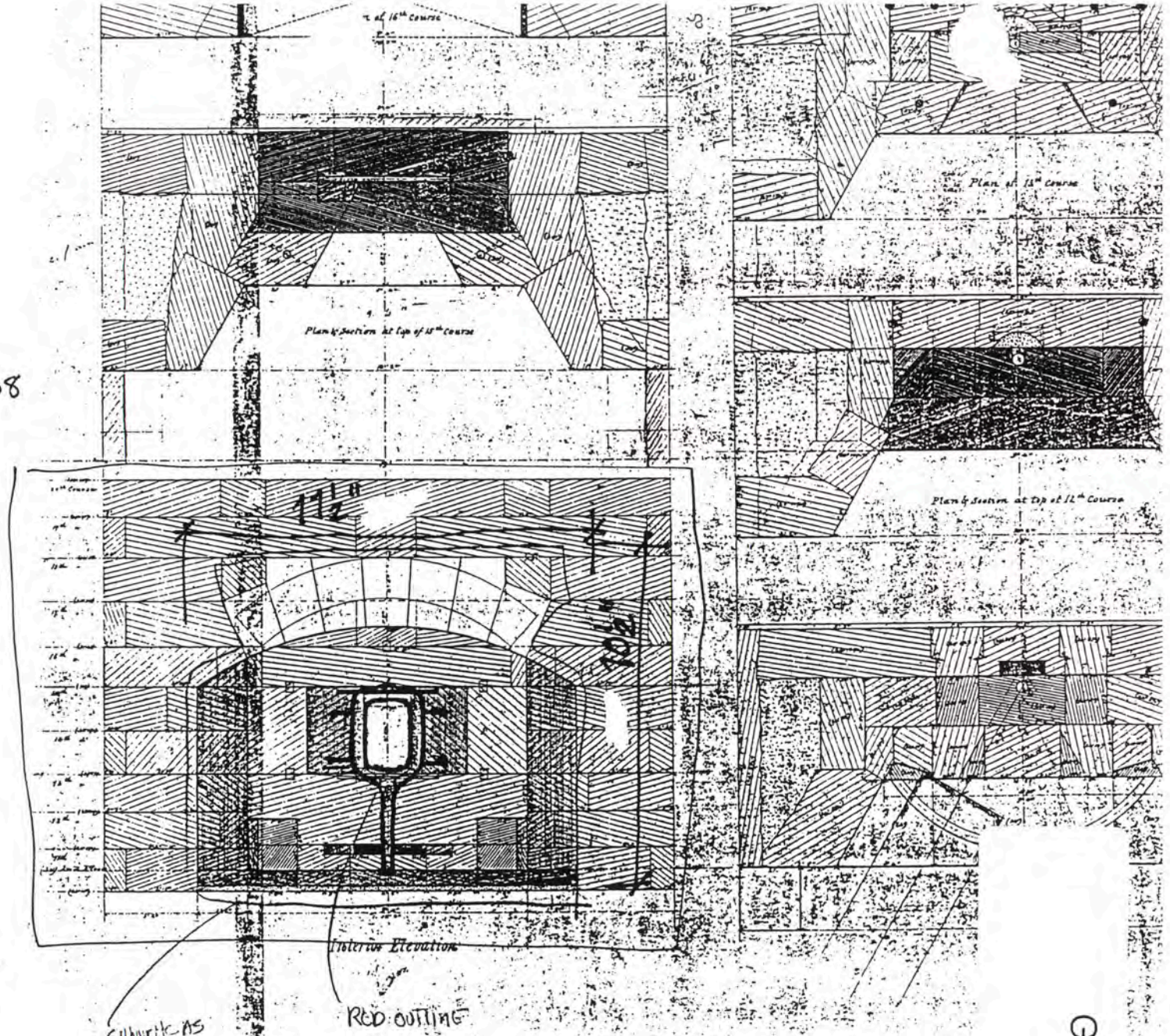


FORT RICHMOND, NEW YORK HARBOR.

D

G-01-007

G-01-008



SILHOUETTE AS SEEN ON DRAWING

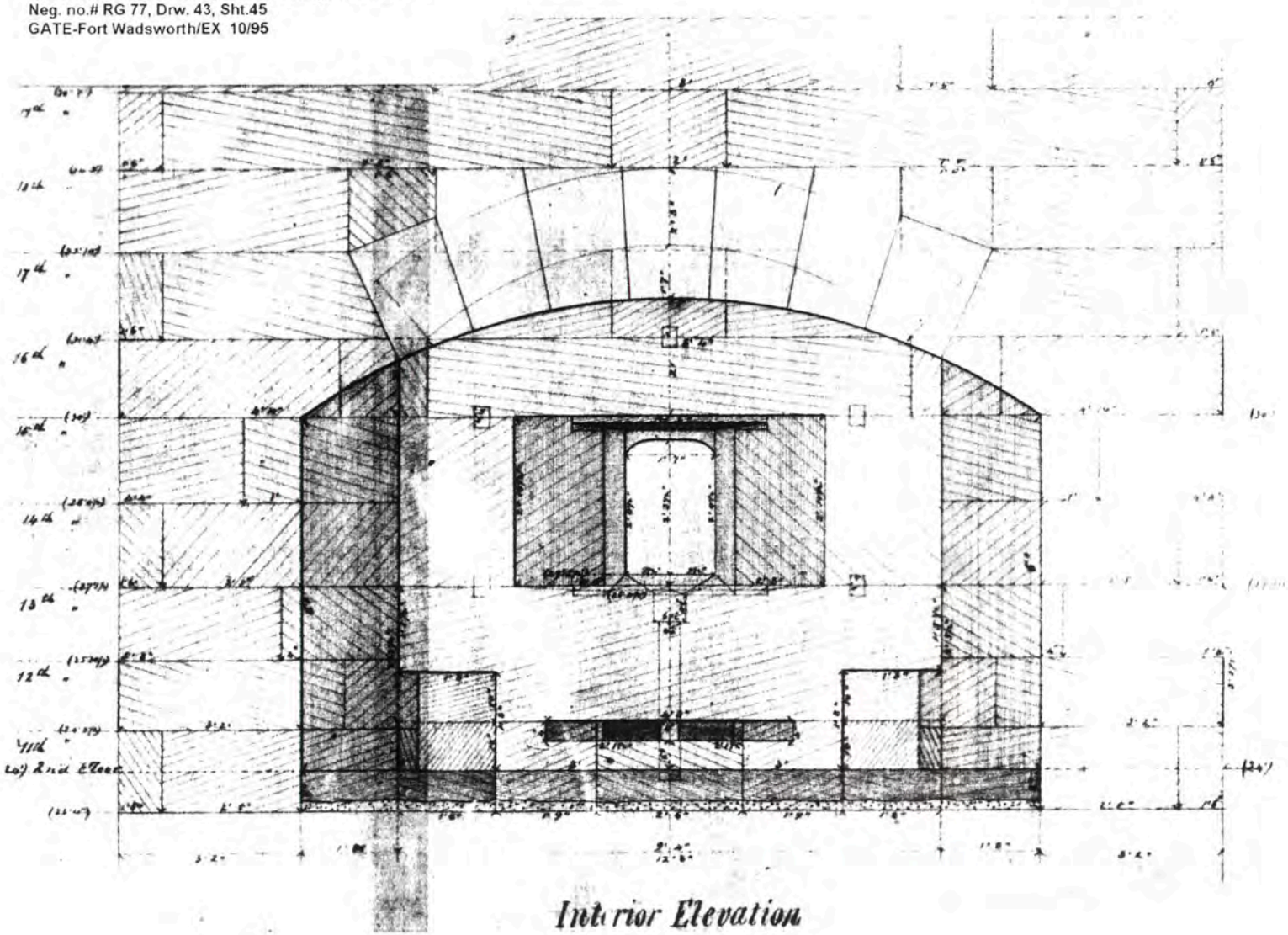
SILHOUETTE

RED OUTLINE

CREATE RED OUTLINE OF EMBRASURE (6pt rule)
HIGHLIGHT PROFILE OF EMBRASURE AS

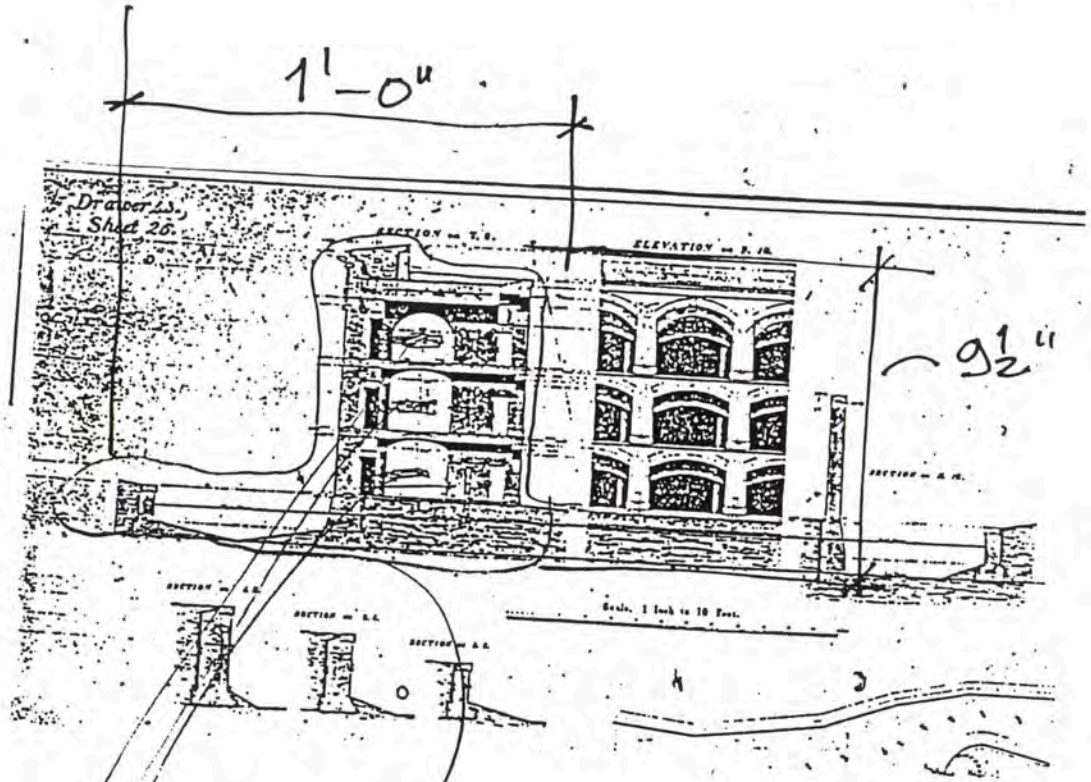
G-01-008

G-01-008
Fort Wadsworth - Interior elevation of casemate
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 43, Sht.45
GATE-Fort Wadsworth/EX 10/95



Interior Elevation

G-01-008



G-01-012

SCAN AS LINE ART, REMOVE BACKGROUND

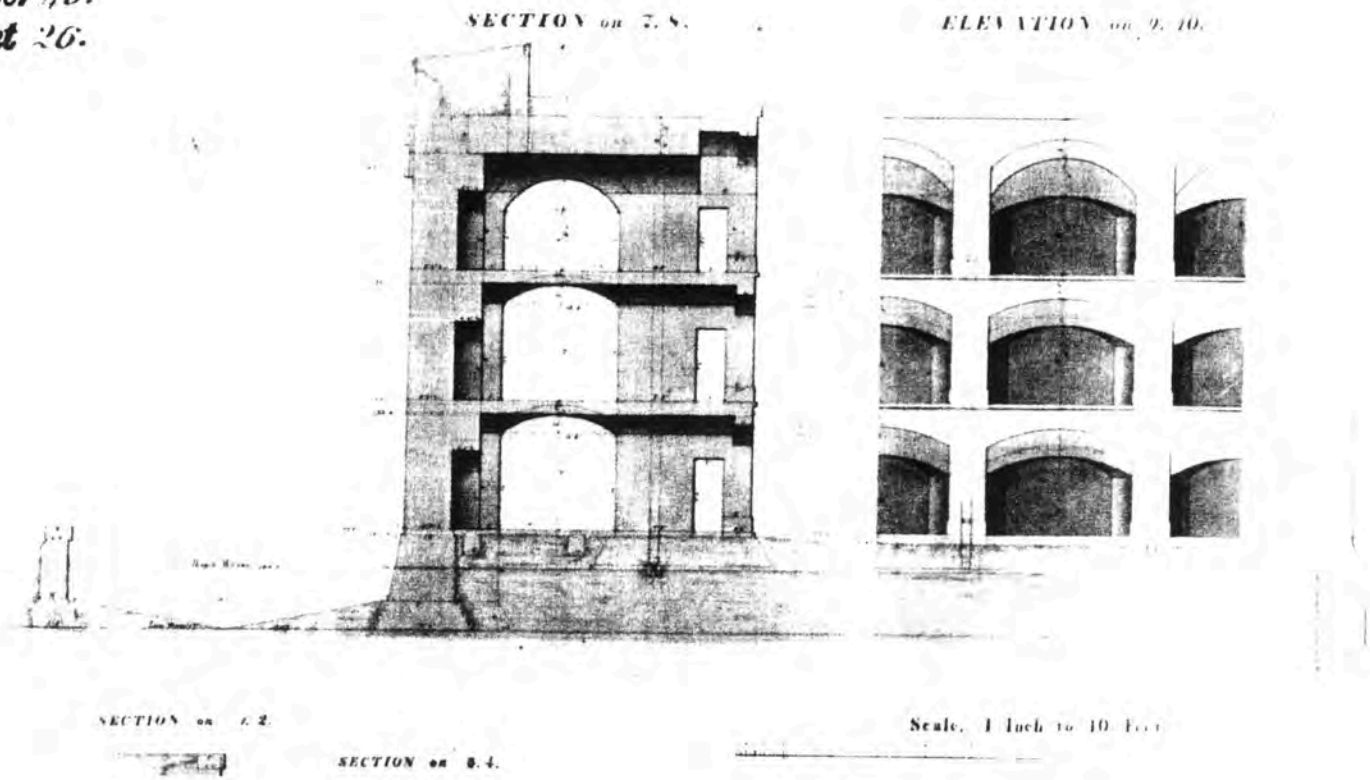
ADD line Drawings of Rodman Gun From Resource pinning

ADD RODMAN GUNS TO CASEMATE AND PARROTT GUN ON BARBETTE

G-01-012

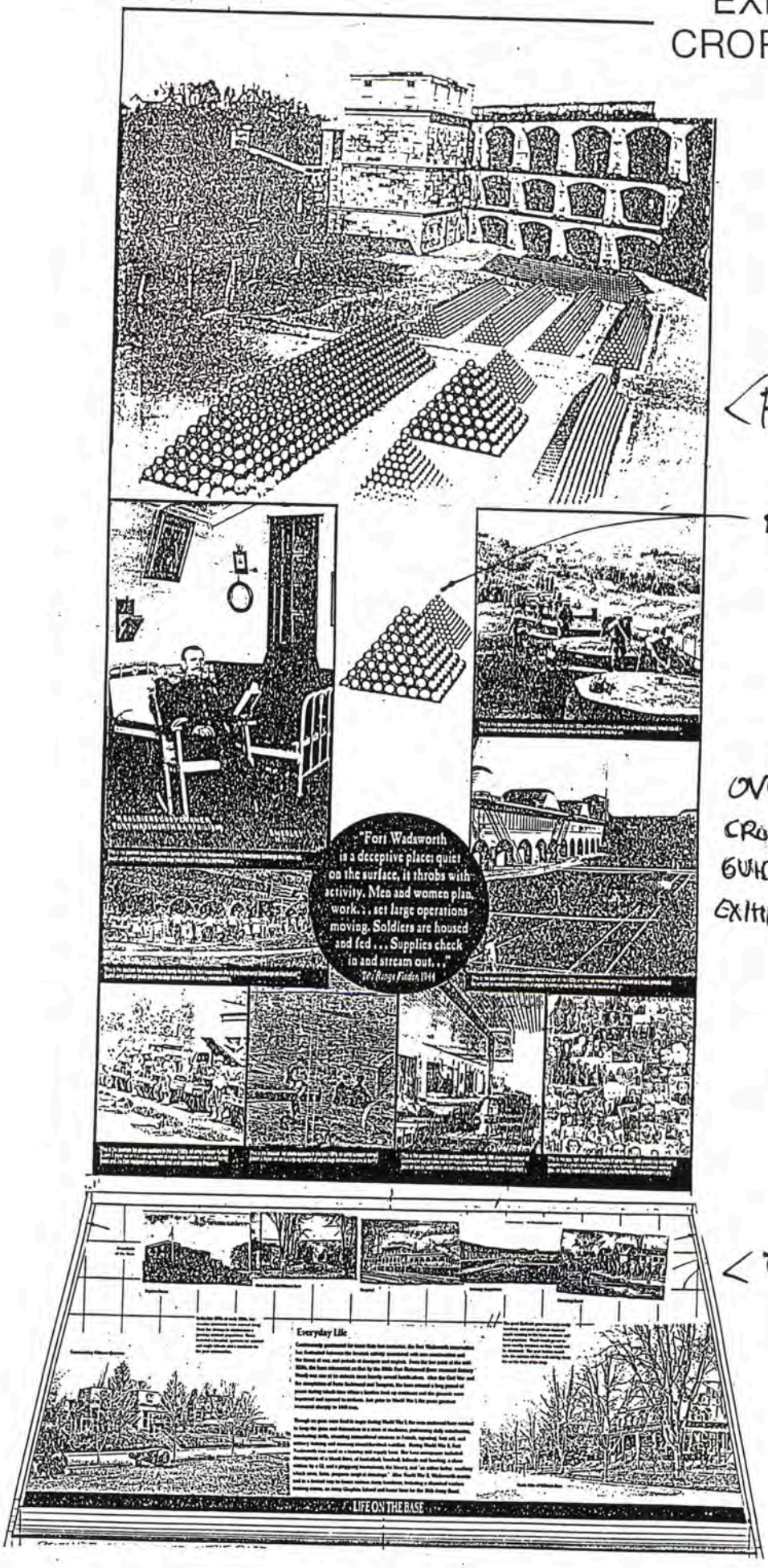
G-01-012
Fort Wadsworth - Existing line art, Cross-section modified by addition of Rodman Gun
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 43, Sht. 26
GATE-Fort Wadsworth/EX 10/95

Drawer 43.
Sheet 26.



G-01-012

EXHIBIT 04
CROP GUIDE



< PANEL

REPEAT SILHOUE

OVERALL EXHIBIT
CROP
GUIDE
EXHIBIT # 4

< TEXTRAIL

G-04-003

COMMANDING OFFICERS QUARTERS (BLDGS #1-#15-ADMIN)
20½"
G-04-003
10½" x 11½" 2/8/1
10½"

G-04-003
Photo of Commanding Officer Quarters on Mont Sec Avenue
Neg.# 92-F-72-5
National Archives, Still Picture Branch, College Park, MD
DUPLICATE GATE-Fort Wadsworth/EX 9/95

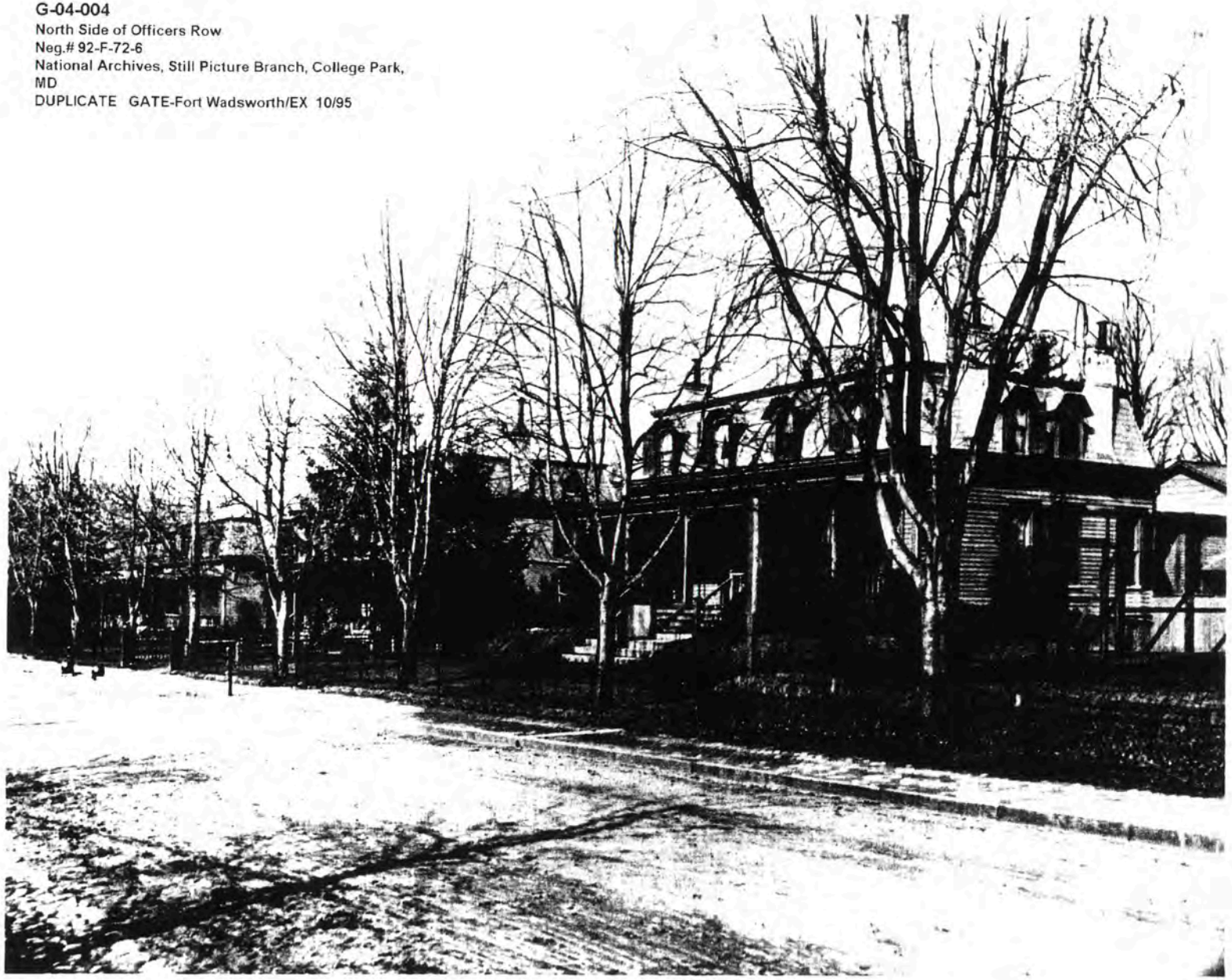


G-04-003

G-04-004

Blend Right Edge
at Bottom
Blend to Edge
Silhouette or Scrim to Drop out Background
20 1/2"
North Side of Officers Row (Houses 4 Street)
G-04-004
1'2" x 1'8 1/2"

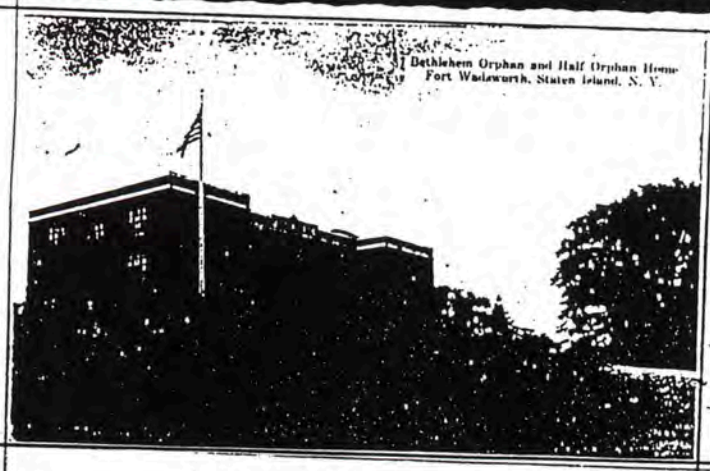
G-04-004
North Side of Officers Row
Neg.# 92-F-72-6
National Archives, Still Picture Branch, College Park, MD
DUPLICATE GATE-Fort Wadsworth/EX 10/95



G-04-004

CROP OFF

5 1/8" TYP.



POSTCARD
1 1-4
(PHOTO IS ORIGINAL)

G-04-005.1

Keep EDGE OF IMAGE

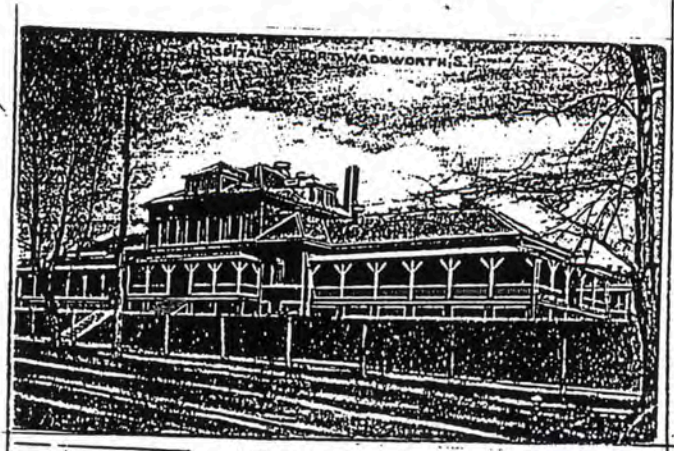
G-04-005.1



S.I.I.A.S
POSTCARD
84.75 32C (OR 321 OR 321)
57hp

G-04-005.4

G-04-005.4 5 1/8" X 8 1/2"



S.I.I.A.S
POSTCARD
84.75 EC
57 hp

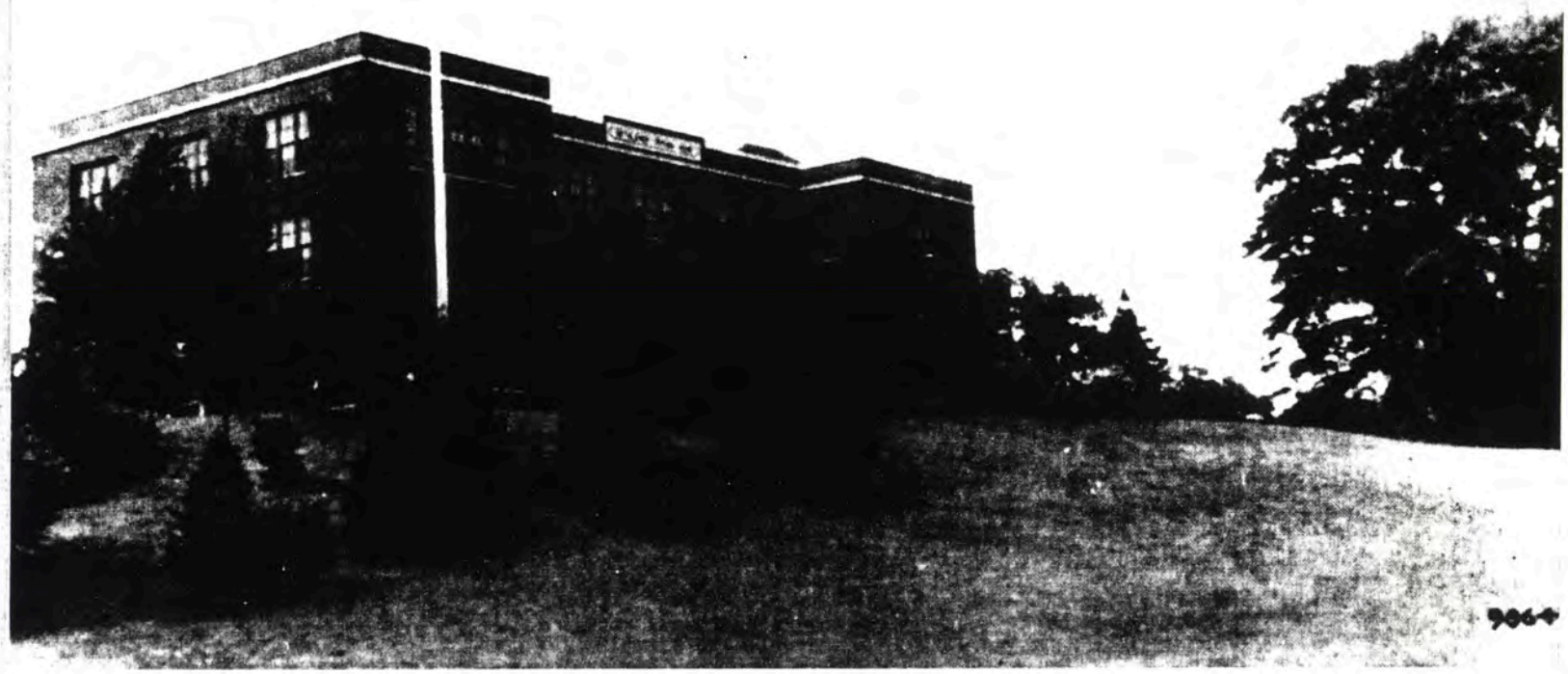
G-04-005.3

USE FULL FRAMING
- KEEP UNEVEN EDGE OF IMAGE
- CROP OFF ANY WHITE POSTCARD BORDER IF IT APPEARS

G-04-005.3 G-04-005.3

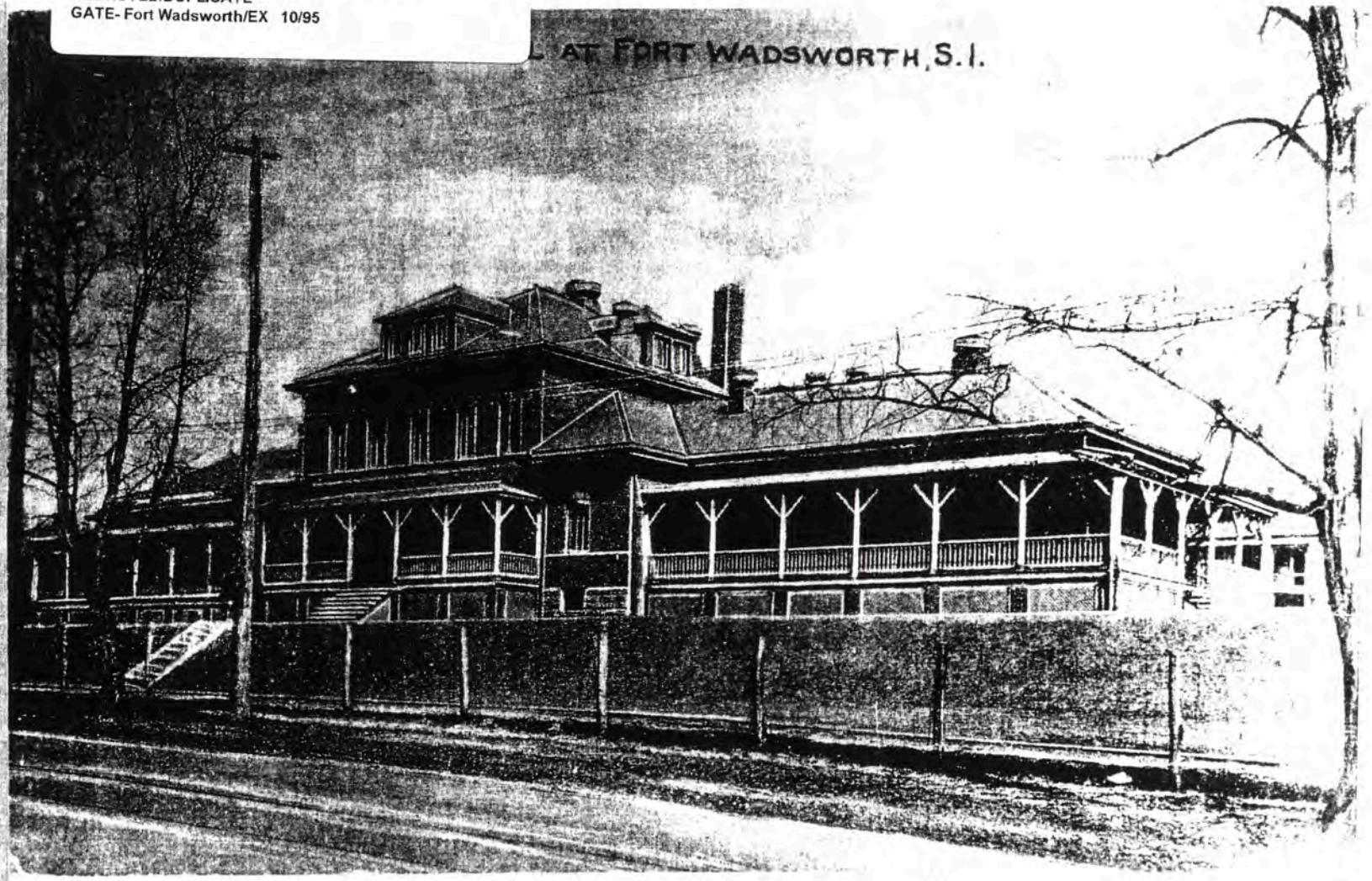
5 1/8" X 8 1/2"

G-04-005.1
Bethlehem Orphan and Half Ophan Home, Fort Wadsworth, Staten Island, NY FL-24 Postcard Collection
Credit: Staten Island Institute for Arts and Sciences
RESTICTED/DUPLICATE
GATE- Fort Wadsworth/EX 10/95



G-04-005.1

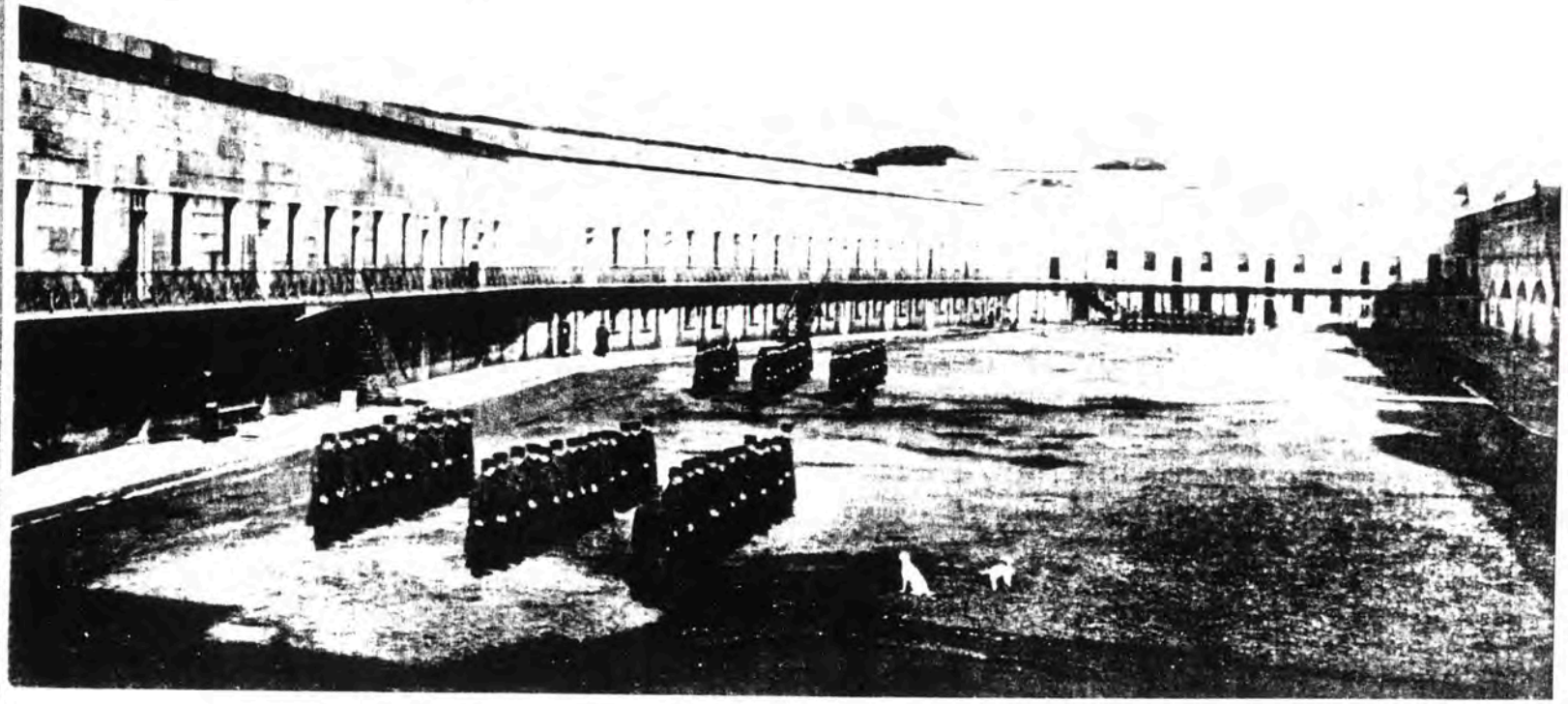
G-04-005.3
U.S. Hospital at Fort Wadsworth, Staten Island, New York 84.75 806 57HP Postcard Collection
Credit: Staten Island Institute for Arts and Sciences
RESTICTED/DUPLICATE
GATE- Fort Wadsworth/EX 10/95



G-04-005.3

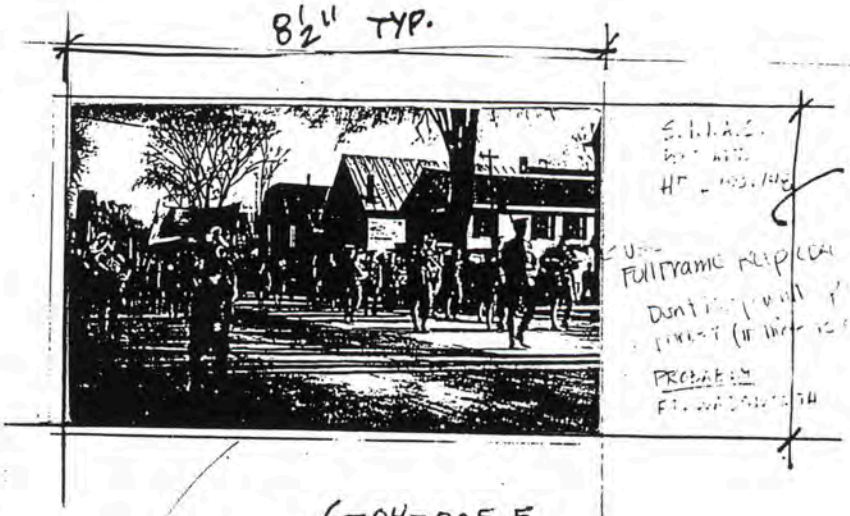
G-04-005.4
Infantry Inspection, Fort Wadsworth, Staten Island,
New York 84.75 332 (or 331 or 321) 57HP
Credit: Staten Island Institute for Arts and Sciences
RESTICTED/DUPLICATE
GATE- Fort Wadsworth/EX 10/95

Infantry Inspection. Fort Wadsworth, S. I.



G-04-005.4

G-04-005.5



G-04-005.5

G-04-005.2

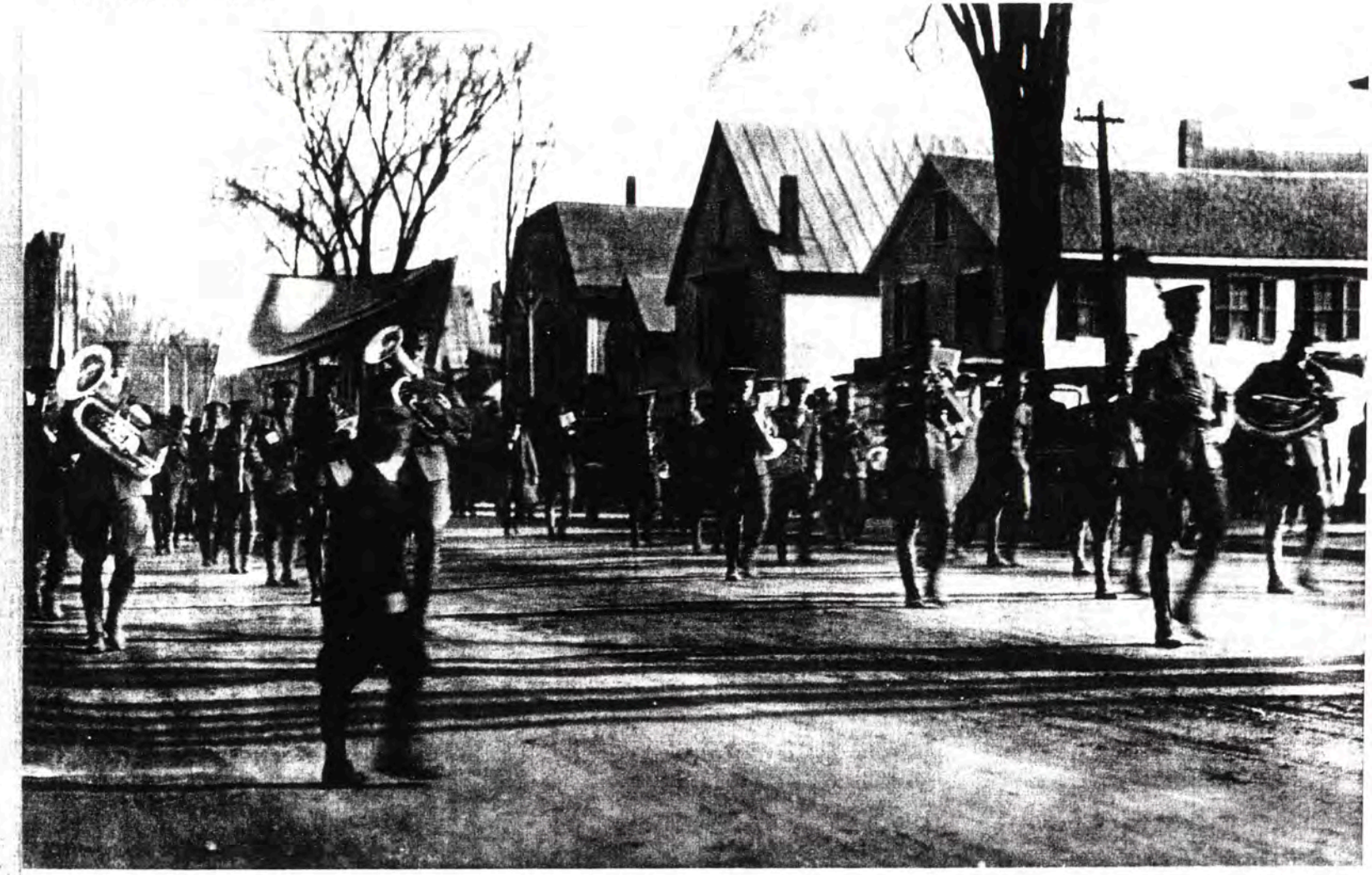


#1

G-04-005.2
5⅛" x 8½"

USE FULL FRAME
- KEEP UNEVEN POSTCARD EDGE (OF IMAGE)
- CROP OFF WHITE POSTCARD EDGE (BORDER) IF THERE IS ONE

G-04-005.2
Fort Wadsworth Marching Band - HP-L190.148 Postcard Collection.
Credit: Staten Island Institute for Arts and Sciences
RESTRICTED/DUPLICATE
GATE-Fort Wadsworth/EX



G-04-005.2

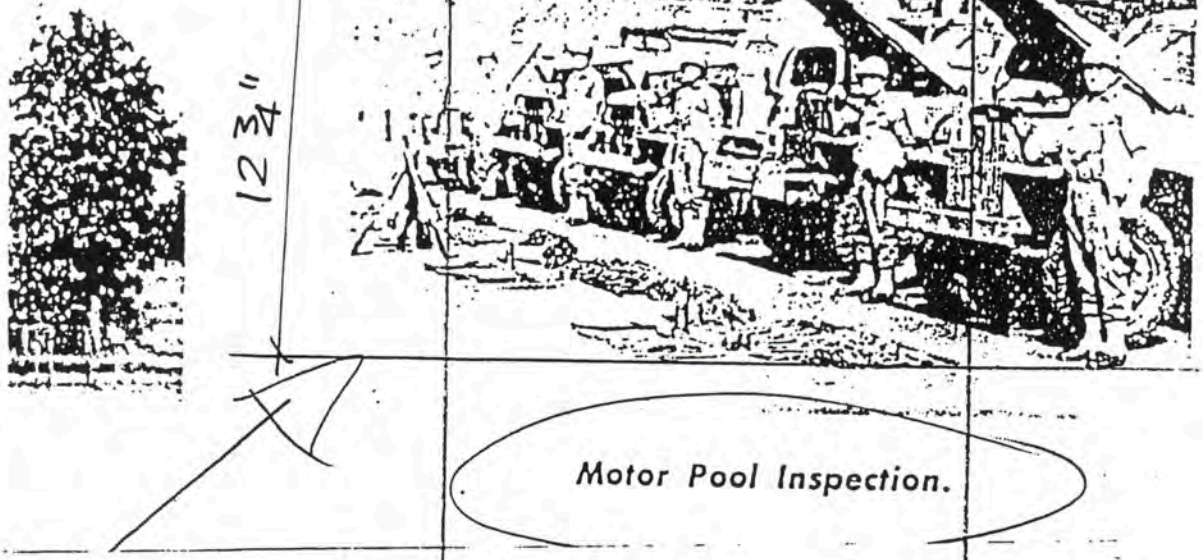
G-04-005.5
Main Gate and Officers' Row, Fort Wadsworth, N.Y.
84.75-333 57HP
Credit: Staten Island Institute for Arts and Sciences
RESTICTED/DUPLICATE
GATE- Fort Wadsworth/EX 10/95



G-04-005.5

G-04-007

ar fields.



11½"

12 3/4"

Motor Pool Inspection.

G-04-007

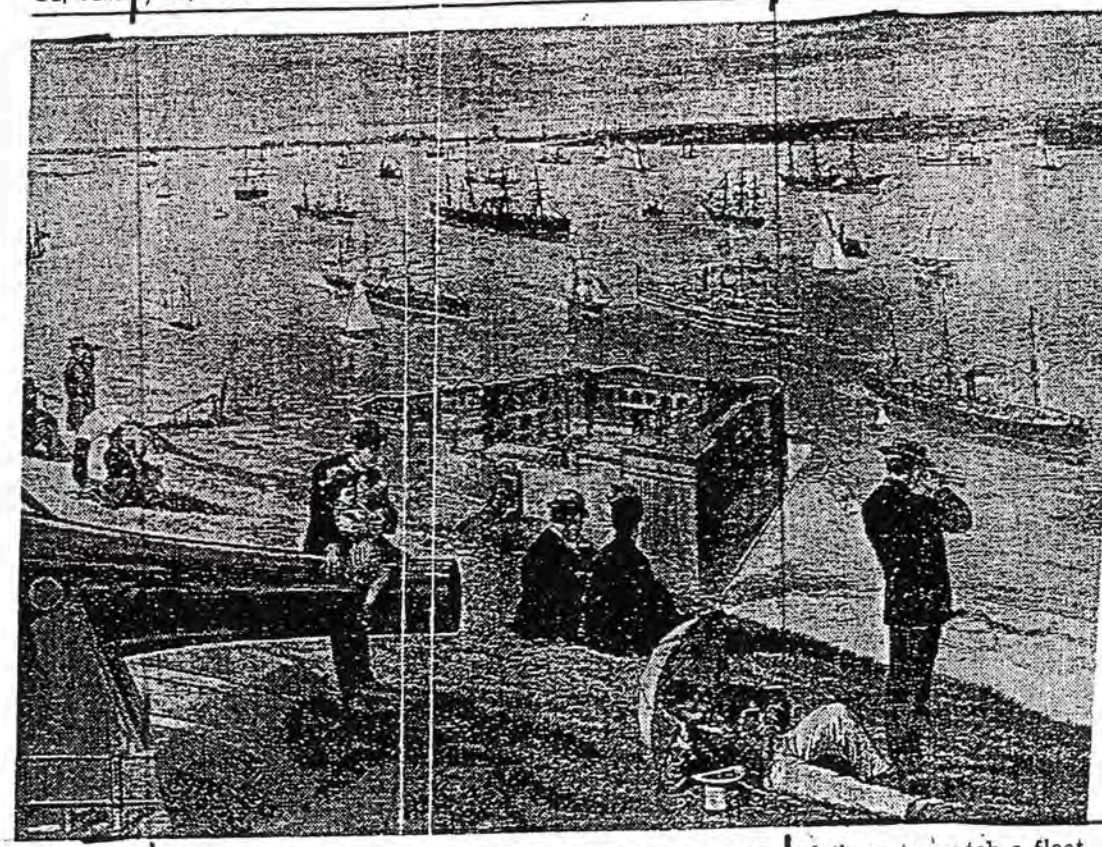
12¾" x 11½"

#4

TRANSPORTATION G-04-007
Motor pool inspection
From: Ranger Finder, Holiday
Issue, 1944, Fort Wadsworth
No negative number
GATE/EX 10/95

11½"

CE, January 25, 1970



12¾"

G-04-008
12¾" x 11½"

orth was at the height of its glory in the 1870s when Islanders gathered there to watch a fleet
eamers putting out to sea. Battery Weed, at the water's edge, was reached via a drawbric

G-04-008

G-04-009

Figure 3.80 EXHIBIT B: Life on the Base TRACING NO 1139

G-04-009
12 3/4" x 11 1/2"

Figure 3.81 Infantry Barracks @ Fort Wood, NY 1891-1895

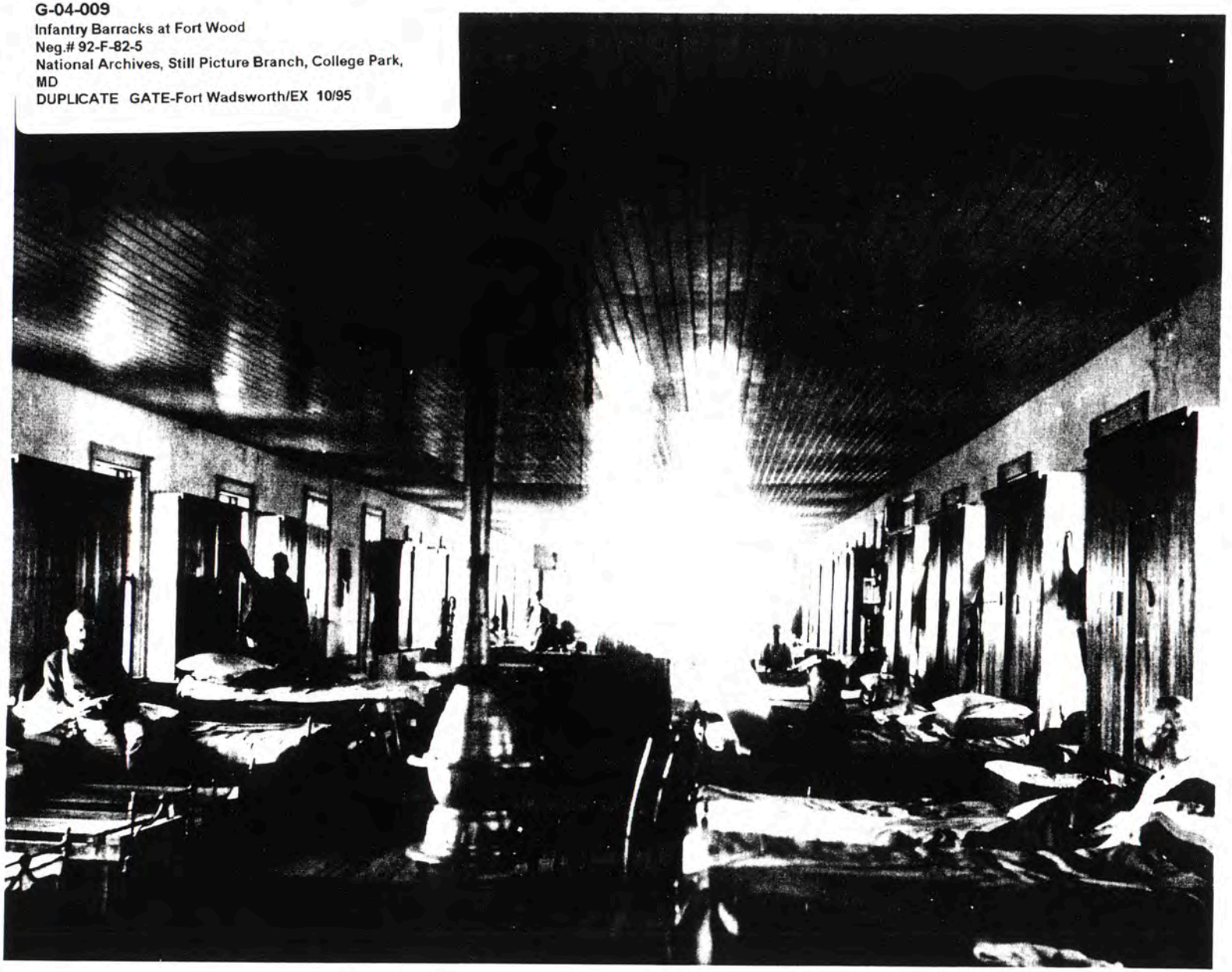
11 1/2"

12 3/4"

PV1196

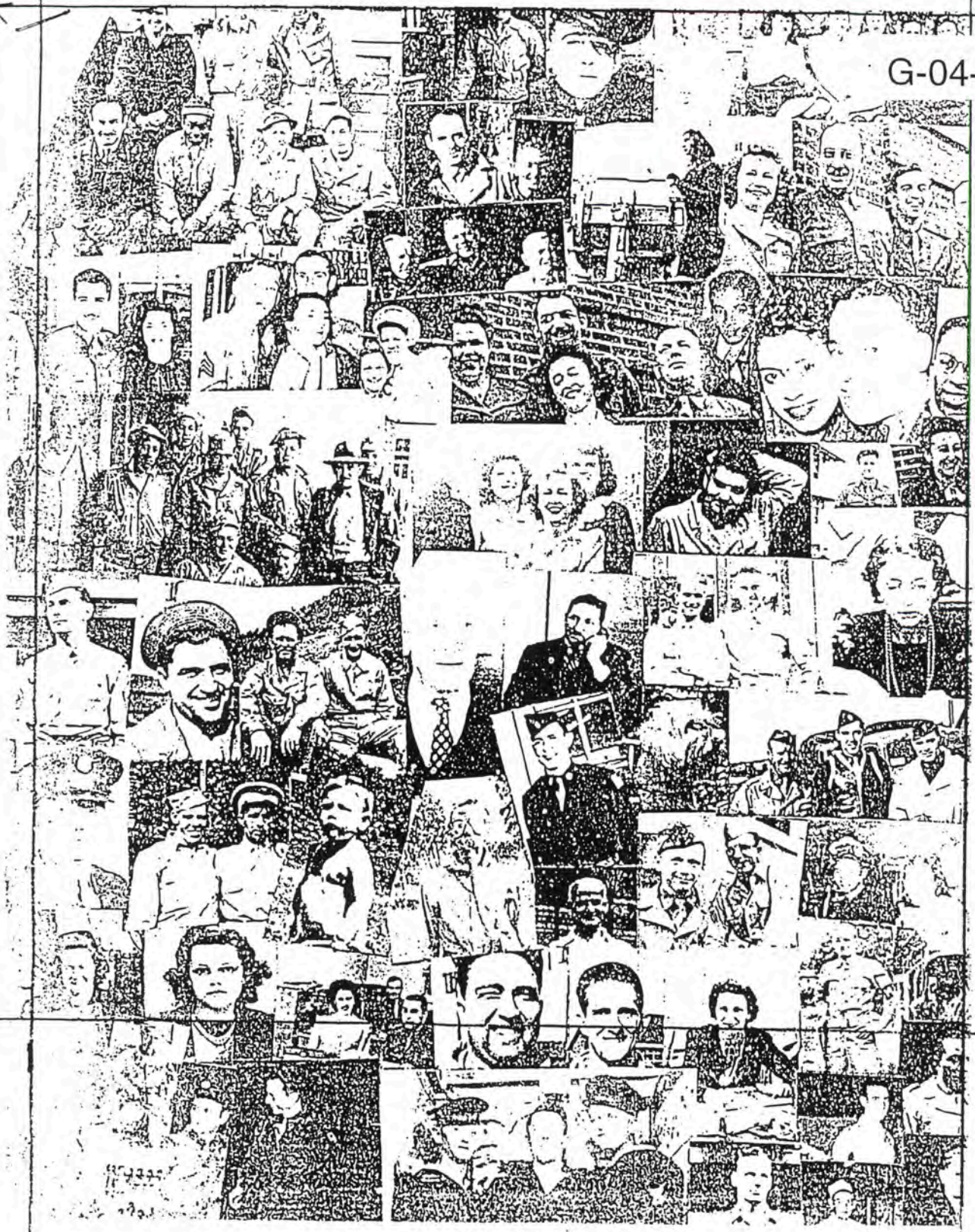
K&M Division
Torrance, CA 90503

G-04-009
Infantry Barracks at Fort Wood
Neg.# 92-F-82-5
National Archives, Still Picture Branch, College Park, MD
DUPLICATE GATE-Fort Wadsworth/EX 10/95



G-04-009

G-04-010



12 3/4"

#

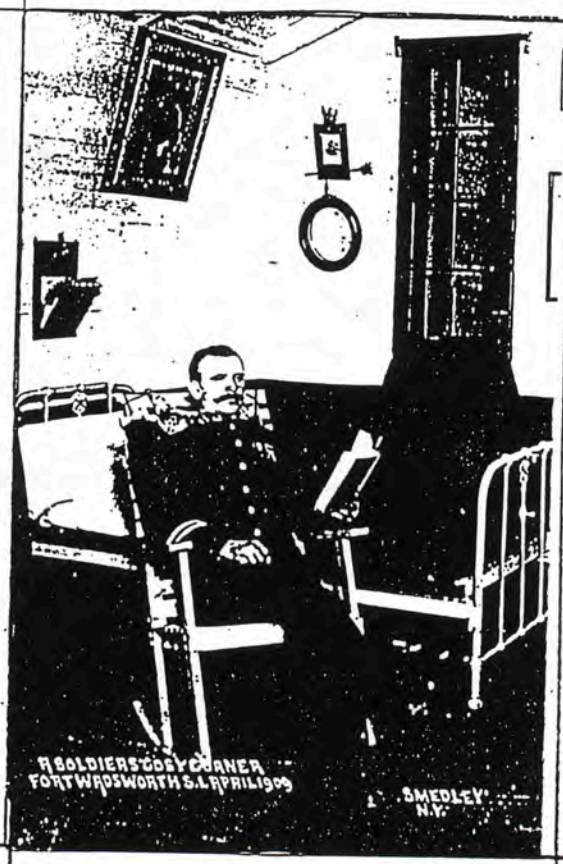
12 3/4" x 11 1/2" G-04-010



PORTRAITS G-04-010
Photo Collage of Men and Women at Fort Wadsworth from base newspaper
From: Range Finder, Holiday Issue, 1944, Fort Wadsworth
No negative number
GATE/EX 10/95

18."

28"



G-04-011

S.I.I.A.S
POSTCARD COLLECTION
#84.75-299
57 hp

#4



G-04-011
Soldier's Quarters in a Casemate - 84.75-299 57HP
Credit: Staten Island Institute for Arts and Sciences
RESTICTED/DUPLICATE
GATE- Fort Wadsworth/EX 10/95

G-04-012

18 "

TRAP BEHIND BULLET CIRCLE

~~Red Cross Blood Bank.~~



8"

TRAP BEHIND BULLET CIRCLE

Outdoor dance at the quad.

G-04-012

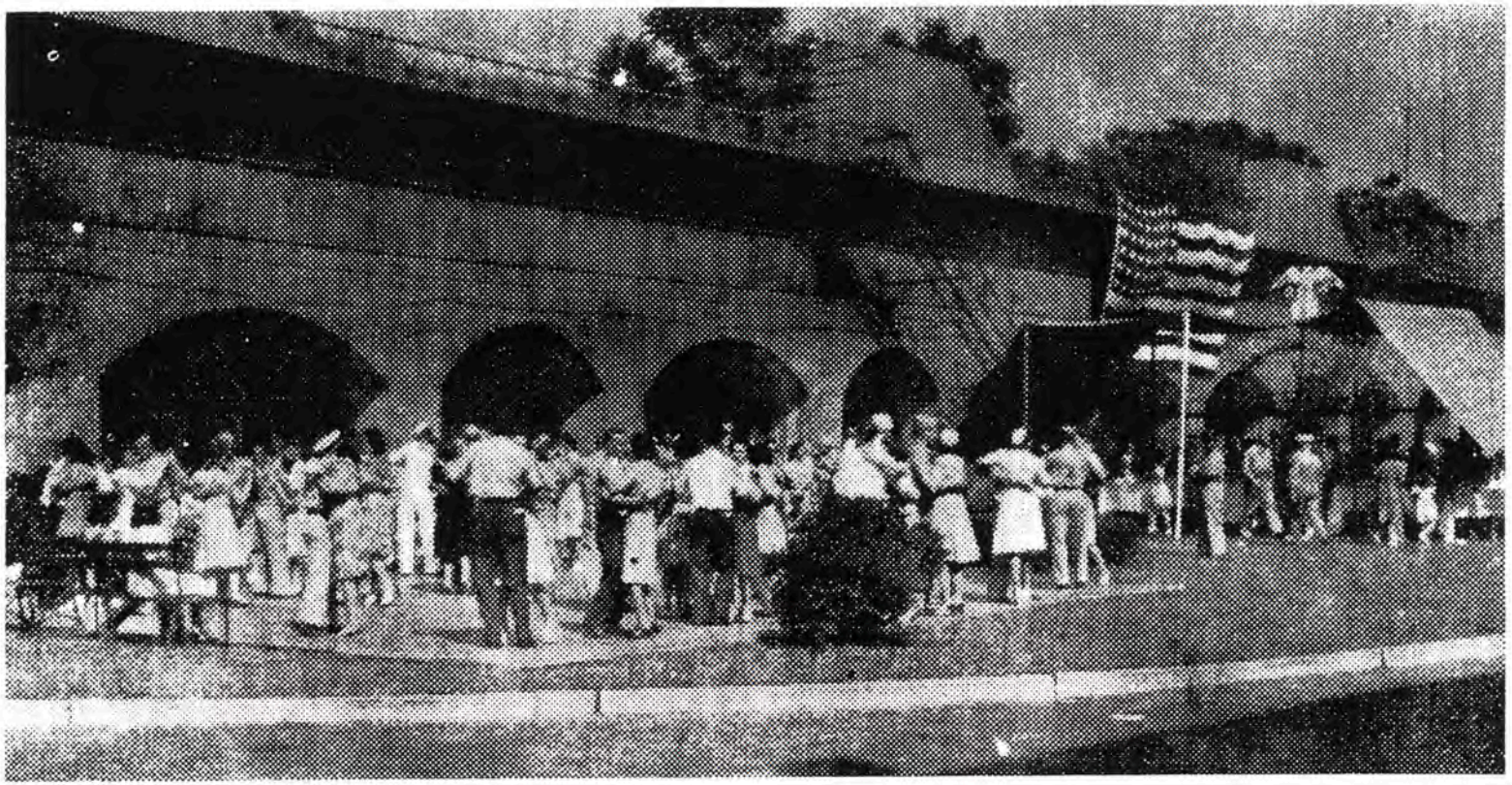
printed

here.

(*Hey,*
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s is the
slugs!)

while
raight.
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Feb

G-04-012
Outdoor dance at the quad
From: Ranger Finder, Holiday
Issue, 1944, Fort Wadsworth
No negative number
GATE/EX 10/95



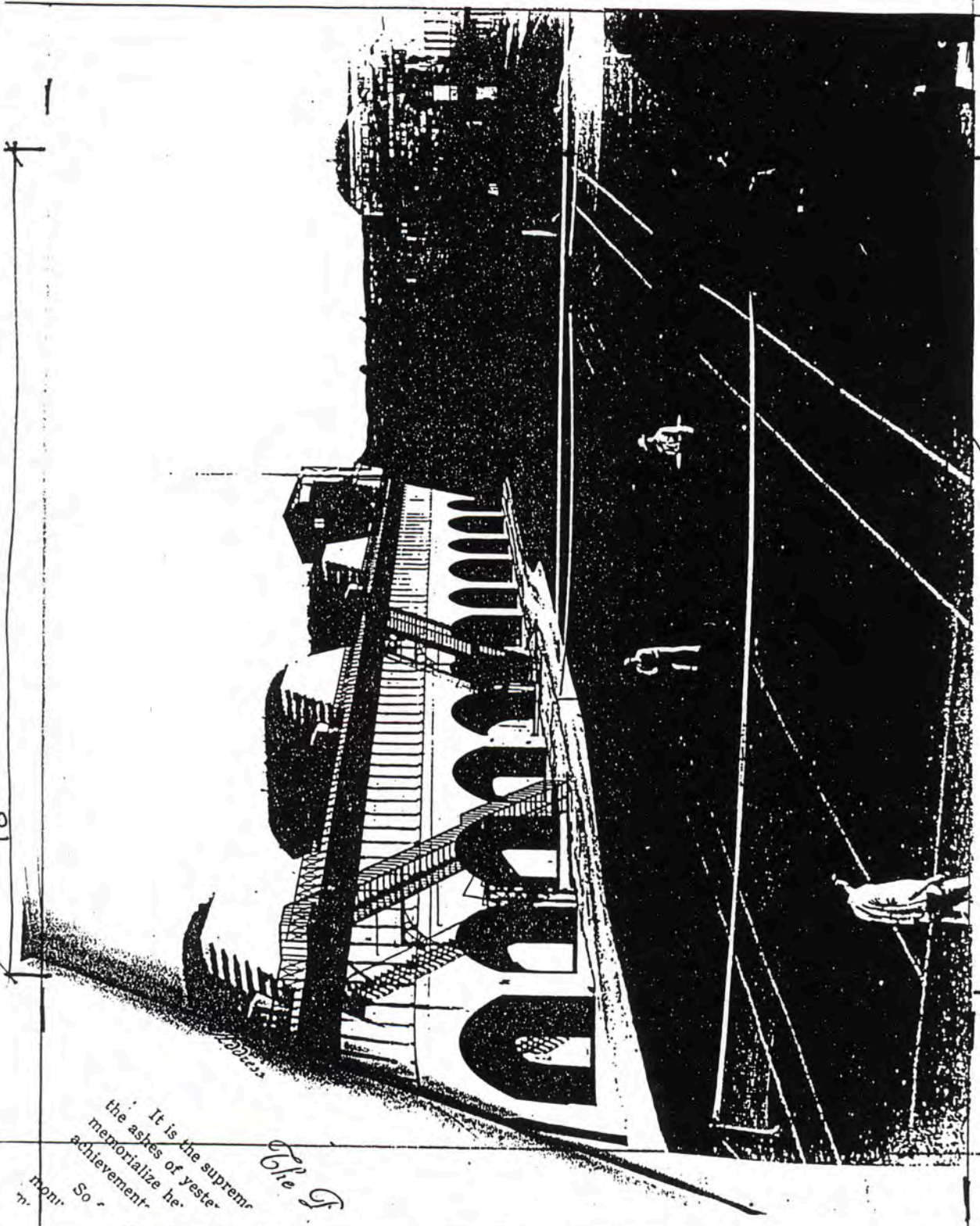
G-04-012

G-04-013

EXHIBIT 8: Life on the Base

TRACKING No. 1130

61



G-04-013

18"

It is the supreme
the ashes of yeste-
memorialize he-
achievement-
So
moni-
m-

G-04-014
1'-5" (17")
1'-6" (1-8"
TRACKING No. 1117
EXHIBIT B: Life On the Base

G-04-015

G-04-015

3' 2½" X 3' 10½"

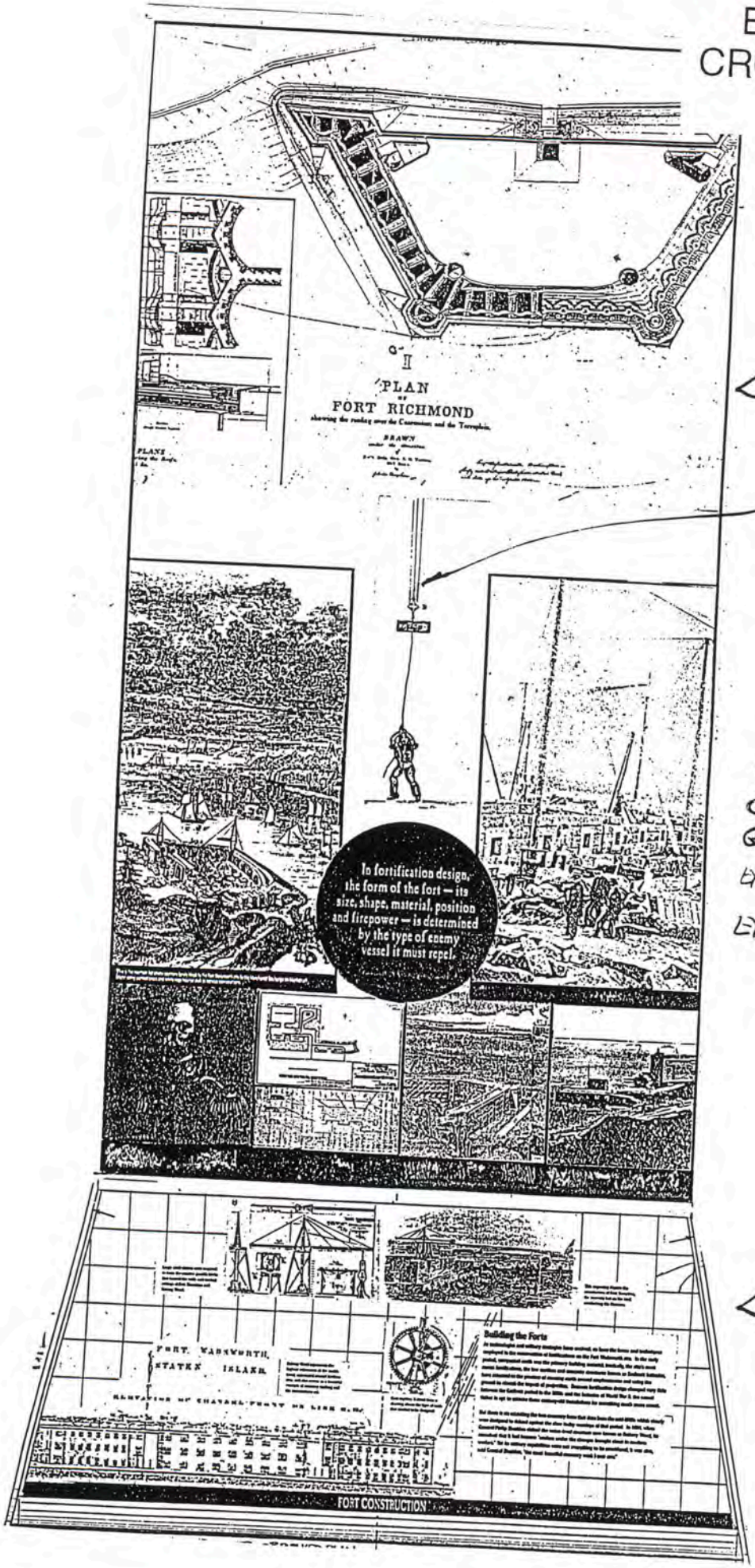
NOTE: REPEAT THIS AS A SILHOUETTE DETAIL (SAME SIZE)

Repeat Stacks of Cannonballs as Silhouette Detail

EXHIBIT II: Casemate Reference Material

TRACING No. 1133

EXHIBIT 05
CROP GUIDE



< PANEL

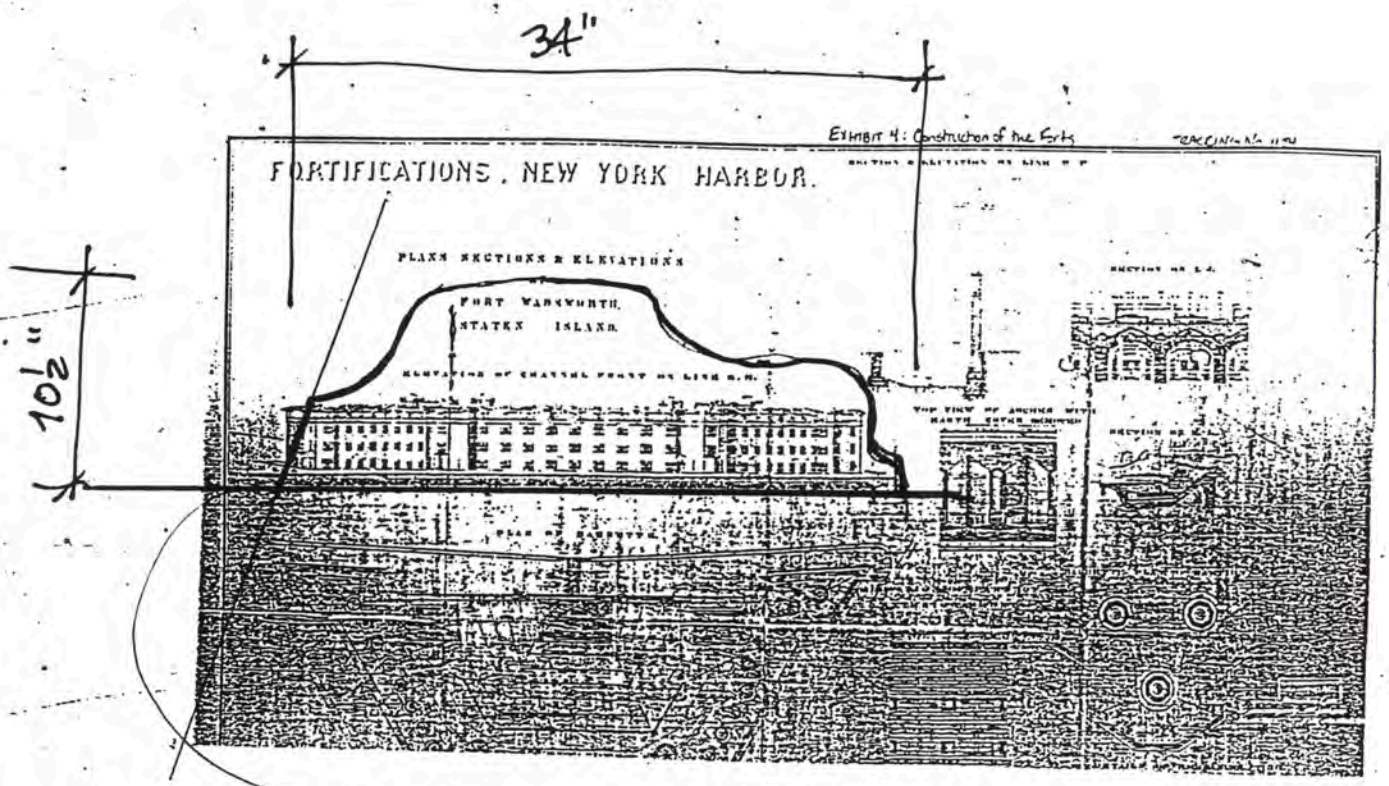
SCALE FROM DRAWING

OVERALL EXHIBIT CROP GUIDE

EXHIBIT # 5

EXHIBIT #5

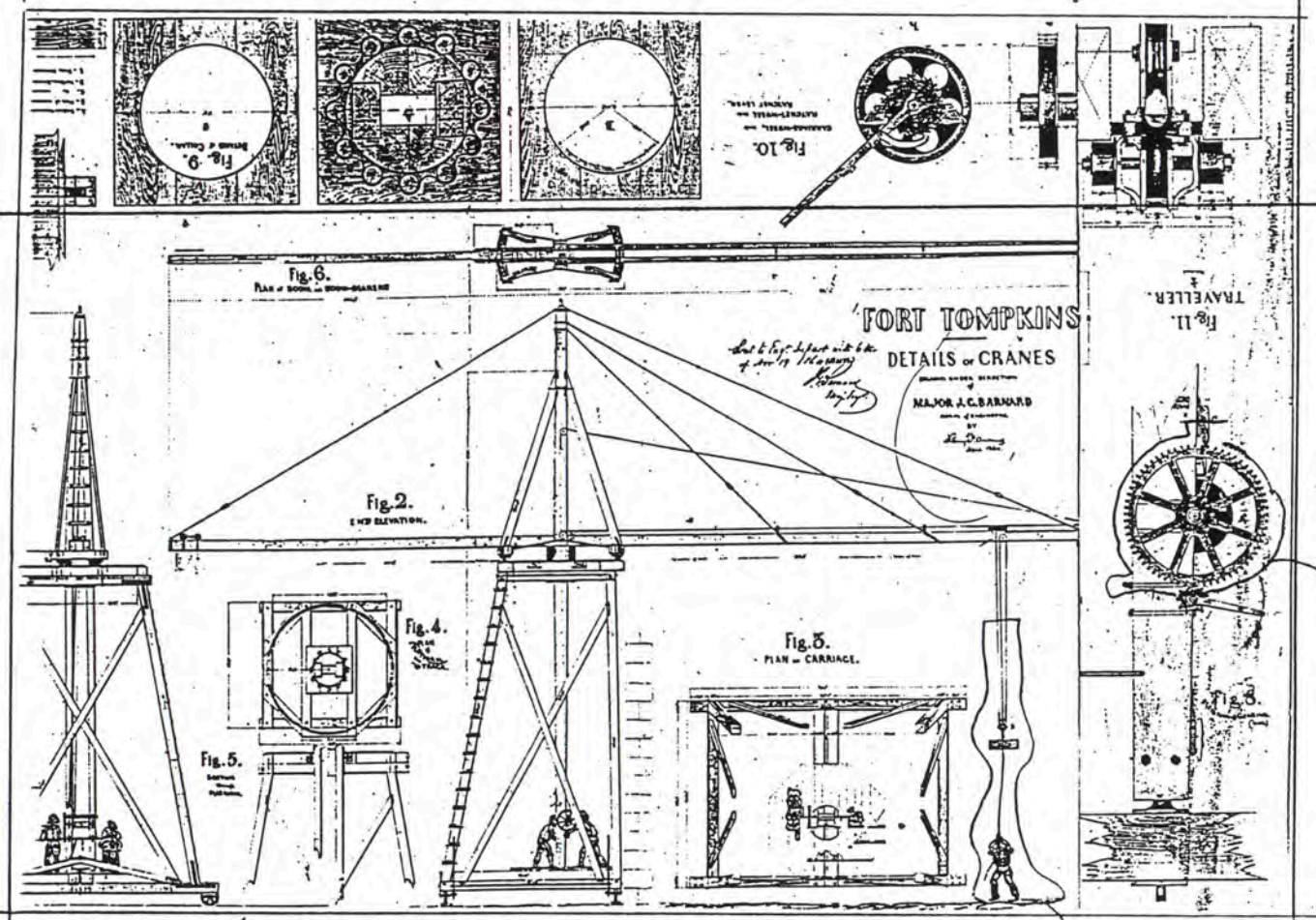
< TEXTRAIL



USED AS line
Ant - Drop out of any
Background

G-05-003
10½" X 2'10"

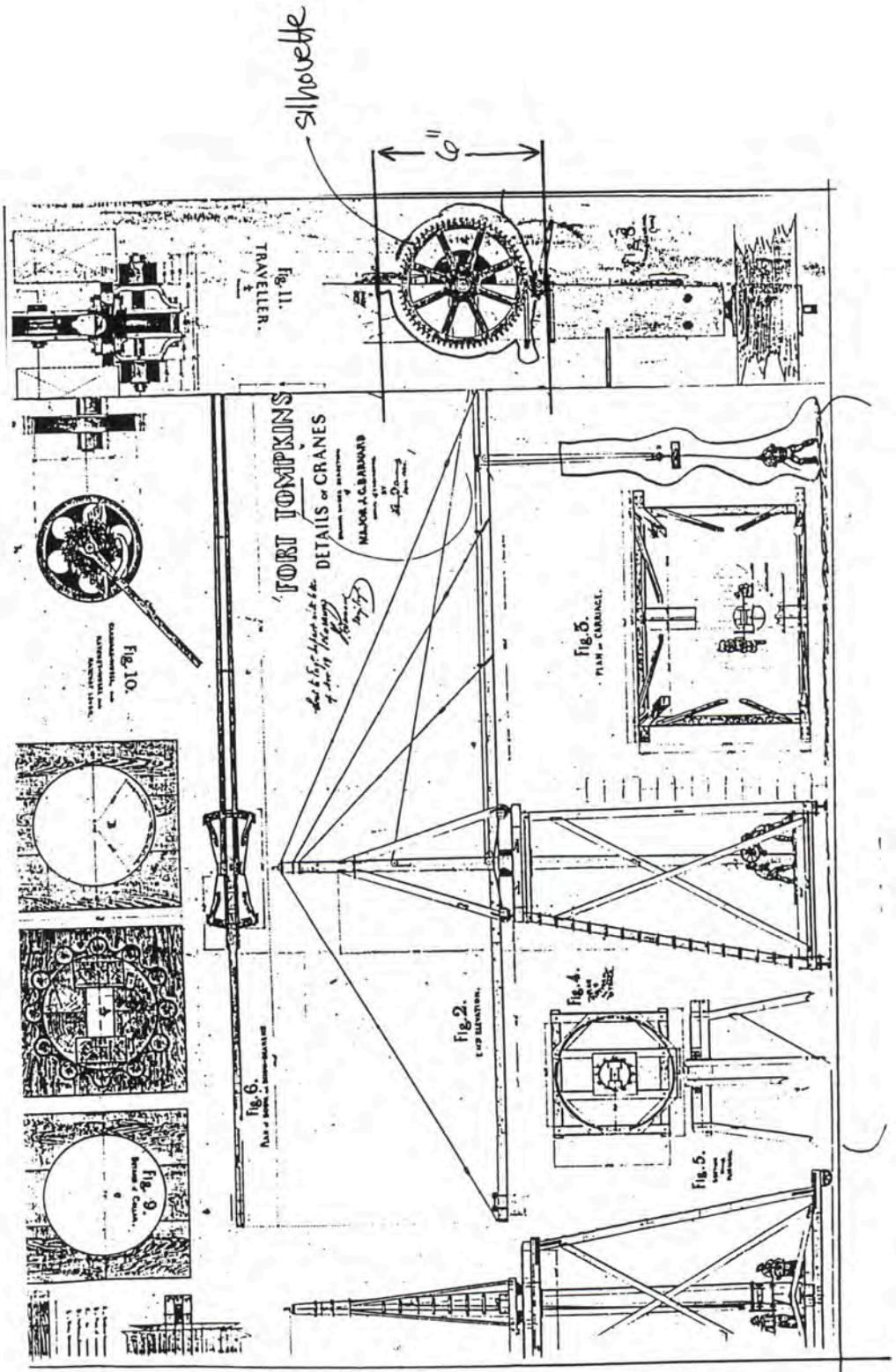
G-05-003



G-05-004

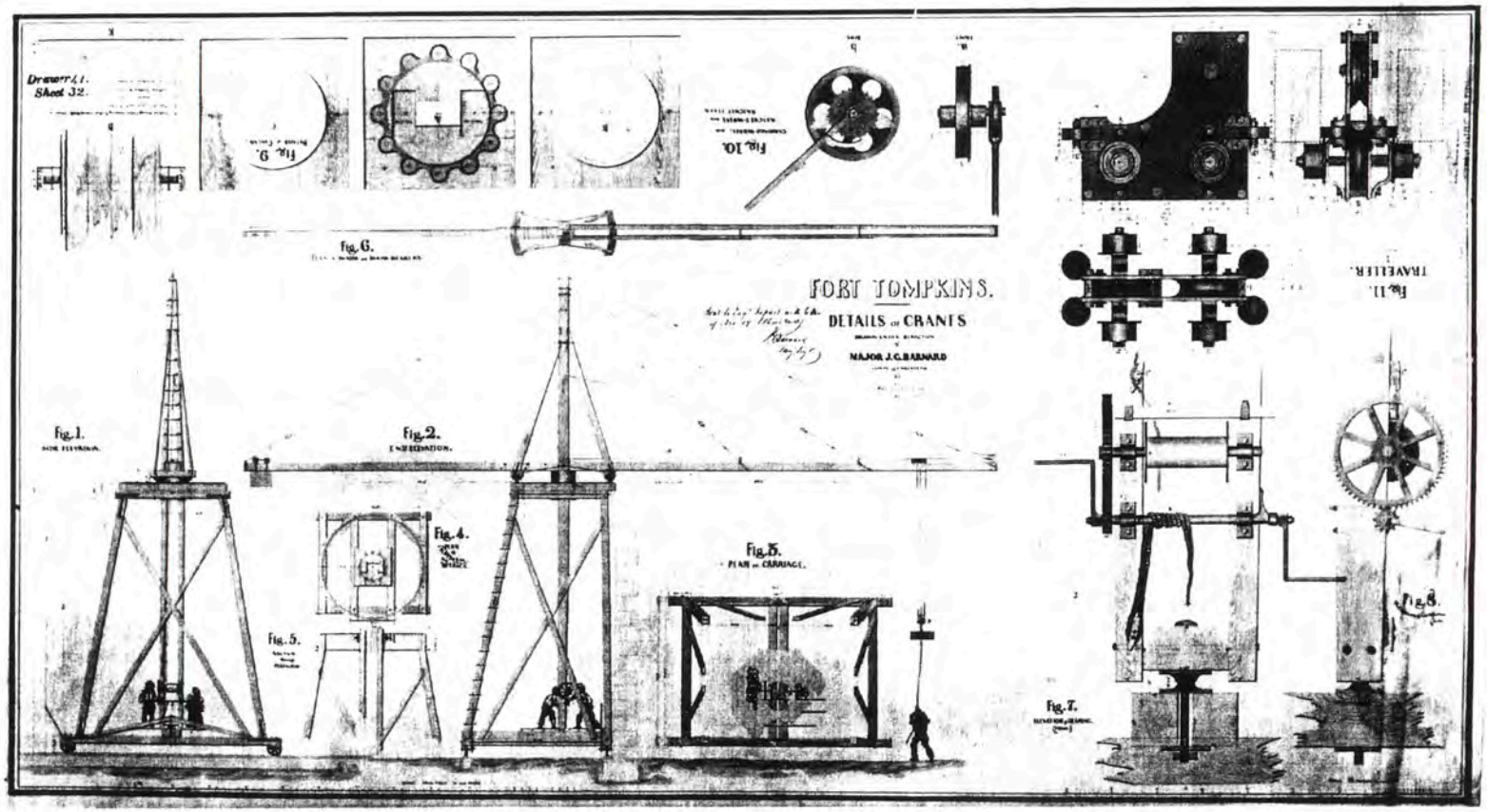
G-05-004

#5


silhouette
FORT TOMPKINS
DETAILS of CRANES
Fig.1.
TRAVELLER.
Fig.2.
Fig.4.
Fig.5.
Fig.6.
Fig.9.
Fig.10.

G-05-004.1

G-05-004.1
Fort Wadsworth - Detail of Construction Gear
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 41, Sht.32
GATE-Fort Wadsworth/EX 10/95



G-05-004.1

G-05-005

Fort Wadsworth, Gateway NRA
Construction taking place on Battery Weed
(sometime between 1847 and 1861) - the color
version was originally printed in Frank Leslie's Illustrated
Magazine in 1862
Credit: Staten Island Historical Society
RESTRICTED
GATEWE 2/95

Tompkins not Weed

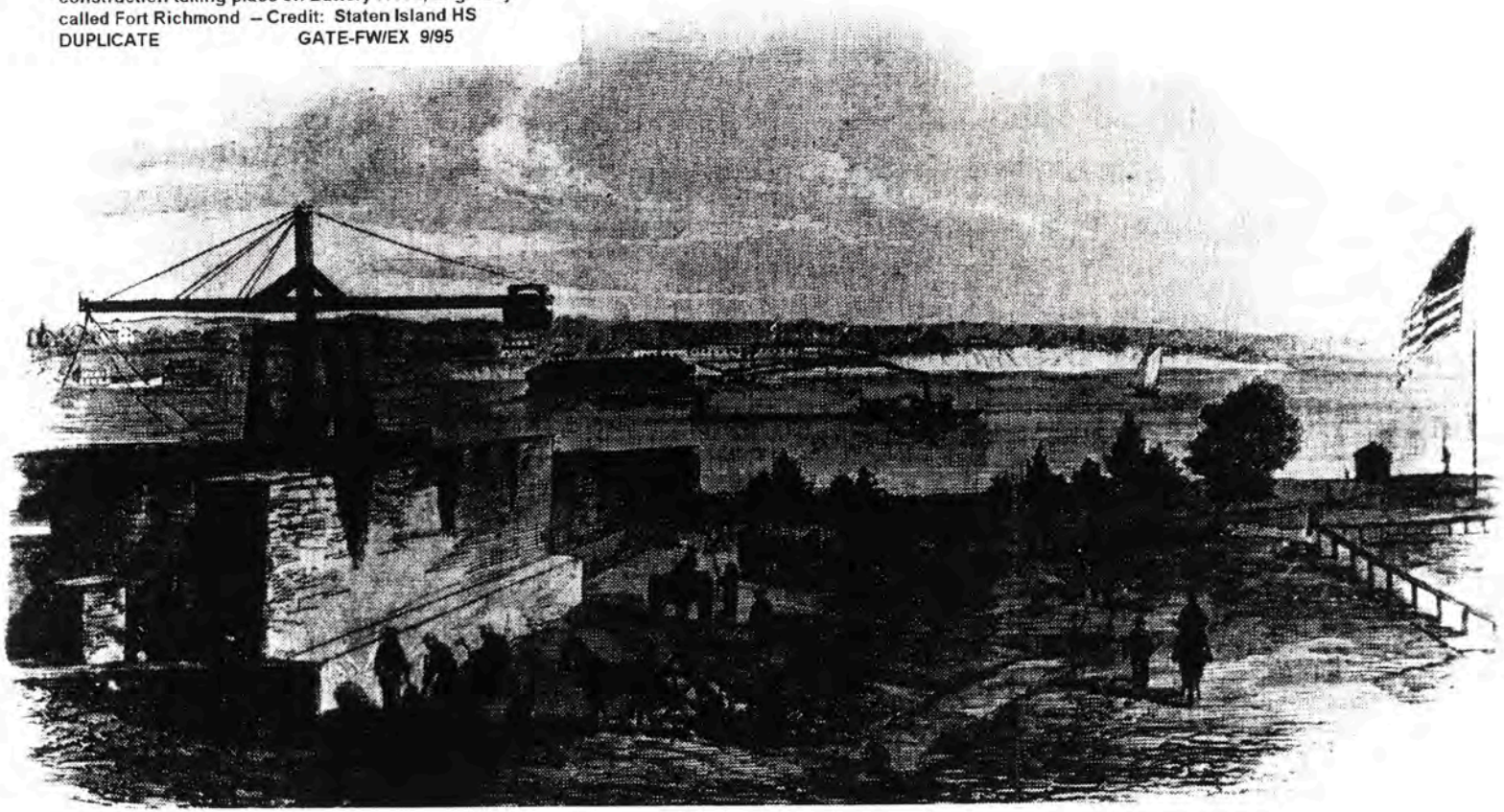
15"

7½"

G-05-005.
7½" X 13"

#5

G-05-005
Chronology, Civil War, Ft. Richmond between 1847-1861 Captioned: A color print which originally appeared in Frank Leslie's Illustrated Magazine in 1861, shows construction taking place on Battery Weed, originally called Fort Richmond -- Credit: Staten Island HS
DUPLICATE GATE-FW/EX 9/95



G-05-005

MAY 29 '95 08:50PM HOWARD-REVIS DESIGN C 20036 1607

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11½"

12¾"

G-05-007

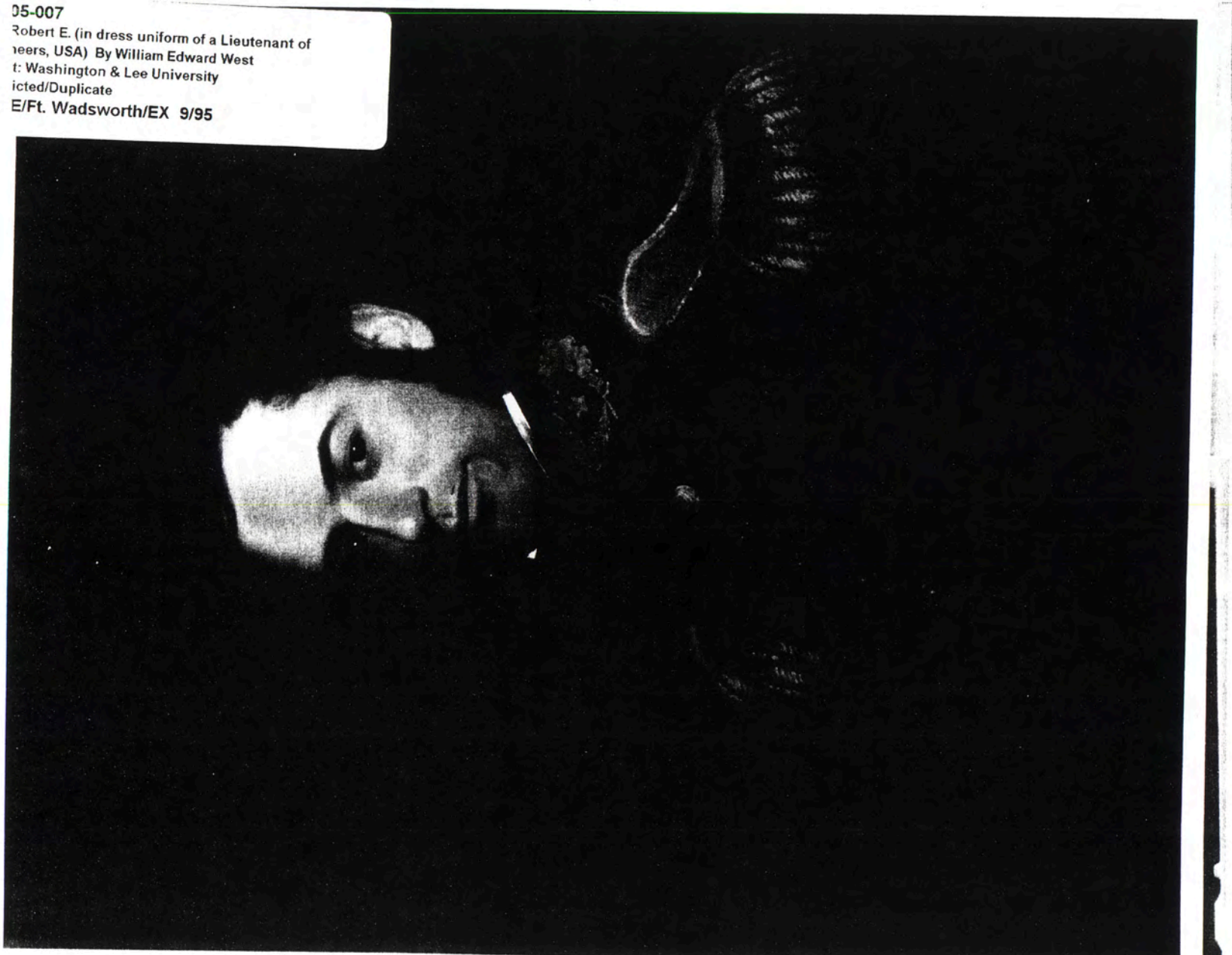
12¾" X 11½"

#5

G-05-007

G-05-007

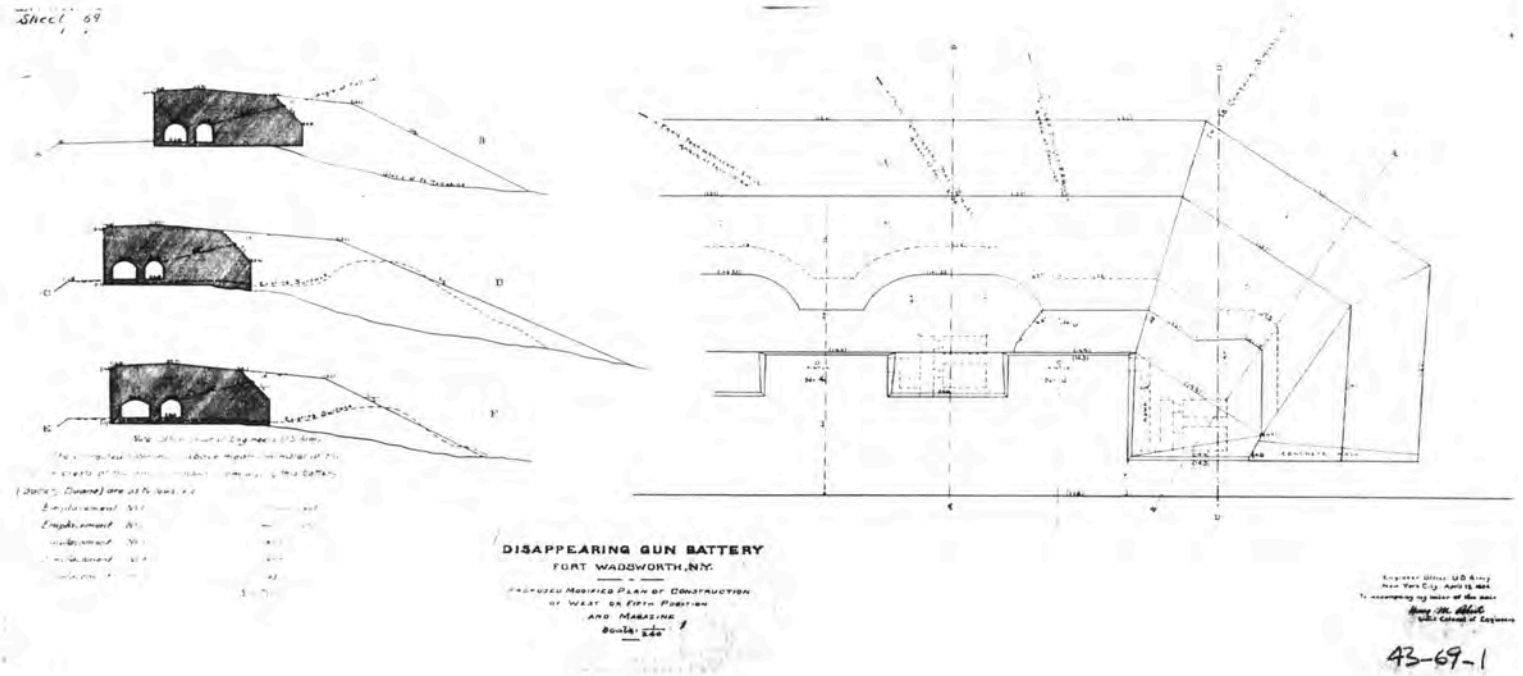
05-007
Robert E. (in dress uniform of a Lieutenant of
neers, USA) By William Edward West
t: Washington & Lee University
icted/Duplicate
E/Ft. Wadsworth/EX 9/95



G-05-008.1

G-05-008.1
EXHIBIT 4: Construction of the Forts
TRACING NO 1164
DISAPPEARING GUN BATTERY
112'4"

G-05-008.1
Fort Wadsworth - Sections and plan of disappearing gun battery
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 43, Sht.69-1
GATE-Fort Wadsworth/EX 10/95



G-05-008.1

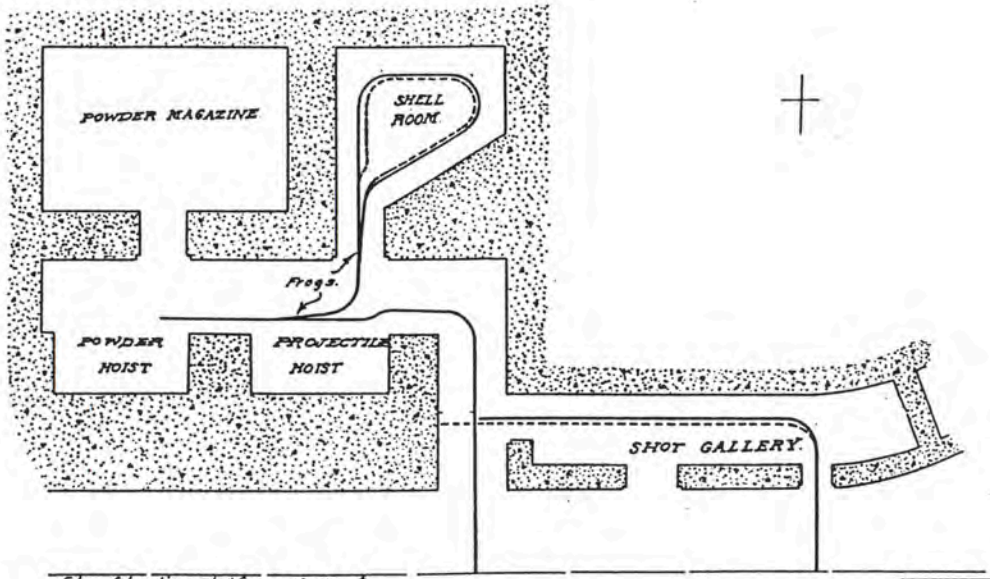
11½"

EXHIBIT 4: Construction of the Forts

TRACING No 1163

WAR DEPARTMENT

CORPS OF ENGINEERS, U.S. ARMY.



EMPLACEMENTS NO. 1 & 2.

Existing trolley track shown thus: ———

Proposed modification shown thus: - - - - - - - -

NOTE: O.C.E., May 15, 1918. Work not authorized. Armament to be removed.

FORT WADSWORTH, N.Y.

MODIFICATION OF TROLLEY TRACKS TO ACCOMMODATE LONG-POINTED PROJECTILES

BATTERY BARRY (2-10 IN.)

ONE SHEET. SCALE 1IN=8FT.

FT. 0 8 16 N FT.

U.S. ENGINEER OFFICE, SECOND DIST. NEW YORK CITY, JUNE 18, 1917.

Approved:

Colonel, Corps of Engineers.

Drawn by H.L.N.
Ch'kd. by [illegible] File No. M.F. 20/39

Transmitted with letter dated June 18th, 1917.

Cartographic Division ⓒ Nat'l Archives RG77 Drw 43 Sht 84-13

Sheet 84 13

G-05-008.2

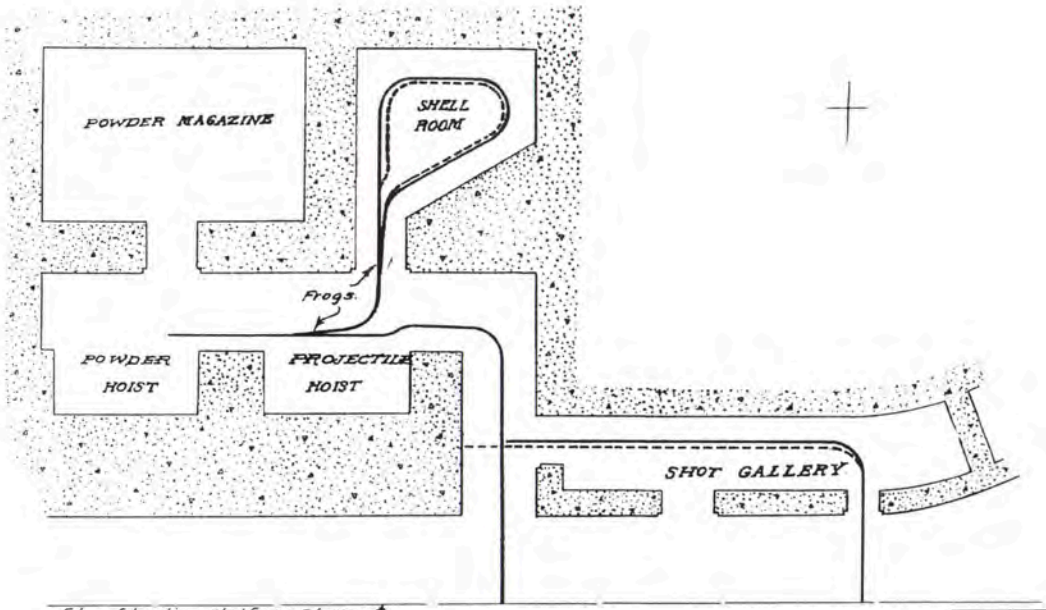
7½" X 11½"

G-05-008.2

7½"

G-05-008.2
Fort Wadsworth - Plan of Battery Barry
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 43, Sht. 84-13
GATE-Fort Wadsworth/EX 10/95

CORPS OF ENGINEERS, U.S. ARMY.



EMPLACEMENTS NO. 1 & 2.

Existing trolley track shown thus: ———————
Proposed modification shown thus: - - - - - - - - - - - - - -

Armament to be removed

FORT WADSWORTH, N.Y.

MODIFICATION OF TROLLEY TRACKS TO ACCOMMODATE LONG-POINTED PROJECTILES

BATTERY BARRY (2-10 IN)

ONE SHEET. SCALE 1 IN = 8 FT.

FT. 0 0 8 16 24 FT

U.S. ENGINEER OFFICE, SECOND DIST, NEW YORK CITY, JUNE 18, 1917

Approved:
Fredrick V. Abbot
Colonel, Corps of Engineers

Drawn by H.L.N
Ch'kd. by [illegible] File No. M.F. 38/59
Transmitted with letter dated June 18th, 1917

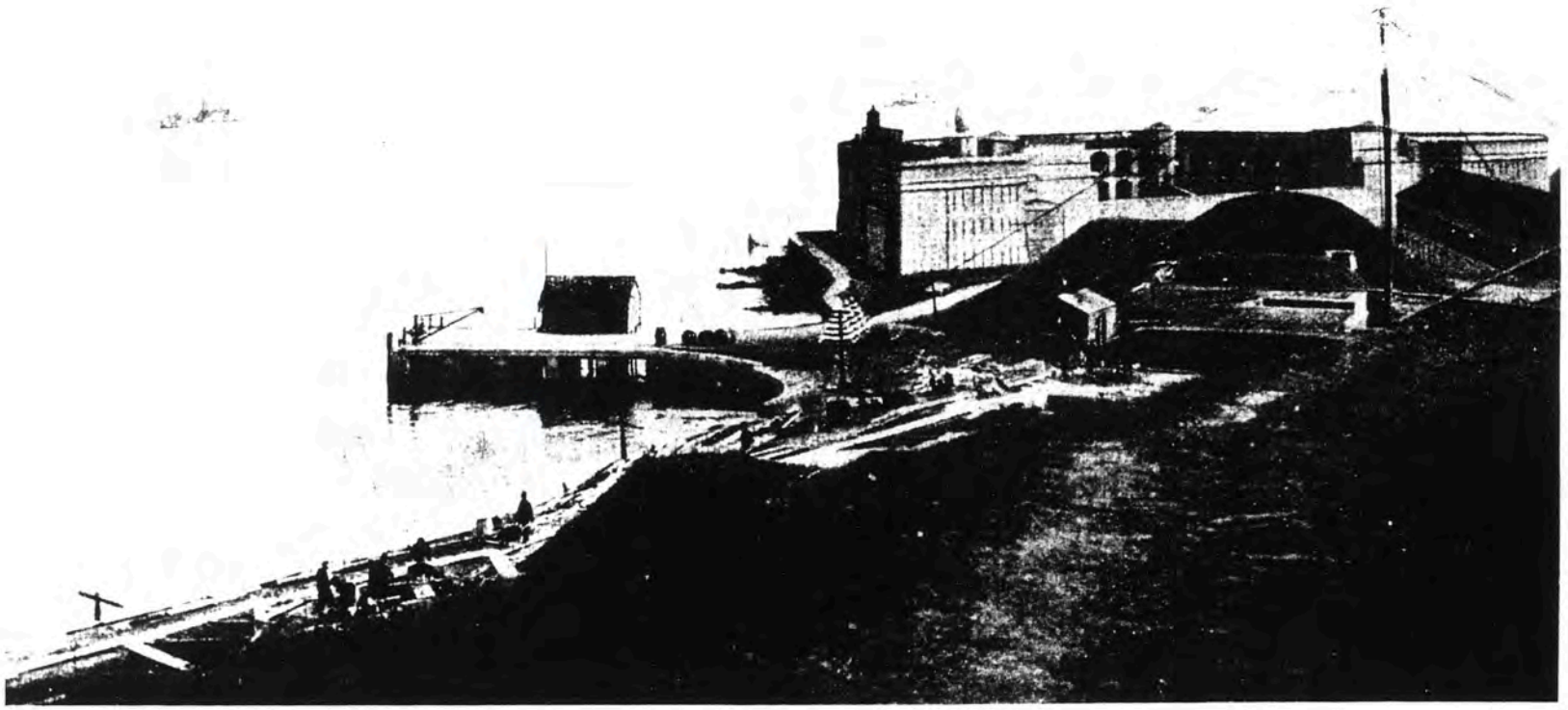
43

G-05-008.2

EXHIBIT No. 4: Construction

G-05-009

G-05-009
Engraving of Wharf on Fort Wadsworth Site with
Battery Weed Beyond 84-75 329 57HP
Credit: Staten Island Institute for Arts and Sciences
RESTICTED/DUPLICATE
GATE- Fort Wadsworth/EX 10/95



G-05-009

G-05-010

G-05-010

12¾" X 11½"

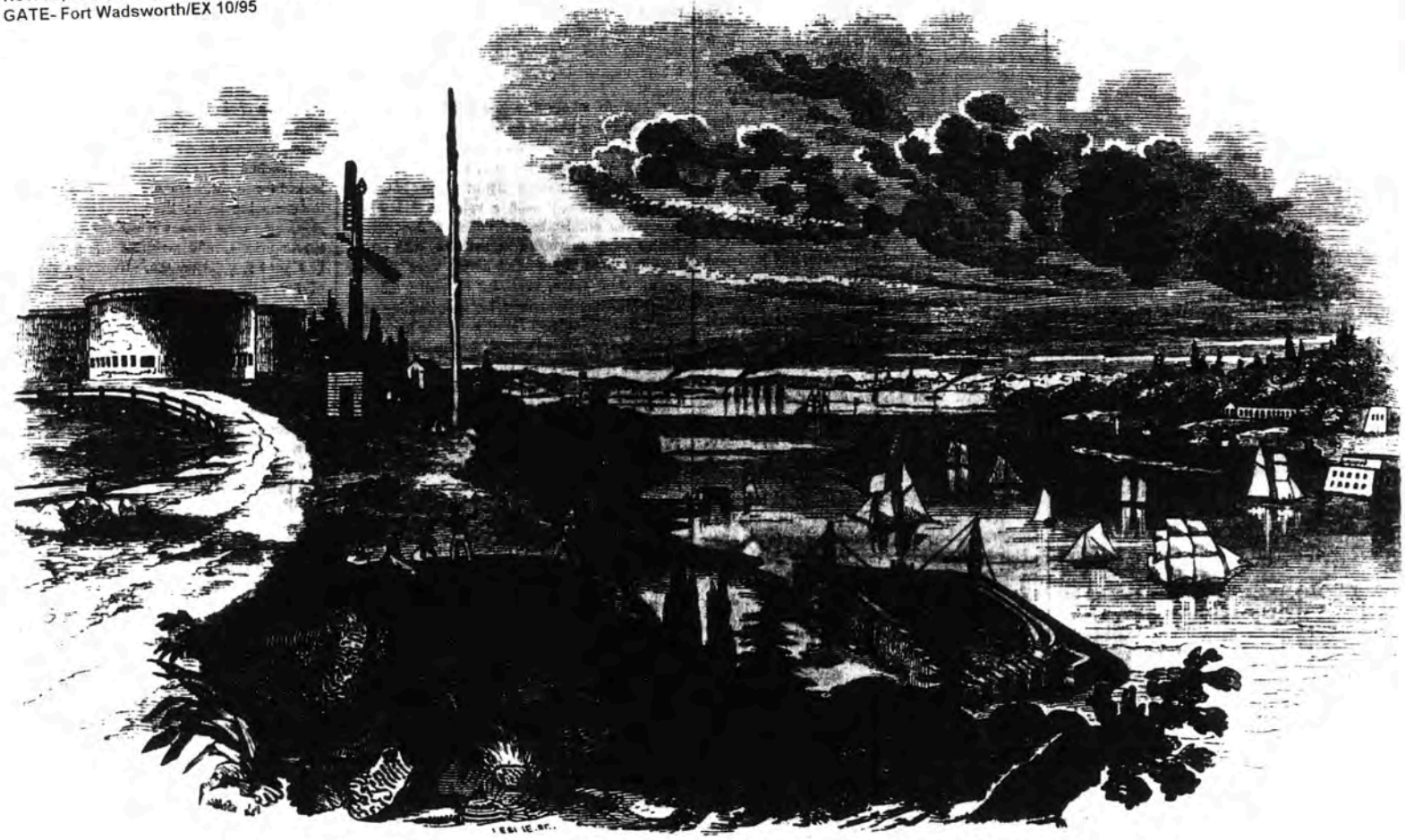
G-05-010

G-05-010
"Great Eastern Coming Up the Narrows into the Harbor of New York" - June 28, 1860
Credit: Staten Island Institute for Arts and Sciences
RESTICTED/DUPLICATE
GATE- Fort Wadsworth/EX 10/95

G-05-011

33"
2'-9"
(1'-6") 18"
EXHIBIT 4: Construction of the Forts
TRACING NO 1165
G-05-011

G-05-011
View of the Bay and Harbor from the Telegraph Station
Photographed from the NPS copy of Gleason's
Pictorial, Drawing Room Companion - Boston, Saturday,
Nov. 27, 1852, Vol. III, No. 22 - AP1, G5, V.2
GATE- Fort Wadsworth/EX 10/95



VIEW OF THE NEW YORK BAY AND HARBOR, FROM THE TELEGRAPH STATION.

G-05-011

EXHIBIT 4: Construction of the Forts („EE) TRACKING NO. 1151

~~Right~~: *The fort at Willets Point, later called Fort Totten, shown during construction in 1862. (U.S. Army) The granite work (lower right) became obsolete during the Civil War and was never completed. (John F. Artes)*

K&M Division Torrance, CA 90503 POLY-VU # PV119G

(Fort (~~Tilden~~) Totten)?

2'9"

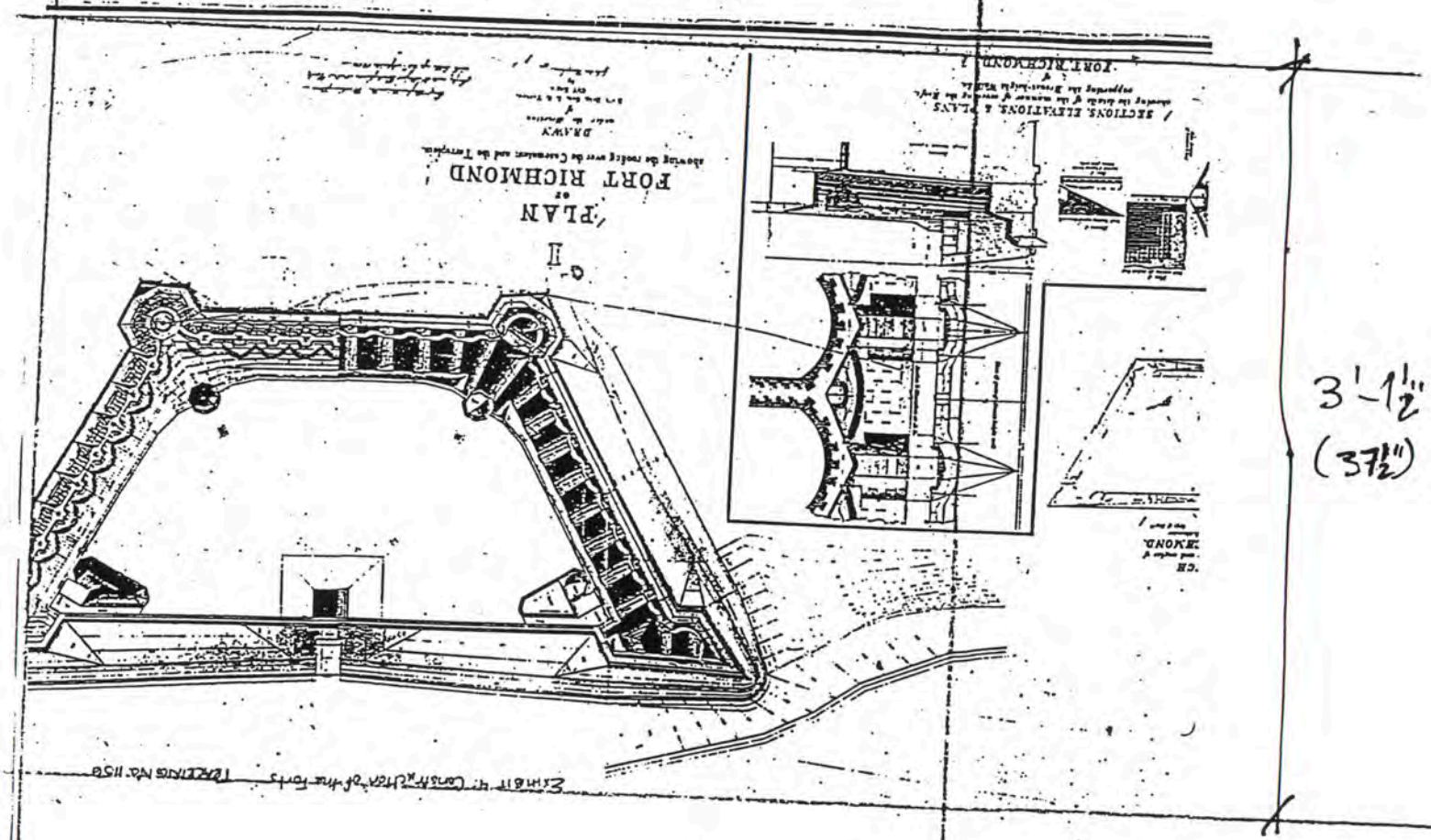
1'-6" (18")

G-05-012

#5

G-05-013

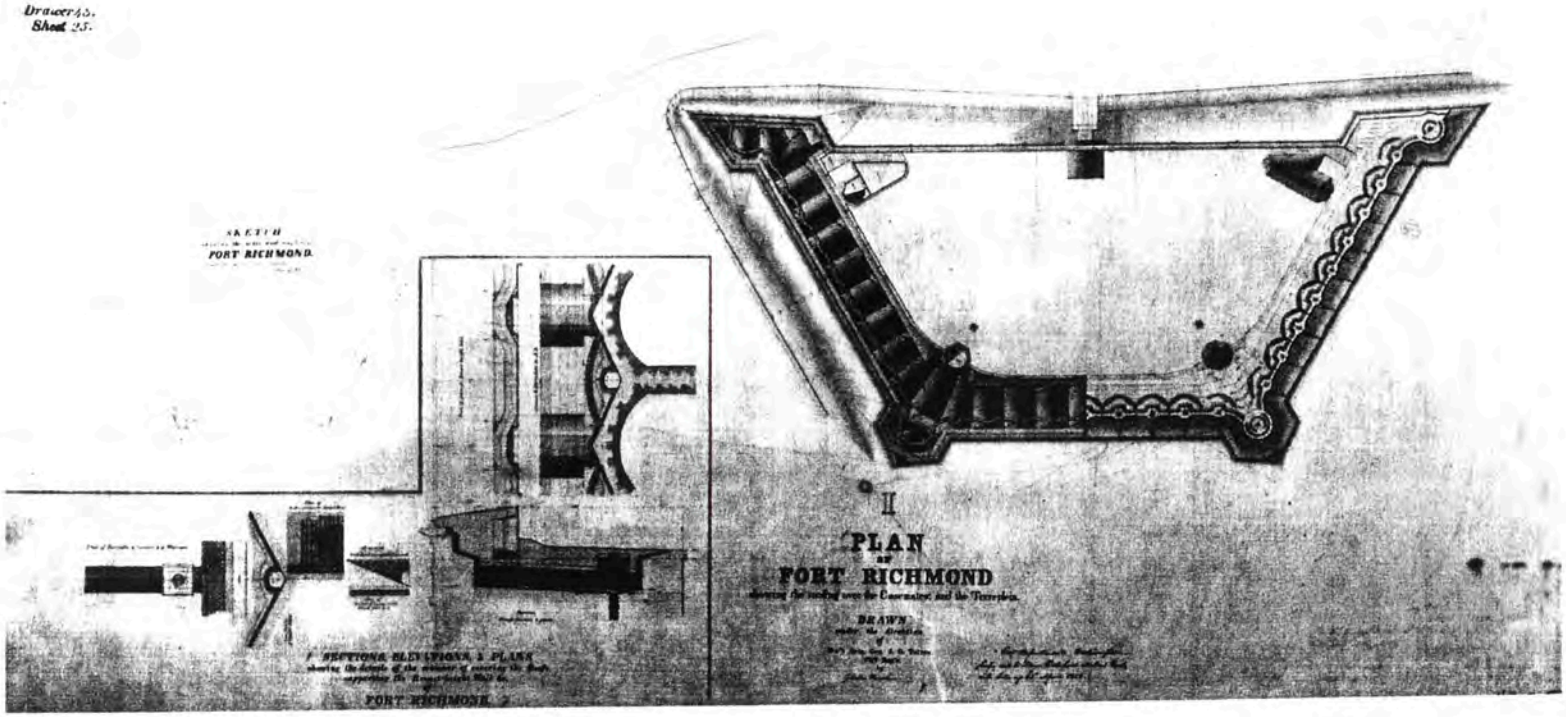
3'-10½" (46½") BLEED ON 3 SIDES



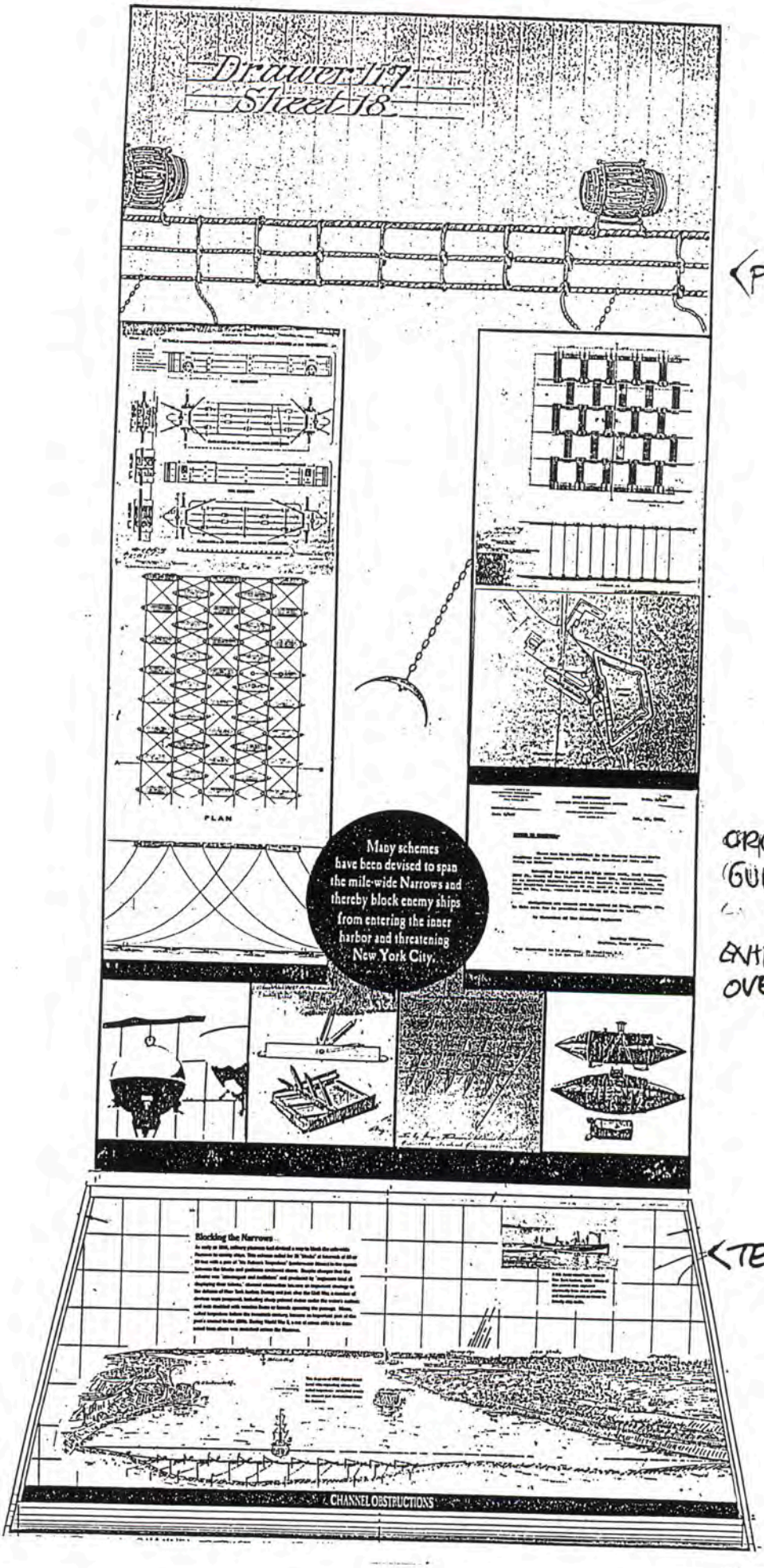
3'-1½"
(37½")

G-05-013

G-05-013
Fort Wadsworth - Plan of Fort Richmond
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 43, Sht.25
GATE-Fort Wadsworth/EX 10/95



G-05-013



PANEL

CROP GUIDE

EXHIBIT #6 OVERALL

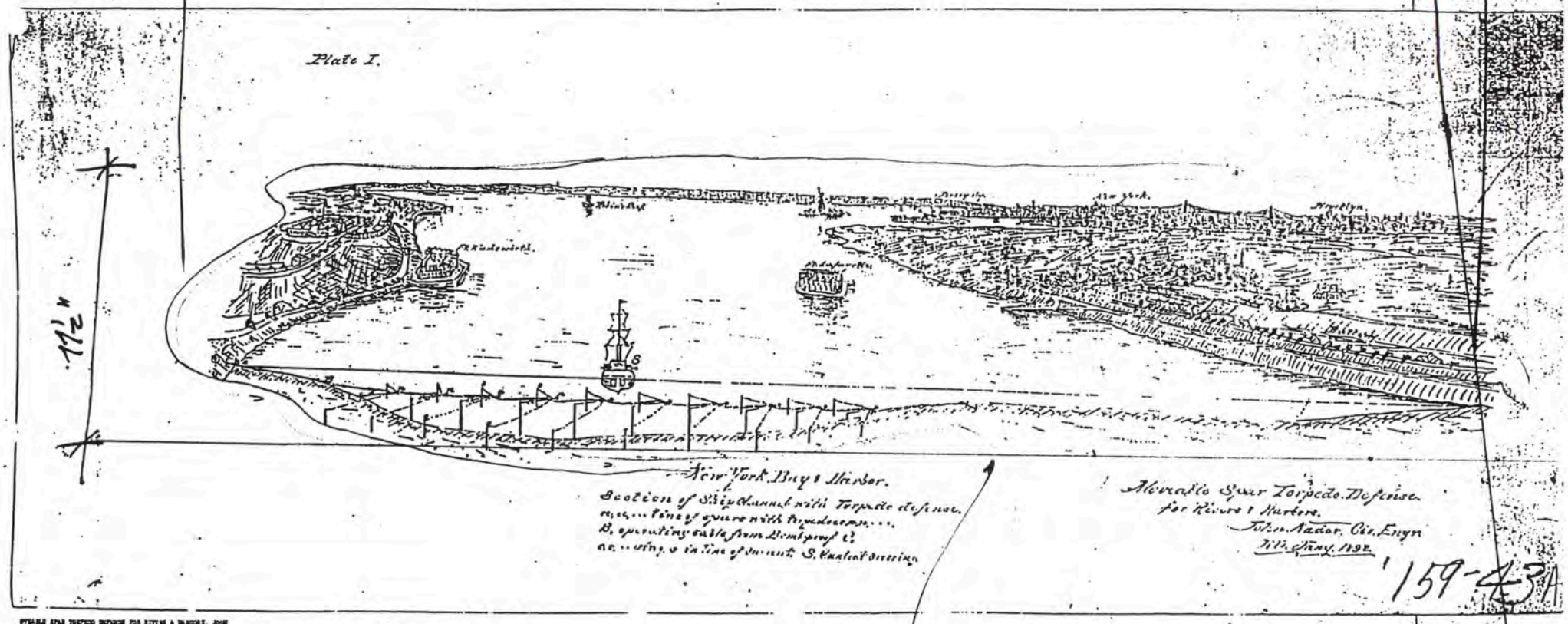
TEXTRAIL

56½"

EXHIBIT 7: Channel Obstructions

TRACKING No. 1198

11"



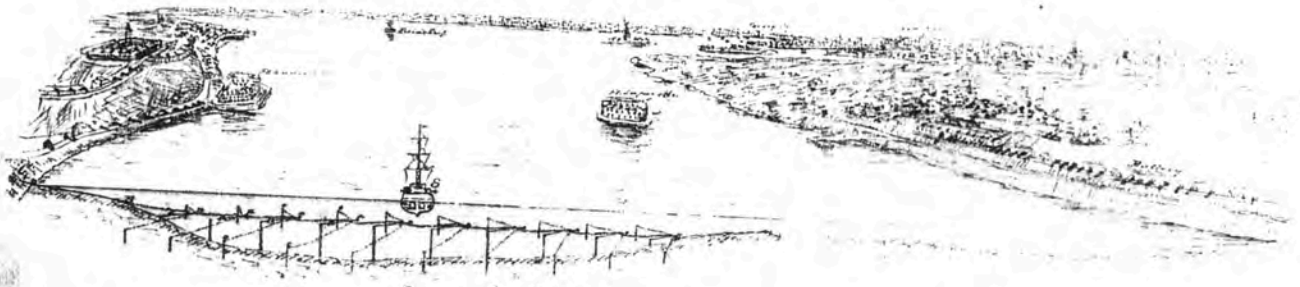
159-43A

G-06-003

Drop out background and print as line art

G-06-003

G-06-003
Fort Wadsworth - Engraving of net with mines across the narrows
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 159, Sht. 43A
GATE-Fort Wadsworth/EX 10/95



159-431

G-06-003

G-06-004

K&M Division
Torrance, CA 90503

PV119E

9"

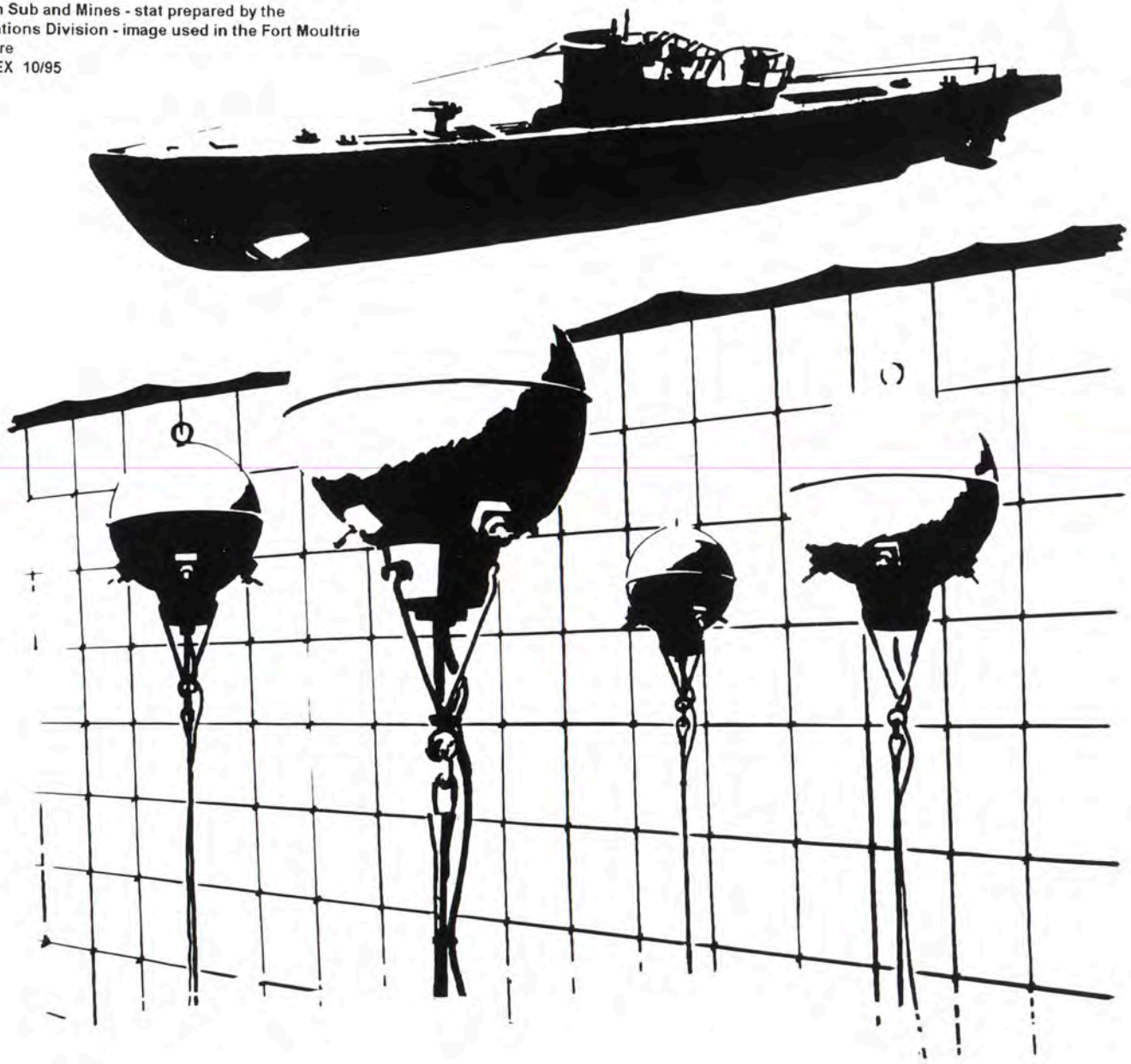
5"

400-90-5

5"x9"

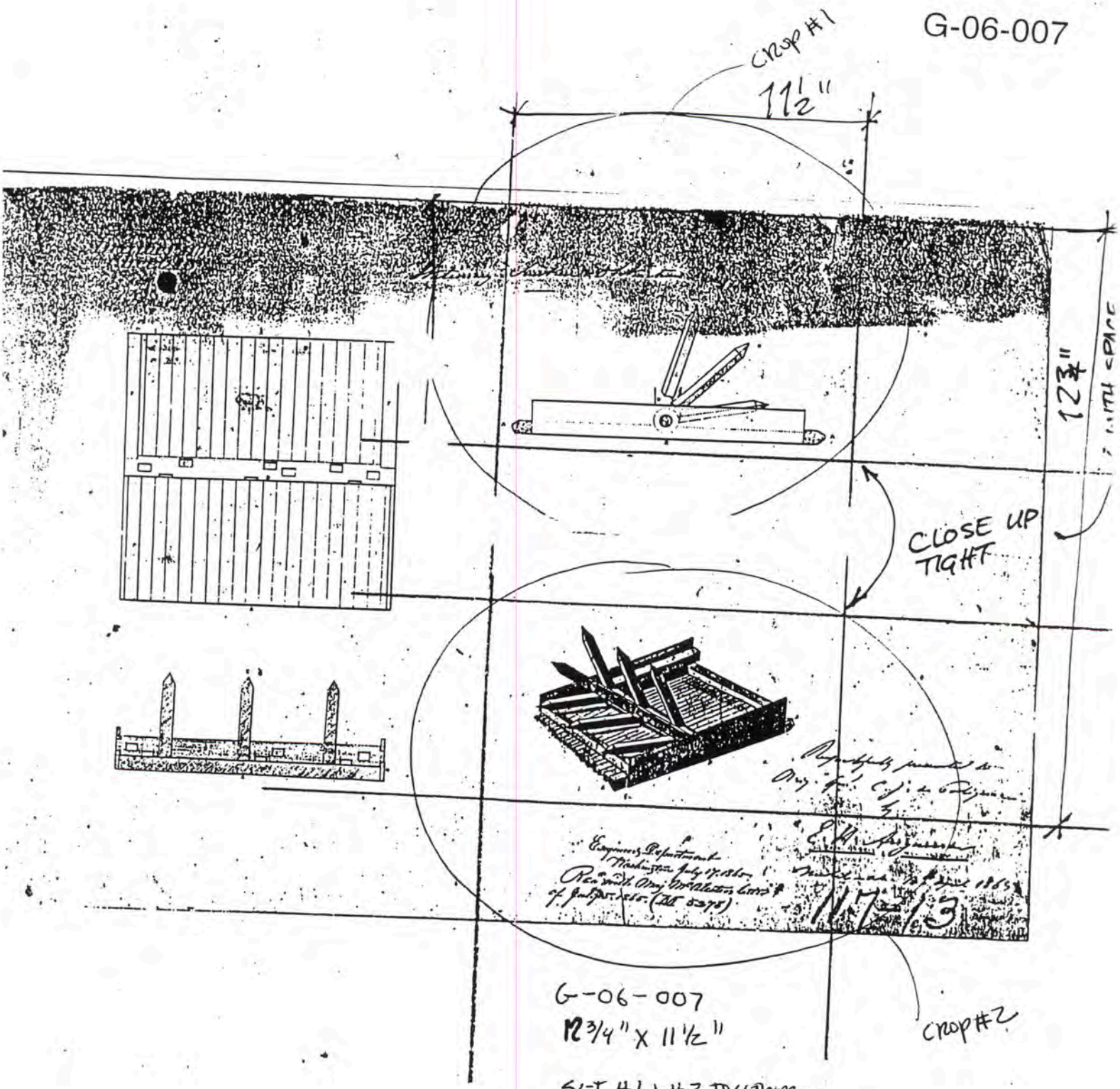
G-06-006

G-06-006
German Sub and Mines - stat prepared by the Publications Division - image used in the Fort Moultrie brochure
WEST/EX 10/95



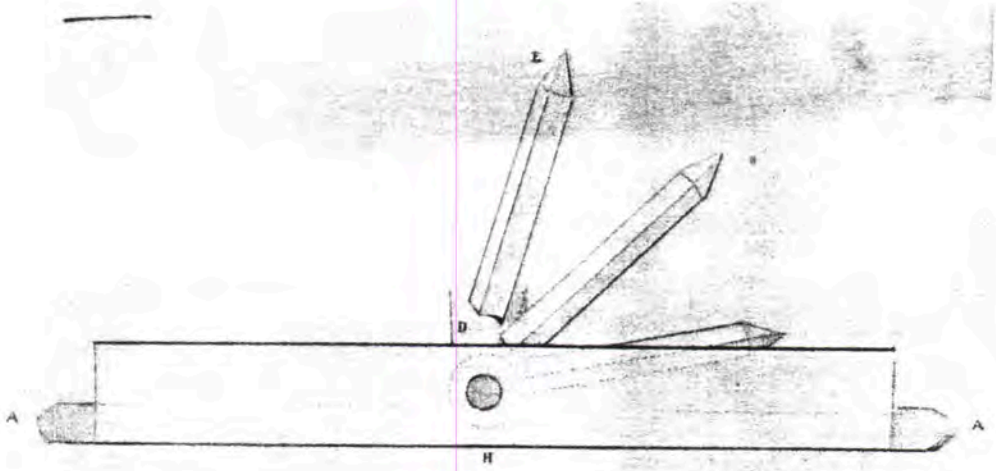
G-06-006

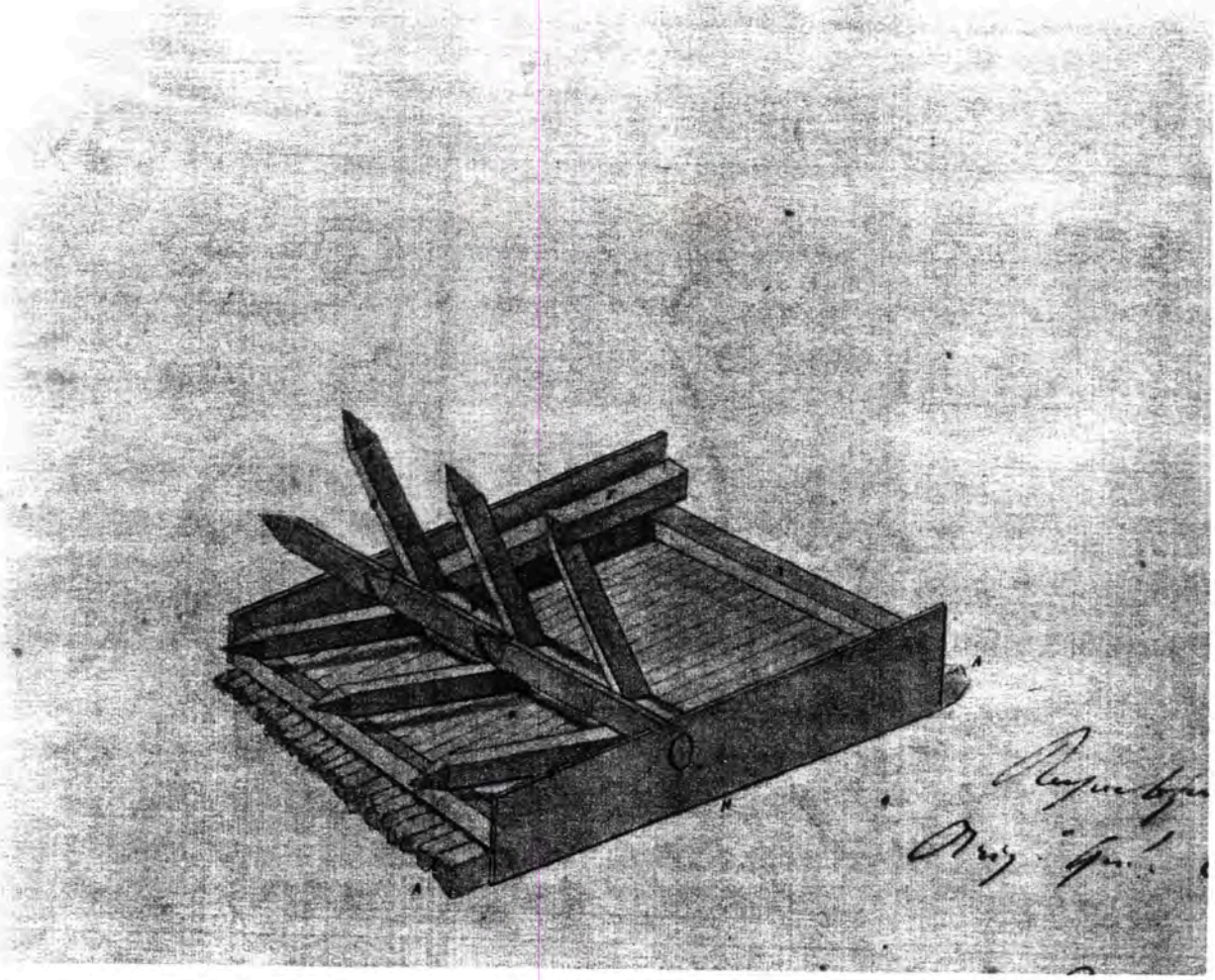
G-06-007



G-06-007
12¾" X 11½"

SET #1 & #2 TOGETHER



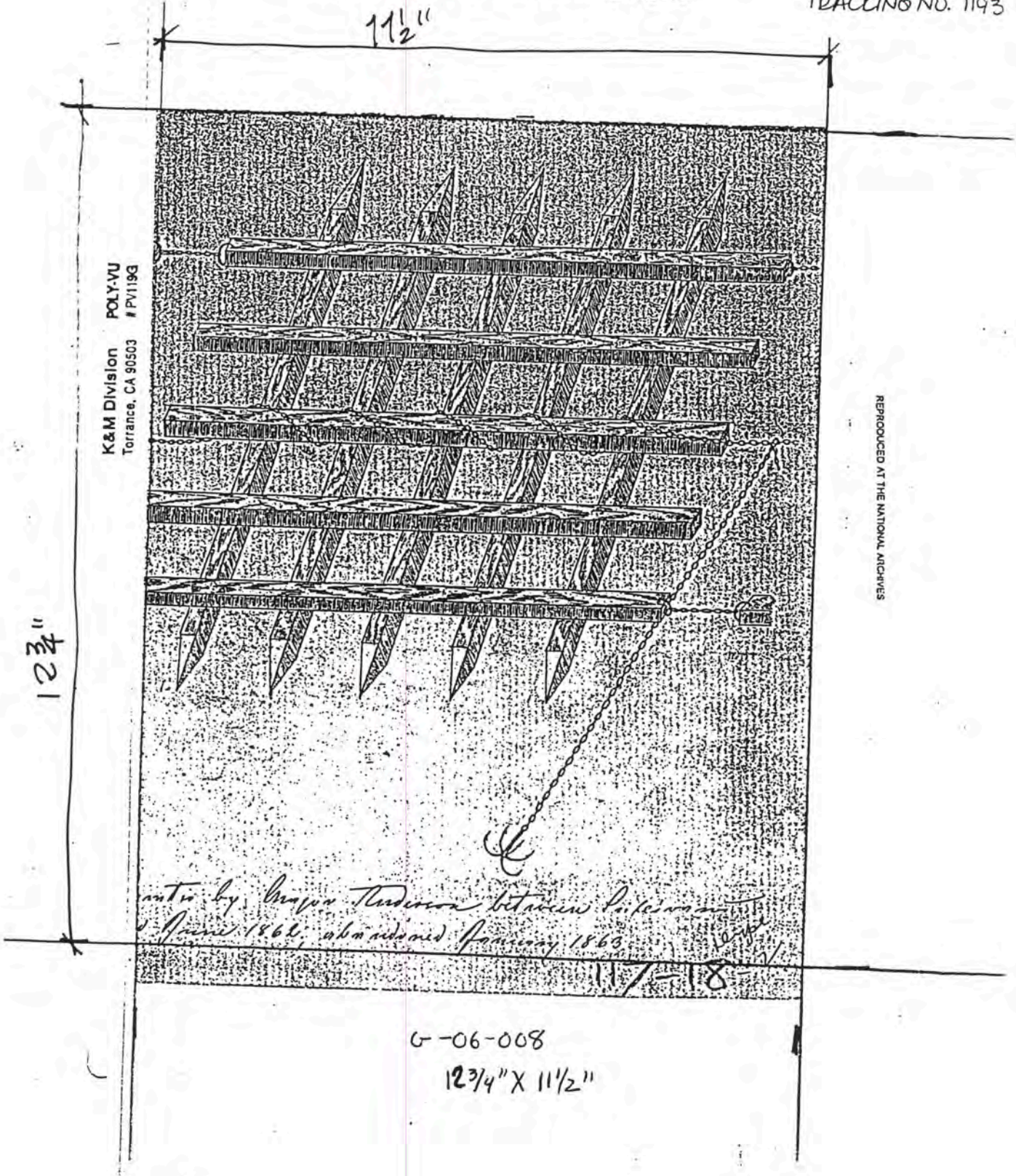


G-06-007
Fort Wadsworth - Engraving of Spiked Device
National Archives, Cartographic, College Park, MD
Neg.no.#RG77, Drw. 117, Sht.13
GATE-Fort Wadsworth/EX 10/95

G-06-008

EXHIBIT 7: Channel Obstructions

TRACKING NO. 1193



REPRODUCED AT THE NATIONAL ARCHIVES

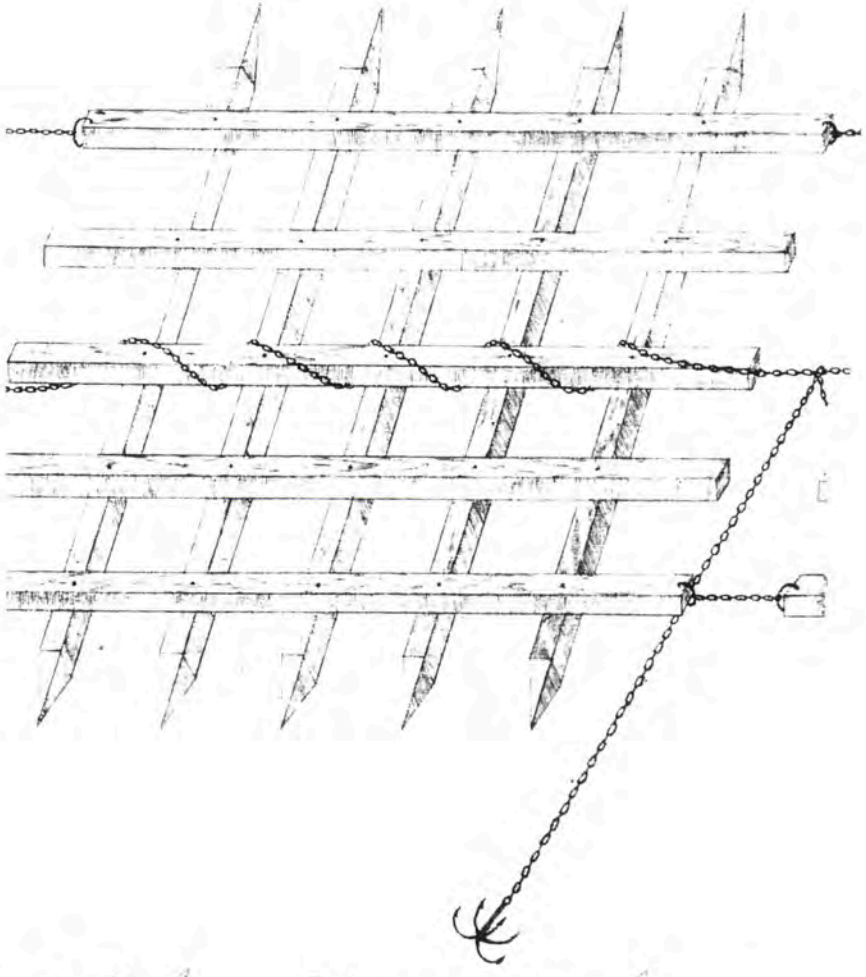
entry by Benjamin Anderson between Baltimore
& June 1861; abandoned January 1863

117-18

G-06-008

12¾" X 11½"

G-06-008
Fort Wadsworth - Drawing of Spiked Gate
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 117, Sht. 18
GATE-Fort Wadsworth/EX 10/95



...ston by Cooper - Pedersen - between Fort Wadsworth
...June 1862. abandoned January 1863

"B21

EXHIBIT 7: Channel Obstructions

TRACKING NO. 1191

G-06-009

11½"

PAGE NUMBERS TO BE COPIED

Waterborne Mines to Fight the U.S. Navy

In October of 1862, the Confederate Congress created a new military branch, the Torpedo Service, to wage a novel sort of warfare. The men of this small, select service were responsible for sowing mines in the rivers, bays and harbors to defend against Federal warships. They employed many sizes and shapes, with assorted explosive charges that were detonated by contact with a vessel's hull or by remote control from shore.

The Confederate mines were plagued by faulty detonators and poor waterproofing. Nevertheless, they did a great deal of destructive work throughout Southern waters, sinking or damaging 43 Federal vessels — including four powerful monitors — by the War's end.

The prospect of encountering an enemy torpedo consistently haunted Federal sailors. A U.S. Navy officer wrote: "The knowledge that a simple touch will lay your ship helpless, sinking without even the satisfaction of firing one shot in return, calls for more courage than can be expressed, and a short cruise among torpedoes will sober the most intrepid deportment."

G-06-009
12¾" X 11½"
Silhouette on Onyx Background

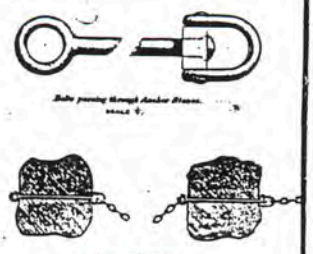
G-06-010

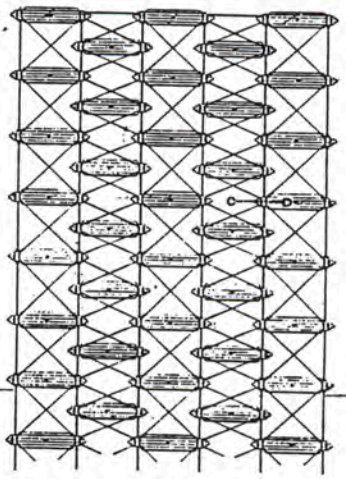
EXHIBIT 6: Channel Obstructions TRACKING NO. 1199

Drawer 117.
Sheet 3.

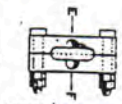
PLAN OF OBSTRUCTING THE ENTRANCE TO N.Y. HARBOR AT THE NARROWS

#6

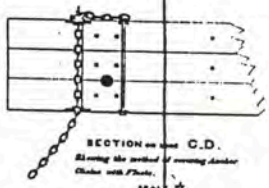




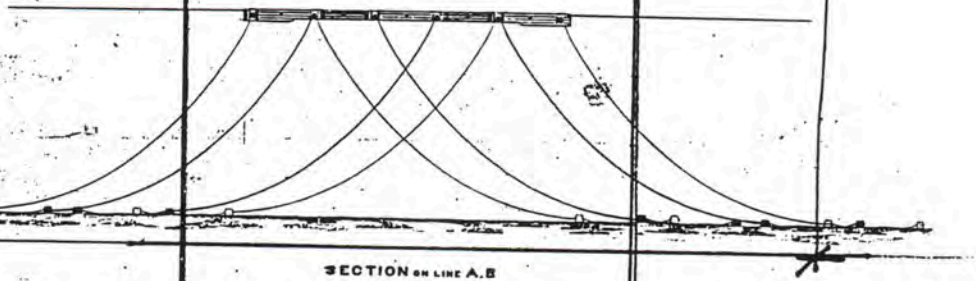
PLAN



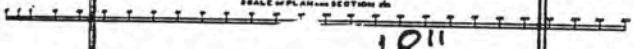




31 3/4"



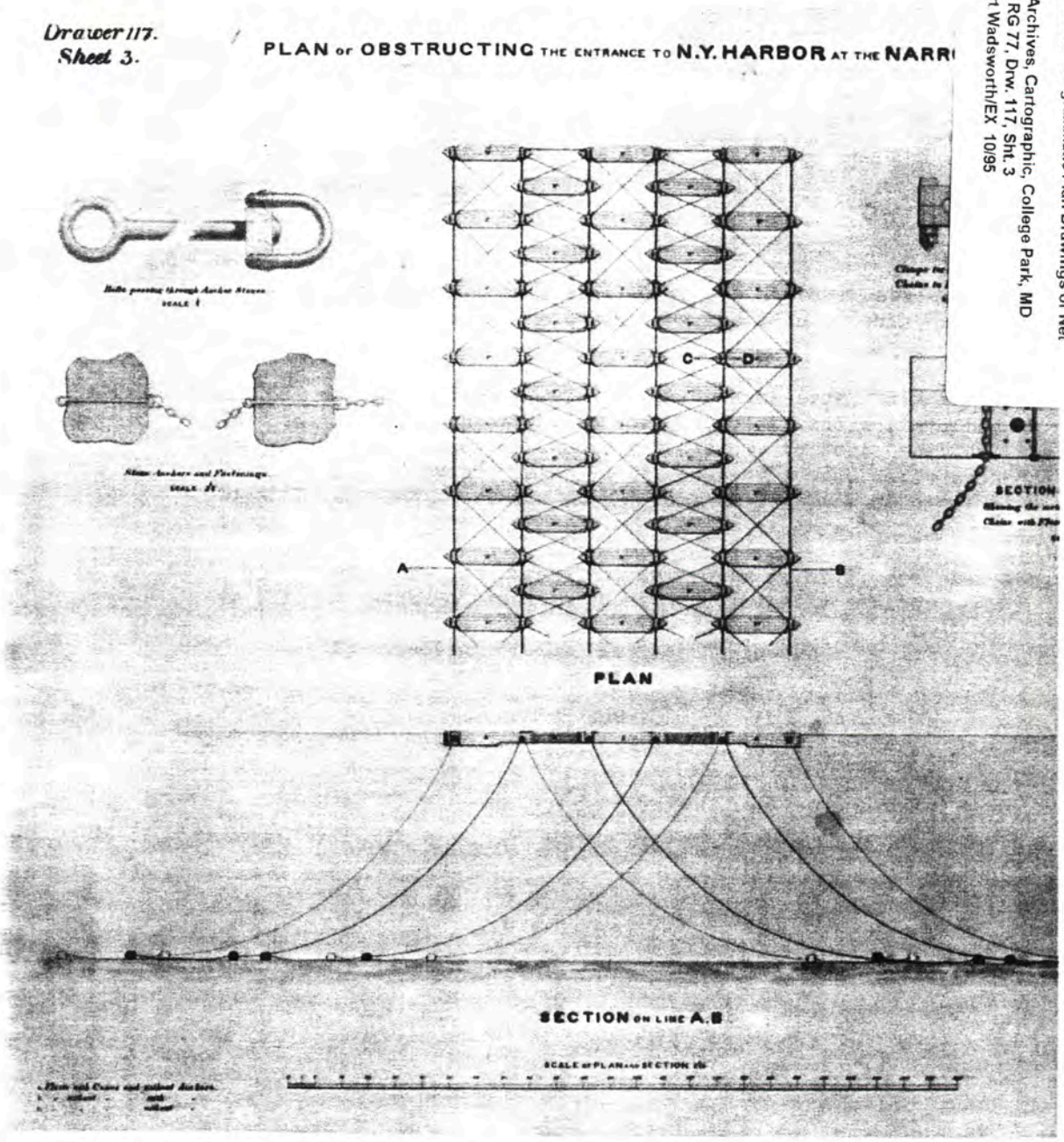
SECTION on LINE A.B



18"

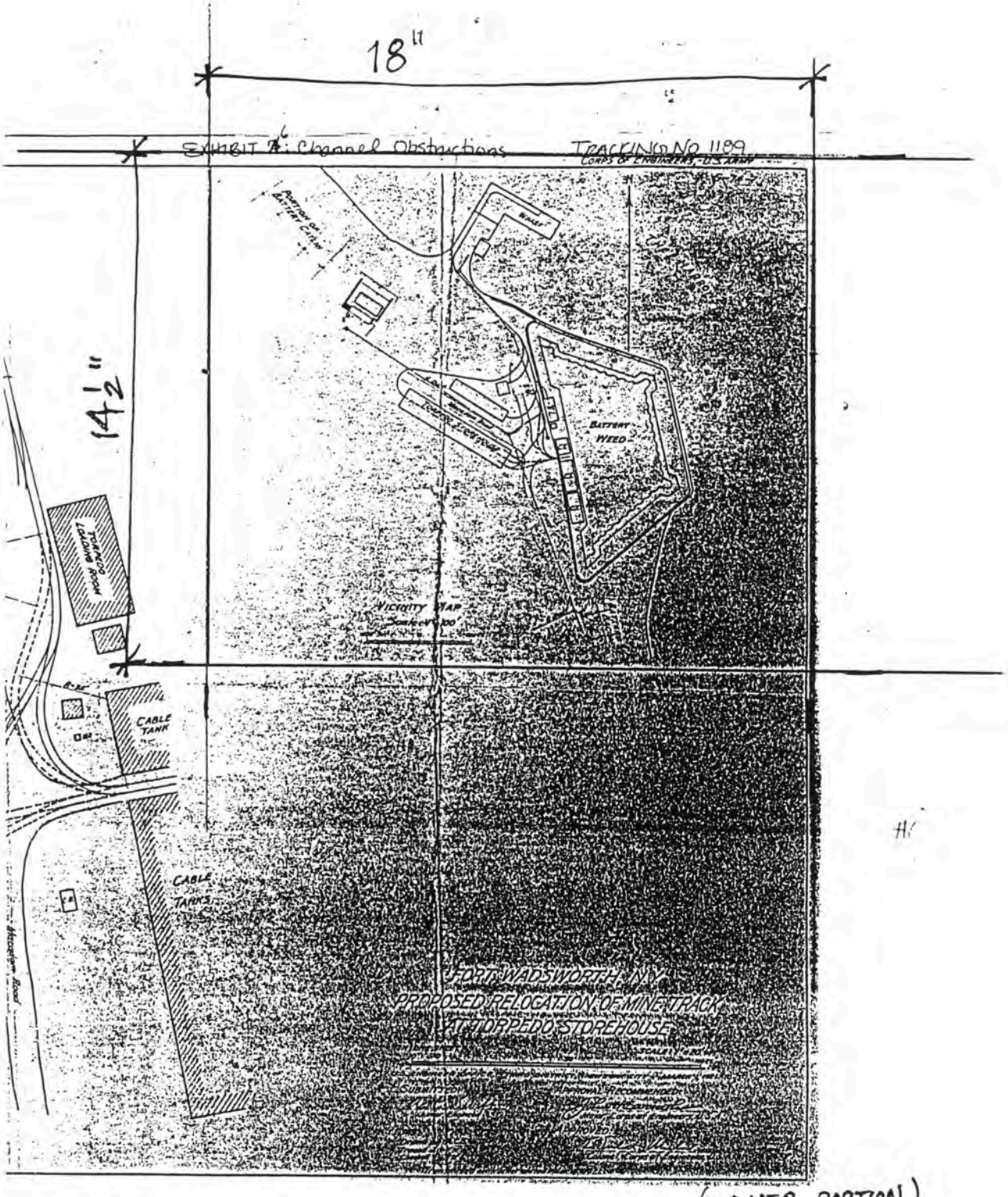
Washington D.C.

G-06-010



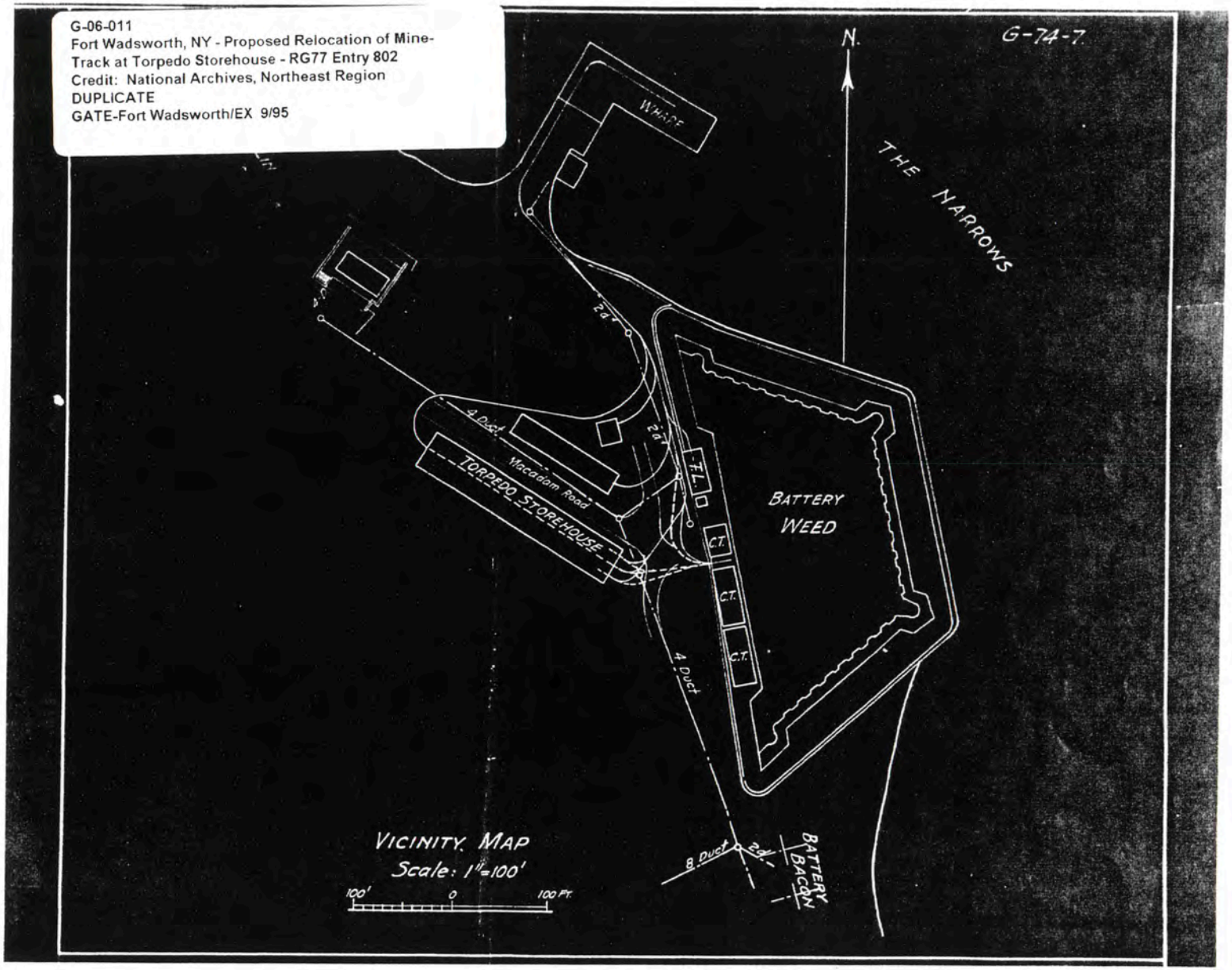
G-06-010
Fort Wadsworth - Diagrammatic Plan Drawings of Net Mines
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 117, Sht. 3
GATE-Fort Wadsworth/EX 10/95

G-06-011



G-06-011 (LOWER PORTION)

G-06-011
Fort Wadsworth, NY - Proposed Relocation of Mine-Track at Torpedo Storehouse - RG77 Entry 802
Credit: National Archives, Northeast Region
DUPLICATE
GATE-Fort Wadsworth/EX 9/95



G-06-011

EXHIBIT 6: Channel Obstructions TRACKING NO 1188

ADDRESS REPLY TO
THE DISTRICT ENGINEER OFFICE
ROOM 608, ARMY BUILDING
NEW YORK, N.Y.

REFER TO FILE NO.
Wads 5/149

WAR DEPARTMENT
UNITED STATES ENGINEER OFFICE
THIRD DISTRICT
ROOM 608, ARMY BUILDING, 39 WHITEHALL STREET
NEW YORK, N.Y.

1929
Wads. 5/149

Oct. 18, 1929.

NOTICE TO MARINERS:-

There has been installed in the Narrows between Forts Hamilton and Wadsworth one cable, the location of this cable being as follows:

Extending from a point at high water mark, Fort Wadsworth, 2200 ft. south of the light on Fort Wood (Ft. Wadsworth), thence in an easterly direction across the Narrows to Fort Hamilton, the Fort Hamilton terminus being 98 ft. east of a wood cable crossing sign 55 ft. long, erected on the bank 42 ft. back of high water mark.

Navigators are warned not to anchor or drag, grapple, etc. in this area due to possible resulting damage to cable.

By direction of The District Engineer:

Reading Wilkinson,
Captain, Corps of Engineers.
ac

Copy forwarded to Lt.McComsey, Ft.Hamilton,N.Y.
" " to 1st New York District, N.Y.

K&M Division POLY-VU
Torrance, CA 90503 # PV1193

15"

G-06-012

18"

ADDRESS REPLY TO
THE DISTRICT ENGINEER OFFICE
ROOM 608, ARMY BUILDING
NEW YORK, N. Y.

REFER TO FILE No.
Wads 5/149

WAR DEPARTMENT
UNITED STATES ENGINEER OFFICE
THIRD DISTRICT
ROOM 608, ARMY BUILDING, 39 WHITEHALL STREET
NEW YORK, N. Y.

Wads. 5/149

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Navigators are warned not to anchor or drag, grapple, etc. in this area due to possible resulting damage to cable.

By direction of The District Engineer:

Reading Wilkinson,
Captain, Corps of Engineers.

acs

Copy forwarded to Lt. McComsey, Ft. Hamilton, N.Y.
" " " to Lt. New York District, "

G-06-012
Letter from War Dept. warning of cable across Narrows,
October 18, 1929
Credit: National Archives, Northeast Region
DUPLICATE
GATE-Fort Wadsworth/EX 9/95

462'11"

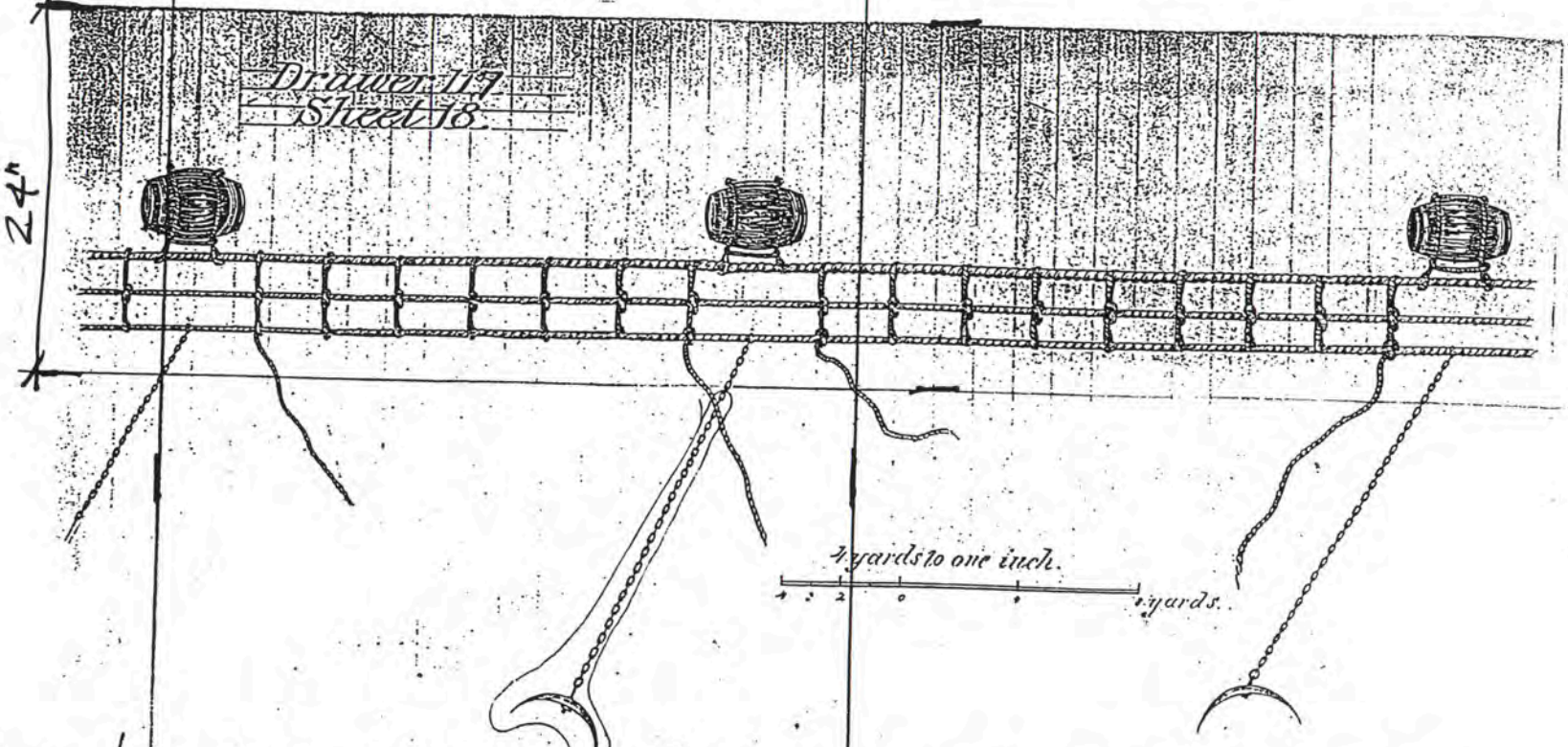
BLEED ON 3 SIDES

6 EXHIBIT 7: Channel Obstructions

TRACK II

24"

Drawer 117
Sheet 18



Rope obstructions laid in April & May 1863 between Sumter and Sullivans, first a continuous line thence cut into sections 30 feet long swinging with the tide around one anchor effective till the evacuation of the City.

6-06-013

~~2' x 3' 10½"~~

2' x 3' 10 1/2"

117-18-1

RG77

DETAILS OF PROPOSED PLAN OF OBSTRUCTING THE ENTRANCE TO N.Y. HARBOR AT THE NARROWS (Plans, elevations, sections & details) Dec. 5, 1863 pms 1863 Dr. 117 Sht 18-1

Silhouette ~~& Repeat~~ this detail in center of panel

Silhouette and Repeat this detail at center of panel.

G-06-013

REPRODUCED AT THE NATIONAL ARCHIVES

G-06-014

G-06-014

Drawer II
Sheet 4

EXHIBIT 7: Channel Obstruct., TRACING No. 1202

DETAILS OF PROPOSED PLAN OF OBSTRUCTING THE ENTRANCE TO N.Y. HARBOR AT THE NARROWS.

EXPLANATION

a 6in. Wire Rope
b Cone Fastenings
c Anchor Holes
d Additional Loops for Floats with
e Connexion First and Last Rope.
f 8 in. Wire Rope Ties

SIDE ELEVATION

SECTION A.B.

PLAN OF ONE OF THE FLOATS WITH THE CONE FASTENINGS.

25'.0"

SECTION C.D.

SIDE ELEVATION

SECTION E.F.

PLAN OF ONE OF THE FLOATS WITHOUT THE CONE FASTENINGS.

FEET.

Washington D.C.
Dec. 5th 1863

19 "

#6

18 "

G-06-014
Fort Wadsworth - Detail of Float
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 117, Sht. 4
GATE-Fort Wadsworth/EX 10/95

Drawer 117.
Sheet 4.

DETAILS OF PROPOSED PLAN OF CONSTRUCTING [illegible]

EXPLANATION
a 6in. Wire Rope
b Cone Fastenings
c Anchor Holes
d Additional Logs,for Floats with Cones,on First and Last Rope
e 1½in. Wire Rope Ties

SIDE ELEVATION

SECTION A...B.

PLAN of ONE of the FLOATS with the CONE FASTENINGS.

SECTION C...D.

SIDE ELEVATION

SECTION E...F.

PLAN of ONE of the FLOATS without the CONE FASTENINGS.

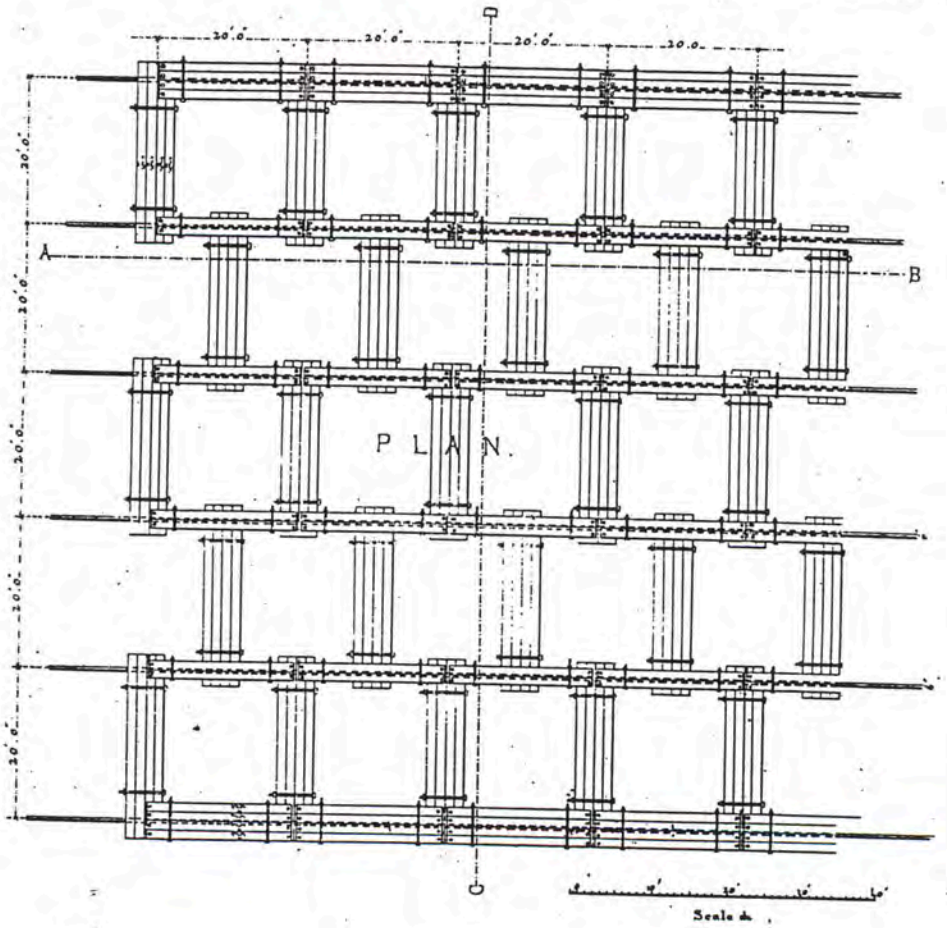
FEET

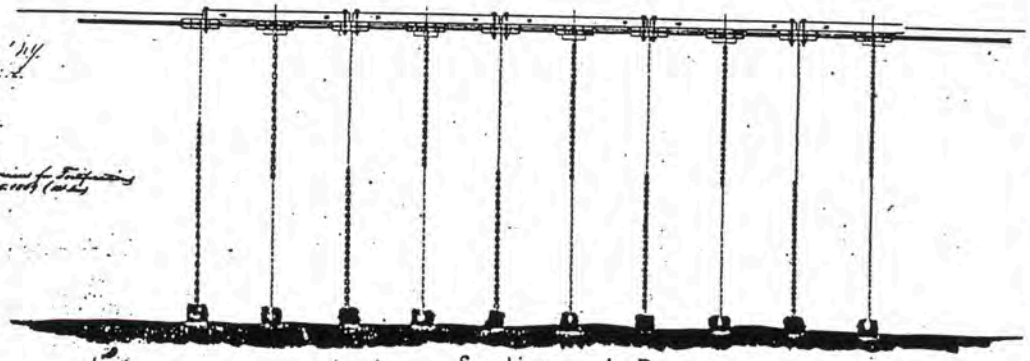
Washington D.C.

Drawing
Sheet 5.

G-06-015

DETAILS OF PROPOSED PLAN OF OBSTRUCTING THE ENTRANCE TO N.Y. HARBOR AT THE NARROWS





Section on A_B.

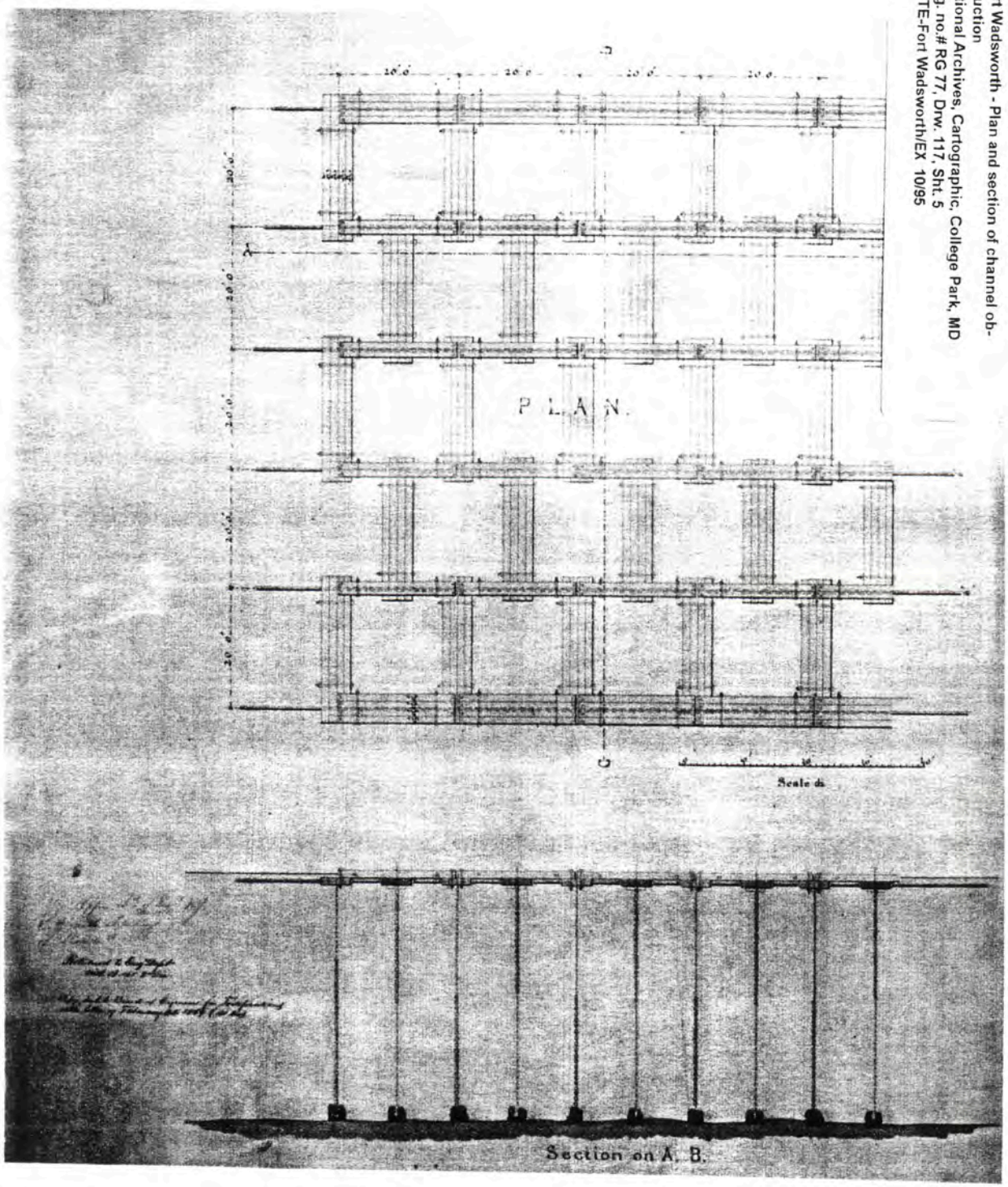
1 1/2" (19")

#6

117-5

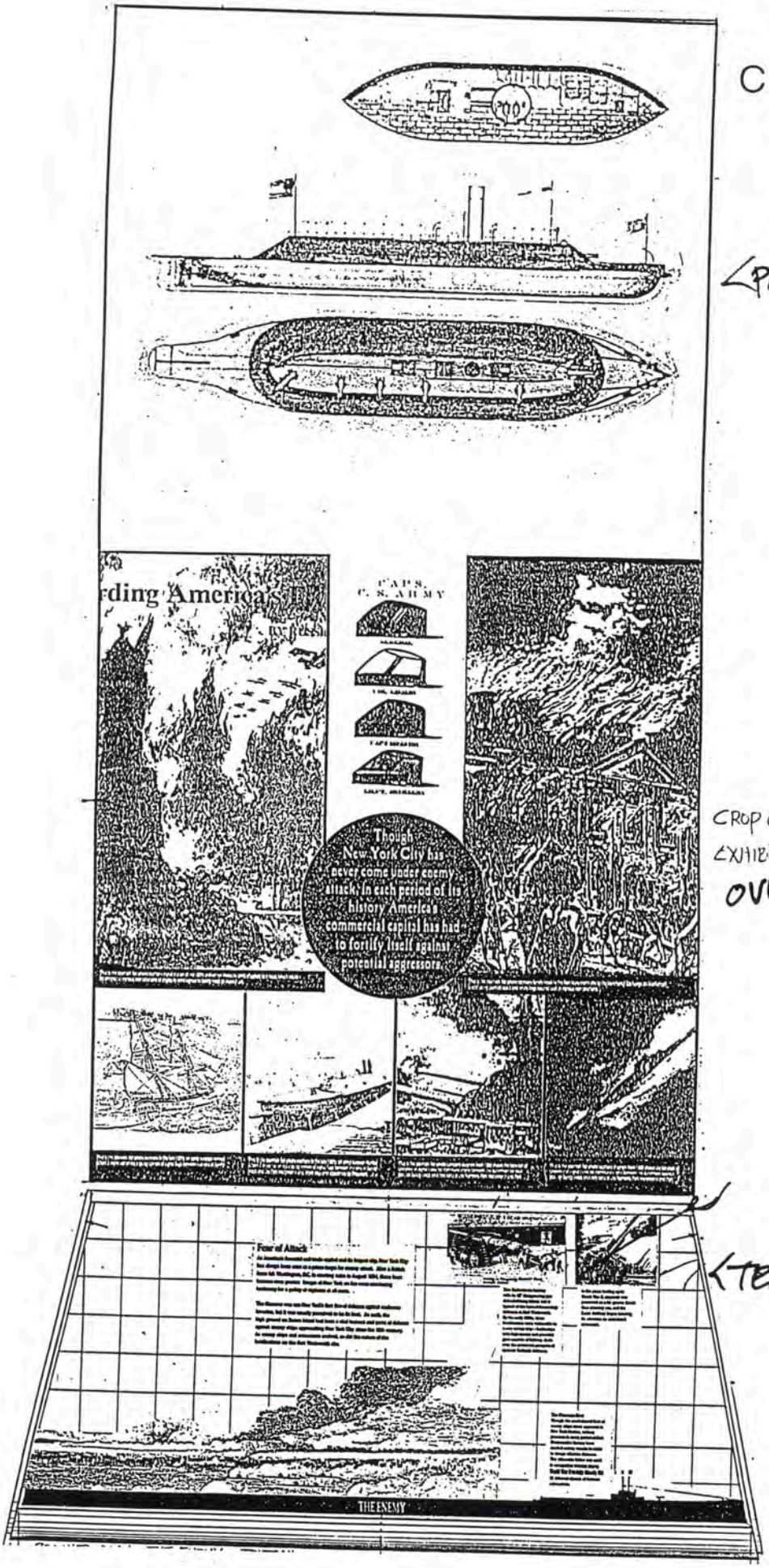
18"

G-06-015



G-06-015
Fort Wadsworth - Plan and section of channel obstruction
National Archives, Cartographic, College Park, MD
Neg. no.# RG 77, Drw. 117, Sht. 5
GATE-Fort Wadsworth/EX 10/95

EXHIBIT 07
CROP GUIDE



PANEL

CROP GUIDE
EXHIBIT #7
OVERALL VIEW

TEXTRAIL

G-07-003

#

REPRODUCED AT THE NATIONAL ARCHIVES

THE BOMBARDMENT OF FORT FISHER, JANUARY 15, 1865.

G-07-003
BLEED LEFT AND BOTTOM
10" X 3' 1½"

K&M Division POLY-VU
Torrance, CA 90503 # PV119G

Labels Schedule

Labels (Text Only)

G-07-004

G-07-004
5 1/2 x 9"

Loading a Disappearing Seacoast Gun

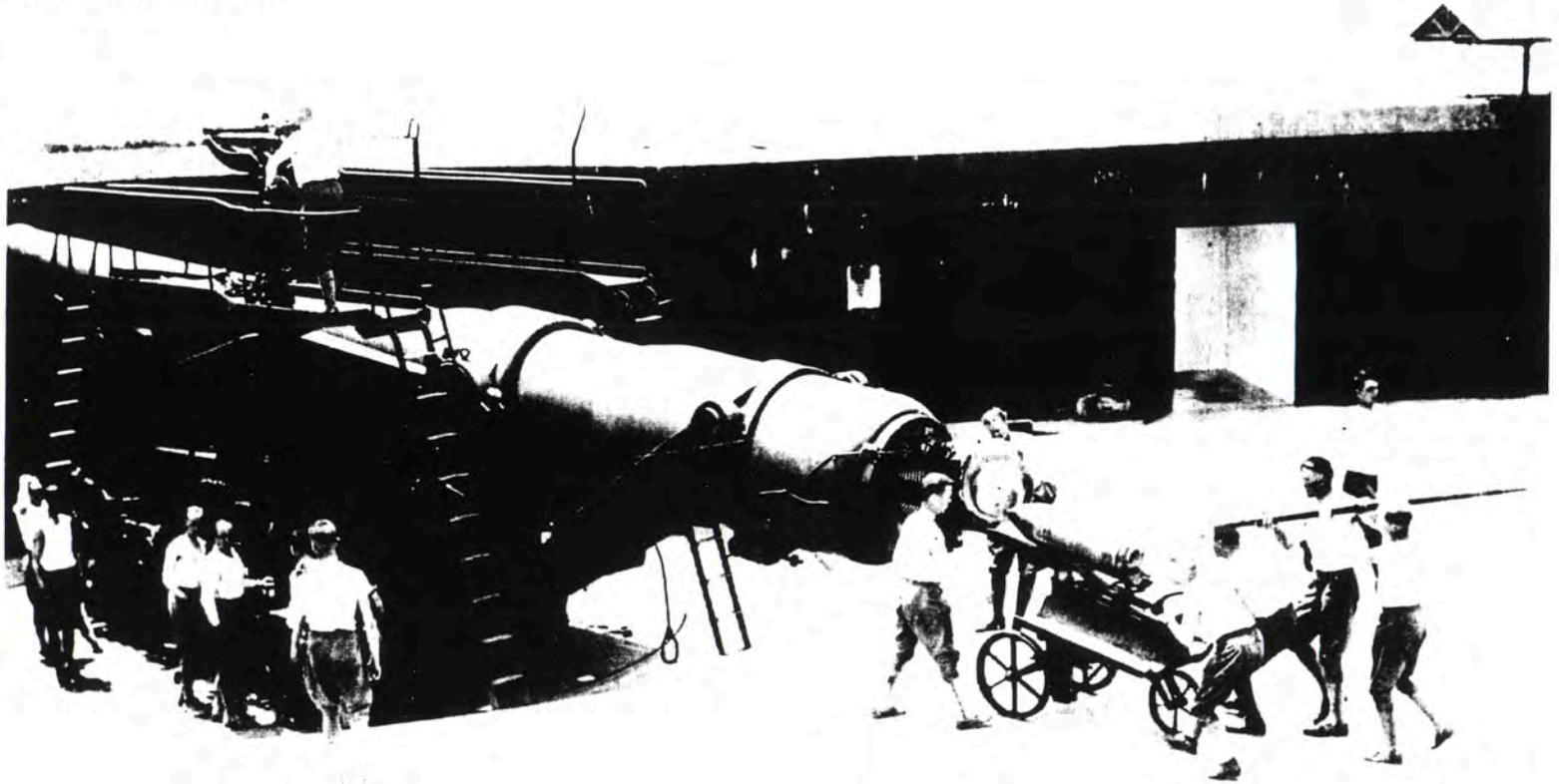
National Archives
165-WW-388-D4
(Fort Monroe, VA)
NPS has photo

#7

9"

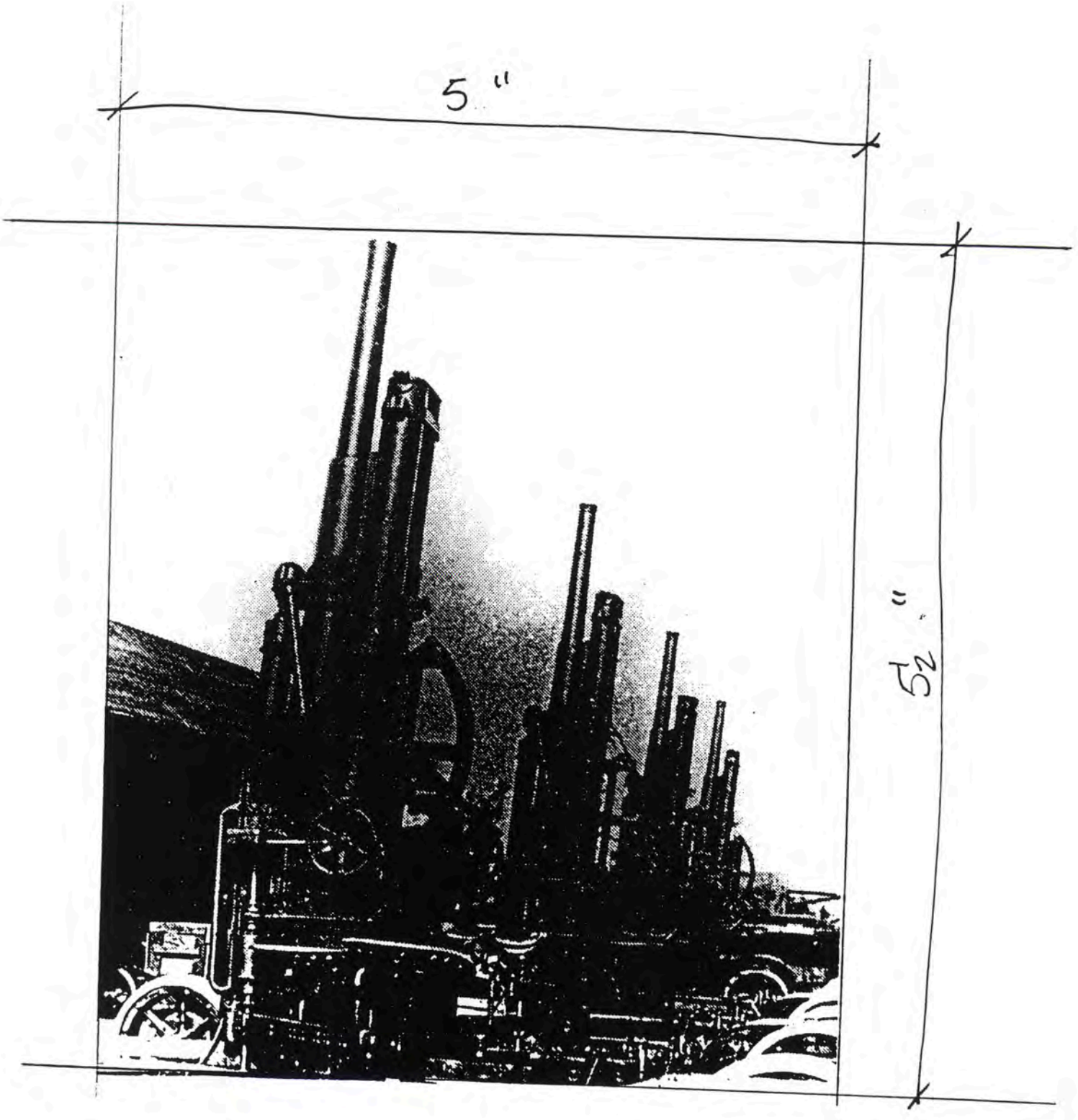
5 1/2"

G-07-004
Artillery - Loading a Disappearing Seacoast Gun
Negative Number: 165-WW-388-D1
Credit: National Archives
Duplicate
GATE- Fort Wadsworth/EX 10/95



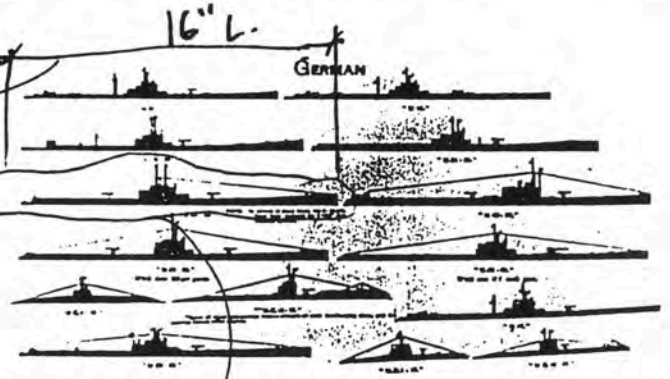
G-07-004

G--07-005
5½" X 6"



Photographs referenced on this sheet are from the NAVAL HISTORICAL CENTER BASIC COLLECTIONS

WWI German Subs



NH 94710

GERMAN SUBMARINES, WORLD WAR I.

BRITISH RECOGNITION CARD, FEATURING SILHOUETTES OF 14 DIFFERENT CLASSES OF GERMAN SUBMARINES.

COLLECTION OF FRAZER V. SINCLAIR, COURTESY OF MRS. MABEL SINCLAIR, 1983.

RELEASED.

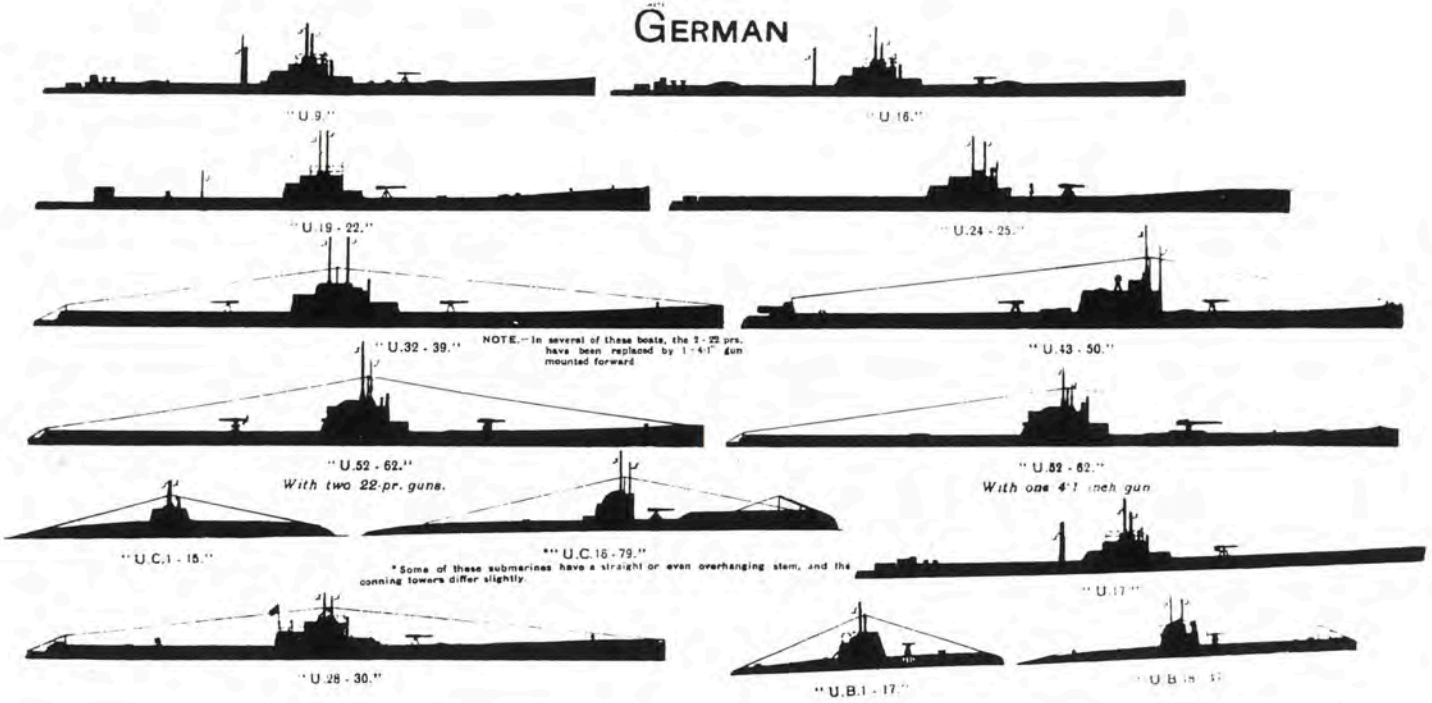
TRACKING No. 1013

G-07-006

Silhouette This one only
2½" x 1'4"

G-07-006

G-07-006
Chronology - World War I - German Submarines
British recognition card, featuring silhouettes of 14 different classes of German submarines. Collection of Frazer V. Sinclair, courtesy of Mrs. Mabel Sinclair, 1983.
Credit: U.S. Naval Historical Center
RESTRICTED/DUPLICATE GATE-FW/EX 9/95



G-07-006

G-07-008

Picture facing Page 227 of "Friendship" located in "The Sailors Magazine and Naval Journal" April, 1829.

Published by the American Seamans Friend Society, N.Y.

				1	8 x 10	$2.00

BRIG FRIENDSHIP, CAPTAIN SIMPSON, OF SHIELDS, ENG.
On board of which the first Bethel Prayer Meeting was held, June 22, 1814.

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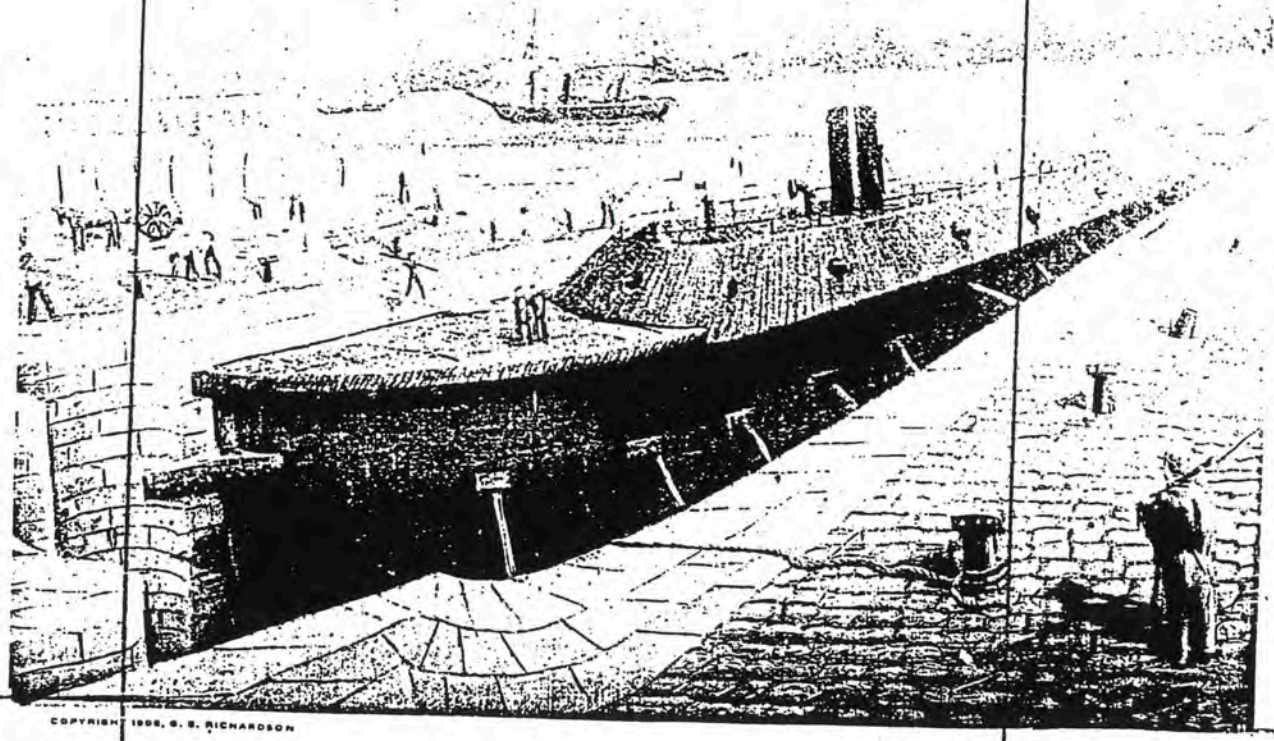
* See
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G-07-008
War of 1812 - Warship
Engraving of British warship from the War of 1812
Neg. # LC-USZ62-64020
Credit: Library of Congress
DUPLICATE GATE-Ft. Wadsworth/EX

LC-USZ62-69114

From Prints & Photographs Div., Library of Congress

G-07-009



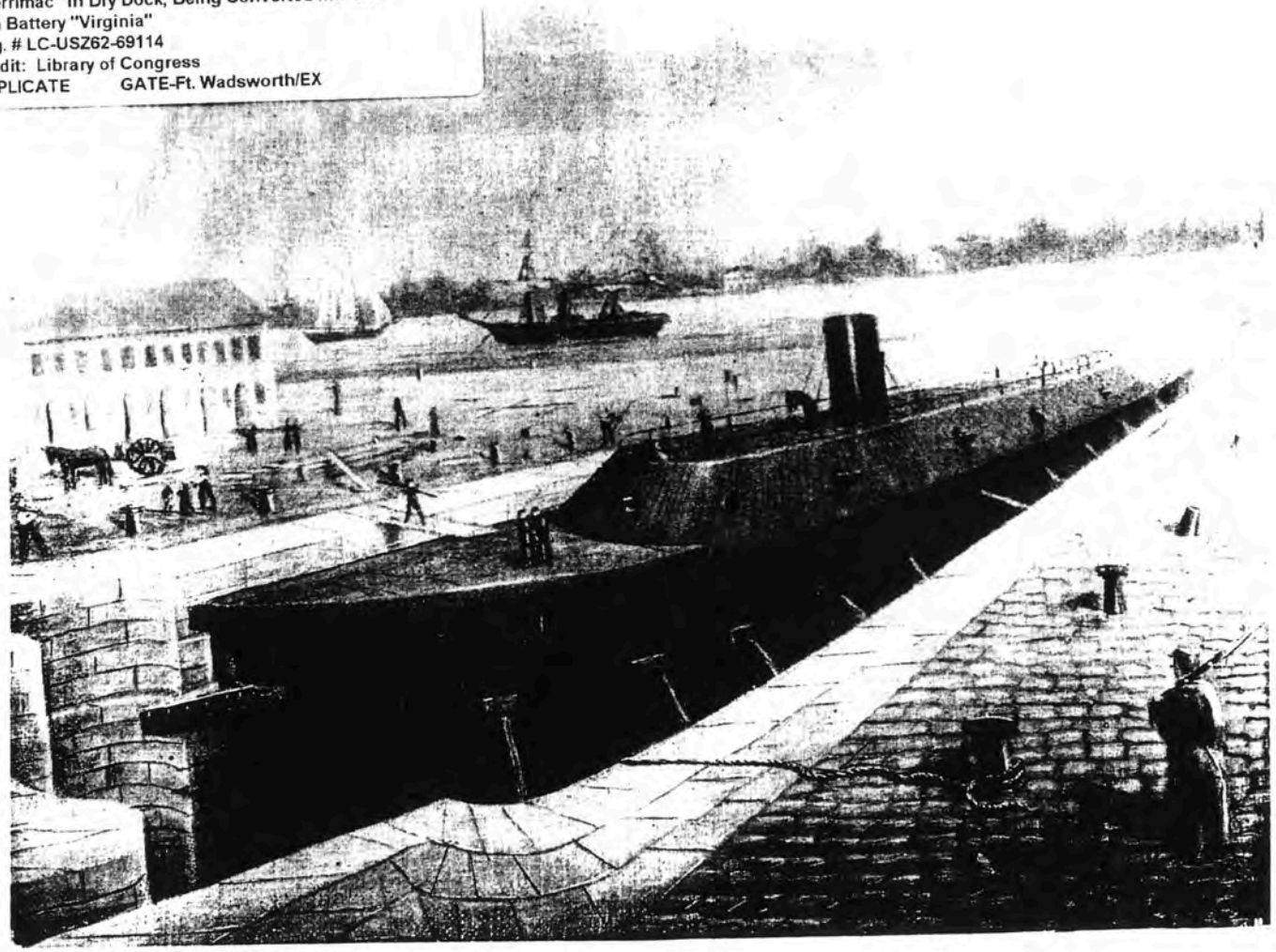
"MERRIMAC" IN DRY DOCK, BEING CONVERTED INTO THE IRON BATTERY "VIRGINIA."

G-07-009

12¾" X 11½"

G-07-009

G-07-009
Civil War - Navy - Confederate Ironclad
"Merrimac" in Dry Dock, Being Converted into the
Iron Battery "Virginia"
Neg. # LC-USZ62-69114
Credit: Library of Congress
DUPLICATE GATE-Ft. Wadsworth/EX



"MERRIMAC" IN DRY DOCK, BEING CONVERTED INTO
THE IRON BATTERY "VIRGINIA."

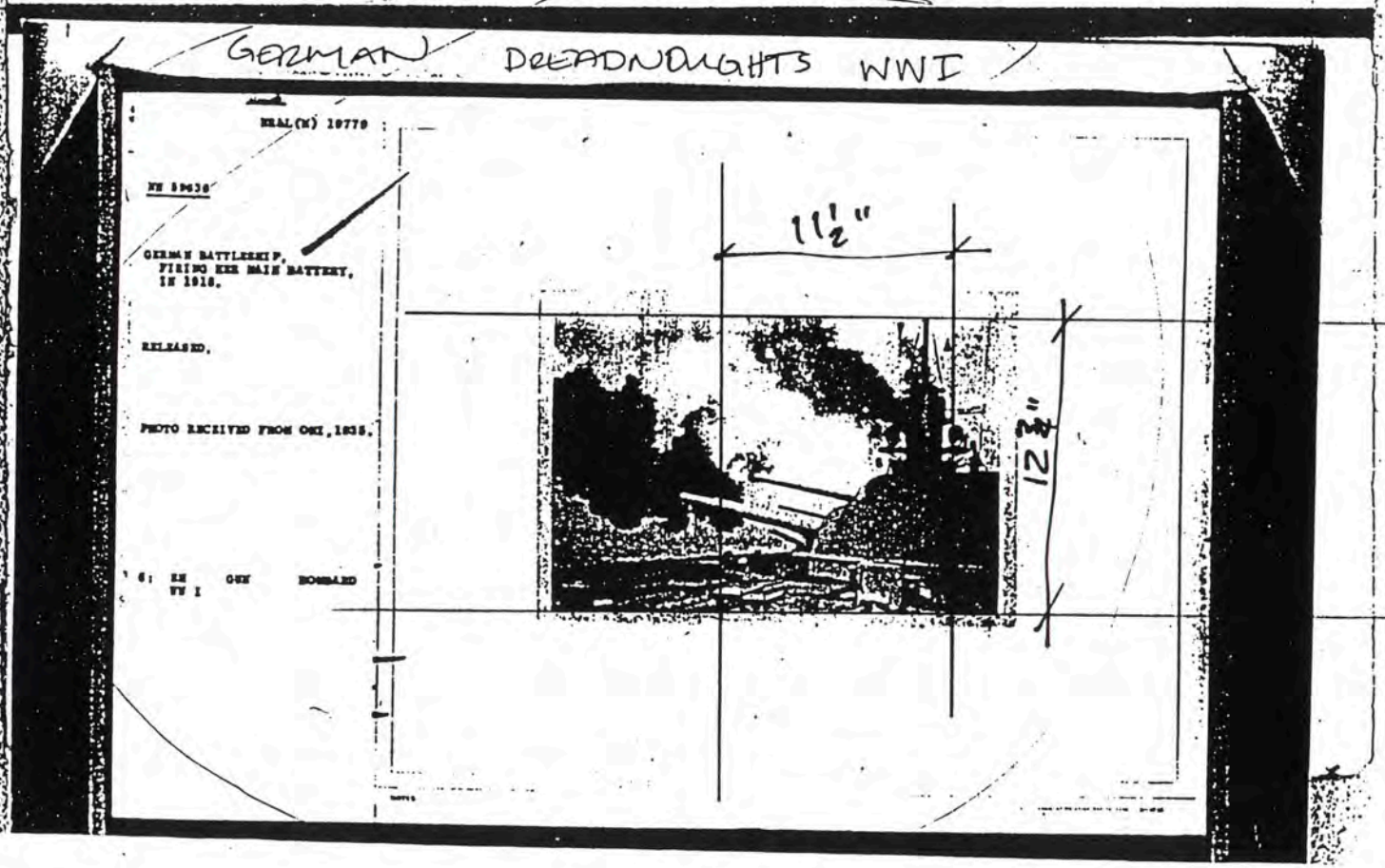
G-07-009

G-07-010

are from the NAVAL

BASIC COLLECTIONS

GERMAN DREADNOUGHTS WWI

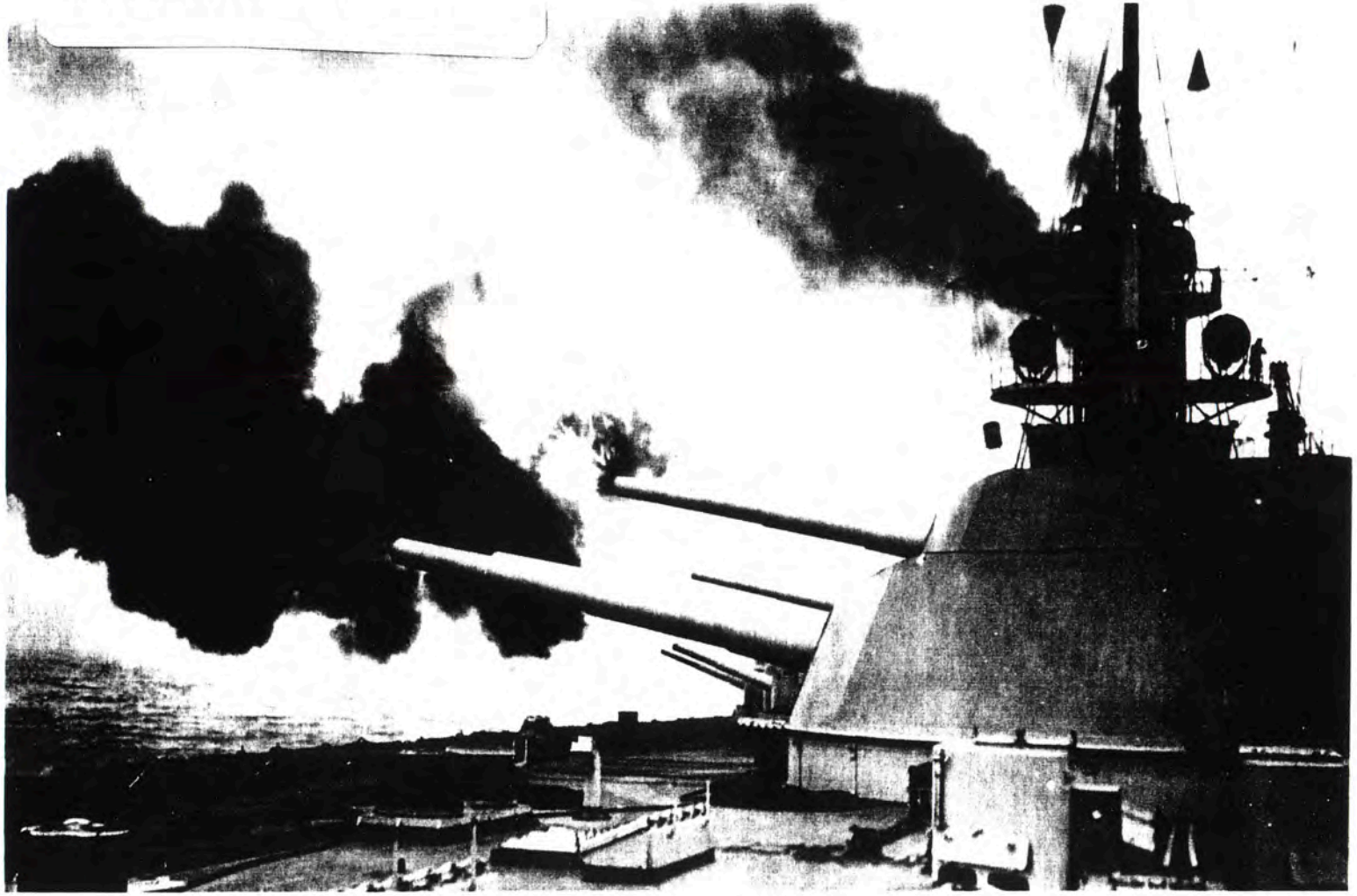


FOR THE ENEMY ALCOVE- POSITION 3

G-07-010
12¾" X 11½"

G-07-010

G-07-010
Chronology - WWI - German Battleship firing her main battery, in 1918. Neg.# NH 59636
Credit: U.S. Naval Historical Center
RESTRICTED/DUPLICATE GATE-FW/EX 9/95



G-07-010

G-07-011

11½"

G-07-011
12¾" x 11½"

Order these photographs from
NATIONAL ARCHIVES

Enemy Alcove

#7

The most common U-boats in WWII - the U-boats ... in WWII
... of NY Harbor in WWII were probably of this class

neg at NHC. Copied from NARS [illegible] Print

WWII U-Boats

80-G-320284
(National Archives)

GERMAN TYPE VII SUBMARINE

EN ROUTE TO AN ALLIED PORT TO SURRENDER, AT THE END OF THE WAR IN EUROPE, circa 7 MAY 1945. THIS BOAT IS SNORKEL-EQUIPPED.

PHOTO RECEIVED FROM COMNAVEU, 25 MAY 1945.

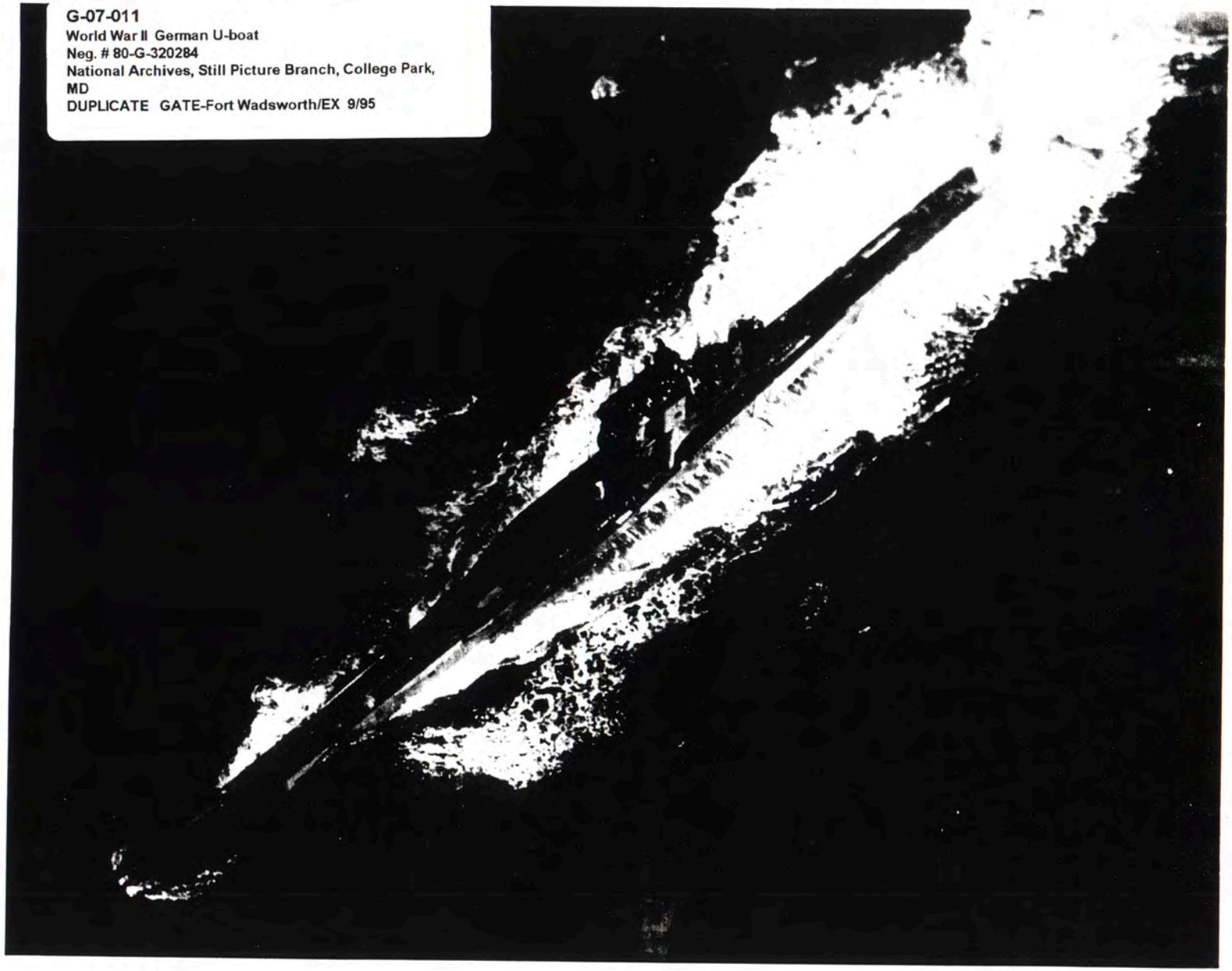
SH WWII-BATLANT
4 WWII-GERM.SURREND.

2 3¼



G-07-011

G-07-011
World War II German U-boat
Neg. # 80-G-320284
National Archives, Still Picture Branch, College Park, MD
DUPLICATE GATE-Fort Wadsworth/EX 9/95



G-07-011

G-07-012

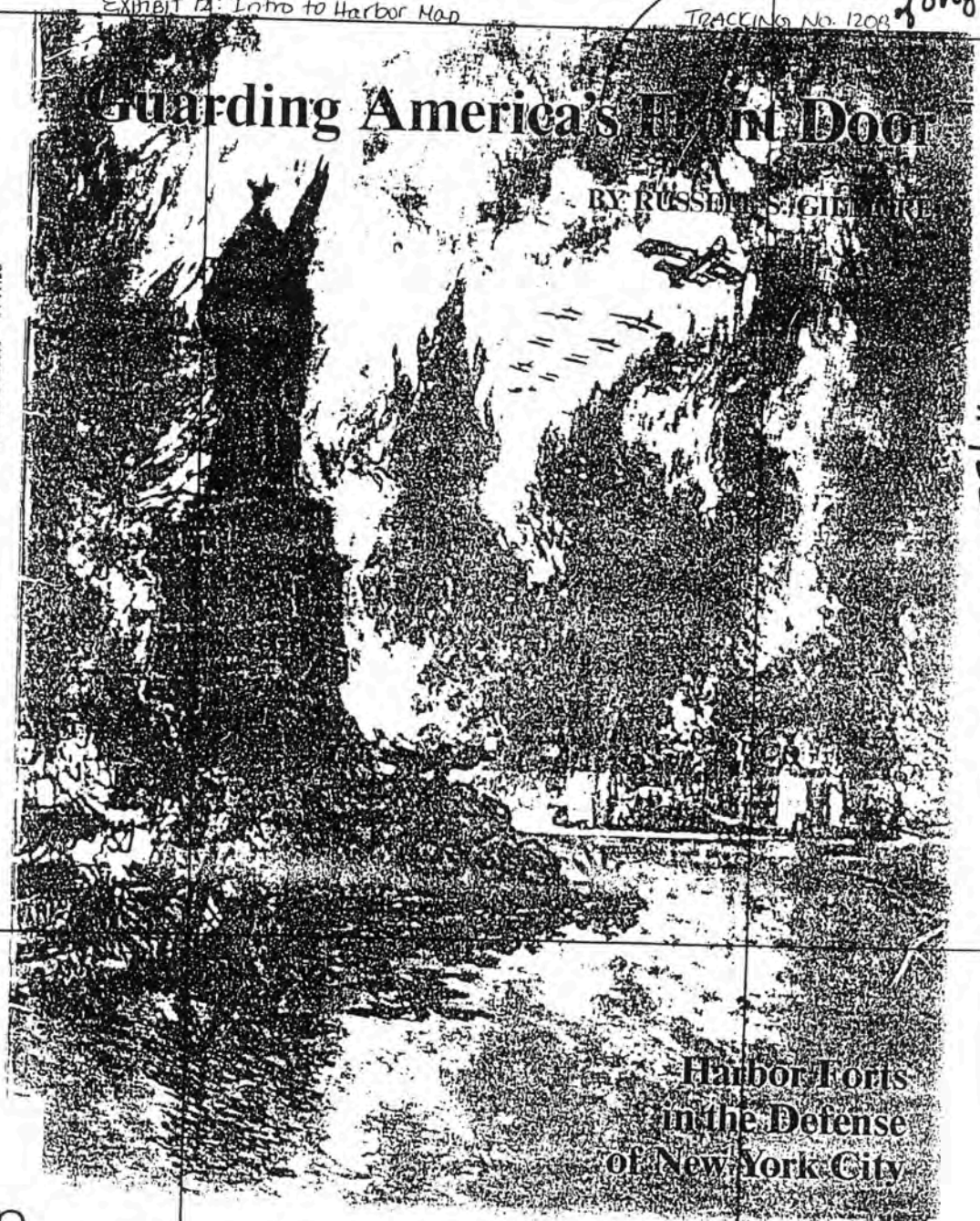
18"

G-07-012

Shoot from National Archives Transcript of original (w/o type)

EXHIBIT 12: Intro to Harbor Map

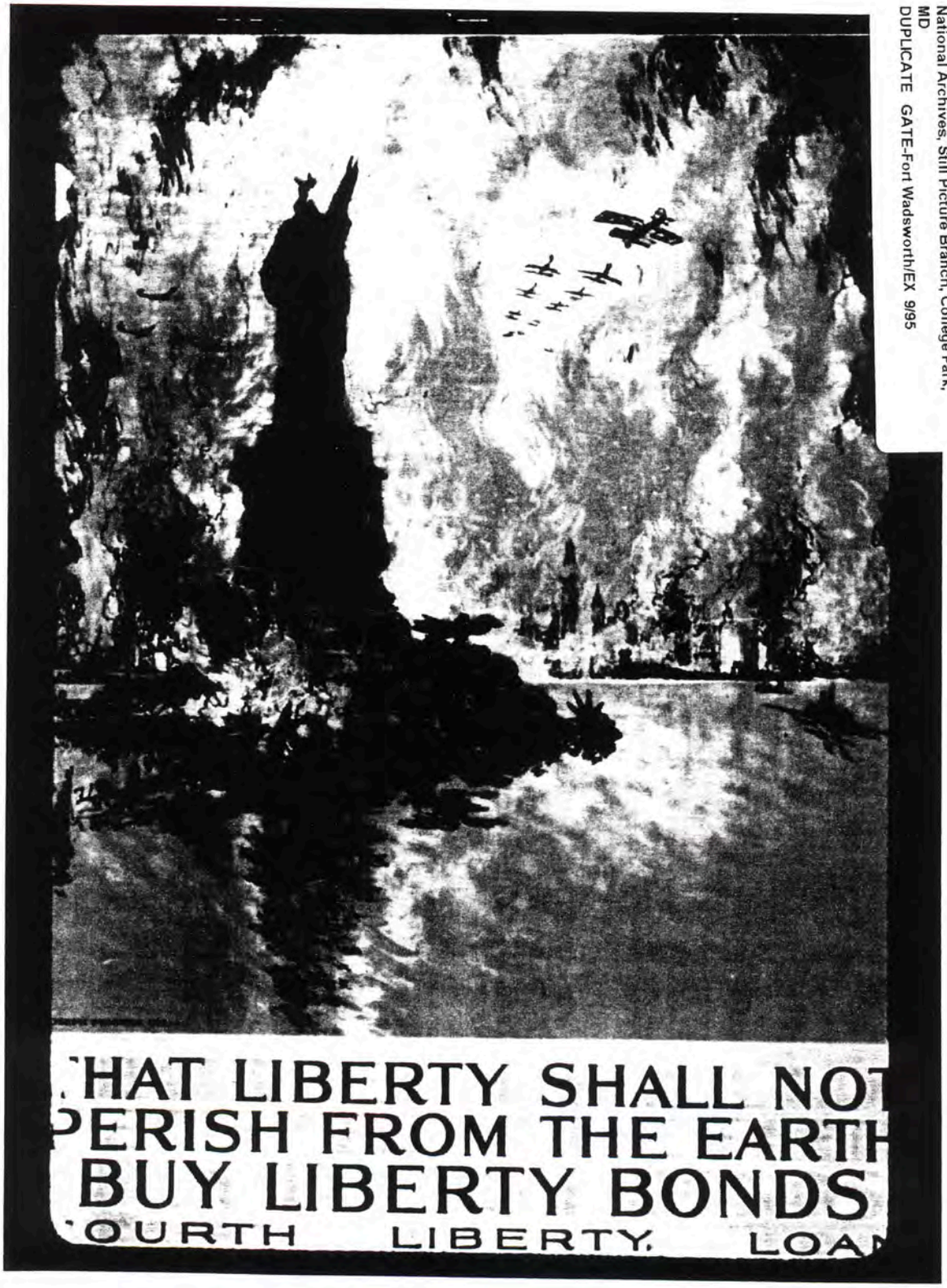
TRACKING No. 1208



K&M Division POLY-VU
Torrance, CA 90503 # PV119G

33 1/2"

G-07-012



G-07-012
Poster of New York Harbor on Fire
Neg. # 1220-WP-65 (Rack T)
National Archives, Still Picture Branch, College Park, MD
DUPLICATE GATE-Fort Wadsworth/EX 9/95

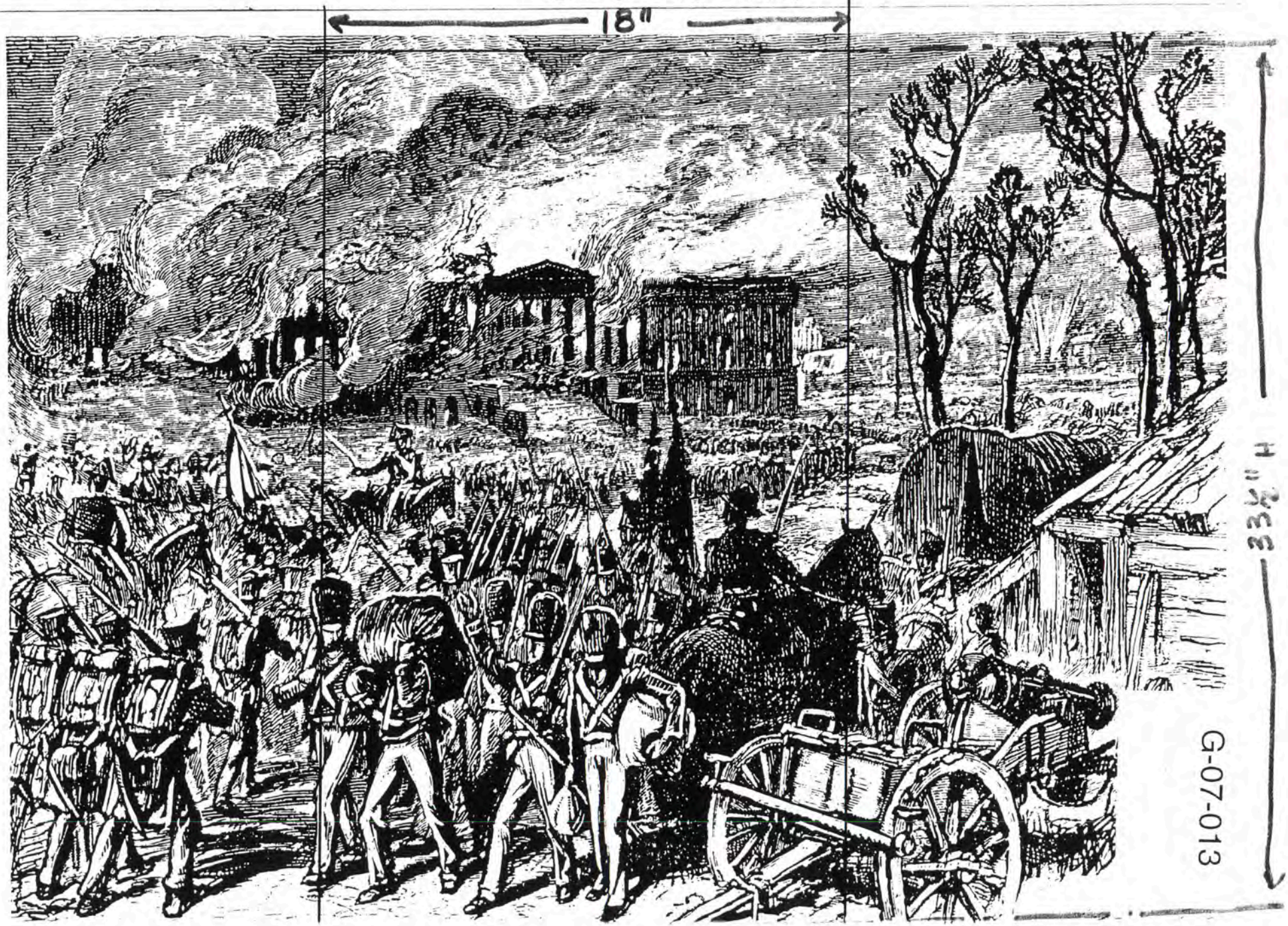
[U.S. C[illegible]l - not accurate because there was no cent[illegible]
build[illegible]r pediment in 1814]

LC-USA7-33623

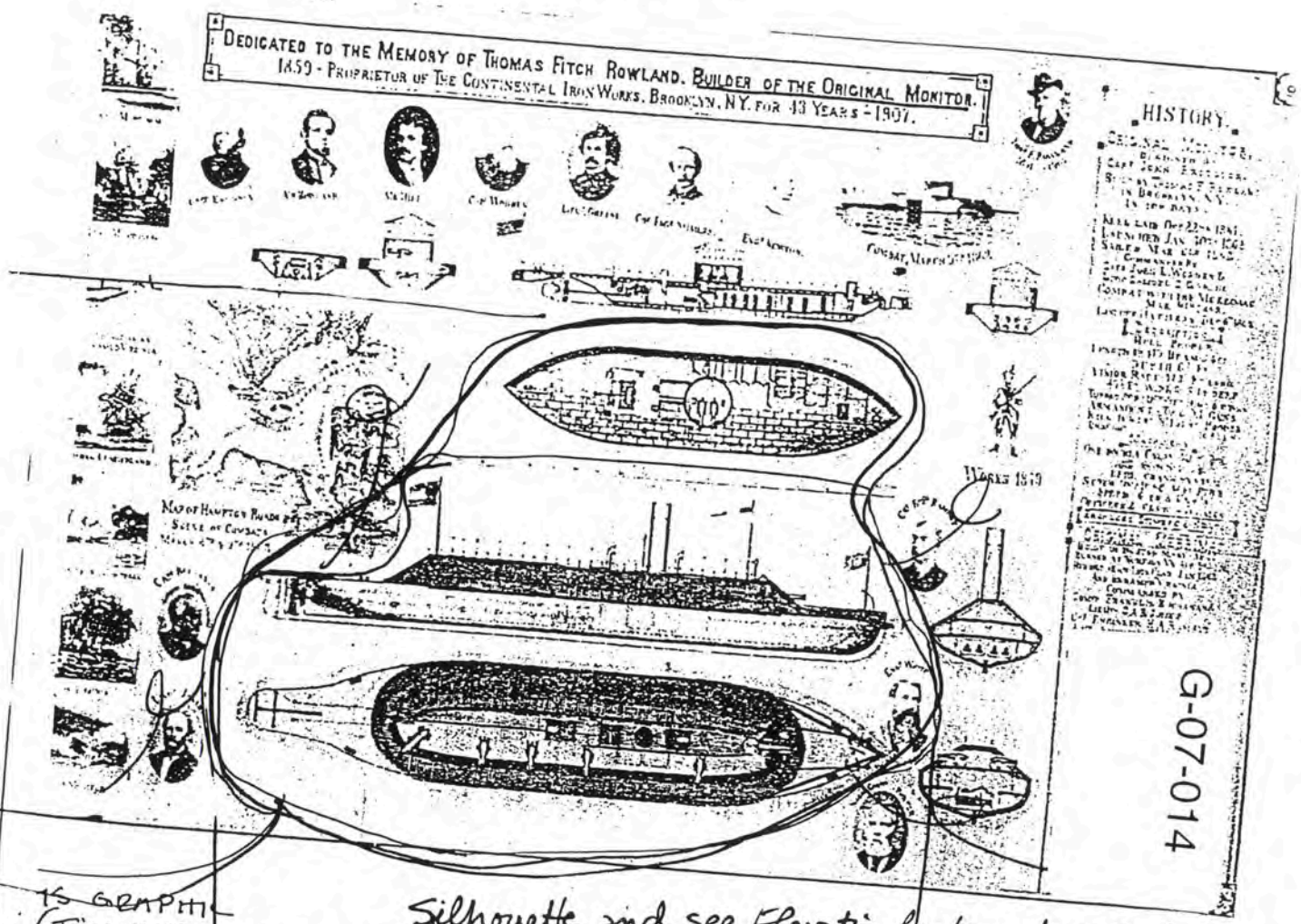
Engraving in Devens, Our First Century, 1876, p. 247

Architect of the Capitol Coll.

6-07-013 alternate



G-07-014



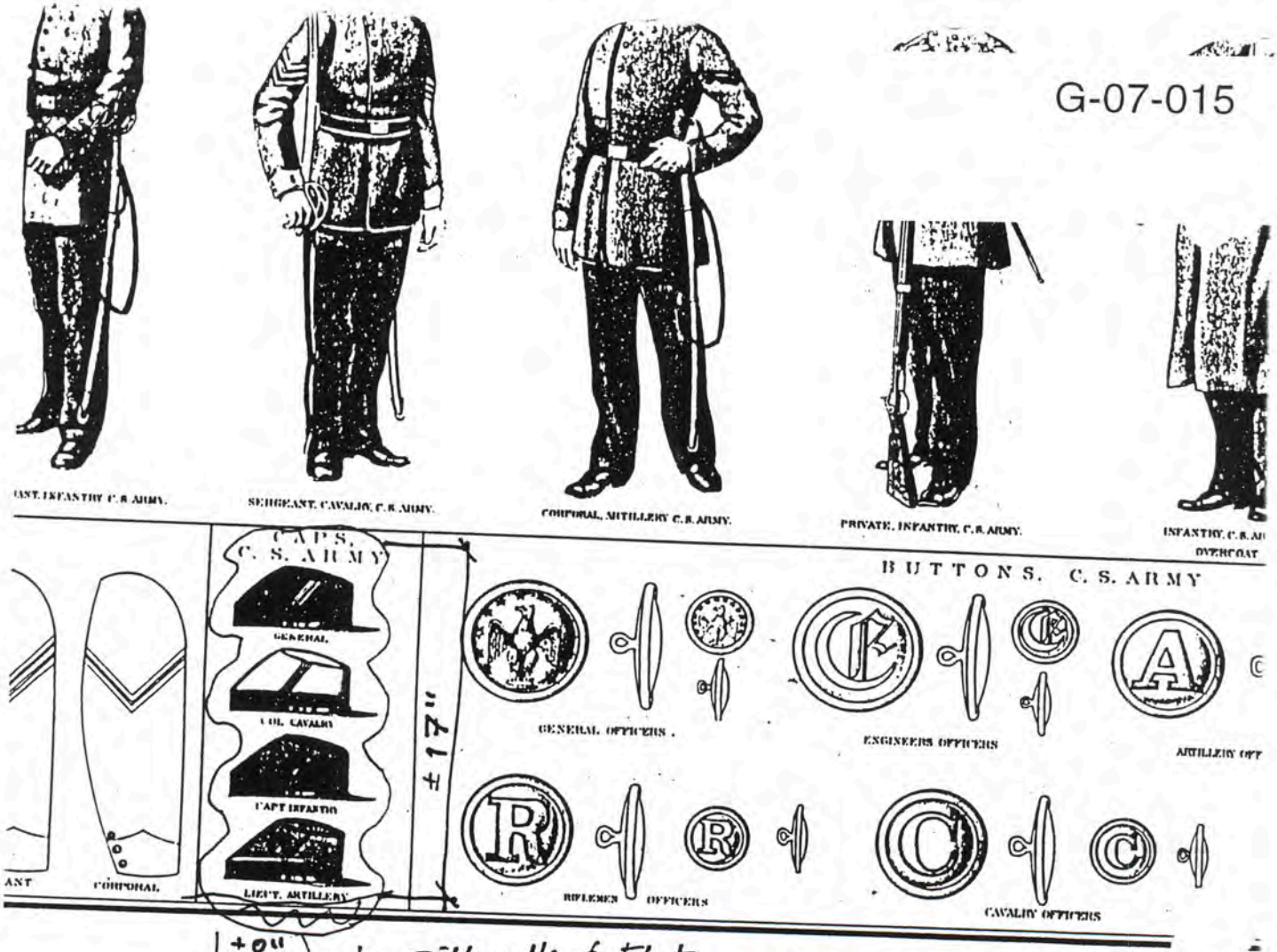
IS GRAPHIC

(I'M HEADING TO THE ARCHIVES REGARDLESS - BUT LET ME KNOW

Silhouette and see Elevation for Layout in Background
3'-11" wide x 3'-7½" H.

Silhouette NS line art

G-07-015



Silhouette & Float in Background 10 3/4" w. TRACKING NO. 10

See Graphic Elevation

Silhouette, used as insert

1'5" x 8"

G-07-015

CAPS, C. S. ARMY



GENERAL



COL CAVALRY



CAPT. INFANTRY

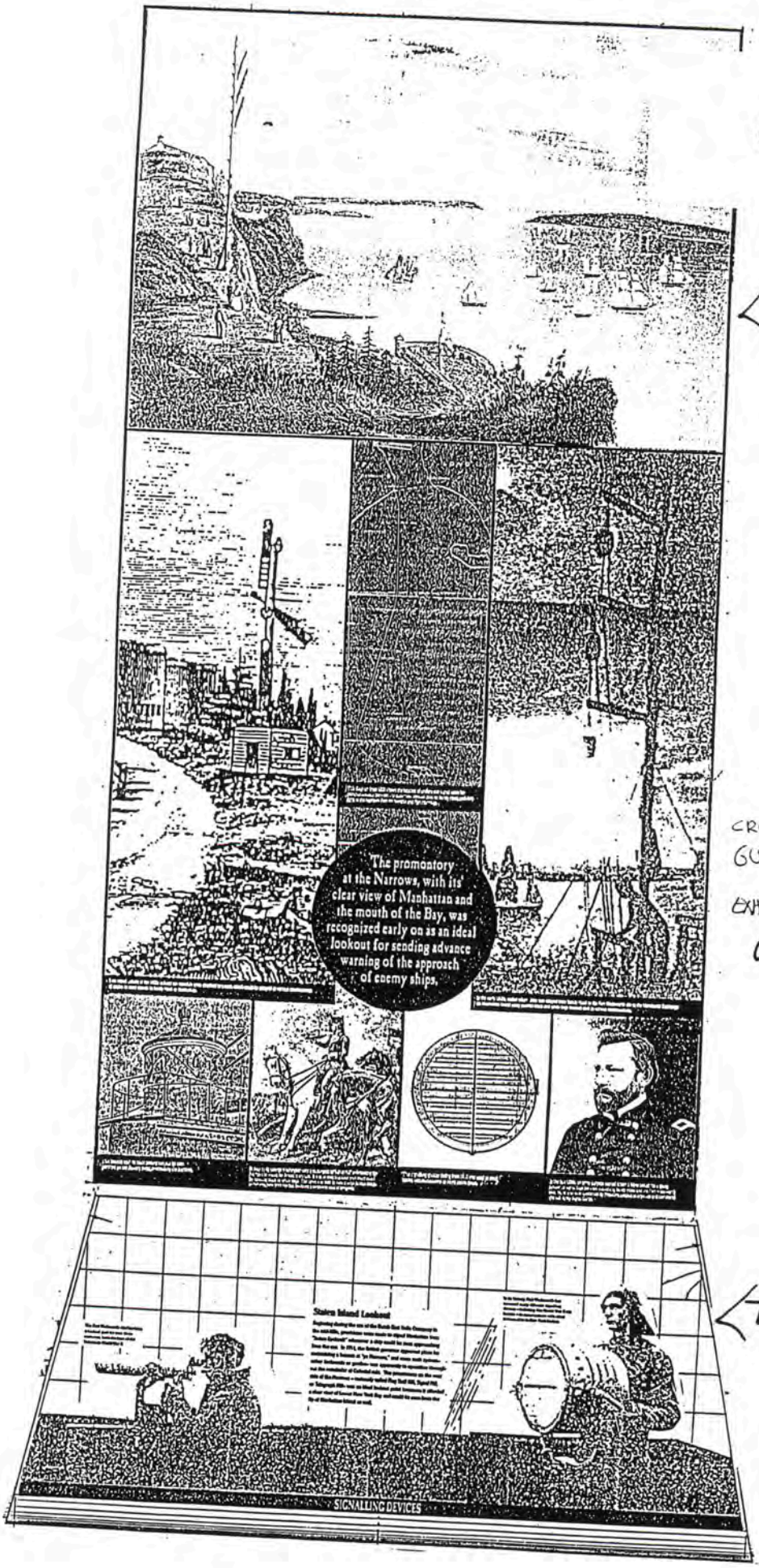


LIEUT. ARTILLERY

G-07-015
Civil War -Confederate Caps
Photographed from Atlas to Accompany the Official Records of the Union and Confederate Armies by Hon. Daniel S. Lamont - plate 172 (CLXII) - 1895 edition from NPS Archives
GATE/EX 9/95

Color Print 11/6/95

EXHIBIT 08
CROP GUIDE



PANEL

CROP GUIDE

EXHIBIT # 8

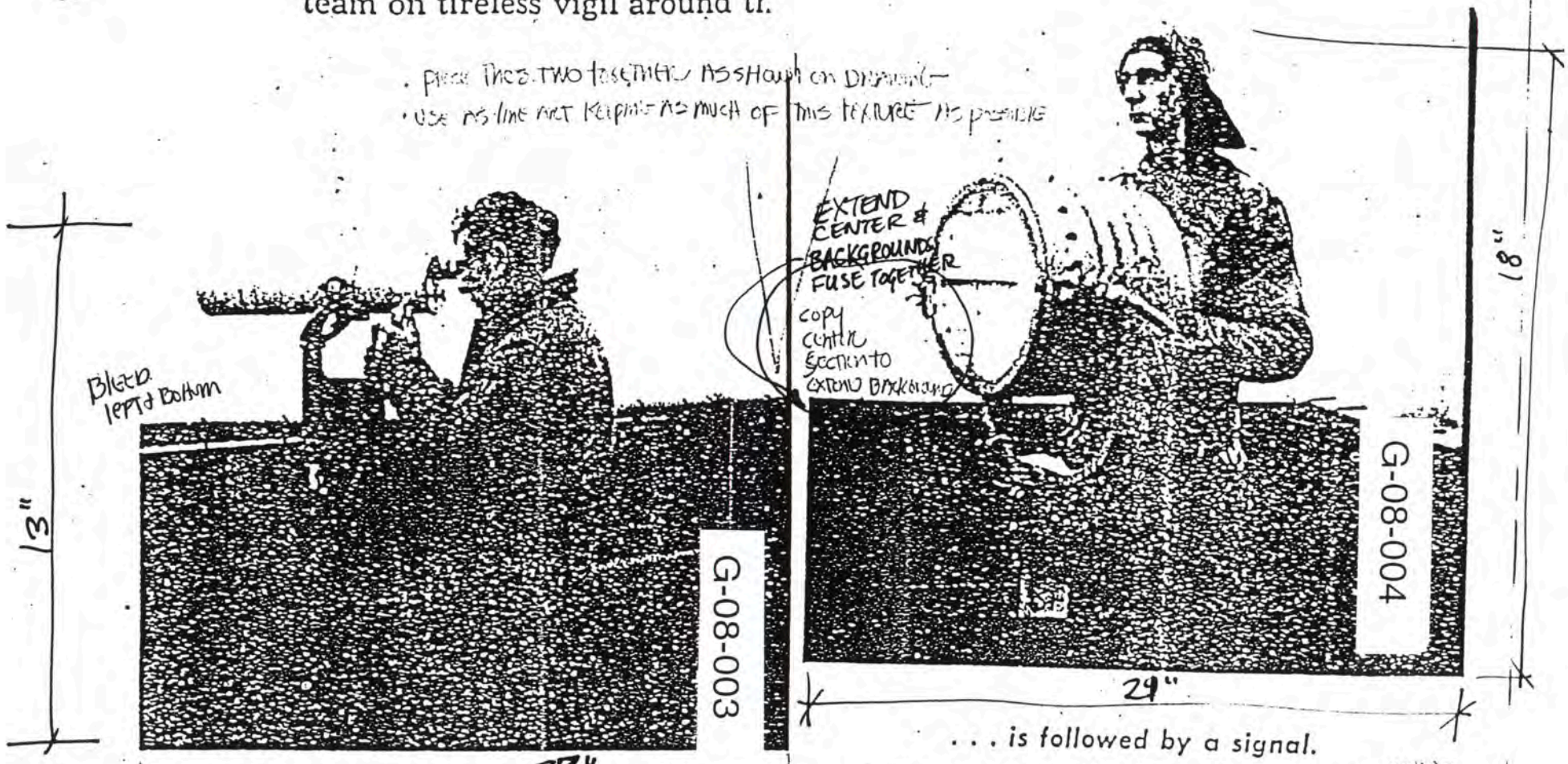
OVERALL

TEXTRAIL

on ti

form a valuable service. Ar.
team on tireless vigil around th.

. PLACE THESE TWO TOGETHER AS SHOWN ON DISPLAY
• USE AS LINE ART KEEPING AS MUCH OF THIS FEATURE AS POSSIBLE



Careful observation . . .

G-08-003

. . . is followed by a signal.

SEE GRAPHIC LAYOUT

BLEED RIGHT & BOTTOM

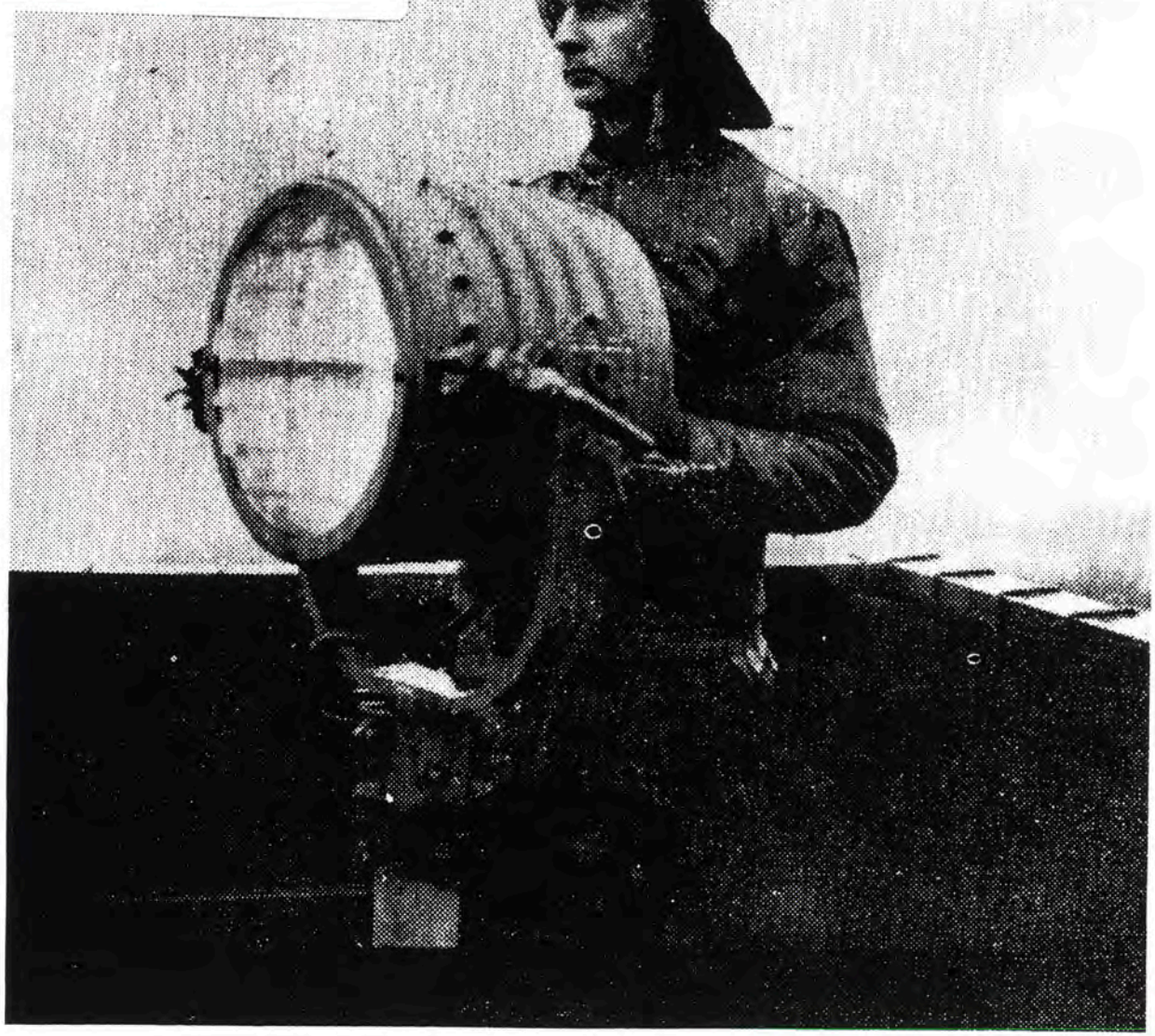
G-08-004

TRANSPORATION G-08-003
Man looking through a spotting scope
"Careful Observation ..."
From: Range Finder, Holiday
Issue, 1944, Fort Wadsworth
No negative number
GATE/EX 10/95



G-08-003

TRANSPORTATION G-08-004
Man using signal beacon
"... is followed by a signal"
From: Range Finder, Holiday
Issue, 1944, Fort Wadsworth
No negative number
GATE/EX 10/95



G-08-004

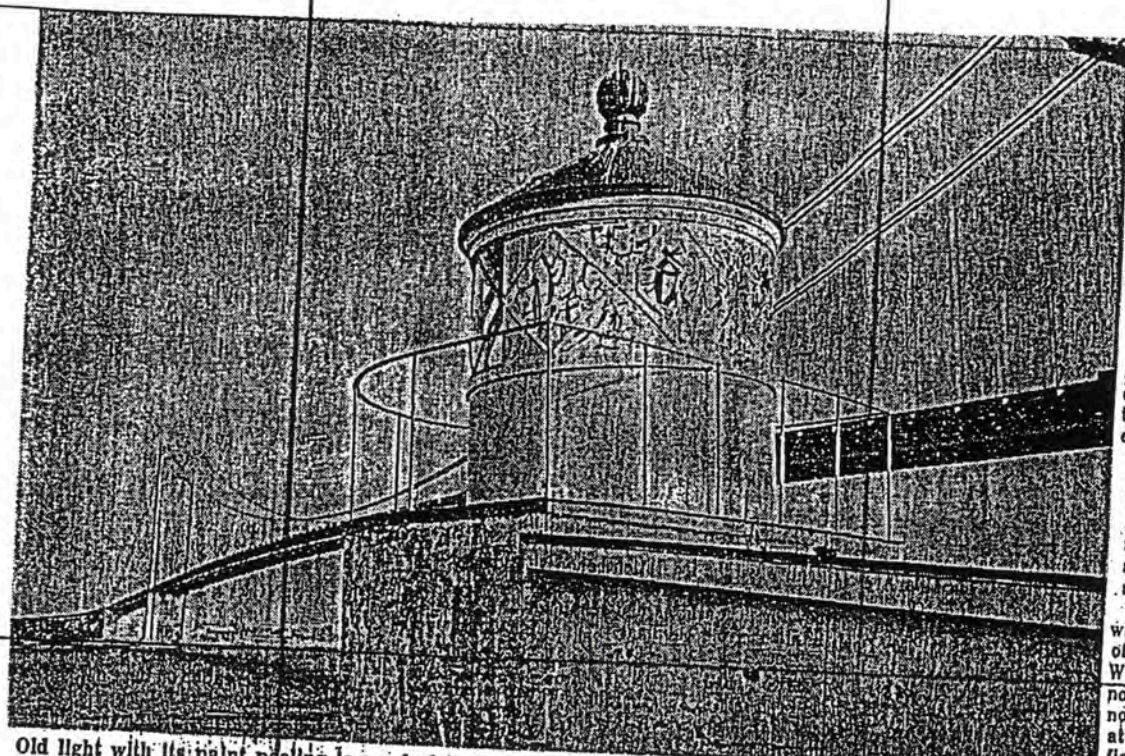
11½"

G-08-006

12¾" X 11½"

#8

12¾"



Old light with its paint peeling is perched in the center of Battery Weed looking over the Narrows. The light was operative until a few years ago.

S.I. Advance Photos by Frank J. Johns.

permittendent, used a fogging device to force a smoke mixture into one of the open air vents. After ten minutes, fog was seen seeping through another vent—proof that there was indeed a hollow space inside.

* * *

TO FURTHER frustrate the workers, the air vents, which are the only openings so far discovered in any of the rooms, ar constructed in such a way that one cannot see through to the other side.

Although temporarily halted at this time, officials feel that either explosives or a diamond-tipped drill could be utilized for entry, a spokesman said.

It is felt that employing explosives might endanger or partly destroy the original structure. A diamond drill is not among the apparatus available to the post engineer section.

Whether someday someone will finally discover the records of when, why and how Battery Weed's rooms were sealed off, no one now can say. But for now, interests has been aroused at Ft. Wadsworth among top officials and it looks hopeful that the post will get the needed drilling equipment to enable them to make the entry.

Man and M
...Which M

SANTA BARBARA, Calif. (AP) — The question of human values in a gadget-crazy world will be probed this week by a group of the world's foremost thinkers, in an international symposium on the technological society.

Philosophers from as far away as Israel, France, Germany, England and Greece will gather here today for the five - day symposium organized by Dr. John Wilkinson of the Center for the Study of Democratic tions.

The problem we face, son said, is that techn

CRV

EXHIBIT 6: Signalling Devices
TRACKING NO: 1079

G-08-006

G-08-007

11½"

George Washington Visiting



From Prints & Photographs Div., Library of Congress

12¾"

G-08-007
12¾" x 11½"

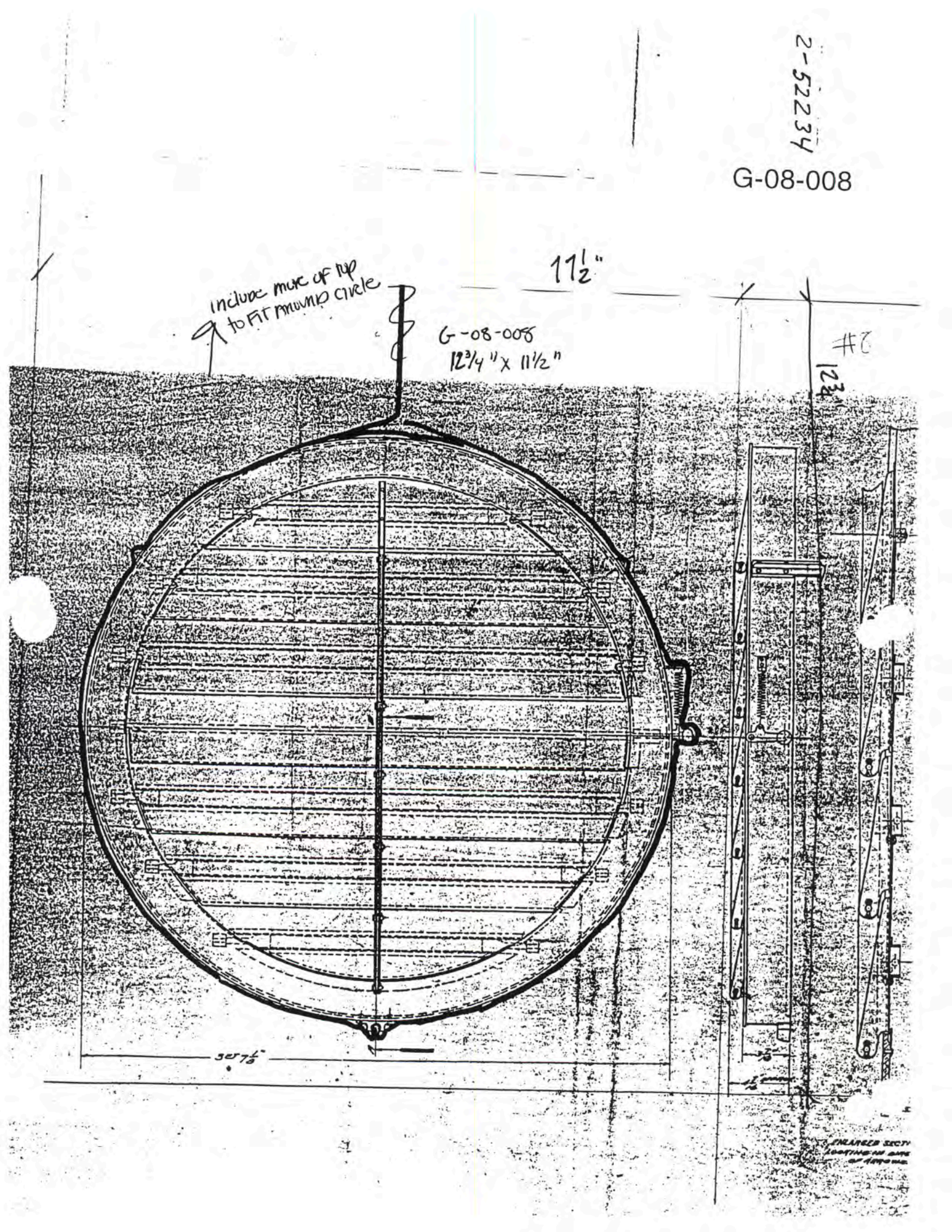
G-08-007



G-08-007
Presidential
Engraving of George Washington on Horseback
Neg. # LC-USZ62-52234
Credit: Library of Congress
DUPLICATE GATE-Ft. Wadsworth/EX

2-52234

G-08-008



G-08-008
Diagram of signalling shutter, includes front and profile view. RG77, Entry 802
Credit: National Archives, Northeast Region
DUPLICATE
GATE-Fort Wadsworth/EX 9/95

G-08-009

11½"

#8

G-08-009
12¾" x 11½"

K&M Division
Torrance, CA 90503

12¾"



Brig. General A.J. Myer

Flag telegraphy, o
signaling with
the mid-19th c
Army surgeon, C
drafted a mem
signal devices
British officers, (
Bolton of the ar
Vice Admiral) Pl
the navy. This
in combat in
War. Ironically,
use by the Co
First Battle of
Pierre Gustave
signal officer t
man who had t
his invention

(first tested @ Ft
~~Sandy Hook~~ ?)



G-08-009
Portrait of photo of Albert J. Meyer
ID#BA-355
National Archives, Still Picture Branch, College Park, MD
DUPLICATE GATE-Fort Wadsworth/EX 9/95

G-08-010

#2

18"

4 3/4"

u. But let us describe the objects. graph is used to answer to the Merchant's e, Wall Street, New York, in refer-

ton and Fort Diamond is beautiful. One or two steamboats leave New York every hour for Staten Island, and are usually crowded; and on gala

of commercial prosperity that presented itself to our eyes from this point. Innumerable ferry-boats, steamers, packet ships, merchantmen,

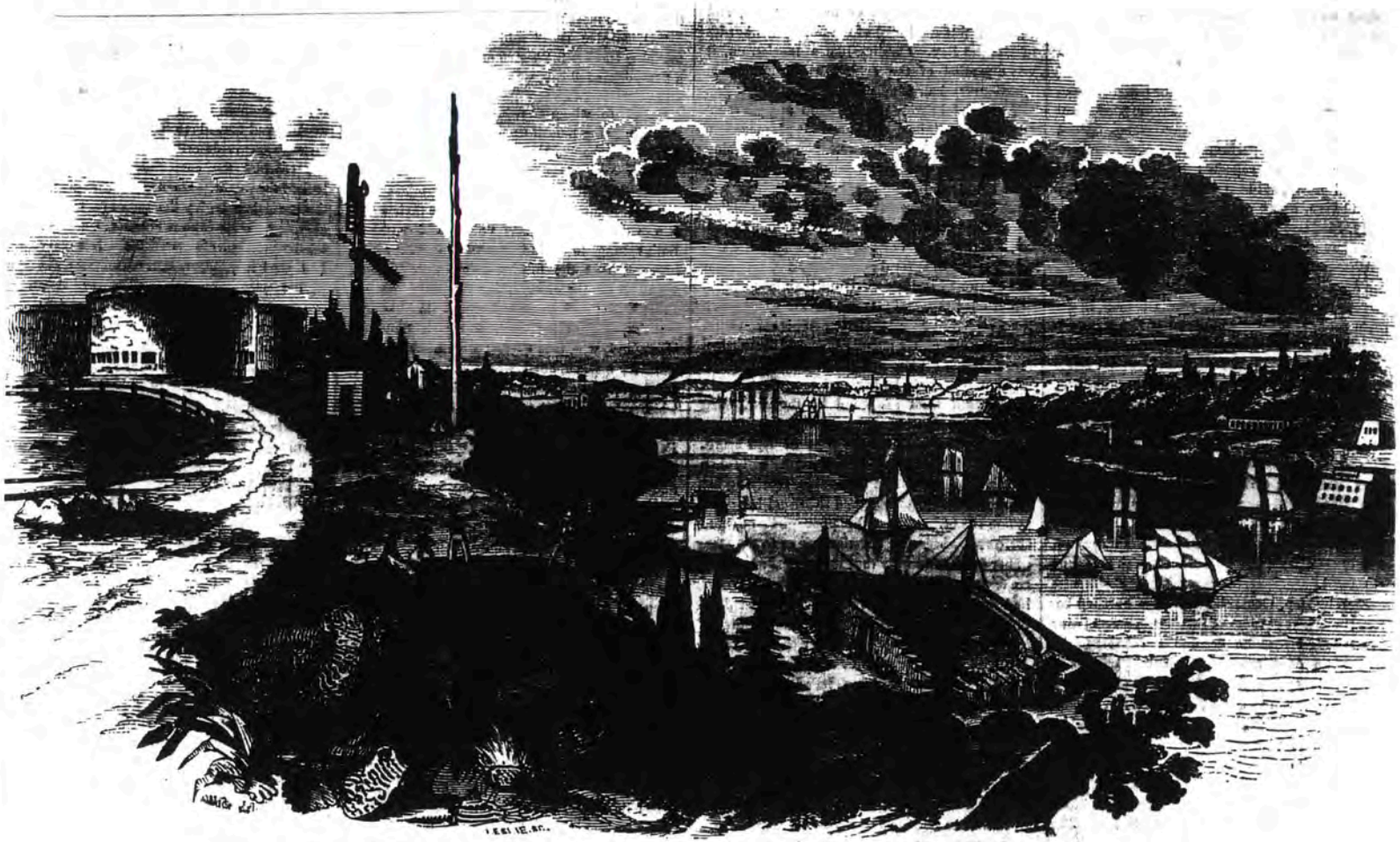
rich our columns by sketches from his pencil, and continue to give all such scenes of interest, from Maine to California.

VIEW OF THE NEW YORK BAY AND HARBOR, FROM THE TELEGRAPH STATION.

SATURDAY, SEPTEMBER 25, 1852

G-08-010

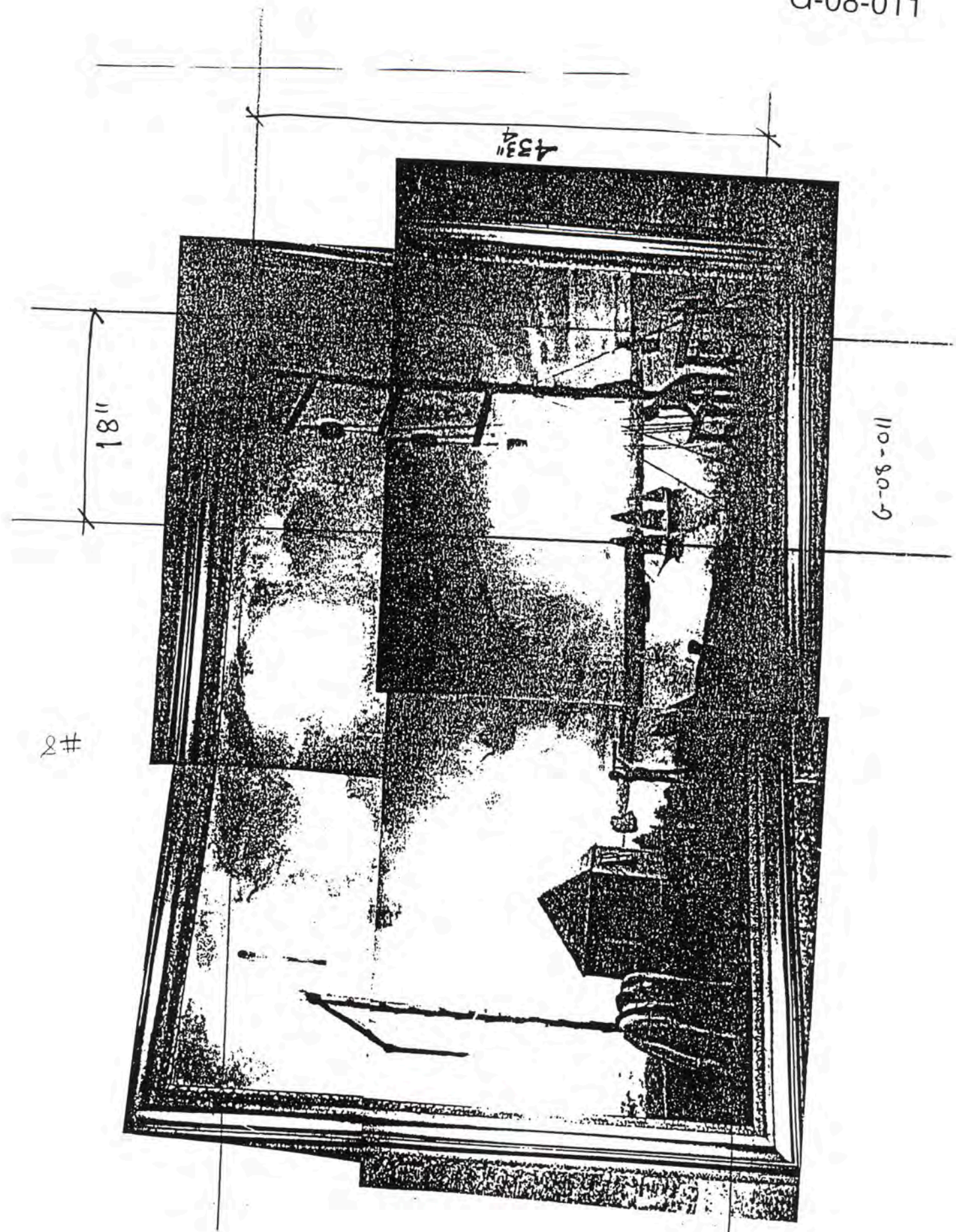
G-08-010
View of the Bay and Harbor from the Telegraph Station
Photographed from the NPS copy of Gleason's
Pictorial, Drawing Room Companion - Boston, Saturday,
Nov. 27, 1852, Vol. III, No. 22 - AP1, G5, V.2
GATE- Fort Wadsworth/EX 10/95



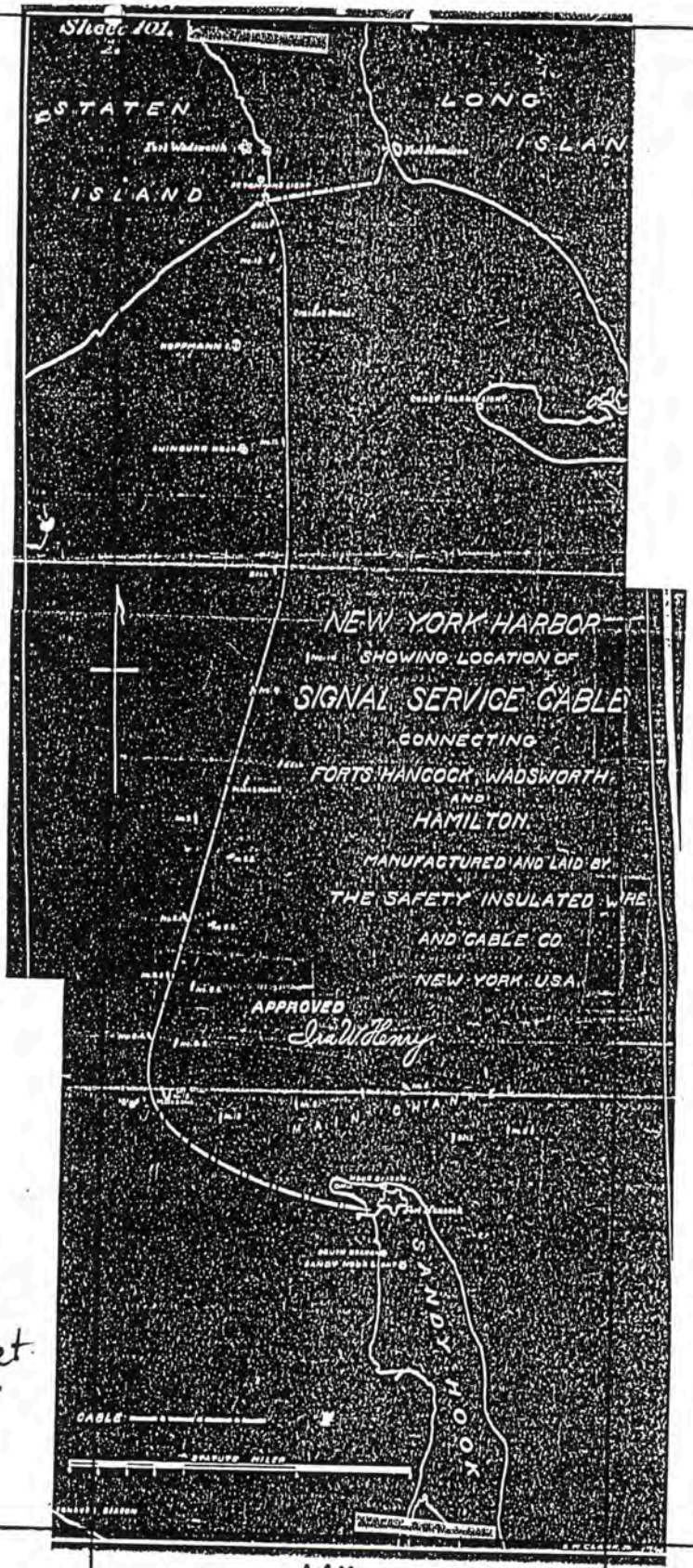
VIEW OF THE NEW YORK BAY AND HARBOR, FROM THE TELEGRAPH STATION.

G-08-010

G-08-011



G-08-012



Graphic traps behind bullet

33"

11"

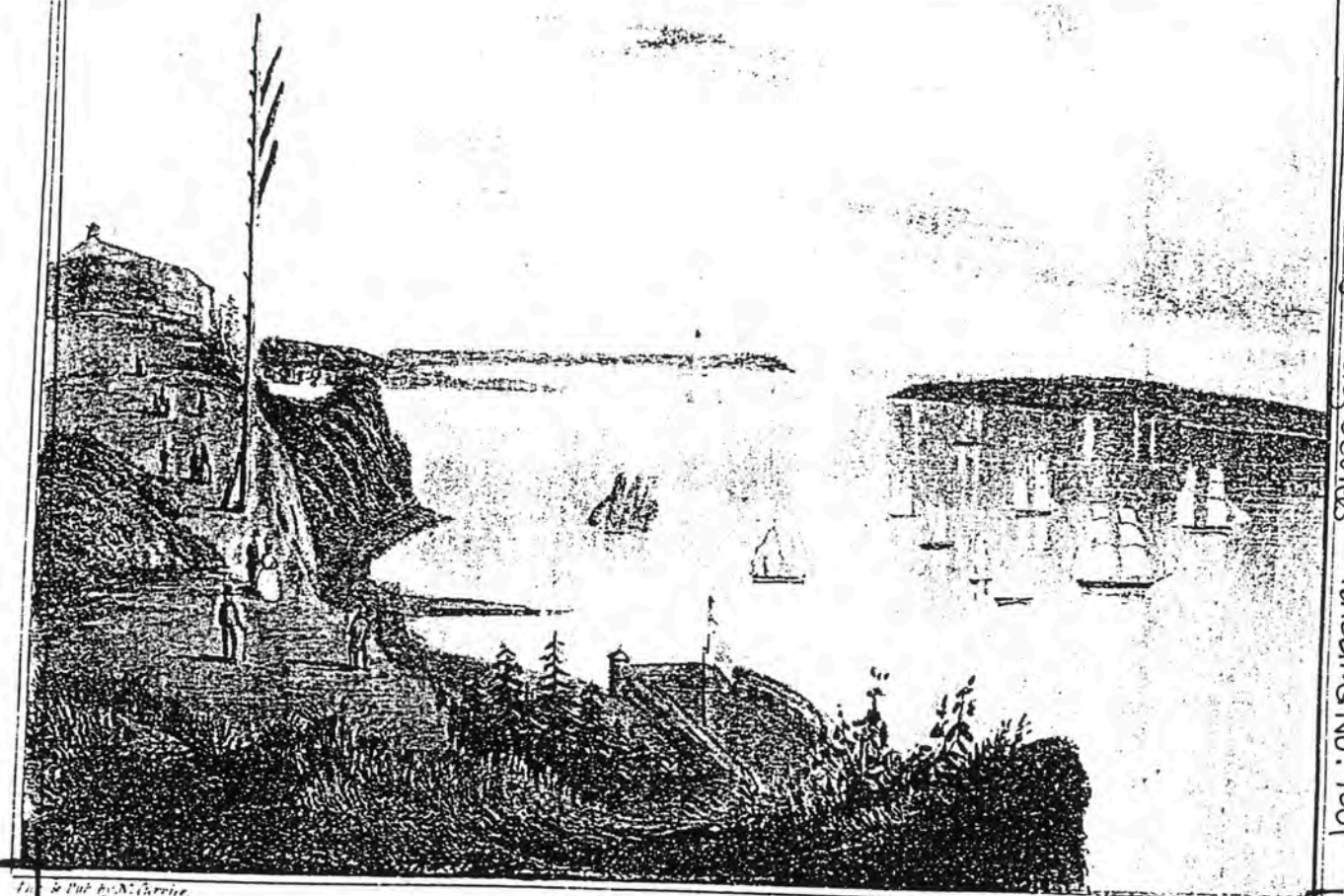
G-08-012

2'9" x 11"

46 1/2" ∞ # · FULL WIDTH OF PANEL — BLEED 3 SIDES

33"

EXHIBIT 6: Signalling Devices TRACKING NO. 1081



NEW YORK BAY.

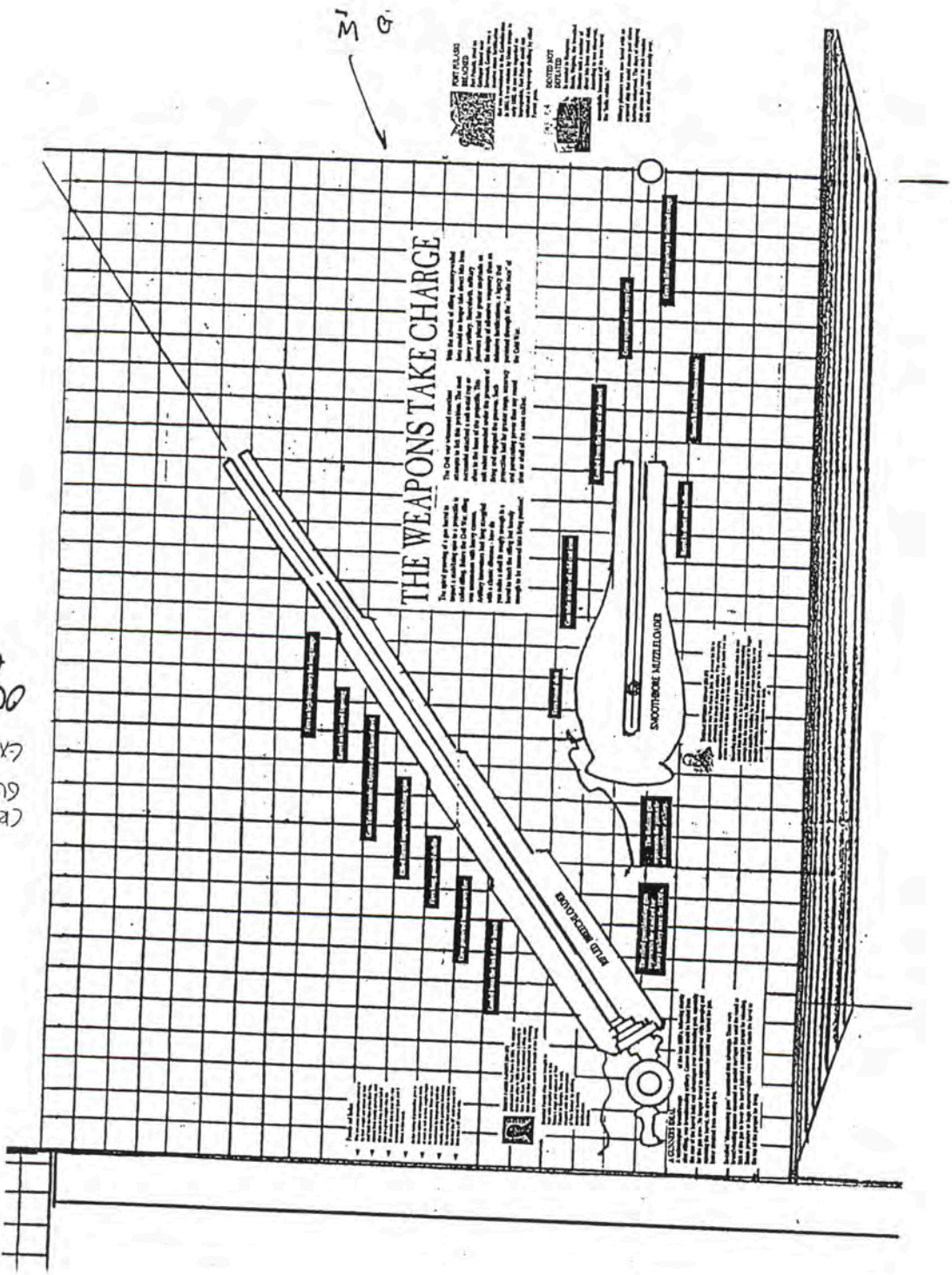
FROM THE TELEGRAPH STATION.

A currier print c. 1850 depicts the three 1812-era stone forts at the Narrows: Fort Tompkins on the hill, Fort Richmond @ the water, and Fort Lafayette (earlier called Fort Diamond) in the distance near the Brooklyn shore (Harbor Defense Museum)

G-08-013

G-08-013

EXHIBIT 09
CROP GUIDE



CROP GUIDE
EXHIBIT #9
OVERALL EXHIBIT

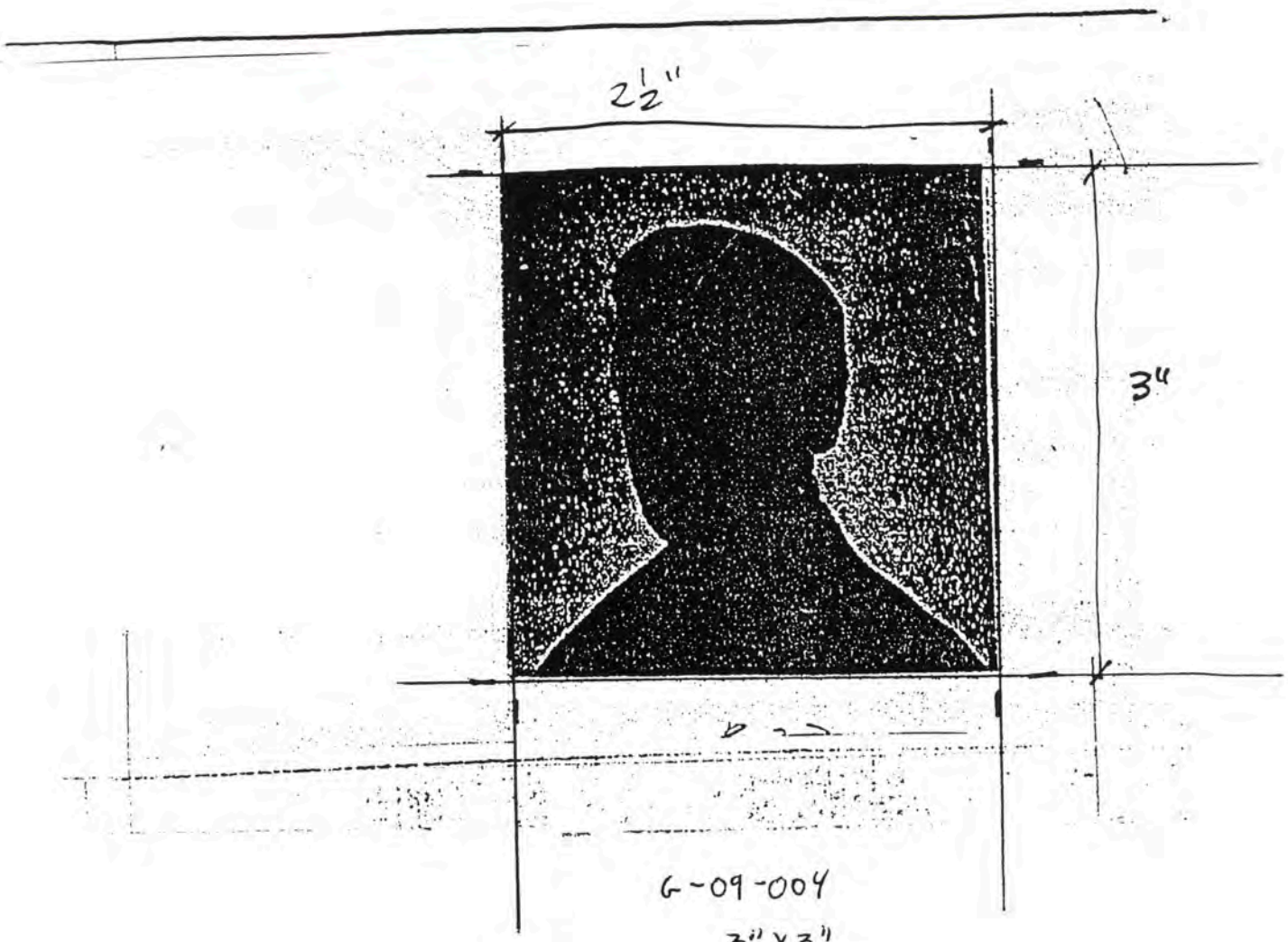

2½"
TOTAL P.002
3⅛"
G-09-003

G-09-003
Portraits - Individual
Rodman, Maj. Gen. Thomas
LC-USZ62-16740
Credit: Library of Congress
Duplicate
GATE- Fort Wadsworth/EX 10/95



MAJ. GEN. THOMAS J. RODMAN.

U. S. ORDINANCE.



G-09-004

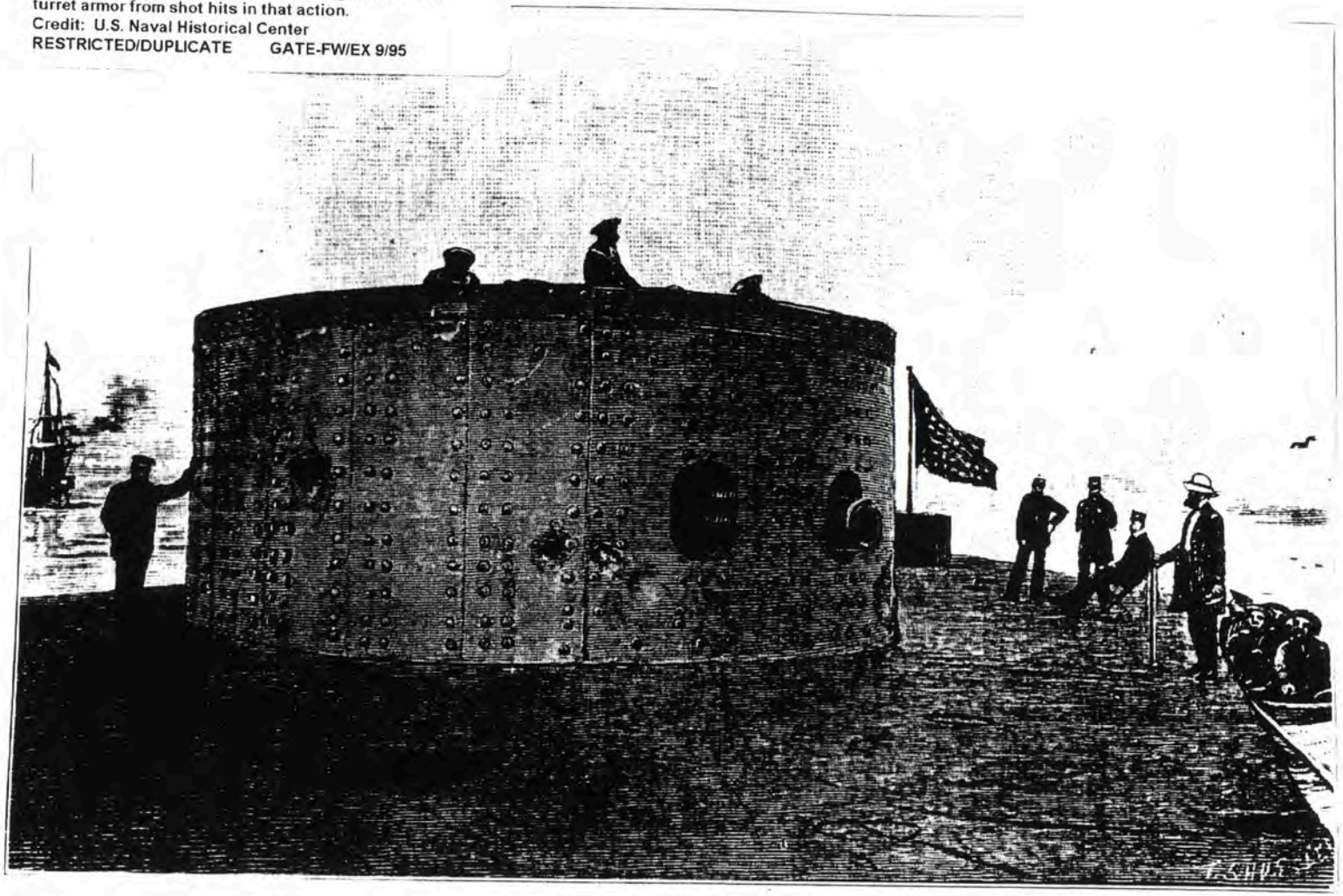
3" X 3"

G-09-005

G-09-005
4½" x 5½"

G-09-006

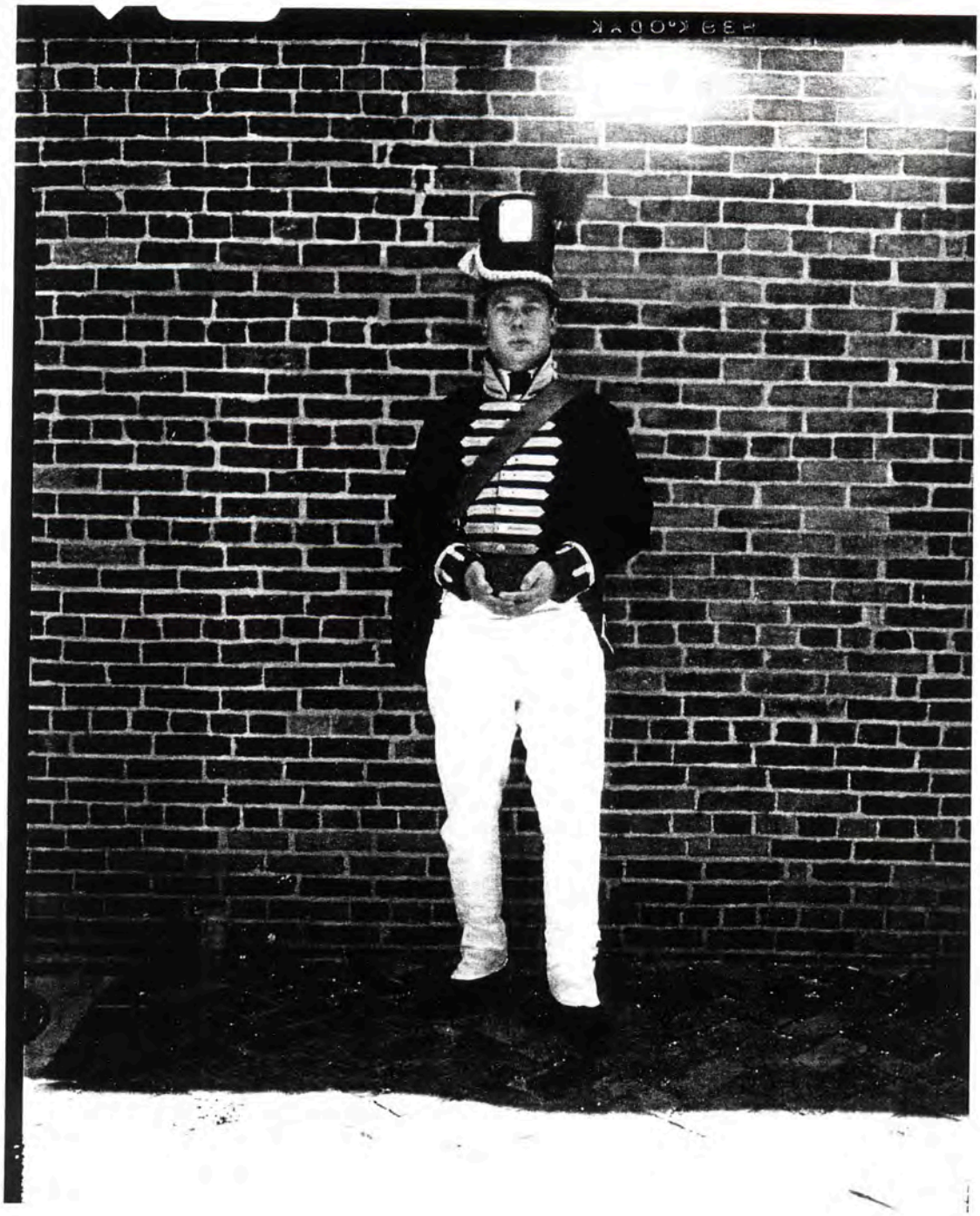
G-09-006
Chronology - Civil War - Navy - USS Monitor (1862)
Engraving after a photograph taken soon after her engagement with CSS Virginia, showing dents in her turret armor from shot hits in that action.
Credit: U.S. Naval Historical Center
RESTRICTED/DUPLICATE GATE-FW/EX 9/95



Effect of Shot on "Monitor" Turret
(From a photograph taken soon after the engagement.)

G-09-006

G-10-005.1



Cross-Section of a 32-pound cannonball
Silkscreen line art by exhibit fabricator

?

G-10-005.3

Silhouette of a smoothbore cannon firing a television
Silkscreen line art by exhibit fabricator

?

G-10-006.1



G-10-006.2

Cross-Section of a 10"
Columbiad Exploding Shell
Silkscreen line art by exhibit
Fabricator

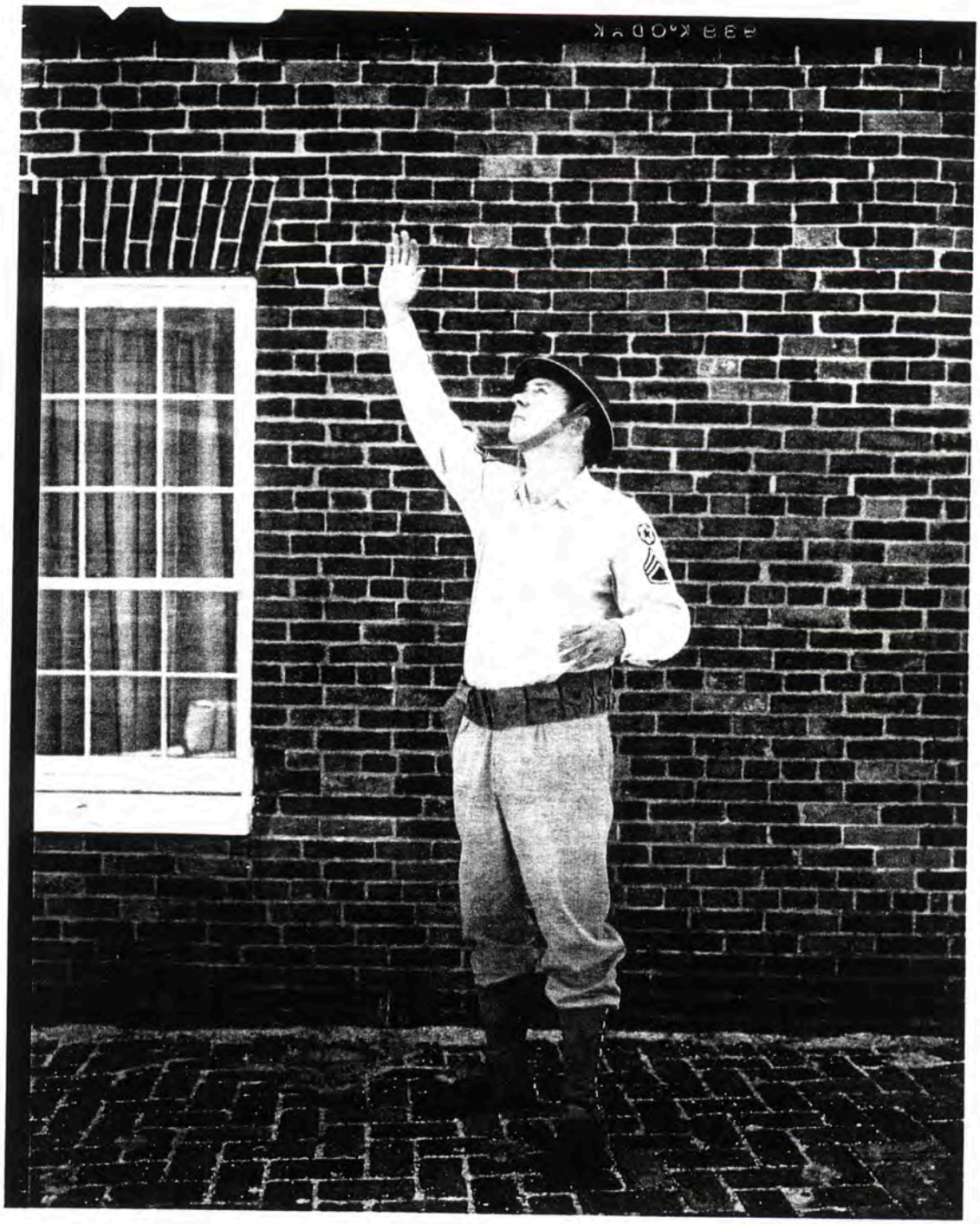
?

G-10-006.3

Silhouette of a 10" Columbiad
firing a refrigerator
Silkscreen line art by exhibit
fabricator

?

G-10-007.1



Cross-Section of a 16" Shell
Silkscreen line art by exhibit fabricator

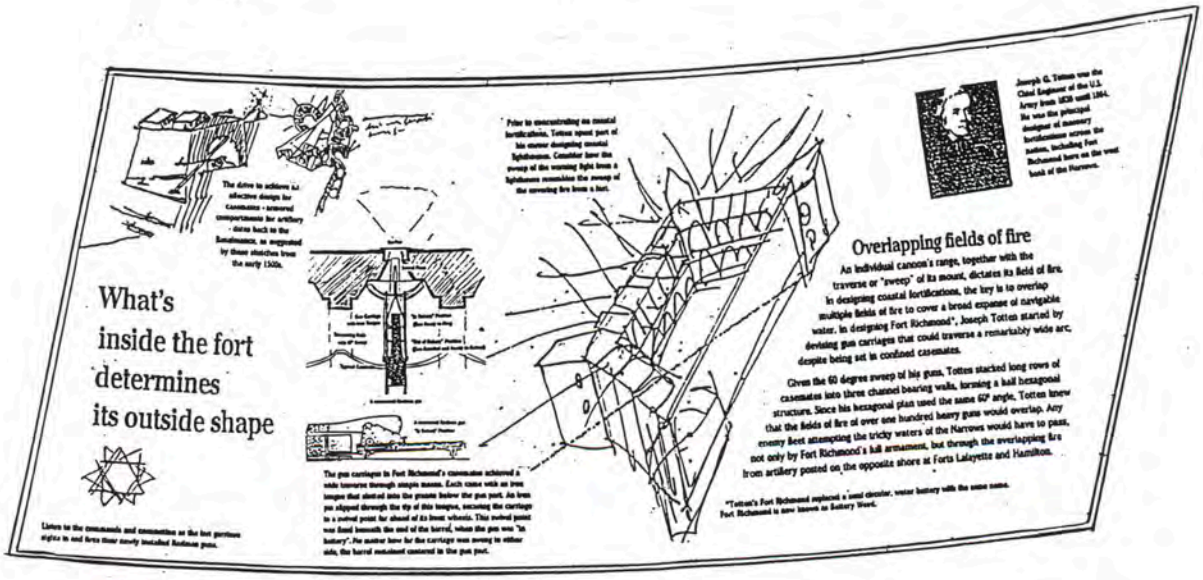
?

G-10-007.3

Silhouette of a 16" rifled Gun
Firing a small car
Silkscreen line art by exhibit
Fabricator

?

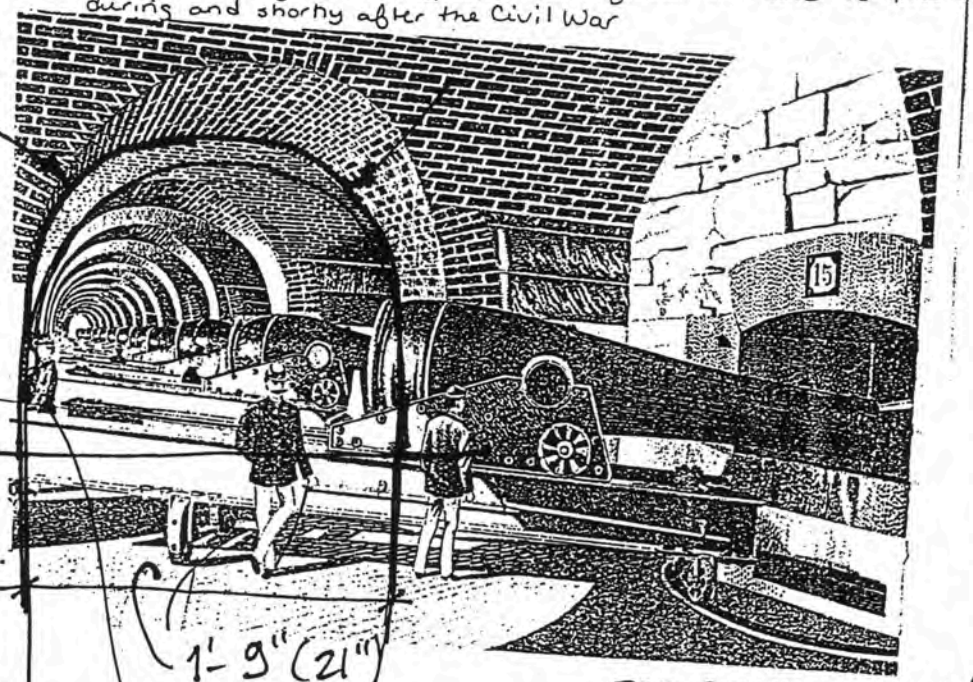
EXHIBIT 11
CROP GUIDE



OVERALL TEXTRAIL
BLACK BACKGROUND
W/ REVERSED OUT
TEXT & LINE ART

CROP GUIDE
EXHIBIT #11

Casemate tier of a Third System fort.
10-inch Rodman guns that replaced the original 32- and 42- pounder armament during and shortly after the Civil War



1'-4" (16")

1'-9" (21")

profile of soldier is to be included

SEE GRAPHIC ELEVATION

Tracings No 1134
Exhibit 11: Casemate Reference Material

ERL



Fabric BACKGROUND

"SURROUND" IS DARK FIELD

AS OUTLINED IN GREEN

silhouette this area and fit into surround

G-11-003

G-11-003

G-11-005

Line Art of Fort Richmond
with overlapping fields of fire
by exhibit fabricator

MAY 30 '95 06:18PM HOWARD-REVIS DESIGN C 2003[illegible] 1607 P.1

4"

5½"

NUMBER 29

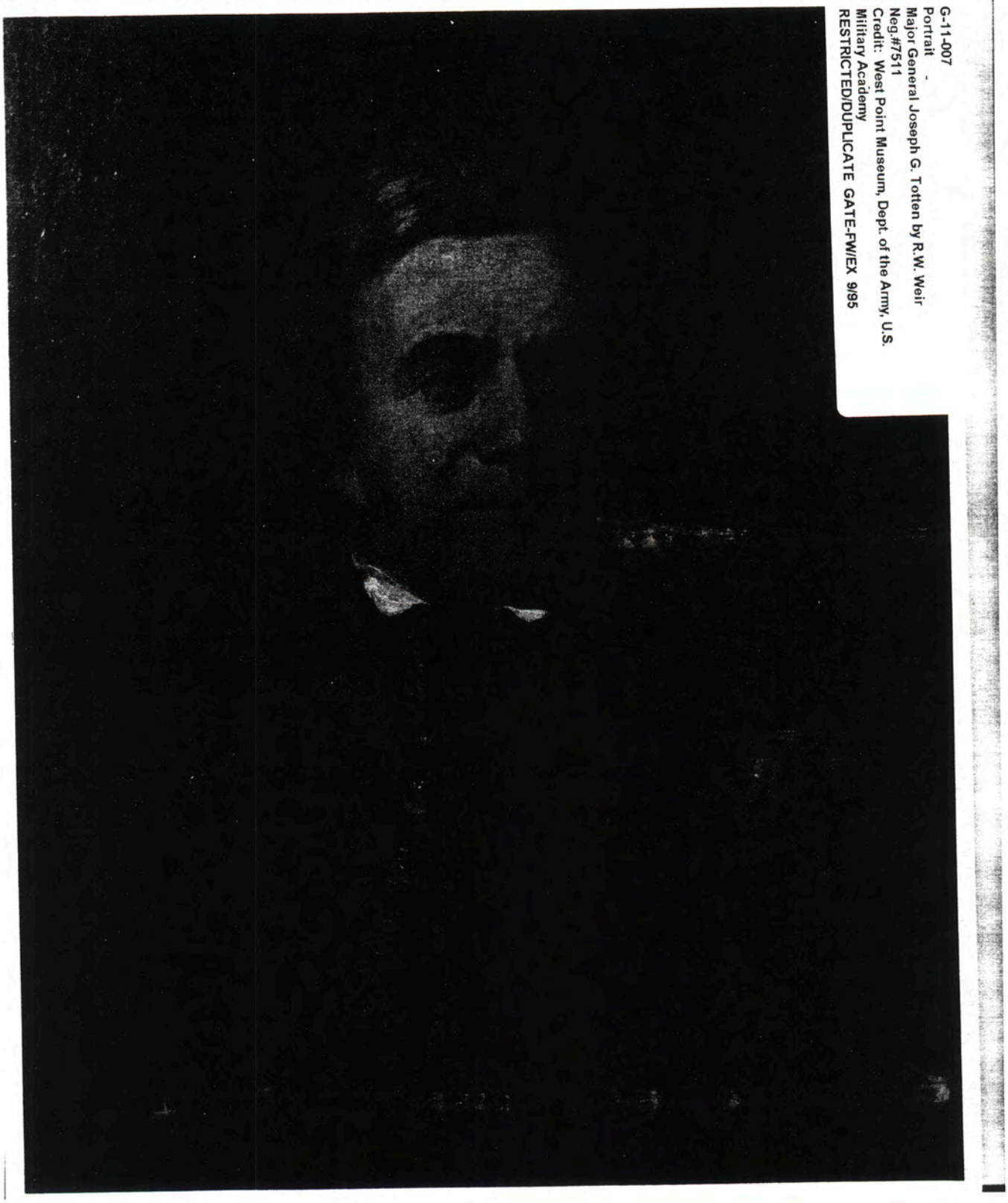
These judgments by two
the American Philosophic
closest approximation in
America to the opinion of
ences. Offered by experi
plaved significant roles in
ıena, the opinions o[illegible]
reflected their distinct sense of unease in being
ed to render judgment on an evident applica-
tion of science whose parameters remained obscure.
Even with Colt's impending patent papers in hand,
these eminent referees would have had no solid basis
for certifying that his system had been demonstrated
at Washington, even in rudimentary form.

No such disquiet pervaded the lengthy report
(Appendix 7) submitted to Secretary Wilkins on 1
May by Colonel Joseph G. Totten (Figure 40), Chief
of the Corps of Engineers and pre-eminent military
engineer in the United States.[184] As conversant with
numerous other military inventions offered to the War

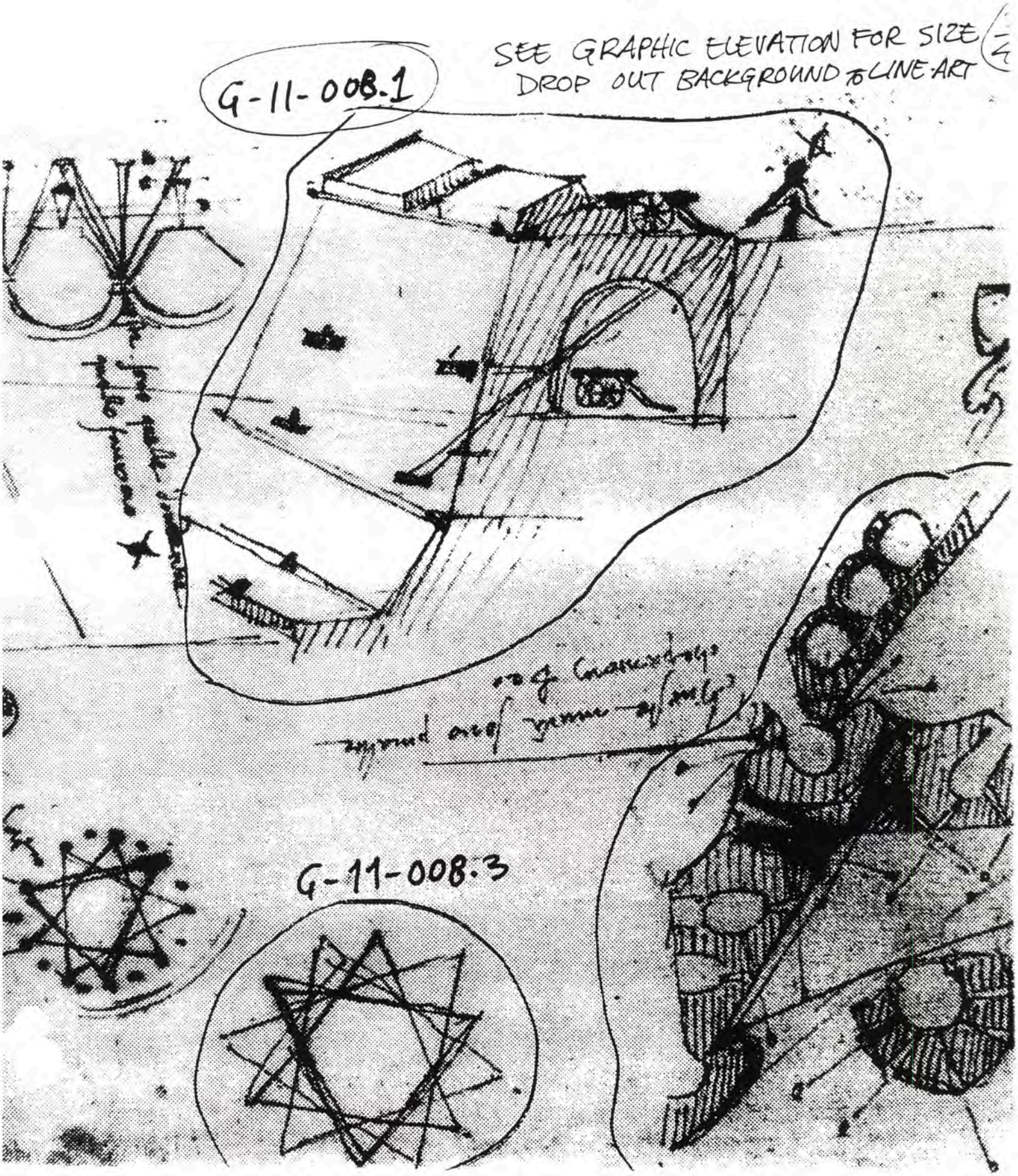


Figure 40.—JOSEPH GILBERT TOTTEN, 1788–1864. A
native of New Haven, this pioneer of United States militar[illegible]

G-11-007
5½" x 4"

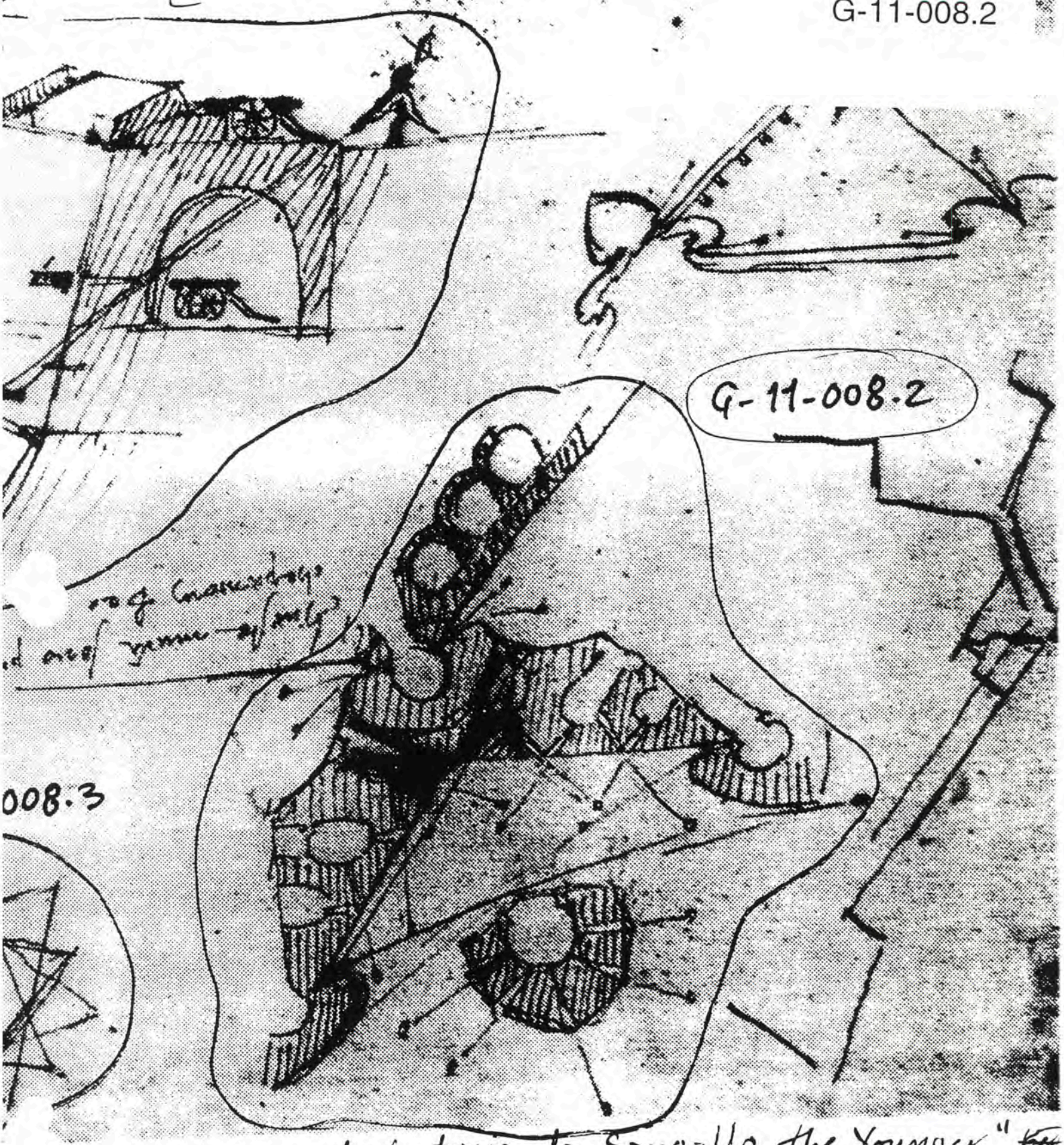


G-11-007
Portrait -
Major General Joseph G. Totten by R.W. Weir
Neg.#7511
Credit: West Point Museum, Dept. of the Army, U.S. Military Academy
RESTRICTED/DUPLICATE GATE-FW/EX 9/95


G-11-008.1
SEE GRAPHIC ELEVATION FOR SIZE
DROP OUT BACKGROUND TO LINE ART
G-11-008.3

[DROP OUT BACKGROUND TO RENDER AS LINE-ART] SEE GRAPHIC ELEVATION 2/40

G-11-008.2



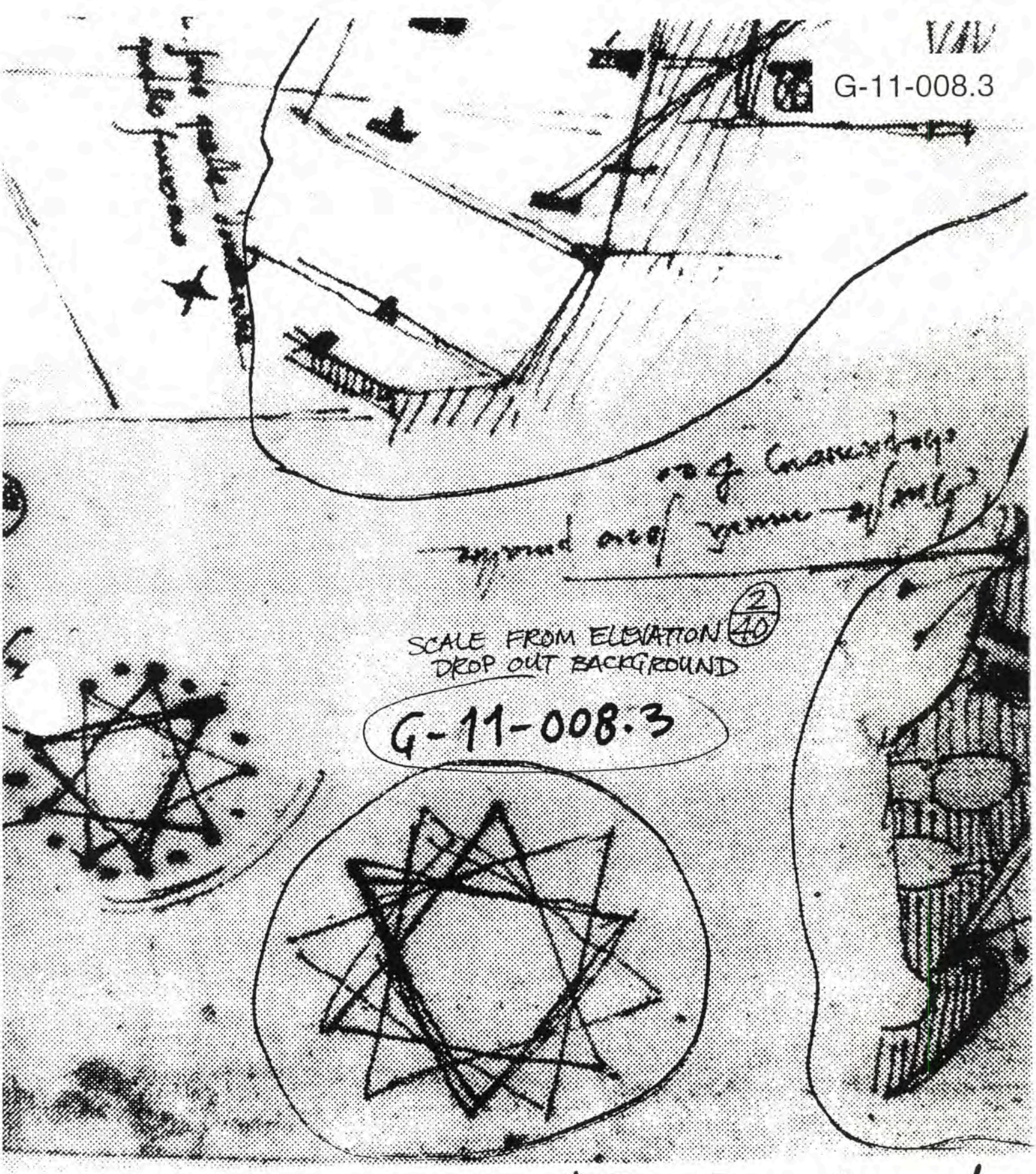
The Drawings of Antonio da Sangallo the Younger" MIT Press 1994

ith an institutional analysis of

The discussion

Theoretical studi

among other thin

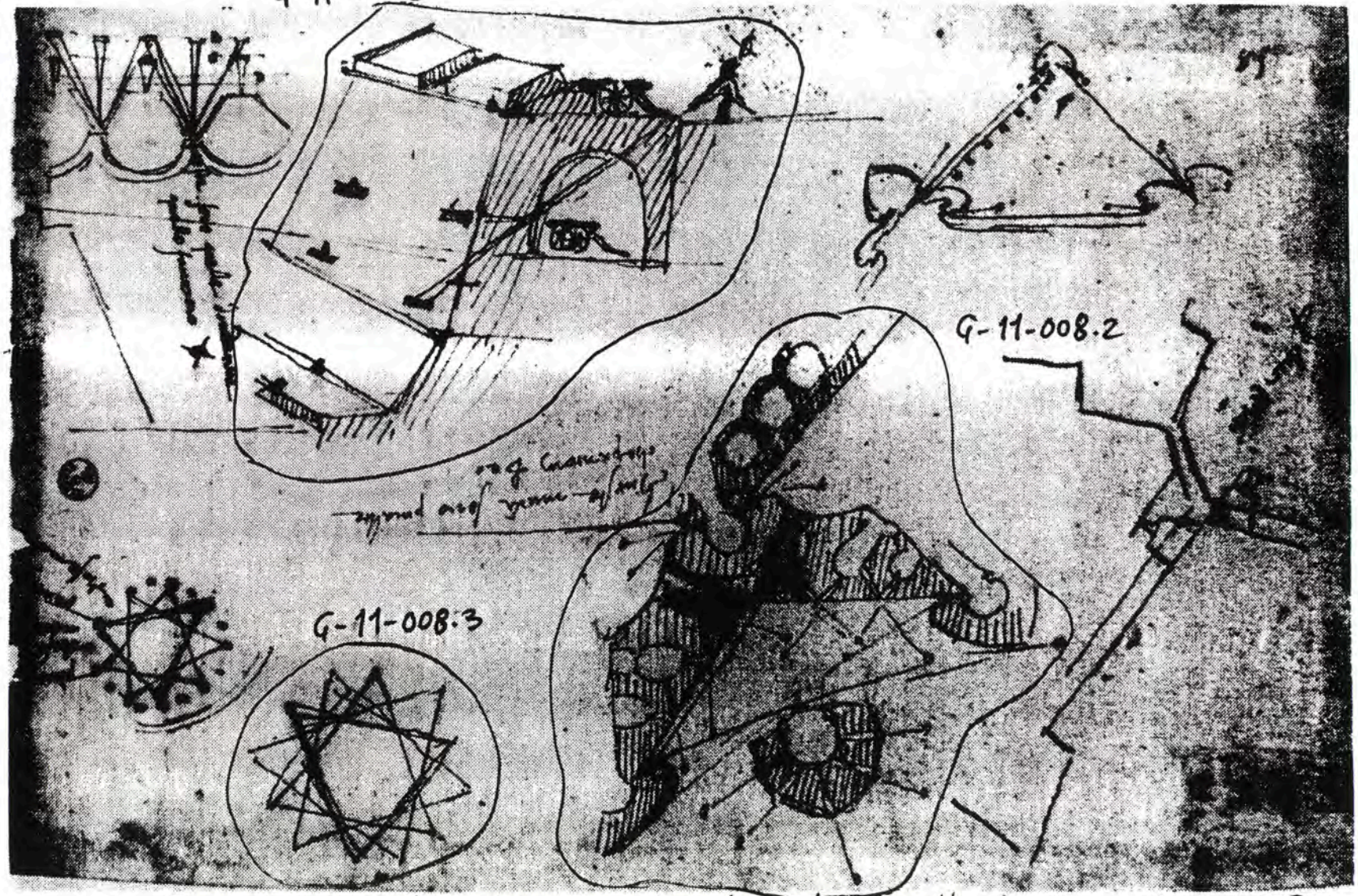


Reproduced from "The Drawings of

stemology, opens with an institutiona

emergence of the engineer. The

SEE ELEVATION 2/40 FOR THESE 3 "FRAGMENTS" FROM SAME ORIGINAL IMAGE.



Reproduce from "The Drawings of Antonio da Sangallo the Younger" MIT Press 1994 ~~Before 1530~~

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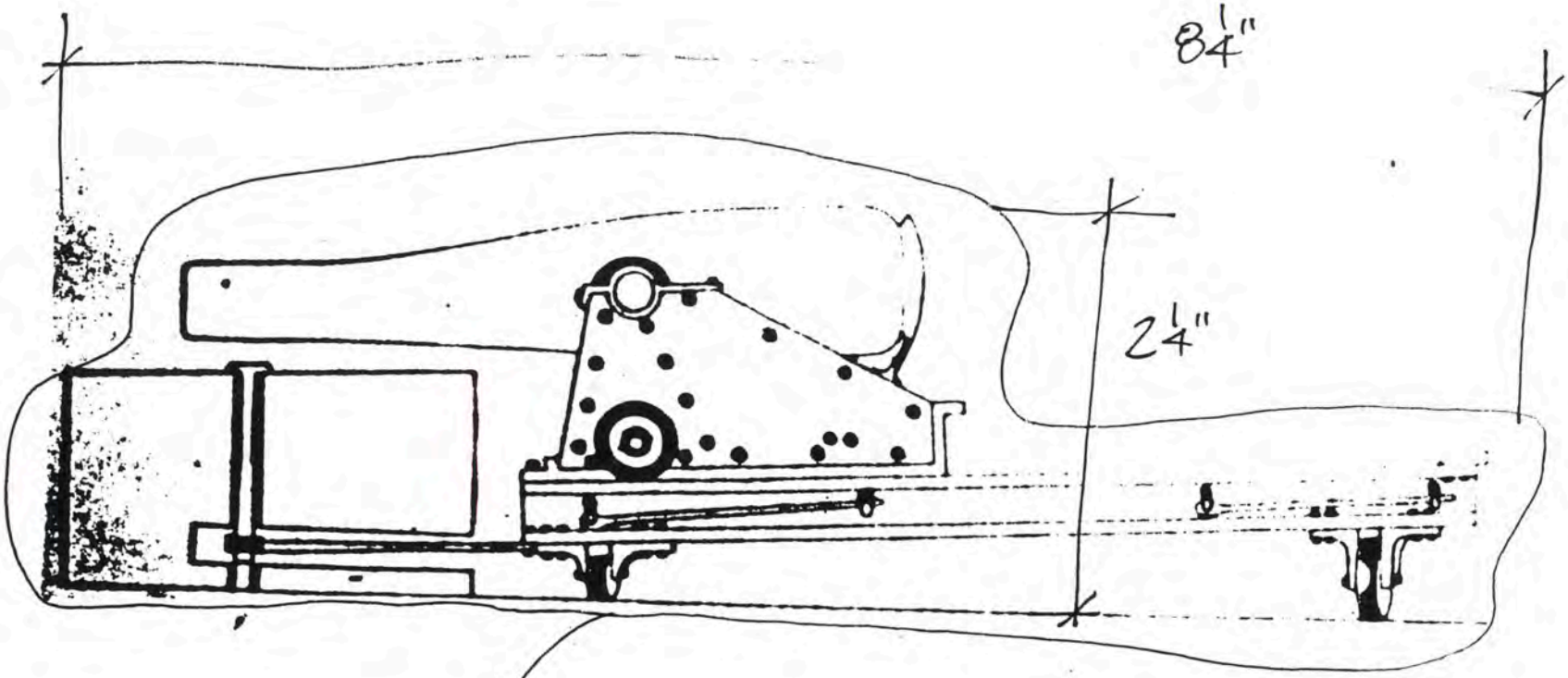
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epistemology, opens with an institutional analysis of the emergence of the engineer. The discussion

Theoretical studies of, among other things, stellar

G-11-009

Merging
~~Mapping~~ of existing line art drawings of a gun carriage and of a gun tube into a single image - by exhibit fabricator



G-11-010

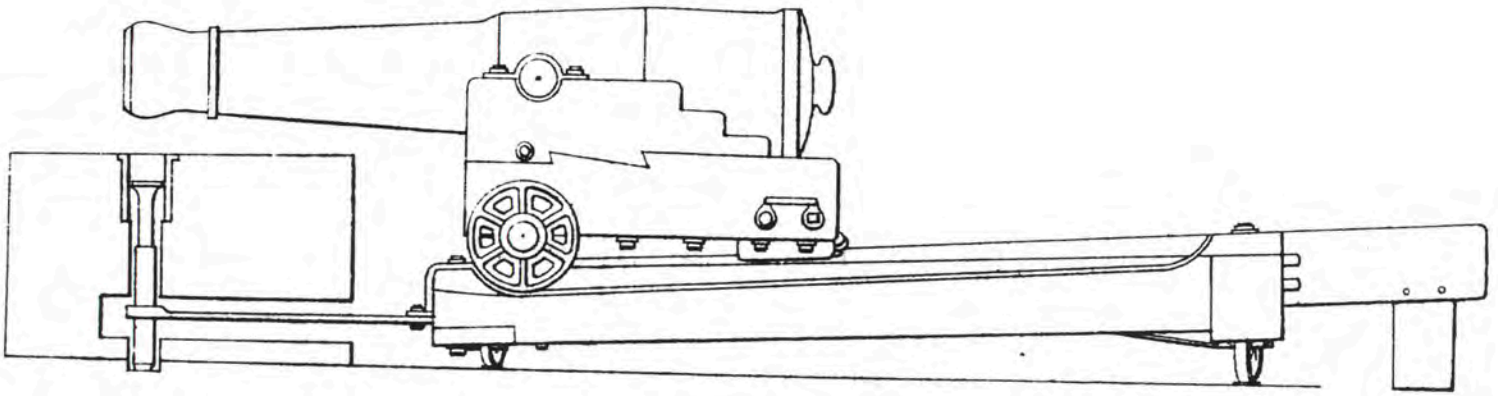
SCALE LENGTH FROM GRAPHIC ELEVATION

LINE ART DETAIL DELETE BACKGROUND

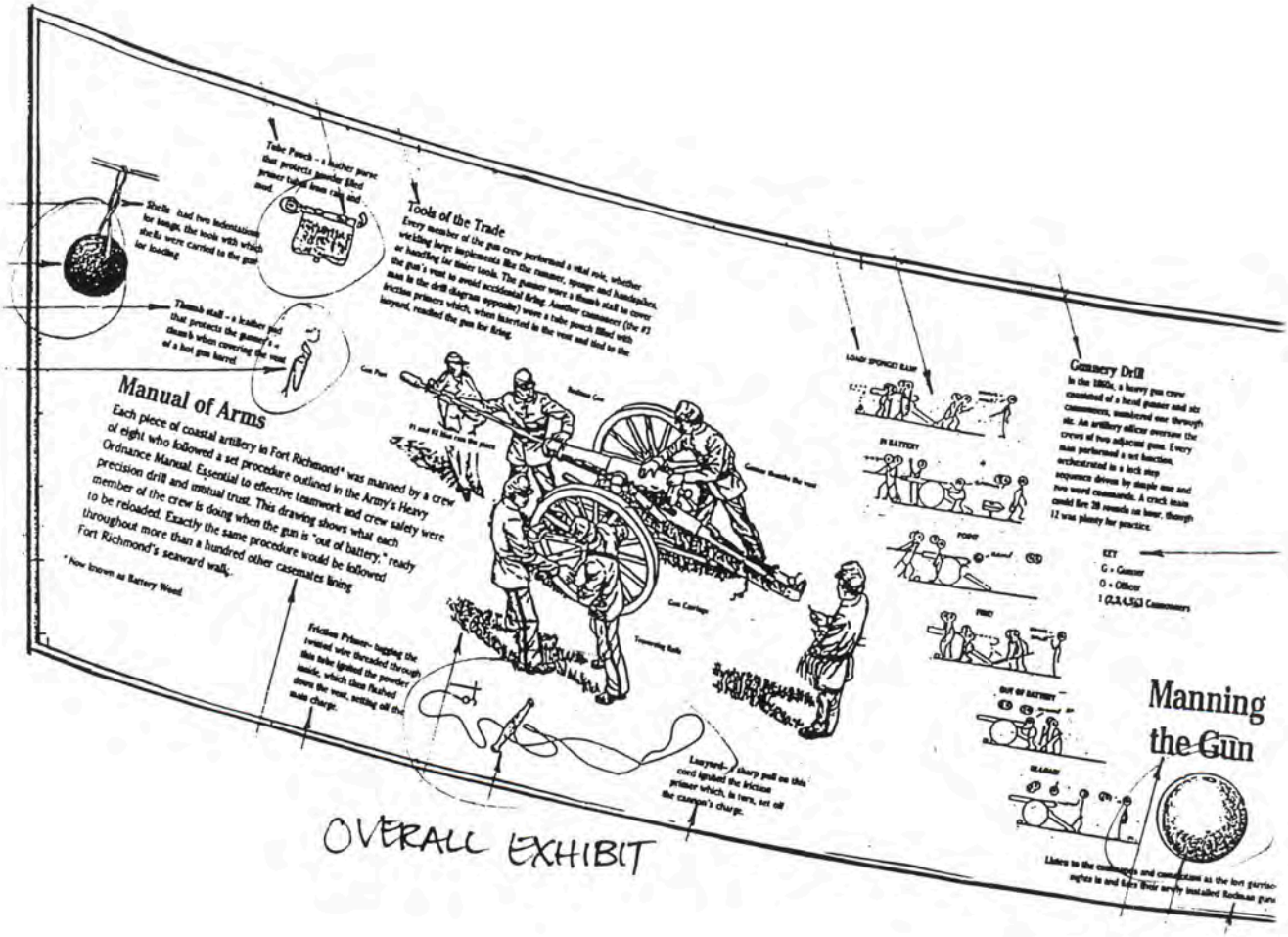
(THIS ARTWORK IS IN THE POSSESSION OF GATEWAY NRA - STATEN ISLAND)

G-11-010

G-11-010
Civil War - Artillery
Rodmans in "battery"
Photographed from Atlas to Accompany the Official Records of the Union and Confederate Armies by Hon. Daniel S. Lamont - plate 173 (CLXIII) - 1895 edition from NPS Archives GATE/EX 9/95



G-11-010



OVERALL EXHIBIT

Custom modification to artwork
depicting soldiers loading gun
Kodalith: by exhibit fabricator



HANDSPIKE FOR FIELD GUN

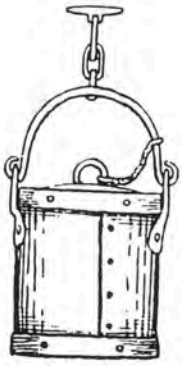
G-11-015



VENT COVER

SPONGE AND RAMMER FOR 3-INCH RIFLE





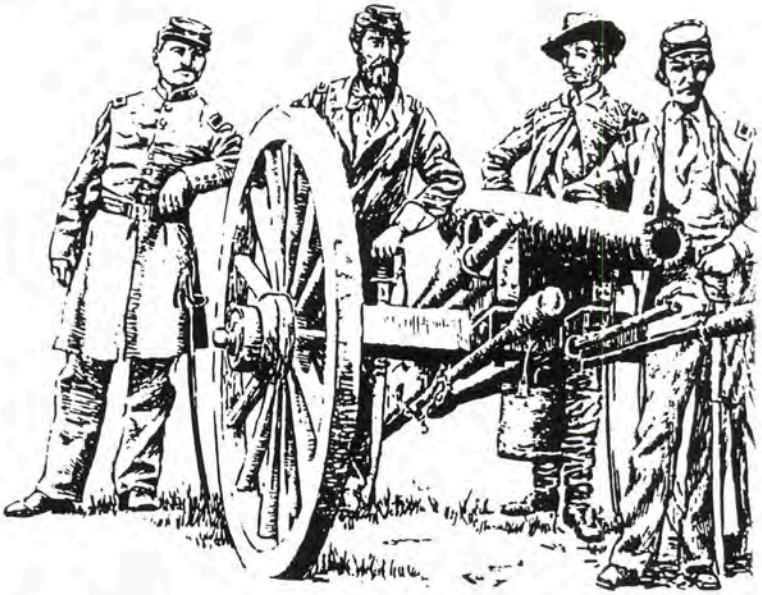
WATER BUCKET

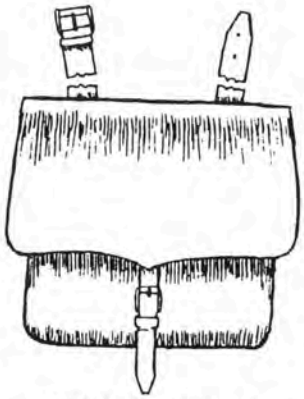


TAR BUCKET

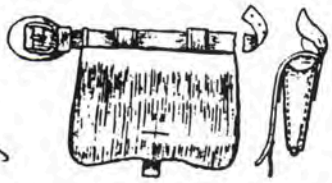
GUN WORM







GUNNER'S HAVERSACK



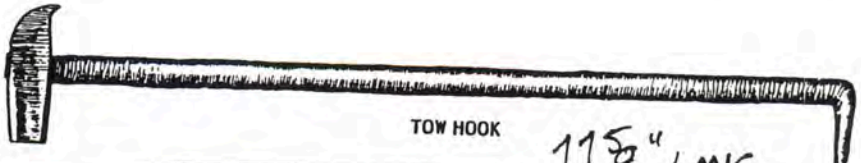
GUNNER'S TUBE POUCH



THUMB STALL



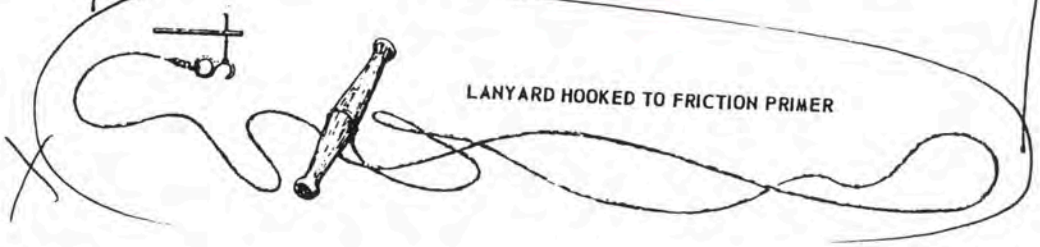
VENT PICK



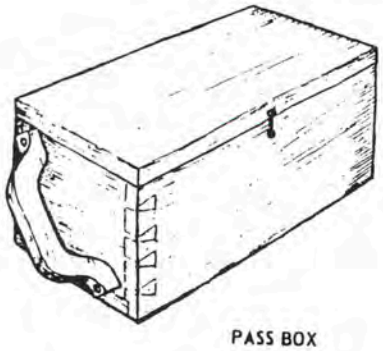
TOW HOOK

11 5/8" LONG

G-11-015

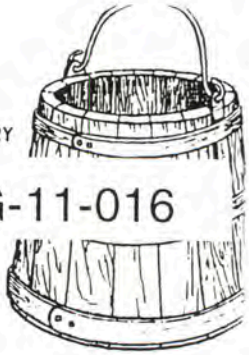


LANYARD HOOKED TO FRICTION PRIMER



PASS BOX

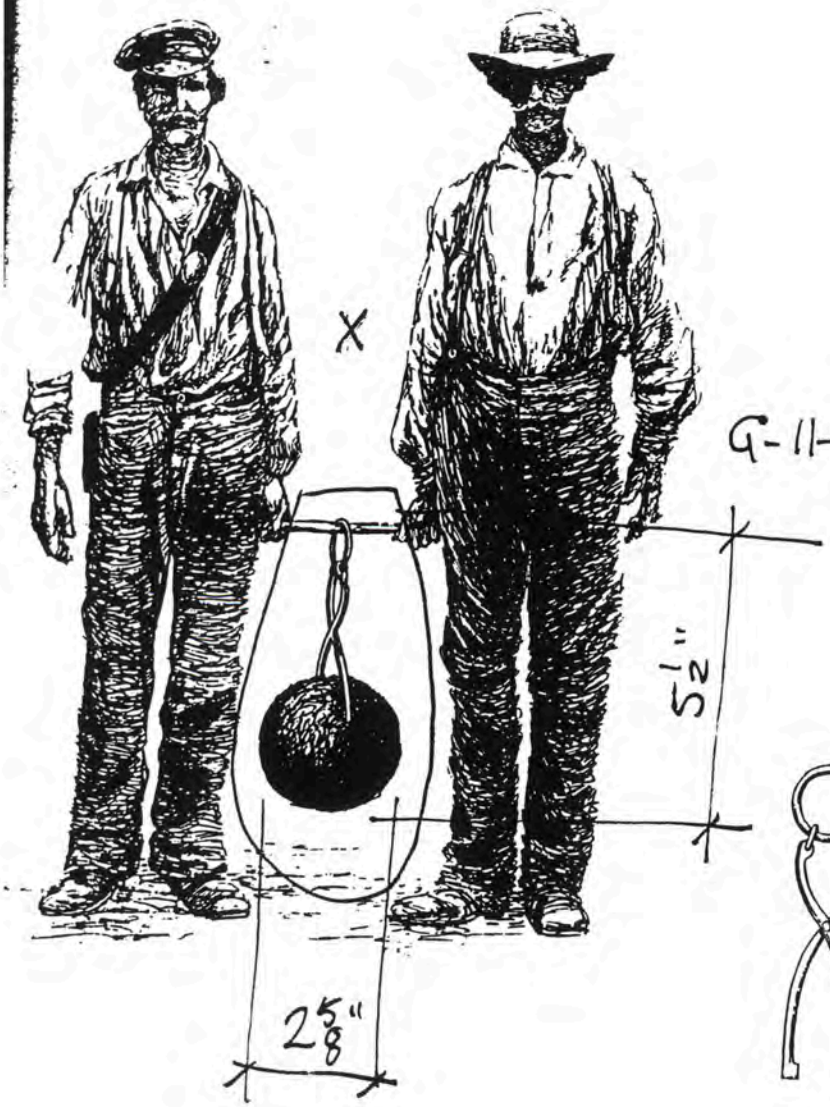
WATER BUCKET FOR SEACOAST ARTILLERY



G-11-016



LINSTOCK



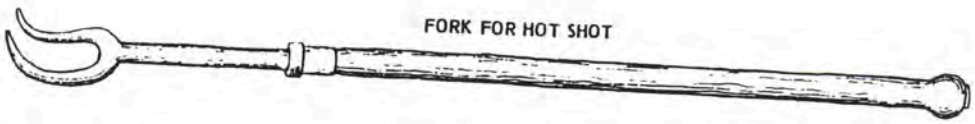


PORTFIRE HOLDER

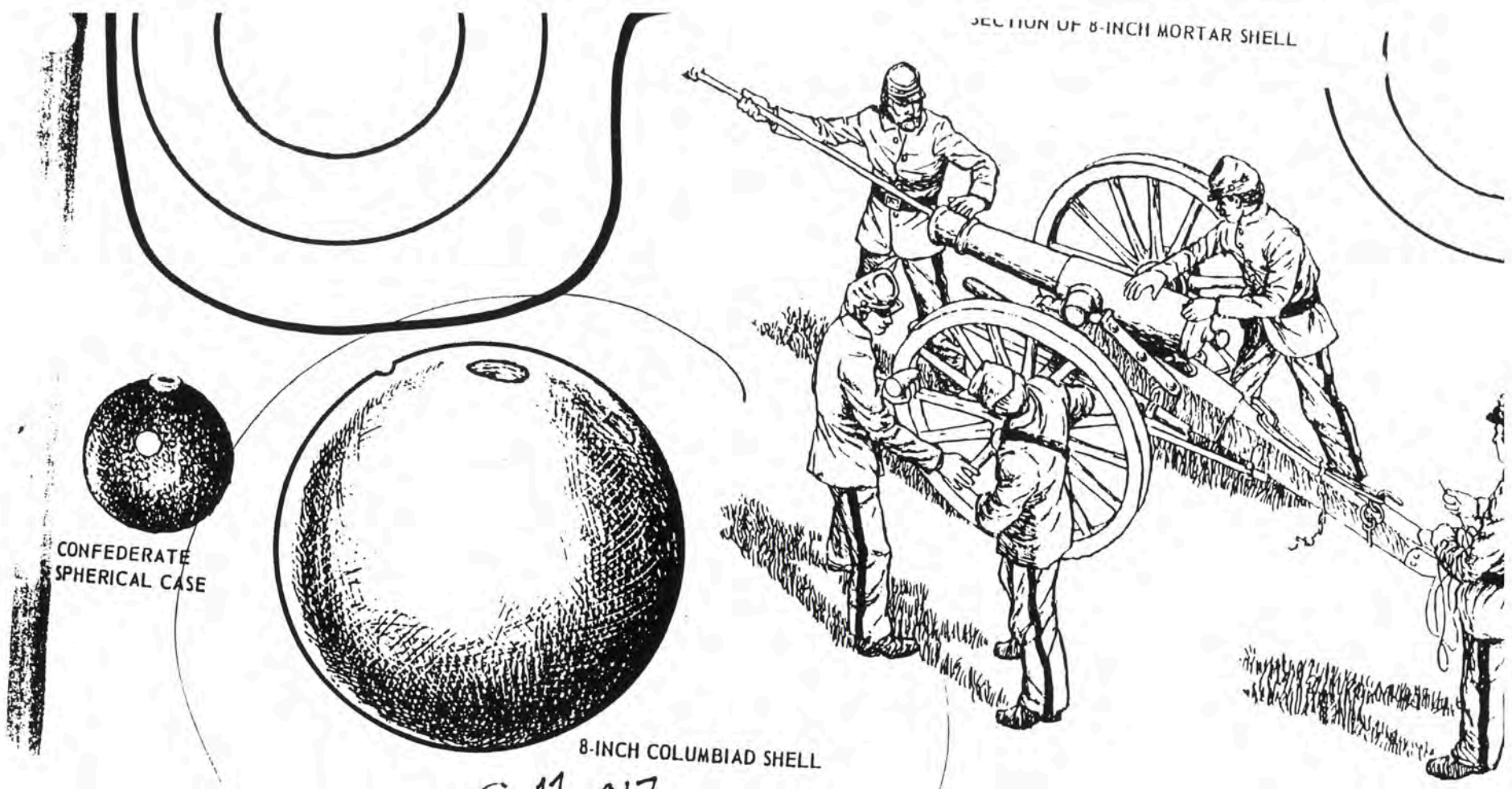


BUDGE BARREL

SHELL TONGS



FORK FOR HOT SHOT



G-11-017

SOURCE: ROUND SHOT & RAMMER

G-11-017



HANDSPIKE FOR FIELD GUN

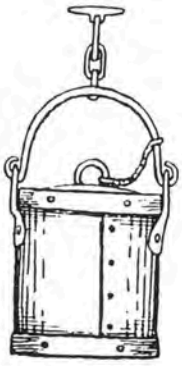
G-11-018



SPONGE AND RAMMER FOR 3-INCH RIFLE



VENT COVER



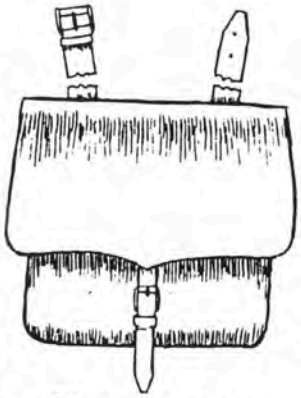
WATER BUCKET



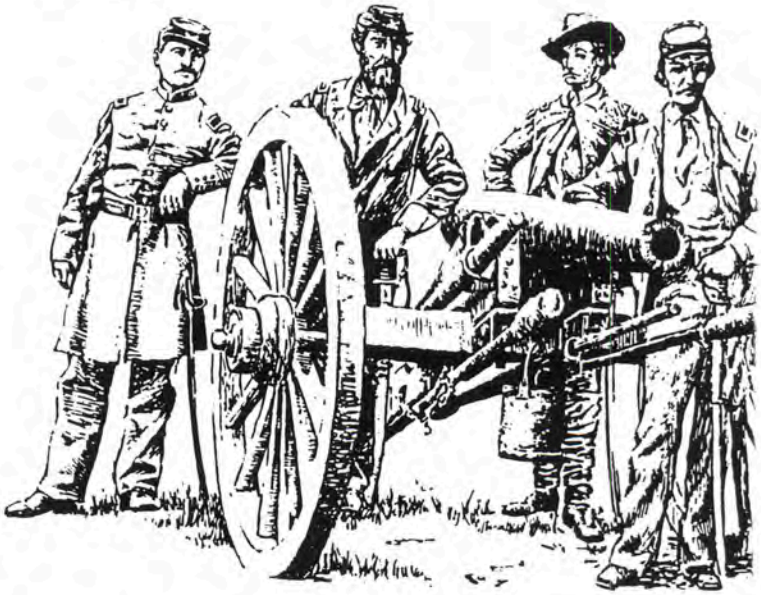
TAR BUCKET

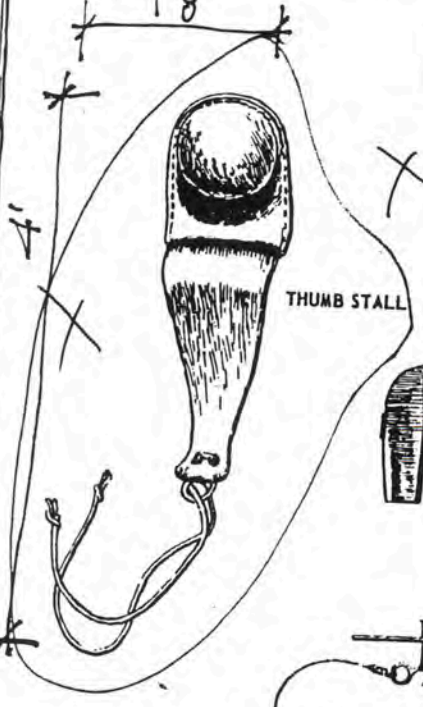
GUN WORM



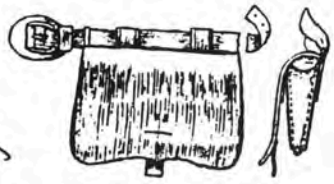


GUNNER'S HAVERSACK





THUMB STALL

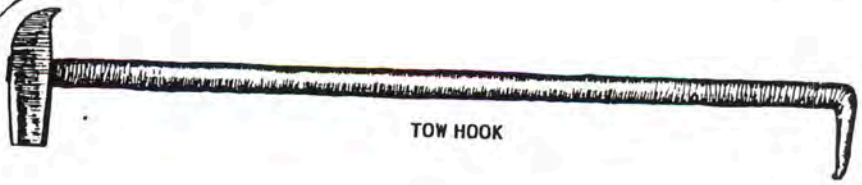


GUNNER'S TUBE POUCH

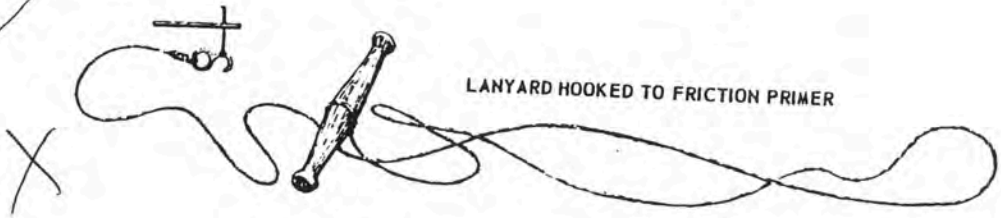
G-11-018



VENT PICK



TOW HOOK



LANYARD HOOKED TO FRICTION PRIMER



HANDSPIKE FOR FIELD GUN

G-11-019



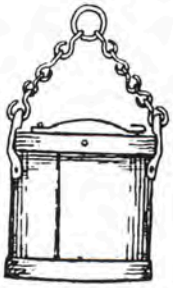
VENT COVER

SPONGE AND RAMMER FOR 3-INCH RIFLE

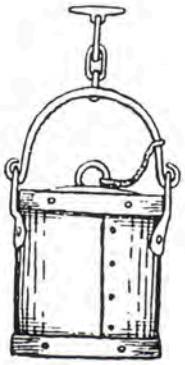


GUN WORM

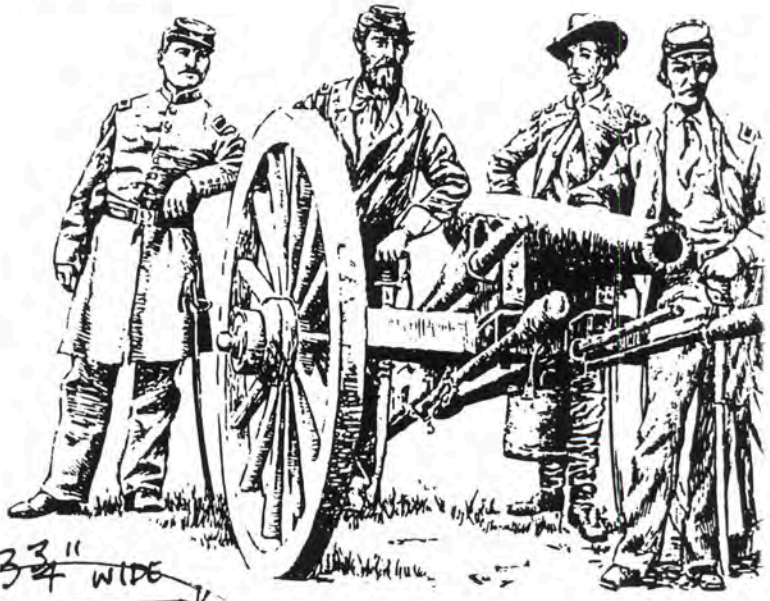




TAR BUCKET

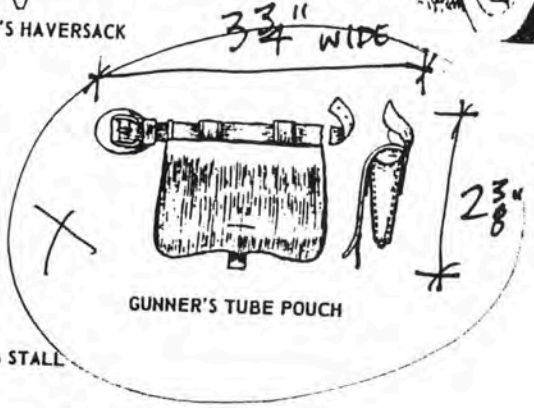


WATER BUCKET



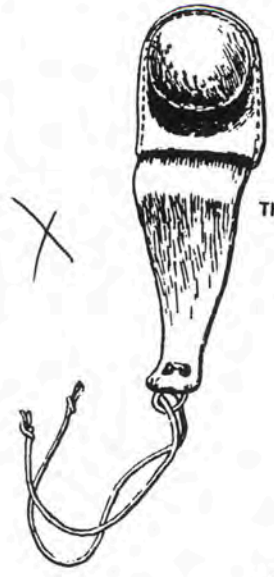


GUNNER'S HAVERSACK



GUNNER'S TUBE POUCH

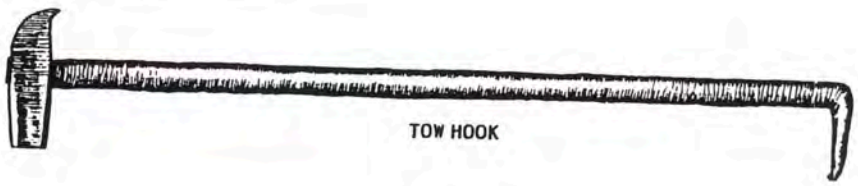
G-11-019



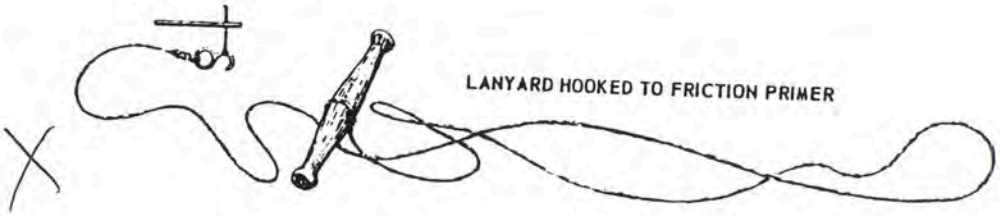
THUMB STALL



VENT PICK



TOW HOOK



LANYARD HOOKED TO FRICTION PRIMER

Load was the second command. Nos. 1, 2, and 4 lai
No. 2 took out the tompion; No. 1 took up the spong
head into the muzzle; No. 2 stepped up to the mu

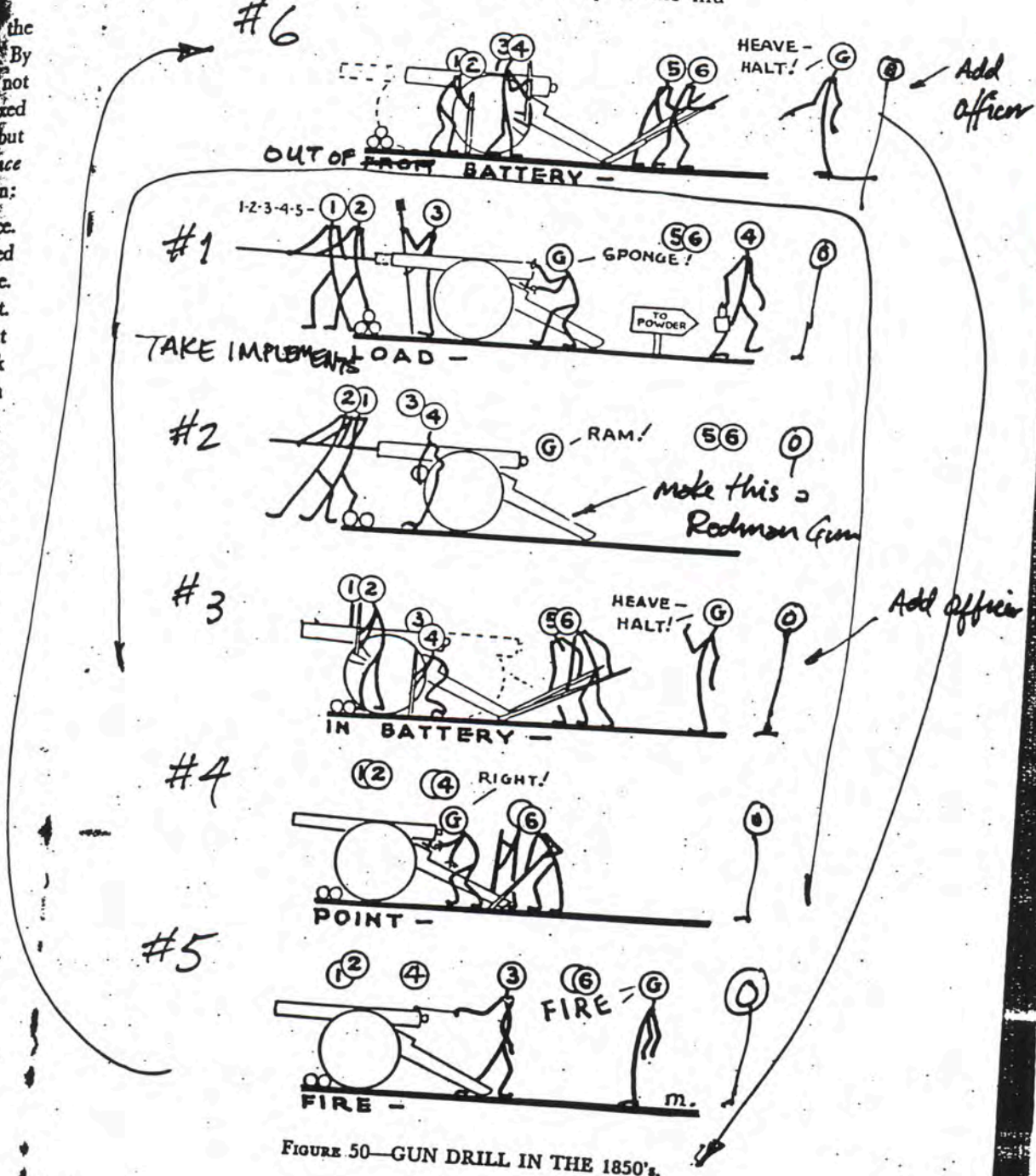
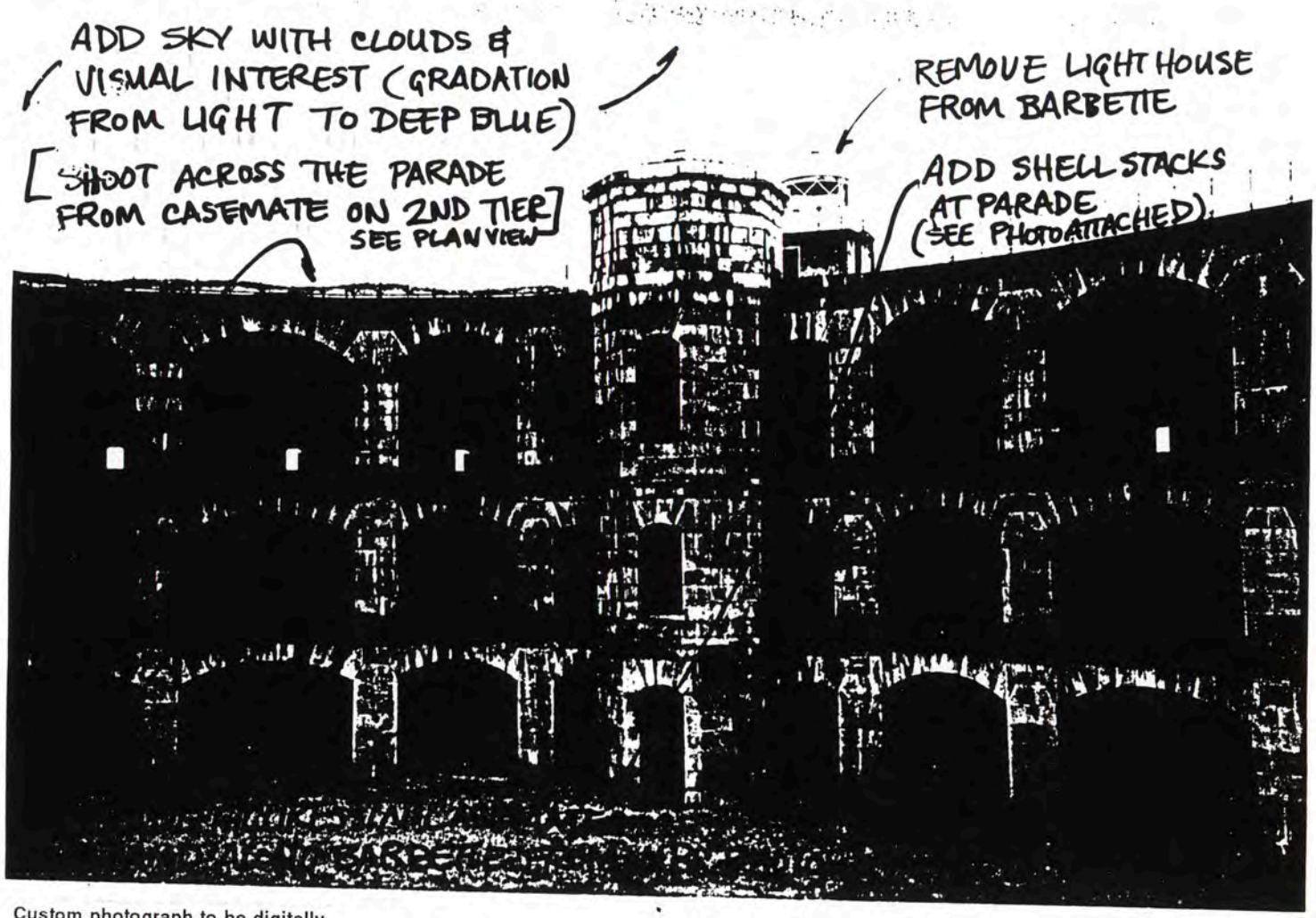


FIGURE 50—GUN DRILL IN THE 1850's.

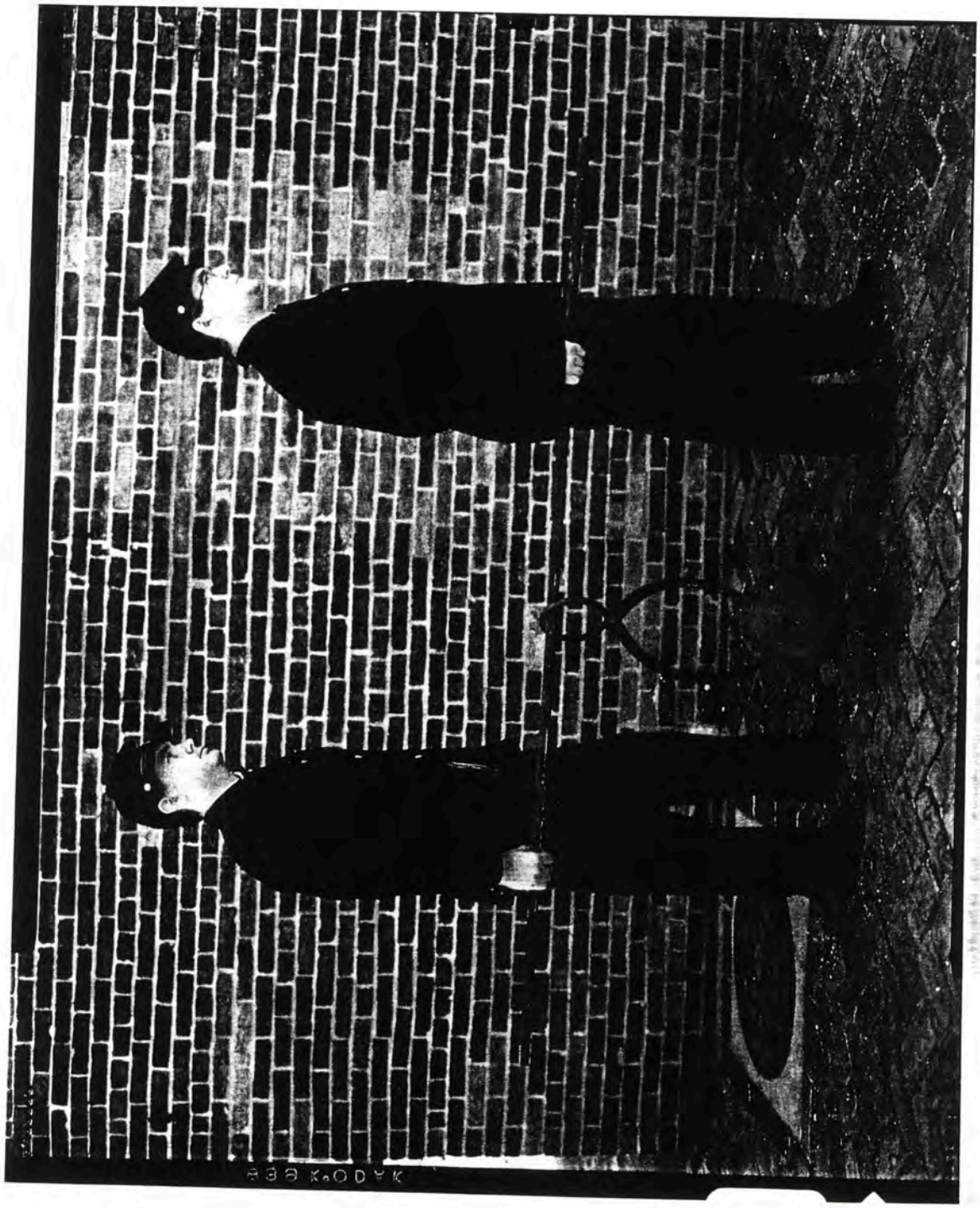
Illustration(based on existing artwork) of gun drill for a Rodman gun; by exhibit fabricator



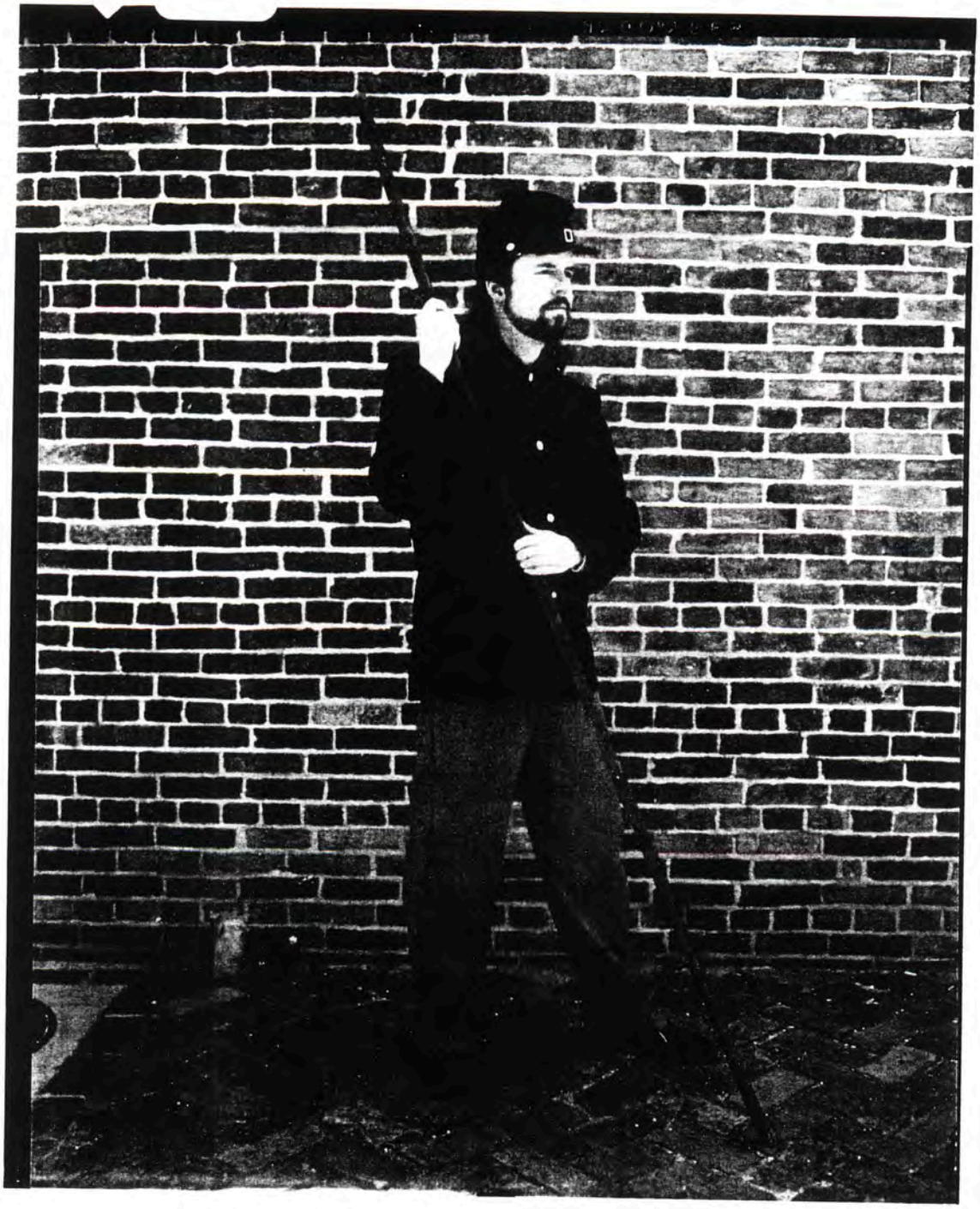
Custom photograph to be digitally retouched (View across Battery Weed's parade ground to casemates in opposite wall. For wall mural; by exhibit fabricator

G-11-021

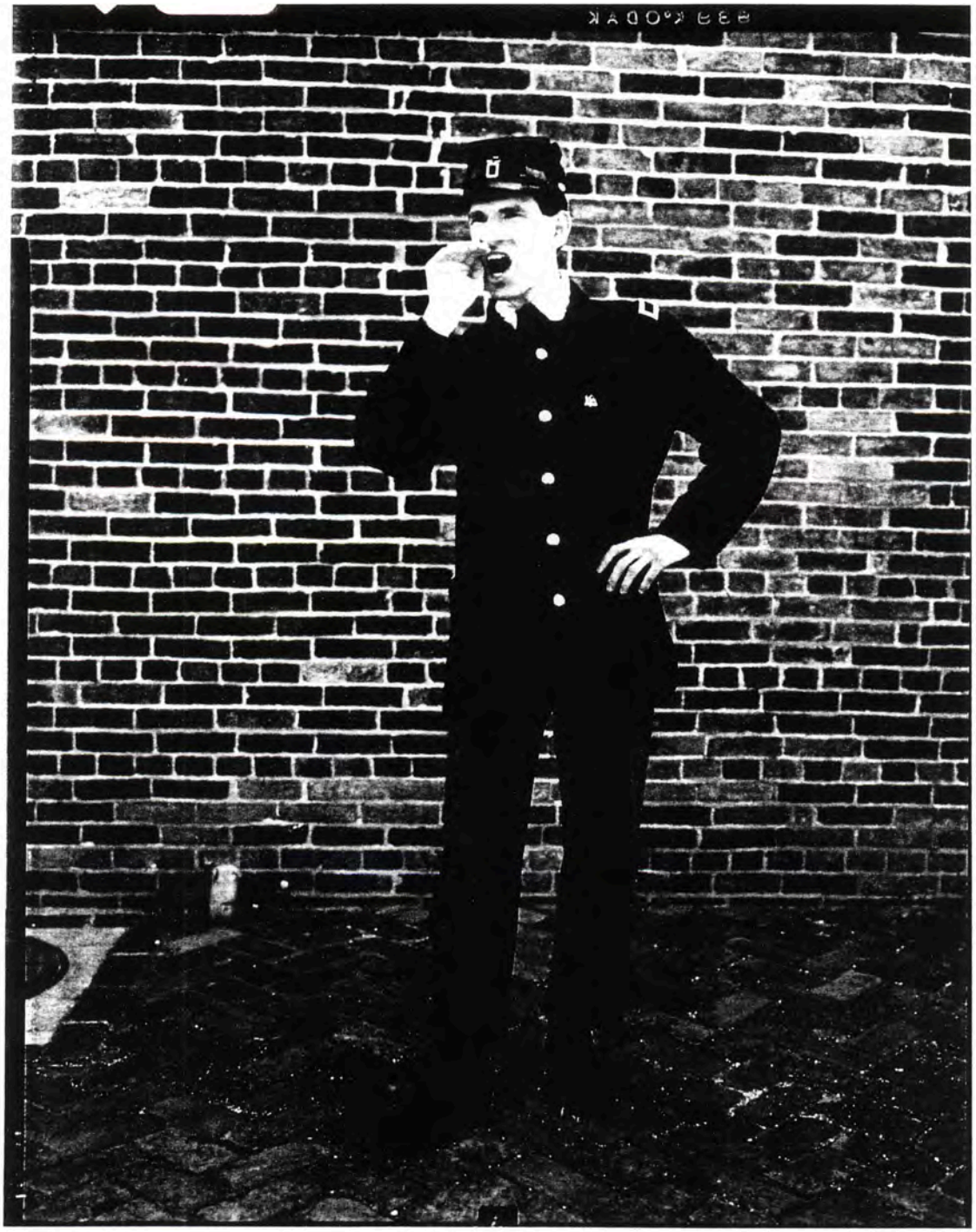
G-11-022 (1)



G-11-022 (2)



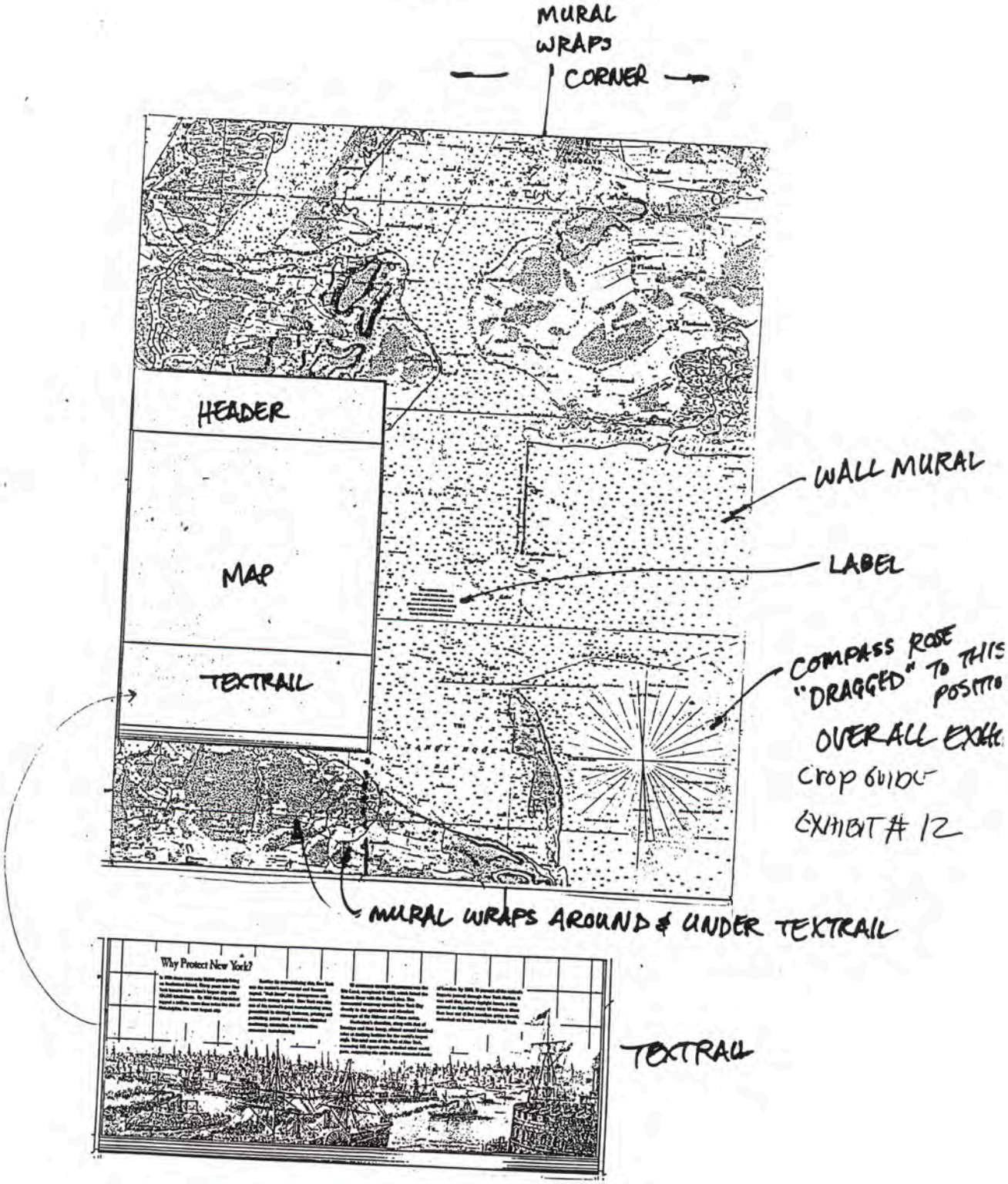
G-11-022 (3)



...view of the harbor from Fort Jay (then ...Columbus) (New York Historical So... ...n Troops outside their quarters at ...w Liberty Island, 1861 (American ...Immigration)

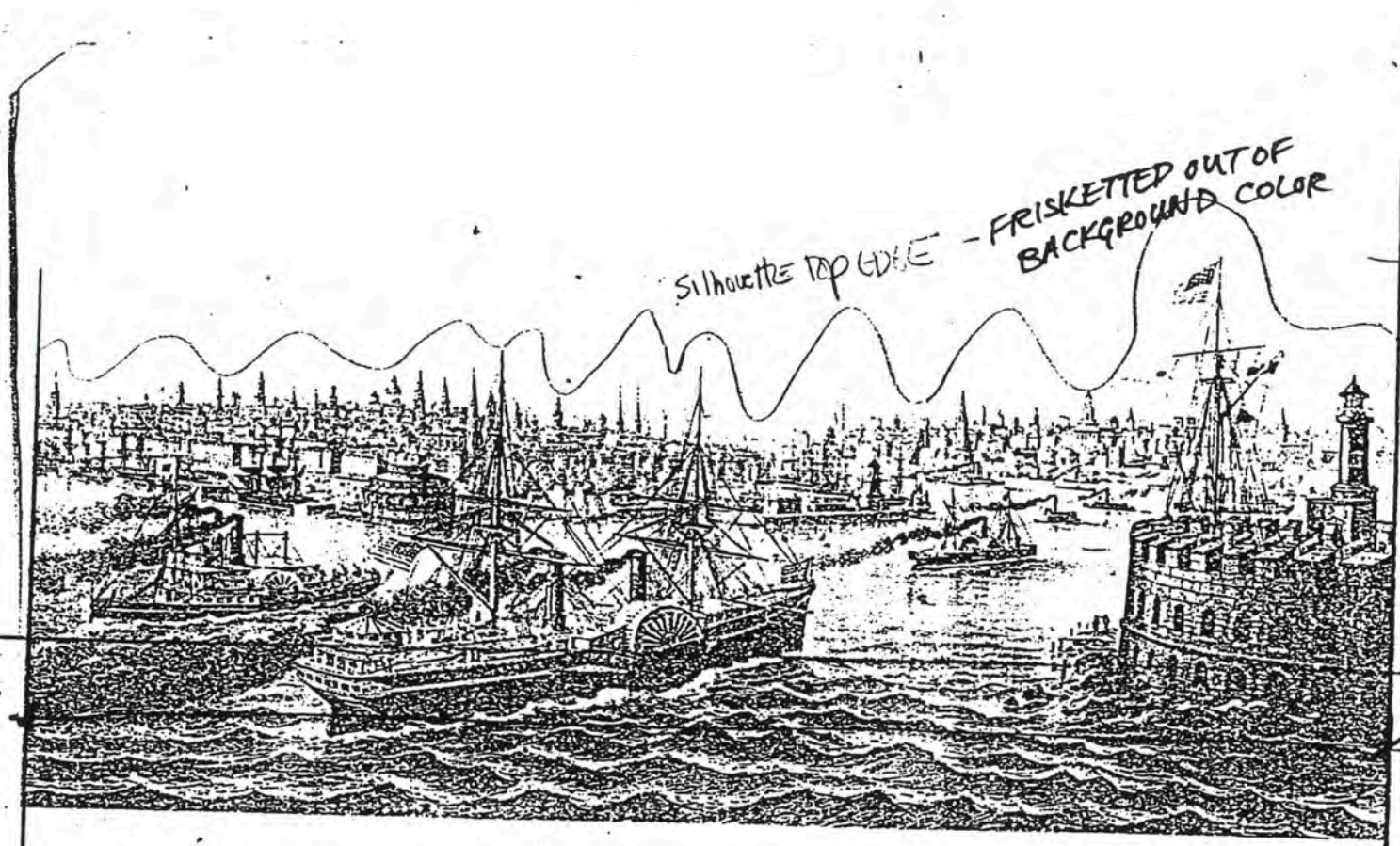
"Views to the Narrows" Graphic at Gun Port Lightbox (Color Duratrans with acrylic face; by exhibit fabricator)

EXHIBIT 12
CROP GUIDE



G-12-002

MAKE ± 11'-9½" (V.I.F.) (141½")
#12
1845
NEW-YORK BAY AND HARBOR
AND THE ESTUARIES.
36-54a
MOVE COMPASS ROSE
G-12-002
MINI WRAP
± 9'-3" (111") SIZE TO WRAP CABINET FULLY



era Fort Gates. Fort Hancock would later rise on the same sand spit since it was too important a site to ignore. Until the dredging of the Ambrose Channel early in the twentieth century, Hancock offered the best first shot at an enemy ship near-

ships. The granite work at Willets Point, like the one at Sandy Hook, became obsolete before it was finished. At the turn of the century, however, when equipped with new long-range guns, Fort Totten emerged as chief protector of New York-

Fort Tilden in the Rockaways covered a thirty-mile fan of ocean with two of the most powerful U.S. coastal guns ever made, sixteen-inch rifles firing a projectile as heavy as a small car. Later, inter-

G-12-003

13½" x 44 3/8"

G-12-003

G-12-004

Line Art Map of New York Harbor with forts and their fields of fire; by exhibit fabricator

Line Art to Indicate 1st System Forts and their time period

Line Art to Indicate 2nd System Forts and their time period

G-12-010

Line Art to Indicate 3rd System Forts and their time period

Line Art to indicate Endicott Era forts and their time period

G-12-012

Line Art to indicate 20th Century fortifications and their time period

G-13-005

Illustration of Fort
Hancock/Battery Potter
Silkscreen line art by exhibit
fabricator

G-13-007

Illustration of
Navesink/Battery Lewis
Silkscreen line art by exhibit
fabricator

Illustration of Fort
Tilden/Battery Harris
Silkscreen line art by exhibit
fabricator

Illustration of Fort Hamilton
Silkscreen line art by exhibit fabricator

Illustration of Fort Lafayette
Silkscreen line art by exhibit
fabricator

Illustration of Fort Columbus
Silkscreen line art by exhibit fabricator

Illustration of Castle Williams
Silkscreen line art by exhibit
fabricator

Illustration of Fort Totten
Silkscreen line art by exhibit fabricator

G-13-021

Illustration of Fort Schuyler
Silkscreen line art by exhibit
fabricator

Illustration of Castle Clinton
Silkscreen line art by exhibit
fabricator

G-13-025

Illustration of Fort Gibson
Silkscreen line art by exhibit
fabricator

Illustration of Fort Wood
Silkscreen line art by exhibit fabricator

G-13-029

Illustration of Fort
Wadsworth/Fort Tompkins
Silkscreen line art by exhibit
fabricator

Illustration of Fort
Wadsworth/Battery Duane
Silkscreen line art by exhibit
fabricator

Illustration of Fort Wadsworth/Fort Richmond
Silkscreen line art by exhibit fabricator

G-14-002

Custom illustrated map of NY population and forts, circa 1807
Color Print

G-14-003

Custom illustrated map of NY population and forts, circa 1816
Color Print

G-14-004

Custom illustrated map of NY population and forts, circa 1865
Color Print

G-14-005

Custom illustrated map of NY population and forts, circa 1910
Color Print

G-14-006

Custom illustrated map of fort sites converted to parks, beaches, historic sites, and recreation areas, at 1994
Color Print

G-14-007

Custom illustration depicting attacking vessels and batteries
Color Print

Labels Schedule

Label Schedule

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		1 Fort Wall Replica			
L-01-001	Quotation 17	**"...making the coast as far as practicable,**	Quote: ITR Caslon Antique, ital, width 80%; Track: normal 150/216 FL, RR; Citation: same as above, size 96/216	Black PMS 7C	OVERALL NOTE: NO BROKEN WORDS EXCEPT WHERE ABSOLUTELY NECESSARY TO AVOID LARGE HOLES
L-01-002	Title 3	**BUILT TO LAST...**	ITC Caslon Antique; Width: 70%; Track: none; Size: Cap Height 3 1/2"	Black PMS 7C	
L-01-003	Primary text 152	This is a replica of the seaward wall of Battery	ITC Cheltenham Book; Width: 80%; Track: normal; Size: 80/96 FL,RR	Black PMS 7C	
L-01-004	Secondary text 52	This view of Fort Richmond* from Fort Hamilton across	ITC Cheltenham Book; Width: 80%; Track: normal; Size: 42/60 FL, RR	Black PMS 7C	
L-01-005	Secondary text 20	Reflecting the stacked decks of an enemy man-o-war, Fort	ITC Cheltenham Book; Width: 80%; Track: normal; Size: 42/60 FL, RR	Black PMS 7C	
L-01-006	Title 4	**TOTTEN'S CONTRIBUTION**	Caslon Antique; Width: 70%; Track: none; Size: Cap Height 1 1/2"	Black PMS 7C	
L-01-007	Subtitle 2	**BETTER IDEAS**	Caslon Antique; Width: 70%; Track: none; Size: Cap Height 1 3/4"	Black PMS 7C	
L-01-008	Primary text 57	**Architect of the Fort** Joseph G. Totten, an 1805	Head: Cheltenham BD 42/38 Text: Cheltenham 36/38	Black PMS 7C	
L-01-009	Primary text 77	**American Export** Called an **embrasure,**	Head: Cheltenham BD 42/38 Text: Cheltenham 36/38	Black PMS 7C	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-01-010	Primary text 50	**Totten Shutters** Another of Totten's	Head: Cheltenham BD 42/38 Text: Cheltenham BK 36/38	Black PMS 7C	
L-01-011	Secondary text 70	**Iron Beats Stone** Totten subjected many	Head: ITC Cheltenham Bold 42/38; Width: 80%; Track: normal Text: ITC Cheltenham Book; Width: 80% Track: normal; Size: 36/38, FL,RR	Black PMS 7C	
L-01-012	Secondary text 87	**The Totten System** So strong was Totten's	Head: Cheltenham BD 34/38 Text: Cheltenham BK 32/38	Black PMS 7C	
L-01-012.1	Subtitle 10	**Cross-Section through Fort Richmond's**	Cheltenham BD 24pt	Black PMS 7C	
L-01-012.2	Identifier(s) 29	[Cross-Section Indentifiers] Tide-filled Moat	Cheltenham BK 24 pt	Black PMS 7C	

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
		4 Life on the Base Alcove			
L-04-001	Title 3	**LIFE ON THE BASE**	ITC Caslon Antique at 65% Width/ Kern Track: none; Cap Height: 7/8"	**PMS 8581C**	Center in 1 1/2" Black Band of PMS 7C
L-04-002	Primary text 319	**Everyday Life** Garrisoned off and on for	Head: Chelt. BD; Width: 80%; Track: normal; Size: 60pt/ 50 FL,RR Text: Chelt. BK 34/44; Width: 80%; Track: normal FL,RR	**PMS 186C**	
L-04-003	Secondary text 50	In the late 1870s or early 1880s, ten wooden structures	Chelt. BK 26/30	**White**	Reverse out of background
L-04-003.1	Caption 5	Commanding Officers Quarters	Chelt. BD 26	**Black PMS 7C**	
L-04-004	Secondary text 59	The great Endicott guns were only rarely fired, and such an	Chelt. BK 26/30	**White**	Reverse out of background
L-04-004.1	Caption 5	North Side of Officers Row	Chelt. BD 26	**Black PMS 7C**	
L-04-005	Title 4	**Snapshots of the Base**	Chelt BD 26/30	**Black PMS 7C**	
L-04-005.1	Caption 2	Orphan Home	Chelt. BK 26	**Black PMS 7C**	
L-04-005.2	Caption 5	Main Gate and Officers Row	Chelt. BK 26 pt	**Black PMS 7C**	

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
L-04-005.3	Caption 1	Hospital	Chelt. BK 26 pt	Black PMS 7C	
L-04-005.4	Caption 3	Infantry Inspection	Chelt. BK 26 pt	Black PMS 7C	
L-04-005.5	Caption 2	Marching Band	Chelt. BK 26 pt	Black PMS 7C	
L-04-006	Bullet text 53	"Fort Wadsworth is a deceptive place; quiet on the	Caslon Antique width: 90% Track: none Size: 90/94 Center	White	Reverse out of PMS Black 7C circle , follow drawing for line breaks
L-04-007	Caption 14	Soldiers and their vehicles line up for a motor pool	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	Reverse out of PMS Black 7C circle , follow drawing for line breaks
L-04-008	Caption 53	A late 19th-century guidebook remarked that "Fort	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	Reverse out of PMS Black 7C circle , follow drawing for line breaks
L-04-009	Caption 34	During the 1890's, the infantry were housed in Fort	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	Reverse out of PMS Black 7C circle , follow drawing for line breaks

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-04-010	Caption 28	As indicated by this photo collage from the base	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	Drop out of PMS Black 7C
L-04-011	Caption 56	A study of living conditions reported: 'The men occupy	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	Drop out of PMS Black 7C
L-04-012	Caption 24	Fort Tompkins' parade ground (which was then referred to as	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 45C	Drop out of PMS Black 7C
L-04-013	Caption 29	Obsolete as a military structure after the Civil War,	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	Drop out of PMS Black 7C
L-04-014	Caption 27	Though none of the guns were mounted after the Civil	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	Drop out of PMS Black 7C

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		5 Fort Construction Alcove			
L-05-001	Title 3	**FORT CONSTRUCTION**	ITC Caslon Antique at 65% Width/ Kern Track: none; Cap Height: 7/8"	**PMS 8581C**	Drop out of Black Band PMS 7C
L-05-002	Primary text 246	**Building the Forts** As technologies and military	Head: Chelt. BD W: 80% TR: normal Size: 60/50 FL,RR Text: Chelt. BK 34/44 FL,RR	**PMS 186C**	
L-05-003	Secondary text 37	Battery Weed represents the highest refinement of the	Chelt BK 26/30	**White**	Reverse out of background
L-05-004	Secondary text 29	Large-scale cranes were required to hoist the massive	Chelt BK 26/30	**White**	Reverse out of background
L-05-005	Secondary text 20	Fort Tompkins, the masonry fort on the bluff overlooking	Chelt BK 26/30	**White**	Reverse out of background
L-05-006	Bullet text 30	In fortification design, the form of the fort—its size,	Caslon Antique W: 90% TR: none Size: 90/94 Center	**White**	Reverse out of PMS 7C Circle, follow drawing for line breaks
L-05-007	Caption 42	In 1841, Robert E. Lee, then a thirty four year old engineer	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	**PMS 452C**	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-05-008	Caption 24	Turn-of-the-century Endicott batteries were massive	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-05-009	Caption 36	Granite blocks for the construction of the masonry	30/34 x 111/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-05-010	Caption 31	Though almost all traces have vanished, a 10-foot deep moat	30/34 x 111/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-05-011	Caption 41	This engraving of the 1850s shows Fort Richmond (now	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-05-011.1	Citation 19	Reprinted from *Seacoast Fortifications of the United*	Chelt. BK width 80% TR: normal size 10-1/2 x 6"	PMS 7C	set baseline 1/4" under image
L-05-012	Caption 50	This photo of Fort Totten in 1862 shows a granite	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		6 Channel Obstructions Alcove			
L-06-001	Title 4	CHANNEL OBSTRUCTIONS	ITC Caslon Antique at 65% Width/ Kern Track: none; Cap Height: 7/8"	PMS 8581C	Drop out of Black Band PMS 7C
L-06-002	Primary text 188	**Blocking the Narrows** As early as 1806, military	Head: Chelt. BD W: 80% TR: normal Size 60/50 FR,RR Text: Chelt. BK W: 80% TR: normal Size: 34/44	PMS 186C	
L-06-003	Secondary text 29	This diagram from 1892 depicts a net laced with	Chelt. BK W: 80% Tr: normal Size 26/30	White	Reverse out of Backgrounds
L-06-004	Secondary text 36	A U.S. Army vessel lays mines in New York harbor, c.	Chelt. BK W: 80% Tr: normal Size 26/30	White	
L-06-005	Bullet text 30	Many schemes have been devised to span the mile-wide	Caslon Antique W: 90% TR: none Size: 90/94 Center	White	Reverse out of PMS Black 7C circle, follow drawing for line breaks
L-06-006	Caption 19	World War II era mines were deployed to discourage	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-06-007	Caption 34	Though clearly designed to pierce the hulls of ships, it's	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-06-008	Caption 30	This string of 40-foot square rafts of sharpened spikes was	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-06-009	Caption 51	During the Civil War, the Confederates developed and	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-06-010	Caption 38	This Civil War-era channel obstruction scheme from	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-06-011	Caption 56	Water mines were common to Endicott defenses, though	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-06-012	Caption 29	Between the two world wars, army engineers installed a	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-06-014	Caption 19	Each float in the plan below was constructed of fifteen 15"			
L-06-015	Caption 22	This channel obstruction scheme from 1869 appears to			

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		7 The Enemy Alcove			
L-07-001	Title 1	THE ENEMY	ITC Caslon Antique at 65% Width/ Kern Track: none; Cap Height: 7/8"	PMS 8581C	Drop out of Black Band 7C
L-07-002	Primary text 149	**Fear of Attack** As America's financial and	Head: Chelt. BD W" 80% TR: normal Size: 60/50 Text: Chelt. BK W: 80% TR: normal Size: 34/44	PMS 186C	
L-07-004	Secondary text 73	This Endicott-era battery with its 12" disappearing gun	Chelt. BK W: 80% TR: normal Size: 26/30, FL,RR	White	Reverse out of background
L-07-005	Secondary text 36	In the years leading up to World War II, airpower was	Chelt. BK W: 80% TR: normal Size: 26/30, FL,RR	White	Reverse out of background
L-07-006	Secondary text 74	**The Phantom Fleet** Though the much-feared fleet	Head: Chelt. BKDW: 80% TR: normal Size: 26/30 Text: Chelt. BK W: 80% TR: normal Size: 26/30, FL,RR	Black PMS 7C	Reverse out of background
L-07-007	Bullet text 34	Though New York City has never come under enemy	Caslon Antique W: 90% TR: none Size: 90/94 Center	White	Reverse out PMS BLack 7C circle, follow drawing for line breaks
L-07-008	Caption 48	This British frigate from the War of 1812 would have	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
L-07-009	Caption 50	During the Civil War, the Confederates were the first to	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-07-010	Caption 49	The turrets equipped with powerful high-angle guns on	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-07-011	Caption 17	During World War II, German U-boats attacked American	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-07-012	Caption 34	Images such as this World War I poster of German	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-07-013	Caption 59	During the War of 1812, the British sailed up the Potomac	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		8 Signalling Devices Alcove			
L-08-001	Title 3	**SIGNALLING DEVICES**	ITC Caslon Antique at 65% Width/ Kern Track: none; Cap Height: 7/8"	**PMS 8581C**	Drop out of 1 1/1" Black Band
L-08-002	Primary text 181	**Staten Island Lookout** Beginning during the era of	Head: Chelt. BD W: 80% TR: normal Size: 60/30 Text: Chelt BK W: 80% TR: normal Size 34/44	**PMS 186C**	
L-08-003	Secondary text 23	The Fort Wadsworth site has been a lookout post for over	Chelt. BK 26/30 FL, RR	**White**	Reverse out of background
L-08-004	Secondary text 36	In its history, Fort Wadsworth has mounted	Chelt. BK 26/30 FL, RR	**White**	Reverse out of background
L-08-005	Bullet text 38	The promontory at the Narrows, with its clear view	Caslon Antique W: 90% TR: none Size: 90/94 Center	**White**	Reverse out of PMS Black 7C circle, follow drawings for line breaks
L-08-006	Caption 17	This beacon can still be seen perched on top of Battery	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	**PMS 452C**	
L-08-007	Caption 62	In May 1776, George Washington sent a contingent	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	**PMS 452C**	

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
L-08-008	Caption 20	This signalling shutter dating from 1910 was used to send	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-08-009	Caption 50	In the late 1850s, an army surgeon named Albert J. Myer	30/34 x 11 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-08-010	Caption 35	This signal station of the 1800s utilized ten movable	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-08-010.1	Citation 19	Reprinted from *Seacoast Fortifications of the United*	Chelt. BK width 80% TR: normal size 10-1/2 x 6"	PMS 7C	set baseline 1/4" under image
L-08-011	Caption 42	In the early 1800s, coded information was relayed from	30/34 x 15 1/2" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	
L-08-012	Caption 41	This diagram from 1898 shows the location of	30/34 x 10" Max ITC Cheltenham medium at 80% Width/ Kern Track: normal flush left, rag right; left margin 3/8" Baseline sits 5/8" from top edge	PMS 452C	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		9 Weapons Take Charge			
L-09-001	Title 4	**THE WEAPONS TAKE CHARGE**	Caslon Antique W: 70% TR: none Size: Cap Height 2 3/4"	**PMS 179C**	
L-09-002	Primary text 202	The spiral grooving of a gun barrel to impart a stabilizing	Chelt. BK Size 42/48 FL,RR x 11"	**PMS 400C**	
L-09-003	Secondary text 118	**THOMAS JEFFERSON RODMAN** (1815-1871)	Head: Caslon Antique W: 70% Size: 32 pt Caps Text: Chelt. BK 36/40	**PMS 465C**	36pt initial cap, run around shape
L-09-004	Secondary text 103	**ROBERT PARKER PARROTT** (1804-1877)	Head: Caslon Antique Size: 32 pt Caps Text: Chelt. BK	**PMS 465C**	36 pt initial cap, run around shape
L-09-005	Secondary text 66	**FORT PULASKI BREACHED**	Head: Caslon Antique 56 pt Text: Chelt. BK 42/46	**PMS 4535C**	Run around shape
L-09-006	Secondary text 83	**DENTED NOT DEFEATED**	Head: Caslon Antique 56 pt Caps Text: Chelt. BK 42/46	**PMS 4535C**	Run around shape
L-09-007	Secondary text 128	**A GUNNER'S IDEAL** A technological breakthrough	Head: Caslon Antique 56 pt Caps Text: Chelt. BK 42/46	**PMS 4535C**	Run around shape
L-09-008	Caption 4	**RIFLED BREECHLOADER**		**Stamped**	See drawing, center on 1 1/2" band.
L-09-008.1	Caption 8	Gun tube is made of layers of machined steel	Chelt. BD 52 pt	**PMS 5855C**	See drawing
L-09-008.2	Caption 5	Barrel is long and tapering	Chelt. BD 52 pt	**PMS 5855C**	See drawing

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
L-09-008.3	Caption 6	Loaded from the back of the barrel	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-008.4	Caption 6	Crew protected from enemy fire	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-008.5	Caption 5	Fires long, pointed shells	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-008.6	Caption 7	Rifled barrel imparts stabilizing spin	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-008.7	Caption 7	Fires in high trajectory for long range	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-008.8	Caption 17	The rifled breechloading gun represents the standard for	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-009	Caption 4	**SMOOTHBORE MUZZLELOADER**		Stamped	See drawing, center on 1 1/2" band
L-09-009.1	Caption 7	Gun tube is made of solid cast iron	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-009.2	Caption 5	Barrel is short and bulbous	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-009.3	Caption 7	Loaded from the front of the barrel	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-009.4	Caption 5	Crew exposed to enemy fire	Chelt. BD 52 pt	PMS 5855C	See drawing

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-09-009.5	Caption 3	Fires round shot	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-009.6	Caption 5	Smooth barrel induces wobble	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-009.7	Caption 8	Fires in flat trajectory for limited range	Chelt. BD 52 pt	PMS 5855C	See drawing
L-09-009.8	Caption 12	The Rodman gun represents the pinnacle of smoothbore	Chelt. BD 52 pt	PMS 5855C	See drawing

Ex ID No.	Category/ Word Count	Sample text	□ Typography	△ Finish Color	Notes
		10 Weigh In with the Big Shots			
L-10-001	Title 5	**WEIGH IN WITH THE BIG SHOTS**	Caslon Antique W: 70% Cap Height 8"	**PMS 130C**	On Scotch Cal Metallic Shadow Blue Background
L-10-002	Primary text 71	**Compare Yourself with These Rounds**	Head: Caslon Antique W: 70% 48 pt with 50 pt initial cap Text: Chelt. BK 44/64 FR, RL	**PMS 540C**	Solid Triangular Arrowhead Dingbats 1/2" long, 3/8" high. See Drawing
L-10-003	Prompt 27	The scales to the right invite you to compare your weight	Chelt. BK 36/44	**PMS 130C**	
L-10-004	Secondary text 80	**Another Useful Comparison**	Head: Caslon Antique 42 Text: Chelt. BK 40/52 Promt: Chelt. BK 36/44	**PMS 540C**	Run around shapes
L-10-005	Primary text 71	**32-Pound Cannonball, circa 1812**	Head: Chelt. BD 56 pt Text: Chelt. BK 42/52 FL Facts: Chelt. BD 40/48 with 36 BD Caps FR	**PMS 540C**	
L-10-006	Primary text 85	**10" Exploding Shell, circa 1860**	Head: Chelt. BD 48 pt Cap Height Text: Chelt: BK 48/54 FL Facts: Chelt. BD 44/8 with 40 pt BD Caps FR	**PMS 540C**	
L-10-007	Secondary text 89	**High-Explosive Shell for 16-inch Rifle, circa**	Head: Chelt. BD Cap Height 3/4" Text: Chelt. BK 52/62 Facts: Chelt. BD 50/58 with 48 pt BD Caps FR	**PMS 540C**	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-10-008	Pedal Labels 6	50 lbs 100 lbs	Chelt. BD width 80% cap height 1-1/4"	PMS 130C	on rubber pedals
L-10-010	Secondary text 113	**Pounds and Inches** Why are some projectiles	Head: Caslon Antique 40 pt Text: Chelt. BK 32/40 FL	PMS 540C	Arrows PMS 130C

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
		11 Casemate Diorama			
L-11-001	Title 4	**ENTER THE GRANITE FORT**	Caslon Antique W: 70% Cap Height: 2 1/2"	**PMS 8581C**	Run around shape
L-11-002	Primary text 83	Just ahead is a replica of the part of a fort called a	Text: Chelt. BK 70/74 Definition: 65/68 Chelt. BD	**PMS 4535C**	Run around shape
L-11-003	Citation 19	Reprinted from *Seacoast Fortifications of the United*	Chelt. BK width 80% TR: normal size 10-1/2 x 6"	**PMS 7C**	set baseline 1/4" under image
L-11-004	Title 10	**What's inside the fort determines its outside**	Chelt. BD Cap Height 1 1/8"/ 1 7/8" FL	**Red Gel #26**	
L-11-005	Primary text 213	**Overlapping fields of fire**	Head: Chelt. BD Cap Height 3/4" Text: Chelt. BK 42/65	**Neutral Density (ND)**	Run around
L-11-005.1	Identifier(s) 25	[Graphic Identifiers] 60° Field of fire	Chelt. BK 24pt	**amber gel #321**	
L-11-006	Secondary text 45	Prior to concentrating on coastal fortifications, Totten	Chelt. BK 36/45 Center	**ND Gel**	
L-11-007	Secondary text 43	Joseph G. Totten was the Chief Engineer of the U.S.	Chelt. BK & BF 36/45 FL, RR	**ND Gel**	
L-11-008	Secondary text 34	The drive to achieve an effective design for casemates	Chelt. BK & BF 36/45 FL, RR Center	**ND Gel**	
L-11-009	Caption 7	A Casemated Rodman Gun "In Battery".	Chelt. 20 pt BK	**ND Gel**	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-11-009.1	Identifier(s) 44	[Graphic Identifier] Typical Casemate	Chelt. BK 20 pt	ND Gel	
L-11-010	Secondary text 79	The gun carriages in Fort Richmond's casemates	Chelt. BK 36/42 FL, RR	ND Gel	
L-11-011	Title 3	**Manning the Gun**	Chelt. BD Cap Height 1 1/8"/ 1 7/8" FL	Red Gel #26	
L-11-012	Primary text 105	**Manual of Arms** Each piece of coastal artillery	Head: Chelt. BD Cap Height 3/4" Text: Chelt. BK 42/65	ND Gel	
L-11-013	Prompt 22	Listen to the commands and commotion as the fort	Chelt. 30/40	Amber Gel #321	
L-11-014	Secondary text 90	**Tools of the Trade** Every member of the gun	Head: 42 pt Chelt. BD Text: Chelt. BK 36/45	ND Gel	
L-11-015	Caption 21	**Lanyard**—a sharp pull on this cord ignited the friction	Chelt. BD & BK 36/42 FL, RR	ND Gel	
L-11-016	Caption 20	Shells had two indentations for tongs, the tools with	Chelt. BD & BK 36/42 FL, RR	ND Gel	
L-11-017	Caption 30	**Friction Primer**—tugging the twisted wire threaded	Chelt. BK & BD 36/42	ND Gel	
L-11-018	Caption 20	**Thumb stall**—a leather pad that protects the gunner's	Chelt. BK & BD 36/42	ND Gel	
L-11-019	Caption 17	**Tube Pouch**—a leather purse that protects	Chelt. BK & BD 36/42	ND Gel	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-11-020	Secondary text 74	**Gunnery Drill** In the 1860s, a heavy gun	Head 42 pt Chelt. BD Text: Chelt. BK 36/45 FL, RR	ND Gel	
L-11-020.1	Identifier(s) 11	**KEY** **G** = Gunner	Chelt. BK 20/22	ND Gel	
L-11-020.2	Identifier(s) 29	**Load** — Sponge! Ram! **In Battery** — Heave!	Chelt. BK 20 pt	Red Gel #26	
L-11-020.3	Identifier(s) 31	Rodman Gun Gun Carriage	Chelt. Bk 20 pt	ND Gel	
L-11-021	Caption 53	**The View** Looking out the rear of this	Head: Caslon Antique 76 with 80 pt Cap Text: Chelt. BK 72/78 Center	PMS 4535C	Initial Cap reverse out of mural

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		12 Guarding the Gates			
L-12-001	Title 3	GUARDING THE GATES		8420C SSE	
L-12-002	Caption 36	Dating from the mid-1800s, this nautical chart shows the	Chelt. BK 40/44 with Caslon initial 48 pt	PMS 8420C	
L-12-003	Primary text 282	**Why Protect New York?** In 1790 there were only	Credit: Set to fit in one line Head: Caslon Antique Cap Height 7/8" Text: Chelt. BK 36/40 x 7" FL,RR	PMS Black 7C	
L-12-005	Title 5	COASTAL DEFENSES OF NEW YORK	Caslon antique W: 70% Cap Height 7/8"	PMS 8420C	
L-12-006	Primary text 102	The singular importance of New York City and its port	Chelt. BK 32/38 FL, RR x 12" with 36 pt Caslon Antique initial	PMS Black 7C	
L-12-007	Title 7	THE HISTORIC DEVELOPMENT OF	Caslon Antique Caps Size: Cap Height 1/2"	PMS 540C	Run around
L-12-008	Secondary text 108	THE FIRST AMERICAN SYSTEM	Head: Caslon Antique 30 pt Caps Text: Chelt. BK 24/28 x 11 3/4" FL,RR	PMS 540C	Run around
L-12-009	Secondary text 110	THE SECOND AMERICAN SYSTEM	Head: Caslon Antique 30 pt Caps Text: Chelt. BK 24/28 x 11 3/4" FL,RR	PMS 540C	Run around
L-12-010	Secondary text 125	THE THIRD AMERICAN SYSTEM	Head: Caslon Antique 30 pt Caps Text: Chelt. BK 24/28 x 11 3/4" FL,RR	PMS 540C	Run around
L-12-011	Secondary text 112	THE ENDICOTT ERA, 1890-1910	Head: Caslon Antique 30 pt Caps Text: Chelt. BK 24/28 x 11 3/4" FL,RR	PMS 540C	Run around

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-12-012	Secondary text 116	TWENTIETH CENTURY	Head: Caslon Antique 30 pt Caps Text: Chelt. BK 24/28 x 11 3/4" FL,RR	PMS 540C	Run around
L-12-013	Secondary text 33	New York was most vulnerable to naval attack	Chelt. BK	PMS 8420C	Center
L-12-014	Prompt 17	Imagine yourself aboard an attacking man-o-war. Try to	Chelt. BK W: 70% Caps, Cap Height 15/16"	PMS 8420C SSE	on PMS 540C

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		13 New York Harbor Map & Fort Models			
L-13-001.1	Title 2	BROOKLYN (red)	ITC Stencil Bold	PMS 8882C	
L-13-001.1	Title 5	LONG ISLAND SOUND (green)	ITC Stencil Bold	PMS 8702C	
L-13-001.1	Title 4	HUDSON RIVER (green)	ITC Stencil Bold	PMS 8702C	
L-13-001.1	Title 3	EAST RIVER (green)	ITC Stencil Bold	PMS 8702C	
L-13-001.1	Title 4	UPPER N.Y. BAY (green)	ITC Stencil Bold	PMS 8702C	
L-13-001.1	Title 4	LOWER N.Y. BAY (green)	ITC Stencil Bold	PMS 8702C	
L-13-001.1	Title 4	ATLANTIC OCEAN (green)	ITC Stencil Bold	PMS 8702C	
L-13-001.2	Title 2	QUEENS (red)	ITC Stencil Bold	PMS 8882C	
L-13-001.3	Title 3	THE BRONX (red)	ITC Stencil Bold	PMS 8882C	
L-13-001.4	Title 3	THE NARROWS (green)	ITC Stencil Bold	PMS 8702C	

Ex ID No.	Category/ Word Count	Sample text	□ Typography	△ Finish Color	Notes
L-13-001.5	Title 4	MANHATTAN ISLAND (red)	ITC Stencil Bold	PMS 8882C	
L-13-001.6	Title 3	STATEN ISLAND (red)	ITC Stencil Bold	PMS 8882C	
L-13-001.7	Title 3	NEW JERSEY (red)	ITC Stencil Bold	PMS 8882C	
L-13-001.8	Title 2	ROCKAWAY (red)	ITC Stencil Bold	PMS 8882C	
L-13-001.9	Title 3	SANDY HOOK (red)	ITC Stencil Bold	PMS 8882C	
L-13-002	Primary text 62	New York was most vulnerable to naval attack	Chelt. BK	PMS 8420C	Center
L-13-003	Prompt 17	Imagine yourself aboard a Confederate raider. Try to	Chelt. BK W: 70% Caps, Cap Height 15/16"	PMS 8420C	Center
L-13-004	Model text 179	FORT HANCOCK/BATTERY	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-005	Caption 30	Primary Materials: Reinforced concrete with earth	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-006	Model text 103	NAVESINK/BATTERY LEWIS	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45	PMS 8420C	Run around, see drawing

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
L-13-007	Caption 22	Primary Material: Reinforced concrete with earth	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-008	Model text 128	**FORT TILDEN/BATTERY**	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-009	Caption 22	Primary Materials: Reinforced concrete with earth	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-010	Model text 91	**FORT HAMILTON** Fort Hamilton was sited on	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-011	Caption 27	Primary Materials: Granite masonry with brick interior	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-012	Model text 140	**FORT LAFAYETTE** Consisting of two enclosed	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-013	Caption 27	Primary Materials: Stone walls on a granite foundation	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-014	Model text 126	**FORT COLUMBUS** Construction started in the	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
L-13-015	Caption 29	Primary Materials: Brick with earth embankments	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-016	Model text 136	CASTLE WILLIAMS Located at the northern tip of	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-017	Caption 39	Primary Material: Red sandstone	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-018	Model text 161	FORT TOTTEN Intended as the sister defensive	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-019	Caption 19	Primary Material: Granite Guns: Thirty–nine13-inch	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-020	Model text 130	FORT SCHUYLER Begun in 1833 Fort Schuyler	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-021	Caption 30	Primary Materials: Granite with earth embankments	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-022	Model text 150	CASTLE CLINTON Located at the foot of	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-13-023	Caption 23	Primary Materials: Brownstone and wood timbers	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-024	Model text 126	**FORT GIBSON** Located on Ellis Island, Fort	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-025	Caption 30	Primary Materials: Brick on a stone foundation	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-026	Model text 121	**FORT WOOD** Constructed on Bedloe's Island	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-027	Caption 20	Primary Material: Sandstone Armament: Thirty	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-028	Model text 151	**FORT WADSWORTH/FORT**	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-029	Caption 31	Primary Materials: Granite outer walls with brick interior	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-030	Model text 126	**FORT WADSWORTH/BATTE**	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45	PMS 8420C	Run around, see drawing

Ex ID No.	Category/ Word Count	Sample text	Typography	Finish Color	Notes
L-13-031	Caption 28	Primary Materials: Concrete, granite and brick with earth	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	
L-13-032	Model text 157	**FORT WADSWORTH/FORT**	Head: Caslon Antique Caps W: 70% TR: none Cap Height 7/8" Text: Chelt. BK W: 80% TR: normal 36/45 Definition: 36/40 Chelt BD	PMS 8420C	Run around, see drawing
L-13-033	Caption 30	Primary Materials: Granite with a brick and sod barbette	Chelt. BD 24/28 with 22 pt Cap Titles, Center	PMS 8420C	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
		14 Measures and Counter Measures			
L-14-000	Sign Header 5	MEASURES <=> COUNTERMEASURES	Caslon Antique width 70%, TR: none Cap Height 4"	PMS 8420	Left arrow and upper line PMS 179C, right arrow and lower line PMS 130C
L-14-001	Primary text 184	Measures and Countermeasures	Head: Caslon Antique Cap Height 4" Text 42/46	reverse out white	Create arrow as indicate on drawing
L-14-002	Secondary text 107	The First Line of Defense	Head: Chelt. BD 30 pt Text: Chelt. BK 30/34 FL x 7"	PMS 8420C	
L-14-002.1	Map Labels 57	[Map labels] New Jersey	Chelt. BK 18pt	Land names-PMS 7C	
L-14-003	Secondary text 89	The Second Line of Defense	Head: Chelt. BD 30 pt Text: Chelt. BK 30/34 FL x 7"	PMS 8420C	
L-14-003.1	Map Labels 70	[Map labels] New Jersey	Chelt. BK 18pt	Land names-PMS 7C	
L-14-004	Secondary text 122	The Third Line of Defense	Head: Chelt. BD 30 pt Text: Chelt. BK 30/34 FL x 7"	PMS 8420C	
L-14-004.1	Map Labels 82	[Map labels] New Jersey	Chelt. BK 18pt	Land names-PMS 7C	
L-14-005	Secondary text 121	The Fourth Line of Defense	Head: Chelt. BD 30 pt Text: Chelt. BK 30/34 FL x 7"	PMS 8420C	
L-14-005.1	Map Labels 82	[Map labels] New Jersey	Chelt. BK 18pt	Land names-PMS 7C	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-14-006	Secondary text 117	**No Line of Defense** During World War II,	Head: Chelt. BD 30 pt Text: Chelt. BK 30/34 FL x 7"	PMS 8420C	
L-14-006.1	Map Labels 139	New Jersey Bronx	Chelt. BK 18pt	Land names-PMS 7C	
L-14-007.1	Identifier(s) 8	Anti-aircraft battery, circa 1930s-1950s	Chelt. BK 24 pt	PMS 179C	
L-14-007.1	Identifier(s) 2	WWII Submarine	Chelt. BK 24 pt	PMS 130C	
L-14-007.1	Identifier(s) 5	WWII Submarine net with mines	Chelt. BK 24 pt	PMS7C	
L-14-007.1	Identifier(s) 7	Long range bombers, circa 1940s-1970s	Chelt. BK 24 pt	PMS 130C	
L-14-007.1	Identifier(s) 6	"Skip" shot or flat trajectory	Chelt. BK 24 pt	PMS 179C	
L-14-007.1	Identifier(s) 5	Low trajectory - frontal fire	Chelt. BK 24 pt	PMS 179C	
L-14-007.1	Identifier(s) 6	High trajectory - plunging fire	Chelt. BK 24 pt	PMS 179C	
L-14-007.1	Identifier(s) 4	High-altitude bombing	Chelt. BK 24 pt	PMS 130C	
L-14-007.1	Identifier(s) 5	Water Battery, circa 1860	Chelt. BK 24 pt	PMS 179C	

Ex ID No.	Category/ Word Count	Sample text	☐ Typography	△ Finish Color	Notes
L-14-007.2	Identifier(s) 9	16-inch rifled gun battery, circa 1920s-1940s	Chelt. BK 24 pt	PMS 179C	
L-14-007.3	Identifier(s) 10	Endicott battery with disappearing guns, circa	Chelt. BK 24 pt	PMS 179C	
L-14-007.4	Identifier(s) 7	Nike missile site, circa 1950s-1970s	Chelt. BK 24 pt	PMS 179C	
L-14-007.6	Identifier(s) 6	Confederate frigate, circa 1860	Chelt. BK 24 pt	PMS 130C	
L-14-007.7	Identifier(s) 8	"Dreadnought" class battleship, circa 1910	Chelt. BK 24 pt	PMS 130C	
L-14-007.8	Identifier(s) 10	World War I "Bismark" class battleship, circa 1940s	Chelt. BK 24 pt	PMS 130C	

Total labels this report: 234

Labels (Text Only)

Exhibit Labels

1 Fort Wall Replica

Quotation

L-01-001

Word Count 17

"...making the coast as far as practicable, impregnable."
President James Monroe, 1820

Title

L-01-002

Word Count 3

BUILT TO LAST...

Primary text

L-01-003

Word Count 152

This is a replica of the seaward wall of Battery Weed*. This four-tiered fortress has commanded the Narrows since the Civil War. When first designed, this fort was considered indestructible by enemy ships. Military engineers were confident that massive masonry walls and iron plate would withstand round shot fired from naval guns.

What the engineers failed to anticipate were several key advances in weaponry. Perhaps the most important was rifled cannon capable of firing pointed projectiles further, faster and with more accuracy than ever before. Vertical walls of granite and brick were simply no match for these guns. That Battery Weed survives intact is due largely to having never come under enemy fire.

*Battery Weed originally known as Fort Richmond

Secondary text

L-01-004

Word Count 52

This view of Fort Richmond* from Fort Hamilton across the Narrows shows an imposing structure of solid stone built low to the shoreline. Behind this water battery's gun ports lurk chambers outfitted with 116 heavy guns for "battering" an invading naval force.

Secondary text

L-01-005

Word Count 20

Reflecting the stacked decks of an enemy man-o-war, Fort Richmond* arranged its guns on multiple tiers.

Title

L-01-006

Word Count 4

TOTTEN'S CONTRIBUTION

Subtitle

L-01-007

Word Count 2

BETTER IDEAS

Primary text

L-01-008

Word Count 57

Architect of the Fort

Joseph G. Totten, an 1805 graduate of West Point, designed Fort Richmond*. Like most West Pointers of his day, he admired the defensive innovations of French military engineers. Totten devoted himself to perfecting a vital part of coastal fortification—the gun port.

Primary text

L-01-009

Word Count 77

American Export

Called an **embrasure**, Totten's oval, cast-iron frame, when coupled with a gun mount of his design, allowed a gun crew to sweep a far wider field, from behind a far smaller opening than ever before. The greater protection afforded the crew meant that Totten's innovation was soon adopted for coastal defense in Europe.

*Battery Weed was originally known as Fort Richmond

Primary text

L-01-010

Word Count 50

Totten Shutters

Another of Totten's inventions was the pair of thick iron shutters inserted in each of Fort Richmond's gun ports. Artillery crews could fling these open to fire and slam them shut to reload, shielding themselves from enemy sharpshooters.

Secondary text

L-01-011

Word Count 70

Iron Beats Stone

Totten subjected many materials to a thorough pounding by artillery. He proved that iron withstood a hammering by round shot far better than stone. Iron plate might dent or deflect, but it would not shatter or explode. He chose to cast his oval embrasure as a single ring of iron, with straps to anchor it into the surrounding granite.

Secondary text

L-01-012

Word Count 87

The Totten System

So strong was Totten's influence on the design of multi-level, masonry fortifications, that American forts of this type are sometimes called the Totten System. Seven foot thick, solid stone walls, a full complement of heavy artillery and, in the case of Fort Richmond*, a moat filled by the tides, won this collection of forts another name- the Permanent System—as if to proclaim they could never be rendered obsolete.

Subtitle

L-01-012.1

Word Count 10

Cross-Section through Fort Richmond's Seaward Wall

Identifier(s)

L-01-012.2

Word Count 29

[Cross-Section Indentifiers]
Tide-filled Moat
Gun Carriage
Embrasure
Gun Port with Shutters
Casemate
Tier 1
Tier 2
Tier 3
Barbette Tier
Granite Wall

4 Life on the Base Alcove

Title

L-04-001 **LIFE ON THE BASE**

Word Count 3

Primary text

L-04-002

Word Count 319

Everyday Life

Garrisoned off and on for more than two centuries, the Fort Wadsworth reservation has fluctuated between the feverish activity associated with new construction and the threat of war, and periods of disrepair and neglect. From the low point of the mid-1830s, the base rebounded so that by the 1860s Fort Richmond (later renamed Battery Weed) was one of the nation's most heavily armed fortifications. After the Civil War and the completion of Forts Richmond and Tompkins, the base entered a long period of peace during which time quarters for officers' families were constructed and improved and opened to civilians. Just prior to World War I, the posts' garrison increased sharply to 1400 men. Though no guns were fired in battle during World War I, the men stationed here worked to keep the guns and themselves in a state of readiness, performing daily calisthenics, conducting drills, manning round-the-clock watches and attending instructional sessions in French, signaling, first aid, and military training. During World War II, Fort Wadsworth was used as a training and supply base. The base newspaper included descriptions of a blood drive, of basketball, baseball, billiards and bowling, a show written by a GI, and a ping-pong tournament, and "an active ladies' auxiliary which sews, knits, prepares surgical dressings." After World War II, Fort Wadsworth continued in a limited way to house various Army functions, including a chemical warfare training center during the Korean War, a Nike command center, an Army Chaplain School and home base for the 26th Army Band.

Secondary text

L-04-003
Word Count 50

In the late 1870s or early 1880s, ten wooden structures were erected along Mont Sec Avenue to accommodate a growing resident military population. These included a hospital, quarters for married and single officers and a residence for the post commander.

Caption

L-04-003.1
Word Count 5

Commanding Officers Quarters

Secondary text

L-04-004
Word Count 59

The great Endicott guns were only rarely fired, and such an event required ample warning to the base residents and local populace. Word would go out to open nearby windows so they would not be shattered. The post barber would take the mirrors off the wall and lay them flat on the floor of his shop.

Caption

L-04-004.1
Word Count 5

North Side of Officers Row

Title

L-04-005
Word Count 4

Snapshots of the Base

Caption

L-04-005.1
Word Count 2

Orphan Home

Caption

L-04-005.2
Word Count 5

Main Gate and Officers Row

Caption

L-04-005.3 Hospital

Word Count 1

Caption

L-04-005.4 Infantry Inspection

Word Count 3

Caption

L-04-005.5 Marching Band

Word Count 2

Bullet text

L-04-006

Word Count 53

"Fort Wadsworth is a deceptive place; quiet on the surface, it throbs with activity. Men and women plan, work...set large operations moving. Soldiers are housed and fed and made comfortable... Supplies check in and supplies stream out... "
The Range Finder, 1944

Caption

L-04-007 Soldiers and their vehicles line up for a motor pool inspection, 1944.

Word Count 14

Caption

L-04-008

Word Count 53

A late 19th-century guidebook remarked that "Fort Wadsworth offers everything for a delightful ramble on a summer's day...It is a veritable lovers' walk. The gentle sloping requires a slow walk...and there is time to say many pretty words before the end is reached..."

Caption

L-04-009

Word Count 34

During the 1890's, the infantry were housed in Fort Tompkins; the room was probably very similar in appearance to this shot of the barracks at Fort Wood during that period.

Caption

L-04-010

Word Count 28

As indicated by this photo collage from the base newspaper, during World War II Fort Wadsworth's residents included many women and children.

Caption

L-04-011

Word Count 56

A study of living conditions reported: "The men occupy four dormitories, casemates in Fort Tompkins, averaging 10 men and beds in each. The casemates are...warmed by a large...coal stove in each, lighted by candles at night...air space ample; each occupant has 500 cubic feet..."

Caption

L-04-012

Word Count 24

Fort Tompkins' parade ground (which was then referred to as "the quad") was the site of outdoor dances during World War II.

Caption

L-04-013

Word Count 29

Obsolete as a military structure after the Civil War, Fort Tompkins' parade ground was for a time converted to the more peaceful ways of lawn tennis.

Caption

L-04-014

Word Count 27

Though none of the guns were mounted after the Civil War, Battery Weed's barbette tier still received periodic cleaning and maintenance.

5 Fort Construction Alcove

Title

L-05-001

Word Count 3

FORT CONSTRUCTION

Primary text

L-05-002

Word Count 246

Building the Forts

As technologies and military strategies have evolved, so have the forms and techniques employed in the construction of fortifications on the Fort Wadsworth site. In the early period, compacted earth was the primary building material; ironically, the site's most recent fortifications, the low earthen and concrete structures known as Endicott batteries, had returned to the practice of massing earth around emplacements and using the ground to absorb the impact of projectiles. Because fortification design changed very little between the Endicott period in the 1890s and the batteries of World War II, the casual visitor is apt to mistake these century-old installations for something much more recent.

But there is no mistaking the two masonry forts that date from the mid-1800s which clearly were designed to defend against the slow bulky warships of that period. In 1884, when General Philip Sheridan visited the water-level structure now known as Battery Weed, he remarked that it had become "useless under the changes brought about in modern warfare." Yet its military capabilities were not everything to be considered; it was also, said General Sheridan, "the most beautiful masonry work I ever saw."

Secondary text

L-05-003

Word Count 37

Battery Weed represents the highest refinement of the multi-tiered, casemated coastal fortification, and also serves as a beautiful example of masonry vaulting and the stonecutter's art.

Secondary text

L-05-004

Word Count 29

Large-scale cranes were required to hoist the massive granite blocks that formed the walls and vaulted ceilings of Fort Tompkins and Battery Weed.

Secondary text

L-05-005

Word Count 20

Fort Tompkins, the masonry fort on the bluff overlooking the Narrows, appears here under construction.

Bullet text

L-05-006

Word Count 30

In fortification design, the form of the fort—its size, shape, material, position and firepower—is influenced by the type of enemy vessel it must repel.

Caption

L-05-007

Word Count 42

In 1841, Robert E. Lee, then a thirty four year old engineer stationed at Fort Hamilton across the Narrows, was charged with overseeing the modernization of Batteries Hudson and Morton on the Fort Wadsworth site.

Caption

L-05-008

Word Count 24

Turn-of-the-century Endicott batteries were massive concrete structures half-buried under an enormous quantity of earth.

Caption

L-05-009

Word Count 36

Granite blocks for the construction of the masonry forts at Fort Wadsworth were floated down the Hudson River from quarries upstate, arriving at this wharf just north of Battery Weed.

Caption

L-05-010

Word Count 31

Though almost all traces have vanished, a 10-foot deep moat filled with 6-feet of water at high tide and nearly dry at low tide once surrounded Battery Weed.

Caption

L-05-011

Word Count 41

This engraving of the 1850s shows Fort Richmond (now known as Battery Weed) under construction. Though construction began in 1847, the fort was not completed until c. 1864 just before the end of the Civil War.

Citation

L-05-011.1

Word Count 19

Reprinted from *Seacoast Fortifications of the United States, An Introductory History* by E. R. Lewis

Caption

L-05-012

Word Count 50

This photo of Fort Totten in 1862 shows a granite casemated fort of the same period as Battery Weed and Fort Tompkins under construction. In this instance, the fort became obsolete before completion and only two of what were to be four tiers were raised.

6 Channel Obstructions Alcove

Title

L-06-001

Word Count 4

CHANNEL OBSTRUCTIONS

Primary text

L-06-002

Word Count 188

Blocking the Narrows

As early as 1806, military planners had devised a way to block the mile-wide Narrows to enemy ships. This scheme called for 28 "blocks" at intervals of 60 or 80 feet with a pair of "Mr. Fulton's Torpedoes" (underwater mines) in the spaces between the blocks and gunboats anchored above. Despite charges that the scheme was "extravagant and inefficient" and produced by "engineers fond of displaying their talents," channel obstruction became an important strategy in the defense of New York harbor. During and just after the Civil War, a number of devices were proposed, including sharp pointed stakes under the water's surface and nets studded with wooden floats or barrels spanning the passage. Mines, called torpedoes before the twentieth century, became an important part of the post's arsenal in the 1890s. During World War II, a net of mines able to be detonated from shore was stretched across the Narrows.

Secondary text

L-06-003

Word Count 29

This diagram from 1892 depicts a net laced with exploding mines—then called torpedoes—stretched across the channel just downstream from the Narrows.

Secondary text

L-06-004
Word Count 36

A U.S. Army vessel lays mines in New York harbor, c. 1890. Mines of this period were exploded electrically from shore positions, and therefore posed no threat to friendly ship traffic.

Bullet text

L-06-005
Word Count 30

Many schemes have been devised to span the mile-wide Narrows and thereby block entering enemy ships from the inner harbor and threatening New York City.

Caption

L-06-006
Word Count 19

World War II era mines were deployed to discourage German U-boats from entering New York harbor.

Caption

L-06-007
Word Count 34

Though clearly designed to pierce the hulls of ships, it's unclear from these drawings how this spiked contraption (c. 1865) was to be mounted in the waters of the Narrows.

Caption

L-06-008
Word Count 30

This string of 40-foot square rafts of sharpened spikes was proposed in 1862 as a means of obstructing the entrance to New York harbor at the Narrows.

Caption

L-06-009
Word Count 51

During the Civil War, the Confederates developed and planted mines such as these in southern waters. The mines sank or damaged 43 Union vessels, including 4 ironclad Monitors. After the war, there was great interest in deploying mines across the Narrows.

Caption

L-06-010

Word Count 38

This Civil War-era channel obstruction scheme from 1863 features floats tied together with wire rope at the water's surface moored to the channel bottom with chains attached to stone anchors.

Caption

L-06-011

Word Count 56

Water mines were common to Endicott defenses, though they were not permanently planted. Several large structures were built in the 1890s to store torpedo mines and their miles of cable, including the 323-foot long, 42-foot wide Torpedo Storage building located next to Battery Weed.

Caption

L-06-012

Word Count 29

Between the two world wars, army engineers installed a cable for halting enemy ships across the Narrows between Fort Wadsworth and Fort Hamilton.

Caption

L-06-014

Word Count 19

Each float in the plan below was constructed of fifteen 15" square wooden logs tightly bundled.

Caption

L-06-015

Word Count 22

This channel obstruction scheme from 1869 appears to be a more rigid version of the earlier scheme to your left.

7 The Enemy Alcove

Title

L-07-001

Word Count 1

THE ENEMY

Primary text

L-07-002

Word Count 149

Fear of Attack

As America's financial and trade capital and its largest city, New York City has always been seen as a prime target for enemy attack. After a British force left Washington, D.C. in smoking ruins in August 1814, these fears became even greater. Images of New York on fire were convincing testimony for a policy of vigilance at all costs.

The Narrows was not New York's first line of defense against seaborne invasion, but it was usually perceived to be its best. As such, the high ground on Staten Island had been a vital lookout and point of defense against enemy ships approaching New York City since the 18th century. As enemy ships and armaments evolved, so did the nature of the fortifications on the Fort Wadsworth site.

Secondary text

L-07-004

Word Count 73

This Endicott-era battery with its 12" disappearing gun defended Long Island, but is typical of the turn-of-the-century defenses at Fort Wadsworth. By the early 1900s, these fortifications were vulnerable to a new enemy ship—battleships with turrets and powerful high-angle guns capable of lobbing shells over the protective parapets of open-air Endicott defenses.

Secondary text

L-07-005

Word Count 36

In the years leading up to World War II, airpower was perceived as a far greater threat than attack by sea, and Coast Artillery began focusing its attention on anti-aircraft armament.

Secondary text

L-07-006

Word Count 74

The Phantom Fleet

Though the much-feared fleet of enemy ships never appeared in New York Harbor, military planners in every period of Fort Wadsworth's history have studied enemy vessels in order to design effective defenses. This silhouette was used in recognition training during World War II and represents one of a total of 14 different classes of German submarine.

Bullet text

L-07-007

Word Count 34

Though New York City has never come under enemy attack, in each period of its history America's commercial capital has had to fortify itself against potential aggressors.

Caption

L-07-008

Word Count 48

This British frigate from the War of 1812 would have sailed as part of a tight formation of warships. Sailing ships tacking through the Narrows would have had to come in at close range, flanks fully exposed to Fort Richmond's 32-pound guns.

Caption

L-07-009

Word Count 50

During the Civil War, the Confederates were the first to develop ironclads, warships with iron plates on the upper structure. These warships could not only sneak past shore batteries unscathed, but also, absorb a direct hit without becoming disabled.

Caption

L-07-010

Word Count 49

The turrets equipped with powerful high-angle guns on World War I-era battleships allowed the enemy to lob shells in a high trajectory from miles away. Endicott batteries, though heavily fortified frontally, were vulnerable to fire from overhead.

Caption

L-07-011

Word Count 17

During World War II, German U-boats attacked American ships just outside New York Harbor.

Caption

L-07-012

Word Count 34

Images such as this World War I poster of German planes bombing New York harbor reflect the fear of the time and succeeded in galvanizing public support for the war effort.

Caption

L-07-013

Word Count 60

During the War of 1812, the British sailed up the Potomac River and captured Washington, D.C., setting fire to many important structures including the White House. This episode, following so soon after America's War of Independence, underscored the need for a national system of coastal defense.

8 Signalling Devices Alcove

Title

L-08-001

Word Count 3

SIGNALLING DEVICES

Primary text

L-08-002

Word Count 181

Staten Island Lookout

Beginning during the era of the Dutch West India Company in the mid-1600's, provisions were made to signal Manhattan from "Staten Eyelandt" whenever a ship could be seen approaching from the sea. In 1711, the British governor approved plans for maintaining a beacon at "ye Narrows," and some such system—either firebrands or gunfire—was apparently in operation throughout the remainder of Colonial rule. The prominence on the west side of the Narrows—variously called Flagstaff Hill, Signal Hill, or Telegraph Hill—was an ideal lookout point because it afforded a clear view of Lower New York Bay and could be seen from the tip of Manhattan Island as well. Whether semaphores and wigwags in the 1800s or radio antennae in more recent times, the Fort Wadsworth site has always served the crucial role of providing advance news of ships, both friend and foe, approaching New York.

Secondary text

L-08-003

Word Count 23

The Fort Wadsworth site has been a lookout post for over three centuries, from the time of settlement to World War II.

Secondary text

L-08-004

Word Count 36

In its history, Fort Wadsworth has mounted many different signalling devices—including this World War II era signal beacon—to communicate with other defense sites in New York harbor.

Bullet text

L-08-005

Word Count 38

The promontory at the Narrows, with its clear view of Manhattan and the mouth of the Bay, was recognized early on as an ideal lookout for sending advance warning of the approach of enemy ships.

Caption

L-08-006

Word Count 17

This beacon can still be seen perched on top of Battery Weed overlooking the Narrows.

Caption

L-08-007

Word Count 62

In May 1776, George Washington sent a contingent to "Signal Hill" overlooking the Narrows to watch for British warships. It was to communicate with Manhattan by hoisting black or white kegs. The news was bad: In June a large British flotilla sailed into New York harbor, initiating a sweeping plan of invasion.

Caption

L-08-008

Word Count 20

This signalling shutter dating from 1910 was used to send coded communications to naval patrol boats.

Caption

L-08-009
Word Count 50

In the late 1850s, an army surgeon named Albert J. Myer tested his wigwag system of signal flags between stations at Sandy Hook and Fort Wadsworth site. Myer was later appointed by President Lincoln to organize and command the U.S. Army Signal Corps.

Caption

L-08-010
Word Count 35

This signal station of the 1800s utilized ten movable arms attached to a mast, which could be arrayed at various combinations of angles to send signals to Sandy Hook or Manhattan.

Citation

L-08-010.1
Word Count 19

Reprinted from *Seacoast Fortifications of the United States, An Introductory History* by E. R. Lewis

Caption

L-08-011
Word Count 42

In the early 1800s, coded information was relayed from Sandy Hook to the Fort Wadsworth site to the Merchants' Exchange on Manhattan Island using painted black and white kegs hoisted aloft in various combinations.

Caption

L-08-012
Word Count 41

This diagram from 1898 shows the location of underwater signal cable for communications between the outermost lookout post on Sandy Hook with the two forts at the Narrows, Fort Wadsworth and Fort Hamilton.

9 Weapons Take Charge

Title

L-09-001

Word Count 4

THE WEAPONS TAKE CHARGE

Primary text

L-09-002

Word Count 202

The spiral grooving of a gun barrel to impart a stabilizing spin to a projectile is called *rifling*. Before the Civil War, rifling was uncommon with heavy cannon. Artillery innovators had long struggled with a classic dilemma - how to make a shell fit snugly enough in a barrel to track the rifling but loosely enough to be rammed into firing position.

The Civil war witnessed countless attempts to lick this problem. The most successful attached a soft metal cup or shoe to the base of the projectile. This soft *sabot* expanded under the pressure of firing and engaged the grooves. Such projectiles had far greater range, accuracy and penetrating power than any round shot or shell of the same caliber.

With the advent of rifling, masonry-walled forts could no longer withstand direct hits from heavy artillery. Henceforth, military planners placed far greater emphasis on the design of offensive weaponry than on defensive fortifications, a legacy that persisted through the "missile race" of the Cold War.

Secondary text

L-09-003

Word Count 118

THOMAS JEFFERSON RODMAN (1815-1871) graduated from West Point and devoted his life to advancing the design of heavy artillery. With wide-ranging experimentation, he proved that the shape of a gun barrel was less crucial to its strength than the way it was made.

Noting that the strength of a cast gun decreased when the iron cooled from the outside in, he devised a process for water-cooling castings from the inside out. Far bigger barrels capable of handling far heavier powder charges could now be developed. Rodman guns grew to be the largest, most powerful smoothbore cannons ever made.

Secondary text

L-09-004

Word Count 103

ROBERT PARKER PARROTT (1804-1877) graduated from West Point in 1824. He resigned from the army in 1836 to supervise a foundry in New York State. There he invented a rifled, cast-iron cannon that was strengthened by shrinking hot iron hoops around the breech of the barrel.

So-called Parrott rifles were brought to bear with dreadful accuracy in the Union's siege and capture of Fort Pulaski in Georgia. This event, coupled with the destruction of Fort Sumter by shelling, rendered masonry fortifications obsolete.

Secondary text

L-09-005

Word Count 66

FORT PULASKI BREACHED

Fort Pulaski, sited on Cockspur Island near Savannah, Georgia, was a massive stone fortification that was surrendered to the Confederates in 1861. It was retaken by Union troops in early 1862. At one time regarded as impregnable, Fort Pulaski could not withstand long-range shelling by rifled Parrott guns.

Secondary text

L-09-006

Word Count 83

DENTED NOT DEFEATED

In combat in Hampton Roads, Virginia, the ironclad **Monitor** took a number of direct hits from round shot. Cannonballs bounced off its armor-plated turret with a tremendous, but harmless clatter.

Military planners were now faced with an armored ship that could steam past shore batteries unscathed. The days of skipping shot across the water to smash wooden hulls or shred sails were surely over.

Secondary text

L-09-007

Word Count 128

A GUNNER'S IDEAL

A technological breakthrough of the late 1800's, coming shortly after rifling, was breechloading artillery. Cannon that were loaded from the rear held a real advantage over front-loading guns. No longer forced to expose themselves while sponging and ramming the barrel, the crew of a breechloader could stay behind the gun, better shielded from enemy fire.

So-called "disappearing guns" maximized this advantage. These cannon were mounted on carriages that used the gun's recoil or "kick" to lower the barrel behind a concrete wall for reloading. Huge counterweights returned the barrel to the top of the parapet for firing.

Caption

L-09-008

Word Count 4

RIFLED BREECHLOADER

Caption

L-09-008.1

Word Count 8

Gun tube is made of layers of machined steel

Caption

L-09-008.2

Word Count 5

Barrel is long and tapering

Caption

L-09-008.3

Word Count 6

Loaded from the back of the barrel

Caption

L-09-008.4 Crew protected from enemy fire

Word Count 6

Caption

L-09-008.5 Fires long, pointed shells

Word Count 5

Caption

L-09-008.6 Rifled barrel imparts stabilizing spin

Word Count 7

Caption

L-09-008.7 Fires in high trajectory for long range

Word Count 7

Caption

L-09-008.8 The rifled breechloading gun represents the standard for heavy artillery since the 1890s.

Word Count 17

Caption

L-09-009 **SMOOTHBORE MUZZLELOADER**

Word Count 4

Caption

L-09-009.1 Gun tube is made of solid cast iron

Word Count 7

Caption

L-09-009.2 Barrel is short and bulbous

Word Count 5

Caption

L-09-009.3 Loaded from the front of the barrel

Word Count 7

Caption

L-09-009.4 Crew exposed to enemy fire

Word Count 5

Caption

L-09-009.5 Fires round shot

Word Count 3

Caption

L-09-009.6 Smooth barrel induces wobble

Word Count 5

Caption

L-09-009.7 Fires in flat trajectory for limited range

Word Count 8

Caption

L-09-009.8 The Rodman gun represents the pinnacle of smoothbore artillery.

Word Count 12

10 Weigh In with the Big Shots

Title

L-10-001

Word Count 5

WEIGH IN WITH THE BIG SHOTS

Primary text

L-10-002

Word Count 71

Compare Yourself with These Rounds

Throw weight refers to the weight of a projectile thrown a distance by artillery. Between the time of America's first coastal defenses and World War II, throw weight increased by a factor of 70. During this same period, the range also multiplied, with the biggest guns firing much heavier shells up to 30 times farther.

Prompt

L-10-003

Word Count 27

The scales to the right invite you to compare your weight with the weight of the projectiles fired from three different seacoast cannons.

Secondary text

L-10-004

Word Count 80

Another Useful Comparison

A basketball and a football weigh about the same. Imagine throwing a football as far as you can to a friend. Then think of passing a basketball to the same spot. Not likely.

The football travels farther and with greater accuracy because its streamlined shape spins as it arcs through the air. The same concept applies to the round and sharp artillery rounds to the right.

Primary text

L-10-005

Word Count 71

32-Pound Cannonball, circa 1812

This solid iron shot was meant for the **32-pound smoothbore cannon** that armed Fort Richmond during the War of 1812. This semicircular water battery preceded the structure now called Battery Weed.

Diameter: 6.4 inches
Weight of projectile: 32.6 pounds
Weight of powder charge: 8 pounds
Range: 1,922 yards (just over one mile)

Primary text

L-10-006

Word Count 85

10" Exploding Shell, circa 1860

This hollow iron sphere, filled with gunpowder, was made for a **10-inch columbiad**. Columbiads ranked among the largest guns ever mounted in Battery Weed. Though this shell is **4 times heavier than the cannonball to the right,** a columbiad fired it 3 times as far.

Diameter: 10 inches
Weight of projectile: 128 pounds
Weight of powder charge: 19 pounds
Range: 5,600 yards (just over three miles)

Secondary text

L-10-007

Word Count 89

High-Explosive Shell for 16-inch Rifle, circa 1940

This streamlined projectile was made for **a rifled, breechloading gun** of the sort that flanked the entrance to New York Harbor during World War II. Though this shell is **20 times heavier than the round shell to the right,** a 16-inch rifle fired it 9 times as far.

Diameter: 16 inches
Weight of projectile: 2,340 pounds
Weight of Powder Charge: 870 pounds
Range: 49,100 yards (about thirty miles)

Pedal Labels

L-10-008

Word Count 6

50 lbs
100 lbs
150 lbs
200 lbs

Secondary text

L-10-010

Word Count 113

Pounds and Inches

Why are some projectiles referred to by their weight and others by their size? Until the Civil War, cannon fired mostly spherical, solid shot made of iron. A round iron ball of a given weight like the 32-pound shot to the left—has a known diameter.

As the variety of projectiles grew to include elongated shells of steel as well as iron, weights began to vary tremendously. Order was restored by expressing the caliber of both the rounds and the guns that fired them in inches. Thus, the 16" shell to the left is fired from a 16" caliber rifle.

11 Casemate Diorama

Title

L-11-001 Word Count 4

ENTER THE GRANITE FORT

Primary text

L-11-002 Word Count 83

Just ahead is a replica of the part of a fort called a **casemate**. It is one of a series of identical casemates overlooking the Narrows from Fort Richmond's* second tier. Imagine it is the summer of 1864. The Civil War is entering its final year. The fort's full garrison is busy firing their newly-installed Rodman guns.

case'-mate - an armored compartment for protecting artillery and crew

*Now known as Battery Weed

Citation

L-11-003 Word Count 19

Reprinted from *Seacoast Fortifications of the United States, An Introductory History* by E. R. Lewis

Title

L-11-004 Word Count 10

What's inside the fort determines its outside shape

Primary text

L-11-005

Word Count 213

Overlapping fields of fire

An individual cannon's range, together with the *traverse* or "sweep" of its mount, dictates its *field of fire*. In designing coastal fortifications, the key is to overlap multiple fields of fire to cover a broad expanse of navigable water. In designing Fort Richmond*, Joseph Totten started by devising gun carriages that could traverse a remarkably wide arc, despite being set in confined casemates.

Given the 60 degree sweep of his guns, Totten stacked long rows of casemates into three channel-bearing walls, forming a half-hexagonal structure. Since his hexagonal plan used the same 60º angle, Totten knew that the fields of fire of over one hundred heavy guns would overlap. Any enemy fleet attempting the tricky waters of the Narrows would have to pass, not only by Fort Richmond's full armament, but through the overlapping fire from artillery posted on the opposite shore at Forts Lafayette and Hamilton.

*Totten's Fort Richmond replaced a semi-circular water battery with the same name. Fort Richmond is now known as Battery Weed.

Identifier(s)

L-11-005.1

Word Count 25

[Graphic Identifiers]
60° Field of fire
Channel-Bearing Wall
Typical Casemate (Open at the Rear)
Parade
Barbette
Typical Gun Port

Secondary text

L-11-006

Word Count 45

Prior to concentrating on coastal fortifications, Totten spent part of his career designing coastal lighthouses. Consider how the sweep of the warning light from a lighthouse resembles the sweep of the covering fire from a fort.

Secondary text

L-11-007

Word Count 43

Joseph G. Totten was the Chief Engineer of the U.S. Army from 1838 until 1864. He was the principal designer of masonry fortifications across the nation, including Fort Richmond here on the west bank of the Narrows.

Secondary text

L-11-008

Word Count 34

The drive to achieve an effective design for casemates —armored compartments for artillery—dates back to the Renaissance, as suggested by these sketches from the early 1500s.

Caption

L-11-009

Word Count 7

A Casemated Rodman Gun "In Battery".

Identifier(s)

L-11-009.1

Word Count 44

[Graphic Identifier]
Typical Casemate
Traversing Rails
Gun Port
Gun Carriage with Iron Tongue
"In Battery" Position (Gun Ready to Fire)
"Out of Battery" Position (Gun Recoiled and Ready to Reload)
Swivel Point
60° Sweep

Secondary text

L-11-010

Word Count 79

The gun carriages in Fort Richmond's casemates achieved a wide traverse through simple means. Each came with an iron tongue that slotted into the granite below the gun port. An iron pin slipped through the tip of this tongue, securing the carriage to a swivel point far ahead of its front wheels. No matter how far the carriage was swung to either side, the barrel remained centered in the gun port.

Title

L-11-011

Word Count 3

Manning the Gun

Primary text

L-11-012

Word Count 105

Manual of Arms

Each piece of coastal artillery in Fort Richmond* was manned by a crew of seven who followed a set procedure outlined in the Army's *Heavy Ordnance Manual*. Essential to effective teamwork and crew safety were precision drill and mutual trust. This drawing shows what each member of the crew is doing when the gun is "out of battery," ready to be reloaded. Exactly the same procedure would be followed throughout more than a hundred other casemates lining Fort Richmond's seaward walls.

* Now known as Battery Weed.

Prompt

L-11-013

Word Count 22

Listen to the commands and commotion as the fort garrison sights in and fires their newly installed Rodman guns.

Secondary text

L-11-014

Word Count 90

Tools of the Trade

Every member of the gun crew performed a vital role, whether wielding large implements like the rammer, sponge and handspikes, or handling far tinier tools. The gunner wore a *thumb stall* to cover the gun's vent to avoid accidental firing. Another cannoneer (the #3 man in the drill diagram opposite) wore a *tube pouch* filled with *friction primers* which, when inserted in the vent and tied to the *lanyard*, readied the gun for firing.

Caption

L-11-015

Word Count 21

Lanyard—a sharp pull on this cord ignited the friction primer which, in turn, set off the cannon's charge.

Caption

L-11-016

Word Count 20

Shells had two indentations for tongs, the tools with which shells were carried to the gun for loading.

Caption

L-11-017

Word Count 30

Friction Primer—tugging the twisted wire threaded through this tube ignited the powder inside, which flashed down the vent to set off the main charge.

Caption

L-11-018

Word Count 20

Thumb stall—a leather pad that protects the gunner's thumb when covering the vent of a hot gun barrel.

Caption

L-11-019

Word Count 17

Tube Pouch—a leather purse that protects powder-filled primer tubes from rain and mud.

Secondary text

L-11-020

Word Count 74

Gunnery Drill

In the 1860s, a heavy gun crew consisted of a head gunner and six cannoneers, numbered one through six. An artillery officer oversaw the crews of two adjacent guns. Every man performed a set function, orchestrated in a lock-step sequence driven by simple one and two-word commands. A crack team could fire 20 rounds an hour, though 12 was plenty for practice.

Identifier(s)

L-11-020.1

Word Count 11

KEY

G = Gunner

O = Officer

1 (2,3,4,5,6) = Cannoneers

Identifier(s)

L-11-020.2

Word Count 29

Load — Sponge! Ram!

In Battery — Heave! Heave! Halt!

Point — Right! Ready!

Fire — FIRE!

Out of Battery — Take Implements!

Reload — Sponge! Ram!

Identifier(s)

L-11-020.3

Word Count 31

Rodman Gun

Gun Carriage

Gun Port

Traversing Rails

Gunner thumbs the vent

#1 and #2 Man ram the piece

#3 Man

#4 Man

#5 Man

#6 Man

Officer

Implements on Stand

Caption

L-11-021

Word Count 53

The View

Looking out the rear of this casemate, you can see across to where the rest of Fort Richmond's heavy guns are mounted - over a hundred emplacements throughout the fort. The top barbette is alive with artillerymen as the full garrison engages in gunnery drill.

12 Guarding the Gates

Title

L-12-001

Word Count 3

GUARDING THE GATES

Caption

L-12-002

Word Count 36

Dating from the mid-1800s, this nautical chart shows the shoals and currents that defense planners knew would drive sailing ships in close to the forts at Sandy Hook and the Narrows.

Primary text

L-12-003

Word Count 282

Why Protect New York?

In 1790 there were only 33,000 people living on Manhattan Island. Thirty years later New York became the nation's largest city with 124,000 inhabitants. By 1860 its population topped a million, more than twice the size of Philadelphia, America's next largest city.

Besides its overwhelming size, New York has long been the nation's commercial and financial capital. "Wall Street" surely has been synonymous with America's money market. And New York has continued to be one of the nation's great manufacturing cities, preeminent in clothing, cosmetics, footwear, publishing, paints, electrical machinery, not to mention armaments manufacturing.

Of enormous strategic importance to New York was the Erie Canal, completed in 1825, which linked the Hudson River with the Great Lakes. This commercial waterway opened the city directly to the agriculture and abundant resources of the Midwest and Plains states.

Manhattan's shoreline, along with that of Brooklyn and New Jersey, offered miles of docking facilities for the world's largest ships. The Port of New York, measuring 175 square miles, rivaled the size of other world ports. By 1860, 70 percent of the nation's imports passed through New York Harbor. During daylight hours, a ship entered or departed every 10 minutes. Four out of five travelers going abroad in the late 19th century, embarked on liners leaving from New York.

Title

L-12-005

Word Count 5

COASTAL DEFENSES OF NEW YORK

Primary text

L-12-006

Word Count 102

The singular importance of New York City and its port prompted the development of a regional system of harbor defenses. Fortifications were placed along the shoreline of both Upper and Lower New York Bay, with Fort Wadsworth and Fort Hamilton flanking the Narrows. This map indicates how, through centuries of effort and at great expense, New York came to be the nation's best defended city. Its harbor is still ringed with significant forts, relics of nearly every phase of American coastal fortifications.

Title

L-12-007

Word Count 7

THE HISTORIC DEVELOPMENT OF FORT DESIGN

Secondary text

L-12-008

Word Count 108

THE FIRST AMERICAN SYSTEM OF FORTIFICATIONS, 1794-1807

Following the War of Independence, Americans felt threatened periodically by both the French and the British. In 1794 Congress authorized the first national system of coastal defense. Funding was meager and states took the lead in building defensive works. Most of New York's forts were first located on or near Manhattan, due to the limited range of artillery. Most were constructed of timbers and compacted earth, and many were replaced by later construction. None of them survive.

Secondary text

L-12-009

Word Count 110

THE SECOND AMERICAN SYSTEM OF FORTIFICATIONS, 1807-1816

In 1807 the aggressive stance of the British navy prompted a new national program of coastal fortification. This plan enjoyed generous federal funding and was largely planned and executed by American engineers. Sometimes earthworks, sometimes masonry, sometimes a combination of the two, these forts might be circular, semicircular, or boldly star-shaped in plan. Solid masonry forts, like Castle Williams here in New York, prompted a new era of fully enclosed, multi-level gun emplacements.

Secondary text

L-12-010

Word Count 125

THE THIRD AMERICAN SYSTEM OF FORTIFICATIONS, 1817-1867

Because most British raids in the War of 1812 succeeded, Americans lost faith in their existing defenses. President Monroe inaugurated a new program of coastal defense, insisting that forts be "built to last the ages." Military engineers set out to conceive a truly integrated, national system. Their principal fort designs had solid masonry walls, densely packed casemates and projecting bastions to protect the outer walls. These massive structures were typically water batteries, erected just a few feet above high-tide to fire directly at the hulls of sailing ships.

Secondary text

L-12-011

Word Count 112

THE ENDICOTT ERA, 1890-1910

A long peaceful interlude followed the Civil War, with interest in coastal defense rising again in the late 1880's. A committee headed by Secretary of War Endicott recommended a new system of seacoast fortifications at 29 critical sites. New York topped the list. Endicott's engineers returned to a reliance on earthworks which, backed up by thick concrete walls, better absorbed the impact of the latest pointed projectiles. Batteries were spread out and blended into the terrain, typically mounting only 2 to 4 heavy cannon apiece.

Secondary text

L-12-012

Word Count 116

TWENTIETH CENTURY FORTIFICATIONS

As the effective range of naval gunnery increased, coastal defenses relied on fewer guns of higher caliber, located farther and farther from the cities they guarded. Heavy cannon were joined by a raft of other defensive weapons -- mortars, underwater mines, submarines nets and anti-aircraft emplacements. But the rise of air power and amphibious landing tactics changed warfare forever. By 1950, all of the big guns had been sold for scrap. Forts around New York were armed instead with Nike missiles which, in turn, were dismantled in the 1970s.

Secondary text

L-12-013

Word Count 33

New York was most vulnerable to naval attack from the south through the Narrows. British frigates threatened to test New York's harbor defenses during the War of 1812.

Prompt

L-12-014

Word Count 17

Imagine yourself aboard an attacking man-o-war. Try to sail past the forts of New York.

13 New York Harbor Map & Fort Models

Title

L-13-001.1 **BROOKLYN (red)**

Word Count 2

Title

L-13-001.10 **LONG ISLAND SOUND (green)**

Word Count 5

Title

L-13-001.11 **HUDSON RIVER (green)**

Word Count 4

Title

L-13-001.12 **EAST RIVER (green)**

Word Count 3

Title

L-13-001.13 **UPPER N.Y. BAY (green)**

Word Count 4

Title

L-13-001.14 **LOWER N.Y. BAY (green)**

Word Count 4

Title

L-13-001.15 **ATLANTIC OCEAN (green)**

Word Count 4

Title

L-13-001.2 **QUEENS (red)**

Word Count 2

Title

L-13-001.3 **THE BRONX (red)**

Word Count 3

Title

L-13-001.4 **THE NARROWS (green)**

Word Count 3

Title

L-13-001.5 **MANHATTAN ISLAND (red)**

Word Count 4

Title

L-13-001.6 **STATEN ISLAND (red)**

Word Count 3

Title

L-13-001.7 **NEW JERSEY (red)**

Word Count 3

Title

L-13-001.8 **ROCKAWAY (red)**

Word Count 2

Title

L-13-001.9 **SANDY HOOK (red)**

Word Count 3

Primary text

L-13-002

Word Count 62

New York was most vulnerable to naval attack from the south by way of the Narrows. But an attack might come from the north via Long Island Sound. The Confederate raider *Tallahassee* lurked off shore at the end of the Civil War. The captain considered a bold run past these forts to attack the Brooklyn Navy Yard.

Prompt

L-13-003

Word Count 17

Imagine yourself aboard a Confederate raider. Try to steam past the forts of New York.

Model text

L-13-004

Word Count 179

FORT HANCOCK/BATTERY POTTER

Fort Hancock is located on Sandy Hook, a spit of land at the mouth of New York Harbor that was first fortified during the War of 1812. Its late 19th–century defenses included the nation's first concrete gun emplacements, designed to blend into the coastline for protection and camouflage. Battery Potter mounted two disappearing guns on hydraulic carriages, the only "steam-powered" artillery ever built in the U.S. Because it took so long to raise, fire, and reload these elaborate guns, the battery became obsolete once faster–acting carriages were developed.

dis´-ap-pear´-ing guns—a type of coastal artillery common in the 1890's. The carriage typically used massive counterweights to cushion the gun's recoil, translating the "kick" into a controlled glide that brought the gun down behind a parapet, where it could be reloaded out of sight of enemy ships.

Caption

L-13-005

Word Count 30

Primary Materials: Reinforced concrete with earth embankments
Armament: Two 12–inch rifled guns on disappearing carriages
Range: Seven to eight miles

Model text

L-13-006

Word Count 103

NAVESINK/BATTERY LEWIS

Completed in 1943, Navesink was comprised of two separate batteries. One mounted 6-inch guns and was called simply Battery 219. The other was Battery Lewis, outfitted with two 16–inch rifles whose field of fire overlapped the companion pair at Fort Tilden, located across the Bay in Rockaway. With the victory of World War II and the rise of airpower, these great guns were deemed obsolete and sold for scrap in 1949. Only the massive concrete "bunker" emplacements remain at Navesink today.

Caption

L-13-007

Word Count 22

Primary Material: Reinforced concrete with earth embankments
Armament: Two 16–inch rifled guns
Range: 30 miles

Model text

L-13-008

Word Count 128

FORT TILDEN/BATTERY HARRIS

Fort Tilden was placed at the outer entrance to New York Harbor to counter the long-range guns arming the latest foreign cruisers and battleships. Battery Harris mounted two 16-inch rifled cannon, some of the few ever produced at the Army's Watervliet Arsenal. These guns were mounted in open emplacements in the 1920s, but Battery Harris was deemed vulnerable to air attack. In 1942 concrete bunkers and expansive earthworks were built to protect these huge weapons.

ri´-fled cannon—artillery using spiral grooves cut in the gun tube to impart a spin to projectiles to achieve longer range and greater accuracy.

Caption

L-13-009

Word Count 22

Primary Materials: Reinforced concrete with earth embankments
Armament: Two 16–inch, rifled guns
Range: 30 miles

Model text

L-13-010

Word Count 91

FORT HAMILTON

Fort Hamilton was sited on the east side of the Narrows to overlap the fire of the original Fort Richmond on the opposite shore. While there may have been a British battery here as early as 1779, construction of the present masonry fort, the first granite structure built to defend the port, was not begun until 1825. Fort Hamilton has remained in continuous active service, the last fortification in New York harbor to enjoy this distinction.

Caption

L-13-011

Word Count 27

Primary Materials: Granite masonry with brick interior construction
Armament: About thirty 32–pounders
Range: 1900 yards (just over a mile)

Model text

L-13-012

Word Count 140

FORT LAFAYETTE

Consisting of two enclosed stone tiers and an open **barbette**, Fort Lafayette was constructed during the War of 1812. Sited right in the Narrows on Hendrick's Reef, this island fort was first called Fort Diamond due to its overall shape. In 1823 it was renamed Fort Lafayette in honor of the French military hero of the American Revolution. Pressed into service as a prison during the Civil War, it soon became known as "the Brooklyn Bastille." This fortress stood until 1959, when it was replaced by one of the two huge towers supporting the Verrazano-Narrows Bridge.

bar-bette´—a platform built on top of a fort to permit firing guns over the chest-high wall known as the parapet.

Caption

L-13-013

Word Count 27

Primary Materials: Stone walls on a granite foundation
Armament: Positions for seventy–two 32–pounders
Range: 1900 yard (just over a mile)

Model text

L-13-014

Word Count 126

FORT COLUMBUS

Construction started in the 1790s on Fort Columbus, sited about a half mile southeast of Manhattan on Governors Island. Surrounded by land on all sides, this island fort adopted the latest French designs favoring triangular **bastions**. It occupied a key position in harbor defense until the 1850s, ultimately expanding into a 100–gun fortification. Later renamed Fort Jay, it has served as the headquarters post for various commands such as the First U.S. Army.

bas´-tion—a projecting part of a fortification that allows guns within the fort to be aimed back along the outside walls to defend against infantry assault.

Caption

L-13-015

Word Count 29

Primary Materials: Brick with earth embankments
Armament: 100 guns including Rodmans, Parrott rifles and columbiads.
Range: Between 2 and 3 miles

Model text

L-13-016

Word Count 136

CASTLE WILLIAMS

Located at the northern tip of Governors Island, and built between 1807 and 1812, Castle Williams marked the first time American military engineers stacked gun emplacements in multiple **tiers**. This vertical wall design became the prototype for all major seacoast forts built in this country prior to the Civil War. With 40-foot high masonry walls measuring 7 to 9 feet thick, Castle Williams invited reuse as a military prison after its role as an active fort came to an end. It has twice served as a penitentiary.

tiers—in fort design, refers to rows of gun emplacements placed one on top of another, often including a top, open level called the barbette tier.

Caption

L-13-017

Word Count 39

Primary Material: Red sandstone
Armament: Fifty-two 42– and 32–pounders on the first and second tiers, with twenty-six 50–pound columbiads on the barbette tier.
Range: 1,900 yards (just over a mile)

Model text

L-13-018

Word Count 161

FORT TOTTEN

Intended as the sister defensive work to Fort Schuyler, Fort Totten was designed in the 1840's as a granite pentagon built into a bluff. Preliminary plans were drawn up by Captain Robert E. Lee, and called for the four-tiered, **channel-bearing scarps** to taper to two tiers as they met the bluff. Construction began in the 1850s, but Fort Totten was judged obsolete before its completion. Work was suspended and the design simplified to comprise only two tiers of casemated guns. As the primary defense for New York's "back door," Fort Totten evolved into a prototype anti–aircraft installation in the 1920s, eventually becoming a Nike missile command site.

scarp—the steep exterior walls of a fort; channel-bearing scarps are those walls mounting cannon aimed directly at the navigation channel.

Caption

L-13-019

Word Count 19

Primary Material: Granite
Guns: Thirty–nine13-inch mortars mounted on the top tier
Range: 2 miles

Model text

L-13-020

Word Count 130

FORT SCHUYLER

Begun in 1833 Fort Schuyler was built to guard the entrance to New York Harbor from the northeast. Sited on Throgs Neck peninsula, this stone fort countered any warships attempting to enter the East River via Long Island Sound. With two casemated tiers of firepower arrayed in a half-hexagonal layout, Fort Schuyler employed three simple bastions to protect its shore-facing walls. An unusally large **outwork** defended against infantry assault from the landward side.

out´-work—a secondary defensive position lying outside the limits of the principal fortification, usually to protect the most vulnerable part- the entrance to the fort.

Caption

L-13-021

Word Count 30

Primary Materials: Granite with earth embankments
Armament: 10–inch Rodman guns mounted in the first tier in 1868
Range: 1,900 yards (just over a mile)

Model text

L-13-022

Word Count 150

CASTLE CLINTON

Located at the foot of Manhattan, in an area still called "The **Battery**", Castle Clinton was originally an island fort connected to Manhattan by a wooden pier and drawbridge. Its semicircular front faced its companion fortification, the three-tiered Castle Williams across the mouth of the East River on Governors Island. Castle Clinton was never raised beyond a single tier, and actually remained in active service for little more than a decade, until 1821. After transfer to the City of New York, this historic structure has served diverse functions, finally becoming a National Monument in 1950.

bat´-ter-y—an emplacement for one or more pieces of artillery, usually without any barracks for stationing a round-the-clock garrison.

Caption

L-13-023

Word Count 23

Primary Materials: Brownstone and wood timbers
Armament: Twenty–eight 32–pounders
Range: 1,900 yards (just over a mile)

Model text

L-13-024

Word Count 126

FORT GIBSON

Located on Ellis Island, Fort Gibson was intended to complement the other defenses ringing Upper New York Bay including Fort Wood, Fort Columbus, and Castle Clinton. Although renovated and remodeled many times over the years, Fort Gibson's semicircular design remained essentially intact. An 1807 proposal to add another brick tier in place of the existing parapet was rejected by engineers due to the spongy nature of the underlying soil. Fort Gibson managed to mount about fourteen 24-pound cannon during the War of 1812.

par´-a-pet—a chest–high wall at the top of a fort that protects defenders from enemy fire.

Caption

L-13-025

Word Count 30

Primary Materials: Brick on a stone foundation
Armament: Thirteen or fourteen 24–pounders during the War of 1812
Range: 1,900 yards (just over a mile)

Model text

L-13-026

Word Count 121

FORT WOOD

Constructed on Bedloe's Island just before the War of 1812, Fort Wood is a fine example of a "star fort." This rare defensive layout without **bastions** was usually employed with island forts that were considered safe from landward attack. Repaired with slight modification in the 1840s, Fort Wood remained in service until the 1880s when it was selected as the stone pedestal upon which to set the Statue of Liberty, whose base it now forms.

bas´-tion—a projecting part of a fortification that allows guns within the fort to be aimed back along the outside walls to defend against infantry assault.

Caption

L-13-027

Word Count 20

Primary Material: Sandstone
Armament: Thirty 24-pounders in 1811
Range: 1,900 yards (just over a mile)

Model text

L-13-028

Word Count 151

FORT WADSWORTH/FORT TOMPKINS

Construction of Fort Tompkins, the second fortification on the west side of the Narrows to bear this name, began in 1859. Not finished until 1876, Fort Tompkins joined a growing list of masonry forts made obsolete by the development of rifled artillery that could reduce them to rubble. Never mounting more than a single heavy gun, Fort Tompkins still remained an active military installation for over a century. Perhaps the least threatening role Army command ever asked it to fill, was when, at the end of the 1800s, Tomkins' central **parade** was transformed into an exquisite set of courts for lawn tennis.

pa-rade´—a broad open lawn or paved area that serves as a place to assemble troops for review, as in "parade ground."

Caption

L-13-029

Word Count 31

Primary Materials: Granite outer walls with brick interior construction
Armament: One 10" Smoothbore converted to an 8" rifle
Range: 3 miles (To be verified)

Model text

L-13-030

Word Count 126

FORT WADSWORTH/BATTERY DUANE

In the decade following 1895, six new concrete batteries for high-powered artillery were built at Fort Wadsworth, including Battery Duane. These clusters of rifled cannon were aimed not at the Narrows, but at the open water of Lower New York Bay. Rapid advances in naval gunnery, including high trajectory cannon capable of showering shore batteries with plunging fire, meant these open-air emplacements were quickly outmoded. By 1915, Battery Duane's disappearing guns had been taken out of service. Only three ever saw duty again, redeployed at Fort Hancock, across the Bay on the Sandy Hook peninsula.

Caption

L-13-031

Word Count 28

Primary Materials: Concrete, granite and brick with earth embankments
Armaments: Five 8–inch rifles on disappearing carriages
Range: 7-8 miles

Model text

L-13-032

Word Count 157

FORT WADSWORTH/FORT RICHMOND*

Sited on the west bank of the Narrows, Fort Richmond was the second water battery built here to bear this name. Begun in 1847, it was a premier Third System fortification, with three granite tiers topped by an open, sod-covered barbette. Armored iron **embrasures**, designed by engineer Joseph Totten, permitted the casemate-enclosed artillery to sweep 60 degrees side-to-side, though the openings were less than five feet square. To further protect the gun crews from enemy fire, Totten outfitted the gun ports with thick iron shutters that could snap shut after each firing.

*Now known as Battery Weed

em-bra´-sure—an opening in a wall through which a cannon is fired; the aperture is often reinforced with extra thick surrounding walls and iron plates.

Caption

L-13-033

Word Count 30

Primary Materials: Granite with a brick and sod barbette
Armament: 116 Rodmans, Parrott rifles, and columbiads with 24 flanking howitzers
Range: 3 miles

14 Measures and Counter Measures

Sign Header

L-14-000

Word Count 5

MEASURES <=> COUNTERMEASURES

Primary text

L-14-001

Word Count 184

Measures and Countermeasures

Initially America held a distinct advantage in defending its cities and ports. Sailing man-o-wars were simply no match for well-armed coastal fortifications. But by the mid–1800s this balance began to shift to the potential foe.

With the advent of steam power, an invading fleet was no longer forced by winds or currents to take a course in close to shore batteries. With armor plating, enemy vessels could survive heavy shelling and steam on past. Outfitted with rifled cannon, ships could stand further offshore and blast away, out of the range of coastal artillery.

At least that is what enemy ships could do until, in a see-saw struggle to hold the "edge", the firepower of coastal guns was again increased to offset the attacking force. This game of matching measures with countermeasures continued into the Cold War, culminating in the deployment of anti-aircraft missile batteries.

Secondary text

L-14-002

Word Count 107

The First Line of Defense

Limits on the range of artillery initially meant placing fortifications close to population centers. Dutch settlers thus fortified the tip of Manhattan. After capturing New Amsterdam, the British upgraded these fortifications. During the Revolution, the British emplaced guns on the west side of the Narrows, about 3 miles further out. They meant to intercept an enemy fleet before its guns were within range of the city. They knew that an exchange of fire would involve forces well within sight of each other.

Map Labels

L-14-002.1

Word Count 57

[Map labels]
New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Sandy Hook
Battery
Battery
Battery
Ft. Jay
Stockhouse (?)
population density {key to population overlay}

Secondary text

L-14-003

Word Count 89

The Second Line of Defense

The U.S. fortified the Narrows early in the 1800s, then replaced these batteries with masonry forts. The guns at the original Fort Richmond and Tompkins had a range of about 1 mile, about equal to the width of the Narrows. Later armament, like larger caliber columbiads, could lob explosive shells onto the decks of enemy ships. With rifled artillery, the effective range of shore batteries increased to nearly 3 miles.

Map Labels

L-14-003.1

Word Count 70

[Map labels]
New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Ft. Gibson
Ft. Wood
Ft. Tompkins
Ft. Richmond
South-West Battery
Castle Williams
Ft. Columbus
Ft. Lewis
Ft. Diamond
Ft. Gates
population density {key to population overlay}

Secondary text

L-14-004

Word Count 122

The Third Line of Defense

Together with rifled cannon, the development of ironclad warships rendered masonry forts obsolete. In the late 1800s, vertical stone forts were superseded by low, dispersed Endicott batteries made of concrete and sloped earth. Many were outfitted with breechloading rifles, that could fire a 1,000–lb. projectile 8 miles. Earth and concrete parapets lent protection against frontal fire, but were vulnerable to "plunging" fire from warships with high-trajectory gun turrets. Endicott batteries also became outmoded, those flanking the Narrows being largely dismantled by World War I.

Map Labels

L-14-004.1

Word Count 82

[Map labels]
New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Ft. Gibson
Ft. Wood
Ft. Tompkins
Ft. Richmond
Castle Clinton
Castle Williams
Ft. Columbus/South Battery
Ft. Hamilton
Ft. Lafayette
Fort at Sandy Hook
Fort Schuyler
Fort at Willets Point
population density {key to population overlay}

Secondary text

L-14-005

Word Count 121

The Fourth Line of Defense

The increasing range of naval firepower led to the emplacement of shore batteries still further away from Manhattan. During World War II, crews of the huge coastal guns at Fort Tilden and Navesink practiced hitting targets 30 miles out at sea with shells weighing more than a ton. But strategists had to contend with far more than surface ships. Enemy submarines prompted nets and mines to be strung across the Narrows. Long-range bombers required searchlights, radar and anti-aircraft batteries. Eventually, the Coast Artillery's sole mission became defense against enemy aircraft.

Map Labels

L-14-005.1

Word Count 82

[Map labels]
New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Ft. Gibson
Ft. Wood
Ft. Tompkins
Ft. Richmond
Castle Clinton
Castle Williams
Ft. Columbus/South Battery
Ft. Hamilton
Ft. Lafayette
Fort at Sandy Hook
Fort Schuyler
Fort at Willets Point
population density {key to population overlay}

Secondary text

L-14-006

Word Count 117

No Line of Defense

During World War II, amphibious landings played a crucial role in both Europe and the Pacific. A port might now be the last place military planners could expect invasion. But it was the development of rocketry that truly spelled the end for harbor fortifications. Intercontinental ballistic missiles made every part of the nation vulnerable to attack, not just the seacoasts. In a world where no true lines of defense can be drawn, most coastal forts, like those surrounding New York, have become historic sites and parks, as well as recreation and conservation areas.

Map Labels

L-14-006.1

Word Count 139

New Jersey
Bronx
Manhattan
Brooklyn
Queens
Staten Island
Hudson River
East River
Long Island Sound
The Narrows
Lower New York Bay
Upper New York Bay
Atlantic Ocean
Castle Clinton (National Monument)
Fort Wadsworth (Gateway National Recreation Area - Staten Island Unit)
Fort Hancock (Gateway National Recreation Area - Sandy Hook Unit)
Fort Tilden (Gateway National Recreation Area - Jamaica Bay Unit)
Bennet Field (Gateway National Recreation Area - Breezy Point Unit)
Fort Wood (base for Statue of Liberty National Monument)
Fort Schuyler (New York State Maritime College)

Fort Tilden (Gateway National Recreation Area - Jamaica Bay Unit)
Bennet Field (Gateway National Recreation Area - Breezy

Identifier(s)

L-14-007.1 Anti-aircraft battery, circa 1930s-1950s

Word Count 8

Identifier(s)

L-14-007.10 WWII Submarine

Word Count 2

Identifier(s)

L-14-007.11 WWII Submarine net with mines

Word Count 5

Identifier(s)

L-14-007.12 Long range bombers, circa 1940s-1970s

Word Count 7

Identifier(s)

L-14-007.13 "Skip" shot or flat trajectory

Word Count 6

Identifier(s)

L-14-007.14 Low trajectory - frontal fire

Word Count 5

Identifier(s)

L-14-007.15 High trajectory - plunging fire

Word Count 6

Identifier(s)

L-14-007.16 High-altitude bombing

Word Count 4