

FORT TOMPKINS
GATEWAY NATIONAL RECREATION AREA

Historic Structures Report

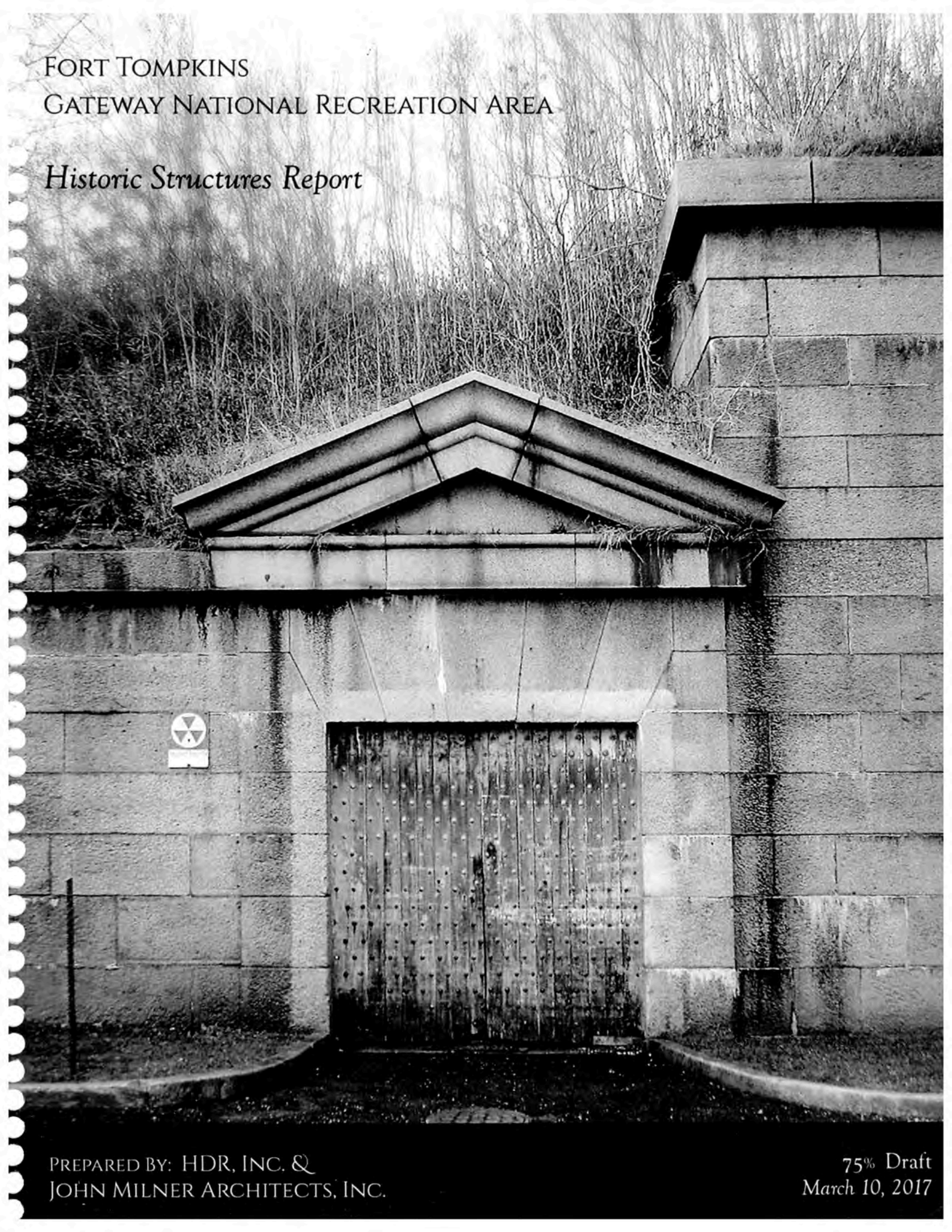


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PART I – DEVELOPMENTAL HISTORY

1.1 HISTORICAL BACKGROUND AND CONTEXT

Fort Tompkins stands as a contributing structure to the Fort Wadsworth Historic Site. Until the development of the NIKE Missile program in the 1950s, this site stood as one of the first lines of coastal defense. Originally, constructed in the mid-19th century, the fort represents the last in a history of coastal defense on the site that spans almost two centuries.

1.1.1 History of Staten Island

Staten Island, one of the five boroughs of New York City, is a 102.5-square-mile island at the southernmost point of the state of New York. The island is separated from the New Jersey mainland by two creeks, the Arthur Kill and Kill Van Kull. The borough, which is coextensive with Richmond County, is separated from the Borough of Brooklyn to the east by The Narrows connecting the Upper Bay and Lower Bay of New York Harbor. The area that would eventually be the location of Fort Tompkins is on a bluff 130 feet above sea level providing a commanding view of The Narrows. It is this vantage point overlooking the primary water approach to Manhattan that gave this part of Staten Island its strategic importance.

There is evidence of prehistoric Native American occupation on Staten Island in the form of Clovis points that date back 14,000 years. While the archaeological record suggests that there were periods when the island was abandoned, intermittent human presence continued. This eventually led to the reestablishment of consistent, though migratory, occupation in several areas of the island.¹ By 1524, when the island was first observed by Europeans (Giovanni de Verrazano under a French flag) the Raritan band of the Lenape tribe was the predominant presence in the area. After Henry Hudson explored New York Harbor on behalf of the Dutch in 1609, the Dutch named the island Staten Island after the Staten-Generaal, the parliament of the Netherlands.² After establishing the Dutch colony of New Netherland, first on Governor's Island in 1624 and soon after on Manhattan, the proprietors made several attempts to settle Staten Island, but were repeatedly repulsed by the native tribes. A small foothold was established at Old Town in 1661, southwest of the future site of Fort Tompkins, shortly before the Second Anglo-Dutch War in 1667 resulted in the transfer of the colony to the English.³ A few years after this transfer, the English secured the rights to the island from the Raritan and began to expand the Dutch settlements and establish new ones with recently arrived settlers.⁴

¹ Jackson, Encyclopedia of New York City

² New England System Support Office, CLR, p. 16.

³ Ellis, p. 55

⁴ Jackson, Encyclopedia of New York City

From the early years of the 18th century, the land on which Fort Tompkins would be built was owned by colonist John Van Deventer and his descendants. They maintained ownership throughout the British occupation during the American Revolution and would do so until it was sold to the State of New York in 1794.⁵

1.1.2 Colonial History of Fortifications at Fort Wadsworth

Following the establishment of Old Town, two blockhouses were constructed to defend the new Dutch settlement. Sources disagree if one of them was in the immediate vicinity of Fort Wadsworth. Claims that a blockhouse was built on Flag Staff Hill or Signal Hill, as the bluff overlooking The Narrows was later known, are the basis of the claim that the site of Fort Wadsworth is the longest continually fortified location in the United States.⁶ Other sources dismiss this possibility and no physical evidence has been found.⁷ If there was a Dutch blockhouse in this location, there is no evidence of the British maintaining such a structure or building any fortifications in this location at all during the pre-Revolution period.⁸ Other small, local New York-area forts, batteries and redoubts are mentioned in many documents and shown on various maps during the colonial period, but none on Staten Island.

It was not until the occupation of Staten Island following the British victory in the Battle of Long Island in 1776 that defensive military construction began. Having served as the British staging area and jumping-off leading up to the battle, the western side of the narrows saw continued use as an artillery depot and defensive emplacement while the island as a whole served as a source of forage and supply for the duration of the war. First attempts to fortify the bluff consisted of a redoubt, a line of 26 gun platforms with numerous cannon and a hot-shot furnace for preparing heated rounds. It is likely defensive installations to protect the Upper Bay were put in place following the entrance of France and its fleet into the war in 1778. By the end of the war in 1783, the British had constructed a four-bastion or six-pointed-star fort (depending on the source) with an interior blockhouse along several barbette battery installations.⁹ With the conclusion of the war, the British departed Staten Island as did a number of Loyalist residents.

1.1.3 First System Military Architecture – 1794-1800

With adoption of the United States Constitution, the Federal government began to consider the comprehensive defense of its vulnerable seacoast. These efforts became more urgent after the general increase of hostility between the United States and the government of Revolutionary France. In 1794, President Washington requested the preparation of a congressional report on the defense of the country's seaports. The report's recommendations, later known as the First American System identified 16 locations to be

⁵ NESSO, CLR, p. 17.

⁶ Black, p. 10.

⁷ New England System Support Office, CLR, p. 16.

⁸ Black, p. 19-21.

⁹ Ibid., p. 22-24.

defended with new fortifications, including the New York City area.¹⁰ At the direction of Secretary of War Henry Knox, Charles Vincent, a French engineer, developed a plan for the defense of New York Harbor. Vincent's initial plan focused on Governor's Island, Bedloe's Island and Ellis Island with additional batteries on Manhattan.¹¹

While the Federal government made plans for defense, New York State moved to fortify New York Harbor at the same time. With the desire for reimbursement by the national government for any funds expended in the effort, the State effort focused on the same locations as outlined in the Vincent report (they worked in concert with the engineer) while expanding the scope to include the narrows.¹² This effort led Vincent to revise his report to include the site of Fort Wadsworth. The eventual direction by Vincent called for a lower battery near the water and an upper fort on the higher bluff. The upper fort, called Fort Stag Stake by Vincent, was to primarily consist of renovating the existing British fort. It is not entirely clear what fortifications were included in the final plan for the west side of the narrows as conflicting outlines exist, but at their largest extent may have included the renovated British fort, two redoubts and three batteries (included one at the water below the fort)¹³

Despite the extensive plans for New York's fortification in the First American System, the actual amount of construction that took place appears to have been much reduced. Many of the forts and batteries in Vincent's plan were either not constructed or only partially completed. The renovation of the British fort may have been completed, but the redoubts and batteries likely were not. After peace with France was achieved in 1800, many of the fortifications were abandoned. Only Fort Jay on Governor's Island, which had been the focal point of the defensive system and largely completed, was maintained. The rest were not garrisoned and fell into disrepair. The First System established a comprehensive scheme for coastal defense of the country, but much of the plans were unrealized.¹⁴

1.1.4 Second System Military Architecture – 1807-1815

After several years of relative quiet, the threat of war with Britain re-energized interest in coastal defenses at the national level. In 1807, the Jefferson Administration prepared a new National Program of Fortifications that would later be known as the Second American System. Staten Island was not included in the plans developed by the Federal government as primary focus remained on the island defenses of the upper bay and Manhattan.¹⁵ Once again, the State of New York, under the governorship of Daniel D. Tompkins, took the lead in establishing a new defensive installation at the Narrows. Eventually coming to an

¹⁰ NESSO, CLR, p. 18.

¹¹ Black, p. 30.

¹² NESSO, CLR, p. 18.

¹³ Black, p. 34.

¹⁴ Ibid., p. 37-38.

¹⁵ NESSO, CLR, p. 18.

agreement with the Federal authorities to collaborate and coordinate defensive efforts, the State worked with Army Engineer Jonathon Williams to develop the fortification plans.¹⁶

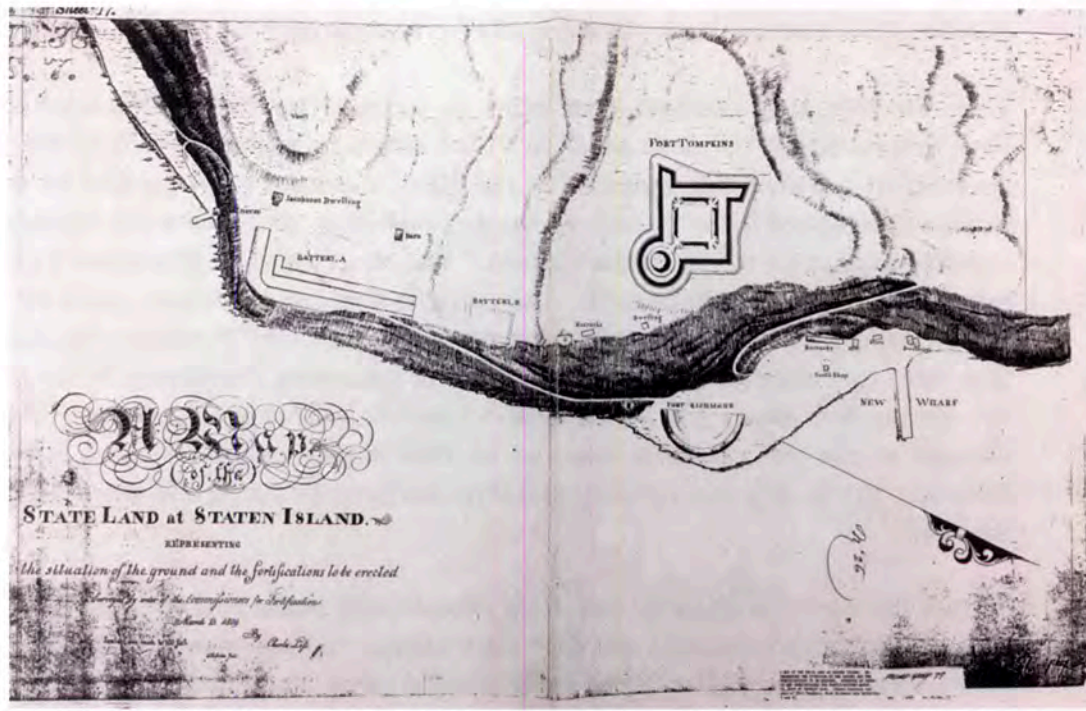


Figure x.xx - 1809 plan for Forts Tompkins and Richmond by Jonathon Williams. Fort Tompkins was never built to this plan.

Williams' initial 1808 plan for the defense of the Narrows included two forts and several supporting batteries. The two forts were to be positioned in roughly the same location as called for in Charles Vincent's plans as part of the First System. One fort was to be located on the water's edge while a second fort would be constructed at the head of the bluff above. The supporting earthen batteries, including Forts Morton and Hudson, would be located downhill to the south from the upper fort. Named Fort Richmond, the water-side fort is shown in an 1809 drawing as a semicircular stone fort with room for 27 guns. Construction on Fort Richmond must have commenced quickly after Williams' initial design was complete as correspondence by Governor Tompkins suggests that the fort was complete by 1810. The original plan of Fort Tompkins, as shown in the 1809 drawing of Williams' proposed design, was for a square fort with a single circular bastion at the southeast corner and polygonal bastions at the southwest and northwest corners.¹⁷ Despite what appeared to be enthusiasm for the project by the State with the beginning of the War of 1812, construction of the upper fort was delayed for several years despite the completion of Fort Richmond and several of the outer batteries.

¹⁶ Black, p. 41-42.

¹⁷ Williams drawing, 1809.

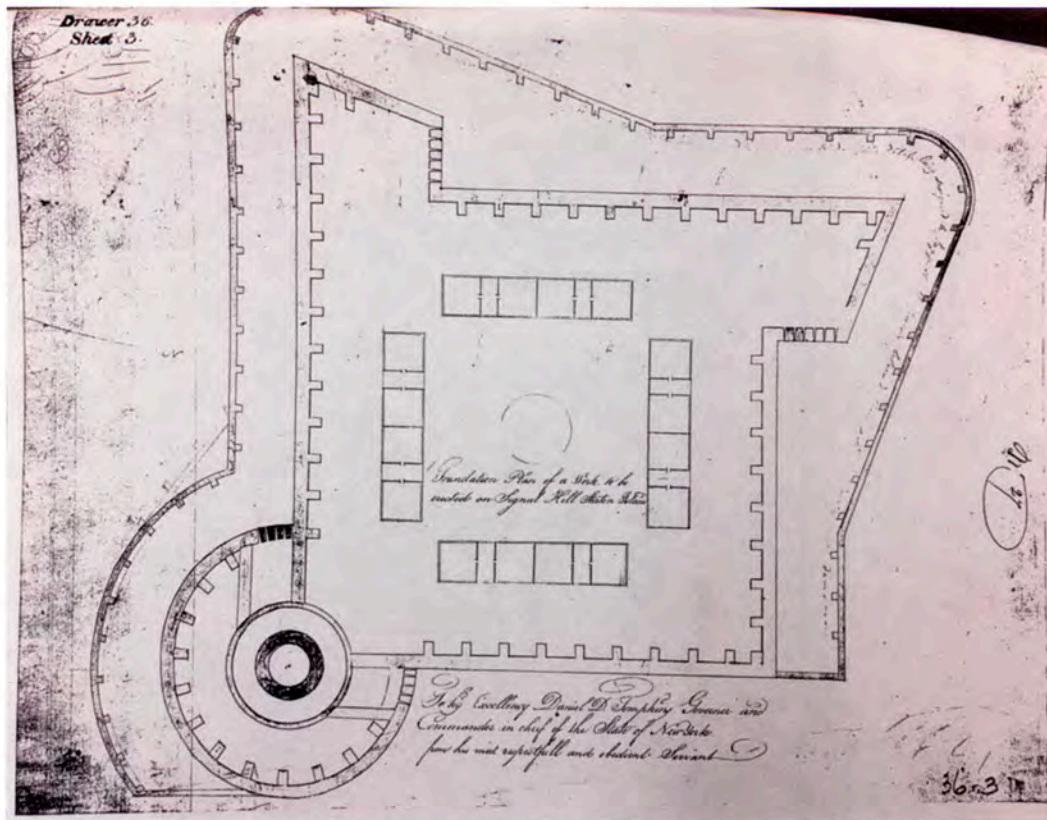


Figure x.xx - 1809 detailed plan for Forts Tompkins by Jonathon Williams. Fort Tompkins was never built to this plan.

It was not until 1814 that construction began on a sandstone fort at the bluff (known as Flag Staff Hill at this time) and now would be based on a new plan.¹⁸ Williams revised the plan for Fort Tompkins away from a square fort and towards a pentagonal fort with circular bastions at all five points. Funds were allocated by the State in April 1814 and construction began shortly after. It is not clear if the remnants of the earlier British fort, possibly as modified during the First System program, were incorporated into the new installation.

By the end of the war in 1815, Fort Tompkins was not yet complete and enthusiasm for the project began to wane. Governor Tompkins convinced the state legislature to allocate funds for its completion, however, using the argument of funds expended and the vulnerable nature of the fort to deterioration in its partially completed state. Construction was substantially completed, likely in 1816, but it does not appear to have been garrisoned and the site was largely abandoned by 1817.

¹⁸ NESSO, CLR, p. 19.

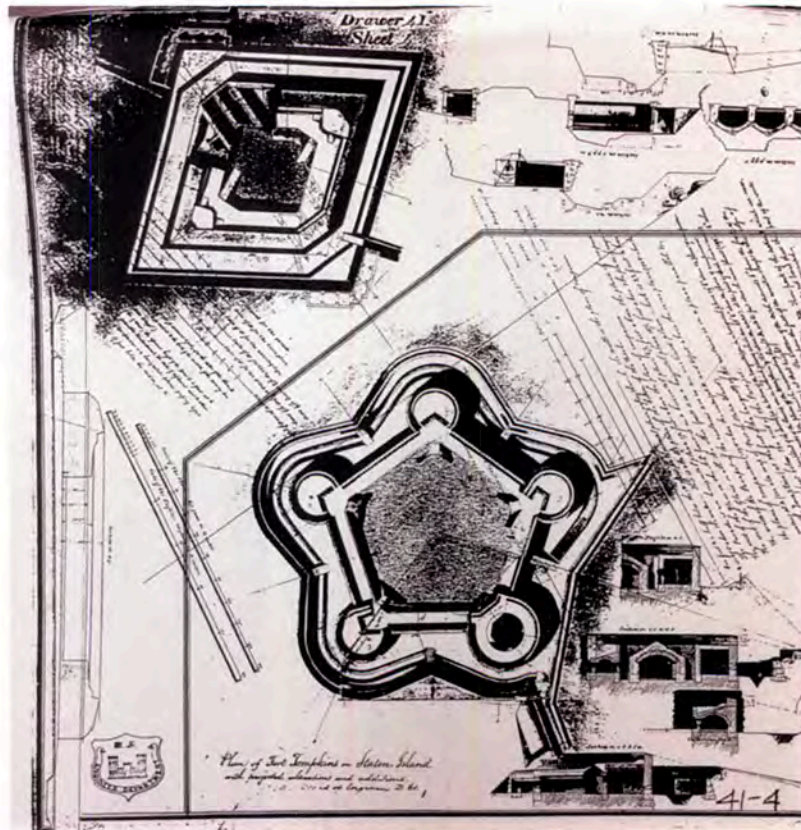


Figure x.xx - 1820 plan of Second System Fort Tompkins. This plans calls for modifications to the existing fort and the construction of a redoubt (upper left) that was likely never built.

Despite the beginning of a new multi-decade program of coastal defense in 1816, the Third American System, no work appears to have taken place at the Narrows site for decades. During this time and through a long and arduous process, the land was ceded to the Federal government as it brought all defensive initiatives for the country under its control. Throughout this period, the Second System structures would be allowed to fall into ruin. New work would not begin until Third System plans began to be implemented in the 1840s following final transfer of the site and subsequent enlargement by the Federal government through additional land purchases.¹⁹

1.1.5 Third System Military Architecture - 1816-1864

While the first two coastal defense programs were initiated in response to direct threats of conflict, the Third American System was begun in a time of peace. Very shortly after the conclusion of the War of 1812, President James Madison recognized that a comprehensive response was need for the failures of the existing coastal defenses during that conflict. In late 1816, Acting Secretary of War, George Graham, formed a board of military engineers to plan and build a permanent and systematic series of seacoast fortifications. It was headed

¹⁹ NESSO, CLR, p. 20.

by a Frenchman, Simon Bernard (1779-1836) who had been the head of the topographical bureau and aide-de-champ to Napoleon who had been exiled after Napoleon's fall. General Joseph Gilbert Totten (1788-1864) was also involved who was an expert in development of 19th-century seacoast fortifications and one of the leading military engineers in America. The board's initial report was issued in 1821 and was then further revised in 1826.

The board's recommendations were not formulated as a response to technological improvements in arms and armament. The focus of the changes was to provide improved siting of defensive emplacements that were more easily defensible and that provided greater coverage of a location. Also important was the strategic decision to prevent enemy ships from gaining access to interior waterways to a greater degree than previously attempted. During the First and Second Systems, despite New York State's insistence on a fortification at the Narrows, the Federal government focused almost entirely on defending lower Manhattan. After the British forces easily entered and traversed the Chesapeake Bay and gained access to Lake Borgne at New Orleans, the importance of preventing free access by enemy ships was recognized. In New York this meant not only the construction of Forts Tompkins and Richmond, but also Fort Hamilton at the east side of the Narrows and Fort Sandy Hook (later Fort Hancock) in New Jersey. These forts would contest attempted entrance into the lower and upper bays of New York Harbor.

The initial plan outlined in the report outlined 50 sites for fortifications, with New York City and Washington, DC being among those considered most important. By the end of the program in the 1860s, 200 sites would be identified as desirable locations for defensive emplacements. Between 1816 and 1867, 42 forts were constructed as part of the Third System with other towers and batteries constructed for additional support.

Due to the absence of impending hostilities, the Army was able to plan and build the forts of the Third System with considered designs that allowed a certain degree of standardization. A characteristic of forts of this period, especially those designed by General Totten, were modular casements of regular size and configuration that could be placed next to and atop each other as desired range, breadth of coverage and available terrain allowed. Later forts constructed during this program would also be fitted with what were now as "Totten embrasures." These were metal embrasure doors that swung freely. The gases launching a projectile would force the doors open in advance of the ball or shell and then, once clear, the doors would automatically return to the closed position. This provided improved protection of each gun and casement from enemy fire. Despite some of these improvements, by the end of the Civil War, improvements in cannons exposed the weaknesses of the forts' construction. With the introduction of cannon rifling, pointed projectiles and enlarged powder charges (enabled by increased strength of the iron), the more powerful and accurate guns proved devastating to the stone masonry of the Third System forts. This is exemplified by the near total destruction of Fort Sumter by these improved artillery pieces near the end of the Civil War.



Figure x.xx – The ruins of Fort Sumter near the end of the Civil War.

1.1.6 Development of Forts Tompkins and Wadsworth

As part of the Third American System, the U.S. Army built the extant Fort Tompkins and Battery Weed (completed in 1876 and 1864, respectively), as well as upgrading Forts Hudson and Morton, on the site of the previous Second System forts.

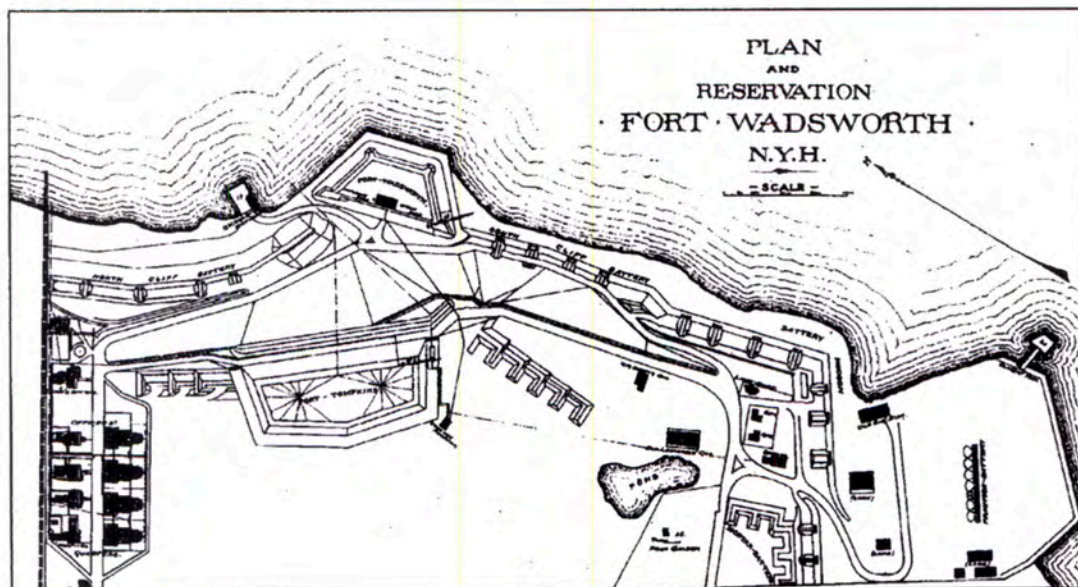


Figure x.xx - 1890 plan of Fort Wadsworth showing Fort Tompkins and Battery Weed.

A more detailed description of Fort Tompkins and its development over time is provided in Section 1.2 – Chronology of Development and Use

1.1.7 Decommissioning and Gateway National Recreation Area

Naval Station New York, the final use of Fort Wadsworth under military ownership, was recommended for closure as part of the 1988 Base Realignment and Closure Commission. With a final decision coming from the Commission in 1993, the base was decommissioned in 1994 and held in caretaker status by the United States Navy until turned over as surplus to the National Park Service. The fort, including Fort Tompkins, was incorporated into Gateway National Recreation Area as part of the Staten Island Unit. While housing some of the administrative functions of the Park Service, the Fort also housed operations of the United States Coast Guard, the Army Reserve and the United States Park Police. A visitor's center was established and guided tours of the historic forts and batteries were given on a regular basis until 2013.

Since 1976, the course of the New York Marathon has started from Fort Wadsworth before leading onto the Verrazano Narrows Bridge on its way through all five boroughs of New York City. The marathon is the largest in the world with over 50,000 finishers annually.

1.1.8 Fort Tompkins in Comparison to other Third System Forts

Additional information on the significance of the Fort Tompkins in the larger context of Third System Forts to be included in the next submission.

Due to the massive masonry blocks used for the forts of the Third American System, a large majority of them have survived to the present. While none serve an active role in defense, many have been adapted over the decades to serve a number of military roles. While some still serve a purpose in this manner, most have become monuments or memorials and a historic record of their time.

Discussion of condition / use

Forts of the Third American System:

Name – Location, Use, Condition, and Ownership (where known).

Maine

Fort Knox – Penobscot River
Fort Popham – Popham Bay
Fort Gorges – Portland Harbor
Fort Scammell – Portland Harbor
Fort Preble – Portland Harbor

New Hampshire

Fort McClary – Portsmouth
Fort Constitution – Portsmouth

Massachusetts

Fort Warren – Boston Harbor

Fort Independence – Boston Harbor

Fort at Clark's Point (Fort Rodman) – New Bedford



Figure x.xx – Fort Adams, Newport Harbor, Rhode Island

Rhode Island

Fort Adams – Newport

Connecticut

Fort Trumbull – New London

New York

Fort Schuyler – New York City

Fort Totten – New York City

Fort Tompkins – New York City

Fort Richmond (Battery Weed) – New York City

Fort Hamilton – New York City

Fort on Sandy Hook (Fort Hancock) – New York City

Delaware

Fort Delaware – Pea Patch Island

Maryland

Fort Carroll – Baltimore Harbor

District of Columbia

Fort Washington – Washington



Figure x.xx – Fort Monroe, Norfolk, Virginia

Virginia

Fort Monroe – Norfolk

Fort Calhoun (Fort Wool) – Norfolk

North Carolina

Fort Macon – Beaufort

Fort Caswell – Wilmington

South Carolina

Fort Sumter – Charleston

Georgia

Fort Pulaski – Savannah

Florida

Fort Clinch – St. Marys River

Fort Taylor – Key West

Fort Jefferson – Dry Tortugas

Fort Pickens – Pensacola Bay

Fort Barrancas – Pensacola Bay

Fort McRee – Pensacola Bay



Figure x.xx – Fort Jefferson, Dry Tortugas, Florida

Alabama

Fort Morgan – Mobile Bay
Fort Gaines – Mobile Bay

Louisiana

Fort Massachusetts – New Orleans
Fort Pike – New Orleans
Fort Wood (Fort Macomb) – New Orleans
Fort Jackson – New Orleans
Fort Livingston – New Orleans

California

Fort Point – San Francisco Bay
Fort Alcatraz – San Francisco Bay



Figure x.xx – Fort Point, San Francisco Bay, California

1.2 CHRONOLOGY OF DEVELOPMENT AND USE

1.2.1 Initial Construction – Mid-19th Century

In 1835, the second Fort Tompkins, constructed ca. 1814, was declared unfit for use by the State of New York. A second fort within Fort Wadsworth, Fort Richmond (now Battery Weed) was also considered inadequate for modern security standards. The guns were rusted and the carriages were decaying at both locations. Fort Wadsworth “constituted an abandoned defensive position, the state-built Second System masonry fortifications being left to deteriorate.”¹ Since the Narrows was a direct passage to New York, these fortifications were considered top priorities and required repairing or rebuilding immediately.

Fort Tompkins was built by the U.S. Government as part of the Third or Totten System of U.S. Seacoast Fortifications. It exemplifies the characteristics of the Third System which typically included one or more tiers of arched casemates that “nearly always extended the full length of the seaward front” and stone or brick walls that were at least five feet thick. The fort was constructed with salvaged rough-hewn granite and sandstone from a previous fort structure.² Third systems were typically hexagonal in plan, however Fort Tompkins was constructed in a pentagonal shape.³

Plans for repairing and upgrading Fort Tompkins began in the 1840s by Joseph G. Totten, Army’s chief engineer, and were completed in 1845. At this time, New York City was the busiest port in America with 70 percent of the total imports passing through the Narrows into the New York Harbor, as it was the main entrance from the Atlantic Ocean. Development of the Navy Yard in Brooklyn also proved reason for increased security at the New York Harbor.⁴ On February 15, 1847, the forts were purchased by the State of New York and demolished. Construction on the third fort began in 1847.

“With federal refortification of the Narrows that began with the construction of the new Fort Richmond in 1847, the landscape began to shift from its romantic, ruined character in the preceding decades since the end of the war with Britain, to a highly engineered, manicured appearance. The landscape during this time also became an integral part of a larger system of defenses designed by General Joseph G. Totten. The headland was carefully engineered to coordinate not only its site-specific conditions, but also a network of fortifications, particularly those on the opposite side of the channel on Long Island: Fort Lafayette as Fort Richmond’s water-level counterpart, and Fort Hamilton as Fort Tompkins’ upper-level counterpart.”⁵

By mid-1850, construction was delayed due to lack of federal funding during the Mexican-American War, and in 1852, construction was suspended completely. Towards the end of the summer of 1854, Congress approved the continuation of work on the new fort.⁶ Federal plans for the fortifications

¹ An Archaeological Assessment, Fort Wadsworth, Staten Island, 4-23.

² Landmarks Preservation Commission (Fort Tompkins).

³ Cultural Landscape Report for the Battery Weed Headland, Page 45.

⁴ Ibid.

⁵ Cultural Landscape Report, p. 48.

⁶ Cultural Landscape Report for the Battery Weed Headland, 46.

required the acquisition of additional lands, including five acres in 1854, and seventeen acres at the top of the bluff along New York Avenue acquired from William Aspinwell in 1856. With these purchases, the federal government was in possession of the area from the waterfront at the Narrows to beyond the crest of Flagstaff Hill, a roughly seventy-acre tract that became known as the United States Reservation.”⁷

In 1857, Congress appropriated \$150,000 for the reconstruction of Fort Tompkins.⁸ Revised plans were created by Lt. John C. Paltrey under the Board of Engineers for the Atlantic Coast, and in April of 1858, they were approved by the Secretary of War. Fort Tompkins was designed with more “inherent flexibility in terms of the uses to which it could be put.”⁹

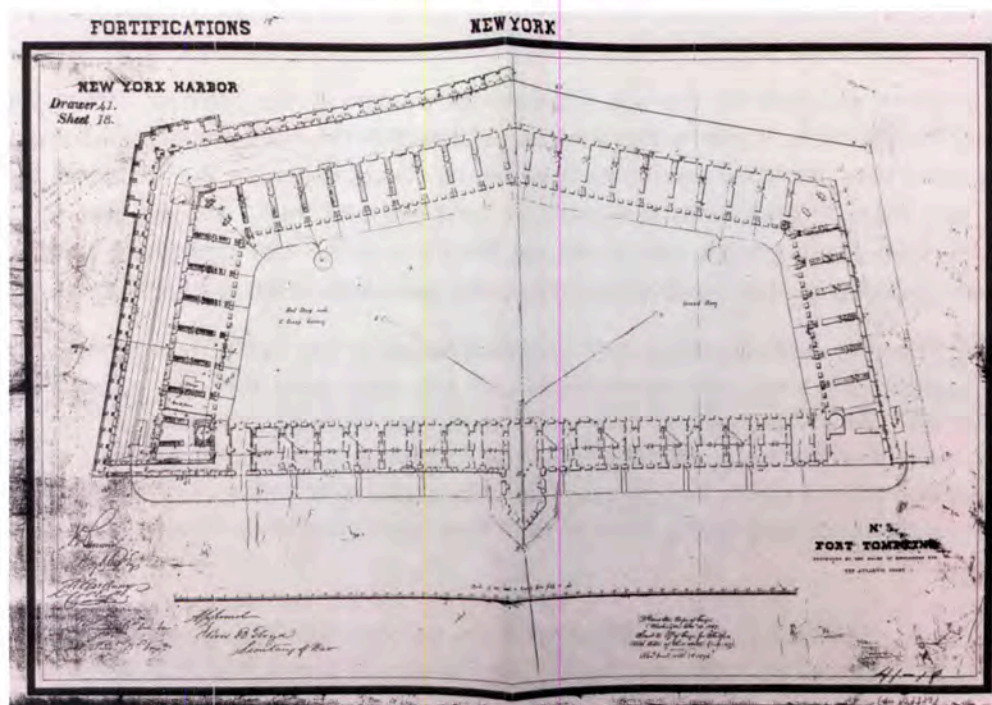


Figure 1: Paltrey's 1858 first floor plan of Fort Tompkins.

Construction continued on the fort in the late 1850s and materials were brought to the site by inclined railway extending from shoreline. Though it was not entirely complete, the new fort was ready for use in 1861. By April 1861, at the start of the Civil War, the fort was still considered only partially complete. On August 8, 1861, the first troops were garrisoned at Fort Tompkins. During the Civil War, construction on the fort slowed again due to the “diversion of men and possibly materials to other construction efforts on the Staten Island site, which had been expanded from the 47 acres ceded by New York State to 70 acres by the mid-1850s.”¹⁰ By 1864, Fort Tompkins was still incomplete. The following year, however, the land fronts of the fort were structurally completed and finish work was beginning on the interior. Construction stopped again between the years 1866 to 1869.

⁷ Cultural Landscape Report for the Battery Weed Headland.

⁸ National Register Nomination.

⁹ Adaptive Reuse Analysis, II-3.

¹⁰ Adaptive Reuse Analysis of Fort Tompkins.

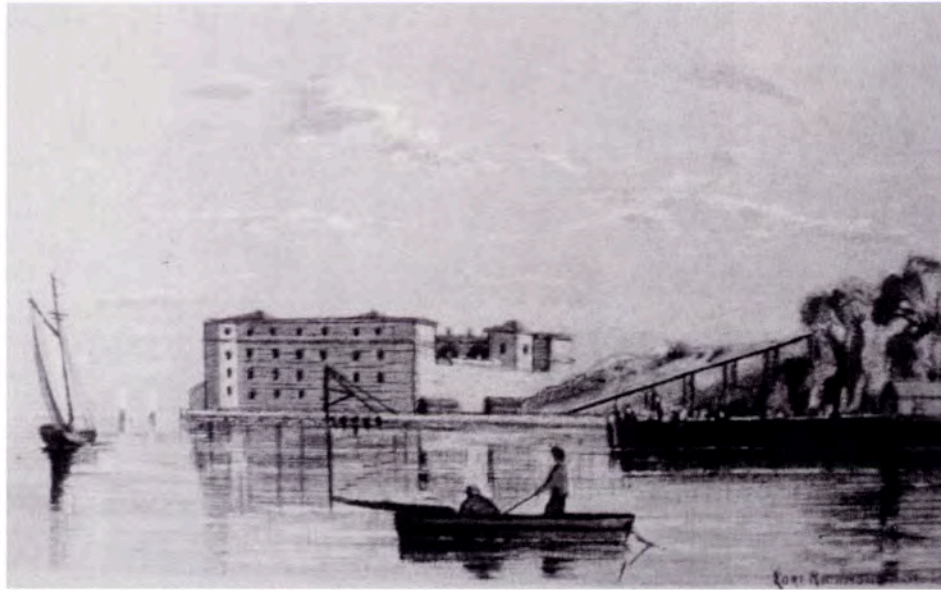


Figure 2: Drawing made in c.1863 looking south at Fort Richmond with the inclined railway extending from the dock up the bluff. The railway was used to move construction materials to the Fort Tompkins construction site. (Image 19411, Gateway National Recreation Area Archives, Fort Wadsworth).

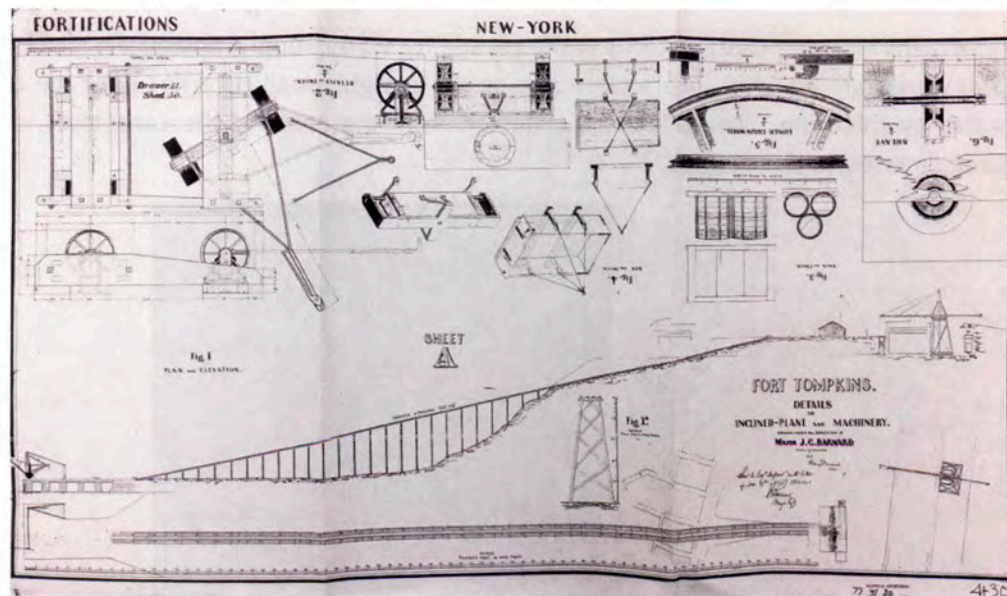


Figure 3: Details of Inclined-Plane and Machinery.

The original plan for the fort included two latrines for troops and eight latrines for officers on “slope in front of the channel scarp, with waste conveyed through a brick sewer to an outlet near Battery Weed.” Despite these plans, apparently only one latrine (for soldiers) was constructed in 1868 near south end of channel scarp. The Facility was replaced in 1870 by another latrine with ten “earth closets” on the south ditch at east end of south land front.

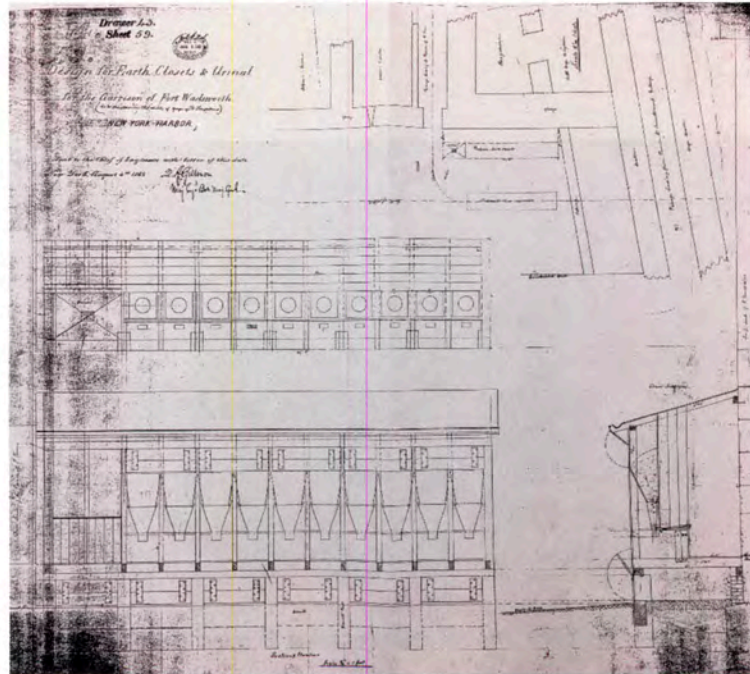


Figure 4: Design for Earth Closets and Urinal, August 4th 1869.

The 1858 plans included three cisterns in the parade for water supply, however it seems as though only two were built by 1866. There were also seven to eight small cisterns under the channel front casemates by this time. The water was collected from the roofs of the casemates with cast iron pipes and directed to the cisterns.¹¹



Figure 5: Model of Fort Pulaski, showing similar construction of the East Casemates at Fort Tompkins with cisterns below.¹²

¹¹ Adaptive Reuse Analysis of Fort Tompkins, II-8.

¹² The Sound of the Guns, Civil War Artillery, Battlefields and Historical Markers.

1.2.2 Late 19th Century

Despite some opposition to modifications of seacoast forts after the Civil War, construction resumed in 1869 with a different design than originally proposed: the Caponiere was omitted, as well as the bastion projecting from the main, east façade. Additional foundations were built on the parade side of the channel front, and casemates were constructed as “bombproof” storage areas. The circular staircases in the original plans were constructed as more oval in shape. As part of this new design, the channel front casemates were “reduced to single tier and their depth increased from about 40 feet to 75 feet for 15 inch guns now intended to be mounted on a high earthen parapet rising above the low masonry channel scarp.” Third System of compactly designed granite casemates “proved to be impossible to modify to accommodate the new larger guns and riddles that emerged following the Civil War.”¹³ It appears as though Fort Tompkins was never completed as originally designed.

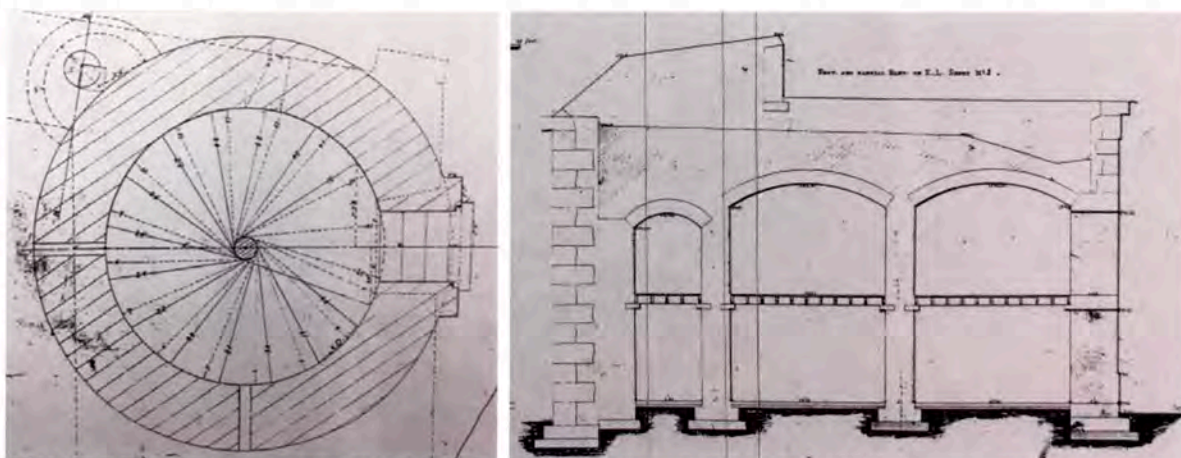


Figure 6: Original plan for circular staircase (left) and two-story East Casemates (right) that were not constructed.

Fort Tompkins was constructed as fortified barracks intended to support Battery Weed and Batteries Morton and Hudson that were constructed at the same time. The casemated masonry fortification was built into the “crest of the hill above Battery Weed overlooking the Narrows, not only for defense, but also to be used for quarter and storage for troops at the various batteries.” Before the construction of the fortifications on Staten Island, the coastal landscape, “somewhat wild and windswept, provided a welcome relief from the pace and disturbance of rapid industrialization and working-class crowds of Manhattan Island, Brooklyn, and nearby cities in New Jersey.”¹⁴

As work continued on the fort, the landscape was evolving as well. The bluff was graded to an “even, engineered slope, completing the plans drawn in c.1863 and extending the work that had been completed earlier to the section off the southwest bastion of Fort Wadsworth.”¹⁵ Grading of the site was completed around 1873, and the “once craggy bluff above the fort” became a “carefully groomed, steeply sloping lawn.”¹⁶ Trees and rocks were removed or relocated, and the site became more open and provided views to the northeast, east, and southeast, essential for use as a military site. It is likely at this time that the “earthwork at the top of the slope parallel to Fort Tompkins,

¹³ Cultural Landscape Report for the Battery Weed Headland, page 47.

¹⁴ Cultural Landscape Report for the Battery Weed Headland.

¹⁵ Cultural Landscape Report for the Battery Weed Headland, page 52.

¹⁶ Ibid.

proposed in the c.1863 plan, was constructed. The earthwork, referred to as a covered way, featured a road along its inner side, later known as Hudson Road, and two gun emplacements at its south end aimed southeast toward Lower New York Bay.”¹⁷

By 1873, 12 casemate platforms (six in the northwest angle of counterscarp gallery and six in the southwest angle), all with three-inch pintles, were “ready for howitzers to be mounted.”¹⁸ The following year, fireplaces in the land-front casements were constructed. Until then, stoves or coal grates were likely the sources of heat at the fort. By 1875, there was a reference to “passages leading to the counterscarp gallery being paved with concrete; as only two such passages were included in the plan of Fort Tompkins.”¹⁹

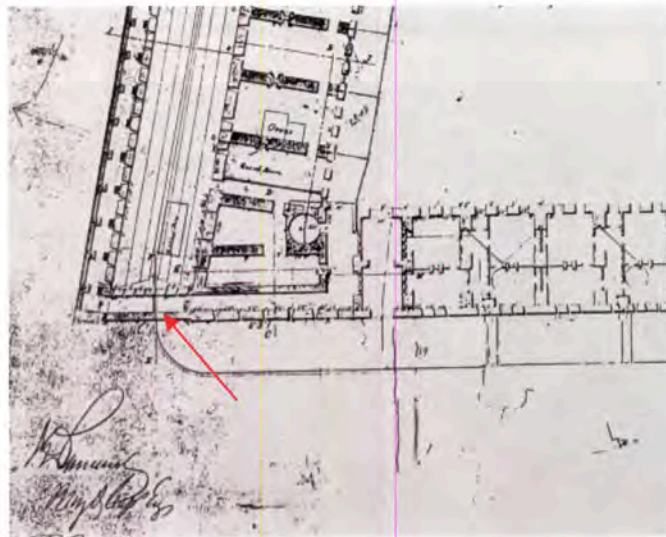


Figure 7: Passage to counterscarp in southeast corner of fort (similar passage in northeast corner).

Construction on the fort was completed in 1875. “With much less military activity, and the completion of major construction at Fort Tompkins by 1876, the landscape of the military reservation began to assume a park-like character with only an occasional test firing of artillery. Within the wider scenic context of the island landscape, the dramatic beauty of the reservation with its bluff overlooking the harbor drew the attention and praise of both military and non-military visitors.”²⁰

¹⁷ Cultural Landscape Report for the Battery Weed Headland, page 52.

¹⁸ Adaptive Reuse Analysis of Fort Tompkins, II-6.

¹⁹ Ibid.

²⁰ Cultural Landscape Report for the Battery Weed Headland, page 48.



Figure 8: Painting by artist and Army soldier, Seth Eastman of Battery Weed, looking east from Fort LaFayette in the Narrows, c.1872. Fort Tompkins is the structure above Battery Weed and at left is the Wadsworth lighthouse. Collection of the U. S. Army Center for Military History.

1875 was the last year that funds were appropriated by Congress for permanent coastal defenses in U.S. (for 15 years). Though just completed, the forts on Staten Island were considered militarily obsolete by the 1870s. Fort Tompkins was “destined to remain underutilized, although continuously occupied to some degree.”²¹ Work on the fort continued through the late 1870s, and between 1876 and 1885, small funds (not exceeding \$100,000) were available for preservation, protection and repair. In 1877, it was reported that Fort Tompkins was ready to receive armament, as it had been for eight years. Lack of funding “not only prevented the mounting of armament, but also left almost half the land front casemates unfinished, and thus unusable for troops as late as 1885.”²² By the late 1880s, the primary use of Fort Tompkins was living quarters, and there were 41 men living at the fort in 1884.

In 1885, a new era was established for fortifications in the United States that lasted until 1910. During President Grover Cleveland’s first term, a joint army, navy and civilian board was appointed under Secretary of War William C. Endicott. This board was known as the Board of Fortifications. The findings of the board illustrated a “grim picture of existing defenses in its 1886 report and recommended a massive \$127 million construction program of breechloading cannons, mortars, floating batteries, and submarine mines for some 29 locations on the US coastline.”²³

Despite the establishment of the Endicott Board, there was no funding for two years beginning in 1885. At this time, eight of the casemates at Fort Tompkins were used for torpedo mines equipment and storage and the rest remained unfinished. Between 1888 and 1889, funding resumed and \$100,000 was distributed each year. In 1890, Congress approved \$1.2 million for the Endicott Program. Fort Tompkins received a small portion of the million-dollar appropriation of 1890. Neither

²¹ Adaptive Reuse Analysis of Fort Tompkins, II-3

²² Adaptive Reuse Analysis of Fort Tompkins, II-5

²³ Description of Endicott Period on Fort Wiki.

of the old forts had “features of great value in the new era of coastal defense and Army was now referring to them (Fort Tompkins and Battery Weed) as ‘old stone fort’ or ‘old casemates.’”²⁴ Third System of “compactly designed granite casemates proved to be impossible to modify to accommodate the new larger guns and riddles that emerged following the Civil War.”²⁵

Part of the million-dollar funding in 1890 included the reconstruction of six structures to new specifications, and the construction of six new batteries on which guns of “unprecedented sophistication and size” were mounted.²⁶ Several other improvements were made at Fort Tompkins during this time including the demolition of the south counterscarp and its galleries to clear the space on the southeast side of Fort Tompkins for the construction of Battery Duane, the largest of the six new batteries. The counterscarp originally stretched around the north, west and south elevations of the fort, creating a ditch or dry-moat approximately 30 feet wide by 40 feet deep.

Other modifications during the Endicott period included the introduction of electricity and the improvement of the water supply at Fort Tompkins. Between 1892 and 1901, Fort Wadsworth was expanded by 129 acres. In 1895, the soldiers’ latrine was remodeled and replaced by fuel and weighing stations. It is likely that Buildings 138 and 139, in north ditch, were constructed during the Endicott period.

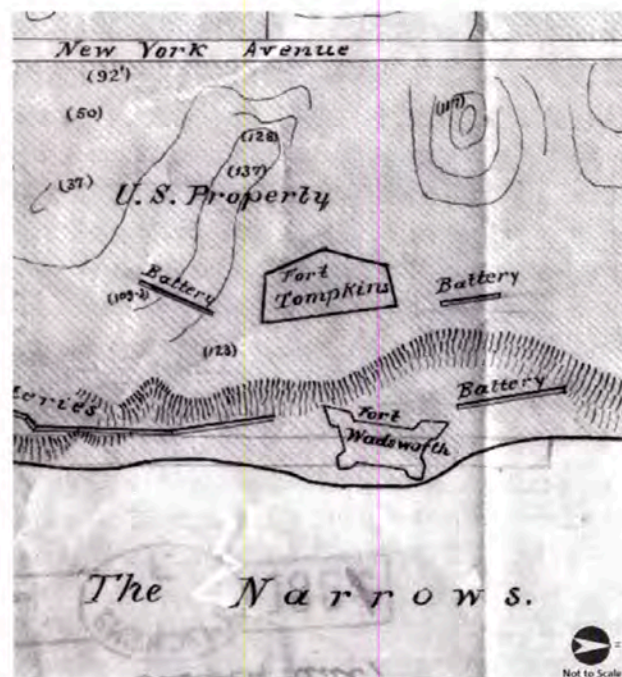


Figure 9: Plan of the U. S. military fortifications drawn in 1882 showing footprint of new Fort Tompkins begun in 1859 (National Archives II, College Park, Maryland).

²⁴ Adaptive Reuse Analysis of Fort Tompkins.

²⁵ Cultural Landscape Report for the Battery Weed Headland, page 47.

²⁶ Adaptive Reuse Analysis of Fort Tompkins.

1.2.3 Early to Mid-20th Century

The development of Fort Tompkins continued into the early 20th century. Between 1900 and 1920, small brick buildings were constructed for fueling and storage. These buildings were likely located on the roof of the fort. In 1902, an electrical generating apparatus in two casemates were installed, to serve the adjacent batteries. By 1908, there was record of stoves in the fort that burned year round, even in the hottest months, to keep interior of fort dry, and “if the fire goes out any damp night, the shoes next morning may be covered with a green mold. At every fall of rain the water, which is absorbed by the grass and earth on top of the walls, runs down some of the inner walls, and collects under and over the floors; and in one room, which has since been occupied, the water was so deep after a heavy rain that boxes floated about.”²⁷

The fort was used to quarter troops through World War I, and housed the post’s main guardhouse and shops for Quartermaster, Ordnance officers, and artillery engineer.” In 1918, a concrete retaining wall was constructed in front of the entrance of Fort Tompkins to permit driving large trucks through entrance. Also in 1918, antiaircraft guns were installed at the fort. By 1920, the soldiers’ latrine was removed from “south ditch” and the location became occupied by a gas station and a truck weighing platform. In 1920, there were only four guns at the fort. Also in 1920, ventilators were installed in the masonry roof and earth parapet of casemate and connected to ducts in rooms of upper and lower tiers. Ducts were provided with registers (louvers) and registers were installed within the outer doors. The galvanized iron ducts were reassembled and erected to provide proper means of ventilation on upper and lower level tiers.²⁸



Figure 10: Aerial view of Fort Wadsworth, ca. 1918.

²⁷ Soldiers Treated Badly Article.

²⁸ Letter from A.C. Swift, Junior Engineer to District Engineer (War Department) 1920.

Prior to 1926, there had never been permanent housing for enlisted men at Fort Wadsworth. Military personnel lived in the casemates of Fort Tompkins, which at the beginning of the 20th century was declared “unfit for long-continued human habitation.”²⁹ Housing was needed to handle wartime needs and in May 1926, Congress approved a housing program and appropriated \$285,000 for barracks at the post.³⁰

Fort Tompkins was extensively renovated in 1939. The Army rehabilitated the fort through the Works Progress Administration program. The interior, now used as administrative spaces, was gutted and refitted; the wood and concrete floors were replaced, new plaster and metal lath were applied to the walls and ceilings, and new doors, windows and transoms were installed. It is likely that the fireplaces were plastered and painted over during the renovations; rooms may have been fitted with stoves for heat since original construction.³¹ At this time, sections of the exterior iron stairs and balconies in the parade were replaced. Interior staircases were also added; before the 1930s, the only two staircases were the main masonry staircases located in the northwest and southwest corners of the fort. New electrical systems were installed and by 1939 an extensive heating systems was implemented (boiler rooms were built in the northwest and southwest angles in the parade).

During the renovations, brick “fronts” were added in some of the openings of the channel front casemates behind the line of arches with windows and doorways suited to the function of each other (for example, wide double-leaf entries for casemates intended for bulk storage or vehicle repair or maintenance). Partitions were also added within some of the channel front casemates, creating offices and storage space, and built-in shelving was added in other casemates. According to the historical record, “whenever space was needed for storage or offices, these casemates were enclosed as required with whatever infill material was available.”³²

By this time, facilities were relocated and new toilet and washroom facilities were constructed within the fort. It is likely that the officers’ facilities were located within the fort in the 19th century, as there was a sewer line under the center of the channel front. The outbuildings were used as paint shops and storage during the renovations.

By 1940, there were 10 defended localities along the Atlantic Coast. This is a dramatic difference between 35 in the early 19th century, and 20 in 1850. Use of Fort Tompkins was “flexible to meet several of the Army’s requirements into 20th century” and commissary use continued into the 1950s. In 1958, the loophole in one of the channel front casemates was opened to accommodate a conveyor for supplies (which heavy double-leaf door and stone and concrete platform remains today).³³ Also in 1958, the Nike Missile System was added to the defense system in the area. Although no missiles were kept at Fort Wadsworth, the post served as the command center for Nikes throughout the area.³⁴ Between 1959 and 1964, several buildings at the site were demolished.

²⁹ National Register Nomination, page 24.

³⁰ Ibid.

³¹ Adaptive Reuse Analysis of Fort Tompkins, III-10

³² Adaptive Reuse Analysis of Fort Tompkins, III-5.

³³ Adaptive Reuse Analysis of Fort Tompkins.

³⁴ National Register Nomination, page 25.

1.2.4 Late 20th Century

In the 1960s, part of the fort was converted to a museum and casemates in the eastern wall were used for displays. Fort Wadsworth Museum was open to the public in 1966. By 1972, Fort Wadsworth was one of areas managed by the National Park Service as part of new Gateway National Recreation Area. On September 25, 1973, the Landmark Preservation Commission held a public hearing on proposed designation of Fort Tompkins as a Landmark. It was approved as it is an excellent example of Third System of Seacoast fortifications. It is part of the oldest, continually manned military installation in the United States, part of one of the “most impressive military installations on the East Coast” and its granite construction is one of the finest in the country. Fort Wadsworth was also designated a Landmark in 1973 as the “oldest active permanently occupied military post in the United States with service under three flags.”³⁵

Between the years of 1974 and 1979, Fort Tompkins was used as a school to train chaplains for the Army. Since its construction in the mid-19th century, Fort Tompkins was “manned continually as coast artillery” location, and eventually became part of Fort Wadsworth and modified for administrative uses. On July 30, 1974, Fort Tompkins Quadrangle was listed in the National Register of Historic Places as a prime example of architectural “era of stone fortifications”.³⁶ Few alterations were made between the Endicott Period and the 1980s. In 1983, the United States Naval Department acquired Fort Tompkins.

1.2.6 National Park Service

In 1994, the Navy left Fort Wadsworth, and the property became part of the Gateway National Recreation Area, and by 1995, the National Park Service controlled the entire boundary. Currently, the United States Coast Guard also uses several of the buildings within Fort Tompkins for offices and housing. Not many changes have taken place since the National Park Service acquired the site, however in 2016, it was proposed that a non-contributing, non-original brick chimney on the south exterior side of Fort Tompkins be demolished.³⁷

³⁵ National Register Nomination.

³⁶ National Register Nomination.

³⁷ Jennifer T. Nersesian. “Proposed Demolition of non-contributing...” February 1, 2016.

1.3 PHYSICAL DESCRIPTION

1.3.1 Setting and General Appearance

Fort Tompkins Quadrangle is set in the northernmost part of Gateway National Recreation Area, on the eastern side of Staten Island. The fort is located in the northeast corner of Fort Wadsworth, a 244-acre site that sits on the highest point overlooking the Narrows of the New York Harbor. The 244-acre site is cut into the side of a hill and sits atop a 150-foot escarpment above Battery Weed, a four-tiered 19th-century fortification on the waterfront of the Upper New York Bay. In addition to Fort Tompkins and Battery Weed, other buildings at Fort Wadsworth include housing, barracks, offices, maintenance/storage facilities, post exchange, and ancillary support facilities. To the east of Fort Tompkins and passing directly over the center of Fort Wadsworth is the Verrazano-Narrows suspension bridge.

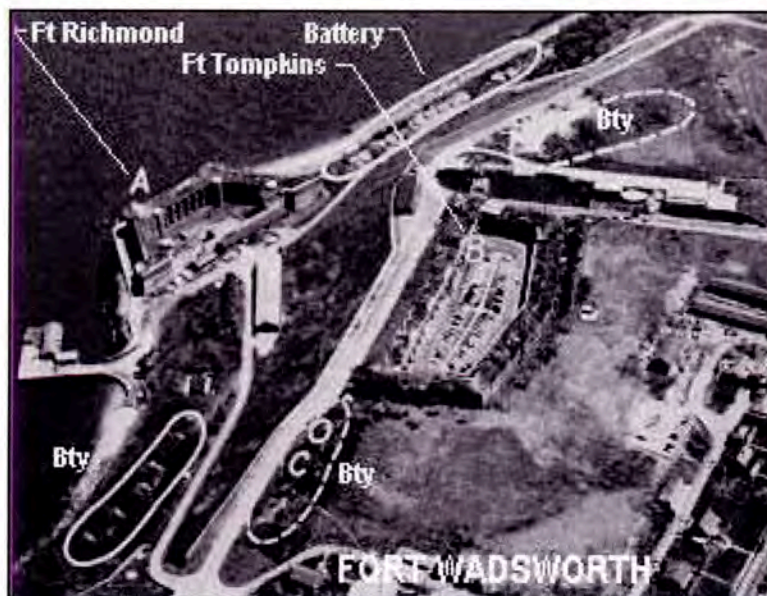


Figure 1: Aerial view of Fort Wadsworth (New York State Military Museum).

1.3.2 Exterior

Fort

Architectural

Fort Tompkins is a massive ashlar stone structure measuring approximately 500' by 250'. The irregular, polygonal brick and stone fort and adjacent counterscarp form a ditch, or dry-moat, around the north and west elevations. The east curtain, or main façade, measures approximately 500' long with two entryways, one on the north end and one on the south. At the north end, the top of the wall slopes back, creating a glacis over the counterscarp. A small flank wall sits between the east wall of the fort and the east wall of the counterscarp, enclosing the dry-moat in the northeast corner. The north, south and west walls are simple in their construction, and although there are likely buildings on the roof above these escarp walls, the roof was inaccessible.



Figure 2: East, main facade of Fort Tompkins (left) and view of counterscarp from southwest corner (right).

Masonry

The fort is constructed with granite masonry. The east façade has smooth-faced granite walls, with rough-hewn granite at the base of the north end. The north and west elevations consist of rough-hewn granite masonry. The south elevation has a combination of smooth-face and rough-hewn granite. The eastern most bay on the south elevation has smooth-face granite, as it was infilled when the Counterscarp was removed for the construction of Battery Duane. The coping on each elevation is constructed with smooth-faced granite coping that projects slightly outward.



Figure 3: Smooth-faced granite walls of east curtain (left) and east end of south elevation where the rough-hewn granite meets the smooth-face replacement granite where counterscarp was removed (right).



Figure 4: Rough-hewn granite walls on north escarpe wall (west wall similar).

Windows

The pattern of fenestration on the main, east façade consists primarily of embrasures, or narrow, vertical slits that are splayed on the interior with enlarged windows. The embrasures on the east façade are typically the height of three courses of granite. There is one other fenestration on the east façade, a square masonry opening with a metal frame and a set of large wooden panels set within the frame. The wood panels have metal strap hinges, and a modern padlock in the center and metal bolts throughout both panels. Three wood blocks are installed across the panels for additional security. The fenestrations on the north, west and south escarpe walls are vertical embrasures similar to those on the east façade.



Figure 5: Detail of embrasure with metal pole at south end of west elevation (left) and embrasures at north end of east elevation (right).



Figure 6: Square, masonry opening on east faced with metal frame and wood security panel.

Doors/Doorways

There are four doorways on the exterior of the fort. On the east elevation, there are two flat-arched entryways with shallow pediments, one at the north end and one at the south end. Each has a set of three-inch thick boards with metal stud bolts throughout each. The south door has a metal strap hinge with a modern lock installed. On the south elevation, there is a granite doorway, with a metal security door and frame with slide bolt and modern lock. This door is not original as there is evidence of a previous door (see conditions assessment of exterior fort doors). On the north elevation, there is a similar granite doorway at the east end of the escarpe wall. It appears as though there was never a door in this opening as there is no evidence of former hardware.



Figure 7: Doors at north end of east elevation (left) and south end of east elevation (right).



Figure 8: Masonry opening with metal gate at east end of south elevation and masonry opening at east end of north elevation (right).

Roof

The roof of the fort is a vegetative roof. When originally constructed in the mid-19th century, the roof likely had soil and minor vegetation. Due to the excessive vegetation, the roof was inaccessible, however information was gleaned from various locations at the fort. Many of the original roof components are still extant, including various buildings.

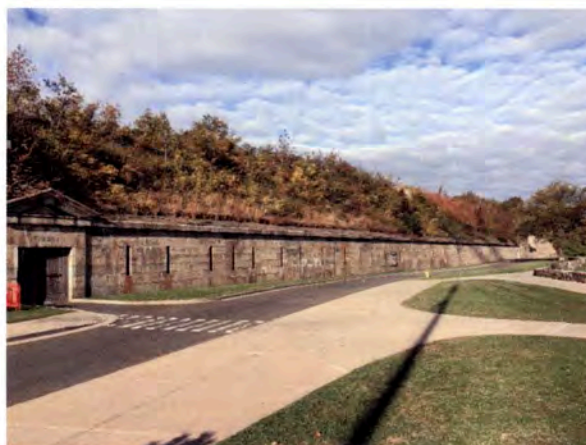


Figure 9: Overview of vegetative roof on the east, main façade.

The rampart of the fort is located above the casemates on the east curtain, overlooking the Narrows. A vegetative parapet wall protects the rampart and associated elements, which are all likely extant, including the barbettes, or platforms on which the guns were mounted (the barbettes are visible from the interior courtyard of the fort). The terreplein, the gently sloping wall between the barbettes and the parapet wall, formed the body of the rampart from packed earth, and is also extant.



Figure 10: Aerial view of Fort Tompkins, likely dating to the 1930s, showing elements of the rampart including the barbettes, terreplein, and parapet wall. Many roof structures are present, however are currently inaccessible.



Figure 11: View of barbettes on east wall from interior parade ground (left) and multiple buildings on the southwest corner of the roof (right).

Chimneys

There are six chimneys throughout the fort: one on the east elevation, two on the south, two on the west and one on the north elevation. The chimney on the east elevation is a stuccoed Concrete Masonry Unit (CMU) chimney. The other five chimneys are brick masonry construction.



Figure 12: Stuccoed CMU chimney at center of east elevation (left) and brick chimney at east end of south elevation (right).



Figure 13: Brick chimney stack at west end of south elevation.

Structural

Walls

The walls of the fort are constructed using stone granite masonry. The stone size varies from approximately 3' to 8' in length. The overall thickness of the exterior wall varies across the fort. The stone masonry rests a continuous mortar bed which is uniform across the entire structure (see Figure ____).

Various openings are formed on the exterior of the structure. Tall vertical windows are consistent across the north, south and west elevations of the structure. These openings are formed by a single stone lintel that spans across the top of the windows. Two smaller doors are located on the north, south and east elevations (one on each elevation). These doors are also constructed using a single stone lintel clear spanning the opening and bearing on the jambs (See Figure ____). Two larger doorways are on the east

face of the structure. These openings are approximately 9' wide and are formed using a granite stone flat arch (See Figure ____).

The foundation for the walls was not visible for most of the structure. At the northeast corner, along the edge of the counterscarp, the stone is smaller at the bottom of the wall (See Figure ____). This stone is not dressed like the rest of the wall and appears to follow the former grade line.



Figure 14: Caption to be included.



Figure 15: Caption to be included.

Roof

The roof of the structure is an earthen roof over concrete. The roof is heavily vegetated, and a detailed assessment of the roof was not performed. Various smaller structures are located on the roof. One structure was accessible in the southeast corner. This structure (shown in Figure ____), was constructed using brick masonry walls and the roof was constructed using steel framing with wood sheathing over the top.



Figure 16: Top of masonry wall and vegetative roof.



Figure 17: Structure on southeast corner of roof.

Counterscarp

Architectural

Masonry

The walls on the counterscarp are rough-hewn granite, similar to the south, west and north elevations of the fort. The walls are 16 courses high of various sizes. The coping on the counterscarp is smooth-faced granite, similar to the east, main façade of the fort.

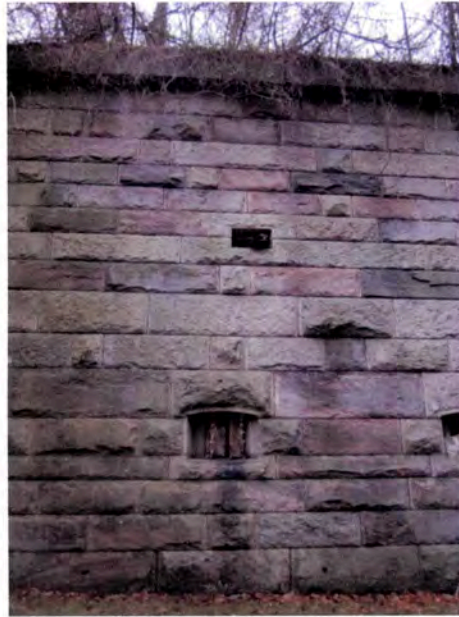


Figure 18: Exterior granite masonry walls of the counterscarp.

Windows

There are three types of windows. The first are embrasures, similar to those throughout the fort structure. The long, vertical masonry openings are located on each elevation of the counterscarp and are approximately two masonry courses tall. The second type of window is a small masonry opening with a slightly curved head and sill. The windows are approximately the size of one course of granite. Most of these openings have a granite jamb within the opening and a set of metal shutters with hinges. These openings are located on the north elevation, the north and south ends of the east elevation, and the south elevation. Above these windows is the third type of masonry opening: a simple rectangular opening in the granite, set between two courses of stone.

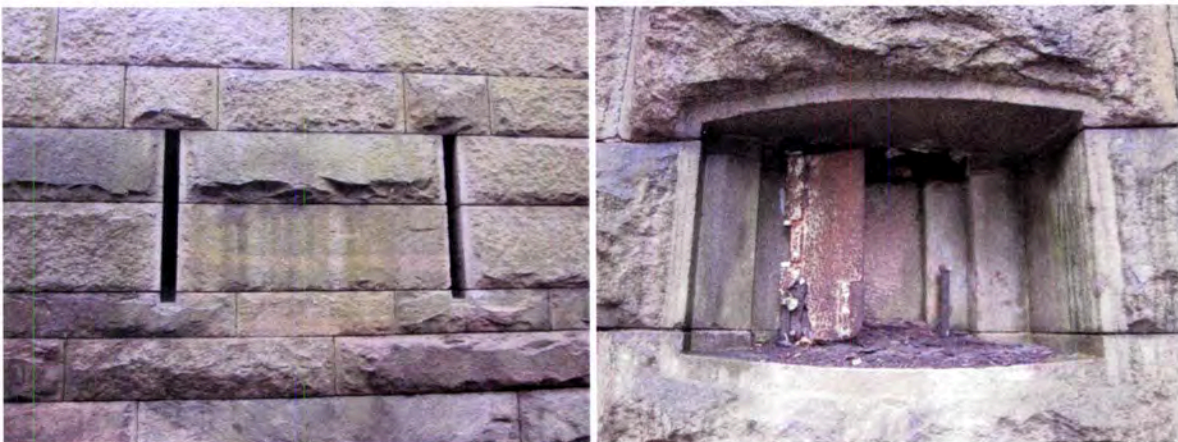


Figure 19: Embrasures (left) and slightly arched masonry openings with metal shutters (right) in counterscarp walls.



Figure 20: Rectangular masonry openings in upper level of granite counterscarp walls.

Roof

The roof of the counterscarp was surveyed from the ground. Though not accessible, it is apparent that the roof is a vegetative roof. The original roof likely had soil and minor vegetation throughout as the counterscarp was built into the earth on the west side. Currently, there are large trees throughout the roof, with vegetation spreading over the granite coping.

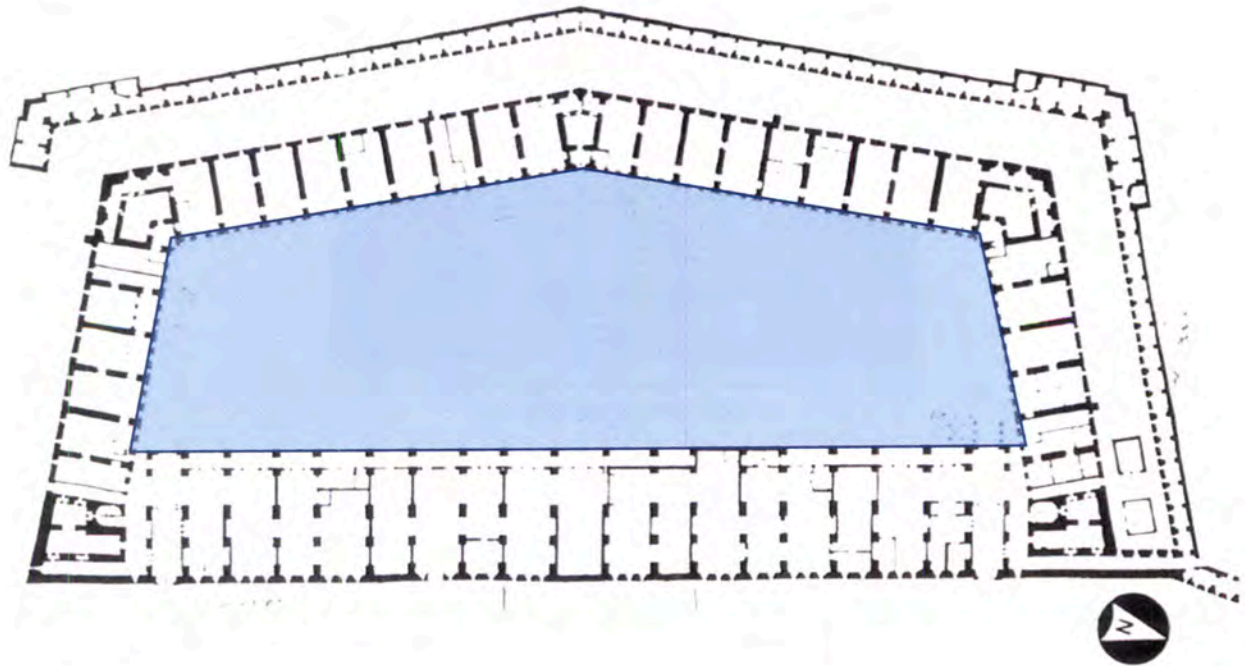


Figure 21: Large trees growing on counterscarp roof (left) and detail of coping and vegetation (right).

Structural

The construction of the counterscarp is similar to the construction of the fort. The north, south and east elevations of the counterscarp that face the dry moat are constructed using granite stone masonry similar to the fort. The roof of the structure appears to be similar to the fort as well, with a heavily vegetative earthen roof extending over the structure. The exterior of the counterscarp along the west elevation is also earthen, with heavy vegetation over the exterior.

Parade



Architectural

North, South and West Elevations

The north, south and west elevations of the interior courtyard parade are constructed of smooth-hewn granite, similar to the east, exterior façade of the fort. These elevations are the exterior courtyard walls of the barracks and offices on the first and second floors of the fort. Each elevation is capped with smooth-faced granite coping, projecting slightly outwards, similar to the coping on the exterior of the fort. In the northwest and southwest corners, the walls and coping are slightly sloped for approximately two courses of granite. There are several buildings located on the roof that are visible from the courtyard, however the roof is inaccessible.



Figure 22: Typical elevation of Interior Parade Ground.

East Elevation

To be included.

Note: For window and door conditions see Interior Conditions of East Casemates.

Windows/Trim and Doors/Doorways

The two-story elevations are pierced with steel doors and rectangular, nine-over-nine, single-hung steel windows. The casemates on the first floor typically contain a central door, flanked by two windows. Originally, the same was true for the second floor, however many of the doors have been infilled with windows with CMU below. The doors on the first and second floors of the parade elevations are typically steel doors with wood three-light transoms. Note: For more specific, detailed descriptions of windows and doors see interior physical description of first and second floors beginning on page xx.



Figure 23: Typical nine-over-nine steel single-hung window (left) and evidence of former door infilled with CMU and steel window.



Figure 24: Typical doorways of Interior Parade Ground.

Gallery and Stairs

Between the first and second-story fenestrations, there is an iron gallery that wraps around the interior of the parade on the north, south and west elevations. The gallery is comprised of diagonal ironwork, with several remaining original rosettes. The structure is supported by iron knee braces between each fenestration on the first floor. There are four sets of iron stairs, (one each on the north and south elevations, and two on the west elevation) with iron stringers, railings, and metal caps on the wood treads.



Figure 25: Steel gallery in Parade Ground (left) and stair in southwest corner (right).

Lift Structure

In the northeast corner of the Parade Ground, there is a lift structure, not original to the fort. The lift structure consists of metal columns and wood and metal framing. There are wood joists and boards below the wood framing the landing. The metal pulley system is still intact, and the structure had a corrugated metal roof. On the north side of the lift, there is a platform structure connecting the lift to the gallery on the north wall. The structure is supported by six brick columns, two steel joists, and one wood joist in the center. There is an approximately three-foot brick and concrete wall under the three brick columns on the south side of the platform. Wood rafters rest on top of the joists to create a platform that previously connected the lift to the gallery on the north wall. There is a metal railing on the platform, attached to the wood rafters and the lift structure.



Figure 26: Overviews of Lift Structure in northeast corner of Parade Ground.

Structural

The main walls on the interior of the fort are similar to the exterior elevations, with granite stone masonry. The first floor has windows and doorways that access each individual casemate (See Figure ____). The second floor is similar, with doors and windows leading out onto a second floor metal platform. At multiple locations, some of the doors have been infilled with concrete masonry units (See Figure ____).

Gallery and Stairs

The metal gallery that extends around the second floor of the north, south, and west elevations is accessed by four staircases. Figure ____ shows a typical staircase. Each staircase is comprised of stringers constructed using riveted 2 1/2" x 5/8" thick steel plates (three stringers per staircase). Wooden steps span across the stringers and steel rod is used to form the railing. The metal platform is constructed using riveted steel approximately 3" x 5/8" thick. The top and bottom of the knee braces terminate into the stone walls, however, the exact depth and details of the connection to the stone are unknown. The

main platform framing spans from knee brace to knee brace supporting what appears to be smaller aluminum wide flange cross framing which supports aluminum grating as the walking surface.



Figure 27: Typical gallery framing (left) and staircase (right) in Parade Ground.

The east elevation consists of arching stone openings spanning between stone pillars which separate each casemate (See Figure ____). Brick arches follow the exterior stone arch. Above the arches is a stone wall consistent with the other elevations of the exterior of the fort. At the top of the east parade ground wall is a steel galley similar to the platform that extends around the north, south, and west elevations. The upper gallery was accessed by two sets of stairs (See Figure ____). The stairs are supported approximately half way up by knee braces that are supported off the stone pillar between casemates. Stair stringer construction consists of riveted 2 1/2" x 5/8" steel plates.

Hoist

A hoist structure (See Figure ____) is located on the northern end of the east elevation. The frame of the structure is created using steel tubing with a corrugated steel roof. The hoist platform itself is constructed with wood framing. The lift is operated using a single hand chain hoist located in the middle of the structure. The top landing for the lift is connected back to the upper level platform using three steel beams supported by brick pillars (See Figure ____). Wooden framing spans across the steel beams to form the walking surface. The top of the walking surface for this platform was not accessible.



Figure 28: Brick arches of East Casemates (left) and the underside of the brick arches of the East Casemates (right).



Figure 29: Stairs located on east elevation (left) and walkway at lift structure (right).

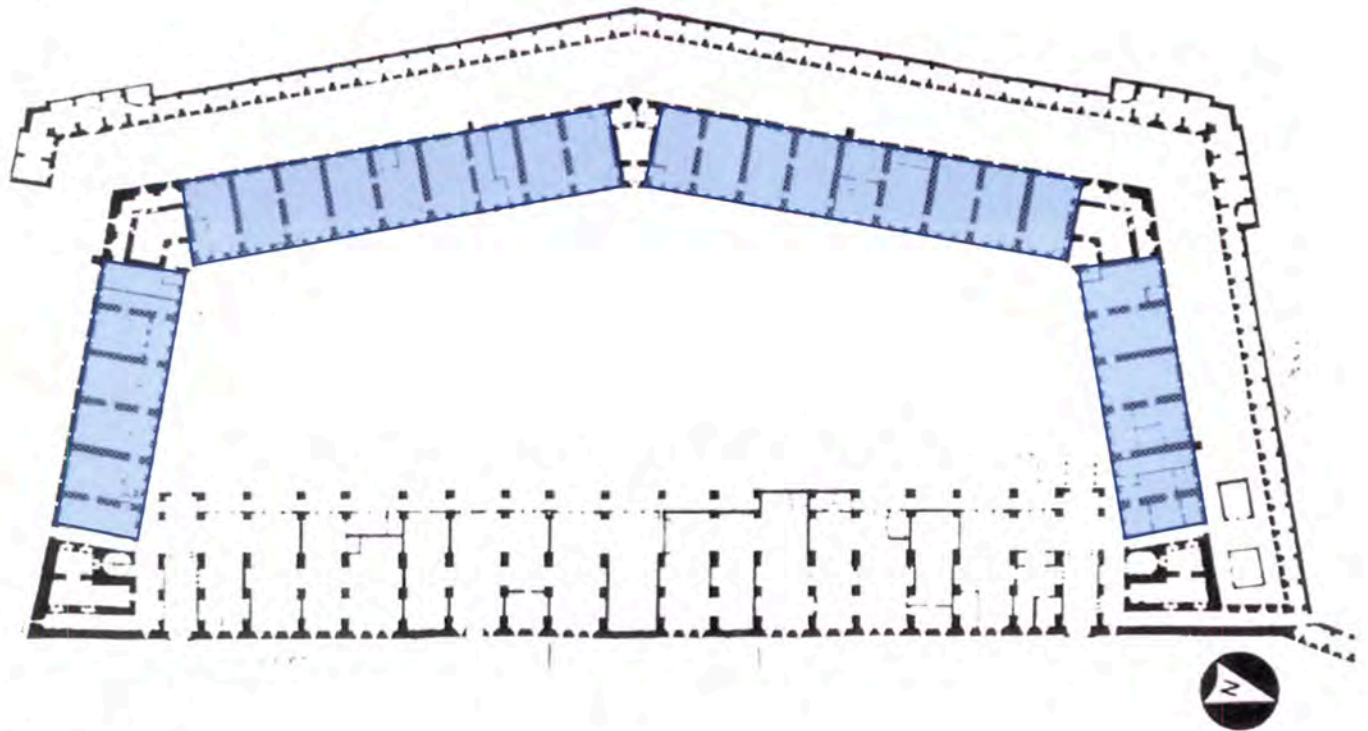


Figure 30: Lift structure in northeast corner of Parade Ground.

1.3.3 Interior

Fort

First Floor



Architectural

Floors

There are several different floor types on the first floor. The majority of the rooms in these sections of the first floor contain either wood or concrete floors. There are concrete floors in Rooms 101, 103-110, 119-133, 135-137, and 139-146. Rooms 113-115 and 134 have wood floors. Rooms 102 and 106 have particle board applied on top of the wood floors. Rooms 116, 117 and 118 have a combination of wood and concrete floors (the concrete floor in Room 117 is in the added room). Finally, Room 136A has a brick floor.



Figure 31: Typical wood floors (left) and concrete floors (right) of first floor.

Walls

Most of the rooms in these sections of the first floor retain their original brick walls. There are brick walls in Rooms 101-103, 106-108, 115-116, 118-122, 127-130, 134-136, 140-141 and 143. Rooms 104, 105, 109 and 110 have a combination of brick and plaster walls, and plasterboard partition walls have been added in Rooms 113, 114, 131, 133, 139, 142, 142A-C, 144-145, 146 and 146A through 146C. It is likely that the plasterboard partitions were added in the 1930s. In Room 117, a separate room was constructed in the southeast corner with Concrete Masonry Unit walls.



Figure 32: Original brick walls (left) and plasterboard partitions that were likely added during the 1930s (right).

Ceilings

The ceilings in the main sections of the first floor consist of shallow brick vaults with exposed steel beams. This ceiling type is present in Rooms 101-110, 113-122, 127-136, and 139-149. There are remnants of paint on the arched ceilings.



Figure 33: Typical arched, brick ceilings with exposed steel joists.

Windows/Trim

Most of the rooms on the first floor contain eight-light steel casement windows with steel frames and stone lintels. Every room in these sections has this type of window except Rooms 103, 107 and 131. Some of the casement windows have been modified but retain the original frame. The rooms also have nine-over-nine single-hung steel windows.



Figure 34: Typical eight-light steel casement windows (left) and nine-over-nine single-hung steel window (right).

Doors/Doorways

There are many different types of doors on the first story including metal, wood and infilled doorways. Some of the doors are original and others were likely added during 1930s renovations. The exterior doors are mostly metal (see physical description of Parade Ground). There are metal doors with metal frames in Rooms 101-105, 110, 117, 119, 122, 127, 133, 136 and 143. In Room 133, the metal door is modified at the top for pipes, and there are two modern doors set into the partition. Some doors were removed, leaving only cased metal openings in place. Rooms 114, 116, 120, 121, 122, 127, 128, 129, 134, 135, 139, 141, 142 and 142 A-C retain the cased metal openings. The cased metal openings in Rooms 133 and 135 are infilled with plywood. In Rooms 113 and 115, the doors are three-paneled, and in Room 130 the door is five-paneled with a glass light in one of the panels. There is a metal lattice security door in Room 108, and a similar door in 106 that has been infilled with plywood.



Figure 35: Typical cased metal opening on first floor (left) and thin metal paneled door (right).

There are also many wood doors on the first floor. In some of the rooms, the doors have been removed and only cased wood openings remain (Rooms 119, 120 and 139). The doors in Rooms 142, 144/145, 146/146A and 146B are flush wood doors; the door in Room 146B is scored to resemble a "Dutch" door. There is a paneled door in Room 118, a two-paneled wood door in Room 114, and five-paneled wood doors in Rooms 113, 136 and 144/145. The doors in Rooms 107, 109, 134 and 144/145 are two-paneled doors, each with four lights, and the door in Room 132 is a three-paneled, four-light wood door. In Rooms 103 and 106, the doors are blocked with steel and plaster panel. The door in Room 132 is infilled with brick and the door in 139 is infilled with CMU.



Mechanical, Electrical and Plumbing

There are junction boxes and electrical boxes throughout the first floor. Most of the light fixtures on the first floor are fluorescent pendants and ceiling-mounted fixtures. There are fluorescent fixtures in Rooms 102, 104, 105, 106, 108, 113, 114, 116, 118, 122, 128, 129, 133, 134, 135, 136, 139, 140, 141, 142, 142A, 142B, 142C, 143, 144/145, 146, 146A and 146B. Other light fixtures consist of a junction box with mounted or suspended light bulb (Rooms 101, 107 and 127). There are wall sconces in Rooms 103, 104 and 105. Finally, in Rooms 104, 105 and 106, there are ceiling-mounted electric heaters, and air ducts in Room 105.



Figure 36: Typical suspended fluorescent lights.

There are many plumbing fixtures on the first floor. The more recent restrooms at the south end of the first floor, Rooms 104 and 105, contain new water closets, lavatories and sinks. There is a new drinking fountain and a hot water heater in Room 103, the vestibule outside of Restrooms 104 and 105. There are other, more dated facilities located throughout the first floor as well. There are water closets in Rooms 109, 122 and 144/145, lavatories in Rooms 109 and 142, and urinals in Room 109. There is

evidence of plumbing fixtures that were removed in Room 139. There are ceiling- and wall-mounted pipes and plumbing stacks throughout the first floor, and most rooms have at least one radiator (many rooms have multiple). Most of the radiators are wall-mounted, though some are ceiling-mounted. There are boilers in Rooms 110, 119 and 143.



Figure 37: Typical radiator and pipes on first floor.



Figure 38: Plumbing fixtures in Room 122 (note wood door herringbone pattern) (left) and lavatories and metal partitions in larger restroom on first floor (right).



Figure 39: Boilers in Rooms 119 and 143.

Fireplaces

Most of the rooms on the first floor have fireplaces. The brick segmental-arched fireplaces are approximately 20 inches deep and four feet high. The rooms that do not have fireplaces are 103, 104, 107, 110, 120 and 143. Room 132 was not accessible, but there is likely a fireplace in the room as there is one drawn on the original floor plans. The fireplaces in Rooms 102 and 118 have been modified; steel diamond plate has been added around the fireplace in Room 102 and three wooden shelves were installed in the fireplace in Room 118.



Figure 40: Typical fireplace on first floor (left) and fireplace with wooden shelves in Room 102 (right).

Structural

Several different types of rooms are located on the first floor, mostly with similar framing. Typical construction for rooms 101 to 110, 113 to 122, 127 to 136, and 139 to 147 includes a concrete foundation slab/subfloor. Wooden flooring has been applied over the concrete subfloor in some rooms, while others have a finished slab for the flooring (see architectural section for detailed floor coverings).

Typical wall construction consists of multi-wythe brick construction. Foundations for the walls were not visible at any of the locations. The upper level framing (ceiling of lower level) consists of steel I shapes clear spanning the room from brick wall to brick wall. Based on field dimensions of the beam at an exposed section in Room 226, the beams are approximately 9" deep with a 3.75" flange width, and a ¼" flange thickness (See Figure ____). Between the steel beams, brick arches span to create the structure for the upper floor. A steel support post was noted at approximately mid-span of the steel beams in Room 102. Other additional non-load bearing partition walls are located throughout the floor plan, but do not appear to be structural.



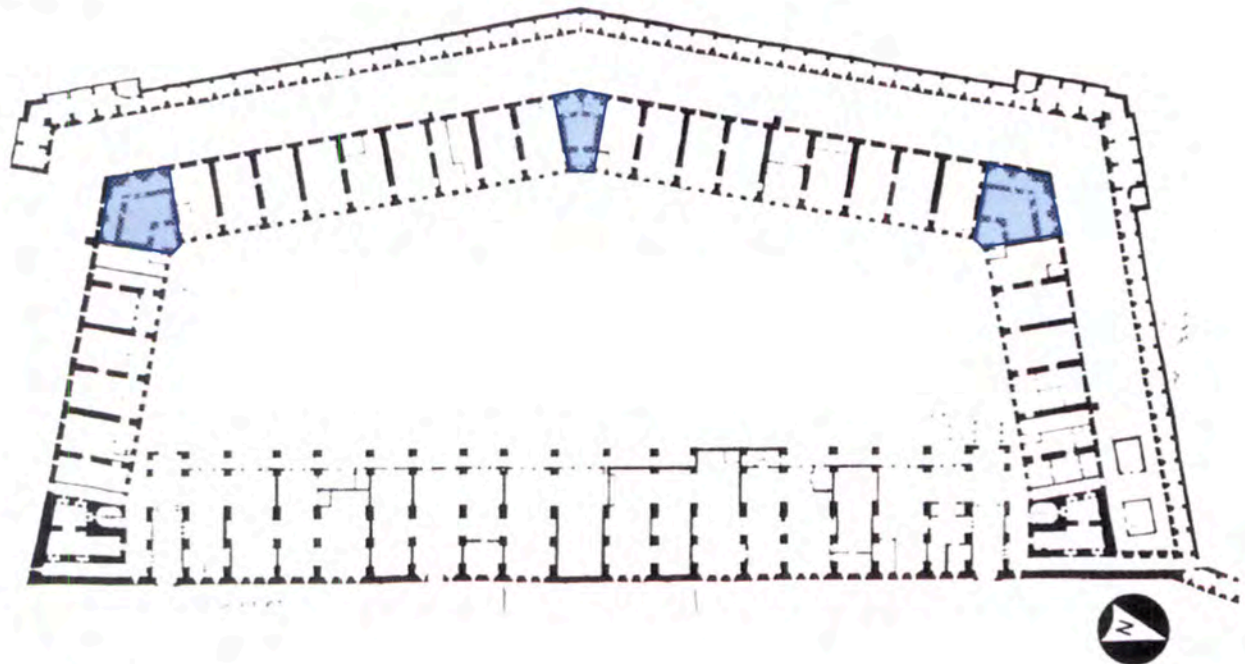
Figure 41: Overview of typical first floor room (left) and detail of typical beam (right).

Interior stair cases, all of wooden construction, are also located on the first floor, extending up to the second floor. These stairs are located in rooms 102, 126, and 131. See Figure ____ below for a typical stair.



Figure 42: Wooden staircase in Room 126.

Corners



Architectural

Floors

The floors in the first floor corners, Rooms 111, 112, 113A, 123, 124, 125, 126, 137 and 138, are concrete.



Figure 43: Typical concrete floor in corner of first floor.

Walls

The walls in the corners are primarily granite, similar to the exterior stone. In Rooms 111, 124, 125 and 137, the granite has some areas of sandstone infill. In Rooms 112, 113A, 136A and 138, the granite walls have sandstone and brick infill, with a wood partition wall in one of the arches in Room 138. Finally, the granite walls in Rooms 123 and 126 are infilled with CMU.



Figure 44: Granite walls (left) and sandstone walls (right) in corner sections of the first floor.



Figure 45: CMU infill in first floor corners.

Ceilings – To be included.

Windows

The primary window type in the corners of the first floor is granite embrasures. These are present in Rooms 111, 124, 125, 126 and 137. There are eight-light steel casement windows in Rooms 113A, 123, and 136A, similar to the windows in the main areas of the first floor. In Room 136A, the metal frame has a modified, four-light sash with metal panels above and below. Two windows in Room 136A are missing and one of the windows in Room 126 is boarded up.



Figure 46: Typical eight-light steel casement window (left) and four-light sash in modified metal frame (right).

Doors

The doorways in the corner sections of the first floor are typically granite doorways (Rooms 111, 112, 124, 136A, 137 and 138). In Room 125, a thick, flush metal door is in place. In Room 123, there is a wood paneled, six-light door, and the doorway in Room 126 consists of a metal frame with no door.



Figure 47: Typical granite doorway in corner section of first floor.

Mechanical, Electrical and Plumbing

The lighting and electrical in the corners consist of conduit and junction boxes in Rooms 113A, 124, 125, and 136, and simple fixtures with bulbs in Rooms 123 and 126. There is a sink in Room 113A, a large stack in Room 112, a ceiling-mounted radiator in Room 113A, and several pipes in Rooms 113A and 136.



Structural

Floors for the corner sections of the fort are all concrete. Although it is believed that the floors are slab on grade, the slab in Room 112 appear to move when load was applied, potentially indicating that the slab was not on grade. Walls for these rooms were constructed using granite masonry with some sandstone mixed in (See Figure __). Stone size for these walls varies (See Figure __) and is not consistent

across the walls. Ceiling construction consists of high arching brick masonry, clear spanning from wall to wall with no interior supports (See typical ceiling in room 112).

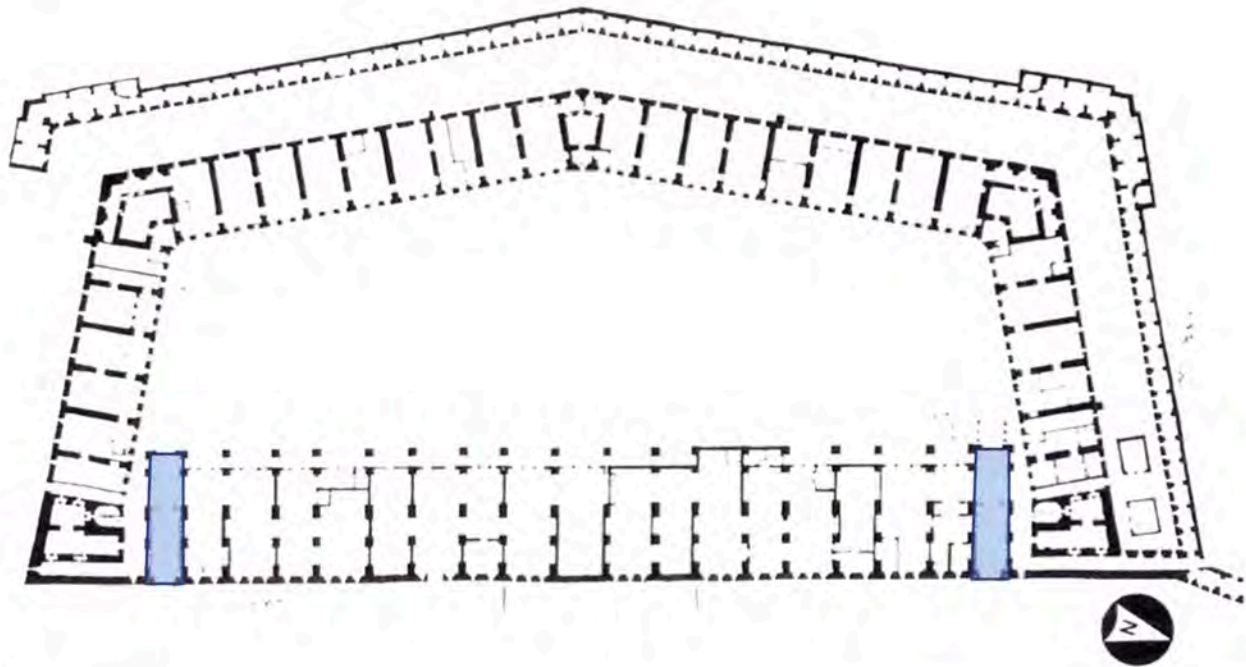


Figure 48: Granite walls in Room 112.



Figure 49: Brick arched ceiling in Room 112.

Sally Ports



Architectural

Near the north and south ends of the east casemates, there are two pedimented sally ports. The floors in the sally ports, originally used as drives for vehicles to enter the fort, are poured concrete. There are concrete "sidewalks" on either side of the drive with concrete curbs. The ceilings are also concrete. The walls in the sally ports are granite with three arches on each side, with three embrasures set into the stone under the middle arch. Each sally port has an exterior doorway with a large pair of three-inch thick wood doors with metal bolts throughout each door. The doorways are also set into an arched opening in the granite walls.



Figure 50: North sally port (left) and south sally port (right).



Figure 51: Ceiling in south sally port (left) and typical embrasures found in both sally ports (right).

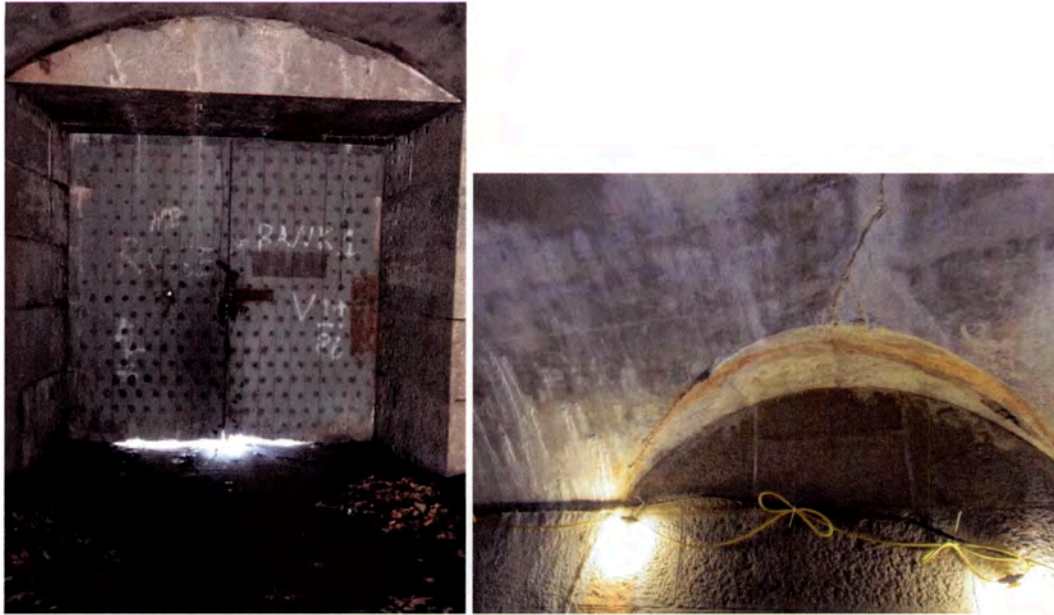


Figure 52: Doors in north sally port (left) and temporary lights in south sally port (right).

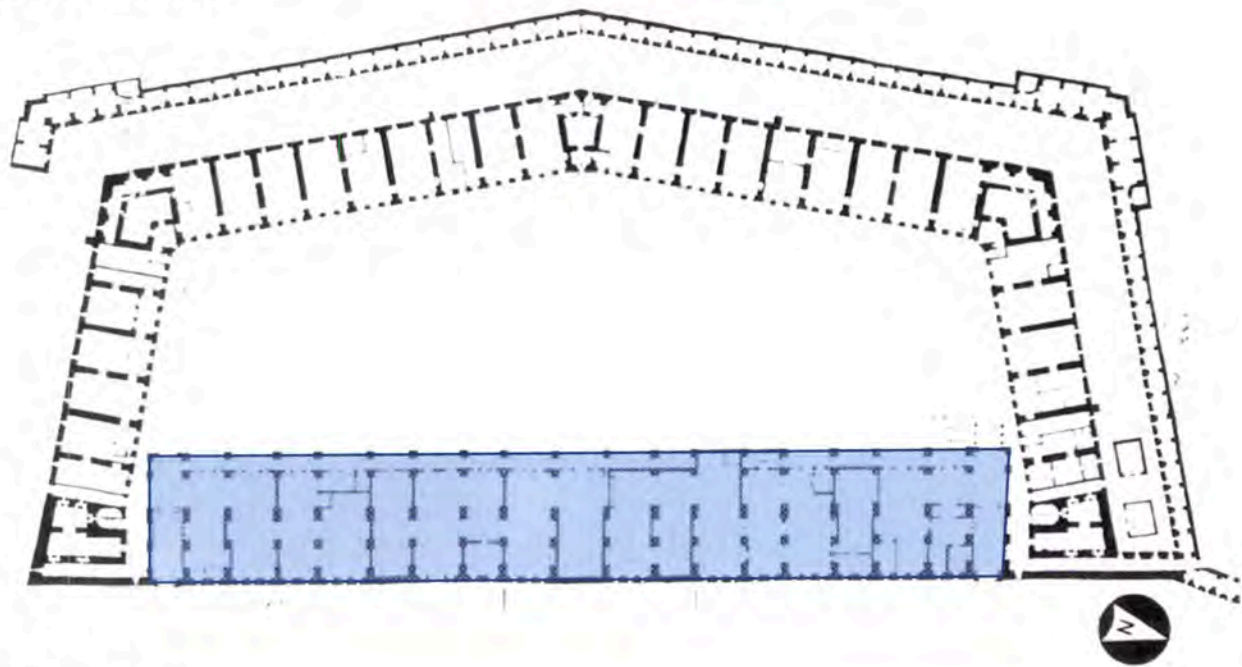
Structural

The sally ports (Rooms 151 and 152) are constructed with granite stone walls (See Figure ____). The floors of the sally ports are concrete slab on grade (assumed) and the ceilings appear to be concrete arches clear spanning the sally ports. At the end of the sally port is a double-door opening leading to the exterior of the fort. The lintel for the opening is a flat arch similar to that noted on the exterior of the fort (See Figure ____).



Figure 53: Caption to be included.

East Casemates



Architectural

The general construction of the interior of the east casemates is essentially defined by their structure. The physical description of this structure, which is uniform for all of the casemates, can be found in the structural section below.

Walls

The west end walls of the casemates are typically constructed of brick and clay tile with a stucco finish at the interior face. There are exceptions where the wall is constructed of concrete block infill at the stone masonry (Casemates E through H). At Casemates E and F, this infill is west of the other casemate end walls and lines up with the face of the parade ground masonry wall. The west wall of Casemate L is constructed of exterior board siding over brick and concrete infill while the wall of Casemate P is constructed of exterior tongue-and-groove wood siding over wood framing. In a number of locations, the masonry arches between the casemates have been infilled with various partitions. The materials used for this infill include concrete block, brick, stucco, drywall and/or wood paneling on wood framing and modern plywood on wood framing. In most locations, the infill walls do not prevent passage between casemates as individual arches are left open or doors have been installed. In a few locations, the infill walls completely separate one casemate from the adjacent casemate.

There are a number of secondary partitions in many of the casemates that enclose areas within the casemates for various purposes including restrooms, mechanical rooms, and what were likely offices. The construction of these partitions varies widely. Partition types include wood paneled walls with large glazed portions, stucco/plaster/drywall on wood framing, stucco/plaster on tile framing, concrete block and brick. Unique locations include timber lattice and metal paneling. What appears to have been a glazed airlock constructed of aluminum was installed in Casemate F. Walls range from partial height to full-height reaching the underside of the brick vault.

Ceilings

There are only a few locations where the interior rooms created by the secondary partitions were built with a lower ceiling. In all of these locations, the ceiling consists of either plaster or drywall on wood or metal framing. These locations include the restrooms in Casemates E and N, the mechanical rooms in Casemates D and N and the office in Casemate P.

Windows

The casemate windows vary from those found in the east walls and those present in some locations at the west wall and in some of the secondary partitions within the casemates.

In the west walls, modern six-over-six-light, wood double-hung windows are found. In alternating casemates, which alternate in the overall north-south dimension, two similar windows are mulled together. These are the most common windows at the casemates, occurring in Casemates A through D and I, J and L. Similar older windows that are likely what was present before the modern replacements were installed are present at Casemates K. A similar relationship is found at the mechanical rooms where Casemate N's mechanical room has an older six-light, in-swinging wood casement. Modern versions of this window are found at the west wall of Casemate N, as well as the mechanical room in Casemate D. The west wall of Casemate Q has two windows that are boarded up. These windows are older metal awning windows with a four-light operable awning sash over a two-light, fixed bottom sash.

In the east walls, a large variety of windows are found in some of the embrasures. They are all of older construction and many of them are wood sliders. Despite similar operation, many of the slider windows vary from each other in construction and configuration. Some sliders have two horizontally arranged lights, some have two vertically arranged lights and others have one lite, three lites or six lites. Sash stiles and rails all vary in size and character as do the muntins, where present. Some of the sliders are within the embrasure stonework, while others are installed at the inside face of the wall. Some of the embrasures do not have windows, but are fitted with wood-framed screens or plywood panels. Some of the plywood panels are solid while others have been fitted with small doors to provide the ability to look out the embrasure opening.

The windows present at the interior secondary partitions are limited to the office in Casemate P. In the north wall of the office, two two-light, fixed wood windows have been installed. They appear to have been double-hung sash salvaged from elsewhere and reinstalled in this location.

Doors

Similar to the windows in the west walls of the casemates, the doors appear to have been replaced in the recent past with the intent of matching an earlier door. Wood stile and rail single and double doors with three raised wood panels below, and a four-light glazed panel above have been installed in Casemates A through D, I, J and N. Similar doors, but in a two-light over three-panel configuration, are located in the mechanical rooms of Casemates D and N. An older door that appears to be the basis for the replacements is located in Casemate Q. Casemate M has a flush metal-clad fire door, while Casemates O through Q have large overhead rolling steel doors with steel tracks.

A variety of doors are present at the secondary partitions within the casemates. Double-thick plank doors with metal studs tying them together are present in the wood grill partitions. Glazed wood-panel doors, some with a glazed transom are present in Casemate D. Both older hollow-metal doors (with a wired-glass panel) and modern flush, hollow-metal doors are present within the north and south walls of some casemates. Some wood doors are constructed of tongue-and-groove wood strips, while some doors are missing, leaving only wood cased openings in those locations. More recent flush, hollow-wood doors are present in a handful of locations. The office in Casemate P has a salvaged six-panel door (the top two panels have been replaced with glass) that, like the windows in this room, appear to have been salvaged from elsewhere.

Mechanical, Electrical and Plumbing

Throughout the casemates, the extant building systems are largely remnants. Four round flues are located at the underside of some of the west brick arches between casemates. They seem to appear in alternating walls, but this is difficult to confirm because of some of the infill construction. These are likely original and served heating stoves. The mechanical systems include a few radiators, which are missing, but the brackets that held them at the walls, and the piping that served them are present in most of the casemates. There are two boilers, one in each of the mechanical rooms in Casemates E and N.

The plumbing is largely limited to the restrooms in Casemates E and N. The larger restrooms in Casemate E include two toilets and a wall-mounted sink in the women's room, while the men's room has a toilet, two urinals and a wall-mounted sink. Two smaller toilet rooms are located in Casemate N and E. The restroom in Casemate E is missing its toilet and urinal, but the sink is still extant. Casemate N's restroom still retains the toilet and sink, but not the urinal. In addition to the restrooms, a series of large cast iron drainpipes are located at the west end of the central interior arches in the walls between casemates. These appear to have directed rainwater from the roof into the cisterns below the casemates. Many of these drain pipes have been enclosed with brick partitions, but openings have been made in many of the partitions revealing the pipes.

The electrical systems include the panels, fuse boxes, shutdown switches, conduit, receptacles, switches and lighting. Nearly all of the electrical system components are surface mounted. In some of the secondary drywall partitions, switches and receptacles were installed within the walls. The conduit is mostly galvanized steel while the lighting consists of several different fixture types. The predominant fixtures in the casemates are ceiling-hung fluorescent linear pendants. Many have the egg-crate diffusers attached to (or dangling from) the bottom of the fixtures. The other ubiquitous light fixture is the round surface-mounted single-bulb fixture. These are often ceramic or metal and installed near the point where the vaulted ceiling meets the north and south walls of the casemates.

Structural

The interior of the east casemates is slab on grade construction (assumed). It was noted however, that casemates F and N have an opening in the floor that lead to a lower level/drainage tunnel. The lower level was full of water and the foundation was unknown. Inspection of this level was not conducted. Also, there are stairs in casemate Q, leading to what appears to be a service area for vehicles.

Typical wall construction on the exterior casement elevation (east) consists of granite stone masonry, consistent with the exterior of the fort. Interior walls separating the casemates consist of granite stone masonry, with multi-wythe brick-arched masonry openings (See Figure ____). Openings, likely for a chimney flue, were noted in the front arch between casemates G and H (See Figure ____). These appear to have been built with the original construction of the arches. Similar openings were also noted in the arches between Casemates A and B. Some of the interior walls are infilled with concrete masonry unit between these arched openings, however they do not appear to be structural.

The ceilings of the casemates are constructed with a single barrel vaulted ceiling clear spanning between each interior wall. At the east face, the barrel vault terminates by arching down towards the east wall.

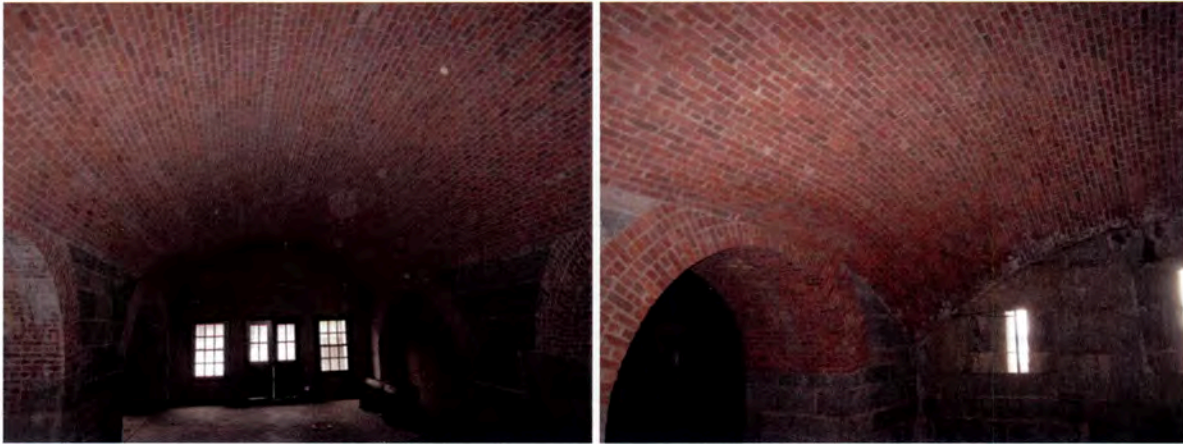


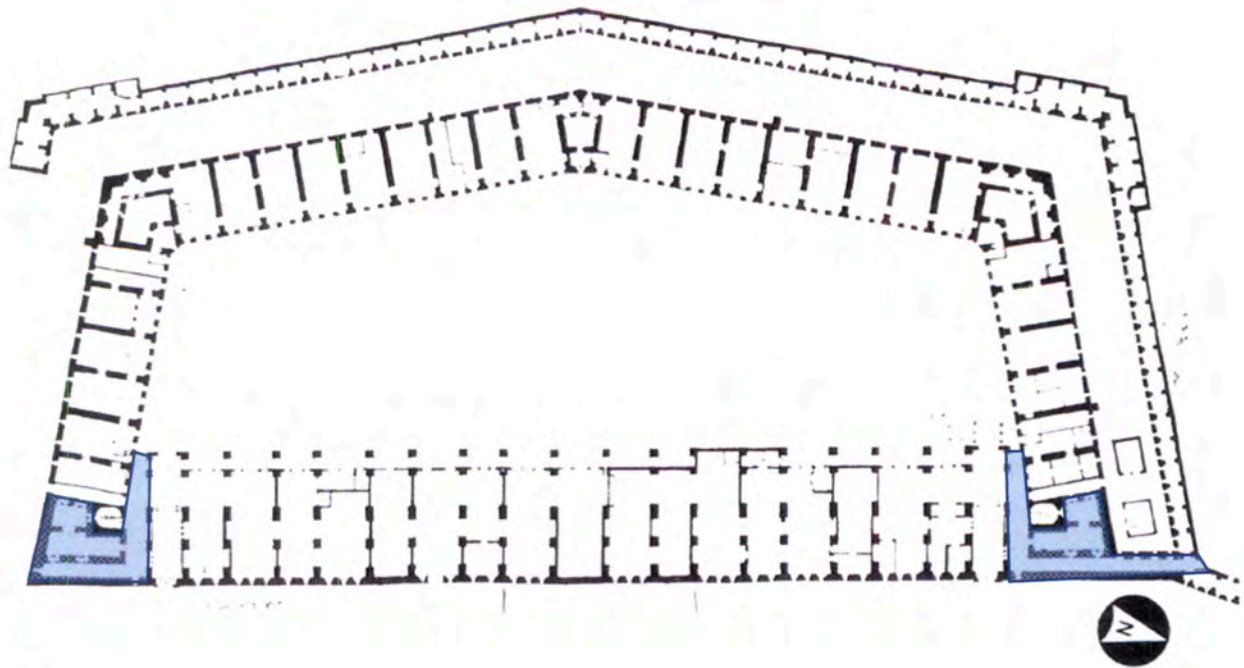
Figure 54: Typical walls, ceilings and masonry openings in East Casemates.



Figure 55: Hole in arched opening.

North and South Corners

Architectural



Floors

The floors in Rooms 147, 153 and 157 are concrete. The floors in Rooms 148 and 149 consist of wood boards. Room 150 has a combination of concrete and dirt. The floors in Rooms 154, 155 and 156 consist of dirt/fill.



Figure 56: Wood board floors in Room 149 (left) and concrete floor in Room 150 (right).

Walls

Most of the walls in the rooms surrounding the staircase are constructed with granite. Room 150 has granite walls, Room 153 has granite walls with sections of plywood on wood framing, and in Rooms 154 through 156 the granite walls are painted. The walls in Rooms 147 and 157 are a combination of granite and brick. Rooms 148 and 149 also contain granite walls, however there are sections of sandstone infill, and these rooms are separated by wood framing.



Figure 57: Granite and sandstone walls in Room 149.

Ceilings

The ceilings in the end sections, Rooms 154, 157, 158 and 159 through 162, are brick, arched ceilings. The ceiling in Room 158 has sections of stone infill. In Rooms 150 and 153, the ceilings consist of painted concrete.

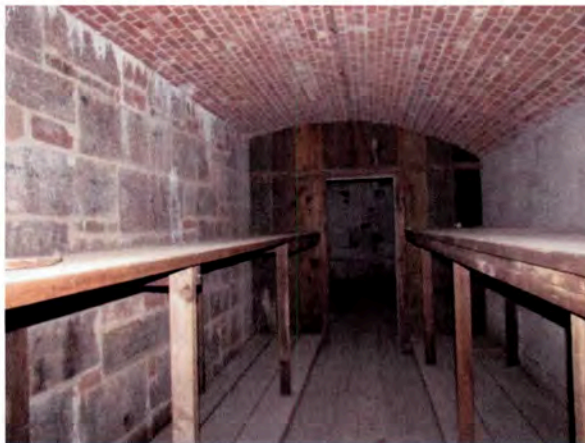


Figure 58: Brick barrel vault ceilings in Room 149.

Windows/Trim

The windows in these sections consist of simple embrasures in the masonry. Rooms 147, 148, 150 and 157 each have embrasures.

Doors/Doorways

There are several different door types in the north and south corners of the first floor. In Room 147, there is a metal security gate and a metal door with transom. Rooms 148 and 149 have wood doors in wood frames, and Room 150 has both an open timber lattice frame and door, and a set of metal gets to the stairs. Room 153 has a three-paneled wood door with plywood over the lights, and Rooms 155 and 156 have wood timber doors with metal rivets. Room 157 has a steel entry gate and a steel cased opening with a transom with metal bars.



Figure 59: Metal security gate (locked) to Room 147 (left) and open timber lattice frame and door in Room 150 (right).

Mechanical, Electrical and Plumbing

There is wall-mounted conduit in Room 147, and ceiling-mounted conduit and light bulbs in Rooms 148, 149, 150, 153 and 157. There is a vertical stack in the southwest corners of Room 150.

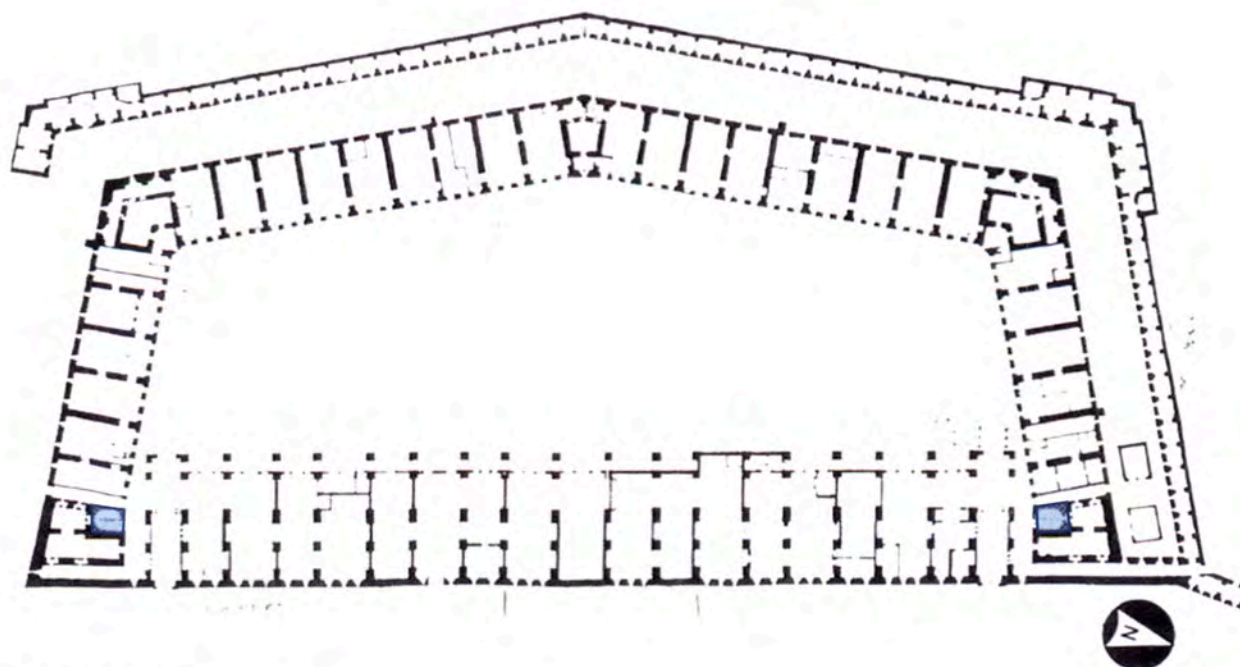
Structural

For rooms 154 to 156, and rooms 148, 149, and 150, the walls are constructed using granite stone masonry similar to the exterior walls of the fort. The ceilings in these rooms are constructed using brick arches clear spanning across the rooms.



Figure 60: Granite walls and brick arched ceilings.

Stairs



Architectural

There are two stone stairways in the fort, one in the southeast corner and one in the northeast corner. The stairs connect the barbette level of channel front with second tier of land fronts and the parade level. The floors in both stairs are honed granite. The landings in the stairs, between the first and second floors, are concrete. The walls in the staircase are smooth-faced granite. There are remnants of paint or whitewash throughout the stone in the staircase.



Figure 61: Honed granite stairs and smooth-face granite walls in south stair (left) and north stair (right).

The ceilings in the stairs are the same honed granite as the walls. There are a few windows in the stairwells. All of the windows are simple embrasures, aligning with the width of the stones.



Figure 62: Detail of granite finishes in north stair (left) and typical embrasure in granite wall (right).

There are several doorways at the north and south staircases. There is one wooden door at the top of the north stair. The door is comprised diagonal beaded boards with metal studs, and metal strips encasing the door. There is a section of plywood infill at the bottom of the door and there is a large gap between the stone threshold and the door. The door is missing at the other doorway at the top of the north stair. The door at the top of the south stair is also missing.



Figure 63: Stairs leading to doorway at roof (left) and detail of door at roof (right) in north stair.

There are electrical wires and conduit in the stairs, as well as electrical boxes. There are also several vertical pipes running through the opening in the ceiling of the staircase.



Structural

The north and south staircase have stone masonry floors, landings and risers (See Figure ____). A stone wall serves as the center support for the staircase, with exterior stone walls supporting the exterior. Risers and landings are constructed using stone clear spanning between the exterior walls and the interior support walls. The ceilings in the staircases are constructed using a concrete barrel roof.

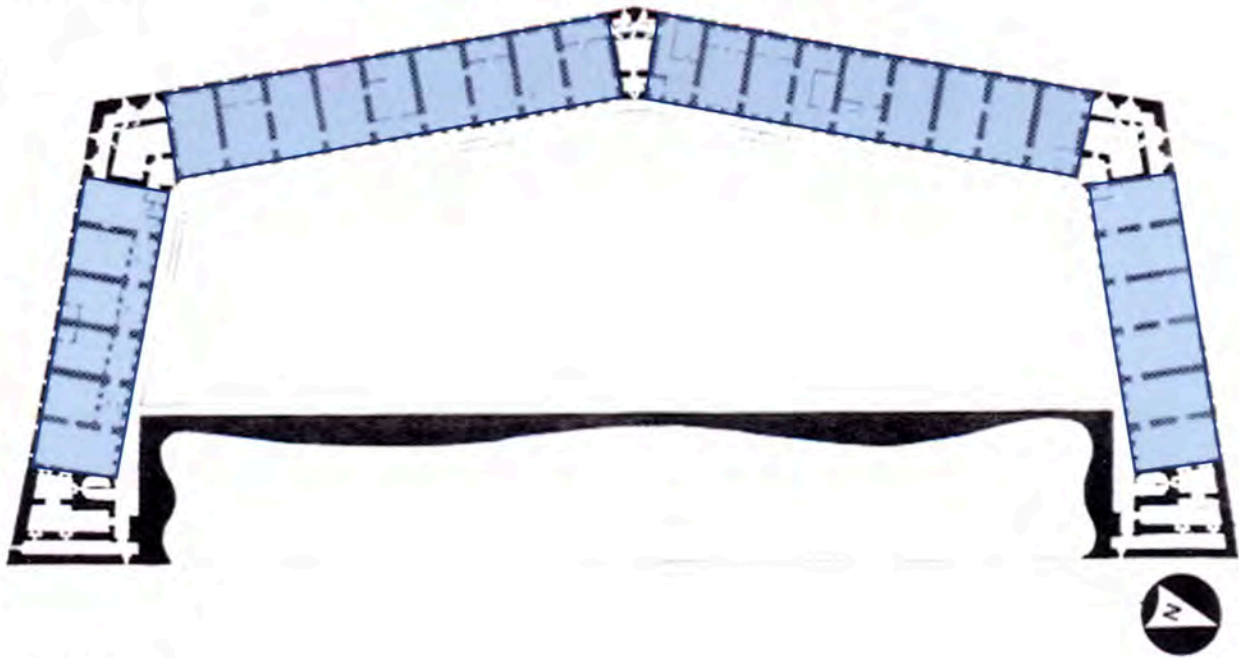


Figure 64: Details of stairs.



Figure 65: Stair leading to roof.

Second Floor



Architectural

Floors

Most of the floors on the second story are wood floors similar to the wood floors on the first floor. There is wood flooring in Rooms 201, 202A, 203, 204, 204A, 207-211, 213, 218, 220-225, 227 and 229. There are remnants of the paint on the wood floors throughout. Plywood has been installed over the wood flooring in Rooms 203A, 212, 214, 215, 230, 235, and in Room 232 the floor joists are exposed with areas of infill. The wood floors were removed in Rooms 205, 205A and 206 exposed the concrete and nailers. Other floor finishes include concrete floors in Rooms 202, 231, 233, 234, and 236- 240. Finally, there are brick floors in Rooms 218A, 222A, 228 and composite sheet flooring in Rooms 219 and 226.



Figure 66: Wood flooring (left) and composite sheet flooring (right).

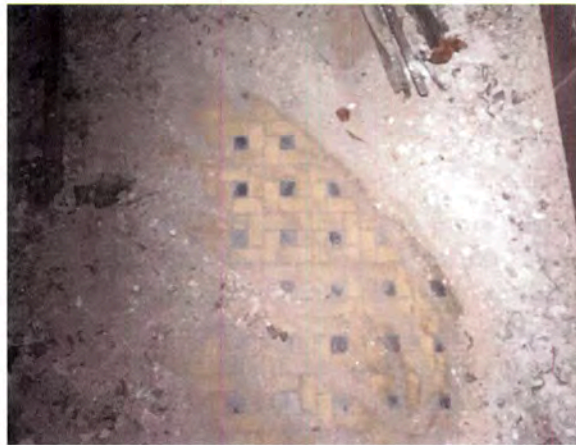


Figure 67: Ceramic tile in a restroom on the second floor.

Walls

Most of the walls on the second floor are brick. Rooms 204, 204A, 205, 206, 207, 209, 210, 212, 214, 218A, 223, 224, 225, 227 through 232 retain their original brick walls. There is evidence of paint or whitewash on most of the brick walls on the second story. Rooms 202, 202A, 203 and 205A have a combination of brick and plaster walls. Plywood and plasterboard partitions were added in Rooms 203A, 208, 211, 213, 215, 218 through 222, 222A and 226, likely during the 1930s renovations. Plywood and batten walls were installed over the brick walls in Room 201.



Figure 68: Typical brick walls (left) and added partitions (right) on the second floor.



Figure 69: Typical plasterboard partition wall, with pivot casement window, creating a large bathroom on the second floor.

Ceilings

Most of the ceilings on the second floor are wood tongue and groove bead board on exposed rafters over the original brick arched ceilings. The bead board ceilings are extant in Rooms 201-207, 209-210, 212, 215, 218, 218A, 219, and 227-231. A plywood and batten ceiling was installed in Room 201, matching the walls in that room. In Room 232, the original brick arch ceiling is exposed, and in Rooms 206A and 206D plaster was added to the original brick arched ceilings. Acoustical ceiling tile has been

added to the exposed wood rafters in Rooms 208, 211, 214, 220-226. The ceiling in Room 213 is fiberglass tile.



Figure 70: Wood bead board ceiling on exposed wood rafters (left) and acoustical ceiling tile on exposed wood rafters (right).



Figure 71: Plywood and batten ceiling in Room 201.

Windows/Trim

Most of the rooms on the second floor contain eight-light steel casement windows similar to those on the first story. There are eight-light steel casement windows in Rooms 201, 202A, 203A, 204A, 205A, 206-218, 218A, 219-221, 222A, 223 and 232. The exterior windows, as noted in the exterior Parade section, are nine-over-nine single-hung, steel windows. Rooms 218A and 222A have vertical six-light pivot windows in the added partitions, allowing light in from the east side of the fort.



Figure 72: Typical eight-light steel casement window (left) and six-light pivot casement window (right).

Doors/Doorways

The doors on the second floor are similar to the first floor, and consist of metal, wood and infill. It appears that there are more wood doors present on the second floor than on the first. Some are original and some were added or modified. There are metal doors in Rooms 202, 203, 204, 206, 206D, 222, and 227. There is a metal sliding door in Room 211, and an iron gate in Room 212. There are cased metal openings located in most rooms, and in Room 222 a wood frame is installed on top of the metal frame.



Figure 73: Sliding metal door in Room 211 (left) and iron gate in Room 212 (right).

There are wood doors in Rooms 205, 223, 226 and 227; the wood door in Room 223 has a metal frame. Room 216A has a wood-paneled door, Room 213 has a single-paneled wood door, 218B has a two-paneled wood door, 207 has a three-paneled door, 222A has a five-paneled wood door and Rooms 215 and 218 have six-paneled wood doors. Rooms 206D and 220 have wood paneled doors each with a single light, Rooms 201 and 215 have paneled doors with six lights each, and the paneled doors in Rooms 208, 219 and 224 have four lights each. There are wood cased frames in Rooms 216, 218, 219 and 221. Rooms 218 and 221 have a metal frame installed on top of the wood frame.

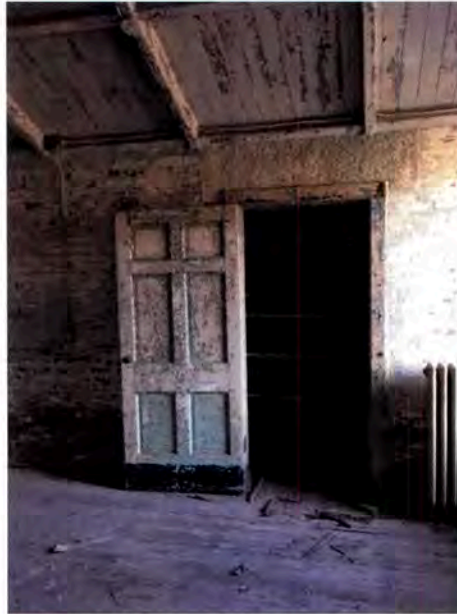


Figure 74: Typical painted, wood paneled door on the second floor.

Mechanical, Electrical and Plumbing

Most of the lights on the second floor are fluorescent pendant lights. Rooms 201, 202, 205-215, 219, 220, 222/222A, 223- 227 and Room 231 all have fluorescent fixtures. There are wall sconces in Room 226A, and the lighting fixtures in Rooms 218A, 229, and 230 have been removed. Rooms 203, 204, 226A, 228 and 232 have junction boxes, some still with light bulbs intact (Rooms 226A, 228 and 232). There are electrical boxes throughout (Rooms 201, 202, 206, 207 and 225), and Rooms 221 and 226 have ceiling-mounted heaters in place.



Figure 75: Typical ceiling mounted light (left) and typical suspended fluorescent fixture (right) on the second floor.

Almost every room on the second story has at least one radiator, however most rooms have two to three radiators. There are also several lavatories on the second story. There are water closets in Rooms 203A, 204A, 206A, 216A, and 231. Room 218A contains two water closets and Room 22A contains three. There are lavatories in Rooms 203A, 204A, 206A, 215, 216A, 219, 226A, 231 and two lavatories each in Rooms 218A and 222A. There are showers in Rooms 203A and 204A, a urinal in Room 206A, and two urinals in Room 222A. There are no mechanical systems on the second floor.



Figure 76: Typical plumbing fixtures and metal partitions in lavatories on second floor.



Figure 77: Typical radiator on second floor.

Fireplaces

Most of the rooms on the second floor, except for Rooms 201, 206A, 206D, 218, 218A and 222, have fireplaces. The segmental fireplaces are similar to the first floor. The fireplaces in Rooms 202A, 203A, 204A, 205, 219 and 231 have been infilled with brick, and the fireplace in Room 220 has been infilled with particle board.



Structural

Framing for the floors on the upper level is described in the first floor ceiling. Above the brick arches is a concrete floor of unknown thickness with wooden strips embedded into the concrete for a subfloor (See Figure ____). A wooden floor is present above the subfloor in most of the rooms (see architectural description for finishes present). The walls of the upper floor consist of multi-wythe brick masonry forming the interior walls that separate each individual casemate. Each casemate is connected with an

opening in the masonry formed by a stone lintel above the doorways (See Figure ____). There are fireplaces in the interior walls which are formed by a brick arch.



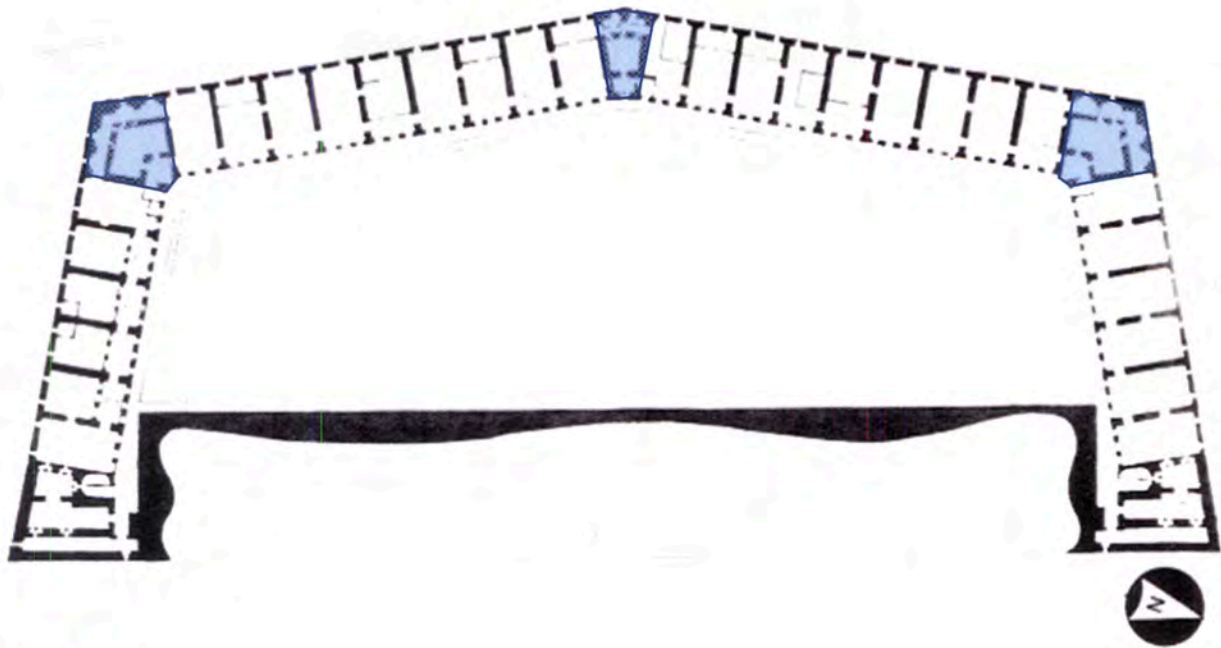
Figure 78: Caption to be included.

The ceiling of the upper casemates is framed with wood construction and gable-style framing. The main framing consists of 5 ½" x 2 ½" wide joists spanning from eave to ridge at 4' on center. Purlins running perpendicular to the main joists are spaced at approximately 4' on center, with a 3 1/2" wide board forming the ceiling. Exact dimensions for all the framing was not obtained. The gabled ceiling appears to be self-supporting, but does not appear to be part of the main structure that supports the earthen roof above. The wood framing is present in all of the second level casemates except for room 232. The main roof structure consists of a brick barrel vault clear spanning between the interior walls of the casemates which is shown below in a photo of room 232.



Figure 79: Bead board ceiling with exposed wood rafters (left) and barrel vaulted ceiling (right).

Corners



Architectural

Floors

There are several different types of floors in the corners second floor. Room 206A has a concrete floor. Rooms 206D and 227A have brick floors, and Room 216 has composite sheet flooring. There are several toilet rooms located in these corners, Rooms 216A, 226A, 226B, and 226C; there are ceramic mosaic tile floors in there toilet rooms.



Figure 80: Typical concrete floor in corner section of second floor.

Walls

Similar to the corners on the first floor, most of the walls in the corner sections on the second floor are granite. The walls in Rooms 206D, 226B and 226C are granite; the walls in Room 206A are granite with brick infill; the walls in Room 227A are granite with sandstone infill; and in 216 the granite walls are infilled with sandstone and plywood. The walls in the toilet rooms, 216A and 226A, are plaster and have a ceramic tile base in 216A and a brick base in 226A.



Figure 81: Typical granite walls in the corners of the second floor.

Ceilings

The ceilings in the corners are typically arched brick ceilings similar to the corners on the first floor. There are arched, brick ceilings in Rooms 216, 226B, 226C and 227A. Rooms 216A and 226A both have plaster ceilings.



Figure 82: Typical brick arched ceiling and granite walls in corner.

Windows

Some of the windows in the corners are eight-light steel casements, similar to the rest of the floor. These casements are present in Rooms 206A and 206D. Other window types in these sections include a set of three-light steel French casements in Room 226A, and four-light steel casement windows in Room 227A. There are also stone embrasures in Rooms 216 and 226B. The embrasure in Room 216 is infilled with brick on the other side of the opening.



Figure 83: Four-light steel French casement window in Room 227A.

Doors/Doorways

Rooms 226B and 226C have granite door openings similar to the granite walls. Room 226A has a wood paneled door, and the doorway in Room 227A is infilled with metal framing, wood boards and insulation.



Figure 84: Wood paneled door in Room 226A (left) and granite doorway (right).

Mechanical, Electrical and Plumbing

There are some electrical elements in the second floor corners. Rooms 206A and 206D have conduit running throughout. There are junction boxes in Rooms 206D, 216A, 216, 226C and 227A; the light bulbs are missing in Room 216. There are electrical boxes in Rooms 218 and 226B.



Figure 85: Electrical equipment in corner section of second floor.

Structural

The corners of the upper level are similar to those on the lower level. Not all corner rooms were assessed due to the limited access and the structural condition of the exterior platform. Walls in the corners are granite masonry with some sandstone infill (See Figure ____). The floor for these areas is concrete. The ceilings in Rooms 206A, 218A and 226A consist of brick masonry barrel vaulted ceilings spanning between interior walls, with stone lintels over the walkways (See Figure ____). The ceiling in Rooms 226B and 226 are high, brick arches spanning between the stone walls.



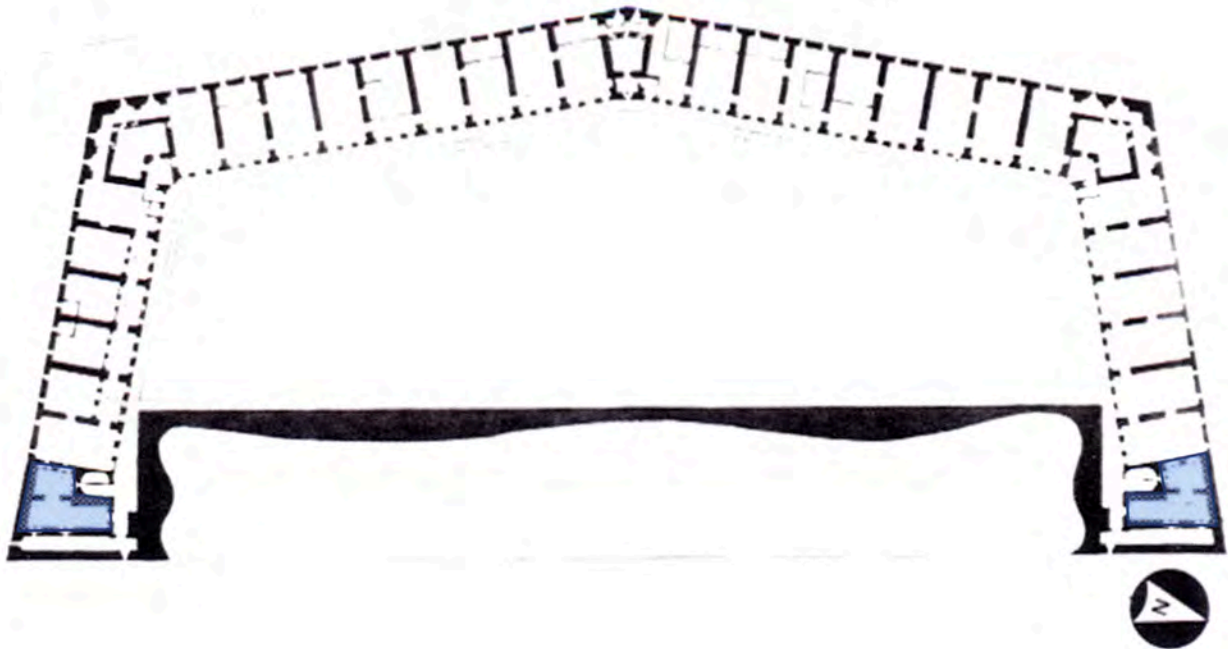
Figure 86: Typical ceiling and walls in Rooms 206A, 218A and 226A.



Figure 87: Brick arched ceiling and granite walls in Room 226B.

Note: 217 and 217A are not accessible.

North and South Corners



Floors

The floors in the north and south corners are concrete. Rooms 233, 234, and 236-240 are have concrete floors, and Room 235 has wood floors with plywood installed on top.



Figure 88: Concrete Floor in Room 236.

Walls

The walls in Rooms 233, 234, 235, 236, 237, 238, 239 and 240 are granite. The granite in Room 236 is whitewashed. The granite in Rooms 237, 239 and 240 is painted, and bead board has been installed over the granite walls in Room 237.



Figure 89: Granite walls in Room 236.

Ceilings

The ceilings in Rooms 233, 234, 235, 238, 239 and 240 are brick arched ceilings. The brick arches in Rooms 235, 239 and 240 are plastered or painted. The ceiling in Room 236 is plaster, and the ceiling in Room 237 is painted concrete.

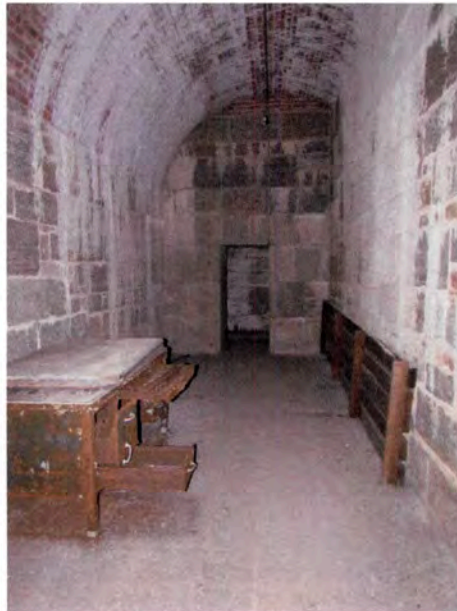


Figure 90: Brick arched ceiling in north corner of second floor.

Windows

The windows in the north and south corners (Rooms 233, 234 and 237) are stone embrasures. There is an eight-light window sash that is nailed in place in Room 235.

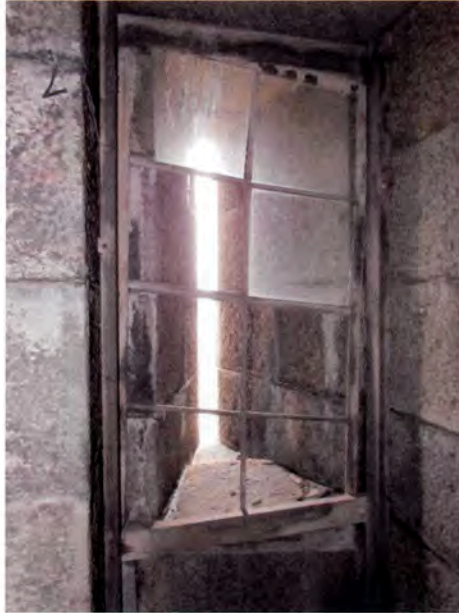


Figure 91: Remnants of an eight-light sash that is nailed in place in Room 235.

Doors

Most of the doorways in the north and south corners are granite openings. Room 236 has several different types of doors; one door is wooden, one is wooden with metal laminate, one is a thick wooden door, and one is a thin metal door. The doorway in Room 238 consists of wood cased opening, and there are wood exterior doors in Rooms 237, 239 and 240. There are no doors in Rooms 233 and 234.



Figure 92: Wood door with metal strap hinges and lock in the south corner of the second floor.

Mechanical, Electrical and Plumbing

There are limited mechanical, electrical and plumbing systems in these areas. Rooms 233 through 236, and Room 238 have junction boxes; light bulbs remain in place in Rooms 236 and 238. Rooms 235 and 236 have radiators, there are pipes in Room 236, and there is conduit in Room 237.

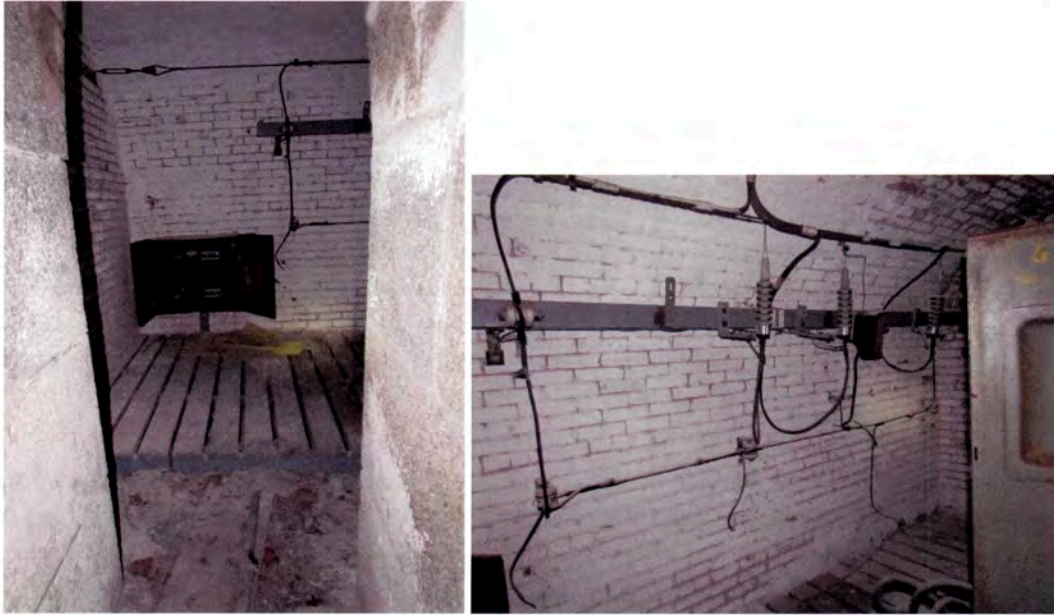


Figure 93: Pipes in north corner of second floor.

Third Floor (Electrical Room)

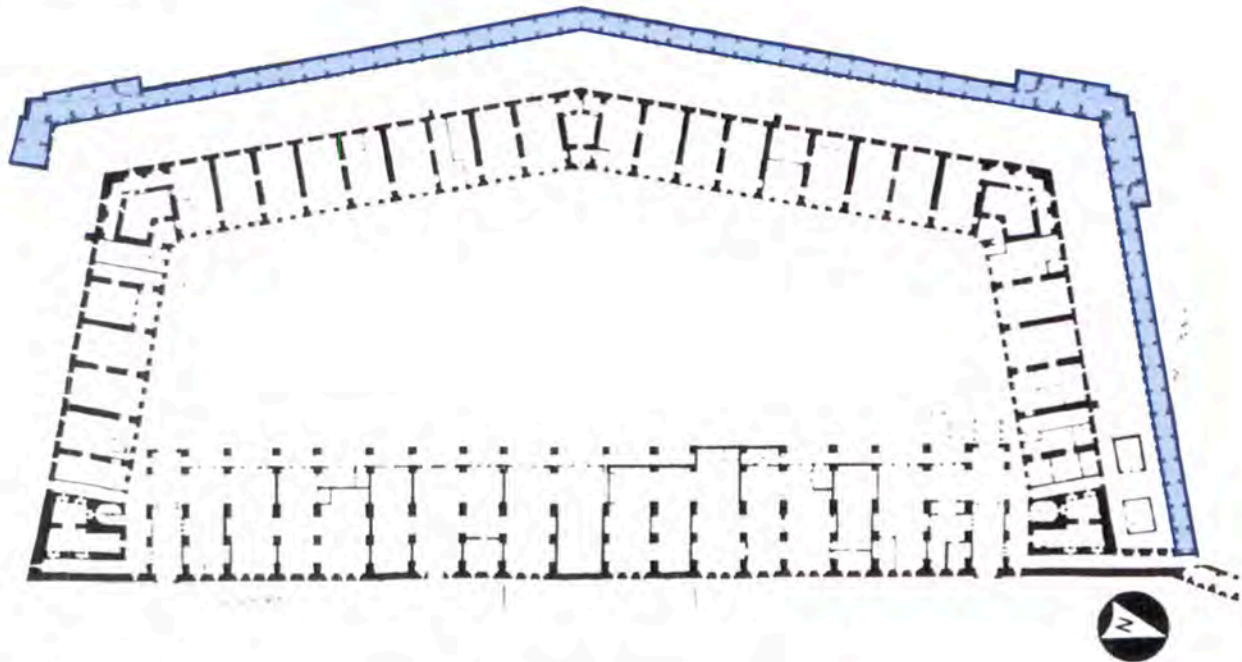
Architectural

The third floor mechanical room is accessed by the south stair. The finishes in the electrical room include concrete floors with a wood pallet installed on top, painted brick walls, and a brick arched ceiling. There are no windows in this room and there is a metal gate in the doorway. The electrical equipment in this room includes an electrical substation, a junction box and a single light bulb for the light fixture.



Structural – To be included.

Counterscarp



Architectural

The general construction of the interior of the counterscarp is essentially defined by its structure. The physical description of this structure, which is nearly uniform for the entire counterscarp, can be found in the structural section below.

Floors

Dirt floors are present throughout the counterscarp with only a few exceptions. In C117, C125 and C165, likely used for powder storage, the floor is concrete. In C144 and C145, where electrical equipment is mounted on the wall, wood platforms constructed of lumber rest on sleepers on the dirt floor. In some locations at the corners of the counterscarp (C118-C123, C166-C170) semi-circular metal rails are embedded in the dirt floor. These would have provided the pivot guns with a stable surface for their wheels.

Windows

The windows of the counterscarp consist entirely of the gunloops and embrasures. At the interior of the embrasures, a stone platform projects into the counterscarp and likely provided support for the pintle that supported the barrel of the gun and allowed it to pivot. Cast iron shutters, known as Totten shutters, are still present at several of the embrasures.

Mechanical, Electrical and Plumbing

The building systems in the counterscarp are very limited. In the casemates near the counterscarp entrance, both those that face into the dry moat and those that face the Narrows to the east, modern

floor lighting has been installed in the modern stone/gravel floor that has been installed. The purpose of these lights appears to have been to provide dramatic lighting of the interior with the intent that it be seen from the exterior. In C144 and C145, the remnants of an electrical system for the counterscarp are present. Mounted on panels constructed from wood boards on wood posts, the equipment that remains seems to include meters, electrical panels, buses, conduit and cabling. The fabric enclosed cables are hung from the walls with metal brackets mounted to the masonry walls. One cable runs along the dry moat wall of the casemates from C145 to C150 where it exists the counterscarp through a gunloop. A second cable runs along the dirt floor all the way to the southwest corner where it exits through an embrasure.

Structural

The counterscarp for the fort was built with much smaller casemates (See Figure __). The floor for the casemates is dirt, consistent throughout the counterscarp. In casemates C101 through C110, a stone/gravel floor has been applied to the dirt floor. A wooden platform is located in room C144. Walls for the casemates are built using a mixture of granite and sandstone masonry with some brick masonry infill. Small openings in the walls are located on the dry moat side of the counterscarp, and are formed using a single stone lintel. Each casemate is divided using a sandstone/brick wall with an arched doorway. The ceiling of the counterscarp is constructed using high arching stone masonry spanning between interior walls (See Figure__).



Figure 94: Brick archways in counterscarp (left) and brick arched ceiling with sandstone arched walls (right).

At the corners of the counter scarp (rooms C115 to C125 and C164 to C170), construction is slightly different. The floors are similar to the other smaller casemates, and the wall and ceiling construction is similar as well. The ceiling height, room width, and the openings all much larger than the previous casemates (See Figure__). An interior wall at rooms C117, C125, and C165 is constructed using multiwythe brick masonry, with a single stone lintel above the doorway (See Figure __). Much larger openings in the exterior walls are also located in these rooms on the dry moat side of the counterscarp. These openings are formed using brick-arched openings (See Figure __).



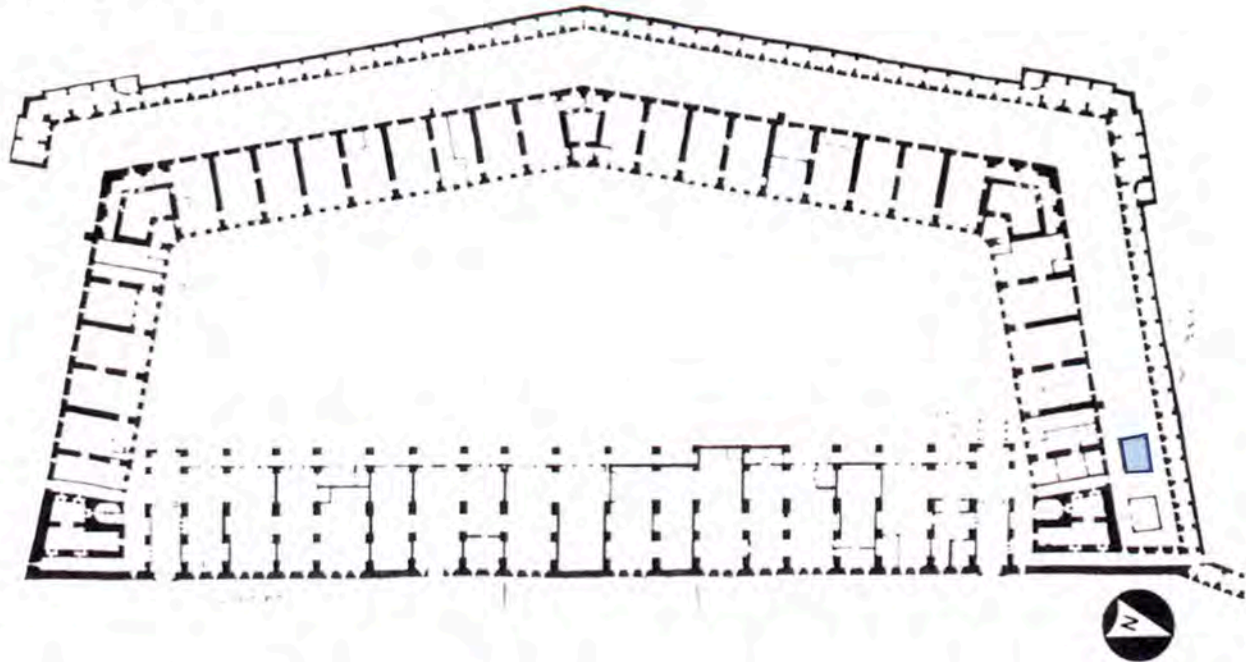
Figure 95: One of the larger casemates in counterscarp (left) and interior granite and brick interior wall in counterscarp (right).



Figure 96: Infilled Gun Port in Counterscarp.

1.3.4 Outbuildings

Building 138



Architectural

Exterior

Building 138 is a small, one-story, brick structure on the north end of the dry moat between the fort and counterscarp. The building has a hipped, asphalt roof with exposed, painted rafter tails and painted wood fascia on each elevation. The west elevation has two bays, separated by a tall brick chimney stack with copper brackets in the middle. Each bay has a slightly arched window with stone sill that has been infilled with plywood and chain-link. The south bay has a pipe sealed with cement protruding from the wall, between the window and the chimney.

The north elevation has two small windows under the wood fascia. The stone window sills are similar to those on the west elevation. The left window has a “hopper” shutter, and the right window has plywood and chain link installed within the frame. There is a piece of wood nailed to the bottom east corner of the brick wall. The east elevation has two doors with a window in the middle. The top of each opening is slightly arched, and each has a wood frame. The window has a stone sill, and plywood and chain-link have been installed in the window and the north door. The south door is an original, five-paneled, metal door with glass infill in one of the panels, and chain-link installed on the exterior of the door.

The south elevation is similar to the north elevation, with two windows under the fascia. Both windows have stone sills. The west window is infilled with plywood and chain-link. The east window is also infilled, and has been modified to accommodate pipes that project from the structure into the fort.



Figure 97: West elevation (left) and north elevation (right) of Building 138.



Figure 98: East elevation (left) and south elevation (right) of Building 138.

Interior

The interior finishes in Building 138 include a concrete floor, a decorative metal ceiling and painted brick walls. There are no baseboards in the room, however the brick is painted to resemble baseboard. The wood window trim and sills are painted, and there are several fluorescent light fixtures suspended from the ceiling. There is a lavatory on the west wall, and radiators on the east and west walls. There is an exhaust fan on the north wall, and pipes and electrical equipment on each of the four walls.



Figure 99: Interior finishes of Building 138.

Structural

Building 138 is constructed using two wythe brick walls with a concrete slab on grade floor (See Figure ____). A single brick chimney is located on the west elevation. The Outbuilding is structurally independent of the fort. Openings in the outbuilding walls are formed with brick arched lintels above both windows and doors (See Figure ____). The roof structure of the building is constructed using built-in-place roof trusses forming a hipped roof which are visible through the metal decorative ceiling. An actual dimension of the roof framing was not obtained. Roof sheathing appears to be tongue-in-groove boards spanning across the roof trusses.

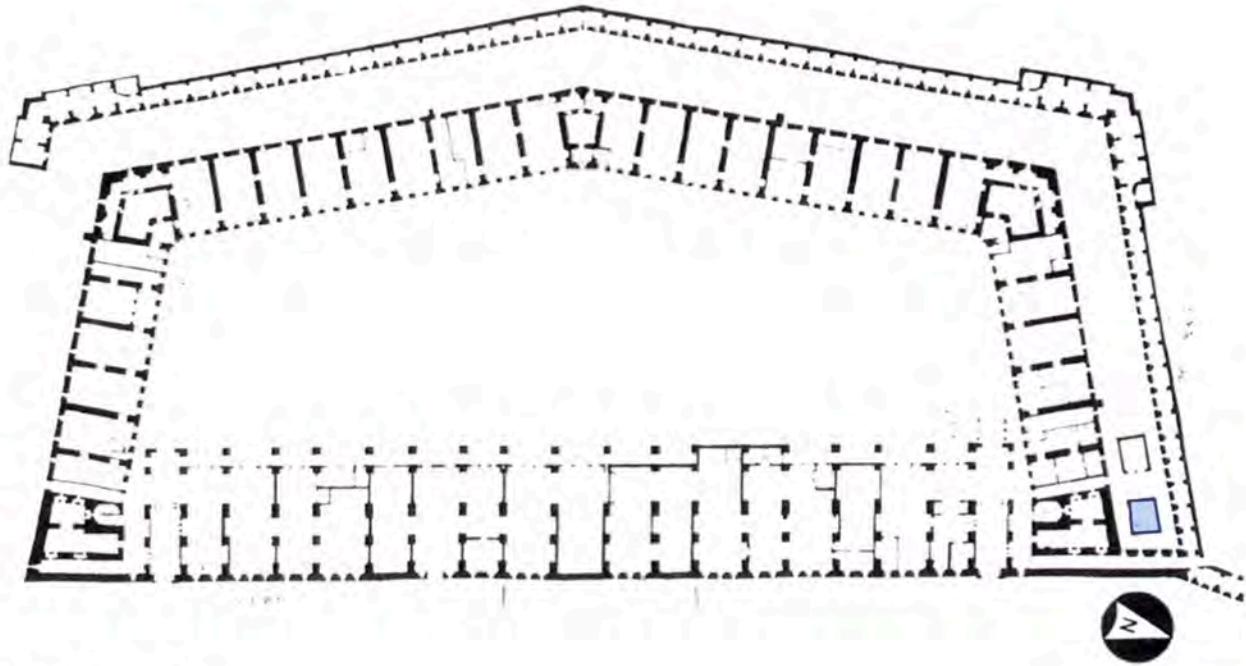


Figure 100: West elevation (left) and east elevation (right) of Building 138.



Figure 101: Framing of roof structure in Building 138.

Building 139



Architectural

Exterior

Building 139 is a small, one-story, brick structure with a gable roof and wood rake board and fascia. It is situated on the east side of Building 138, located on the north end of the dry moat, between the fort and counterscarp. The west elevation has two fenestrations. The first is a rectangular window with a wood frame and lintel, a stone sill and wood bead board infill. Above the rectangular opening is a square window with a stone sill, wood lintel and plywood infill. The north elevation has two fenestrations, each with stone sills and lintels, and plywood infill.

The east elevation has two small, square windows, each with stone sills, and wood frames and lintels. The windows are separated by a chimney in the center of the elevation. The brick chimney has a granite cap at the top and copper flashing at the gable roof line. The south elevation has a central window flanked by two doorways. The window and doors have stone lintels and stone sills, and the window is infilled with plywood. The west, wooden door is partially in place, and a piece of the wood frame on the south door is partially intact.



Figure 102: West elevation (left) and north elevation (right) of Building 139.



Figure 103: East elevation (left) and south elevation (right) of Building 139.

Interior

The interior finishes in Building 139 include a concrete floor, painted brick walls, and a plasterboard ceiling that is largely missing, exposing the wood rafters. The window on the west wall is infilled with plywood and has a wood lintel. The window on the south elevation is a six-light casement window; there are two similar six-light casement windows on the north elevation. There are two windows on the east elevation: a four-light hopper window (three lights on the right and one light on the left) on the left side of the elevation, and a two-light hopper window on the right side. There are electrical wires and conduit present, and a junction box with a single light bulb in the ceiling.



Figure 104: Interior finishes of Building 139.

Structural

Building 139 is similar construction as Building 138. The main walls are constructed using two wythe masonry brick construction with a concrete slab on grade floor. Openings in the masonry are carried by both stone and wooden lintels (See Figure __). The roof structure is framed by wood trusses with wooden sheathing similar to Building 138 (See Figure __). The main roof structure of this out building is a gable roof. A single brick chimney is located on the east elevation.



Figure 105: Caption to be included.

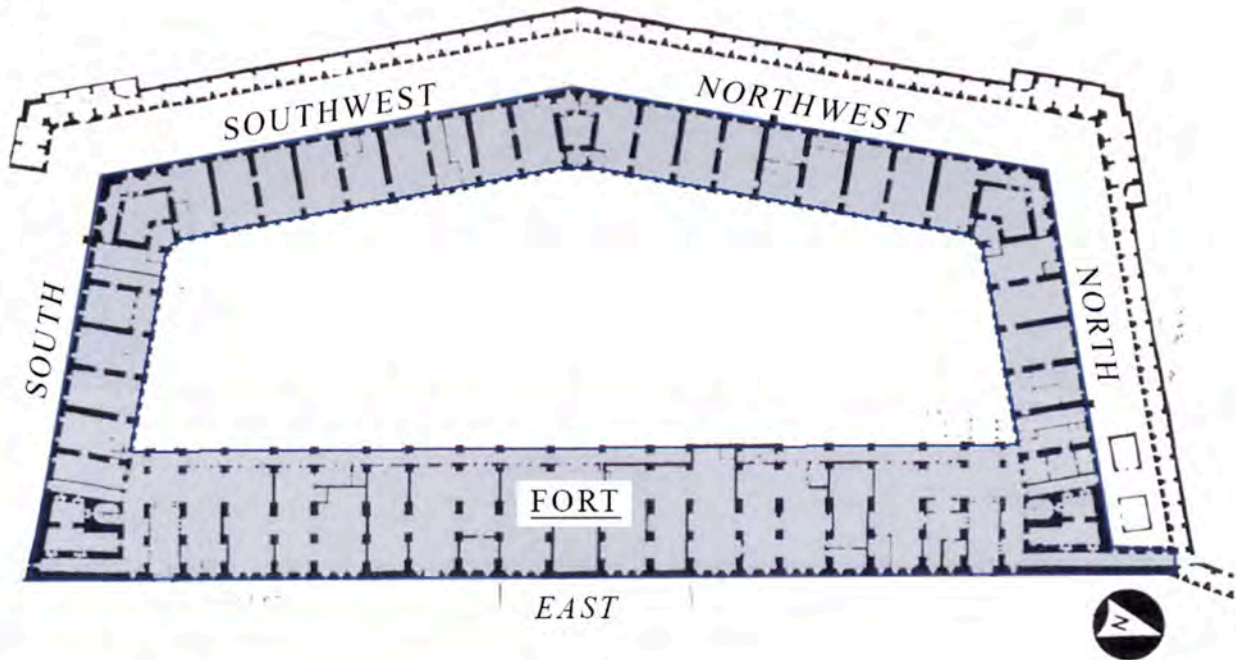


Figure 106: Roof structure of Building 139.

1.5 CONDITIONS ASSESSMENT

1.5.1 Exterior

Fort



Architectural

Masonry

The masonry on the exterior of the fort is generally in fair condition. Some of the granite is spalling, and some of the coping is broken or missing. The pointing is missing in several areas, and the coping generally requires 100% repointing throughout. There are also small masonry holes and abandoned anchors throughout the structure. There are minor cracks throughout the fort as well, there are typically located around the lower corners of the masonry openings.

There is minor vegetation on the structure, and biological growth throughout, particularly in the pointing and along the coping on each elevation. There is also an abundance of efflorescence and rust stains throughout, typically towards the tops of the walls and near ground level. The rust stains are typically located below the masonry openings. There is water damage in several areas of the exterior, with active water and staining. The condition appears to be serious, and is likely caused from issues on the roof.



Figure 1: Piece of broken granite coping and water stains (left) and severe rust stains (right) on south section of west elevation.

East elevation

There is significant efflorescence and rust staining on the east elevation. There is also biological growth, some within the pointing. The staining appears to be concentrated in the center of the elevation, and below most of the masonry openings. The coping is exhibiting biological staining and growth as well, generally along the entire elevation. Some of the concrete has minor spalls, particularly at the north and south ends of the elevation. The amount of repointing required on the east elevation varies; the north and south ends generally require approximately 50%, and the center of the elevation varies from approximately 40-70%.



Figure 2: Severe stains on the smooth-face granite (left) and biological staining on the coping (right) of the east elevation.

South elevation

There are minor efflorescence and rust stains throughout the south elevation. There are also minor holes, abandoned anchors and minor cracks, typically around the masonry openings. Some of the

granite coping is missing or broken, particularly around the chimney, and the coping appears to be shifting on the east side of the elevation. Generally 10% of the elevation requires repointing, and the east end requires approximately 50%.

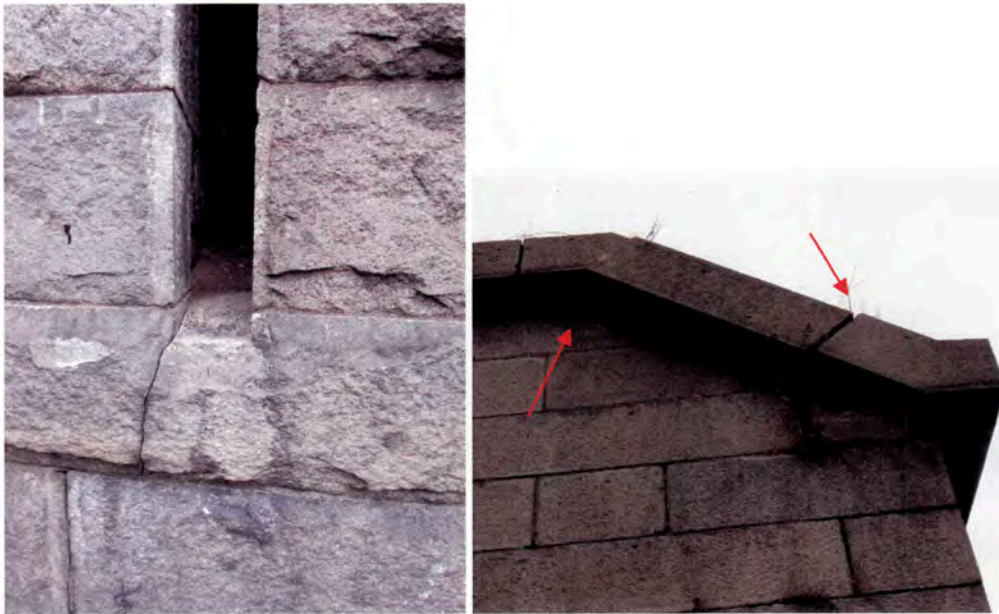


Figure 3: Minor crack under masonry opening (left) and shifting coping stones (right) on the south elevation.

West elevation

North section

On the north section of the west elevation, there are several areas where active water is present. The areas exhibiting active water are the north end, on the north side of the chimney, and towards the south end of the section. There are minor cracks on the north end of the section, typically under the masonry openings. There are minor holes and spalling through the section. The north section requires approximately 10% repointing.



Figure 4: Active water (left) and minor crack under masonry opening (right) on the north section of the west elevation.

South section

There are large areas of active water on the south section of the west elevation. The condition is most severe in the center of the section and on the north end. There are several rust, efflorescence and water stains throughout the south section. Abandoned hardware and minor holes are present at this section, and there are a few minor cracks around the masonry openings. 100% of the north end requires repointing (around the chimney and to the north) and the rest of the section requires approximately 15% repointing.



Figure 5: Active water (left) and rust stain from bar in masonry opening (right) on south section of west elevation.

Flank between Fort and Counterscarp

The small section between the fort and the counterscarp is exhibiting minor stains and biological growth. There is significant vegetation on the roof of the structure, and the elevation generally required 20% repointing.



Figure 6: Vegetation on roof (left) and minor stains on small section between counterscarp and fort.

North elevation

There is vegetation and biological growth throughout the north elevation. There are also efflorescence and rust stains that are more severe around the chimney and at the west end. Evidence of active water is visible on the north elevation, particularly serious in center of the elevation and at the west end. There are minor cracks on the north elevation, and it requires approximately 10% repointing.



Figure 7: Active water on west end of north elevation (left) and minor crack in masonry (right).

Windows

The windows on the exterior of the fort are generally in fair condition. The embrasures are in fair condition. Many have been infilled with concrete at the bottom, and some have been infilled completely. The infilled sections are in poor condition. The concrete appears to be deteriorating, and some that are infilled completely are cracked and crumbling. Many of the embrasures have been infilled with metal pipes, screens and wires. The metal is rusting, and creating stains on the granite walls. Some of the windows have been infilled with debris, including piles of bricks or trash. The masonry opening on the east elevation is in poor condition with deteriorating wood, a rusted frame that is broken on the bottom, rusted strap hinges, and rusted bolts. The wood is warped and no longer fits the shape of the opening.



Figure 8: The masonry opening and wood panel on the east elevation is in poor condition (left). Many embrasures have been modified with concrete at the bottom to accommodate the metal bar.



Figure 9: Embrasure infilled with concrete and a pipe (left) and embrasure infilled with debris (right).

Doors/Doorways

The conditions of the doorways vary from good to poor. The doorway on the north elevation is in good condition. It appears as though there was never a door to the fort from this elevation, but simply a rectangular opening in the granite wall (there is a doorway with a gate at the end of the long walkway on the interior of the fort for security). The stone at the doorway is in good condition, with minor vegetation surrounding the opening.

The door on the south façade is similar to the north, and also in good condition. The metal gate has minor rust, and some of the hardware has been replaced. The hook plate is still extant and a modern padlock was added for security. The stone around the door opening has been cut out, which indicates that there was a door head previously located here. Holes in the stone at the top west corner of the door and abandoned hardware on the east side of the door are further evidence that a frame was removed from this doorway.



Figure 10: Masonry opening on north elevation (left) and masonry opening with metal gate on south elevation.

The doors on the east elevation are in poor condition. The north doors have splitting, rotting and deteriorating wood at the bottom of each door. The hardware is missing and the bolts throughout the doors are rusted. The south doors are also in poor condition; both doors are deteriorating, and the wood is rotting, creating a substantial gap where the doors meet. The strap lock is extant in the center of the doors, however it is rusting, and a modern padlock has been added. The bolts are also extant, and exhibiting rust. The paint has been stripped, and there are water stains on each door.



Roof

The majority of the roof is inaccessible, therefore a thorough assessment was not possible. One section of roof that was visible was the low portion of the fort on the north side of the east elevation. This section was not intended to be vegetative, however, there is a large amount of vegetation present. This could be affecting the stones at this location, and causing further issues with water penetration.



Figure 11:

Chimneys

The chimneys on each of the elevations exhibit different conditions. The stuccoed CMU chimney on the east façade is in fair condition. The stucco is deteriorating, and there is a small area at the bottom of the east side of the chimney that appears to be spalling. There is also a small crack at the top of the structure.



Figure 12: Small crack at the top of the east chimney and an area of patching at the bottom.

The brick chimenys on the north, south and west elevations are in poor condition. The chimney on the north elevation is missing the frame around the cleanout opening at the bottom of the stack, and there is heavy staining around the opening. There are several vertical cracks on the north chimney, including one above the cleanout. There are areas of missing pointing, in particular on the west side of the chimney, and a large hole and abandoned hardware on the east side of the chimney.

The two chimenys on the west elevation are in similar condition to the north chimneys. The chimney on the north side of the west elevation has missing pointing, particularly near the top, cracks throughout, and part of the metal frame of the cleanout opening is missing.



Figure 13: Cracks, spalling and missing bricks on chimneys.

Structural

Masonry

The exterior walls of the fort are generally in good condition. Minor cracking in the stone was visible in various locations (noted below), and efflorescence was also noted at various locations on the exterior of the fort. On the southeast corner of the fort, a diagonal crack was noted at the base of the wall (See Figure ____). Also, there is mortar missing at the flat arch above the southern door on the east elevation (See Figure ____). Efflorescence was also noted at various locations on the east elevation (See Figure ____). The stuccoed CMU chimney on the east elevation is in fair condition. There is significant spalling just above the roof (See Figure ____). The chimney does not appear to be in danger of imminent collapse based on observation from the ground. The chimney was not accessible from the roof, so a detailed assessment was not possible.



Figure 14: Diagonal crack in granite (left) and flat arch on east elevation (right).



Figure 15: Caption to be included.

On the south elevation of the fort, the stone is in similar condition as the east elevation. Some minor cracking in the stone was noted around the windows (See Figure ____). The chimney on the east side of the south elevation is in fair condition, with cracks at the base (See Figure ____). The chimney on the west side of the south elevation is in poor condition. Metal straps intended to laterally brace the

chimney to the stone structure have failed at multiple locations. The brick masonry has also hinged at the roof level, and is in danger of imminent collapse.



Figure 16: Crack below masonry opening (left) and crack at base of east chimney on south elevation (right).



Figure 17: Overview and detail of west chimney on south elevation.

The west and north elevations of the structure are in similar condition as the south and east elevations with minor cracks noted on the north elevation (See Figure __). The chimneys on these elevations are also in fair condition, with minor cracks throughout (See Figure __).



Figure 18: Crack at base of wall on north elevation (left) and crack in chimney on west elevation (right).

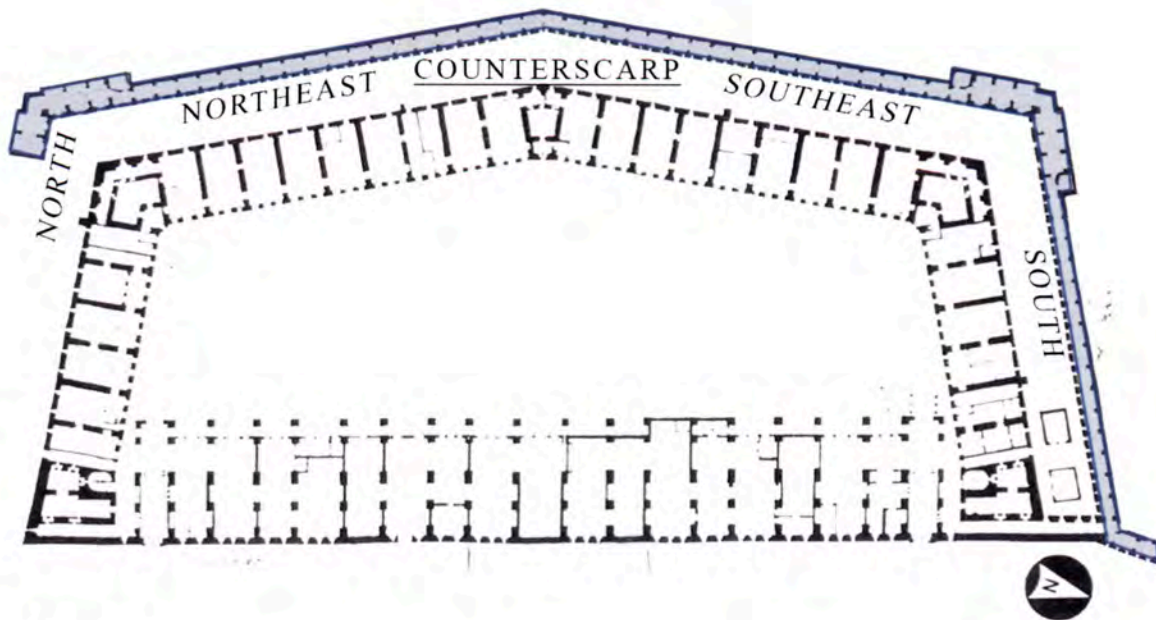
Roof

The roof of the fort is mostly inaccessible, and a thorough assessment of the roof was not conducted. Heavy vegetation is present throughout the entire roof. On the east elevation, cracking in the concrete roof was noted just above the top of the wall (see Figure __).



Figure 19: Crack in concrete below level of vegetation.

Counterscarp



Architectural

Masonry

North Elevation

The north elevation is in fair condition. There is biological growth on the entire surface of the elevation. The elevation requires approximately 75% repointing. The coping on the north wall requires 100% repointing. There is also a significant amount of vegetation at the coping.



Figure 20: Overview of rough-hewn granite walls of the Counterscarp (arrow is pointing to north elevation).

East Elevation

South Section

The south section of the east elevation is in fair condition. There is biological growth and water staining on the south end of this section, particularly on the upper level, under the windows on the lower level and in the lower south corner where the wall meets the north elevation. There are two small holes near ground level at the south end, as well as a couple of holes above the area between the fifth and sixth embrasures (counting from the south end). There are minor cracks and spalls in this section including a crack on the south side of the first embrasure, a spall on the north side of the first embrasure (between the ground and the opening), and approximately eight small cracks, typically found near the masonry openings. There is a more substantial crack in the stone on the upper level, near the middle of this section. In many areas, the stones retain their quarry marks.

On the north end, there is moisture near ground level and under some of the masonry openings. This condition occurs for approximately 30% of the section. There is one spall under the third embrasure and one on the south side of the 11th embrasure (counting from the right). There are approximately nine minor cracks, and similarly to the south end, they are mostly near the masonry openings. There is a fair amount of vegetation along the coping on this entire section.



Figure 21: Water damage near ground level of the west elevation.

North Section

The north section of the east elevation is in fair condition. There is some biological staining throughout the entire section, however it is not as severe as the south section. There are quarry marks throughout the stone and a fair amount of water stains, biological growth and vegetation along the coping on this entire section.

At the south end, there are two metal brackets between the first and second embrasures, conduit to the left of the first embrasure, and a pipe below the second embrasure (counting from left). There is a hairline crack near the third embrasure and a hole between the fifth and sixth embrasures. There are approximately five small holes in the center of this section, as well as two minor cracks near the masonry openings. There is a minimal staining on the lower middle window at the north end of this section.



Figure 22: Crack in granite wall below masonry opening on west elevation.

South Elevation

The granite walls on the south elevation is in fair condition. The east end of the south elevation appears to be in better condition than the west end. There is significant moisture and biological staining at the west end of the south elevation, particularly on the upper portion of the west end. There is moisture and staining below the windows on the west end, as well as biological growth in the pointing. Along the coping of the south elevation, there are areas of moisture and biological growth and staining, just below the vegetative roof. The biological growth and staining continues east on the elevation, however the conditions aren't as poor as the west side.

On the west end, there are approximately five small holes in the granite, on the west side of the first embrasure in this section. This appears to be the only section where the holes are present, however there are several locations with graffiti and paint stains are present. One location is approximately in the center of the elevation, and there are four other locations on the east end. There is a small spall in the granite under one of the windows, located about half way between the middle and east side of the south elevation, and a metal, rusted bracket with electrical wires is attached under one of the embrasures on the east end. Similarly to the east elevation, there are quarry marks in the stone throughout the entire elevation.



Figure 23: Staining under masonry openings (left) and paint stains (right) on south elevation.

Windows

The counterscarp windows are generally in good condition. The embrasures are in good condition; only one embrasure, on the north end of the east elevation, has been modified and has a single brick placed at the bottom of the opening. While the half-arched openings are in good condition, the shutters installed within them are in poor condition. They are deteriorating, and extremely rusted. Many are fixed and no longer operable. Other openings have been infilled with cement, bricks and pipes. The shutters remain in place and are fixed with the infill surrounding them. On the west end of the south elevation, there appears to be a piece of wood protruding from one of the upper level windows.



Figure 24: Infilled window (left) and rusted metal shutters (right) of Counterscarp.

Roof

The condition of the roof is unknown as it was not accessible. It appears to be overgrown with vegetation, likely causing problems for the roof structure.

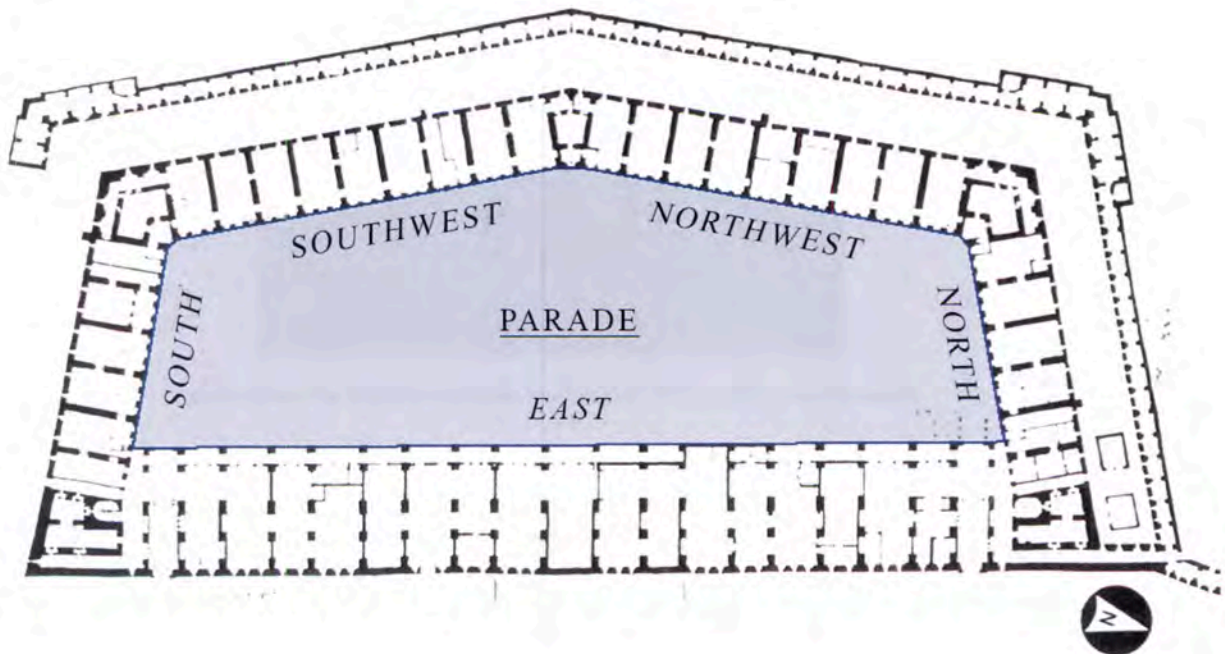


Figure 25: Vegetative roof and biological staining on coping of counterscarp.

Structural

The exterior of the counterscarp is in similar condition to the fort exterior. The stone is in good condition with minor cracking. There is heavy vegetation on the roof, similar to the fort. Access to the roof was not available so a thorough assessment was not conducted.

Parade



Architectural

North, South and West Elevations

The north, south and west elevations of the Parade Ground are in fair condition. There are significant rust stains at every knee brace supporting the gallery between the first and second floors. There are also rust stains around the window sills, particularly on the second floor, and some of the metal window frames are exhibiting rust as well. The doors are generally in good condition with some paint deterioration and minor rust at the jambs. Each elevation is also exhibiting efflorescence throughout and biological staining throughout.

On the south elevation, four of the doorways on the second floor are infilled with windows and concrete masonry unit (CMU) below. Each infilled area is in poor condition; the cement sills are deteriorating, exposing the metal rebar. There is conduit running the length of the elevation with metal anchors causing moderate rust stains. There small holes and abandoned hardware on the south elevation, biological staining near the ground and vegetation in the southwest corner. Conduit with metal anchors causing rust stains.



Figure 26: Typical biological staining and efflorescence on granite walls of Parade Ground.

On the west elevation, six of the doorways are infilled with window and CMU. Their conditions are similar to those on the south elevation. The west elevation is exhibiting efflorescence, rust stains from conduit running the length of the elevation, and paint stains. There are small patches, holes and spalls throughout. The conditions of the north elevation are similar to the others. There is active water on this elevation. Some of the window sills are spalling. The conduit and anchors are rusted, causing the stains on the granite walls.



Figure 27: Modified door opening with deteriorating sill and exposed rebar on second story (left) and rust stains on granite walls of Parade Ground (right).

East Elevation

The east elevation of the parade is in fair condition. Similarly to the north, south and west elevations, there are areas of efflorescence, and water and rust stains. There is active water in front of Casemate C. There are several cracks and missing pointing in the arches of the east elevation. The upper gallery is in poor condition; the knee braces and railing are extremely rusted. The stairs

on the south end are also in poor condition; they are rusted and the treads are missing. The north stair on this elevation is missing.

Note: For conditions of windows and doors see Interior Conditions of East Casemates on page xx.



Figure 28: Southeast corner of Parade showing staining and efflorescence on east elevation (left) and crack in masonry arch on east elevation.

Note: For conditions of windows and doors in the Parade Ground, see Interior Conditions Assessment for First and Second Floors.

Gallery and Stairs

The gallery, located on the second story of the north, south and west elevations, is in poor condition. The assessment was made from the ground, as dangerous conditions made the gallery inaccessible. The diagonal ironwork on the baluster is in good condition, however many of the original decorative iron rosettes are missing. The knee braces are extremely rusted, leaving significant rust stains on the granite walls. All of the stairs connecting the gallery to the ground are also in poor condition. The wood treads are warping and rotting, and have metal applied on top of each tread. The metal caps on the treads are extremely rusted. The stringers and railings are also exhibiting a fair amount of rust. The stairs on the north elevation have eight missing treads. The remaining treads have metal caps similar to the other three staircases, and are also extremely rusted.

Hoist

The hoist structure in the northeast corner is in poor condition. There is a large amount of vegetation throughout, and the entire structure, including the platform, is rusting. The metal framing, pulley system and corrugated metal roof of the hoist are all exhibiting rust. The steel joists on the adjacent platform is also exhibiting rust. The wood rafters and wood flooring on the platform

are rotting and splitting. The brick columns are cracked and displaced by the wood and metal joists above. Metal tie-rods have been installed between the columns, and are also exhibiting rust. The railing on the platform is rusted and partially missing.



Figure 29: Rusted metal framing of lift structure (left) and detail of cracked brick column supporting platform.

Structural

The stone on the inside of the fort is in good condition based on observations from ground level. Staining due to rust from the attached walkway is consistent throughout the entire interior elevation of the fort (See Figure __). On the south face, concrete spalling was noted underneath one of the window sills, exposing the reinforcement in the concrete (See Figure __). Minor efflorescence of the walls was also noted on the interior of the parade grounds.



Figure 30: Caption to be included.

The stone on the east elevation of the interior parade ground is in good condition, similar to the other elevations. Efflorescence was noted at various locations (See Figure __). Efflorescence was also noted on the stone arches that span in front of the casemates on both the brick masonry and

the exterior stone masonry (See Figure ____). An active water leak was visible directly in front of casemate "C". Deterioration was also noted in the pointing and extends into the mortar beds of the brick portions of the arches (See Figure ____).

The upper gallery was inaccessible during the condition assessment and observations were limited to visual observations from the ground. In general, the upper gallery is in poor condition. The knee brace brackets for the gallery are heavily corroded and the walking surface of the upper gallery is missing or has been removed. The guardrail on the upper gallery also appears to be heavily corroded. The stairs and guard rails on the south side that lead up to the upper gallery are heavily corroded, similar to the upper gallery. No stair treads were present for the south stair and the base has been fenced off due to its deteriorating condition. The knee brace brackets supporting the intermediate landing for the south stair are shown in Figure _____. These brackets are slightly different than those found on the gallery on the west side of the fort. The brackets are showing signs of corrosion, but do not appear to be separating from the stone walls. The stair on the north side is missing. Evidence of connections that have been removed on the east stone wall are still present, as well as an upper landing.



Figure 31: Efflorescence on wall (left) and on stone and brick arch (right).



Figure 32: Caption to be included.



Figure 33: Caption to be included.



Figure 34: Framing for landing at south stair on east elevation.

Gallery and Stairs

The gallery extending around the second level on the north, south and west elevations of the parade ground is in poor condition. The steel for the gallery, in general, is exhibiting heavy corrosion in areas (See Figures __). The primary concern for the gallery is the connections between the gallery and the stone wall. No details were obtained showing exactly how the knee brace brackets are connected to the wall, however it appears that this connection appears to be failing. Section loss was noted at the base of the brackets (See Figure __). Also, spalling in the stone was noted in around the connections at various locations, possibly due to rust jacking at the base (See Figure __). It appears that some of the brackets are beginning to tilt, and separate from the wall.

The grating on top of the gallery appears to be aluminum and is in good condition. The grating does not appear to be original to the gallery. The guardrails on the edge of gallery are also showing signs of slight corrosion, however no section loss appears to be occurring as noted from observations from ground level. The top of the gallery was not accessible due to structural concerns, therefore a detailed assessment of the top of the walkway was not possible.

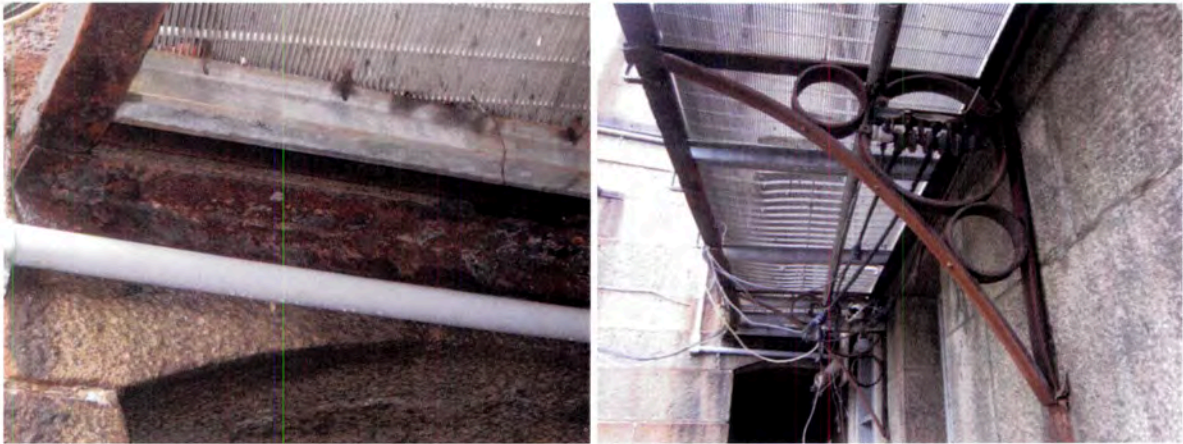


Figure 35: Corrosion of Gallery members.



Figure 36: Caption to be included.

The stairs for the upper gallery are in fair condition. Slight corrosion was noted on the railings and the stringers (See Figure ____). The wooden steps that span between the stringers are starting to show signs of deterioration and have split in some locations. Also the diamond plate treads that are attached to the wooden steps are heavily corroded and are no longer attached to the stairs in some places (See Figure ____). The knee brace brackets that support the upper landing for the stairs are also heavily corroded at the connections, similar as the gallery described above.



Figure 37: Caption to be included.

Hoist

The hoist structure on the north side of the east elevation is in poor condition and it appears to have partially collapsed. The steel framing forming the hoist structure is heavily corroded, but does not show evidence of section loss (See Figure ____). The platform connecting the hoist structure to the upper walkway on the north elevation is in poor condition. The steel beams are heavily corroded, and are exhibiting heavy section loss (See Figure ____). The wood framing that spans between the steel beams is also showing signs of deterioration. The brick pillars supporting the steel beams are heavily cracked at the top around the steel beam bearings, likely due to rust jacking caused by the corrosion on the steel beams (See Figure ____).



Figure 38: Hoist structure (left) corroded beam (right).

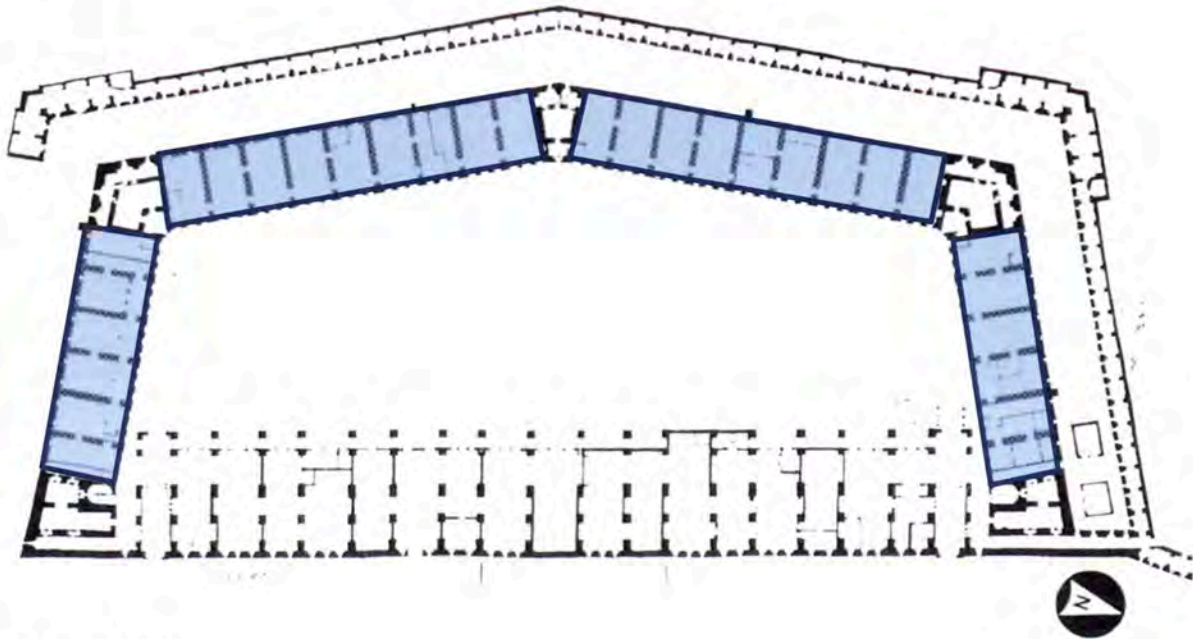


Figure 39: Cracked pillar at beam landing.

1.5.2 Interior

Fort

First Floor



Architectural

Floors

The wood floors in these sections of the first floor are in poor condition. Large sections are missing, and the boards are deteriorating, splitting, warping, rotting, or buckling. There are some areas with water damage, and there is a large amount of debris throughout, especially where the wood is missing. In these areas, the subfloor is exposed, and is also beginning to deteriorate. In many rooms, particle board has been applied on top of the boards, however the plywood is sagging or deteriorating in some areas as well. In some rooms, it appears that concrete has been added where the wood flooring is in poor condition.

The concrete floors on the first floor are generally in fair condition with some areas of water and biological staining. There are minor cracks, spalls and patches in the concrete floors. There is minor efflorescence, and dirt and debris collecting in these areas. Some of the concrete floors have been modified with sections cut out for systems or drains.



Figure 40: Deteriorating wood floors (left) and concrete floor (right) on first floor.

Walls

The conditions of the walls on the first floor vary from fair to poor. The brick walls are in fair condition, with minor spalling, cracking and missing pointing. There are areas with several layers of paint, and other areas where the paint is peeling and deteriorated. There is extensive water damage and biological growth in some areas and active water in others. Some of the bricks are uneven or broken, likely from water damage, and there are some rust stains throughout. There are some holes throughout the brick, likely from hardware that has been removed.

The plaster walls on the first floor are in fair condition with minor cracks and holes, and peeling paint. Some of the plaster, along with the lath, is missing. The CMU walls are in good condition. The conditions of the partition walls vary from poor to fair. The plasterboard is warped, deteriorated or delaminating, likely due to water infiltration. In these areas some of the framing is exposed. There are nail pops, exposed framing, holes, and areas with plywood infill.



Figure 41: Water damage and severe staining on brick wall (left) and deteriorating plasterboard partitions (right).



Figure 42: Typical conditions of first floor brick walls.

Ceilings

The brick ceilings in these sections are generally in fair condition. There are some remnants of parging throughout that is deteriorating in some places. Some of the ceilings are exhibiting spalling bricks, efflorescence from water infiltration, and some surface damage from paint or parging removal. In some rooms, there appears to be a black coating over the brick and under the paint, and there are patches and anchors or hangers throughout. All of the exposed steel joists are exhibiting rust, and there are mounting plates located in the center of the steel joists in Room 147.



Figure 43: Typical ceiling conditions of first floor.

Windows/Trim

The windows are generally in poor condition. Most of the eight-light steel casement windows have missing or broken lights. All of the steel casement windows are exhibiting peeling or deteriorated paint, and rusted frames and hardware. In Rooms 104 and 105, the lights have been replaced with security glass. One of the sash has been cut in Room 106, and is missing in 134, and plexiglass has been installed in both. The lights in Room 116 have also been replaced with plexiglass. The windows have been removed in Room 110. In Room 105, the bottom two lights have been removed and infilled with cement 105. Several of the lights are painted in Rooms 113, 116, 144 and 145.

In Room 108, all of the lights have been removed and infilled with plywood and pipes. The sash in Rooms 116 and 118 have been replaced with wood sash and a wood frame. A wood screen has been added in Room 118, and is in poor condition, and two storm windows have been added in Room 130, both lights missing or broken. The sash in Room 129 is broken; one casement is missing in 139 (with deteriorated sill extant); one casement frame is broken in 139; and the casement in 146 is broken and displaced. In Rooms 119, 143 and 146, the top lights of the casement windows have been modified for systems; Rooms 114, 127, 128 and 129 are boarded up or infilled with plywood; and an exhaust fan (and plywood has replaced the middle sash in 144/145. There is a large amount of debris in the opening in Room 128. There are metal bars in the windows of Rooms 129 and 130 that are in poor condition. The single-hung, exterior steel window is in poor condition; there are no lights in the bottom sash and the top right light has been removed for a pipe.

The single-hung steel windows on the first story are generally in good condition. In Room 102, the single-hung window is blocked by the stair and an additional wood sash and trim are installed at the interior face of the wall. The windows are exhibiting minor rust and deteriorating paint throughout. Some of the rooms, including Room 107 and 114, the rust is severe. In Rooms 117, 120 and 131, there is a single broken light in one of the single-hung windows, for a total of three broken lights. There are four broken lights in Room 135 and three broken lights in Room 136.



Figure 44: Wood framed window with wood storm panel (left) and typical eight-light steel casement window (right).

Doors/Doorways

The conditions of the doors on the first floor vary from fair to poor, with the exception of a few that are in good condition. The metal doors, some paneled and some flush, are generally in poor condition; they are rusted, fixed in place, and have broken lights, rusted hardware and broken frames. The paint is peeling on most of the doors, some are delaminating, and several have been modified at the top to accommodate systems. The cased metal openings are also in poor condition. They are all extremely rusted, and some are deteriorating, exposed original wood cased openings underneath. The doors with metal bars are also in poor condition; the door in Room 106 is fixed with plywood, and metal dowels have been added on others.

The conditions of the wood doors, including flush and paneled doors, vary from poor to good. Many are exhibiting fading or peeling paint, checking, missing or rusted hardware, and broken, splitting or sagging rails. Some of the door hinges are broken and some doors are detached from their hinges. Many of the lights are broken and some have plywood over the lights. Similar to the metal doors, some of the wood doors have also been modified at the top to accommodate systems. Two of the wood doors, located in Rooms 122 and 146, are scored to resemble a "Dutch" door; the door in Room 122 is a paneled door with a herringbone pattern, unlike others on the floor. The wood cased openings are in fair condition; the hardware is rusted, the paint is fading, some pieces are warping or splitting, and some sections are infilled.

The doors are infilled with CMU in Rooms 139 and 143, with brick in Room 131, and with plywood in Rooms 133 and 135. Several of the doors are blocked; in Room 102 the door is blocked by a stair, and in Room 103 it is blocked with a steel and plaster panel. The metal doors are generally in poor condition. The conditions of the added partition doors also vary. Some of the plaster and metal partitions are in good condition, including in Room 106, and others are missing doors and the frames have peeling paint and exposed nails.

The exterior metal doors with three-light wood transoms above are generally in good condition. Some of the metal doors are exhibiting minor rust and deteriorating paint. In Room 101, the metal door is fixed in place and does not open. In Rooms 201, 144 and 145, the doors are wood, not metal. The door in Room 102 is a three-panel, four-light wood door, also with a three-light transom above. This door is in good condition. The door in Room 144 is a flush wood door and the door in Room 145 is a five-paneled wood door. Both of these doors are in fair condition.



Figure 45: Brick infill in metal cased opening (left) and five-paneled closet door (right).



Figure 46: Modified wood-paneled door (left) and deteriorating five-paneled metal door (right).

Mechanical, Electrical and Plumbing

In this section of the first floor, there are many fluorescent light fixtures, both ceiling-mounted fixtures and suspended pendants. All are in poor condition; they are no longer operable and are extremely rusted. There are junction boxes and conduit throughout, also in poor condition, some with missing fixtures and all exhibiting extensive rust. The electrical box in Room 102 is modern and in good condition.

On the southwest side of the fort, modern facilities have been added. There are two modern lavatories, two modern urinals and two water closets in Room 104, all in good condition. There are three modern sinks and four modern water closets in Room 105, all in good condition. The wall sconces and ceiling-mounted heaters in Room 104 are both in good condition, however only one heater is operable.

The accessories in the restrooms, including metal partitions, baby-changing stations, recessed trash receptacles, wall-mounted dryer, wall-mounted towel and soap dispensers, are in good condition. In the vestibule leading to these new restrooms, Room 103, there is a modern water heater and drinking fountain, both in good condition, although the water fountain is inoperable. The wall sconces in this room are also in good condition.

The first floor has other plumbing fixtures in several rooms, and some fixtures have been removed. There are two lavatories, two urinals, and two water closets in Room 109, all in poor condition with significant dirt and rust. There are water closets in Rooms 122 and 144, and a lavatory in Room 142. All of these fixtures are in poor condition as well. The three boilers on the first floor, in Rooms 110, 119 and 143 are all in poor condition; they are no longer operable and have severe rust throughout. Most rooms have at least one radiator, as well wall-mounted and/or ceiling-mounted pipes, all extremely rusted and no longer in use.



Figure 47: Deteriorating electrical and mechanical systems of first floor.

Fireplaces

The fireplaces on the first floor are generally in fair condition. Some of the fireplaces have been modified with pipes and steel lintels. Diamond plate was installed on the fireplace in Room 102, and is very rusted, and wooden shelves were installed in Room 118, and are in good condition. There are cracks in the back wall of most of the fireplaces, some severe, and some of the fireplaces have multiple cracks. Some of the bricks in the arches are cracked or spalling, and many have patches or missing pointing. Many of the flue/vents have been modified with electrical boxes.



Figure 48: Brick fireplace with crack at back wall (left) and modified fireplace (right).

Structural

The conditions of the interior rooms were fairly consistent throughout. The condition of the wooden floors were generally in poor condition, particularly in Rooms 107, 116, and 117. Concrete floors were typically found to be in good condition with minor cracking. The brick walls on the perimeter were generally in good condition. Cracking was noted on the back wall of most of the brick fireplaces. (See Figure __ for crack in room 107). In Room 107, there is a crack in the stone lintel above the door connecting the room to the adjacent room (See Figure __). The crack was noted to extend entirely through the first stone.

The single post that is located in Room 102 is in fair condition, with minor corrosion. (It is unknown why the post is located in this room and not in others). The conditions of the roof beams vary from fair to poor with corrosion present on the beams throughout the structure. The amount of corrosion varies from room to room. Major corrosion with section loss was noted on beams in Rooms 102, 107, 111, 113, 127, 128, 134, 140, and 142 (See Figure __ below). The extent of the corrosion on these beams is not clear as they are mostly encased in brick. Further investigation is recommended to determine the extent of the corrosion and to see if it extends up into the web of the member and into the upper flange. The steel brick arch support on the rear wall, which appears to be an angle or ledge beam, is showing signs of heavy corrosion in Rooms 127, 128, 134, and 140 (See Figure __). The brick arches that span between the beams are generally in good condition with the exception of Room 102, where there is a longitudinal crack running parallel with the steel beams. The crack spans almost the entire width of the room, and may indicate that the beam supporting the arch has been

compromised and that the beam has deflected. Further investigation is required to determine the cause of the crack.



Figure 49: Caption to be included.

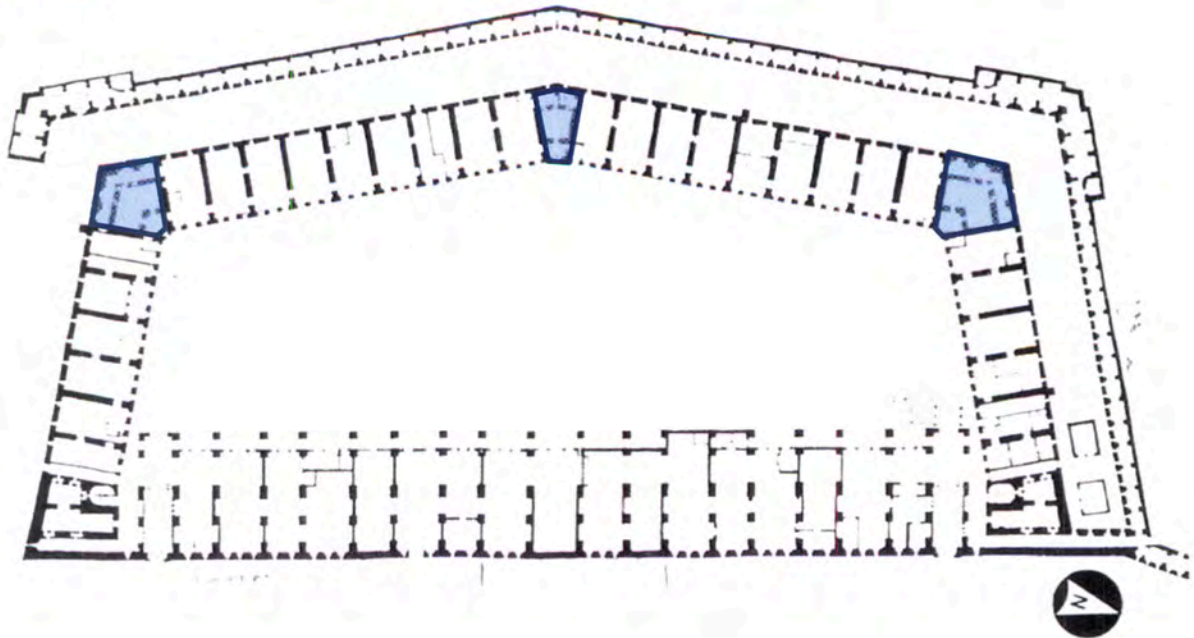


Figure 50: Caption to be included.



Figure 51: Caption to be included.

Corners



Architectural

Floors

The concrete floors in the corner sections vary from poor to fair condition. There is major water damage in some areas, as well as large cracks, active water and vegetation. In fact, the damage is so poor in Room 112, assessment was carried out from Room 111, as there was major water damage and dangerous conditions. There is also a fair amount of dirt and debris collecting in these corner sections. The brick floors in the corners are in poor condition with cracks, spalling and missing pointing.



Figure 52: Typical floor conditions of corner sections with water damage and vegetation.

Walls

The granite walls in the corner sections of the first floor are generally in poor condition. While the granite itself is in good condition, with some peeling paint, areas of sandstone and brick infill are in poor condition. There is active water, efflorescence, and some areas where the pointing is missing 100%. The sandstone is extremely deteriorated, that there are mounds of dust collecting on the ground. Some of the brick is spalling and there are many layers of paint throughout these corner sections.



Figure 53: Deteriorating wall conditions of the corners including water damage (left) and fading whitewash (right).

Ceilings

The ceilings in the corner sections are in poor condition. Some of the brick-arched ceilings have heavy parging, and all are missing pointing; approximately 50% of the ceiling in Room 123 will need repointing and Rooms 111, 112, 113A, 124, 125, 136A, 137 and 138 will need 100% repointing. There are pipes and holes in the arch in Room 113A, and the ceilings in Rooms 124 and 125 are spalling and have missing bricks in some areas.



Figure 54: Typical brick arched ceiling in corner sections.

Windows/Trim

The conditions of the windows in the corner sections vary from poor to good. The steel casement windows are in poor condition, all exhibiting severe rust and missing or broken lights. There are 24 broken lights in Room 113A, five in Room 123, and eight missing in Room 136A. Seven lights are infilled with plywood in Room 113A, and the entire window in Room 126 is boarded up with plywood. In Room 136A, both windows are displaced, and one the metal-framed, four-light window, with metal panels on the top and bottom, has a large pipe installed in the bottom panel. The granite embrasures in Rooms 111, 124, 125, 126, 137 and 138 are in good condition.



Figure 55: Modified window in corner section of first floor.

Doors/Doorways

Most of the door openings in the corners are granite doorways similar to the walls. The granite is in good condition, with some water damage in adjacent areas. The wood-paneled door in Room 123 is in fair condition, and is splitting in some places. The paint is peeling and the hardware is rusted. The thick, flush metal door in the corner of Room 125 has been modified to accommodate electrical systems, and is in poor condition; the door and door hardware are rusted. The metal cased opening in Room 126 is in poor condition with severe rusted throughout.



Figure 56: Typical granite doorways in corners of first floor.

Mechanical, Electrical and Plumbing

The electrical systems in these corner areas include junction boxes and wall-mounted conduit. The junction boxes are in fair condition with some extant fixtures, and exhibiting minor rust. The conduit is in poor condition, and is rusted. The pipes in these Rooms are extremely rusted, included a plumbing stack in Room 111 that has extensive water damage. The ceiling-mounted radiator in Room 112 is in poor condition and is extremely rusted.

Structural

The concrete floors in the corners were in good condition with minor cracking throughout, with the exception of Room 112. When pressure was applied to the floor in Room 112, the floor appears to give, emitting a crunching sound. Further investigation is needed to determine why the floor is deflecting, what is underneath, and how it is supported. In Room 111, there is an active water leak in the roof structure. Also, the steel beam near the entrance to the room is heavily corroded and is exhibiting section loss (See Figure ____). The arched ceiling in Rooms 124 and 137 are exhibiting loss of brick and heavy erosion of the mortar joints (See Figure ____). The arched ceilings in Rooms 123, 125, 137, and 136A are showing signs of erosion in the pointing, extending into the mortar beds.

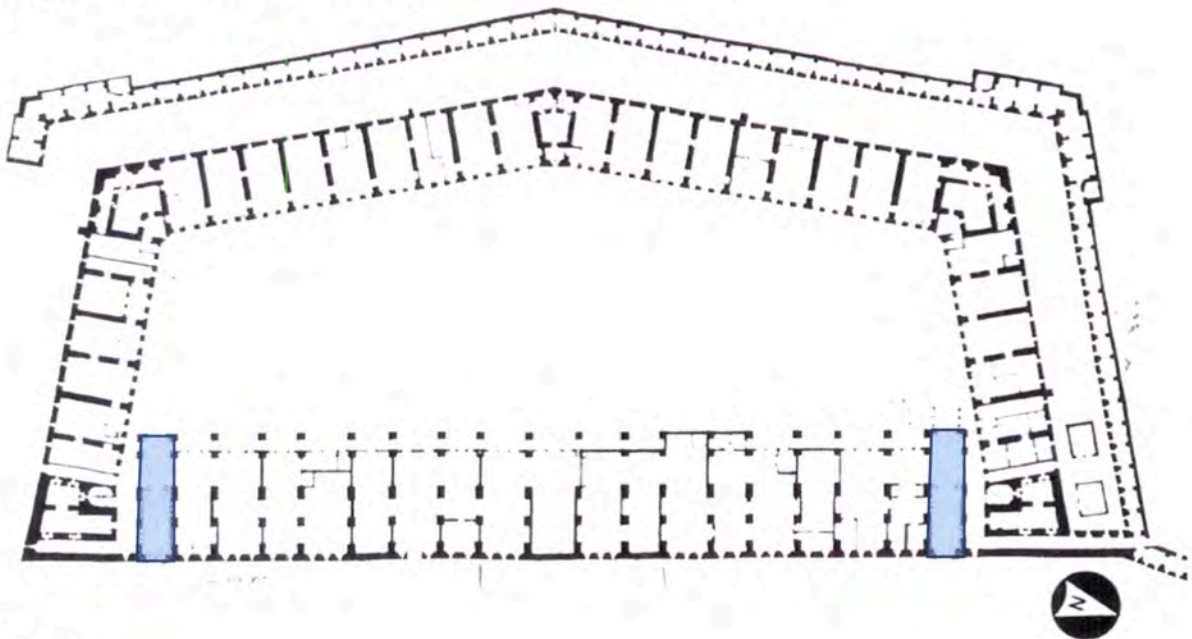


Figure 57: Rusted beam at entrance to Room 111 (left) and brick loss in Room 124 (right).



Figure 58: Brick arch with missing pointing in room 136A.

Sally Ports (Rooms 151 and 152)



Architectural

The sally ports are generally in fair condition. The concrete floors in the sally ports are in fair condition with some large cracks running almost the entire length of the drive from the exterior wood doors into the fort. Some of the cracks have been sealed. The granite walls are also in fair condition. There are several areas of rust and efflorescence, especially around the granite arches and near the ceiling. The concrete barrel ceilings are in fair condition with minor cracks throughout. The concrete ceiling is spalling at the north sally port, and there is moisture damage on the east end of the south sally port.

The granite embrasures in the Sally Ports are generally in good condition. The south embrasure in Sally Port 152 is infilled and one of the other embrasures is deteriorating. The embrasures in Sally Port 151 are in good condition. The electrical systems consist of junction boxes, conduit, and temporary construction lights. The conduit and junction boxes are rusted, and the junction boxes are missing fixtures. There are no mechanical or plumbing systems in the Sally Ports.



Figure 59: Efflorescence on wall of north sally port (left) and spalling concrete ceiling in south sally port (right).

Note: For conditions of the doors see Exterior Fort Conditions Assessment beginning on page xx.

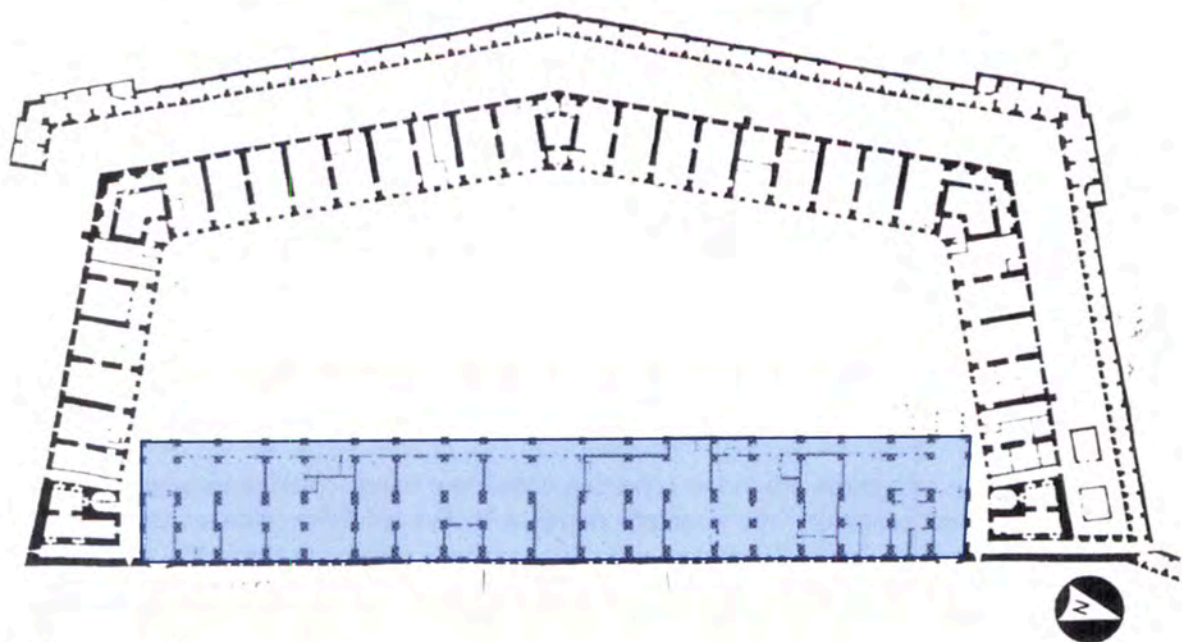
Structural

The floors in the sally ports are in fair condition with some minor cracking throughout. The stone walls are in good condition. The concrete barrel is in fair condition with cracks running both perpendicular and parallel to the arches and the concrete is spalling at the north sally port (Room 151).



Figure 60: Crack in concrete roof (left) and concrete spalling (right).

East Casemates



Architectural

Floors

The concrete floors in the east casemates are generally in good condition, but display a wide variety of conditions from one casemate to the next. These conditions range from modern concrete installed in the recent past with minor cracking and chipping in Casemate A to concrete floor with minor spalling and partition scarring in Casemate F. Other casemate floors exhibit large spalls and abandoned plumbing penetrations (Casemate E). Some casemates are full of sand or debris making assessment of the floor condition difficult (Casemates G and O, respectively). In many of the concrete floors, a hole or hatch has been put in the floor to provide access to the flooded basement space below. These openings vary in condition from good, with tight metal frame and hatch, to poor with

concrete damage at the hole and a missing frame and hatch. Some of the holes have been patched with concrete. The plywood floor of the stage in Casemate H is in relatively good condition.



Figure 61: Hatch in floor with damage to concrete, missing frame and rusted hatch.

Walls

The brick, stone and concrete block walls are in good condition overall wherever visible. There are isolated occurrences of brick deterioration and stone delamination, but these are minor. Areas of the masonry require repointing, as much as 20% in some individual casemates, but overall the masonry is generally sound. There is consistent water infiltration and efflorescence at the east walls of the casemate with the amount of infiltration being greater in the casemates at the center and south end of the fort. This infiltration has caused soiling, biological growth, rusting of abandoned iron anchors and embrasure bars. In locations where additional wall surfaces have been installed over the masonry, such as stucco, the water has damaged these finishes as well. A unique condition is the concrete block infill walls that make up the men's and women's restrooms in Casemate F. These walls are in good condition overall with only minor damage where plumbing fixtures have been knocked from the walls.

Supplementary wall finishes at the masonry and also secondary partitions have generally not fared as well as the masonry and are largely in poor to fair condition. Drywall and plaster are typically in poor condition with cracking and spalling typical in the plaster while the drywall is in many locations badly damaged or missing. Some of these conditions are attributable to general deterioration due to age or climate, but much can also be attributed to vandalism or general abuse. Wood paneling and plywood are typically in bad conditions with open joints, gouges and water damage at the former and delamination, warping and general damage present at the latter. Tile and wall glazing have also fared poorly over time with tile cracking and detaching from the walls and much of the glass broken.



Figure 62: Various wall conditions at the east casemates. Clockwise from upper left: Casemates N, C, E, L.

Ceilings

The bricks at the vault ceilings are generally in good condition except for a series of conditions that occur relatively consistently. The mortar joints at the east end of the casemate ceilings are significantly deteriorated, likely due to the amount of water infiltration occurring in these areas. In some locations, the mortar is missing to a depth of over 1 inch. Bricks in this area are often somewhat deteriorated as well. The other area of consistent deterioration is at the large arches that occur at the west ends of the casemates. Similar mortar, and occasionally brick, deterioration is often present with cracking visible as well. This cracking largely follows joint lines, but does cut through individual bricks in some instances.



Figure 63: Brick and mortar deterioration at casemate ceilings.

Windows

The condition of the windows at the west end of the casemates differ greatly from the windows at the east end of the casemates. Most of the windows at the west ends are modern replacements that are in good condition overall. They suffer from general heavy soiling and some of the window hardware has begun to weather and rust, likely due to the sea air. Most of the replacement windows were installed in walls that either had no interior finishes or existing deteriorated finishes. It is likely for this reason that they were installed with no interior trim. One or two of the windows have broken glass in the sash, likely from vandalism, but overall they are in great condition. The west end windows that have not been replaced are generally in poor condition and likely inform the condition of the others before replacement. These windows have open joints, missing/rusted hardware, splitting trim, cracked/broken/missing glass panes and general damage such as fastener scarring, broken parting beads and loose or damaged stops. Some of the sash in these windows have racked and are stuck in place.



Figure 64: Range of conditions at west end windows at the casemates.

The windows and screens at the east ends of the casemates are generally in extremely poor condition. Much of this deterioration is due to the poor construction of the windows and screens as many appear to have been installed in an ad hoc manner by the occupants. In addition to the quality of construction, the consistent water infiltration that has occurred at the east ends of the casemates has likely accelerated the deterioration. Typically, the frames of these windows are racking, have slipped out of place, have open joints between members, missing members, loose or damaged stops and parting beads, have suffered widespread damage from water as well as fasteners and anchors and are generally just falling apart. The sash, where present, are in similar condition with general racking, open joints, missing or broken glass, failed putty and rusting hardware. Because of the condition of the frames, many sash are only nominally held in place and many have slipped out of their frames and lie loose in the embrasures. The screens that have been fitted to many of the windows and embrasures are in similar condition with the screens warped, rusted and/or damaged.



Figure 65: Range of conditions at east end windows at the casemates.

While the above conditions are typical at the east end of the casemates, there are unique examples that are in slightly better condition. Some of the embrasures have been fitted to receive mechanical equipment or covered with plywood and, while in somewhat better condition, are still only in fair to poor condition. Other openings have been fitted with plywood to prevent intrusion or vandalism and are in good condition.



Figure 66: Modern plywood infill at embrasure (left) and older plywood infill fitted with mechanical equipment at Casemate O (right).

In addition to the windows in the east and west ends of the casemates there are a small number of windows in the secondary partitions in the casemates. In Casemate P, there are two fixed wood windows that appear to have been salvaged from another location and reinstalled. These windows are in fair condition with some rusting fasteners, open joints and failing putty. Plexiglass panels installed over gunloops at the sally port in Casemate Q are in fair condition with significant soiling and fastener rust.

Doors

Similar to the windows, the doors in the casemates are found in a variety of conditions. At the west ends of the casemates, several doors have been replaced with modern doors that, with the exception of occasional hardware damage and soiling, are in very good condition. Some splitting at the wood trim of the new doors is found in a few locations. There are also a small number of doors in secondary partitions that have been installed in the relatively recent past that are in good to fair condition. These doors have some minor hardware rusting, but this is minor where found. When the focus shifts to the older doors in the casemates, the condition level falls quickly. Most of the existing older doors range from fair to very poor condition with only a few exceptions that may be classified at the higher end of a designation as "fair." Metal doors, including hollow metal doors, metal-clad fire doors and overhead rolling doors all exhibit a degree of rusting, severe at the fire door (Casemate M) and door with wired glazing (Casemate E), and hardware damage and rust. Also at the fire door the sheet metal has begun to ripple and warp. The frames for the metal doors are generally in fair condition, but exhibit rusted jambs near the floor.

Where older wood doors and/or frames are present, the doors and frames are in poor condition with only one or two exceptions. Similar to the older windows, many of the doors exhibit open joints, water damage (especially in members near the floor), fastener damage, broken panes (where glazed), rusting or broken hardware, and damage or splits at panels, trim and stops. A unique example of a wood door in fair condition is in a secondary partition in Casemate P where a glazed wood paneled door was salvaged from elsewhere and reinstalled. Aside from open joints and minor rust at the hardware, this door is in far better shape than most. The same can be said for the two double-thick board doors held together with studs. Other than minor water damage at the bottom edge and rusting at the studs, these doors are in fair condition.



Figure 67: Modern wood replacement door (left) and significant rust and damage at hollow metal door (right).

Mechanical, Electrical and Plumbing

With only rare exceptions, all of the building systems in the casemates are in poor condition. Some modern lighting has been installed in a few of the casemates, but otherwise most of the components are missing, rusted or damaged. Cast iron drain pipes from the roof, where visible, are badly rusted and often broken. Plumbing fixtures and accessories are either missing, broken, rusted, soiled and/or askew. Electrical lighting, panels and receptacles are universally either badly rusted, damaged or missing. A few exceptions are ceramic light fixtures in some areas that need rewiring but otherwise may be in fair condition (these were typically at casemate ceilings and difficult to assess at close range) and galvanized steel conduit, which has resisted rust in many locations. Most of the mechanical systems have been removed, but where radiators piping and mountings or exhaust fans remain, they are badly rusted.



Figure 68: Damaged electrical panels (left) and rusted exhaust fan (right).

Structural

An assessment was not made in Casemates I and J as they were not accessible. In general, the casemates on the east side are in good condition. The concrete floors are in good condition, with only minor cracking noted. There is a hole in the floor towards the east wall in casemates F and N that was likely used as an access panel to the lower level (See Figure __). There is a crack in the east wall of casemate M, and cracking in the CMU wall of the existing men's bathroom outside of casemate E.

The concrete arches in the casemates vary from fair to good condition. There is minor cracking in the main barrel arch in Casemates A, B, E, H, L and P (rear arch) (See Figure __). Further cracking may be present in the arches, however they were not visible due to the coatings on the barrels. Water intrusion from the roof was detected along the east wall of casemates C, D, E, H and M, (See Figure __). Also, the pointing in the barrel arch has eroded on the east side, between the last opening and the east wall, in casemates A, F, G, and H.

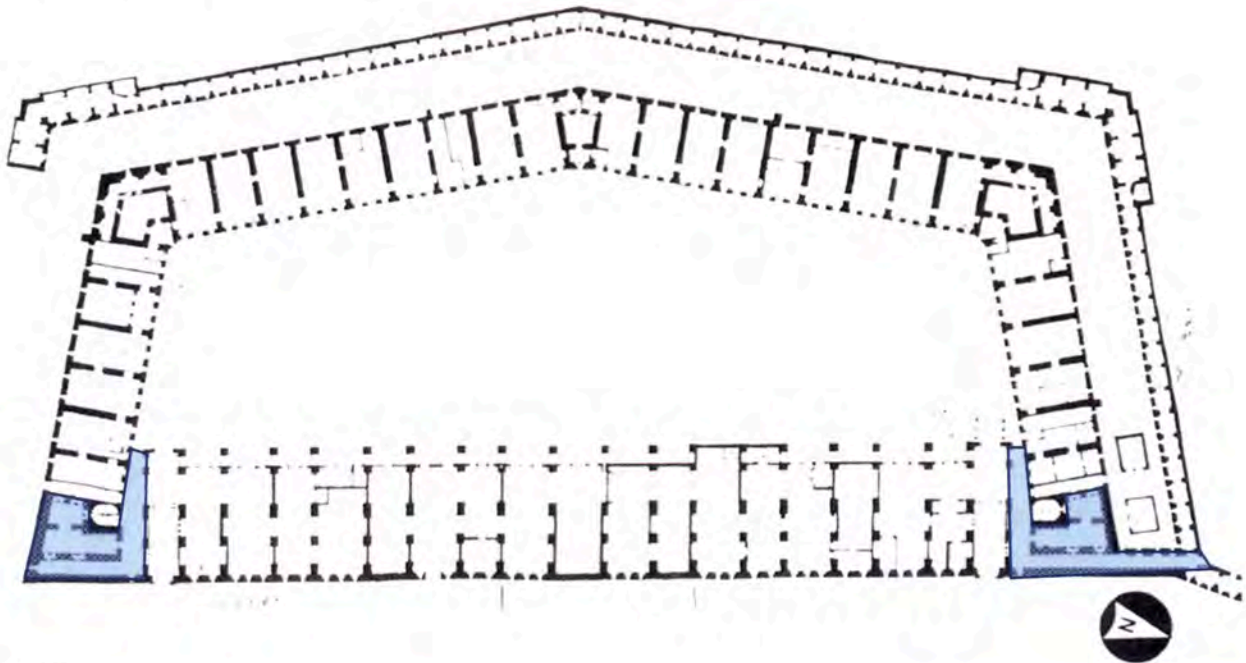


Figure 69: Hole in floor in Casemate N (left) and crack in east wall of M (right).

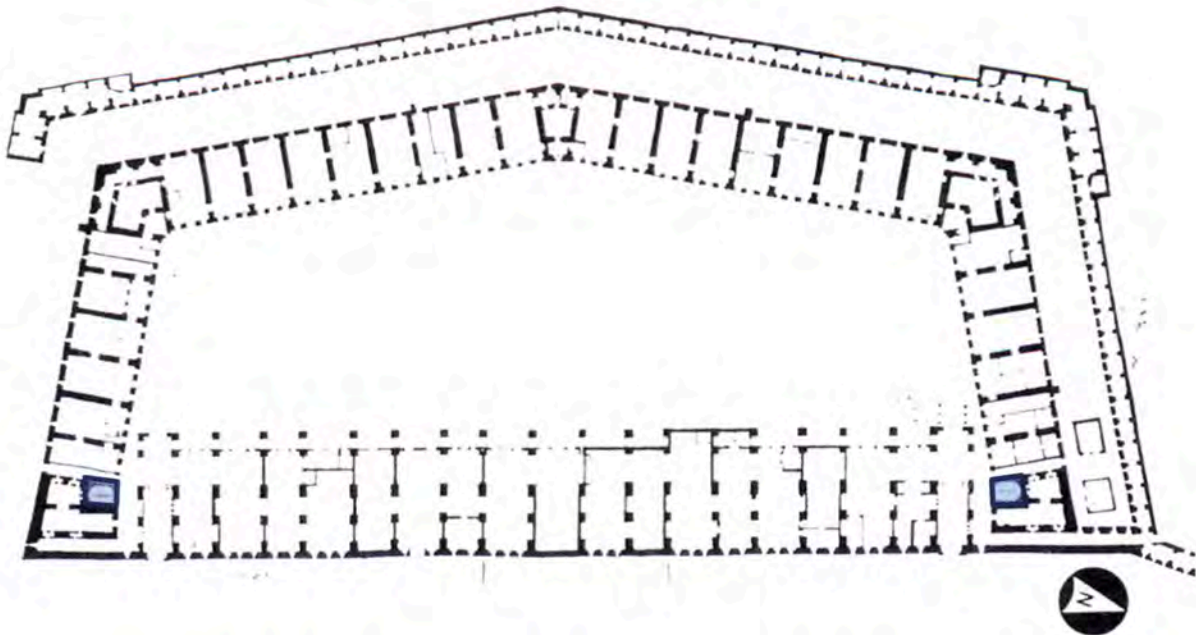


Figure 70: Crack in masonry barrel arch (left) and water intrusion on east wall (right).

North and South Corners – To be included.



Stairs



Architectural

The floors in the north and south stair are in good condition. There is minor spalling on the risers and a fair amount of debris on both locations. The conditions of the walls in the stairs vary, with better conditions on the lower floor and worse conditions on the second floor. There are areas of moisture and efflorescence, and various holes cut into the stone for pipes and conduit. Many of the

apertures where the pipes are located are also filled with cement or foam insulation. The paint/whitewash on the walls is fading, flaking and chipping, especially on the second floor.

The ceilings, similar to the walls, are in fair condition. The paint/whitewash on the ceilings is also fading and flaking, and there is more efflorescence on the ceiling than on the walls. There are also minor cracks in the ceiling. The stone embrasures are in good condition, though some dirt is present, and several appear to be filled with brick on the other side.

There are two doorways in the north stair: one door is missing and the other contains a wood door. The door that remains is in poor condition and is warped and splitting. There is one doorway in the south stair, on the first floor. The wood door with 5" veneer bead board has been removed but is placed next to the doorway. The wood frame is extant. Both are in fair condition.

There is a combination of old and new electrical systems. The junction boxes in the north stair are rusted and missing fixtures. The conditions of the wall-mounted boxes and conduit in the south stair vary from fair and operable to old and in poor condition. There are pipes in the south stair that are rusted and in poor condition.

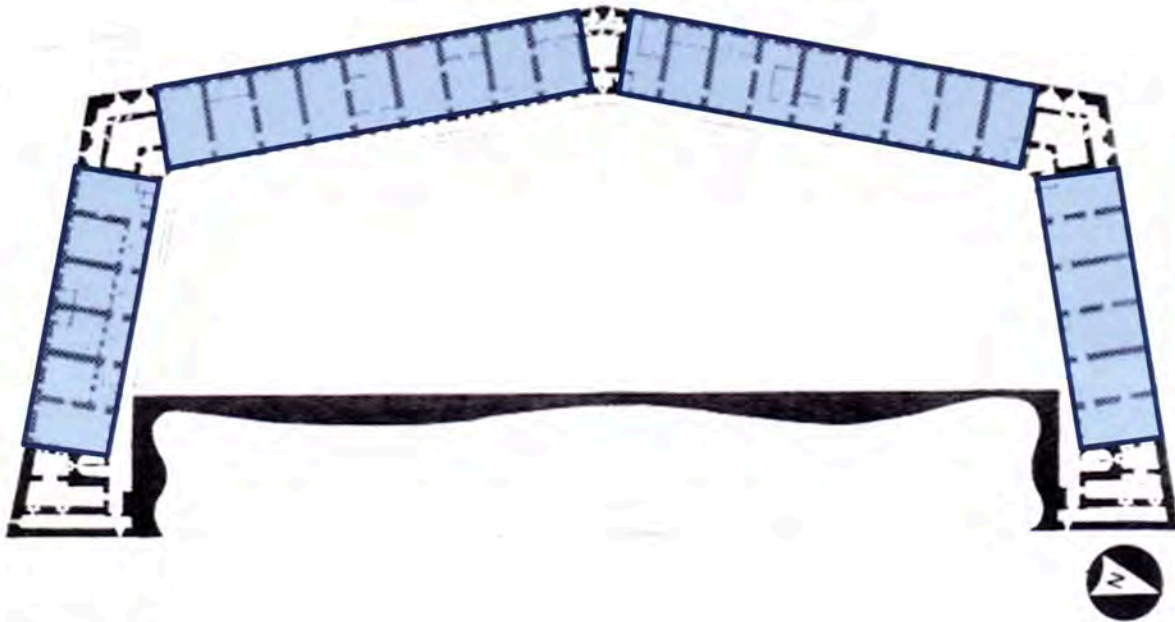
Structural

The main staircase structure is in good condition. The stone walls floors appear to be in good condition. There is a non-original wooden post on the northern staircase (See Figure ____). Though unclear whether the post is load bearing, it is in good condition. There are minor cracks in the roof-level barrel arch in the staircases (See Figure ____).



Figure 71: Wood post in north stair (left) and crack in roof structure on south stair (right).

Second Floor



Architectural

Floors

Most of the floors on the second floor are wood, and are generally in poor condition, with the exception of Room 201 where the wood floor is in good condition. Sections of the wood flooring are removed, or not sound. The boards are warping or splitting, the paint is fading or missing completely, and there is water damage and biological growth in several of the rooms. Plywood is installed on top of the wood floors in several locations, and is also deteriorating. In some of the rooms, the wood is completely removed, exposing the joists and nailers that are also damaged.

The composite sheet flooring in several of the rooms is also in poor condition as it is warping, bulging, and deteriorating. The brick floors appear to be in fair condition, however this is a large amount of debris obscuring the floor. There is a large amount of dirt and debris throughout the entire second floor. The concrete floor in Room 202 is in good condition.



Figure 72: Typical floor conditions on the second floor.



Figure 73: Deteriorating wood and plywood floor coverings on second floor.

Walls

The conditions of the walls vary from poor to fair. The brick walls on the south side of the fort are in poor condition. The brick in these rooms is spalling, and there are many displace, broken or cracked bricks. These rooms require extensive repointing, ranging from 50-70%. The plywood and batten walls in Room 201 are in poor condition with water damage, deteriorating paint and holes through.

The walls in the southwest and northwest sections are generally in fair condition with deteriorating paint, efflorescence, graffiti, and holes, some significant and measuring as much as 10". These rooms require 10-50% repointing. There are 2x6 boards installed at the "cornice" in Rooms 212 and 214 that are in poor condition and exhibiting rot and moisture. The cement walls in Room 218A are in good condition with a large amount of deteriorating paint. The walls in the north section are generally in fair condition with peeling paint, holes in brick, spalling, and erosion. These rooms require 20-50% repointing. Some of the walls in this section are bulging (see Structural Conditions Assessment below).

The partitions on the second floor are generally in poor condition. The plaster board partitions are in poor condition with water damage, holes, missing sections, and evidence of previous repair

work. The bead board partitions are in fair condition with peeling paint and missing trim. The wood partitions are in fair condition with missing panels and windows, deteriorating paint, missing glass, and deteriorating boards.



Figure 74: Deteriorating brick walls.



Figure 75: Deteriorating plasterboard partitions.

Ceilings

The conditions of the ceilings on the second floor vary from poor to fair. Most of the rooms contain wood beaded board on exposed rafters. Many of the boards are sagging, deteriorated, or damaged. Some sections are removed, some of the boards have been replaced and there are patches

throughout. The paint on the wood ceilings is deteriorating and there is mold and biological growth in several areas.

Some of the ceilings have been modified with acoustical or fiberglass tile. Some have been replaced completely, and some have section of tile with the bead board. All of tiled ceilings are in poor condition; sections are missing or sagging, and there is significant water damage throughout. The plywood and batten ceiling in Room 201 is also in poor condition with significant water damage, holes, and deteriorating paint. The brick arched ceiling in Room 232 is in fair condition with some water damage.



Figure 76: Water damage in acoustical ceiling tile (left) and sagging bead board and exposed wood rafters (right).



Figure 77: Deteriorating ceiling tiles.

Windows/Trim

The windows on the second floor are generally in poor condition. The eight-light steel casement windows have broken or missing lights. Some windows have broken or missing glass in every single

light. All of the steel frames are exhibiting fair amounts of rust, deteriorating paint, and graffiti. The casement frame in Room 229 is broken.

The windows in 201 and 219 have plywood infill in several of the lights. There are wood screen inserts in the steel casement windows in Rooms 207, 209, 210, 211, 213. The screens are in poor condition and are badly torn in Room 211. Iron security bars are installed on the windows in Room 211 and are badly rusted. In Room 212, the bottom muntins were removed and the bottom four lights have been replaced with a single-light. The casements in Rooms 215, 218, 220, 222/222A were modified to accommodate systems and vents. Some of the lights in the casements in Room 231 were replaced with painted plexiglass.

The three six-light pivot casement windows in Room 218 are in fair condition with three broken lights and a large amount of peeling paint. The six-light pivot casement windows in Room 222/222A are in good condition with fading paint.

The conditions of the single-hung steel windows on the second floor vary from fair to good. There is minor rust and deteriorating paint on most of the windows. In Room 226, there are two broken lights. The frames in this room are very rusted. In Room 231, it is likely that the east window is original, however the west window appears to be a replacement. The west is in good condition, while the east is in poor condition with three broken lights.



Figure 78: Pivot casement window (left) and typical eight-light steel casement window (right).

Doors/Doorways

The conditions of the doors vary from poor to good. The conditions of the wood paneled doors in Rooms 201, 205, 207, 213, 214, 215, 218, 218A, 219, 222/222A, 223, 224 and 227 vary from poor to fair condition. Their deteriorating conditions include peeling paint, splitting wood, missing mullions, rusted or missing hardware, and broken or missing lights. The metal frame for the wood door in Room 224 has a wood frame applied on top. The wood paneled doors in Rooms 208, 209 and 210 are in good condition, with some broken lights.

Wood cased openings in Rooms 216, 219 and 220 are in good condition with peeling paint, rusted hardware, and some wood blocking added in Room 216. The door in Room 216 was removed and is located next to the opening. Wood frames are installed on top of metal frames in Rooms 218 and 222 (both in poor condition) and in Rooms 221 and 226 (both in fair condition).

The conditions of the metal doors on the second floor vary from poor to fair. The metal doors in Rooms 202, 203, 204 and 227 are in poor condition; they are rusted and have deteriorated paint and rusted hardware. The metal doors in Rooms 206 and 222/222A are in fair condition with rusted hardware. The metal frame in 222/222A is in poor condition; it is broken and extremely rusted.

The metal cased openings in Rooms 215, 219, 220, 221, 223, 224, 225, 226, 228, 229, 230 and 231 are in poor condition and extremely rusted. Some of the frames are broken. The metal cased opening in Room 213 is infilled. The metal sliding door in Room 111 is also in poor condition and extremely rusted. The door with iron bars, located in Room 212, is in poor condition. They are rusted and fixed in place.

The exterior metal doors on the second floor are generally in good condition. Most of the doors have a three-light, wood transom above, also in good condition. Room 231 does not have a transom above the door. The wood door in Room 232 is a replacement and is missing a light in the transom. Some of the doors are exhibiting minor rust and deteriorating paint. The metal frame in Room 226 is rusted.



Figure 79: Typical conditions of second floor doors.

Mechanical, Electrical and Plumbing

The lighting fixtures on the second floor, consisting of suspended pendants and ceiling-mounted fluorescent fixtures, are in poor condition. Each are exhibiting a large amount of rust, and some are partially detached from the ceiling. Junction boxes, conduit and outlets are also in poor condition;

they are rusted and missing fixtures. Some of the electrical boxes appear to newer and are in fair condition.

There are several restrooms on the second floor. Room 203 has a lavatory, sink and shower. All are in poor condition; they are rusted, dirty and no longer in use. The lavatory in Room 215 is disconnected and rusted, and the lavatory in Room 219 is in fair condition. Room 216A has a water closet and lavatory; both are dated, dirty and rusted. The two lavatories and water closets in Room 218A are also in poor condition and rusted. Room 222/222A is a large space with many plumbing fixtures: three water closets, two lavatories and two urinals. The lavatories and urinals are in fair condition, and the water closets are in poor condition and very rusted. The water closet in Room 231 is in poor condition, while the lavatory in Room 231 is in fair condition.

Most rooms have at least one radiator, some have two or three. The radiators are no longer in use, some are disconnected and all are extremely rusted. There is a cast iron waste vent in Room 206 that is in poor condition.



Figure 80: Rusty suspended fluorescent light fixture with bird nest (left) and typical conditions of radiators (right).

Fireplaces

The conditions of the second floor fireplaces are similar to those on the first floor, most in fair condition. The fireplaces in Rooms 202A, 203A, 204A, 205A, 206, 219 and 231 are infilled with brick; the brick infill in Room 231 is bulging. The fireplace in Room 220 is infilled with particle board, which is deteriorating and in poor condition. Many of the fireplaces have missing pointing and most have cracks, typically in the back wall or in the arch. Many of the fireplaces are evidence of efflorescence, and have water damage or spalling, typically in the brick arch. There are shifting or missing bricks around the fireplaces in Rooms 221 and 223. Some of the fireplace flues/vents are infilled with brick, including those in Rooms 212, 213 and 214; the brick infill in Room 212 is bulging. The vent in Room 230 is rusted, and there is smoke damage around the vent in Room 221.

Structural

In general, the wooden floors for the upper floor are in poor condition (See Figure ____). In many locations the flooring is missing, and the wood that has been embedded into the concrete is

deteriorating. The wood floors were noted to be in poor condition in Rooms 204, 205, 206, 207, 208, 212, 218, and 219.

The walls of the upper floors are in fair condition, with some missing pointing in Rooms 213, 220, and 223. There are cracks in the brick walls separating fire places, similar to the first floor (See Figure ____). The door jamb between Rooms 202 and 203 is broken, with missing bricks (See Figure ____). Two interior brick walls are out of plumb: the wall between Rooms 223 and 224, and the wall between Rooms 229 and 230(See Figure ____). There are also holes in the mortar in the wall between Rooms 229 and 230, extending back into the wall. It is unknown why the walls are bowing; further investigation is required to determine the reason for the out-of-plumb walls, and to determine if any major structural issues are present given the extent of the condition. Finally, there is a large amount of pointing grout missing, and it is unclear how much load from the roof is being supported by the wall. Currently the roof structure does not appear to be in distress.

The wood ceilings on the second floor are in fair condition. In some areas the ceiling is showing signs of deterioration, particularly at the end bearing of the purlins spanning from eave to ridge (See Figure ____). This condition was noted in Rooms 225, 227, 228, and 229 (See Figure ____). The wood ceiling is missing in Room 232. Based on areas that are visible, the arches in the brick barrel roof structure above the wood ceiling appear to be in good condition.



Figure 81: Deteriorated floor (left) and crack above fire place (right).



Figure 82: Broken door jamb (left) and bowing wall (right).



Figure 83: Missing mortar in bowing wall (left) and failed roof purlin bearing (right).

There are cracks in the arched brick roof structures in Rooms 237 and 238, as well as missing mortar and deteriorated brick in the ceiling in Room 238 (See figures __ and __). The stone walls and arched brick ceilings in Rooms 239 and 240 appear to be in good condition, with minor cracking in the concrete floors. There is also some efflorescence on the ceilings of these rooms and a large longitudinal crack in the ceiling in Room 235 (See Figure __). The roof structure in Rooms 233 and 234 appear to be in good condition, with some efflorescence in the ceiling. Finally, there is a crack in the rear wall of Room 233.

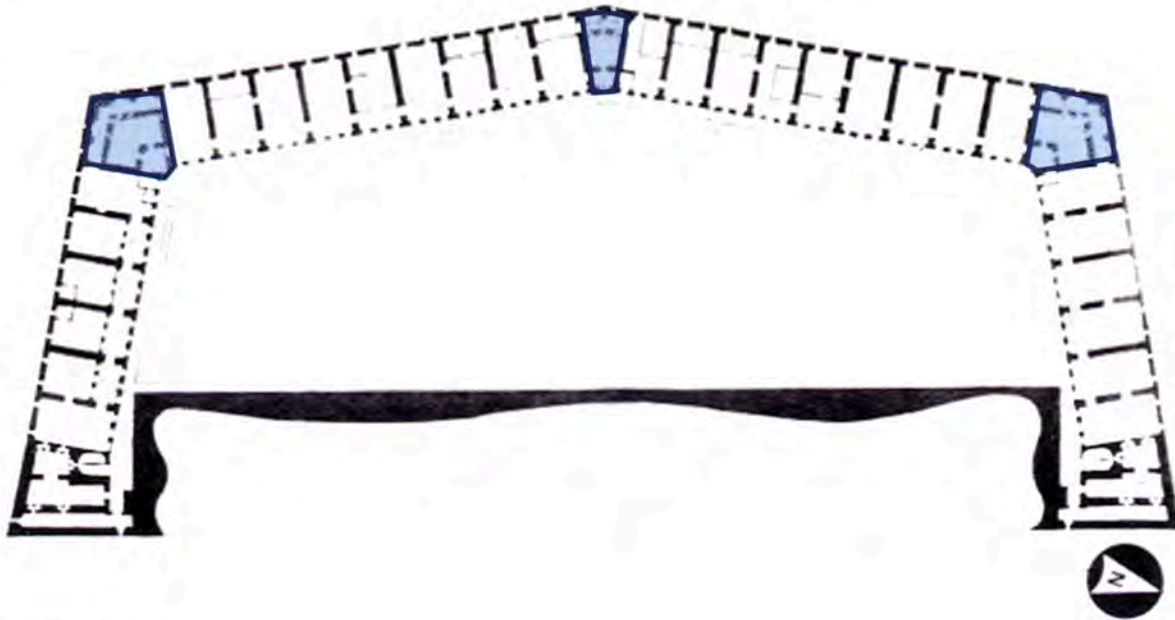


Figure 84: Captions to be included.



Figure 85: Crack in roof of Room 235 (left) and efflorescence in Room 233 (right).

Corners



Architectural

Floors

The conditions of the floors in the second floor corners vary from poor to fair. There is debris obscuring some of the concrete floors, however they appear to be in fair condition with some cracking and some standing water. The brick and ceramic tile is also obscured, and their condition aren't clear, however the ceramic tile appears to be in fair condition. Finally, the composite sheet flooring is in poor condition; it is deteriorating, cracking and sections are missing.



Figure 86: Deteriorated composite sheet flooring (left) and brick floors obscured by debris (right).



Figure 87: Water damage on concrete floor in corner section.

Walls

The condition of the walls vary from poor to good. Section of the granite walls are in fair condition, while others are in poor condition exhibiting efflorescence, missing pointing, and severe water damage (in the northwest corner of the fort). In one area, there is an active leak, with severe water damage and rust that carries through the granite wall to the room on other side. There is at least one crack in the granite, and some deteriorating mortar in these areas.

The sandstone infill is in poor, with a fair amount of efflorescence throughout. The plywood infill is also in poor condition, and is warping in some sections due to water damage. The plaster wall conditions vary from poor to fair with deteriorating plaster throughout, and the brick base is in fair condition. Finally, the tile wainscot walls in the lavatories are in good condition.



Figure 88: Crack in granite and deteriorating paint (left) and severe water damage on granite walls (right).

Ceilings

The ceilings in the second floor corners are generally in poor condition. The brick arched ceilings (some with parging) are generally in poor condition with water damage, active leaks, mold and biological growth. Approximately 50% of the pointing is missing in these areas, the paint is peeling and there is efflorescence throughout. The plaster ceilings are also in poor condition with cracks and peeling paint throughout.



Figure 89: Typical brick ceilings in corners with evidence of water damage.

Windows/Trim

The steel French casement windows are in poor condition. There are three sets, each with three lights, and twelve of the lights are broken. One of the lights has been modified with plywood and a waste pipe is installed. The steel frames are rusted and the paint is deteriorated and peeling throughout. The single-light, double-hung window is in fair condition with peeling paint on both sash. The embrasures in the corner sections are in good condition; two have been infilled with brick on the exterior of the opening.



Figure 90: Modified French casement window (left) and one-over-one double-hung window (right).

Doors/Doorways

The conditions of the metal doors in the corners vary from poor to good, with most of the hardware on these doors very rusted. The conditions of the wood doors and frames vary from poor to fair with peeling paint, checking, scoring, rusted hardware and wood blocking added in some locations. One doorway is blocked with metal framing, wood board, and insulation, however half of the wood boards are missing. The granite doorways are in fair condition with water stains, active leaks and efflorescence on most.



Figure 91: Typical doors in corner sections showing water damage (left).

Mechanical, Electrical and Plumbing

The systems in the corner sections are generally in poor condition. The conduit and electrical boxes, are extremely rusted and the junction boxes are rusted, missing fixtures and detaching from the walls. The light fixtures, including suspended fluorescent lights and wall mounted sconces are rusted and missing fixtures. The plumbing fixtures including lavatories, water closet and urinals are rusted, dated and dirty, and the radiators and floor drains are also rusted.



Figure 92: Typical plumbing and electrical systems.

Structural

Rooms 206B, 206C, 217, and 217A were not accessible at the time of the assessment due to the condition of the upper walkway. The walls in the corners are in good condition with some minor repointing needed in Room 216 along the west wall and in Room 227A (See figure ____). There are areas of sandstone infill, showing signs of deterioration (See Figure ____). A leak in the roof was visible in Room 226B; the roof structure needs to be repointing in Rooms 206A, 226B, and 227A.



Figure 93: Pointing missing in wall (above) and deteriorating sandstone (below).

Third Floor

Architectural

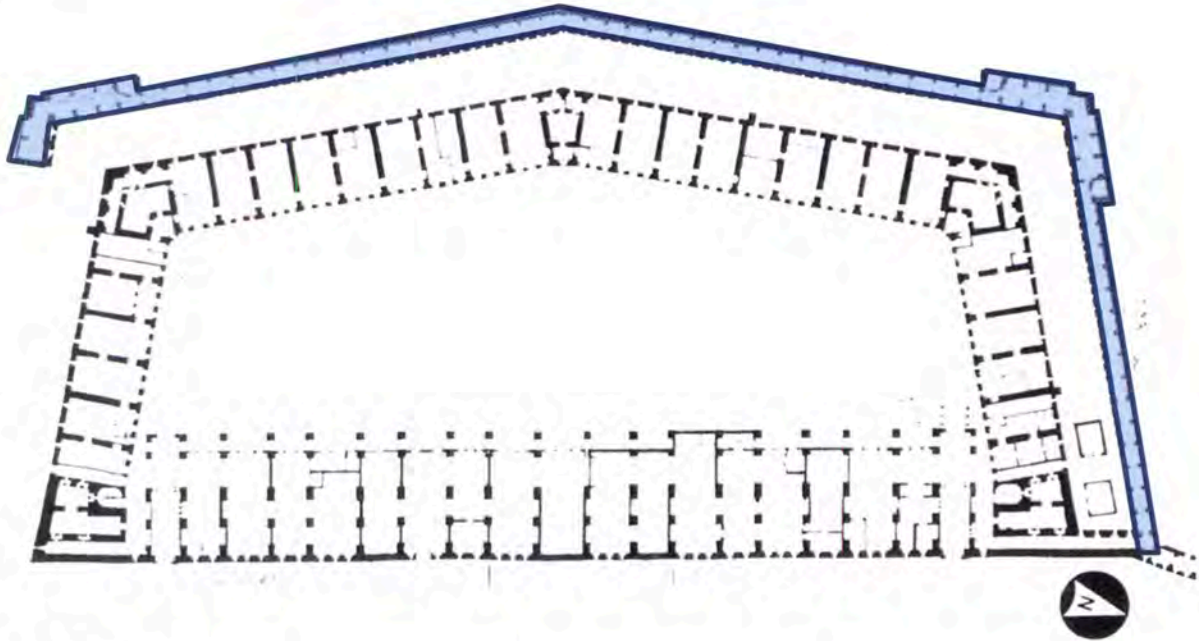
The floor in the third floor electrical room is in fair condition with some accumulation of dirt and debris. The brick walls and brick arched ceiling are also in fair condition, however they require 100% repointing. There are no windows in this space, and the only door opening, a metal lattice security door is in poor condition and extremely rusted. The electrical systems, including junction boxes and electrical substation appear to be in fair physical condition, although their operating condition is unknown.



Figure 94: Rusted security door (left) and missing pointing in brick ceiling and walls (right).

Structural – To be included.

Counterscarp



Architectural

Floors

The dirt floors through most of the counterscarp are fairly consistent though varying somewhat in depth. One exception is C146 which has a large depression in the floor that corresponds with a brick drain enclosure in the west wall. The hole is traversed by a pair of wood planks. The cementitious fill and gravel floor at C101-C109, near the current entrance to the counterscarp is in good condition. The metal edging that defines the edges of the newer flooring is in fair condition with only minor surface rust present. At the corner rooms of the counterscarp, the dirt floor is at its thinnest and most densely packed, exposing the semicircular rails of the pivoting gun carriages. The concrete floors in rooms C117, C125 and C165, where visible, appear to be in good condition.



Figure 95: Wood planks traversing the depression in the floor at C146 (left) and exposed pivot rails (right).

Walls

Described in greater detail in the structural section below, the brick and sandstone masonry walls of the counterscarp are experiencing significant levels of deterioration through erosion and spalling. Conditions are decidedly more pronounced at the glacis-facing walls though the deterioration is present to a lesser degree at the dry moat walls as well. Efflorescence occurs regularly at the glacis wall masonry as well. The mortar joints throughout the counterscarp are in poor condition with a majority requiring comprehensive repointing. In the worst locations, mortar is missing in joints to a depth of an inch or more.

Ceilings

The bricks at the vault ceilings are generally in better condition than many of those found at the walls, but the mortar is frequently worse. Outsized areas of mortar joints have experienced large degrees of mortar loss. Efflorescence is significantly more pronounced at the ceilings.



Figure 96: Brick and mortar deterioration at the northeast "tail" of the counterscarp.

Doors

A few of the Totten embrasures at the corners rooms of the counterscarp have retained their cast iron shutters. These shutters have been damaged in some locations through abuse or unintentional damage, but most of the doors that remain have suffered damage through extensive rusting. In some locations, rust has resulted in significant material and section loss. In Rooms 158 and 160, near the entrance of the counterscarp, two former door openings have been blocked shut with steel planks. This steel is significantly rusted as well, but still appear to be sound.



Figure 97: Badly deteriorated embrasure shutters (left) and significant rust and door blocked with steel (right).

Mechanical, Electrical and Plumbing

The modern lights installed in the cementitious floors at the north end of the counterscarp appear to be in fair condition. There has been some water infiltration or condensation occurring inside the fixture, but it is not clear that this has damaged the fixture as they are made for exterior use. At C144 and C145, the abandoned electrical equipment and cabling are in very poor condition. In one location, C146, the brick enclosure for a roof drain has been damaged and the drain exposed. The drain is in poor condition with the entirety of the drain significantly rusted and large holes in the sides of the cast iron pipe present.



Figure 98: Modern floor light fixture (left) and badly deteriorated electrical equipment (right).

Structural

In general, the counterscarp is in good condition and the dirt floor is mostly consistent. The wooden platform in C144 is in fair condition, showing some signs of deterioration (See Figure__). In C145, the soil has been removed, with two wooden boards extending over the excavation (See Figure __). The boards deflect heavily when weight is added, and they are not designed to take pedestrian loads.

The sandstone walls are consistently eroding throughout the counterscarp (See Figure__). The erosion currently does not appear to extend further than 1" at its deepest, and is not a structural concern, however, it should continue to be monitored. There are cracks in approximately half of the arched passageways between casemates, (See Figure __). The cracks do not appear to run beyond the brick arch and are not an immediate structural concern.

In the entrance to the counterscarp (Room 158), there are signs of erosion in the brick, pointing and mortar bed (See Figure __). There is a longitudinal crack on the south side, running parallel with the barrel roof (See Figure__).



Figure 99: Wooden platform (left) and excavation of Counterscarp (right).

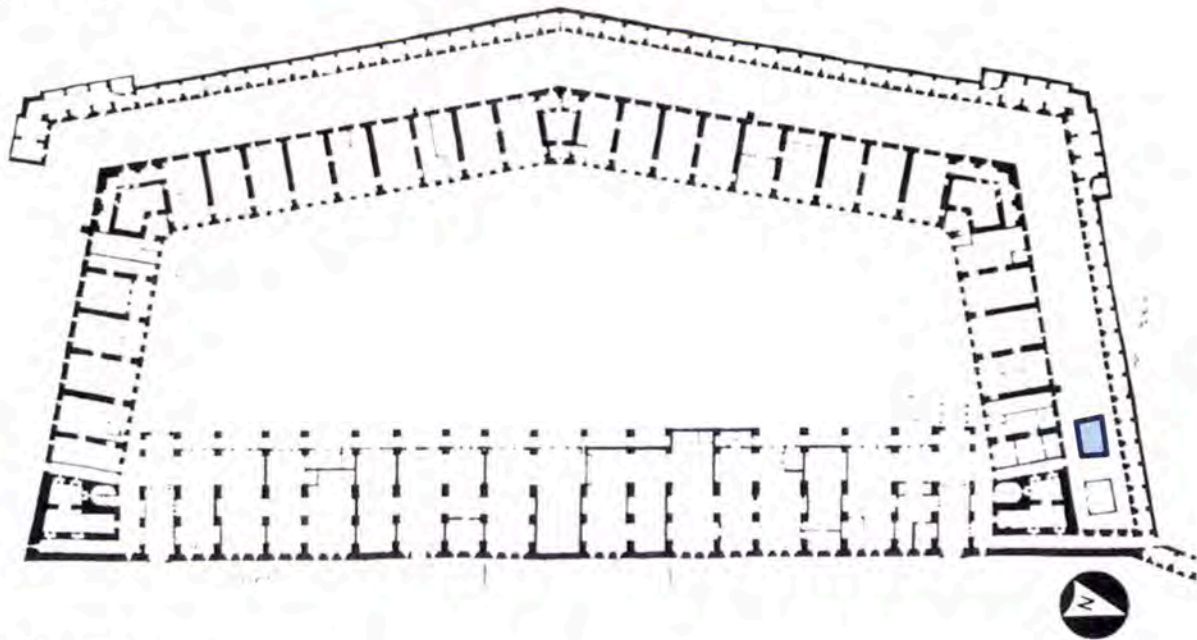


Figure 100: Eroded sandstone (left) and crack in brick arch (right).



Figure 101: Erosion to brick / mortar (left) and crack in barrel (right).

Building 138



Architectural

Exterior

Building 138 is generally in poor condition. The exterior brick walls are in fair condition with some cracking, staining, missing bricks (east elevation), and deteriorating or missing pointing throughout. There is a crack in the stone foundation on the east elevation, and there is abandoned hardware, holes in the brick, a pipe (sealed with cement) protruding from west elevation. Other conditions include efflorescence stains, graffiti and mastic material throughout the structure, and piece of wood attached to the bottom west corner of the north elevation.

The roof of Building 138 is in poor condition. There are two large holes: one on the east elevation near the fascia, and one on the west elevation, with several missing shingles. The rafter tails and fascia are in fair condition with areas of fading and peeling paint, vegetation, and biological growth, and there are pipes and wires protruding from the fascia. The chimney is also in fair condition with cracks and missing pointing, and vegetation atop the structure. The copper brackets on the north side of the chimney are rusting and partially detaching.

The windows are in poor condition, as each is infilled with plywood and chain link and some of the windows have minor cracks in the arches. The wood frames are in fair condition with deteriorating paint. The granite sills are generally in good condition with paint stains from the painted wood frames. The shutter on the east window of the north elevation is warping, has peeling paint, and rusted hardware, and there are two pieces of wood nailed to shutter. The east window on south elevation is infilled and there are pipes and wires connecting to fort from this window.

The doors are in poor condition. The original metal door on south side of east elevation is rusted, the wood frame is rotting and there glass panel is broken. The paint is deteriorating and the

hardware is rusted. The door on the north side is infilled with plywood and chain link, and there is a large hole in the center of the door (this door has been partially infilled on interior for a window).



Figure 102: Stains on masonry below damaged roof and fascia (left) and stepped crack in masonry (right).



Figure 103: Large hole in plywood infill and paint stains on masonry of north elevation.

Interior

The interior of Building 138 is in poor condition. While the floor and the walls are in fair condition, the metal ceiling is in extremely poor condition. The floors have some minor cracks and a large amount of trash throughout. The walls are exhibiting peeling paint, stains and efflorescence. The ceiling is severely deteriorating and completely rusted with holes and peeling paint. Large sections are missing and the rafters are visible.

The windows are also in poor condition. One the west wall, the sash in the south window is intact, however all of the glass is missing. The right window is infilled with plywood. The small windows on the north and south elevations are also infilled with plywood. On the east elevation, part of the sash

in the north window (previously a door), is missing and is partially infilled with plywood. Some of the trim and sills on the windows are deteriorating, however most appear to be in fair condition with peeling paint throughout.

The systems in Building 138 are in poor condition. The suspended fluorescent light fixtures are extremely rusted and some are partially detached from the ceiling. The electrical panels and conduit are also in poor condition and severely rusted. The two radiators, one on the east elevation and one on the west, are no longer in use and severely rusted. The lavatory on the west wall is also no longer functioning, dirty and rusted.

Note: For conditions of doors see exterior conditions assessment above.



Figure 104: Overview of interior of Building 138 (left) and deteriorating metal roof (right).

Structural

The exterior brick walls for Building 138 are in fair condition with minor cracks throughout. There are interior and exterior diagonal cracks in the northeast corner (See Figure ____). The structure does not appear to be in distress, however the crack should be monitored as it could be caused by a foundation settlement issue, and it is possible there are other structural issues. The roof is in poor condition; there are multiple holes in the roof, allowing moisture to penetrate, and in some areas the roof trusses are showing signs of deterioration and will likely need to be replaced (See Figure ____). The ceiling under the trusses is also heavily corroded and missing in some areas (See Figure ____).

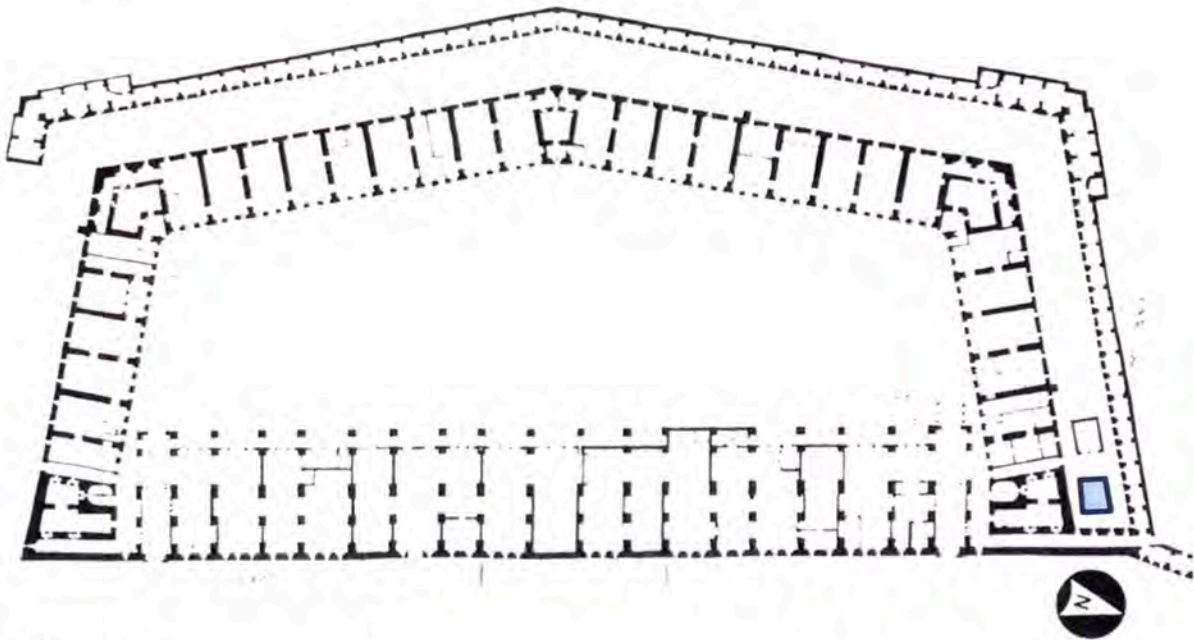


Figure 105: Diagonal crack in northeast corner of interior (left) and exterior (right) of Building 138.



Figure 106: Holes and deteriorated wood in roof of Building 138.

Building 139



Architectural

Exterior

Building 139 is generally in poor condition. The condition of the bricks walls vary from poor to fair. On the west elevation, there are cracks next to and under the windows, and there is minor spalling and broken bricks in the corners of the structure. On the south elevation, some of the bricks are spalling near the door jambs and to the west of the window, and there are several minor cracks with broken bricks. There is moderate biological growth on the south elevation and severe biological growth on the east elevation, especially near the foundation and where the roof is missing. There are cracks and minor spalling throughout, as well as peeling paint. The north elevation is exhibiting mild efflorescence and brick spalling, and there are three cracks around the windows with a loose brick at one of the window jambs. The pointing on the structure is generally in fair condition, likely requiring 20% repointing throughout, however the pointing on the east elevation is in poor condition and will likely require at least 70% repointing. It is evident that some previous repairs and spot pointing on the exterior walls occurred at one time.

The windows in Building 139 are in poor condition. On the west elevation, the stone lintel and sills are in good condition, and the concrete sill is in poor condition with a significant crack. The sash on the upper window is covered with beaded board and the wood lintels, casing, jamb and plywood infill are in poor condition; they are rotting and splitting and the paint is deteriorating. The window on the south elevation is also in poor condition; it is infilled with plywood and there is significant spalling at the stone sill. The stone lintel is in good condition. The windows on the east elevation are in poor condition. All of the wood elements, including the lintels and plywood infill are rotting, splitting and have deteriorating paint. Some of the trim is missing and there is biological growth and water damage on the windows. The stone sills are in good condition. The windows on the north

elevation are in fair condition. They are infilled with plywood, and the stone lintels and sills are in good condition.

The conditions of the doors, both located on the south elevation, vary from poor to fair. The west door is in poor condition; the wood jamb and stiles are rotted, the bottom rail and glazing are missing, and the upper glazing is cover with plywood. The hinges and hardware are rusted, the stone sill is in fair condition and the stone stoop is in good condition, however it is sloping towards the building. The east door is in poor condition; the wood jamb is rotted and the wood stiles and rails are severely deteriorated. There is minor spalling on the stone lintel, the stone sill is in fair condition, and the stoop is buried in the ground.

The wood elements on Building 139 are in poor condition. On the west elevation, the cornice and rakeboard are deteriorated, especially in northwest corner. There is severe vegetation on the fascia board, the paint is deteriorated, the ends are rotting on the north elevation, and it is partially missing on the east elevation. The roof is in poor condition, with large sections of shingles and rafters missing.



Figure 107: Stepped crack in masonry (left) and missing section of roof causing deteriorating conditions on the masonry (right).

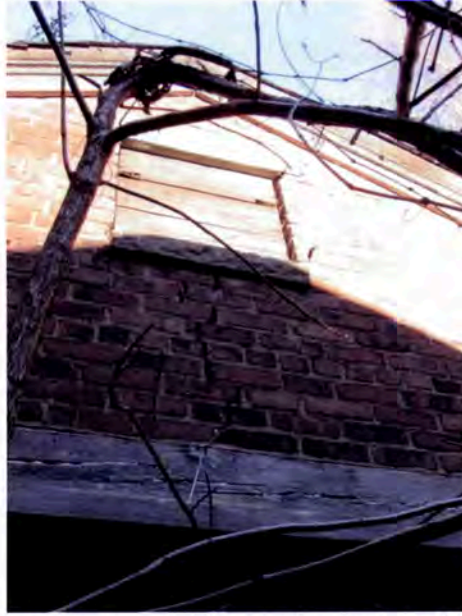


Figure 108: Large masonry crack between fenestrations of Building 139.

Interior

The interior of Building 139 is generally in poor condition. The floor appears to be in fair condition with a few minor cracks, however it is mostly obscured by a large amount of debris due to the extremely deteriorated roof. The brick walls are in fair condition with some areas of peeling paint, stains and efflorescence. The ceiling is in poor condition. It is extremely deteriorated and mostly missing. A large hole in the roof is visible near the ridge beam, exposing the interior to the elements. The rafters are exposed and severely rotted.

The windows are also in poor condition. On the west window, the wood is deteriorating and the paint is peeling. On the south elevation, the wood is deteriorating, the paint is peeling and the bottom left light is broken. The windows on the north elevation are also exhibiting deteriorating wood and peeling paint. All of the glass is extant in the left window and the bottom, center light of the right window is missing. The east windows are similar to the rest; the left window retains all glazing, and both lights are missing in the right window. All of the wood lintels are deteriorating and the paint is peeling.

There are no mechanical or plumbing systems in Building 139. The remnants of electrical wiring and conduit are extant and in poor condition, exhibiting severe rust.

Note: For conditions of doors see exterior conditions assessment above.



Figure 109: Hole in roof and deteriorating wood rafters (left) and overview of the interior of Building 139.



Figure 110: Hole in roof and water stains on brick interior wall.

Structural

The condition of Building 139 is similar to Building 138. The exterior brick walls are in fair condition, with minor cracking in the northeast and northwest corners, which do not appear to be major structural concerns (See Figure __). There are multiple holes in the roof, leading to areas of deterioration on the trusses (See Figure __).



Figure 111: Cracks in masonry in northeast corner (left) and northwest corner (right) of Building 139.



Figure 112: Deteriorating wood trusses in Building 139.

GLOSSARY

accessibility	Capable of being reached; providing access. Typically referring to ease of entry and use by disabled persons.
arch	A curved construction spanning an opening.
ashlar	Squared building masonry used in the construction of walls and other structures.
bay	A basic unit or module of a building defined by regularly repeated elements.
barbette	A platform on which guns are mounted to fire over a parapet.
barrel vault	A continuous arched roof of stone, or semi-circular section, supported by parallel walls.
bastion	A work projecting outwards from the main walls of a defensive enceinte, designed to enable the garrison to see and defend the adjacent perimeter together with the area in front of the ramparts.
battery	A platform, usually protected by a parapet, for canon and mortars.
beam	A rigid structural member designed to carry and transfer transverse loads across space to supporting elements.
blockhouse	A small fortified work consisting of one or more rooms fitted with loopholes in its sides to permit defensive fire in various directions.
caponiere	A sheltered defensible passage across the ditch of a fort or cut through the glacis, linking the outerworks to the main enceinte; sometimes used to provide additional flanking fire along the ditch.
casemate	A vaulted chamber built in the thickness of the ramparts and used as a barrack or gun position (firing through embrasures).
casing	The finished, often decorative framework around a door or window opening.
cladding	A protective covering that protects the exterior structure of a building (see siding).
coastal battery	A work, sometimes fortified against direct assault, designed to engage enemy ships close to the shore.
coping	A sloped or beveled stone cap places on top of a parapet or wall so as to protect the masonry and infill below from the penetration of water from above.

counterscarp	The outer wall of the ditch facing the ramparts.
counterscarp gallery	A casemate within the counterscarp fitted with musketry loopholes to defend the ditch and scarp wall.
curtain	The main wall of a defensive work, usually the length of a rampart between two bastions.
cutting	A narrow opening in the parapet of the covered way, cut through the crest of the glacis, to allow for the passage of troops onto the glacis – designed to facilitate counterattacks and are therefore usually found on the parapets of the places-of-arms.
deflection	The displacement of a structural element under load.
ditch	A dry trench outside a fortified work, usually rock-hewn, to obstruct direct assault on the main walls.
double hung window	A window having two vertically sliding sashes, each in separate grooves or tracks and closing a different part of the window.
eave	The overhanging lower edge of a roof.
embrasure	An opening cut in the parapet through which a gun could be fired without exposing a guncrew, normally wider at the front than at the rear; in casemates an enlargement of a window opening by means of splayed sides.
enceinte	The fortified perimeter of a defensive work, and the area enclosed by it.
Endicott Period	During President Grover Cleveland's first term, in 1885 to 1889, Secretary of War William C. Endicott convened a board comprised of Army and Navy personnel and knowledgeable civilians to study locations, fortification types, armament, and protective materials for coastal defenses. The Endicott Board met in 1885 and early the following year released findings that called for defensive structures at twenty-six coastal locations.
escarpe	The wall of a fortified work which forms the side of the ditch facing outwards towards the counterscarp.
escarpment	A steep slope in front of a fortification to impede an enemy's approach.
fenestration	A general term used to denote the pattern or arrangement of windows on an exterior wall.
flat-arch	An arch with a horizontal intrados, having little or no convexity.

flank	That section of a fortified work designed to defend an adjoining work and to provide enfilading fire.
foot of glacis	The line where the sloping glacis meets the level ground of open country.
fort	A fortified military establishment, a fortress without a city.
glacis	The sloping ground in front of a fortress spanning from the top of the parapet of the covertway down until it reaches open country, cleared of all obstacles to bring an advancing enemy into the direct line of fire.
grade	The vertical elevation where the ground meets the foundation of a building. Also called <i>grade line</i> .
gun-loop/gun-port	A circular loophole with accompanying vision-slit through which early medieval guns and cannon could be fired from behind a parapet or from within a casemate.
joist	A timber that spans the width of a building and supports the floors and, at the attic level, the base of the roof framing.
light / lite	A term for each pane of glass in a window.
lintel	A horizontal stone placed over an opening to carry the weight of the wall above it.
load	Any of the forces to which a structure is subjected.
loophole	A long and narrow opening in a wall to provide for vision and small arms fire; loop window or arrow slit, a loophole for crossbows; gun loop, a loophole for small early cannon.
magazine	A storage place for gunpowder and other munitions.
masonry	The stonework or brick work of a building or wall.
moat	A wide and deep trench surrounding the walls of a fortress or castle, usually filled with water.
mortar	Masonry bonding cement usually composed of lime and sand; in the late nineteenth and twentieth centuries, of Portland cement.
moulding	A decorative recessed or relieved surface used for finishing or purely as ornamentation.
muntin	In windows, the thin bar used to hold glass panes in place; in paneled doors, the vertical central members used to hold the panels in place.

parapet	A breastwork on top of a rampart intended to provide shelter for troops behind it.
piazza	A large open space or courtyard inside a fortress, a parade ground.
pointing	The finish treatment for mortared joints.
rafter	The sloping framing element that is seated on a plate or a false plate and supports the roof covering.
rake	A board or molding placed along the sloping sides of a gable to cover the ends of the siding; the inclined, usually projecting edge of a sloping roof.
rampart	A thick wall of earth or masonry forming the main defense of a fortress, usually reinforced from the rear with terreplein.
ridge	The line of intersection of the opposite slopes of a roof.
sally port	A concealed gate or underground passage leading from inside the fortress into the ditch; a postern.
sash	A frame in which glass window panes are set; often subdivided by muntins.
single-hung window	A window having two sashes, of which only one is moveable.
soffit	The exposed flat surface of any overhead building component, whether of an arch, eave, balcony, beam, cornice or lintel.
stile and rail	A term to describe a type of paneled door constructed of stiles (upright members framing panels) and rails (horizontal member framing panels). Panels are distinct sections or divisions recessed below or raised above the general level or enclosed by a frame.
terreplein	The packing of earth forming the body of a rampart; the gently sloping ground behind a parapet, formed from packed earth.