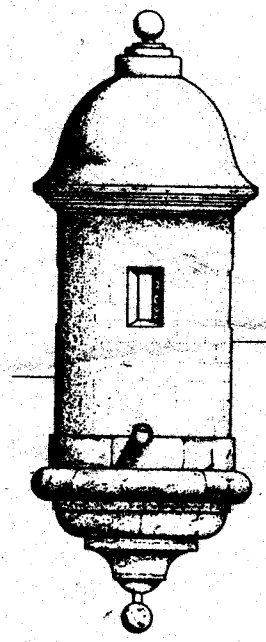
THE FORTIFICATIONS OF SAN JUAN NATIONAL HISTORIC SITE

Volume II



HISTORIC STRUCTURE REPORT

El Fuerte de San Cristóbal

THE FORTIFICATIONS OF SAN JUAN NATIONAL HISTORIC SITE

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Volume II

El Fuerte de San Cristóbal

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National Park Service

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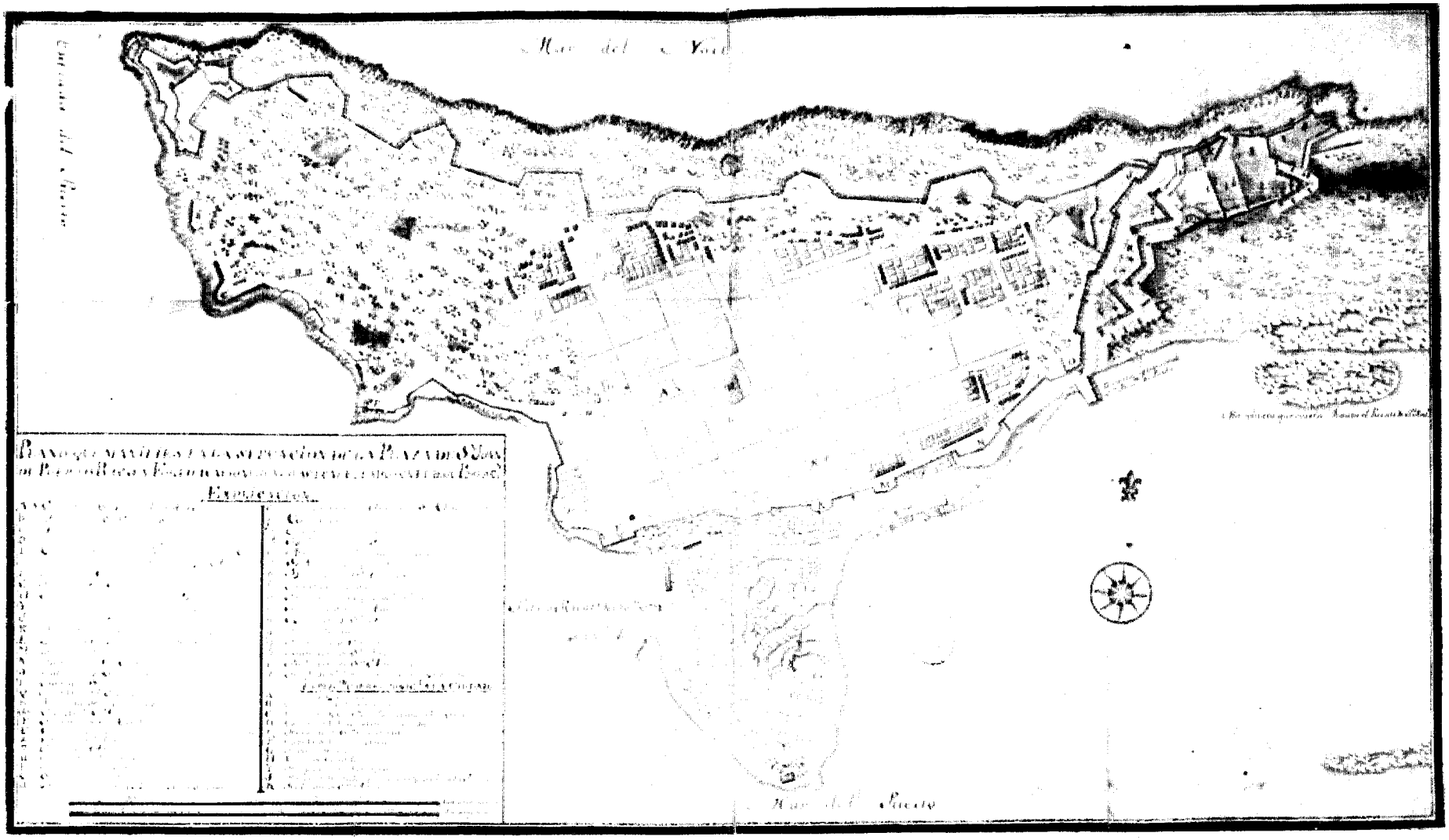
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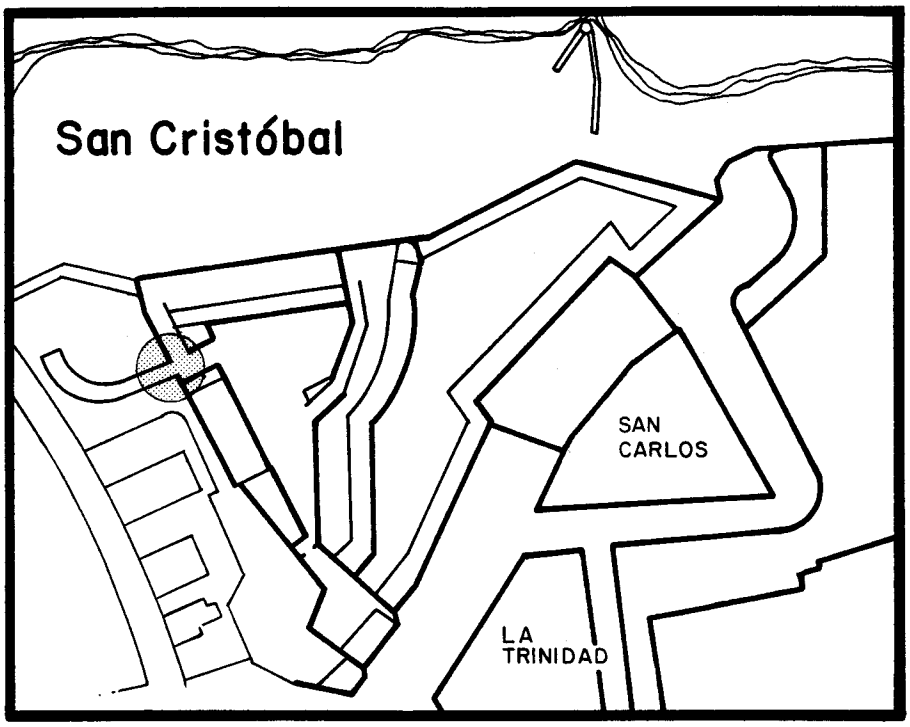
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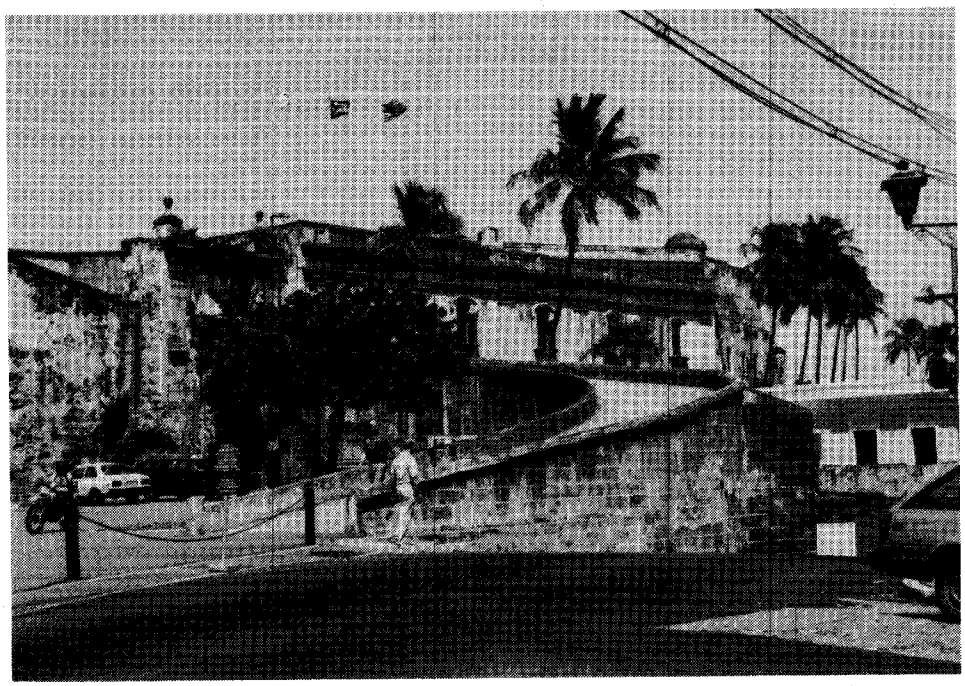
CHAPTER 1

MAIN GATE
(ENTRADA PRINCIPAL)

Description

The main section of the fort of San Cristóbal is accessed by a long, curved, gently sloping ramp and its associated Main, or Principal Gate located at the west wall (fig. 1.1). The flat area on the north side of the ramp is utilized as a parking lot, bounded on the north by a modern brick retaining wall containing remnants of the original parapet wall. Remnants of an earlier low brick retaining wall survive directly in front of the west wall. The area on the south side of the ramp is a grassy strip bounded on the east by the cistern arcade below the Officers' Quarters and on the south by quarters 208 and 209. One of Old San Juan's main streets, Calle Norzagaray, runs perpendicular to the Main Gate's ramp on a north/south axis west of the entrance.

The ramp itself is constructed of ashlar stone and hand molded brick and measures approximately 20 feet high (maximum) and 14 feet wide (fig. 1.2). The truncated remains of its former configuration, a wider curve, can be observed on the south shoulder of the present ramp. Piercing the eastern end



1.1. Main Gate and entrance ramp to San Cristóbal. (Photo by CPR, 1986.)

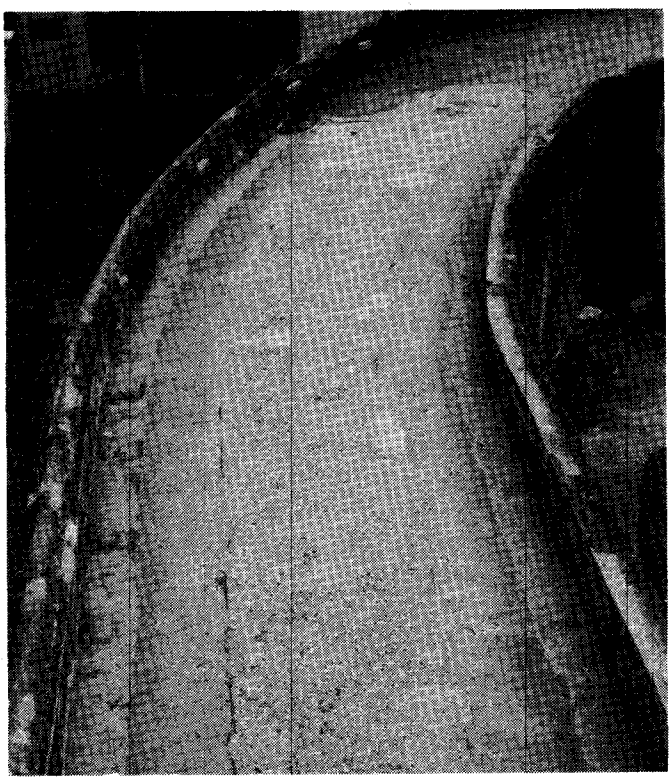


Figure 1.2. Entrance ramp showing cementitious pavings and infilled gutters. (Photo by CPR, 1986.)

of the ramp are two elliptical brick barrel vaults (Nos. 1 and 2). The western vault (No.2) is now infilled on the north face (fig.1.3). This rubble infill has in turn been punctured by a large rectangular opening and two smaller openings to the west. The east vault (No. 1) is larger and only partially infilled on the extreme eastern edge of its north face. Both of the arched and rectangular openings are fitted with modern wooden slat gates. On the south face of the ramp, the two barrel vaults are open and fitted with mechanical systems.

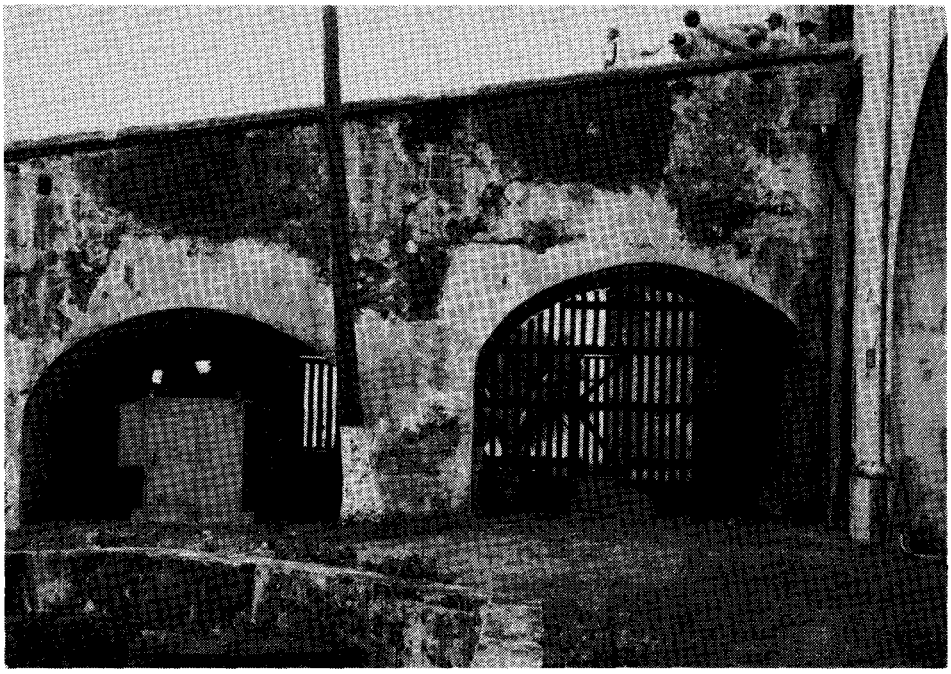


Figure 1.3. Two elliptical barrel vaults piercing eastern end of entrance ramp. (Photo by CPR, 1986.)

The upper walls of the ramp rise approximately 4 feet above the ramp pavement and are of squared rubble on the north and capped on the south by a curved stone coping. The ramp walls are covered with various stuccoes. The oldest surviving stucco is on the south face. The ramp is paved with at least three cementitious pavements, the sides being infilled gutters.

The portal of the Main Gate (fig. 1.4, 1.5, 1.6) is architecturally the most elaborate of the present gateways and is distinguished by a Tuscan order frontispiece. The segmental arched entryway is flanked by single pilasters supporting a full entablature surmounted by a broken pediment with pedestaled finials. On the frieze, centered above the entryway, is a carved scallop shell. Decorative carving is also found in the lobed ball finials rising above the broken pediment on a delicate neck and cushioned base supports. The frontispiece is of ashlar and appears to have been carved in place judging from the extension of the blocks into the coursed rubble walls to the north and south, and the close

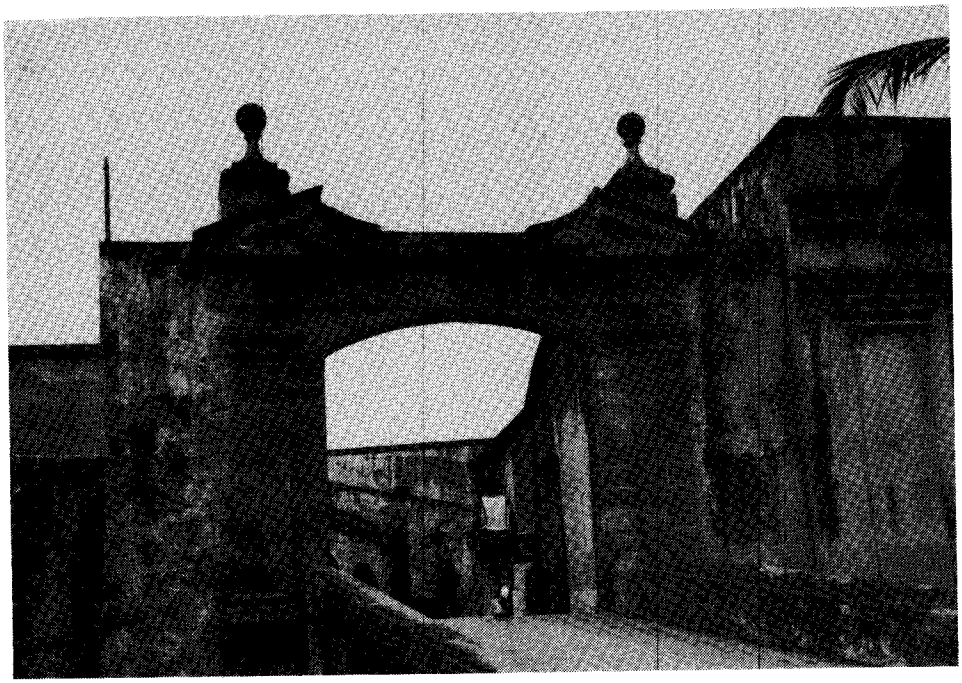


Figure 1.4. East elevation of Main Gate to San Cristóbal. (Photo by CPR, 1986.)

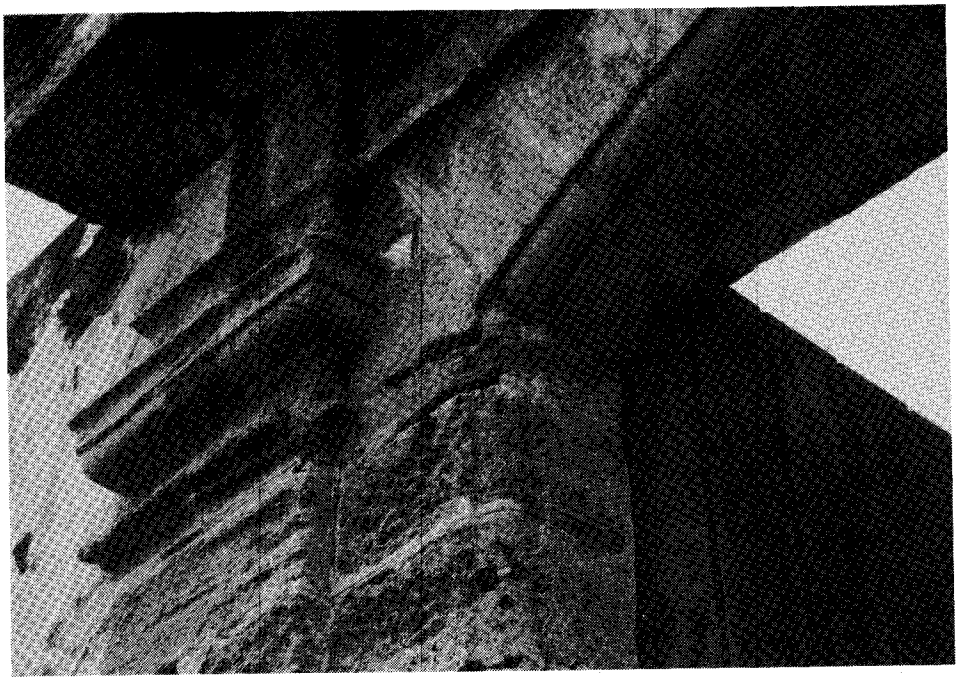


Figure 1.5. Detail of masonry joints of the Main Gate. (Photo by CPR, 1986.)

relationship between the carved ornamentation and the unit masonry. The stone work was laid with brick spacers.

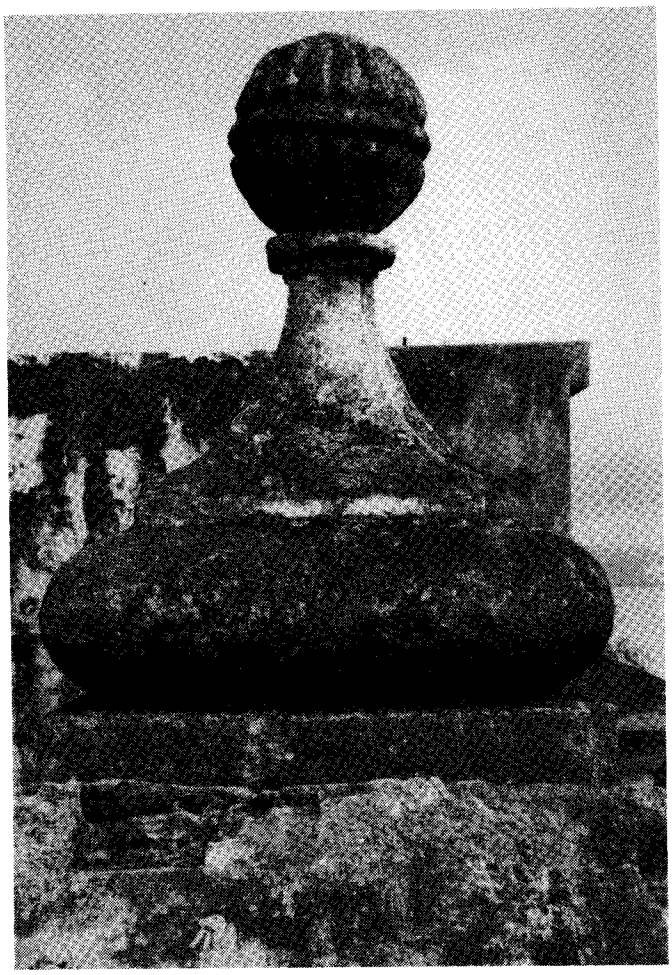


Figure 1.6. Carved finial on Main Gate's post. (Photo by CPR, 1986.)

The finial assemblies are carved from a single piece of stone and rest on stuccoed brick pedestals. The stone work of the front (west) elevation carries to approximately half the depth of the gate. The soffit reveals the interface of the front stone masonry with the stuccoed brick construction of the rear elevation.

The rear (east) elevation is architecturally undistinguished. The opening is flat, arched, and splayed outward to accommodate inward swinging gates. The opening is fitted with a two-leaved reproduction wooden gate made of planks. Each side of the two-leaved door turns upon a strong iron pivot resting in an iron socket and is fastened to the wall with hooks and hinges. In the lower part of the door, on the right leaf, there is a wicket door "in order to pass through."[1]

Structural Evolution

Period 1: 1625-1765

No references to the Main Gate appear in the available documentation during this period that predates the planning and construction of the unit.

Period 2: 1765-1809

Both O'Daly's existing conditions and proposed modernization plans of 1765 for San Cristóbal indicated that the principal entrance to San Cristóbal was situated on the north. However, by 1769 he had relocated the entrance. The 1769 plan showed a broad straight-run ramp and two post gate on the west on axis with the three proposed cisterns below the Plaza de Armas. O'Daly's plan of 1773 retained this location even though the cisterns were redesigned and oriented on an east-west axis. Mestre's plan, and the associated copy drawings of 1783, located the west gate and ramp in their present location just north of the 1774 block of the Officers' Quarters, though the straight configuration of the ramp curved in a northerly direction. (See fig. 1.7 for details on all the above-mentioned plans.)

The earliest views of the Main Gate and Entrance Ramp as depicted by Engineer Juan Mestre in the late-eighteenth century suggested that the gate was originally designed, and possibly built, without its present broken arched pediment. Mestre depicted a gate with a simple wooden lintel spanning two masonry posts capped by stone finials identical to those existing today. (See fig. 1.8, 1.9) These finials were supported by pilasters with large molded capitals. The south post was joined to the Officers' Quarters by a flat wall and on the north, a scrolled coping bridges the wall and gate post.[2] Although it is possible that the gate was never constructed as illustrated, several construction anomalies suggest that the gate was altered sometime before 1821.

The present portion of the gate below the springing line of the segmental arch closely follows the eighteenth-century designs. Its ashlar construction is integral with the adjacent walls and the carving of the blocks appears to have been executed in-place. However, at the necking of the pilasters the design departs from the drawings. It is this element in fact that is carved from a single thin slab of stone, unlike the molded blocks below. Coincidentally, the stonework above this element is of a slightly different color from that below.

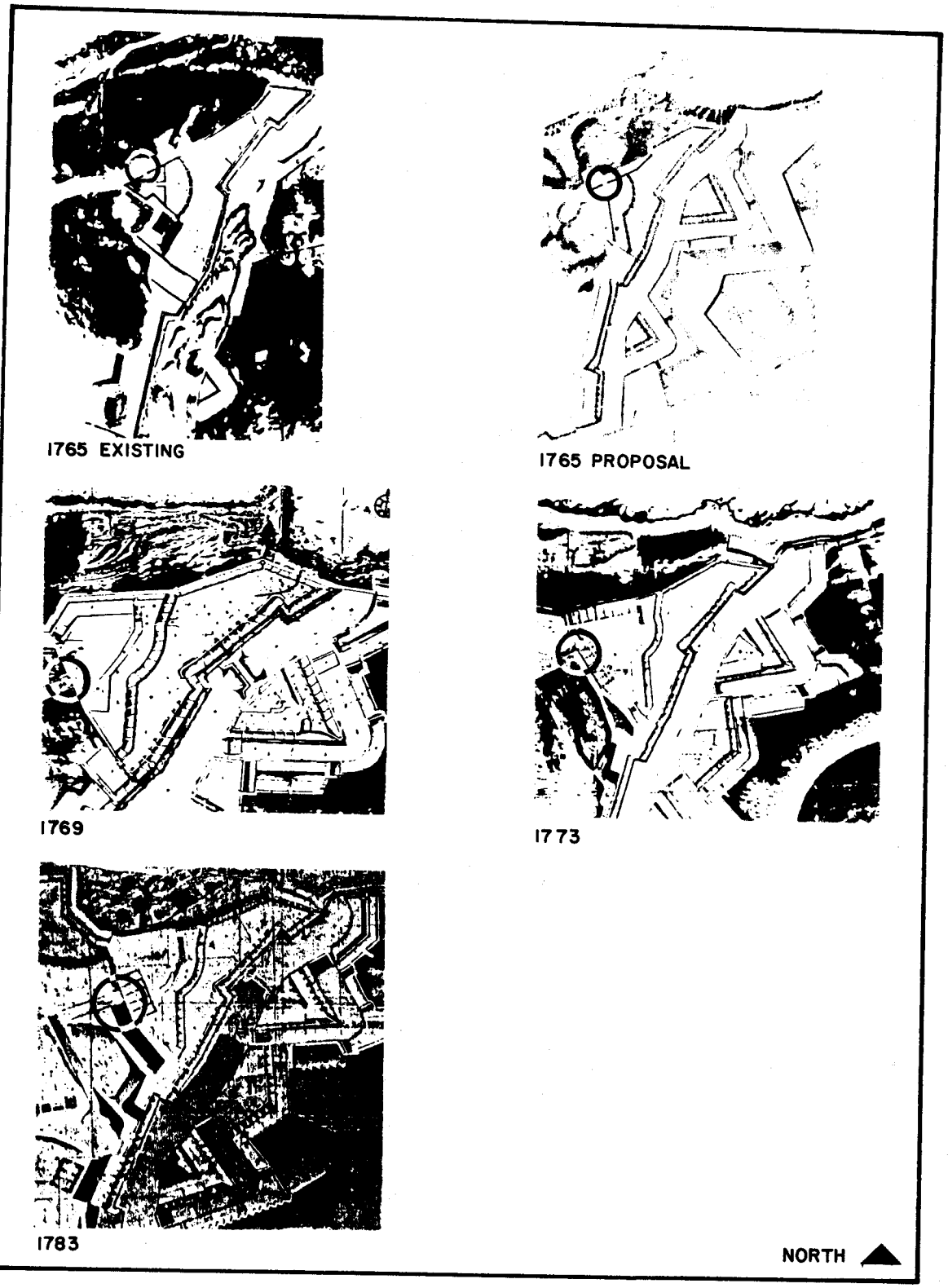


Figure 1.7. Early plans of San Cristóbal. Orientation of main entrance circled.

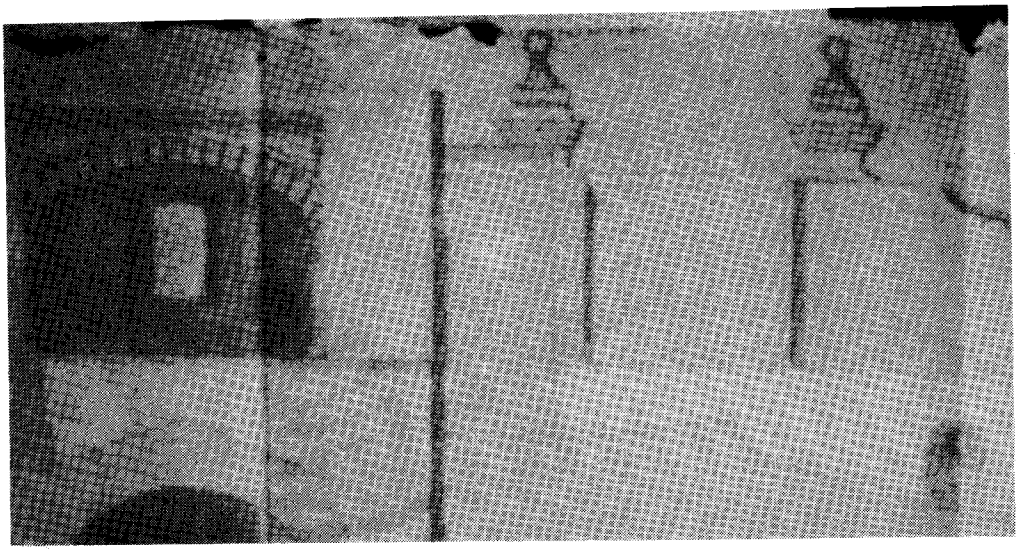


Figure 1.8. Section showing Main Gate. Drawing believed to be a 19th-century copy of 1783 drawings by Juan Mestre.

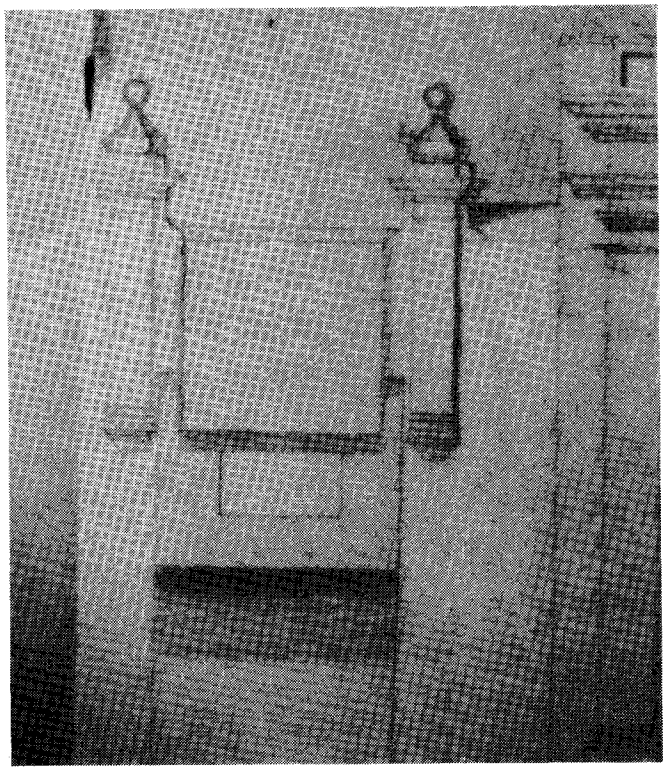


Figure 1.9. East Elevation of Main Gate. Drawing believed to be a 19th-century copy of 1783 drawings by Juan Mestre.

The only elements above this line that were shown on the drawing are the stone ball finials that rest atop brick bases. It is conceivable that the design of the gate was dramatically altered during or after construction by the insertion of the segmental arch and broken pediment. If this was the case the existing stone finials were recycled and raised. This work may have been executed in 1783 when eight masons from Spain were working on the construction of the (now extinct) Santiago Gate.[3] The use of a single scallop shell carved above the entrance on both gates leads to this speculation, especially when one considers that this motif was the symbol for St. James (patron saint of Santiago) and for the Spanish cities of Mondonedo and Cadiz.

Overall, during this period the ramp was shown much as it exists today with low coping walls of equal height and two large open vaults at its eastern end. (The function of the vaults is unknown.) The terrain to the north appeared unaltered. Surviving stucco evidence suggests that the ramp walls were parged with a white stucco painted yellow/ocher and scored with 3/4 inch wide joints. These joints were highlighted with black. The stone portions of the entrance gate also appear to have been painted with the same finish (without stucco parging). This combination of painted ashlar stone work and painted stuccoed rubble may represent an original treatment for these surfaces.

Period 3: 1809-1837

The first known representation of the pedimented gate appeared in a sketch by August Plee' executed in ca. 1821 (fig. 1.10).[4] During the early-nineteenth century, repairs were made to the ramp (1829), and in 1832 a temporary structure was installed atop the pediment.[5] Known as a "telegraph", this wooden structure supported flags, fireworks, and other ceremonial regalia commemorating the birth of Isabel the Second. The evidence for this framework can still be

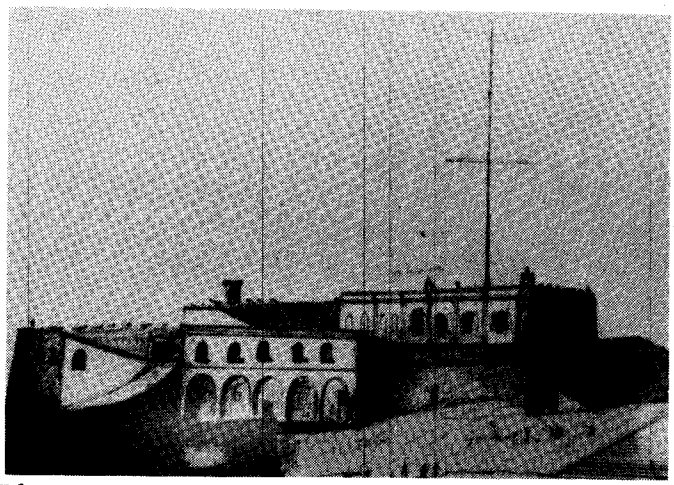


Figure 1.10. Detail of sketch by August Plee, ca. 1821, showing east elevation of San Cristóbal.

seen as paired notches cut into the top of the pediment masonry and the remains of an iron pin located top center.

Period 4: 1837-1868

As depicted in the model of 1839, a secondary picket gate approximately 20 feet from the main gate appeared on the ramp for the first time.[6] This structure can clearly be seen in the 1861 Castro plans and elevations as a pair of buttressed masonry posts straddling the coping walls. (See Volume I.) It contained a pair of green slatted wooden gates that swung inward toward the Main Gate. A green slatted wooden transom was clearly depicted. Evidence for the transom slats can still be seen in the lintel soffit as a series of small rectangular holes cut into the stone and bordered by early stucco. These holes presumably held the transom slats depicted in the Castro drawings. A pair of rectangular pockets on the gate's inner jambs just below the springing line of the arch may have held the transom lintel. Directly to the north of the gate, a small rectangular sentry box with a single dumbbell-shaped window appears in the location of the earlier scrolled coping. Although undated, this additional lookout probably related to the construction of the Guardhouse to the north in the early nineteenth century. Now removed, the ghost of the sentry box can clearly be seen today.

Also at this time (1861), the curved ramp appears to have been stuccoed. The western most arch was infilled with masonry and pierced by a rectangular window and door. The eastern arch remained open for communication, although it was fitted with a picket gate. The ramp copings appeared as they are today; flat on the northern wall and of rounded stone on the south. The ramp was enclosed along its northern wall by a green wooden picket fence that was supported by masonry piers. The south coping terminated at the base of the ramp in a cylindrical newel post topped by a finial. A gate at the base of the ramp led into a closed area to the north (fig. 1.11). This area was paved with three concentric paths, mirroring the configuration of the ramp. The concentric paths were traversed radially by one full path flanked by half-length paths. In the northeast corner of this quadrant a small square building with a double flat roof terminated the central radial path. Two sets of low retaining brick walls flanked the west and northeast edge of the quadrant. The entire area appeared grassy and may have been used as an animal pasture.

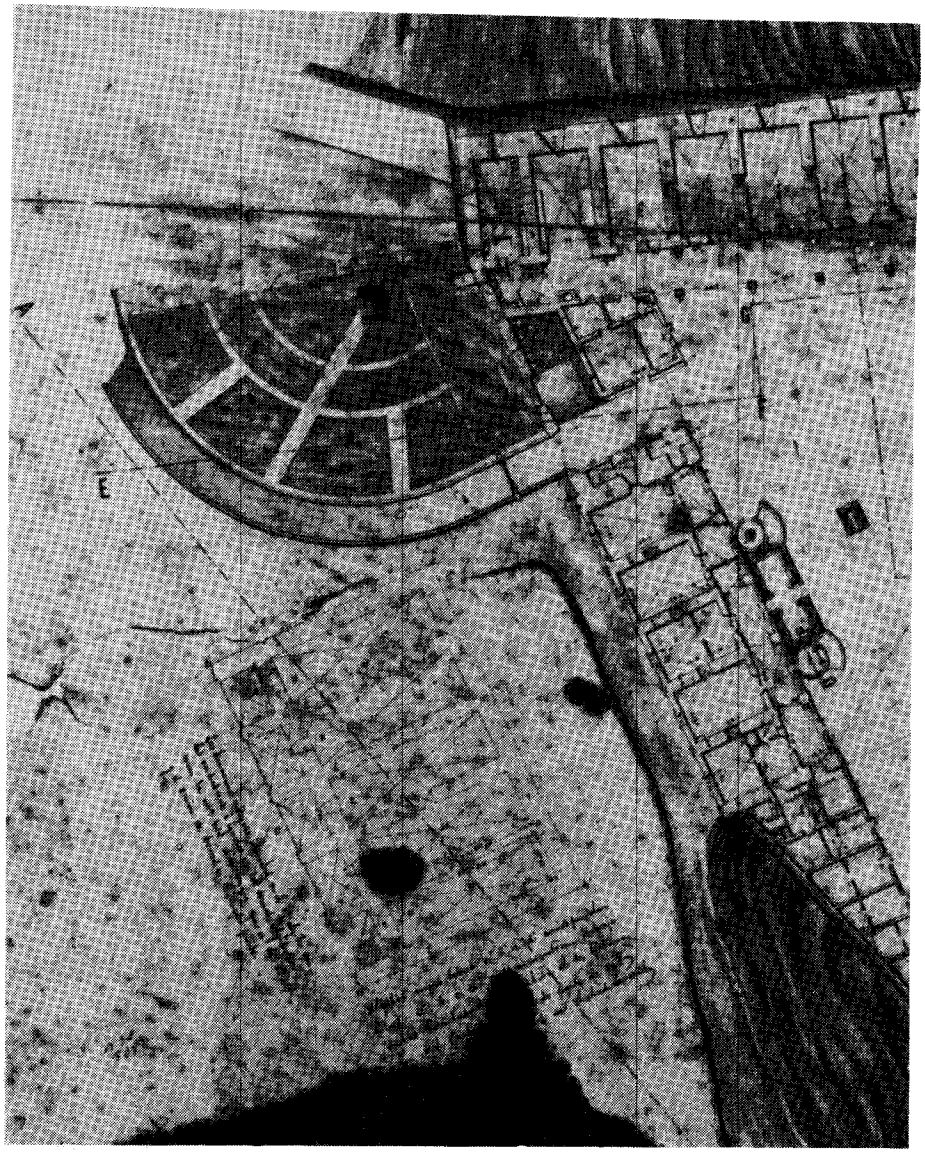


Figure 1.11. Plan with Officers' Quarters and entrance ramp. Entry garden on the south. Detail from drawing by Manuel Castro, 1861.

Period 5: 1868-1898

No references to the Main Gate and Entrance Ramp appear in the available documentation during this period.

Period 6: 1898-1986

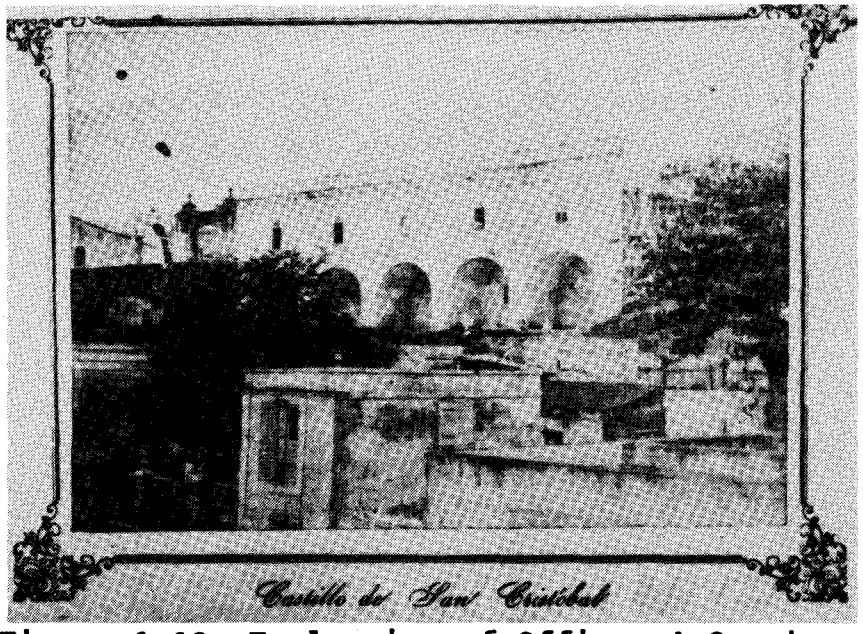


Figure 1.12. Early view of Officers' Quarter showing west elevation including a portion of Main Gate, ca. 1885-1900. (San Juan NHS Archives.)

Photographic views of the Main Gate and Entrance Ramp from 1884-1912 showed few alterations from 1861. (See fig. 1.12, 1.13.) By this time the secondary picket gate and buttressed posts were removed as well as many of the lower ramp posts. Only the picket fence at the base of the ramp was retained, though in an altered form. The two lower posts were now fitted with a new gate and capped with four cannonballs. The north quadrant adjacent to the ramp was clearly planted during this time with trees and possibly crops. By 1904 a temporary shed structure was constructed adjacent to the ramp's eastern arch on the south side. Also around this time, the floor of the ramp appears to have been resurfaced (1901). Documents record at least three repavings, the earliest being done in 1901. At that time the ramp was described as being "in bad condition due to traffic picking out the concrete of which it is composed".[7] Also in 1901, side gutters were installed and a wooden rail fence, presumably to keep animals out of the fort garden, was erected within the north quadrant. A photograph from 1912 (fig. 1.14) indicated that by this time, the ramp's picket fence was replaced, the

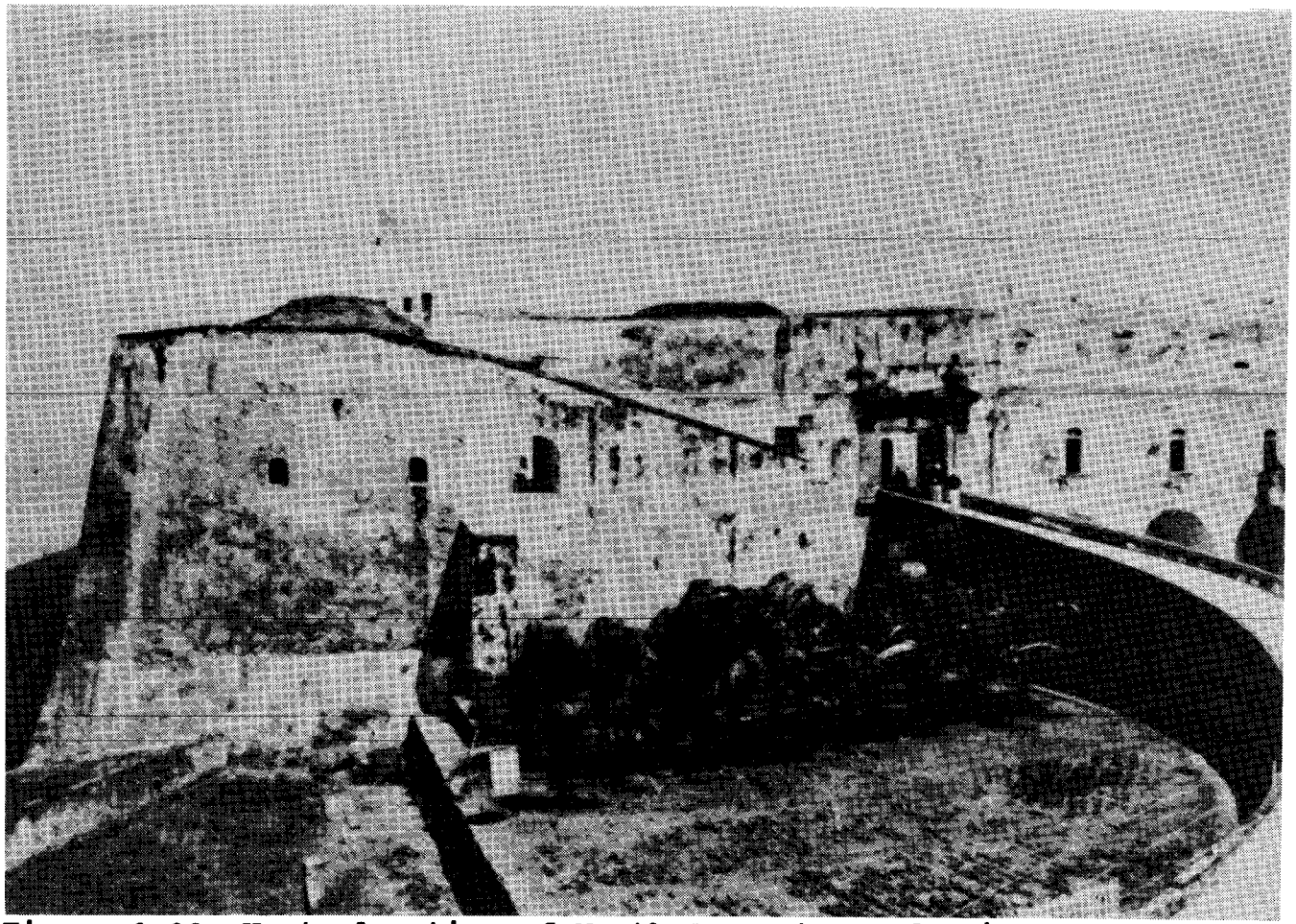


Figure 1.13. West elevation of North Casemates and Main Gate, ca. 1899-1912. (Photo, San Juan NHS Archives.)



Figure 1.14. Photograph from the Cronica, August 12, 1912, showing west elevation of the fort. (San Juan NHS Archives.)

sentry box removed, and the sloping terrain beyond the end of the ramp terminated in a curved rubble stone retaining wall.[8]

In the late 1930s, the configuration of the Entrance Ramp and its surrounds changed considerably. Historian Edward Bearss detailed the changes in a report dated 1984.

> ... the roadway paralleling the military wall westward from Fort San Cristóbal to Santo Domingo Bastion was widened, improved, and redesignated as Boulevard del Valle. Coincident with this project, the ramp giving access to San Cristóbal's Main Gate was realigned for about one-third of its length. The section realigned was that nearest Norzagaray Street. This permitted municipal authorities to widen the subject street, between Sol and Luna Streets. The quadrant bounded by the ramp, military wall, Norzagaray Street, and the west front of the fort was landscaped. A parking place for military vehicles was created in the area between the entrance to the ramp and the military wall opposite Sol Street. The remainder of the area was treated as a park with brick and stone walks, grass, and palm trees.[9]

A brick retaining wall fitted with a reconstructed cast stone sentry box (1939-40) was built to the north of the enlarged parking area. Photographs of 1938-40 (fig. 1.15) indicated that the slatted wooden transom and solid wooden gate of the Main Gate were removed by this time.[10] The north face of the eastern arch (No. 2) beneath the ramp also appeared closed off, possibly infilled along with the south face in 1861.

Photographs from the 1960s provide the first views of the altered ramp, the modified section of which appeared to have been scored in an imitation of the ramp's earlier finish. On the south face of the ramp the truncated remains of the original ramp were left in place. It is likely that at this time, the recessed water channels along the parapet walls were infilled, levelling them with the ramps' central portion and altering water flow and drainage systems. Also visible in photographs were modifications to the gate posts at the bottom of the ramp (now topped with a single cannon ball). They were moved some 90 degrees to the east. A new asphalt parking lot was created in the north quadrant by filling the terreplein of the area. A new retaining wall terminated the newly repaved ramp. The Main Gate was fitted with a modern chain link gate (fig. 1.16).[11]

During 1964, the quadrant area to the north of the ramp was further modified by the extension of the paved parking lot and the complete removal of the paved and planted area up to the

low brick retaining walls.[13] By 1967-68, the gate's stonework was repaired. HABS photographs showed corbelled brick pockets (no

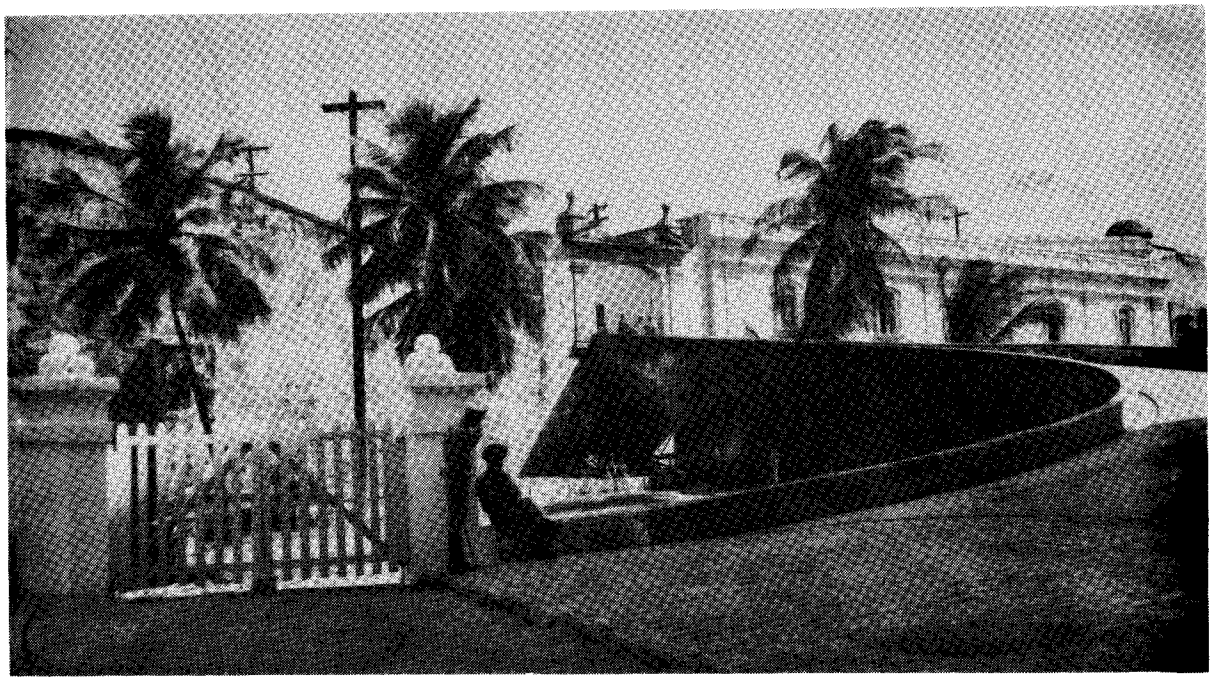


Figure 1.15. View of entrance ramp and Main Gate, ca. 1939. (HABS negative 181.178.)

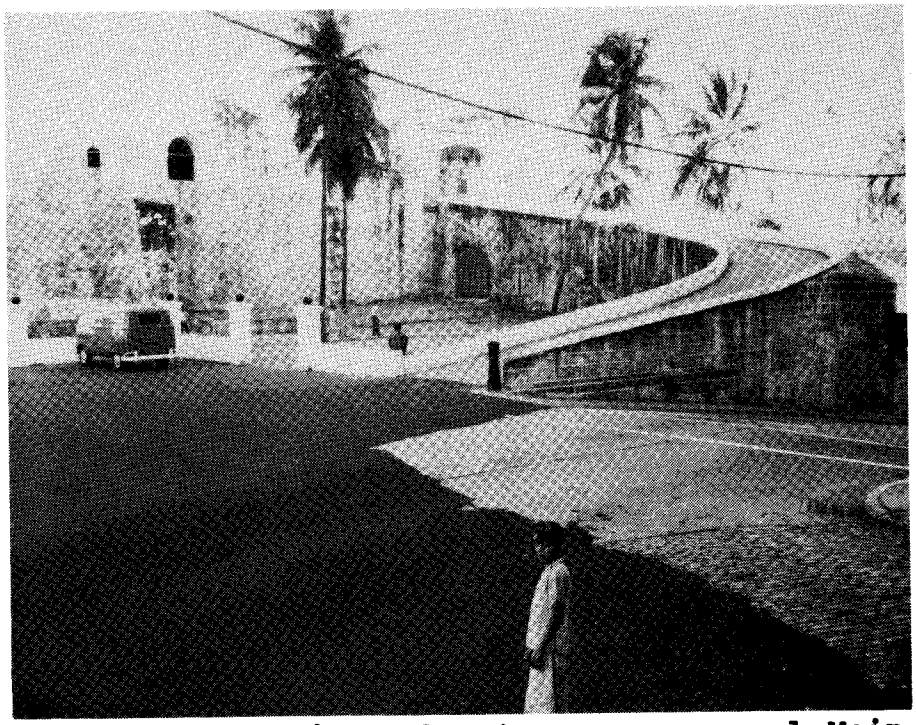


Figure 1.16. View of entrance ramp and Main Gate. HABS photo by Jack Boucher, January 1960.

longer extant) that presumably accommodated earlier hanging gates. (See fig. 1.17.) The ramp's east arch (No. 1) was seen to have been partially masonry infilled and the remainder of the opening fitted with a modern wooden gate. A window was cut through the north infill wall of this arch and a brick wall laid in running bond pierced by a simple wooden doorway remained on the southern face of the ramp's west arch (No. 2). In ca. 1965 a reproduction wooden gate was installed. Hurricane Hugo destroyed this gate in 1989.[14]

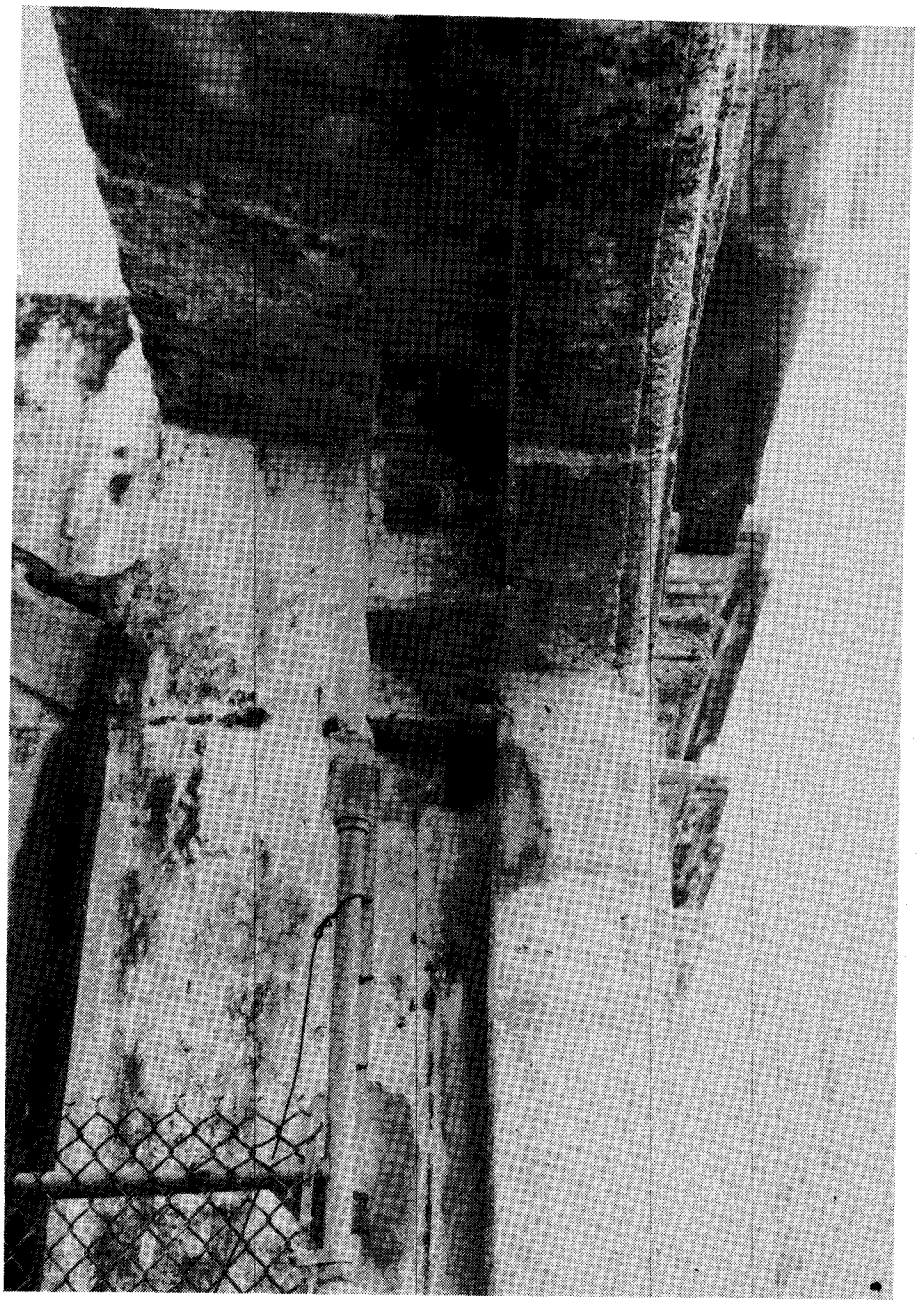


Figure 1.17. South jamb and head of court side of Main Gate as seen from below, showing traces of the slatted transom depicted on the Castro drawings of 1861. Photo by Frederik Gjessing, 1965. (HABS negative 181.189.)

Conditions

The present condition of the ramp walls is poor with problems that will accelerate their deterioration. The ramp surface is in good condition although its central section shows differential weathering, general surface cracking and isolated areas of patching repairs. As with other structures throughout this site, all problems seem to be associated with water infiltrating into the masonry walls. Because the ramp walls are completely unprotected from the weather, erosion of building materials is a typical problem. Conditions seem to be most severe at the northern elevation; probably because it is exposed to the open sea.

Because the ramp has always been the main entrance to the fort, the continued traffic (first people and animals, later vehicles) has necessitated periodic repaving of its surface.

The present condition of the Main Gate itself is relatively sound with problems primarily affecting surface materials. In general, the gate's frontispiece (western elevation) is in stable condition with open joints and minor missing elements observed at both pilasters. More serious deterioration is concentrated on the eastern (rear) elevation of the gate and its adjacent wall to the north. Because the gate itself is a freestanding open structure with all surfaces exposed to the elements, its fabric is particularly susceptible to deterioration. Long-term problems, such as excessive moisture absorption, may be related to poor maintenance and repair procedures.

The sandstone pilasters of the west elevation show widespread, but uniform, differential weathering. This weathering however, is much less discernible on the five lowest stone courses that were replaced during the 1968-70 period with a similar sandstone.[15]

There are minor areas of stone loss on the northern pilaster's capital and molding, as well as areas of severe erosion. Both conditions were documented in photographs taken during the early 1960s. Missing fabric of the segmental arch and capital of the southern pilaster have been patched with repairs that are easily discerned. The ornamental stone finials are in good condition, although both show weathered and rounded profiles. Leaching deposits can also be seen on the thin necks of each finial.

The adjacent (northern) coursed rubble wall is in much poorer condition, showing areas of extensive cavity erosion, a variety of surface discolorations and the dark staining usually associated with biological activity. Two conditions

that allow additional water to enter the wall are the cracks that cover the entire wall surface and open joints of the ashlar blocks.

The rear portion of the gate is in poor condition with severe differential weathering observed at the level of the broken pediment and stucco failure and cavity erosion present at the bottom of the north wall. Modern patches cover the area under the spring of the segmental arch where projecting brick corbels that held a secondary gate system were located until their recent removal.

NOTES

1. Ricardo Torres-Reyes. Historic Structures Report, San Cristóbal Gates (RSP-H-11), San Juan NHS, October 5, 1964, p. 4.

2. Juan Mestre, drawing of the Main Gate of San Cristóbal, 1783. (Copy exists at NAHPC, Boston, MA.)

3. Construction Report of Juan F. Mestre, September 13, 1783. Microfilm located at San Juan NHS. Original located at AGI-SD, Seville, Spain.

4. The original ca. 1821 sketch by french artist August Plee is in the collection of San Juan NHS, San Cristóbal. It is reproduced here from HABS negative #181.197.

5. Interview with Juan Blanco, Historian, Center for Preservation Research. Columbia University, New York, November 1986.

6. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at the Museo del Ejercito, Madrid, Spain.

7. Edward Bearss, Historic Structure Report, Historical Data Section: San Juan Fortifications, 1898-1958 (U.S. Dept. of the Interior, NPS, Feb. 1984), p. 80 and p. 373.

8. This photograph dated August 17, 1912 is on page 129 of Puerto Rico Illustrado. This photo has been copied by HABS, negative no. 181.93.

9. Bearss, pp. 373-374. See also, Drawing labeled 1040, "Boulevard del Valle-Details at San Cristóbal," sheet 1 of 3, no date. NAHPC and San Juan NHS files.

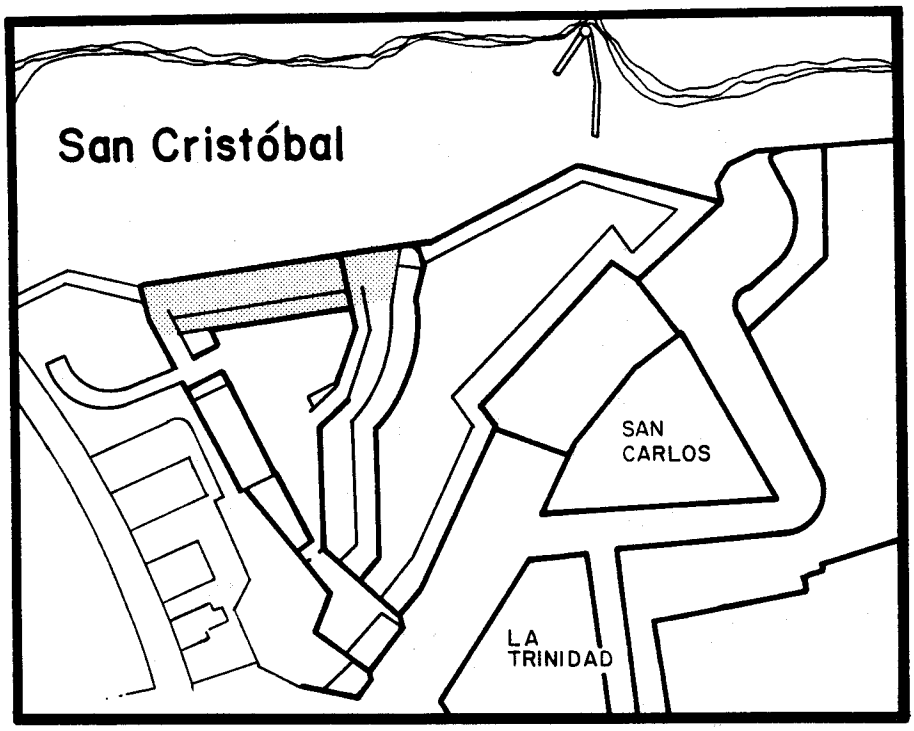
10. These photographs taken by the U. S. Army Corps of Engineers are in the collection of San Juan NHS, San Cristóbal.

11. As documented by a construction drawing titled "Parking and Layout Plan, Fort San Cristóbal," prepared by the NPS, dated August 12, 1961. In the collections of NAHPC and San Juan NHS. NHS-91/30024.

13. Dead File 22, San Juan NHS Archives.

14. Torres-Reyes. Richard Crisson believes that the gate was installed shortly after this report.

15. Completion Report, D.2623. Drawing, 3/21/63, "Main Gate, Stone Mason's Diagram showing stones to be replaced." San Juan NHS, Archives.



CHAPTER 2

NORTH CASEMATES
(CASAMATAS DEL NORTE)

Description

The North Casemates, Casamatas del Norte, is the long, narrow structure on the north side of the Plaza de Armas. Together with the Guardhouse (Chapter 3), the North Casemates form the northern boundary of the Plaza de Armas. It was constructed under the supervision of Chief Engineer Thomas O'Daly and Engineer Juan Francisco Mestre
and is composed of various interrelated elements. The main portion is the one-room deep structure made up of: nine vaulted casemates; a pair of two-story, vaulted, powder magazines; and a paved terreplein above. A one-story open loggia (galería), running east to west, ties the casemates together on the south elevation. The loggia has six and one-half arched bays. It was constructed in ca. 1849-1858 and greatly increased the functional aspects of the casemates providing shelter and additional space for the soldiers' daily activities. (See figs. 2.1 - 2.3.)

Built in two stages, the pair of two-story casemates date from 1768-1771; the remaining nine, single-story casemates date

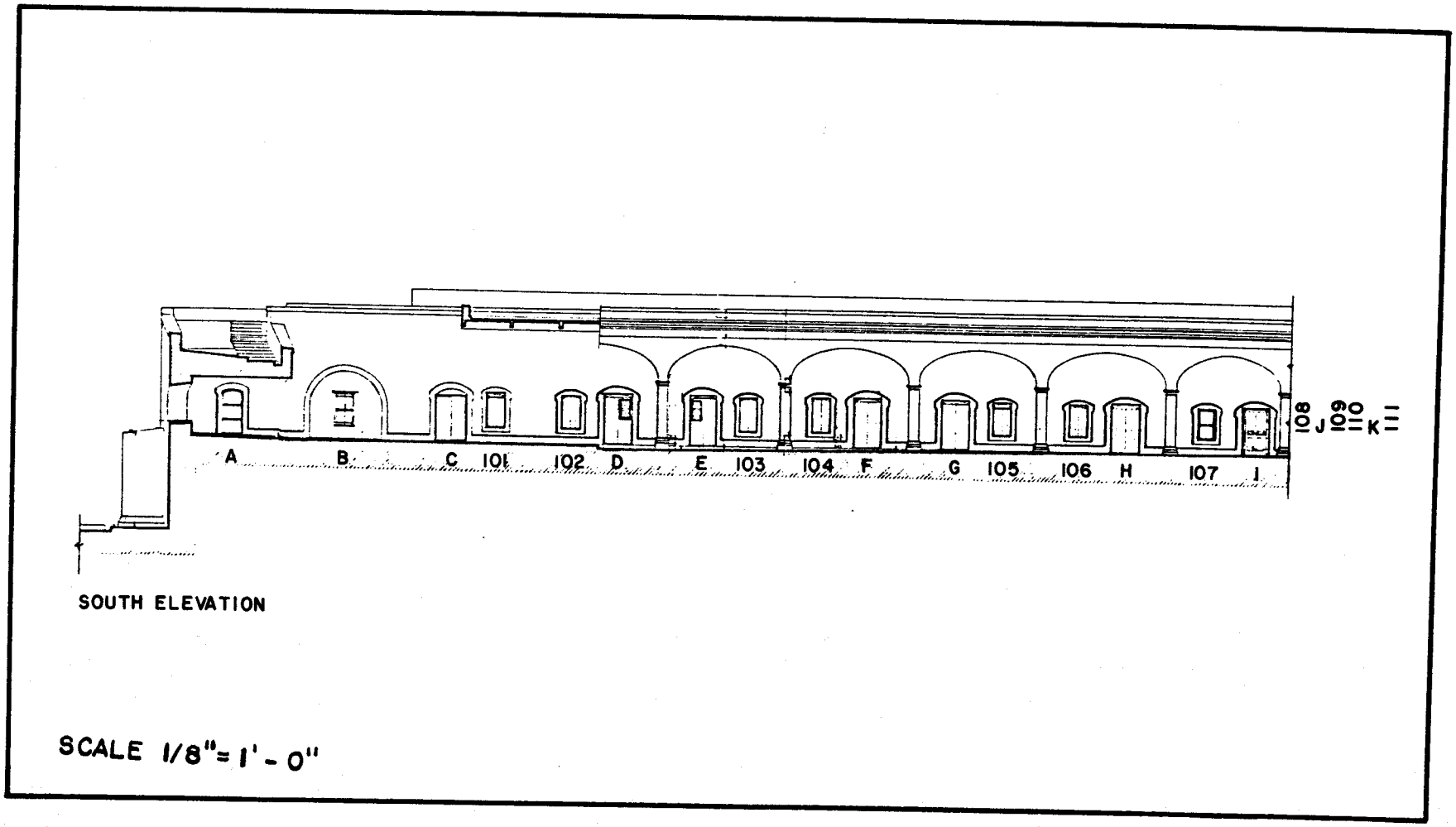


Figure 2.1. South elevation of North Casemates with window and door openings labeled, as drawn by HABS (1963) and annotated by Jana Gross (1989).

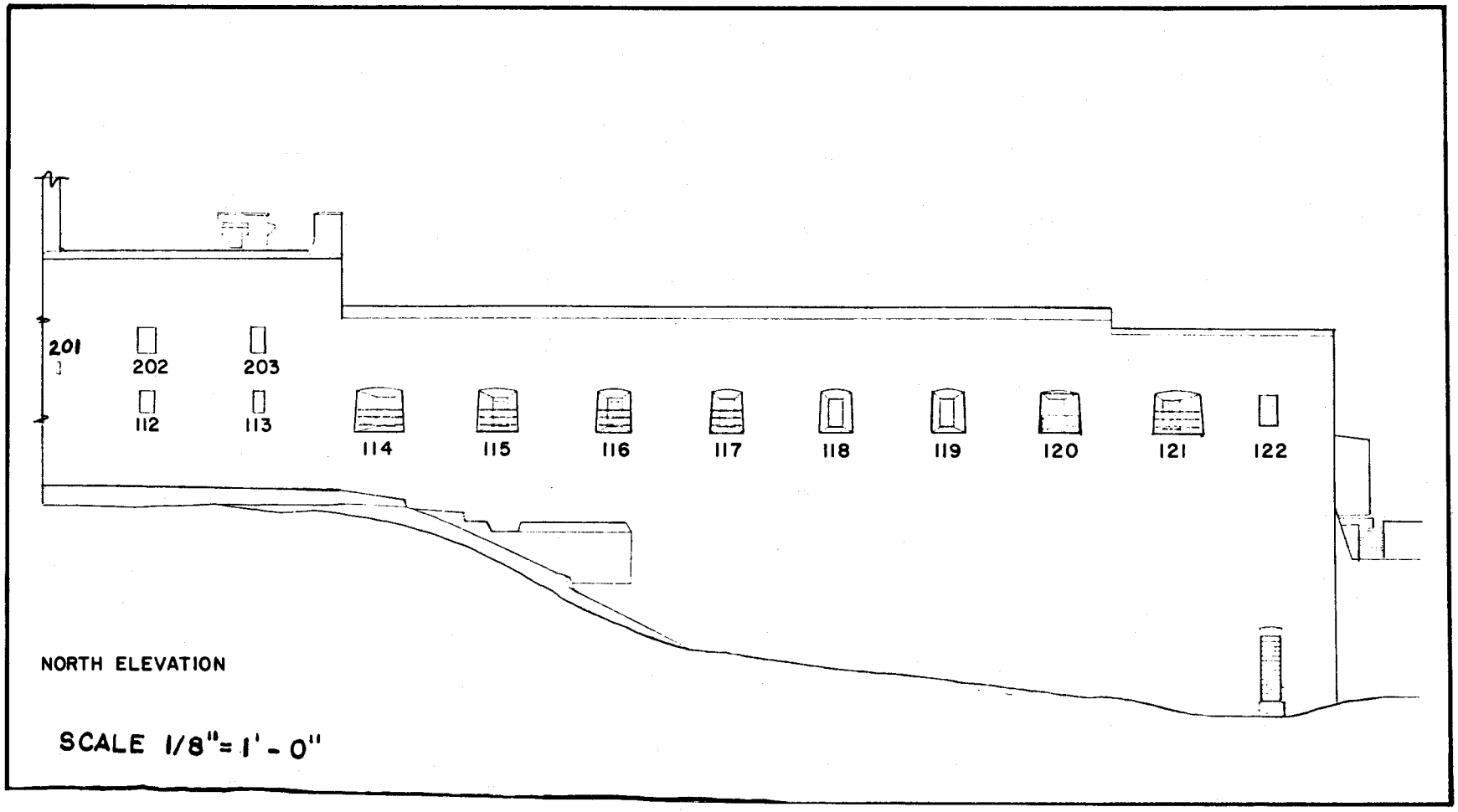


Figure 2.2. North elevation of North Casemates with window openings labeled as drawn by HABS (1963) and annotated by Jan Gross (1989).

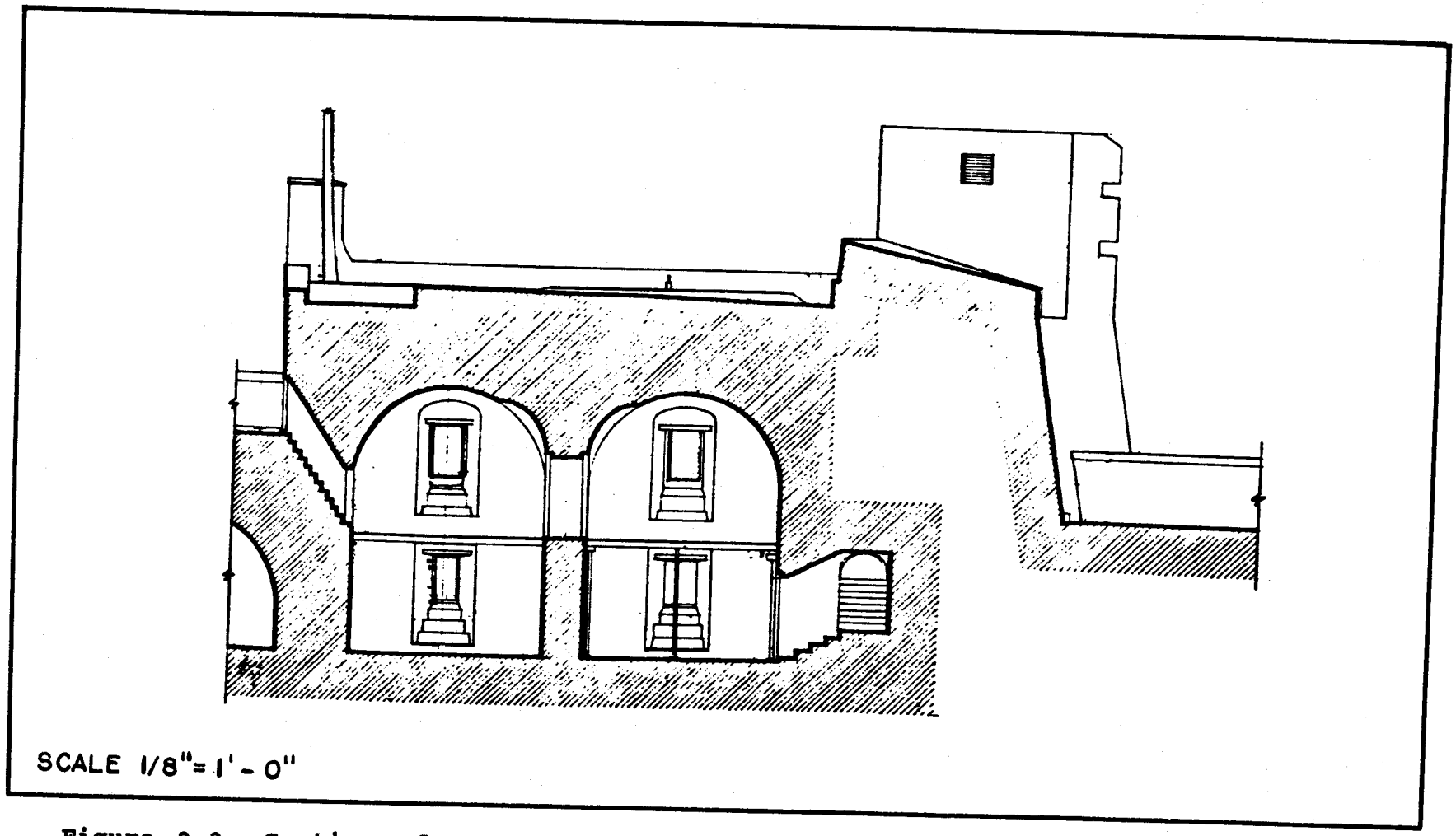


Figure 2.3. Section of North Casemates looking north and showing the two-story magazines. Drawn by HABS (1963) and annotated by Jana Gross (1989).

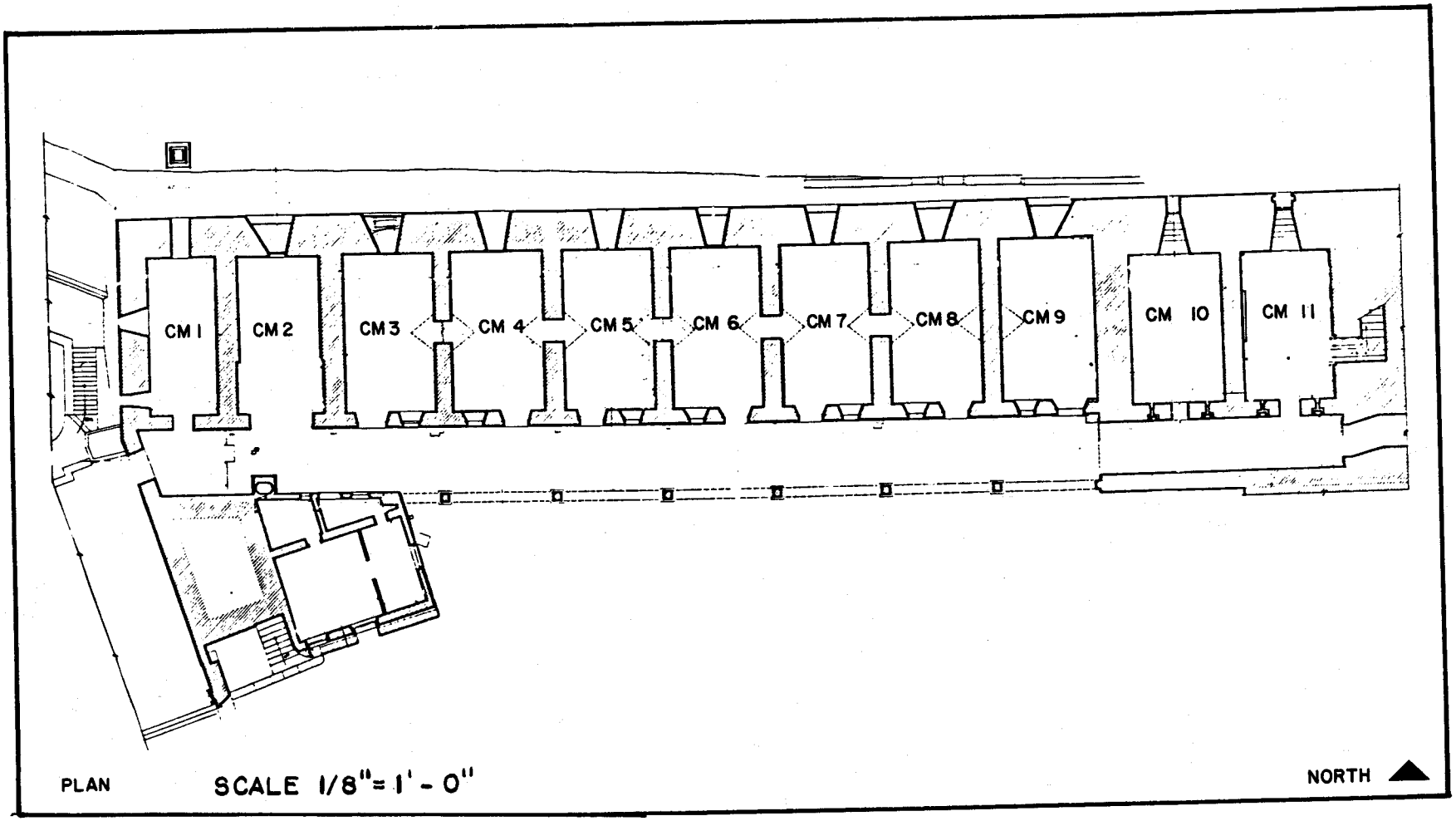


Figure 2.4. First floor plan of North Casemates with casemates labeled. Guardhouse in lower left. Drawn by HABS (1962) and annotated by Jan Gross (1989).

from 1774-1785. Today, the structure houses a multitude of functions: offices, library, bookstore/giftshop, storage rooms, and locker room. Several unfurnished vaults are interpreted by the NPS as embrasured casemates. Citations for all dates used in the description will be provided in the following "Structural Evolution" section.

For clarification during this discussion, the casemates and magazines have been. Beginning with the far west casemate, the one-story vaults have been assigned numbers 1 through 9, and the two-story powder magazines numbers 10 and 11. (This numbering system corresponds to one devised and implemented by HABS in 1963.) Vaults will be referred to in an abbreviated form using "CM" to denote casemate. Dates mentioned in this section will be cited in the following structural evolution section. (See fig. 2.4.)

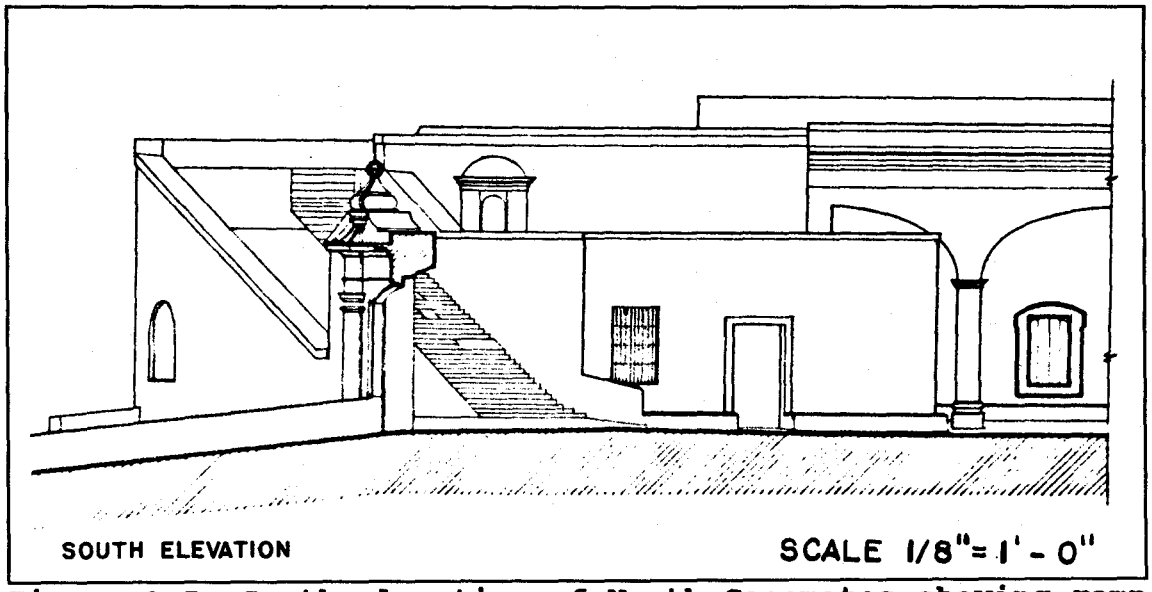


Figure 2.5. South elevation of North Casemates showing ramp to upper terreplein. Drawing by HABS (1963).

The terreplein of the North Casemates is accessible by a short but steep ramp at the western end (fig. 2.5). This ramp separates the Guardhouse from the Main Gate of San Cristóbal. Two gun emplacements are distinctly marked on the terreplein. They consist of two semi-circular tracks of stone pavers laid flush and an iron mount bolted to the terreplein.* The floor

*In 1986, after this report was written, one of the 24 cm howitzer "Ordonez" cannons was reinstalled on the westerly emplacement after restoration by the National Park Service at Harper's Ferry.

of the terreplein is covered with hormigón. There are numerous cement patches and covers that provide access to below-surface drainage outlets. The roof-top is designed to collect water; numerous drain holes funnel the rainwater into drainage pipes and cisterns located below the Plaza and the casemates.

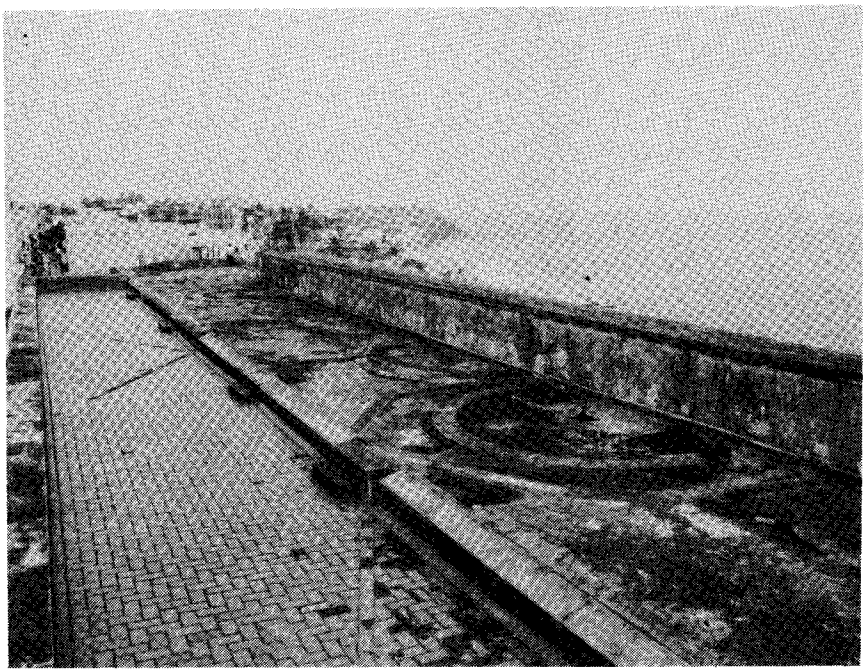


Figure 2.6. View of upper terreplein looking northwest. Note tracks from gun emplacements. Photo by Richard Crisson, 1986.

The roof itself is of thick brick and "mamposteria" construction designed to support the floor of the terreplein (fig. 2.6). The only cornice associated with the North Casemates occurs over the south loggia. It consists of a raised flat frieze supporting a quarter-round molding; above this is a soffit with a plain fascia, supporting a cyma-recta crown molding. A low parapet wall with flat coping projects above the cornice.

At the northwest corner of the terreplein a concrete base remains to mark the location of a telescope probably installed in the twentieth century; the telescope no longer remains.

The roof over the loggia is paved with glazed, red clay, paving tiles. There is an intermediate projecting parapet that separates the loggia roof from the terreplein. It is broken at regular intervals to allow collected water to flow toward the terreplein drains. Sloping parapets face north and protect the gun positions. A low parapet is constructed of brick and stone rubble parged with stucco. Small patches at regular intervals connect with and follow the west ramp, these denote the location of vertical supports for a railing installed ca. 1943.

On the north and west facades, massive battered walls took excellent advantage of the steep and rugged cliffs overlooking

the Atlantic Ocean and provided a great defensive advantage (fig. 2.7). The west facade of the North Casemates encloses both CM-1 and the ramp to the terreplein level. At the southern end of the facade are the Main Gate and Entrance Ramp to San Cristóbal. The cut stone wall is battered and angular, with a sloping section paralleling the west ramp. The upper edge of the wall has a slight projecting parapet of cut sandstone. A small iron pipe is located above and centered within the two smaller west windows. Apparently introduced for drainage, the age and source of this pipe has not been identified. Large random-sized sandstone blocks comprise the lower section of the northwest corner of the walls as well as the buttress. Smaller cut stone, rubble stone, and crushed brick comprise the rest of the wall.

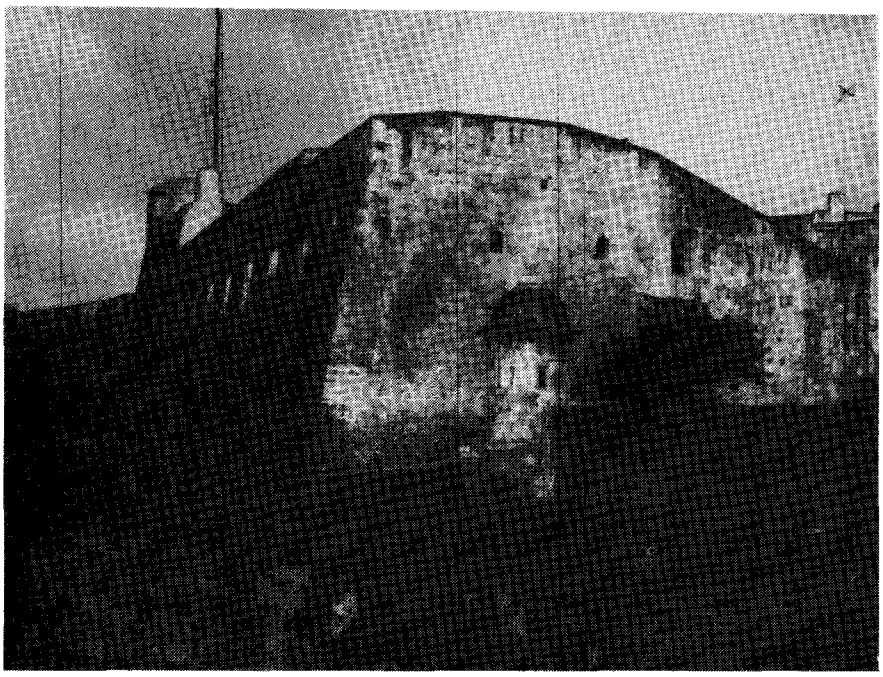


Figure 2.7. North and west elevations of North Casemates looking east. Photo by Richard Crisson, 1986.

The west ramp (fig. 2.5) dates from the late eighteenth century. It has steps of varying sizes adjacent to the east cheek wall and slopes down in a southerly direction. The floor of the ramp has a hormigón surface broken up in regular intervals by five horizontal bands. These are made of rectangular, flat, stone laid flush with the hormigón. A six foot wide stairway adjoins the right cheek wall. Risers and treads are of varying dimensions and are paved with bricks laid in mortar.

The north wall (fig. 2.2) is one of the most impressive features of San Cristóbal. Extending a distance of over 208 feet, the battered wall rises to a height of 49 feet at the northeast and 79 feet at the northwest corner. Its sloping parapet is stepped up to protect its double gun emplacement. Almost the entire wall is of uniformly dimensioned ashlar.

The openings piercing the walls of the North Casemates have been labeled for the purpose of this study. Exterior doorways have been labeled A - K, going from west to east; windows have been numbered similarly from 101 - 203. (See figures 2.3, 2.5, and 2.7.)

The main portion of the south elevation (fig. 2.1) is characterized by a regular arrangement of doors and windows. Doors D and E seem to be original and have an upper, adjustable, louvered opening. The door reproduction hardware is modern. Door architraves match those of window openings 101 through 107.

Window openings 101 through 107 have interior wood shutters of vertical, native hardwood planks fastened with reproduction hand-wrought iron hardware. Interior sills are of brick with a wood nosing.

The remaining door openings on the south elevation are of varying types, though all are of vertical wood planks. CM-1 has a small segmental arch doorway (A). An iron grille door is attached by socket and pintle hinges to the masonry. CM-2, with its large, arched opening (B) was reopened after 1963, but the early opening may date from 1774-85 when the casemate began to be utilized as the kitchen. The stuccoed surround has chamfered corners below the springing line and is pierced by a round hole facing south at an approximate height of 8 feet. This may be the location of an earlier stove pipe.

At the opposite end of the south elevation, doorways J and K lead to the original powder magazines. Both surrounds and paired doors are modern and similar to those described for work done in 1975. Window openings 108 through 111 are unusual, yet indicative of the powder storage functions of CM-10 and CM-11. The window openings are composed of two exterior vents located side by side. The vents angle inward and form one 10 inch interior opening. It is not known whether these were designed to ventilate the rooms, to prevent an accidental explosion by a deflected bullet, and/or for security purposes.

Fourteen window openings pierce the north elevation (fig. 2.2). Proceeding left to right, CM-10 and CM-11 contain four unusual window openings (112, 113, 202, and 203). They are splayed and have stepped, stuccoed sills with reproduction wood interior shutters. Window 201 is a narrow vertical slit. This opening allows for the constant ventilation of the easterly stairway. CM-2 through CM-9 contain windows 114 through 121. All are splayed, like an embrasure, and have wide sloping sills. Segmental arches, sandstone voussoirs and quoins extend down to the sill level of each window opening. Although none of the original shutters remain, most openings have reproduction, interior wood shutters with modern hardware.

Within the embrasure of window 120 is an unusual feature: a masonry tub, enclosed by brick. It was installed ca. 1940.

Only three window openings are found on the west elevation. Two small arched windows, 123 and 124, open onto CM-1. Both have embrasure-like openings. Below the west ramp and on center with the loggia is a much larger arched opening (125).

The floor plan (fig. 2.4) of the North Casemates is long and narrow. All of the eleven casemates are rectangular in plan. CM-1 through CM-9 have twentieth century cement flooring. The first floor of CM-10 and CM-11, and the east and west stairways are also covered with cement. The steep narrow west stairway in CM-10 is unused. Modern plywood doors with padlocks secure both ends of this stairway. The treads are laid with brick but the overall construction is of brick rubble, covered with white plaster.

On the interior, there are few, if any, surviving trim or decorations of either eighteenth century construction campaign. The structure was restored by the NPS in the 1970s and most of the walls are covered with cement, whitewashed, or painted white. Other than window and door openings, the interior is devoid of decorative features. Neither of the stairways in CM-10 and CM-11 have decorative features.

The actual subsurface conditions of the North Casemates are unknown. The structure appears to sit on bedrock. Portions of rock outcroppings project out from the north wall at the Casemates' northeastern end. Solid, load-bearing walls are battered slightly from the base up to the parapet. The walls appear to have been supported by means of stone piers set into the hill. Portions of the hill survive to form the cliff which descends to sea level. There is also one very large stone buttress at the lower center of the west wall. Although it is possible that it was part of the original construction, it is not possible to confirm this by visual inspection. It is safe to say that the building was heavily reinforced, not only to withstand artillery shelling, but to support its own heavy cannon placed on the terreplein.

The extant electrical and plumbing systems at the North Casemates were installed after 1961 to replace utility and mechanical systems installed in the early twentieth century. These systems include electrical service in many of the casemates; a water cooler in CM-2; and an air-conditioning apparatus in the curatorial storage areas of CM-9, the offices in CM-3, and in the second story (office/library) of CM-10 and CM-11. The electrical system appears to be connected to the panel box in the northeast room of the adjoining Guardhouse. Various electrical conduits traverse the north elevation just below window level.

Structural Evolution

Period 1: 1625-1765

The North Casemates were built after 1765 as part of the modernization project for San Cristóbal. Therefore, there is no information for this period.

Period 2: 1765-1809

The casemates on the north side of the Plaza de Armas were built in two stages: the first in ca. 1768-1771 and the second in ca. 1774-1785. Comprising the oldest part were the two magazines in two levels located on the east end (fig. 2.3) that functioned as powder magazines. They were known in the eighteenth century as the vaults for repuesto de polvora (storage for powder). Their roof terreplein became the north end of the enlarged caballero. Three years after the completion of the magazines, a one-story extension to the west was begun. This addition included nine vaults, a terreplein above, and an access ramp at the far west end. Housed therein were quarters, kitchen, and latrine. The vaults were then referred to as bovedas á prueba (proofed vaults), generally assumed to mean bomb-proof vaults. The terreplein above was called the batería (battery). Both old and new sections were built under the direction of Engineers Thomas O'Daly and Juan Francisco Mestre. No part of the structures had yet been conceived in the original modernization plans for San Cristóbal in 1765. The first known documented record is dated 1769.

Construction of the two story powder magazines was well underway by January 15, 1769, based on Thomas O'Daly's plan (fig. 2.8). This plan labeled the vaults "H" and described them as: "Two magazines [almacenes] for storage of powder; they lack vaults."[1] This has been interpreted to mean that the foundations and the first story had been completed and were lacking only the second story vaults.[2] The magazines were shown situated at the edge of the north cliff. Immediately adjacent on the east side was the newly-widened flank of the North Bastion. To the south was communication gallery "E" (Tunnel 2) also built at this time. The second story vaults were completed sometime before March 1771.[3] El Caballero was subsequently raised to match the height of the new magazines.[4] The terreplein of the magazines thus became a part of the new enlarged caballero that is discussed at length in Chapter 4.

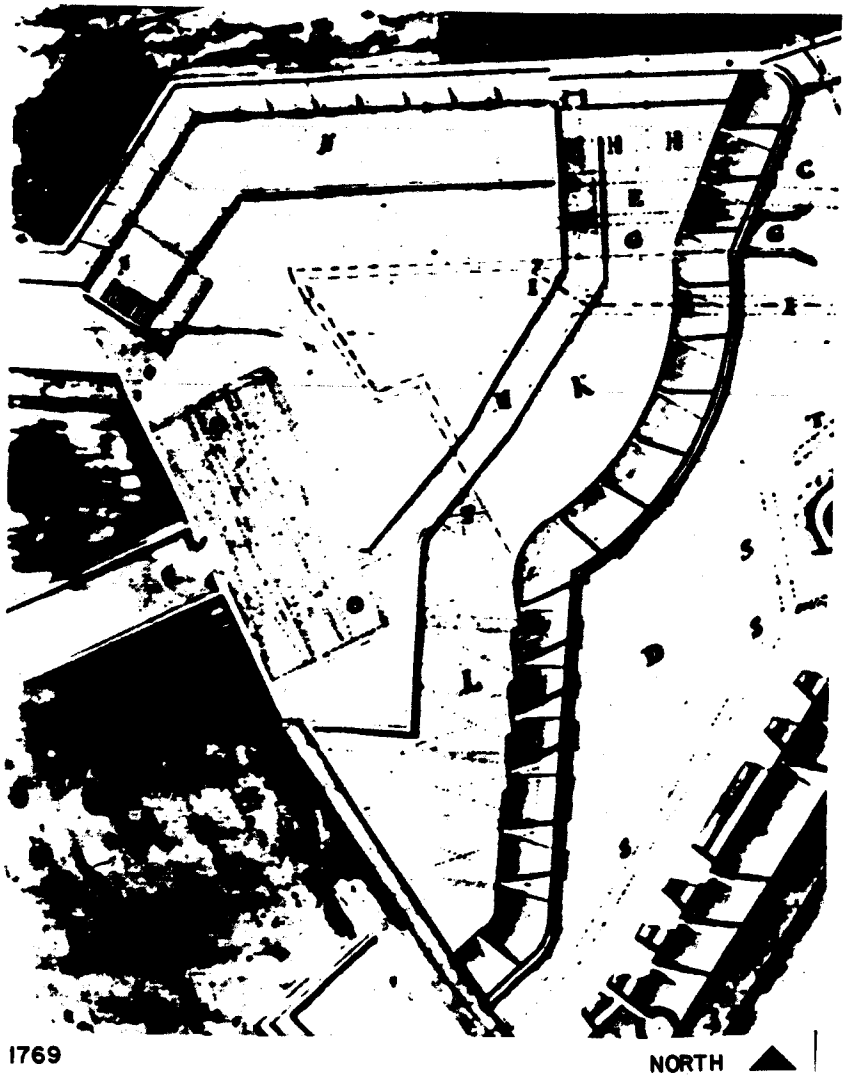


Figure 2.8. Detail of Thomas O'Daly's January 15, 1769 proposed construction plan showing the location of North Casemates labeled "N". (San Juan NHS Archives.)

The second story exterior walls of the powder magazines were constructed using rubble stone, as observed in 1986 at the west wall. A "fine mortar finish" or stucco was no doubt applied to the exterior walls in late 1771, along with other structures at San Cristóbal, to protect them from the harshness of the weather.[5] In 1772-3, stucco was also applied to interior surfaces, including el Caballero, to facilitate in the collection of rainwater.[6] Since the terreplein of the powder magazines was the north end of el Caballero, this too would most likely have been stuccoed. Inside, the walls were covered with a fine stucco finish.

Following their construction, the two-story powder magazines were pictured in O'Daly's 1773 plan of San Cristóbal. (See fig. 2.9.) Here they were labeled "L" and described as, "Proofed storage for powder in two levels."[7] Whether or not the vaults were used at all times to store powder is questionable. One map, undated but probably delineated sometime between 1769 and 1773, qualified their use for powder storage "during siege times."[8]

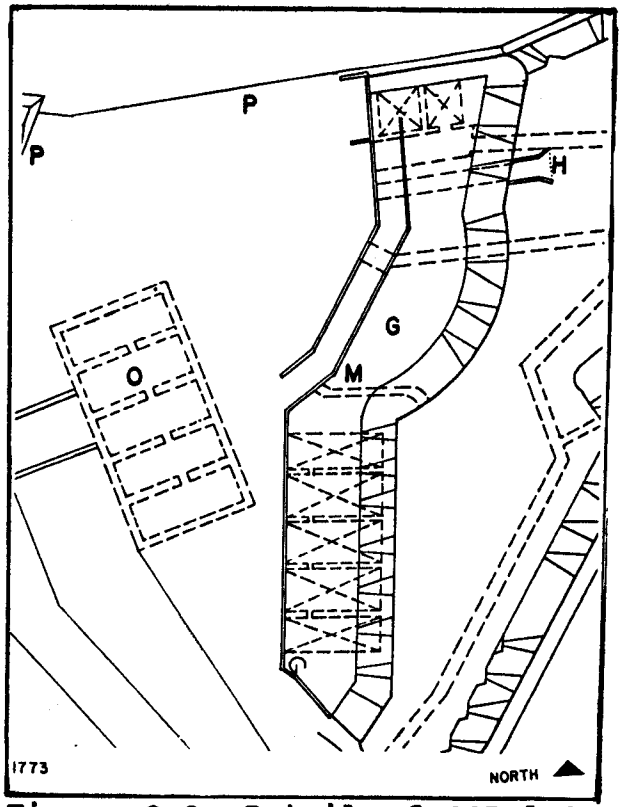


Figure 2.9. Detail of O'Daly's August 8, 1773 proposed construction plan as traced by Jana Gross (1989).

Work on the one-story addition to the west of the powder magazines did not begin until 1774.[9] Planning for these vaults, however, commenced five years earlier. The design, as originally conceived by O'Daly in his plan of 1769, differed from that actually built. The proposed structure (fig. 2.8) was not straight, but angled at its west end to enclose the Plaza. Access to the battery above was gained by two flights of stairs positioned at right angles to one another. Inside, the space was divided into seven vaults. On the plan, the proposed structure was labeled "N" and described in the legend as: "Projected battery in extension with seven proofed vaults for magazines or barracks."[10]

This layout remained unchanged, but the interior functions were more clearly defined in an undated plan believed to post-date 1769 (fig. 2.10). Here, the north vaults were labeled "I" and the southwest vaults "K," described in the legend as:

> I. Another five [vaults] for quarters.
>
> K. Two identical [vaults] for kitchens and latrine which serve as a [water] outlet for the upper platform with which they are maintained clean.[11]

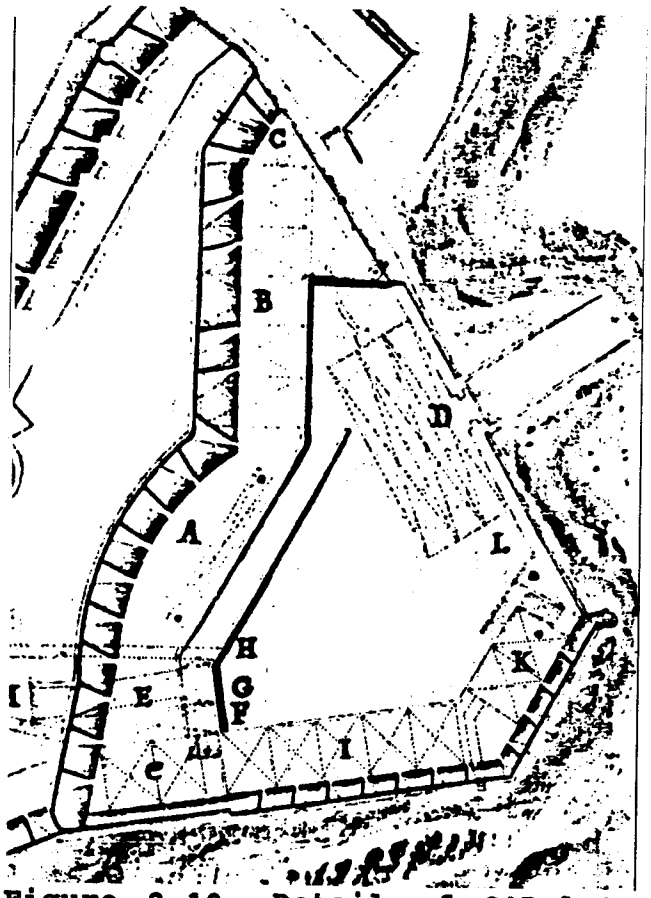


Figure 2.10. Detail of O'Daly's plan showing North Casemates labeled "e", "I", and "K". Ca. 1769.

The same angled configuration was apparent, although with less detail shown, in O'Daly's general plan dated August 31, 1772.[12] Exactly when this design was revised is not known. Just one year prior to construction, in 1773, O'Daly prepared a plan showing existing conditions (fig. 2.9). Not pictured on the plan was the proposed structure on the north side of the Plaza. Instead, the area was labeled "P" and described in the legend as: "Appropriate space for five proofed vaults and a battery above."[13]

A beginning construction date of 1774 is taken from a report by Thomas O'Daly.[14] Work on the vaults apparently continued for at least ten years. Actual descriptions of the final design and construction are provided by Engineer Juan Francisco Mestre's plan of 1783 and by construction reports dated 1784 and 1785.

The vaults were not built on a flat piece of land but against the side of the high north cliff. Reasons for locating the structure on this difficult site may have been both to make the north slope more inaccessible to potential intruders and to maintain the size of the Plaza. Because of the steep angle

of the slope, the size of the north and south foundation walls below the level of the Plaza differed dramatically. On the south side closest to the Plaza, the wall was relatively small and not exposed to view. On the north side, however, the wall rose from the base of the cliff and was massive in scale.[15] The piers of these walls were stone blocks to provide stability.[16] Tying the walls together just below the level of the interior floors was a system of paired arches. These also functioned to support the floors which were composed of a hormigón.[17] The roof of the vaults was constructed so as to minimize the problems of humidity and water infiltration. Before the terreplein was installed, a smooth mortar mixed with brick dust was applied to the outside. A drainage system was also installed that channeled rainwater onto the terreplein through conduits within the south wall and onto the Plaza.[18] The roof was built to function as a battery and therefore to carry the weight of cannons. Along the south side was a low parapet wall and on the exposed north side a thick barbette parapet.[19]

Although the vaults were not yet completed, the plan of 1783 (fig. 2.11) illustrated their design.[20] These were shown in a straight line with a ramp to the battery at the west end. A report prepared in that same year described the vaults as "being built in a line enclosing the Plaza of the Castle."[21] The number of vaults in the plan was nine. Unlike the earlier Troops' Quarters, each vault was designed with an exterior doorway facing the Plaza. Each vault except that on the far west also had a window facing the Plaza. Not illustrated were window openings in the north wall, although these were included in earlier proposed designs. Interior communication was made possible between the seven vaults on the east side via doorways in the partition walls. These vaults were most likely intended for the quarters and said to accommodate a battalion.[22] Solid walls segregated the two west vaults both from the quarters and from each other. Mestre's report of 1785 identified the farthest vault as the lugar comun (latrine) and the one next to it as the cocina or (kitchen). The latrine pits were flushed by water channeled from the Plaza and waste water from the kitchen to "facilitate constant cleanliness." The main conductor pipe, located beneath the floor of the latrine vault, drained at the base of the north wall and thus eventually to the ocean. Both the latrine and the kitchen had "everything needed for [their] outfitting" and were found in use by January 1785 (fig. 2.12).[23]

An additional feature that undoubtedly dates to this initial construction period, but for which no documentation was found, is an interior stairway. The stairway connects the east end of the ca. 1774-85 battery with the second floor west vault of the earlier powder magazine. This communication would have been essential for supplying the cannons emplaced on the upper

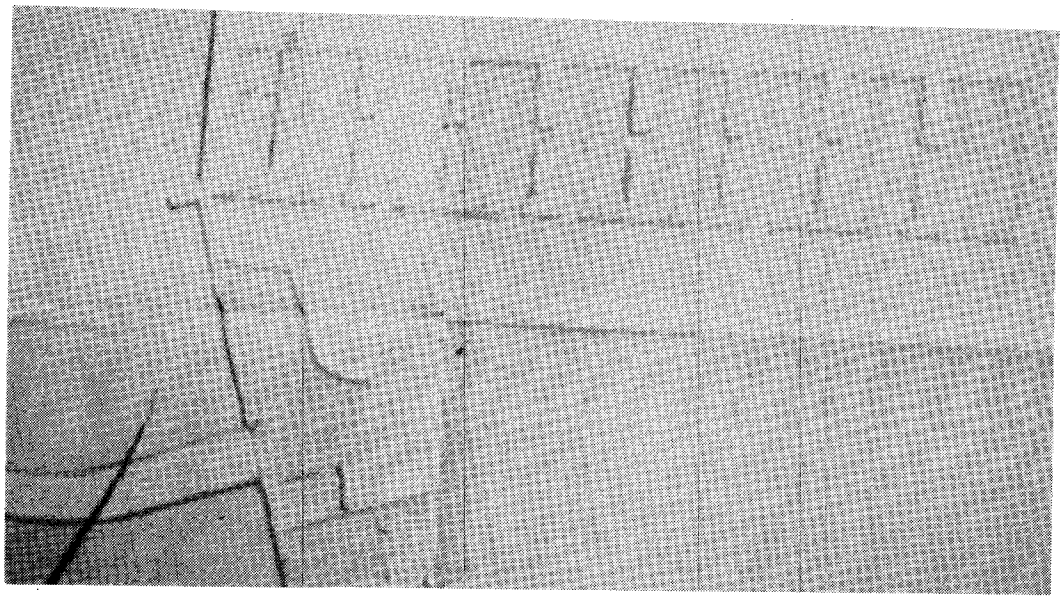


Figure 2.11. Plan by Juan Mestre, 1783. Drawing believed to be 19th-century copy of original drawing. (San Juan NHS Archives.)

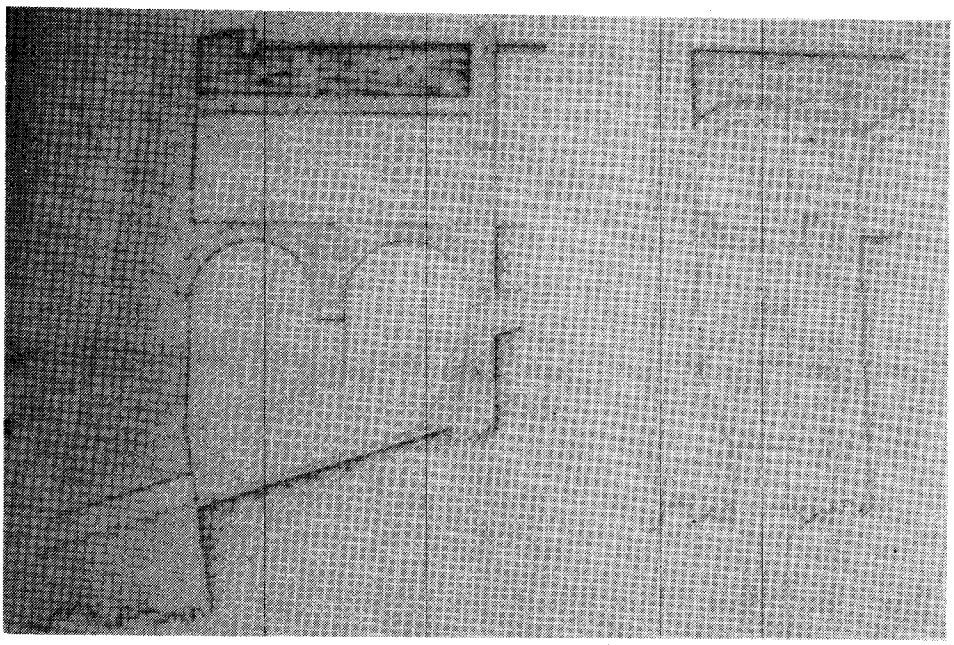


Figure 2.12. Profile looking east through latrine vault and showing drainage system. Juan Mestre, 1783. (San Juan NHS Archives.)

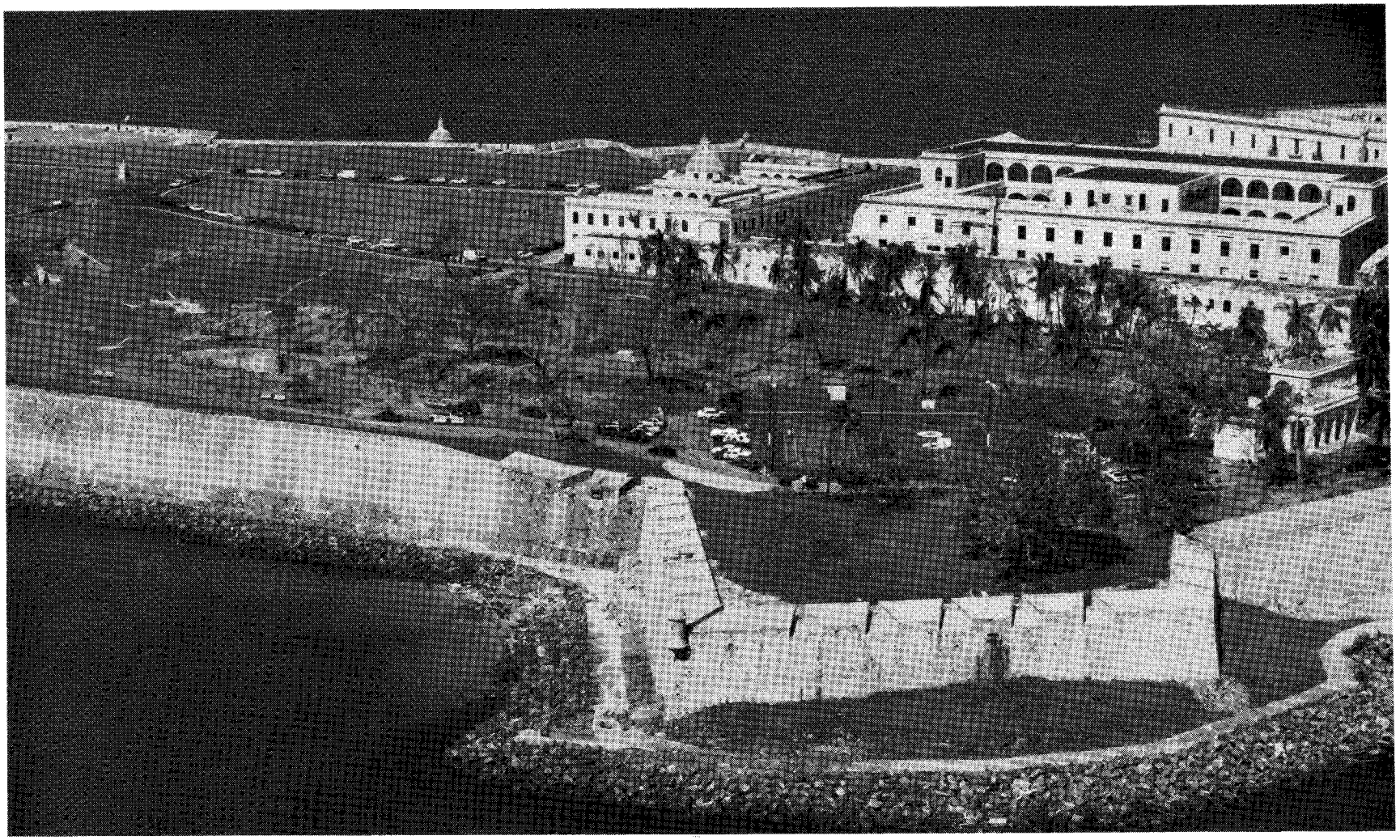


Figure 13. North view of Parcel B, 1989. Aerial view of Parcel B shows the Casa Rosa, the tennis courts, and the play area, the San Agustín Road and Bastion. The condition of Parcel B trees was indicative of damage caused by Hurricane Hugo, September 1989. PRSHPO, San Juan, PR.

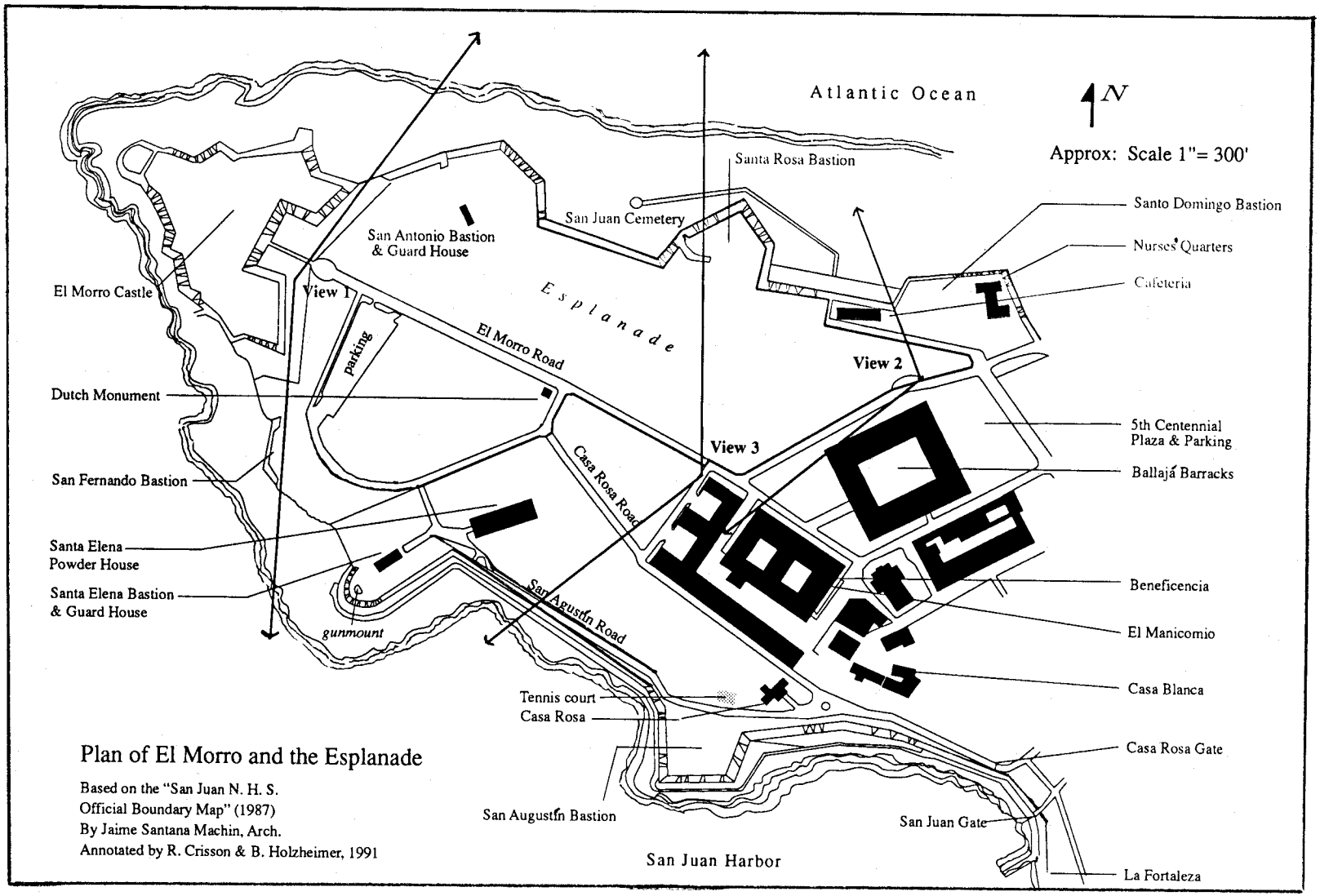


Figure 14. Existing Conditions. Site plan indicates locations of existing buildings, roads, vegetation, and primary views. The primary views (Views 1, 2, and 3) are keyed to composite photographs depicted in Figures 15, 16, and 17.

terreplein with ammunition. The steps are constructed of brick.

Many layers of paint were found on the lower plaster wall of the former kitchen vault. Unfortunately, it was not possible to date the earliest red and black layers, lacking both documentation and/or a datable element for comparison. Similarly, in the east stairway of the powder magazine, the earliest finishes could not be dated. Here, the earliest paint scheme divided the wall into two parts: the lower walls painted brown and the upper walls white. Whether or not this was an eighteenth-century treatment remains unknown.

Period 3: 1809-1837

Unlike other areas of San Cristóbal, a surprising amount of information was found on the structure north of the Plaza for this period. This includes a sketch dated ca. 1821 (fig. 2.13) and a description of work done in 1830.

The sketch from ca. 1821 is a view looking from outside San Cristóbal toward the northeast.[24] Clearly illustrated were the exterior west wall of the north vaults and the west ramp to the battery. Two window openings were located in the wall of the first vault, identified in the eighteenth-century documents as the latrine. These windows were on the plan of 1783. The sketch, therefore, provides evidence that they were actually constructed. Not visible on the 1783 plan, but appearing in the sketch, is another large window opening with arched top located in the ramp wall. This opening exists today and was part of the original construction.

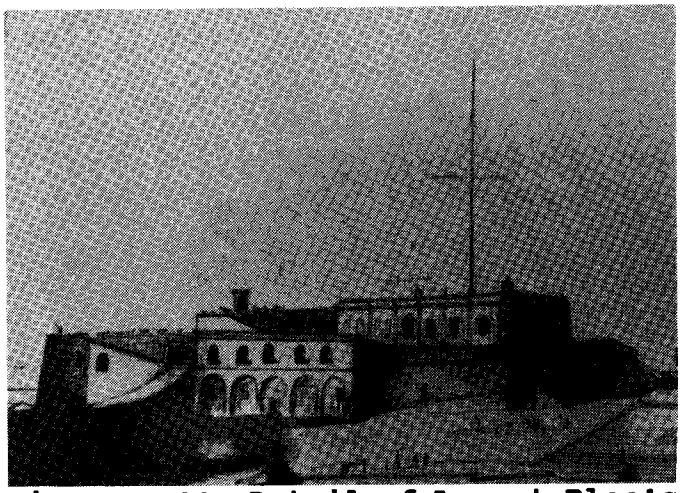


Figure 2.13. Detail of August Plee's sketch of San Cristóbal, east elevation, ca. 1821.

A description of work done in 1830 at San Cristóbal was published in a military history of unknown date. In this history, both the two-story powder magazine and the one-story vaults north of the Plaza were mentioned, although not specifically identified by name. While most details are vague, comparison of this description with the eighteenth-century

documents, the later nineteenth-century plans, and the remaining historic building fabric helps to pinpoint what work was done where.

The structures described as "two storage vaults" with "stairways" have been interpreted to be the two powder magazines in two levels. These vaults were noted:

> . . . [to] have been roughened and plastered, the floors worked on, stairways, doors and windows as well, closets and wardrobes added for the troops' housing.[25]

It appears that the magazines were adapted for the troops' quarters at this time. The extent of the renovations, however, is difficult to ascertain. For example, were the vaults plastered for the first time or replastered? Exactly what work was done to the floors, doors, and windows? As for work on the "stairways," it is possible that the walls of the west stairway to the terreplein of were plastered then. No historic closets and/or wardrobes remain today in the vaults.

In the one story vaults, work was done both inside and out. This area was described as located "to the left of this [entrance] ramp." It received the following treatment:

> . . . on the exterior wall . . . masonry 375 varas long has been roughened and plastered superficially . . . placing a bell and eight sliding windows in the vaults to the left hand side.[26]

Here again, it is difficult to determine the exact nature of the work. The "exterior wall" may be the west wall outside San Cristóbal. There is no other documentation nor evidence of a "bell" at the north vaults. It has been conjectured that the cupola of the adjacent Guardhouse may have been a bell tower, but this structure had apparently not been built by 1830. The "sliding windows" are similarly ambiguous. These may have been located in either the north or south facade windows. Nothing remains today that could be construed as a "sliding window" unless the reference was to window shutters.

Work on what was most likely the Plaza side of the "North Vaults" and their interiors was also addressed:

> . . . worked on, plastered & whitened [were] the cornices and latrines, adding iron rods [grilles?] to the kitchen fires, executing 8 cubic varas of masonry plaster, [and] adding to shelves and a box [frame] 10 varas long.[27]

According to the eighteenth-century documents, the latrine was located in the far west vault and the kitchen in the vault adjacent to it. "Whitened" may refer to whitewashing. This type of finish is found throughout San Cristóbal on interior and exterior stucco surfaces, in some cases pigmented. The "kitchen fire" or stove appears to have been located in the southeast corner of the second vault based on the later 1861 Castro plan. Whether or not the "shelves" and "box" were also located in the kitchen or intended for the adjacent quarters could not be ascertained.

Period 4: 1837-1868

The powder magazines and casemates were well documented during this period. Sources of information include the 1839 model, Rafael Clavijo's 1859 report, Manuel Castro's 1861 drawings, and Leon de Castro's 1868 plan (references provided below). These provide our first detailed views of the structures and their interiors. Also recorded were alterations, the most significant being the building of an open galería (loggia) in front of the vaults. Other changes included the modernization of the kitchen vault, construction of a sentry box and steps at the battery ramp, painting the walls facing the Plaza, and the installation of another latrine room outside the original latrine vault. In the late 1850s, the north vaults were referred to for the first time as the bovedas de las casamatas (casemate vaults). This may indicate that the vaults were being utilized as gun positions.

The 1839 model of San Cristóbal shows the basic configuration of the Plaza's north side little changed from Mestre's 1783 plan or the later sketch of ca. 1821.[28] However, the fenestration of the one story casemates on the Plaza side is different. In the 1783 plan, doorways and windows were paired in casemates CM-2 through CM-9 to present a symmetrical facade. In the model, the doorways and windows were interchanged in CM-3, CM-8, and CM-9. That the openings were actually built this way is unlikely. Careful comparison of the 1783 plan with that of 1861 and existing conditions today would seem to indicate that this detail of the model is incorrect. Another detail of questionable validity in the model is the absence of window openings in the north wall. Although north windows were indicated only in the powder magazines in the 1783 plan, north openings were shown in the one story vaults in the earlier designs of 1769, ca. post-1769, and 1772. (Please note, abbreviations used here and elsewhere in the structural evolution, i.e. CM-1, are not historical designations. They were assigned to the casemates by HABS documentation in 1963.)

Also shown in the model were colors of structures. All features of the exterior north vaults were colored gray, and some other structures on the Plaza were colored yellow and white. This gray was most likely an unpainted stucco finish based on analysis of paint sample SAJU 02 P08, removed from the exterior wall between vaults number three and four.*

Following a gap of about ten years, Rafael Clavijo of the Engineering Command for Puerto Rico summarized the improvements made at San Cristóbal between 1849 and 1858. This was included in his review for the year 1858.[29] Of these renovations, three focused on the north side of the Plaza. Most notable was a "high and spacious gallery" constructed in front of the bovedas de las casamatas. This gallería was described as providing a covered area: ". . . where the soldier can come out free of the sun and rain to do his daily chores which he previously did with great inconvenience".[30]

Another improvement involved the kitchen. Here it was noted that, ". . . also constructed were economical kitchens and a charcoal kiln . . ."[31]

One possible interpretation of "constructed" may be the remodeling of the original kitchen located in CM-2 while "charcoal kiln" has been translated from the Spanish carbonera which may also mean coal bin. One change to the kitchen not described here that may have occurred at this time was illustrated in the plans of 1783 and 1861. In 1783, a doorway and window faced the Plaza in CM-2. By 1861, however, the entire south wall was open to the Plaza, perhaps to provide better ventilation. This configuration exists today.

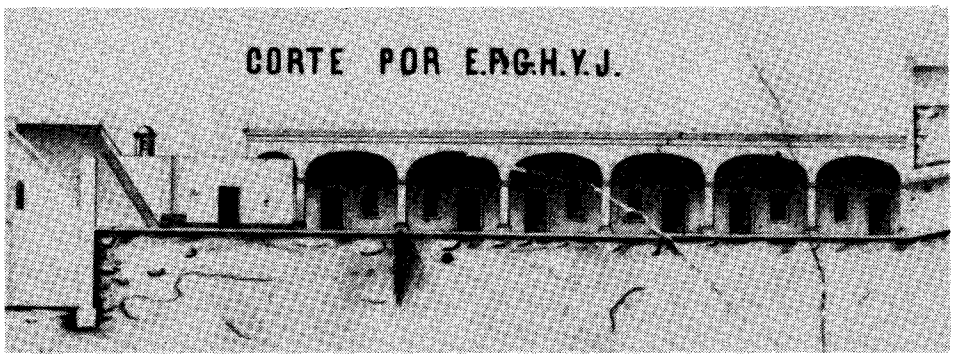
One other alteration accomplished during the period 1849-1858 was partitioning of one of the vaults. Specifically, it was recorded, "There have been partitions made in one of the north vaults for sergeants' rooms."[32]

Which vault was divided is not known. Castro's plans of 1861 indicated partitions only in the latrine vault. Not until the plan of 1868 was CM-3 shown bisected by an east-west partition.

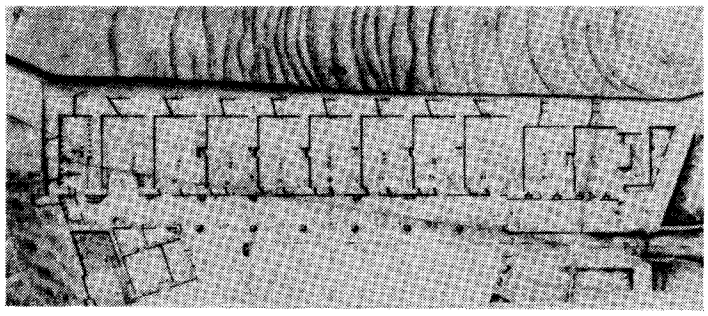
In 1861, delineator Manuel Castro recorded the Castillo de San Cristóbal including the north side of the Plaza (See Volume

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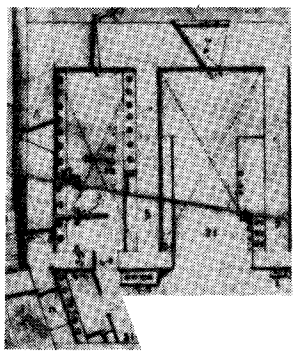
*Park staff at SAJU indicated to Richard Crisson that the model has been repainted at least once by park staff to spruce up the model's appearance. Current color schemes, therefore, do not necessarily reflect original paint treatment. Paint analysis of the model should be considered in future research.



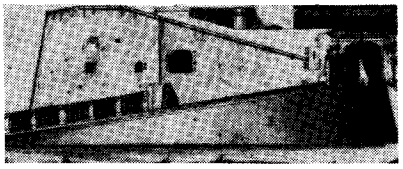
SOUTH ELEVATION



FIRST FLOOR PLAN



PLAN
KITCHEN & LATRINE



WEST ELEVATION



SECTION
LOOKING EAST

Figure 2.14. Details of 1861 plans and elevation drawings by Manuel Castro showing the North Casemates. (San Juan NHS Archives.)

I, nos. 27-37 for complete set of drawings).[33] Illustrating the powder magazines and north vaults were five drawings: a first floor plan, second floor plan, roof plan, section looking east, and a south elevation. While the intent of these drawings has not been determined (e.g., to record existing conditions or proposed work) they do provide a valuable detailed view of this area and the new loggia (fig. 2.14).

The powder magazines in Castro's drawings appear little changed from their configuration today. Two separate floors were clearly illustrated with two magazines located on each floor. Connecting the two floors was a U-shaped staircase on the east side of the east magazines. This stairway was ventilated by a narrow window in the upper north wall. Not shown was the west stairway connecting the second floor west magazine with the terreplein of the North Casemates. This, however, may have been an oversight since both the earlier documentation and plaster analysis seem to indicate it was extant by 1830. The two magazines at the first floor Plaza level were each entered through a centrally-placed doorway in the south wall. On either side of these doorways were small ventilation windows. Air and light was provided to each magazine by a window in the north wall. The doorway in the partition wall between the two magazines was shown to be enclosed. Upstairs, however, this doorway remained open between the magazines. Also upstairs, one window each was located in the north wall. Whether the four magazines were still in use as quarters in 1861, as they were in 1830, is not known.

The one-story casemates to the west of the powder magazine numbered nine in 1861 (as they did in the plan of 1783). Outside, on both the south and east facades of the structure, the walls were drawn as smooth as if finished with stucco. The new loggia on the south facade, built sometime between 1849 and 1858, was similarly drawn. This loggia covered the entire area in front of the vaults except for a space in front of CM-2 (the kitchen). This no doubt was intended to facilitate the dissipation of smoke from the kitchen's cooking fires. The loggia was an open design consisting of a roof supported by six columns. Arches spring from above the columns. In these arches louvered panels were installed. These panels effectively enclosed the upper part of the loggia and would have provided additional protection from the sun and driving rain.

Two additional improvements, possibly constructed at the same time as the gallery but not described in the 1859 report, were a sentry box and steps in the west ramp to the battery. Both were clearly illustrated in the 1861 drawings. That they were actually built is confirmed by later photographs and remaining building fabric. The sentry box was shown in the

west wall of the ramp adjacent to the main gate. It was rectangular in shape and entered through a doorway just off the ramp in its east wall. In the opposite west wall of the sentry box was a long narrow vent that provided a view of the main entrance ramp. The steps were built into the slope of the west ramp. These were narrow and numbered thirty. They did not climb the entire length of the ramp but reached only as far as the cupola of the new Guardhouse. Based on remaining physical evidence, this cupola is believed to have been built as a part of a cistern tower or an above-ground water receptacle or holding tank. The steps would have provided access to the top of the tower for manual hauling of water.

Castro's drawings were color washed, and the south facade of the north vaults, including the loggia, were shown as yellow, white, and green. Colored yellow in the south elevation drawing were the exterior wall of the vaults and the columns and arches of the loggia.* Evidence indicates that this yellow finish was a pigmented whitewash. Colored white in 1861 were the trim (architraves) of the doorways and windows and the cornice of the gallery. Colored green in the drawing were the louvered panels in the upper gallery arches. These were similar to the green louvered shutters in the 1861 elevation drawing of the Troops' Quarters. Unfortunately, both the louvered panels and the louvered shutters were removed in the twentieth century so no confirmation or match of this color could be made.

The existing arrangements of doorways and windows in the one-story casemates are the same as those illustrated in the 1861 drawings. Unfortunately, no doors or window shutters were detailed for any of the facades. In the south wall facing the Plaza in 1861, CM-1 and CM-2 had one doorway each, and CM-3 through CM-9 a doorway and a window. Changes appear to have been made in CM-2 and CM-9 based on comparison with the 1783 plan. The 1783 doorway and window of CM-2 were replaced by one wide doorway. This was possibly done in 1830 along with other improvements to the kitchen previously described. In CM-9, the 1783 doorway and window changed places. The reason for this small alteration cannot be explained. Perhaps this was not an alteration but a last minute change to the design of 1783 since the structure was not completed until 1785. This may be the same case with CM-2. Information provided by the model of 1839 is of little value for this south facade because the fenestration differed markedly from both the 1783 and 1861 configurations. It has therefore been discounted as erroneous and not referred to in this discussion.

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*Yellow was also the color of the first finish observed in paint sample SAJU 02 P08 removed from the exterior south wall between vaults three and four.

Three window openings were located in the west facade in 1861. The two small windows on the north side were in the latrine vault. To the south of these was one large, arched, opening located beneath the ramp to the terreplein. While only the latrine windows were illustrated in the plan of 1783, all three are thought to be original and were shown in the sketch of ca. 1821 and the model of 1839. In the 1861 west elevation drawing, a detail not previously seen was a grille enclosure in the large window opening. This grille was composed of seven vertical and two horizontal bars. Whether or not it actually existed cannot be confirmed, lacking both later photographic and physical evidence.

In 1861, the north facade had nine windows. These corresponded to each of the nine interior casemates. Those in CM-2 through CM-9 were shaped like embrasures -- narrow on the interior side and wide on the exterior side -- to enable emplacement of cannon. Whether or not cannon were emplaced in 1861 is not known. Evidence of grilles shown in plan on the exterior sides of these windows suggests that they were not. Unfortunately, these grilles were not illustrated in elevation. The date of these north window openings has been questioned since they do not appear in either the 1783 plan or the 1839 model. Earlier plans, however, included them, indicating that the plan and model may not have been accurate in all details.

Interior detailing of the one-story vaults in 1861 suggested that the latrine was still located in the far west vault and the kitchen in the vault next to it. Use of the seven vaults to the east was not clearly defined.

In drawings of the original latrine vault (CM-1), 18 privy holes were clearly indicated along the east and west walls. At the south end of the east wall was a rectangular feature that may have been a trough utilized as either a urinal or wash basin. This latrine vault was partitioned near the entrance doorway into a small front section and a large rear area. In the front at the west wall was a small partitioned closet containing two privy holes. This closet was ventilated by a window. The same arrangement was found on the north side of the partition wall. Here, the closet and trough were located in the front part of the large back room. This closet, however, had no window. Further into the back room, privy holes lined the east and west walls: seven on each side. Unlike the two closets in front, these were not screened for privacy. Two windows, facing west and north, ventilated this open area.

Additional latrine accommodations were illustrated in 1861 just outside the original latrine vault. A room partitioned at the west wall beneath the ramp had five privy holes. An unidentified boxed feature at the south wall of this room may

have been a urinal or wash basin. In the west wall was the arched window, previously described as covered by an open grille. The date of this latrine room is not known. It did not appear in the plan of 1783 nor was the room described in the original construction reports. No physical evidence remains of its existence. Of interest, however, are the multiple layers of paint observed on the walls.* The earlier finish appears to predate the ca. 1849-58 exterior yellow. Paint layers on the lower walls are a dark color such as gray, black, or red. Lighter colors were found above, such as white and yellow. By about 1861, the lower walls appear to have been finished gray and the upper walls yellow. How this compares with the original latrine vault (CM-1) is difficult to ascertain since those walls have been extensively repaired with modern cement.

The kitchen was originally located in CM-2 next to the latrine vault. According to Castro's drawings, this still seems to have been the case in 1861. As mentioned previously, the entire south wall was open. A cook stove with six burners was located in the southeast corner. Its placement here is corroborated by the extant remains of what is thought to be a stovepipe hole in the south wall. Immediately adjacent to the stove at the east wall in 1861 was a large rectangular feature that may be the "charcoal kiln" (or coal bin) described in 1859. On the opposite wall, a long, narrow, rectangular feature may be the "6 shelves" added in 1830. Many paint layers were found and are similar to the area outside of the latrine vault.** Also similar to this area, was the apparent practice of painting the lower walls a dark color such as black, gray, or red.

In the seven casemates to the east of the kitchen (CM-3 through CM-9), no detailing is provided in 1861 drawings to indicate their use. A likely guess is quarters for soldiers. In the plan of 1861, the interconnecting doorways were closed off and form niches or closets. Whether or not this was actually done cannot be confirmed because this arrangement is not seen in later drawings and no physical evidence remains. (This conversion of doorways into closets was, however, documented in the Officer's Quarters.) (See Chapter 8.) Treatment of an interior wall in 1861 was illustrated in a section and showed the east wall of CM-6 as plain and colored white.

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*Paint samples SAJU 02 P04, SAJU 02 P05 from the lower and upper south wall.

**Paint sample SAJU 02 P12 removed from east wall, north corner of this vault.

Leon de Castro recorded the west side of the Plaza in 1868.[34] Included in his plan (fig. 2.15) were the first three (west to east) of the north vaults. CM-1 is labeled "10. Latrines," and CM-2 "9. Kitchen." Although the east wall of the kitchen is only generally detailed, neither vault appears to have changed since 1861. Alterations are evident in other areas. The latrine room outside the original latrine vault was not shown. Also, partition walls have been added in CM-3 to create two rooms and a small closet in the northeast corner. It is not known if these changes were actually existing, or proposed by de Castro in 1868.

Period 5: 1868-1898

No information was found for the early years of this period. Documentation on the later years refers to modifications to the north vaults in preparation for war.

Following occupation of the American forces in 1898, after the Spanish-American War, an inspection report was prepared on the defenses of San Juan. This report included San Cristóbal.[35] On the north side of the Plaza, two 24-cm howitzers were found emplaced on the battery of the single story vaults. Evidence of their exact locations is visible today. Ammunition for these guns was stored in the casemates below and "sent up to the barbette tier through a circular well by means of a small shot crane."[36] Precisely where this well was located, and which casemates were employed, as magazines is not known. The north parapet in front of the guns was reinforced with earth and concrete ca. 1897. This reinforcement was illustrated in an early photograph taken before the occupation (fig. 2.16). The emplacement was located on the slope of the parapet and shaped like a gable roof. The gun crews were protected by earthen traverses, also visible in the photograph. One of the traverses was located between the two guns and supported by barrels and sacks. The emplacement on the parapet remained until early in the twentieth century.

Period 6: 1898-1987

From October 1898 through 1960, San Cristóbal was administered by the U.S. Department of the Army. Beginning in September 1961, that responsibility was passed on to the NPS. Both agencies have made changes and repairs to the structures north of the Plaza. Under the Army, the structures were known as the casemates, sea casemates, casemates quarters, or by a building number. "North Casemates" became the common name for

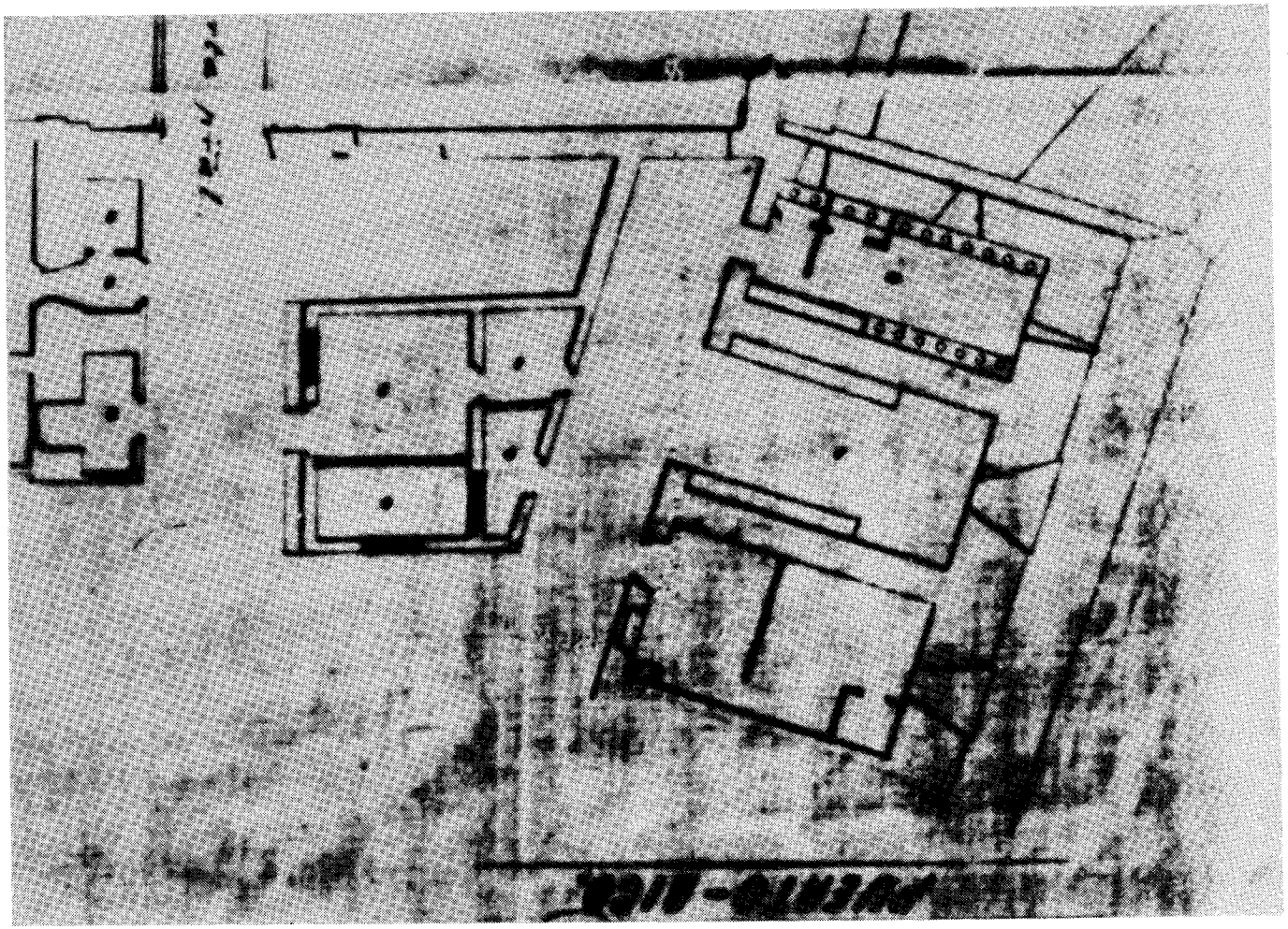


Figure 2.15. Detail of 1868 plan by Leon Castro showing west end of North Casemates. (From HABS negative 181.31.)

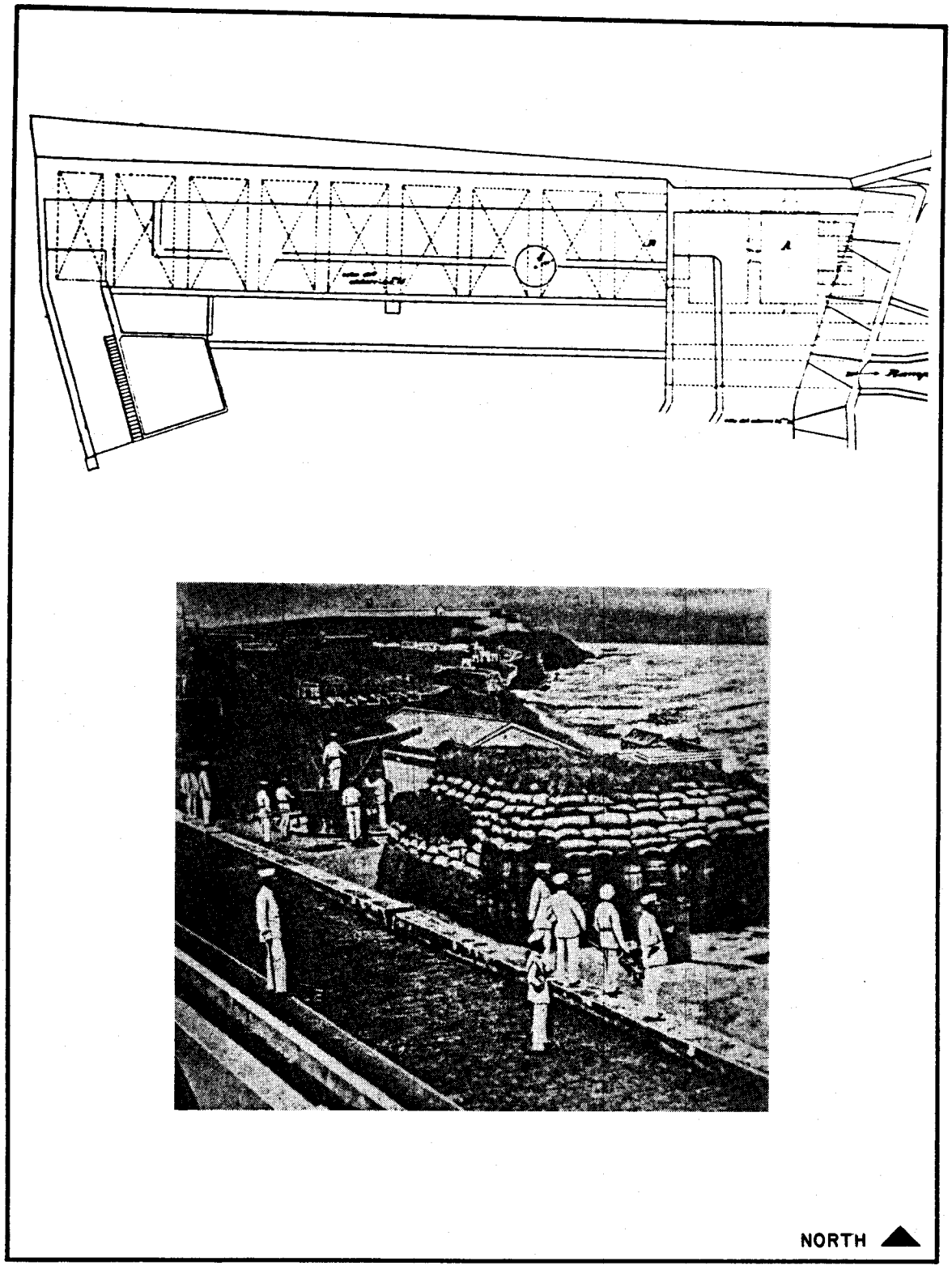


Figure 2.16. Plan and photograph, both dated ca. 1897, showing late-19th century gun emplacements on terreplein of North Casemates. (Plan, San Juan NHS Archives. Photo, Crónicas de la Guerra, 1973.)

both the north vaults and the powder magazines after their recording by HABS in 1963.

Early twentieth-century photographs and plans of the Plaza's north side indicate both similarities and differences when compared with Manuel Castro's 1861 drawings. Photographic evidence confirms that some features illustrated by Castro and believed to have been built in the mid-nineteenth century in fact existed. These include the sentry box adjacent to the Main Gate, the narrow steps built into the west ramp, and the louvered panels in the arches of the loggia. Other features that remained unchanged were the arrangements of doorways and windows and the location of the kitchen in CM-2. Enclosing the west facade's large arched window opening were two horizontal bars, not the grille shown in 1861. The interior doorways interconnecting CM-3 through CM-8 were open in 1901 rather than partitioned, resembling their original eighteenth-century configuration. The west stairway of CM-10, leading to the battery was illustrated for the first time. As previously discussed, however, this stairway is thought to pre-date 1861.[37]

Whether or not the latrine was still located in CM-1 in October 1898 has not been determined. Assuming it was, it would most likely have been relocated in the spring of 1899 when city water and sewer systems were introduced.[38] By December 1899, bathroom facilities for the enlisted men were located in the south wing of the Officer's Quarters. The plan dated February 1901 indicated that the original latrine in the north vaults (CM-1) was then a storeroom for wood (fig. 2.17).[39]

In December 1899, work on the San Cristóbal quarters including the casemates was proposed. This was approved in early 1900 and presumably carried out.[40] Outside, all walls facing the plaza were to be whitewashed. It was suggested that the "body wall be washed a greenish tint" and the loggia's pilasters and arches be "whitewashed."[41] The closest color to a "greenish" tint found in any of the exterior paint samples in 1986 was a light blue. Whitewashing of the loggia could not be confirmed because it has since been heavily refaced using cement. Exterior woodwork of the doors and windows was to be repainted in 1900. Inside, walls and ceilings were to be whitewashed and woodwork repainted. The old floors, determined to be in bad condition, were to be overlaid with a layer of cement. It was assumed that this could be done economically because the building had a proper foundation. Cement floors exist today and may date to this early renovation.

The plan of San Cristóbal dated February 12, 1901, labeled the use of each vault north of the Plaza.[42] Beginning at the west end, CM-1 was a storeroom for wood. This wood was most

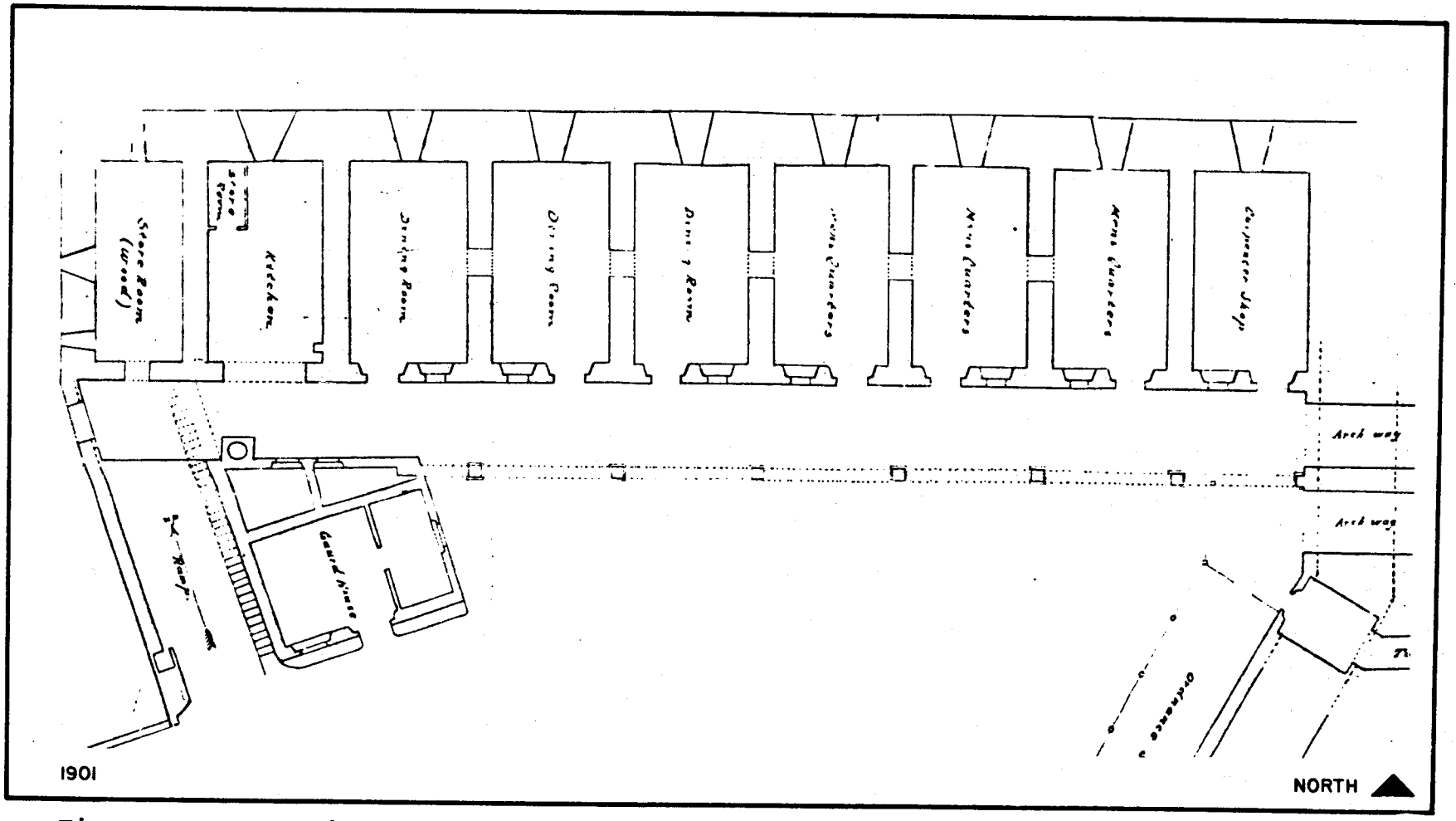


Figure 2.17. Detail of plan by Guy S. Boyce, dated 1901 and titled "Quarters at Fort San Cristóbal" showing North Casemates. (San Juan NHS Archives.)

likely fuel for use in the adjacent kitchen in CM-2. Placement of the kitchen stove was not shown, although a rectangular shaped "store room" was illustrated in the north corner along the west wall. A popular color for the lower walls of the kitchen in the 20th century was a brick red.* Next to the kitchen were three conveniently placed "dining rooms" in CM-3, CM-4 and CM-5. These were followed by three "men's quarters" in CM-6, CM-7 and CM-8. And lastly, in number CM-9, is the "carpenter shop." The allocation of space in the adjacent powder magazines was not shown.

Electric lighting was installed at San Cristóbal, and presumably in the structure on the north side of the Plaza, between 1901 and 1904. These electric lights replaced coal oil and regulation lamps described as being unsatisfactory because they gave off heat and blew out in the breezes.[43]

Between the years 1902 and 1908, many requests were made to fund repair work, but only a small portion of these were actually approved. Not funded in 1902 was a proposal to remove the old plaster and replace it with Portland cement plaster at the "sea casemates." Specifically, it was recommended that the exterior, the ceiling of the loggia, and the interiors of the nine "casemates" be replastered. Conditions were apparently not critical, since the work was described "not an immediate necessity." However, by 1906, the buildings at San Cristóbal were reported to be "badly in need of repairs." The next year, the living quarters, possibly including the North Casemates, were whitewashed using minimal funds. Not until 1908 was extensive work undertaken on the San Cristóbal quarters. This work involved repairing and repainting the outside walls, replacing decayed doors, and rebuilding the "gun platform" that formed the roof of the dining room. Materials specified included: oil paint with white lead and colors for the walls; double "solid panel" doors for the doorways; and native hardwood joists and strips, building bricks, and cement for the terreplein. No evidence of lead-containing oil paint was found in exterior paint samples, suggesting that this may have been changed to a traditional whitewash finish. Of the exterior south doors, only those in CM-3 and CM-4 were identified as "old" in 1963. Therefore, the six doors in CM-1 and CM-5 through CM-9 must have been replaced, possibly in 1908. As for the terreplein, this was most likely the ceiling of dining vaults (CM-3 and CM-4) beneath the west gun position. Here it was noted that all the timbers were decayed and the structure falling down. This repair was undoubtedly carried out.[44]

Sometime before August 17, 1912, the mid-nineteenth century sentry box was removed. Clearly visible in a photograph of

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*Paint sample SAJU 02 P12.

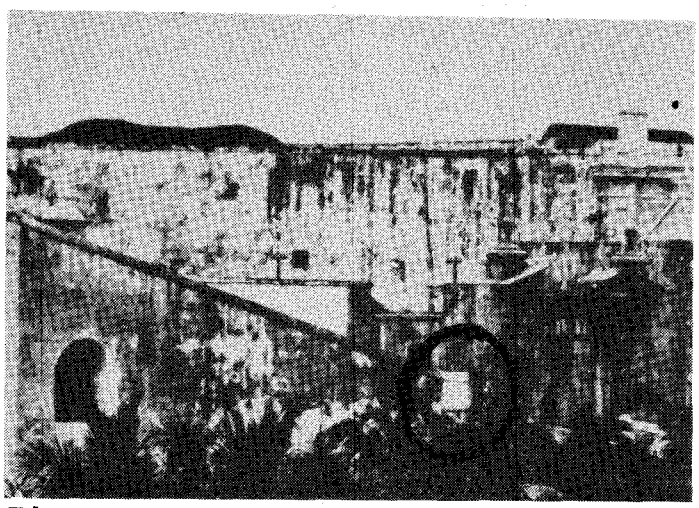


Figure. 2.18. August 17, 1912. Location of removed sentry box circled. (Puerto Rico Illustrado, San Juan NHS Archives.)

that date was a light-colored patch in its former location (fig. 2.18). This is on the lower west wall of the ramp to the terreplein of the North Casemates, adjacent to the main gate.[45]

On a plan of 1935, four of the nine casemates north of the Plaza were unchanged in use from 1901 and five were being used differently.[46] Still shown as storage (deposito) was the original latrine (CM-1). CM-6, CM-7, and CM-8 were still labeled as quarters for the compañía. However, the former dining rooms, CM-3, CM-4 and CM-5, were appropriated for quarters. Not surprisingly, the adjacent kitchen was also relocated (to the Troops' Quarters) and CM-2 was now used for storage. Lastly, the former carpenter shop in CM-9 was allocated to the ordenanza (soldier assigned to attend upon a superior officer and carry orders). As before, use of the space in the powder magazines was not specified.

The two earthen mounds on the north battery parapet were removed sometime before the late 1930s. These mounds were last, and most clearly, seen in a photograph dated in the 1920s. An aerial photograph dated ca. 1938-40 confirms this. However, no documentation has been found for their removal.[47]

The loggia was extensively rehabilitated in August 1939. Photographs of the work in progress show the roof completely removed and in the process of being rebuilt.[48] Already installed were the wooden ceiling joists at the west end. This was no doubt when the red clay paving tile "tile deck" was constructed as illustrated in the 1963 HABS drawings. Extant at this time were the mid-nineteenth century louvered panels in the gallery arches. It was at about this same time that a basketball backboard was attached to the lower louvered panel of the third arch from the east.

A need for additional space during the World War II years prompted the construction in 1943 of a temporary frame building on top of the north vaults.[49] The vaults downstairs were used, most likely as quarters, by the U.S. Army and Marine Corps. CM-11 and CM-12 contained a carpenter shop and a storeroom.

The temporary frame building above housed naval quarters, a reading room and a chapel. An undated plan of the 1940s illustrates the layout of the various rooms.[50] One photograph of the northwest facade showed this building to be a long, one-story, gabled-roof structure with board siding (fig. 2.19). Its foundation was elevated above the level of the terreplein, no doubt so as to facilitate drainage. Two alterations seen in the photograph were apparently made at this time to make the site safer and more accessible. One temporary improvement was the installation of a protective railing along the top of the west ramp wall and the low north parapet. The other, which still exists today, involved the widening and lengthening of the extant nineteenth-century steps in the ramp.[51] Exactly when the frame building and railing were removed is not known. Aerial photographs taken in the mid-1950s show no structure on the terreplein.[52]

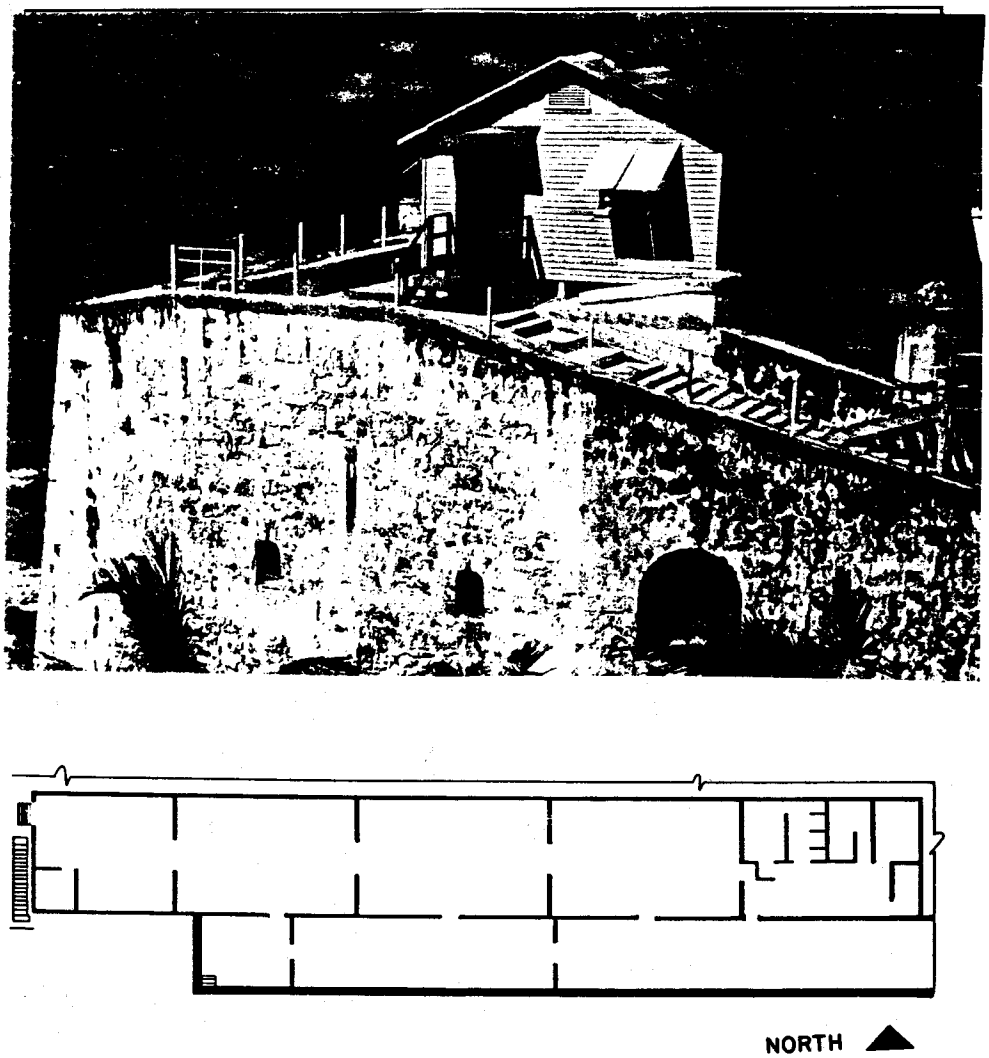


Figure 2.19. Detail photograph and plan showing temporary frame building (1943) on terreplein of North Casemates. (Photo by Rotkin, San Juan NHS Archives. Undated plan, "General Floor Plan San Cristóbal," San Juan NHS Archives.)

Recorded for the first time (in the same ca. 1940's plan that shows the layout of the temporary building) was a tub in the north window embrasure of CM-3. More accurate measured drawings of this tub were made in 1963 showing a low brick wall enclosing the lower part of the window. This feature, stuccoed with a red brickdust mortar, exists today. The documentary information seems to indicate that it was built sometime after the vault came into use as a dining room, ca. 1901-1935. By 1935, the vault was labeled as quarters (compañía), although no tub was yet illustrated. Therefore, an appropriate installation date of post-1935 to pre-1945 has been assigned.

In 1947, the one-story casemates were known as "Building 18" and their function noted as "Navy Barracks." The powder magazines were then "Building 23" and listed as the "Carpenter Shop and J.O.C. [Joint Operations Center] Supply Office."[53] Two years later, in 1949, the North Casemates were simply labeled as "Building 212."[54]

The Army undertook a major rehabilitation of the San Cristóbal quarters in the 1950s. It was at about this time that the louvered panels were removed from the gallery arches, a ground-supported basketball backboard placed in front of the third arch from the east, and an exterior floodlight installed on the loggia to illuminate the basketball court.[55] A scope of work dated 1958 also lists extensive repairs for the "guardhouse and north front casemates."[56] Work was specified for vaults "A-1 through A-13" but unfortunately no key was provided as to their locations. The following repairs were described for all the vaults. In the doorways and windows, damaged and deteriorated wood and metal was to be replaced with new treated lumber and bronze hardware. All woodwork, both inside and out, was to be painted. Inside, the existing cement plaster was to be patched and the walls and ceilings painted. New iron grilles were specified for areas A-1 and A-10. A new concrete floor was specified to replace the deteriorated wooden one in A-11. Precisely what was done, and where, could not be determined.

The structures were vacated by the Army in 1960 and occupied by the NPS in 1961. A temporary visitor center was located in the casemates, based on photographs dated to 1961 and 1962. These show a large "Visitor Center" sign attached to the exterior south wall between CM-4 and CM-5. Probably installed at this time and illustrated in later drawings were railings in the interior doorways between CM-3 and CM-4 and CM-5 and CM-6.[57]

Early in the 1960s, the NPS commenced repair and restoration work. By July 1962, the Army's basketball backboard had been removed from its location in front of the loggia.[58] The deteriorated stuccoed doorway and window opening surrounds on

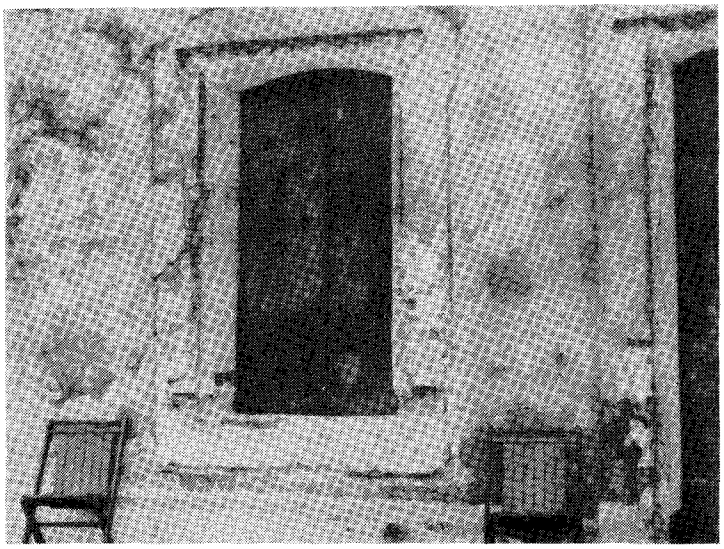


Figure 2.20. Window, south elevation, North Casemates. Note deterioration, ca. 1963. (San Juan NHS Archives.)

the south facade were photographed in 1963 (fig. 20). By December of that year, the Superintendent noted that "repairs and patching to the [loggia?] arches and moldings of the North Casemates [are] nearly complete."[59] A series of Accelerated Public Works' photos showed the repairs under (fig. 2.21).

HABS prepared eight measured drawings of the existing conditions for both the casemates and the powder magazines in 1963.[60] Both structures were then labeled the "North Casemates" and the vaults numbered, from west to east, CM-1 through CM-11. With the exception of interior details, the general layout remained unchanged from the mid-nineteenth century. HABS recorded "crushed brick pavement" at the terreplein level, "earth fill" in the north parapet, and the remains of the two 1897 gun positions. Below, doors and window shutters were detailed for the first time. (See fig. 2.1, 2.2, 2.3, 2.5.)

In 1963 and 1964, eight sheets of plans were drawn for the restoration and conversion of six of the nine one-story North Casemates into museum space.[61] CM-3 was to be a "Museum Laboratory" and CM-4 through CM-8 "Museum Rooms." All old and modern doors and door frames, and shutters and shutter frames, were to be replaced with new materials in the south and north facades of these vaults. The new doors and shutters were designed with vertical boards. Slated for removal were the "embrasure railings" in the north windows of CM-6, CM-7 and CM-8. The two interior railings in the doorways between CM-3 and CM-4 and CM-5 and CM-6 were also to be removed. In place of one railing between CM-3 and CM-4 a new door was to be installed. Details of the electrical wiring were shown on one sheet, although the extent of the new work is not clear. Apparently no longer in use by this time were "3 abandoned ceiling outlets" in the loggia ceiling presumably for electric lights. While it is obvious that this work was done based on existing conditions today, no documentation has been found on its completion. Also, it appears that contrary to the plans, some old doors were saved and reinstalled in the south facade of CM-4.



Figure 2.20a. APW photo, window on south elevation, ca. 1963. (San Juan NHS Archives.)



Figure 2.21b. APW photo, loggia, ca. 1963. (San Juan NHS Archives.)

Extensive repair work was planned in 1975 for forty one "casemates" at both San Cristóbal and el Morro.[62] Possibly included were the north vaults and powder magazines of the North Casemates (project locations were not specified in the Section 106 Compliance statement). Proposed work included: scraping interior walls and ceilings; patching damaged plaster with a mixture of sand, hydrated lime and white cement; painting inside plaster with a vinyl-epoxy masonry paint (bone white color); and, replacing damaged door and window woodwork with new treated lumber. Today, the interiors of both the north vaults and the powder magazines are painted white.

By 1981, the wood flooring in the second story of the powder magazines (CM-10 and CM-11) was reported to be so rotten that walking on it was unsafe. Although its date of construction was not noted, this flooring was described as "non-historic". Proposed work involved "replacement in kind" so that the space could be used for classrooms, storage, or interpretation. While it had been planned to record the progress of the work using photographs, measurements, and written descriptions, no such documentation has been found.[63] The good condition of the floor today is evidence that it was replaced. Sometime thereafter, a library was installed in the west magazine, an office in the east, and partition walls built for storage closets.

Other changes have been made by the NPS since 1961 for which specific dates are not known. These include the following: a water fountain installed in CM-2; a partition wall built in CM-3; CM-4 was adapted as a small gift shop; the old doors were stripped of their paint and reinstalled in south facade of CM-4; and an air conditioning system installed in the powder magazines (CM-10 and CM-11).

Conditions

The exterior walls of the North Casemates are in relatively good condition, though they vary greatly depending on their location. Patched, but smooth, painted stucco faces the Plaza on the south side. Ashlar and rubble stone with weathered, eroded, and stained stucco faces north and west. There are many patches and stains, particularly at the higher levels of the wall. Seven internal wall drains may explain the black stains and biological growth. The wall above CM-2 is badly stained. This is due to constant exposure from its exposed condition. The easterly vaulted area which leads to Tunnel 1 is stuccoed and painted white. It appears in excellent condition. Several modern wall plaques have been affixed to the wall and serve to interpret these areas.

On the north wall, much of the stucco is eroded clearly exposing the stone pattern. There are many areas of light-colored Portland cement. This stucco is applied within the outer face of the eroded stones and gives the wall its pockmarked appearance. This wall is badly stained and has areas where plants are rooted to it. The wall below the window in CM-3 is particularly pocked due to a masonry tub installed therein. Although no longer in use, the twentieth-century tub collects rain water which filters through the wall. The stairway in CM-10 is unused and deteriorated.

The roof is in good condition but exhibits various areas of wear and weathering. The flat, paved terreplein has patches and stains over the masonry and the more recent (ca. 1939) paving tiles. The paved ramp has cracks and patches of Portland cement stucco. The sloping parapet has cracked, patched, and weathered stucco.

The loggia is in generally good condition, though the base moldings of the columns are severely eroded with most of their details missing.

NOTES

1. O'Daly's plan of January 15, 1769, is included in Volume I, no. 6 of this report.

2. Ricardo Torres-Reyes, "Construction History of San Cristóbal: 1634-1800" (National Park Service: San Juan National Historic Site, June 1965), pp. 45 and 69. Torres- Reyes adds in his translation of H.H., "only lack the two vaults of the second floor."

3. Ibid., p. 69. Original reference is to construction reports by O'Daly.

4. Ibid., p. 69.

5. Ibid., p.76.

6. Ibid., p.84.

7. O'Daly's plan of 1773 is included in Volume I, no. 11 of this report.

8. This plan is included in Volume I, no 11.

9. Torres-Reyes, "Construction History," p. 91. Original reference is to a construction report by O'Daly dated 1/5/1775 and covering the months of July through December 1774. (AI-SD 2510-45).

10. The 1769 plan of proposed construction by Thomas O'Daly is included in Volume I, no. 8 in this report.

11. See note 8.

12. The August 31, 1772 plan of San Juan by Thomas O'Daly is included in Volume I, no. 10 of this report.

13. The August 8, 1773 plan by O'Daly is included in Volume I, no. 17 of this report.

14. See note 9.

15. The relative size of the walls and their orientation is shown graphically in a section elevation drawing through the latrine vault by Juan Francisco Mestre, 1783.

16. Torres-Reyes, p. 110. Original reference is to construction reports by Mestre dated 1/19/1784, 7/1/1784, and 1/8/1785 (AI-SD 2509-31, 2510-50, 2510-51).

17. Construction report by Mestre, 1/8/1785 (AI-SD 2510-51). The passage reads, "All the vaults have had their floors installed using a good "hormigon sacado a plano . . . "

18. Ibid. Mestre described both the brick dust mortar and drainage of the terreplein. Not described were the conduits built into the south wall that are presumed to have been constructed at this time. See also Torres-Reyes, "Construction History," p. 110.

19. Construction of both the parapet and the barbette parapet are mentioned in Mestre's report of 1/8/1785.

20. Mestre's September 13, 1783 plan is included in Volume I, no. 18.

21. Report by Casanova, 1783. National Archives, Records of the Spanish Governors of Puerto Rico, RG 186.

22. Ibid.

23. Construction report by Mestre, 1/8/1785.

24. The original ca. 1821 sketch by french artist Auguste Plee is in the collection of San Juan NHS, San Cristóbal. It is reproduced here from HABS negative #181.197.

25. Alvaro Bazán, Archivo Naval, (ca. 1830), p. 31. Source cited by Juan Blanco, CPR, Columbia University. Original archive in Museo del Servicio Naval, Madrid, Spain. Also in microfilm, Exp. 14966, San Juan NHS.

26. Ibid., p.31.

27. Ibid.

28. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at Museo del Ejercito, Madrid, Spain.

29. Rafael Clavijo, report dated February 27, 1859. A hand-written transcription from the microfilm is in the library at San Juan NHS. Although no source is given, records of the late historian Ricardo Torres-Reyes indicate this report is in the National Archives, Washington, D.C.

30. Ibid.

31. Ibid.

32. Clavijo, Report dated Feburary 27, 1859.

33. The 1861 Castro drawings are reproduced in this report in Volume I, nos. 27-37.

34. 1868 plan by Pedro Leon de Castro, San Juan NHS Archives.

35. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Dept. of the Interior, NPS, Feb. 1984), p. 34. Original reference is to a report by Major Crosby & Colonel Goethals entitled "Notes on the Defenses of San Juan, Puerto Rico," National Archives, Record Group 77.

36. Ibid.

37. The features mentioned in this paragraph are documented by the following photographs and plans, all in the collection of San Juan NHS:

- Sentry box: photo, ca. 1898-1912.
- Ramp steps: plan, ca. 1897 (no.107-2-9).
- Gallery panels: photo, ca. 1920s.
- Doorways and windows: plan, 2/12/1901 (no.7-3-134).
- Kitchen vault: plan, 2/12/1901 (no.7-3-134).
- Battery mounds: early photos, but most clear ca.1920s.
- West window guardrails: photo, ca.1898-1912.
- Interior doorways: plan, 2/12/1901 (no.7-3-134).
- West stairs in powder magazine: plan, ca. 1897 (no.107-2-9).

38. Bearss, p. 103. Original reference is to a document entitled "Proceedings of Board Convened by Special Order No. 1 - Jan. 4, 1900," National Archives, Record Group 92.

39. Plan entitled "Quarters of Fort San Cristóbal . . . as they exist February 12, 1901," in the drawing collection of San Juan NHS, no. FC7-DR3-ENV134.

40. Bearss, pp. 108-111. Original reference is to correspondence in the National Archives, Record Group 92.

41. Ibid., p. 109. This suggestion was made by Captain Vodges.

42. See note 40.

43. Bearss, pp. 131-135. Original references are to an Inspection Report dated May 1901 and to correspondence in the National Archives, Record Group 92.

44. Bearss, pp. 119-123. Original reference is to correspondence in the National Archives, Record Group 92.

45. The photograph dated August 17, 1912 is page 129 of Puerto Rico Ilustrado. This photo has been copied by the HABS, negative no. 181.93.

46. 1935 plan entitled "Plan of Proposed Repairs to Fort San Cristóbal" by the Puerto Rican Emergency Relief Administration, drawing collection San Juan NHS, drawing no. NHS-SJ 9754 and location FC7-DR5-ENV141. It is not clear in this drawing what "repairs" are proposed.

47. Both photographs dated ca. 1920 and ca. 1938-40 are in the collection of San Juan NHS, both were copied by HABS, negative numbers 181.39 and 181.30.

48. Two photographs showing the loggia roof work are in a completion report dated August 16, 1939, untitled except for a dedication "to Col. John W. Wright." This report is in the photo collection of San Juan NHS, San Cristóbal.

49. Bearss, p. 374. Original references are to a plan dated 1943 and a booklet entitled San Cristóbal, San Juan Puerto Rico, U.S.A., no date.

50. Undated plan, ca. 1940s, entitled "General Floor Plan, San Cristóbal, Fort Brooke, Puerto Rico," in the drawing collection of San Juan NHS, (no. 8-0-95 169).

51. Undated photo by Rotkin, Government of Puerto Rico, labeled "View of old Fort San Cristóbal showing new army barracks." Photo is in the photo collection of San Juan NHS, San Cristóbal.

52. Aerial photographs, ca. 1950s, in the collection of San Juan NHS, San Cristóbal.

53. Plan dated 1947 and entitled "General Layout Fort Brooke & Vicinity." Included in Bearss' San Juan Fortifications, pp. 432-433.

54. Plan dated 1949 and entitled "As Built Survey Fort Brooke," drawing collection San Juan NHS, location no. FC1-DR4-ENV020.

55. These alterations are seen in an undated (ca. 1950s) photograph by Roberto Cole, Economic Development Administration of Puerto Rico, in the collection of San Juan NHS, San Cristóbal.

56. Bearss, pp. 377-379. Original reference is to specifications entitled "Rehabilitation of Enlisted Troop Housing, Motor Park, and Administrative Facilities at San Cristóbal Area, Fort Brooke, Puerto Rico," dated January 10, 1958.

57. Photograph dated December 1961 and labeled "Entrance to the temporary visitor center, San Cristobal . . ." in the collection of San Juan NHS. The later plan is dated 4/64 and entitled "Museum San Cristóbal: North Casemates Castillo de San Cristóbal," location no. FC1-DR5-ENV141 (sheet 2 of 8).

58. "Proyecto Restaurar Castillo San Cristóbal de Manera que Aparezca Como Era en 1861," El Mundo, July 11, 1962. Included with the article is a photograph that documents the absence of the basketball backboard.

59. Four photographs labeled "Window and door frames of North Casemates . . . during process of repair" are in the 1963 "Completion Report - Accelerated Public Works, San Juan." The work is also documented in the "Superintendent's Monthly Report, San Juan NHS," 10/4/1963. Both are in the files at San Juan NHS, San Cristóbal.

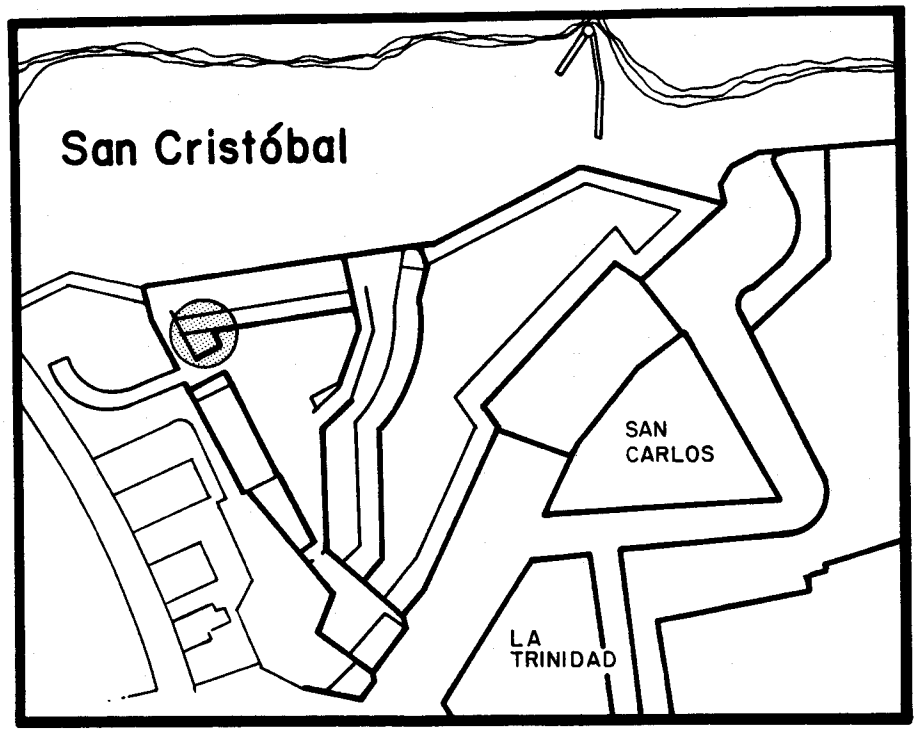
60. "Castillo de San Cristóbal: North Casemates, San Juan Puerto Rico," by HABS, 1963, survey no. PR-101.

62. "Museum San Cristóbal: North Casemates Castillo de San Cristóbal," by the Eastern Office Division of Design and Construction, NPS. Location no. FC1-DR5-ENV141, in the drawing Collection of San Juan NHS, San Cristóbal.

62. Project description for Section 106 Compliance Statement, "Patch and Paint Casemates, Forts El Morro/San Cristóbal, SAJU NHS," 1975; and, letter dated Nov. 24, 1975, From: Regional Director, To: Advisory Council, Re: 106 Compliance.

63. Replacement of the wood floor is documented by two memos regarding Section 106 Compliance Statement:

5/7/1981 To the Regional Director, SE Region, from the Superintendent SAJU (transmitting project statement).
5/18/1981 To the Superintendent, SAJU, from the Associate Regional Director, SE Region (approving proposal).



CHAPTER 3

THE GUARDHOUSE AT THE NORTH CASEMATES (CASA DE LA GUARDIA)

Description

The Guardhouse, (La Casa de la Guardia or Cuerpo de Guardia de la Tropa), is a distinct component of the North Casemates. It is located at the northwest corner of the Plaza de Armas attached to the small ramp that provides access to the terreplein level of the North Casemates. It is a small plain structure, that is utilitarian in appearance. The Guardhouse is strategically situated on the Plaza so as to control pedestrian access in and out of the fort (fig. 3.1).

The Guardhouse was built in two phases, with the south section built between 1784-1839 and the north section added around 1861. It was used historically as the Troops' Guardhouse (Cuerpo de Guardia de la Tropa). The building is now used by the NPS as a visitor information center. The one-story Guardhouse is shaped like a trapezoid. The east, south and west walls date from the original construction. The building has no cornice but is capped with a small, projecting, overhanging parapet. Windows and doorways have been numbered for this study.

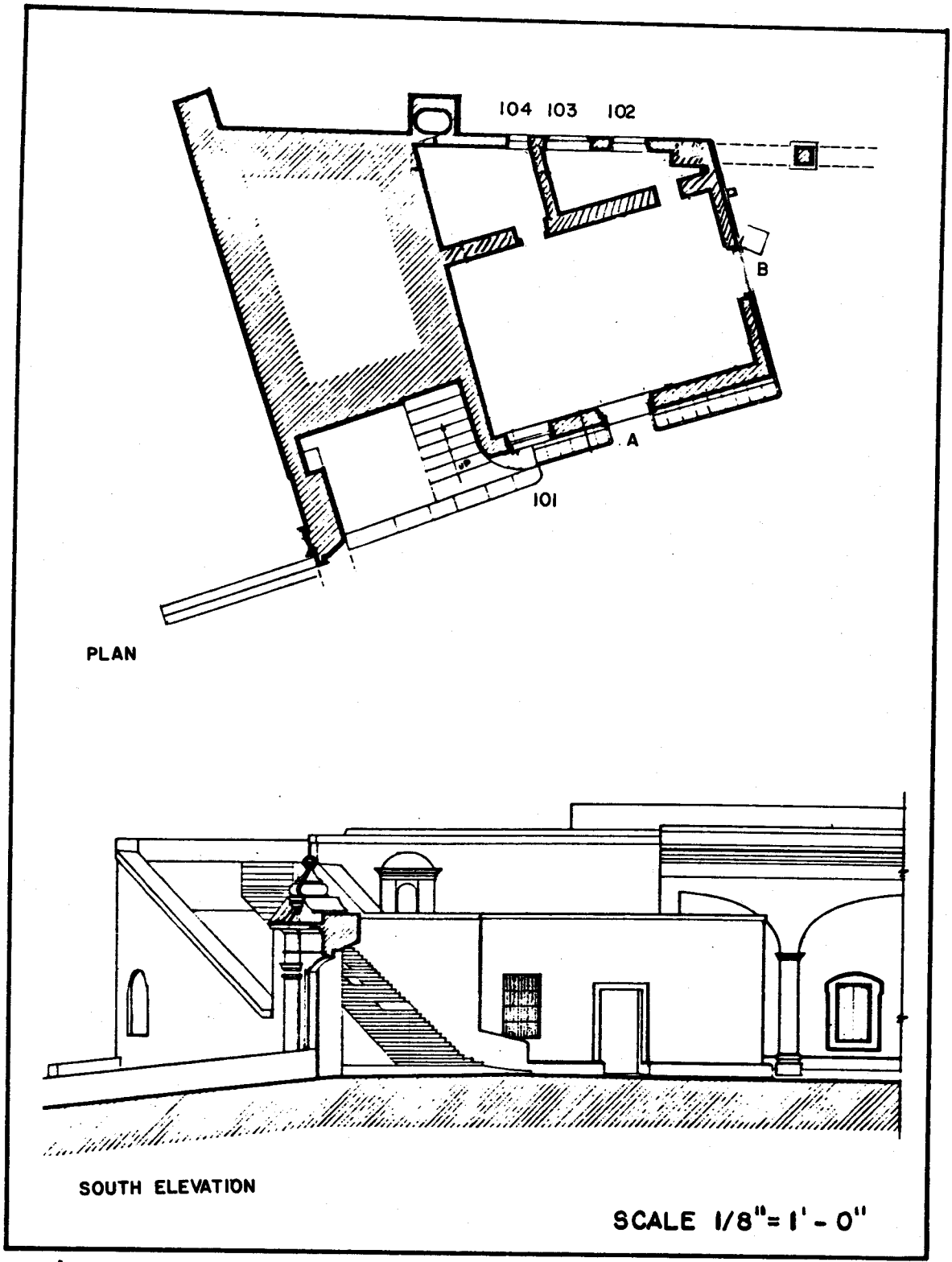


Figure 3.1. Plan and south elevation of Guardhouse with openings labeled. HABS drawings (1963) annotated by Jana Gross (1989).

The west wall forms the side, or cheek wall of the ramp to the terreplein level of the North Casemates. It is of smooth cement stucco, painted white, with yellow-tinted patches.

The south wall contains the main entrance (A) to the building and a window (101). A noticeable feature is a projecting base at the foot of the south wall. This base is used as a built-in bench and is covered with cement and blue-stone paving tiles. It is not known when the tiles were installed. Modern identification signs are attached to the wall.

The east wall has one large doorway (B). The wall is of similar construction and condition to the west wall, but appears to have more recent Portland cement patches near the roof drain and at the lower section above a shallow, projecting base.

The north wall is part of the 1849-1861 addition. It also appears recently patched. It is painted mostly white with sections of yellow paint. This wall is distinguished by the attached square "cistern tower" at the northwest corner. San Cristóbal. The tower is the most interesting and puzzling of the building's features. It rests on a square, flat, projecting base. It is constructed of brick and brick rubble, and dates from ca. 1861. The exterior stucco of the shaft is scored to imitate ashlar block construction. The tower is characterized by a round dome top and a narrow arched opening facing south. A small round window faces north. The dome is supported by a molded cornice consisting of a square profile and a torus with a cyma recta molding above (fig. 3.2). It may have been a small holding tank to provide gravity-pressurized water to the kitchen and latrine casemates directly to the rear. No historical documentary evidence, however, has corroborated its function.

The north wall also has three window openings placed high on the wall. Proceeding from east to west, the windows are numbered 102, 103, and 104. Windows 103 and 104 have wood frames with notches that indicate locations of pintels for early interior shutters. The hardware was of the type described as having socket and pintels of distinctive triangular shape, sometimes called <u>capuchinos</u> for its resemblance to the hoods worn by Capuchine monks.

The interior of the building is subdivided into three rooms (fig. 3.1). The rooms are plain and have no decorative features or trim. The larger of the three rooms takes up the whole south width of the structure and is currently used as a visitor information area. It also houses the copy of the original 1839 model of San Cristóbal. The floor is covered with modern Portland cement.

To the north are two small and oddly-shaped rooms that connect with the south room. The northeast room is now used for storage and the larger (northwest) room is used for both storage and as an office for the NPS protection staff. The flooring in both rooms is cement. All of the interior walls and ceilings appear to be covered with a smooth coat of cement plaster and whitewash.

The only interior doorways are in the wall (2 feet thick) that divides the south room from the north room. Since this wall was an exterior wall, the present interior doorways may be the original (1784-1839) exterior window openings or doorways. Both rectangular openings have no decorative trim and wooden doors and iron hardware are of recent origin.

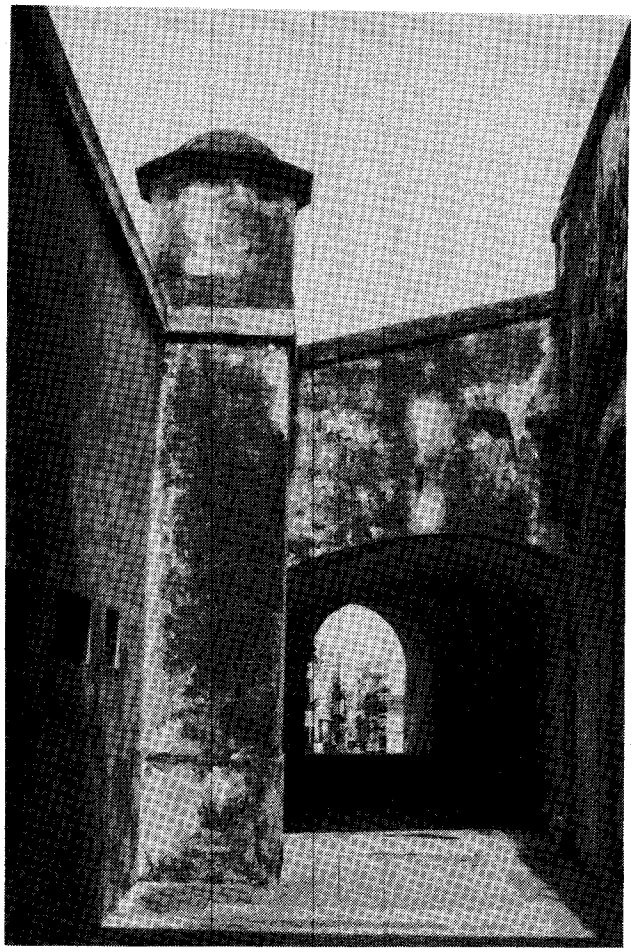


Figure 3.2. Cistern tower on north wall of Guardhouse. Photo by Richard Crisson, 1986.

The flat roof appears to have been extensively rebuilt and covered with Portland cement. There is a low parapet wall built of brick and parged with stucco. The parapet appears to be original and probably served to collect rain water. Within the parapet, at the northeast corner, is an internal roof drain. The main level of the Guardhouse is on grade with the Plaza de Armas. However, access to the roof can be gained from the adjacent ramp to the upper level of the North Casemates.

The Guardhouse has a modern electrical system. There are modern ceiling fixtures, outlets, and switches. The northwest room contains the electrical panel box that feeds from the Officers' Quarters.

Structural Evolution

Period 1: 1625-1765

The Plaza de Armas on which the Guardhouse is sited was built after 1765. Therefore, there is no information on the building for this period.

Period 2: 1765-1809

The Plaza de Armas was constructed as part of the 1765 modernization project for San Cristóbal as were the North Casemates on the north side of the Plaza. However, the exact construction date for the Guardhouse is uncertain. It does not appear to have been part of the original modernization project as it was not shown in the plans of 1765, 1769, 1773, or 1783.[1] Nor was it mentioned in the construction reports. The original section may have been built during this period after 1784, but prior to 1839.

Period 3: 1809-1837

No documentation was found for this period. None-the-less, the original south section of the building may have been constructed during this time based on the model of 1839.

Period 4: 1837-1868

The Guardhouse is extensively documented during this period by the 1839 model, construction reports, and architectural drawings. The first construction phase is illustrated by the model of 1839.

The enlarged structure as we know it today is illustrated by the drawings of 1861 and 1868. In addition, the legend of the 1868 drawing provides the first documented reference to Cuerpo de Guardia de la Tropa (Troops' guardhouse).

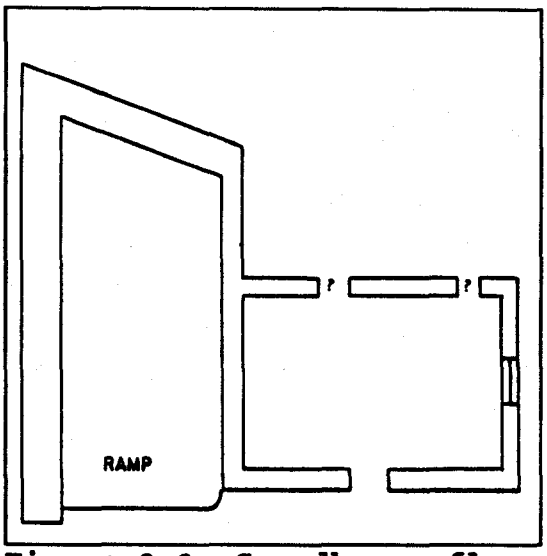


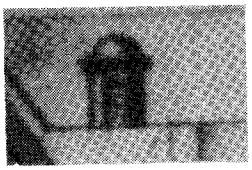
Figure 3.3. Guardhouse floor plan based on 1839 model and drawn by Barbara Yokum, 1986.

The model (fig. 3.3) provides the first evidence of a structure in the location of the present Guardhouse.[2] Here, the building is rectangular in shape with a flat roof, a doorway in the south facade, and a window opening in the east facade. Openings in the north facade are not apparent. Based on this information, the Guardhouse as we know it today was originally smaller and comprised what is now the large south room. In the model, the exterior walls are a neutral gray color unlike some other structures on the Plaza that are colored yellow.

Not until the mid-nineteenth century was the building enlarged to its current configuration. Manuel Castro first illustrated the structure with a north addition in 1861. Exactly when the addition was built, however, remains unknown because the intent of the drawings has not been determined. If the drawings record existing conditions, the addition may have been constructed between 1849 and 1858 at the same time as other work at San Cristóbal. One such project completed at this time was the arched loggia attached to the North Casemates and incorporated into the northeast corner of the addition.[3] If, on the other hand, the drawings were intended to illustrate proposed new work or alterations, the north addition may have been built shortly after 1861. Were this the case, it appears that the addition was built exactly as proposed.

Castro recorded the building in tri-color drawings. Included were a south elevation, a roof plan, and a floor plan. (See fig. 3.4.) These, along with extant building materials examined in 1986, provide a detailed picture of ca. 1861 conditions.

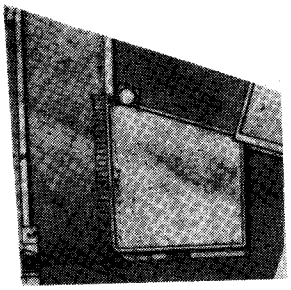
On the exterior, walls appear to have been a smooth material such as stucco and were colored yellow. Yellow was also



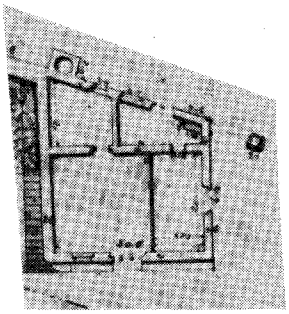
Detail Cupola



South Elevation



Roof Plan



Floor Plan

Figure 3.4. Detailed views of Guardhouse from the 1861 drawings by Manuel Castro. (San Juan NHS Archives.)

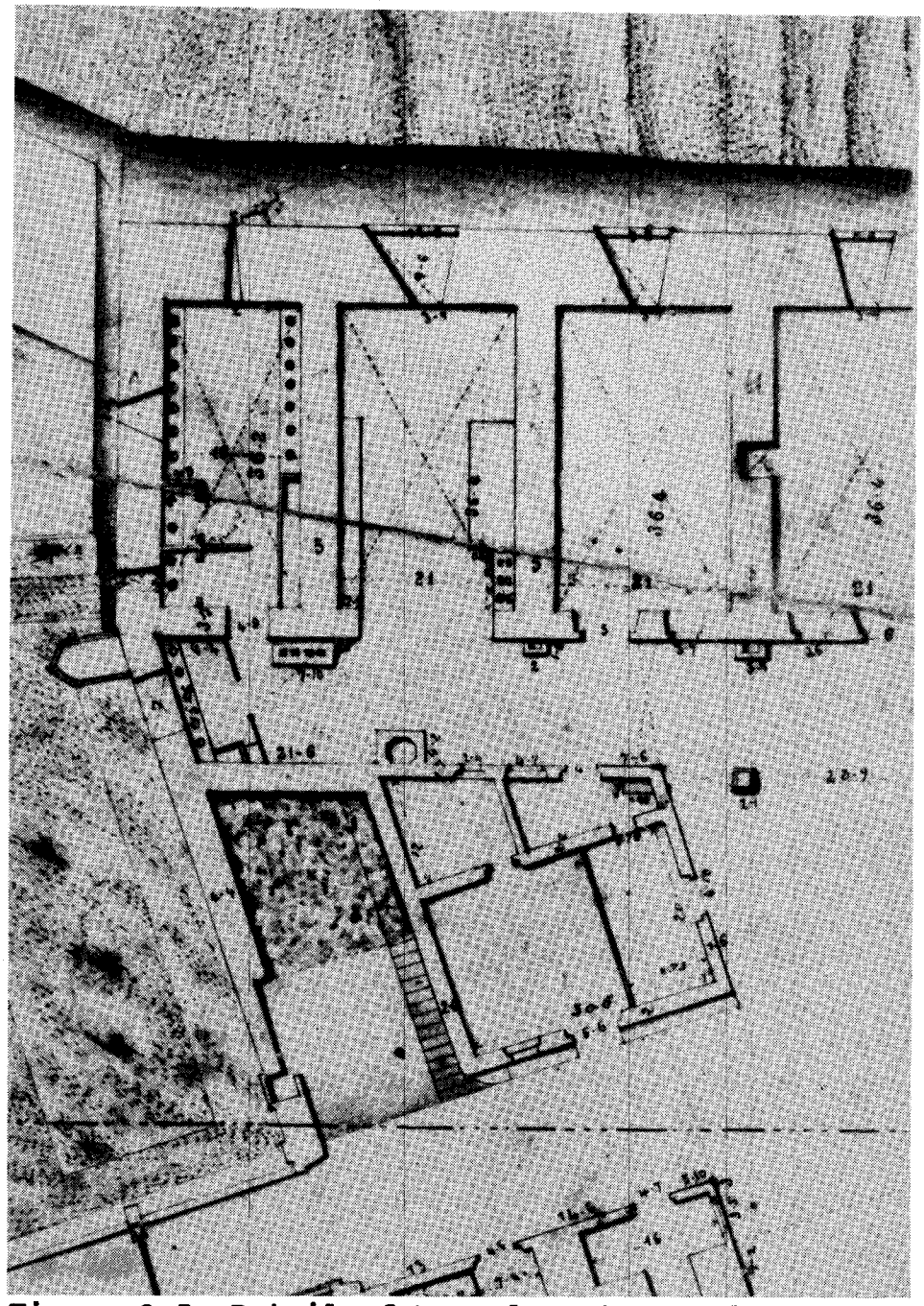


Figure 3.5. Detail of Manuel Castro's plan showing Guardhouse and four western North Casemates. From HABS negative.

observed to be the color of the first finish in a sample removed in 1986 from the exterior east wall, north side.*

In ca. 1861, doorways and windows were located on the south, east, and north facades (fig. 3.5). In the south facade facing the Plaza was a doorway in the middle of the wall and a window to the west side. It is of interest to note that while both doorway and window are illustrated in the plan, only the doorway was shown in the south elevation drawing. This has been attributed to delineator error. In the east facade there was one doorway in the original part of the building. This was enlarged from an early window based on comparison with the 1839 model. On the new north facade, facing the North Casemates, were one doorway and two windows. The doorway was on the east side and flanked by two windows to the west. Remaining physical evidence of old features at these windows helps to further define their early appearance. These are small windows of rectangular shape set horizontally and high up in the wall. Their frames are wood and the larger east window is divided by a central vertical mullion. Early paint on the exterior side of the mullion indicates that the frames were first painted white (in a resinous medium) and later gray. Cutouts in the frames for pintels evidence early shutters that hung on the interior sides of the windows. It is doubtful that vertical bars presently seen in the openings are original. Based on the paint evidence, extant bars appear to be of 20th century vintage.**

An interesting feature at the lower south wall was shown both in the 1861 plan and elevation drawings. This was a low projection at the base of the building (colored green). Today, this feature is used as a bench and may have served the same function in the nineteenth century. No samples were taken to confirm the early green color as it is now completely covered by modern tiles and Portland cement.

Yet another exterior feature of interest illustrated in 1861 was a cupola that may have been an early chimney, a bell tower, a sentry box, or a cistern. It was shown located on the north facade (west side) and projected above the level of the flat roof. In plan, it appeared as a hollow rectangular tower attached to the exterior wall. In elevation, the shaft above the roof level was shown octagonal in shape with a domed roof and arched opening (in the shape of a doorway) facing south.

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*SAJU 02 P16, this finish was color matched to Munsell ?? and identified to be a type of pigmented lime wash similar to a whitewash.

**Exterior side of mullion, SAJU 02 P21. Window bars, SAJU 02 P22.

Remaining physical evidence today further indicates that it was constructed of brick using a lime mortar composed of brick dust.* The exterior was stuccoed with a beige lime mortar similar to the building, and lines were scored to resemble ashlar between the high base and roof line. Yet another opening, round in shape, was located at the roof level in the north wall. As for the function of this tower with cupola, physical evidence provides some clues. It was probably not a chimney because the top opening is roofed over. Likewise, there is no evidence of a bell support. The one documentary reference to "placing a bell" at San Cristóbal is dated 1830, apparently before the north addition and shaft were even built. As for a sentry box, there is no evidence of interior flooring to accommodate a sentry. By the process of elimination and deduction, a cistern is the most likely function of the structure.

Like other cisterns designed to hold water, the interior of the shaft is stuccoed with a smooth finish. How the shaft was filled with water is difficult to ascertain due to modern patching and repairs in this area. One source appears to have been manual hoisting using buckets or other containers. Access to the top of the shaft was up a flight of narrow brick steps built into the adjacent ramp. These steps continued up the ramp only as far as the level of the cistern. Still extant today at the top of the steps in the wall adjacent to the tower, is a small trough with a drainage outlet into the shaft. Containers of water could have been emptied into this trough. Once filled, the cistern would have been able to provide a source of pressurized water. This may have been used by either the kitchen or latrines in the adjacent North Casemates. An attempt to find the outlet for the water was made in 1986 by examining the exterior and interior surfaces of the shaft. Outside, no evidence of a spigot was found. The interior examination was likewise unsuccessful due to a large amount of debris at the bottom of the shaft. An alternate possibility is that a pipe in the floor of the shaft carried water beneath the pavement to a nearby casemate.

Manuel Castro's 1861 floor plan of the building illustrated four interior rooms of different sizes. By the placement of partition walls and doorways, two suites consisting of two rooms each were created. One suite was located on the west side of the building and the other on the east side. The west was the larger of the two and was entered through the south doorway closest to the Main Gate. These rooms may have housed the guards who manned the gate and the sentry box. Both rooms of the west suite were lit and ventilated by one window each. The smaller east suite was entered by two doorways and was

*SAJU 02 M08

therefore more likely to have multiple functions. One doorway entered the southeast room from the east and the other the northeast room from the north. Only the back northeast room, facing the kitchen, had a window.

In 1868, seven years after Manuel Castro's drawings, a plan was prepared by Leon de Castro. (See fig. 3.6.) For the first known time, the building's four interior rooms were labeled and their functions described in the legend. Unfortunately, the copies of the plan available for this study were of poor quality and illegible. However, a report done in the 1960s did refer to this legend which included the Cuerpo de guardia de la tropa north of the Officer's Quarters.[4]

Period 5: 1868-1898

No specific information on the Guardhouse was found for these years. However, physical evidence indicates that work was probably done in the cistern at this time. This work involved repairs to the interior mortar at the upper level.*

Period 6: 1898-1987

During this period, San Cristóbal has been under the jurisdiction of the U. S. Department of the Army (1898-1961), and the NPS (1961 to the present). Both agencies have made repairs and changes to the Guardhouse. Figure 3.7 illustrates the evolution of the Guardhouse plan during the twentieth century.

Shortly after the occupation of San Cristóbal by the U. S. Army, repair work was done to the buildings. Proposed in 1899 and approved in early 1900, were repairs to several structures including the "Guardroom." All exterior walls facing the Plaza de Armas were to be whitewashed, and the woodwork of the doors and windows repainted. An old door was to be replaced with a pair of light double doors. This may have been in the south exterior doorway where double doors were indicated in a floor plan of the 1940s. Inside, all walls and ceilings were to be whitewashed and the old woodwork repainted. This work was presumably carried out.[5]

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*Red mortar composed of brick dust (SAJU 02 M09) was used to stucco the interior exposed bricks. This patching mortar differs from the original brick dust mortar by being a deeper orange/red color and also a stronger mix.

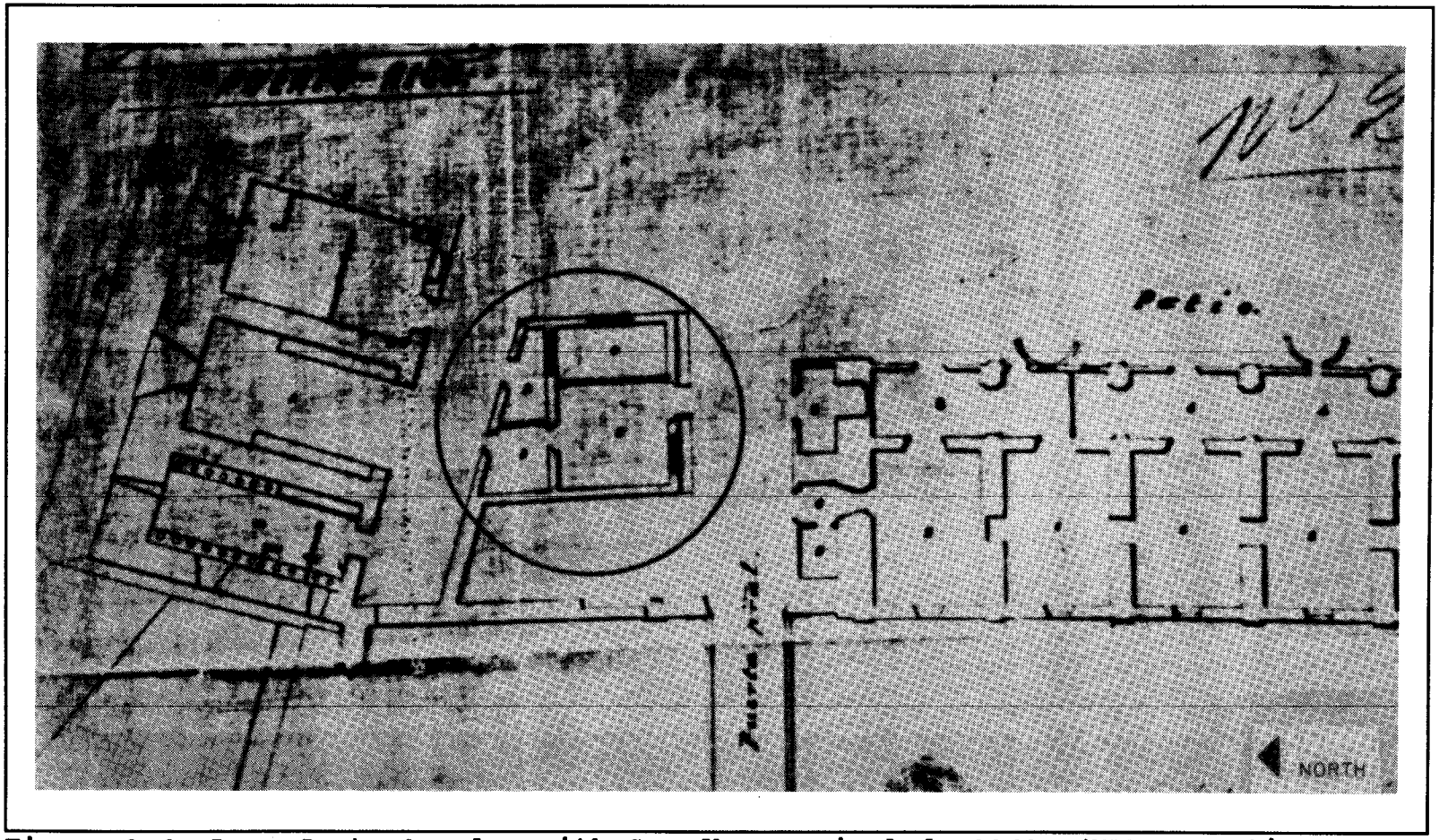


Figure 3.6. Leon Castro's plan with Guardhouse circled, 1868. (HABS negative 181.31.)

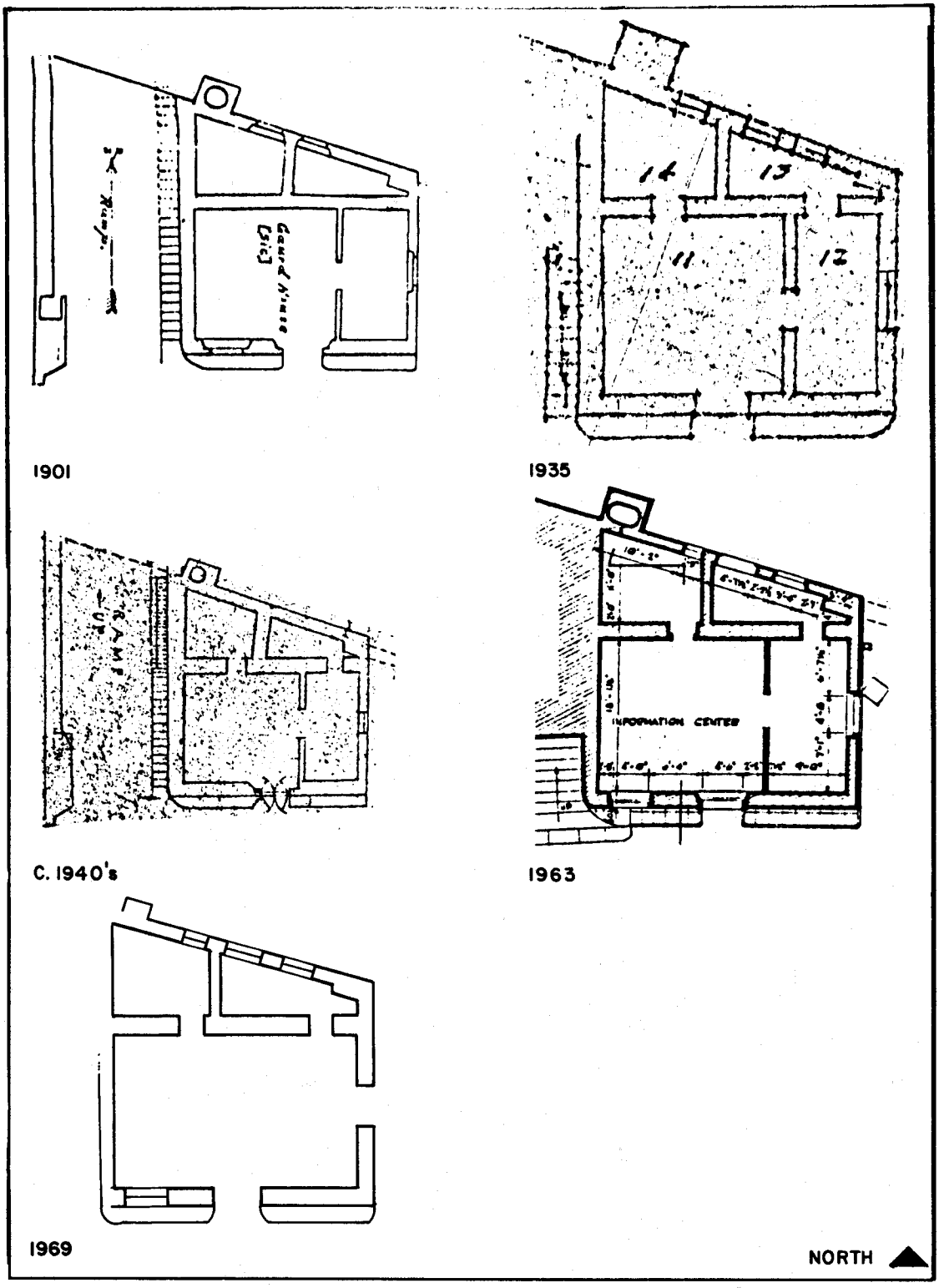


Figure 3.7. Selection of 20th-century plans of Guardhouse showing the evolution of structure's floorplan and fenestration.

One year later, on 12 February 1901, the building was illustrated in a plan showing the existing allocation of quarters at San Cristóbal.[6] The four-room configuration of the structure remained unchanged from the 1860's plans and the southwest room was labeled "Guard House." However, several changes are apparent in the locations of doorways and windows. On the exterior, the doorway in the east facade was shown as a window, and the doorway in the adjacent north facade not shown and presumably blocked up. Inside, a doorway had been added in the partition between the two front rooms. The two doorways formerly connecting the front rooms with the smaller back rooms were also missing, possibly indicating that the back rooms were not in use. Exactly when these changes took place is not clear.

Electric lighting was installed during the early 1900s at San Cristóbal, replacing the coal, oil, and regulation lamps.[7] Although no specific information was found on wiring the Guardhouse, this most likely occurred between 1901 and 1904.[8]

Other work possibly done at this time, based on the analysis of painted finishes, was the installation of iron window bars on the north facade windows. A paint sample removed from the vertical bars of the middle opening is lacking the early paint layers observed on the adjacent wooden window frames. The bars have about one half the number of paint layers as the frame. Once installed, bars and frame were painted in a similar manner with red and black colors predominating.

Following a gap in documentation of about twenty-five years, the next view of the building is a plan of San Cristóbal dated 1935.[9] The four rooms were then numbered 11, 12, 13, and 14, but no key or description was provided. Little appears to have changed with the exception of the north doorway that disappeared in 1901, and is shown here converted into a window. Also, the interior doorways between the south rooms and the rear and north rooms were reopened. Not shown was the window on the south facade. This was no doubt the delineator's error since two photographs taken in the late 1930s document the window's existence.[10]

Use of the Guardhouse changed twice in the 1940s. In 1943, it was converted into an "orderly room".[11] It continued as such through at least 1947 at which time it was labeled building no. 27 and described as both the "Orderly Room & C.O. Office."[12] By 1949, it had become the "Supply Building," also known as building no. 212.[13]

In 1958, major rehabilitation work was carried out on structures on the Plaza including the Guardhouse. In the scope of work for this project, the rooms in both the Guardhouse and the North Casemates were designated "A-1 through A-13." The

following work was specified: inside, the existing cement plaster was to be patched and the walls and ceiling painted; in the doorways and windows, damaged and deteriorated wood and metal were to be replaced with new treated lumber and bronze hardware to match the existing; and all woodwork, both inside and out, new and existing, was to be painted.[14]

In the 1960s, the NPS began to use the building. A photograph taken in 1962 documents a new plaque attached to the eastern side of the south facade of the building.[15] It appears to have been metal and of a type that is commonly used to designate National Historic Sites. One year later, in 1963, HABS measured the building as part of a set of drawings for the North Casemates.[16] It was then labeled the "Information Center" and recorded in a floor plan, roof plan, south elevation and section. In these drawings, the arrangement of the rooms and the location of doorways and windows were shown as unchanged from conditions in 1935. Further, grilles were drawn in the windows, the seats of the south bench scored as if covered with tiles, the roof noted to be a "concrete deck," and the north shaft labeled a "cupola."

By the time the building was photographed in December 1969 (fig. 3.8), several changes had been made.[17] On the south facade, the earlier plaque had been removed, the wall behind it patched, and a new larger plaque installed between the window and the doorway. On the same facade, to the east of the doorway, was installed a small sign that read "Guard House/Casa de la Guardia." In the east facade, the earlier window had been enlarged into a doorway. Looking into the building from this new doorway, it appears that the partition wall dividing the south rooms had been removed. No major alterations have been made to the building since this time.

In 1975, extensive repair work was planned in the forty-one casemates of both San Cristóbal and el Morro. Although specific locations were not described in the Section 106 Compliance statement, it is possible that the Guardhouse was one of these areas. Proposed work included: scraping interior walls and ceilings; patching damaged plaster with a mixture of sand, hydrated lime, and white cement; painting inside plaster with a vinyl-epoxy masonry paint, bone white color; and replacing damaged door and window woodwork with new treated lumber.[18]

Today, the basic exterior configuration of the Guardhouse resembles that of ca. 1861.

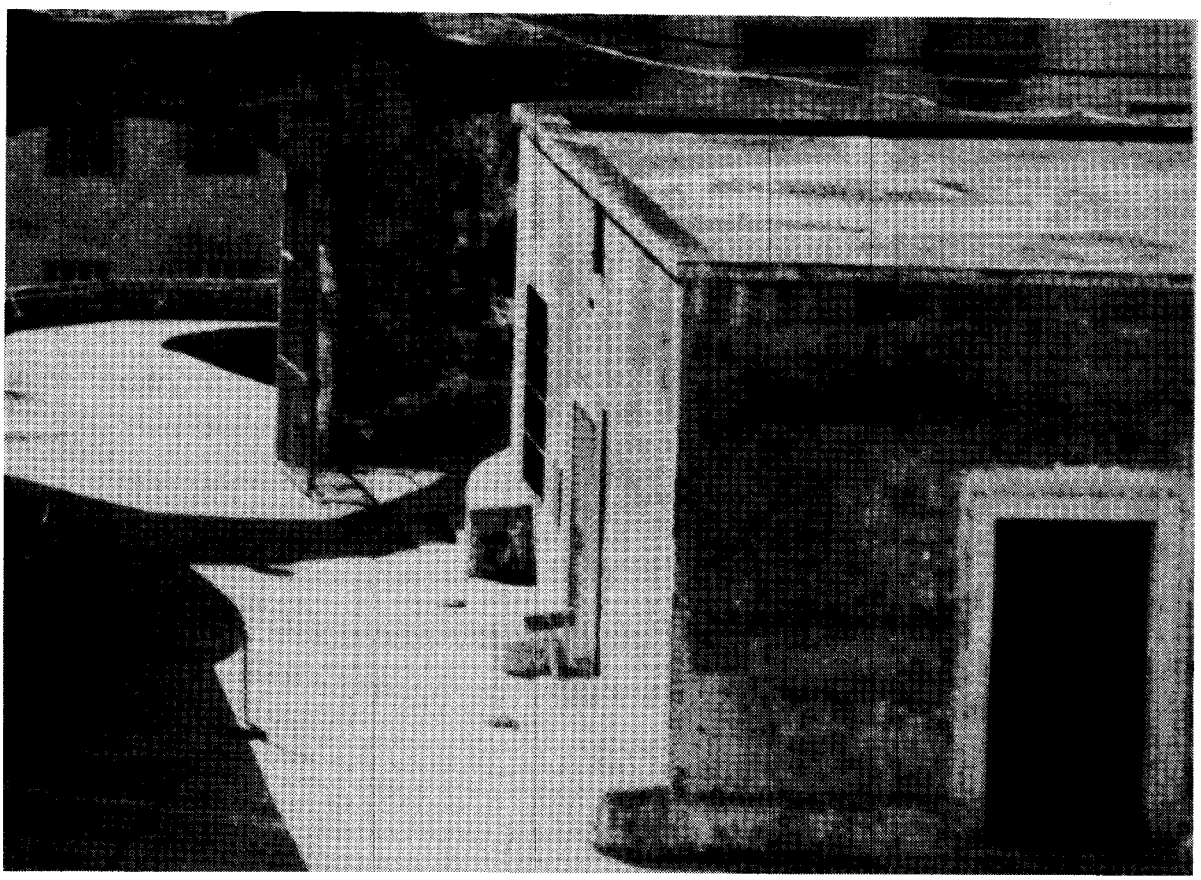


Figure 3.8. Photo showing restored doorway in east elevation of Guardhouse, 1969. (San Juan NHS collection.)

Conditions

Although the Guardhouse has been extensively repaired, patched and repainted throughout the twentieth century, late as the exterior today approximates the building's appearance in 1861. In general, the masonry walls are covered with Portland cement and although patched and discolored, appear to be sound and in good condition.

The flat roof appears to have been extensively rebuilt and covered with Portland cement. Most of the roof is heavily stained due to excessive moisture and lack of proper drainage.

The octagonal cistern tower on the north elevation is constructed of brick and brick rubble, all in good condition. The parged interior however, is partially eroded to expose bricks. Additional interior surfaces inside the building show considerable patching with Portland cement.

Most of the door and window openings show modern reproduction doors and hardware. The north doorway is missing.

NOTES

1. Copies of these maps dated 1765, 1769, 1773 & 1783 are included in Volume I, no. 4, 8, 11, 19.

2. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at Museo del Ejercito, Madrid, Spain.

3. Review for the year 1858 dated February 27, 1859, by Rafael Clavijo, Engineering Command Island of Puerto Rico. This includes a review of work done between the years 1849-1858. The original document is in the National Archives, Washington, D.C. A handwritten transcript of the microfilm by Torres-Reyes is in the library of San Juan NHS and was used for this report.

4. Woodrow W. Wilkins, "Historic Structure Report Part I: Officers Quarters . . . San Cristóbal" (NPS: San Juan NHS, October 1961), p. 6.

5. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Dept. of the Interior, NPS, Feb. 1984), pp. 108-111. Original reference is to correspondence in the National Archives, R.G. 92.

6. "Quarters at San Cristóbal...as they exist February 12, 1901," drawing collection San Juan NHS, No. FC7-DR3-ENV134.

7. Bearss, p. 131. Original reference is to an inspection report dated May 1901, in the National Archives, R.G. 92.

8. Ibid., pp. 133-5. Original reference is to correspondence in the National Archives, R.G. 92.

9. 1935 plan entitled "Plan of Proposed Repairs to Fort San Cristóbal" by the Puerto Rican Emergency Relief Administration, drawing collection San Juan NHS, drawing no. NHS-SJ 9754 and location FC7-DR5-ENV141. It is not clear in this drawing what "repairs" are proposed.

10. One photograph is included in a completion report dated August 16, 1939, untitled with the exception of a dedication "to Col. John W. Wright," and found in the photo collection of San Juan NHS, San Cristóbal. The second photograph is an aerial view dated ca.1938-40 that is also at San Juan NHS but uncataloged. A copy is also at the HABS office in Washington, D. C., negative no. 181.30.

11. Bearss, p. 374. Original reference is to a drawing entitled "Plan of San Cristóbal Fort and Vicinity, Joint Operations Center, October 25, 1943, San Juan, P.R.," files San Juan NHS, San Cristóbal.

12. Plan dated 1947, "General Layout Fort Brooke & Vicinity." Included in Bearss' San Juan Fortifications, pp. 432-433.

13. Plan dated 1949 and entitled "As Built Survey Fort Brooke," drawing collection San Juan NHS, drawing no. FC1-DR4-ENV020.

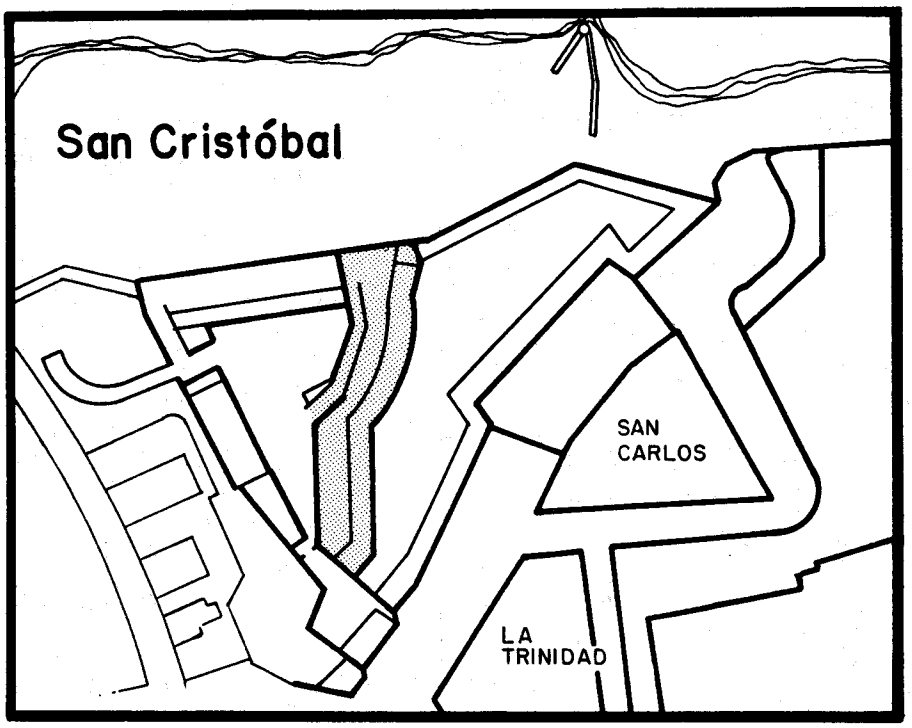
14. Bearss, pp. 377-379. Original reference is to specifications entitled "Rehabilitation of Enlisted Troop Housing, Motor Park, and Administrative Facilities at San Cristóbal Area, Fort Brooke, Puerto Rico," dated January 10, 1958.

15. Photo by R. V. Keune, January 1962. A copy is in the photo collection of San Juan NHS; also in the Washington office of HABS, negative no. 181.174.

16. "Castillo de San Cristóbal North Casemates," HABS 1963, Survey No. PR 101 (8 sheets).

17. Photo collection, San Juan NHS. The photo shows the east and south facades and is simply labeled "Dec./69."

18. Project description for Section 106 Compliance, "Patch & Paint Casemates, Forts El Morro/San Cristóbal, SAJU NHS," 1975; and, letter dated Nov. 24, 1975, From: Regional Director, To: Advisory Council, Re: 106 Compliance.



CHAPTER 4

THE CAVALIER
(EL CABALLERO)

Description

Located on the east side of San Cristóbal's Plaza de Armas, el Caballero extends from north to south to enclose the Plaza. Long and angular, the structure caps a portion of the North Casemates and the whole of the Troops' Quarters. The accompanying ramp to the west gives access to the terreplein. A circular stair and two cistern heads project above the terreplein. El Caballero is the highest structure of San Cristóbal and derives its name (cavalier) by occupying a lofty position. (See figs. 4.1, 4.2 and 4.3.)

The significance of the cavalier is derived from its military importance and use through history. Together with the North Bastion, la Trinidad, and San Carlos, it defended the entire land approach to San Juan. It provides a 360 degree vantage that includes the Atlantic Ocean to the north, the land-front (and modern day San Juan) to the east, the harbor and port to the south, and the old city of San Juan and el Morro to the west. With all embrasures facing east, toward the original land front, it generally appears in its late-eighteenth century configuration.

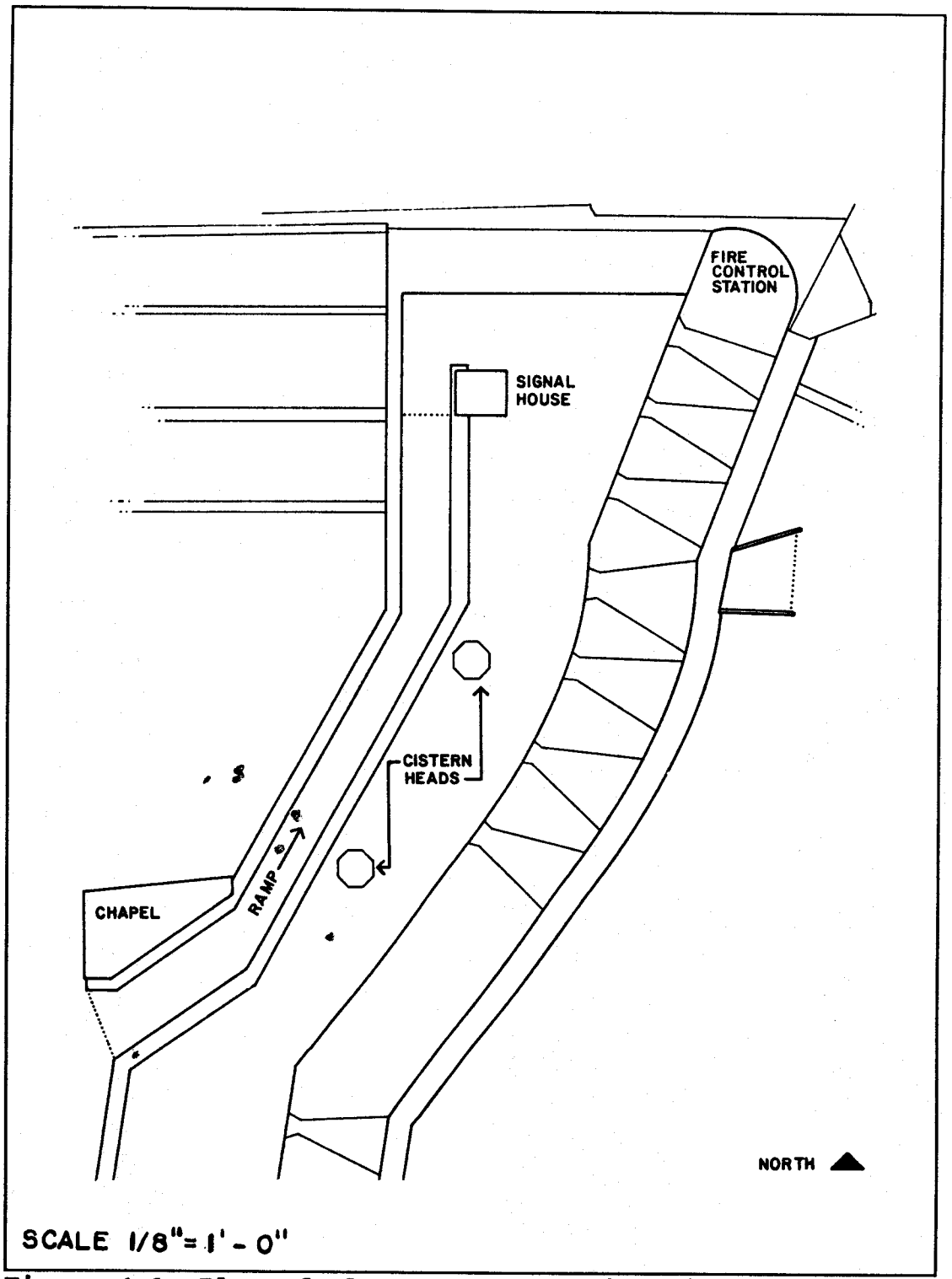


Figure 4.1. Plan of el Caballero showing cistern heads, signal house, World War II fire control station and stair. Drawing by Jana Gross (1989) based on 1970 HABS site plan.

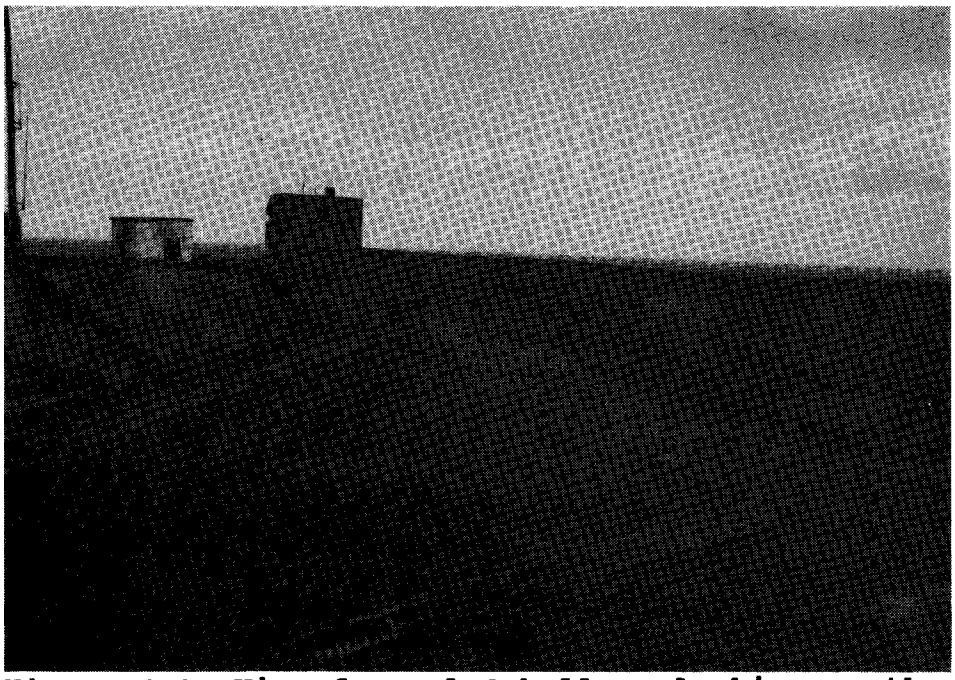


Figure 4.2. View from el Caballero looking north. Photo by CPR, 1986.



Figure 4.3. View from el Caballero looking south. Photo by CPR, 1986.

El Caballero is probably situated on bedrock which formed the crest of the hill originally located here. Above this rocky base are tamped earth and layers of brick and stone rubble covered with stucco. There are areas of hewn stone acting as reinforcing. An early-seventeenth-century cistern within el Caballero also serves to support the terreplein. There are two corroded iron outtake pipes located about five feet down on either side of the west opening (over the ramp). In addition, there is a circular clay pipe located higher up along the east side of the southerly cistern head that may have been the intake pipe. The west opening into the cistern has a tapered downspout which was used to channel water runoff in a similar fashion to cistern no. 3 under the Plaza.

The structure is load-bearing masonry. The rubble walls are largely battered and reinforced with cut stone at corners and projections. Acting almost as retaining walls, they contain the earth-fill and masonry terreplein.

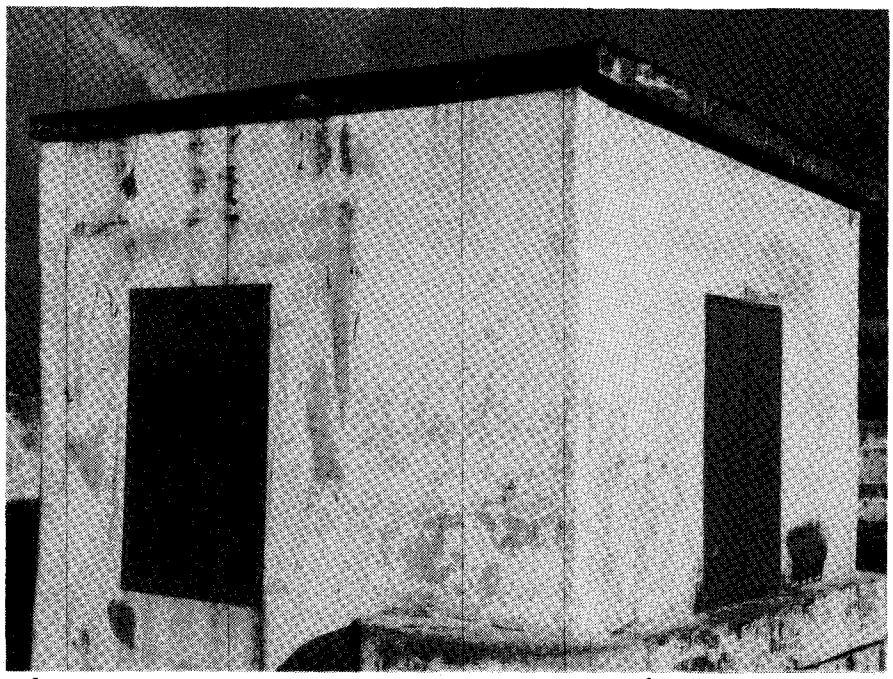


Figure 4.4. East and south elevations of the signal house on el Caballero. Photo by Richard Crisson, 1986.

The signal flag house adjacent to the ramp is of brick or brick-rubble construction with wooden roof joists and a masonry roof (fig. 4.4). Originally it housed the flags hoisted onto the adjacent signal pole to signal incoming ships. It is unused today. The solid wood plank paired shutters of the building's two windows are secured by cross-bars set on angles. The hardware and shutters are modern and sit flush to the outer wall. The south-facing doorway is of similar construction and date. The structure is capped with a simple, flat, projecting cornice. Drips of tar are evidence of a modern bituminous coating on the roof.

The two-story fire control station at the northeast corner, is made of reinforced concrete and dates to 1942 (fig. 4.5). It was an integral element of the 1941 fire control installation for the San Juan harbor defense. It is a rhombus in plan and has a rounded corner. Situated on top of the 1770's parapet, it has long, narrow, horizontal openings for windows on both levels. The windows face north, and are deeply set into the structure to provide wide recessed sills. A window with an inward-opening shutter faces south at the second story. The roof is flat, sloping northward, and has no cornice. Interior conditions were inaccessible due to a "special use permit" between the NPS and San Juan Ports' Authority.

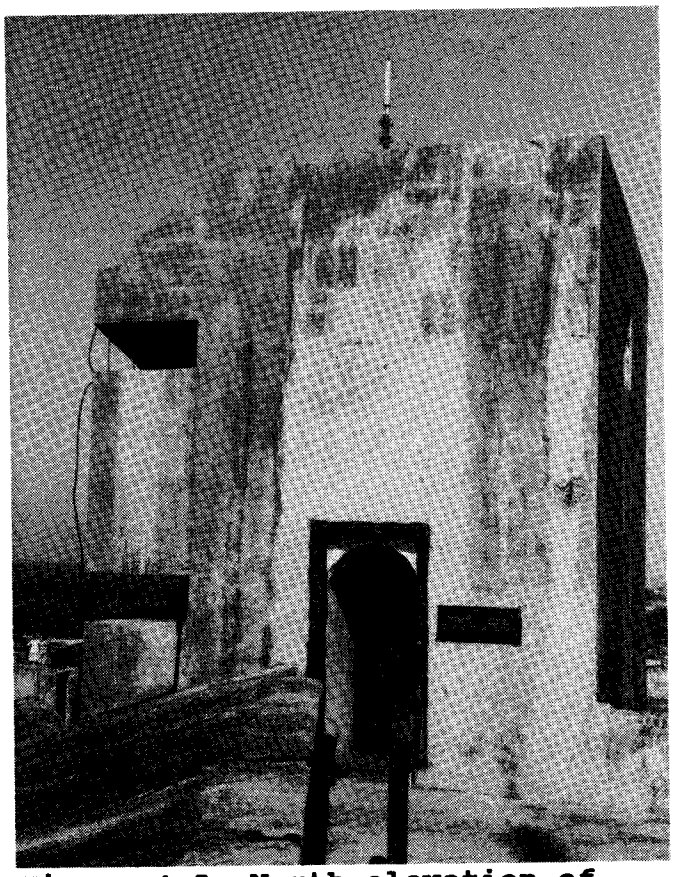


Figure 4.5. North elevation of fire control station on el Caballero. Photo by Richard Crisson, 1986.

The west facade of el Caballero faces the Plaza and contains the wide sloping ramp that joins the Plaza with the terreplein of el Caballero (fig. 4.6). The left cheek wall of the ramp is rubble masonry covered with Portland cement. This wall is pierced twice by the arched openings of Tunnel 2 and Tunnel 3, leading respectively to the postern gate (and moat) and to the North Bastion. Attached to the southern end of the ramp is the Chapel (la Capilla). The right cheek wall of the ramp is in effect the west wall of el Caballero. Rising vertically, it contains the cistern opening and the low, arched opening (Tunnel 4) of the ramp to the South Bastion. The paving of the ramp consists mostly of brick and stone rubble separated at regular intervals by horizontal stone bands flush with the stucco. There are many repairs and several square concrete access covers. These apparently lead to the sub-surface water drainage system.

The west wall of el Caballero continues above the Troops' Quarters, and forms the low projecting parapet of the latter

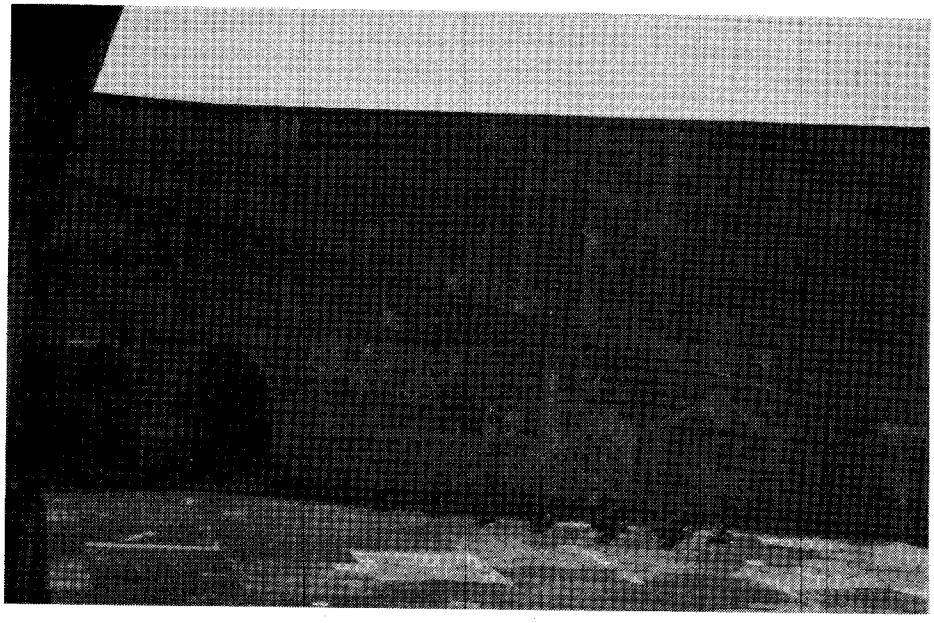


Figure 4.6. Ramp up to el Caballero, west elevation. Photo by Richard Crisson, 1986.

building. The interior face of the parapet is characterized by four evenly-spaced niches of unknown purpose. The niches are mostly covered with smooth Portland cement stucco.

The north elevation faces the Atlantic Ocean and consists of a high, battered, random-sized, sandstone wall. It is capped by a 3 foot high sloping parapet. At the northwest corner is a tall masonry pier. The pier serves to support the wooden signal pole. The pier is of brick and brick rubble covered with beige lime stucco.

The east elevation is comprised of the characteristic embrasured wall of el Caballero. It is gently battered, and runs in a southerly direction. The long curtain is made distinctive by its surviving section of 1634-44 curved wall. To the immediate south are fourteen embrasures, interrupted by a solid, sloping parapet wall. Embrasures are positioned and angled to dominate every portion of the fortification front. The main section of wall is of random-sized stone and brick and stonerubble; it is covered with remnants of yellow lime stucco. d The south wall is described in the Troops' Quarters section, Chapter 10. The upper and lower parapets are of brick and stonerubble with a stucco covering.

Visible at the southwest corner is the circular stair tower (fig. 4.7). Although its walls are an extension of the lower (Troops' Quarters) wall, the actual 1773 construction of the tower is of brick and stonerubble covered with reddish stucco and re-surfaced with a white stucco. Of note in the stair tower is the use of cut sandstone for the cornice, doorway, and circular window.

The stair winds down to the first and second floor of the Troops' Quarters. Most of the walls and ceiling are whitewashed Portland cement. No utility or mechanical systems have been introduced into the stairway. There is a fading decorative painting of interlaced fretwork on the domeceiling; it is reminiscent of Islamic elements prevalent in Hispano-Moresque architecture. The sculptural bell-shaped, dome roof is constructed of brick rubble covered with reddish stucco. It is highlighted by a stone and brick cornice which is raised where the doorway intersects.

El Caballero's terreplein was designed to support heavy artillery. Access to it is gained via the west ramp to the Plaza. The paving of the ramp is hormigón. The terreplein is covered with various kinds of hormigón and some areas are paved with brick and stone. Drainage and gun emplacement tracks are patched with Portland cement. The east wall has an open perimeter drainage trench just below the parapet. In addition, two 18th century cistern heads are located on the terreplein. Remnants of original stucco remain today.

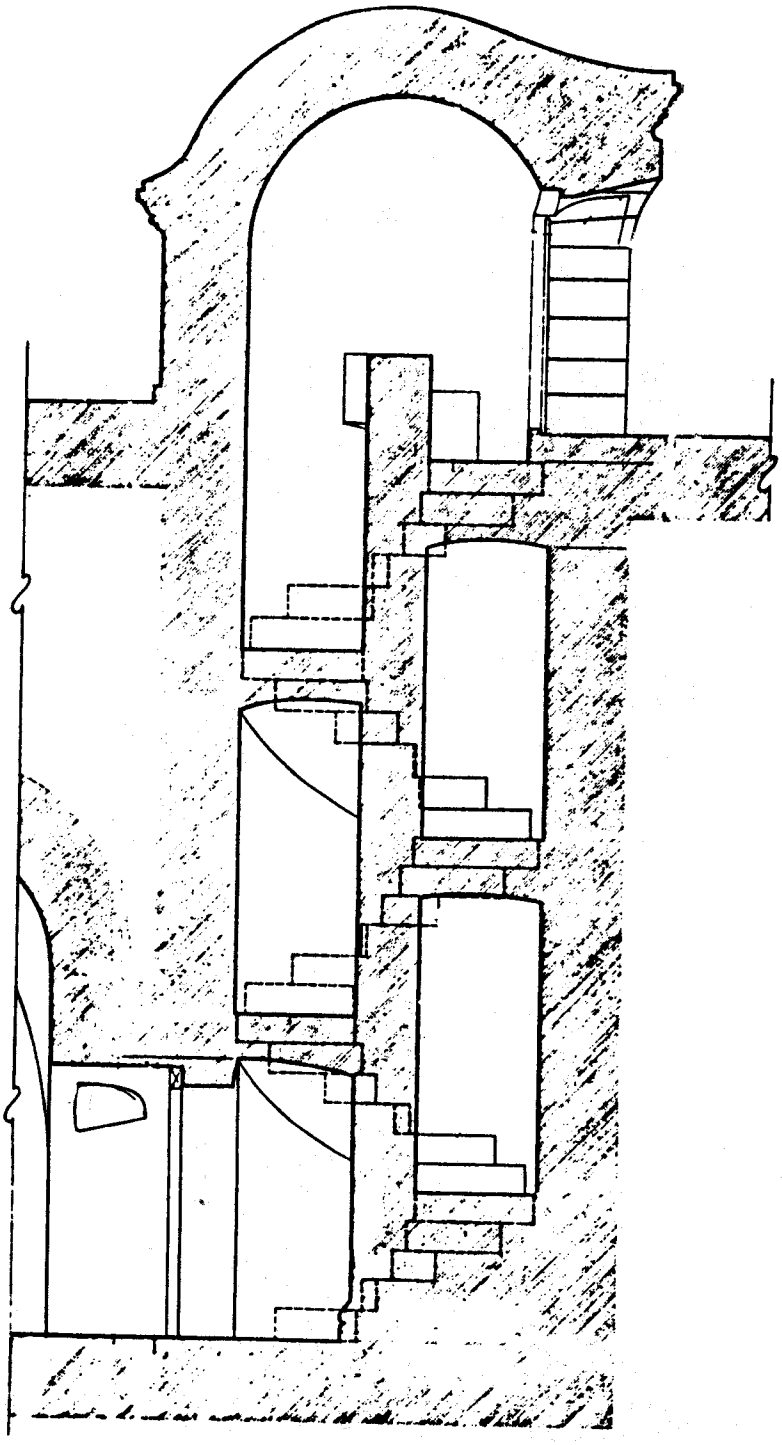


Figure 4.7. Section of spiral staircase. HABS drawing, 1962.

Structural Evolution

Period 1: 1625-1765

The highest part of San Cristóbal, el Caballero, is also one of its oldest features. The curved east wall appears in the map of 1678 and most likely dates to the original 1634-1644 construction of the fort. It was known in the seventeenth century as la Santisima Trinidad (Most Holy Trinity).[1] In 1702, this feature was labeled in french as "A" emphasizing its importance as the center of the fortification. Not until the eighteenth century was it referred to as el Caballero (the cavalier), meaning a high platform on a bastion. Plans from this period are all included in figure 4.8.

The plan of 1678 was sketched by Engineer Luis Venegas Osorio for the repair and proposed expansion of San Cristóbal. Here la Santisima Trinidad was shown as semi-circular, with a curved wall on its east side. Flanking it to the west was a demi-bastion. No additions were proposed to the feature at this time, although repairs may have been in order. These, unfortunately, were not detailed.

The same basic configuration was shown in the French plan of 1702 by an unknown author.[2] Two additional details were included; seven embrasures in the semi-circular wall, and a ramp to the west enclosed by the flanking demi-bastion. Different from 1678, was the northwest wall illustrated in 1702 as a straight line. This may have been a proposed alteration as the intent of the 1702 drawing was to record both existing conditions and proposed new work. Alternatively, the 1702 plan may have simply been a more accurate rendition of the existing works.

A description of the existing interior of el Caballero was written in 1731 as part of a survey of the San Juan fortifications. This survey was done by three military engineers who described a large cistern within el Caballero for holding water. The cistern, however, was dry because the water had drained through several cracks.[3]

Engineer Thomas O'Daly also described the cistern in his report on the existing conditions at San Cristóbal in 1765. This he called a "capacious and [bomb] proofed cistern."[4] Whether or not it then contained water was not noted. O'Daly's plan that accompanied the report showed el Caballero unchanged from the 1702 plan, with seven embrasures to the east and an access ramp to the west. In addition, the

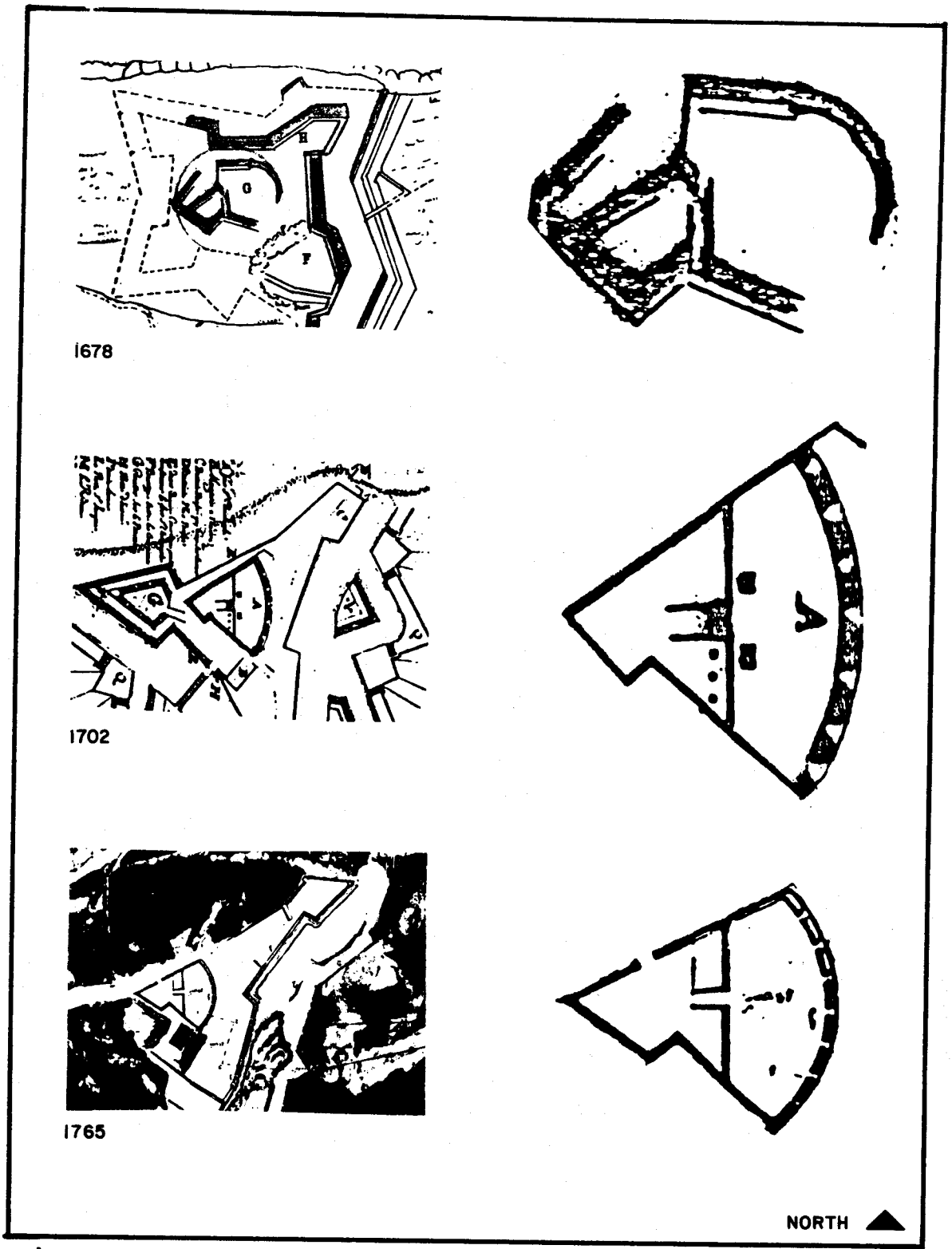


Figure 4.8. Early plans showing el Caballero. Compiled by Barbara Yokum, 1986.

terreplein was recorded to be 48 royal varas (132 feet) above sea level.* This was 7 varas (19.2 feet) above the level of the adjacent bastion to the east known as the North Bastion.

One mortar sample removed in 1986 from el Caballero is believed to date from this first period.**

Period 2: 1765-1809

A component of the modernization project for San Cristóbal in 1765 was raising and lengthening the existing semi-circular platform. It was known throughout this period as el Caballero.

In O'Daly's 1765 proposal for the modernization the old Caballero with its entrance ramp was left intact. Added to the south side only was an extension with six embrasures facing east. This extension was labeled "C" in the plan and described in the legend as:

> Wing that will be added to el Caballero to increase the fire power against the height of its approaches.[5]

The design had changed four years later when O'Daly drew up another plan in 1769 (fig. 4.9) and proposed to raise the platform of the "old" Caballero (K), "6 pies [about 5.58 feet] in order to better dominate the outer works and the terrain in front." This made the old ramp obsolete, so a new ramp was designed along the west side whose purpose was "carrying artillery to el Caballero." Already under construction was a new addition to the north with three embrasures on its east side. Within this addition would be powder magazines, the entrance to Tunnel 1, and Tunnel 3 to the North Bastion (all discussed in later chapters). Still projected to the south was the wing (L) described as the "battery in continuation of the Caballero." The design had changed slightly since 1765, being enlarged southward and having seven embrasures instead of six. Construction, however, had not yet begun.[6]

Completed prior to March 1771, was the new addition north of the old platform that included the top portion of the

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*1 vara = 33 inches.

**SAJU 03 M01. Taken from exterior curved wall as reached from North Bastion. Similar to other samples from 17th-century features at San Cristobal, SAJU 11 M03b and SAJU T1 M02.

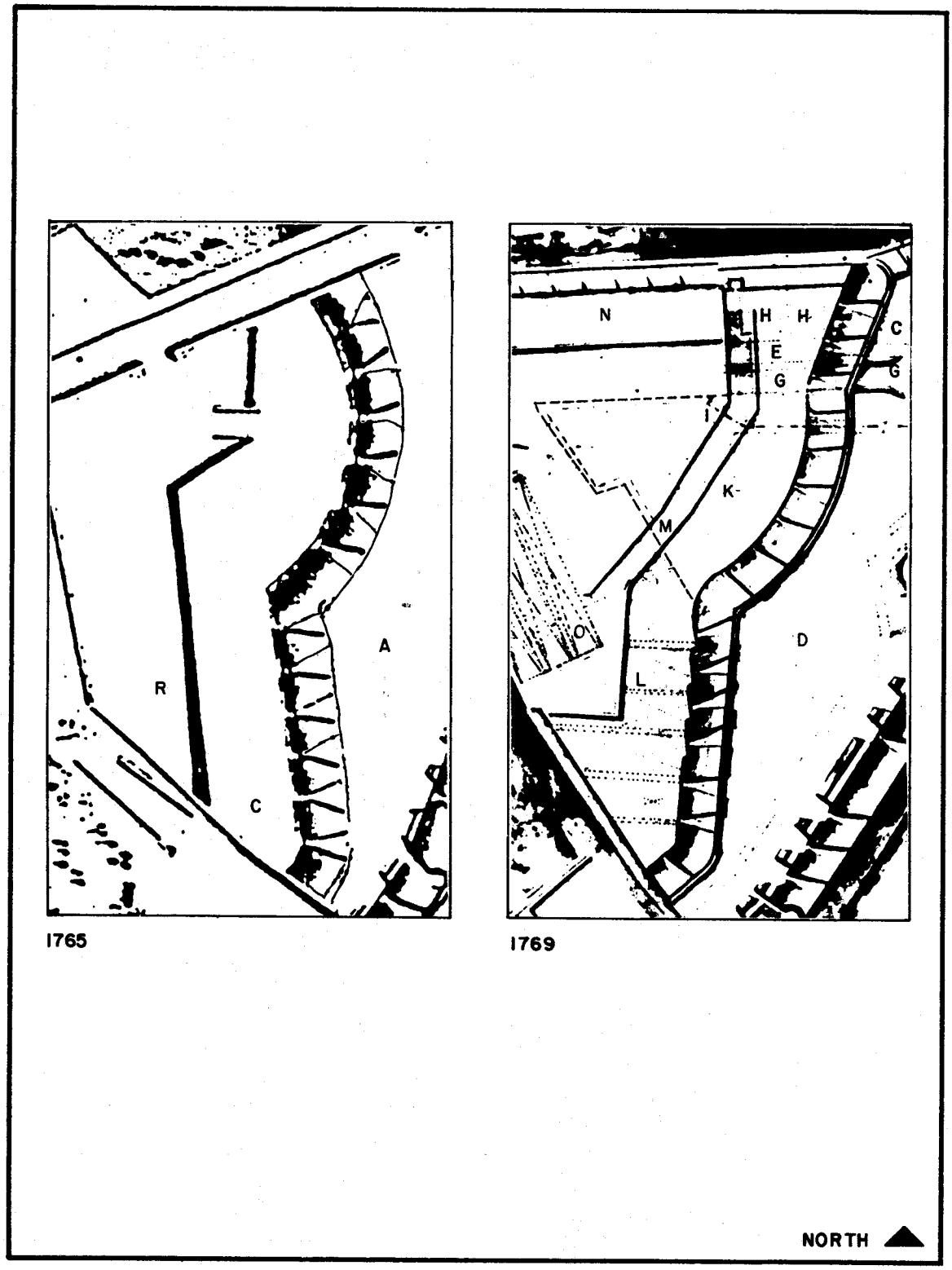


Figure 4.9. Details of two plans by O'Daly showing proposed designs for el Caballero. Note outline of old Caballero indicated on 1769 plan.

new ramp. Although intended for artillery, this ramp was no doubt usefulfor hauling building materials. To the south, excavation for the new foundation was begun in early March 1770 and the first floor well underway by October 1770. In March 1771, the second floor of the south wing was completed as was the elevation of the "old" Caballero. Tamped earth, 4 feet deep, formed the terreplein base to the south and was presumably used on the entire platform. In November and December 1771, "the works continued hastily in the final plastering of the old and new walls of the castle. The purpose was to leave all exterior surfaces protected from the harshness of the weather by means of a fine mortar finish."[7]

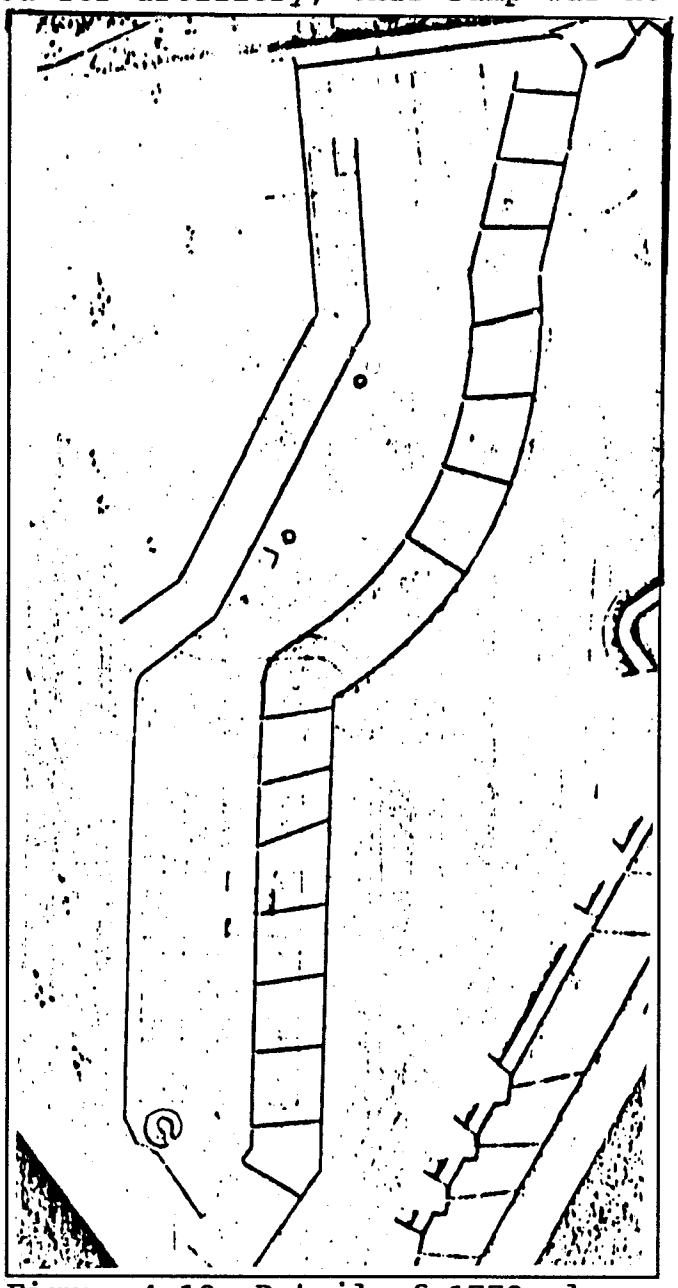


Figure 4.10. Detail of 1773 plan by O'Daly showing modernized el Caballero as built.

A more detailed picture of the new construction is provided by O'Daly's notes and plan of 1773.[8] The notes explain "all the esplanades of the batteries [of San Cristóbal] are finally built, half of hewn stone and the remainder of hormigón." Also described as covered with hormigón was "the interior space of San Cristóbal and Caballero . . . to collect water for the cistern." The plan (fig. 4.10) illustrated fourteen embrasures in the east parapet wall facing the land approaches. In addition, a large opening faced southeast at the south end of the parapet. This too was apparently a gun position since a later accounting mentioned that el Caballero "can mount 15 cannon." At the southwest corner of the new lengthened platform was a small circular feature. This was the stair tower covering the

"spiral staircase for communication" to the vaults (Troops' Quarters) below. The west facade of this stair tower was illustrated in an elevation drawing also done in 1773. One other feature of interest in these plans are two small circular objects on the west side of the raised semi-circular area. These were not described in the notes or legend but comparison with later drawings and existing conditions identifies them as the cut sandstone cistern heads.[9] The cistern heads were most likely new in 1773, but the cistern itself was probably the old cistern described in the 1731 survey. (See fig. 4.18.)

Examination of the building materials extant today gives us further information on the construction of 1770-1771. El Caballero appears to have been built with a combination of rubble sandstone and brick (mamposteria) for the walls; hewn stone for the terreplein, corners of walls, and architectural features; and whole bricks for portions of the parapet walls.*

A decorative touch was found on el Caballero at the hewn sandstone doorway of the stair tower. Remnants of red andblack coloring applied to the white scored mortar joints may still be seen.** Only the outer edges of the joints are colored, leaving an interior band of white mortar exposed. Articulating the white mortar are two parallel black lines, and outside these lines is the brick-red coloring. This coloring has the appearance of a fine plaster finish and may be a pigmented whitewash. Similar treatment of stonework joints was also observed in 1962 at the east facade of the Officers' Quarters.

Period 3: 1809-1837

Repair work to el Caballero in this period is documented in a report dated 1809, and existing conditions by a sketch dated 1821. It appears that both the signal poles and the signal house were installed and built at this time.

In 1809, it was reported that the esplanades and the upper portions of the merlons and embrasures of el Caballero had deteriorated considerably. This had resulted in water infiltration into the vaults below, most likely at the Troops' Quarters. To repair this, old work was removed and reconstructed. Rubble masonry was used for both the esplanades and to coat the merlons and embrasures.[10]

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*See samples: SAJU 03 M02, SAJU 03 M05, SAJU 03 M06, SAJU 03 M07, SAJU 03 M08, SAJU 03 M12, SAJU 03 M17.

**SAJU 03 P06

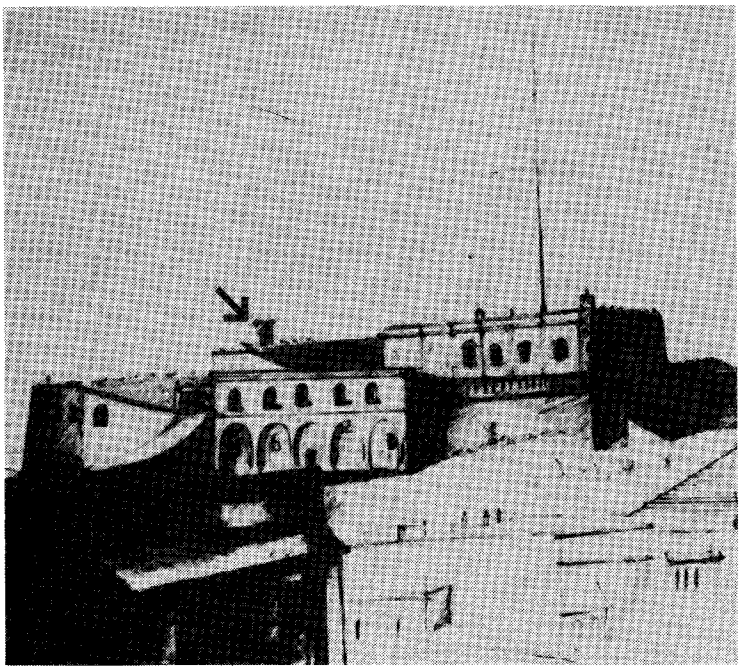


Figure 4.11. Detail of August Pleé sketch, 1821. East elevation. Arrow points to possible signal house on el Caballero.

More than ten years after these repairs were made, the west side of el Caballero was documented in a sketch (fig. 4.11) made of San Cristóbal in 1821.[11] Seen for the first time in this sketch is a large signal pole north of the stair tower and a small building in the same approximate location as the signal house today. The design of this small building differs in detail from the existing structure and the rendering of other features is only approximately accurate. Therefore, the signal house may have existed as early as this sketch having been built sometime after the plan of 1783, but before 1821. Its probable function was storage space for the ship signal flags, hence the name "signal house."*

Period 4: 1837-1868

El Caballero is documented during this period by the 1839 model of San Cristóbal and the 1861 drawings by Manuel Castro.[12]

The 1839 model shows el Caballero unchanged from its 18th century design with two exceptions. First, the stair tower at the southwest corner was missing. This, however, is assumed to have been an erroneous omission. Second, the signal house

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*A sample of exterior lime stucco, SAJU 03 M16, was removed in 1986 from the exterior lower east wall. This stucco is a beige color with white quartz sand of medium grain size. It is almost identical in composition to an interior plaster sample SAJU 02 M13, from the west stairway of the powder magazines. This stairway is thought to have been built sometime between 1774 and 1785, although not plastered until later.

was modeled as it exists today: almost square in shape, with flat roof, one doorway in the south facade, and two windows (one in the east facade and one in the west facade).

Delineator Manuel Castro recorded San Cristóbal in color-washed drawings in 1861 (fig. 4.12). These provide the most detailed views of el Caballero to date. Unchanged in 1861 were the original eighteenth-century embrasures, the stair tower, and the two cistern heads. The intricate detailing shows for the first time; a small round window in the west facade of the stair tower, the octagonal shape of the cistern heads, and the long rectangular shape of the early cistern below. The cistern was located at the first floor level of the Plaza and oriented parallel to the ramp at the west wall. Horizontal access to the cistern today is through a small opening in the exterior west wall above the ramp. This same opening was clearly illustrated by Castro. Enclosing the cistern opening in the drawing was an open grille of basketweave design.

Also shown in their same locations were the later signal pole and signal house, both probably built after the plan of 1783 and before 1821. The signal house was colored yellow, white, and green in 1861. The body of the building was yellow, its simple cornice white, and the south door and west window shutters green. This was similar to the paint scheme for the buildings on the Plaza below. However, no verification of this color scheme for the signal house has been found. The one exterior paint sample removed from the body of the building has no evidence of an early yellow finish.*

One new feature illustrated in 1861 was a flagpole. This was on the west parapet of the south extension, north of the signal pole.

Period 5: 1868-1898

Changes were made to el Caballero in the 1890s in preparation for war with the United States. Some of these changes are documented.

Two documented renovations were made in ca. 1897.[13] A 24-cm. howitzer was emplaced at the west parapet adjacent to the ramp, and a powder magazine built to supply it. (See fig. 4.13.) Alterations made to accommodate the gun included building of a raised base and a mound of earth at the west wall for protective cover. The magazine was built behind and to the south of the gun within the east parapet wall of the south extension. Two embrasures, located immediately south of the

*SAJU 03 P03

extension. Two embrasures, located immediately south of the curved wall, were destroyed to make room for the new structure. When completed, the roof peaked only "slightly above the line of the superior slope of the adjacent parapet."[14] The new magazine was constructed in concrete. El Caballero was known at this time as La Batería del Macho (based on the ca. 1897 plan for the new magazine).

Two other undocumented changes were the construction of a large one-story building on the south end of el Caballero and the relocation of the signal pole to the opposite north end. Both were recorded in early photographs taken soon after the American occupation.[15] The south building is most clearly seen in a photograph dated ca. 1899 looking towards the north (fig. 4.14). The exterior siding material is difficult to identify; it appears to have been either clapboard or brick. The roof was flat. The function of the building is not known. The signal pole was moved to its present location at the northwest corner of el Caballero sometime after 1861. Supporting it at the base is a small projection constructed of bricks.

Period 6: 1898-1987

San Cristóbal was administered by the U.S. Department of the Army from October 1898 through 1961. Beginning in September 1961 to the present day it has been under the jurisdiction of the National Park Service.

A few alterations were made to el Caballero in the early years of the twentieth century. Photographic evidence indicates that sometime after the spring of 1899, the building at the south end was demolished and a small structure erected. This new structure appears to have been about the size of a sentry box with an open canopy roof. It too was removed sometime before 1912.[16] A 75 foot iron flagstaff was requisitioned in 1901 and installed on el Caballero in the early months of 1902. A 1912 photograph (fig. 4.15) shows this flagstaff located near the east parapet at the junction of the curved wall and the south extension. Its great height was supported by four guy wires attached to the adjacent east merlons and west terreplein.[17]

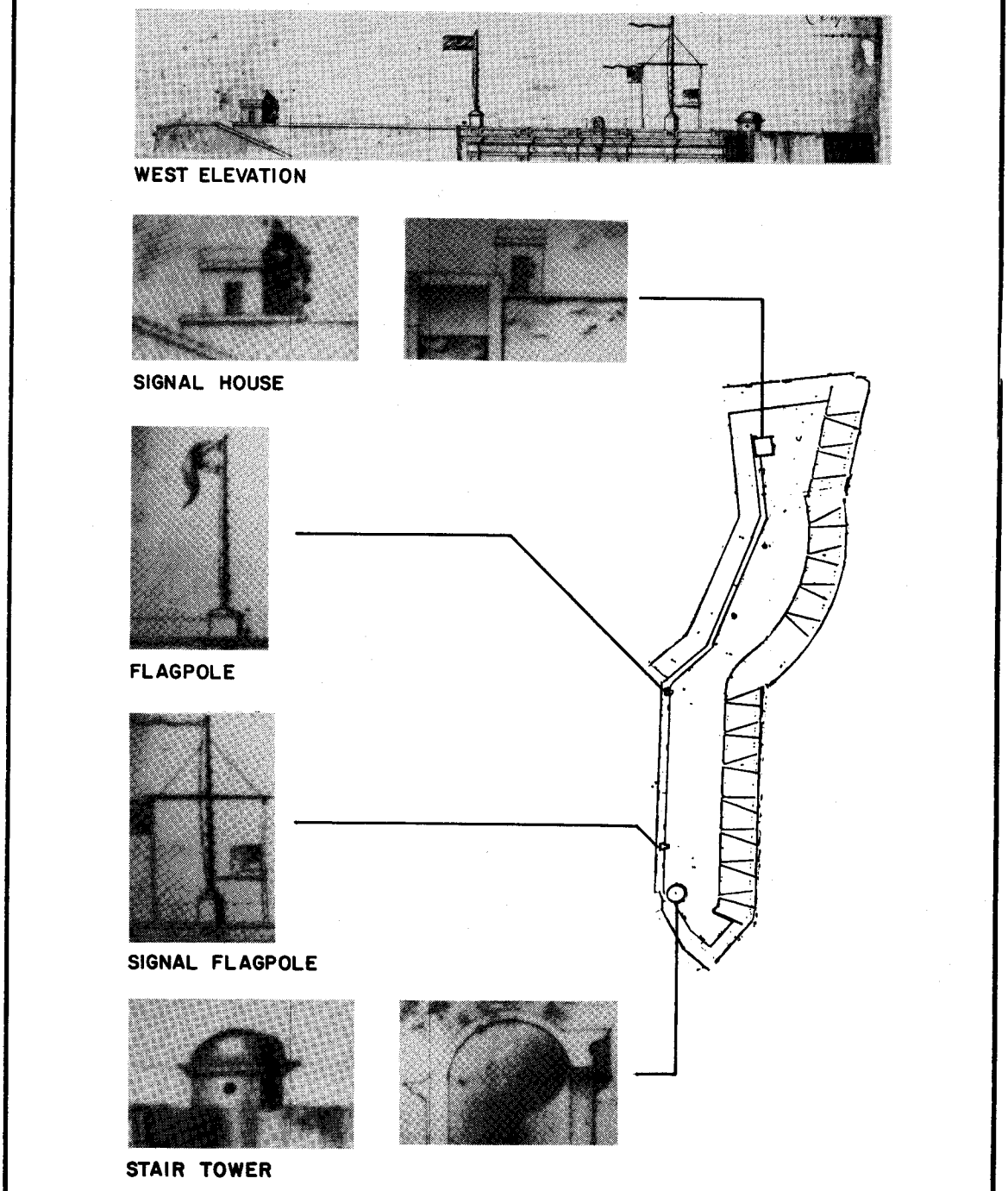


Figure 4.12. Detailed views of el Caballero from 1861 drawings by Manuel Castro. Compiled by Barbara Yokum, 1986.

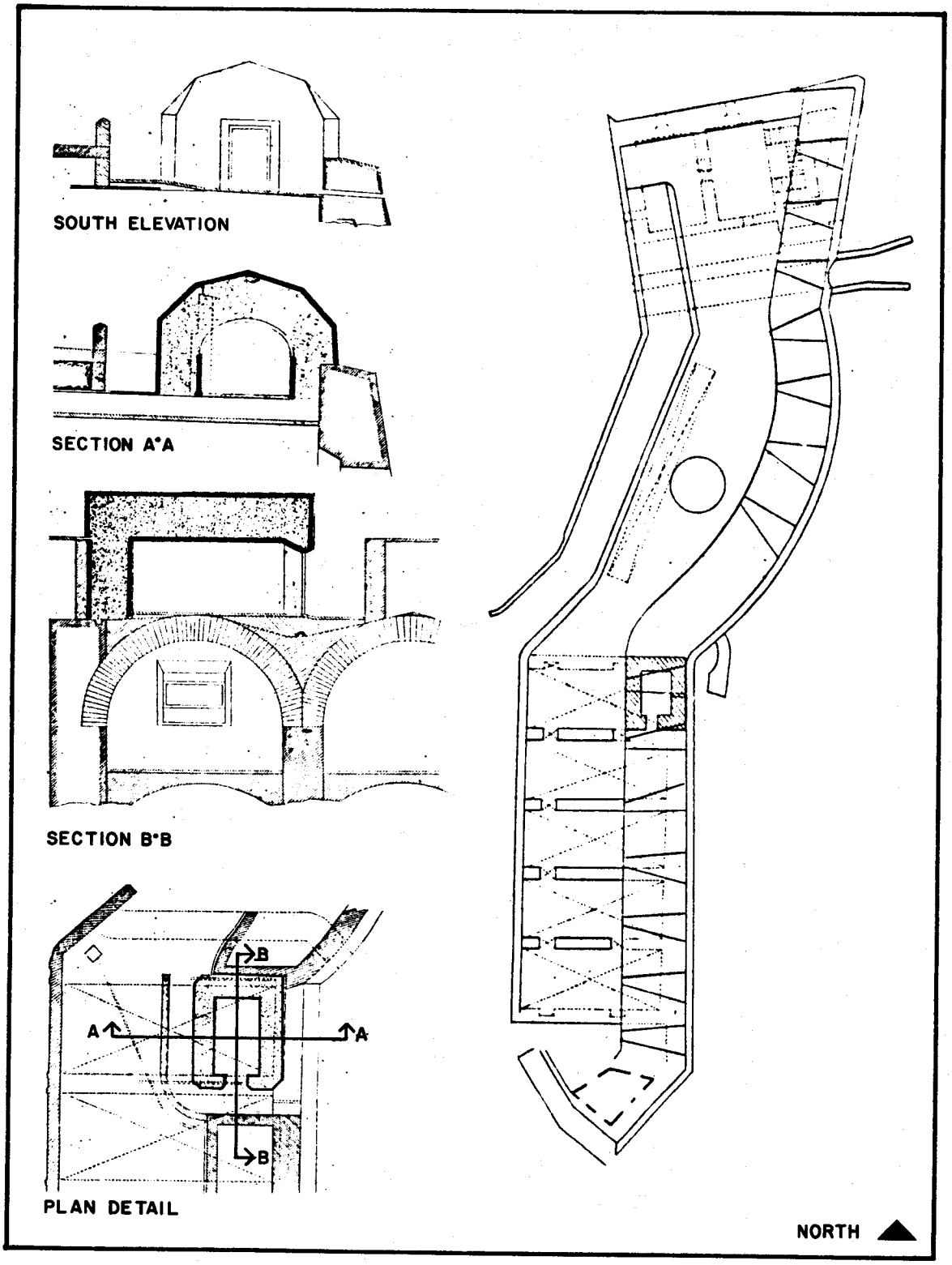


Figure 4.13. The new powder magazine, ca. 1897. From drawings obtained by Colonel Goethals in 1898. (San Juan NHS Archives.)

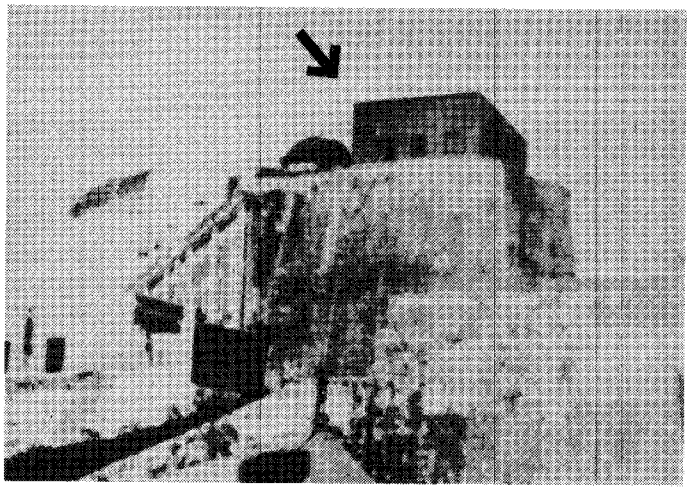


Figure 4.14. Detailed photographic view of new structures on the south end of el Caballero, ca. 1899. (San Juan NHS Archives.

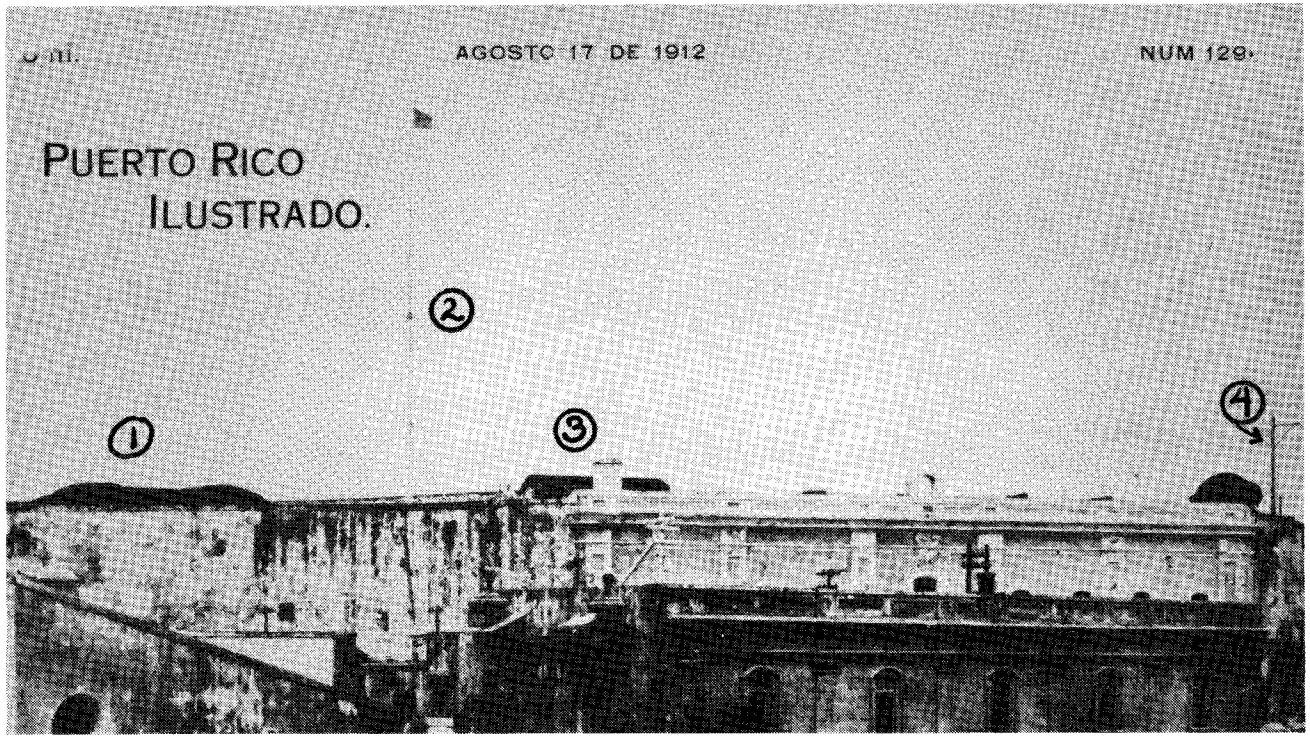


Figure 4.15. Detail of view dated 1912 (numbers added). Note following features: 1) earthen mound, ca. 1897; 2) iron flagstaff, ca. 1902; 3) powder magazine, ca. 1897; 4) possible derrick. (San Juan NHS Archives.)

Apparently obsolete, the smaller Spanish flagpole on the northwest corner of the Troops' Quarters had been removed.[18] This may have been the same illustrated by Castro in 1861.

The World War II years, 1939-1945, saw many changes to el Caballero. It was at about this time that the 75 foot flagstaff, the signal pole to the northwest, the remnants of the 1897 gun position and the magazine in the east parapet wall were removed. Following removal of the magazine, the two embrasures it had obliterated were restored to their eighteenth-century configuration. Emplaced on a merlon in the curved east wall was a large wood pole. This pole, supported by three guy wires, most likely served a communications function. In the late summer of 1942, a concrete fire control station was constructed. Known as a "2-room manhole," and "Manhole A," the station was located at the northeast corner of el Caballero where it still remains today. This structure was part of the "Harbour Defense Project" begun in 1941.[19]

A plan (fig. 4.16) of San Cristóbal made in about the late 1940s records the use and terminology of the structure on the north end of el Caballero. At the northwest corner was the reinstalled "Signal Pole." Nearby, at the head of the ramp, was the "Ship Signal House." On top of the signal house was a triangular symbol labeled "Trian. Sta. San Cristóbal." The new World War II fire station was labeled the "Observation Post." The two historic cistern heads, no longer in use, were denoted "Masonry Blocks."[20]

Photographs taken in the decade of the 1950s chronicle the repair and restoration work that was undertaken.[21] The exterior of the signal house appeared lighter in color, perhaps due to repainting or restuccoing. Installed over the doorway and window openings were hoods to shield the sun and rain. At the stair tower, a comparison of photographs taken in 1953 and 1960 indicate that the exterior wooden door was replaced. The exterior side of the door in 1953 was composed of flush boards installed horizontally. By 1960, the boards in the new door were oriented vertically. (See figs. 4.17, 4.18.)

Under the jurisdiction of the National Park Service in 1961, a new flagpole was reinstalled at the northwest corner of the south extension (Troops' Quarters). This was the historical location of the flagpole from the mid-nineteenth century until 1902. Shortly thereafter, two other flagpoles of equal height to the first were

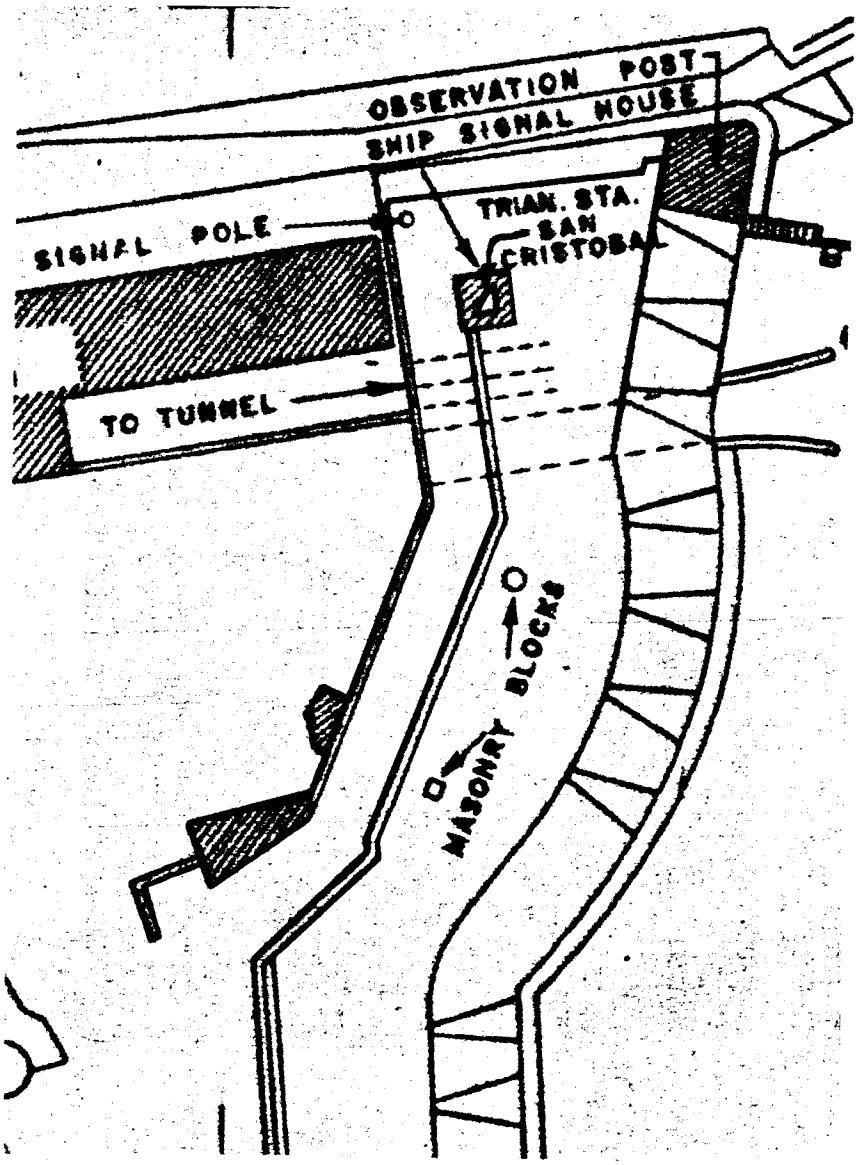


Figure 4.16. Detail of plan Fort Brooke as Built," Office of the Engineer, U. S. Army, ca. 1949, highlighting el Caballero. (San Juan NHS Archives.)

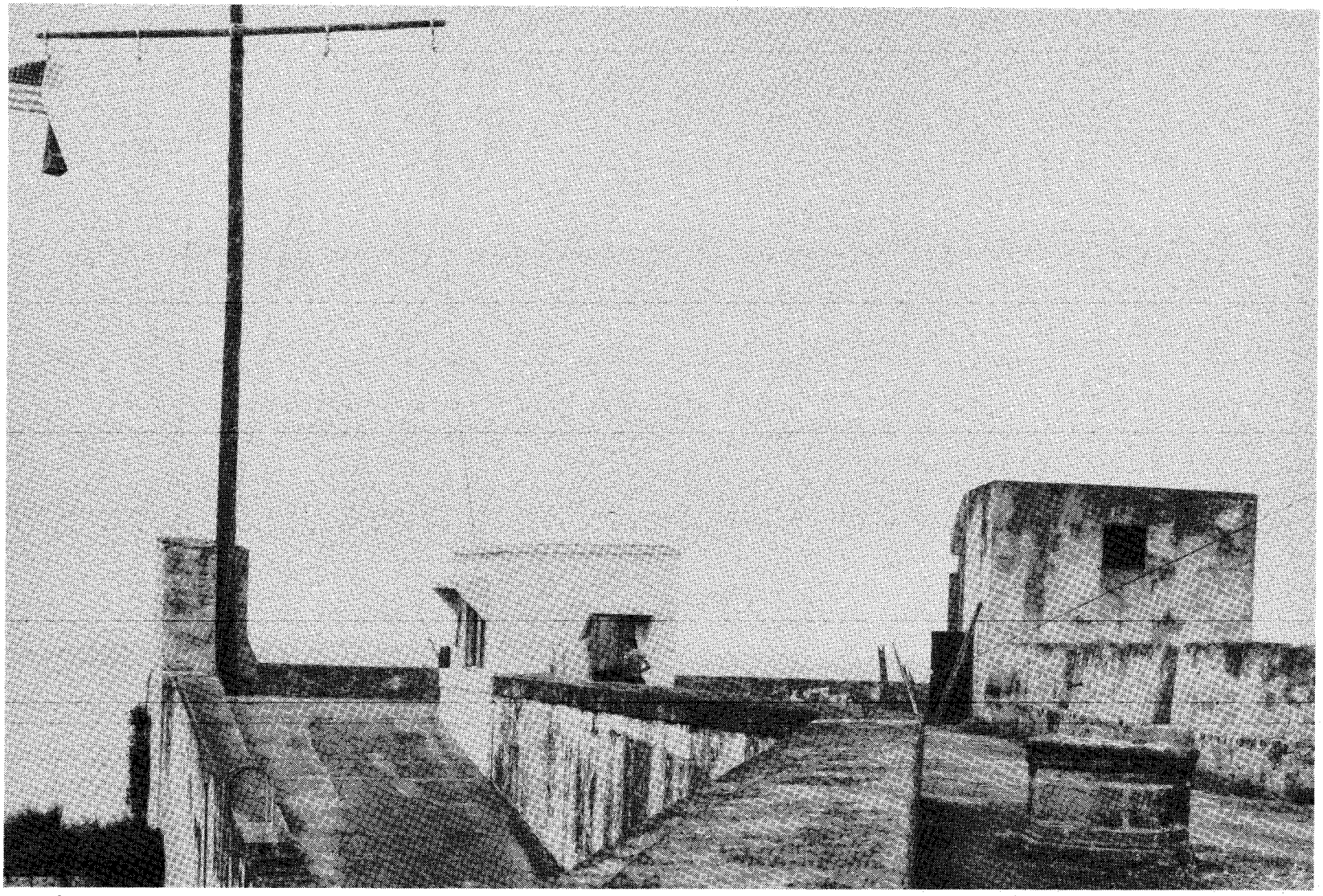


Figure 4.17. North end of el Caballero with signal house on left and fire control station on right. Ca. 1960. (San Juan NHS Archives.)

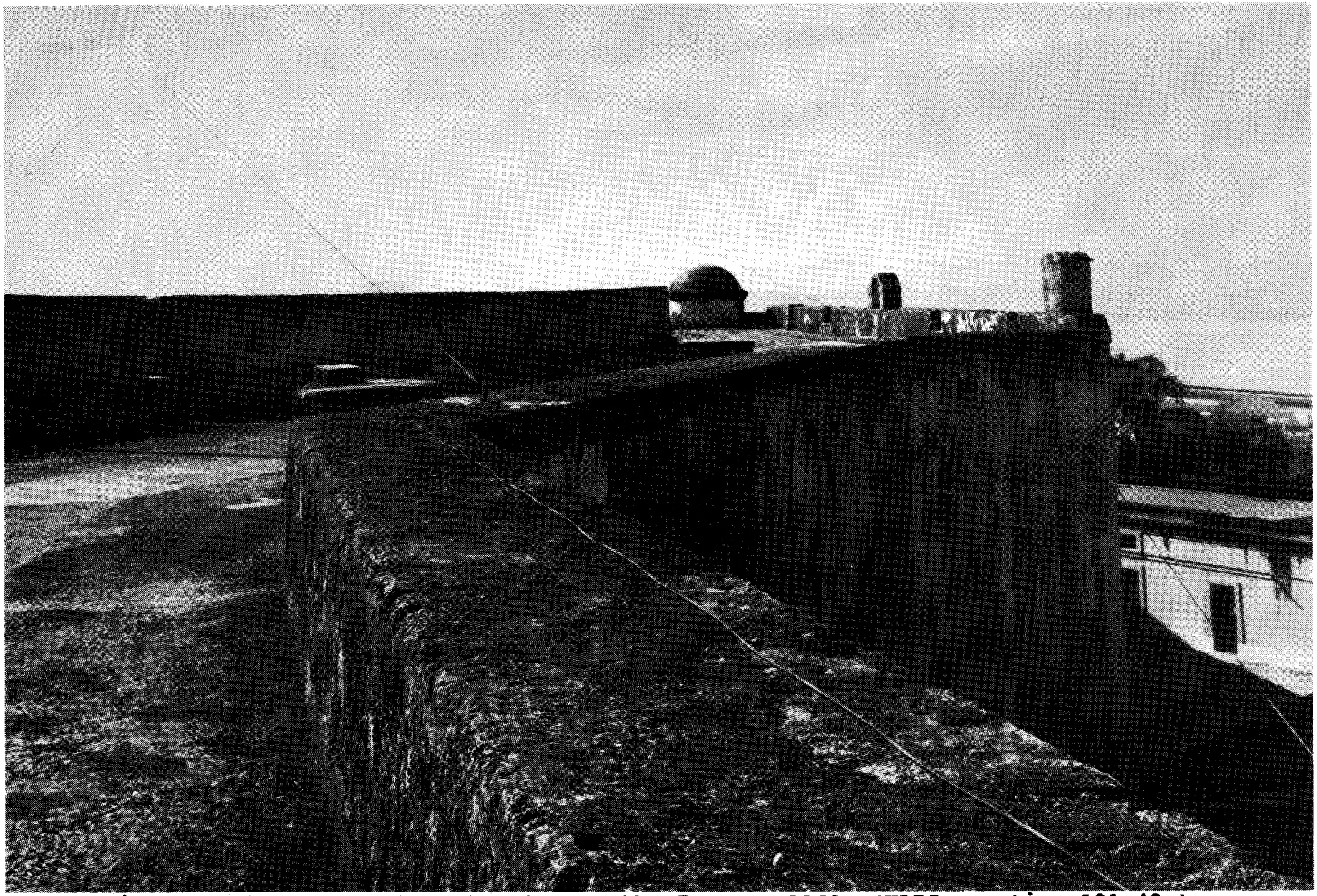


Figure 4.18. El Caballero looking south, January 1960. (HABS negative 181.42.)

installed next to it. Later, on September 8, 1963, the Spanish flag was officially raised; adjacent to it were the flags of Puerto Rico and of the United States.[22]

Portions of el Caballero have been recorded over the years by the HABS. In 1962, a plan of the south extension was included as the roof plan for the Troops' Quarters. Similarly, in 1963, a plan of the north extension was included as the roof plan for CM-10 and CM-11 of the North Casemates. The two eighteenth-century cistern heads and cistern were measured and drawn in 1970 (fig. 4.19).[23]

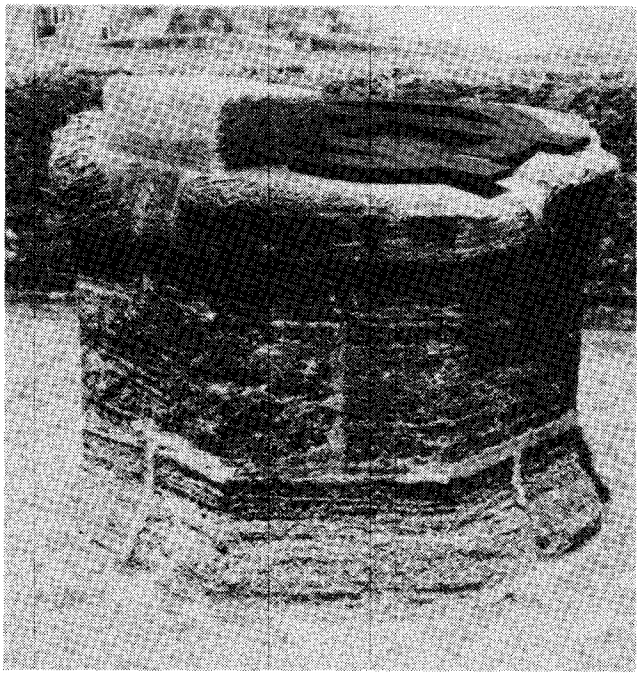


Figure 4.19. Cistern head on el Caballero. Photo by Richard Crisson, 1986.

The large wood pole was installed by the U. S. Army during World War II. Thought to have served as part of the communications system, it was removed sometime after 1962 and before 1971. The only documentation on its removal has been historic photographs.[24]

Also undocumented is restoration work at the signal house. Today, the door and window shutters have the appearance of modern reproductions and are unpainted. This work was possibly done in the mid-1970s at the same time that door and window shutters were restored in the Troops' Quarters.[25]

Conditions

El Caballero's configuration remains largely today as it appeared in the late-eighteenth century. Of important architectural significance are the primary surviving elements: cistern and curved wall dating to 1634-44; masonry embrasures, cut-sandstone cistern heads and stair tower dating to 1771-1773; and concrete firing control station dating from 1942. Walls and paving appear in good condition. However, cavity erosion of brick is common at parapet and embrasure edges. Banquettes suffer extensive brick loss. Stucco erosion is evident at the merlons, terreplein and stair tower.

On the left cheek wall of el Caballero's ramp are cement patches indicating where early twentieth-century military structures have been removed. The cheek wall is topped by a hewn stone cap partially covered with cement. Joints are thin, and the weathered stone is darkly-stained due to excessive moisture. A deteriorated section of the wall, above the parapet of the North Casemates, allows a view of subsurface conditions: mamposteria with yellow sand covered with pigmented yellow lime stucco, and recovered with smooth white painted cement stucco.

The right cheek wall of the ramp is covered with cement patches and most of the wall is streaked with stains due to moisture.

The small signal house with cracked stucco in the upper south wall may be indicative of underlying structural problems. Directly over its window and door openings are cement patches indicating the locations of recently-removed masonry hoods.

The concrete walls of the fire control station in the northeast corner of el Caballero's terreplein are stained and deteriorated in places to expose rusting reinforcing steel.

Parapet walls are in varied conditions. The east embrasured wall is so eroded and stained that it is difficult to distinguish the rubble masonry from the cut stone, or from the stucco. The banquettes and parapet tops are edged with exposed bricks in a soldier courses; these have been repointed with a very dense cement mortar causing much brick deterioration.

The stucco on the south wall, described mostly as part of the Troops' Quarters, is severely eroded and hard to distinguish from the subsurface masonry. Much of the wall has been parged with cement. Though the walls appear stable, extensive stone replacement in vertical configurations seem to indicate previous vertical cracks - perhaps due to earthquake activity. Other patches seem to date to various twentieth-century repairs done by the U. S. Army.

The spiral stair at the southwest corner of the terreplein is in fair condition. However, 1/2 to 3/4 inch joints are visible in places due to eroded and missing stucco. The walls are partly stained and a small section of the base is patched with cement.

Deterioration of el Caballero, as with all other units of the San Cristóbal, may be largely ascribed to moisture, weathering, and biological activity.

NOTES

1. Ricardo Torres-Reyes, "Construction History of San Cristóbal: 1634-1800" (NPS: San Juan NHS, June 1965), p. 8. In reference to the original 1678 plan, Torres-Reyes says, "the fort or redoubt had a semi-circular cavalier (G) known as Santisima Trinidad." In fact, the original legend may have read "la Santisima Trinidad" or "El Caballero de la Santisima Trinidad."

2. Ibid., pp. 10-11.

3. Ibid., pp. 11-12. Original reference is to the report dated November 10, 1731, in the Archives of the Indies, Santo Domingo.

4. Ibid., p. 23.

5. Ibid., From the translation accompanying exhibit IX, pp. 26-27.

6. Ibid., p. 45.

7. Ibid., pp. 69-70 and 76. Original references are to the construction reports by Engineer Thomas O'Daly.

8. Ibid., pp. 87-92.

9. The cistern heads were measured and drawn in 1970 for the Historic American Buildings Survey by Historical Architect Fred Gjessing.

10. Report on the state of the works including San Cristobal for the year 1809. Records of the Spanish Governors of Puerto Rico, in the National Archives, RG 186.

11. The original ca. 1821 sketch by french artist Auguste Pleé is in the collection of San Juan NHS, San Cristóbal. It is reproduced here from HABS negative #181.197.

12. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristobal. The original model has been dated to 1839 and is on display at Museo del Ejercito, Madrid, Spain.

13. Sources include an inspection report of the defenses of San Juan dated 1898 (Bearss, San Juan Fortifications, pp. 27 & 34), a drawing of the new magazine dated ca. 1897 obtained by Colonel Goethals in 1898 from the Spanish (drawing no. 107-2-10), and an undated photograph of El Caballero on page 85 of Crónica

de la Guerra Hispanoamericana en Puerto Rico (1922, reprinted 1972 and 1973). See Runcio in "Secondary Sources."

14. Edwin C. Bearss, Historic Structure Report HIstorical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of the Interior - National Park Service, Feb. 1984), pp. 34-35. The quote is from the 1898 inspection report by Major Crosby and Colonel Goethals.

15. These photographs are in the collection of San Juan NHS, San Cristobal.

16. The one photograph that shows this small structure is undated but thought to be about 1900. It was taken from outside the fort looking northeast. The other photograph, dated August 17, 1912, is found as no. 129 of Puerto Rico Ilustrado. Both are in the collection of San Juan NHS, San Cristobal.

17. Bearss, pp. 123-4. Original reference is to correspondence in the National Archives, R.G. 92. The base of the flagstaff and four guy wires are clearly seen in a photograph of el Caballero included on page 85 of Cronica de la Guerra Hispano Americana en Puerto Rico (1922, reprinted 1973).

18. Photographs taken after 1902 document the disappearance of the Spanish flagpole.

19. The various changes to el Caballero during the World War II years are documented by the following sources:

FEATURE		SOURCE
- 75 foot flagstaff removed	-	Missing in ca. 1938-40 aerial photo.
- Signal pole removed	-	Ditto.
- 1897 gun position removed	-	Ditto.
- 1897 magazine removed	-	Bearss, HSR, p. 262. Original reference is to Specification No. F-28-5 that included, "Restoration of embrasures and roof on top level of San Cristobal Fort, including demolition of debris, construction of embrasures, and repairs to floors and walls."
- Communications pole emplaced	-	Extant in photos dated ca. 1942. The 3 guy wires are seen in the HABS photos dated Jan. 1960.
- Concrete manhole built	-	Bearss, HSR, pp. 359 & 376.

20. The undated plan is entitled "Fort Brooke As Built," location no. FC1-DR4-ENV020 in the drawing collection San Juan NHS, San Cristobal.

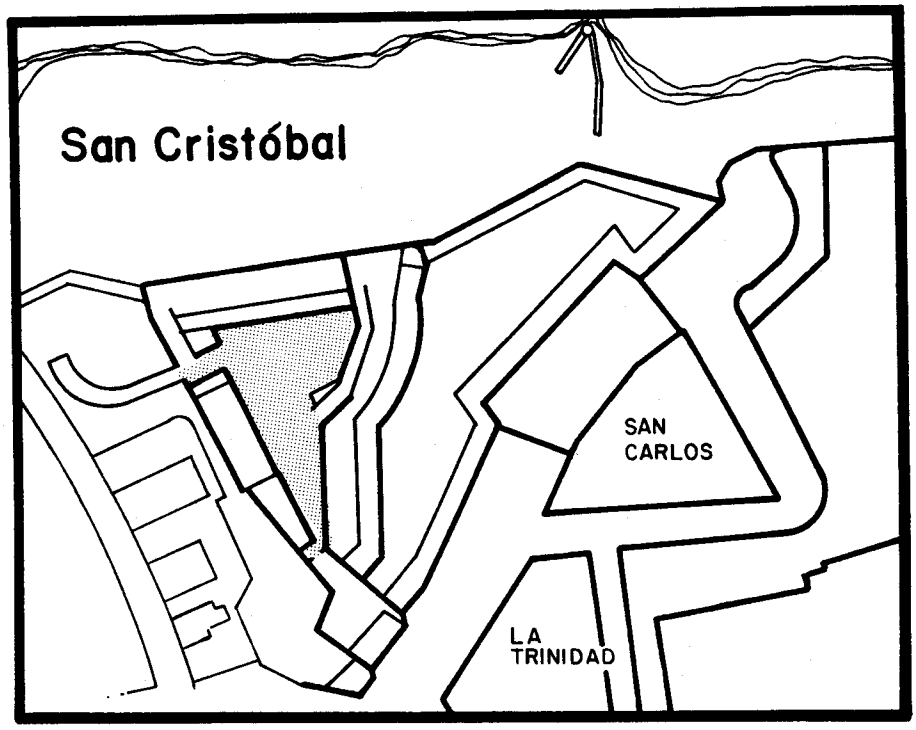
21. Photographs specifically referenced here are in the collection of San Juan NHS and include the following:
- Aerial view labeled "7503/034-4/ANT 58."
- Photo #551, "stairhouse architectural detail" by Gjessing, 8/1953.
- HABS photo of stair tower by J. Boucher, Jan. 1960, negative no. 181.49.
- HABS photo showing signal house by J. Boucher, Jan. 1960, negative no. 181.4.

22. The new flagpole is illustrated in a photograph labeled "The new flagpole, San Cristobal upper level, San Juan NHS - Dec. 1961." Raising of the Spanish flag is described in a news article, "Cristobal: A New Flag," The San Juan Star, Monday, Sept. 9, 1963.

23. Drawings by the HABS that include el Caballero are:
- "Troops' Quarters," Survey No. PR-100 (1962), sheets 4 and 5 of 11.
- "North Casemates," Survey No. PR-101 (1963), sheet 8 of 8.
- "Cistern Heads--El Caballero," survey no. (1970), 2 sheets.

24. Photographs are in the collection of San Juan NHS, San Cristobal.

25. Replacement of many door and window shutters in the Troops' Quarters is documented by drawings, correspondence and reports dated 1974-1977.



CHAPTER 5

PLAZA, CISTERNS, AND WELL HOUSES (PLAZA DE ARMAS, CISTERNA, NORTH AND SOUTH WELL HOUSES)

Description

Plaza de Armas

The Plaza de Armas (fig. 5.1, 5.2), historically known as the Plaza Baja (Lower Plaza), and the Patio Principal (Principal Patio), is the large open triangular area of San Cristóbal bounded on the north, west, and east by the North Casemates, Officers' Quarters, Main Gate, and the Troops' Quarters and ramp. The Plaza served as the primary place of assembly and parade for San Cristóbal and still functions as the center for the site's activities. External access to the Plaza was, and still is, through the Main and South Gates. Internal circulation was accessed through the various ramps and tunnels to the upper and lower levels and the outworks. The Plaza was also an essential element in the water drainage and retrieval system designed at San Cristóbal. Two additional elements in the water retrieval system closely related to the Plaza are; the cisterns beneath the Officers' Quarters, and the Well Houses located in front of the Officers' Quarters on the

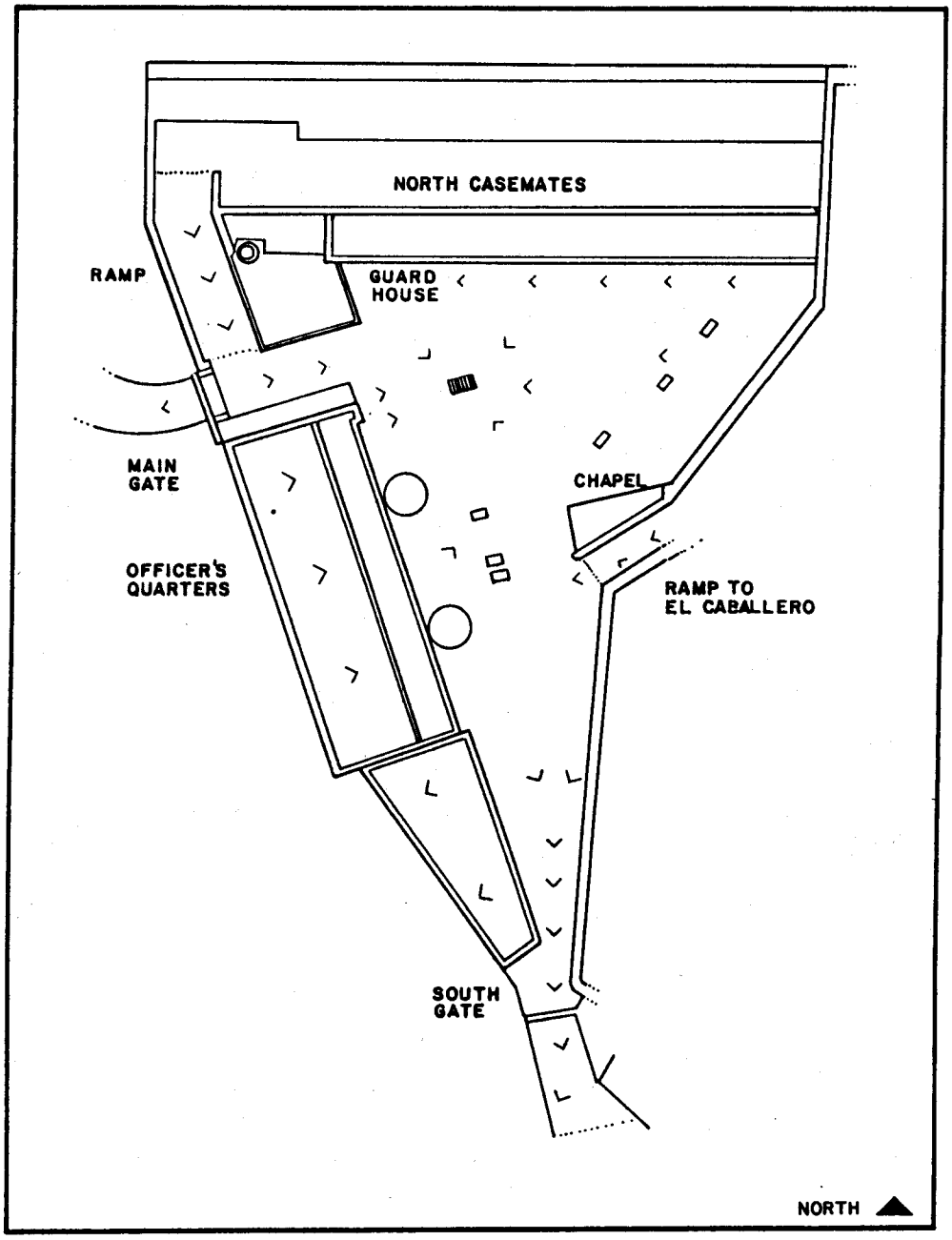


Figure 5.1. Drawing of Plaza de Armas and surrounds showing drainage patterns. Based on a 1939-39 Corps of Engineers drawing. Rendering by Jana Gross, 1989.

Plaza itself. Discussion of the Cisterns and the Well Houses are included in this chapter.

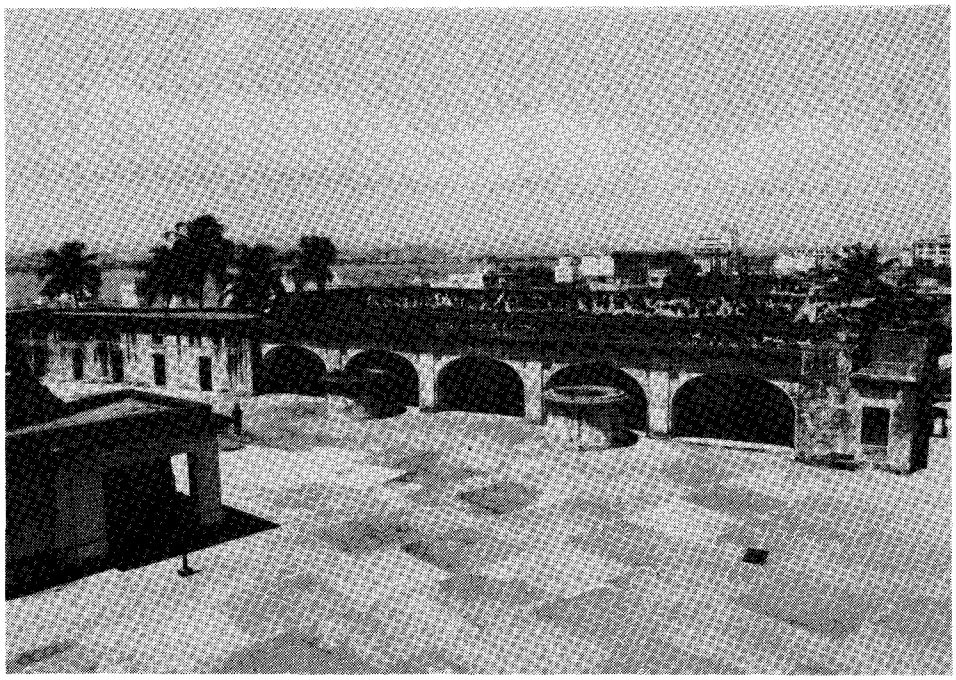


Figure 5.2. View from el Caballero showing the Plaza de Armas, Well Houses, and Officers' Quarters. Photo by CPR, 1986.

The Plaza is paved with modern concrete scored in large blocks in alternating colors of pink and gray. The surface is pierced by various modern concrete block covers providing access to the drainage system below. Although the present pavement is from ca. 1962, the Plaza retains its original contours for draining and collecting rainwater from the adjacent buildings. Water collected is fed (along with the runoff from the terreplein of el Caballero and the North Casemates) into the five principal cisterns directly below. The remainder was channeled to the northwest corner to flush the eighteenth-century latrines. Non-collected rain water is discharged out the north and west walls through scuppers.

Cisterns

Below the casemates of the Officers' Quarters and extending eastward beneath the Plaza de Armas lie the principal cisterns of San Cristóbal. Construction of all five cistern vaults is generally the same, each being rectangular in plan, barrel vaulted, and positioned partially above grade on the west elevation. (See figs. 5.3, 5.4.) A shallow blind arcade extends along the west facade of the Officers' Quarters allowing direct access by means of a doorway, to the north and south cisterns or vaults. As originally constructed, the five vaults were designed to function as two independent cisterns composed of two connected vaults on the north side (1 and 2),

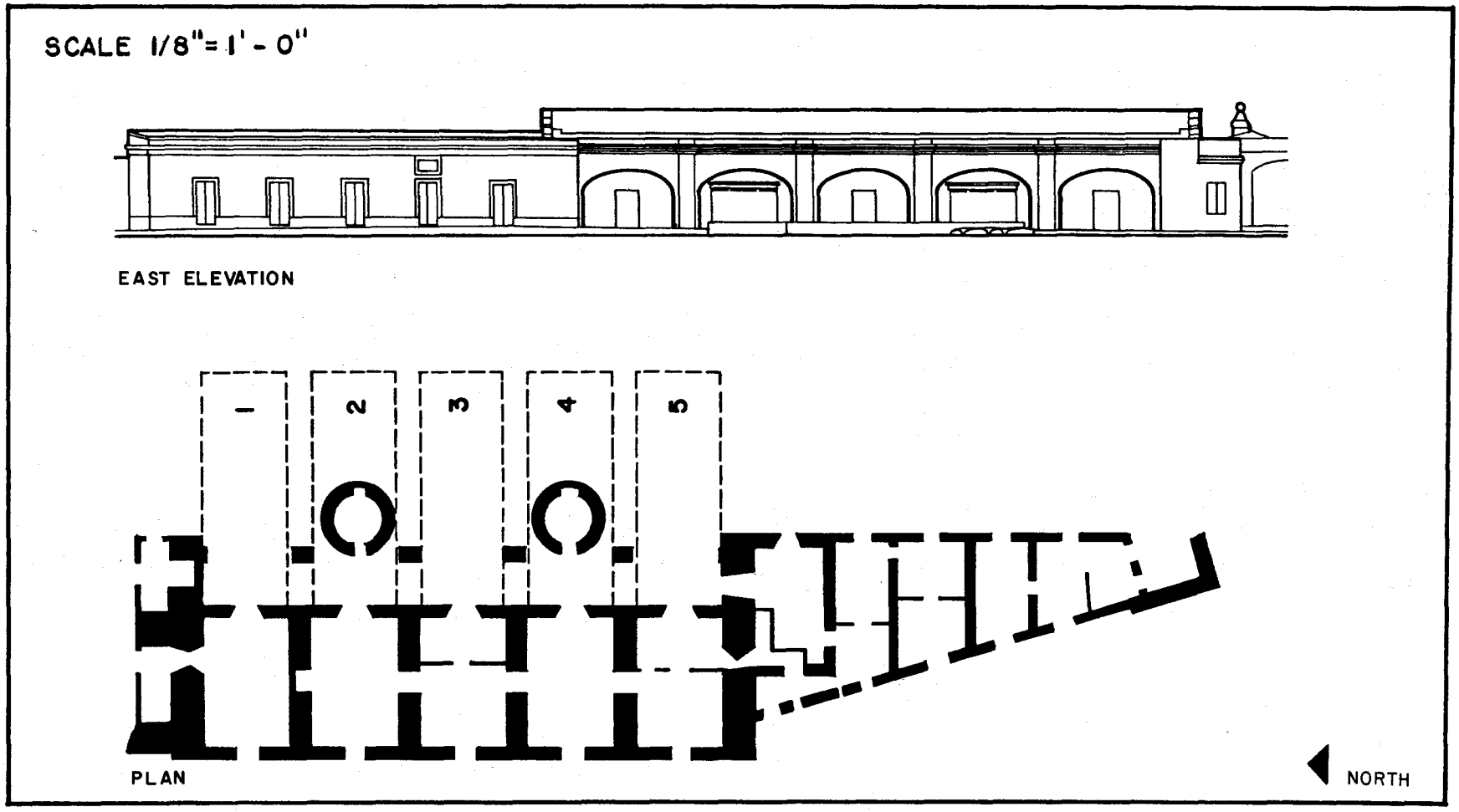


Figure 5.3. East elevation and plan of Officers' Quarters showing the Well Houses and their cisterns. Drawing by HABS (1961) annotated by Jana Gross (1989).

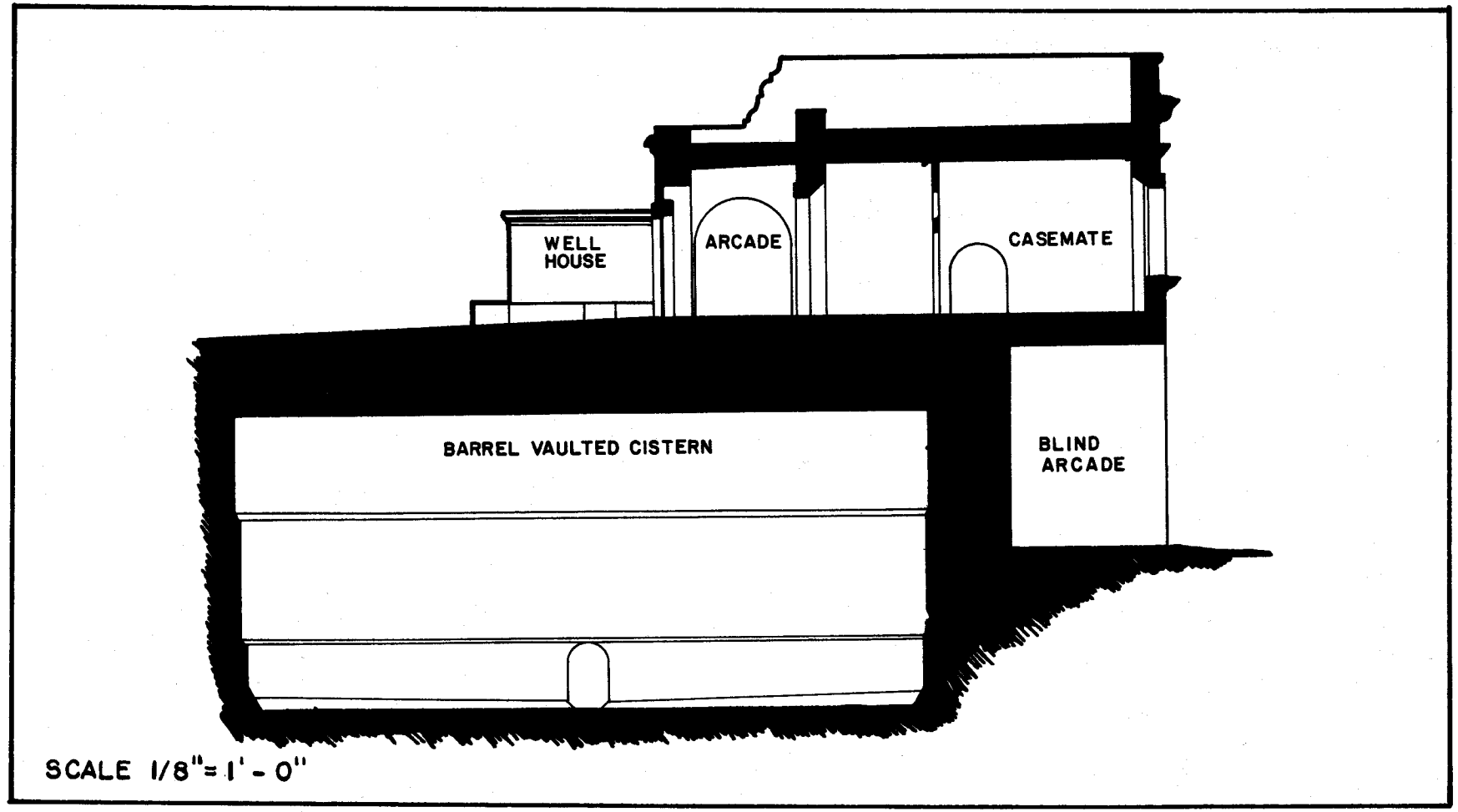


Figure 5.4. Section through cistern vault 3 looking south. Drawing based on 1961 HABS drawings. (Jana Gross, 1989.)

and three connected vaults on the south side (3, 4, and 5). Presently cisterns 1 and 2, and 4 and 5 are connected; the connection between cisterns 3 and 4 has been sealed. Cisterns 2 and 4 communicate with the Well Houses located directly above.

The five cisterns are approximately 57 feet in length, 17 feet in width, and rise approximately 24 feet to their apex. They are constructed of stone and brick; the hand-molded brick vaults are supported by walls of ashlar stone. All surfaces are parged with modern cement stucco on the walls and brick dust stucco on the vault. The floor is paved with cement. Cisterns 1 and 5 have direct exterior access from the west blind arcade via a straight-run flight of brick steps of double-arched construction. The lower arch of the north stairs has been infilled.

All five cistern vaults were originally covered with a bituminous coating. Cisterns 1, 2, 4 and 5 are presently drained. Three wall paintings in cisterns 2, 4, and 5 appear to date to the original construction and were decoratively painted. These murals were called murales votivos (devotional paintings). Preliminary inspection suggests that they were executed a secco or on dry stucco. The presence of devotional paintings within the cisterns indicates the great importance of water to the inhabitants of the fort (fig. 5.5).

Cistern 1 is connected to its contiguous cistern (#2) by a small round arched opening located at the middle of the common wall at ground level. An intake pipe enters at the center of the vault, possibly feeding from the Plaza de Armas (fig. 5.6).

Cistern 2 is pierced by a circular, square-ended brick shaft that links the north well head (Well House) to the cistern. Directly below this opening is a square basin in the cistern floor that may have accommodated a water bucket. A shallow trough runs west from this basin down to a similar pool located at the base of the west wall. As in Cistern 1, an intake pipe enters along the center axis near the east end, possibly draining from the Plaza de Armas. Another pipe, possibly an overflow pipe, is located below the west wall window. High on the east end wall near the top of the vault is a monochromatic or grisaille painting of the Crucifixion. Two sets of stencilled water gauges (40 to 280 meters) also exist on the east end wall.

Cistern 3 presently functions independently as a cistern; its connection to its contiguous cistern (# 4) has been sealed. At this time, cistern 3 is the only cistern containing water (probably draining from the Plaza above).

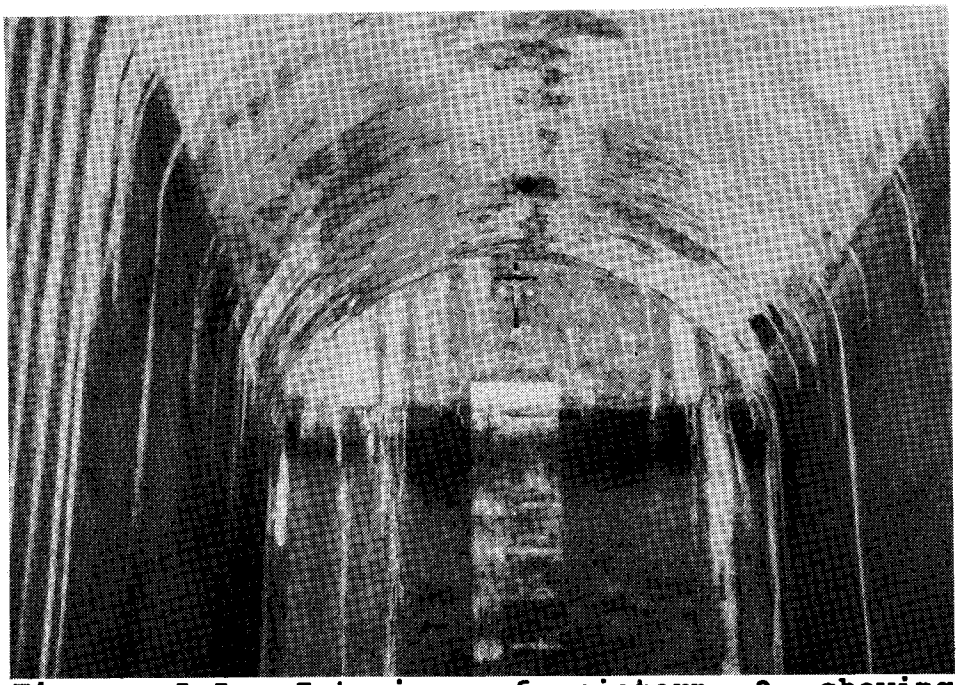


Figure 5.5. Interior of cistern 2 showing grisaille painting of the Crucifixion. Photo by CPR, 1986.

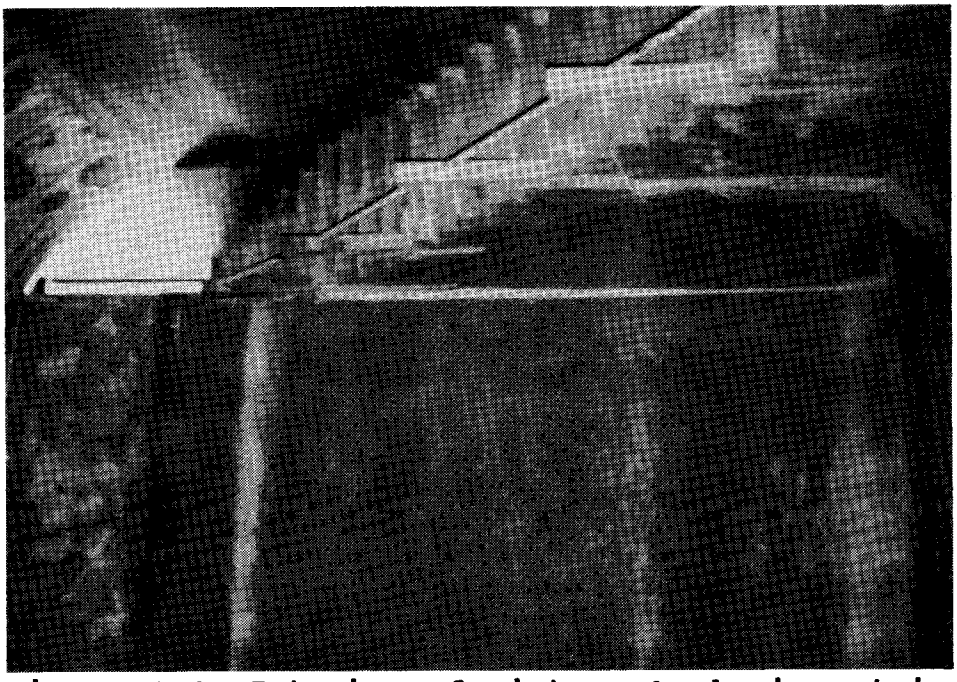


Figure 5.6. Interior of cistern 1 showing stair leading to exterior on west elevation. Photo by CPR, 1986.

Cistern 4 is linked to its contiguous south vault (# 5) by a small rectangular passageway located at the middle of the common wall at ground level. A vertical shaft connects the vault to the south well head above. Centered directly under the shaft is a rectangular pool. A circular well about 1 foot deep is cut through the floor in the northwest corner. Three intake pipes of differing diameters enter the vault on its western end wall below the springing line of the arch. Near the top of the vault on the east end wall is a small decoratively-bordered grisaille painting of a single female figure, possibly the Virgin Mary. On the wall below, a water gauge is stencilled on the modern cement parging.

Cistern 5, the southernmost of the cistern vaults, has an intake pipe at the apex of the vault at its midpoint. On the upper portion of the east end wall is an arched, painted mural with a decorative border, depicting St. John the Baptist -- the patron saint of the city of San Juan.

Well Houses

The Well Houses are located on the Plaza de Armas directly in front of the main block of the Officers' Quarters. Equidistant from the center casemate, they are situated above cisterns 2 and 4 and are connected directly with them. Both were simply well houses until modifications in the mid-nineteenth century changed the south structure into a bath house several years.

Both structures are open-roofed and circular in plan. They measure approximately 12 feet in overall diameter and are about 6 feet in height. The walls rest on a low projecting base. Access to each is through a rectangular, wooden, framed opening on the west side with a raised brick threshold. The walls are cement, stuccoed and finished near the top by a banded stucco cornice that in turn is capped by the continuation of the wall forming a low parapet. The walls are constructed of hand molded brick and stone rubble.

Each structure contains a 3 foot high, octagonal, stone well head that rests over the opening to the cistern below. Well heads are modern reproductions. The floors are of modern hormigón (crushed brick and cement). Two small rectangular drains pierce each structure on the north and south sides respectively. A chamfered native wood beam running north to south, spans the masonry walls directly over each well head and supports reproduction hoisting equipment for retrieving water from the cisterns.

Whereas the northern Well House is a modern reconstruction (1973-76) of concrete block on the original foundation, the southern Well House has remained structurally intact with

evidence of previous rehabilitation (including its recent restoration). Remnants of ca. 1861 dumbbell-shaped vents and cornice brackets, presumably part of the nineteenth-century polygonal glass and metal roof depicted by Castro in his plans of 1861, are easily discernable on its outer walls. Similarly, a ghost of the nineteenth-century interior pool niche can be seen on its east wall.

Structural Evolution

Period 1: 1625-1765

The Plaza de Armas was not in existence at this time, although O'Daly's construction records indicated that by 1765, its construction was planned. In his explanations of the modernization project of 1765 O'Daly stated that the "old demi-bastion and powder house behind the cavalier" had to be obliterated and the space used to form a plaza with a cistern underneath.[1] No specific documentation on the currently located Cisterns has been found for this period though references to the disrepair of the existing cistern within el Caballero indicated that a cistern did exist. It also suggested the necessity of incorporating a new cistern system within the O'Daly revisions commencing in 1765. No structures were planned to be above the cisterns at this time.

Period 2: 1765-1809

O'Daly's proposed plan for the modernization of San Cristóbal in 1765 was the first that showed the demi-bastion to the west of the cavalier and the old powder house removed, the south gorge infilled, and a plaza created. Several features of this proposal, such as the Rampa de Subida (main access ramp), were modified before construction. The plan of 1773 was a more accurate representation of the Plaza as it may have appeared prior to the enclosing of the north and west walls and the construction of the Officers' Quarters and North Casemates. During this time, prior to the erection of these structures, the Plaza probably remained unpaved (fig. 5.7).

Mestre's drawings of 1783 (fig. 5.8) were the earliest showing the Plaza enclosed on the north by the North Casemates, on the west by the Officers' Quarters and on the southwest by the west wall. Also shown for the first time were the wellheads that pierce the Plaza above the cisterns, and the curved main entry ramp just north of the Officers' Quarters. A square feature, perhaps a pool to collect water, appeared on the drawings. Records of this period stressed the importance of the Plaza in water collection: "The waters of the plaza which were not directed to the cisterns, were carried to the latrine pits and then to the ocean through a master drain conduit".[2] These conduits ran under the Plaza as shown on the sketches of this period.

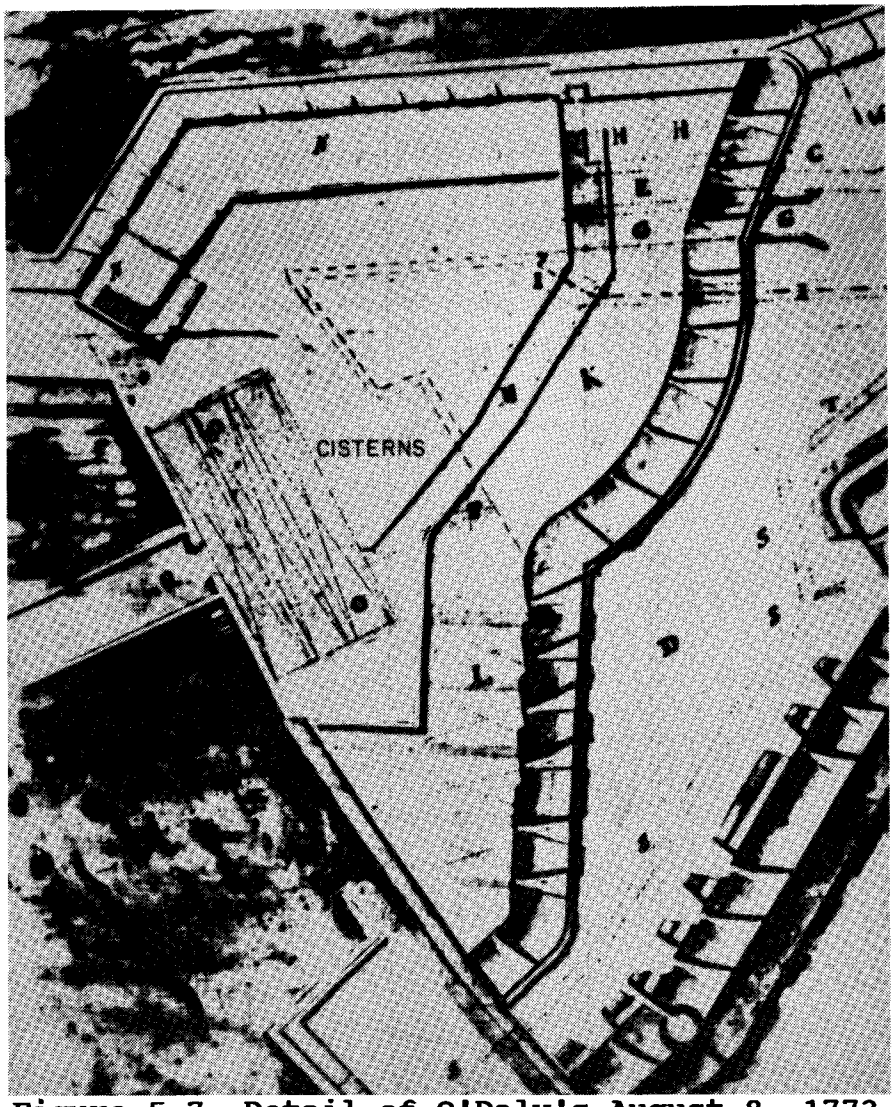


Figure 5.7. Detail of O'Daly's August 8, 1773 plan showing cisterns oriented east to west.

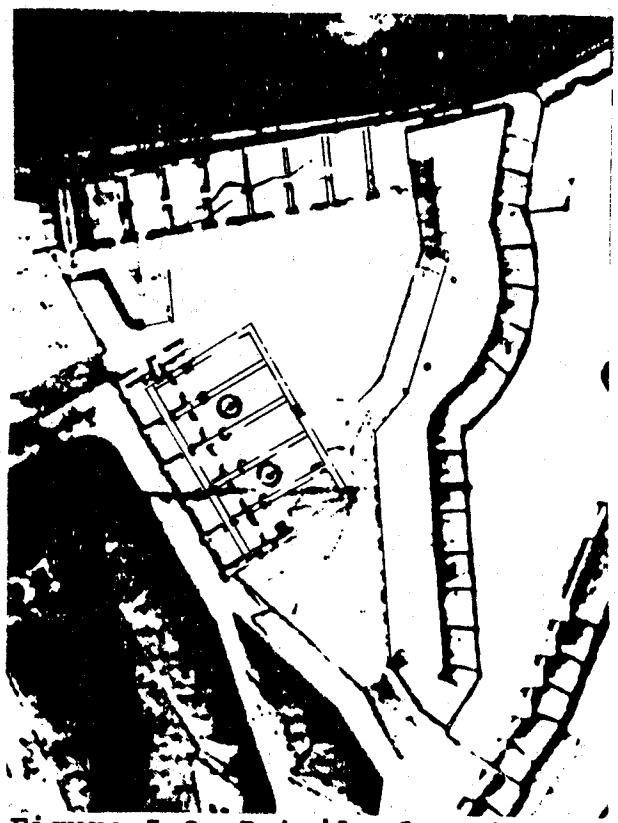


Figure 5.8. Detail of September 13, 1783 plan by Juan Mestre showing Plaza de Armas.

The Cisterns were first seen on O'Daly's original designs of 1769 (fig. 5.9) proposed the construction of three large vaulted cisterns under the Plaza de Armas centered in front of the west Rampa de Subida and running north-south, parallel to the west wall. These were described on the plan as:

> (O) Projected bomb-proof cisterns, capable of supplying 5000 persons with water for 3 months. This is considered of first importance because of having no other sure means of providing this article in time of siege since they have few and none bomb-proof in the city, and to save the continuous expense which is experienced in bringing water in small boats from the surrounding rivers.[3]

This configuration was amended by 1773 (fig. 5.7) to include five large vaults arranged to form two independent cisterns of two and three vaults each now oriented east-west in approximately the same location. According to construction records, the cisterns were near completion by the end of June 1774 and were rendered on the interior with a parging of bitumen and red hydraulic mortar that still survives.* It is likely that the interior devotional paintings (murales votivos) were also executed at this time. Also in these records was the first reference to the construction of the porticos above for guard rooms and lodging (Officers' Quarters). By March or April of 1775 the cisterns were in operation and the portico above ready for use.[4]

Mestre's plan of 1783 and related contemporaneous drawings confirmed the completion of O'Daly's work and depicted both the feed system for the cisterns and the Well Houses with heads for water retrieval. As substantiated by the physical evidence of the drainage system on the terreplein of el Caballero, these drawings indicated that the water was collected from the vicinity of the northeast and east tunnel ramps and was channelled under the Plaza de Armas to an open square conduit from which outtakes fed the two cisterns (see figs. 5.10). In addition to the cisterns, the conduit also supplied water to the latrines located in the extreme west casemate of the North Casemates. In plan, both well heads appear to be identical. The heads themselves were octagonal in shape and were surrounded by roofless circular walls open on the west to provide direct access from the Officers' Quarters.

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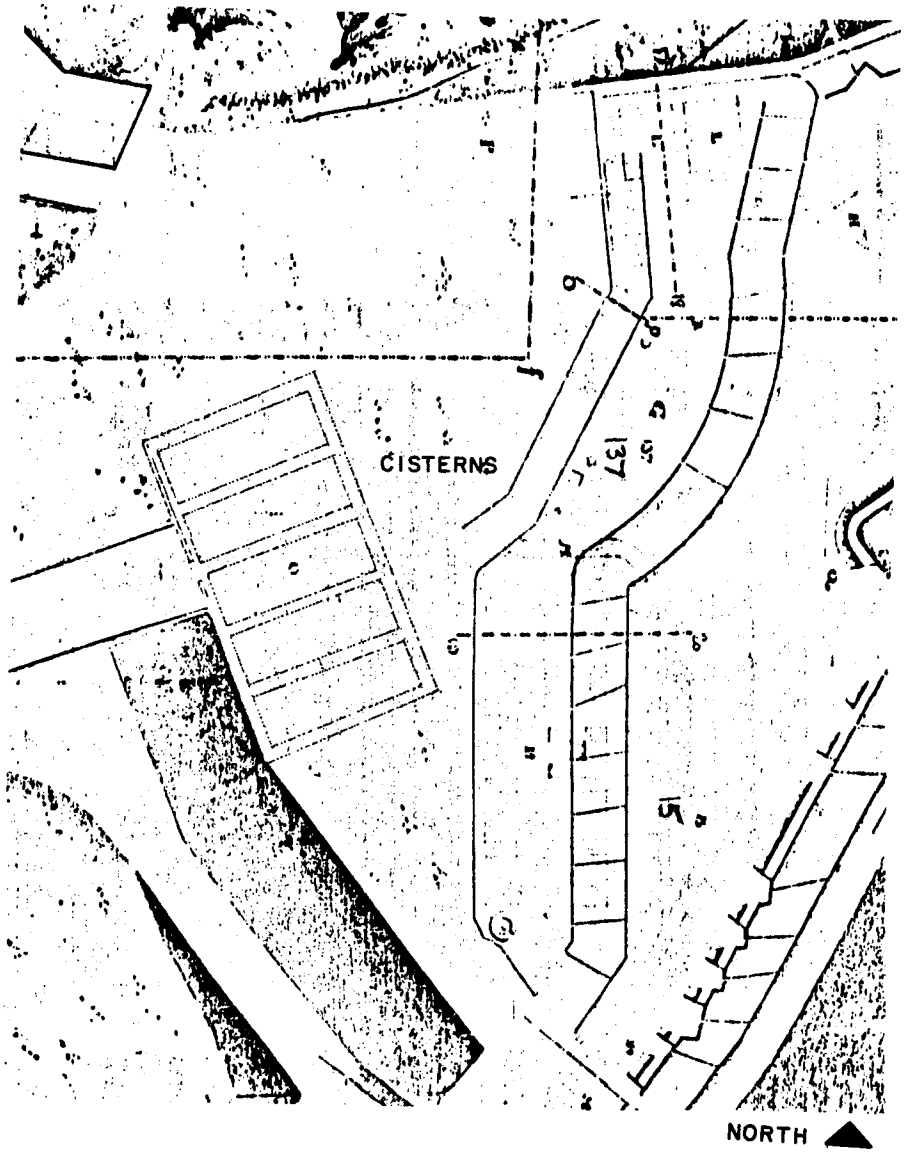


Figure 5.9. Detail of O'Daly's January 15, 1769 proposed plan showing cisterns oriented north to south.

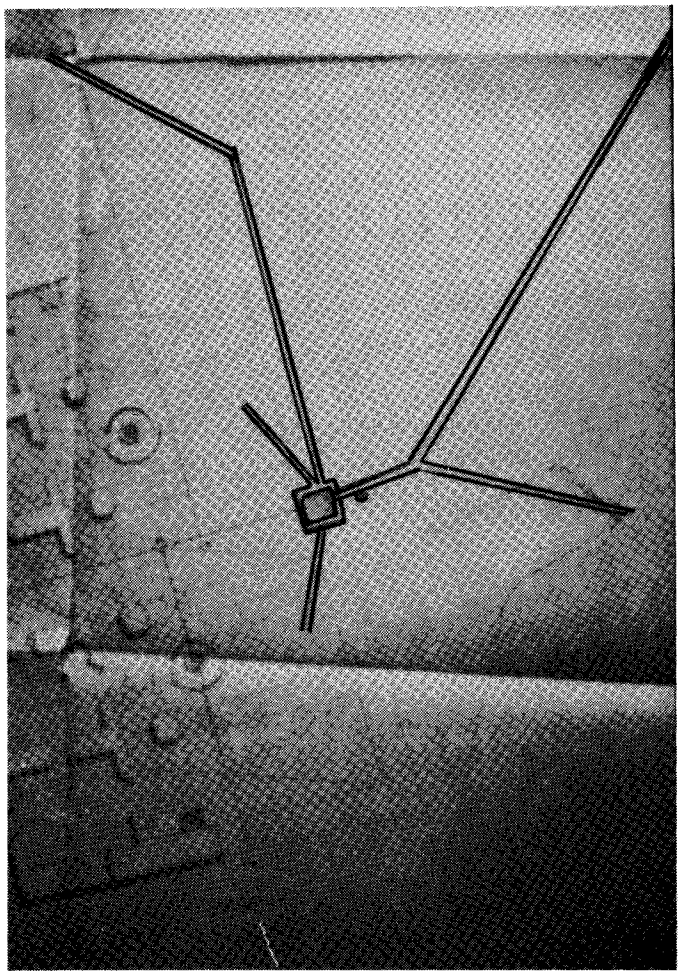


Figure 5.10. Plan by Mestre, 1783, showing water retrieval system beneath the Plaza de Armas. Drainage network highlighted. (San Juan NHS Archives.)

Period 3: 1809-1837

No specific references were made to the Plaza de Armas in available documents during this period, although it was extant at this time.

The earliest reference to work on the Well Houses during this period was to repairs made to hatches in the cistern caps.[5] By 1839, the loggia of the Officers' Quarters was enclosed and the Well Houses connected to the arcade walls with short passageways allowing private access to them from the quarters.[6]

Period 4: 1837-1868

With the exception of the addition of the Casa de la Guardia (Guard House), the Plaza de Armas appeared unmodified in the model of 1839.[7] However, according to the model shallow segmental pools or troughs were constructed to the east of the Bath and Well Houses. Records from 1858 documented the construction of an addition to the south of the Officers' Quarters on the Plaza de Armas.[8] This addition to the Plaza was likewise illustrated on the Castro plans of 1861. (See fig. 5.11.) Other modifications to the Plaza that were illustrated in 1861 included, walls to the east of the Officers' Quarters, the small conduit house in the center, the Chapel, and a small structure adjacent to the wall of the ramp to el Caballero.

According to the Castro plans the cisterns remained unchanged. However, the well houses underwent major alterations including the conversion of the south Well House to an officers' bath house and the insertion of a low walled garden (parterre) between the two structures. The bath house was created by removing the well head and inserting a small engaged oval pool (3 to 4 feet deep) and niche on the interior of the east wall. Low platforms flanked the pool on either side. The original circular wall was modified into an octagonal wall presumably to accommodate the glazed pyramidal roof illustrated in Castro's renderings. The walls must have been restuccoed at this time and pierced by dumbbell-shaped vents.* Castro's drawings suggested an interior elaborately decorated with Islamic elements characteristic of Hispano-Moresque architecture perhaps including a marble pavement

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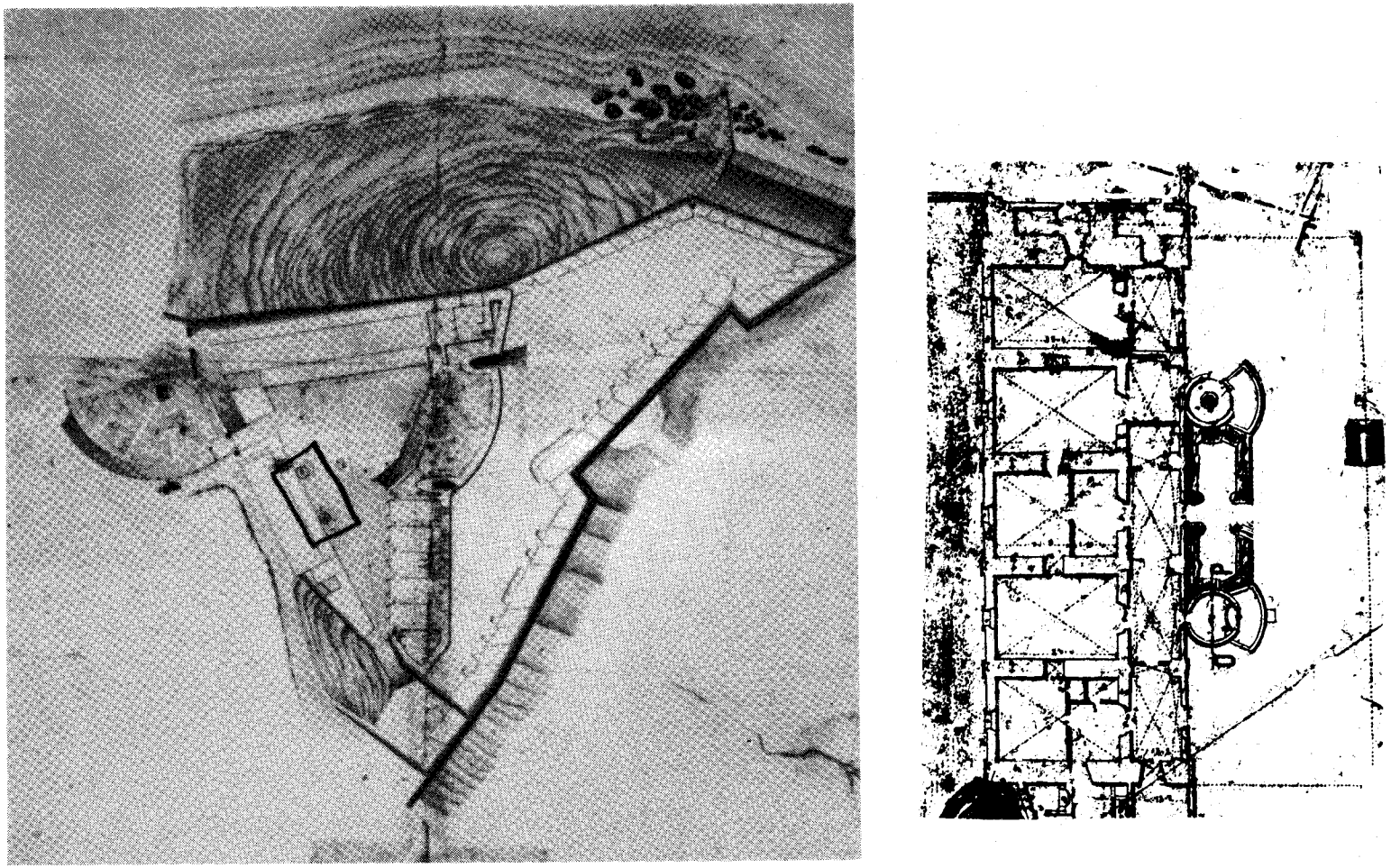


Figure 5.11. Manuel Castro's 1861 plan showing the Plaza de Armas with detail on right. (From NAHPC negative.)

and pool. Judging from the pre-demolition photographs dated 1962 and remnants of the marble pavement in the pavement at the north end of the arcade, some of the decoration survives.[9] A surviving patch of the original configuration (the horseshoe arched entrance) confirms part of Castro's intended design.

The walled garden inserted at this time was a rectangular raised garden (parterre) between the Well Houses. This garden was entered on axis to the central bay of the Officers' Quarters and with the exterior pools, created a facility for recreation and personal hygiene.

The northern Well House also underwent minor modifications during this period including the insertion of an opening through the wall on the north, the closure of the earlier opening, insertion of a new window (east wall), and construction of a small pool and niche to the east. Castro's plan indicated a beam running north to south cantilevered on the wall, presumably to support a hoisting mechanism for water retrieval.[10]

Period 5: 1868-1898

Available documentation for this period indicates that no significant modifications were made to the Plaza at this time. Likewise, no specific mention is made of modifications to either the Cisterns or the Well Houses.

Period 6: 1898-1986

One of the first new elements to appear during this period was a small projecting structure of undefined function in the middle of the Plaza de Armas as well as a large windmill.[11] The latter consisted of a wind driven water pump and a wooden tank on a metal base installed in 1899 on the site of the former Well House (presumably demolished at that time). (See fig. 5.12.) The non-potable water in the tank was utilized for police purposes and for sanitary plumbing during periods when the city water supply might fail to supply sufficient water.[12]

In a 1901 plan (fig. 5.13) of the fort by the Constructing Quartermaster, a shed structure referred to as "Ordinance Stores," was indicated along the entire east wall of the plaza below the ramp to el Caballero.[13]

The 1901 plan and a ca. 1905 photograph also indicated that the southern Well House was modified by the addition of a steeply-pitched sheet metal roof with a cupola vent.[14] The oval pool was retained with the addition of a small sink on the

interior south wall. The garden area retained its general configuration and plantings. References in 1903 and again in 1938-40 mentioned general maintenance and repair to the cisterns. Sometime before 1922, the windmill was removed. However, water continued to be discharged from city mains into the cisterns from which it was pumped into large wooden tanks on the roofs of the adjacent buildings.

No significant alterations to the area were recorded until the 1950s when the pavement was broken for the construction of ditches and a small shed structure (fig. 5.14). This structure had an engaged, segmented, conical roof and was used as both a paint and sign shop. It was built on the Plaza against the ramp wall north of the Chapel. A ghost of the shed structure remains visible. At the same time, the pavement was broken and repaved for the construction of ditches to allow the installation of a new water main.[15] Photographs taken by HABS (ca. 1960) show conditions prior to restoration of the Well Houses (fig. 5.15).

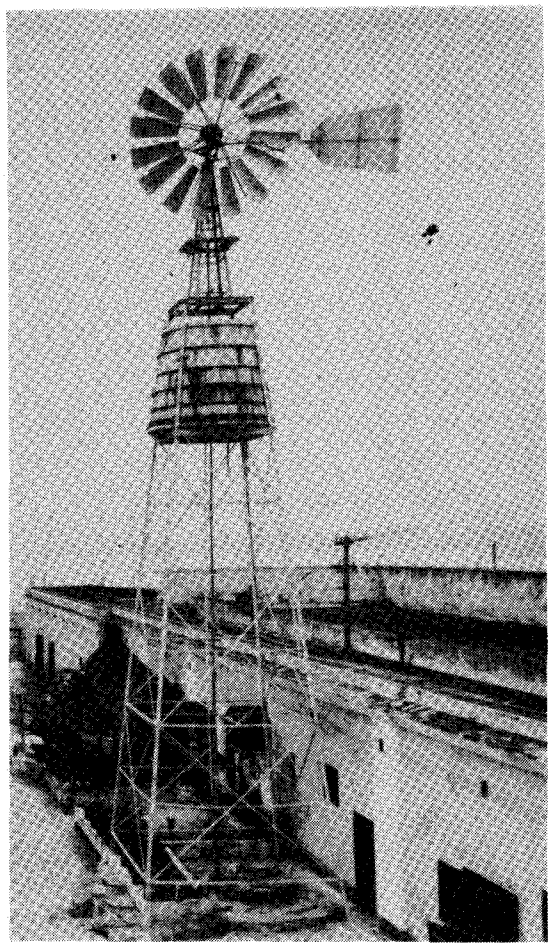


Figure 5.12. Detail or view of Plaza, ca. 1905, showing windmill in place on site of former Well House. (HABS negative 181.25.)

By 1962, the conduit house was removed and the modern pink and gray pavement installed. In 1964, restoration of the loggia and Well Houses to their late-eighteenth century appearance was proposed by the NPS involving the demolition of the nineteenth-century garden and bath house additions as well as the reconstruction of the (north) Well House. However, restoration was not undertaken until 1971-76 when the southern Well House (nineteenth century bath house) was restored to its present configuration and the northern Well House was reconstructed. At that time, the dumbbell-shaped vents were infilled with masonry and parged with cement. Today these patches are easily discernible. A large area patched in light colored cement at the lower portion of the structure can be associated with the removal of the garden curb wall. The new

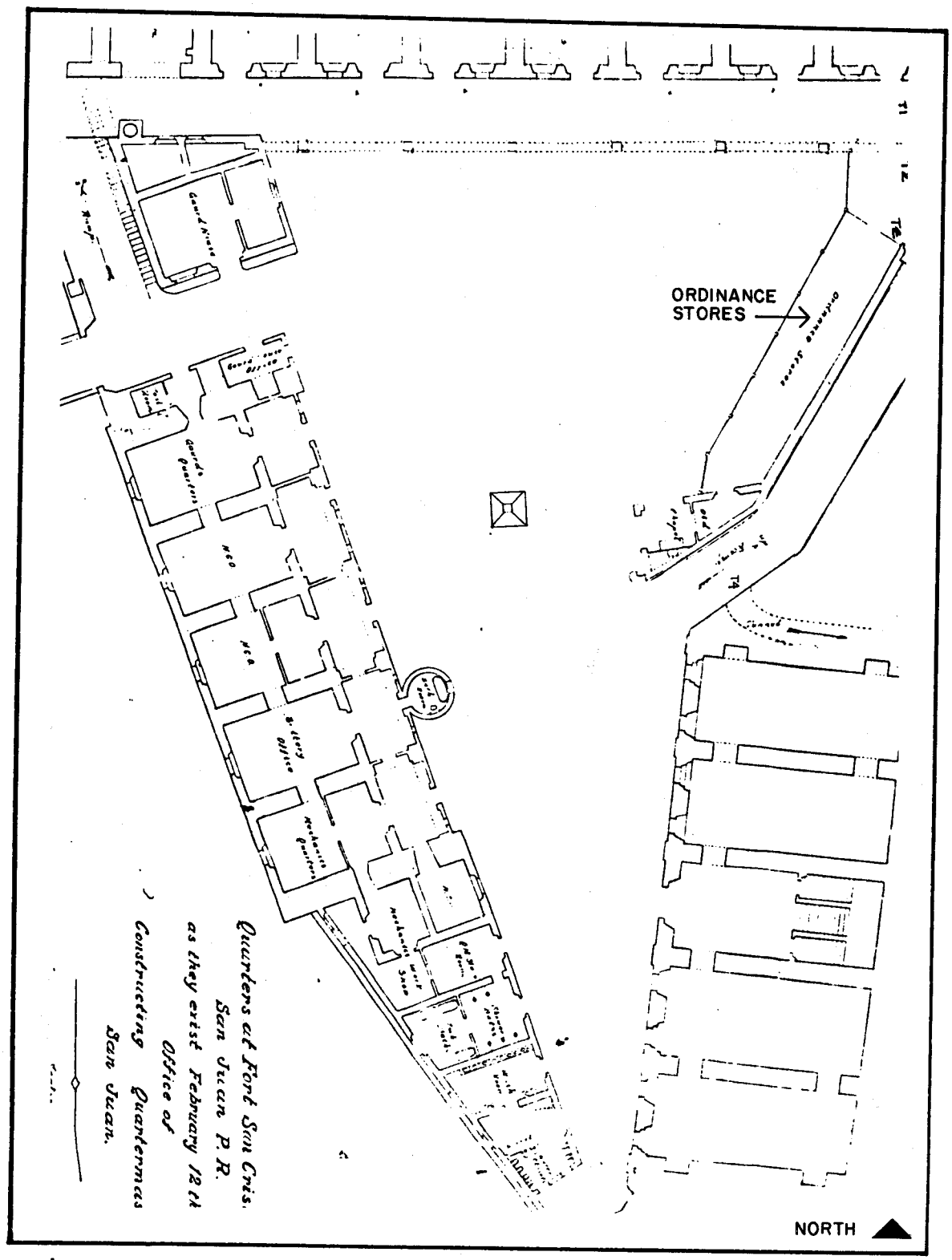


Figure 5.13. The Plaza de Armas as it appears in Guy S. Boyce's 1901 plan. (San Juan NHS Archives.)



Figure 5.14. View of modern paint shop at base of ramp to el Caballero. HABS photo by Jack Boucher, 1960.

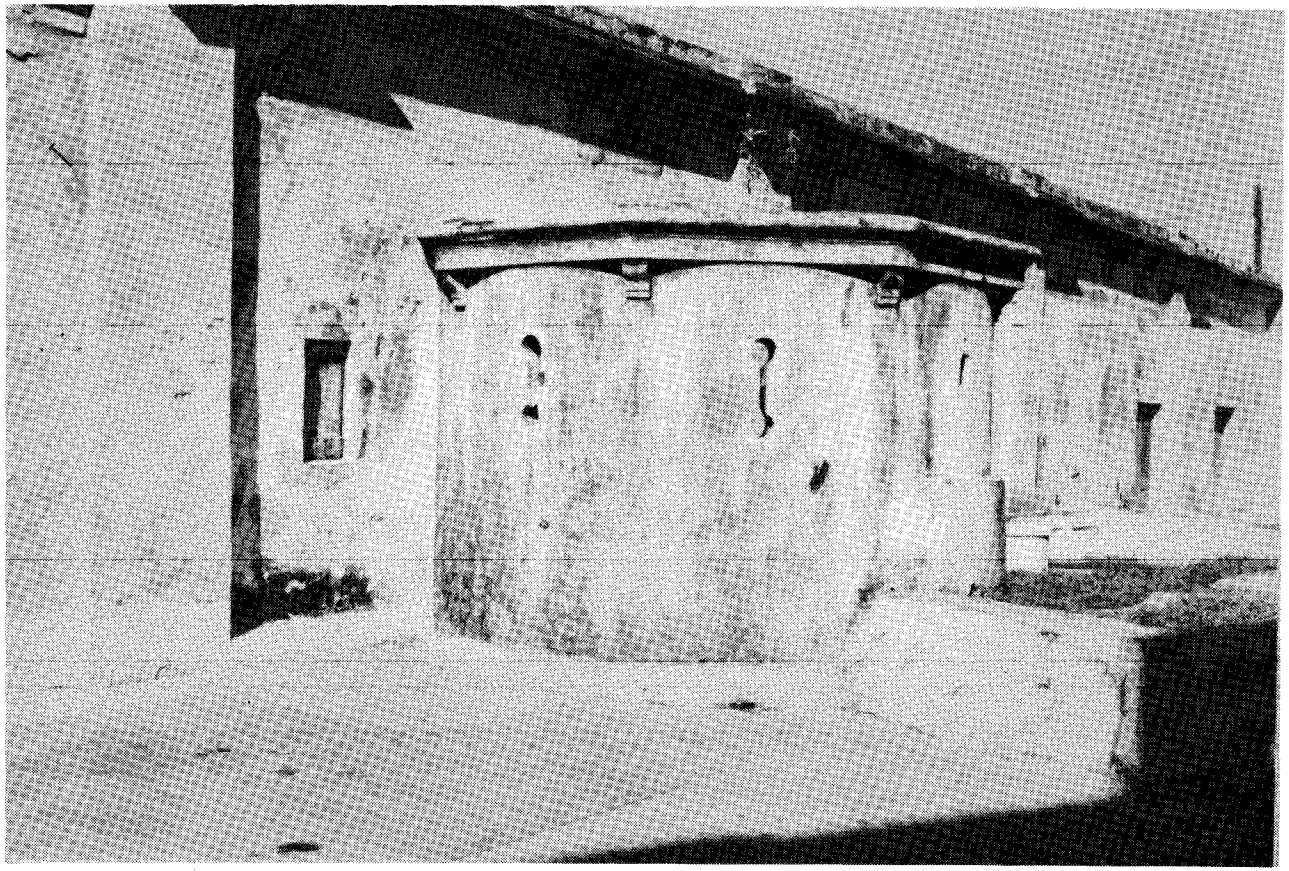


Figure 5.15. Exterior view of the south Well House before restoration. HABS photo by Jack Boucher, January 1960.

round cornice that replaced the octagonal one formerly topping the structure, was inserted at a lower level creating a low parapet wall.

In post-1971 photographs the shed structure was no longer seen and historic cannons were in place on the Plaza in the area below the ramp to el Caballero.

Conditions

The Plaza de Armas is in stable condition with identified problems related to repairs or alterations to the drainage system or the addition and removal of various structures including the windmill, the garden curb wall (between Well Houses) and a small structure near the Chapel. There is minor cracking and exterior patching, but no visible biological activity. Although the form of the eighteenth-century Plaza has remained primarily intact with minor additions and losses, the surface itself has been repaved numerous times. Use of the Plaza as a parking lot during the 1960s added mechanical stresses that no doubt exacerbated the deterioration of the surfaces. The surface is pierced by manhole covers made of concrete providing access to drainage systems below.

The conditions of the Cisterns beneath the Officers' Quarters and Plaza are in fair condition with the most deterioration affecting the wall surfaces. Biological growth and extensive leaching deposits cover the majority of the surfaces of the cisterns. Even though the thick masonry walls were designed to be watertight (and have largely remained so), all of the cisterns possess extensive leaching deposits concentrated on the vaulted ceilings, probably caused by water percolating from above. This could eventually lead to structural failure and is a condition that should be monitored. The devotional mural paintings in the cisterns show advanced signs of deterioration.

The present condition of the Well Houses is basically sound with little significant structural deterioration. However, minor stucco cracking and associated biological growth and leaching deposits are readily observed. All conditions noted on these structures appear to be related to their open, freestanding construction that has left them continuously exposed on all faces to the eroding action of wind, sun and rain. The northern Well House currently suffers from minor surface cracking and a variety of discolorations and dark biological staining indicating a long-term problem associated with excessive moisture absorption. The uneven discoloration of the facade may indicate varying degrees of water retention. The conditions identified above are seen on all elevations. However, the moisture-related problems seem to be more serious at the northern side where shade prevails. Conversely, the somewhat better condition of the southern portion might be explained by the fact that this area has been periodically dried by the sun. The south Well House shows the same conservation problems identified with the north Well House. Most evident is an overall stucco surface cracking condition; some cracking is severe enough to have accumulated leaching deposits and minor surface accretions.

NOTES

1. As translated by Ricardo-Torres Reyes in Construction History of San Cristóbal: 1634-1800 (U.S. Dept. of Interior, NPS, San Juan NHS, June 1965), pp. 43-53.

2. Ibid., p. 111. Original reference to Juan Mestre's reports of January 19, 1784, AI-SD 2510-31; July 1, 1784, AI-SE 2510-50; January 8, 1785, AI-SD 2510-51.

3. Ibid., p. 46. O'Daly's January 15, 1769 plan. Legend translated by Torres-Reyes.

4. Ibid., pp. 89-92. Original references to construction reports as follows:

Report of O'Daly, January 20, 1774, covering the four months of October 1773-January 1774. AI-SD 2510-44.

Report of O'Daly, June 30, 1774, covering the period of January 20-June 30. AI-SD 2510-45.

Report of O'Daly, January 5, 1775, covering the months of July-December, 1774. AI-SD 2510-45.

Report of O'Daly September 15, 1775. AI-SD 2510-45.

5. See 1808-1817 documents by Ignacio Mascaro in the National Archives Microfilms Division, reel no. 33, in the collection of San Juan NHS, San Cristóbal.

6. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display at the Visitor Information Center at San Cristóbal. This model has been dated 1839 and is on display at Museo del Ejercito, Madrid, Spain.

7. Ibid.

8. "Parte de la Revista Pasada Communique of Official Revue of 1858." Executed by the Commadoreia Exerta de Ingenieros la Isla de Puerto Rico. Servicio Histórico Militar 4-1-8-5. Madrid, Spain.

9. Pre-demolition photographs dated ca. 1962 in the collection of San Juan NHS, San Cristóbal.

10. Ibid.

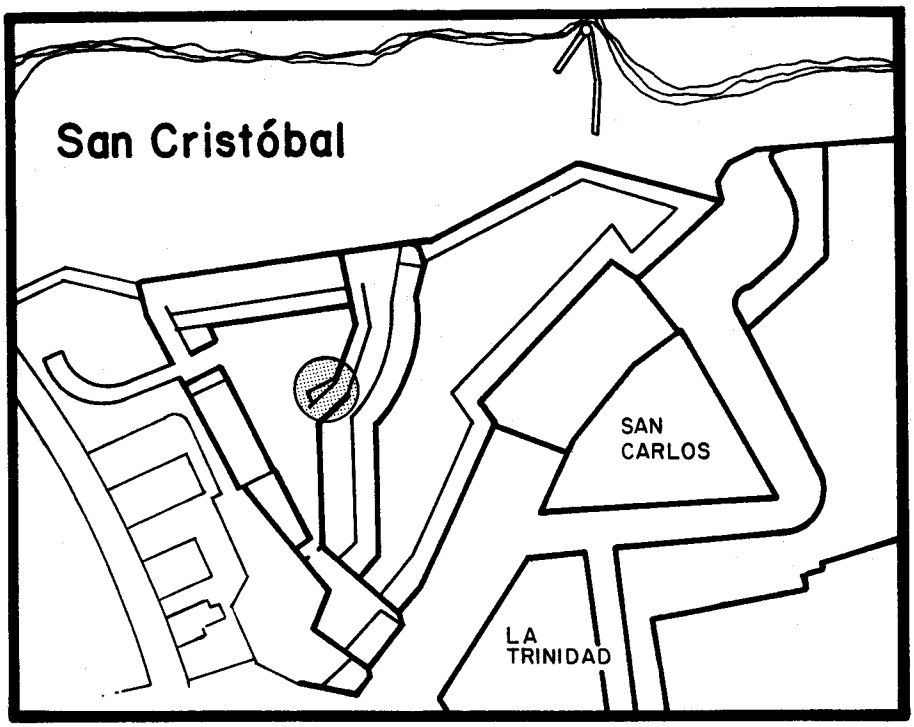
11. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of Interior, NPS, February, 1984), p. 377.

12. Bearss., p. 125.

13. A copy of this 1901 plan by Guy S. Boyce, titled "Quarters at Fort San Cristóbal, San Juan, P.R. as they existed February 12th 1901, Office of Constructing Quartermaster, S.J." is in the drawing collection of San Juan NHS under location number FC7-DR3-ENV134.

14. Ibid.

15. Bearss, p. 377.



CHAPTER 6

THE CHAPEL
(LA CAPILLA)

Description

The Chapel (La Capilla) of San Cristóbal is a triangular-shaped structure on the Plaza de Armas (figs. 6.1, 6.2). Its undocumented name is la Capilla de Santa Barbara. Built in the mid-nineteenth century, this building is the only chapel noted at San Cristóbal in available documentary evidence. It is one story high, measuring almost 13 feet from its base to the top of the roof parapet. Architecturally, it represents a simplified expression of the nineteenth century's neoclassical style. Its most distinctive decorative feature is the gracefully-shaped interior altar.

The structure was recorded by HABS during the summer of 1989. (See figs. 6.3 and 6.4.) There are two square doorways on the north facade ("A" and "B"). The easterly doorway ("A"), has a square architrave. There is no door nor evidence of previous hardware. There is a third doorway, "C", on the west facade. Neither doorway "B" or "C" have surrounds or hardware. These doorways, however, have a section of balustrade fixed within them. The balustrades were installed by the NPS sometime between 1963 and 1971 and consist of a handrail, lower rail, and turned balusters of various designs. The entire

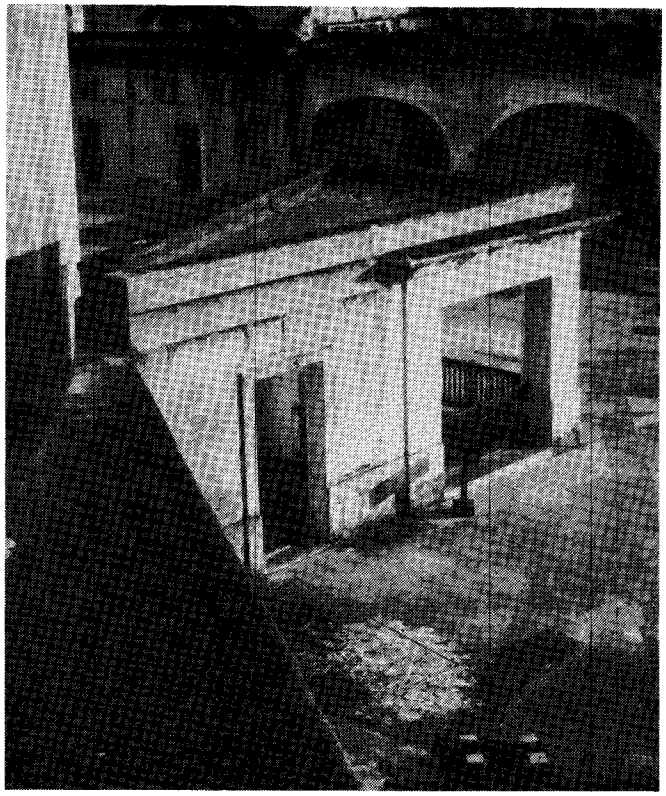


Figure 6.1. North elevation of the Chapel. Photo by Richard Crisson, 1986.

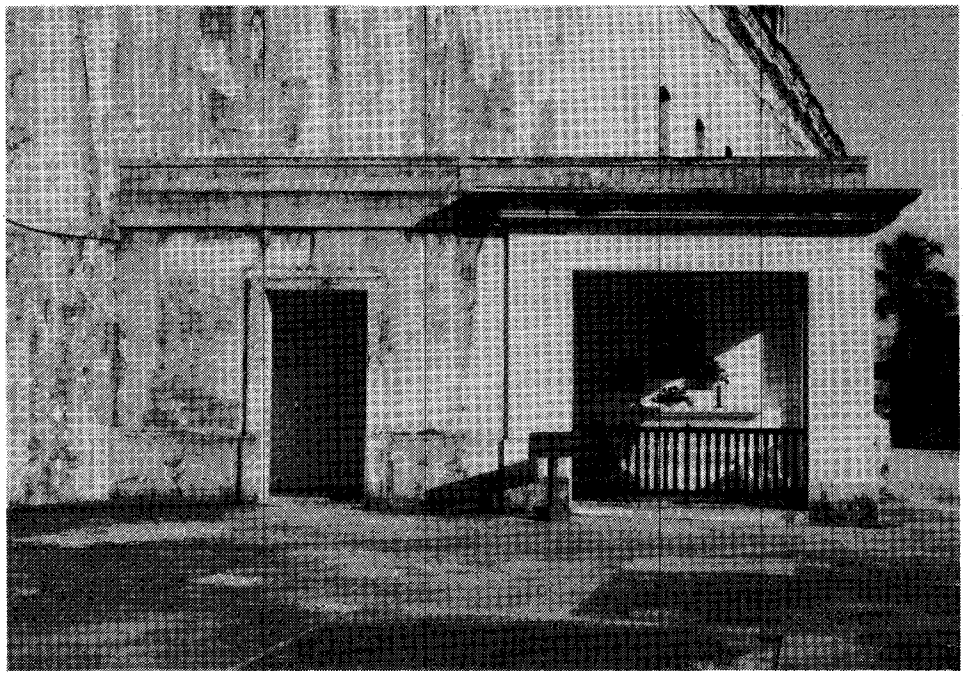


Figure 6.2. North elevation of the Chapel. Photo by Richard Crisson, 1986.

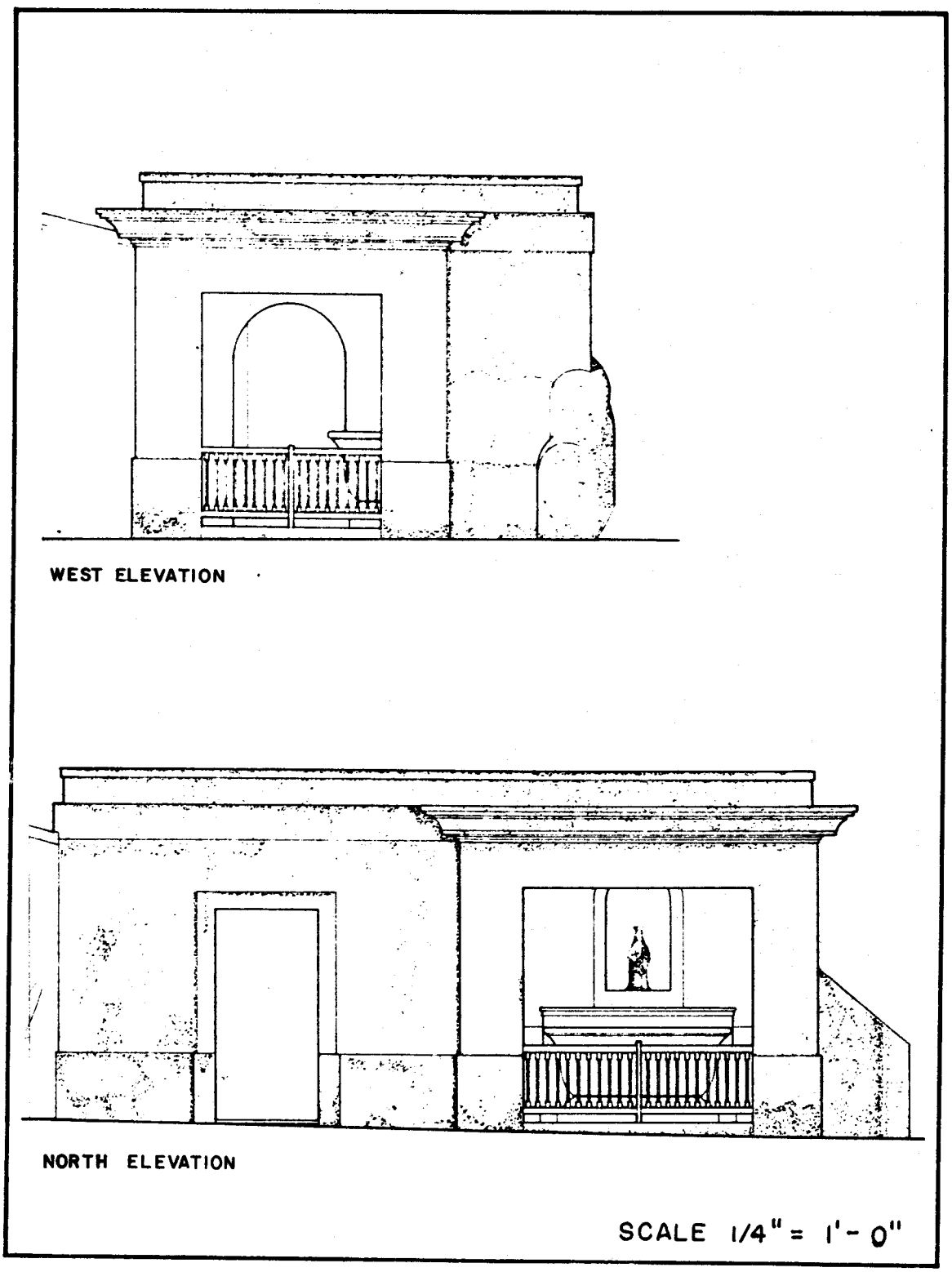


Figure 6.3. North and west elevations. Drawings by HABS, 1989.

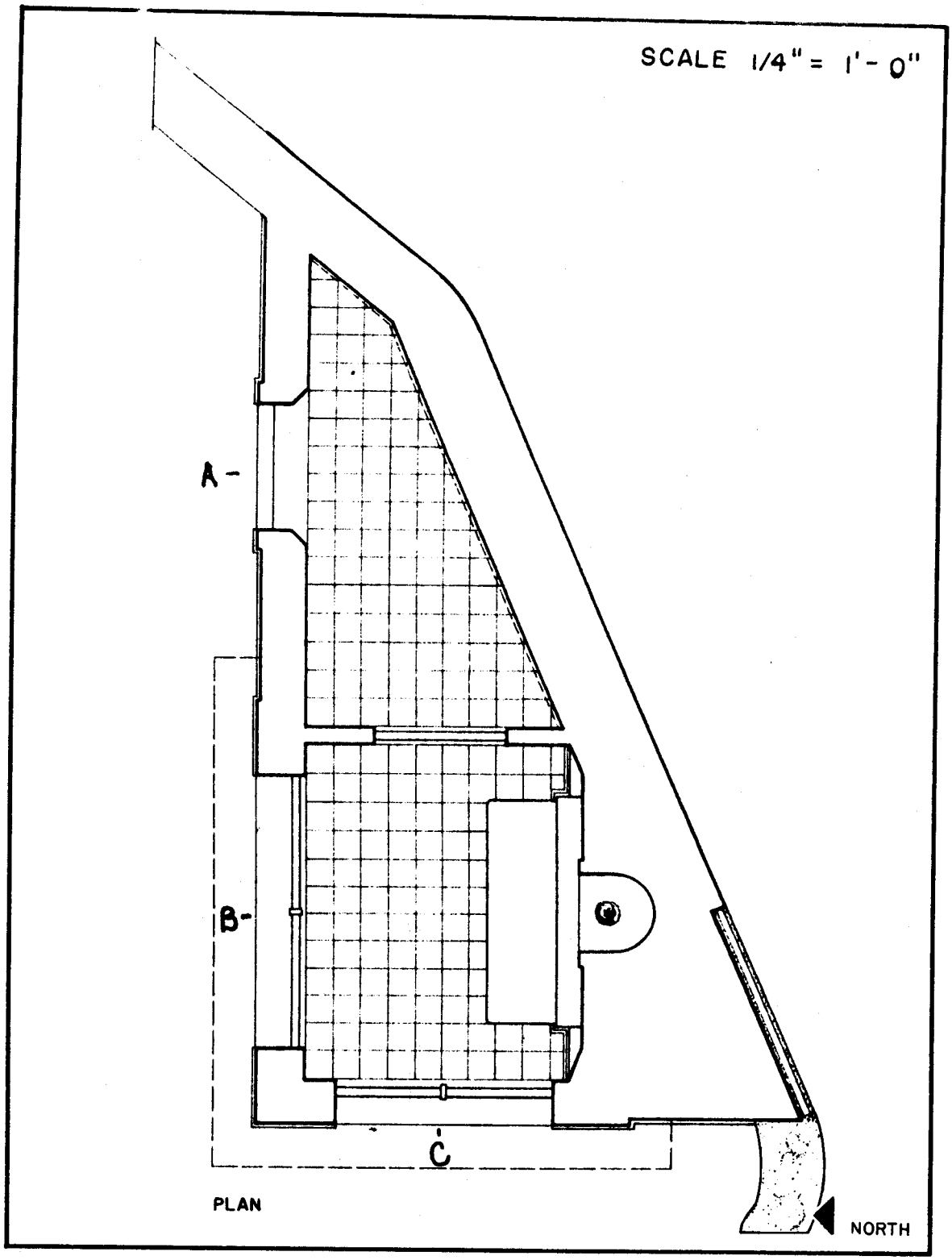


Figure 6.4.Plan of the Chapel. Drawing by HABS, 1989.

unit is built of a native hardwood. There are no window openings in this building.

The flat roof is trapezoidal in shape and is paved with large, rectangular, red ceramic tiles. The projecting cornice, overhanging the two large openings, consists of a sloped coping above a large cavetto molding. The cavetto molding sits on smaller flat and molded profiles. The cornice appears to be constructed of concrete covered with Portland cement stucco. Above the cornice and the flat backband (flat band behind cornice) is a wall parapet with a square and slightly raised coping. Within this parapet, on the southeast elevation, is a roof drain that empties into a built-in gutter within the cheek wall of the ramp up to el Caballero. This gutter empties into a drain hole in the ramp wall extension and finally discharges into the subterranean drainage and cistern network below the Plaza. Access to the roof can be gained from the adjacent ramp to el Caballero.

The interior of the Chapel is divided into two rooms. (See fig. 6.4.) The larger room on the west can be considered the sanctuary. It contains the altar and altarpiece. The smaller room to the east, considered the vestry, adjoins the first and is connected by a doorway.

The interior walls and ceilings appear to be covered with smooth cement stucco painted white. The altar faces north and is of masonry, finished in a manner similar to the walls. It features a cyma recta profile on a much smaller inverted cyma recta sitting on a square base. The overhanging top has a torus profile. The whole unit is attached to the wall (fig. 6.5). Although the altar may look original, it is probable that it was extensively repaired or reconstructed soon after the 1898 attack and attendant explosion.

The altarpiece above has a shelf and a deep concave wall niche. The arched niche with its flat surround contains a modern icon of Santa Barbara; the Chapel's namesake.

An arched opening, 4 feet 5 inches wide, connects the sanctuary and the vestry and is the only interior doorway. This opening contains a fixed balustrade similar to those described at doorway "B" and "C". Although we do not know if the Chapel has ever been used for worship, its open arrangement would have allowed numerous worshippers to face the sanctuary and its altar during religious services.

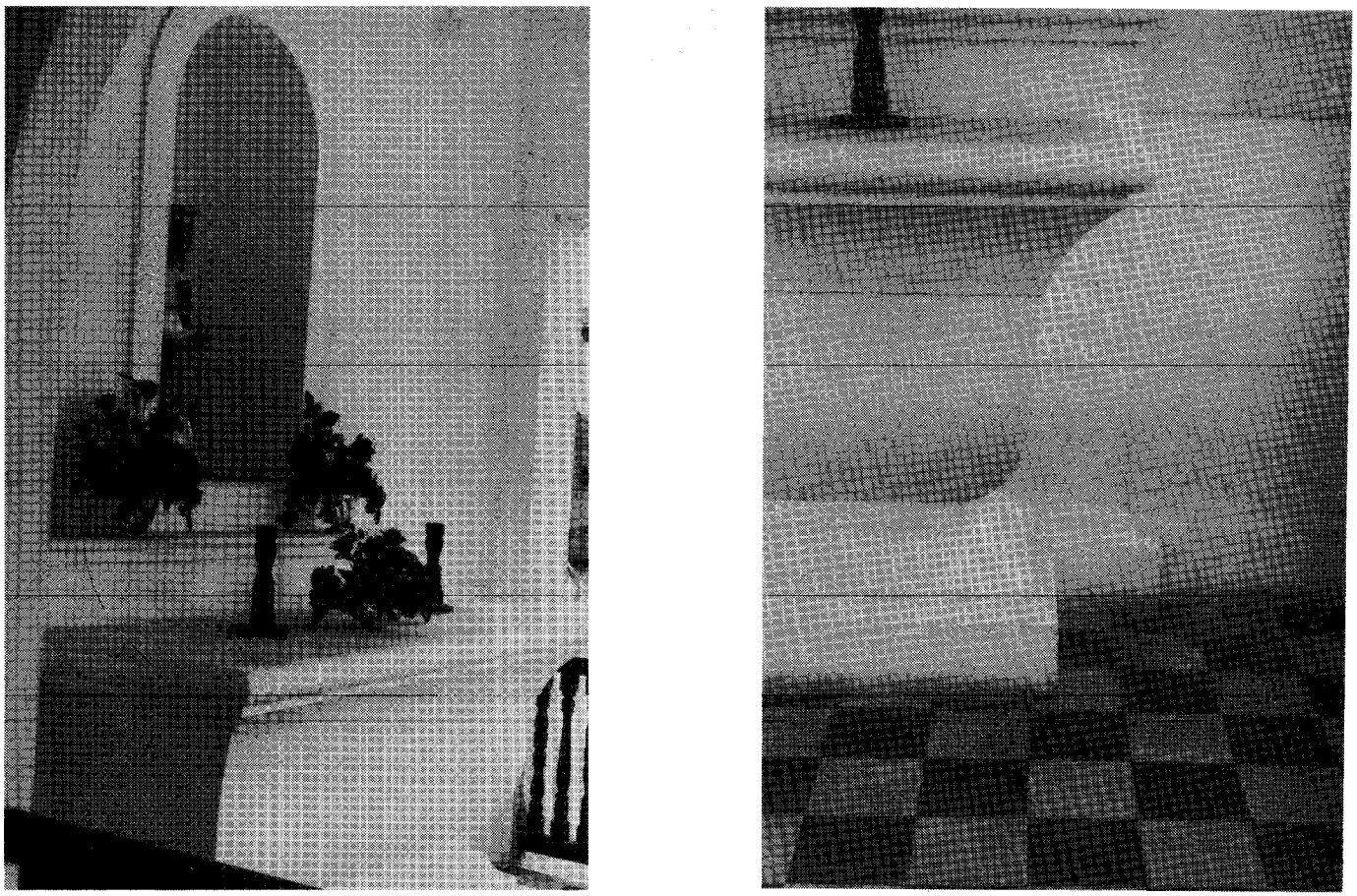


Figure 6.5. Two views of the altar showing the recessed niche for votive statue and the molded profile of the base. Photo by Richard Crisson, 1986.

Structural Evolution

Period 1: 1625-1765

The Plaza de Armas on which the Chapel is sited was built after 1765. Therefore, there is no information on the Chapel for this period.

Period 2: 1765-1809

The Plaza de Armas was constructed as part of the 1765 modernization project for San Cristóbal. The Plaza, along with the ramp leading to el Caballero was substantially completed by 1769.[1] It was on the Plaza, immediately adjacent to the wall of the ramp, that the Chapel was eventually built. Exactly when this occurred is not known although it is doubtful that it was built in the eighteenth century. The Chapel is not included in the detailed modernization drawings for San Cristóbal of Engineer O'Daly. Nor does it appear in subsequent drawings or construction reports of later years.

Period 3: 1809-1837

No reference to the Chapel was found in the documentation for these years.

Period 4: 1837-1868

The Chapel appears to have been constructed sometime during this period. The three possibilities are sometime after 1839 but before 1861, shortly before 1861, or shortly after 1861. Although no written references were found, the drawings of 1861 clearly indicate the existing or proposed use of the building as a chapel.

In 1839, a large scale model was made of San Cristóbal and its outworks.[2] The Chapel, on the east side of the Plaza de Armas, was not included. Presumably, it had not yet been built.

Not until 1861, when detailed drawings were prepared by delineator Manuel Castro, was the Chapel documented. The intent of Castro's drawings, unfortunately, is not known. Three possibilities exist. First, the drawings may have been a recording of existing conditions. In this case, the Chapel

would have been constructed sometime after 1839, when the model was built, and before 1861. Second, they may have documented recently completed work, in which case the Chapel may have been built shortly before 1861. Finally, the drawings may have been a proposal for new work thus dating the Chapel construction as sometime shortly after 1861. Whatever the intent, the Chapel as it exists today is identical in location and form to that shown by Castro (fig. 6.6). Therefore, the delineator was either accurate in his recording of existing conditions, or the proposed new building was constructed exactly as designed. In either instance, the drawings provide us with a valuable first look at the building.

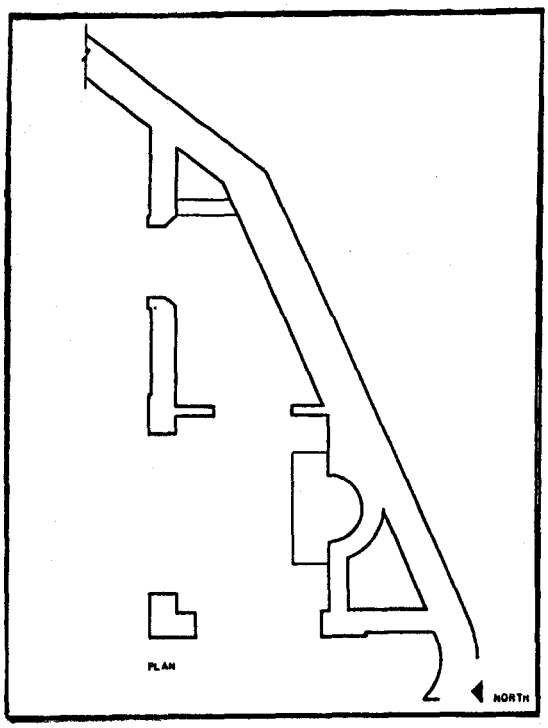


Figure. 6.6. Retracing of Castro's 1861 plan of the Chapel by Jana Gross, 1989.

The east elevation and roof and floor plans illustrated a small building of trapezium shape nestled at the foot of the ramp to el Caballero. Its south and east walls were set at an angle and comprised the eighteenth-century outer wall of the ramp. New walls on the north and west sides, perpendicular to one another, enclosed the space. The exterior walls were flat, smooth-looking, and a cream color (most likely a stucco finish). Unlike some other buildings on the Plaza, the walls were not colored yellow. Three doorways opened into the building: two in the north facade and one in the west facade. A cornice was located only above the two wide doorways at the northwest corner of the building. No doors were shown in the doorways and there were no windows. The roof appeared to have been flat; the section indicated that rafters ran in a north-south direction.

In 1861, two rooms were shown to be interconnected by a wide doorway. The small room on the east side was trapezoidal, entered from the outside by a narrow doorway in the north facade. The function of this room was not indicated. The larger room on the west side was rectangular and open to the outside by the two previously described wide doorways: one in the north facade and one in the west facade.

The 1861 elevation showed the south end of the west room in great detail. A semi-circular niche was cut into the back south wall. This niche was an integral part of that room's

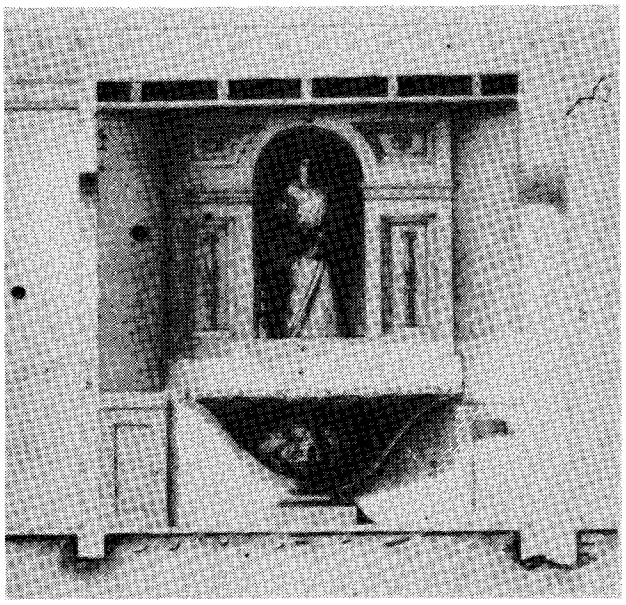


Figure 6.7. Section through Chapel by Castro, 1861, showing altar area. (San Juan NHS Archives.)

function, as lavishly illustrated in the section labeled M-N (fig. 6.7). Set in front of the south wall was an altar with curvelinear sides resting on a center base. The side of the altar was colored blue with dark veining reminiscent of marble, and in its center was a representational drawing of a turreted castle. On either side of the altar were two small paneled projections at the same height as the altar. The upper half of this wall was intricately detailed. Within the center recessed niche was a statue probably of Santa Barbara (the patron saint of artillery men). The south wall surrounding the niche was decorated by a spring molding (arched molding that springs from the top of a pilaster) and four panels, within which are symbolic motifs. Two rectangular panels were located below the spring molding, one on either side of the niche, each featuring an upward reaching forearm and hand design. Above these panels and the spring moldings were two smaller panels with less clearly defined symbols. In each were a box-type container, open at the top to reveal contents that can not be identified. The south wall itself was a white color, as were the panels and designs.

No early descriptions or photographs are known to confirm or deny the 1861 drawings of the Chapel. While the south wall niche is still extant, no panels or molding remain. It may be that these were not architectural features but in fact trompe l'oeil work. Similarly, the altar may have been marbelized, transforming the otherwise plain altar into the stately one exhibited in 1861. Such decorative painting was found in the eighteenth-century Chapel at el Morro during an investigation in 1955; on the walls was found a paint layer that "showed traces of mural decorations of an architectural nature."[3] No such investigations were carried out in 1986 at San Cristóbal's Chapel.

Period 5: 1868-1898

The Chapel appears to have continued in use as such through the latter half of the nineteenth century. Not until the American invasion of 1898 did its function change.

During the invasion, the Chapel is said to have been "converted hurriedly into a storehouse for cartridges."[4] This no doubt referred to the long "ordnance" stores building constructed at the base of the ramp to el Caballero abutting the Chapel at its north wall. This new structure is first seen in the 1901 drawings (fig. 6.8) entitled "Quarters at Fort San Cristóbal as They Exist February 12, 1901."[5] Here, the east room of the Chapel was incorporated as the south end of the storage building and the west room remained independent and most likely remained in use as a chapel. During the invasion:

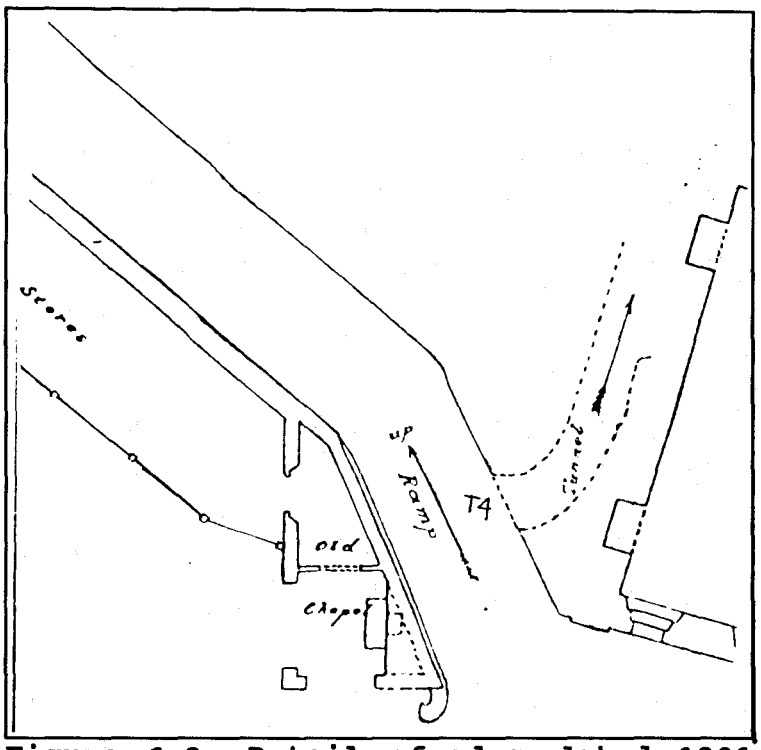


Figure 6.8. Detail of plan dated 1901 showing the "Old Chapel" and proximity of ca. 1890's "Ordnance Stores." (San Juan NHS Archives.)

> [A] projectile which did not have or had lost its fuse, pierced through a wall 9 feet thick; entered the chapel . . . and remained in a vertical position, in front of the statue of Santa Barbara . . .[6]

Had explosives been stored there, fuse or no fuse, the Chapel would probably have been destroyed.

The exact extent of damage sustained to the sanctuary is unknown. However, it can be assumed that the floor, and the roof required repairs. A comparison of the present altar with that illustrated in 1861 shows a substantial difference in configuration, perhaps indicating its destruction at this time.

Period 6: 1898-1987

The Chapel has seen several uses since the American occupation of San Cristóbal in 1898. Its twentieth-century functions have included not only chapel, but barber shop and storeroom. Many repairs have been made over the years,

including installing a new roof in the late 1930s and removing modern intrusions in the 1960s. Between 1963 and 1971, the building was completely restored. Today, its exterior appearance resembles that of 1861.

The 1901 existing conditions plan of San Cristóbal labeled the building as the "Old Chapel."[7] One year later it was being used as a barber shop. This function was discovered in a proposal to remove the old plaster from the walls of certain areas of San Cristóbal (including the "barber shop in old chapel") for replacement with a new coat of Portland cement. While it was deemed as "not an immediate necessity," it was also recognized the work would be "necessary before a lapse of much time." In fact, the repairs were deferred.[8]

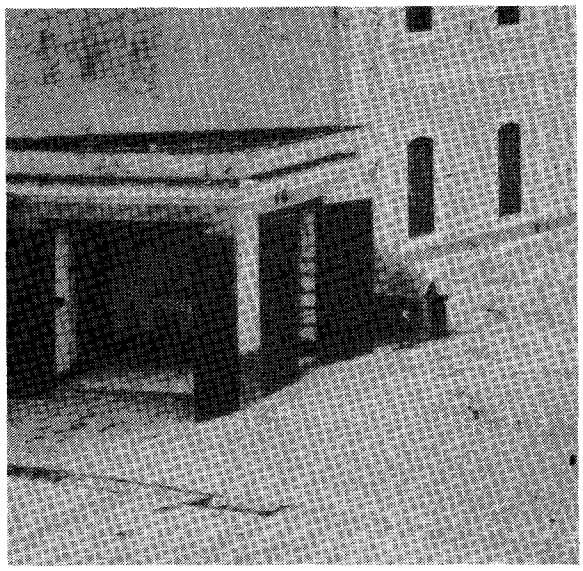


Figure 6.9. View of chapel, ca. 1905, showing north and west elevations. (HABS negative 181.25.)

Our first photographic view of the Chapel is dated ca. 1905 (fig. 6.9).[9] A small fragment of flashing or roof at the north wall may indicate that the "ordnance" building was still attached. A chair with a headrest in the west room may indicate the continued use of this building as the barber shop. The exterior walls had a high base articulated by a dark finish. The walls above the base were a light shade. A cornice was located midway between the tops of the doorways and the low parapet wall enclosing the roof. At the north and west doorways of the sanctuary were double doors of a dark color, paneled on the inside and flush on the outside. Inside the sanctuary, the raised floor appeared to be of poured concrete. The interior walls were a light color with the exception of the baseboard which was dark. The interior doorway in the east wall was arched. Suspended above the empty chair was an electric light fixture with a simple shade. (Electric lighting was installed at San Cristóbal between 1901 and 1904.) At the south wall may be seen the east end of what was most likely the altar.

In the 1930s the building was once again referred to as the Capilla (Chapel), and in 1935 it was also labeled building number "50." By 1935 the ordnance building had been removed and the Chapel's north facade was visible once more.[10] Approval

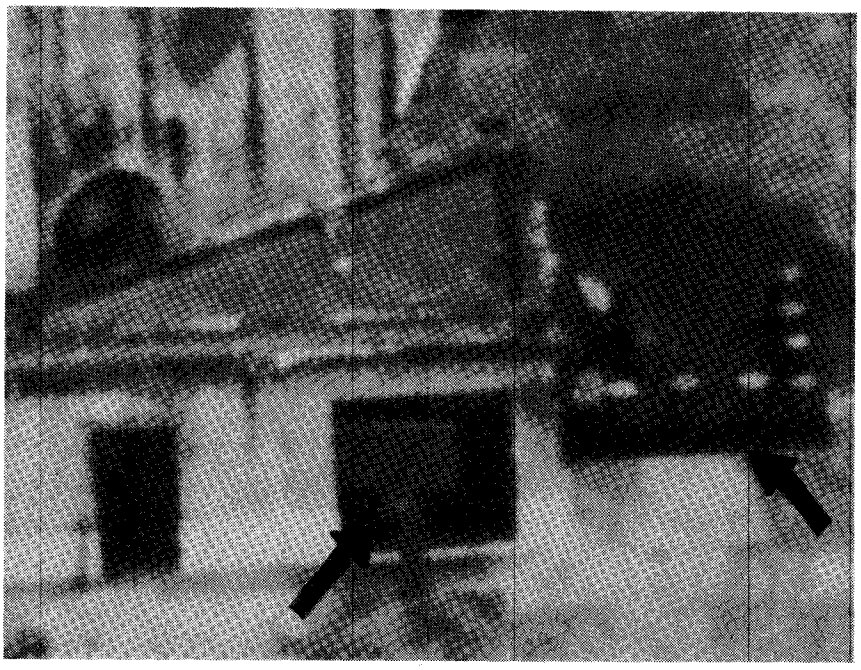


Figure 6.10. Detail of aerial photograph showing the Chapel, ca. 1950. (San Juan NHS Archives.)

was obtained in 1938 to expend Works Project Administration funds on two structures on the Plaza, one being the Chapel. Both exterior and interior work was proposed. This involved patching, plastering, and painting the walls both inside and out; replacing the brick masonry roof; repairing the cement floors; and installing new hardware where necessary.[11] A drawing dated January 4, 1939, and entitled "Repairs to Chapel" described in further detail the work planned for the upper part of the building.[12] New beams of reinforced concrete were to be installed above the two wide doorways of the west room. The existing cornice was to be restored. A new roof was to be installed, composed of a perimeter reinforced concrete collar beam, a 5 inch reinforced concrete slab, and "promenade" tiles measuring 6 by 12 inches by 1/2 inch. The pitch of the roof was to be towards the existing drain centrally located in the back south wall. It is assumed that this work was done, although no documentation of its completion has been found. Of particular interest is the proposed molding profile of the cornice over the doorways that differs from the profile today. Possibly the cornice as built in 1939 did not closely adhere to the design, or else the cornice has since been reworked.

Use of the Chapel changed again in the 1940s, and in 1943 the building was labeled as a storeroom.[13] The chapel for San Cristóbal was then located in one of several rooms in a temporary frame building on the terreplein of the North Casemates.[15] It was also about this time that a basketball court was installed on the Plaza, with the south end basket and backboard located immediately in front of the former Chapel's north facade (fig. 6.10). An outside water spigot was situated on the Plaza at the southwest corner of the Chapel. This was protected from vehicular traffic by a curb

set at a right angle and seven posts. Both the basketball court and the water spigot and hydrant remained as fixtures on the Plaza for approximately the next twenty years.[16]

In January 1960, HABS photographed the building. (See fig. 6.11.)[17] Comparison of this view with our earliest photograph reveals some changes. In 1960, the exterior doors were placed differently and were of a new design. The new doors hinged on the interior (vs. exterior of 1905) side of the doorjamb and had a multi-panel design (vs. flush surface of 1905) on the exterior side. In 1960 the basketball court was illuminated by an electric floodlight situated on the northwest corner of the roof. Water sources were close at hand, with a water spigot on the southwest side of a new fire hydrant at the northeast corner. One other photograph taken at this time documents another change.[18] The north facade was used as a sign for a military parking lot and lettered with "MPCI" and "MCPI VEHICLES ONLY."

Not until it was administered by the NPS in 1961 were the modern intrusions slowly removed from the Chapel. Photographs taken in 1962 showed the doors, the basketball court, the exterior floodlight, and the parking signs gone. Slated for demolition in July 1962 was the water spigot and its protective concrete curb. An interior view showed the present marble tile floor in the west room, although the exact date of its installation is not known. It would have to have been sometime after the ca. 1905 photograph that shows a plain, possibly concrete, floor in this room. Through 1963, the exterior base of the building was shown to be a lighter color than the body of the building. Staining was apparent at the roof parapet and cornice.[19]

According to a newspaper account, a statue of Santa Barbara, donated to the Chapel by the Spanish government, was officially blessed in September 1963. The paper reported that the statue "received a two-gun salute from the fort's ancient cannon."[20] This statue is said to be in the collection of San Juan NHS at San Cristóbal.

Sometime after 1963 and before 1971, the Chapel was completely restored by the NPS.[21] No drawings or written documentation have been found on this work, but a set of untitled black and white photographs are available for illustration. Both the exterior and the interior walls appeared to have been painted a light color.

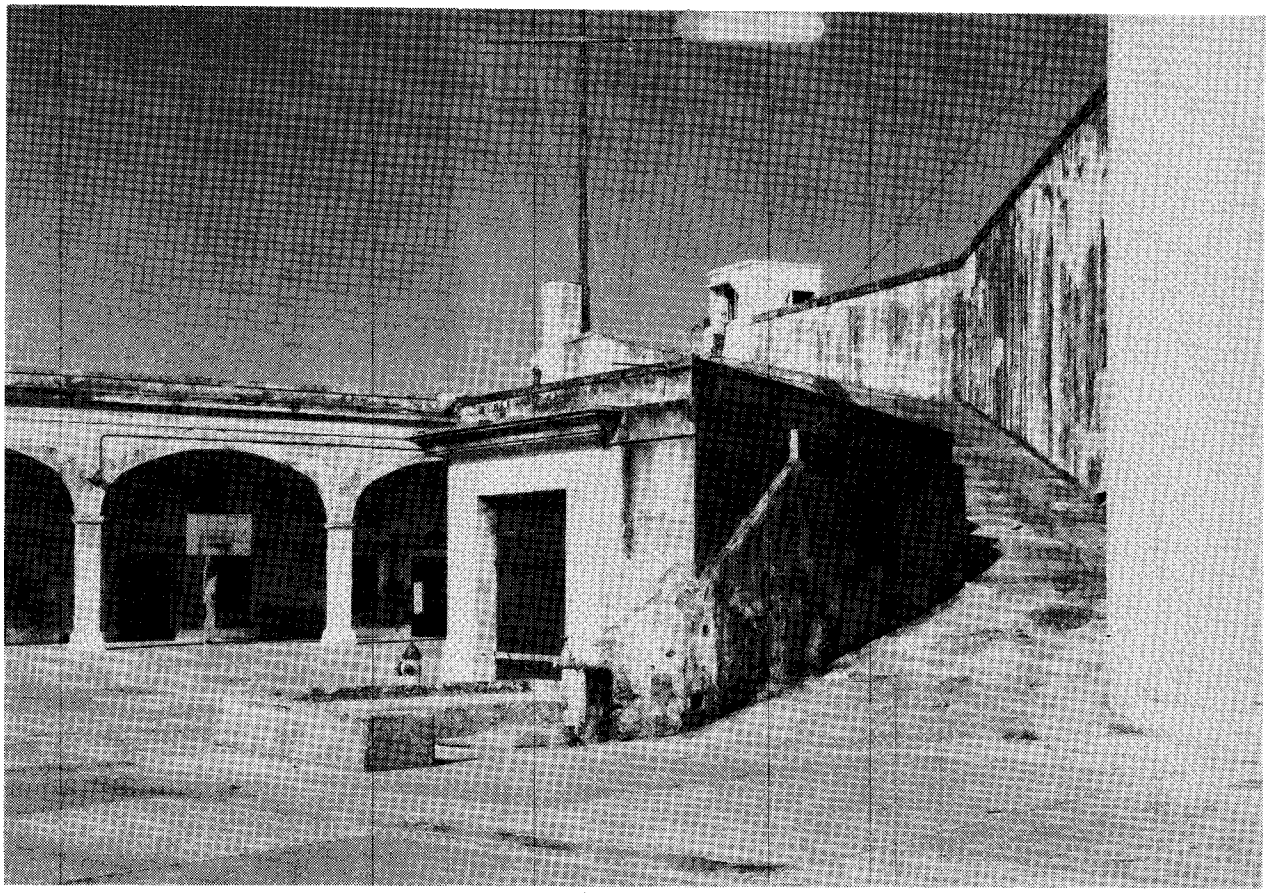


Figure 6.11. West and south elevations of the Chapel. HABS photo by Jack Boucher, 1960.

A new low balustrade was installed at the north, east, and west doorways of the west room. In the niche is a small statue of Santa Barbara (fig. 6.12).*

One last modern intrusion was removed in ca. 1972. This was the fire hydrant: four black and white photographs document its removal.[22]

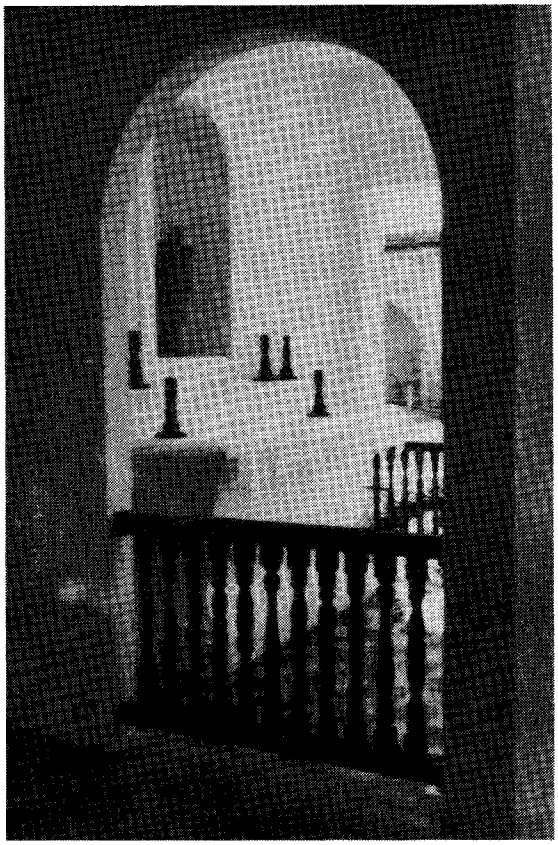


Figure 6.12. Interior of the Chapel after restoration by the NPS, 1971. (San Juan NHS Archives.)

*Paint sample SAJU 05 P001, removed from the exterior south wall finished with Portland cement stucco, has only three layers of paint. The first layer, yellow in color, is believed to date to this restoration campaign.

Conditions

The Chapel appears to be in fair condition. However, the 1986 structural inspection identified potential serious foundation problems relating to moisture infiltration or subterranean drainage below the Plaza.
The structural system is mostly load-bearing masonry. As detailed in the 1939 drawing, however, the structural system was significantly altered by substituting reinforced-concrete "lintel beams" over the north and west openings, and by adding a reinforced concrete "collar beam" on the southeast wall. These are used to support a 5 inch steel-reinforced concrete roof slab. As at this writing, exterior structural cracks are being monitored by instrumentation, but the cause and severity of this condition is not yet known.

Although the building has been extensively repaired in the twentieth century, there are various horizontal structural cracks in the north and west walls that appear to be caused by shear stress. In January 1987, a structural monitoring instrument gauge was installed in the interior northwest corner. Constant monitoring will determine the current rate of movement and the potential for structural failure.

It is probable that the portions of the walls not repaired with concrete in the twentieth century remain as originally constructed in the nineteenth century (i.e., built of brick and rubble stone). The southeast wall is much thicker and accommodates the angular variations of the adjoining ramp. All of the exterior surfaces are covered with Portland cement and are painted yellow. Fifty percent of the walls are discolored and stained. The stains, caused by excessive moisture, are most noticeable on the cornice, at the base of the walls, and in those areas associated with the drainage system.

NOTES

1. Based on plan by O'Daly, 1769 that is included in Volume I, no 8 of this report.

2. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at Museo del Ejercito, Madrid, Spain.

3. Fred Gjessing, "Report on the Investigation and Restoration of the Chapel: San Felipe Del Morro" (San Juan: National Park Service, n.d.), p.7. Investigation work is noted on page 1 to have been done in the spring and summer of 1955.

4. Angel Rivero, Crónica de la Guerra Hispanoamericana en Puerto Rico (Barcelona: Editorial Edil, Inc., 1972), p.92. This is a reprint of the original book published in 1921.

5. Drawing collection San Juan NHS, San Cristóbal, location no. FC7-DR3-ENV134.

6. Rivero, Crónica de la Guerra, p.92.

7. Ibid.

8. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Dept. of the Interior, NPS, Feb. 1984) pp.117-118. References cited by Bearss are to correspondence in the National Archives, RG 92.

9. This photograph is included and dated in a Historic Structure Report on the Officer's Quarters by W.W. Wilkins, 1961. The original is noted to be in the National Archives, Washington, D.C. A copy is also in the Washington Office of HABS, negative no. 181.25. The photo post-dates removal of the flagpole from the Troops' Quarters in ca. 1902 (a new pole was installed elsewhere in Feb. 1902) and pre-dates removal of the windmill sometime before a photograph dated August 1912.

10. Information for 1935 was obtained from a drawing entitled "Plan of Proposed Repairs to Fort San Cristóbal," May 1935. Drawing collection San Juan NHS, San Cristóbal, No. FC7-DR5-ENV141, and NHS-SJ. 9754.

11. Bearss, pp. 326-8. References cited by Bearss are to correspondence in the National Archives, RG 92.

12. Drawing collection San Juan NHS, San Cristóbal, No. 212 1042.

13. Bearss, p. 375. The reference cited by Bearss is a plan of San Cristóbal dated Oct. 25, 1943, Collection San Juan NHS.

15. Ibid., p. 374.

16. Both the basketball court and the exterior water spigot are documented by photographs in the collection of San Juan NHS, San Cristóbal (uncataloged).

17. Photo by Jack Boucher, HABS negative no. 181.4.

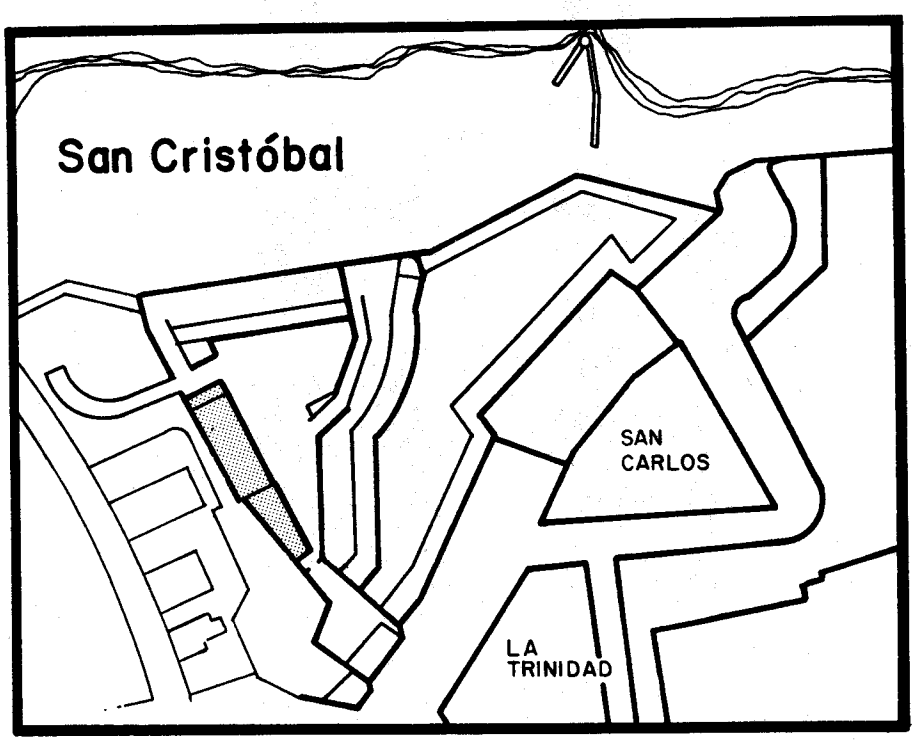
18. Undated photograph, on file at HABS - negative no. 181.28.

19. Photo by R. Keune, 1962. HABS negative no. 181.165. Documentation on the water spigot is provided by a photograph entitled "Detail - modern curb wall prior to demolition - by Rullan, July 1962," in the photo collection of San Juan NHS, no. 1060.

20. "Cristóbal: A New Flag," The San Juan Star, Monday, Sept. 9, 1963.

21. Five photographs, photo collection San Juan NHS - San Cristóbal (uncataloged). These are labeled only "1971."

22. Photo collection San Juan NHS, San Cristóbal (uncataloged). One of the four is labeled "1972?"



CHAPTER 7

OFFICERS' QUARTERS
(PABELLÓN DEL GOBERNADOR)

Description

The Officers' Quarters, historically referred to as the Pabellón del Gobernador (Governor's Pavillion), is located along the western edge of the Plaza de Armas and forms the western wall of San Cristóbal between the Main and South Gates. It was built between 1773 and 1775. The present building is comprised of three distinct units: the original main block, the north addition, and the south annex. (See fig. 7.1.) The complex is presently used for park administration, public lavatories, and storage facilities.

The main block of the Officers' Quarters is five bays in length with a five-bay open loggia extending across the east elevation. The block is one story high on the east elevation and two stories on the west elevation. (See fig. 7.2, 7.3.) The latter is formed by the topography and the grade change accommodating a series of cisterns below.

The loggia on the east is constructed with ashlar piers that support the brick walls above. The groin vaults of the loggia,

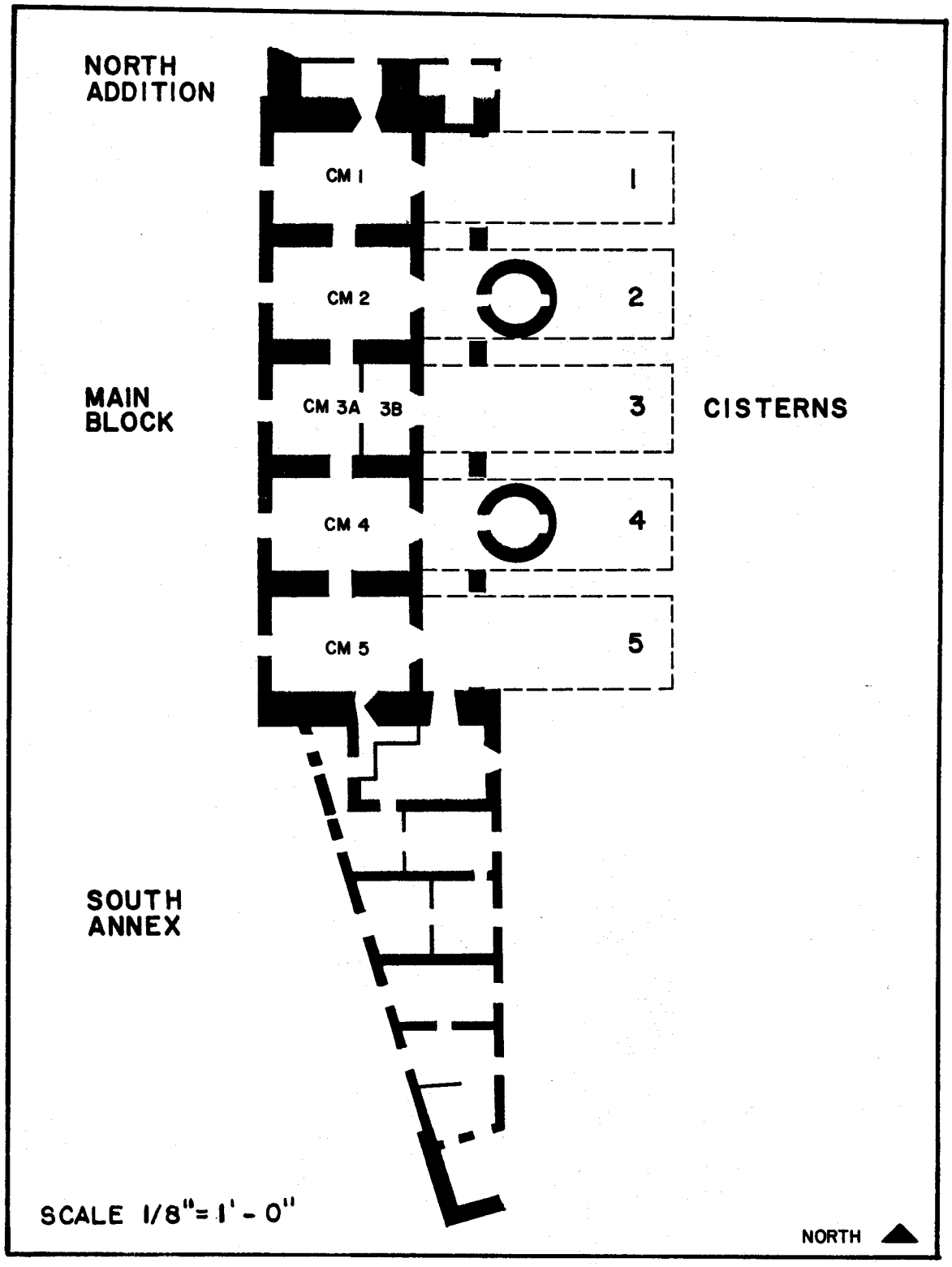
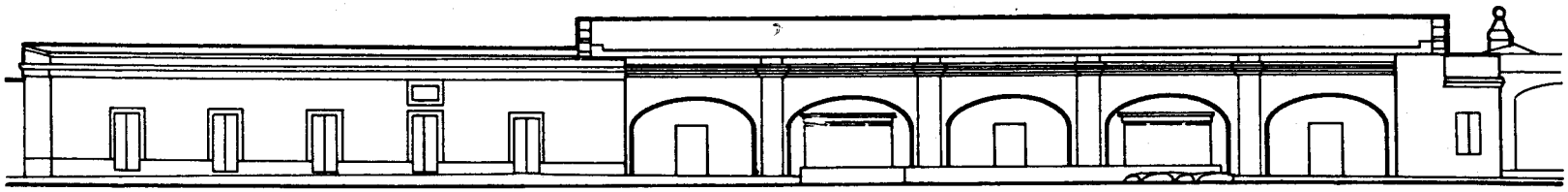


Figure 7.1. Plan of the Officers' Quarters with casemates and cisterns labeled. HABS drawing (1961) annotated by Jana Gross (1989).



EAST ELEVATION

SCALE 1/8"= 1' - 0"

Figure 7.2a. East elevation of the Officers' Quarters. HABS drawings (1961) annotated by Jana Gross (1989).

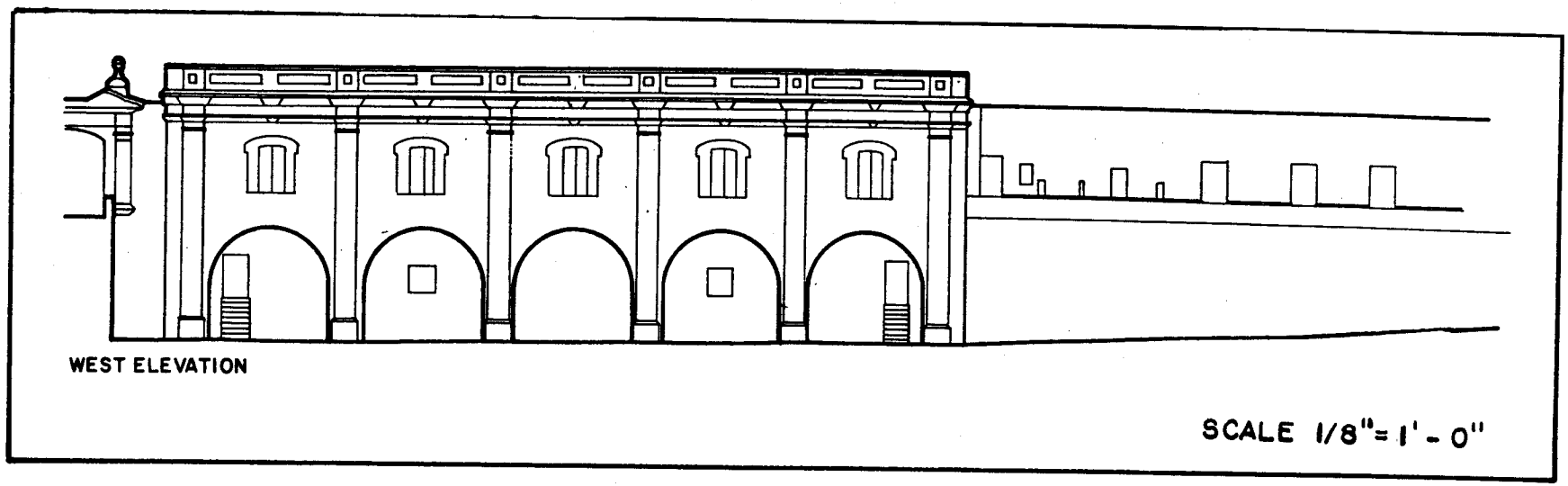


Figure 7.2b. West elevation of the Officers' Quarters. HABS drawing (1961) annotated by Jana Gross (1989).

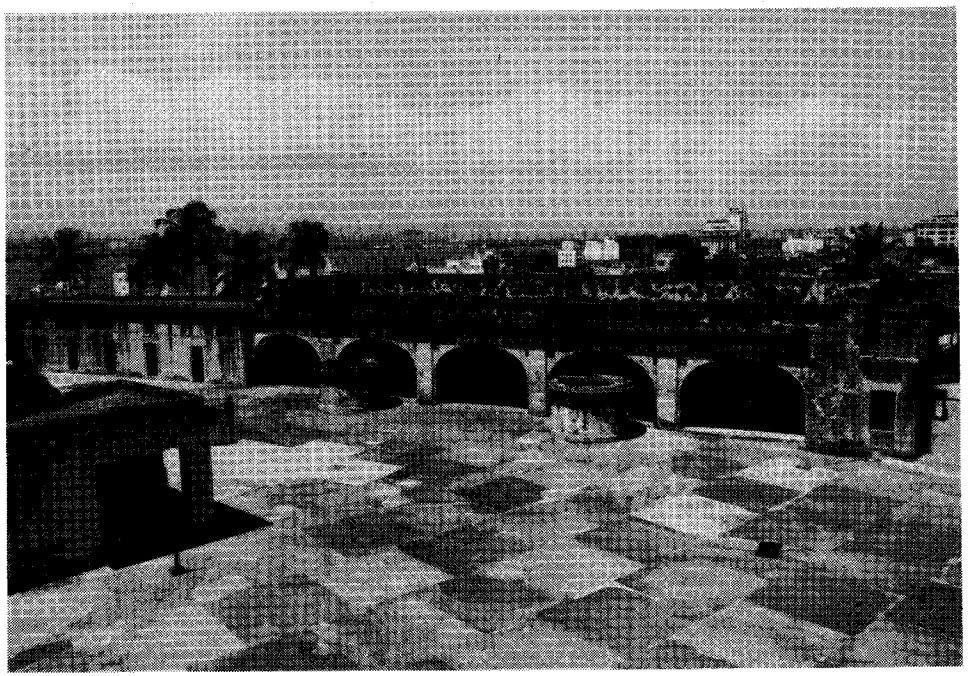


Figure 7.3. East elevation of the Officers' Quarters with Well Houses in front and Chapel to the left. Photo by CPR, 1986.

as well as the block's interior walls, are also of brick. The massive end walls are of rubble construction and terminate in high scroll-ended parapets (fig. 7.4).

The loggia's pavement rises approximately two inches above the plaza. The north and south bays are paved with black and white square marble tiles. The remainder is paved in modern hormigón (crushed brick and cement). The whole is edged with a single course of brick. The east elevation is capped by an elaborate stone cornice surmounted by a low brick parapet. Traces of early painted finishes on the loggia's stone piers and stuccoed voussoirs are visible and are similar to those found on the main ramp and gates.

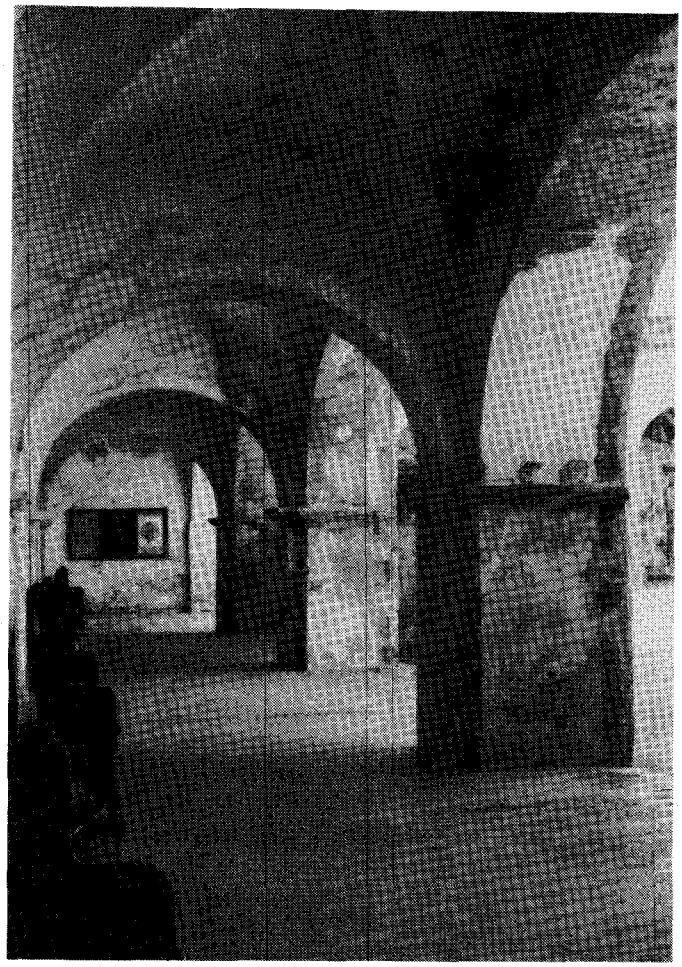


Figure 7.4. View looking north through loggia. Photo by CPR, 1986.

The east elevation behind the loggia is articulated by five semi-elliptical arches facing east, each separated by a single, wide, shallow pilaster springing from low stone piers. The piers are capped by a simple stone molding at the springing line. The single bay width of the loggia is traversed north to south by five low semi-circular arches that spring from the front piers back to pilasters on the building's east wall. Each bay of the loggia contains an elongated groin vault.

The main block of the Officers' Quarters is likewise divided into five bays. Centered on the east wall of each bay is a segmental arched doorway leading from the loggia in to the casemates. For clarification in this discussion, the casemates are numbered CM-1 through CM-9 moving from south to north. Each opening is articulated by a simple banded surround that is chamfered on lower opposing jamb edges. All of the openings are filled with reproduction wooden doors, frames, and transoms

except for CM-1 that still retains its original transom. The barrel vaulted casemates (CM-1 through CM-5) of the main block are of equal size and rectangular in plan. Although the casemates have an east-west orientation, low barrel vaulted passages cut through the midpoint of the common walls dividing each chamber and allowing for inner communication between the casemates. (See fig. 7.5, 7.6.) Generally, at the point where this vaulted passage enters each casemate it is surmounted by a partial groin vault that appears to have been inserted to reinforce the main barrel vault. The exact configuration of these vaults and treatment of the passages (i.e. door enframements and doors) varies somewhat in character from casemate to casemate.

CM-1 possesses a partial groin vault on its north wall and a smaller partial groin on the center of its south wall that accommodates the arched opening of the connecting passage. The north wall of this casemate retains an original wooden mortise and tenon door casing, probably of ausubo, that held an inward opening exterior door on the north wall of the main block. No door is presently hung in the opening, but evidence of early cappucine hinges can be seen on the left and right jambs of the casing as well as evidence of a mortise for a center dead bolt. Ghost marks of later butt hinges are also evident. The door to the loggia appears to retain the only original wooden transom. It is made of vertical boards with horizontal interior battens. Nails are hand-wrought and rose-headed. Two small oval vents (presently sealed) are cut through each leaf of the transom flanking the central mullion. The floor of this casemate is covered with modern linoleum tile.

CM-2 is connected to its adjacent casemates by short barrel vaulted passages surmounted by partial groin vaults. CM-2 has the only window configuration in the Officers' Quarters with a raised and recessed spandrel panel. This configuration is found elsewhere and appears to be an original detail allowing access to the windows. The floor is of modern concrete scored into 16 inch squares.

CM-3 retains its ca. 1861 masonry partition wall that divides this casemate into two separate chambers; CM-3A on the west and CM-3B on the east. Room 3A, the larger space has equally sized partial groin vaults on opposing north and south walls that accommodate the barrel arched passage between CM-3 and CM-4. This north passage still retains traces of an early wooden casing with cappucine pintle ghosts on each jamb. Presently CM-3A has a carpeted floor. The partition wall is pierced by an elliptical vent that is located directly above a rectangular door opening fitted with a reproduction wooden door. This opening gives access to the east chamber (CM-3B) and is centered on the partition wall. Evidence of shelving exists on the east side of the partition wall. Although the

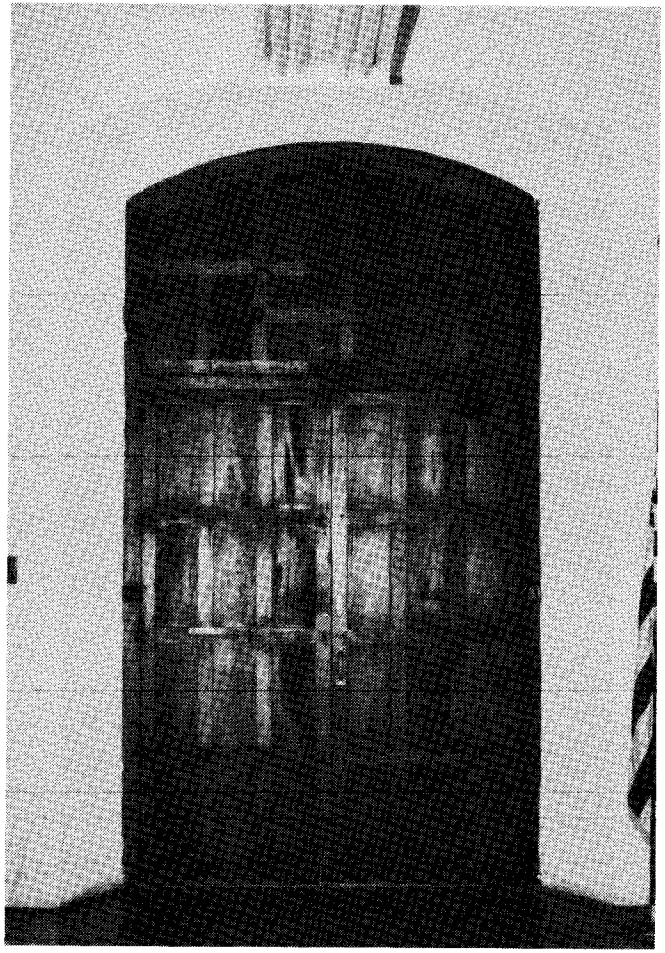


Figure 7.5. Segmental arched doorway leading from loggia into CM-1. Photo by CPR, 1986.

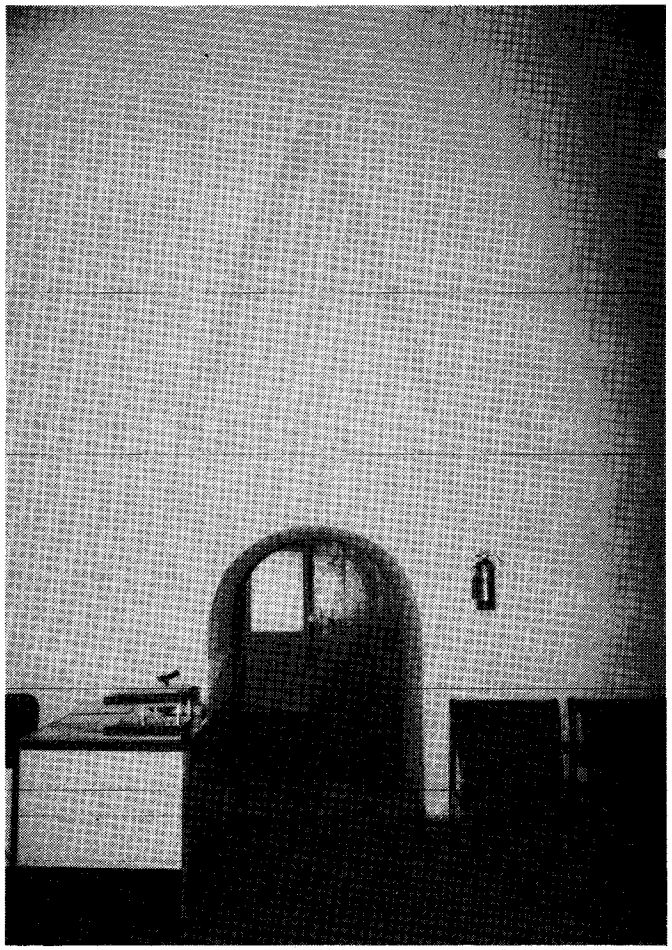


Figure 7.6. One of low vaulted passages cut through common wall dividing casemates. Photo by CPR, 1986.

floor of CM-3B is primarily of modern concrete scored intosquares to imitate large tiles, there is a decorative encaustic tile band across in its center.

CM-4 is connected to its adjacent casemates by short barrel vaulted passages surmounted by opposing partial groin vaults. The vaults of the passages are carved out on opposing sides to provide clearance for at least one pair of inwardly swinging arched doors in each passage. A partition wall may have further divided the passages forming cupboards and closets. The worn floor of this casemate is laid in small red square tiles with a buff colored diamond pattern in the center.

The south wall of CM-5 has a splayed segmental arched opening that was an original exterior opening and later gave access to the 1846 addition. This opening is fitted with an original native wood mortise and tenon casing containing a raised six-panel door hung on cappucine hinges. The south (formerly the exterior) side of the door has molded stiles and rails. The floor of CM-5 is paved with ceramic tiles.

The west, or city elevation, is similarly five bays wide, but two stories in height. Each bay is articulated by a colossal order pilaster that supports a complex entablature and parapet above. (See fig. 7.2.) This elevation is pierced by a loggia consisting of five barrel vaulted chambers lying on an east-west axis and extending east under the main block and plaza. The chambers are cisterns for water storage. The blind arcade on the west elevation articulating the cistern units are sealed with solid masonry walls and receased approximately ten feet in from the plane of the facade.

The second story of the west elevation contains a single arched window opening centered in each bay. The openings are articulated by molded segmental arch enframements with a projecting molded sill and pendant in shallow relief below. Louvered wooden shutters and louvered transoms hang in the window openings. The high parapet wall is outlined with a series of shallow rectangular panels intersected by a small panel above the pilasters.

The main block has a double flat roof that is traversed longitudinally (north/south) by a low parapet wall several feet west of the east facade parapet.* This parapet divides the roof into two rectangular sections; the westward and larger one resting over the main block, and the eastern section serving as the roof of the loggia. (See fig. 7.7.) The north end of the roof is raised slightly and is paved with bricks of smaller dimensions. The side parapets of the original structure have

* Bedding mortar sample, SAJU 07 M03.

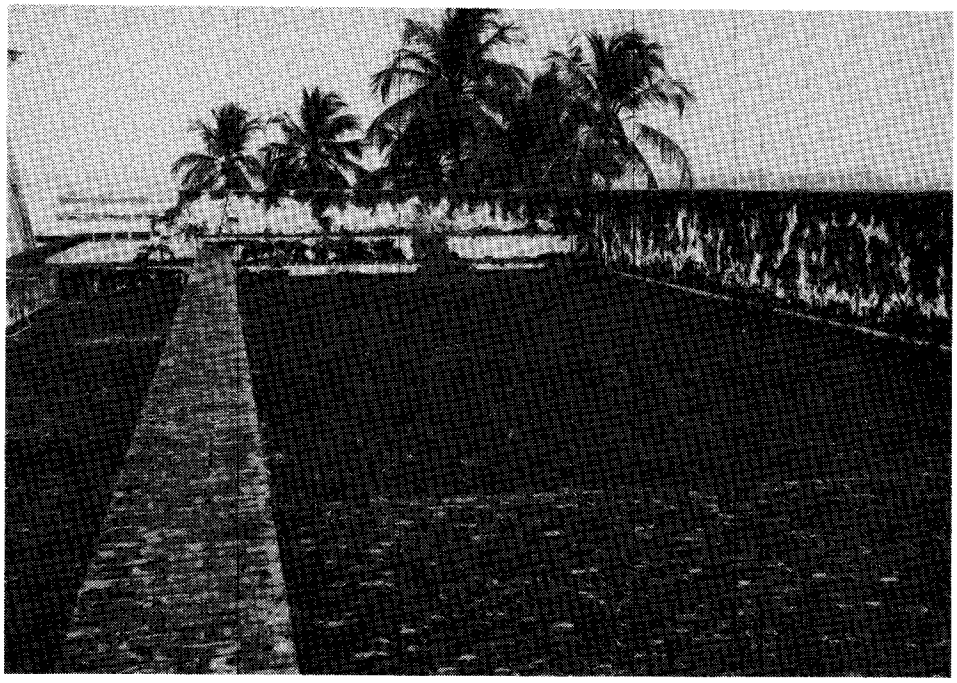


Figure 7.7a. Northern portion of Officers' Quarters roof. Photo by CPR, 1986.

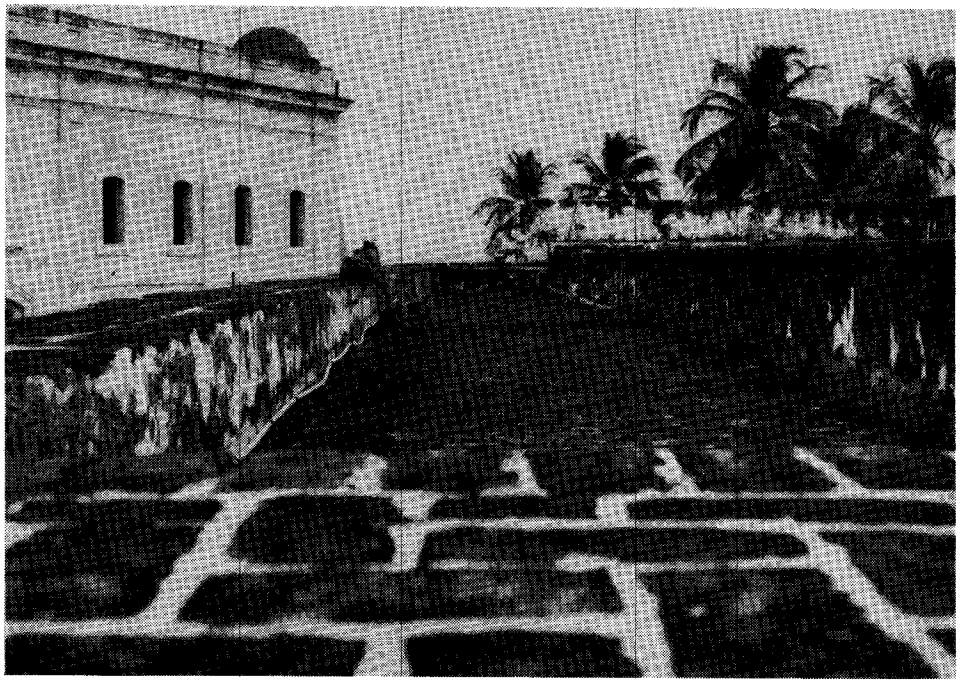


Figure 7.7b. Southern portion of Officers' Quarters roof. Photo by CPR, 1986.

scrolled termini made of stuccoed brick. These side parapetwalls have two steps running their entire length that were probably used for viewing purposes.

The main roof pitches slightly downward toward the east to facilitate drainage. Five scuppers pierce the secondary parapet wall, allowing the upper or westward portion of the roof to drain down onto the eastern section of the roof. This section pitches downward toward the plaza and to its northeast and southeast corners where drains allow it to flow down onto the Plaza.

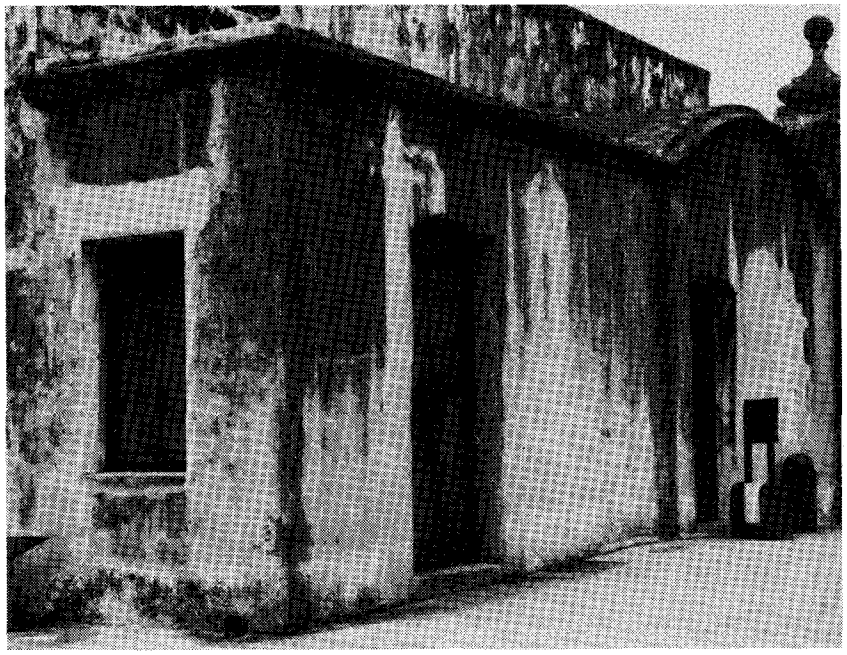


Figure 7.8. West and north elevations of north addition. Photo by CPR, 1986.

Of a later construction date (ca. 1783) than that of the main block and cisterns, is the single-story addition situated on the north end of the Officers' Quarters adjoining the east wall of the Main Gate. This small north addition (fig. 7.8, 7.9) served as an integral component of the security system surrounding the main entrance to San Cristóbal and thus, relates more closely to the principal entry gate, sentry box, and guard house than to the Officers' Quarters itself.

The walls of the north addition are topped by a simple projecting stucco cornice. Two segmental arched door openings pierce the north facade; each is fitted with modern reproduction wooden doors and transoms. The ghost of a window has been infilled and parged and is clearly seen on the west end of the north elevation below the vaulted portion of the roof. The east elevation has one rectangular window opening fitted with a wooden reproduction shutter made of vertical boards and horizontal battens.

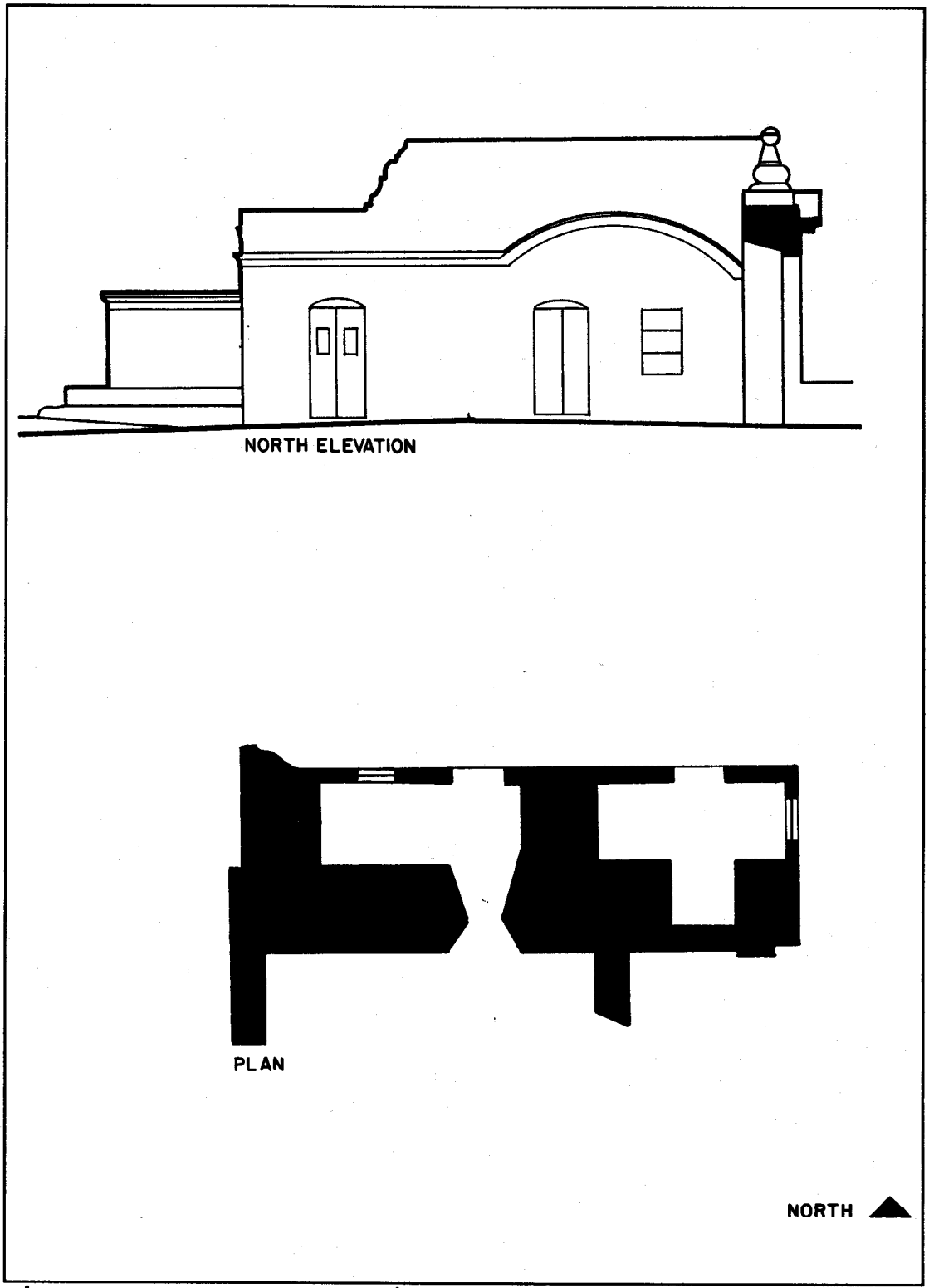


Figure 7.9. North elevation and plan of north addition to Officers' Quarters. By Jana Gross based on 1961 HABS drawings.

The roof of the north addition is flat on the east and humped on the west indicating the barrel vaulted room below. Both sections are laid in brick pavers. A low brick parapet surmounts the flat portion of the roof. Rain water runs eastward down the slope of the vault and is directed by a slight pitch of the flat section toward the northeast corner of the roof where it drains through a single outlet onto the Plaza de Armas.

The addition contains two narrow rectangular rooms. The east room is slightly smaller and has a small square alcove to the south (formerly a passage connecting it to the loggia if the main). The west room is barrel vaulted and accessed either through an opening from CM-1 or through a door facing north. The opening into CM-1 is segmentally arched with double-splayed jambs and chamfered edges. It is fitted with an original rectangular wooden door enframement of mortise and tenon construction (a modern door and enframement was installed in the opening after this investigation was conducted).

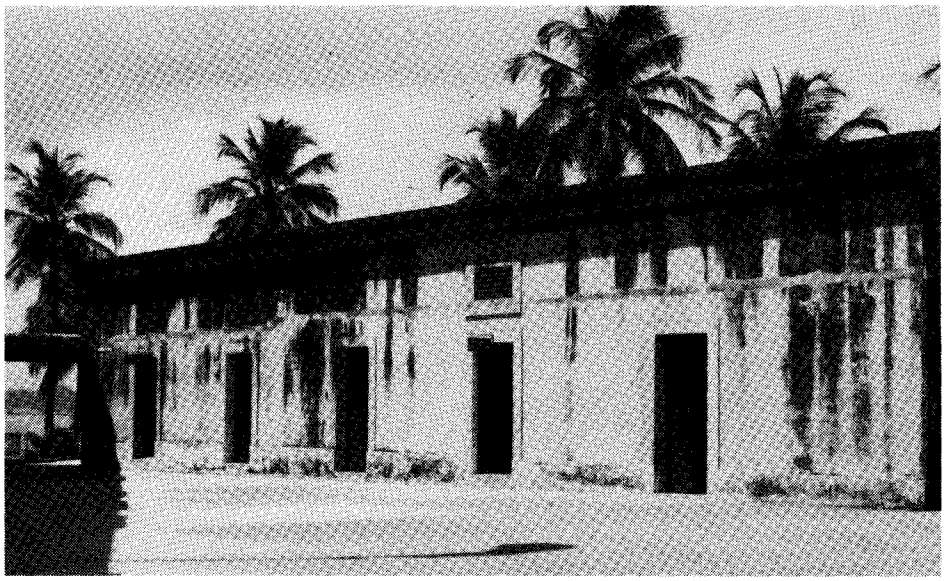


Figure 7.10. East elevation of the south annex of the Officers' Quarters. Photo by CPR, 1986.

Two types of floor paving are in place: the east end is of stone tiles and the west end is modern concrete. These two pavements relate to a former partitioning of the space into two small rooms. Ghost lines can be seen along the ceiling and in line with the projecting masonry reinforcement around the north doorway.

At the opposite end of the building is the south annex (fig. 7.10), a single story addition to the Officers' Quarters. The wing is roughly triangular. This addition contains approximately ten varying-sized rooms that are used by the NPS for administration and to accommodate public restroom facilities, storage closets and changing rooms for park administration.

The east elevation exhibits five rectangular door openings with plain banded masonry surrounds pierce this otherwise unarticulated facade. Openings are fitted with modern wooden doors. One rectangular ventilator with a banded-masonry surround is located above the second doorway from the north end of this wing. A low parapet wall (parged in modern cement) tops this addition.

The west elevation of the south annex rises above, and is engaged to, the battered stone wall of San Cristóbal. The facade is pierced by nine openings of differing dimensions, some of which have been partially infilled. Two scuppers project one foot from the plane of the facade. In addition, a series of scuppers run north at the level of the Plaza. Below the central scupper is a semicircular stone basin. It is likely that it originally collected and drained water run off. Below this wing, the west wall is traversed by two large iron waste pipes.

The roof has been replaced with modern concrete, covered with red clay tiles laid in a herringbone pattern. Ventilation pipes from the restrooms below pierce the parapet wall at the roof level. The roof of this addition pitches downward to the north and southwest corners to feed two scuppers located on the west side.

Structural Evolution

Period 1: 1625-1765

No documentation on the Officers' Quarters has been found for this period that predates the planning and construction of the structure.

Period 2: 1765-1809

The Officers' Quarters were not indicated on any of the 1765 plans or sections that detail O'Daly's modernization of San Cristóbal. It was O'Daly's construction reports of 1773-75 that documented that the Officers' Quarters were planned, designed, and built during this brief two to three year period, with actual work concentrated in 1775.[1] These records also indicated that the structure was planned and built without the customary approval from Spain. The late historian Ricardo Torres-Reyes explained that by the last six months of 1774,

> "five vaults with porticoes were being built above the cistern for guard rooms, lodging for the officer in charge of the cleanliness and custody of the fortress, and the personnel assigned for the daily distribution of water and cleaning of the cisterns."

By the end of the first months of 1775, the five vaults with porticoes above the cisterns were ready for use.[2] The five-bay quarters with five corresponding cross vaults, including well house structures, were completed during 1775. A document dated March 31, 1775 referred to the building specifically for use as "lodging for officers or any other use the governor may desire".[3] Originally, as shown on plans dated ca. 1775-83, the thick north and south end walls of the Officers' Quarters were each pierced by a single doorway forming a central communication corridor that ran north-south through the building.

On Juan Mestre's plans and sections dated September 13, 1783, a narrow single bay addition housing two rooms was shown in plan for the first time on the north side. (See figs. 7.11, 7.12.) The west cross-vaulted room was accessed from the main block through its outwardly-splayed, external entrance. Illustrations showed that each room of the small rubble, brick, and stone addition also possessed an opening giving access directly to the north or Main Gate area. All illustrations from this period depicted an open loggia on the east elevation. Two circular structures with circular well heads were



Figure 7.11. Section through the Officers' Quarters showing cisterns below, ca. 1775-1785.

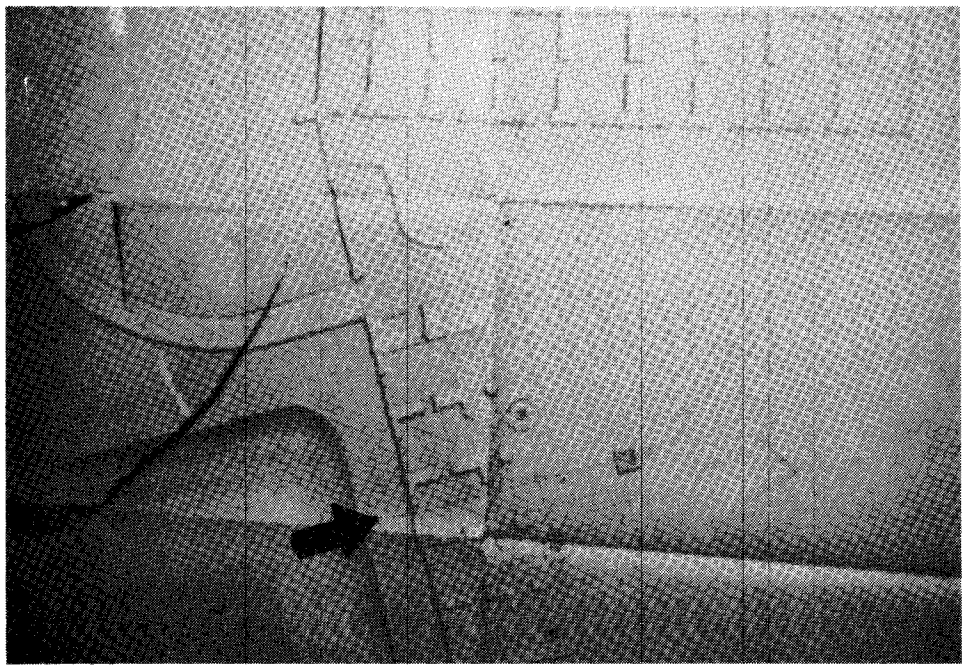


Figure 7.12. Plan of the Officers' Quarters by Juan Mestre, ca. 1783.

represented in what appears to have been their original form. A section taken through the Officers' Quarters (ca. 1775-1785) illustrated certain details of interest regarding the structure and its construction.[4] The masonry arches of the loggia were depicted as ashlar stone with clearly visible joints. Panels between the arch and projecting cornice appear to be recessed. The east elevation of the north addition was shown without windows in contrast to later drawings. Other details are discussed in sections of this report pertaining to the Cisterns and Well Houses. (Chapter 5).

Period 3: 1809-1837

The earliest available view of the west elevation of the Officers' Quarters is found in an 1821-23 sketch (fig. 7.13) of the fortifications drawn by August Plee, a French artist and botanist, while touring Puerto Rico.[5] As this view was only a rough sketch, the accuracy of details must be somewhat suspect. Nevertheless, some features of the city side elevation were of interest. Plee drew a simple facade pierced by five windows, each with a projecting sill, but with no enframements visible. The elevation was topped by a projecting cornice of different profile from that later seen and traversed by a secondary projecting cornice that runs across the facade below the windows and above the large arches of the blind arcade.

Period 4: 1837 - 1868

A model of 1839 documented the Officers' Quarters as extant during this period.[6] the model itself has been found inaccurate in its representation of many construction details, it is unlikely that it is totally in error in this respect.*

It is apparent from the 1839 model that by this time, the loggia was infilled. The infill construction (fig. 7.14) effectively transformed the exterior loggia into five small interior chambers that provided enclosed access for officers to their bath. These infill walls were constructed of brick laid in a running bond with vertical slits for light and ventilation. Evidence for these walls is retained in the form of a narrow line running up each pier through the projecting molding and along the underside of each arch at the point of contact of partition walls with the main structure. Stucco

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*It should be noted that this model was previously misdated to 1846. The correction of this error will alter (make more accurate) certain previously established dates of construction based on the incorrect dating of the model.

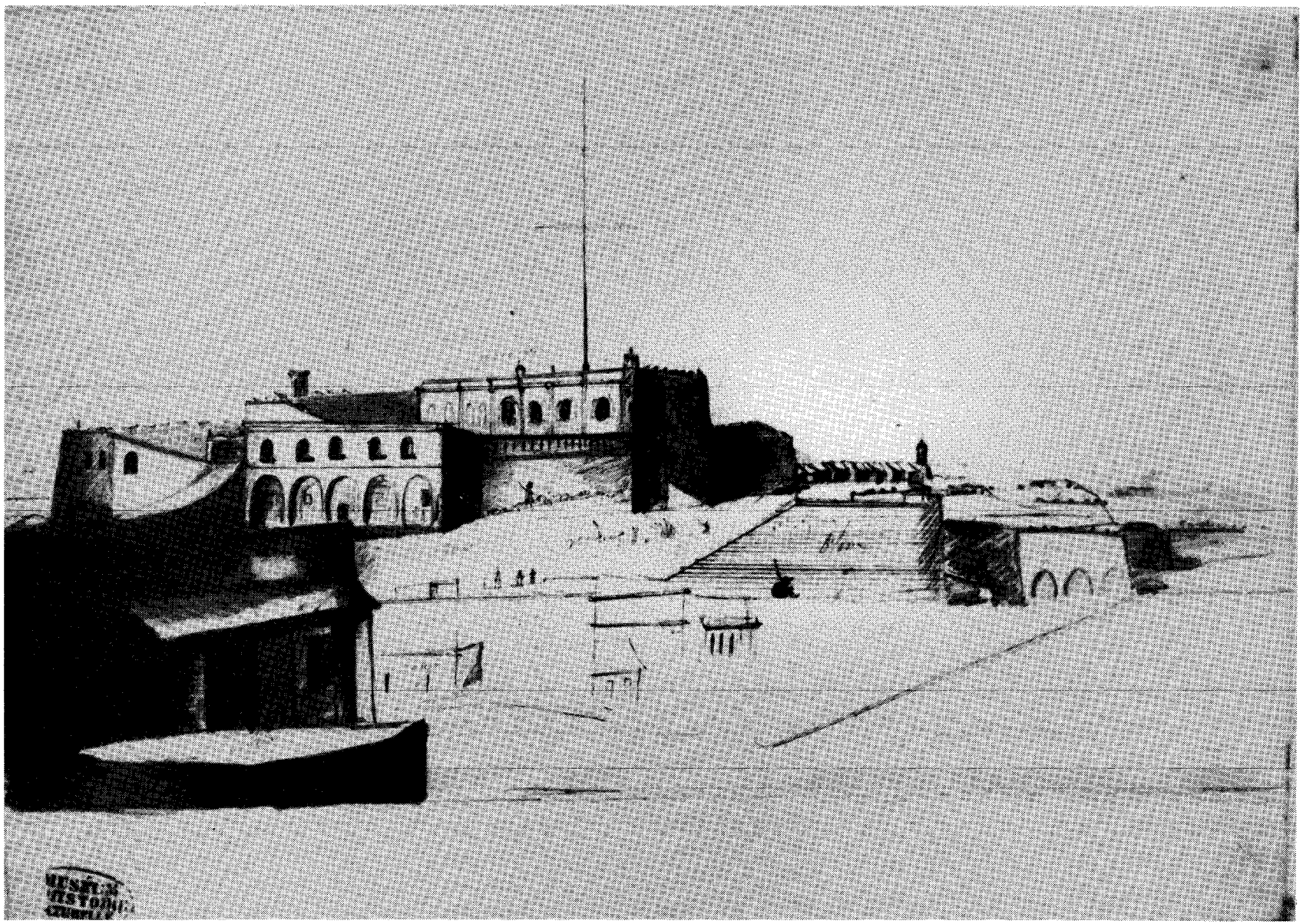


Figure 7.13. Sketch by August Pleé, ca. 1821, showing the west elevation of San Cristóbal. (HABS negative 181.197.)

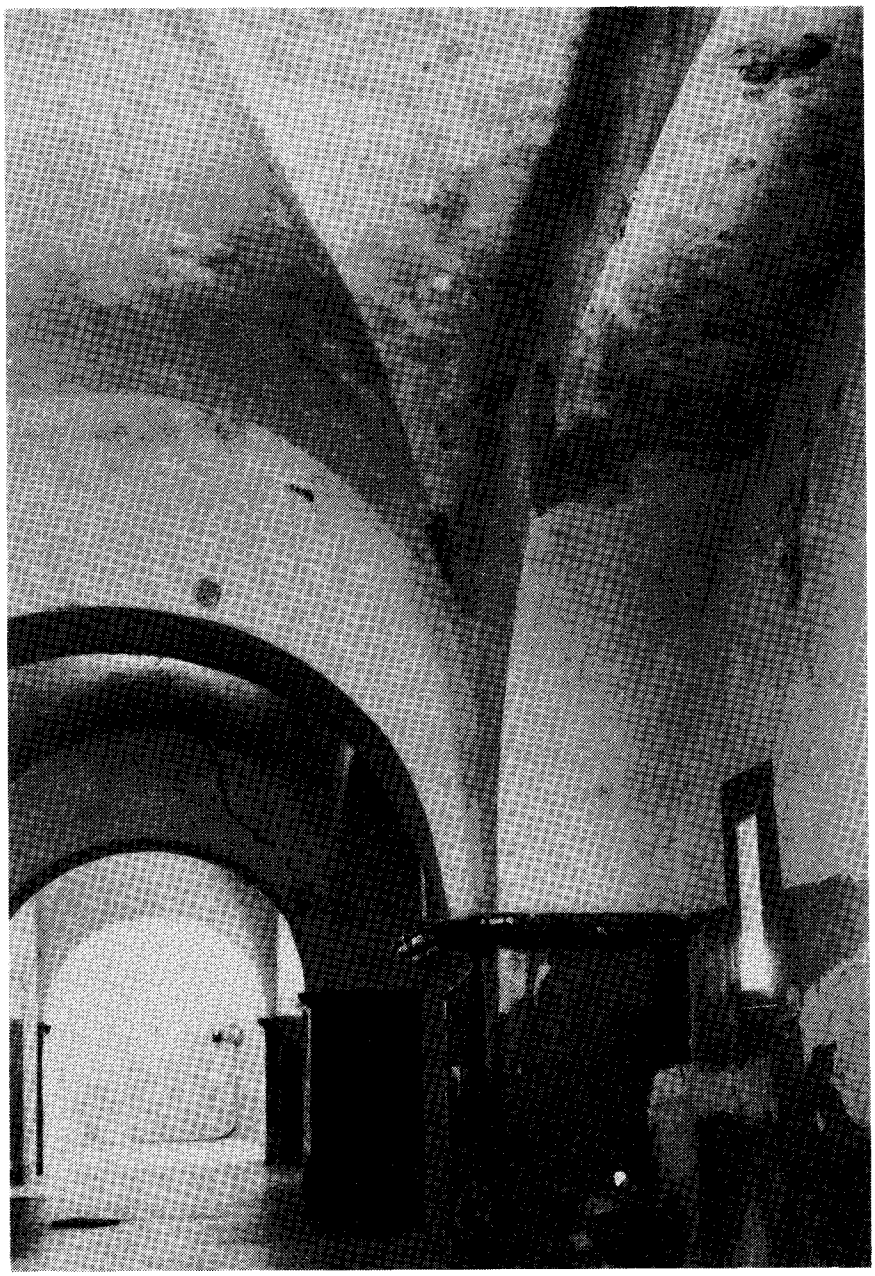


Figure 7.14 Interior of loggia looking north prior to restoration. HABS photo by Russell V. Keune, 1960.

build-up is greater on the interior side of this line, indicating that the infill wall covered this area. Missing sections of each molding indicate where the infill walls were located. These pieces were either removed at the time the walls were built, or when they were taken down.

The model showed the addition of a small single bay structure adjacent to the southern end of the 1775 block of the Officers' Quarters. It contained two rooms with no interior connection. The original Officers' Quarters entrance on the south elevation was retained to provide access into the newly constructed west chamber. An opening was cut through the south end wall of the Officers' Quarters loggia to access the east chamber. Each chamber was pierced by a window in its south elevation. The west chamber possessed a window in its west wall. The east chamber similarly possessed one window on its east wall.

Records dated February 16, 1845, documented the renovation (or decoration) of an office in the Officers' Quarters for the office of the Governor of Puerto Rico. It was recorded that this work was carried out at the cost of 1664 pesos and 7 reales, for the comfort, distinction, decency, and decorum of the officers.[7] Details are unknown.

An earlier completion date for the south annex is further substantiated by an 1854 plan that showed this addition complete at least in form and plan.[8]

An official document of 1858 discussed significant "improvements and alterations" made to el Morro and states that similar significant improvements were made at San Cristóbal for the previous year.[9] This suggests that it was at this time that the doors and windows of the Officers' Quarters received their louvered shutters. The report also documented the construction of a building on the Plaza de Armas for use as a bathroom, barbershop and two prisons. The construction occurred between 1849-58 and most likely referred to the construction of the south annex of the Officers' Quarters.

Of special interest are rooms 1, 2, and 2A that appear to survive from an earlier addition of ca. 1835 and then incorporated into the south annex between 1849 and 1858. This earlier structure is evidenced by the thick masonry walls of these rooms. In Room 1, a modern closet fills the splayed opening cut through the thickness of the north wall and that served as a doorway linking the ca. 1835 addition to the loggia of the main block. Room 2B, formerly a partially enclosed patio area, was converted to a room in the twentieth century, and retains original architectural fabric. A cylindrical recess about three feet wide exists in the east wall approximately one foot from the ground. Archival documentation

suggested that this recess was formerly utilized as an exterior officers' latrine in 1861.

Many changes made to the Officers' Quarters during this period were detailed in Manuel Castro's extensive set of plans and elevations of 1861. (See fig. 7.15 and Volume I.) For the first time the west elevation appeared in a measured drawing. The simple upper cornice depicted by Plee (ca. 1821) was now seen as an ornate cornice with a parapet. The intermediate cornice has been removed. The facade was articulated by six colossal pilasters with projecting bases and capitals. Cistern vaults 1 thorugh 4 of the blind arcade were enclosed with wooden slat partitions, each pierced by a rectangular door opening, and vaults 1, 2, and 4 by a window or vent. Segmental arched window surrounds were seen in place at this time. The western elevations of the ca. 1832 and ca. 1850 additions to the south of the Officers' Quarters were also clearly depicted by Castro. The west elevations were varied in height and configuration.[10] The configuration and height of these walls were later unified as evidenced in the irregular parging and differing window openings.

Castro's plans of San Cristóbal dated 1861 depict five chambers of varying sizes comprising the ca. 1850s addition to the Officers' Quarters. They appeared divided internally by narrow partition walls, each chamber having direct access to the plaza through an opening facing east. In plan, the southern end wall of this addition was seen to have two openings: a doorway providing on the west providing access to the adjacent chamber and a window. At least six latrines were indicated in the chambers adjacent to the south wall of the main block. Evidence for at least one of these can still be seen in the semi-circular niche in Room 2 of the south annex. This was also the first plan in which the Bath and Well Houses are shown connected to the loggia of the Officers' Quarters.

Changes to the casemates of the main block during this period included the addition of partitions or swinging doors in the connecting passages. Evidence for the doors may still be found on surviving wooden door casings in CM-3a and CM-4. Remaining marks from butt or cappuchine hinges indicate the existence of paired doors at each opening. There is also evidence that a thin partition wall once sealed these passages possibly forming cupboards or closets. These cupboards were apparently fitted with paired doors hung on triple butt hinges, the outlines of which still remain. The north passage opening of CM-4 still retains a beaded mortise and tenon arched casing, possibly relating to the cupboards.

The fact that closets may have existed is supported by information contained in 1962 photographs of these passages.[11] Ghosts of evenly spaced shelves on the walls were clearly

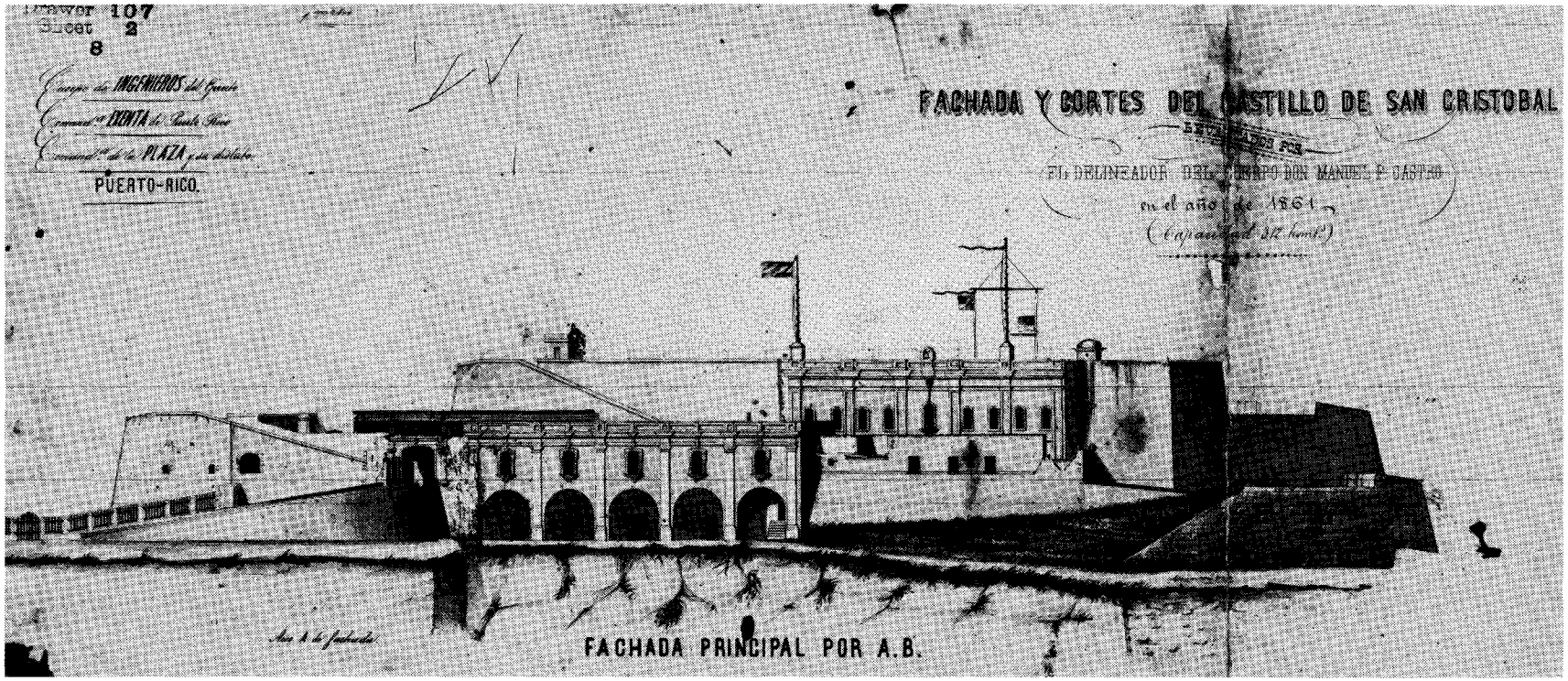


Figure 7.15. West elevation of the Officers' Quarters. Drawing by Manuel Castro, 1861. (HABS negative 181.22.)

visible and edges of the arches appeared to have been cut out, as if a door enframement had been set in and later removed. A short partition wall was also visible to the west of the doorway in the west chamber of the north addition. Evidence for this partition remains as a narrow groove in the floor that may have been cut to accommodate a stud door casing running north to south. Another outline runs along the ceiling in line with the floor groove. What may have been a hole on the floor for the door's dead bolt remains. The ca. 1835 opening cut through the north end of the loggia had been infilled by this date with a narrow partition wall that remains extant today.

The earliest reliable depiction of the Officers' Quarters exterior color scheme is found in the Castro drawings. Most of the building's west elevation was shown as yellow except for the pilasters, window surrounds, cornices, and the fifth chamber of the blind arcade, all of which were white. Window transoms and louvers (presumably wooden) appeared dark green. The wooden slat partition walls were represented as dark brown. Analysis of paint samples from these areas may confirm the 1861 color scheme.

In Leon de Castro's plan of the Officers' Quarters dated 1868 (fig. 7.16), the southern end wall of the south addition was pierced by two openings, both shown as doorways. This most likely indicated that the eastern-most of these was enlarged and modified from the earlier window. The single chamber off of these openings was subdivided into two chambers, each accessed by one of the openings. Circulation in this wing has been subsequently altered by the introduction of various partition walls. The loggia, enclosed ca. 1835, has been partially reopened by removing at least two sets of north to south partition walls that formerly subdivided the space. All six latrines were represented on the plan.

Period 5: 1868-1898

Little documentation is available for the first twenty-five years of this period. Photographs from the late-nineteenth century provided the only available representations of the Officers' Quarters.[12] In a view from the southwest dated ca. 1899, the slat partition walls that were depicted by Manuel Castro in 1861 as filling the arches of the west elevation's blind arcade were no longer in place. No physical or photographic evidence for the actual existence of these partitions has been found. The question remains as to whether they were planned and never built, or constructed and removed leaving no evidence in surviving physical fabric or in photographic documentation. Although this nineteenth-century image is in black and white, it did provide limited information

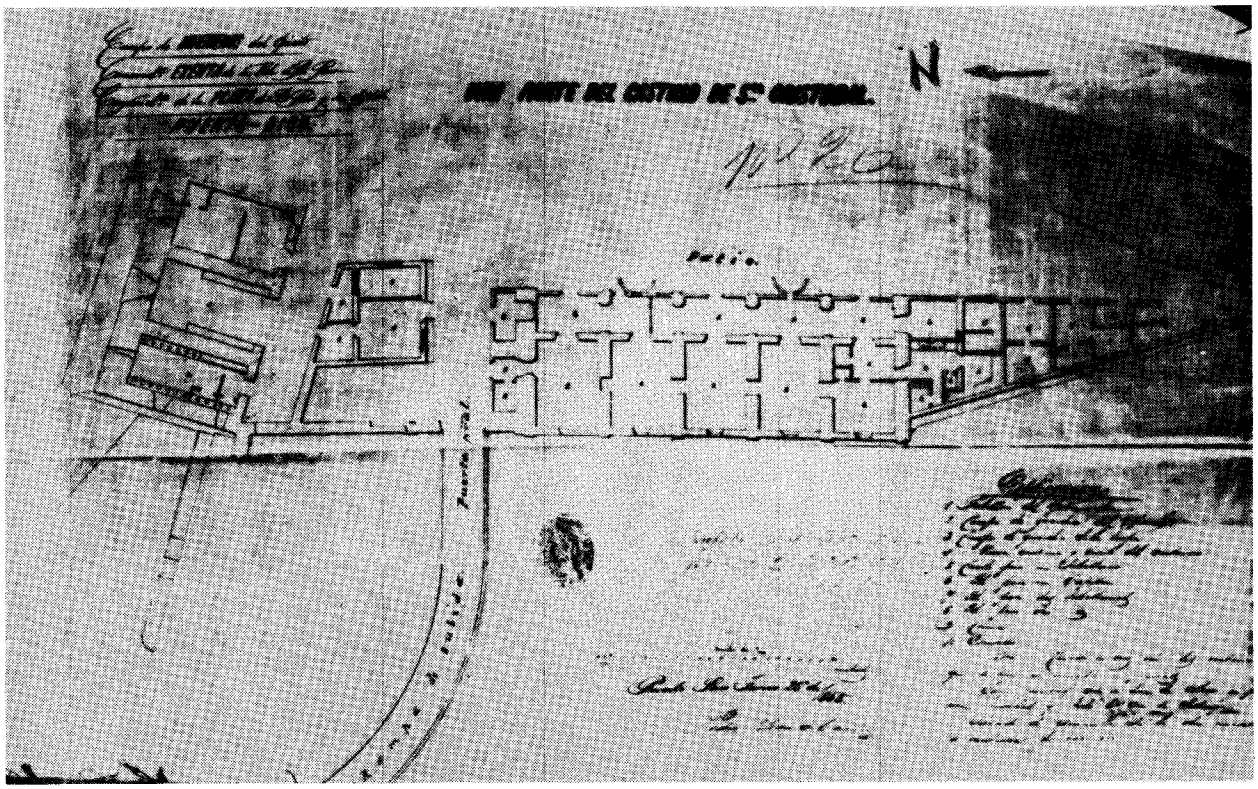


Figure 7.16. Plan of Officers' Quarters by Leon de Castro, 1868. (Archive de Indies, Seville, Spain.)

on the exterior finishes of the period. As illustrated by Manuel Castro in 1861, a two-tone scheme was also discernible with a light tone on the pilasters and projecting elements and darker tones on all other surfaces.

Period 6: 1898-1986

Twentieth-century documentation of modifications at San Cristóbal include plans, inspection reports, drawings, and photographs largely generated by the U. S. Army from 1898 to 1961 and the NPS from 1961 to the present.

Changes to the Officers' Quarters were illustrated in a 1901 plan (fig. 7.17) labeled "Quarters at Fort San Cristóbal."[13] Little change was seen in the main (1775) block. Worth noting however, was the disappearance of the circular well house to the east of the Officers' Quarters formerly attached to the loggia infill wall. The small partition wall in the west chamber of the north addition was still extant at this time. In the south addition there was some altering of partition walls and usage of space. The latrines indicated on earlier plans of 1861 and 1868 have been removed and replaced by a mechanic's workshop. Rooms 4, 5 and 6 were converted for use as shower baths, tub baths, washrooms and water closets. The eastern-most doorway on the south elevation was modified into a window. In addition, the building received a coat of whitewash at this time, probably to cover failing stucco.[14]

There are remains of a lead and copper pipe system imbedded in the parapet wall of the roof of the main block of the Officers' Quarters. These may relate to the wind mill structure erected to the east of the Officers' Quarters directly over the site of the original north well house in ca. 1899. In a photograph dating to ca. 1905, the water tank was seen to have connected to a narrow pipe which ran the entire length of the structure's parapet wall. (See fig. 5.12).[15]

Also shown in this photograph were many electrical wires and poles that may relate to present day scars on the building. The former location of an electrical conduit trench of the 1940s is still noticeable in a long horizontal patch running across the Officers' Quarters east facade just above the apex of the arches. Scattered cement patches and small holes located at the center of each arch and pilaster are directly associated with a series of electrical wires that were attached to the face of the building. Metal pins that were left in place created the rust stains visible today.

There is little available documentation of the Officers' Quarters between the years 1910-1937. It appears likely that

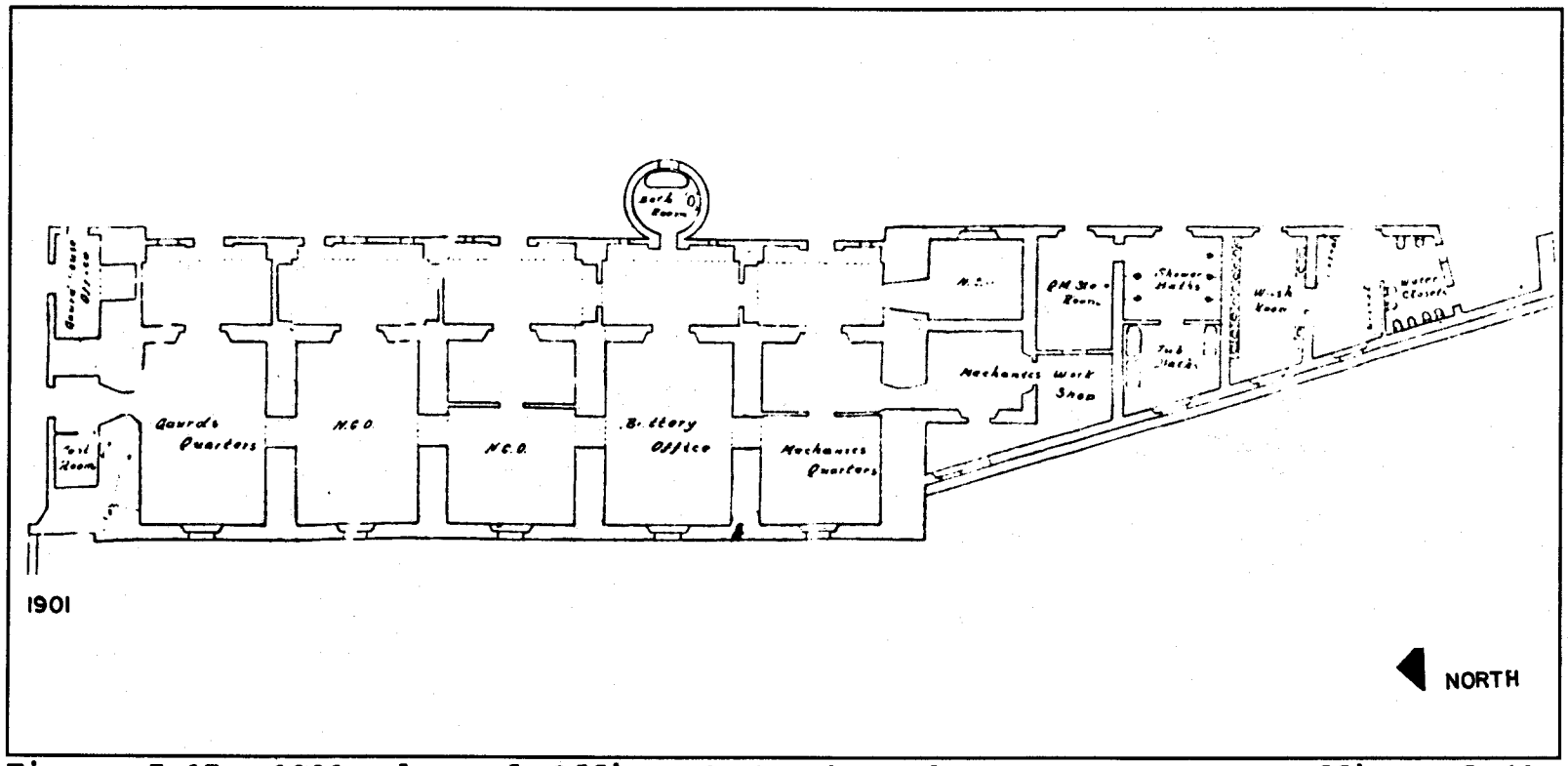


Figure 7.17. 1901 plan of Officers' Quarters by Guy S. Boyce, Office of the Constructing Quartermaster. (San Juan NHS Archives.)

minimal work, limited to minor repairs and general maintenance, was undertaken by the U. S. Army during this period. However, the west elevation was completely re-stuccoed with Portland cement in a futile attempt to arrest the prevalent stucco failure.[16]

In December of 1938 a series of improvements to the south wing of the Officers' Quarters were approved. These included, the replacement of roof tiles, remodelling of electrical and plumbing installations, patching and plastering of walls (both interior and exterior), installing new hardware where necessary, repairing cement floors, and general painting of both interior and exterior walls.[17]

By 1940, the U. S. Army Construction Quartermaster reported that the irregular configuration of the three separate roofs of the southern additions (clearly seen in 1861 plans, Volume I) had been eliminated by bringing the walls flush with the main wall and level with the main roof (which had been comprised of many small roofs at different levels). The earlier roof and brick tiles were replaced with a 3-inch reinforced concrete slab roof with tiles measuring 6 by 12 by 1/2 inches laid over it.[18] Physical evidence for these alterations is evidenced by the varying thicknesses of the parapet walls, and in the irregular nature of parging and fenestration in the south annex.

A detailed account of the use of space within the building was provided in the 1943 plan by the U. S. Army's Joint Operations Center.[19] The quarters in the north addition were occupied by the military police as a guardroom. Rooms in the main block of the building had multiple uses. Proceeding from north to south, there were recreation rooms (table tennis and billiard), a post exchange, and a weather office. The rooms formed by the enclosed loggia, fronting the above five rooms and opening onto the plaza, were likewise assigned to post exchange activities. The latrines were housed in the south annex.[20] Surviving metal clamps and minor loss of historic fabric may be explained in part by the installation and later removal of overhead telephone and electrical wires and a series of underground drains indicated on a 1949 Corps of Engineers plan labeled "As-Built Survey of Fort Brooke."[21]

Photographs from 1960 (fig. 7.18) illustrate many elements of the Officers' Quarters that have since been removed or altered.[22] It is likely that many of the changes occurred during the conversion of the Quarters to offices between 1961-64. The loggia infill walls of CM-1, CM-3, and CM-5 retained rectangular raised-brick door enframements. Failing stucco reveals that other casemates retained original vertical ventilation slits. These, along with earlier window openings, were infilled with brick and stucco or plaster (fig. 7.19).



Figure 7.18. East elevation of Officers' Quarters before restoration. HABS photo by Russell V. Keune, 1960.

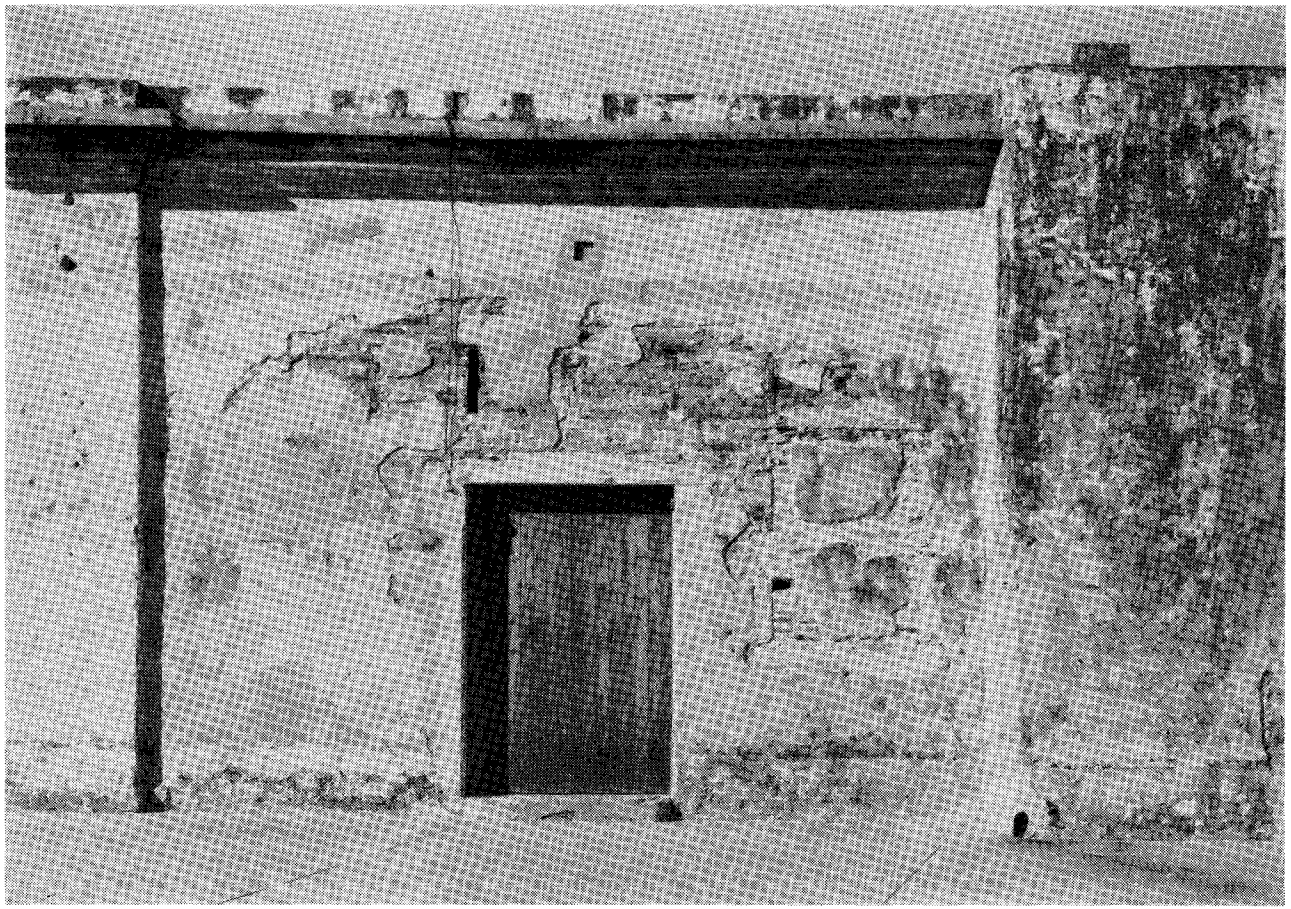


Figure 7.19. East elevation of CM-1 with loggia filled in and ventilation slits evident. HABS photo, ca. 1960. (Negative 181.167.)

Views of interior casemates showed extant wooden door and window enframements that most likely date from the 1850s. During the conversion from casemates to offices in the 1960s, masonry partitions between CM-1 and CM-2 and CM-4 and CM-5, were removed. Likewise in the 1960s, the partition between the CM-4 and CM-5 of the loggia was removed, the partition in CM-5 was removed, two windows flanking the officers' bath were enclosed, and one window on the north elevation of the north addition was sealed.[23]

A set of NPS drawings dated 10 November 1961 through 23 February 1962 entitled "Rehabilitation and Restoration - Officers' Quarters Phase II", contained some additional information on the modifications made to the structure during conversion.[24] Existing four-panelled louvered doors with cappucine hinges and louvered transoms were shown, as were their replacement designs that were to be fabricated of mahogany. Sheet 3 of the set showed a brick wall illustrated in period photographs in place in arch 3 of the west facade with the note "to be removed." A special note detailing the reparation and cement coatings of moldings and surrounds was also found on these drawings. Evidence for these coatings may still be seen in the thickened profiles of moldings and surrounds at the quarters.

The opening of the arches of the loggia did not occur until April of 1965.[25] Photographs dating from 1971 showed ghosts left by the partition removal as well as at least three different flooring tiles on the loggia's floor.[26] In several NPS photographs (from 9 August 1976) of the Officers' Quarters the wooden joist and rafter ceiling of the north addition appeared badly decayed; it was replaced with a modern replica shortly thereafter.[27]

Conditions

The Officers' Quarters are in stable condition although there are many conditions affecting overall surface materials. The east facade is generally in poorer condition than the west facade due in part to the many alterations made to the plaza elevation.

The re-opening of the east loggia upon removal of ca. 1820s infill partitions in 1965, has resulted in the loss of moldings on the pilasters at the springing line of arches in front of CM-1 and CM-5. Loss of stucco and the consequent exposure of rubble stone in the upper walls may also be related to this demolition. The entire exterior wall surface is covered with Portland cement patches, indicating that conditions in this area have been problematic for some time. Stucco has failed completely on the pilasters exposing the sandstone blocks beneath. Biological activity due to excessive moisture is visible below the cornice and on the parapet wall. The vaults of the loggia are generally in good condition but suffer from flaking of painted and stuccoed finishes.

The east and north facades of the north addition are characterized by long-term deterioration. A large diagonal crack at the junction of the north addition and the original building appears to be associated with differential settlement. Failing drainage systems have led to water seepage through the masonry walls and to subsequent biological activity as evidenced by dark stains on the walls.

The west facade of the main block and of the additions is in good condition as compared to the east facade.

The building's exterior primary and secondary cornices are seriously eroded and have lost their sharp profiles. Biological activity in the form of mildew is observed around all windows openings and at the upper cornice. Long vertical cracks are visible on the pilasters and smaller cracks are located around the arches.

By-in-large, wooden doors and shutters are in stable condition.

The interior spaces of the Officers' Quarters are in overall sound condition. Continuous use of this building as office space over the past 20 years has most likely increased routine maintenance and contributed to the generally stable condition of building fabric. Scattered areas of flaking plaster and mold growth on plaster are present. These conditions probably relate to areas of moisture infiltration.

NOTES

1. These construction reports by Thomas O'Daly are dated 5/12/1773, 1/20/1774, 6/30/1774, 1/5/1775 and 9/15/1775 (AGI-SD) 2510-44 and AGI-SD 2510-45).

2. Ricardo Torres-Reyes, Construction History of San Cristóbal: 1634-1800 (National Park Service: San Juan National Historic Site, June 1965), p.91. Original reference to reports of Thomas O'Daly, June 30, 1774, covering the period of January 20-June 30, and report dated January 5, 1775 covering the months of July-December, 1774. AGI-SD 2510-45.

3. Woodrow W. Wilkins, Historic Structure Report Part I - Officers' Quarters Castillo de San Cristóbal (NPS, San Juan National Historic Site, October 1961), p. 9. Original reference to a construction report by Thomas O'Daly dated 3/31/1775, AGI-SD 2510-47.

4. This section entitled "Elevacion y Perfil que pasa por la linea 1 2 3 4," although undated and unsigned, most likely accompanied Mestre's plans of 1783.

5. The original ca. 1821 sketch by french artist August Plee is in the collection of San Juan NHS, San Cristobal. It is reproduced in this report from HABS negative #181.197.

6. A copy of the original 1835 model commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at Museo do Ejercito, Madrid, Spain.

7. February 16th, 1845. Archivo Histórico Nacional Ultramar, P.R. Legajo 6354, expediente 46.

8. This 1854 unsigned plan, entitled "Plano de la Plaza, San Juan Bautista de Puerto Rico" is located in the San Juan NHS Drawing Collection.

9. "Parte de la Revista pasada en el ano de 1858 - Ysla de Puerto Rico, Commandancia Exerta de Ingenieros." Servicio Historico Militar no. 4-1-8-5, Madrid, Spain.

10. The photographs dated ca. 1898 and the ca. 1904 postcard are both in the collection of San Juan NHS, San Cristóbal.

11. Russell V. Keune, Officers' Quarters, Historic Structures Report, Architectural Data Section (NPS, April 1962).

12. These untitled photographs dated ca. 1880-1889, are in the collection of San Juan NHS, San Cristóbal.

13. A copy of this plan, titled "Quarter's at Fort San Cristóbal, San Juan, P.R., as existed February 12th 1901, Office of Constructing Quartermaster, S.J." is in the drawing collection of San Juan NHS under location number FC7-DR3-ENV134.

14. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of Interior, NPS, February 1984), p. 109.

15. This untitled photograph is in the collection of San Juan NHS, San Cristóbal.

16. Bearss, p. 307.

17. Ibid., p. 326-327. Original reference to drawings titled, "Repairs to South Portion of West Building, Structural Plan, Office of the Constructing Quartermaster, Post of San Juan, P.R., Repairs to San Cristóbal Fort, Project No. QM 3419-QM 7119-099-A999-89 Sub-project DD, Dec. 30, 1938." Information also included in correspondence of Violante to Constructing Quartermaster, Jan. 27, 1939, WNRC, RG 92, File 600.1.

18. Ibid., p. 327.

19. Ibid., p. 374.

20. Ibid., p. 374.

21. This plan dated 1949 and entitled "As-Built Survey of Fort Brooke Company Headquarters" is in the drawing collection San Juan NHS - San Cristóbal, drawing no. FC1-DR4-ENV020.

22. Keune, Historic Structure Report.

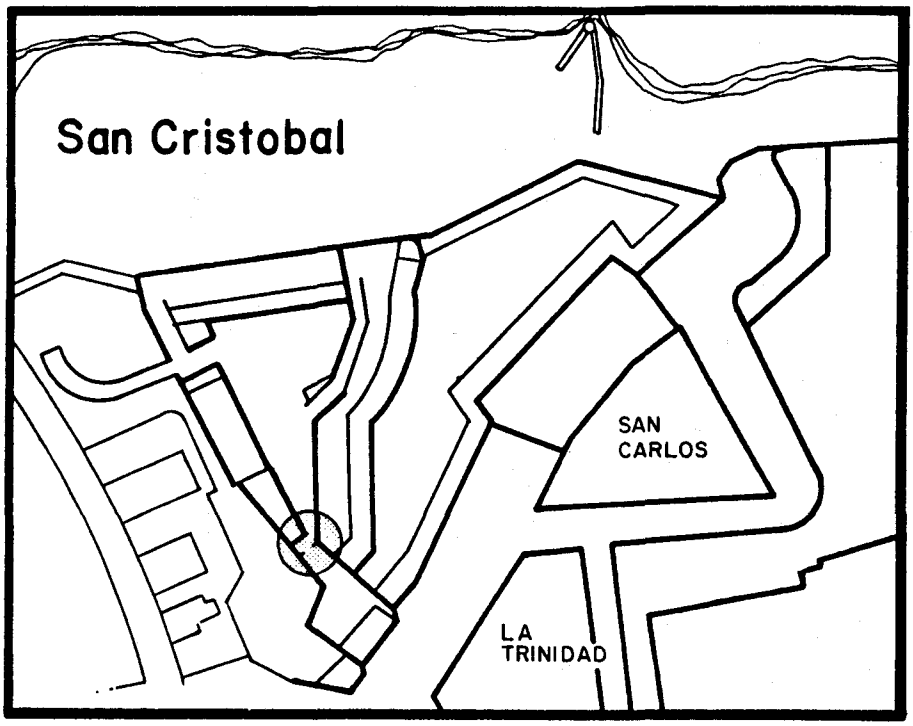
23. See NPS Completion Report D.2623, in the collection of San Juan NHS, San Cristóbal.

24. NPS Drawing NHSSJ 3062, dated 11-10-61 and 2-23-62 available in the collection of San Juan National Historic Site, San Cristóbal.

25. NPS Completion Report D.2623, (San Juan NHS, San Cristóbal, Supertendent's Office).

26. NPS photograph dated 1971 on file in the collection of San Juan NHS, San Cristóbal.

27. NPS photograph, "Interior View of Ceiling Supporting Structure also shown Officers' Quarters - Fort San Cristóbal" and dated 8-9-76, located in the collection of San Juan NHS, San Cristobal.



CHAPTER 8

THE SOUTH GATE

Description

The South Gate is located at the southern tip of the Plaza de Armas giving access to the upper and lower batteries of the South Bastion and to the sloping terrain (pomerium) to the west of the fort. Originally, this gate also gave direct access to Santiago Gate, the main entrance to the city. The gate is engaged on the east to the battered wall of the southwest corner of the Troops' Quarters and on the west to a low ornamented parapet wall south of the ca. 1861 north addition to the Officers' Quarters. A gently sloping ramp leads away from the gate in a southwesterly direction terminating at the lower battery of the South Bastion. The gate was historically known as Puerta del Socorro (gate of back-up assistance). (See figs. 8.1, 8.2, 8.3.)

The South Gate is of simple design, characterized by two monumental stone posts (9 feet high) which support a brick and wood lintel. The posts are of ashlar stone (10-12 inches high, variable length) laid with brick spacers creating joints 1-2 inches wide and are topped by brick-supported, bell-shaped sandstone caps. Mortises, now filled at the apex of each molded stone cap, suggest that the posts were once finished with decorative finials. Surviving stucco evidence suggests

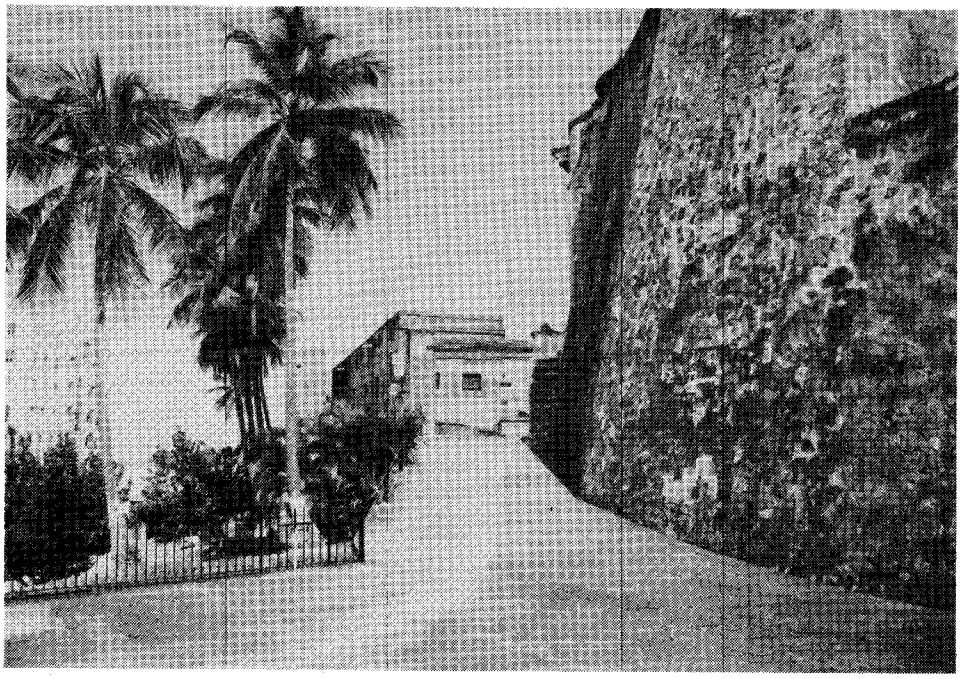


Figure 8.1. View of the South Gate looking north into the Plaza de Armas. Photo by CPR, 1986.

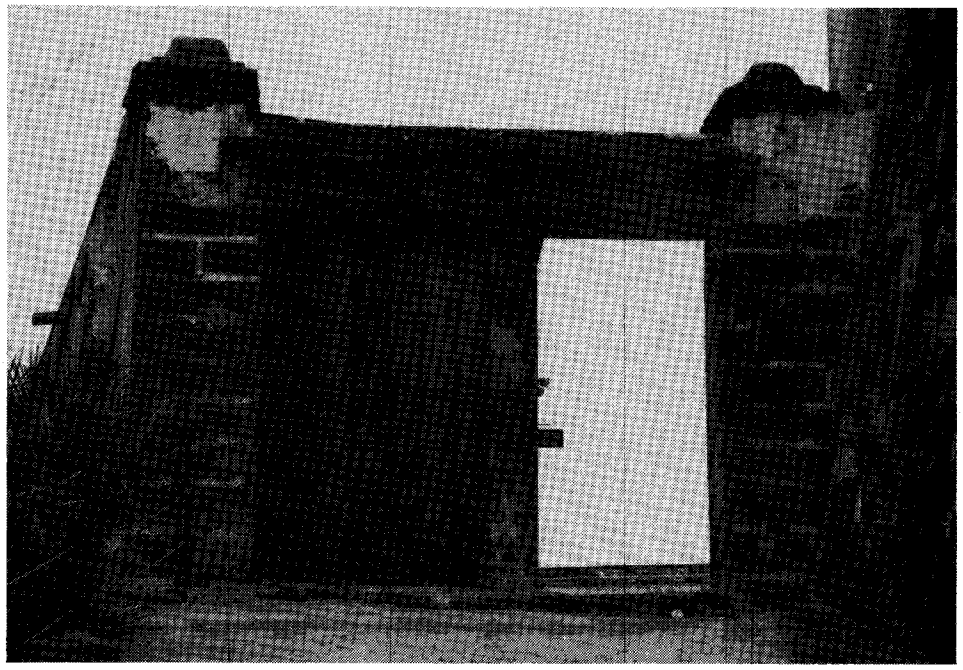


Figure 8.2. South elevation of South Gate looking into Plaza de Armas. Photo by CPR, 1986.

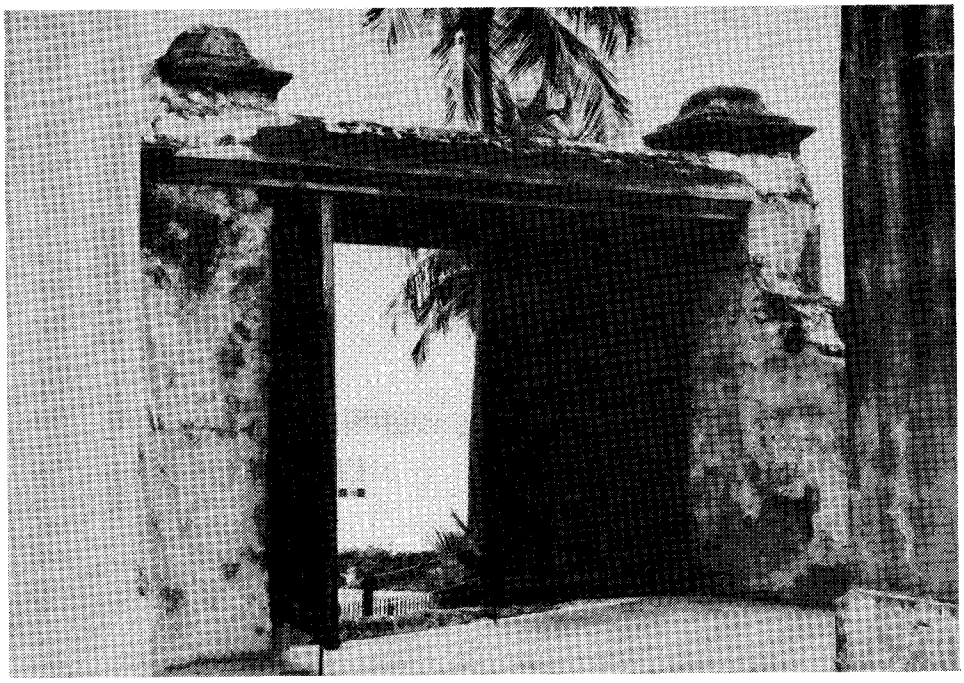


Figure 8.3. North elevation of South Gate. Photo by CPR, 1986.

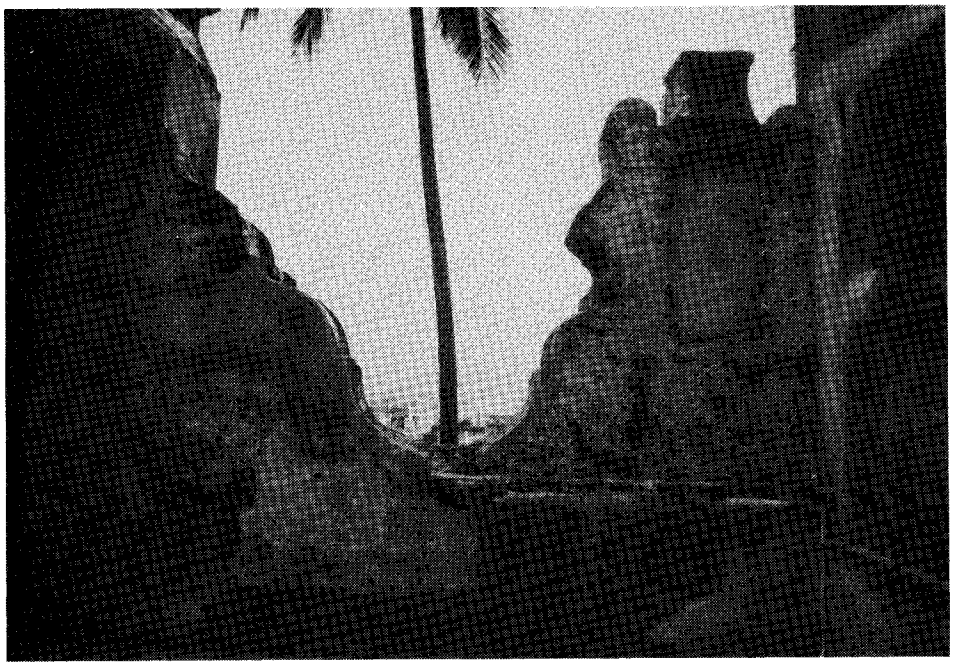


Figure 8.4. West wall adjoining the South Gate with scrolled parapet. Photo by CPR, 1986.

that the exterior gate was stuccoed and scored with 7/8-1/16 inch joints outlined in black.*

The brick lintel is ornamented on both sides by a molded cornice, the exterior being more elaborate. The interior face of the entrance is splayed outward to accommodate a pair of inward-swinging doors. The opening is now fitted with a reconstructed gate of narrow wooden slats held upright by crossbars sometimes referred to as a harrow gate. The gate retains its original raised (6-inch) stone threshold.

The west wall (fig. 8.4) incorporates an elaborately scrolled parapet which is comprised of a double scrolled gablet (small ornamental gable) and a scrolled buttress of different profile which is engaged to the gate's west post. The profile of this scrolled buttress matches the scrolled parapet wall on top of the original (1775) end walls of the Officers' Quarters. Evidence of a round arched niche, now rubble infilled, can be seen on the west face.** The wall is constructed of brick; the scrolled profiles which have been somewhat altered are created by cut or molded bricks with stucco parging.

The ramp leading down to the lower batteries is surfaced with modern hormigon and flush-edged with modern brick. Drainage from the ramp feeds into a brick-lined drainage trough which runs north down the sloping terrain.

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*SAJU 08 M09.

**SAJU 08 M11.

Structural Evolution

Period 1: 1625-1765

The South Gate was not in existence during this period of the fort's development.

Period 2: 1765-1809

In plans dating through 1766, internal access into the fort from the south was introduced as a series of temporary ramps leading up the slope from the pomerium below. Although the present ramp was established by 1773, no formal gate is depicted until Mestre's plans of 1783 (fig. 8.5). This gate marked the intersection of the newly established ramp and the end of a low parapet wall extending from the southwest corner of the original block of the Officers' Quarters (constructed at this time) to enclose and define the Plaza de Armas. Nineteenth-century copies of late eighteenth-century drawings (fig. 8.6), possibly by Mestre, provide the earliest depiction of this gate and its associated west wall. The west face is shown in elevation as a low parapet wall connected by a scrolled coping to a square, stone capped post. The coping is similar in profile to that of the end parapet walls of the Officers' Quarters. It is unclear whether this gate was initially

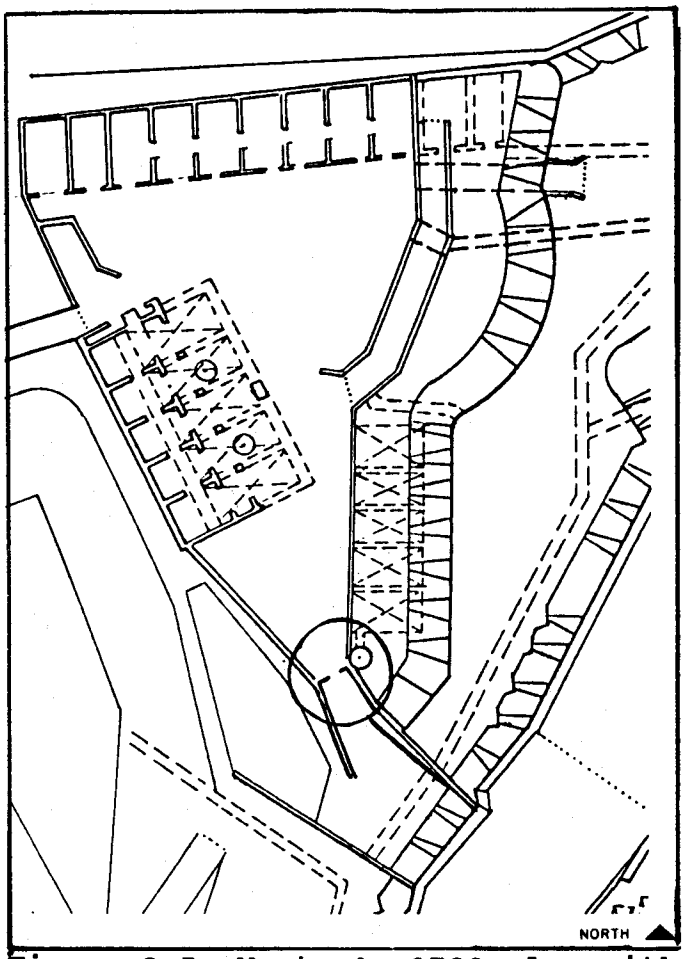


Figure 8.5. Mestre's 1783 plan with South Gate circled. Tracing by Jana Gross (1989) based on tracing by Torres-Reyes (1965).

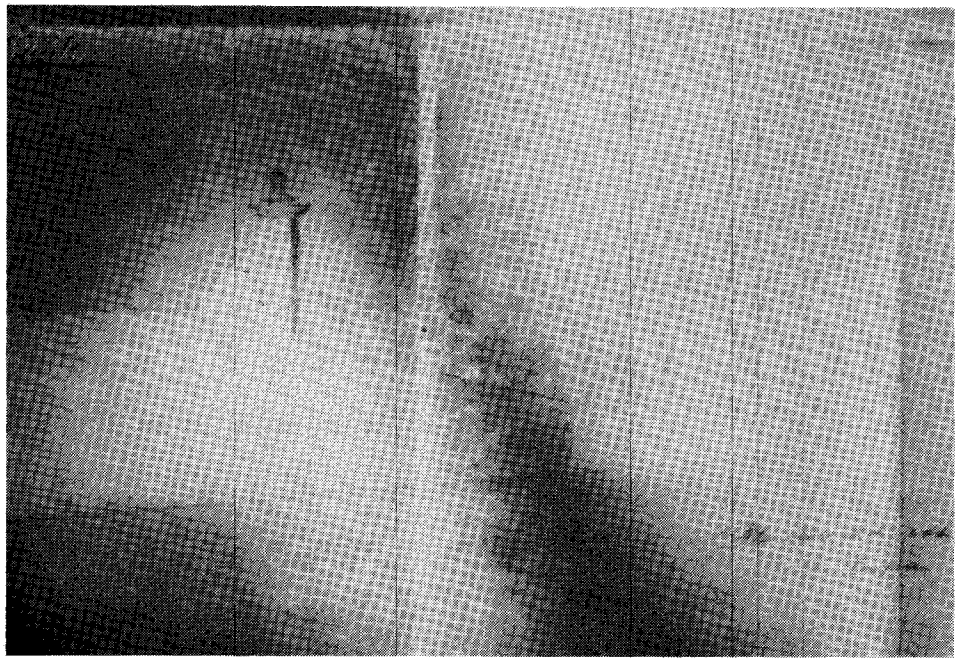


Figure 8.6. 19th-century copies of 18th-century drawings by Mestre. Top: Section looking east. Bottom: Section looking south.

constructed with an overhead lintel or simply as two posts containing a harrow gate. At this time, the post's decorative caps were of a type similar to those found on San Cristóbal's Main Gate.

Period 3: 1809-1837

Building documents of engineer Ignazio Mascaro dated 1808-1817 clearly indicate that the southern portion of the west parapet wall was increased in height during this period in order to prevent the frequent escape of soldiers.[1] This modification must have affected the South Gate and surrounding area, but at present no documents are available to illustrate the effect of the alterations on the structure.

Period 4: 1837-1868

A model of the San Cristóbal fortifications dated 1839 includes the South Gate and depicts for the first time a lintel spanning the gateposts.[2] It is probable that the lintel was constructed some years prior to this, possibly at the time the gate was built. No documentation has been found to substantiate this.

Documentation for this period includes plans and construction records which reflect the general trend of alteration, modification, and completion which characterizes San Cristóbal's building projects during this time. It is at this time that the name Puerta del Socorro is first used.[3]

Construction records kept during the period 1849-58 refer to widening and increasing the height of the Santiago Gate.[4] While the South Gate is not referred to specifically in these documents, it is clearly stated that similar repairs and modifications were made in various locations at San Cristóbal. It is highly possible that the South Gate was also raised at this time by the lifting up of its lintel onto the brick extensions (2 feet) that are presently visible on top of each gate post. Although at present it is unclear whether this modification occurred, it would explain the curious brick and ashlar construction of the South Gate.

The Castro plans and elevations of 1861 (fig. 8.7) contain many informative illustrations of the South Gate. Directly to the north of the gate, a decoratively scrolled projection of different profile than that of the western gate post appears with a slightly recessed masonry wall connecting the area between the scrolls and the west post of the gate. Although this is the first available representation of this decorative

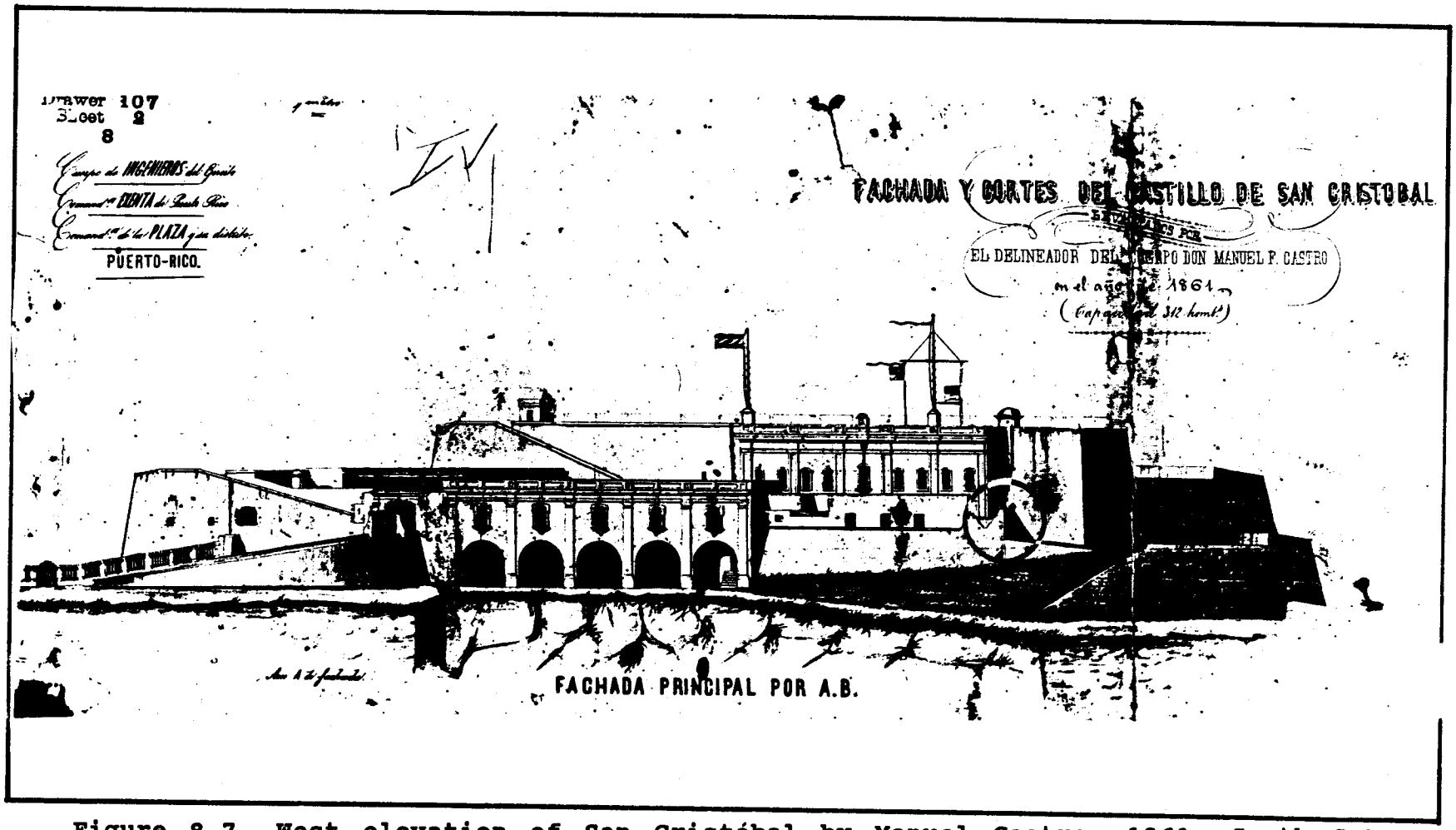


Figure 8.7. West elevation of San Cristóbal by Manuel Castro, 1861. South Gate circled. (HABS negative 181.22.)

element, it was probably constructed atop the parapet wall someyears prior to 1861, with the area between the decoratively-scrolled projection and the west gate post infilled by this time. No niche or rubble-filled arched opening is seen in the Castro elevations of the west facade of the fort, but it is extant and visible in 1986. A large wooden door fills the entire flat arched area between the two gate posts.*

Period 5: 1868-1898

Modifications to the South Gate do not appear in any available documents during this period.

Period 6: 1898-1986

A photograph (fig. 8.8) dated ca. 1898 shows a large portion of the gate opening to have been infilled with a masonry wall to accommodate a modern narrow wooden door set in a wooden frame on the eastern side of the opening. Fragments of broken glass, which most likely served as deterrents to climbing on the gate, covered the top of the lintel and the small masonry infill wall. A photograph dated 1899 indicates that a small rectangular opening or window was cut through the masonry infill between the decorative scroll and the west gate post.[5]

The next notable developments in the South Gate's evolution are not until the 1960s when many features evidenced in the photographs of the 1963 Accelerated Public Works disappear in ca. 1964 images.[6] (See fig. 8.9.) Among these are the infill between the parapet scroll and west gate post (now replaced by a metal reinforcing bar), and two small shed structures that were engaged to the interior walls of the west corner of the gate. Traces of interior finishes from these structures are still visible on the original west and south walls in the ca. 1964 photographs.

During the 1968-70 restoration of the gate, the thick masonry wall that had been constructed to narrow the gate's opening was removed, as was the crushed glass embedded on the top of the lintel. At this time the gate was fitted with a reconstructed gate of wooden slats.

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*SAJU 08 M04, scrolled projection. SAJU 08 P03, parapet wall. SAJU 08 M02, arch of the door opening.

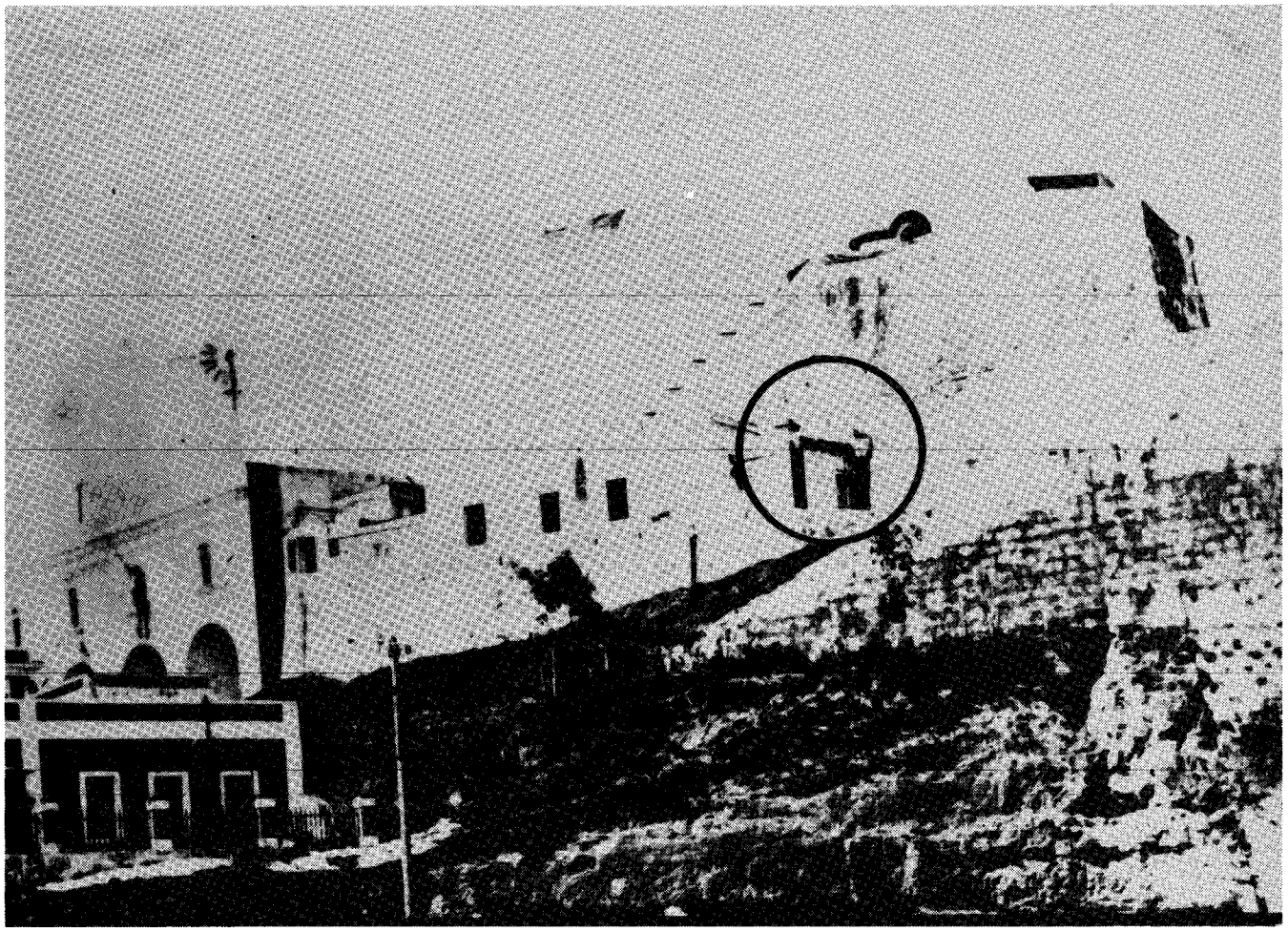


Figure 8.8. View of south west portion of San Cristóbal with South Gate circle. Note masonry infill of doorway, ca. 1898. (San Juan NHS Archives.)



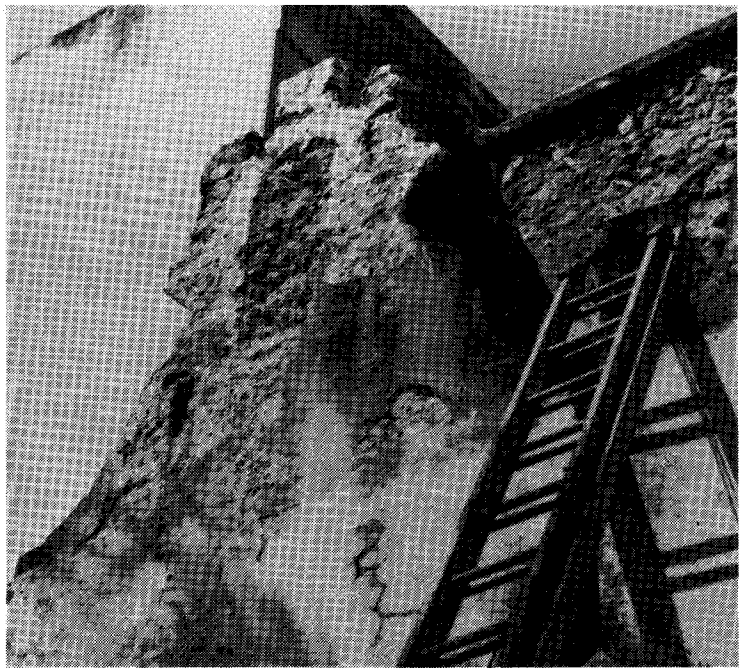


Figure 8.9. APW photos showing existing conditions and methods of patching of the South Gate, ca. 1963. (San Juan NHS Archives.)

Conditions

The South Gate shows many conditions which have been observed at other structures throughout the site. These include erosion, open joints and differential weathering. As the gate and its west wall are open unprotected structures, constant exposure to the weather has caused continued erosion and loss of mortar. Biological activity, however, has been minimized in this area because the exposed gate also receives the drying action of the sun. Although many modifications have been made to the structure, it is in fair condition.

At the gate itself, differential weathering is observed more specifically on the southern and eastern faces of the stone posts. Although both dressed ashlar sandstone posts show many open joints (mostly bed joints), a higher concentration is seen at the western post. There are also localized areas of repair which have been patched with a light colored mortar that does not match the original stone in color or texture.

The sandstone caps that top the posts are in good condition, although profiles are somewhat dulled from weathering. There are remains of an old stucco with scribed lines at the uppermost portions of the stone posts. The gate's stone threshold is severely eroded and shows scattered mortar patches and losses of stone probably related to the removal of the infill wall during the 1968-70 restoration. The cornice shows minor cracking, severe erosion and black staining associated with biological activity.

The adjacent scrolled west wall (gable and buttress) is in much poorer physical condition than the gate itself. The brick and rubble fill construction is, as would be expected, more severely eroded than the ashlar stone posts. Documentation indicates that this has been a continuously problematic area.

NOTES

1. These building documents in the form of microfilm are available at the National Archives Microfilm Division, San Juan, Puerto Rico, reel no. 33.

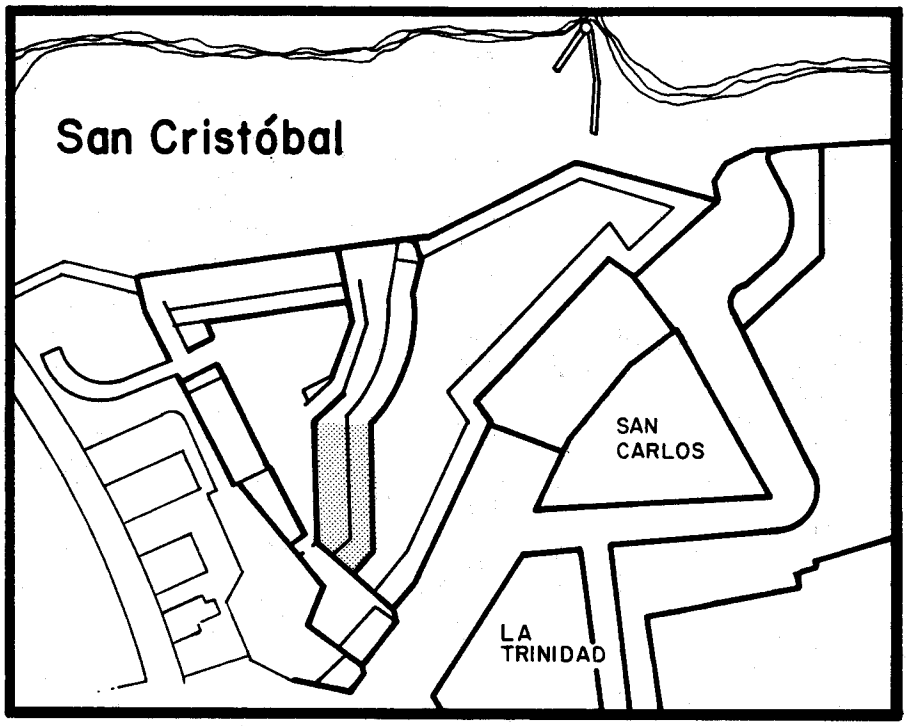
2. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristobal. The original model has been dated to 1839 and is on display at Museo del Ejercito, Madrid, Spain.

3. According to personal communication of author with Juan Blanco, CPR, Columbia University, Puerta del Socorro is a nineteenth-century term for assistance gate. Reference microfilm Archivo Historio Nacional (Ultramar - P.R.), Legajo #6354. Madrid, Spain.

4. See "Parte de la Revista Passada - Communique of Official Revue of 1858" executed by the Commodareria Exenta de Ing., Isla de Puerto Rico, SHM 4-1-8-5.

5. Both photographs, dated 1898 and 1899 respectively, were taken from outside looking west towards the Fort. Copies are in the photo collection of San Juan NHS, San Cristobal.

6. Four photographs nos. 59-62 labeled "Plaza de Armas, San Cristobal existing conditions at time work was initiated" are in the 1963 Completion Report - Accelerated Public Works, San Juan. Copies are in the files at San Juan NHS - San Cristobal.



CHAPTER 9

THE TROOPS' QUARTERS (CUARTELES)

Description

The Troops' Quarters of San Cristóbal is a rectangular building serving as the east boundary of the Plaza de Armas. It is a large building with its main facade facing west, a steeply-sloped ramp on the northwest side, and a high battered wall on the south side. The two-storied building is capped by el Caballero, the highest point of San Cristóbal. The east wall is battered up to the terreplein level of el Caballero. The building was constructed in 1771 as part of the extensive remodeling and expansion of San Cristóbal done under the supervision of Engineer Thomas O'Daly. Its symmetrical facade is broken only by decorative rooftop details and a sculptural stair tower at the southwest corner.

The main facade (fig. 9.1) is divided into five bays by flat colossal order pilasters. Each bay is arranged symmetrically with paired doorway and window openings; the center bay with the main doorway has a single window above. There is a projecting base which varies in height to correspond to the grade of the Plaza. The plane of the wall is broken by a belt course at the approximate height of the second story. Over the

windows is a heavy belt course with a cavetto molding below a sloping torus molding It separates a fascia which is overhung by a sloping, projecting cornice.

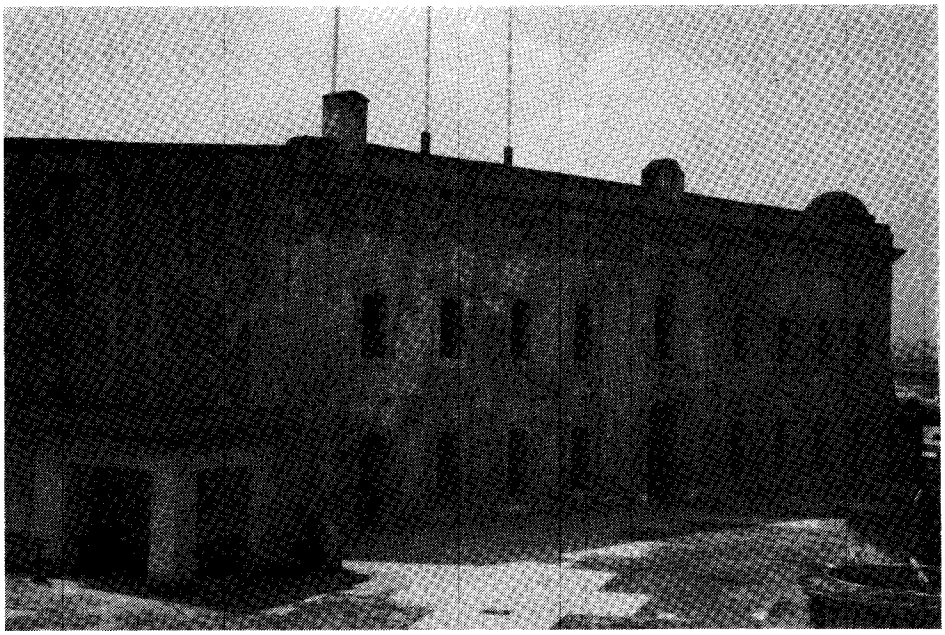


Figure 9.1. West elevation of the Troops' Quarters. Photo by Richard Crisson, 1986.

To aid in identifying specific doors and windows, all openings were labeled by HABS. On the west facade, letters A through C were assigned to the doorways, numbers 101 through 106 to the first story windows, and 201 through 206 to the second story windows. On the east facade, numbers 107 through 110 were assigned to the first story windows and 210 through 214 to the second story windows. (See figs. 9.2, 9.3.)

The north elevation is attached to the ramp up to el Caballero. It is a massive battered wall covered with smooth Portland-cement stucco. There is an arched opening at the base of the ramp on the north end of the Quarters which leads to the vaulted ramp of Tunnel 4.

The south and east elevations also consist of battered walls. The south rises from grade up to el Caballero, it is capped by the stair tower (and described as part of that feature). This wall abuts the South Gate support and the southern end of the Plaza de Armas. The east wall rises from the terreplein of the South Bastion to the top of the embrasures of el Caballero. The south wall has been heavily repaired with small stone block patches.

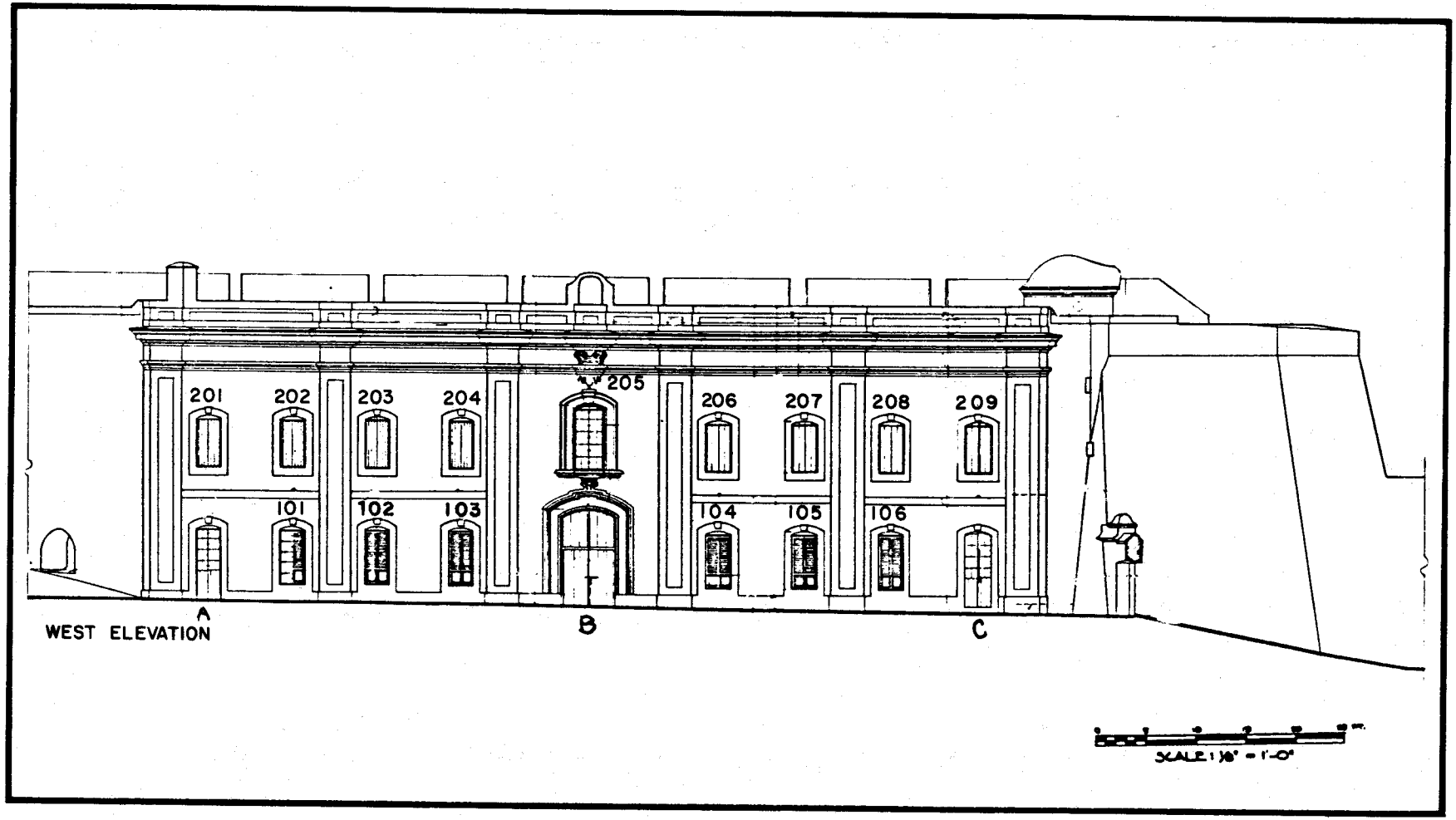


Figure 9.2. Troops' Quarters, west elevation with door and window openings labeled. HABS drawing (1962) annotated by Jana Gross (1989).

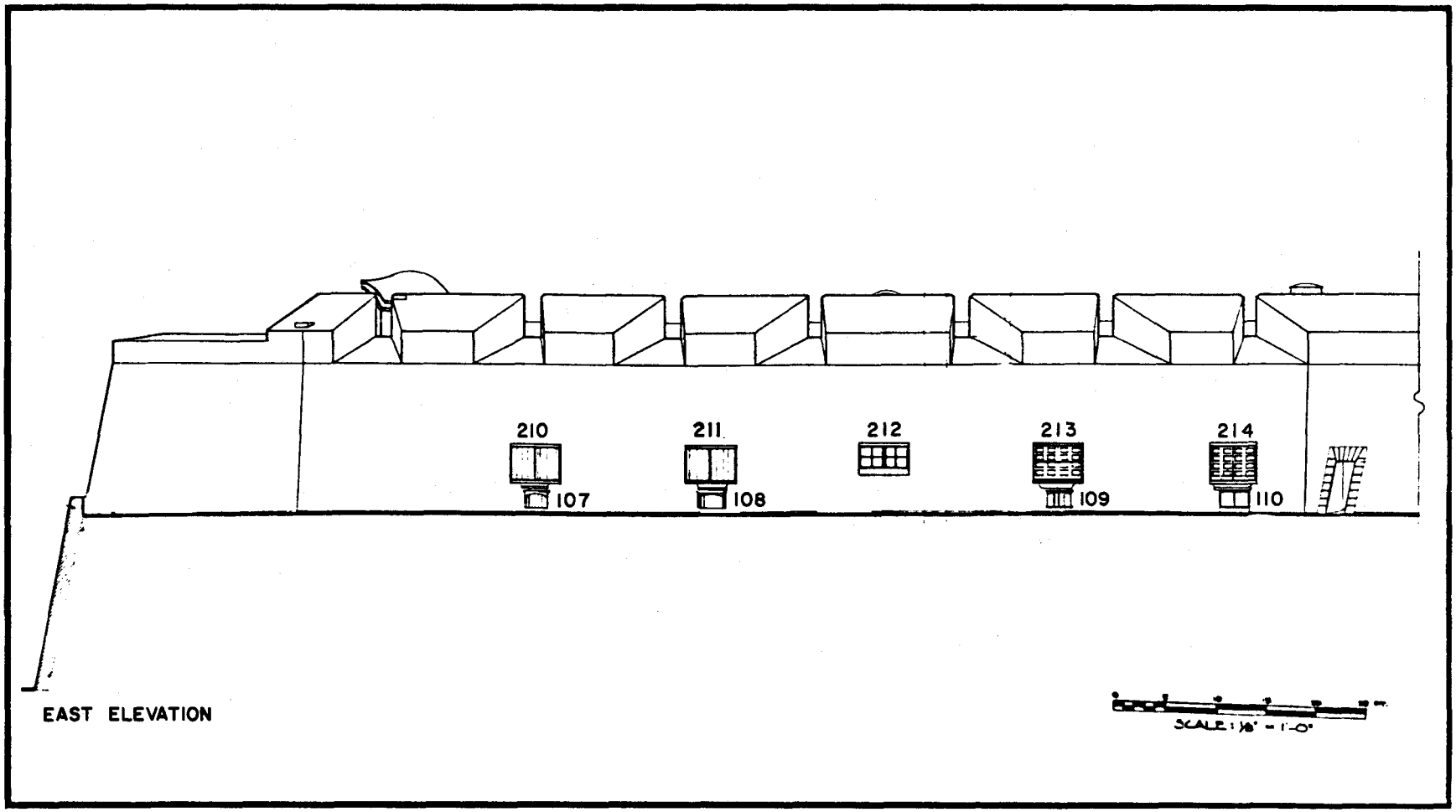


Figure 9.3. Troops' Quarters, east elevation with window openings labeled. HABS drawing (1962) annotated by Jana Gross (1989).

Entrance to the Troops' Quarters is gained through one of three doorways in the west facade ("B"). The principal entrance (fig. 9.4) is centrally located and has a segmental arch with a keystone. There is a wide stuccoed architrave with an ogee and a large round molding separated by a small,angular, channeled groove. Set within this opening is a hardwood frame which appears new or extensively repaired. Original paired wooden doors below a fixed transom are fastened with hand-wrought nails.

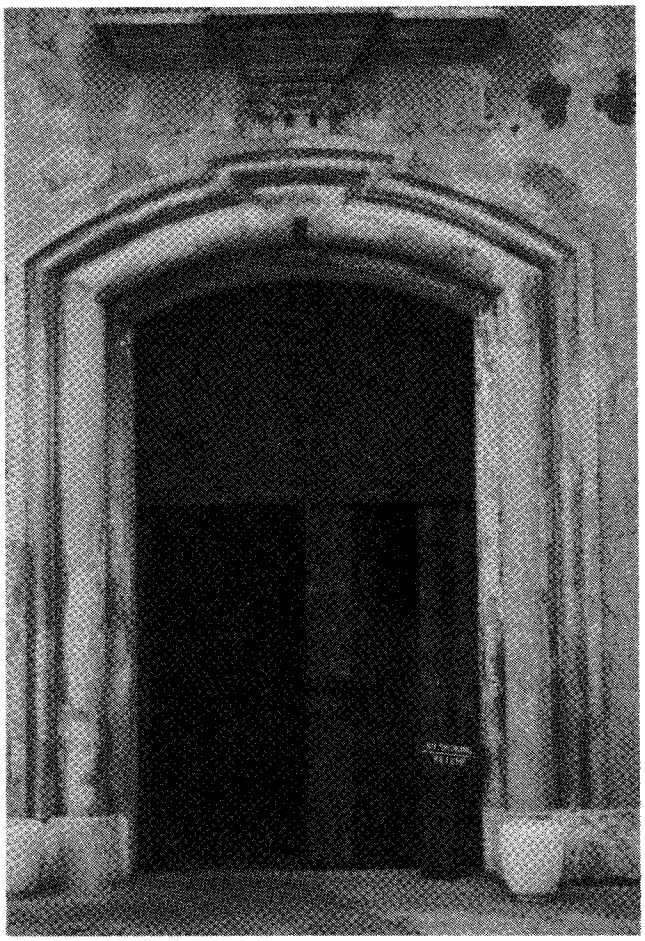


Figure 9.4. Principal entrance ("B") to the Troops' Quarters. Photo by Richard Crisson, 1986.

The north and south doorways, "A" and "C", are identical. Both openings have segmental arches with keystones and are flat in profile. Both openings match in size and profile the existing window surrounds. Although both doorways were originally window openings, no clear physical evidence of this change remains. All of the interior doorways of the Troops' Quarters are arched with paired wooden doors. Most doors date from the 1975 restoration.

The locking devices on doors and window shutters consist of hand-wrought sliding pin bolt latch fastened with modern padlocks. Cappucine hinges are used (see Glossary). Numerous socket and pintle combinations per door or window leaf fasten each to the wood surround. All of the hardware is new having been fabricated and installed in the mid-1970s. Although unpainted, it is frequently oiled to inhibit rust formation.

The building's flat roof is discussed as part of el Caballero. The only cornice is that of the west facade. It is a large projecting element of brick covered with stucco. It consists of a cyma recta over an ovolo and cavetto molding of equal dimensions. The cornice is articulated over each of the

six pilasters. There is a parapet above the cornice with recessed panels of varying widths.

At the northwest corner of the parapet sits a solid masonry tower that helps to support a modern flagpole with its Spanish flag. Two additional flagpoles for the United States and Puerto Rican flags are attached to the parapet by means of modern hardware.

In the center bay of the west facade parapet is an arch that probably housed a bell sometime between 1773-1821. No evidence remains of a header beam, or other means of bell support, nor of the bell itself. However, there is a square wrought-iron staple attached to the parapet that may have been used to tie the rope for the bell.

The two-story structure is subdivided into interconnected casemates, or bombproofed vaults. For convenience, each of the ten interconnected casemates was numbered (south to north) and labeled CM-1 through CM-10 by HABS in 1962. The museum space is in CM-2 and CM-4. The audio-visual room is in CM-1. CM-3 serves as the entrance and location of the main staircase. CM-5 is unused. The second floor of the Troops' Quarters is almost on grade with the terreplein of the South Bastion. It is of the same dimensions as the first floor. The casemates are numbered CM-6 through CM-10 and are all connected by paired doors. With the exception of CM-5, the interior was restored in the 1970s. (See figs. 9.5 and 9.6.)

The main stairway of the Troops' Quarters is in CM-3 and is supported in part by the east wall. It consists of a center staircase with a landing and two reverse runs connecting the first and second floors. The stairway is framed on the first floor by an arch detailed with masonry moldings. On either side are two small doorways with segmental arches. Centered over each paired door is an elliptical opening to provide light and ventilation for two storage rooms beneath the stairs. Newel posts and balustrades are of turned wood painted dark green (fig. 9.7). At the second floor, patches and markings on the newels indicate where the balustrade was originally open to provide access to a mezzanine level. The mezzanine existed in 1861 and was removed sometime after 1901.

There is a steep masonry stairway leading from CM-5 to the South Bastion. Placed within the east window opening, it appears to have been used for emergency access purposes. CM-6 has access to the most interesting architectural feature of the unit: the spiral staircase of el Caracol (the shell) which leads to the rooftop of el Caballero and is discussed more fully in that chapter.

Most of the existing paving on both floors is modern poured concrete. There is wall-to-wall carpeting in some of the casemates. CM-5 has had its flooring removed to expose loose sand and clay. Remnants of twentieth-century mosaic tile are imbedded in the floor. The walls and ceilings of the interior are generally covered with cement and painted white.

Building utility systems are housed in the Troops' Quarters in CM-5. Arriving underground, electrical wiring is then taken to a modern panel box in the utility closet below the main stairway. Electricity powers the lighting throughout the building in addition to the modern air conditioning system in the museum and audio-visual rooms. New plumbing provides hot and cold water to the sink in CM-10, which as of January 1987, served as a kitchen and lunchroom for park staff.

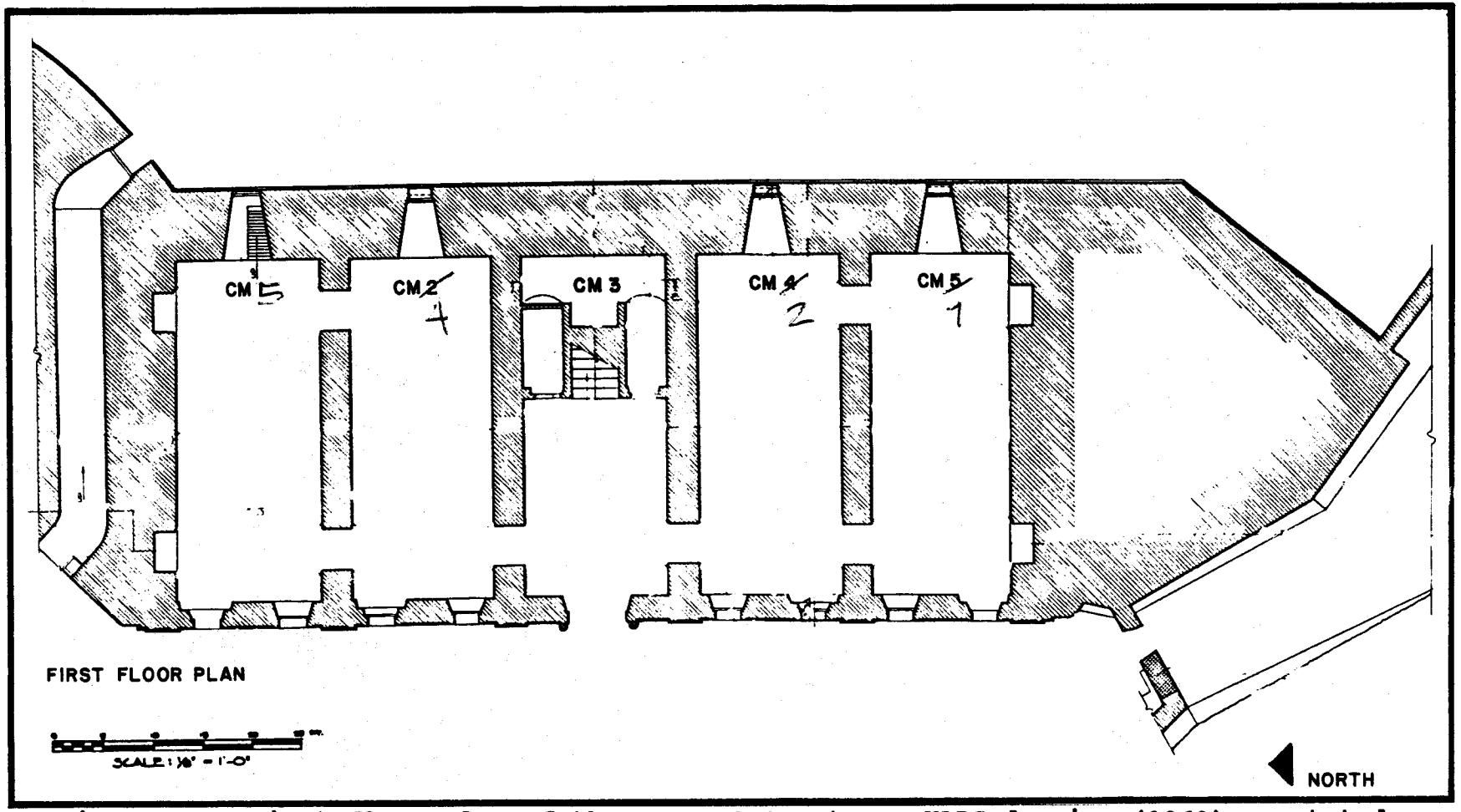


Figure 9.5. First floor plan of the Troops' Quarters. HABS drawing (1962) annotated by Jana Gross (1989).

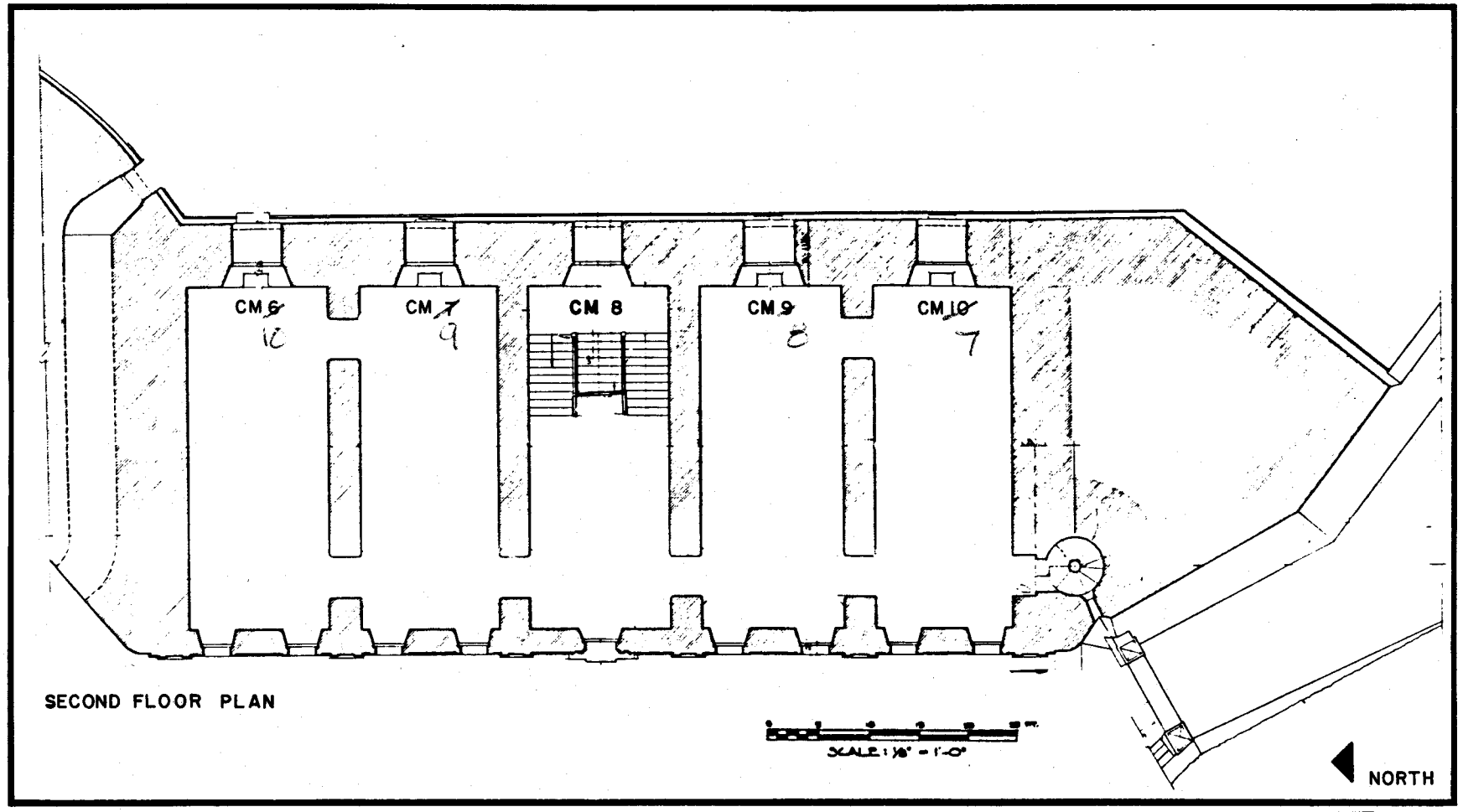


Figure 9.6. Second floor plan of the Troops' Quarters. HABS drawing (1965) annotated by Jana Gross (1989).

Note: 11/10/92 - CORRECTION
RICHARD ERISSON STATES THAT
1961 draftsman made mistake
in labeling the Troop Qtrs
casemate in reverse to their
standard names from earlier HABS

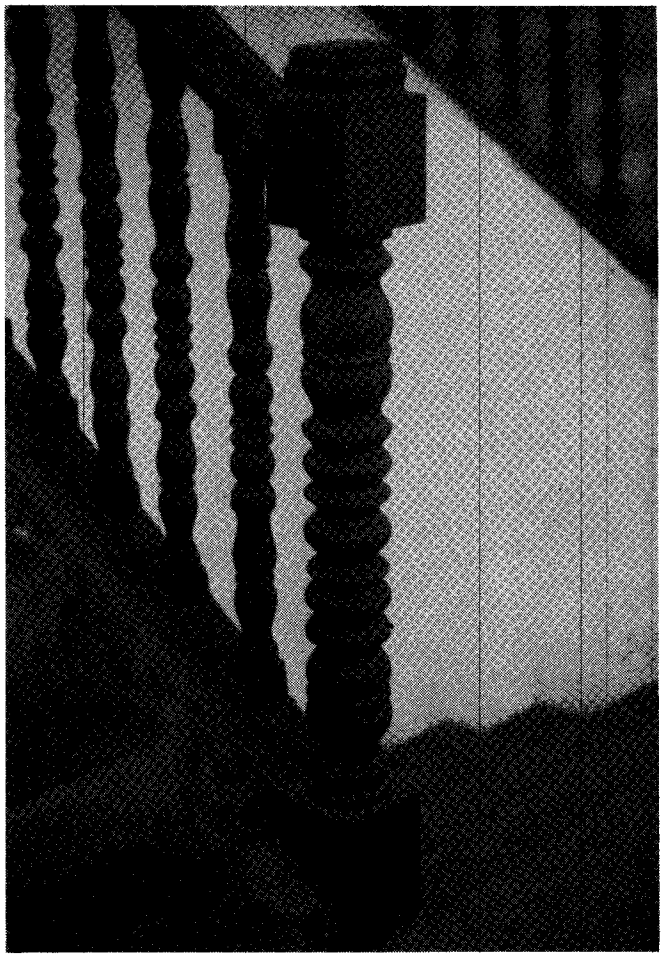


Figure 9.7. Balustrade and newel of the main stairway. Photo by Richard Crisson, 1986.

Structural Evolution

Period 1: 1625-1765

The Plaza de Armas on which the Troops' Quarters is sited was built in the second half of the 18th century. Therefore, there is no information for this period.

Period 2: 1765-1809

The Troops' Quarters was envisioned by Engineer Thomas O'Daly as an integral part of the modernization project for San Cristóbal in 1765. This structure was built on the east side of the new (1769) Plaza de Armas on the site of an earlier powder magazine and on the south side of the 17th century Caballero. Construction began in 1770 and was completed in 1771.[1] Names to which the structure was referred in the eighteenth century include the "wing added to el Caballero," the projected or new "battery," and the "five [bomb] proof vaults . . . which can be used as quarters." Not until the twentieth century was the name "Troops' Quarters" commonly used.

Two drawings (fig. 9.8) by O'Daly, one dated 1765 and the other 1769, illustrated the proposed new structure. The 1765 plan showed a rectangular feature labeled "C", explained in the legend to be:

> Wing that will be added to el Caballero to increase the fire power against the heights of its approaches.[2]

By 1769, a more detailed design had been developed. Rather than a straight rectangular shape, the structure was enlarged to the west, thus creating a right angle jog and enclosing the south end of the Plaza. Here it was labeled "L" and described as:

> Projected Battery in continuation of the new Caballero, with five very ample [bomb] proofed vaults, which will be divided into two floors..."[3]

A third plan, undated and of unknown authorship, proposed an enlarged structure as in 1769 but with six instead of five vaults. Situated at the south end was what is assumed to be the stairs, labeled "C" and described: "Door for help when the enemy has breeched and the main gate is barricaded."[4]

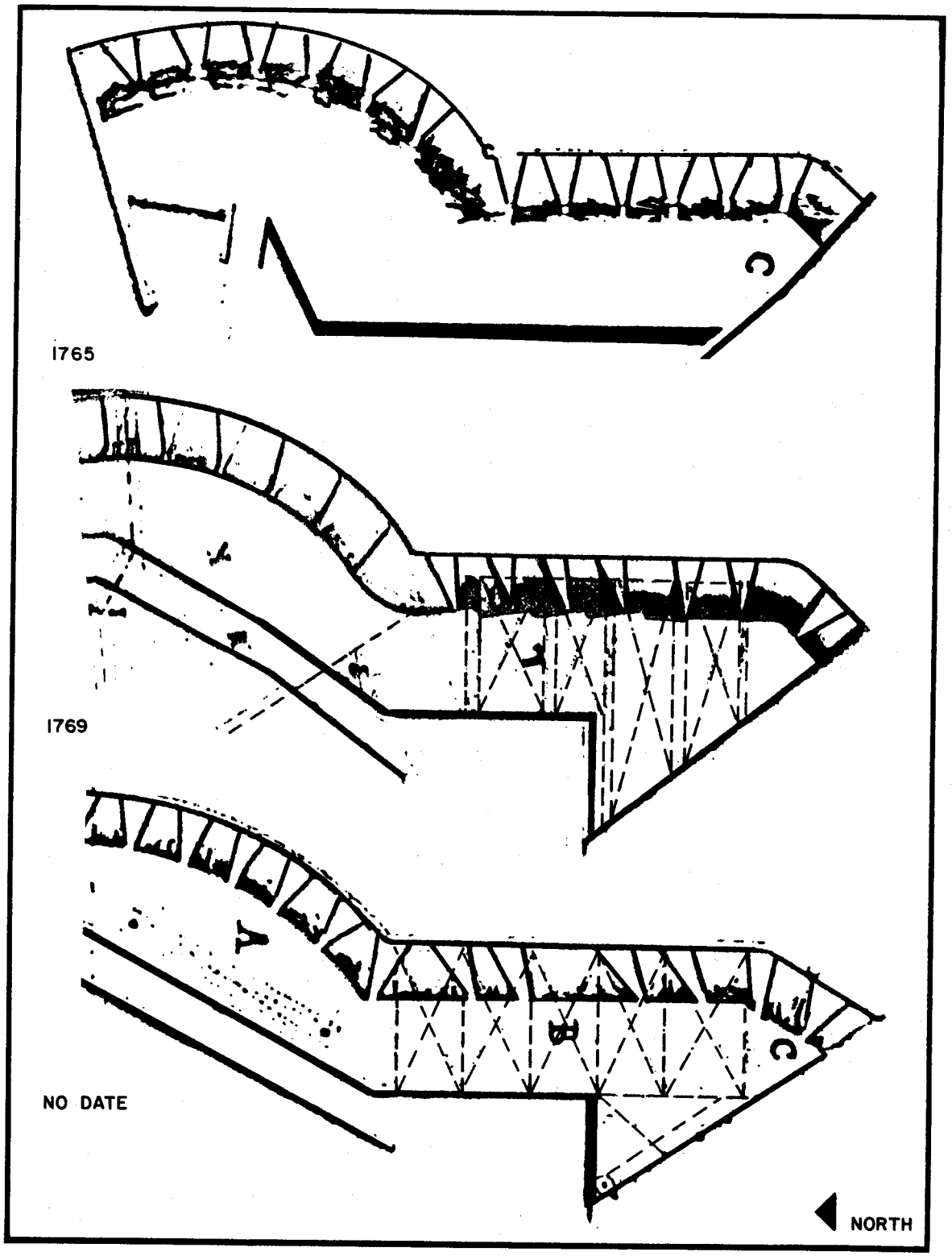


Figure 9.8. Three proposed plans for the Troops' Quarters. ("No Date" plan probably dates to 1769.)

The construction reports written by O'Daly dated March 1, 1770 and March 15, 1771 documented the actual building progress.[5] Excavation for the foundation was begun in early March 1770. Work on the first floor vaults commenced shortly thereafter and continued through October 1770. Only five months later, in March 1771, the second floor was entirely completed. The structure, however, was "still humid and not quite united in a mass" when stone and mortar were overlaid on the four feet of tamped earth at the roof (or terreplein) level. This was done in order to emplace the guns as soon as possible on the roof which was the south end of el Caballero. To support this premature weight and to prevent the formation of cracks, props were employed inside the vaults. How long these remained in place is not known. Finally, in the last months of 1771, the old and new exterior walls of San Cristóbal were stuccoed. The new vaults were probably stuccoed at this time as well.[6]

The first view of the new vaults as built is provided by O'Daly's plan and elevation drawings of 1773 (fig. 9.9). Here, the new wing was labeled "n" on the plan and described as:

> Five [bomb]-proofed vaults with two levels which can be used as quarters, with a spiral staircase for communication . . .[7]

The end note below the legend further specified that these were "newly constructed." The plan showed a structure almost identical in shape to that originally proposed in 1765, with five rectangular vaults of about equal size. An interior staircase was located at the east wall of the center vault and a spiral staircase at the far southwest corner. The west elevation drawing clearly showed a symmetrical front facade divided into five bays that correspond to the five vaults. Each of the bays was articulated by a full two-story pilaster. In the center bay was a wide doorway (first story), and above it a central window. The adjacent north and south bays had four windows each: two in the first story and two in the second story. There was a total of one doorway and seventeen windows. Not shown were window shutters and a bell support.

The 1773 drawings also showed a wing of triangular shape attached to the south facade. It is within this wing at the northwest corner that the spiral stair was contained. Other than this, the wing appeared to have no other function than to provide a protective thick wall to the vaults, and to increase the area of el Caballero above. Whether the interior was hollow or filled is not indicated.

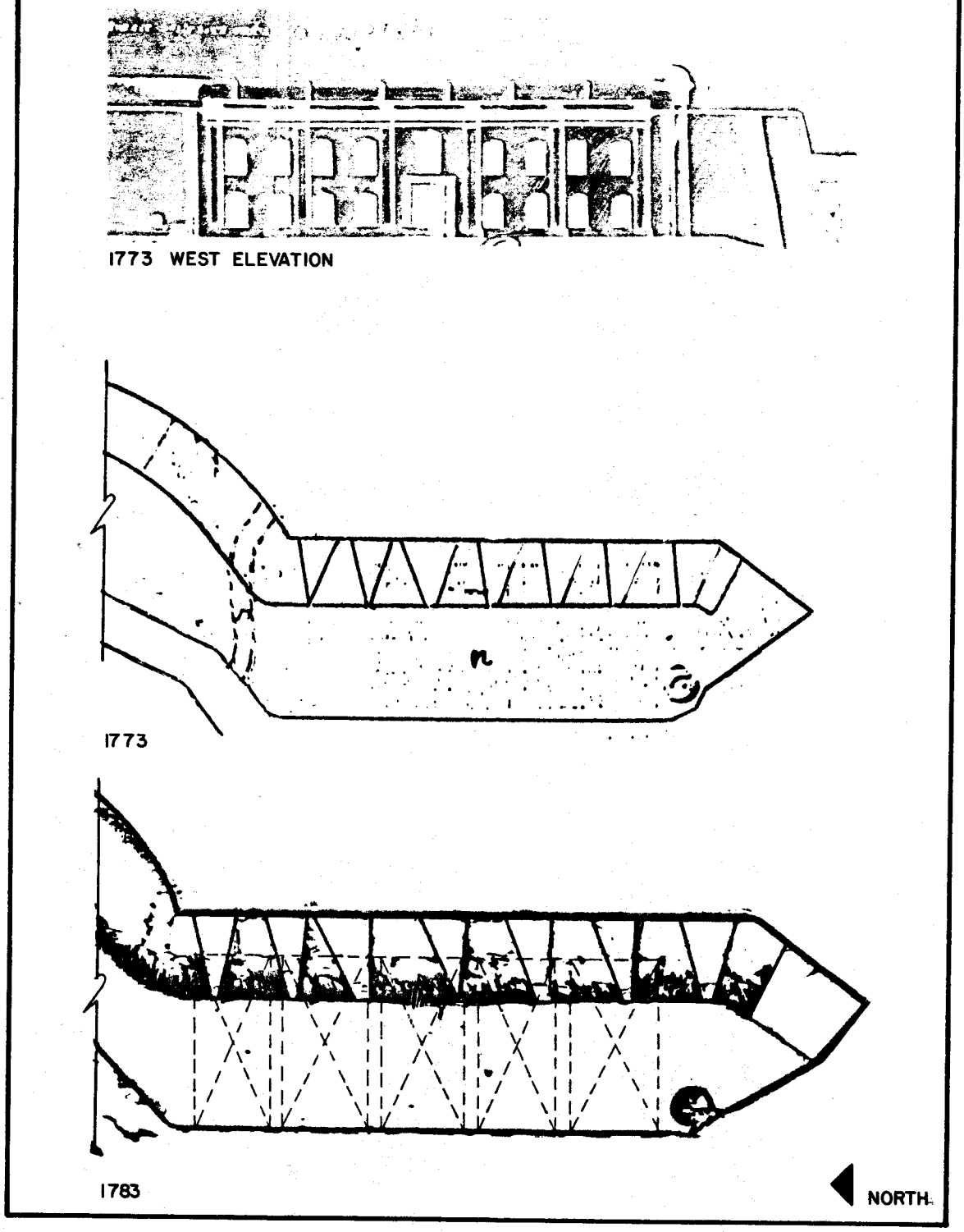


Figure 9.9. The Troops' Quarters as built, 1773 and 1783. Details of drawings by Engineers O'Daly and Mestre.

Period 3: 1809-1837

The only information found on the building for this period is a sketch dated ca. 1821 (fig. 9.10).[8] While certain "artistic liberties" appear to have been taken with architectural details, the basic form of the building was shown little changed from the more exactly rendered elevation of 1773. Two new features were the arched bell housing and a signal pole, both located at the roof level of the west facade.

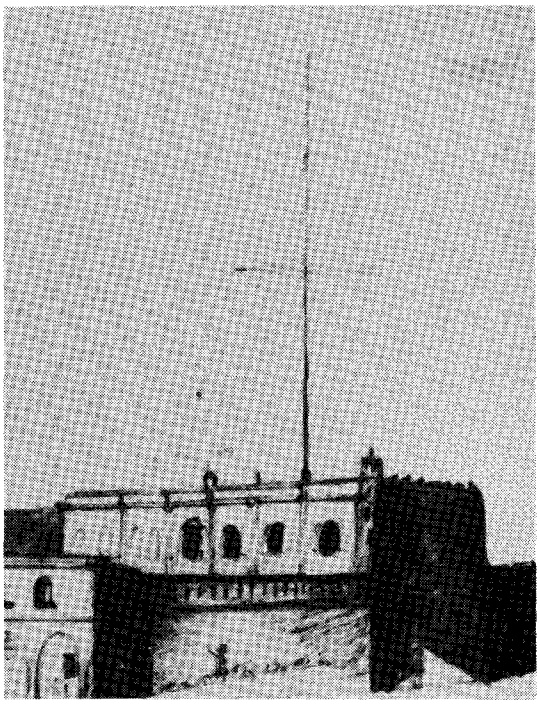


Figure 9.10. Sketch by August Plee, ca. 1821. (HABS negative 181.197.)

The sketch is a view looking northeast towards San Cristóbal. The second story west facade and the south facade are visible. Inaccuracies that are apparent include the number of bays and the number of windows. The west facade in this sketch was divided into six bays instead of five as shown in 1773, in later drawings, and as it exists today. The number of windows was correct for the three bays on the north side but incorrect on the south side. The bell housing was located, as it is today, in the middle of the west facade on the roof. No bell was drawn in the arched enclosure. A large signal pole was located to the south of the bell housing.

Period 4: 1837-1868

Two sources document the building during this period: the 1839 model and the 1861 plan and section by delineator Manuel Castro.[9] In both, exterior colors were recorded for the first time. The drawings are noteworthy for their detail, showing louvered shutters in the windows and vaulted interiors. The drawings note that San Cristóbal had a capacity of 312 men, some of whom lodged in these quarters.

In the model of 1839, the west facade is almost identical in design to that of the 1773 elevation drawing by O'Daly. This facade was two stories and divided by pilasters into five bays. Left out in the model were the stair tower shown in 1773

and ca. 1821, and the bell housing shown in ca. 1821. Detailed for the first time was the present-day belt course between the first and second stories in the end bays. Although this model has been repainted within the last ten years, the painter used similar colors to those originally used.[10] The body of the Troops' Quarters was painted yellow, the trim (i.e. the exterior base, pilasters, beltcourse, cornice, and door and window surrounds) were painted white. The windows were painted gray and the front door painted red. It is not possible to ascertain in the model if the gray windows represent window openings or closed shutters.*

Verification of some of the model's exterior colors is provided by paint analysis. Paint samples were removed in 1986 from many exterior features of the west facade. Only at the window openings, however, were early finishes found to survive. These suggest that the window shutters may have been painted gray and the exterior trim white. A paint sample was removed from one of the solid (vs. louvered) eighteenth-century shutters located on the second story of the south side.** Although paint was stripped from all the shutters in the 1970s, some was found preserved in the deep cracks in the wood. The earliest paint layers were observed to have a brown resinous medium. Several layers are gray, one of which may date to the 1830s. Similarly, the interior window frames appear to have been painted the same as the shutters.*** Early white finishes were observed in a sample from an exterior first story window surround.**** The exterior trim is covered with stucco. Although it is not possible to precisely date these finishes, enough layers survive to make an 1830s date feasible.

Though the existing front door appears to be original, it too was stripped of its paint in the 1970s and no early layers were found intact.***** Therefore, no physical evidence for a red front door was found. Documentation, however, supports the use of red pigment in the early nineteenth century at San Cristóbal. In 1808, engineer Ignacio Mascaro' wrote of using "a mixture of liquid pitch, tallow and red ocher" to preserve the palisades and the gates.[11]

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*Paint analysis of the model should be considered in any future research.

**SAJU 09 P14

***SAJU 09 P20, removed from a frame in SJNHS artifact collection.

****SAJU 09 P08

*****SAJU 09 P12

In 1861, Manuel Castro recorded the Troops' Quarters in five drawings: a west elevation, first floor plan, a second floor plan, a roof plan, and a section (figs. 9.11 and 9.12). Although the intent of the drawings is not known (e.g., recording existing conditions or proposed work), the east portion appears to have changed little from its appearance as recorded in 1773, ca. 1821, and 1839. The several new features shown for the first time are confirmed to have existed by later photographs and written descriptions. The drawings are therefore thought to be an accurate recording of the building as it looked in ca. 1861.

In 1861, the exterior west facade was little changed from earlier descriptions with the exception of four new additions and slight differences in paint colors. First, the windows had louvered shutters. Although these are now missing, early photographs and remaining physical evidence of hinge pintles in the window jambs indicate that these were located on the exterior side of the window openings.[12] Second, a flagpole and base on the far north corner of the roof had joined the earlier pre-ca. 1821 signal pole on the south side. Third, a bell had been installed in its pre-ca. 1821 housing located on the roof between the two flag poles. Lastly, two decorative elements were located on the west facade: one above and one below the second story window in the middle bay.

The 1861 color scheme was as follows. The body of the building was yellow and the trim white. The exterior base, was gray and the new louvered shutters and possibly the door green. In fact, several layers of early green paint in a resinous brown medium were found in paint samples from the exterior side of the older interior solid shutters.

The 1861 plans and section "K.L." provide a detailed view of the interior vaults. As originally built in the 1770s, these consisted of five vaults on each of the first and second floors, a communication stairway between the two floors in the middle vault, and a spiral stairway from the second floor to el Caballero in the southwest corner. This was unchanged in 1861. Further details were provided in these drawings. In three of the four end vaults were two wall niches (their function is unknown). These were located in the first story north vault (north wall), the first story south vault (south wall), and the second story north vault (north wall). Interior communication between all the vaults was via doorways in the interior partition walls. Direct access to the upper terreplein of the adjacent bastion to the east was provided from all first floor vaults through a small opening in the upper east wall reached by means of a ladder. The ladder located in the north end vault appears to have been built in. All other ladders were moveable. On the second floor, all vaults had one large window opening centered in the east wall;

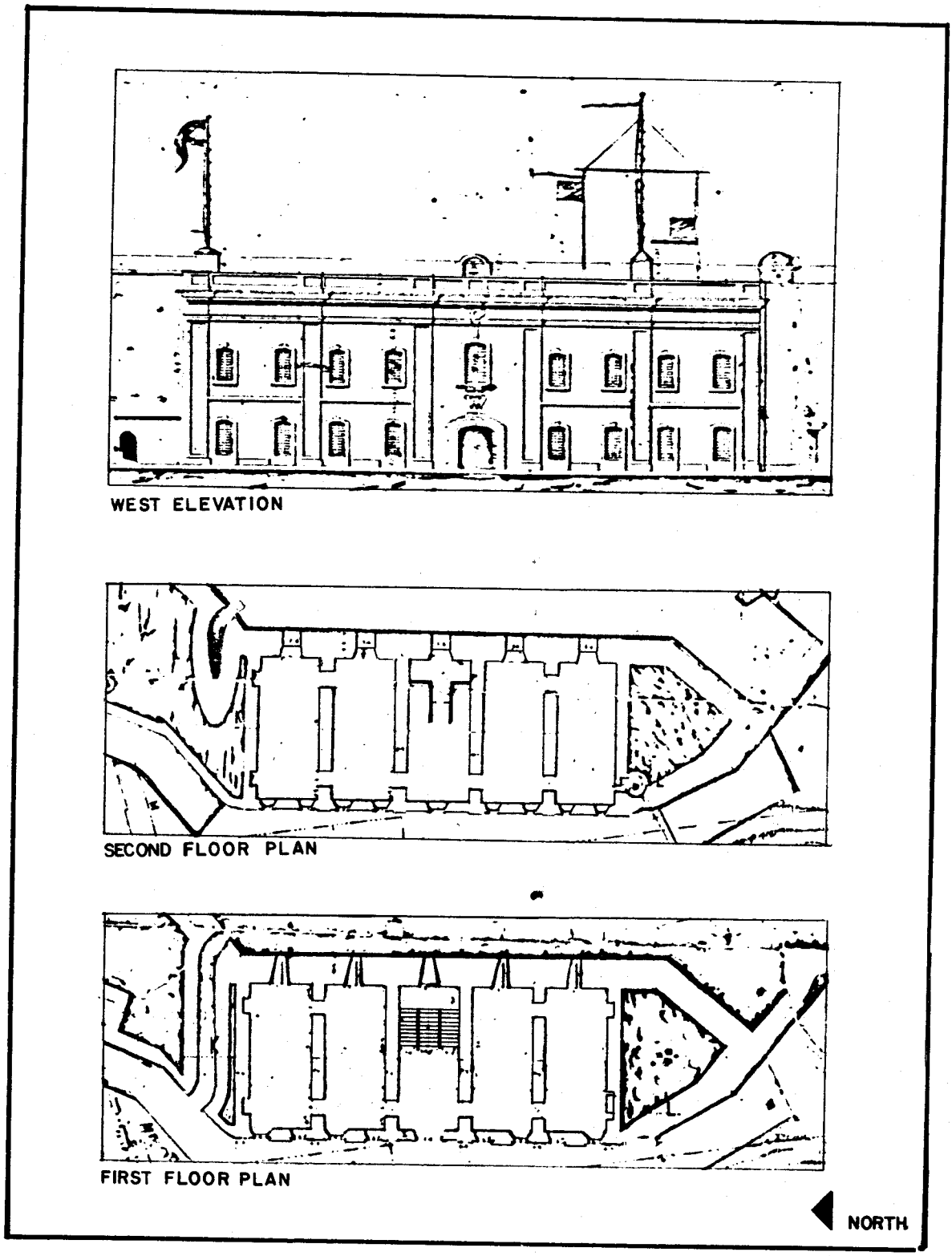


Figure 9.11. Details from Manuel Castro's 1861 drawings showing the west elevation and floor plans of the Troops' Quarters. (San Juan NHS Archives.)

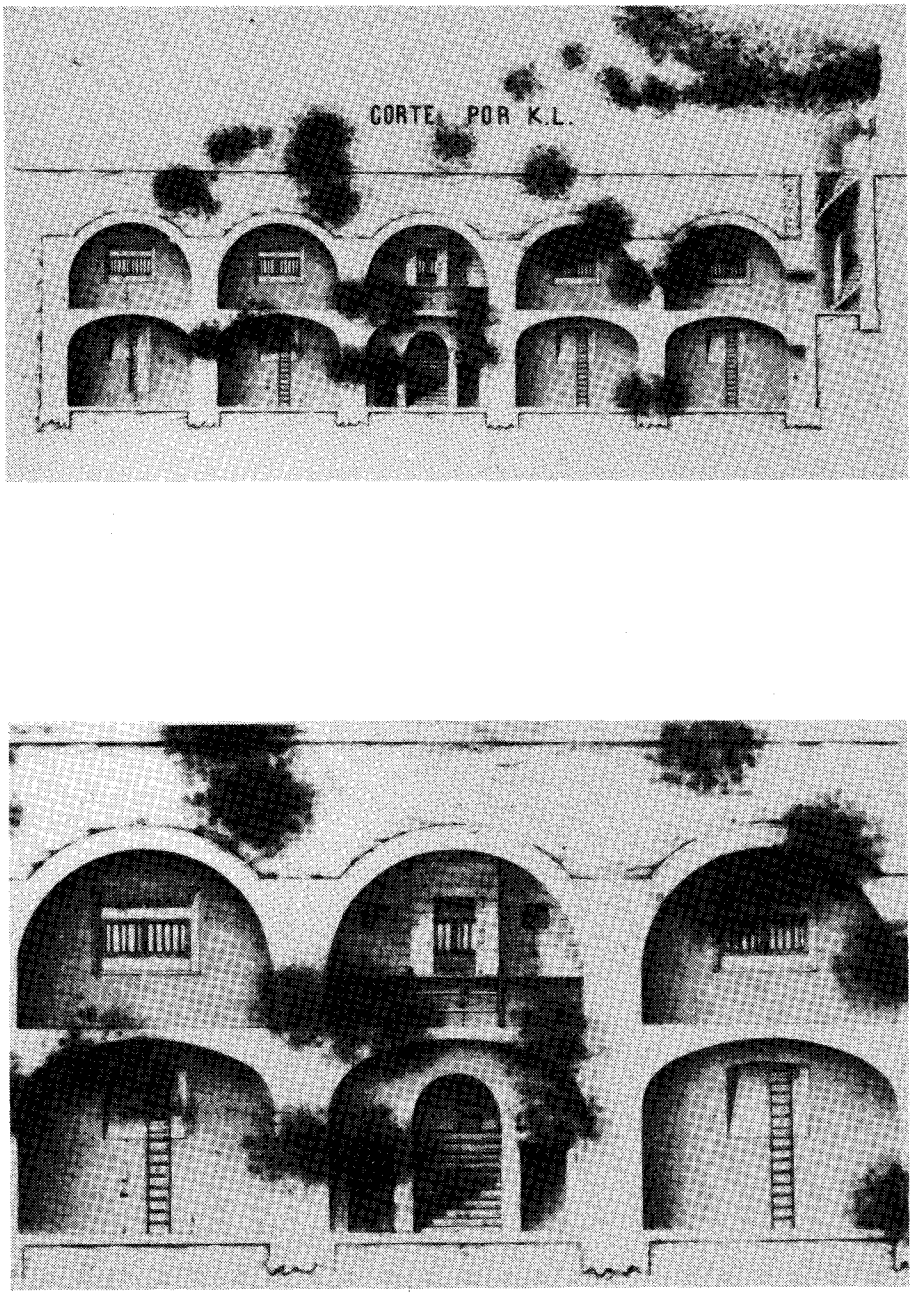


Figure 9.12. Manuel Castro's section of the Troops' Quarters, 1861. (San Juan NHS Archives.)

these windows were horizontal openings enclosed by frames fitted with vertical bars.

Of special interest is the subdivision of space in the middle stairhall vaults as shown on 1861 drawings. On the first floor, a north-south partition was located at the staircase. In this partition were three doorways: one large center arched opening flanked on either side by two smaller openings, resembling a Palladian window. The center doorway was the entrance to the stairs. The smaller doorways accessed rooms under the stairs that were most likely used for storage. Upstairs, the vault was partitioned in a most unusual arrangement. Here, a small rectangular room was built in the stairwell at the east wall. The floor level was higher than the second floor of the vault making so that a small three-step staircase in front of the entrance doorway necessary. The partition walls for the room appear to have been made of planks installed horizontally. In these walls, on either side of the doorway, were two small square windows. The function of the room is unknown although the provisions for air and light would seem to rule out storage. The atypical location and apparent wood construction of this room suggest that it may have been a later addition.

Period 5: 1868-1898

The only information for this period was obtained from paint samples removed in 1986 from both sides of the remaining eighteenth-century solid style shutters on the west facade.* These samples indicate that colors had lightened considerably, ranging from whites to light gray to blue gray. Whether or not the exterior louvered shutters were painted in a similar manner could not be determined because they had been removed and apparently discarded during restoration work in the 1970s. Similar to the first half of the nineteenth century, the stuccoed exterior window surrounds appear to have been painted white.**

Period 6: 1898-1987

In this period, the Troops' Quarters has undergone several renovations and has functioned as quarters, kitchen, dining facility, and museum. Remodeling and maintenance work has been

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*SAJU 09 P014, P015, P016, P017, P018.

**SAJU 09 P08.

done while under the jurisdiction of both the U. S. Department of the Army (1898-1961) and the NPS (1961-present). During this period, it has been called the "enlisted men's quarters," the "2-story casemates," and the "Troops' Quarters."

The paint samples examined from the original door and the remaining interior solid window shutters show a dramatic change in paint colors following the American occupation. Over the light whites and grays, colors applied during the twentieth century include red, green, black, mustard yellow, and brown. Most popular in recent years, prior to paint removal in the 1970s, were various shades of green.

Early black and white photographs of San Cristóbal, taken after the American occupation in 1898 and before the windmill installation in 1899, show the Troops' Quarters little changed from its appearance in 1861.[13] The building configuration was unaltered, the exterior trim on the west facade still highlighted with a light color, and the flagpole still located on the north corner of the roof -- albeit flying the American flag. Different from 1861 were features at the roof level. The signal pole was missing from the south side, apparently moved sometime after 1861 to the north side of el Caballero. Also missing was the bell. Four artillery pieces (that appear to be cannon), pointing towards the west were added at some time after 1861.

An inspection of the fortifications in the autumn of 1898 found the Troops' Quarters to be "dry and well ventilated."[14] However, they were apparently also in need of repairs. In the spring of 1899 the "enlisted men's quarters" were remodeled.[15] While the exact nature of the renovations is not known, interior Portland cement plaster applied to walls over the original lime plaster is believed to date from about this time.* Funds were allocated one year later for extensive repairs to the second floor. Proposed work that was approved and presumably carried out included whitewashing the five vaults (then called "rooms"), painting the woodwork, replacing existing shelving that was in poor condition and infested with bedbugs, and installing a new door frame in the far south room at the entrance to the spiral stairs. Also proposed were repairs to the existing cement treads of the middle stairway and a new cement floor for the room beneath the staircase.[16]

The year 1901 was notable for: the first mention of specific uses for the interior vaults; and the first introduction of electric lighting. The existing locations

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*SAJU 09 M06

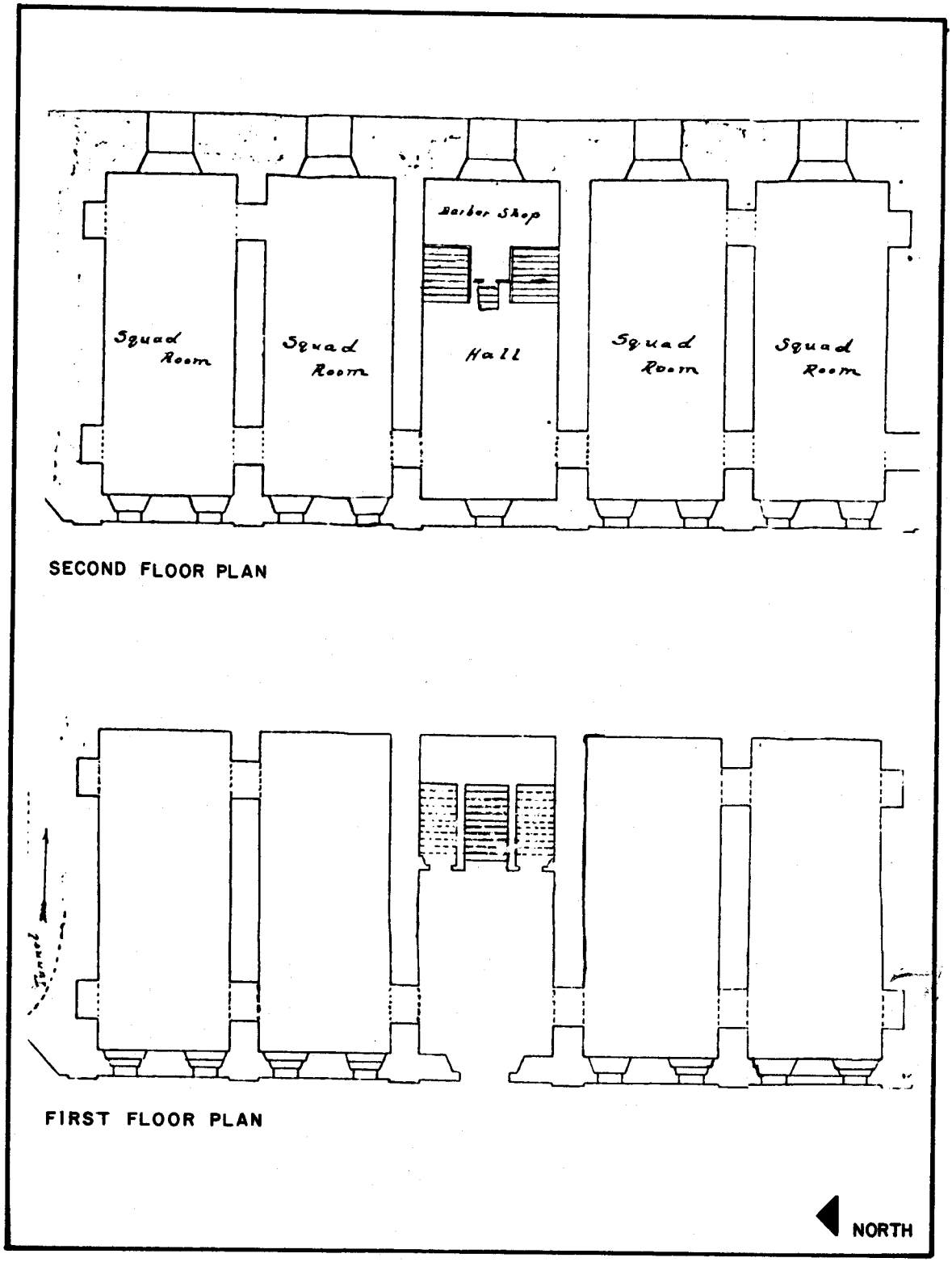


Figure 9.13. Detail of plan, "Quarters at Fort San Cristóbal," showing interior layout of the Troops' Quarters, 1901. (San Juan NHS Archives.)

and uses of the quarters at San Cristóbal were detailed in a plan dated February 12, 1901.[17] This plan (fig. 9.13) showed the first floor vaults of the building unlabeled and apparently not used as quarters, and the second floor vaults labeled as "squad rooms", "hall", and "barber shop". Four squad rooms were present, two located to either side of the center stair hall. The barber shop was located in the east end of the hall in a small partitioned room over the stairs; this was the same room first illustrated by Castro in 1861 and believed to be a later addition to the original structure. Also in 1901, the coal oil and regulation lamps then in use were determined unsatisfactory because of the heat they gave off and their tendency to blow out.[18] Therefore, wires were strung, fixtures positioned, and meter boxes installed for 16-candle power incandescent lights.[19] The control room appears to have been the first floor north vault (CM-5) where several obsolete switches, meters, and fuse boxes were found affixed to the walls in 1986.

By 1902, it was reported that the exterior walls of the "area outside 2-story casemates" required repairs, although these were judged "not an immediate necessity." Proposed at this time was the removal of the old stucco and replacement with a new coat composed of Atlas Portland cement, sand, and lime. Funds, however, were not allotted and the work was postponed.[20]

Whether or not the exterior was restuccoed within the next few years is not recorded, although a photograph (fig. 9.14) of the northwest facade dated ca. 1905 seems to show it in good repair except for a crack at the upper north corner, west facade.[21] In fact, the west facade was virtually unchanged from the elevations of 1861. Coloration, although shaded in black and white, appears to have been similar. Louvered shutters, which differed only slightly by having a panel in their lower sections, were still in place in the windows. The flagpole formerly located at the northwest corner of the roof was missing. The base support was shown in place, but the pole itself was most likely taken down in 1902 when a new 75 foot flagpole was installed elsewhere on el Caballero.[22] The four artillery pieces emplaced sometime after 1861 on the roof were still extant in the ca. 1905 photograph.

In 1906, the buildings at San Cristóbal were noted to be badly in need of repairs. Money was therefore allotted in the next couple of years to make repairs to these buildings. In 1907, interior squad rooms were whitewashed and some hardware replaced. The following year, funds were available to replace deteriorated doors, repair exterior stucco, and paint the outside walls with oil paints using white lead and colors.[23]



Figure 9.14. View dated ca. 1905 showing west and north elevations of the Troops' Quarters. (HABS negative 181.25.)

Exactly what work was done at the Troops' Quarters was not specified.*

More than twenty five years later, in May 1935, a plan was prepared by the Puerto Rican Emergency Relief Administration entitled "Plan of Proposed Repairs to Fort San Cristóbal."[24] Exactly what repairs were proposed is not clear. However, the plan is of interest because it labels the use of the vaults on both floors and illustrates two structural changes. Excluding the center stair vaults, the four vaults upstairs and two downstairs on the south side are labeled Compañía (company), most likely indicating their use as quarters for troops. Downstairs, on the north side of the stairhall, CM-5 was the Cocina (kitchen), and CM-4 the Comedar (dining room). The two structural changes illustrated are the absence of the east partitioned room over the stairs in the second floor stair hall, and the conversion of two first story windows into doorways in the west facade. These doorways are shown at the extreme north and south ends of the building.

The first photograph of one of the new doorways is an aerial view taken ca. 1938-40 when the nearby Officers' Quarters renovations were underway (fig. 9.15) In this view, the trim of the north doorway was a stark white in comparison to the subdued monochromatic appearance of the rest of the west facade. No longer is the trim highlighted in a light shade as it had been in 1861 and ca. 1905.[25] Perhaps the deferred restuccoing of the walls as recommended in 1902 had finally been carried out, or the entire facade refinished. Paint samples from the stuccoed walls and window surrounds indicate that both the body and trim of the building were covered with what appears to be a Portland cement wash, followed by two whitewash layers.**

In the 1970s, the floors inside the Troops' Quarters were determined to "have been raised from 9 to 15 inches through additions of floor finishes."[26] Of this amount, 5 to 6 inches were said to have been added during World War II by casting concrete slab floors over existing floors. In the kitchen vault, drains and utilities incorporated in the floor destroyed the earlier surface.[27]

Throughout the 1940s, the building continued to function as a kitchen, dining room, and lodging facility. A chimney for the kitchen was finally installed sometime before the

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*While the exterior walls may have been repaired, paint samples reveal that no lead oil paint was used in extant finishes. SAJU 09 P04, P07, P08, P09, P19.

**SAJU 09 P04, P06, P07, P08, P09, P19.

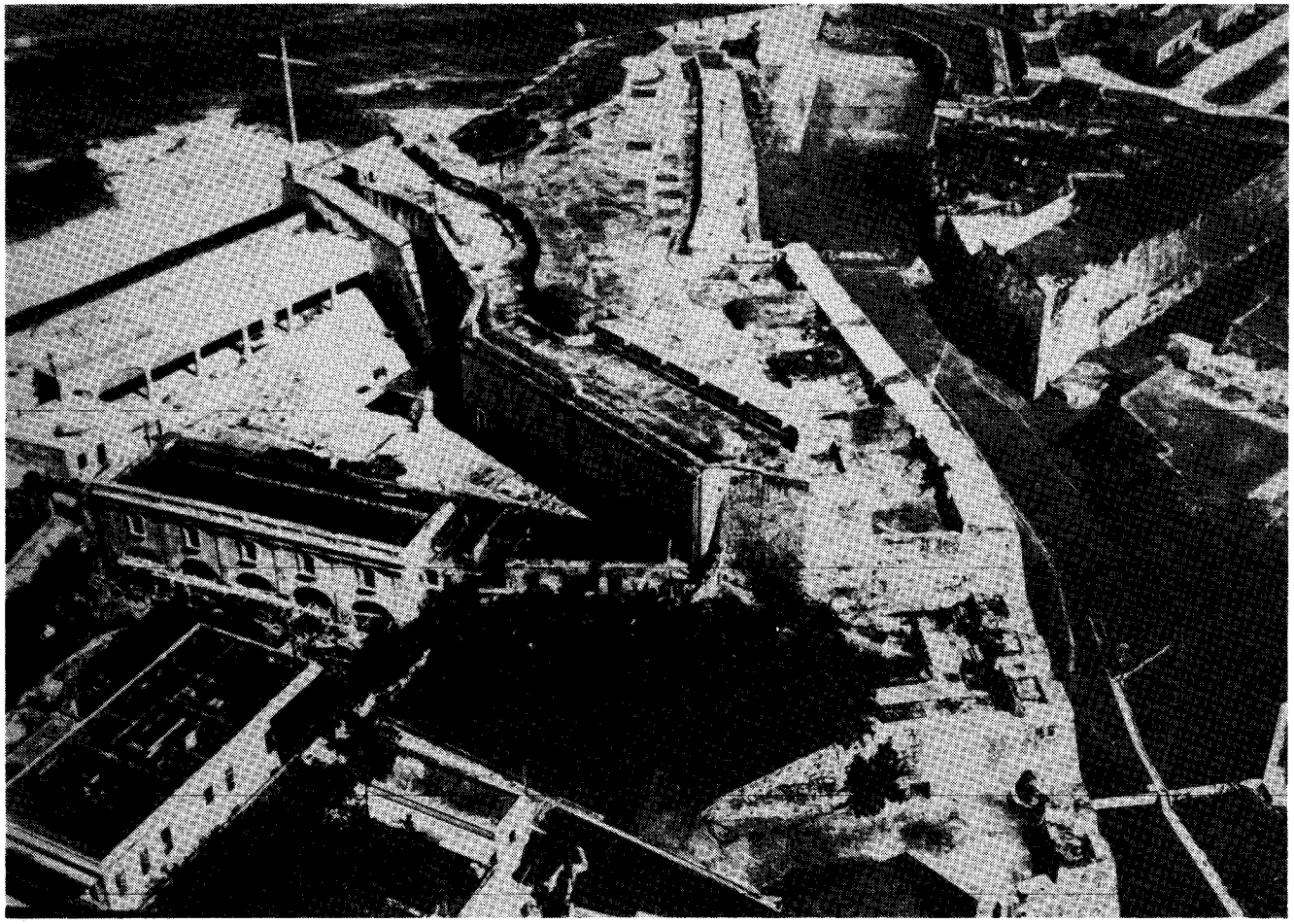


Figure 9.15. Aerial view of San Cristóbal looking northeast, ca. 1938-40. (HABS negative 181.30.)

spring of 1942 as evidenced by a photograph of it attached to the west facade.[28] This chimney was located between the doorway and window of the kitchen in the first floor north vault. The hole made in the wall for the chimney flue was uncovered by the NPS in the 1970s during repairs to the west facade. Although its use was not then known, it was described as "uniform and rectangular (manmade)," measuring 31 inches wide by 6 inches high."[29] In 1943, a plan of San Cristóbal identified a kitchen and mess halls on the first floor, and squadrooms on the second floor. Four years later, in 1947, a general plan described the building succinctly as "number 22. Squad Room & Mess Hall."[30]

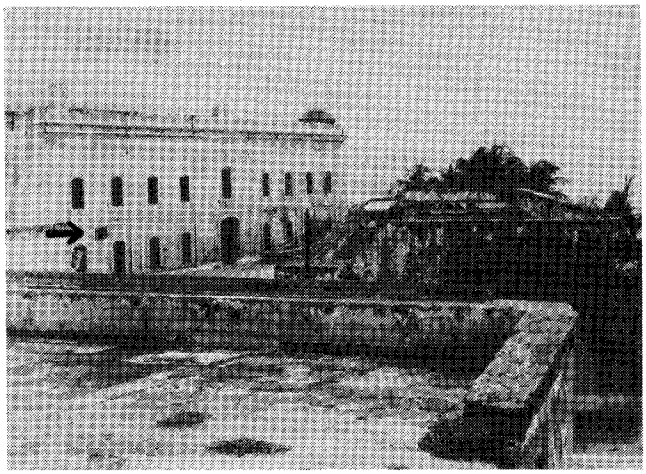


Figure 9.15. Detail of view showing west elevation, ca. 1950. Note remnant of former kitchen chimney. (San Juan NHS Archives.)

In 1958, major rehabilitation work was carried out by the U. S. Army.[31] The rooms were then numbered "C-1 through C-11". Unfortunately, it has not been determined for this report which number corresponds to which room, although in some cases work was intended for all of the rooms. For example, in rooms C-1 through C-11 it was specified to patch existing cement plaster walls. In all windows and doorways, wood and metal that had been damaged or was deteriorated was to be replaced with new treated lumber and replicated bronze hardware to match the existing. All rooms, except C-1, were to be painted including walls and ceilings and interior and exterior millwork surfaces. In "supply rooms" C-7 and C-10 only, new iron grille doors were to be constructed and new masonry partitions built. It is assumed that this work was done, although no iron grille doors nor additional partition walls remain today. (See fig. 9.16.)

In the 1960s, the building was recorded by HABS and renamed the "Troops' Quarters." The exterior west facade was photographed in January 1960 and measured drawings prepared during the summer of 1962.[32] In addition, existing conditions of the electrical system were recorded by the NPS in September 1962.[33] Both the drawings and photographs illustrated a building basically unchanged from its eighteenth-century appearance, yet modernized and in need of repairs. (See fig. 9.17.)

In the HABS photographs, the west facade had a mottled/patched appearance and was crossed by electrical conduits. The doors of the two end doorways appeared to be old shutters that were lengthened using vertical boards. Window shutters were of mixed styles, including louvered, narrow vertical board, and wide vertical board. Exterior louvered shutters were in first story windows only. Only interior solid shutters survived in the second story windows, and of these only shutters in the middle and south vaults were of wide vertical board design and therefore probably of an early date. On the east facade, the small first story windows were boarded over. The small window in the middle stair vault illustrated in Castro's 1861 drawings is missing. The second story east windows were enclosed with two types of shutters: paneled on the north side and narrow vertical boards on the south side.

As mentioned in the preceding description, HABS numbered the vaults from south to north. On the first floor are CM-1 through CM-5, and on the second floor are CM-6 through CM-10. According to the drawings floor surfaces were noted to be "modern mosaic tile" on the first floor, and "modern concrete" on the second floor and in the first floor room beneath the stairs. The stairs in the middle vaults (CM-3 and CM-8) and the spiral stairs at the south end were finished with "modern concrete". Only in the spiral stairway were the walls described as having a "lime plaster finish." In the first floor stairhall (CM-3), the partition wall was shown for the first time to have oval-shaped openings above the two side doorways and a decorative molding on the archway opening to the stairs. In the adjacent first story vaults, only one ladder was extant at the east wall in CM-5.

A flagpole was reinstalled in 1961 at the northwest corner of the roof where one had been located from about the mid-nineteenth century until 1902. Shortly thereafter, two additional flagpoles of equal height to the first were installed. On 8 September 1963, the Spanish flag was officially raised in its original location. In the center the flag of Puerto Rico was raised and to its right the flag of the United States.[34]

In 1974, plans were begun to install a new museum in the first floor vaults of the Troops' Quarters. The extensive rehabilitation and restoration work that ensued, both outside and in, is documented in memoranda, letters, 106 compliance proposals, drawings, photographs, contract documents, and a completion report.

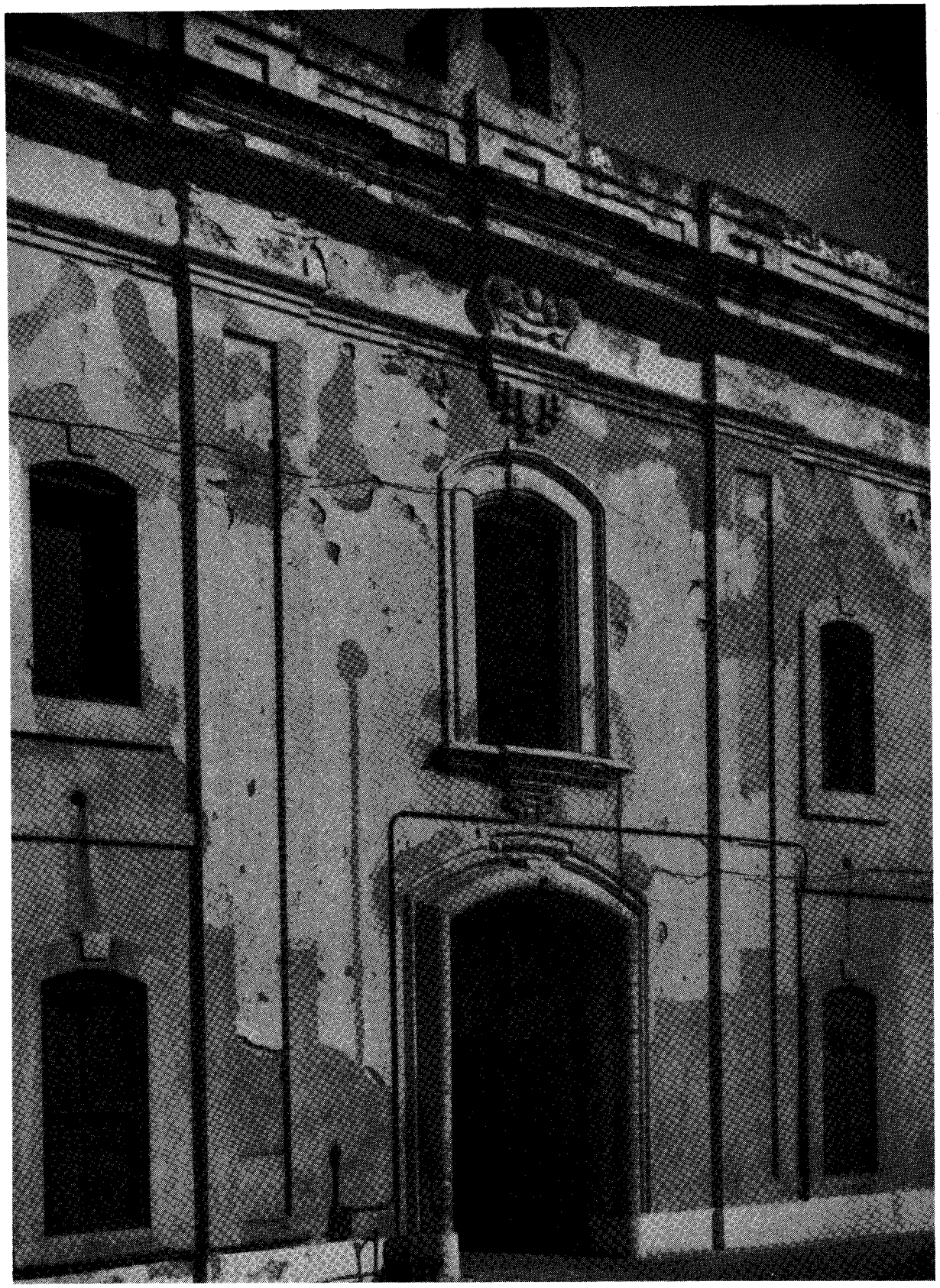


Figure 9.17. West elevation, main entrance. Photo by HABS, January 1960.

It was estimated that of the original doors and window shutters, 50% had been retained in various stages of preservation varying from good to poor. Existing original doors and shutters were to be repaired and reinstalled and missing ones replaced by exact reconstructions.[35] The old hardware was to be removed and replaced by new reproduction hardware made by the Hartland Forge of Vermont.[36] The paint finishes on one shutter from the Troops' Quarters were examined by the NPS Museum Lab at Harpers Ferry, West Virginia who identified 22 layers of paint.[37] All paint, however, was subsequently stripped from the original doors, window frames,[38] and window shutters and the wood then treated with a mixture of kerosene and linseed oil.[39] No research or justification for this treatment has been found. (See fig. 9.18.)

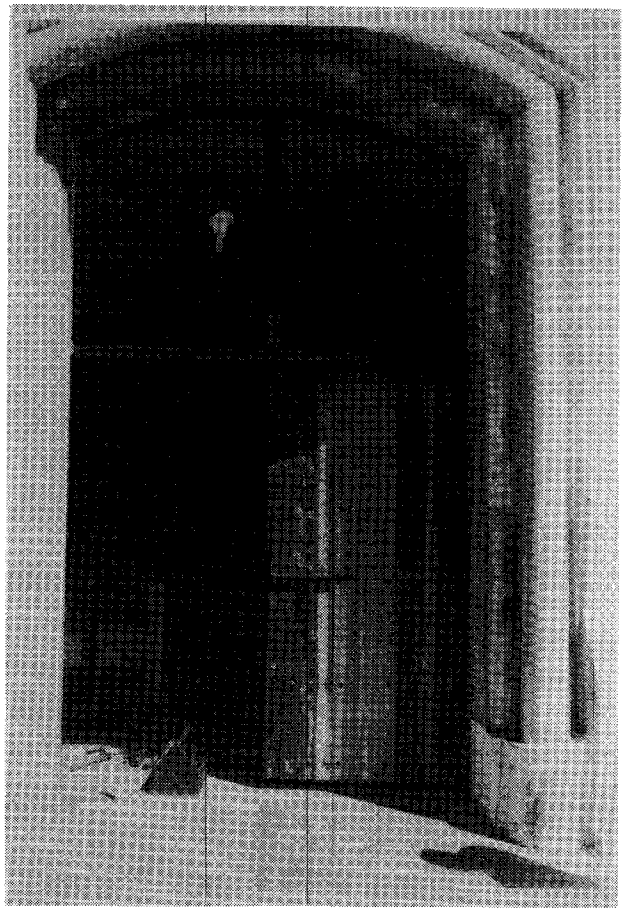


Figure 9.18. Main entrance during restoration, ca. 1874-75. (San Juan NHS Archives.)

The following is a specific account, excluding finishes and hardware, of the documented work carried out at each exterior opening.[40] Interior rooms are cross-referenced in brackets using the HABS numbering system.

WEST FACADE

Door A [CM-5, HABS]

Existing door presumably sent to Harpers Ferry Museum Lab for restoration and reinstalled as recommended in the correspondence. Door frame lintel was salvaged from the original and door frame jambs reproduced in

mahogany. Note that this is an original 18th-century window opening converted to a doorway sometime between ca. 1905 and 1935. The upper portion of the door may be an original eighteenth-century window shutter.

Door B [CM-3, HABS]

Existing door originally slated for replacement but later scheduled to be sent to Harpers Ferry for restoration. Upper shutters recommended to be repaired at the site. This is the only original exterior doorway in the west facade.

Door C [CM-1, HABS]

New door and frame constructed of mahogany. Note that this is an original 18th-century window opening converted to a doorway sometime between ca. 1905 and 1935.

Window 101 [CM-5, HABS]

Original plans were to repair the shutters and reuse the frame in this window. This is corroborated by the drawings for new work that do not include this window. However, the completion report/photo log notes that the "shutters are reproductions of the originals." The report also describes that the interior sill was restored by replacing existing brick "with same kind."

Window 102 [CM-4, HABS]

Original plans were to repair the south leaf shutter and make a new north leaf. The construction drawings, however, specify new shutters and the completion report/photo log states "reproduction shutters installed (mahogany)." Also described in the completion report is the window frame which is original except for the bottom replaced "with same kind."

Window 103 [CM-4, HABS]

Existing shutters repaired, stripped of paint, and reinstalled. Window frame reproduced using salvaged ausubo wood. Interior window sill restored by replacing half of the bricks with bricks salvaged from elsewhere.

Window 104 [CM-3, HABS]

Original plans were to repair the shutters and reuse the frame. The construction drawings, however, specify new shutters and frame for this window. Unfortunately, no mention of this window is made in the completion report/photo log.

Window 105 [CM-2, HABS]

Existing shutters presumably sent to Harpers Ferry for restoration and reinstalled as recommended in the correspondence. Original plans specify a new frame.

Window 106 [CM-1, HABS]

Original plans were to repair the shutters and frame lintel at the site and install new frame jambs. This is corroborated by the drawings for new work which do not include this window. No mention is made in the completion report/photo log.

Window 201 [CM-10, HABS]

Reproduction period shutters and frame constructed of mahogany.

Windows 202, 203, 204 [CM-10, CM-9, HABS]

Reproduction period shutters constructed of mahogany. Existing frames reused.

Windows 205, 206 [CM-8, CM-7, HABS]

Existing shutters cleaned of old paint and reinstalled. Frame is original.

Window 207 [CM-7, HABS]

Existing shutters cleaned of old paint and reinstalled. Frame specified to be replaced.

Window 208 [CM-6, HABS]

Existing shutters cleaned of old paint and reinstalled. Frame is original.

Window 209 [CM-6, HABS]

Existing shutters presumably sent to Harpers Ferry for restoration and reinstalled as recommended, with new frame provided.

EAST FACADE

Windows 107, 108, 109 [CM-1, CM-2, CM-4, HABS]

New shutters and frames constructed of mahogany. Fixed louver shutter design is an adaptation to accommodate modern air conditioning units.

Windows 110, 210, 211, 212, 213, 214 [CM-6 through CM-10, HABS]

New shutters and frames constructed of mahogany. Solid shutter design based on existing shutters at west facade.

The walls of the exterior west facade were also repaired in the 1970s. Old exposed electrical conduit was replaced with new conduit that was embedded in the wall and patched over. Also patched at this time was the former chimney flue between the doorway and window of CM-1. The completion report/photo log records that the hole had previously been plastered over but not filled. Therefore, to prevent future collapse, the hole was filled and plastered over once again.

Inside, work was done on the floors, walls, ceilings, doors, and the mechanical and electrical systems.[41] On the first floor, existing non-historic ceramic tile floors were trenched to receive new electrical lines for museum space in CM-1, CM-2, and CM-4. Floors were then leveled, cleaned, and sealed. Walls and ceilings throughout the building were scraped, patched and painted. Patching was done using a mortar composed of sand, hydrated lime, and white cement. The paint was a vinyl-epoxy masonry type, bone white in color. Interior wood doors were installed (both restored and reproduction), in four doorways. Of these, only one pair (E), located in CM-3 at the south closet, was repaired and reinstalled. All other doors and frames were reproductions constructed of mahogany. They were located in CM-3 at the north closet doorway (D), the doorway between CM-8 and CM-9, and in CM-10 at doorway (J) to the circular stairs. Modern glass doors were designed in conjunction with a new air cooling system for museum rooms CM-1, CM-2 and CM-4. Although the glass doors were not installed, three air conditioning units were placed in the east windows. Electrical service to these units was laid in the floors and a control panel located in the south closet of CM-3. Other electrical work involved concealing exposed electrical conduit and relocating existing service in CM-5 to the south closet of CM-3.

The first floor's north vault (CM-5) had walls and ceiling scraped, patched, and painted, and the north wall alcove restored. Sometime in the latter half of the 1970s, an architectural/structural investigation was undertaken by NPS Architect Fred Gjessing. At this time, the floor was removed

and plaster stucco taken off the walls in sections to reveal the masonry structure beneath.[42] Today, the vault remains in disassembled condition.

Conditions

The Troops' Quarters are in excellent structural condition. The character of the building is generally unchanged from its initial construction.

There are however, several elements of deterioration which should be noted. For example, exterior sections of early stucco painted yellow appears eroded, cracked, patched and stained. On the north elevation, the smooth Portland cement stucco is heavily stained due to excessive moisture. Likewise, on the east elevation, stucco is badly weathered, and on the south, darkly stained with widespread biological growth.

The flat roof of the building is discussed in Chapter 4 although it may be said that the condition of both parapet and cornice is poor with much weathered stucco exposing the brick and stone. It is stained and quite weathered.

The interior, with the exception of CM-5, was restored in the 1970s by the NPS and is in excellent condition.

NOTES

1. Ricardo Torres-Reyes, "Construction History of San Cristobal: 1634-1800," NPS report, San Juan NHS, June 1965, pp. 66 and 69. References cited by Torres-Reyes are the quarterly reports by Thomas O'Daly dated March 1, 1770, and March 15, 1771 (AI-SD 2503).

2. Torres-Reyes, Legend to Exhibit IX, pp. 26-27.

3. Ibid., p. 46.

4. This undated plan is included in Volume I, no. 9, of this report.

5. Torres-Reyes, pp. 66, 69, and 70. See note 1 for original references.

6. Six mortar samples removed from the structure known today as the Troops' Quarters are believed to date from the original construction period.

SAJU 09 M03 - South wall of CM-5, beige-colored soft lime mortar.
SAJU 09 M10 - Exterior stucco from east wall, orange colored lime mortar.
SAJU 09 M02
SAJU 09 M07 - Found in walls beneath plaster, lime mortar colored orange by brick dust.
SAJU 09 M04
SAJU 09 M05 - Early interior wall plaster, beige-colored soft lime mortar characterized by sea shells in the sand.

7. Torres-Reyes, p. 66.

8. The original ca. 1821 sketch by french artist Auguste is in the collection of San Juan NHS, San Cristobal. It is reproduced here from HABS negative #181.197.

9. A copy of the original model, commissioned by the Kin of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristobal. The original model has been dated to 1839 and is on display at Museo del Ejercito, Madrid, Spain. The 1861 Castro drawings are reproduced in this report in Appendix A17.

10. Correspondence, Hector Marin, Park Ranger San Juan NHS to Richard Crisson, Historical Architect, 17 February 1987.

11. Ricardo Torres-Reyes, "Historic Structure Report Part II: El Abanico Fort," NPS report, San Juan NHS, April 1965, p. 12. The reference cited by Torres-Reyes are the construction reports of Engineer Ignacio Mascaro', 1808, in the National Archives, Washington, D.C.

12. This evidence was examined in January 1987 by E. Blaine Cliver, Chief of the Historic Preservation Center, National Park Service. Each shutter leaf was attached by two pintles spaced 4+ feet apart.

13. Four photographs were examined for this report. All are dated ca. 1898-99 and were taken from outside looking east or northeast towards the Fort. Copies are in the photo archives of San Juan NHS, San Cristobal. Additional information about each includes the following:

1. View dated by San Juan NHS "ca.1898-99."
2. Photo also on file at HABS in Washington, negative number 181.29.
3. Photo included in Bearss' San Juan Fortifications pp. 436-7 and also on file at the National Archives, photo no. 77-F-107-3-30.
4. Postcard view entitled "Castillo San Cristobal, San Juan, P.R." with writing dated May 2, 1904.

14. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of the Interior, NPS, February 1984), p. 35. Original reference is to a report by Major Crosby and Colonel Goethal entitled "Notes on the Defenses of San Juan, Puerto Rico," National Archives, R.G. 77.

15. Ibid., p. 103. Original reference is to "Proceedings of Board Convened by Special Order No. 1 - Jan. 4, 1900," National Archives R.G. 92.

16. Ibid., pp. 108-111. Original reference is to correspondence in the National Archives, R.G. 92.

17. Drawing collection San Juan NHS, San Cristobal, No. FC7-DR3-ENV134.

18. Bearss, p. 131. The reference cited by Bearss is an Inspection Report dated May 1901, in the National Archives, R.G. 92.

19. Ibid, p. 133. Original reference is to correspondence in the National Archives, R.G. 92.

20. Ibid., pp. 117-118.

21. A copy of the photograph is in the photo archives of San Juan NHS, San Cristobal. The original is in the National Archives. This undated view has previously been dated ca. 1905 in an HSR on the Officers' Quarters. It was taken sometime after the flagpole was removed from the Troops' Quarters in 1902 and before the windmill was removed sometime before August 1912.

22. Bearss, pp. 123-4. Original reference is to correspondence in the National Archives, R.G. 92. The new iron flagstaff was installed in the early months of 1902.

23. Ibid., pp. 119-123. Original reference is to correspondence in the National Archives, R.G. 92.

24. Drawing collection San Juan NHS, San Cristobal, No. FC7-DR5-ENV141, & NHS-SJ. 9754.

25. Photo archives San Juan NHS, San Cristobal. Also on file at HABS in Washington, negative no. 181.30.

26. "Effect of Restoring Shutters and Doors and Installing a Museum in the Ground Floor Casemates of the Troops Quarters, Fort San Cristobal, SAJU NHS . . ." with attached cover letter dated August 28, 1975, from the Acting Regional Director Southeast Region to State Historic Preservation Officer of Puerto Rico.

27. Former NPS Historical Architect Fred Gjessing to Richard Crisson in a telephone conversation March 10, 1987. Mr. Gjessing was involved in the demolition of the floor in this vault in the late 1970s.

28. This uncataloged and undated photograph is in the photo archives of San Juan NHS, San Cristobal. Shown under construction is the World War II fire control station on El Caballero that was completed in the late summer of 1942 (Bearss, HSR, p. 359).

29. Undated photo log/completion report with handwritten notes and sketches entitled, "Maintenance Rehabilitation of Physical Facilities Programs: San Cristobal Museum Restoration." On file in the Superintendent's office, San Juan NHS, file no. D24.

30. Plan with legend entitled "General Layout Fort Brooke and Vicinity." Included in Bearss' San Juan Fortifications, pp. 432-433.

31. Bearss, pp. 377-379. Original reference is to specifications entitled "Rehabilitation of Enlisted Troop Housing, Motor Park, and Administrative Facilities at San Cristobal Area, Fort Brooke, Puerto Rico," dated Jan. 10, 1958.

32. Both photographs and drawings are in the collection of San Juan NHS, San Cristobal: HABS photo negative no. 181.5, and drawings number NHS-S.J. 3067 (11 sheets).

33. Existing conditions recorded in drawing entitled "San Cristobal Electrical Safety Survey, Fort San Cristobal Troops' Quarters" dated 9-11-62. San Juan NHS drawing no. FC1-DR4-ENV137.

34. The new flagpole is illustrated in a photograph labeled "The new flagpole, San Cristobal upper level, San Juan NHS - Dec. 1961." Raising of the Spanish flag is described in a news article, "Cristobal: A New Flag," The San Juan Star, Monday Sept. 9, 1963.

35. "Effect of Restoring Shutters and Doors and Installing Museum in the Ground Floor Casemates of the Troops' Quarters, Fort San Cristobal, SAJU NHS . . ." with transmittal letter dated August 28, 1975.

36. Drawing entitled "Hardware Details - Troop Quarters" by F. Gjessing, April 22, 1976, Drawing no. 393/80,005. Also, "Statement and Certificate of Award" for contract no. CX500071306 awarded to the Hartland Forge and dated September 22, 1977.

37. Memorandum dated May 8, 1974, to the Superintendent SAJU from Architect regarding paint analysis of woodwork in the Troop Quarters, San Juan NHS, San Cristobal.

38. One window frame with its paint intact is now in storage with the artifact collection in the North Casemates. Although its original location is not identified, this was most likely a first story window in the Troops' Quarters based on its size and paint evidence.

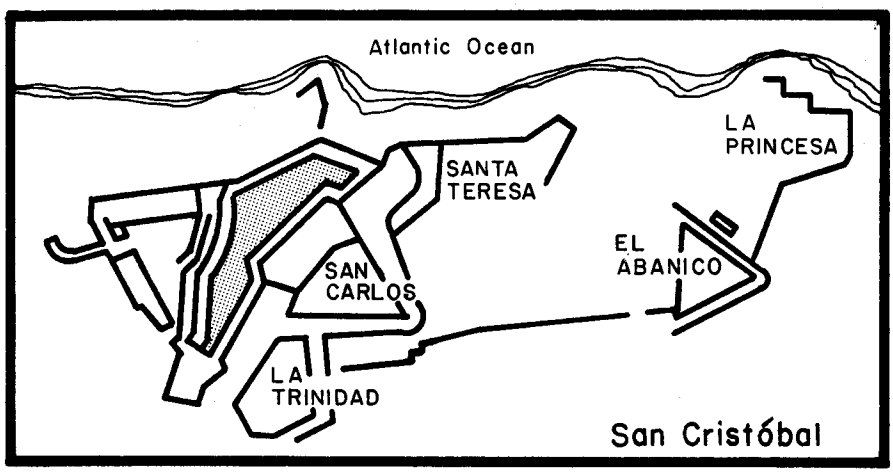
39. The "kerosene and linseed oil" treatment is documented in the photo log/completion report in a file entitled "Maintenance Rehab. of Physical Programs: San Cristobal Museum Restoration," file no. D24. Regarding paint stripping, see memo dated July 31, 1985, to the Associate Regional Director SE Region from Architectural Conservator regarding "Obliteration of Historic Architectural Finishes and Disposition of Historic Building Materials at SAJU NHS."

40. Ibid. Also, photo log/completion report cited in note 28; handwritten notes entitled "Notes on shutters and doors of Troop Quarters, San Cristobal, SAJU NHS" (7 pages) dated March 19, 1974; memorandum dated April 5, 1974 to the Superintendent SAJU from Architect regarding "Troop Quarters Rehabilitation of Doors and Shutters;" and, "Draft" scope of work dated May 7, 1974. According to former National Park Service Architect Fred Gjessing, the existing 19th century exterior louvered shutters

were removed at this time. He did not know if they had been stored or discarded. (Telephone conversation, F. Gjessing to R. Crisson, 3/10/1987).

41. See reports and drawings previously cited in notes 28, 34, and 38. Also reviewed were 106 compliance statement "Patch & Paint Casemates, Forts El Morro/San Cristobal, SAJU NHS," 1975; letter dated Nov. 24, 1975, from the Regional Director to the Advisory Council regarding 106 compliance; Drawings no.393/80002 (FC7-DR3-ENV133), "Glass Treatment for Exterior Masonry Arches" and "Mechanical & Electrical Work, First Floor," Oct. 24, 1975; and Drawings no. 393/94001, "Rehabilitation of Troop Quarters" by Victor M. Garcia Assoc., n.d.

42. Completion report/photo log is cited in note 28. Involved with this undertaking was former NPS Architect Fred Gjessing. Although he took notes on his findings, these were never written in a report. (Telephone conversation, F. Gjessing to R. Crisson, 3/10/1987).



CHAPTER 10

NORTH BASTION, CURTAIN, AND SOUTH BASTION (BALUARTE DEL NORTE, CORTINA, BALUARTE DEL SUR)

Description

The eastern defense of San Cristóbal forms an irregular semi-circular configuration adjoining the west (curtain) wall of el Caballero and the Troops' Quarters. It is composed of the North Bastion, the Curtain, and the South Bastion. (See figs. 10.1, 10.2, 10.3.) The northern most section is the North Bastion, historically known as the Baluarte del norte (1765) and Baluarte plano del norte (1766). Adjoining the North Bastion on the south is the Curtain with its curtain wall and terreplein known historically as the Baluarte medio (1766), Baluarte plano (1766), and Cortina ("curtain"). The South Bastion forms the lower portion of the eastern defense. It also was known as the Baluarte plano (1765), and as the Baluarte plano del sur (1766). For the remainder of this chapter, and for references in related chapters, the terms North Bastion, South Bastion and Curtain will be used.

The masonry walls are generally of uniform construction, characterized by rough-cut coursed ashlar with cut stone at the salient angles and shoulders of the bastions, the sentry box, and many embrasures. These exterior walls possess a slightly

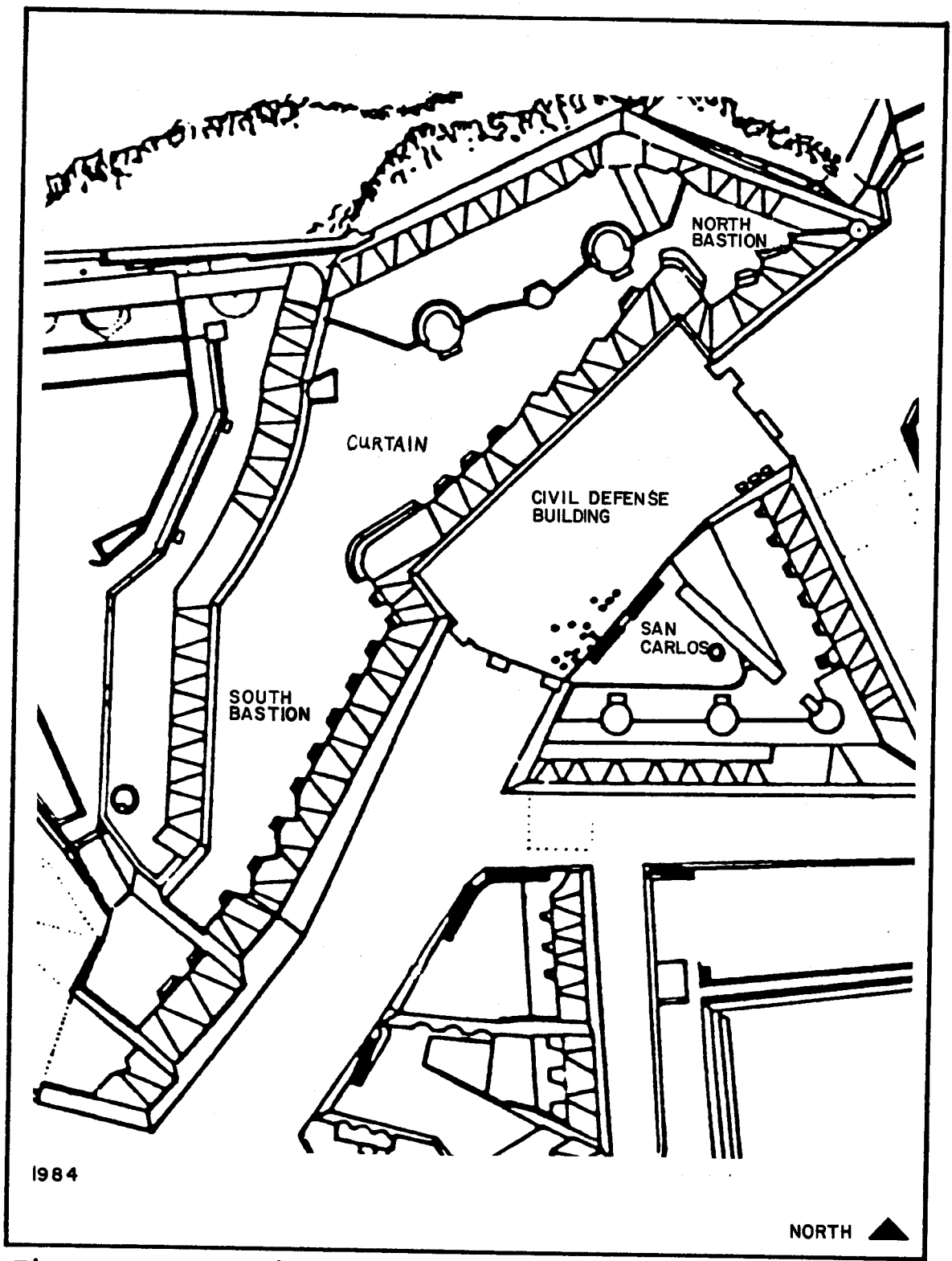


Figure 10.1. Detail of 1984 HABS site plan of San Cristóbal showing the North Bastion, the Curtain, and the South Bastion.

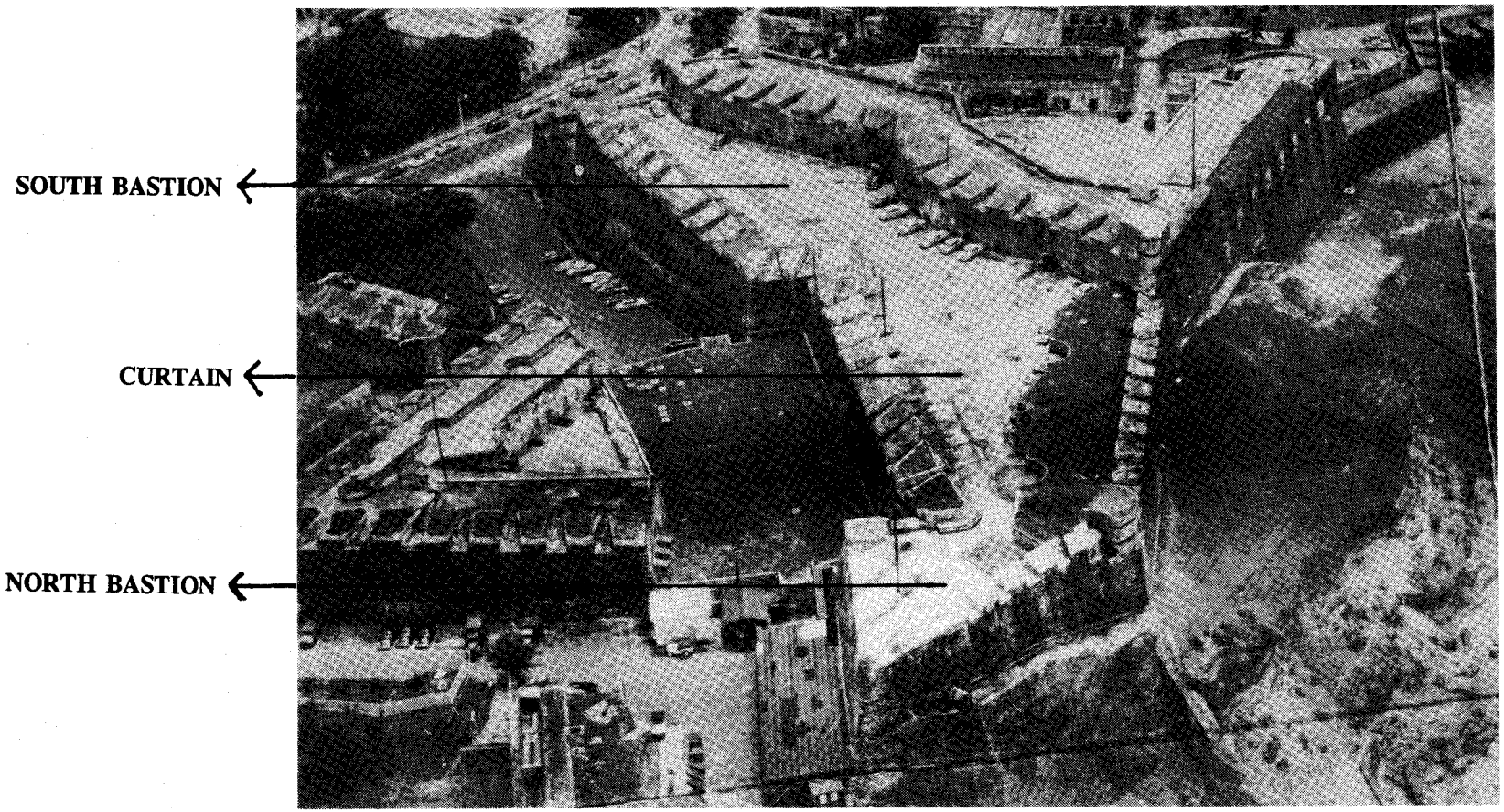


Figure 10.2. Aerial view of the North and South Bastions, the Curtain and surrounds, ca. 1945. Consider only for general configuration. (San Juan NHS Archives.)

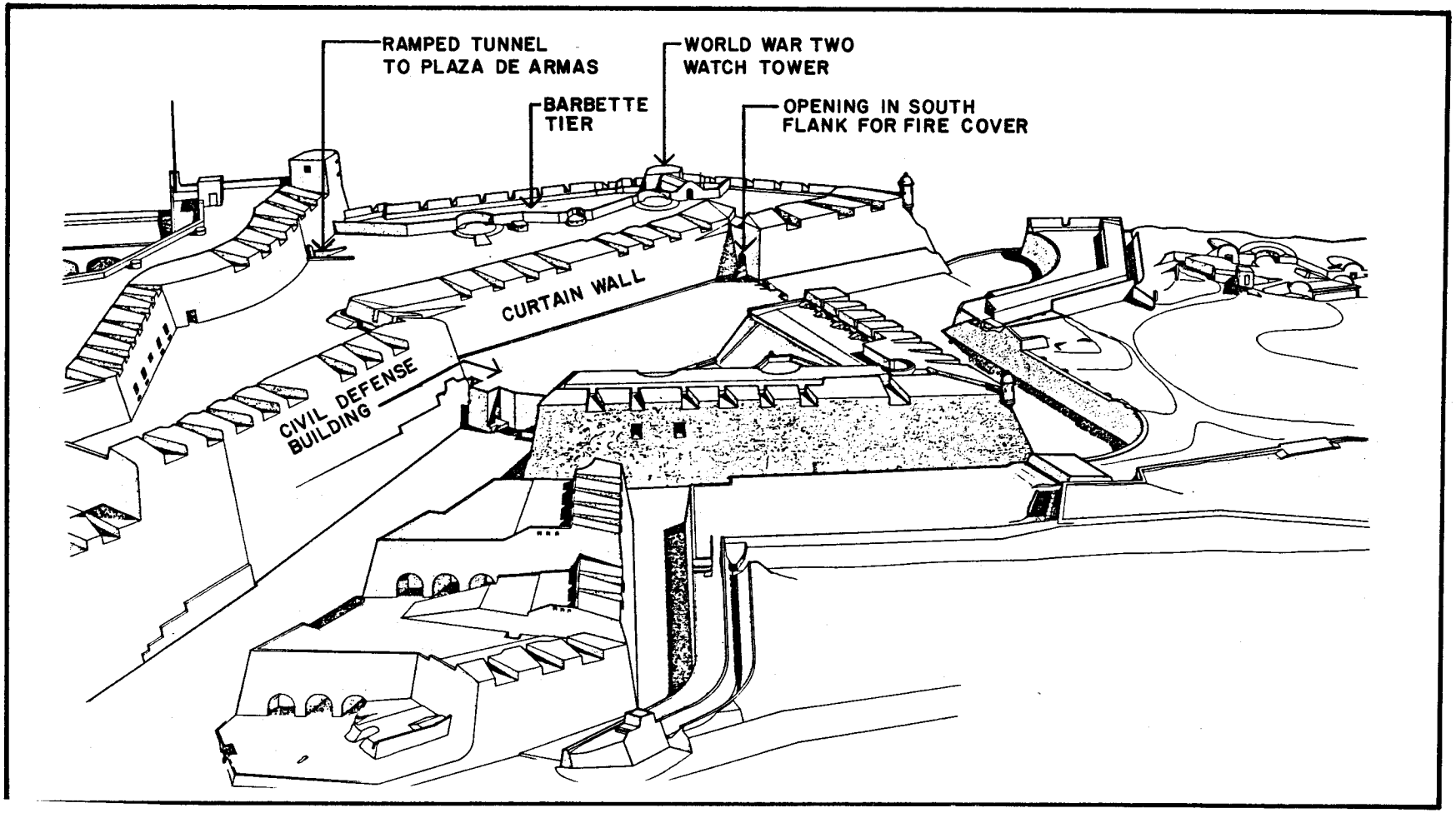


Figure 10.3. Perspective drawing by HABS, 1985. Annotated by Jana Gross, 1989.

projecting base that has been largely concealed along the curtain wall by the World War II Civil Defense infill.

Much of the outer wall has been resurfaced during at least four different repair campaigns beginning as early as 1921. These include: (1) a light colored stucco into which many small stones are inserted; (2) a 1 inch veneer of rectangular and polygonal slabs pointed with cement installed by the Army Corps of Engineers in 1938-40; (3) an orange cement stucco scored in the same patterns as the veneer that may be contemporaneous with or later than the 1938-40 work; and (4) the most recent repair work involving the application of grey Portland cement fills and patches.*

The North Bastion is joined to el Caballero by the north battery of the upper terreplein. Direct access to this area is gained through two ramped tunnels that run through the redoubt from the lower Plaza de Armas. The entrance of the north tunnel ramp is defined by two low splayed stone walls with rounded stone copings similar to those of the main entry ramp.

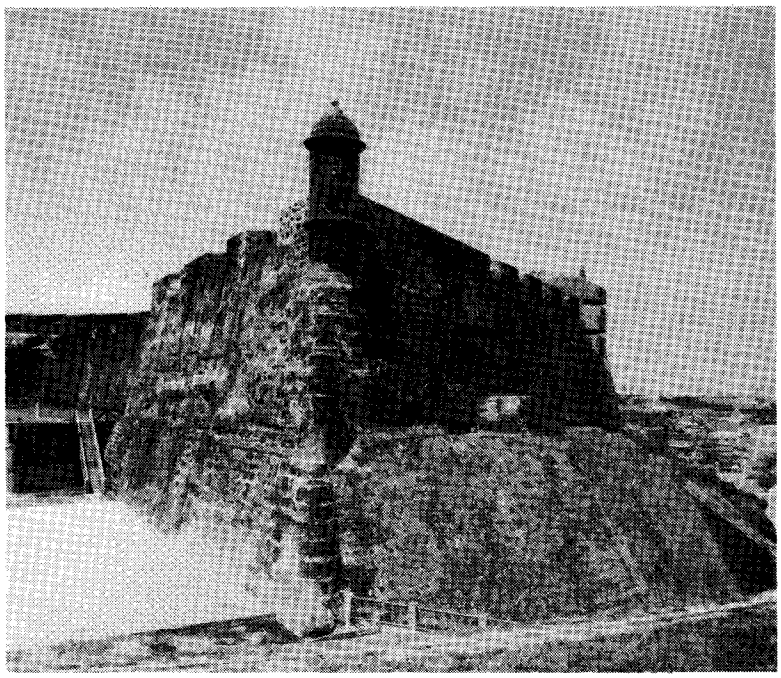


Figure 10.4. North and east walls of the North Bastion with sentry box. Photo by CPR, 1986.

The masonry of the North Bastion appears to exhibit two distinct systems that may relate to the raising of the earlier bastion in 1765. The sentry box (fig. 10.4) located at the northwest salient angle of the bastion is one of the few early echaugettes (sentry boxes) to survive. It is bonded to the upper wall. Like the salient angle, it is constructed of finely cut ashlar block set with brick spacers.

The south flank of the North Bastion contains an arched opening that pierces the wall at an oblique angle. The

*See SAJU 10 M05, SAJU 10 M10, SAJU 10 M01, SAJU 10 M08.

exterior reveal of the arch is constructed of bricks. The remainder of the reveal is constructed of squared blocks of ashlar. This opening served as an additional embrasure below the terreplein level to provide fire cover for the adjacent curtain wall. Modern cast concrete steps lead down from this opening to the earth covered roof of the Civil Defense headquarters now filling a large portion of the main moat. Also evident on this flank are several bricks, forming what appears to be the springline of an arch to the east of the existing arched opening. These remnants may relate to an earlier blind arcaded wall system as was known to have existed in the Santiago curtain.[1]

On the lower wall of the east face is the ghost of a shed roof and its associated parging and concrete pad below. These indicate the presence of a large garage constructed in 1918-19.[2]

A barbette tier was built on the north battery of the upper plaza in 1895-96 consisting of two semicircular gun emplacements in a sloped retaining wall. The retaining wall and gun platforms survive today.

A World War II watch tower and modern elevated scenic lookout are located on the eastern extreme of the enclosed area. The watch tower is constructed of poured reinforced concrete as is evidenced by the ghosts of wooden formwork that are clearly visible on the walls and vault. Originally this structure was covered with earth.

The drainage system of the North Bastion consists a series of brick drains located around the perimeter of the north battery. The gutter is capped at certain areas.

The Curtain lies between the North and South Bastions and consists of an embrasured curtain wall and wide terreplein commanding defense of San Carlos and the main moat. The curtain wall has been significantly obscured by the insertion of the Civil Defense headquarters in the main moat. Extensive Army Corps stone repair work covers most of the visible wall. Located beneath the central merlon is the narrow rectangular brick-trimmed vent of the dungeon that is situated directly behind the curtain wall (figs. 10.5, 10.6).

The terreplein of the fort's eastern defenses is a large continuous masonry-surfaced platform that was created by back filling against the earlier east wall of the San Cristóbal

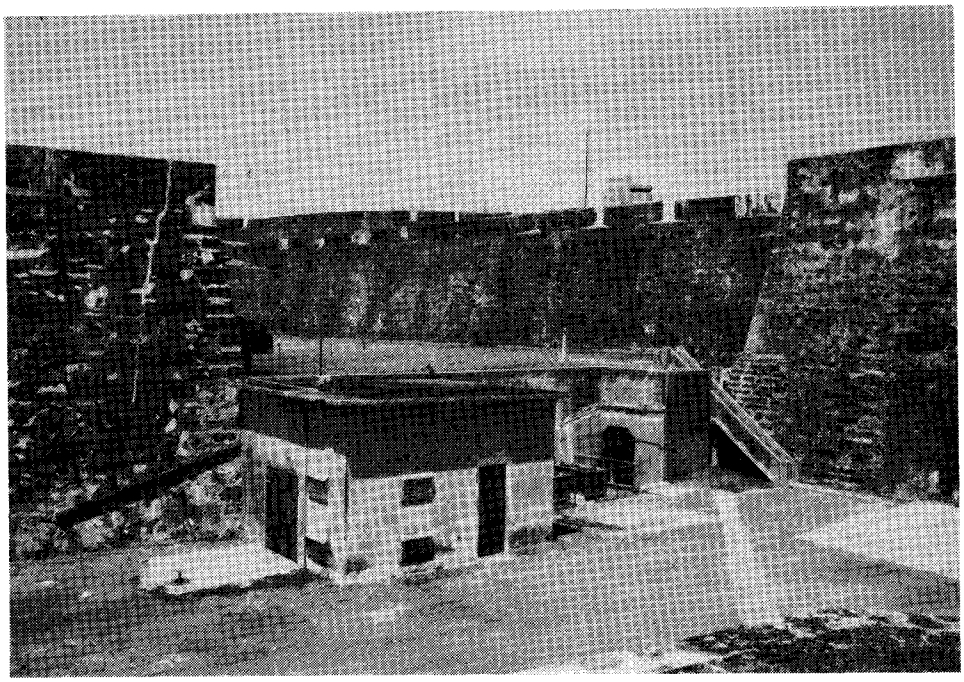


Figure 10.5. View of the Curtain with obscuring Civil Defense Building in foreground. Photo by CPR, 1986.



Figure 10.6. Terreplein of the North Bastion and Curtain looking north. Photo by CPR, 1986.

Redoubt (fig. 10.7). It is bordered on the east by the curtain wall. Its expanse is interrupted only at its northern end by the 1895-96 barbette wall.* The pavement displays numerous campaigns of patching, the most obvious of these being brick filled cracks.** A single course of brick extends along the entire length of the juncture of the terreplein and the San Cristóbal Redoubt.

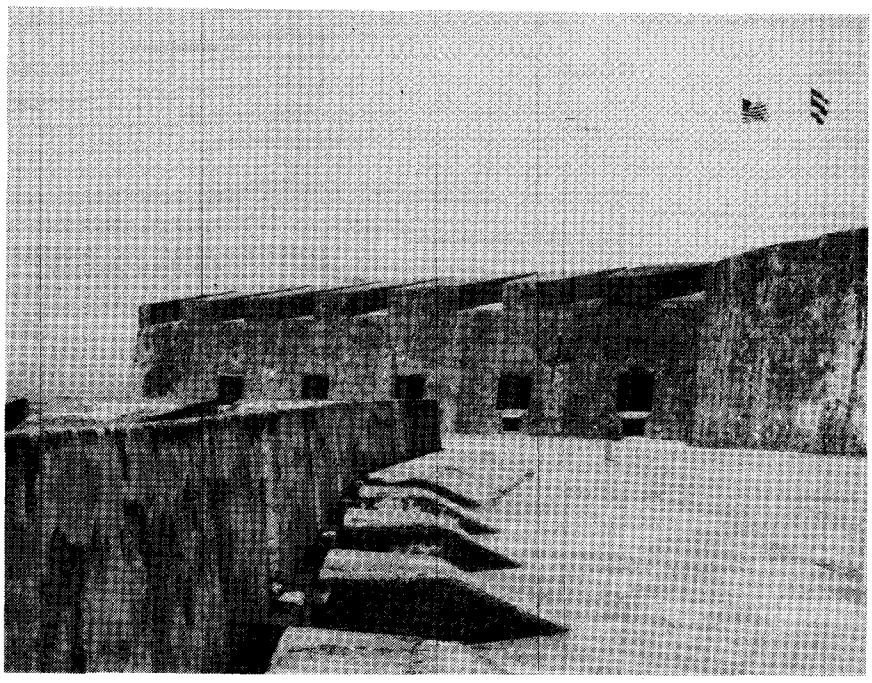


Figure 10.7. View of banquettes behind the embrasured wall of the curtain wall looking south. Photo by CPR, 1986.

Circular gun platforms on the terreplein are constructed of a coarse reinforced concrete. They are ringed on the terreplein side by a semicircular ramp of red crushed brick concrete. Along the curvelinear wall the platform slopes downward. It originally terminated in an open gutter, now filled, that fed a brick drain piercing the center of the circular wall. A cast-iron gun plate still remains on the west platform. Approximately midway between the gun emplacements, the plane of the retaining wall is indented to accommodate a shaft that served as an ammunition magazine.

Directly to the east of the west gun pad, a square (19 by 19 inch) ventilation shaft with a raised stone sill pierces the terreplein. Its shaft runs to a depth of 11 feet where it enters the tunnel below and is presently topped with a recent cast concrete slab. Surviving wrought iron cross-bars may relate to an earlier cover that fit within the stone sill.

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*Sample of terreplein surface. SAJU 10 M47, grayish white concrete, may date from the 1780s.

**SAJU 10 M41

Although seemingly flat, the terreplein is actually divided into gently sloped segments to facilitate drainage of the surface. This system has been carefully planned to direct rainwater into three collection centers (one per unit) serviced by a complex series of open gutters and drains that feed the principal cisterns below the Plaza de Armas, as well as discharge runoff beyond the walls. These open perimeter gutters are constructed of flat paver bricks laid end-to-end and closed on their interior side with a course of edge set brick. This box gutter abuts the terreplein surface with a flat brick edging. The gutter runs through the majority of the banquettes. A linear course of cut sandstone blocks extends along the perimeter of the eastern walls, apparently serving to define a continuous eastern slope from the remaining terreplein and direct water towards the perimeter gutters. Collection for the North Bastion is located at the west end of the north battery where it feeds into a culvert that appears to slope south towards the principal ramp to the lower plaza. The Curtain's terreplein drains through a central culvert located just south of the central embrasure. Drainage of the South Bastion terreplein occurs beneath the central banquette and appears to drain to the west beneath the pavement and through el Caballero's southern tunnel to a drain near the Chapel.

The face wall of the South Bastion has the greatest elevation along the moat (figs. 10.8, 10.9). Its projecting base at the southern end is stepped up from south to north and appears to relate to the eighteenth-century excavation work to increase the height of these walls. Directly below and to the east of the shallow bastion is a modern asphalt parking lot.

The two lower batteries to the south of the South Bastion are stepped downward, the lower (southernmost) having been partially truncated during the demolition of the southern end of the fortifications in 1896. Two modern reinforced concrete retaining walls faced with a polygonal rubble veneer (ca. 1938) now terminate the western edge of the battery's terreplein and its lower slope. Currently, the lower retaining wall is surmounted by a cyclone link fence. The southern flank of the uppermost battery terminates in a low brick coping that gives access to the earthen ramp connecting the uppermost battery to the sloping terrain below. The western end of the south flank incorporates a steeply pitched trough that channels rainwater from the terreplein above. Access to the upper battery is gained from the South Gate ramp. The entrance to Tunnel 5 is located on the southern flank of the uppermost battery.

Embrasures of North and South Bastions and the Curtain are of varying configuration, materials, and construction

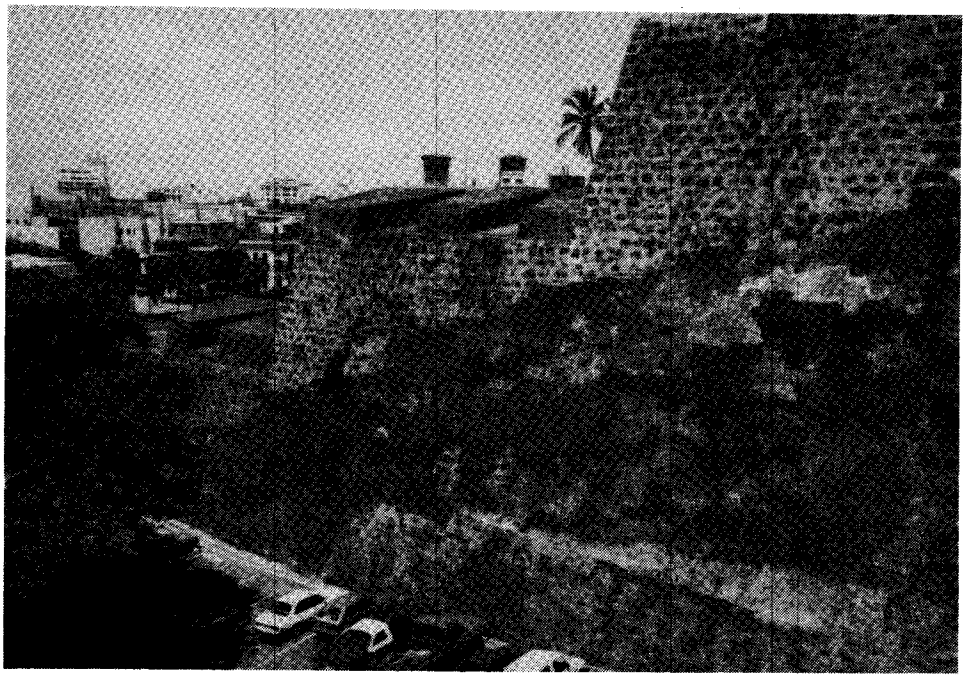


Figure 10.8. Face wall of the South Bastion looking west. Photo by CPR, 1986.

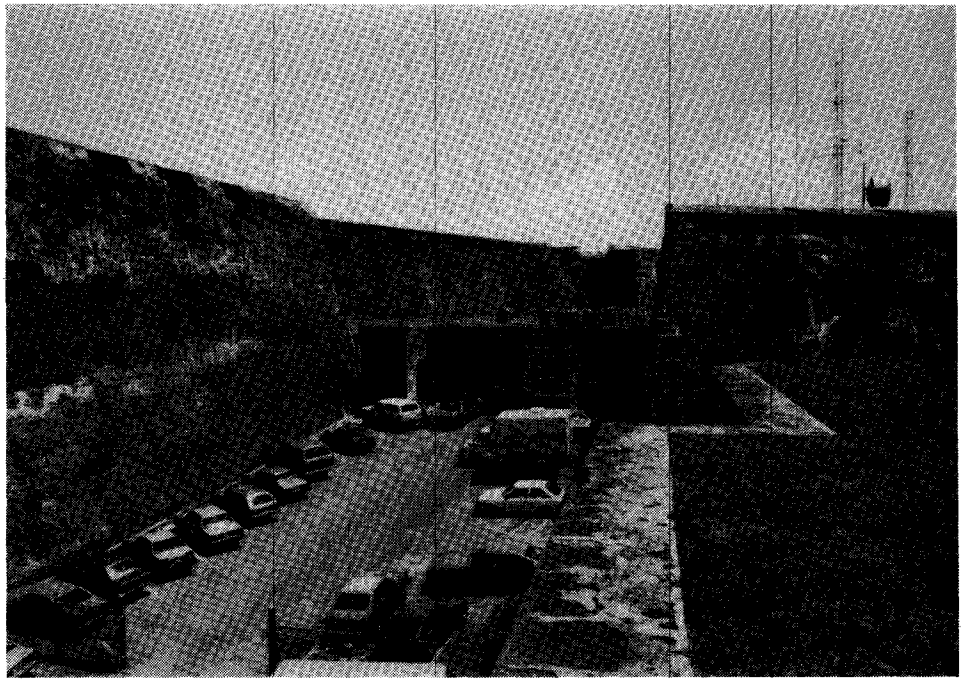


Figure 10.9. Face walls of the South Bastion and the Curtain looking north up the moat. Photo by CPR, 1986.

techniques. All embrasures are approximately the same height and are of rubble fill construction with numerous stucco coatings of various dates. Embrasure openings are trimmed with either ashlar or brick or a combination of both. Stone is generally used for the exterior edges and for interior corners. Subtle variations appear to relate to location, construction period, and repair/alteration. At least five distinct types can be observed. (See figs. 10.10, 10.11.) In general, Type I embrasures are found along the north battery and the north face of the North Bastion, while Type II embrasures are found only on the south face of the North Bastion. Type III embrasures extend along the entire length of the Curtain and flanks of the adjacent bastions. Type IV embrasures are located on both faces of the South Bastion and Type V on the lower batteries of this bastion.*

Banquettes of various widths extend along only the eastern walls. In general, the banquettes are constructed of rubble stone with brick platform edges. Presently, the entire banquette is covered in white stucco that conceals former renderings.**

Evidence of at least seven masonry cannon ball pads can be observed on the terreplein: two on the west end of the north battery, two behind the curtain wall, and three on the South Bastion. The two pads on the South Bastion have been reconstructed with cannon balls.

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*Samples from embrasures. SAJU 10 M27, merlons' top edges. SAJU 10 M15, quoins.

**SAJU 10 M25, SAJU 10 M33.

Type	I	II	III	IV	V
I.Face Edge(A)	Brick (canted)	Ashlar (canted)	Brick	Brick	Brick (canted)
E.Face Edge(A')	Ashlar	Ashlar	Ashlar	Ashlar	Ashlar
I.Top Edge(B)	Brick	Brick	Brick	Brick	Brick
E.Top Edge(B')	Ashlar	Ashlar	Ashlar	Ashlar (rounded)	Ashlar
Top Edge(C)	Brick	Brick	Brick	Brick	Ashlar
I.Corner (D)	Ashlar	Ashlar	Ashlar	Ashlar	Ashlar
E.Corner	Ashlar	Ashlar	Ashlar	Ashlar	Ashlar

Figure 10.10. Table of embrasure conditions compiled by CPR, 1986.

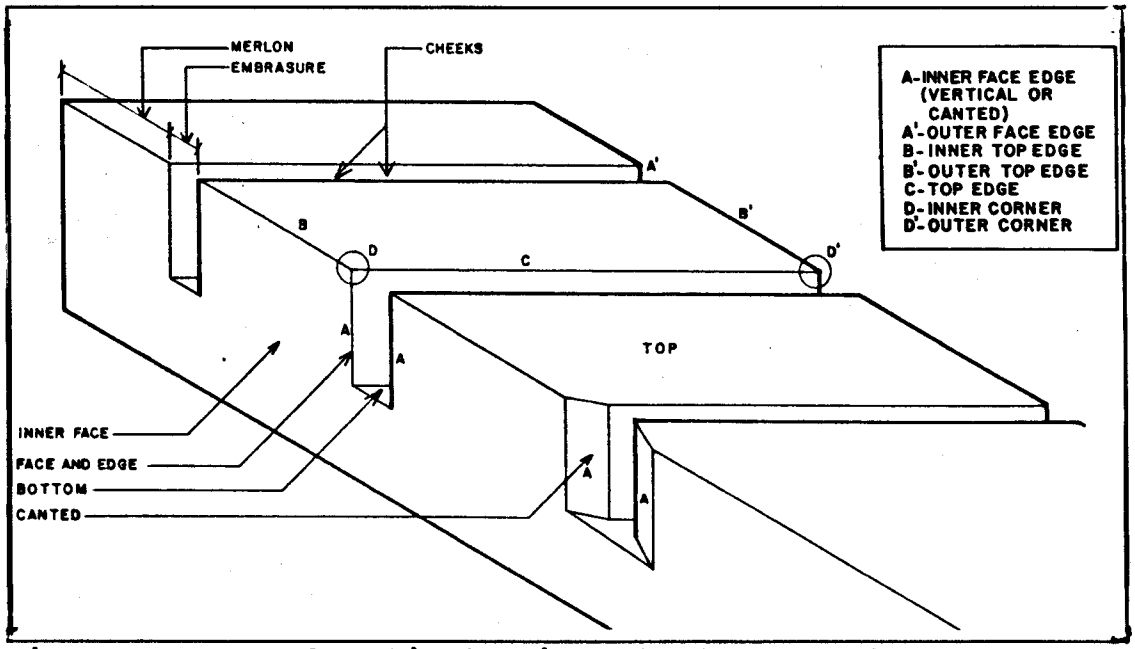


Figure 10.11. Schematic drawing of embrasures by CPR, 1986.

Structural Evolution

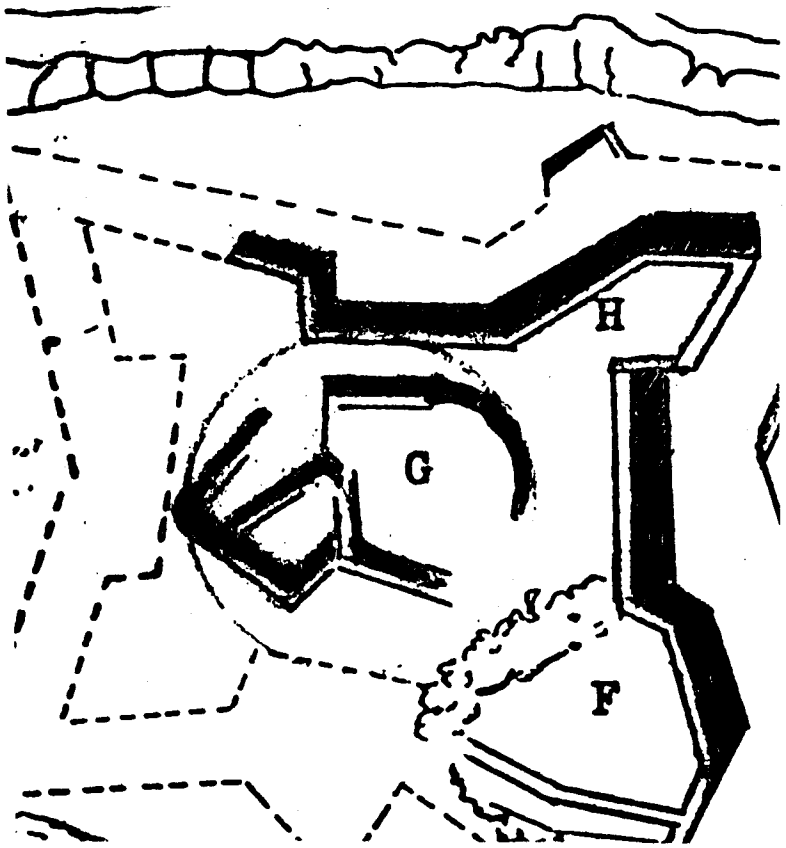
Period 1625-1765

Prior to this period, documents record that the construction of a wall running from the Atlantic Ocean on the north to the San Juan Harbor on the south was proposed. This wall was intended to close the throat of land where the fort is presently situated effectively cutting off the city from all possible land approaches. Although modified, the North and South Bastions and the Curtain are the surviving elements of this wall begun in 1634.[3] Plans of 1678 and 1702 (fig. 10.12) showed that the eastern defenses of San Cristóbal included the South Bastion connected by a curtain to a North Bastion facing the sea. Torres-Reyes noted that at this time the North Bastion was in reality a demi-bastion because it only had one flank.[4]

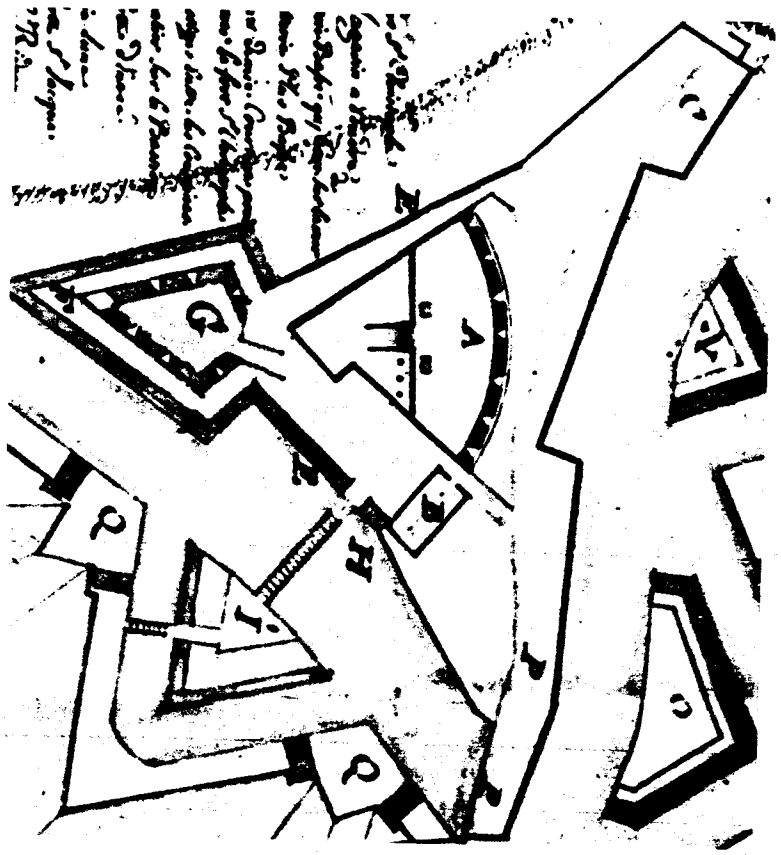
According to construction documents, governor Juan José Colomo (1743-1750) reported that in 1749 it was necessary to reinforce the North Bastion with two high buttresses or counterforts to prevent its collapse. "The Bastion had been raised upon natural rock, but during a sea storm its sandy footing remained openly [sic] in great extent". He also noted that "delinquents and idle vagrants of the Island" were used to carry out the reparations.[5] (These counterforts appear on O'Daly's existing condition plans of 1765.)

The North Bastion was still being built in 1759 with the embrasures and merlons of its batteries not yet completed. Records noted that during this early period these portions of the defenses were plagued with structural problems related to their siting and construction. "Lack of counterscarp revetment weakened the terrain and caused frequent landslides into the moat. The formidable surf affected the northern part of the fort continually".[6]

Masonry from this early period of construction can be seen in the mid-section of the land front. It is clearly of a different character, carved sandstone blocks being of smaller dimension, with levelling courses of thin flat rubble.



1678



1702

Figure 10.12. Left: Detail of Osorio Venegas' plan of San Cristóbal, 1678. Right: Detail of a 1702 plan showing North ("O") and South ("P") Bastions connected by a curtain.

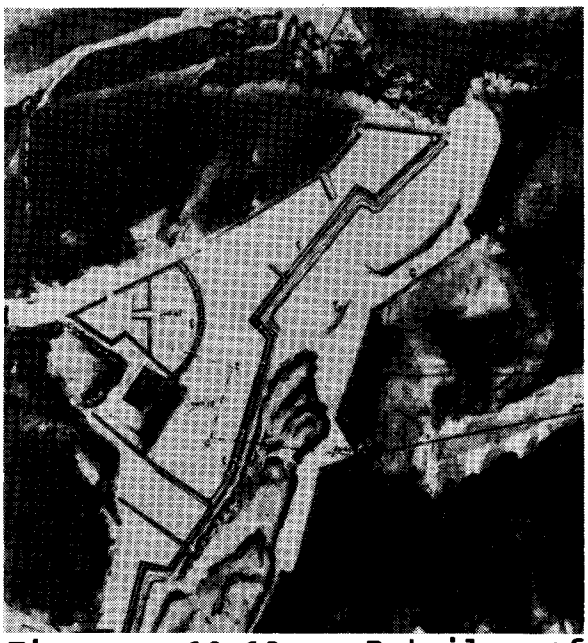


Figure 10.13. Detail of O'Daly's 1765 existing conditions plan.

O'Daly's modernization project of 1765 included many significant modifications and improvements to this line of San Cristóbal's defenses. In his as-built plan of 1765 (fig. 10.13) the land front of San Cristóbal was shown as complete with two bastions and connecting curtain). However, the masonry walls of these elements were quite narrow (only 5-6 feet thick) with few embrasures delineated. Torres-Reyes noted that the weakness of the parapet was increased due to the lack of a regular moat at this time.[7] The northern part of the fort, built without a western flank, was very narrow in 1765. Because of this design flaw, the bastion formed such an acute angle that artillery facing the sea was "unserviceable". Part of the O'Daly plan included widening the angle from the foundations. This was "to be resolved upon a very great cost because of its ending on the top of a steep bluff that goes down one hundred and five feet to the sea".[8]

In order to understand the structural evolution of these elements of the defenses it is necessary to summarize the lengthy coverage of this project found in Torres-Reyes' Construction History. Major alterations proposed in the 1765 plan included deepening the moat to form a good covered way, thickening the parapet walls to 18 feet, and raising parapet walls to a corresponding height in an effort to correct their weakness. All modifications were to be accomplished without reducing fire power. The flanks of the North and South Bastions were to remain short, but as the North Bastion was considered the main front of attack it was thought necessary to thicken its parapets. The only feasible way to accomplish this, because of the cliff to the north and the Bastion's acute angle, was to widen the Bastion to the west. With this widening, the Bastion acquired more capacity and a new flank that dominated every part of San Sebastian beach on the northwest of San Cristóbal.[9] Evidence of the widening of the North Bastion is seen in Tunnel 1. The earlier north wall of the fort was incorporated as the tunnel's southern interior

wall. The tunnel itself and its present north wall were built as part of the widening campaign of 1765.[10]

Before thickening the parapets, excavations were made at various locations to determine their strength, stability, and composition. Military engineers concluded from the excavations that the foundations of the parapets had been laid in a "systematic manner". This conclusion led engineers to use probes to estimate the foundation's ability (directly related to foundation thickness) to support the additional weight of the projected parapets. Interior and exterior faces of the walls were found to be in good condition, of good construction, and of sufficient dimension to support the new work. Parapets and merlons were begun using traditional construction techniques, however, under threat of war with England, the process was changed to speed construction. New parapets and merlons were filled with earth as they were constructed rather than being let to dry first.[11]

By 1767, excavation was nearing the face of the North Bastion. Under the curtain wall terrain was found to be natural rock of the same type as that cut for the other faces. Because of this it was felt to be sound procedure when deepening the moat to cut the rock out under the curtain with the same talus as the old work laid above.[12] These different phases of the wall's excavation are visible today. Distinct bands of stone illustrate that natural rock was cut in different campaigns but retained the same slope.

O'Daly's 1769 plan and profiles of the construction works (fig. 10.14) are the first available graphic representations of the work executed and planned between 1766-9. (Color plans from 1765 exist though they may not have actually been executed.) Extremely informative legends and explanations accompanied these documents. Items of particular interest included the new parapets with their embrasures comprising all of the front (west and north) of the fort; raising areas of the curtain walls and terreplein above the old work; raising the sentry box of the North Bastion northwest corner; reinforcing the terrains along the North Bastion; and excavating a deeper main moat.

Physical evidence for the preceding changes can be seen in the existing fabric of parapets and embrasures that date largely from this period. It is evident that the original hewn stone sentry box of the North Bastion, that was raised and "recycled" at this time, survives. It is of a character identical to others of the early period and rests above an area of stone different in character than that below (corresponding in height (8-9 feet) to the raising of the wall).

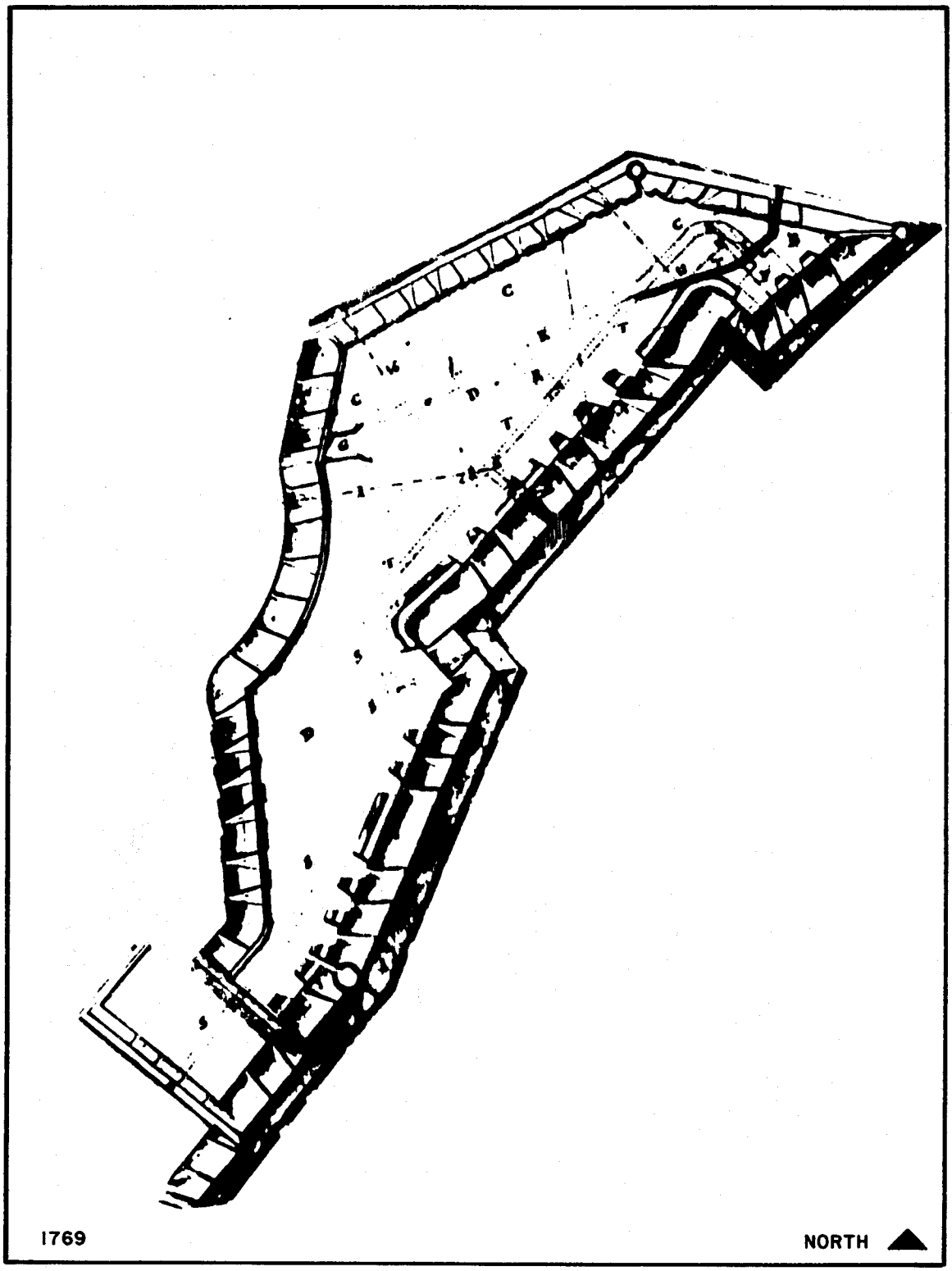


Figure 10.14. Detail of O'Daly's proposed construction plan showing North Bastion, Curtain, and South Bastion.

Sections of the north walls of San Cristóbal drawn by Mestre and O'Daly in 1769 showed the buttress reinforcement, and method of reinforcing terrain near the northern part of the shoulder and face of the North Bastion and north of the counterscarp area. (See fig. 10.15.) In September of 1769 the northern "part of the curtain between the North and South Bastions tumbled together with the temporary wooden bridge spanning the moat between the fort and San Carlos Ravelin."[13] The bastions and their flanks were not affected, presumably because the North Bastion had been recently reinforced and the South Bastion's foundation was very stable. The moat in these undamaged areas had already reached its required depth; in other areas excavation had begun but was incomplete.

The inside revetment of the parapets and their foundation remained intact. Cracks thought to be superficial were found in all of the new works, including one running continuously through five merlons of the North Bastion. The collapsed portion of the curtain had a height of 18-19 feet and a length of 23-24 tuesas. Torres-Reyes explains,

> At both ends of the fallen wall clear remains were found of blind arches joined to the wall without any mortar. The keystones of the arches were eight feet below the level of the cordon, 3 feet thick, and the arches diameter about 12 feet. The arches were filled with wet clay, the same as on the interior of the wall. Only the scarp and the inside face of the wall were covered with a fine finish.[14]

Investigations as to the cause of the collapse concluded that the least reinforced section of the wall had fallen because this old and unknown construction technique of adding blind arches to insides of walls had given engineers inaccurate estimates of foundation thickness and load bearing capacity. It appears that their measurements of foundation thickness had included piers and curved stones that were not attached to the body of the wall and therefore did not add to actual bearing capacity. It was also found that the top of the clay-filled wall was opened in 1766 to receive new parapets. This wall was left open for three years, allowing continuous water filtration that softened the interior of the wall and precipitated the collapse of these weak arches within the wall.[15]

The second stage of construction and modernization ran from 1769-1773. Early in this stage, cracks in the revetment of the North Bastion's parapet resulting from the settlement of new works on the old walls (recorded as early as 1764), needed repair. Fill was removed. Embrasures and merlons were rebuilt using better construction techniques.[16] This rebuilding may in

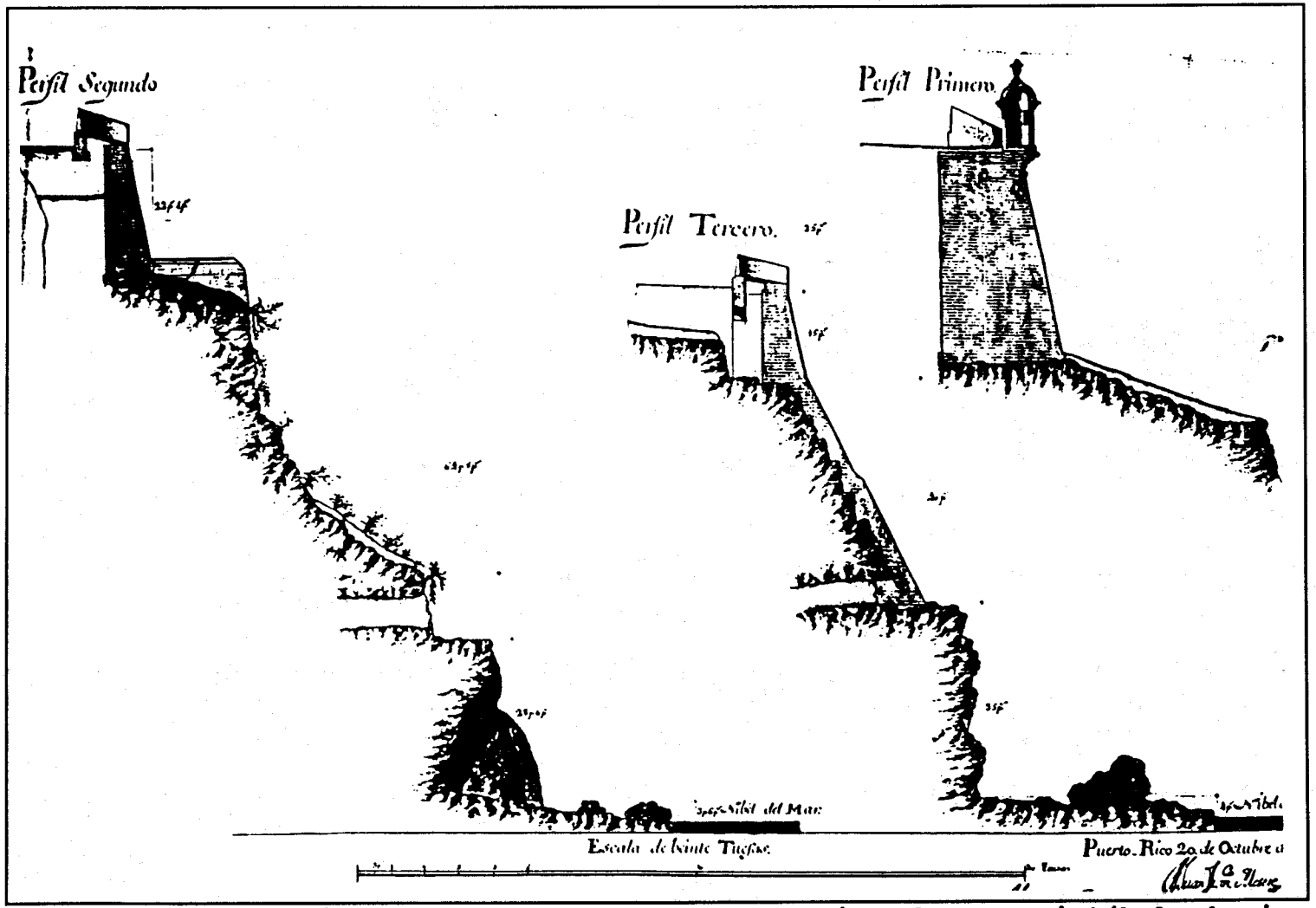


Figure 10.15. Profiles of north walls and terrain of San Cristóbal showing buttress reinforcement of North Bastion and north counterscarp area. Drawings by O'Daly and Mestre, 1769.

part explain the different character of the embrasures and merlons of the North Bastion.

Reports detailed that by 1770, the new curtain (extant today) was completed. In 1771 walls were stuccoed with a fine stucco.* It is known that by 1773, 14 embrasures had been completed on the north and 23 to the east. O'Daly's extensive series of sections and elevations from February 26, 1773 represented these elements in their completed form.[17] (See fig. 10.16.) Of special interest was a section through the Santiago Bastion (taken directly to the south of the South Bastion) that illustrated the blind arched system of construction within the wall that is thought to have led to the collapse of curtain.

Mestre's plans of 1783 (fig. 10.17) showed the entire system in a more fully developed form though the North and South Bastions and Curtain appear unaltered.[16]

It is likely that portions of the line of defense sustained structural damage in an earthquake in 1787. A report submitted by Spanish military engineers detailed 1789 reparations and clearly stated that repairs were made to the parapets of the North Bastion, esplanades, and the cistern beneath the Caballero.[17] Records of 1808 stated that "work to the inside face of parapets was carried out and that a mortar or cement of rough aggregate was applied on top of merlons".[18]

Period 3: 1809-1837

No specific references to the North and South Bastions or the Curtain were found in available documentation for this period.

Period 4: 1837-1868

Although 1859 records documenting work performed on el Morro and San Cristóbal during the years 1849-58 described the closing of embrasures at el Morro they contained no specific references to work on the land front of San Cristóbal. Because the document was prefaced with the statement that "similar significant improvements were made at San Cristóbal" it may be inferred that embrasures were also closed or worked on at San Cristóbal at this time.[19] This closing could explain the anomaly seen in the middle embrasure on the east face.

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*SAJU 10 M09.



Figure 10.16. Detail of Mestre's 1783 plan. North Bastion, Curtain, and South Bastion only.

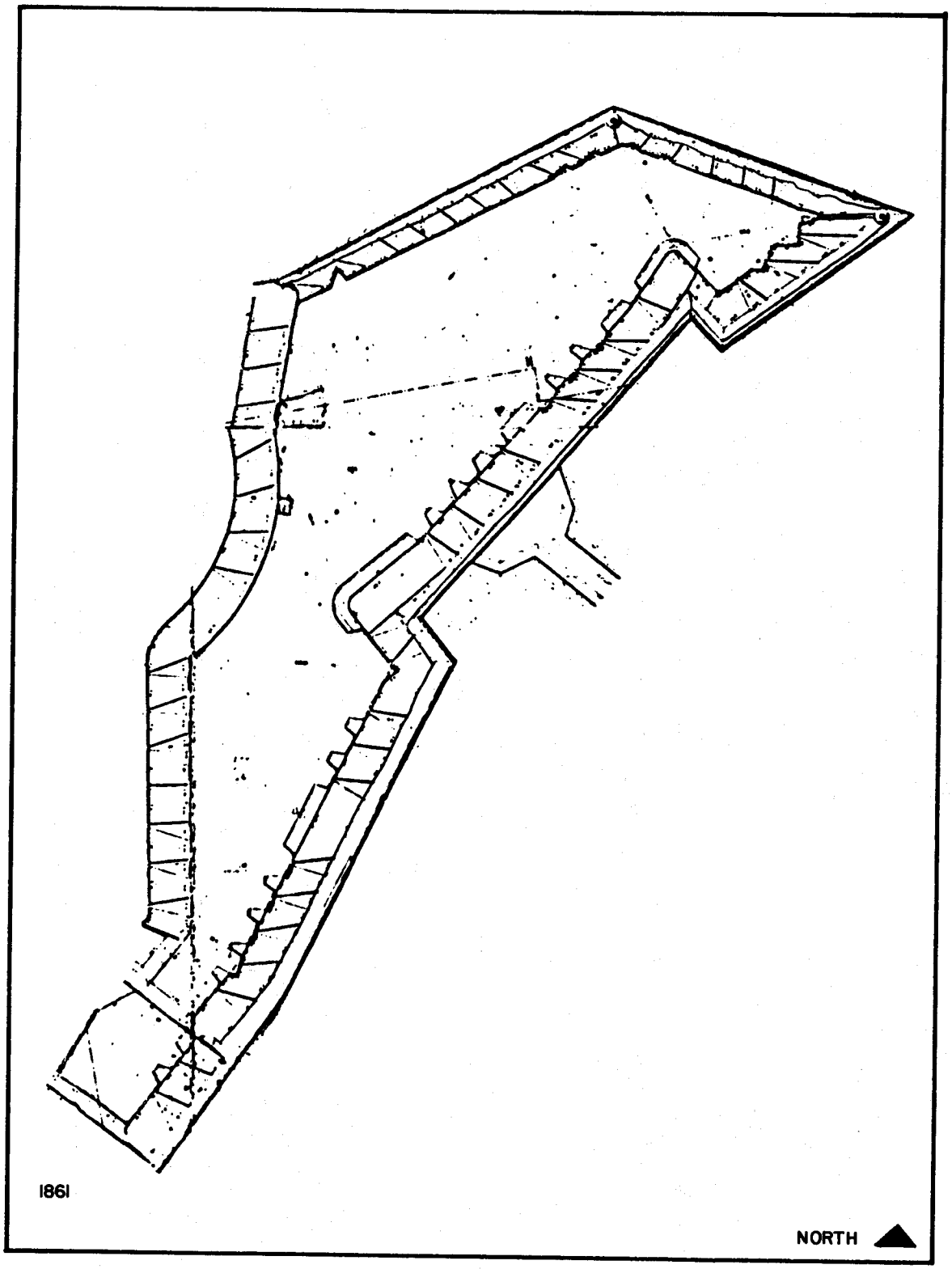


Figure 10.17. Detail of Manuel Castro's 1861 plan showing North Bastion, Curtain, and South Bastion. (San Juan NHS Archives.)

Physical fabric suggests that it was decreased in size by the expansion of its southern merlon by infilling with rubble brick and stone. The embrasures and merlons of this section of the Bastion are of a different character, i.e. Type II (see fig. 10.10), than others of the fort; it is likely that these were all modified at this same time.

The Castro plans and elevations of 1861 (fig. 10.17) did not show major alterations to either the Curtain, North or South Bastions. Of interest however, was a small structure with a double-pitched roof, shown only on the topographic plan, that appears to coincide with an arched opening now filled (excavated and filled in 1963) in the wall of el Caballero. Located adjacent to the curved (and oldest) section of the wall, the small structure appeared to project a few feet from the plane of the wall onto the terreplein.

Castro's profile C-D illustrated an interesting construction detail of the firing steps of the lower batteries of the South Bastion. The three stepped firing steps were not solid, but rather, shown with large arches cut out underneath, possibly to facilitate drainage. These firing steps are extant, but were somewhat altered by the infilling of the arches. A small drainage trough still runs under each banquette.

Period 5: 1868-1898

In the late-nineteenth century, physical modifications were made to San Cristóbal as part of the extensive preparations for the impending Spanish-American War. Many of these changes took the form of additions to the interior of the existing fort and were visible on an 1898 Plan of San Cristóbal.[20] The plan (fig. 10.18) showed three earthen traverses (running east/west) located along the inner face of the South Bastion. Rectangular traverses provided additional cover for gun crews and were constructed over eighteenth-century firing steps, obscuring them from view.

Also during the 1895-96 war preparations, a low (six foot) poured concrete wall reinforced with earth fill was constructed on the terreplein of the north battery. Two semi-circular gun emplacements in the retaining wall accommodated artillery (15 cm ordinez) that was mounted behind its interior slope and rested on raised circular platforms. Remains of a barbette tier including a retaining wall and gun platforms survive today on the terreplein of the North Bastion. According to Bearss,

> The parapet of the north front of this part of the fort had likewise been strengthened with concrete and platforms built behind it on which were

emplaced two 15cm ordinez rifles on front-pintle carriages. Midway between these guns and immediately in the rear of the parapet, a circular well led vertically downward to an old passageway in the masonry below which served as a magazine.[21]

Period 6: 1898-1986

Photographs dating from the late-nineteenth and early-twentieth centuries published in Cronicá de la Guerra Hispañoamericana en Puerto Rico by Angelo Rivero are among the earliest available detailed images of the bastions of San Cristóbal during this period.[22]

The majority of changes made to the North Bastion during the period of U. S. Department of the Army administration (1898-1960) are recorded in the HSR written by Edward Bearss in 1984. Of specific interest was the erection of a garage in the main moat at San Cristóbal in the winter of 1917-19 to house motor vehicles.[23] Photographs showed this structure and confirmed that it was extant until at least 1958. Surviving evidence may be seen at the base of the North Bastion's scarp (east) wall. The site of the former structure is presently marked by a concrete floor and the partial cement stuccoing of the adjacent sandstone wall. Extant stucco indicates that the garage was approximately the height of the base section of the scarp and about four-fifths of its length. The ghost of a shed roof, either flat or pitched remains on the masonry wall. Also at this time, a galletted stucco was applied to the walls of the bastions of the fortress, presumably as a sensitive repair.*

In 1922, the lowest walls of the lower battery of the South Bastion were refaced, repairing damage sustained in 1897. This damage and subsequent repairs explains the difference in character noted on these lower walls.[24]

The years 1938-42 saw extensive reparations and alterations to the bastions of San Cristóbal. Under Army Corps of Engineers Specifications F-28-2 through F-28-5 the following significant works were carried out on the bastions: patching and facing of walls and the repairs to drainage on the Plaza de Armas including gutters and main drainage channels.[25] By January of 1939, the removal of debris and masonry from embrasures and their subsequent repair was recorded to be about 20% complete.[26] Period photographs show earth fill still in place on the northern portion of the bastion as well as extant

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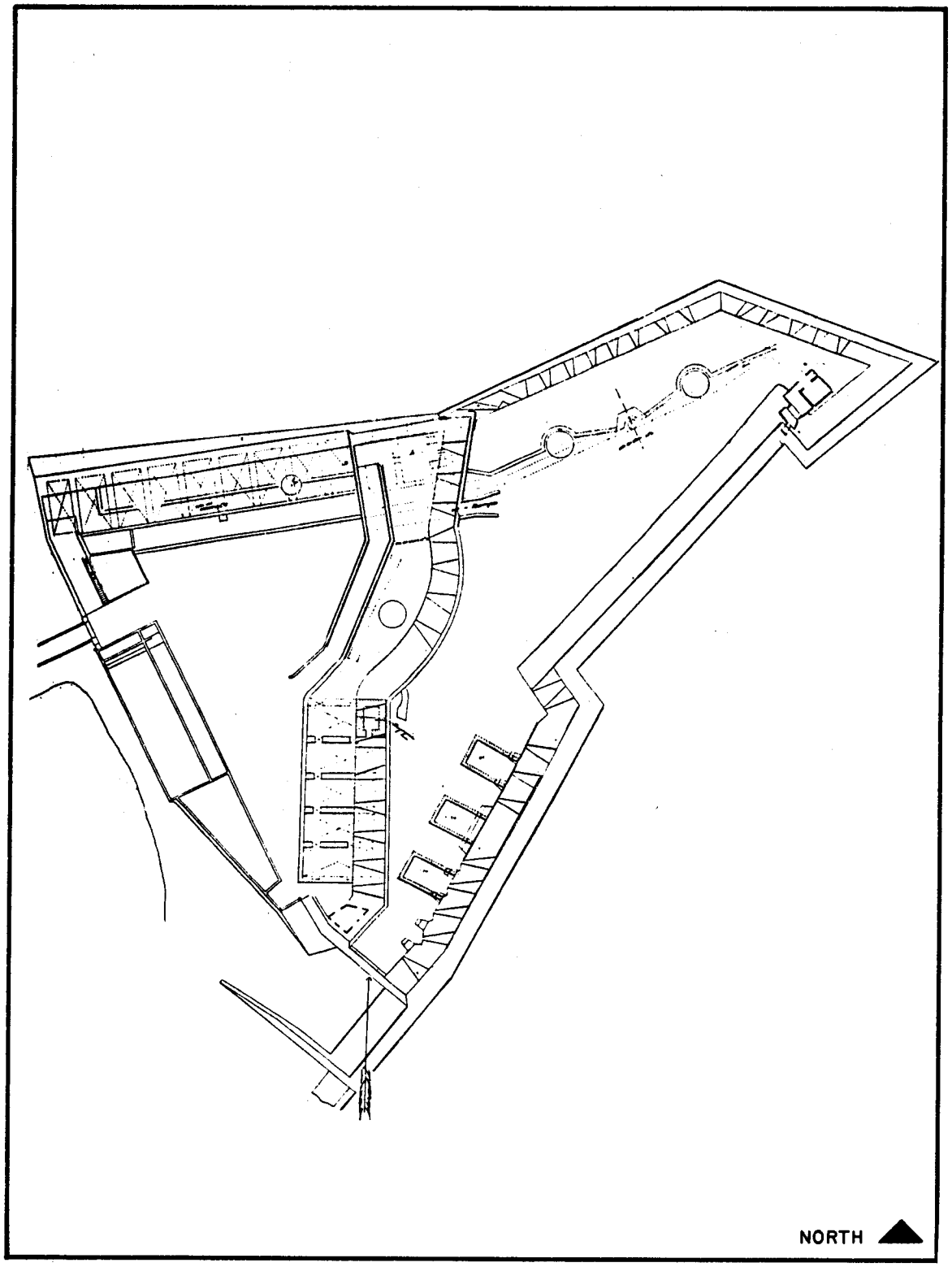


Figure 10.18. Drawings of Colonel Goethals showing modifications for modern guns and location of new magazine, ca. 1898. (San Juan NHS Archives.)

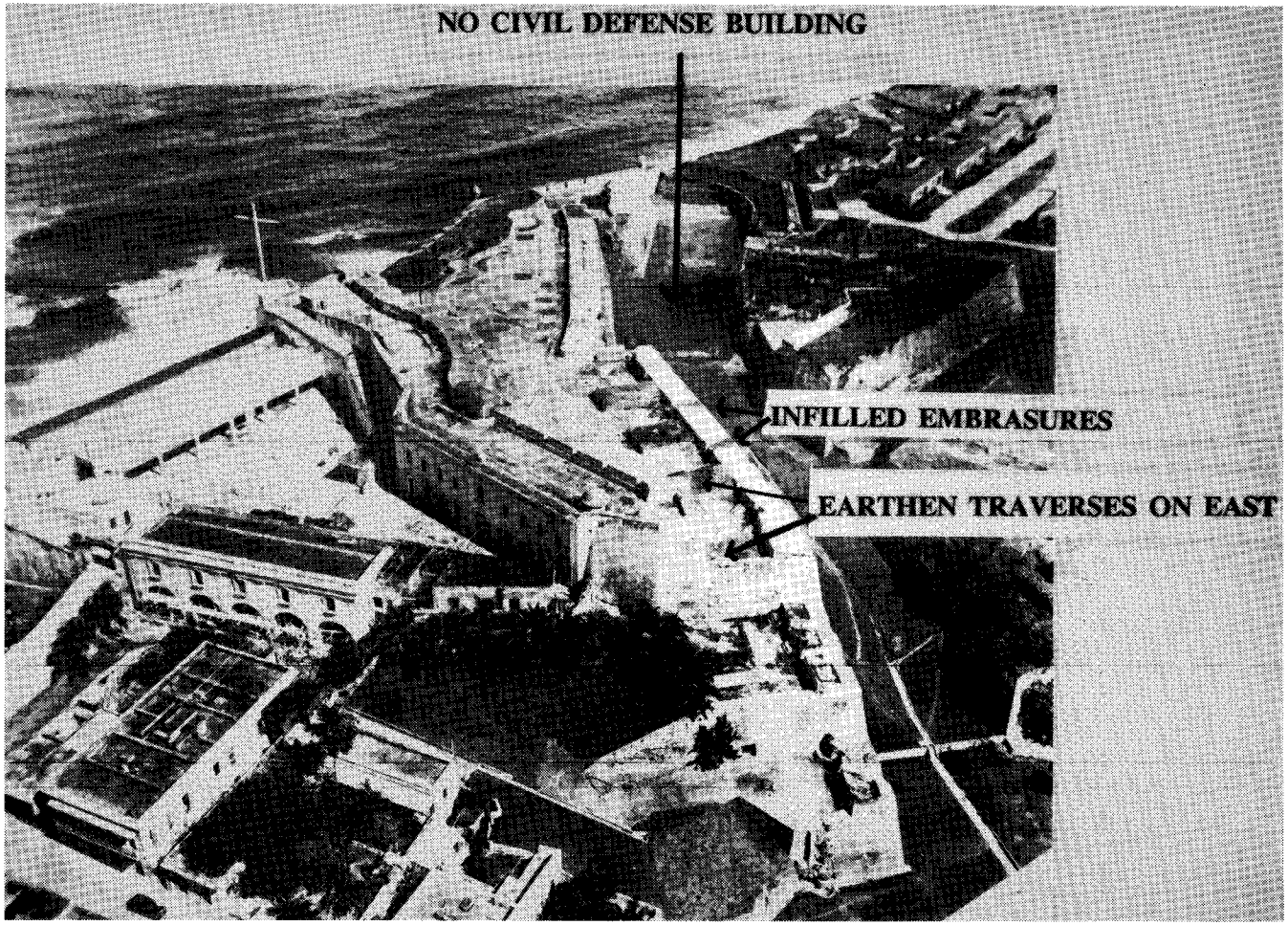


Figure 10.19. Aerial view of San Cristóbal ca. 1938-40. Note infilled embrasures and earthen traverses along the curtain wall. (San Juan NHS Archives.)

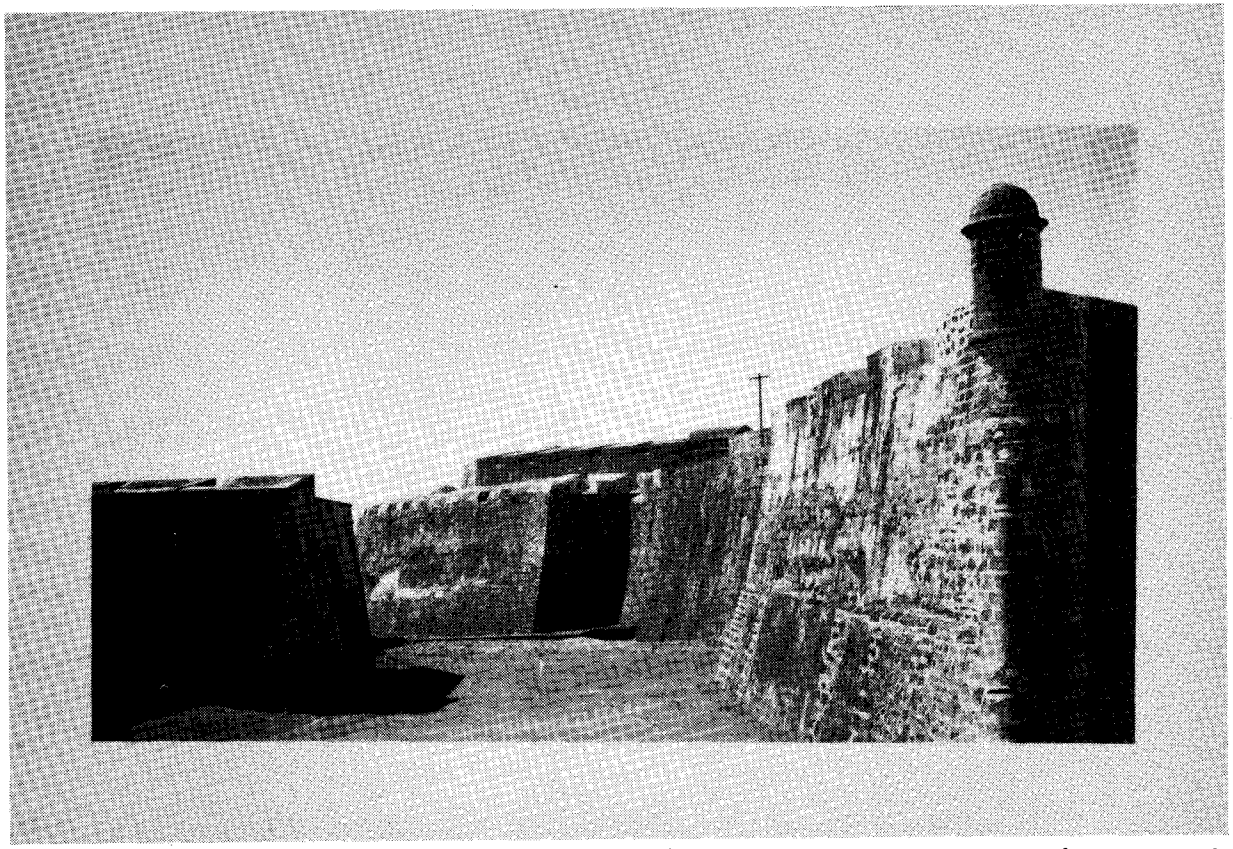


Figure 10.20. View of the main moat prior to construction of the Civil Defense Building, ca. 1938-40. (San Juan NHS Archives.)

traverses on the east (fig. 10.19). Also called for in the specifications and carried out in 1940, were the repairs to the sentry box at the salient angle of the North Bastion. This project called for the pointing, patching and refacing of such portions of the old sentry box as needed and the placing of a new finial to replace one that had been destroyed.[27]

Approximately one-half the height of the exterior face (east) of the curtain, the southern flank of the North Bastion, and the northern flank of the South Bastion remain obscured by a modern building presently housing the headquarters of the Puerto Rican Civil Defense. Built in the early 1940s as part of the preparations for World War II, the building was described as a "reinforced concrete bombproof structure constructed by the military in the moat between the hornwork and San Carlos Ravelin".[28] This structure was erected in the main moat of San Cristóbal directly to the east of the bastions.

Preconstruction photographs (1938-40) show the eighteenth-century covered way and moat to have been extant and predominantly intact (fig. 10.20). These early elements were totally obliterated by the military during construction of the bunker. Its construction dramatically altered the fort's eighteenth-century configuration.

In the following years, additional repairs and minor additions were made to the bastions. Among these were the "two ventilators and the concrete base supporting the SCR tower" located on the terreplein of the northeast bastion, and "manhole, B" a fire control station in the parapet at the seafront's northeast angle.[29] These ventilators and observation tower base first appeared on a plan dated July 6, 1949. This plan also showed numerous radio antennae and wires traversing the area from east to west. The presence of these wires may explain numerous small scars from metal cramps and fasteners on embrasures and their parapets.[30]

By the late 1950s, the earthen traverses on the eastern portion of the terreplein had been removed and the area was utilized as a parking lot. (See fig. 10.21.) Numerous photographs dating from this period showed automobiles parked between firing steps adjacent to the parapet walls.[31] Photographs indicated that the area continued to be used for parking until the early 1960s, by which time the garage in the moat had been destroyed and the area had become a paved parking facility. It appears that scars from electrical conduits and portland cement parging still seen in this area are the surviving fragments of this garage facility.

In the early 1960s, extensive repairs to the terreplein and drainage systems of the bastions were begun. From February

through June 1963, under the Accelerated Public Works Program (specification D24), 500 tons of earth were removed from the north embrasures exposing original flooring and drainage gutters.[32] These early features, that are largely extant today, may be seen in Accelerated Public Works photographs.[33] At this time, modern stairs from Tunnel 2 to the roof of the Civil Defense Building and down to the northern section of the moat were constructed. By 1971 the scenic platform had been constructed although access stairs have since been replaced.

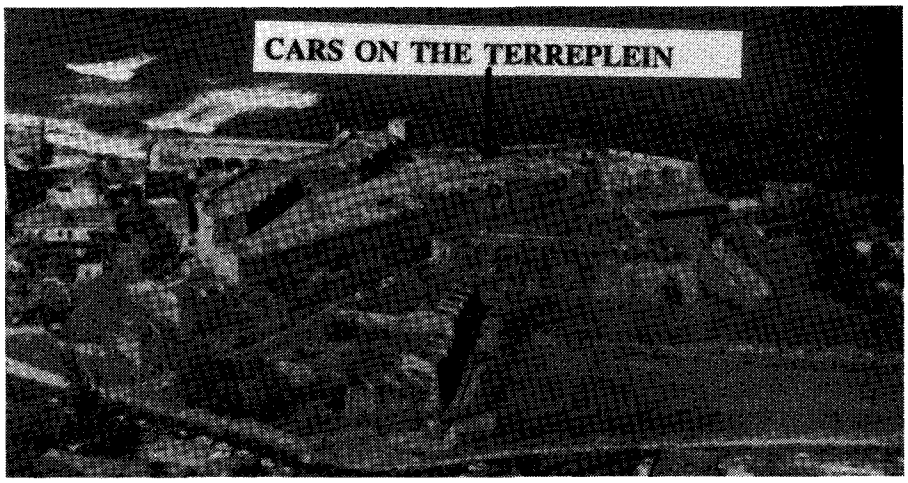


Figure 10.21. View of San Cristóbal, ca. 1950, showing terreplein used as a parking facility. (San Juan NHS Archives.)

Conditions

All components of San Cristóbal's eastern defenses suffer from cracks, scattered patching, minor biological growth and stucco failure. Some areas are naturally more deteriorated than others.

The North Bastion is generally in good condition although some of the problems affecting surface materials may be symptomatic of more serious deterioration. Severe cracks may indicate failure of the tie between the face stone and the inner structure of the wall. Documents dating from the eighteenth century reported similar structural problems related to the bastion's construction. The parapet walls show more surviving stucco on their interior surfaces. The lower surfaces have lost almost all stucco, probably due to water and salt damage.

Numerous repairs can be seen to lateral cracks along the interface of the outer and inner walls of the embrasures. At the embrasures' brick sills, significant erosion and stucco loss is observed.

The terreplein area has significantly changed with different military campaigns. Remnants of many different colored pavings exist. The numerous patches that cross the pavement (in all directions) might be related to repairs made to the drainage system. Likewise, the unsuitable 1950s and 1960s use of this area as a parking lot undoubtedly caused much damage to physical fabric.

The northern face, or seaward wall, has always received the most severe exposure to wind, airborne salt and water. Extensive U. S. Army Corps cut stone repairs have been made to the lower or base portion of the wall and to drainage scuppers. Biological growth is present in all voids on this face, indicating continued drainage problems.

The present condition of the defense's curtain wall is basically sound. However, it is suspected that widespread cavity erosion may be present behind the extensive veneer that covers much of this wall. The lower portion of the wall is covered by the Civil Defense building making it impossible to evaluate conditions of this portion.

The present condition of the South Bastion is basically sound. In general, the massive eastern walls are in good condition, although there are large areas of U. S. Army Corps cut stone infill that indicates previous problems. Much of the masonry construction on this face is exposed due to extensive loss of stucco. Although this bastion is somewhat protected from exposure, stucco loss has allowed differential weathering to occur. The galleted repair done early this century survives better at the lower section of the wall perhaps because this section is partially protected from driving rain and wind by the Civil Defense Headquarters.

NOTES

1. Juan Mestre, 1783 plan of the city of San Juan.

2. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Dept. of the Interior - National Park Service, February 1984) p. 154. Original reference to correspondence between Talman and Post Quartermaster, San Juan, March 10, 1919, NA, RG 392, Coast Defenses of San Juan 1917-1919, File 600.

3. Ricardo Torres-Reyes, Construction History of San Cristóbal:1634-1800 (Dept. of Interior - National Park Service, San Juan National Historic Site, June 1965), pp 6-8. Original reference to correspondence from the Governor to the Crown, April 30, 1636. AI-SD 156-26, 156-2-83; Governor to the Crown, 1638. AI-SD 156-3-95.

4. Ibid., p. 9.

5. Ibid., p. 12. Original reference to report from Governor Colomo to the Crown, June 14, 1749. AI-SD 2500-1.

6. Ibid., pp. 12-13. Original reference is to a document entitled "Junta de Fortificación, October 7, 1752, Engineer Valdelomar", AI-SD 2504-4.

7. Ibid., p. 23.

8. Ibid., p. 24.

9. Ibid., p. 28.

10. Most of the information for this first stage of construction, unless otherwise cited, is found in the reports of O'Daly and other engineers and technicians, September 24, 1769, etc. in connection with the fall of the curtain wall of San Cristóbal on September 19. This is a very long collection of technical reports, rich with information on construction details and techniques. AI-SD 2504-104.

11. Torres-Reyes, Construction History, p. 39.

12. Ibid., p. 40.

13. Ibid., p. 54.

14. Ibid., p. 57.

15. Ibid., p. 58-59.

16. Torres-Reyes, p. 64.

17.Information for this period comes from Thomas O'Daly's plans and profiles and from his written reports covering work performed during January-April 1773 and October 1773-January 1774. AI-SD 2510-44.

16. The written account of Engineer Juan Mestre, dated September 13, 1783, is found in the National Archives, Washington, D.C., Record Group 186, Records of the Spanish Governors.

17. Archivo General de Indes, Sevilla, Sto Domingo 1787-89.

18. Building Records by Toribio Montez are available in the form of microfilms in the National Archives Microfilm Division, reel no. 33, at Fort san Cristóbal.

19. See "Parte de la Revista Passada - Communique Official Revue" executed by Commandoria Exenta de Ing., Isla de Puerto Rico, 1858.

20. A copy of this untitled 1896 plan made by the U.S. Army is in the files of San Juan NHS. Drawing no. 107-2-9. Unfortunately, the legend at the bottom left side of the drawing could not be deciphered.

21. Bearss, p. 35.

22. Angel Rivero, Crónica de la Guerra Hispanoamericana en Puerto Rico (San Juan: Instituto de Cultura Puertorriquena, 1972). Images unavailable for this report.

23. Bearss, p. 154. Original reference in report of Talman to Post Quartermaster, San Juan, March 10, 1919, NA, RG 392, Coast Defenses of San Juan 1917-19, File 600.

24. Ibid., p. 188. Original reference to report and estimates from Colonel Newcomer to Chief Engineer, July 24, 1922, WNRC, RG 77, Entry 50-23, Box 115.

25. Ibid., pp. 262-64. Original reference to Specification No. F-28-1 through F-28-5, work which commenced on April 1, 1938 and terminated on May 28, 1940 by order of the constructing quartermaster upon exhaustion of available monies.

26. Ibid., p. 277. Original reference to report "Preservation of Historical Fortifications, San Juan, P. R.," undated, WNRC, RG 77, Entry 50-23, Box 115, detailing work accomplished September 1, 1938-January 31, 1939.

27. Bearss, p. 264. Original reference to Specification F 28-6 of the work which commenced on April 1, 1939 and was terminated on May 28, 1940 byu order of the constructing quartermaster.

28. Ibid., p. 375. Bearss notes that documents for this period (1942-1950) on file at the National Archives are either classified or have not been accessioned and thus readily available documents pertaining to the Joint Operations Center are limited to several drawings at San Juan National Historic Site.

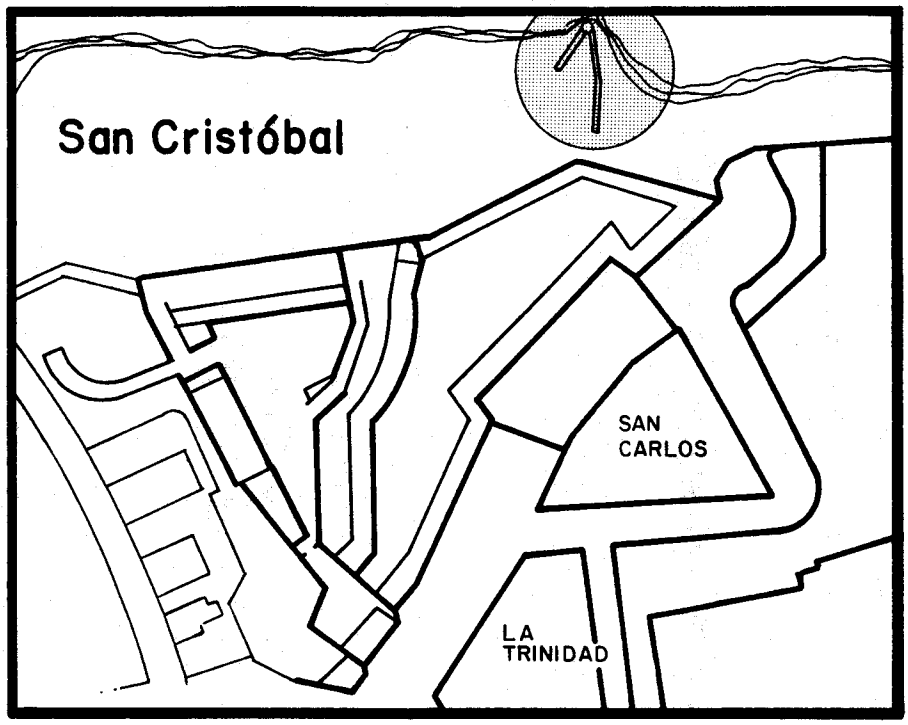
29. Ibid., p. 376. Original reference to plan entitled "Fort Brooke as Built, U.S. Army Forces Antilles & Military District, Puerto Rico, Office of the Engineer, Ft. Brooke, Puerto Rico," found in SAJU files.

30. This 1949 plan entitled "As-Built Survey Fort Brooke, Corps of Engineers" is in the drawing collection of San Juan NHS - San Cristobal, under location number FC1-DR4-ENV020.

31. Late 1950's photographs are available in the photo collection of San Juan NHS - San Cristobal.

32. "Completion Report of Accelerated Public Works, San Juan National Historic Site", in the SAJU files.

33. Twelve photographs labeled "Baluarte Plano showing existing conditions and various flaws in pavements, walls, window frames, etc. corrected during progress of work" are in the 1963 "Completion Report - Accelerated Public Works, San Juan - APW-3". The feature mentioned in this paragraph are documented in photo number 110. These photos are in the files at San Juan NHS - San Cristobal.



CHAPTER 11

FORT OF THE POINT
(FUERTE DEL ESPIGÓN)

Description

El Espigón is a picturesque and desolate outpost located at the lowest level of San Cristóbal, facing north toward the Atlantic Ocean. It is of triangular shape and sits on a rocky outcrop with a sentry box cantilevered over the parapet walls. It is bordered on two sides by a maintenance platform built in the 1970s that sits on a projecting coral reef ledge. (See figs. 11.1 - 11.4.)

This north outpost is significant for being one of the few surviving seventeenth-century features of San Cristóbal. First called Bastión, it was denoted as el Espigón (the point) in the eighteenth century. In another instance it was called Cortadura del Tajamar (parapet of the breakwater). A colorful Puerto Rican legend provided the name by which it is popularly known today: La Garita del Diablo (the devil's sentry).

El Espigón is constructed entirely of load-bearing masonry. It consists mostly of sandstone rubble and ashlar, brick and stone rubble, and brick laid in mortar. The seventeenth-century east and west parapet walls are of battered construction and are mostly ashlar sandstone with some infill

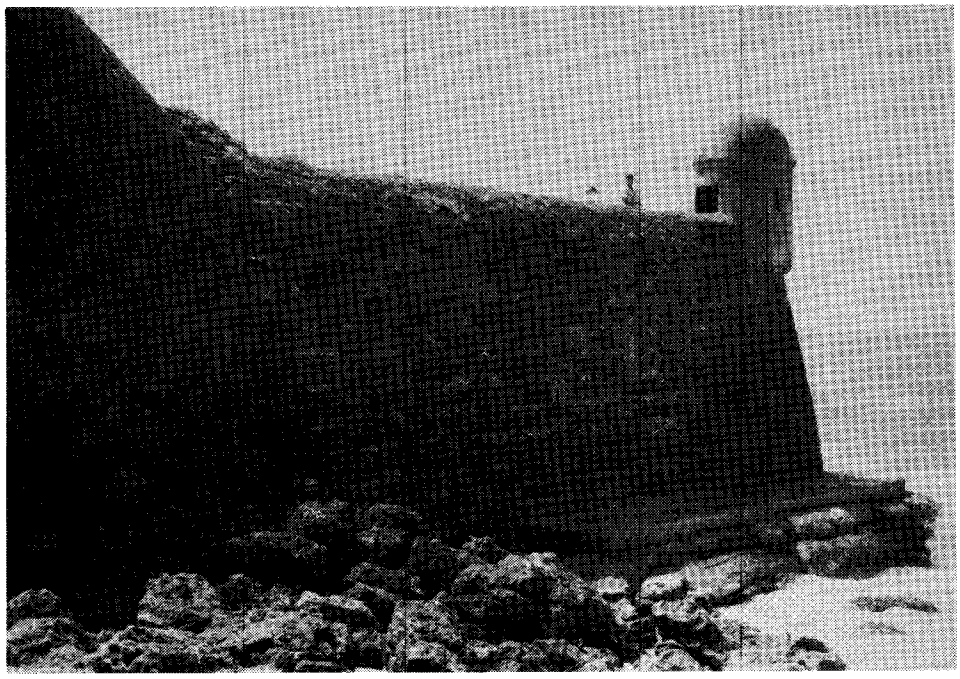


Figure 11.1. East elevation of el Espigón from above. Photo by Richard Crisson, 1986.

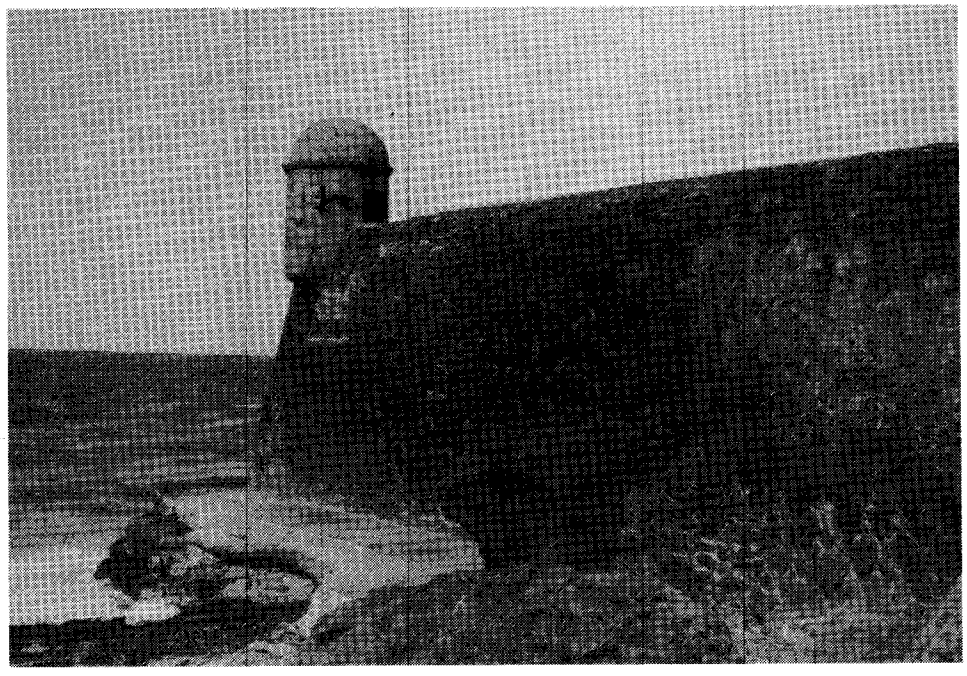


Figure 11.2. West elevation of el Espigón. Photo by Richard Crisson, 1986.

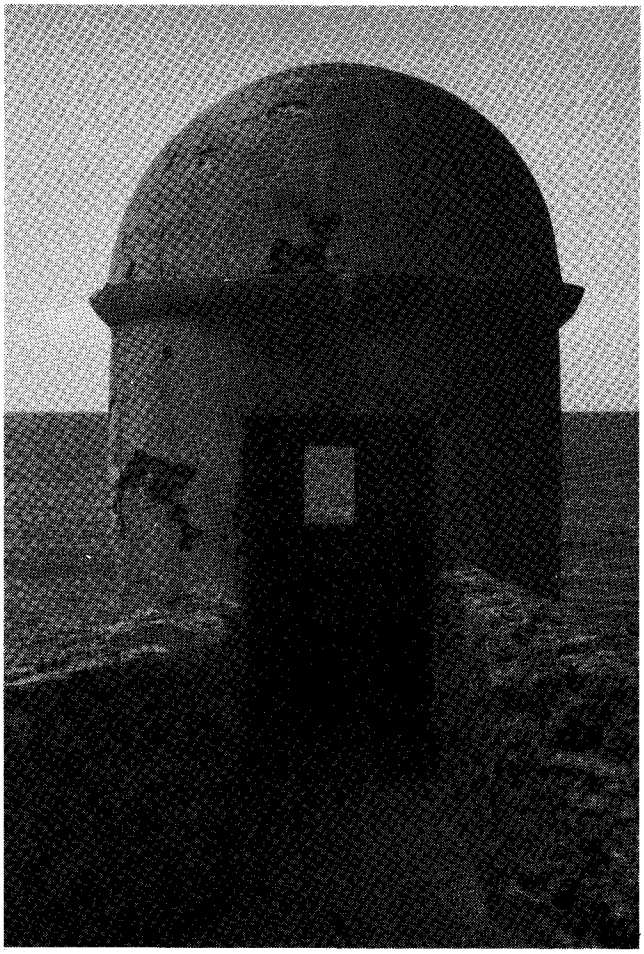


Figure 11.3. Sentry box of el Espigón looking north. Photo by Richard Crisson, 1986.

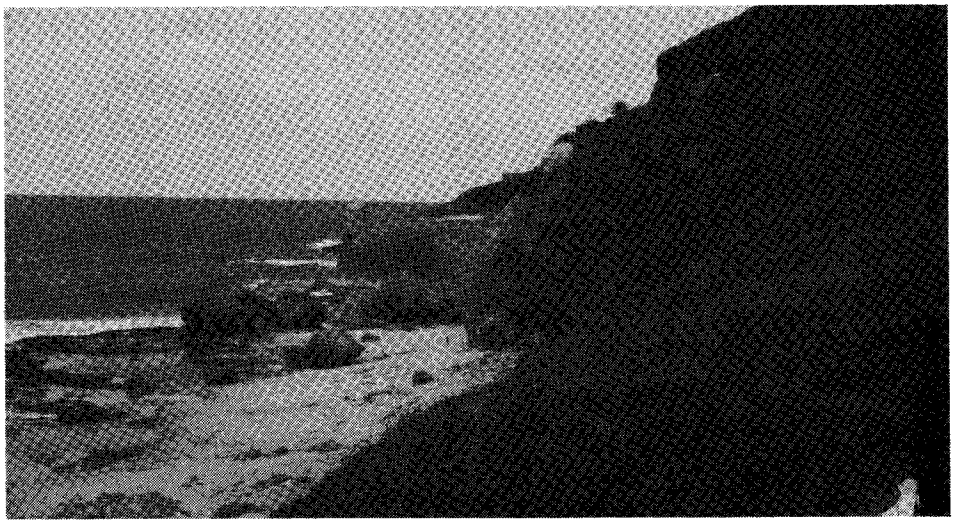


Figure 11.4. View of el Espigón looking northeast. Photo by Richard Crisson, 1986.

of rubble sandstone. The east parapet wall dating to 1678-1702 also extends upward to meet the base of the North Bastion. The top of the wall is rounded and composed of numerous fragments of brick and stone rubble.

The circular wall of the eighteenth-century sentry box is constructed of bricks laid in mortar. The corbelled decorative base is of hewn sandstone constructed in sections. These materials are visible where the wall's Portland cement stucco coating is cracked or missing. There is no evidence of a painted finish.

The only doorway to the sentry box is approached from the gorge connected to the terreplein and faces south. There are three window openings, on the east, west, and north sides. The openings have neither trim nor hardware. These openings were extensively repaired and rebuilt in the early twentieth century.

El Espigón's ca. eighteenth-century sentry box is the only one at San Cristóbal with a semi-circular domed roof. It was, however, extensively repaired in the early twentieth century. The roof terminates at a quarter-round decorative cornice.

The only interior space of el Espigón is that of the sentry box. The floor consists of packed soil, similar to that of the gorge and terreplein. Interior drainage is achieved by surface runoff toward a single drain. This drain is located in the west parapet wall, approximately 1 foot below the existing grade. The interior wall and ceiling of the sentry box are finished with a smooth coat of twentieth-century Portland cement, in fair condition. There is no decorative interior trim, hardware, or mechanical systems.

A maintenance platform is accessed by climbing down the west parapet and over a rocky path. The platform itself forms a walk along the two exposed sides of el Espigón. The east side links up with a shoreline trail ending at la Princesa. The west side of the platform leads to a beach path that terminates at the neighborhood known as "la Perla."

Structural Evolution

Period 1: 1625-1765

The outpost located on the north coast of San Cristóbal is one of the fortification's few remaining features dating from the seventeenth century. This outpost may have been constructed as early as ca. 1634-1644, at the same time as the original fort, and certainly before the map of 1678. Its east wall appears to have been extended up the north slope between 1678 and 1702. The only name associated with the outpost in this period is Bastión. A bastion is generally defined to be "a projecting part of a fortification."[1] Early plans from this period are found in figure 11.5.

Our earliest documentation on el Espigón is dated 1678. By this time, San Cristóbal had begun to deteriorate and a plan was drawn up by Engineer Luis Venegas Osorio for its repair and expansion.[2] In his sketch, existing features appear to be delineated by solid lines and proposed features by dashed lines. Shown by a solid line along the beach was the distinctive angle of the north outpost. No name was assigned to this feature and no details such as the sentry box were shown. The plan, however, is of great importance because it enables us to date the outpost as having been built sometime before 1678. Two mortar samples are believed to date from this original construction period, (ca. 1634-1678). Both were removed from the east parapet wall, west upper side, near the sentry box at the north end.*

The next view of the north outpost is in a plan simply dated 1702.[3] As with the 1678 plan, the existing conditions of San Cristóbal and Santiago Gate were shown along with proposed new work. The outpost was labeled "D. Bastion." Differing from the 1678 plan was the east wall of the bastion that extended south in the direction of the North Bastion. A mortar sample was removed from this portion of the wall which slopes steeply up the north face.**

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*SAJU 11 03a, deep bedding mortar colored orange by brick dust. SAJU 11 M03b, white finish mortar characterized by large amount of white rod-shaped shells in the sand component.

**SAJU 11 M04, lime mortar colored orange by brick dust. It appears similar to ca. 1634-78 bedding mortar sample SAJU 11 M03b.

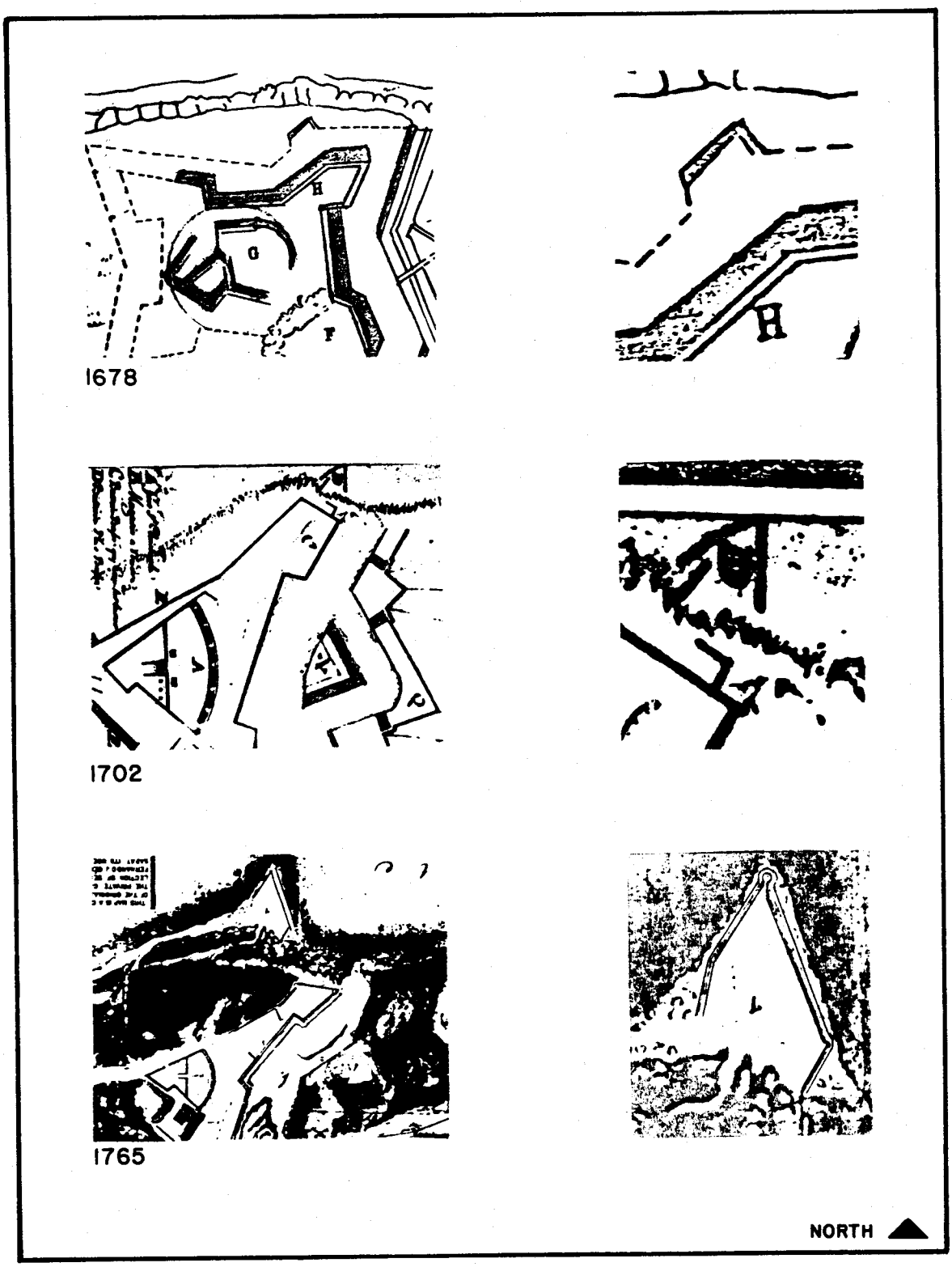


Figure 11.5. Early plans including el Espigón. Compiled by Barbara Yokum, NARO, NPS, 1986.

Period 2: 1765-1809

It was during this period that the north outpost acquired the name el Espigón meaning the point or breakwater.[4] Work done in these years included the constructing a small structure at the inside west wall (ca. 1769-73) and installing of a retaining wall adjacent to the upper east wall (1771). Plans from this period are found in figure 11.6.

The first reference to el Espigón is in two plans dated 1765 by Engineer Thomas O'Daly: one showing the existing fortifications, and the other the proposed modernization project.[5] In both, el Espigón was labeled "7" and described in the legends: "el Espigón dominated by a rugged and loose rock." No changes appear to have been intended for el Espigón at this time since both the existing and modernization plans were identical. A circle, that is most likely a sentry box, was located at the northern tip of the outpost. Access to the outpost appears to have been via trails traversing the north slope. An opening in the wall in the west side would have afforded access from this side or from the south.

Changes to el Espigón are apparent four years later in the plan of San Cristóbal by O'Daly sent to Spain on January 15, 1769.[6] Since the plan showed both completed and proposed work, it is difficult to ascertain if changes were, in fact, carried out. Comparison with later plans indicates that they were not. In the plan, the outpost was labeled Fuerte del Espigón (fort of the point). New additions to the outpost included three embrasures in the east wall, three embrasures in the west wall, and a square structure adjacent to the interior side of the west wall. The square structure appears to have been either a banquette or a small building. Of these additions, only this structure appears to have been built. It will be discussed later.

In 1771, work was completed on a new retaining wall above and to the east of el Espigón to support the loose terrain below the North Bastion.[7] This stabilized slope, labeled "RR" in the 1773 plan, was joined to the upper east wall of el Espigón.

The earliest known elevations of el Espigón were executed by O'Daly in 1773.[8] The north, east, and west elevations (fig. 11.7) clearly showed a round sentry box at the north tip with three small window openings and a domed roof topped with a finial. Today, the dome is flatter and lacks a finial. In the plan that accompanies the elevations was the previously mentioned small square structure with hipped-roof attached to the west wall. Since this structure was not shown in the elevations, it may be that its height fell below the height of the walls.[9]

The legend of the plan described the outpost in the endnotes:

> The post named el Espigón is located below the scarped wall of the Castle, serving as an outpost to the beach.

In 1865, this note was added by the late historian Ricardo Torres-Reyes was the statement: ". . . this post was not renovated."[10] Unfortunately, the statement was not referenced and no documentation has been found to support its validity.

The last known eighteenth-century plan that included el Espigón is dated 1783 by Engineer Juan Francisco Mestre.[11] It once again showed the rounded sentry post to the north and the unidentified structure adjacent to the inside west wall. It also labeled the outpost "Espigón. (See fig. 11.6.)

Period 3: 1809-1837

No documentation was found for el Espigón during this period.

Period 4: 1837-1868

In the first part of the nineteenth century, el Espigón was represented in both the 1839 scale model of San Cristóbal and in the 1861 plans by delineator Manuel Castro. Most notable, however, is the new name that is said to have become associated with the outpost at this time: La Garita del Diablo (devil's sentry box).

In both the model and Castro's plans,[12] el Espigón was shown with its east and west walls and sentry box. Not shown was the small square structure located inside the west wall (last seen in the 1783 plan). Considerable detailing was provided in the Castro plans, such as individual stones in the east and west walls and the round finial of the sentry's domed roof (fig. 11.8). In addition, the ocean appears to have encroached on the outpost making the northern tip completely surrounded by water.

This sentry post was apparently still in use in the nineteenth century based on a story published in 1943 and said to have taken place "over a century ago." It may be this tale that was responsible for the name la Garita del Diablo. The story goes is follows:

> On a dark and stormy night a sentry was assigned to duty at this post. The next morning his clothes were found, but he had vanished. A high drop to the sea made escape impossible in that direction. The arrangement of the works at that time apparently did not make escape by land a probable solution of his disappearance. This was consequently viewed as the work of the Devil--hence the name for the box. . . . Later research has disclosed the truth of the story. The soldier deserted his post . . . [and] . . . was located some years later at a farm near Caguas.[13]

While the above event was said to have occurred in the early nineteenth century, no documentation has yet been found to indicate that the structure was thereafter known as the la Garita del Diablo.

Period 5: 1868-1898

Very little information was found on el Espigón for this period. Only one document, dated May 15, 1880, chronicles the intent to abandon the post then referred to as an Emplazamiento (emplacement). One explanation for the proposed abandonment is provided by the previously described story:

> Many [soldiers] were so fearful that they refused to take the post at all and the military authorities at one time were compelled to seal off the box and to post no sentry there at all.[14]

A more likely explanation, however, is provided by the proposal itself (fig. 11.9).

The proposal, dated 1880, is a drawing entitled "Modified Project for the Repairs and Conservation of the Castle of San Cristóbal".[15] Shown on the sheet were three sketches of the north outpost. Figure 1 was a plan described as "emplacement which is projected to be abandoned;" Figure 2 was a section through the center of the sentry box and looking east; Figure 3 was an elevation of the west side. All three drawings recorded obvious signs of deterioration. The north front wall, directly beneath the sentry box, was eroded away, most likely by wave action. The west wall at both the top and south ends was in bad condition. Along the top, the stones have fallen away in several areas. At the south end, almost one-third of the entire wall shifted and was at an angle to the remaining wall, perhaps the result of an earthquake. Lastly, a large

hole was shown in the ground adjacent to the inside west wall. This may have been the ruins of the small eighteenth-century structure formerly located in this vicinity, or simply a washed out area. The sentry box was still extant, along with the finial on its domed roof.

By 1880 el Espigón appears to have been suffering from many years of deferred maintenance due in part to its difficult siting. Historian Juan Blanco maintains that by the late-nineteenth century the post was considered an obsolete strategic site of no use to repair or maintain.

Period 6: 1898-1987

Considerable repair work was done to el Espigón while under the jurisdiction of the U. S. Army (1898-1961) and later the NPS (1961-present). Although no longer used as a strategic defense location, it was considered an historic feature and an integral part of the protective north wall system. While under the management of the U. S. Army the outpost became popularly known as the "Haunted Sentry Box." Beginning in the 1960s, the NPS revived the earlier name for the outpost, la Garita del Diablo (Devil's Sentry Box).

One undated photograph of el Espigón's west elevation documents an advanced state of deterioration.[16] Based on the conditions shown, this view was taken sometime before 1928. Condition of the front foundation wall was little changed from the 1880 drawings, being eroded below the sentry box. The sentry box itself had worsened since 1880. The finial was missing, the brick walls and rubble roofing material exposed, and the window openings broken away and enlarged.

Considerable repair work was done to the sentry box at some point before April 17, 1928.[17] Although the foundation was still undermined, the sentry box appeared to be in good condition in this photo and covered with a smooth coat of stucco. The east window was repaired, but the roof finial was still missing. One mortar sample was removed from the interior wall at the east window and is believed to date from this repair work.*

In May 1928, additional repair work was proposed by the District Engineer "in the vicinity" of el Espigón. This was to be done simultaneously with other work in the area. The

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*SAJU 11 M01, characterized by distinctive light brown sand and dark brown fines.

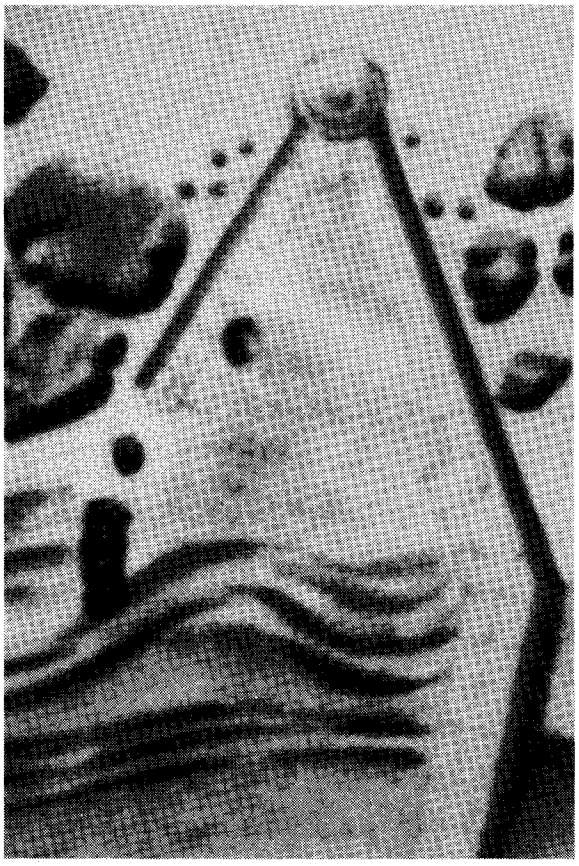


Figure 11.8. Detail of 1861 plan by Manuel Castro showing el Espigón. (San Juan NHS Archives.)

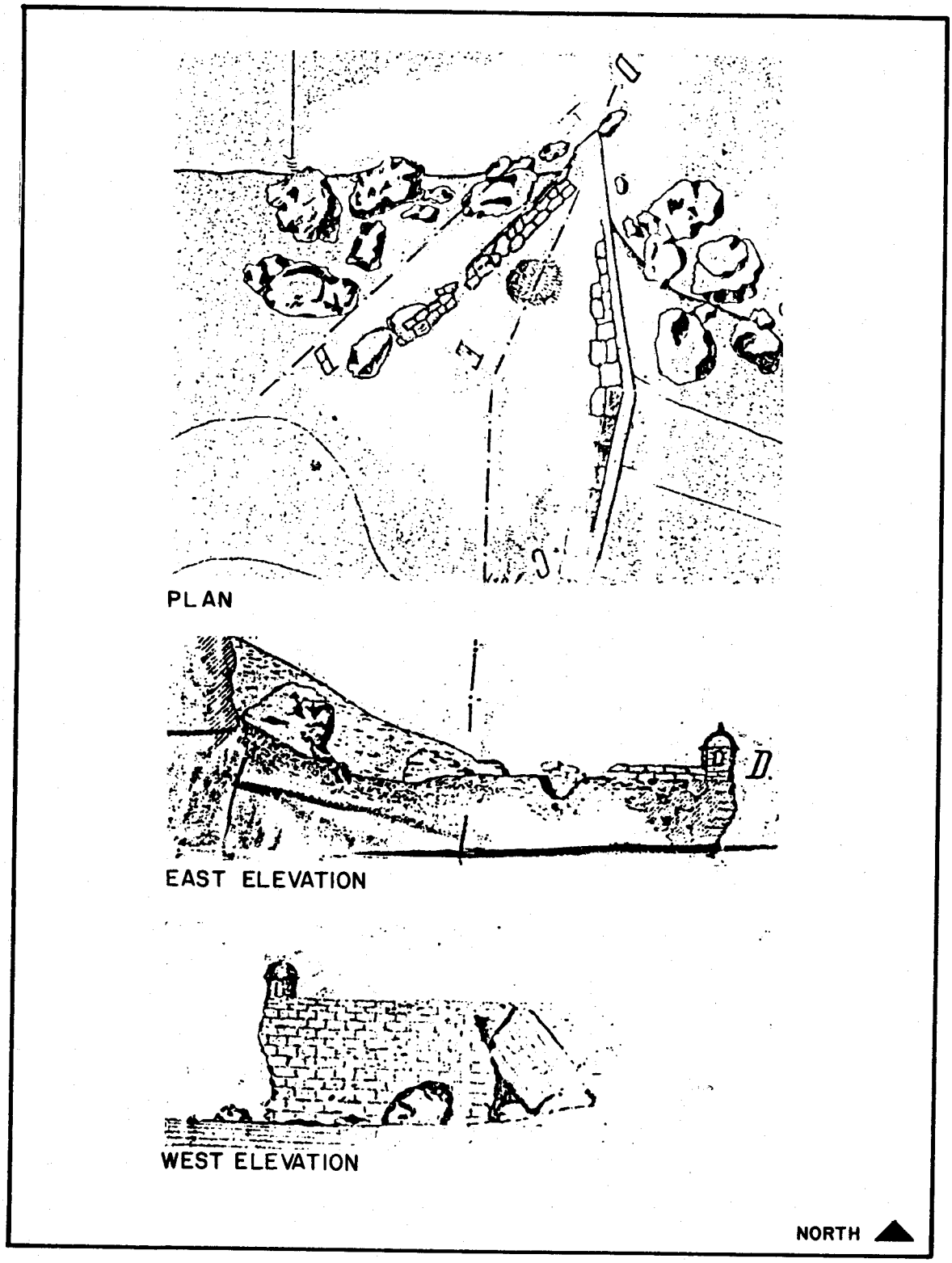


Figure 11.9. Details of drawing dated May 15, 1880, "Proyecto Modificado de Reparación y Conservación del Castillo de San Cristóbal." (San Juan NHS Archives.)

estimated cost of 250 cubic yards of concrete masonry for the job was $3,750. This expenditure, however, was not approved.[18]

Not until the late 1930s was the foundation repaired (W.P.A. funds were used). By this time, according to the completion report, the front "foundation had been undermined very badly so that the upper portion was a cantilever exposed to the full force of the Atlantic Ocean."[19] This is shown both in a photograph taken at the commencement of work in April 1938 and a drawing entitled "Condition of 'Haunted Sentry Box' - Proposed Repairs."[20] Shown on the drawing (fig. 11.10) were conditions similar to those in 1880 including the shifted west wall at the south end and a "small cave-in" just inside the west wall. The work was carried out in April, May, and June of 1938. Sand bags were used to hold back the water. At the north tip, below the cantilever, a concrete base was poured and reinforced with short lengths of sharpened rail driven into the rock below. Above this, the large void was filled with rubble concrete fill and faced with natural sandstone rock quarried from the immediate vicinity. The sentry box itself was said to have "required only a minimum of pointing up."[21] A photograph (fig. 11.11) included in the completion report and dated June 24, 1938, shows the entire west wall and north front wall repaired. The south end of the west wall appears to have been completely refaced with stone.

Work carried out in 1939 involved the building of a protective revetment at the base of the east wall that extended along the north coast to the east. The material of the revetment was to be "rubble" as described in the drawing entitled "Proposed Revetment at Foot of Wall North Shore of San Cristóbal Fort." By June 30, 1939, this work, along with other tasks described in the specification package, were 95 percent complete.[22]

In 1956, only fourteen years after the extensive repairs made to the walls of el Espigón, the north front was once again observed to have a small undercut beneath the sentry box. This was detailed in a drawing entitled "Plans Showing Existing Condition of Fortification Walls," dated February 17, 1956. A "badly weathered area" in the middle section of the west wall was also noted. No work was done at this time.[23]

The same undercut condition was described again in the 1975 Army Corps of Engineer's report entitled "Foundation Condition Appraisal". It was warned that "the occurrence of a major storm -- could result in irrevocable loss of this part of the fortification." The recommended action was to fill the cavity with "grout bags" and to build a 5-foot wide maintenance platform at the base of the walls.[24] Exactly when this was done is not known. The maintenance work platform exists today.

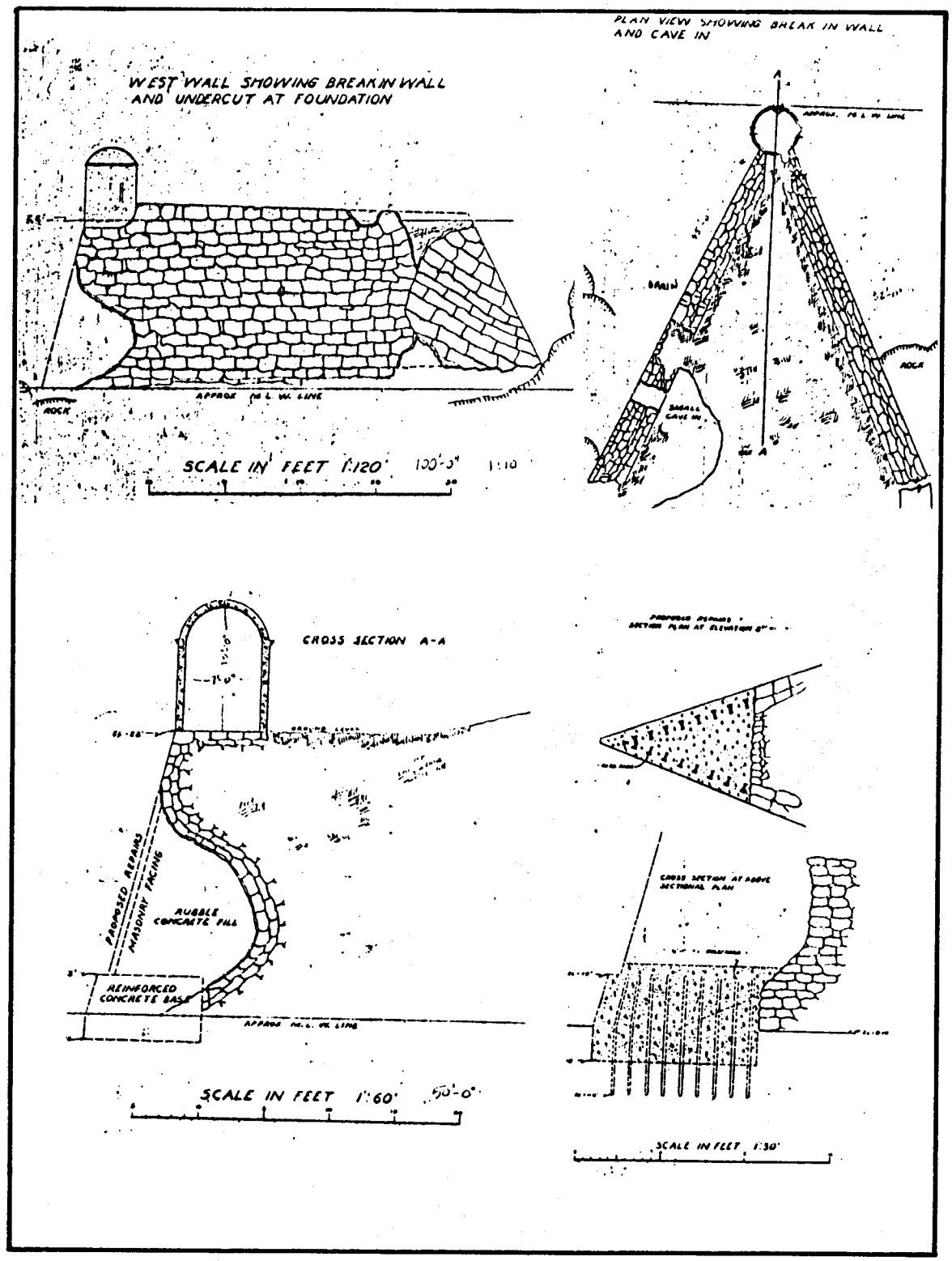


Figure 11.10. Proposed repairs to el Espigón, 1938-39. U. S. Engineer Office, War Department. (San Juan NHS Archives.)

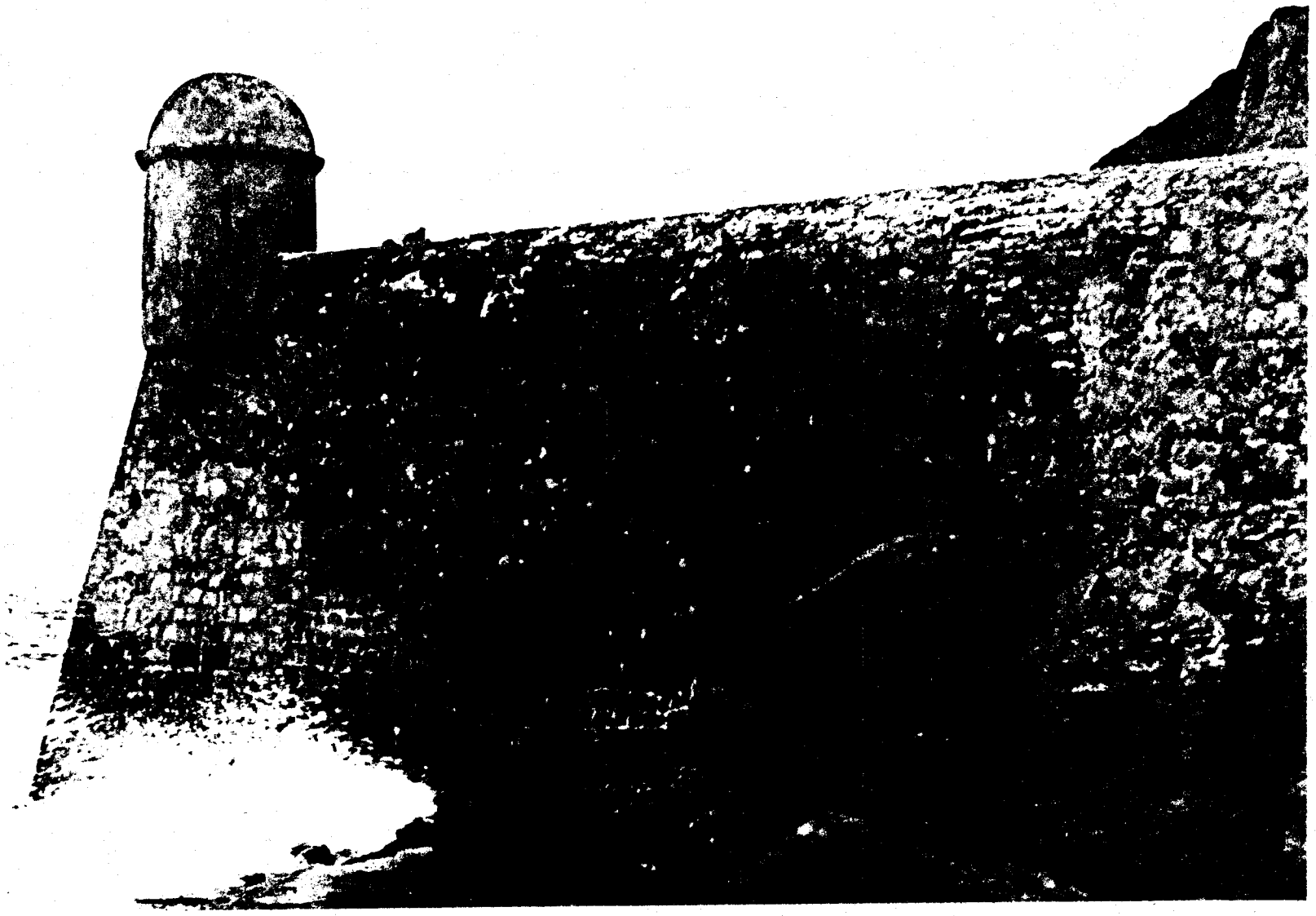


Figure 11.11. View showing the restored west elevation of el Espigón from the completion report dated August 16, 1939. (San Juan NHS Archives.)

Conditions

El Espigón is solidly constructed of load-bearing masonry but is in poor condition. Extensive repair work has been carried out in the 20th century to stabilize the undermining of the salient angle caused by the Atlantic Ocean.

In the 1970s, the north tip of the base was strengthened using reinforced grout-filled bags capped with hydraulic concrete. Although large cracks and areas of stone infill in the middle of the west wall appear to indicate earlier damage from earthquake activity, the present condition of the foundation is stable. Likewise, there are no apparent structural problems with the terreplein area of el Espigón.

The east and west parapet walls, circular wall of the sentry box, sentry box openings and roof however, are deteriorated. Almost all of the stone and mortar on the east and west parapet walls appears weathered and spongy and there is no extant evidence of stucco on the walls. A section of the east parapet extension is noticeably undercut, and has an area of missing soil and stone.

The circular wall of the sentry box has areas with bricks now exposed showing severe brick erosion. Its window openings have been extensively repaired and rebuilt in the early 20th century and the stucco of the roof is cracked and missing in places exposing areas of eroded brick rubble and mortar. Sections of the cornice are missing as well.

The structural condition of the walls along the north coast of San Cristóbal were briefly examined in July 1986 by Civil Engineer Todd Rutenbeck. At this time, the east extended wall of el Espigón was identified to be "badly undercut with a large area of soil and stone missing." Repair and rebuilding was recommended to correct this hazardous condition. No comments were made on the coastal walls or the sentry box of el Espigón.[25]

NOTES

1. Clarence L. Barnhart, ed., Thorndike Barnhart Comprehensive Desk Dictionary (New York: Doubleday & Co., Inc., 1957), p. 96.

2. Ricardo Torres-Reyes, "Construction History of San Cristóbal: 1634-1800" (National Park Service: San Juan National HIstoric Site, June 1965), pp. 8-10.

3. Ibid., pp. 10-12.

4.It is also referred to in one map dated 1766 as Cortadura del Tajamar (parapet of the breakwater). (Atlas American by Manuel de Rueda, 1766).

5. Torres-Reyes, Exhibit VII.

6. Ibid., Exhibit XI, pp. 44 and 49.

7. Ibid., p. 72.

8. Ibid., pp 81-86.

9. A later drawing of the outpost, dated 15 May 1880, recorded the outpost in deteriorated condition. Shown clearly in a section is a hole in the ground located inside the west wall about where the structure had been. Possibly this was the remains of a floor sunk below ground level. Alternatively, it may only have been a washed out area, as described in a 1938 plan as "small cave in."

10. Torres-Reyes, "Construction History," p. 72.

11. The 1783 drawings by Mestre are included in Volume I, no 10 in this report.

12. The 1861 Castro drawings are reproduced in Volume I, nos. 27-37 of this report.

13. Edward A. Hoyt, 2nd Lt., A History of the Harbor Defenses of San Juan P.R., Under Spain, 1509-1898 (San Juan: Antilles Coast Artillery Command, 1943), pp. 148-49. This legend was earlier told by Dr. Cayetano Coll y Toste and first published in 1917 in a book of legends (reprinted in 1962 and entitled Seleccion de Leyendas Puertorriquenas). Dr. Coll y Toste dates the legend as 1790.

14. Ibid.

15. "Proyecto Modificado de Reparación y Conservación del Castillo de San Cristóbal," in the Military Museum in Madrid, Spain, map no. 032-364.

16. Printed in the lower right hand corner of this photograph is "A.41." The original is in the Archivo Historico del Ayuntamiento de San Juan and copies are at San Juan NHS.

17. Photo published in Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1965, by Edwin C. Bearss (U.S. Department of the Interior/NPS, Feb. 1984), pp. 524-5. The photograph is in the Washington National Records Center, R.G. 77.

18. Bearss, San Juan Fortifications p. 234.

19. Excerpt of caption to photograph dated June 24, 1938. This is a loose page numbered "35" at the bottom and was presumably at one time part of a completion report.

20. Both the photograph and the drawing are in the archives of San Juan NHS at San Cristobal. The photo is included in an untitled photo album dated August 16, 1939, and dedicated to "Col. John W. Wright." The drawing is numbered NHS-SJ. 9055 and was prepared by the United States Engineer Office, P.R. District.

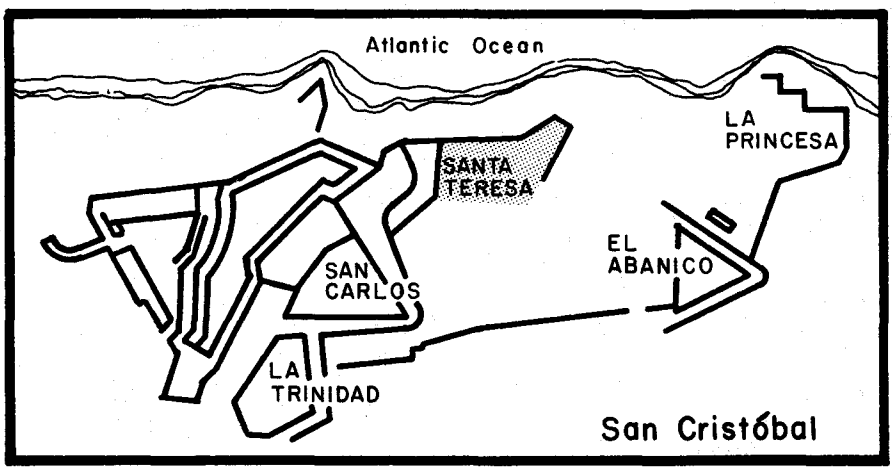
21. Bearss, p. 285. The referenced quote is from the "Completion Report . . . April 1938 to May 28, 1940."

22. Ibid., p. 287. The drawing is numbered NHS-SJ.9057 and was to accompany Specification No. F-28-5. This work was also done using W.P.A. funds.

23. Corps of Engineers, U. S. Army, "Survey Report on Fortification Walls, Fort Brooke, San Juan, P.R.." (1956). Supplement 1 - Figures 14, 15 & 16 are photographs of the damage. This is also detailed in a drawing in Supplement 2, and in San Juan NHS archives drawing no. NHS-SJ. 9197.

24. National Park Service, Southeast Regional Office and U. S. Army Corps of Engineers, "Foundation Condition Appraisal & Improvements Recommended" (1975), pp. 7 and 12. Appendix A, figures 10, 11 and 12 are photos of the existing conditions, and Appendix A p. 17 is a drawing of the proposed work.

25. Todd Rutenbeck, Civil Engineer, "Structural Inspection of Castillo San Cristobal, San Juan, Puerto Rico," Denver: Bureau of Reclamation Engineering and Research Center, October 1, 1986.



CHAPTER 12

SAINT TERESA BATTERY (EL BALUARTE DE SANTA TERESA)

Description

Santa Teresa Battery is located east of San Cristóbal's North Bastion along the northern edge of the glacis. Its present form reflects two distinct military uses of the eighteenth and late nineteenth centuries. The original eighteenth-century form as a redoubt functioned primarily as a seaward defense with a seawall extending along the northern coastal cliffs and secondarily as a landward defense with several small moats and ditches before the rampart at the eastern extreme. What is now referred to as Santa Teresa actually developed as three units. The western most covered way is related in function to the North Bastion of San Cristóbal; the central battery relates to eastward land defenses; and the firing steps and eastern moat relate to the first line of defense. (See figs. 12.1, 12.2.) It is the central battery that was most altered in the late-nineteenth century and was known as Santa Teresa.

The various elements of Santa Teresa will be described in order from west to east. The curved unit opposite the North Bastion serves as the counterscarp of the main moat ending at the seawall (fig. 12.3). A door at the center of this curved wall led to an extensive tunnel system extending southeast branching out to the east under the glacis. This tunnel door is no longer visible due to 1963 repairs. The curved wall of the western covered way has been altered and repaired in the twentieth century. Much of the surface has a twentieth century galletted stucco. The original stone coping has been resurfaced with modern concrete. At the northernmost end of the main moat where this wall turns the corner, the rubble

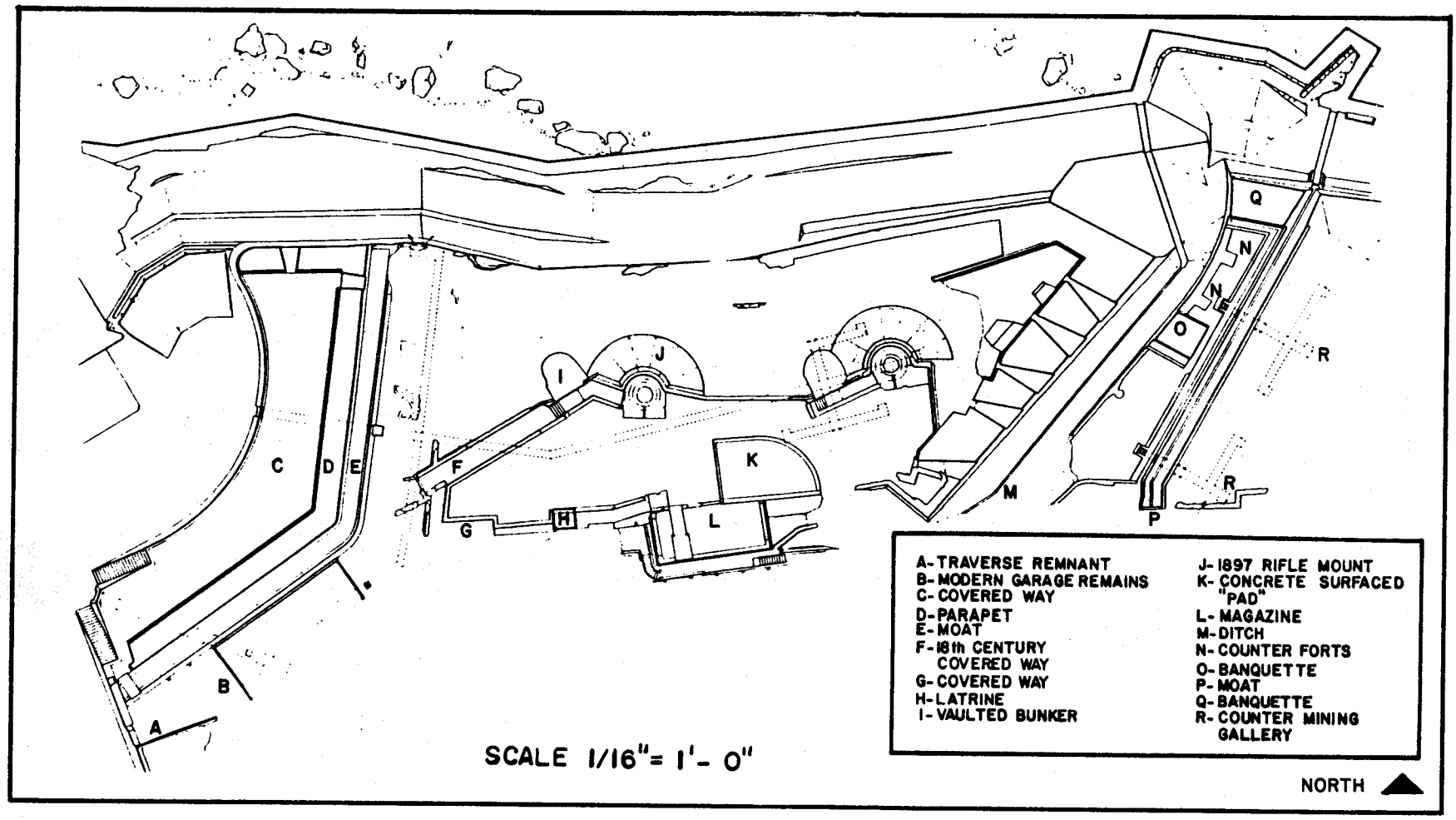


Figure 12.1. Overall plan of Santa Teresa Battery with individual features labeled. HABS drawing (1986) annotated by Jana Gross (1989).

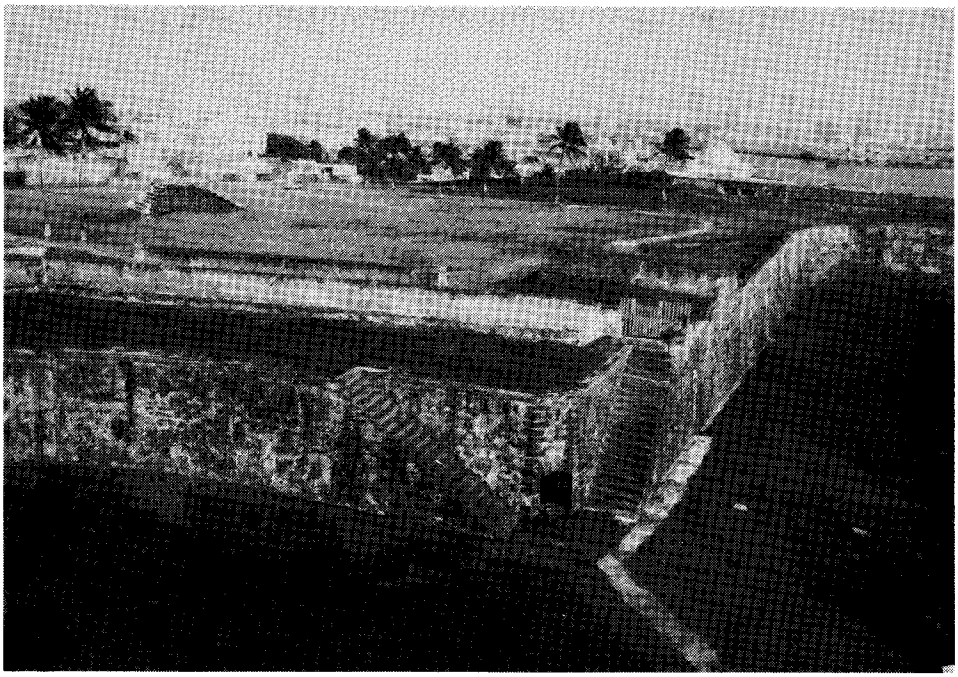


Figure 12.2. View of Santa Teresa looking east from the North Bastion. Photo by CPR, 1986.



Figure 12.3. View of Santa Teresa looking east and showing the curved unit opposite the North Bastion. Photo by CPR, 1986.

construction changes to ashlar. Here the wall surmounts the seawall. This change in construction technique was employed for greater strength against direct attack as well as providing improved resistance to the elements.

At the junction of the north moat of San Carlos is a second tunnel door enframed by a pair of stairs leading up to the (curved) covered way (fig. 12.4). The corners are built of ashlar with stone chinking. The lintel is a segmented arch with voussoirs also of ashlar. Scored lines are discernable around the arc of the voussoirs.

On the covered way there is an occasional stone block capping the wall under the sod. It is unclear whether this was part of a coping or if it was a pavement. These blocks however, are of similar construction to coping at la Trinidad Counterguard. Eighteenth-century plans are somewhat ambiguous concerning the origin of this material.

The original stair construction is similar to that of la Trinidad with cantilevered stone blocks that have been covered with cement. Stairs are 77 inches wide.

At the northern end of the covered way overlooking the ocean is a parapet with a single embrasure. This seaward parapet is of typical parapet construction with exterior dressed stone and interior rubble retaining walls with earth fill and a brick sill at embrasure level. The merlon surfaces and embrasure cheek walls have the polygonal stone facing that is typical of 1938 Army Corps repairs.

To the east and the southeast is a parapet overlooking a moat that is banded on the right by a one-foot ditch (fig. 12.5). The parapet is of rubble construction with a brick rowlock course at the upper interior edge and cut sandstone blocks at the corners. The cut stone used at the corners of the parapet is chinked with brick. Specially molded bricks are used for coping to accommodate the slope of the merlon. The south portion of the exterior parapet wall has parging of cement up to the level of the moat wall to the east, with galletting above. The northern stretch of the parapet has galletting with sporadic areas of portland cement patching.

Although areas have eroded, several campaigns of stucco finish survive. The rubble is layed in a white mortar covered with a red/beige stucco that may represent a second finish. The third stucco (outer layer) is white. The brick coping has only a brickdust stucco that is contemporaneous with the outer white stucco. This treatment of the coping is similar to that found on the north rampart of San Carlos.[1]

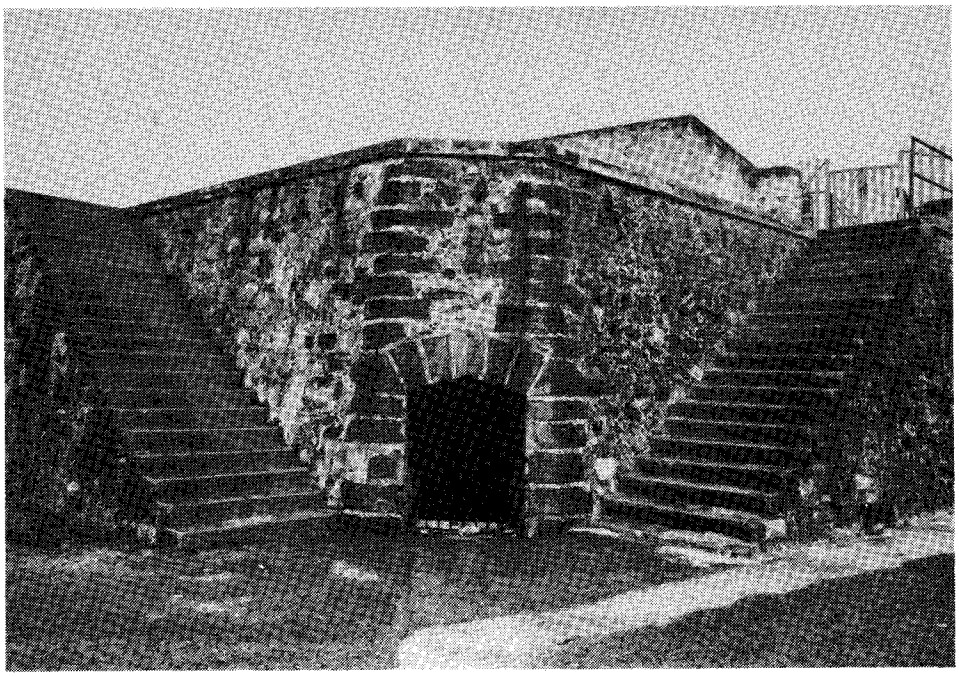


Figure 12.4. Stairs leading up to the curved covered way flank an entrance to a countermining tunnel. Photo by CPR, 1986.

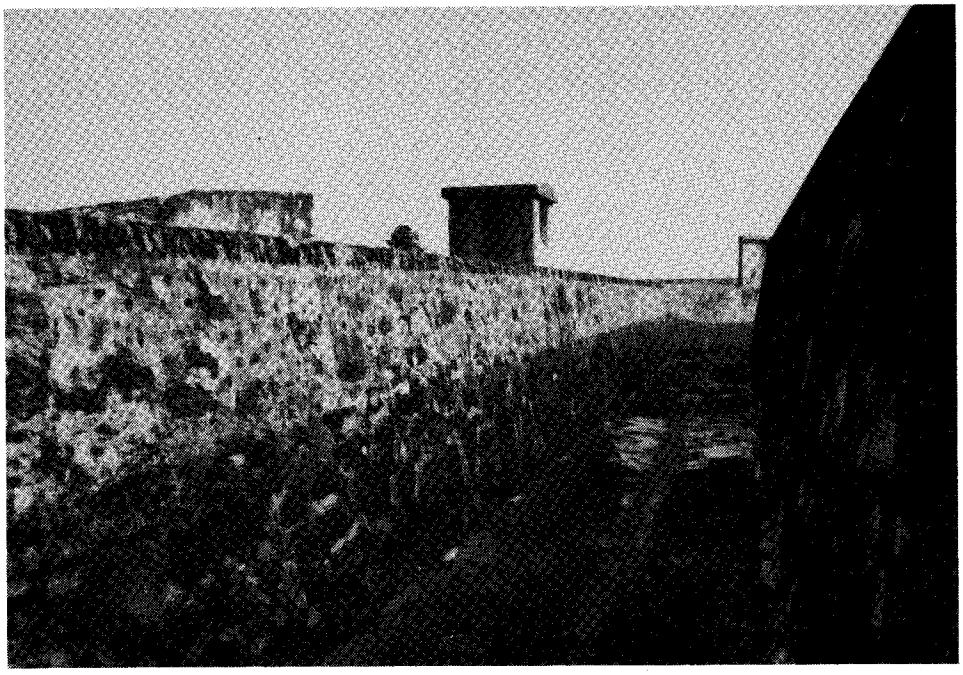


Figure 12.5. Shallow moat running beside the curved covered way. Photo by CPR, 1986.

The battered exterior parapet wall borders on a small moat that follows the northeast and north orientation of the wall. The moat is about 8 feet wide tapering to about 6 feet at the bottom. It is 6 feet 9 inches deep. The floor gently slopes to the center from the base of the walls facilitating drainage. Water flows from north to south and is dispelled through a scupper in the counterscarp of the San Carlos moat.

The southern end of the moat is parged with cement. A hole at the point of the drain to the scupper has been cut through the cement. The drain is constructed of bricks in a segmented arch.

On the northeast edge of the moat, approximately 7 feet south of the 132 degree deflection angle of the counterscarp, is a square brick flue for ventilation of the tunnel beneath. Additional ventilation for this tunnel is provided at the north end through two slotted vents in the sea wall.

At the southeastern corner of the parapet, opposite the stairs to the curved covered way, are two posts constructed of ashlar stone laid with brick chinking. The stones are notched with pockets for a gate leading to a wooden footbridge (no longer extant). One crossed over the moat by means of this footbridge to reach the eastern portions of Santa Teresa. Almost 9 feet beyond the footbridge the remains of an eighteenth-century traverse for the San Carlos counterscarp covered way are visible. Just north of the bridge, abutting the southeast portion of the moat's wall, are the remains of a modern garage. A formed concrete slab and three walls are extant; joist pockets are visible in the back wall for rafters that supported the roof structure.

An eighteenth-century covered way leading to the fort of Santa Teresa lies just north of the deflection angle of the curved covered way (F). It is diagonal and consists of rubble wall fragments running north-south at the entrance and remains of a firing step to the south. The north-south wall fragments may be part of the 1772 campaign for the outer parapet wall that was later destroyed. A mitred stone at the western end of the wall may be a detail from the 1773 design for a diagonal opening into the outer parapet wall. At ground level is a line of paving connecting the two north-south walls that are also constructed of brick and rubble. The covered way now functions as a passageway to the 1897 rifle mounts and terminates at the late-nineteenth century seaward battery.

The Battery consists of an east-west oriented monolithic concrete parapet wall, two gun mounts (J), and a magazine (L). At the gun mounts, the parapet has stone coping and is reinforced on the seaward side by a semi-circular area of concrete topping the earth embankment. The gun mounts are

concrete cylinders embedded in the earth behind the parapet (fig. 12.6).

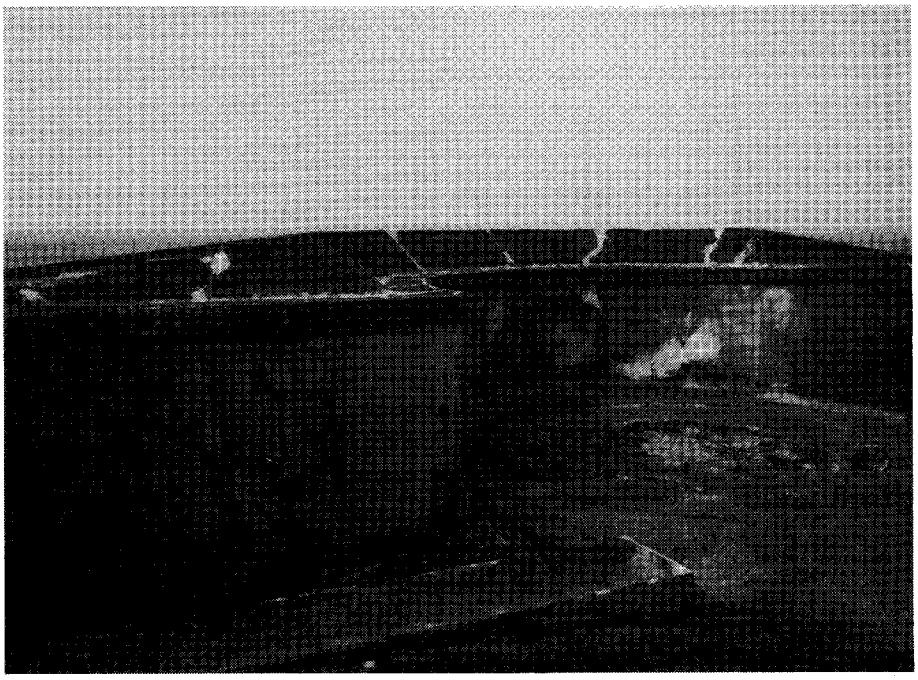


Figure 12.6. One of 1897 circular gun mounts embedded in the earth behind the semi-circular parapet. Photo by CPR, 1986.

Just west of each gun mount is a vaulted recess constructed of formed concrete that was used for ammunition storage (I). (See fig. 12.7, 12.8, 12.9.) The south facade of these vaulted bunkers has an elliptical arched doorway with decorative concrete work above the opening articulating a keystone and a lintel. Above this is a raised concrete plaque with the inscribed date of 1897. The interior stucco has graffiti dating from 1922 to the 1940s. Access to each unit is as follows; from the west are four concrete stairs leading down to the vault and east of the vault is a concrete ramp ascending to the semi-circular gun mount. At the vault, along the ramp and stair, is a concrete retaining wall.

At the western end of the diagonal covered way is a second, covered way leading south and then east (G). The walls are battered stone. One section of wall retains evidence of the location of a lean-to structure. Further to the east along this covered way is a brick structure with a shallow brick barrel vault that served as a latrine (H). Ventilation for the building is provided by a square opening in the ceiling at the northwest corner and a small round window opening in the east wall. The exterior is stuccoed with cement. Set into the cement floor are two 9-3/4 inch cast iron pipes that served as drains.

East of the latrine is an 1897 magazine (L). Access is from the east and west via stairs of brick and cement that lead to an entrance below grade. A poured concrete wall at the western end, and a concrete wall that may incorporate an earlier rubble

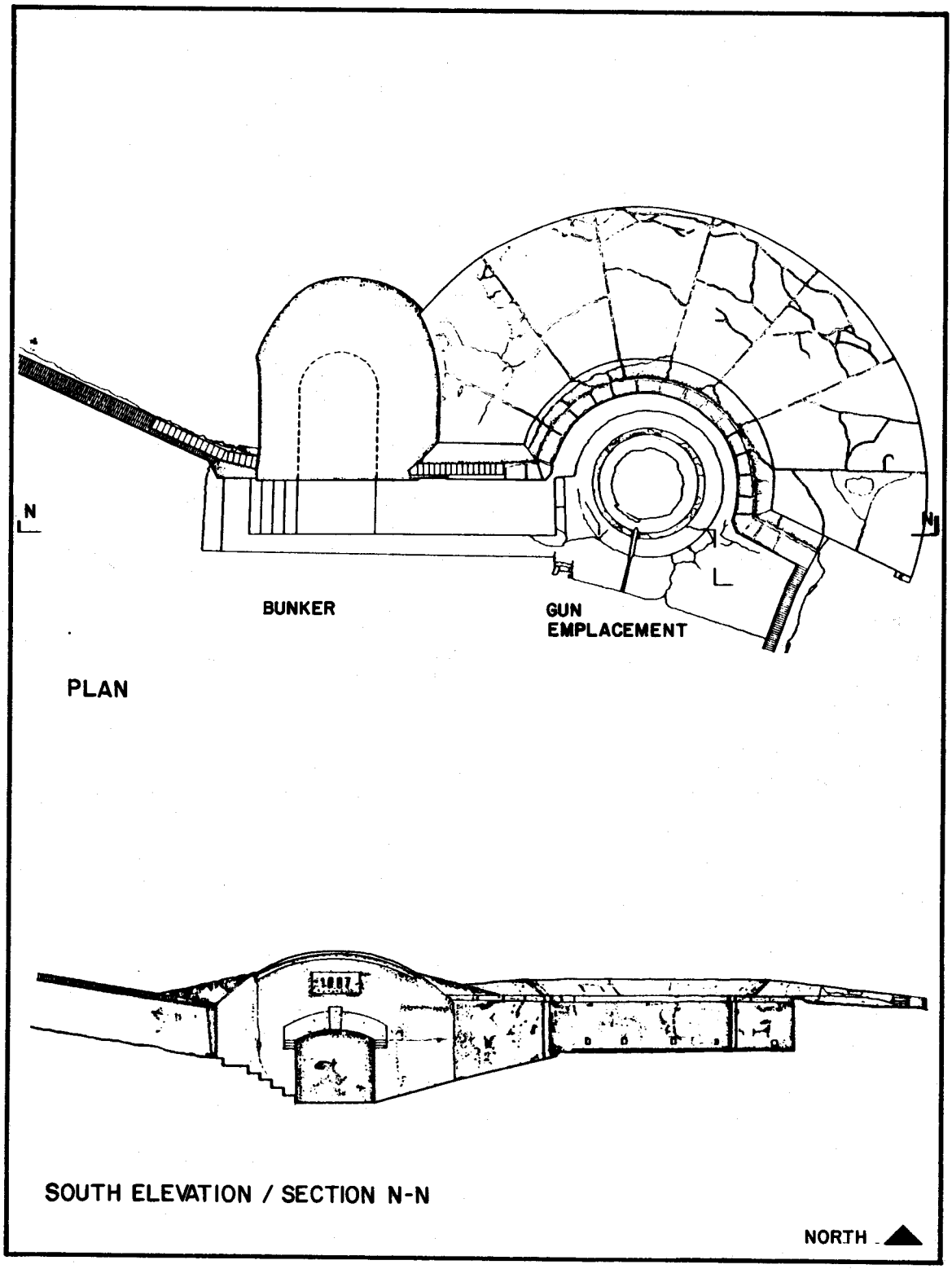


Figure 12.7. Plan and south elevation of 1897 gun emplacement and bunker. Detail of 1986 HABS drawing.

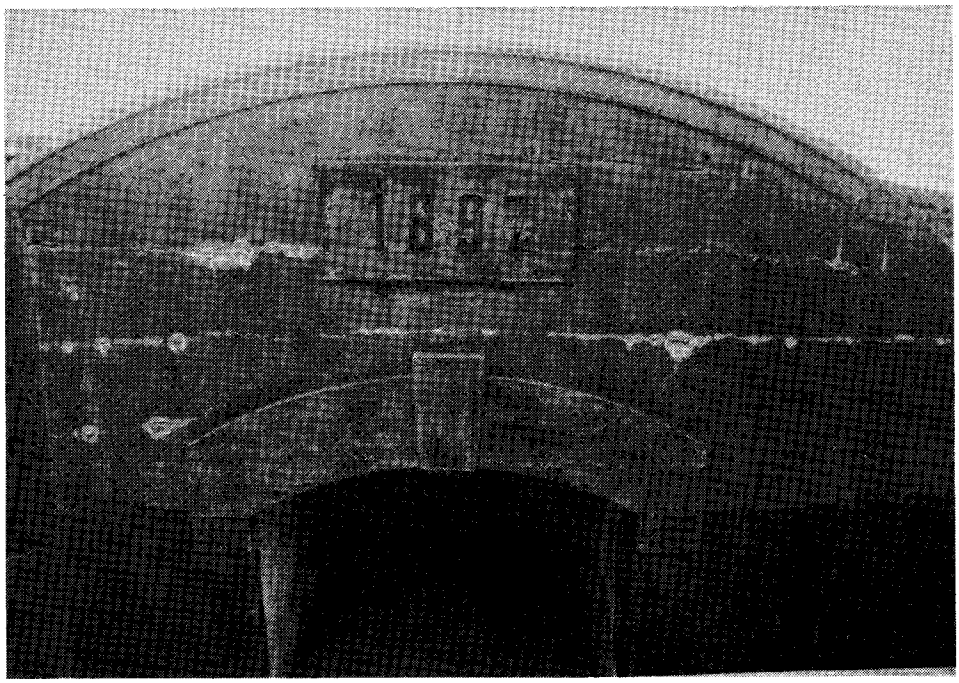


Figure 12.8. Vaulted bunker at 1897 gun emplacement. Photo by CPR, 1986.

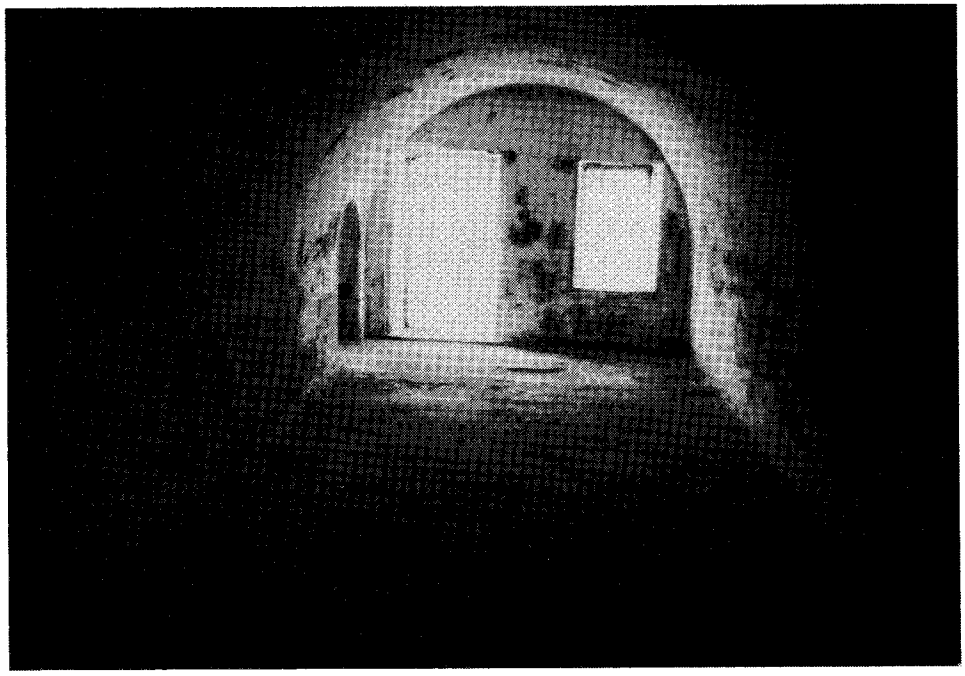


Figure 12.9. Interior of vaulted bunker at 1897 gun emplacement. Photo by CPR, 1986.

wall to the east, function as retaining walls. At grade level there are five concrete piers. The floor is surfaced with concrete with a series of drain covers. The wall of the magazine is constructed of rubble and has a simple molded cornice. The main facade faces south with three doors. The brick vault and door enframements with rubble walls are now surfaced with concrete (fig. 12.10).

The interior space has a single barrel vault divided into three chambers. The outer chambers are identical in dimension; the center is slightly narrower. The construction is identical for all three. The doorways for the outer chambers were once framed for double doors, and the door for the interior was single. The pockets left from the frames are now filled with mortar. A narrow entrance leads to the rooms that have a single molded shelf along the east and west walls. Several corroded, machine-made nails remain in the shelves.

To the east of the structure (at the same grade) is a paved drain running diagonally from the southwest corner of the structure down and to the northeast wherefrom it disappears into the ground.

To the northeast of the structure is a concrete surfaced pad with retaining walls (K). The curved northeastern retaining wall is coped with brick bearing the manufacturer's stamp, "San Patricio." The rubble battered wall to the south partially serves as the northern wall of the magazine.

The eastern most portion (figs. 12.11, 12.12) of Santa Teresa consists of an eighteenth-century parapet that originally had five embrasure openings. The seawall to the north joins with the parapet that turns (from the seawall) and faces east. Four embrasures and two northern banquettes remain intact. The south portion of this parapet is only partially extant; the merlon is gone and the base of the parapet and embrasure cheek walls remain, exposing the rubble construction of the eighteenth-century walls. The embrasure openings are edged with chamfered stone blocks, and the parapet and cheek wall upper edges are brick. The embrasures, although altered and partially destroyed, exemplify typical eighteenth-century embrasure/parapet construction techniques.

The exterior wall is of coursed rubble construction with stone leveling courses measuring 44 inches deep. The interior wall is similar, measuring 32 inches deep. The surviving merlons have brick coping with chamfered stones at the embrasure openings. A single wythe of brick is used as edging at the opening. The bank of embrasures overlooks a small moat with a narrow brick-lined drain sloping to the seawall in the center. (See figs. 12.13, 12.14.)

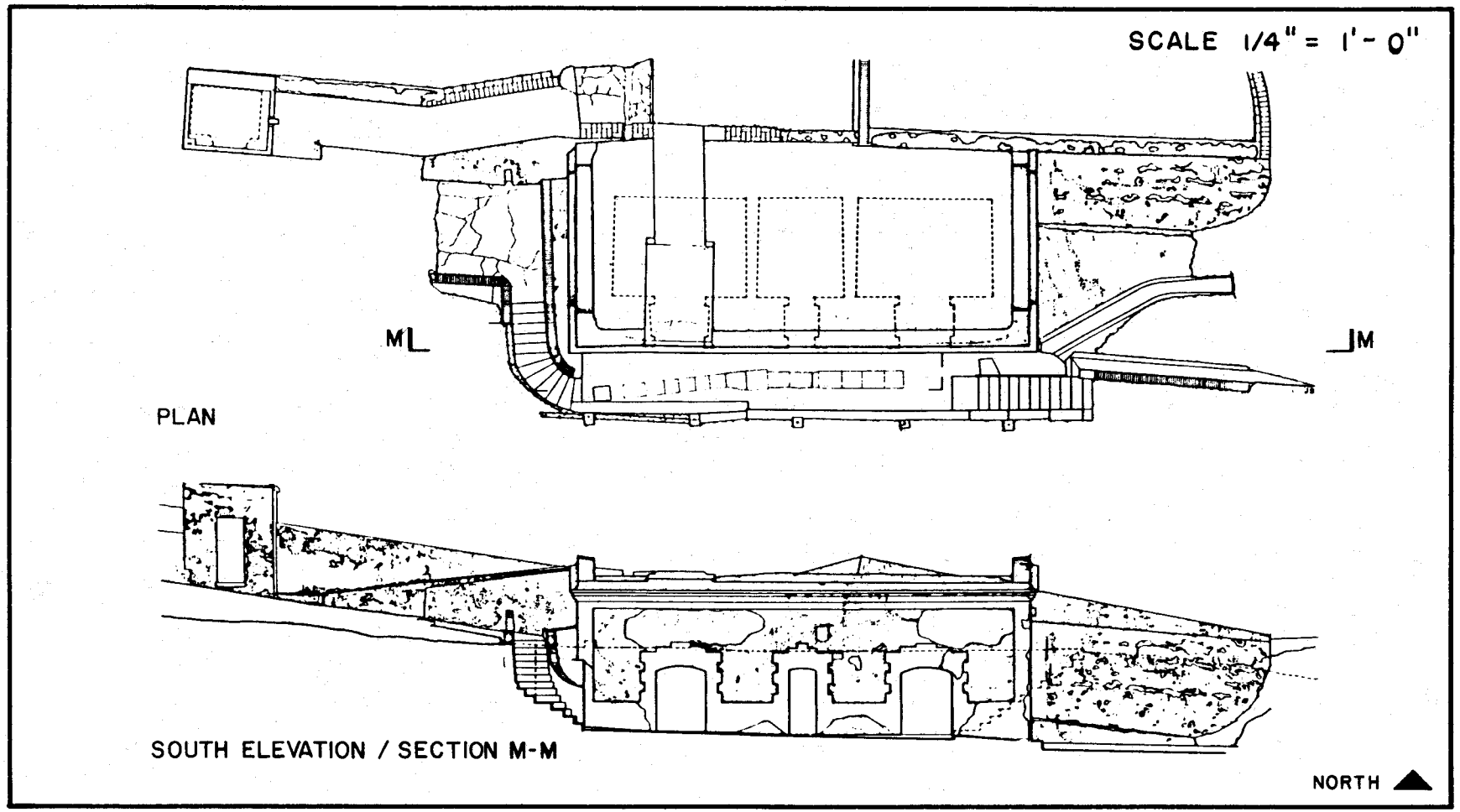


Figure 12.10. Plan and south elevation of 1897 magazine. Detail of drawing by HABS, 1986.

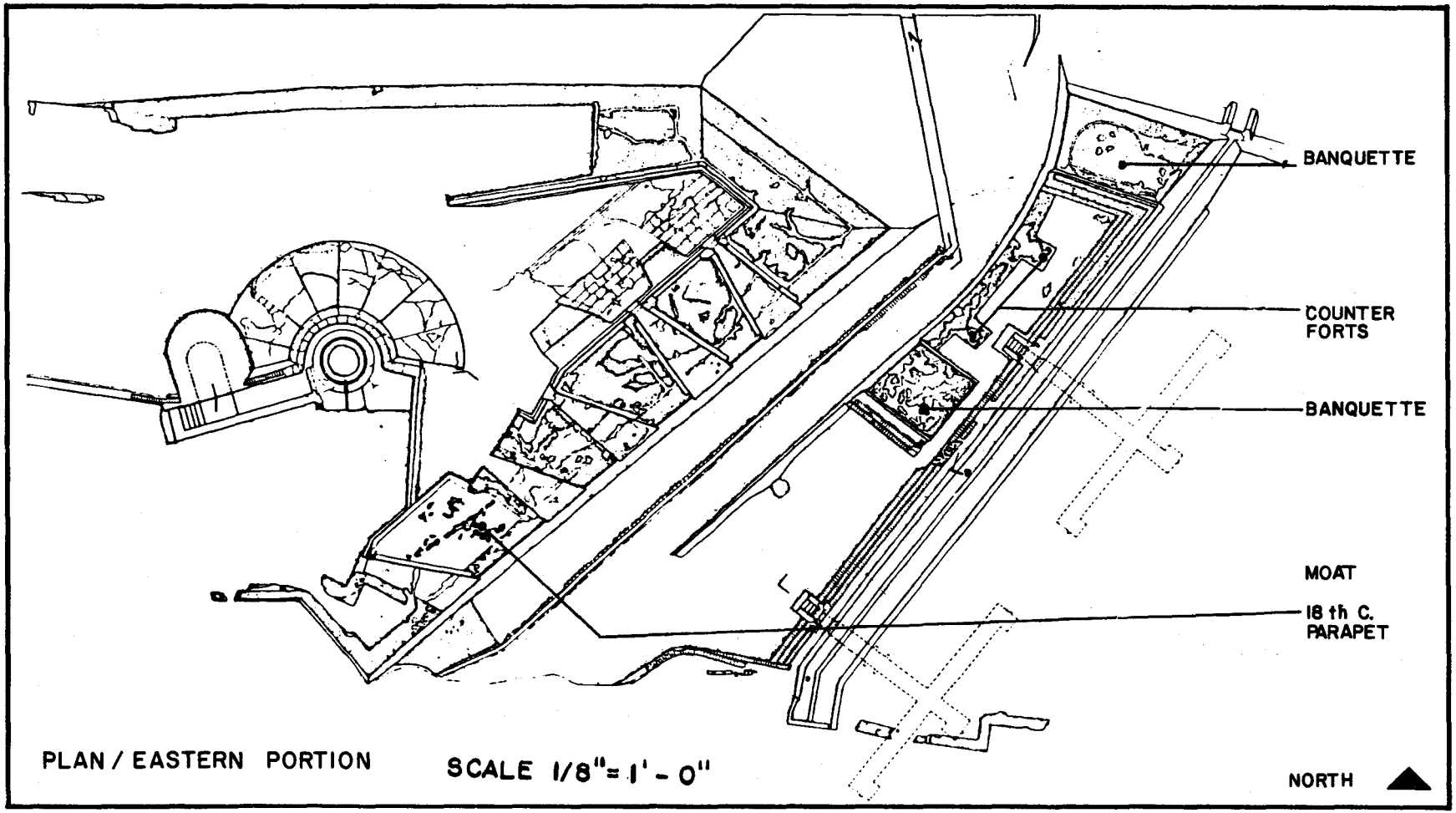


Figure 12.11. Plan of the eastern portion of Santa Teresa Battery showing the eastern embrasured parapet wall, moat and countermining tunnels. Drawing by HABS, 1986.

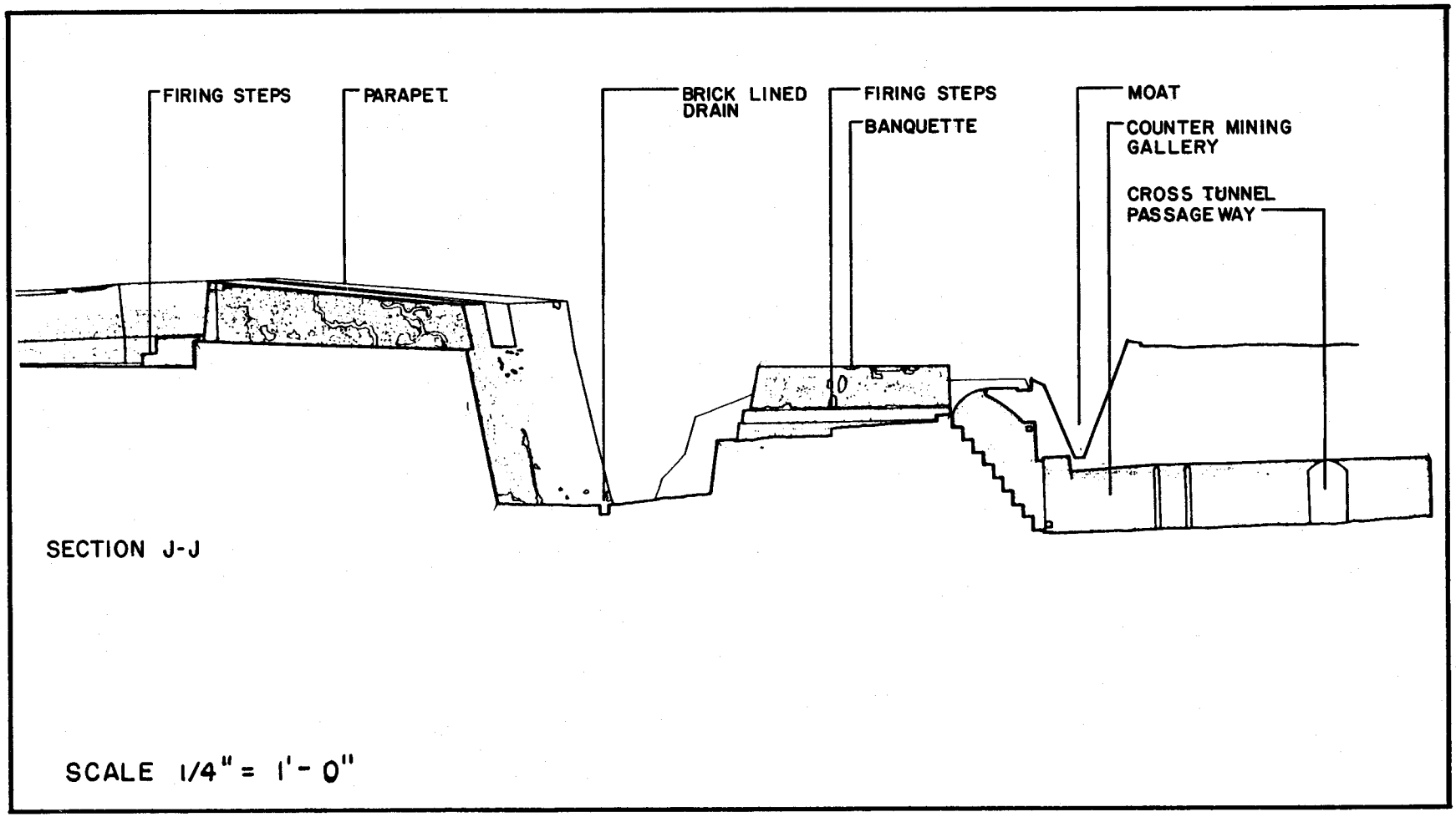


Figure 12.12. Section J-J from the eastern portion plan (fig. 12.11) showing defensive fortifications. Detail of drawing by HABS, 1986.

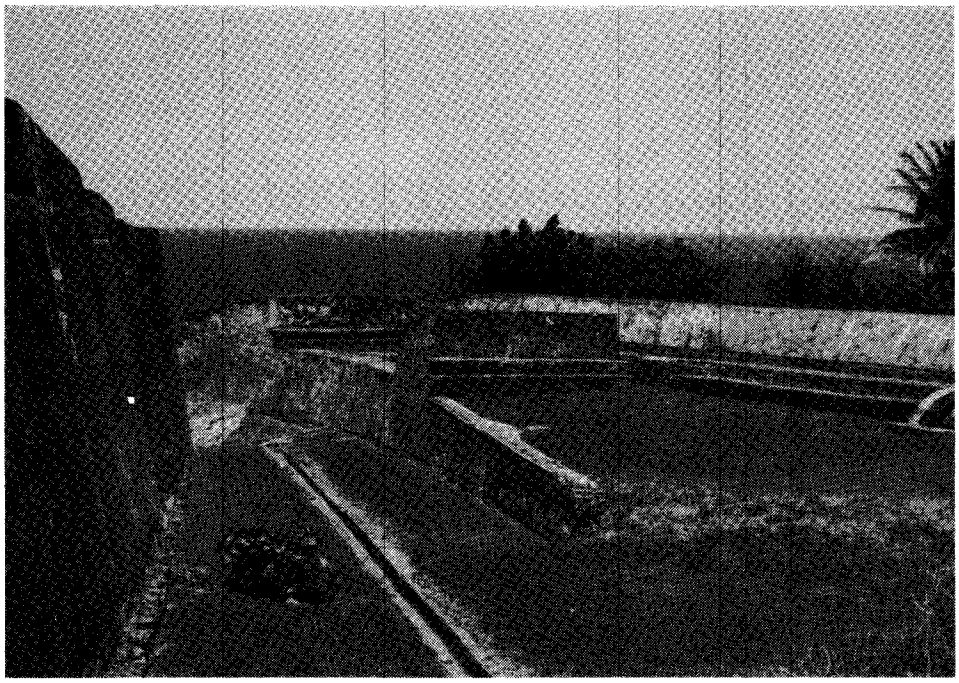


Figure 12.13. Eastern most portion of Santa Teresa. Parapet on left, small moat in center, banquettes and firing steps on right. Photo by CPR, 1986.

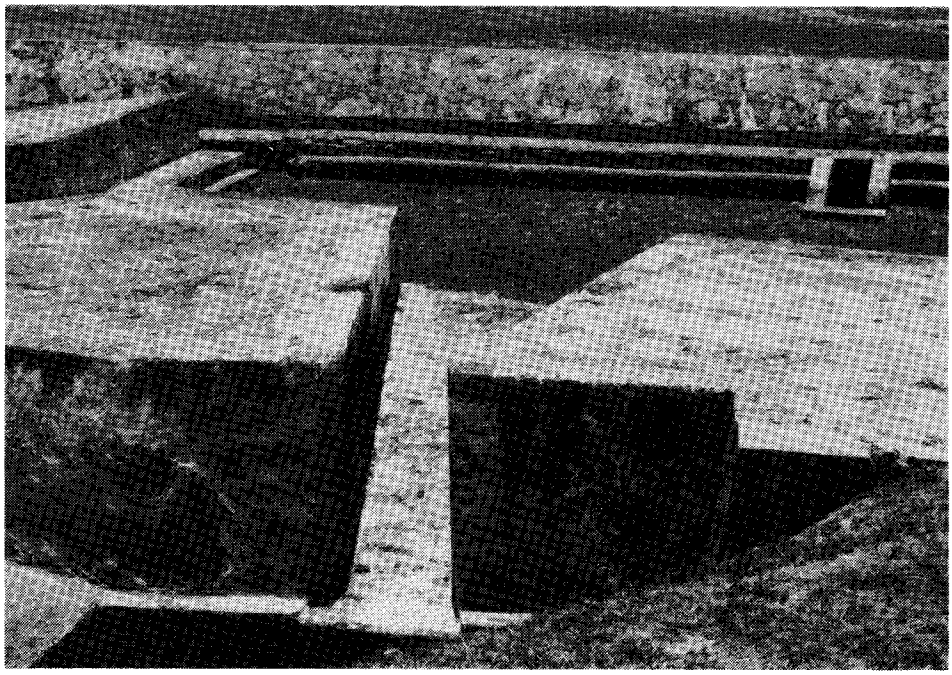


Figure 12.14. One of eastern-most 18th-century embrasures looking east. Photo by CPR, 1986.

Two banquettes with north-oriented firing steps are located on the east side of the small moat. The northwest sides of the banquettes are an integral part of the retaining wall. These two banquettes are oriented to the north and served to help protect this section of the seawall from a landing party. They are surrounded on the north and east with a parapet wall. Two counterforts (buttresses), now exposed, are found at the northern end between the two eastern most banquettes (fig. 12.15).

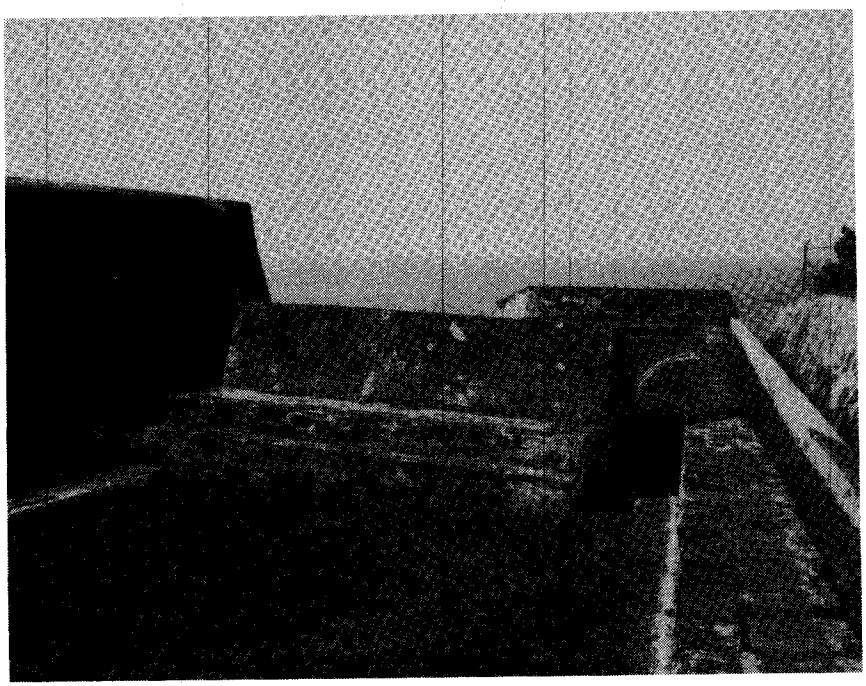


Figure 12.15. North-oriented banquette with firing steps at the eastern edge of Santa Teresa Battery. Photo by CPR,1986.

This eastern parapet wall overlooks a small moat that terminates at a brick retaining wall on the south side (fig. 12.16). The construction method is assumed to be rubble, as is evident at the small moat of the curved covered way. Located along the eastern parapet are two countermining gallery entries (Tunnels 9 and Tunnel 10) that descend and head east under the moat. The steps are constructed of rowlock brick with three courses of stretchers. The rounded enframement of the entry is also brick, covered with stucco.

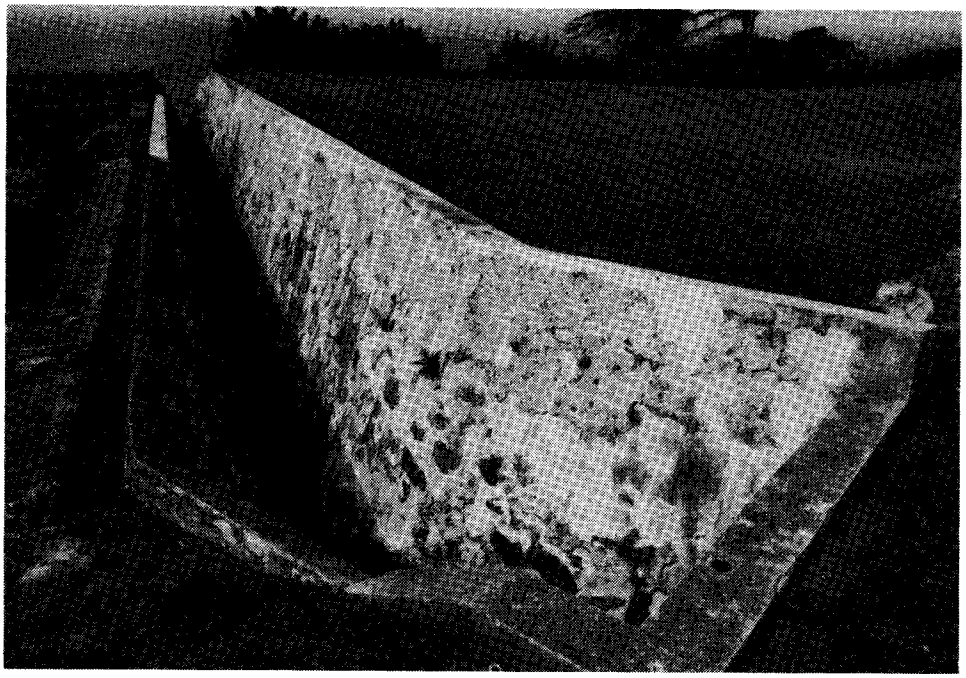


Figure 12.16. Small moat running north to the sea. This feature is the farthest to the east of all Santa Teresa features. Photo by CPR, 1986.

Structural Evolution

Period 1: 1625-1765

No documentation was found for Santa Teresa Battery during this period.

Period 2: 1765-1809

The structures identified as Santa Teresa date primarily to this period (excepting the construction associated with the 1897 gun mounts and magazine). The earliest reference appears in engineer Thomas O'Daly's 1765 existing conditions plan for San Cristóbal. This plan showed the curved wall of the North Bastion counterscarp with a sloping earth embankment to the east. In the 1765 O'Daly proposed work plan, this area evolved into a covered way that followed the line of the two ravelins fronting San Cristóbal. (See fig. 12.17.)

Early in 1769, O'Daly produced a construction plan depicting works from 1766-69 (fig. 12.18). The plan showed a hook-shaped redoubt atop the North Bastion counterscarp wall. A profile for the plan showed posts on the west face of the eastern parapet wall forming a palisade. The tunnel leading from the corner stairs was shown, but the tunnel with entry in the curved counterscarp wall was not shown. The western part of the glacis was shown to slope east at the eastern wall of the redoubt.

The following translation of the legend from the 1769 plan indicates what work was in progress:

> r (curved wall): counterscarp begun and in place, lacking only 7 feet of its [intended] height.
>
> e (corner tunnel): countermine begun in the re-entrant angle of the counterscarp. This will run at the level of the Moat under the parapet of the covered way with branches in order to blow up the ground behind the crest of the glacis. It also will receive its ventilation in the coastal cliff. At the level of the covered way will be extended branches that should be blown before the lower mines, succeeding by this means in moving the same earth twice.
>
> k (covered way): projected redoubt to supplement the small defense that because of the steepness of the terrain is drawn from the parapets of the fort and

> ravelin and for the same reason more exposed to the attacks of the besieger.[2]

It appears that the first elements to be built were those closest to the North Bastion of San Cristóbal. The counterscarp was of rubble construction, incorporating some outcropping with cut stone corners and cut stone articulating the southwest tunnel entrance. At this point (1769) the counterscarp and southeast tunnel were begun, while the hook-shaped redoubt was only projected.

Apparently the redoubt underwent several design changes before the structure in its present configuration was built. The redoubt's function was altered in an undated plan of O'Daly's (fig. 12.19) that depicted a small ravelin-like structure in the covered way. O'Daly's August 31, 1772 existing plan (fig. 12.20) showed a parapet with deflective angle facing east overlooking a covered way with a second parapet wall in the same configuration. This plan used the Spanish drafting convention of depicting new construction in red, and work yet to be executed in yellow. Depicted in red at this point were the curved wall, stairs, north parapet, west parapet overlooking small moat, outer retaining wall of moat, and outer parapet wall.

Engineer O'Daly produced a plan February 26, 1773 with modifications to proposed construction that included the addition of a countermining gallery under the banquette/outer parapet wall. The following new construction was depicted in red: the curved counterscarp, north parapet and embrasure, double stairs, southwest tunnel with countermining gallery, parapet with firing step with channels for gate posts at north and south ends, retaining walls forming the western most moat, and an outer parapet wall enclosing the northern portion of the covered way with an opening on a diagonal just south of the deflection angle. Only the moat itself was represented in yellow. The outer wall was represented in black which probably indicates its completion in the previous construction campaign. (See fig. 12.21.)

Visible in the southern end of the parapet are indentations, presumably for gate posts. This detail is clear in the 1773 plan. However, the northern end has been repaired, thereby removing or covering evidence of similar markings.

In 1778 the necessity of a northern seawall and a temporary or permanent outwork was recognized.[3] In 1779 two temporary works of earth and wood were begun and referred to as Redoubt 1 (later known as Santa Teresa) and Redoubt 2 (el Abanico). Sometime between 1779 and 1783 the temporary works were made permanent.

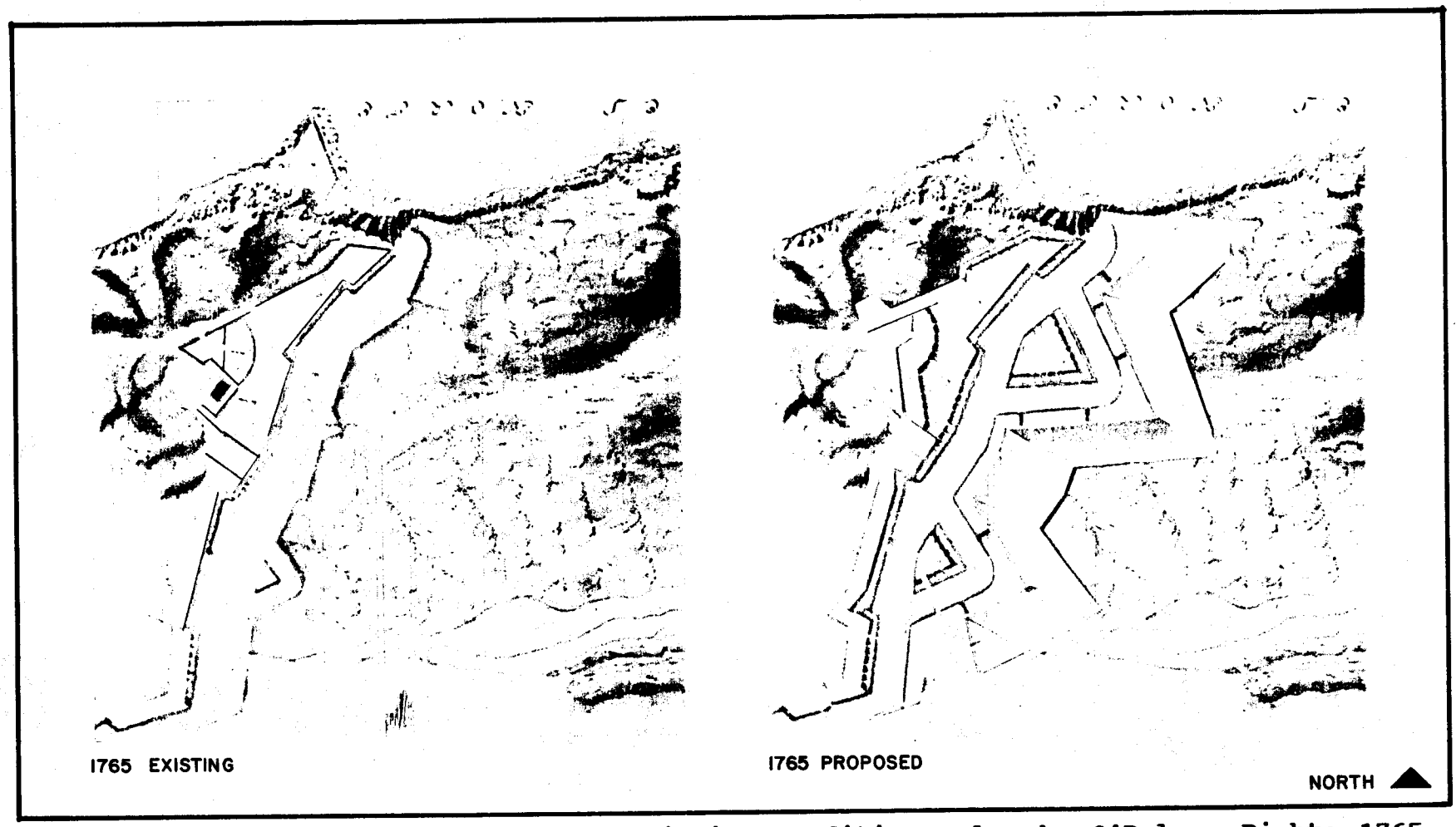


Figure 12.17. Left: May 17, 1765 existing conditions plan by O'Daly. Right: 1765 proposed modernization plan by O'Daly.

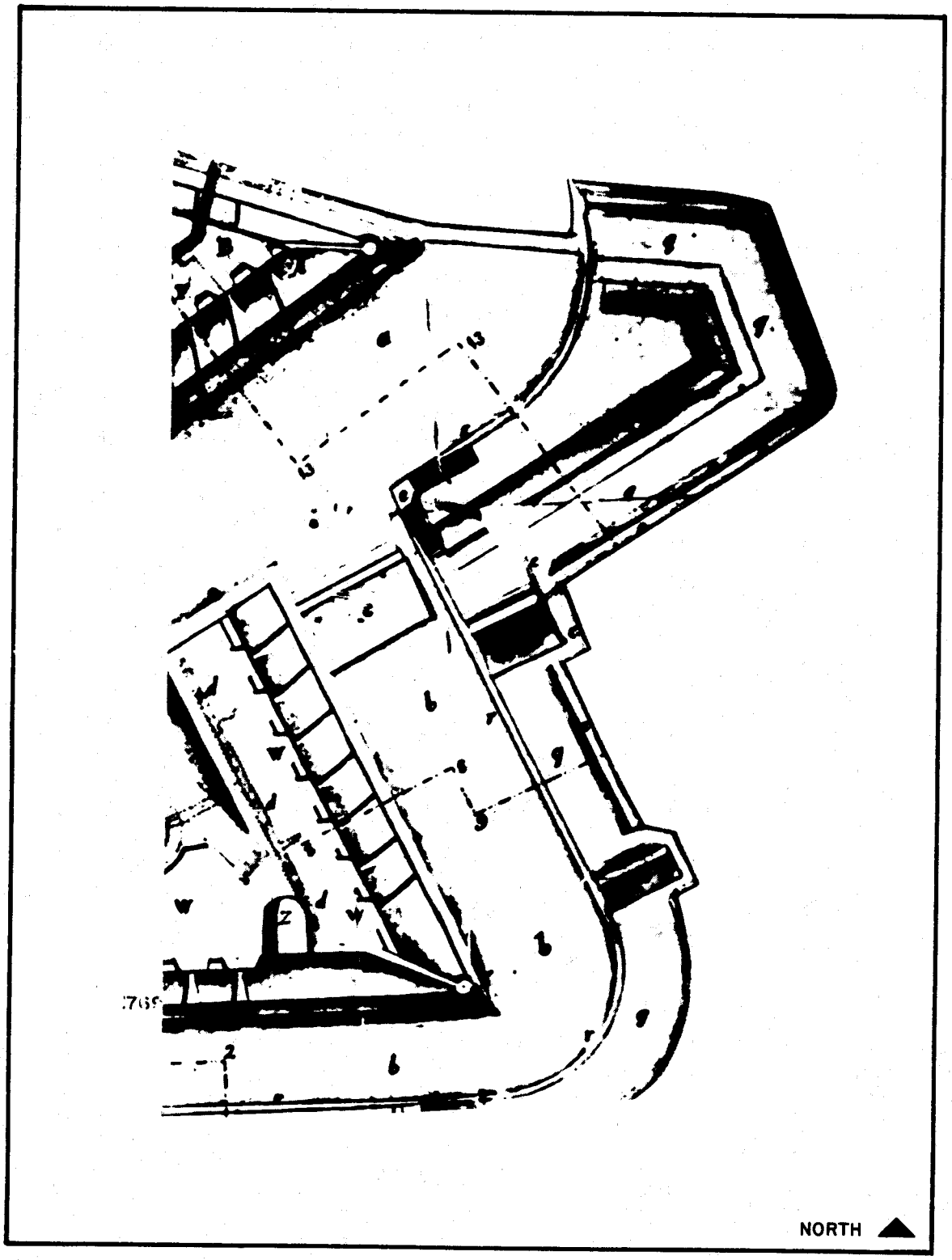


Figure 12.18. Detail of 1769 proposed construction plan by O'Daly showing ("q") covered way, and ("e") countermine tunnel.

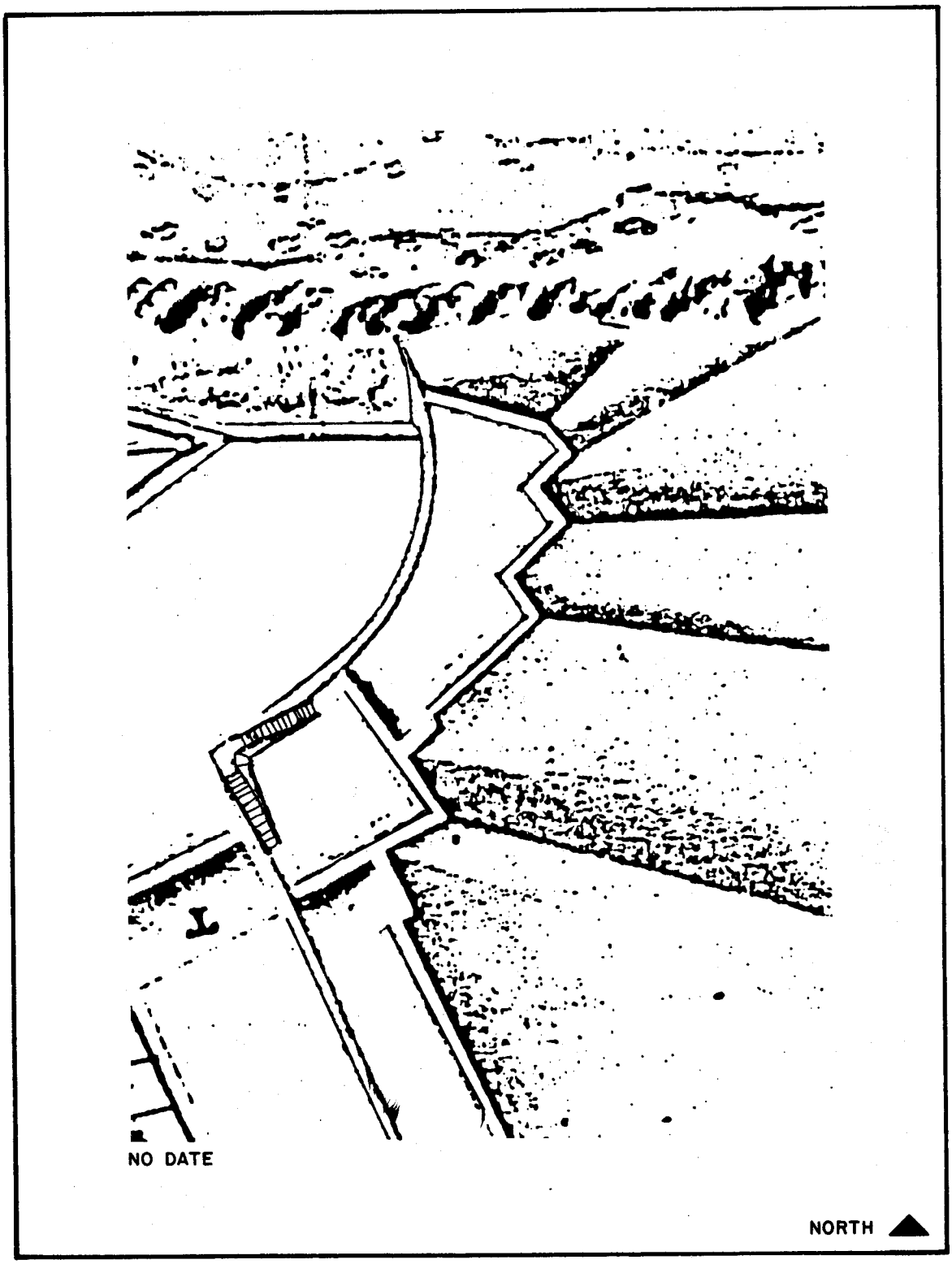


Figure 12.19. Detail of undated plan by O'Daly, ca. 1769, showing curved covered way and its eastern glacis.

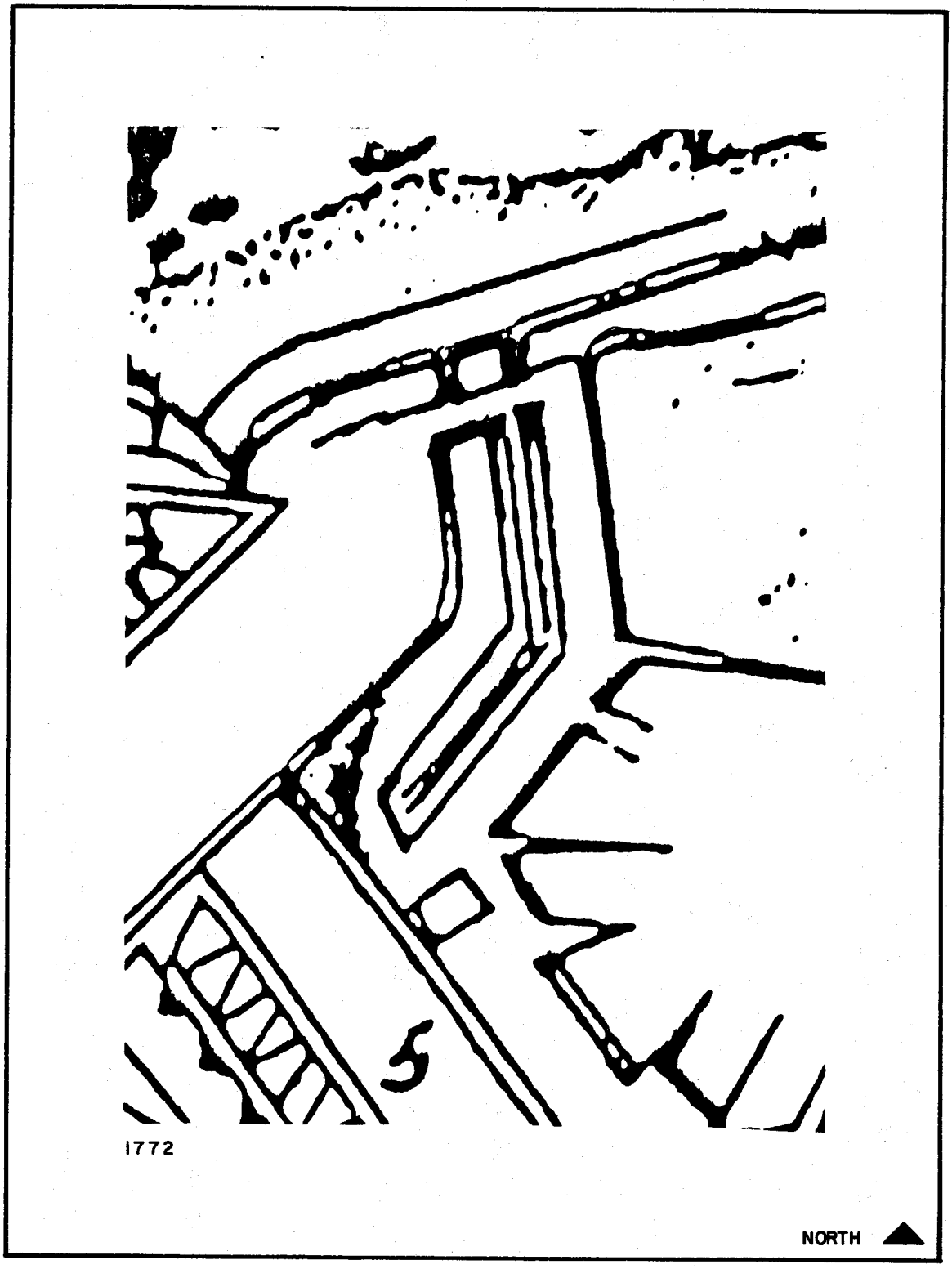


Figure 12.20. Detail of August 31, 1772 existing conditions plan by O'Daly showing curved covered way of Santa Teresa.

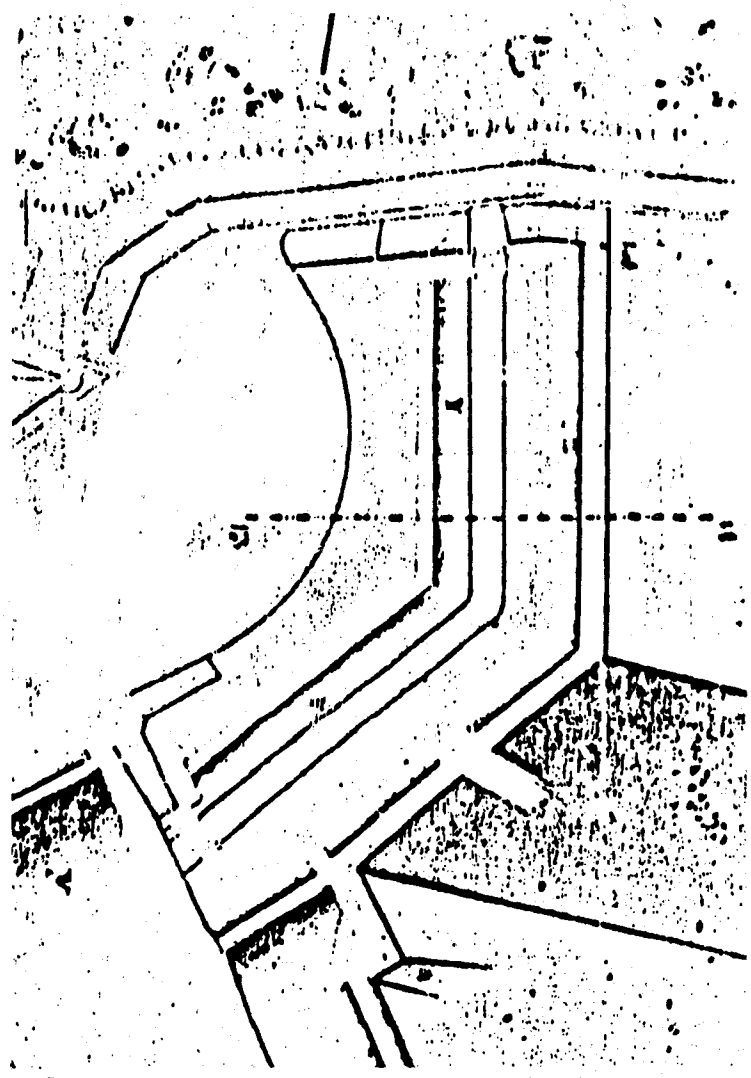


Figure 12.21. Detail of February 26, 1773 plan by O'Daly showing the curved covered way of Santa Teresa.

Juan Mestre began extensive plans and sections of the San Cristóbal fortifications in September of 1783. It is in this 1783 plan that a fort (Santa Teresa) appeared to the east of the covered way with access to the fort by means of a diagonal covered way (fig. 12.22). The seawall ran from the counterscarp and continued into a parapet with embrasures for five cannons facing east. This overlooked a small ditch, two northward banquettes, and a continuation of the first line of defense moat with a parallel mining gallery. At this point there was a single entrance to the north that led into an easterly shallow-branched gallery. Linking the counterscarp and covered way with the first and second lines of defense was a covered way with tambours (see glossary). This constituted a fully developed land defense in conjunction with la Princessa, el Abanico, and the first and second lines of defense. Also, the second tunnel from the North Bastion's curved counterscarp appeared for the first time.

The sections of Mestre's September 1783 plan pertinent to Santa Teresa are Profiles Nos. 1 and 2. (See fig. 12.23.) Profile No. 1 represented a cut through the first defense line that appeared to be similar to the eastern moat and steps. Here wooden posts (perhaps palisades) were set along the western retaining wall of the moat at a height extending slightly above the height of the eastern retaining wall. A channel to receive wooden posts existed between the brick steps overlooking the eastern moat that is now overgrown with vegetation. Profile No. 1 also recorded the existence of a palisade along the first line of defense. In Profile No. 2 the construction of the covered way with the tambours included wooden posts (fagina) lining the interior of the southern retaining walls.

No design changes were evident in the 1792 plans of Juan Mestre. At this point construction had moved to the eastern section of the fort. Some time between 1783 and 1792, the north wall and revetment of the embrasures were built, as well as the tambours and eastern firing steps. The recent construction indicated in red includes the small north-south moat to the east, walls of the tambours covered way, and the outer embrasure wall.

After 1792, little new design or additional construction seems to have taken place, although in the 1796 reports to Spain a mention was made of inspections and repairs of the outworks, especially to the gates and palisades of the defense lines.[4]

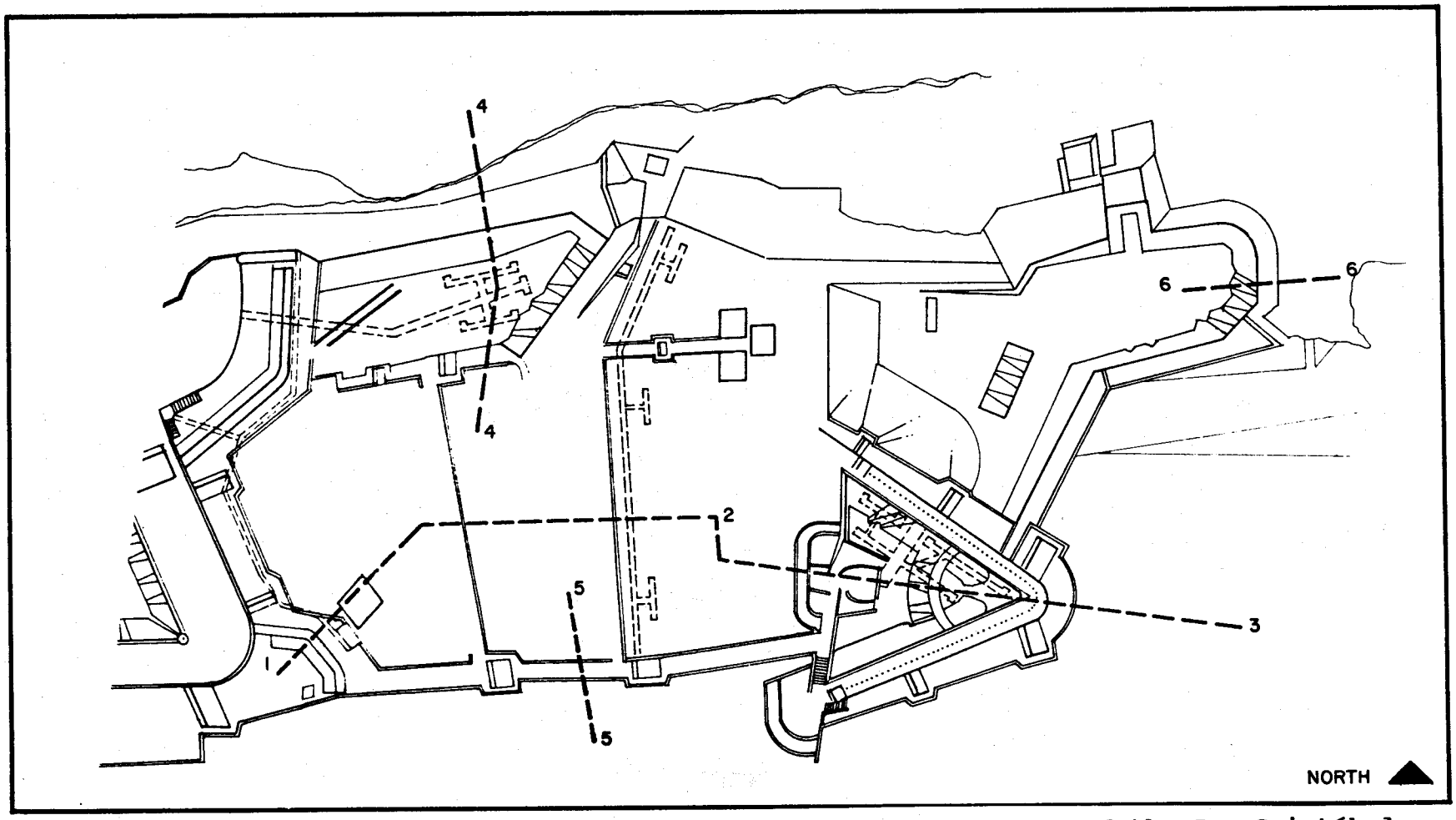


Figure 12.22. Modern tracing of Mestre's September 13, 1783 plan of the San Cristóbal outworks adapted from Torres-Reyes Construction History of San Cristóbal (1965).

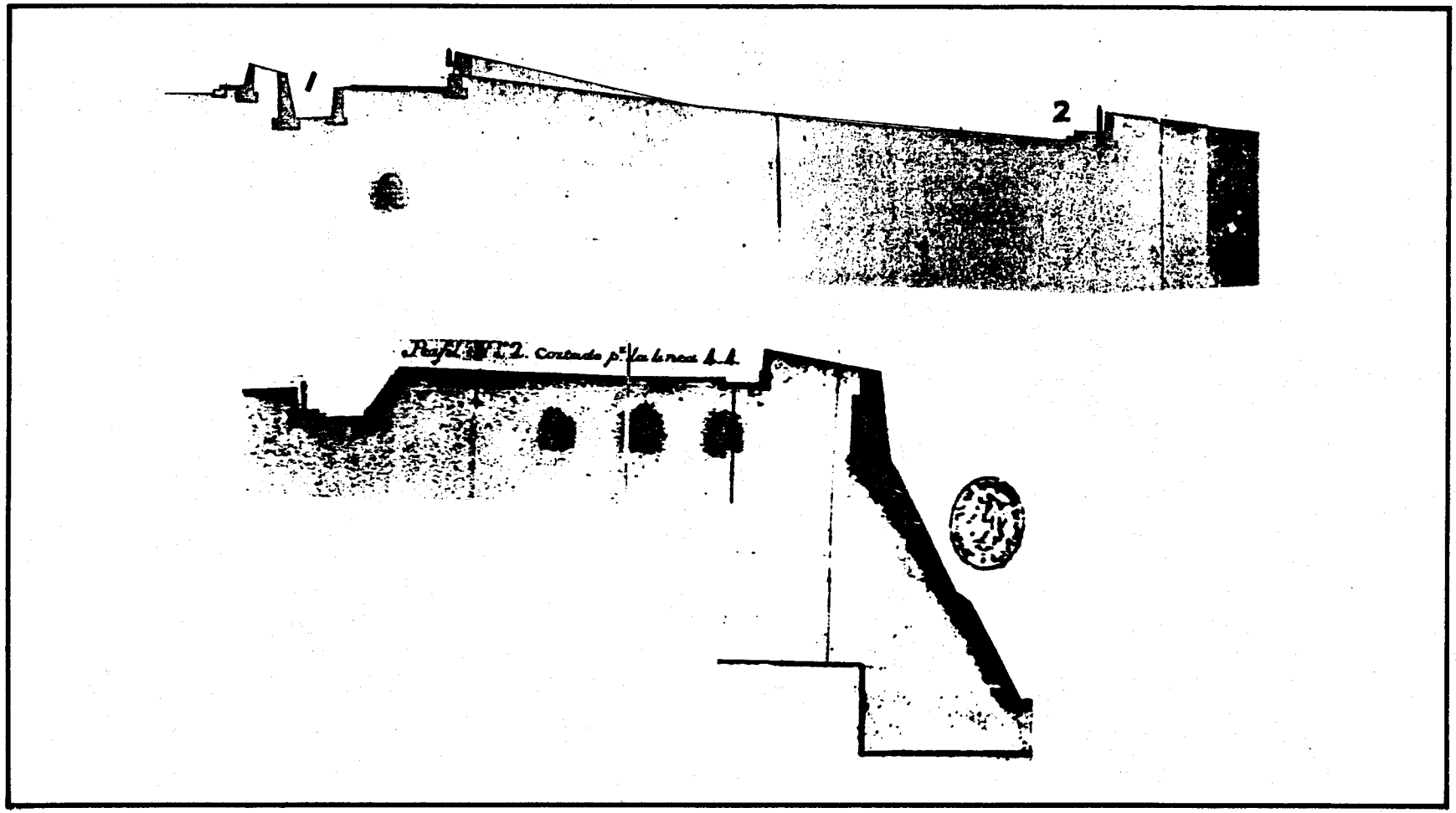


Figure 12.23. Top: Detail of Profile No. 1 by Mestre, 1783, showing the moat and palisade of the first retreat line.

Bottom: Profile No. 2 by Mestre, 1783, looking west at cut line 4.4 on fig. 12.22.

Period 3: 1809-1837

No documentation was found for Santa Teresa during this period, nor is there physical evidence of construction at this time.

Period 4: 1848-1868

No documentation was found for Santa Teresa during this period, nor is there physical evidence of construction at this time.

Period 5: 1868-1898

Documents of the nineteenth century are few. Plans of the city dating to 1879 and 1888 showed no significant changes to Santa Teresa, partially because the scale of these plans did not allow much detail of the individual units of San Cristóbal. It is not until the Spanish began preparing the fortifications for the Spanish-American War that there was any significant documentation of the redesign of Santa Teresa.

In 1895, the Spanish began alterations to Santa Teresa that greatly changed its original function as a land defense. They partially demolished areas of Santa Teresa in preparation for new structures, as well as placing earth fill over original masonry walls such as the outer parapet and embrasures.[5]

Concrete was used for the construction of the 1897 additions to la Princesa. A similar material was used at Santa Teresa and is presumed to date to this period. The new construction at Santa Teresa consisted of a battery with two gun mounts, vaults, and a three-chambered magazine.

Period 6: 1898-1986

After the United States assumed responsibility for the military fortifications of San Juan, an inspection was conducted to inventory the structures. Repairs were made according to these assessments. In 1902, the U. S. Army Corps of Engineers removed the "earth traverse" located on the first line of defense. The capacity of the powder magazine was reported in 1903 as 13,500 pounds.[6]

When the United States entered World War I, the fortifications were prepared for occupation. At this time, Santa Teresa does not appear to have been modified.

In 1930, construction was begun on la Princesa officers' quarters including the dynamiting of the "remains" of Santa Teresa battery.[7] It is not certain what was dynamited, however, it may be that at this time the outer parapet wall was demolished. It was not until 1938 that repairs or alterations to Santa Teresa were recorded in W.P.A. plans of tunnel locations; these plans do not show the parapet wall east of the western moat. According to historian Edwin Bearss, the two tunnels (on the far east) were cleaned, fumigated, and wired for temporary lights.[8]

By 1939, a concrete structure was erected abutting the southeastern wall of the western moat. This may be Building No. 214 that appears in other documents.

The presence of the Army is clearly reflected in the "As-Built Survey of Fort Brooke"[9] conducted in 1949. (See fig. 12.24, 12.25.) The la Princesa officers' quarters occupied the entire area of the glacis to the east of Santa Teresa. Several concrete structures associated with the motor pool included Building 214 (the garage) abutting the western moat, and in the main moat, the grease rack, and a square structure at the center of the curved counterscarp. At this time, the western moat had two concrete buttressing slabs to the left and right of the deflection angle. Other structures indicated in the 1949 survey were: the latrine, a structure on the "roof" of the magazine, and an incinerator on the covered way against the southeast parapet (material unknown). The floor of the diagonal way and its south wall were described as made of concrete. Most of the eastern embrasures had earth fill covering all but the two northernmost embrasures and merlons. Indications of a drainage system appeared in the eastern brick-

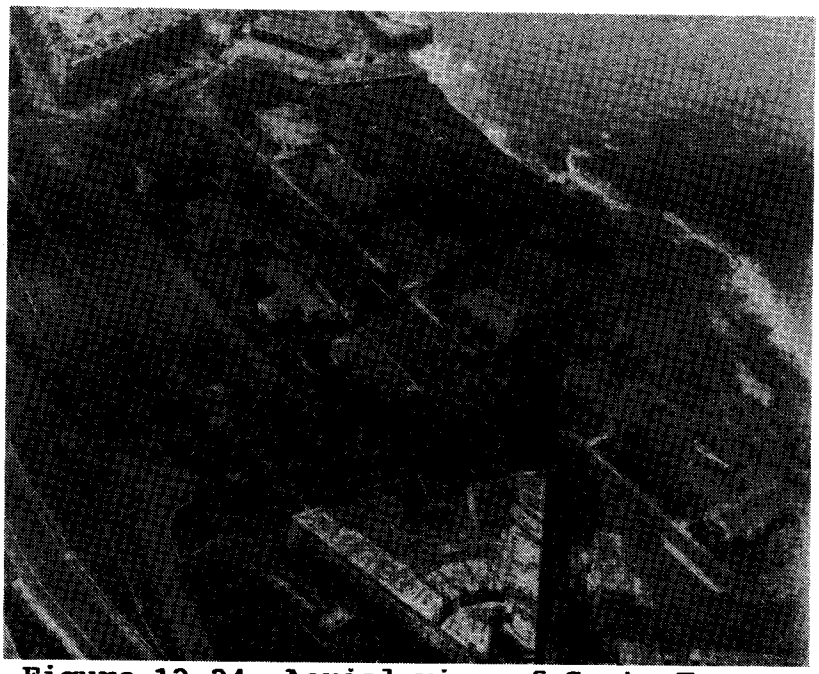


Figure 12.24. Aerial view of Santa Teresa showing army housing on glacis, ca. 1950. (San Juan NHS Archives.)

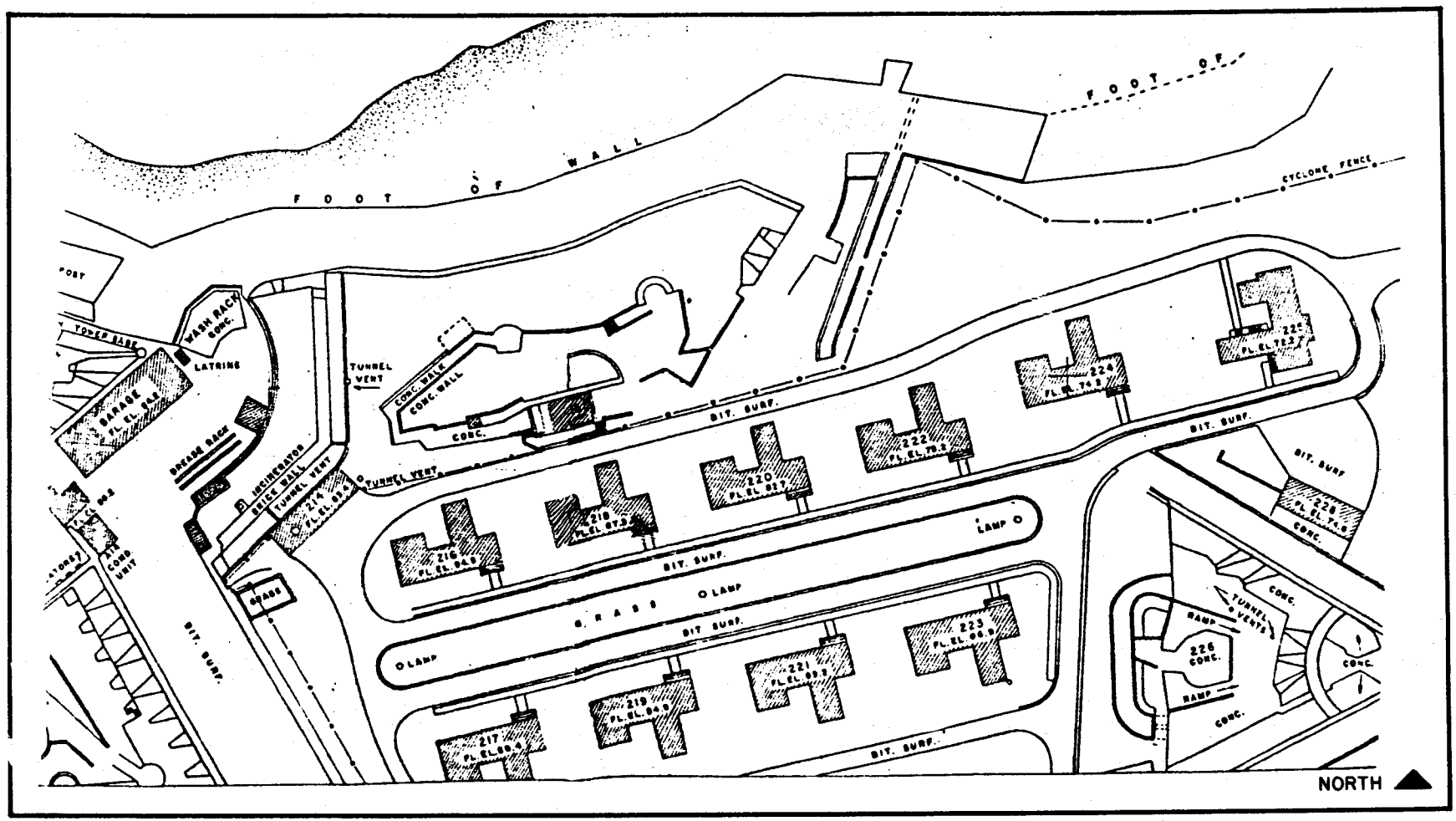


Figure 12.25. Plan "Fort Brooke As Built," Office of the Engineer, U. S. Army Forces Antilles, ca. 1949. Illustrates new army housing at Santa Teresa and La Princesa. (San Juan NHS Archives.)

lined ditch, although no such notation is made for the western or eastern moats.

In 1960, the NPS recorded the entire fortification system in photographs; later plans for restoration were produced based on these photographs. The photographs showed the battery of Santa Teresa overrun with vegetation and the covered way of the counterscarp, though deteriorated, in use.

The 1963 NPS Landscape Development plan shows the removal of some of the intrusive elements such as the grease rack and incinerator.[10] The garage and earth fill of the east embrasures remain in place today.

Photographs from May 1963 show major repairs to the curved counterscarp and the addition of a concrete coping (fig. 12.26). Photographs accompanying the "Completion Report, Accelerated Public Works, Work Progress" show earth fill being removed from the south end of the five embrasures on the east side.

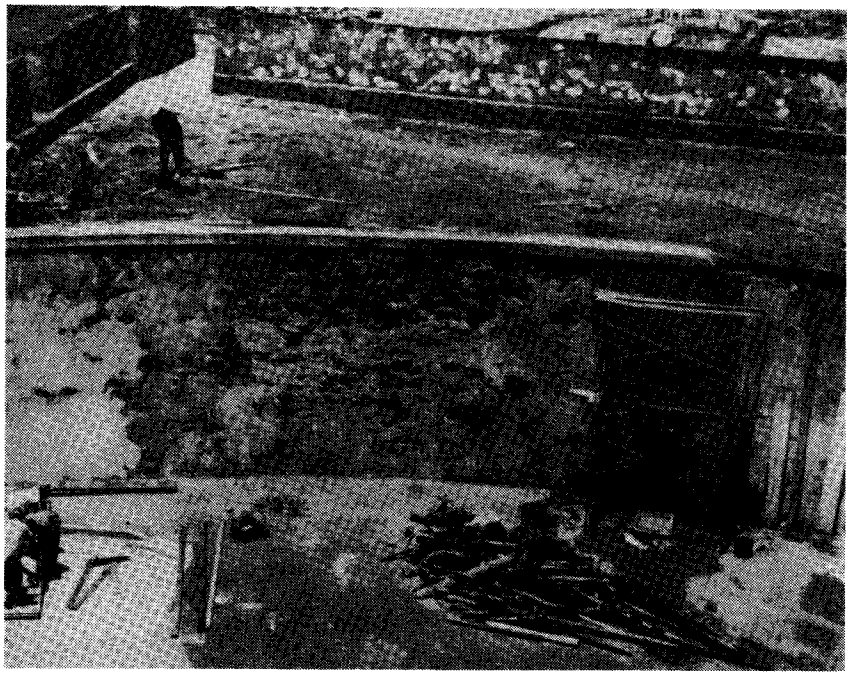


Figure 12.26. APW photo showing work on the curved covered way, May 1963. (San Juan NHS Archives.)

Conditions

Detailing conditions of Santa Teresa from west to east, the counterscarp of the North Bastion has been subject to erosion over a period of many years. As early as 1960, there was evidence of differential weathering, cavity erosion, and biological growth. Random repair work is interspersed with older stucco. Where stucco is no longer present, stone has weathered and is somewhat recessed from joints that retain their stucco finish.

The north-oriented portion of the parapet wall has been completely refaced with 1938 Army Corps stone veneer. The east-oriented parapet wall is generally in good condition, although at the southern end near the foot bridge there is a large vertical crack extending from the base of the wall. This crack was repaired in 1960, but has since reopened.

The entire length of the western moat's retaining walls have been galletted. From the deflection angle southward, the galletted surface of the parapet wall, the retaining wall, and the original surface of the drainage trough are covered with cement parging up to the height of the eastern (retaining) wall. Vertical repairs in the parapet wall at the deflection angle and toward the southern end are the result of the removal of the buttresses (mentioned above), possibly in 1963 when the parapet cracks were repaired.

Ruinous walls, that were part of the eighteenth-century configuration of Santa Teresa, are extant at the extreme western end of the diagonal covered way. Considering their partial demolition and reincorporation into later construction, they are in relatively good condition. Within the passage, various stuccos survive, although severely weathered in characteristic swirling patterns. For the most part, the pavement remains in place, however there are areas presently overgrown with grass.

The seawall in the area of the 1890s gun mounts and the eighteenth-century embrasures has eroded leaving exposed rubble. This severe erosion is most likely due to the absence of a protective coping.

The easterly embrasured parapet wall is intact except for the southernmost corner that was leveled to embrasure height in the 1890s. Along the entire length of the parapet wall there is a crack that runs parallel to the front face of the wall and coincides with the earth-fill and the rubble interface. This crack has been repaired but has reopened.

The gently curved retaining wall to the east of the (eastern) drainage ditch exhibits differential weathering and cavity erosion. Several campaigns of stuccoing similar to those found on the curved counterscarp of the North Bastion covered way are visible.

The eastern moat appears to have suffered extensive damage at some point in time. Currently, there are at least three repair campaigns visible on the surfaces of its retaining walls. These walls have different repair patterns than those of the western moat. Here, there have been several campaigns of spot-patching, whereas the western moat was entirely parged.

The 1897 gun mounts are in generally good condition, although both mounts show some signs of distress. A series of cracks radiate outward from the seaward face of the coping stones through the concrete surface of the semi-circular collar and seem to relate to the seams of the embankment covering. These have been repaired but have reopened.

The magazine of the 1897 gun emplacements is in good condition structurally, but the surface is deteriorated. Photographs from 1960 show much of the east and west facades obscured by the earthfill. Exposed surfaces exhibit a moderately weathered, light colored stucco. At the interface of the northwest corner and the earth, there is stucco loss baring the brick vault construction. This may be due to collection and retention of water runoff from the barrel vault. The now exposed facades to the east and west show several stucco and patching materials and a variety of discoloration.

The latrine is in very good condition with numerous stuccoes that have differentially weathered. There is some metal staining from a screen that at one time may have covered the oval opening on the east facade.

NOTES

1. Mortar sample numbers for these finishes are not available as the sample keys have not been found.

2. Ricardo Torres-Reyes, Construction History of San Cristóbal: 1634-1800 (Dept. of Interior, NPS, San Juan NHS, June 1965), pp. 48-49. Original reference to legend to January 15, 1769 Plan and Profiles prepared by Thomas O'Daly.

3. Ibid., pp. 95-97. Original reference to reports by O'Daly for September 12, 1778, January 12, 1779 and June 17, 1779. AI-SD 2510-49.

4. Ibid., p. 114. Original reference found by Torres-Reyes in 3 bound volumes Documentos militares de Puerto Rico procedentes del Archivo Militar de Segovia.

5. Edward A. Hoyt, 2nd Lt., History of the Harbor Defenses of San Juan P.R., Under Spain, 1509-1898 (San Juan: Antilles Coast Artillery Command, 1943), p. 99.

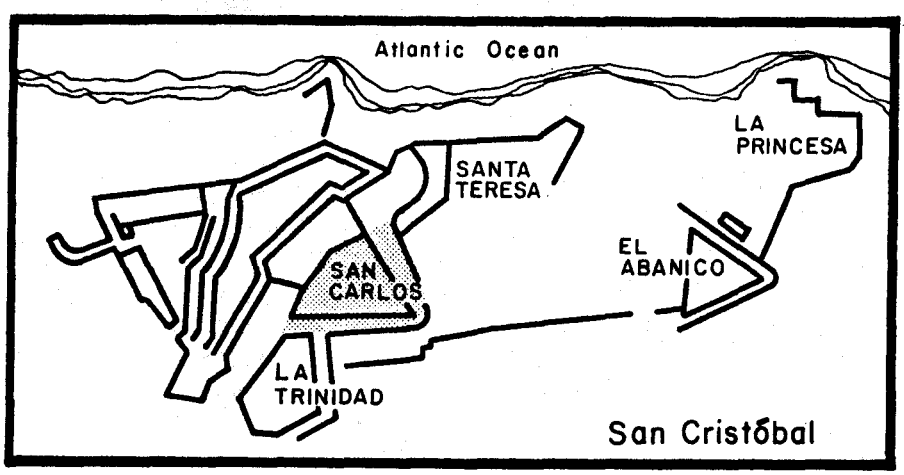
6. Edwin C. Bearss, Historic Structure Report HIstorical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of The Interior, NPS, February 1984), p. 84. Original reference: Flayler to Gillespie, April 25, 1902, NA, RG 77, General Correspondence 1894-1924, Doc. 37106/16.

7. Ibid., p. 315. Original reference to Completion Report for Construction of 10 sets of Quarters at La Princesa, San Juan, Puerto Rico, WNRC, RG 77, Entry 319, Box 391.

8. Ibid., p. 277. Original reference to report, "Preservation of Historical Fortifications, San Juan, P.R.," undated, WNRC, RG 77, Entry 50-23, Box 115.

9. "Fort Brooke as Built, U. S. Army Forces Antilles & Military District, Puerto Rico, Office of the Engineer, Ft. Brooke, Puerto Rico," found in files San Juan NHS.

10. 1963 NPS Landscape Development Plan, San Juan NHS Archives.



CHAPTER 13

SAN CARLOS RAVELIN (REVELLÍN DE SAN CARLOS)

Description

Revellín de San Carlos, or San Carlos Ravelin as it will be referred to throughout the chapter, is constructed of coursed stone ashlar and rubble with a scored stucco finish. It lies to the east of the main curtain wall of San Cristóbal. (See fig. 13.1.) To the north of San Carlos the land slopes gently away until it reaches the sea cliffs. To the south, the rocky terrain drops off rapidly toward the city. The parapets of San Carlos overlook a countermoat beyond which lies Santa Teresa Battery to the north, la Trinidad Counterguard to the south, and a glacis to the east.

The north parapet is approximately 200 feet long and the south approximately 248 feet long. The salient angle between the two parapets is 65 degrees. There is a sentry box located at this junction. The height of the walls varies as measured from the elevation of the existing moat floor.

The original entrance to the ravelin was by means of a caponier from the main curtain wall of San Cristóbal to stairs leading up to the lower terreplein of San Carlos. This area is now the site of a 1940s civil defense shelter that has obliterated both the caponier and original stairs to the ravelin. (See fig. 13.2.) At present, San Carlos is accessed from San Cristóbal via the sodded roof of this civil defense shelter.

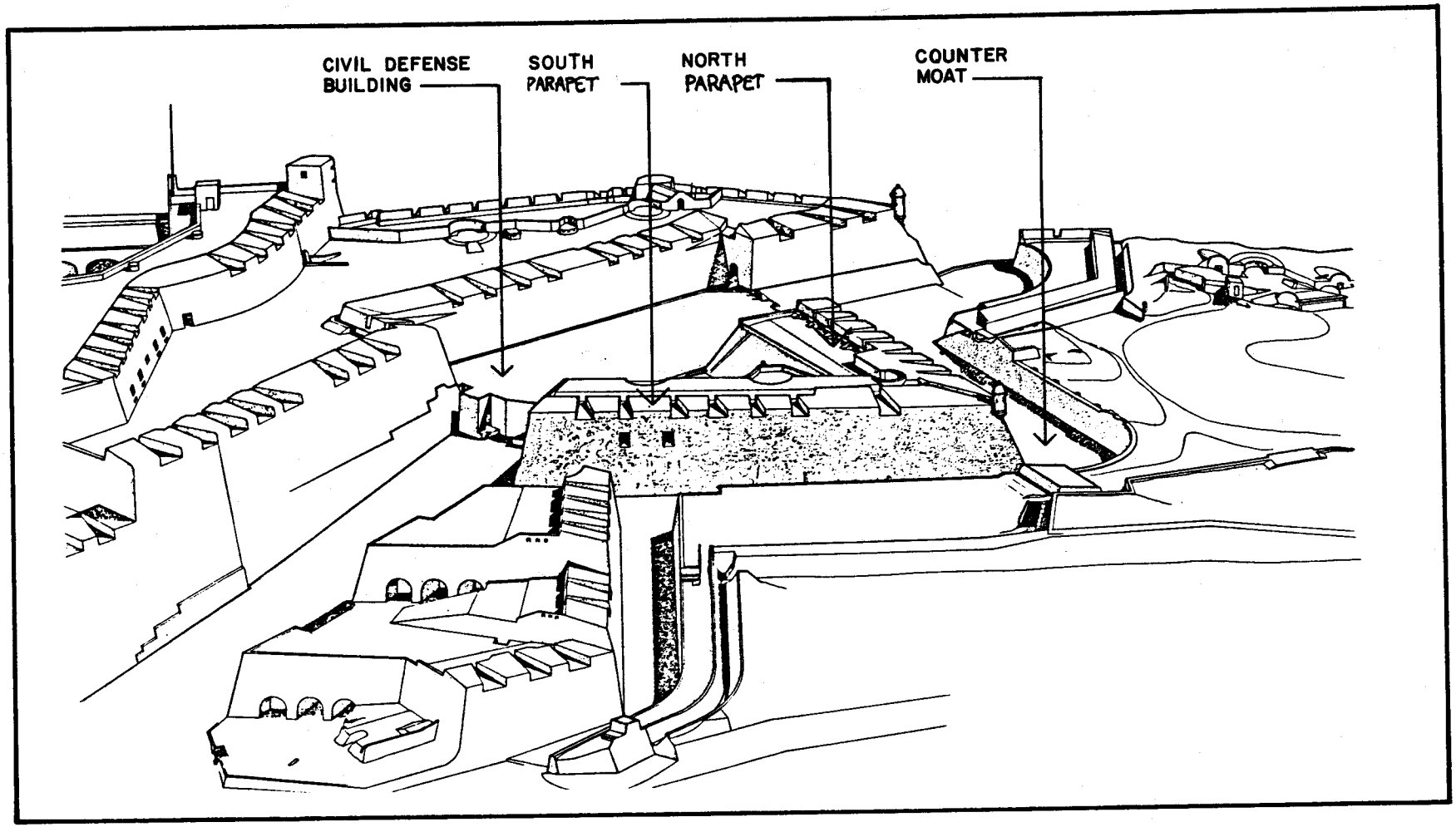


Figure 13.1. Aerial perspective of San Carlos Ravelin with features labeled. Based on a HABS site plan (1985), annotated by Jana Gross (1989).

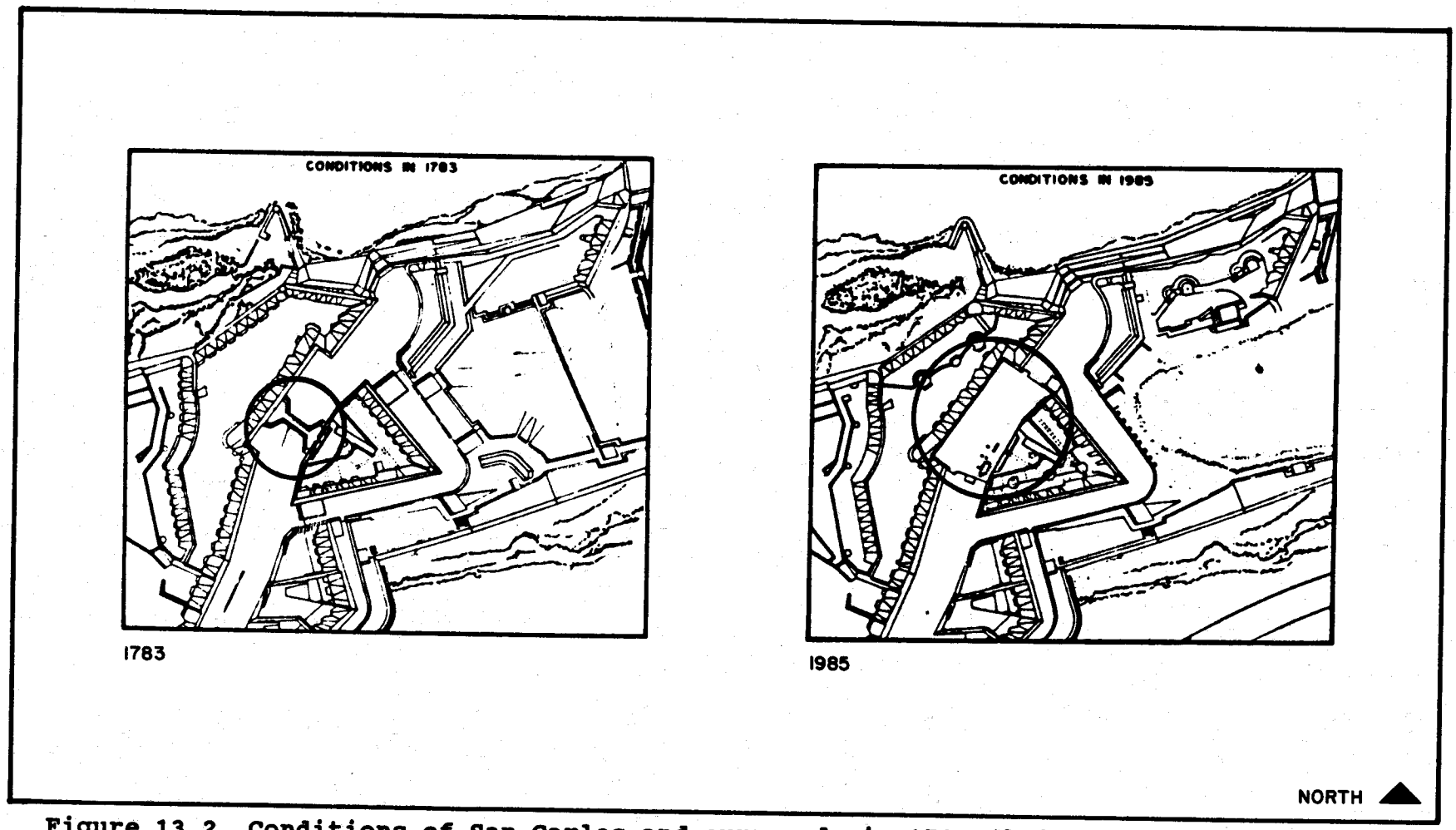


Figure 13.2. Conditions of San Carlos and surrounds in 1783 (left) and 1986 (right). Drawings from HABS cover sheet (1985).

A raking slope to the north of the lower terreplein buttresses the interior face of the north parapet. The upper levels of both the north and south parapets are accessible via a ramp ascending along, and parallel to, the north parapet (fig. 13.3).

The lower walls of the north and south parapets of San Carlos Ravelin (figs. 13.4, 13.5) are essentially composed of outer and inner sandstone retaining walls with earth and/or rubble fill. The counterscarp facade is battered from the foot of the foundation wall to the embrasure level.

The parapets capping the ravelin are between 13 and 20 feet thick and are covered with a 4 inch-layer of concrete. The north parapet is built of rubble with brick coping and brick edging at the chamfered corners of embrasures. The brick corners of the embrasures are capped with cut stone and covered with brickdust stucco with pencilled joints delineating faux quoins. The south parapet is constructed of faced rubble and buff brick coping with squared corners. No cut stone is present. Faced rubble is extensively used even at corners.

The north parapet has seven embrasures, three of which were partially in-filled by 1897 modifications to the fortification system. There are five existing banquettes abutting the embrasures, four of which survive unaltered (fig. 13.6). The fifth, eastern most banquette, has been modified by the addition of steps to facilitate access to the sentry box area behind the 1897 breast-height wall.

A drainage ditch runs under the banquettes along the base of the parapet wall. The ditch is paved with a single wythe of red brick laid flat end to end, and runs the entire length of the north parapet sloping toward the east. The surface between the banquettes is covered with hormigón broken by a row of large paving stones sloping towards the lower terreplein. The combination of the paving slope and drainage ditch provides the water removal system for the upper level of the north parapet.

A significant amount of original stucco (ca. 1773) is observed on the western facade of the north parapet.[1]

The south parapet has seven embrasures. The 1897 modifications for the emplacement of three 15 cm Ordonez

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[1] SAJU 13 M05, north rampart west wall. Soft, buff colored stucco with a yellow-pink substrate with white aggregate. SAJU 13 M06, north rampart west wall. Layer below soft stucco, hard, chalky, lime-rich mortar.

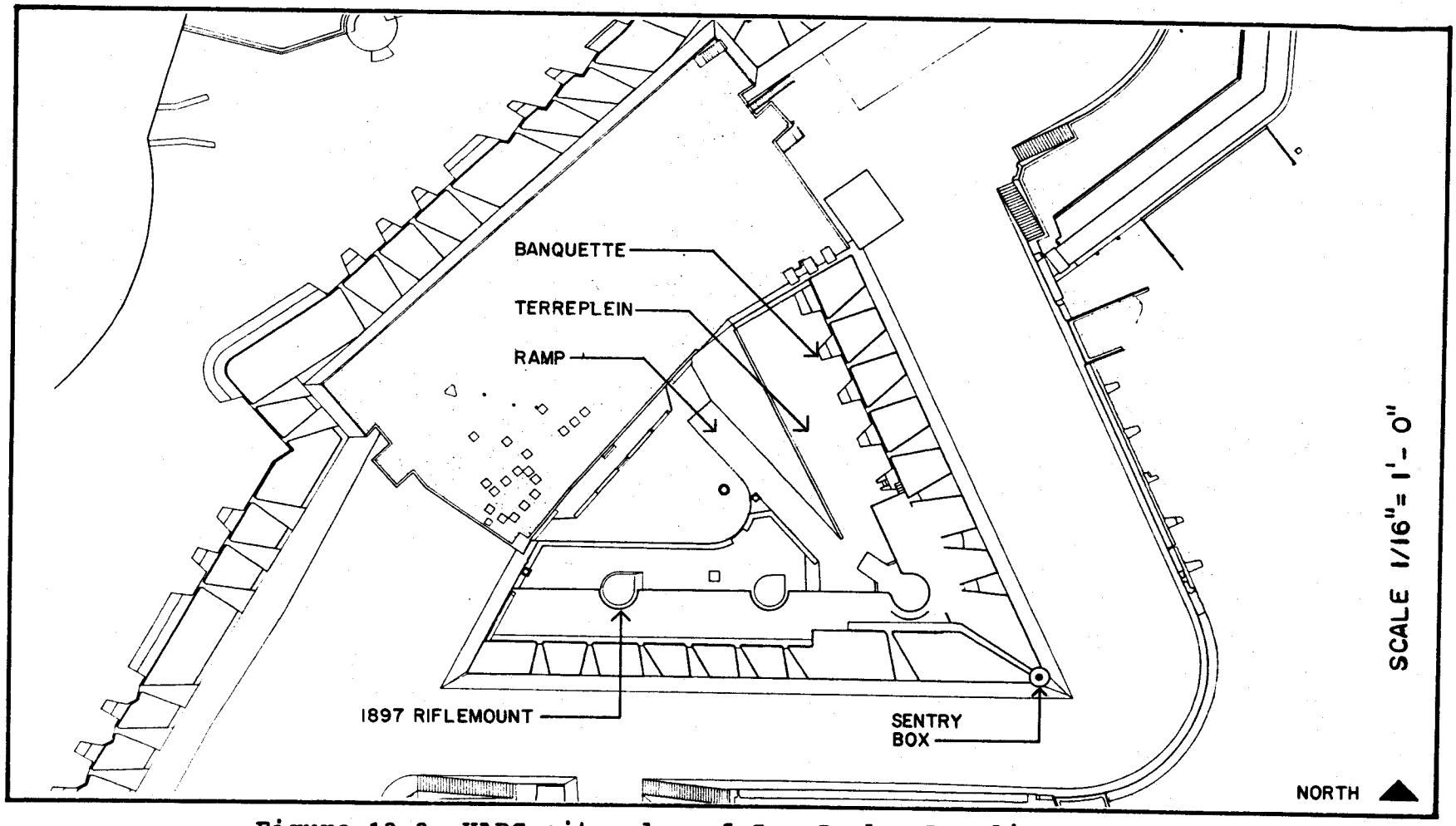


Figure 13.3. HABS site plan of San Carlos Ravelin, 1985.

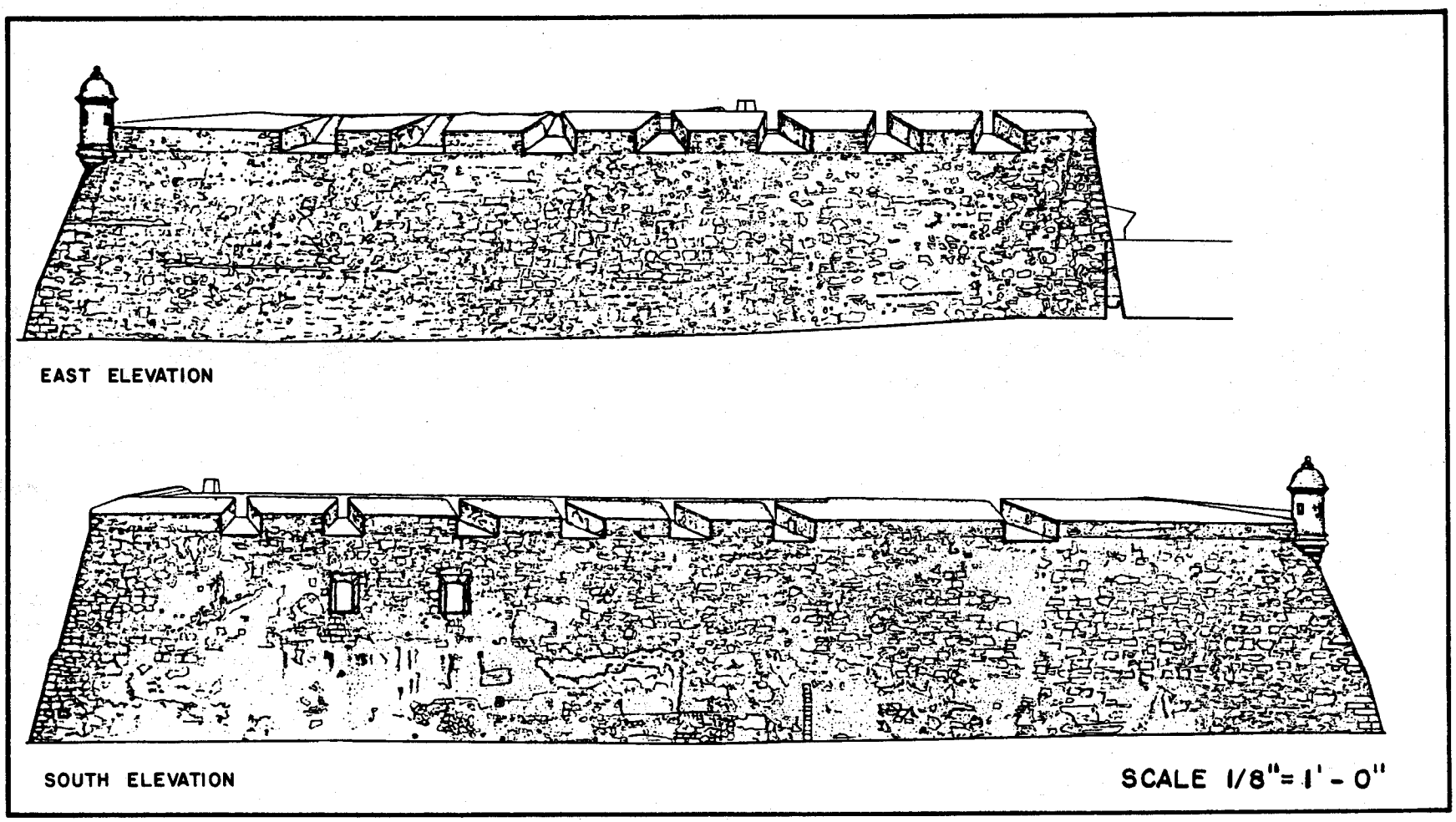


Figure 13.4. North and south elevations of San Carlos Ravelin. Drawing by HABS, 1985.

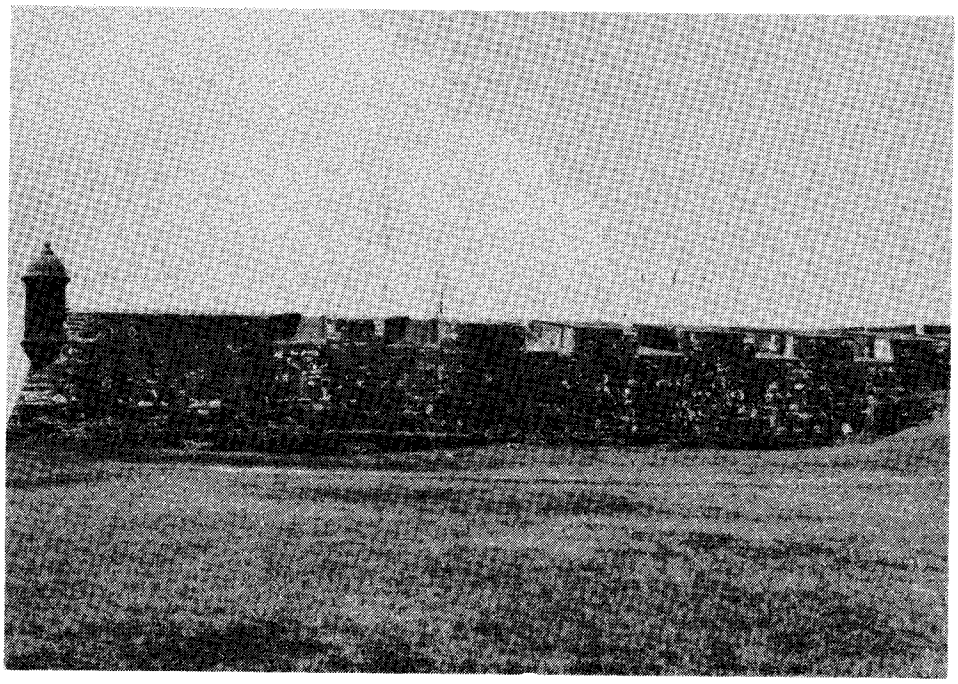


Figure 13.5. East elevation of San Carlos Ravelin. Photo by CPR, 1986.



Figure 13.6. Terrepleins of San Carlos Ravelin showing the north facing embrasures and banquettes with the salient angle to the right. Photo by CPR, 1986.

rifles included the construction of a breast-height wall approximately 20 feet wide that now limits access to the original embrasures (fig. 13.7).In addition, the northern parapet wall is solid because it would have drawn the initial attack. However, the south parapet houses casemates (fig. 13.8).

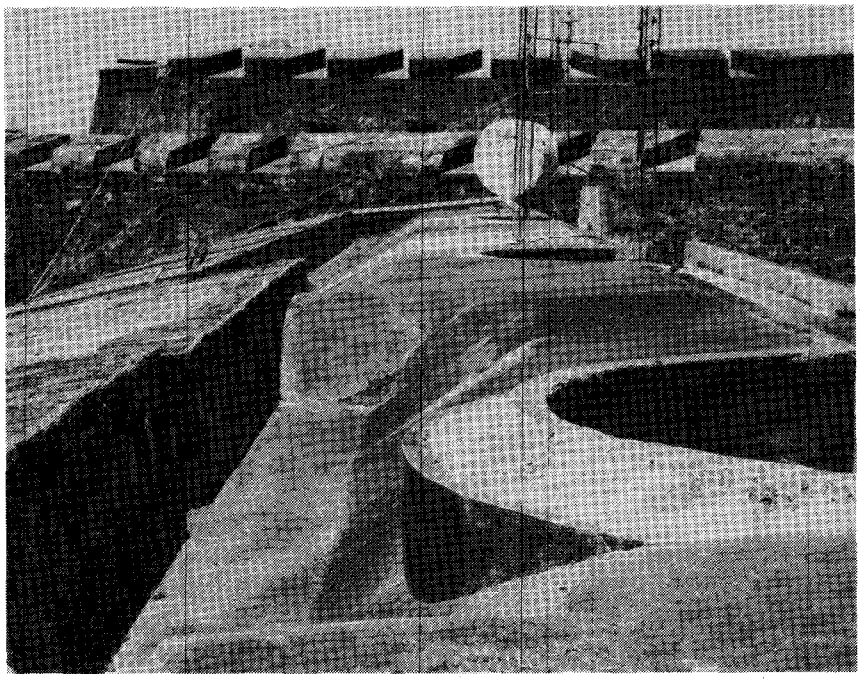


Figure 13.7. South parapet of San Carlos Ravelin showing three 1897 gun emplacements. Embrasures of the South Bastion and el Caballero in the background. Photo by CPR, 1986.

Decorative finishes are visible where stucco remains intact. On the scarp wall of the south parapet under the sentry box there are remnants of what appears to have been an inscribed plaque or ornamental design. At the western end of the south parapet exterior facade there is a raised rectangular surface with decorative stucco remnants.

Exterior window openings piercing the southern parapet wall on the south and west faces are framed by dressed stone. Both openings on the south have chamfered, recessed areas visible from the counter moat.

There are two intake openings located at the western edge for drainage on the upper level of the south parapet. Both openings lead to a brick-lined drain that runs inside the interior parapet wall down to the collection cistern. The original drainage system was altered when the wall was opened up and scuppers were inserted to carry water out of the wall.

Three circular rifle mounts are located in the recesses of the south parapet revetment wall. These cylinder-like mounts are made of concrete and are 12 1/2 feet in diameter and 14 feet deep.



Figure 13.8. Interior of casemate within the northern parapet of San Carlos. Photo by CPR, 1986.

Structural Evolution

Period 1: 1625-1765

No documentation was found for San Carlos during this period nor is there physical evidence of construction from this period.

Period 2: 1765-1809

The earliest reference regarding San Carlos Ravelin appeared in engineer Thomas O'Daly's 1765 proposed plan for San Cristóbal (fig. 13.9). In this plan, San Carlos was shown to the east of the curtain wall of San Cristóbal. The north parapet had five embrasure openings and the south had four. There was no covered way in the moat between the main fort and the ravelin.[1]

During the period from 1765 to 1769, various construction reports to Spain described the progress of construction at San Carlos. Excavations for the moat were begun in 1766 at the point where the wall of San Carlos would rise. By 1767, heavy work had begun at the ravelin (presumably the north parapet to which the south battery was later added). A wooden bridge was built to connect the newly constructed San Carlos with San Cristóbal. Construction continued through 1768.[2]

In January of 1769, O'Daly produced a construction plan (fig. 13.10) depicting works from 1766-69. This plan showed the state of the projected work, the excavations, countermines, terrepleins, and the configuration of the fort after completion.[3] The plans showed San Carlos fronted by a counter moat with traverses at the junctions with the main moat. The caponier linking the ravelin and the main fort was shown, as well as a covered way with traverses atop the counterscarp wall of the ravelin moat. The north parapet had seven equidistant embrasure openings; the south had five openings that were not uniformly spaced. A passageway led to a sentry box at the salient angle. The ramp leading from the lower terreplein was present as well as a curved stair adjacent to the ramp that leads to the upper level of the south parapet.[2] A rounded barrier against rebound batteries for the south parapet was depicted. In the south parapet,

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[2]See sample SAJU 13M50 for analysis of stucco from ramp coping stones.

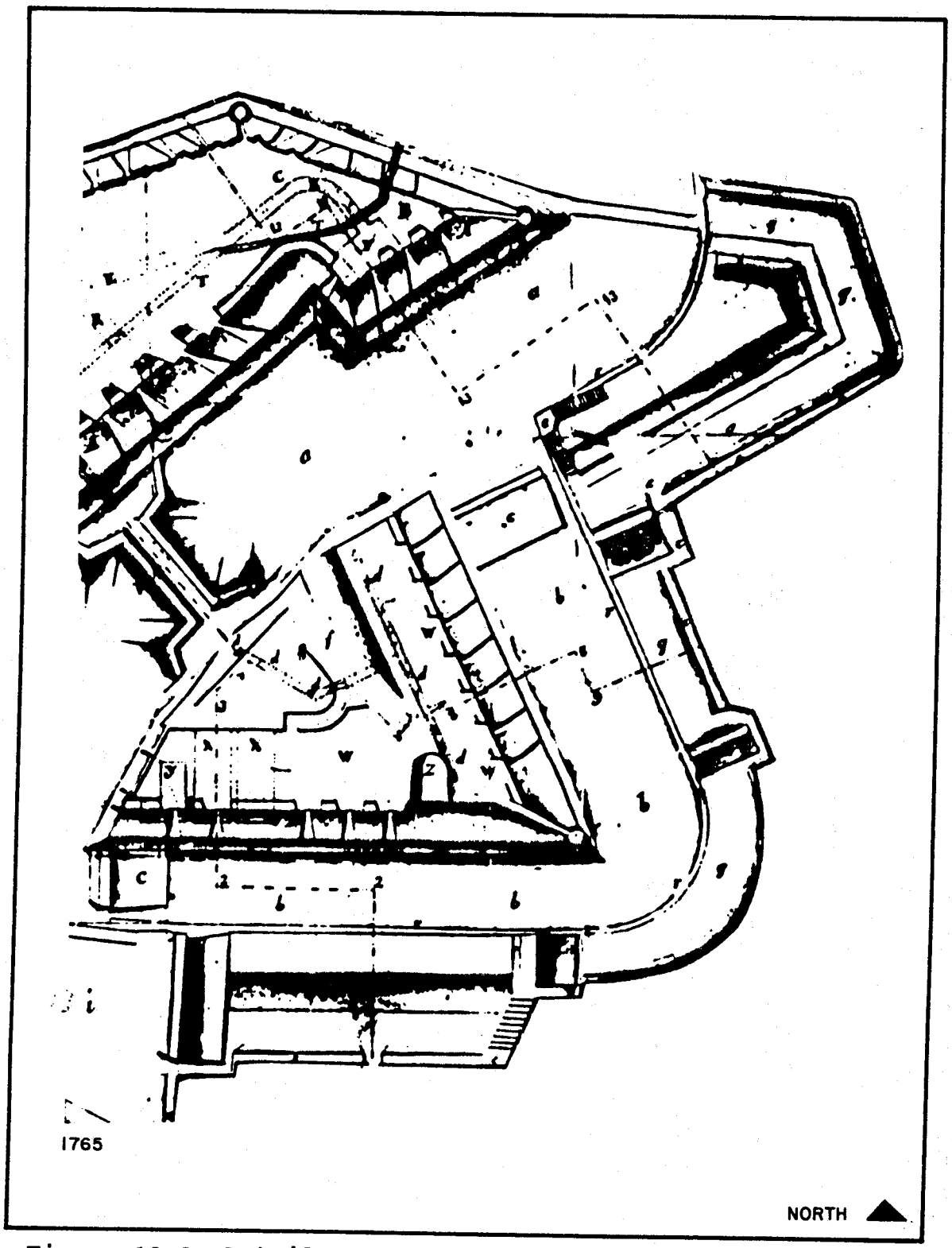


Figure 13.9. Detail of O'Daly's 1765 proposed construction plan showing San Carlos Ravelin.

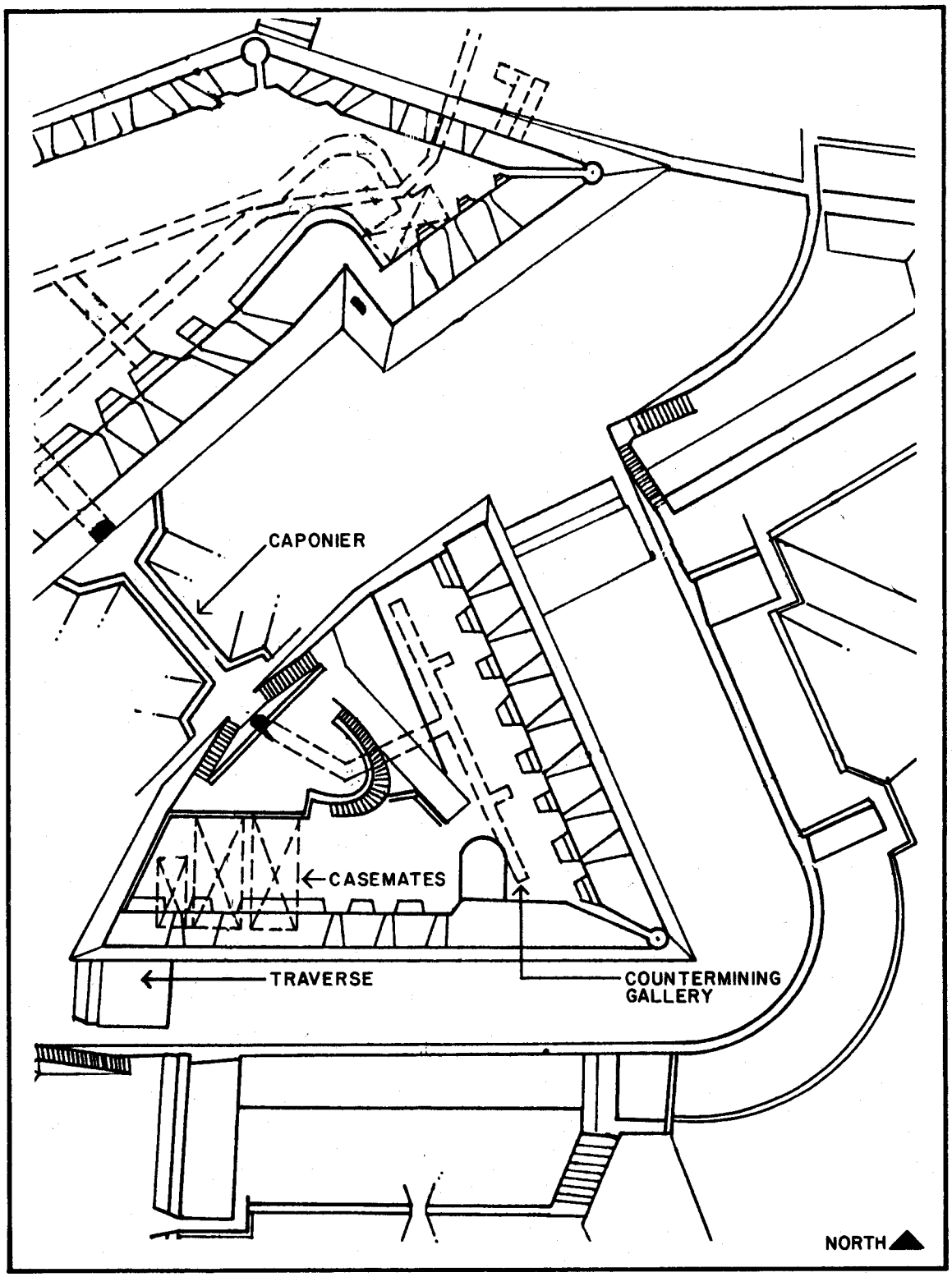


Figure 13.10. January 15, 1769 proposed conditions plan of O'Daly. Tracing by Torres-Reyes (1965), retraced and annotated by Jana Gross (1989).

two vaulted casemates and one vaulted powder storage chamber were shown. A projectedcountermining gallery was indicated along the length of the north parapet.

The following is a summary of a translation of the April 21, 1769 report to the Governor by Thomas O'Daly noting pertinent features:

-Both traverses built.

-Countermining gallery projected will have entry at level of moat between the staircases.

-Ramp for ascending the ravelin.

-The moat around the ravelin; X feet wide on the north and 7/10(X) on the south due to the steepness of the terrain.

-Staircase for ascending the ravelin when the ramp is exposed as a result of a breach made in its north face.

-Counterscarp begun.

-Covered way in front of the ravelin, atop the counterscarp wall.

-Caponier to the ravelin.

-San Carlos is said to be lacking the parapet and the facing for the stairway from the moat.

-Two strong vaults in the ravelin: 42 feet by 16 feet. The front of the ravelin to which these were adjoined is the least exposed to attack since the enemy batteries would be seen from the rear.

-Powder storage, equally strong, west of the vaulted chambers.

-Barrier against rebound batteries to which the south face of the battery is exposed.[4]

Accompanying the plan of 1769 were profiles, one of which includes San Carlos (fig. 13.11). Profile Number 1 cut through the countermoat and the San Carlos south parapet center casemate. The interior section of the casemate showed the west wall with a doorway to the western chamber and a ventilation shaft above the door. There were indications of two square openings at mid-wall that do not relate to any physical evidence.

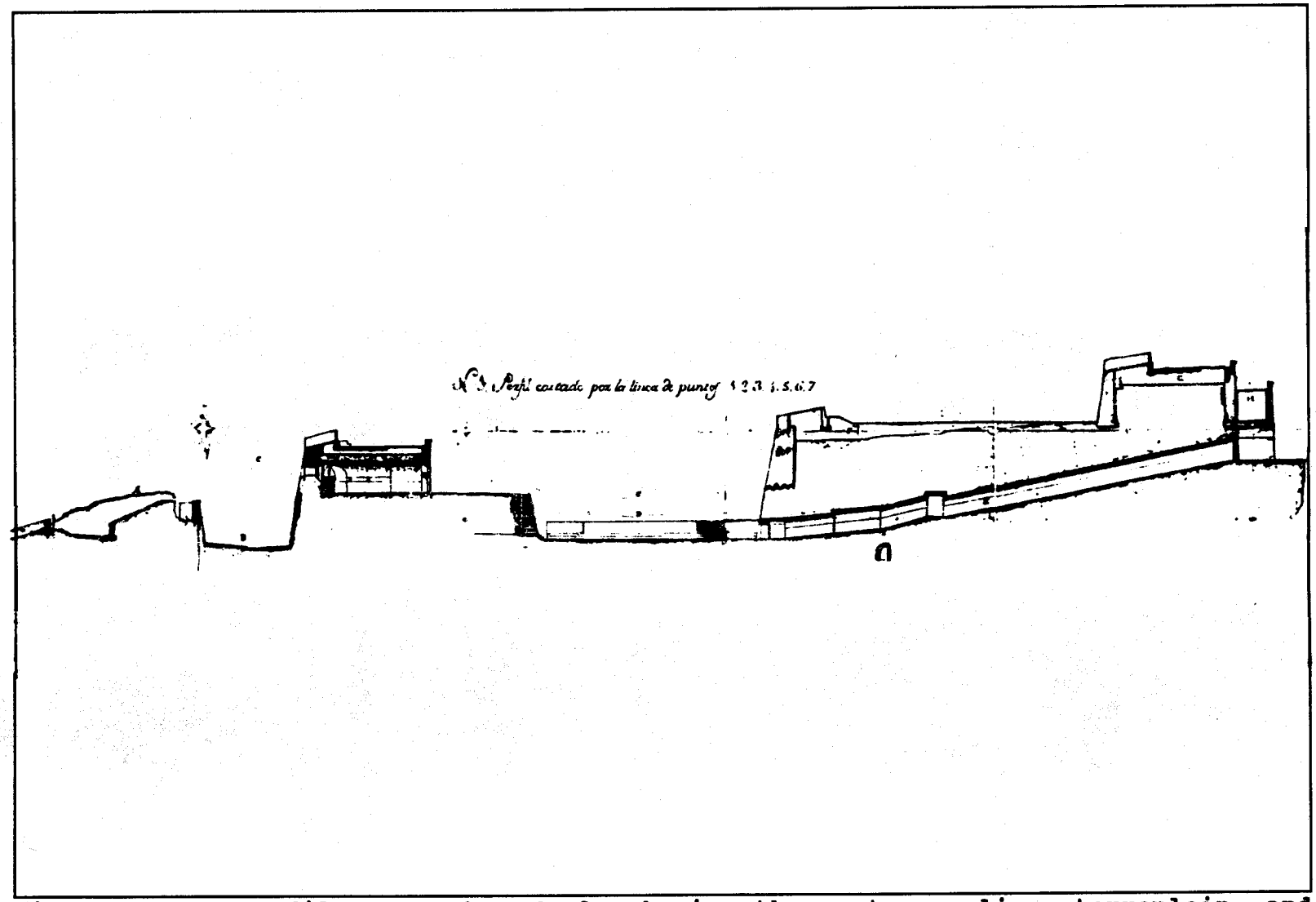


Figure 13.11. Profile No. 1 by O'Daly showing the moat, cavalier, terreplein, and stairs of San Carlos Ravelin. October 20, 1769.

A later "as built" plan believed to date to ca. 1769 was also produced by O'Daly (fig. 13.12). On it, the most notable change was the deletion of the curved stairs for retreat from the south parapet. This resulted in a continuous interior parapet wall for the south parapet. A section through the easternmost chamber showed a door communicating between the two eastern casemates, a window in the south wall, and a coped interior parapet wall.

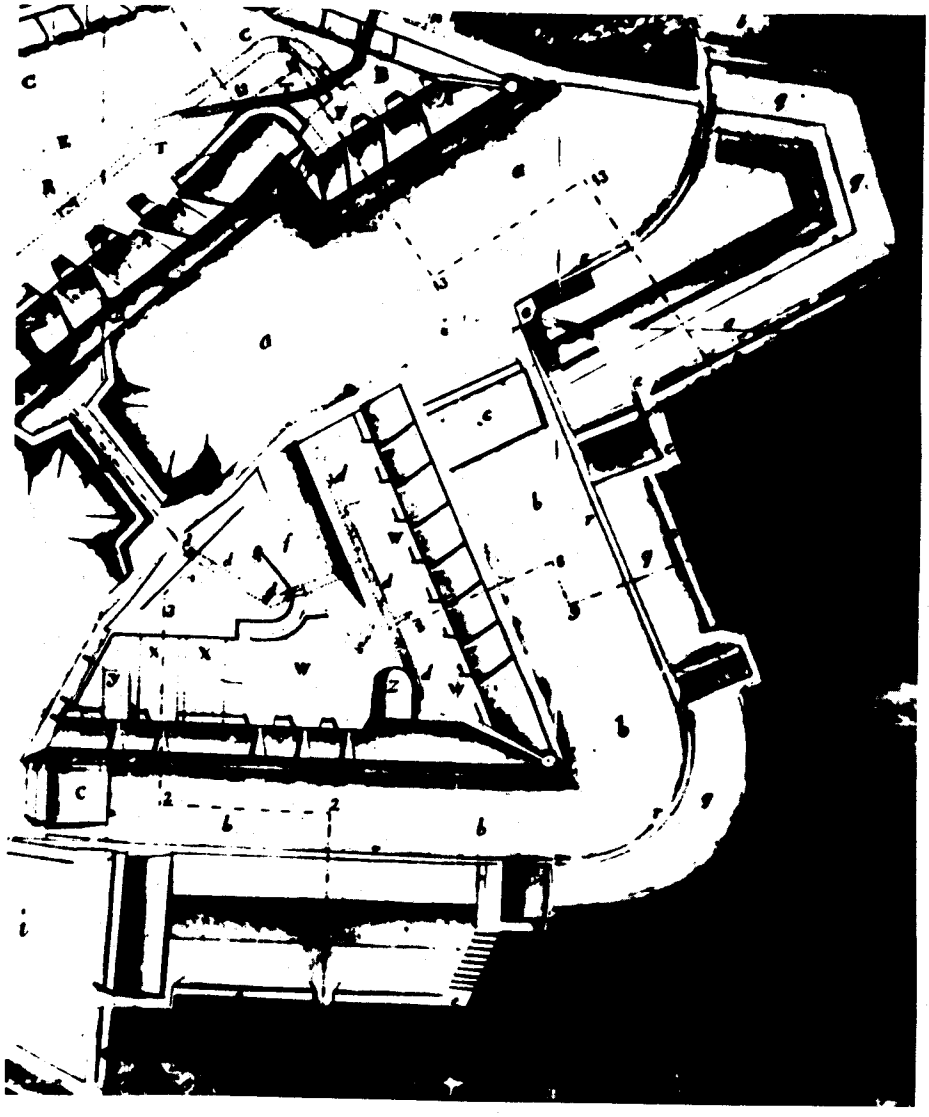


Figure 13.12. Detail of "As-built" plan by O'Daly, 1769, showing San Carlos Ravelin.

According to the construction reports, work was completed at San Carlos in February 1770 with the completion of two embrasures.[5] By 1771 the heavy artillery was in place with five cannons in the north parapet and six cannons in the south. The 1772 O'Daly plan of work completed by 1771 showed the completed San Carlos with exterior elements depicted in red (fig. 13.13). The double stairs and caponier were shown in red as well.

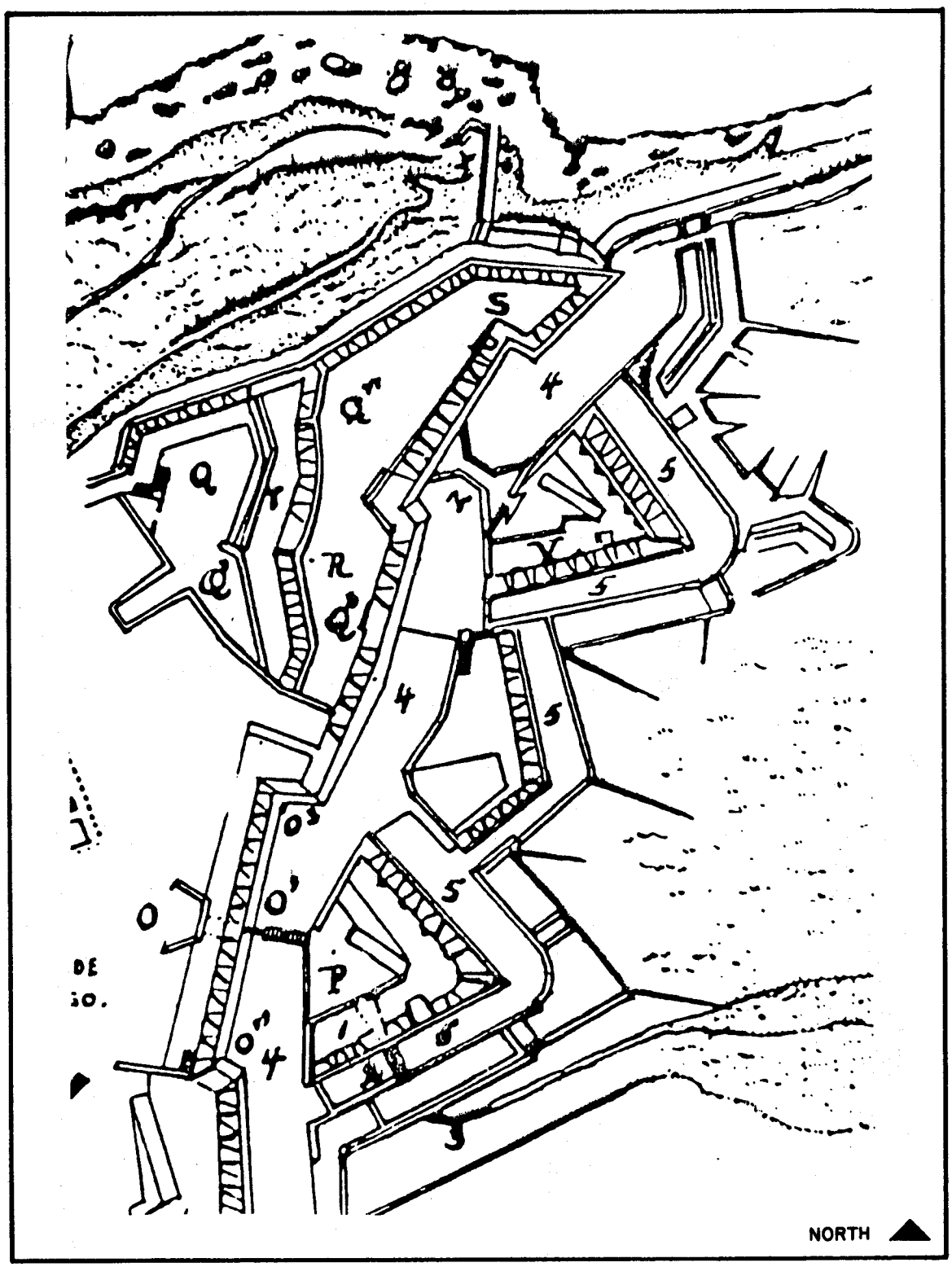


Figure 13.13. Detail of the 1772 plan of San Cristóbal by O'Daly. San Carlos is labeled "P" and its moat "5".

On February 26, 1773 O'Daly submitted a plan with profiles and elevations of all the works of the land front. Already constructed were all the embrasures and banquettes on the north parapet. The eastern most banquette was completed in the most recent building campaign. On the south parapet two additional embrasures were shown near completion with the seven banquettes depicted as new work. The rebound barrier on the south parapet was depicted as rectangular with a banquette on the west face.

The traverse located in the San Carlos countermoat abutting the exterior wall of the south parapet at the western end was now depicted as rectangular with a banquette on the west face. This traverse was the "Barrier against rebound batteries" mentioned in O'Daly's reports of 1769.

The work recorded in the construction reports of 1766-1769 was confirmed in this 1773 plan including stairs from the moat to the lower terreplein, countermining tunnel and entry, and the caponier. Likewise the partially completed new work of 1769, (all embrasures, most of the banquettes of the north parapet, and the rebound battery barrier) were shown. Work begun and completed in 1769, (easternmost banquette of north parapet, passage way to sentry box and sentry box , all banquettes of south parapet, banquette for the rebound battery barrier, interior parapet wall of south parapet, three chambers of south parapet, and the cistern well head), were reconfirmed on the 1773 plan.[3] A second rectangle to the south of the well head was also indicated on this drawing; the identity of this feature has not been determined.

The 1773 section through the south flank of San Carlos (fig. 13.14) is helpful for illustrating the construction techniques of the casemates and south parapet. The south scarp of the parapet utilized the natural rock through which the countermoat is excavated. Thick masonry walls extended up from a natural rock base forming the exterior wall for the parapet and embrasures. Brick was used for the vaulted ceilings that were covered with earth fill. Cut stones were set into the pavement along the revetment wall and were the firing pads. The rest of the esplanade was shown as paved. Some details that did not appear in previous plans or drawings were delineated in the February 26, 1773 profile. The finial at the intersection of the ramp and curved parapet wall was shown in profile. The interior parapet of the south parapet was shown without a coping.

[3]SAJU 13 Ma23 and 13 Mb23, eastern most banquette of north rampart. SAJU 13 P22, passage to sentry box and sentry box.

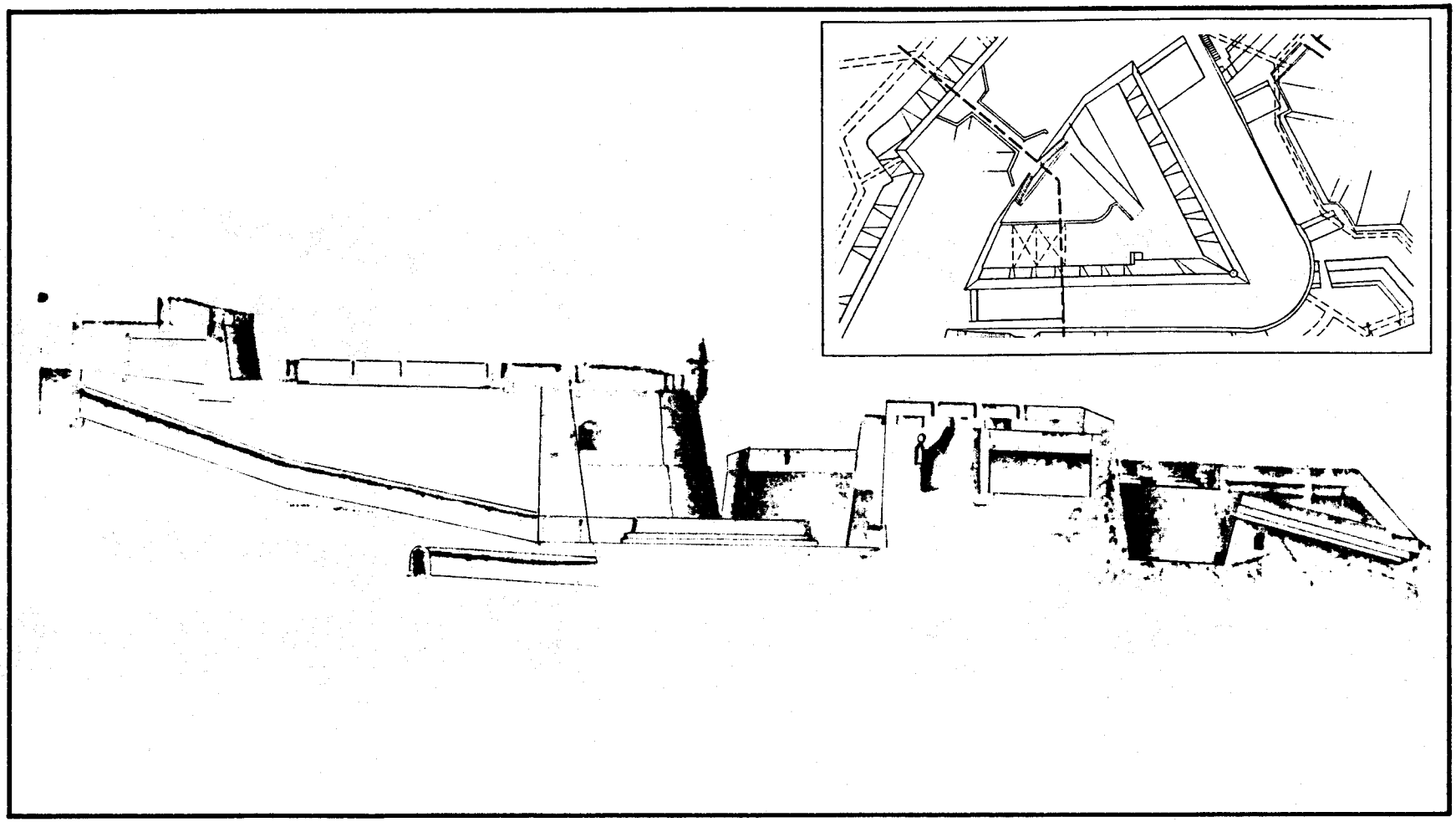


Figure 13.14. Section cutting through south flank of San Carlos, North Bastions, and Main Moat looking north. Section dated February 26, 1773, by O'Daly.

Except for the absence of the countermining galleries, a later drawing dated August 8, 1773, is identical to the earlier plan of 1769.

Juan Mestre issued plans on September 13, 1783, in which San Carlos was represented unchanged. Even in the later 1792 Mestre drawing, no changes in plan have occurred though the exterior walls, double stairs and caponier and curved parapet were still shown as new work. (See Appendix A-12 and A-13.)

Period 3: 1809-1837

In 1818, plans for two lightning rods were drawn (figs. 13.15, 13.16). One drawing showed construction details for lightning rods to be erected on masonry bases at San Carlos and la Trinidad; the other drawing showed San Carlos in plan with the two locations for the rods at the northern end of the west facade of the south parapet and at the midpoint of the south parapet[4]. In addition, the construction of the windows in the south wall of the casemates was illustrated in plan, section, and elevation. The outer opening in the scarp wall was splayed stone; pockets were indicated that probably held wooden members. The wide jamb was approximately the width of the wall with pockets for a wooden frame. The window in the south wall of the east casemate was now completely cemented over. The middle casemate's south window was still intact with the original tan lime bedding mortar. The lintel of the frame would have been a segmental, with projecting ears accommodated by pockets in the masonry. Two shutters would have folded into the space created by the jamb. Section A-B showed part of the lower terreplein and a cut through the middle casemate. The north door construction appeared to have two masonry semi-arches over the door. Currently the void is filled with brick. It is interesting to note that the section through the south parapet showed a solid masonry wall, whereas toward the western end, as depicted previously, natural rock was incorporated into the wall. The presence of natural rock is apparent when viewing the western facade of the south parapet.

In plan there was a parapet wall at the lower terreplein level overlooking the double stairs from the moat. This was the only indication of such a wall found in plan. Physical evidence would indicate that it is unlikely that the present wall is from the 1818 period.[6]

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[4] SAJU 13 M08, stucco from the lightning rod base.

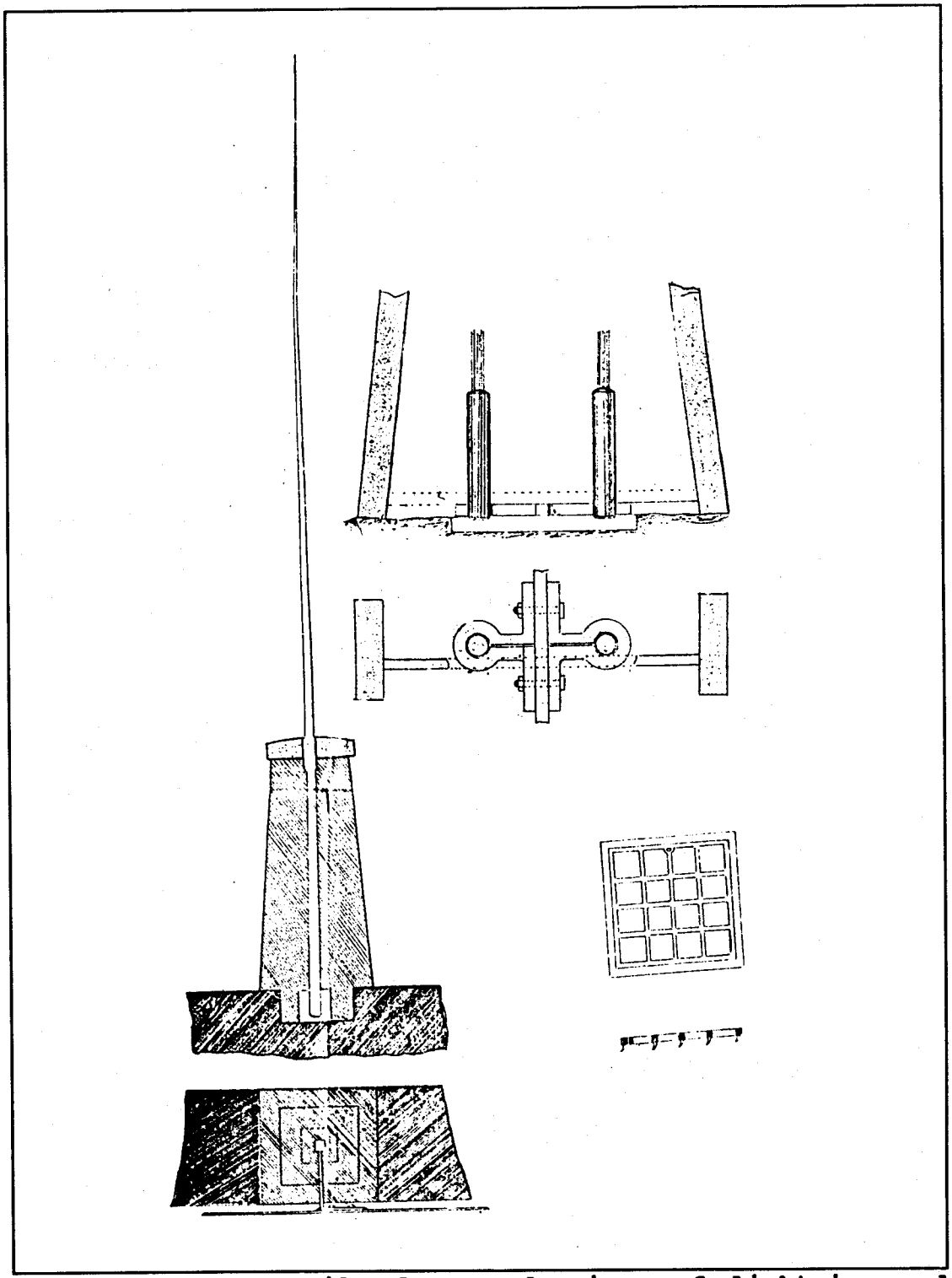


Figure 13.15. Detail of 1818 drawings of lightning rod installed at San Carlos Ravelin. (Servicio Histórico Militar-España, Madrid, Spain.)

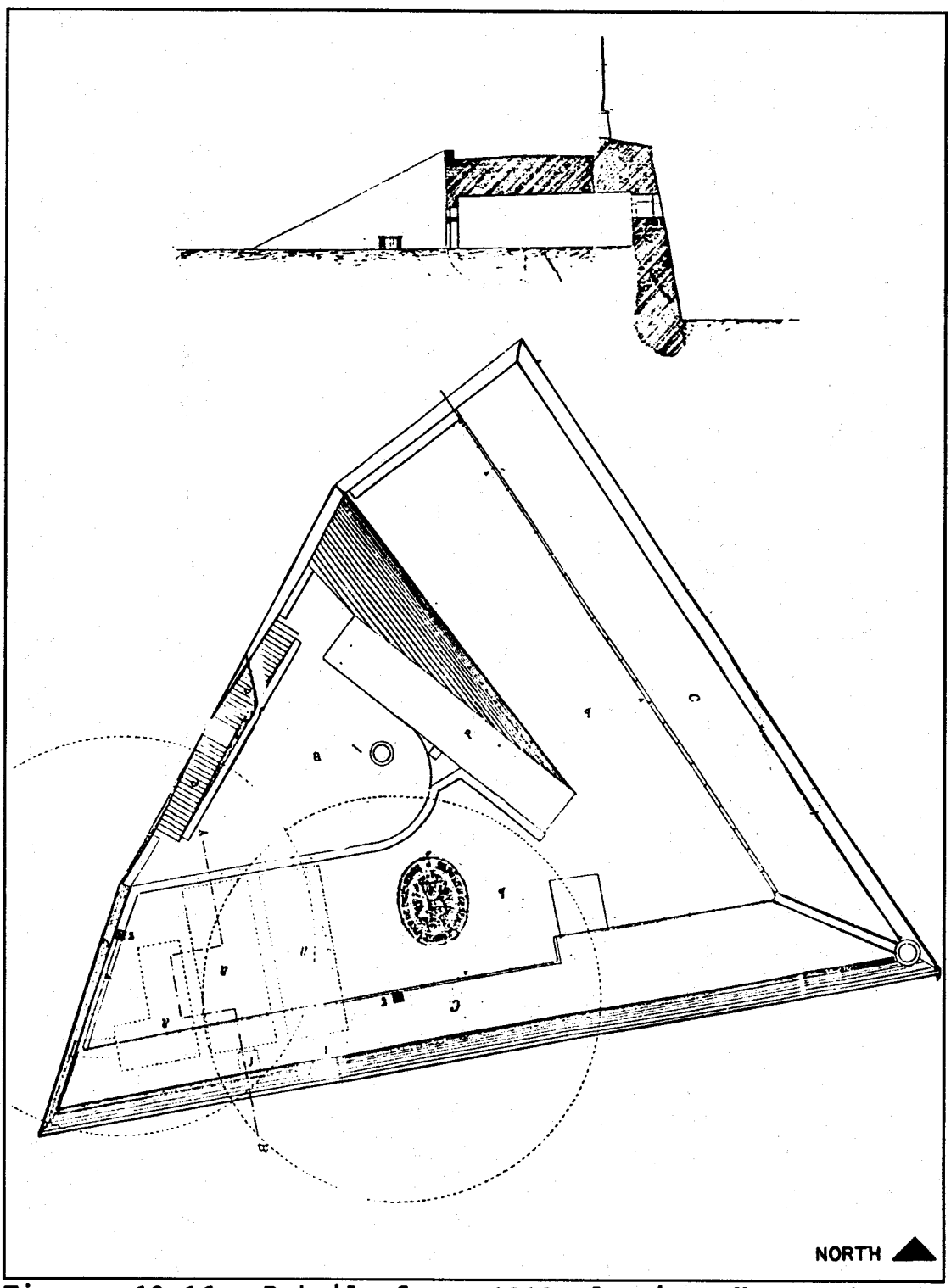


Figure 13.16. Detail from 1818 drawing "Proyecto de Habilitación de las Bovedas de S. Carlos para Polvorín" showing lightning rod at San Carlos. (Servicio Histórico Militar-España, Madrid, Spain.)

Period 4: 1837-1868

San Carlos appears in the 1861 Manuel de Castro general plan of Castillo de San Cristóbal. Due to the scale there was little detail and no design changes are noted. The two casemates were depicted in blue.

Period 5: 1868-1898

In 1896, the Spanish demolished the Santiago Ravelin to the south of la Trinidad Counterguard in order to improve vehicular traffic flow into Old San Juan. With the elimination of this portion of the San Cristóbal fortification system came the need to alter existing works to compensate for the loss of defensive power. The decision was made to alter San Carlos ravelin to accomplish this objective.

In 1897, extensive adaptation was begun to enable the emplacement of three 15 centimeter Ordonez rifles. The Spanish reinforced the parapet wall of the south parapet and the eastern portion of the north parapet with earth fill to a thickness of 13 to 19 feet. A revetment wall was constructed along the entire length of the southern parapet to accommodate the three 15 cm Ordonez rifles that were installed in semi-circular recesses (two on the south parapet and one at the salient angle).[7]

The three embrasures were partially filled and covered with concrete. The revetment wall was of rubble construction with various materials used, including marble and brick.[5] The corners and coping were composed of brick with a stone cap at the corners and two levelling courses of brick at the bottom of the wall. This construction method was used throughout the revetment wall except at the circular gun recesses where the brick edging was replaced by stone coping.

Period 6: 1898-1986

There is no documentation available on San Carlos for the early twentieth century. However, with the availability of WPA funds there was an active repair campaign from 1938 to 1940.

Drawing No. 1037 documents some of the repairs made in 1938-1939. (As in several sources from this period, San Carlos was erroneously identified as "la Princesa Fort".)[8] Certain

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[5]SAJU 13 M11, revetment wall.

details of the casemates were shown, while other equivalent details were missing. This was perhaps the only existing representation of the niche at the southeast corner of the east casemate. In the small magazine, the vent to the west of the window was shown. Although the connecting doorway between the central and west casemate was shown, the connecting doorway between the central and eastern casemate was not.

By 1939, money had been appropriated for the development of San Juan harbor defenses. During this period, efforts were made to continue repairs and remove debris to facilitate military operations of the fortifications. Specifications and their accompanying plans and drawings of 1939-1940 (now located in the San Juan NHS archival collection) recorded the work of this period. One drawing, "Embrasures Fort San Cristóbal and Fort la Princesa Debris Removal and Restoration of Walls", File No. F-33B, documented the work at San Carlos, again referred to as "la Princesa Fort". The drawing documented the removal of earth that filled the space between the 1897 concrete parapet and the original revetment wall of the south parapet and eastern end of the north parapet. The top surfaces of the merlons that were exposed by the removal of the earth fill were repaired, and retaining walls at the outer openings of the embrasures were removed.[9] The plans did not indicate the repair technique for the merlons. Currently, the merlons are edged with a soldier brick course and cut stone corners. This differs from the original construction still evident on the north parapet.

Although not noted in this drawing, presumably the present stone veneer was applied at this time to the revetment. Again, the corner detail differs from the original construction. Whereas the veneer extends to the corner on the south parapet, on the north parapet the corners of the embrasure openings are brick with cut stone capping the top.

Eight sentry boxes throughout the fortifications were replicated and installed in 1938-1939. However, the sentry box at San Carlos was not replaced until 1939-1940 as documented in the previously mentioned drawing.[10] The replacement was of concrete block that appear to have been made from the forms developed in 1938, set on the original base. Three openings at floor level allow drainage of water runoff from the battery barrier through the passage to the sentry box.

After the United States entered World War II, the addition of a bunker in the main moat (now the Civil Defense Building) largely altered the appearance of San Carlos. The caponier that provided access and communication between San Cristóbal and San Carlos was destroyed in order to accommodate construction of the twentieth-century Civil Defense Building.

(See fig. 13.17.) The double stairs from the moat level were obliterated by construction of the bunker with the result that the only approach to San Carlos is by way of Tunnel 1 or across the roof of the bunker. There is now a concrete platform with several steps down to the lower terreplein level that almost runs the length of the terreplein. A low wall built of San Patricio bricks (a local brickyard) borders the platform with an opening at the center for two concrete steps down. The only depiction of such a wall is in the 1818 drawings; however, it is more likely that the San Patricio brick date from the 1897 period or possibly later. (San Patricio bricks are also found in association with the construction of the 1897 magazines).

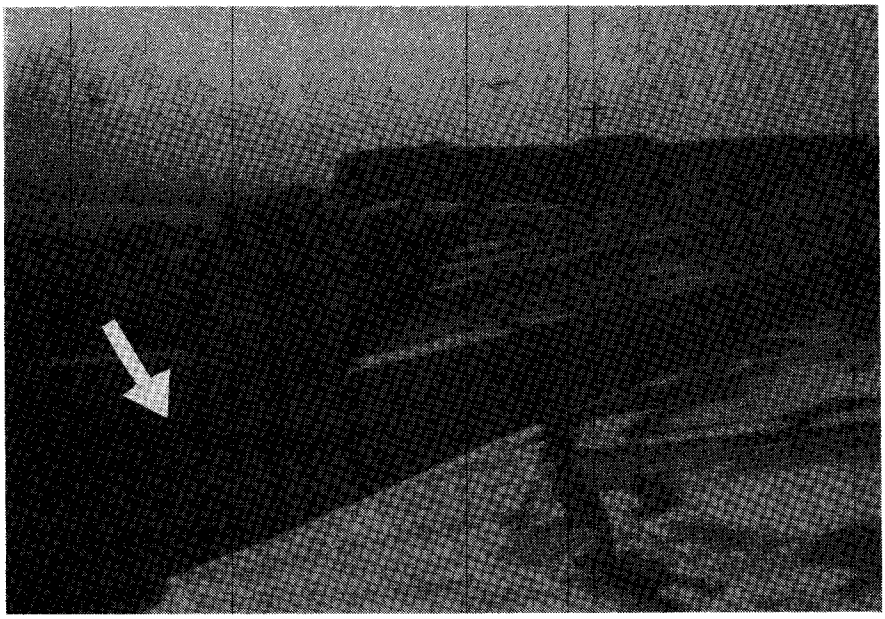


Figure 13.17. Photo from the parapet of the North Bastion looking south and showing the caponier in the main moat, ca. 1930. (San Juan NHS Archives.)

The 1949 "As Built Survey, Ft. Brooke" indicated the locations for radio antennae and electrical distribution.[11] The existing concrete step was shown replacing the original double stairs. (See fig. 13.18.)

The 1956 "Roof Plan, Castillo de San Cristóbal" did not show much detail due to its function as a document of the roof. The plan of the casemates omitted the doors and windows to the south, the window to the west in the small casemate, and the connecting door between the central and eastern casemate. The platform step on the terreplein showed steps at either end, rather than at the center.[12]

The U. S. Army Corps of Engineers Accelerated Public Works Projects were active again in 1963. The Corps was contracted to remove vegetation and all earth fill as well as to repair and patch the ravelin walls. Various photographs from this

period show the patching of San Carlos with cement (fig. 13.19).[13]

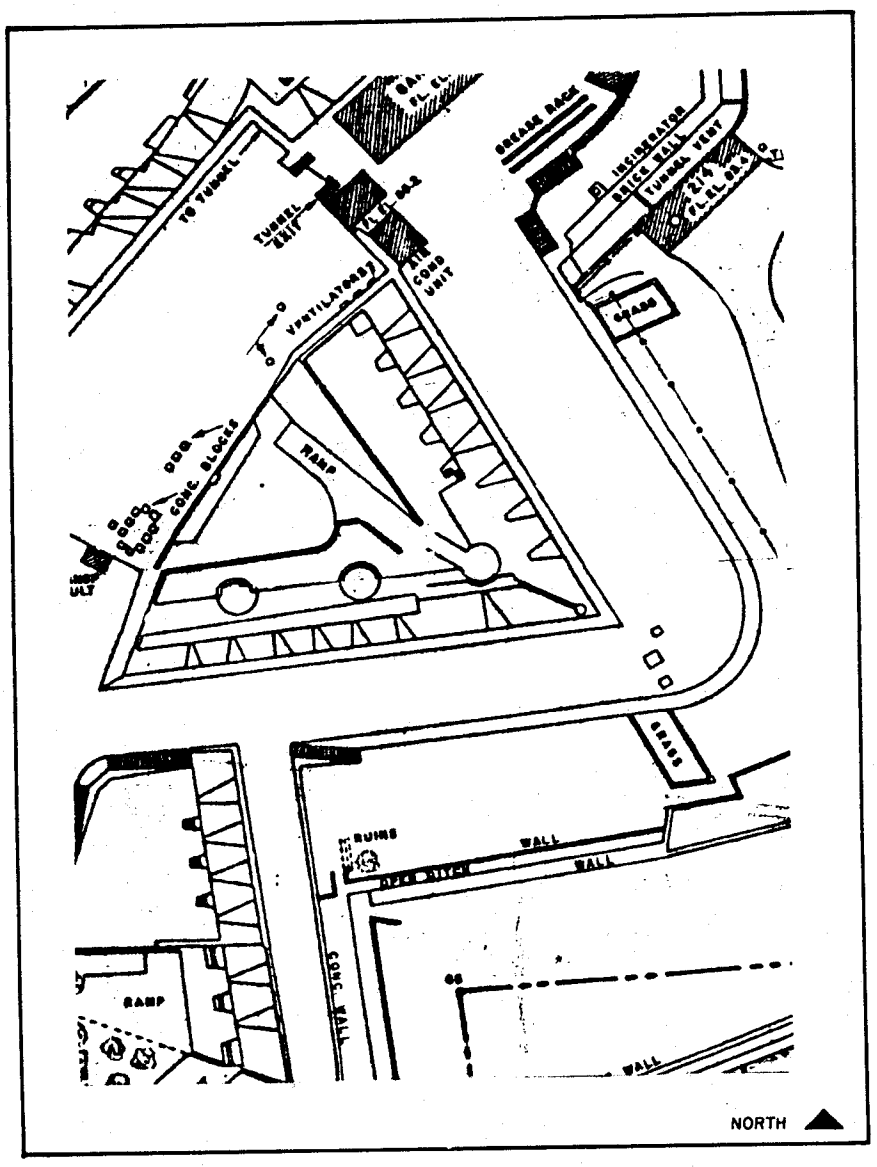


Figure 13.18. Detail of "As Built Survey, Ft. Brooke" plan showing locations for radio antennae, 1949. (San Juan NHS Archives.)

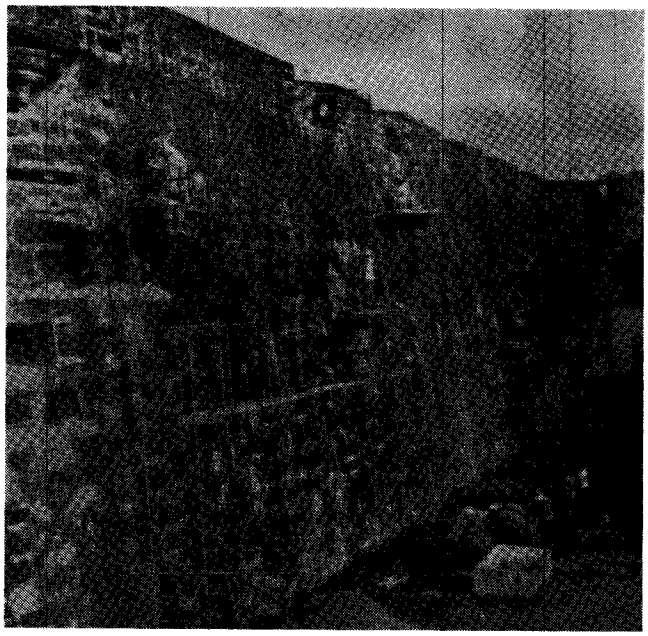


Figure 13.19. APW photo showing repairs to San Carlos, 1963. (San Juan NHS Archives.)

Conditions

San Carlos is generally in stable condition with most deterioration affecting surface materials only. San Carlos is the least altered of all the units of the San Cristóbal system with a good deal of early material surviving. However, conditions observed, if left unchecked, may result in an acceleration of the rate of deterioration.

The stuccoes of the exterior walls have weathered revealing eroded stone, crushed brick and mortar fill and broken-brick fill. Little stucco remains on the exterior surfaces. There is some differential weathering of the ashlar, with much patching throughout the exterior facades. Typically, the rubble walls are eroding at a significantly faster rate than the ashlar exterior walls.

Much of the surface of San Carlos is discolored by a combination of soiling and biological growth. The appearance of discolored areas contrasts greatly with recent repair materials. Discoloration also occurs on some later additions such as the rebuilt sentry box.

Twentieth-century alterations filling the three easternmost embrasures of the north parapet has redirected water runoff through the embrasure openings, rather than into the drainage channels. Patterns of biological growth on the walls below are indicative of this moisture.

The obliteration of the original drainage system and the shifting of loads on the south terreplein due to 1890s and 1940s alterations has led to a multitude of moisture related conditions.

Cracks appear in the window of the center casemate and on the scarp wall near the window.

NOTES

1. Ricardo Torres-Reyes, Construction History of San Cristóbal: 1634-1800 (U.S. Department of Interior, NPS, San Juan NHS, June 1965), pp. 26-28.

2. Ibid., pp. 33-43.

3. Ibid., pp. 45-53.

4. Ibid., pp. 44-47. O'Daly report to the governor, April 21, 1769. AI-SD 2502-27.

5. Ibid., p. 68.

6. Two drawings dated April 1818, each entitled; "Proyecto de habilitación de las bovedas de S.Carlos para polvorón. Comandancia de San Juan." Drawing 032-417 describes lightning rods used at San Carlos. Drawing 032-418 describes in plan, section, and elevation window openings and placement of lightning rods. (Obtained from Servicio Historico Militar-Espana, Madrid.)

7. Edwin C. Bearss, Historic Structure Report HIstorical Data Section: San Juan Fortifications 1898-1958 (U. S. Dept. of the Interior, NPS, February 1984), p. 36.

8. Drawing No. 1037 - "Historical Fortifications S. Cristóbal Fort and Vicinity Existing Conditions," file no. F-32-E. Collection of San Juan NHS.

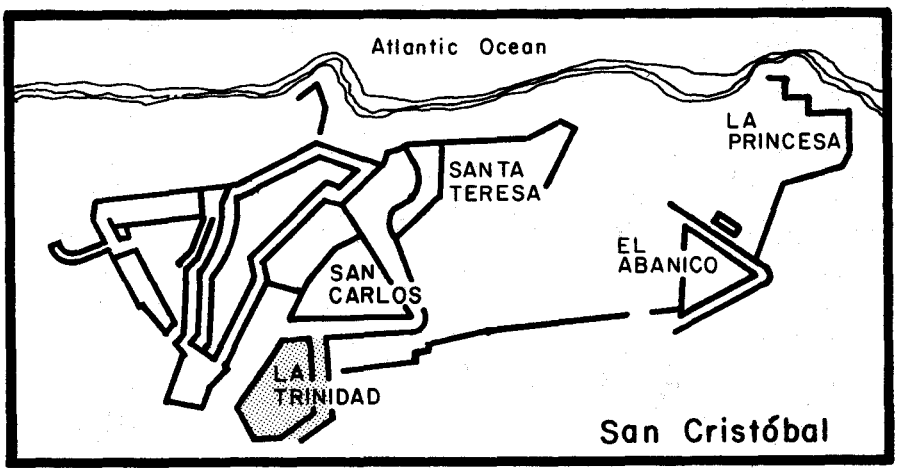
9. Bearss, p. 302. Original reference: "San Juan, Puerto Rico, Embrasures Fort San Cristóbal and Fort La Princesa, Debris Removal and Restoration of Walls, Historical Fortifications, U.S. Engineer Office, Pto. Rico District, San Juan, W.P.A. Allotment to O.Q.M.G.--F.Y. 1939-40."

10. "Embrasures Fort San Cristóbal and Fort La Princesa Debris Removal and Restoration of Walls," File No. F-33B. Collection of San Juan NHS.

11. Plan dated 1949 and entitled "As Built Survey Fort San Cristóbal," drawing collection San Juan NHS, #A501.796, location no. FC1-DR4-ENV020.

12. This 1956 plan entitled "Roof Plan Castillo de San Cristóbal" is in the drawing collection of San Juan NHS - San Cristóbal, under location number NHS-SJ-2074.

13. Completion Report. 1963. Accelerated Public Works. Located in the files at San Juan NHS.



CHAPTER 14

TRINITY COUNTERGUARD
(LA COUNTERGUARDIA DE LA TRINIDAD)

Description

La Counterguardia de la Trinidad, or la Trinidad as it will be referred to throughout the chapter, lies to the south of San Carlos Ravelin and to the east of the South Bastion of San Cristóbal and functioned as a counterguard protecting these structures from breaching fire. There is a 55 foot elevation drop in the topography from north to south accommodated by stepping down the slope in multiple levels. Four major levels were formed; upper, intermediate, lower, and base. The unit is bounded by the main moat of San Cristóbal on the west, San Carlos' countermoat on the north, and by its own countermoat on the east. On the south is the Munoz Rivera roadway. (See figs. 14.1 and 14.2)

The parameters of the upper, intermediate, and lower levels run in the following manner. From the northeast corner the counterguard scarp wall (exterior east wall) runs south for 148 feet 7 inches and then changes to a southwest orientation for a distance of 72 feet 2 inches. From here it changes direction running northwest for 49 feet. At this juncture, the angle of deflection is approximately 62 degrees. The wall then runs west for 73 feet 1 inch. From here the wall runs approximately northeast for a distance of 146 feet 3/4 inches forming the western parameter. At this point the wall curves to the east at a pair of double stairs and continues east for 57 feet 6 inches rejoining the northeast corner.

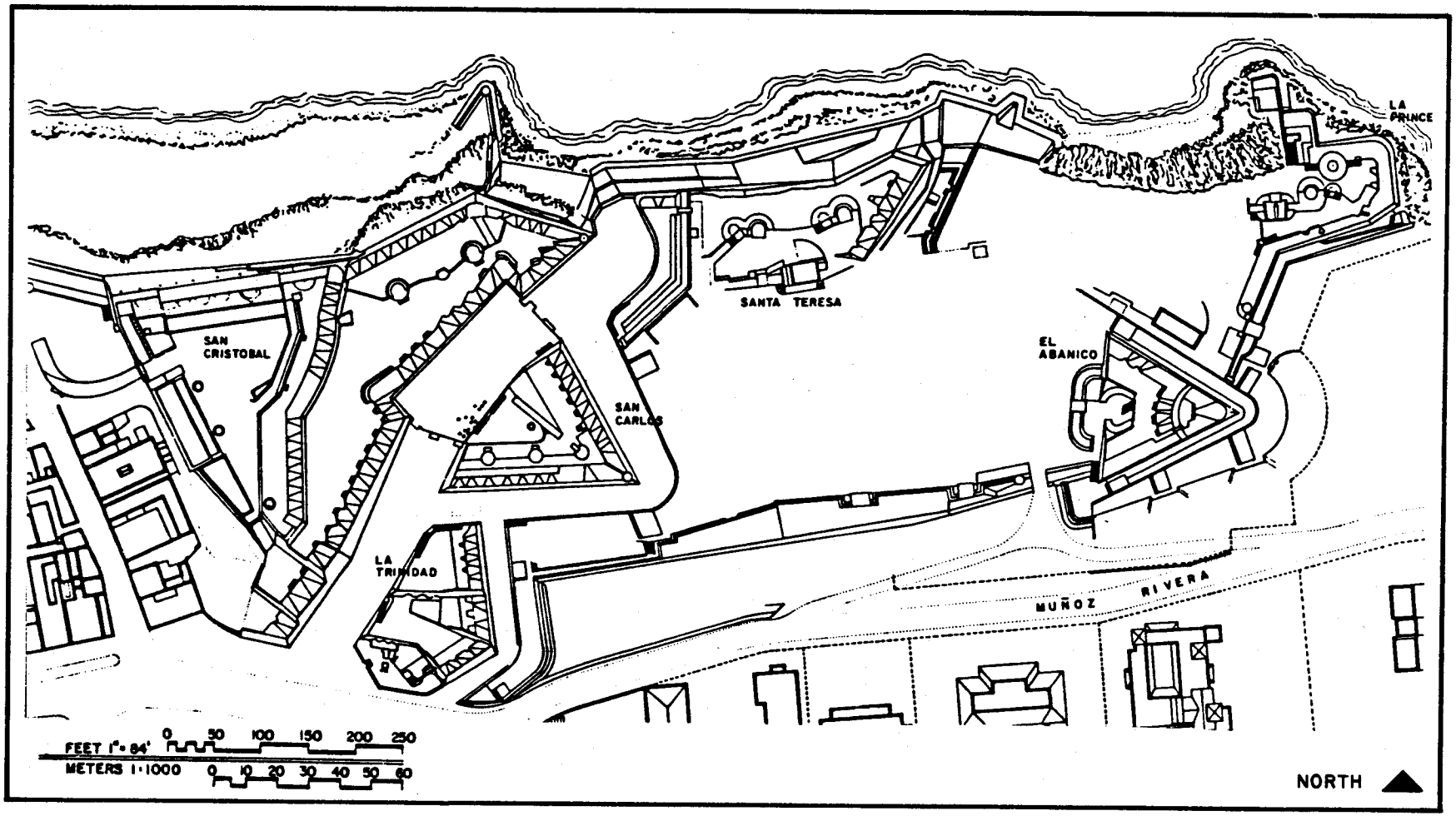


Figure 14.1. Site plan of San Cristóbal showing location of la Trinidad. Drawing by HABS, 1984.

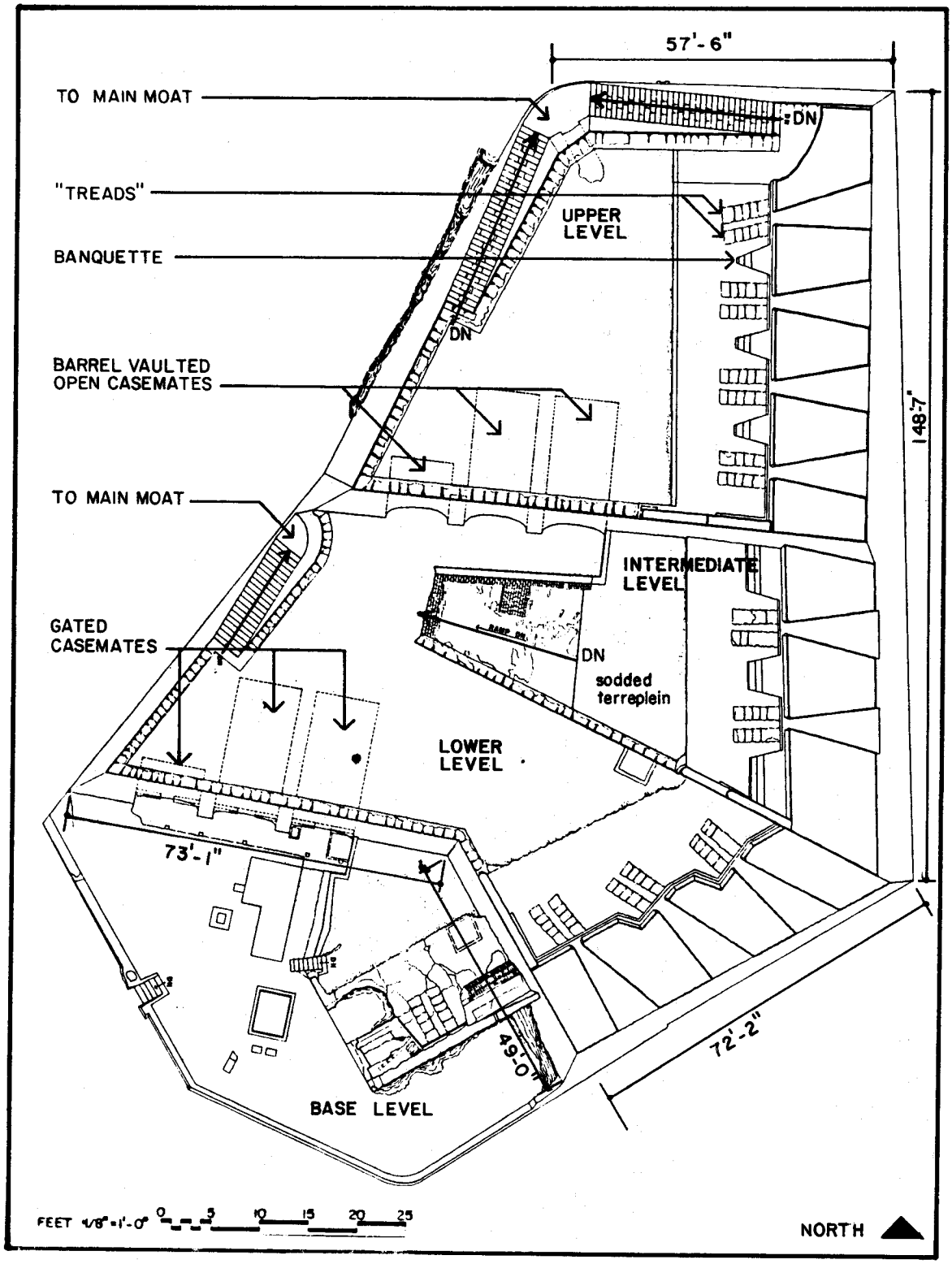


Figure 14.2. La Trinidad Counterguard with levels and elements labeled. HABS drawing (1984) annotated by Jana Gross (1989).

Each level of la Trinidad functioned as an independent battery with access by stairs to San Cristóbal's main moat. Each level (except the base) is characterized by an esplanade with embrasures facing either east or southeast to protect a sodded terreplein.

The upper level faces east with four embrasures and three banquettes. The three banquettes are composed of two stone steps leading up to a stone platform. Each banquette is fan-shaped, expanding toward the parapet wall. The back corners of the platform are edged in two wythes of rowlock bricks. On either side of each banquette are pairs of stone treads that served as pads for the cannons emplaced there.

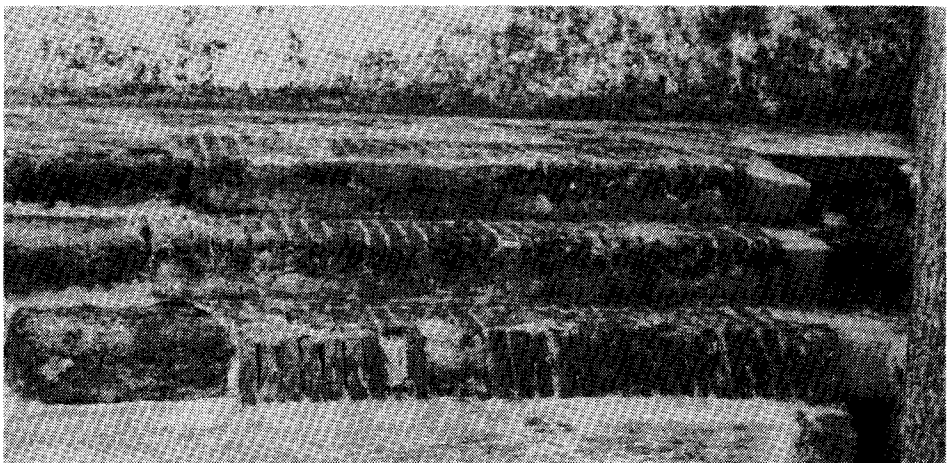
As on the parapets of the San Carlos Ravelin, the perimeter brick-lined drainage ditch at this level runs along the base of the parapet wall and under the banquettes; the slope runs north to south. Along the southern parapet the slope runs east to west and it is exposed until just before the point where the wall begins to slope downward. It then runs exposed to the western end of the south parapet where the channel changes direction, making a 90 degree turn to the south toward an outlet to the middle of the counterguard.

There are two distinct levels that comprise the middle area of la Trinidad: the intermediate and the lower. The intermediate level is reached from the lower level by means of a ramp connecting the two. At the top of the ramp, the sodded terreplein is protected by a parapet wall with two embrasures facing east. Abutting the parapet are three banquettes and a pair of stone tracks at each embrasure opening (figs. 14.3, 14.4, 14.5). As is the case on the upper level, a brick-lined perimeter drainage ditch runs along the base of the parapet wall and under the banquettes with a north-to-south slope. Along the southern parapet wall the slope is east to west and is exposed until just after the point where the wall begins to slope downward.

The lower level of the middle area is that section at the bottom of the ramp directly accessed from the main moat by a stairway on the west. The parapet wall (east) of the lower level is pierced by three embrasures facing southeast. At each of the three embrasures are pairs of stone tracks. A brick sill constructed of one wythe of rowlock bricks tops the lower portion of the parapet wall. In general, most of the stucco finish remains on the brick of the interior face of the parapet walls without any sign of pencilled or scored joints. As is the case with the upper and intermediate levels, a perimeter brick-lined drainage ditch runs along the base of the parapet wall sloping northeast to southwest.



Figure 14.3. Firing steps and firing windows at the southeast corner of the intermediate level of la Trinidad. Photo by CPR, 1986.



Structural Evolution

Period 1: 1625-1765

At this time, la Trinidad does not appear in historical documents concerning the San Cristóbal fortification system. There is no physical evidence of construction from this period.

Period 2: 1765-1809

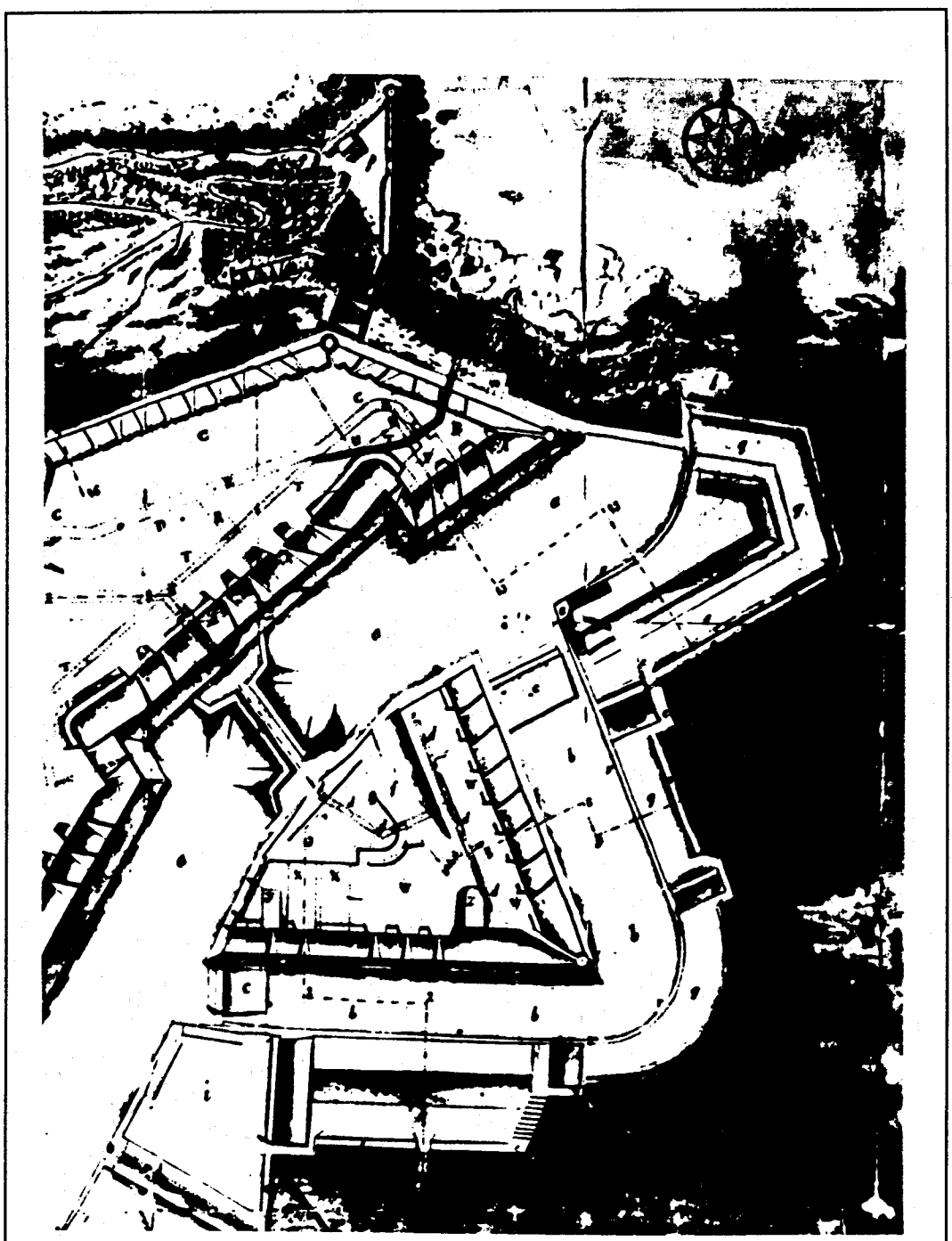
In January of 1769, Thomas O'Daly produced a construction plan (fig. 14.7) depicting works from 1766-69. He also documented this work in a report.

> South of the ravelin [San Carlos], places of arms at different levels were being raised to equilibrate the drop of the terrain.[1]

The January plan showed two terrepleins on two levels with a barrier between, and access to both levels via double stairs (feature i). In this plan, la Trinidad did not appear as a counterguard.

In 1773, O'Daly produced several plans for San Cristóbal that show la Trinidad as part of the defense system. On February 26, 1773, O'Daly issued a plan in which la Trinidad appeared. The terrain (a 55 foot difference in elevation) necessitated dividing it into three useful batteries surrounded by a narrow moat. The plan showed each level having three embrasures and banquettes. A fourth banquette appeared on the upper level plan. Double stairs allowed access to the upper level, a ramp provided access to the intermediate level, and a single stair to the lower and base levels. The base level was shown without a ramp. Two casemates were depicted on the base level, but the configuration differs from that in later plans. A tunnel from the base level to the covered way of Santiago Ravelin was shown.

On August 8, 1773, O'Daly issued another plan (fig. 14.8)



shown on the upper level. A small rectangular chamber was shown between the double stairs leading to the upper level. Two casemates were shown at the lower and base levels. A ramp provided access from the lower level to the intermediate level; another ramp allowed access from the base level to the northern esplanade of the base level.

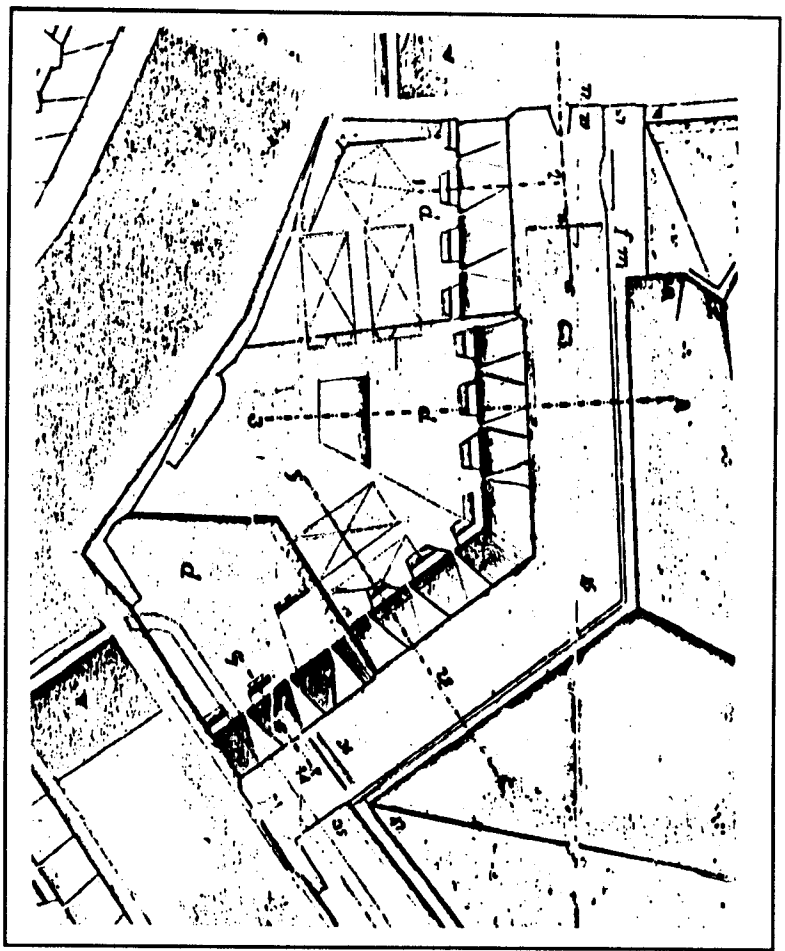


Figure 14.8. Detail of O'Daly plan, August 8, 1773.

Construction reports from this period noted the progress of the counterguard. In January of 1774 it was reported that the gun esplanades of the la Trinidad were finished with hewn stones, but the excavation of its moat was incomplete.[2]

By December of that same year it was reported that the moat had been completed but the covered way was still in progress. The construction reports for the period of June 1775 through August 1776 indicated that the glacis in front of la Trinidad had been completed. Reference was also made to ". . . opening of vaults through the soft stone under the three levels of la Trinidad."[3**]

On September 13, 1783, Engineer Juan Mestre submitted a plan (fig. 14.9) that depicted la Trinidad Counterguard in the configuration that partially exists today. There were three casemates in parallel configuration shown on the lower and base levels; each set of three consisted of two large and one small chamber. A ramp was shown for access to the intermediate level and access to the northern esplanade of the base level.*

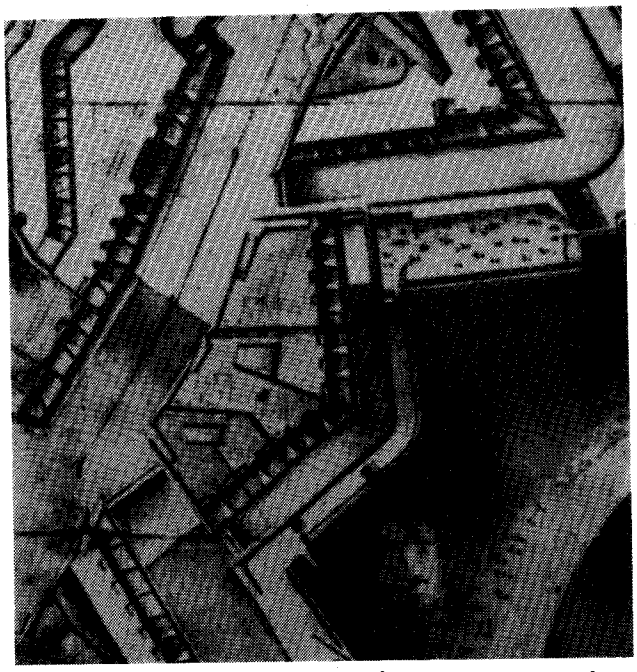


Figure 13.9. Detail of Mestre plan, September 13, 1783.

Engineer Mestre issued a similar plan on November 17, 1792 (see Volume I). There were three embrasures on the upper level, two on the intermediate level, three on the lower level, and two on the base level (one at the top of the ramp, one below). This plan was small in scale and several features were not shown.

Period 3: 1809-1837

No references to la Trinidad appear in the available documentation during this period.

Period 4: 1837-1868

The De Castro plan of 1861 (dated August 1864) is a small scale plan that does not show a great deal of detail (fig. 14.10). However, it is notable that for the first time the

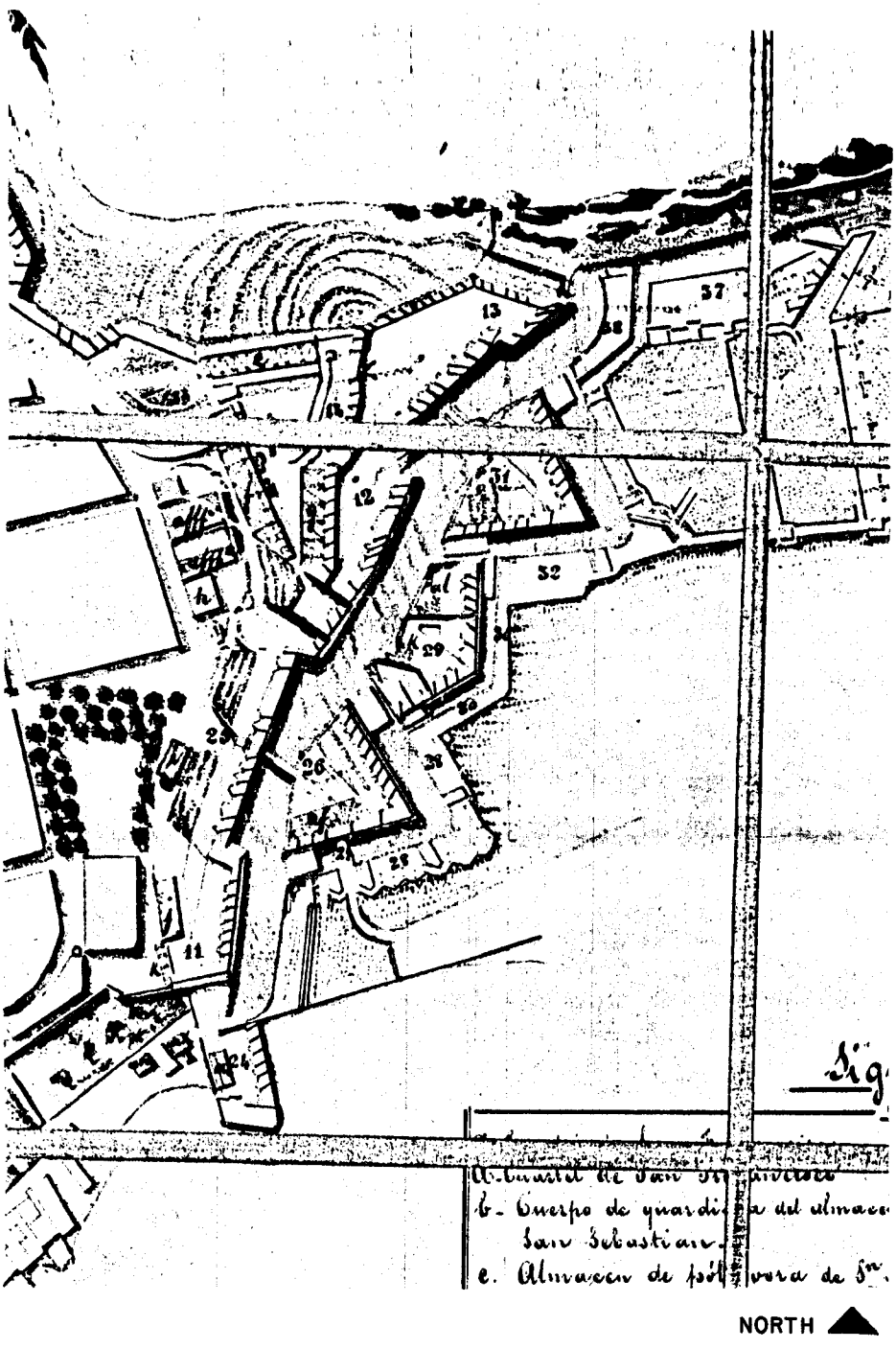


Figure 14.10. Detail of plan dated August 1864 by Manuel de Castro showing la Trinidad labeled "29". (San Juan NHS Collection.)

Period 5: 1868-1898

In 1892 a royal decree was issued for the demolition of the Santiago Ravelin, Santiago gate, and the base level of la Trinidad Counterguard. Changes in military strategy and technology, as well as the expanding urban population of San Juan, resulted in the destruction of this portion of the SanCristóbal defense. Most of the base level was demolished in 1894. With this demolition project, the defense of San Cristóbal was seriously impaired. Up until this time, la Trinidad served to defend the bastion behind it and the exposed approach to San Carlos Ravelin.[4]

Period 6: 1898-1986

Photographs from the 1930s indicate that the intermediate and lower levels had temporary lean-to structures constructed on them and were planted with large shade trees. A photo from the Fort Brooke period indicated the location of several trees on lower and intermediate levels (fig. 14.11). Before the 1960's photographs were taken, however, these trees had been removed. Several plans from the 1938-9 period showed la Trinidad in its semi-demolished state. Documentation does not indicate further demolition from this period.

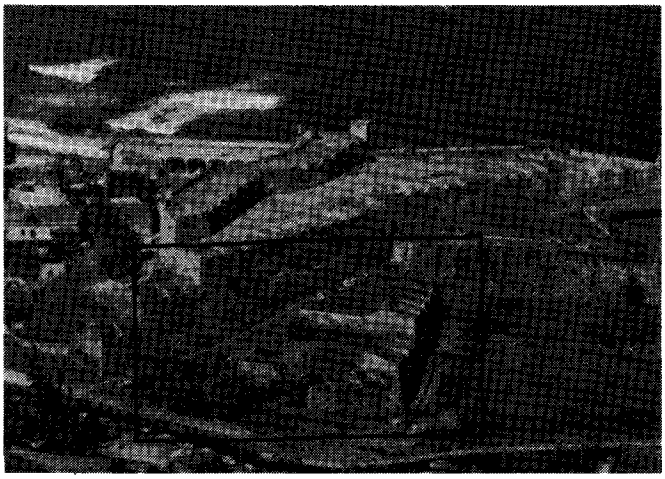


Figure 14.11. Aerial view of fort, la Trinidad circled, ca. 1955. (San Juan NHS Archives.)

A plan dated January 1956, (drawing NHS-SJ-2074, As Built Fort Brooke) labeled the three casemates of the base level as a "tool room", "chlorinator", and "pump house". At present these casemates are still used for mechanical systems. The stairs from the moat to the base level were shown in this plan, although they were demolished as part of the 1892 Royal Decree.

The repairs of the Accelerated Public Works of the 1960s included the removal of soil and vegetation that covered the lower portion of the ramp. The 1963 photographs (fig. 14.12) illustrated the extent of the repairs. Repairs included the replacement of the coping running the length of the northern

edge of the ramp with concrete, and a concrete repair of the surface at the upper portion of the ramp.[5] Between February 18, 1963 and June 28, 1963, it was reported that two brick partitions were removed from two casemates, an "old latrine" was excavated, and the entire la Trinidad area was patched.[6]

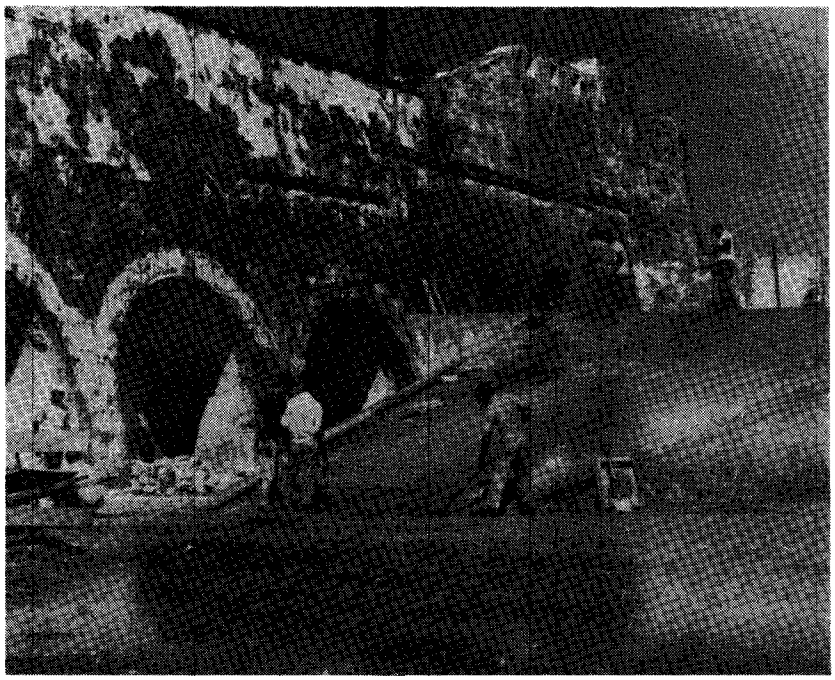


Figure 14.12. APW photo showing work in progress at la Trinidad including the removal of earth fill, 1963. (San Juan NHS Archives.)

For a visual overview of the structural evolution of la Trinidad Counterguard see figure 14.13.

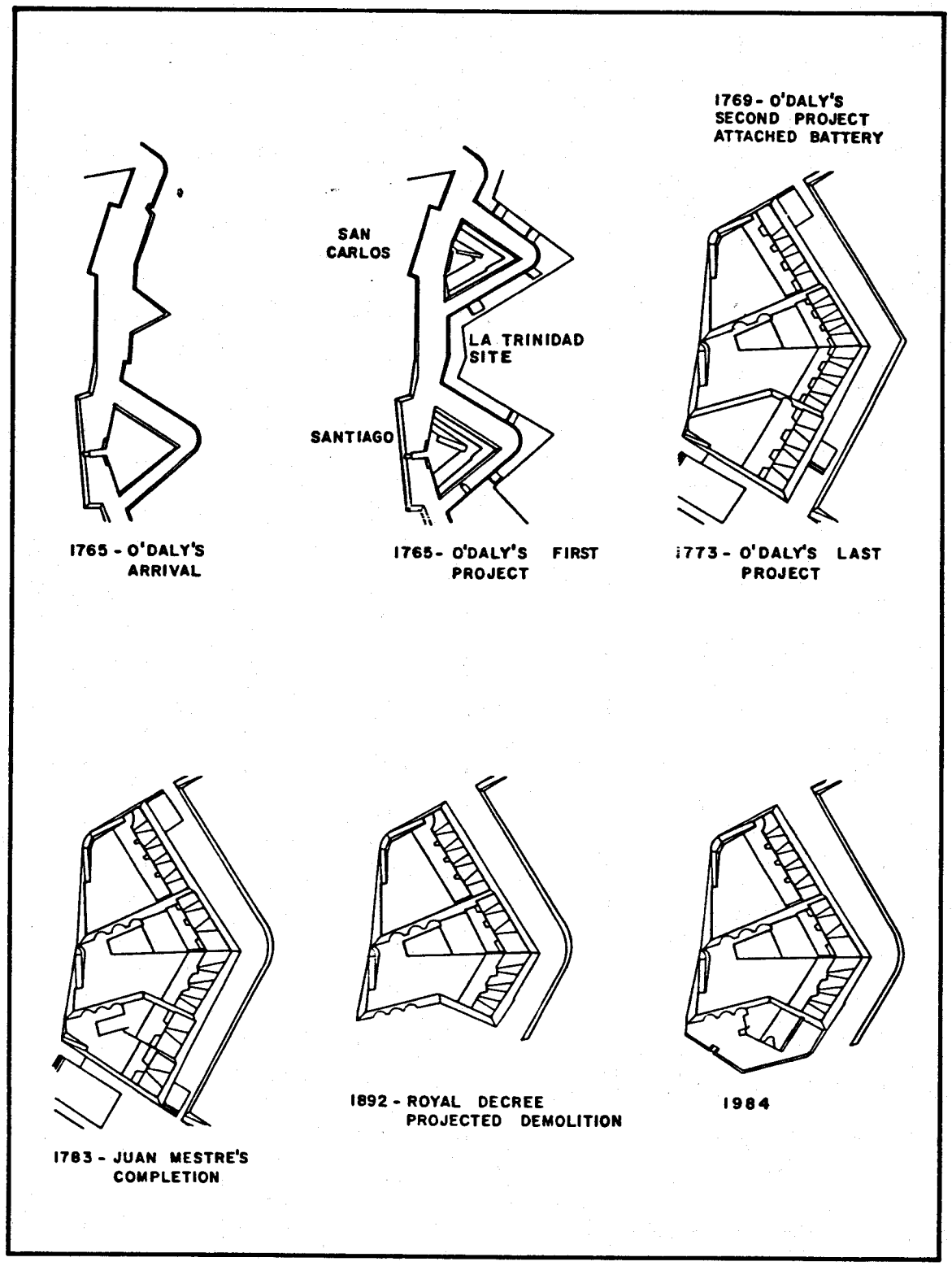


Figure 14.13. The evolution of la Trinidad Counterguard as indicated on HABS cover sheet, 1984.

Conditions

Other than the 1894 demolition of the base level of la Trinidad, the present condition is basically stable with little significant damage to the surviving structure. Many of the conditions that have been observed throughout the site, such as stucco erosion, open joints, and biological growth, also appear at la Trinidad. However, la Trinidad's unique three-tiered design to accommodate the drop in terrain, utilization of live rock in construction, and partial demolition may account for several additional conditions.

In general the scarp walls of the countermoat are in better condition than the walls facing San Cristóbal with more remaining scored stucco finish. There are, however, a series of vertical cracks along the length of the scarp facade and several repair patches of the same vertical configuration.

The walls facing the moat have not fared as well, most notably the facade of the lower level. Much of the rubble construction is exposed due to extensive loss of stucco resulting in differential weathering of the rubble. Various patching materials indicate a continuous erosion problem in this area. The stairs leading to the lower level have been completely resurfaced with concrete as compared to the double stairs, leading to the upper level, that have exposed eroded stone with raised mortar joints.

In general, the merlons are in good condition with isolated patching and associated biological growth. The embrasure floors are in good condition, with the exception of the embrasures floors of the upper level that have Army Corps repairs associated with separation of the facing stones from fill material. The continuous cracking pattern typical of this problem is not as pronounced at la Trinidad as it is elsewhere in the fort.

The banquettes of all levels are suffering from cavity erosion. The brick work that is not eroding severely is generally in good condition. Except at the uppermost stones, the sides of the upper level banquettes still retain their finish. The intermediate level banquettes retain little stucco finish. What survives of the base level banquette is in a ruinous state with cracking, open joints, and vegetation growth.

The tunnel door enframement has lost most of the stucco finish and the stone is weathering differentially with areas of loss at the four corners. These losses may be associated with the replacement of the original wooden door and frame, or

may be a result of the use of the small tunnel chamber for equipment storage.

The ramp connecting the lower level to the intermediate level is in fair condition. The extant original stone curbing on the southern side exhibits differential weathering. Most of the surface, perhaps as much as 85%, is covered with various patching materials reflecting a continuous maintenance problem in this area. The deterioration on the sides of the ramp is similar to that found in association with altered drainage systems in other structures of the fort.

The sodded portion of the terreplein is well maintained; at present there are no large plants and the grass is trimmed on a regular basis.

Walls of the lower level casemates are surfaced with a layer of stucco and several paint finishes in various states of deterioration. The surfaces of the walls are riddled with corroded iron nails and numerous holes. These conditions result from the presence of moisture in all casemate walls, in particular the center and eastern casemates.

The base level casemates are currently used to house mechanical systems and equipment. The interior walls of these casemates appear to be in good condition and have recently been refinished.

Little original fabric remains at the base level. Soil fill, that provided a level surface for the esplanade, has eroded and a cavity now exists under the pavement. If left as is, the pavement will eventually collapse.

Most conditions at la Trinidad are a result of inadequate drainage for large sodded areas and misdirected runoff. It appears that the original drainage system channeled water flow successively from the uppermost level down to the lowest level. There is no documentation or physical evidence apparent of a system to drain the sodded terrepleins. Consequently, masonry adjacent to, or underneath a terreplein, exhibits signs of water damage.

NOTES

1. Ricardo Torres-Reyes, Construction HIstory of San Cristóbal: 1634-1800 (U.S. Dept. of Interior, NPS, San Juan NHS, June 1965), pp. 54.

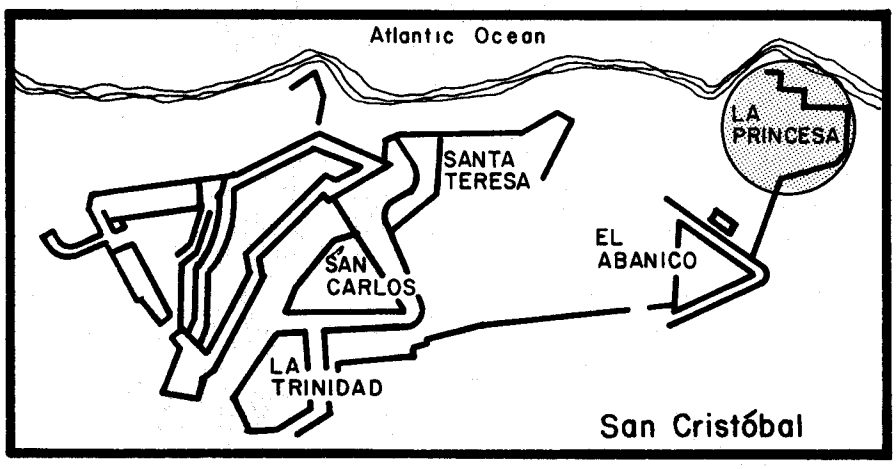
2. Ibid., p. 93. Original reference is to a report by Thomas O'Daly covering the four months of October 1773-January 1774. AI-SD 2510-44.

3. Ibid., p. 93. Original reference is to a report of Thomas O'Daly September 14, 1775 and January 9, 1776. AI-SD 2510-45.

4. 1892 decree for demolition of Santiago Gate found on sheet 1 of HABS drawings of La Trinidad Counterguard, PR121, 1984.

5. Accelerated Public Works - La Trinidad, repairs documentation, 1963. Dead files, D24. San Juan NHS Archives.

6. Accelerated Public Works - Patching on La Trinidad. June 28, 1963. Dead Files, D24. San Juan NHS Archives.



CHAPTER 15

FORT OF THE PRINCESS (FUERTE DE LA PRINCESA)

Description

The outwork now commonly referred to as la Princesa (fig. 15.1) was originally known as Fuerte de la Princesa (Fort of the Princess). It derives much of its architectural interest from surviving features dating to its initial construction between 1779-1783, as well as to subsequent modification projects dating to ca. 1896 and ca. 1940. Its location, adjacent to the Atlantic Ocean, east of San Cristóbal, and north of el Abanico, is emphasized by massive cliff-like walls facing north and east.

The original function of la Princesa as a bastion (a strong point in the outworks) was to improve the irregular land features and to prevent access to el Abanico from the east and north shore. Significantly, both the 1896 gun position and the larger ca. 1940 gun-block indicate a re-orientation of la Princesa towards the sea. By the late nineteenth century and into the twentieth century, la Princesa was the primary focus of the coastal defenses. It is highly significant as an illustration of three centuries of military technology.

The shape of la Princesa is approximately square, 225 feet by 225 feet, inclusive of moats. To facilitate discussion, elements will be discussed in a clockwise direction beginning with the north moat and terminating with the central features. This coincides with the chronology of the site.

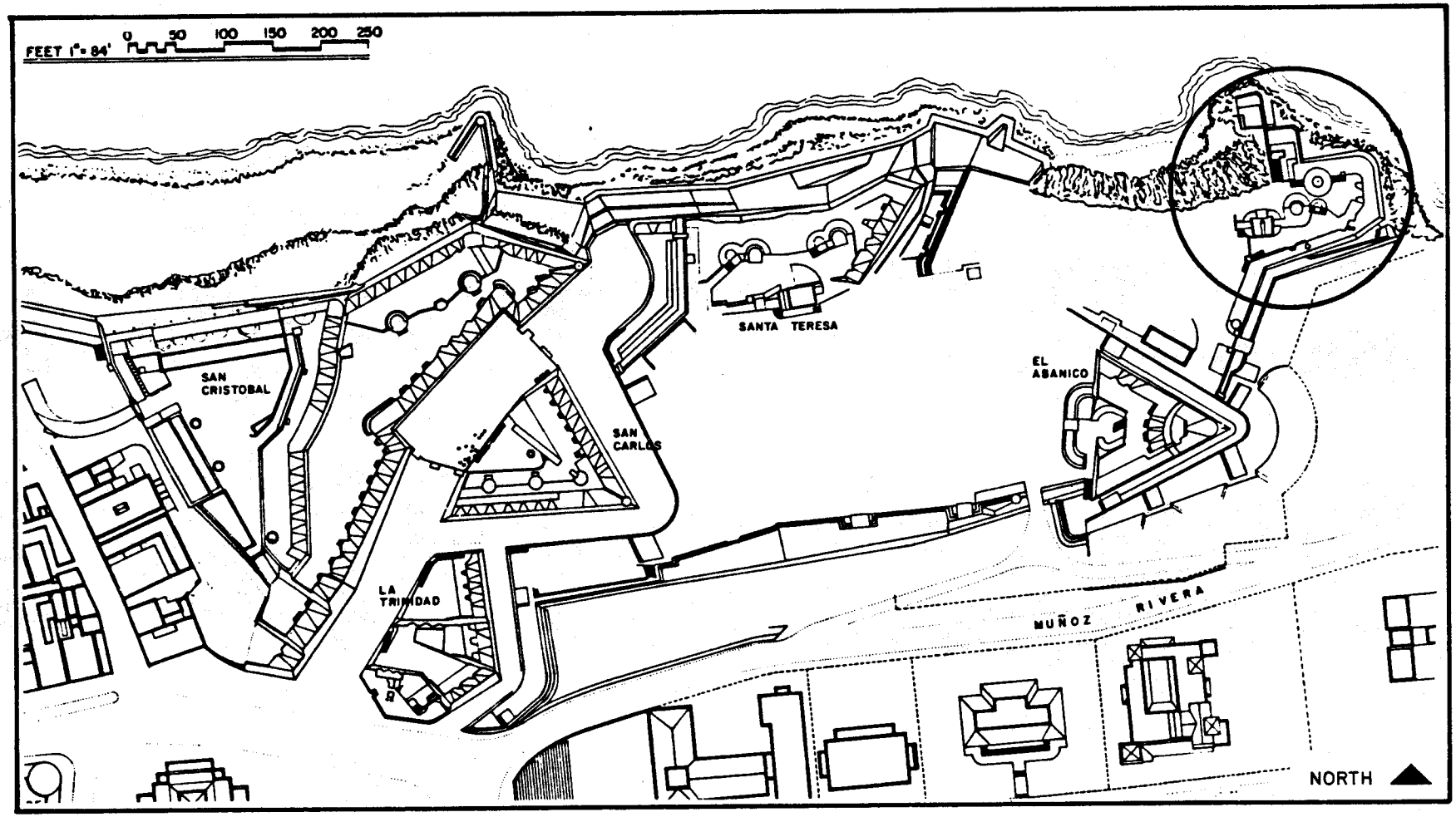


Figure 15.1. Site plan of San Cristóbal with the fort of la Princesa circled. Drawing by HABS, 1984.

The north moat is a small section of dry moat projecting from the north face of la Princesa. It slopes down almost to sea level and has vertical walls varying in height. Adjacent to the east side of the north moat is a fragment of a sloping glacis consisting of stucco over stone. The west wall of the moat bends at a right angle towards the west to form a broad sloping parapet. Fragments of a banquette for artillery firing seaward run along the parapet. A sod-filled terreplein (referred to by HABS as North Covered Way) is effectively enclosed on the west and north by this wall and parapet. On the east side of the terreplein/covered way is a small steep earthen ramp leading up to a rubble masonry bridge supported by two elliptical brick vaults. The vaults open onto the south side of the terreplein below and may have served as temporary shelters. (See figs. 15.2 - 15.5.)

From the bridge, access was made to a small doorway leading to three eighteenth-century bombproofed vaults beneath the main parapet. These three underground vaults below the main (north) parapet were part of the original construction of la Princesa. They are located southeast of the elliptical brick vaults described above. The primary function of these vaults was as troops' quarters and powder storage.

The larger of the vaults has a wide arched doorway with sandstone quoins and voussoirs in its south wall. Remnants show that joints were originally scored in the stucco. There are fragments of a stuccoed belt course and columns with capitals. A low square-headed doorway on the western wall contains a post-1963 steel grate door and provides access to the north moat by way of above mentioned bridge and ramp.

To the east of the large vault are two smaller rooms with brick vaults. A doorway leads from the large vault into each of the smaller rooms. The southern of the small rooms has a low masonry ledge projecting from the north wall.

The door in the south wall of the larger vault leads to a long steep stairway with a straight run of 28 risers accessing the main parapet level.

The main parapet walls of la Princesa are steeply-battered, and rise between 50 and 60 feet above sea level. The north and east walls follow the geography of the terrain and jog in roughly two sections adjoining each other at a 90 degree angle in the northeast corner.7 (See fig. 15.5.)

The original ca. 1783 walls are now exposed and consist of dressed ashlar sandstone, with horizontal courses of chinking stone. Near the top of the wall is a series of square patches indicating the earlier fraise designed to prevent the enemy from

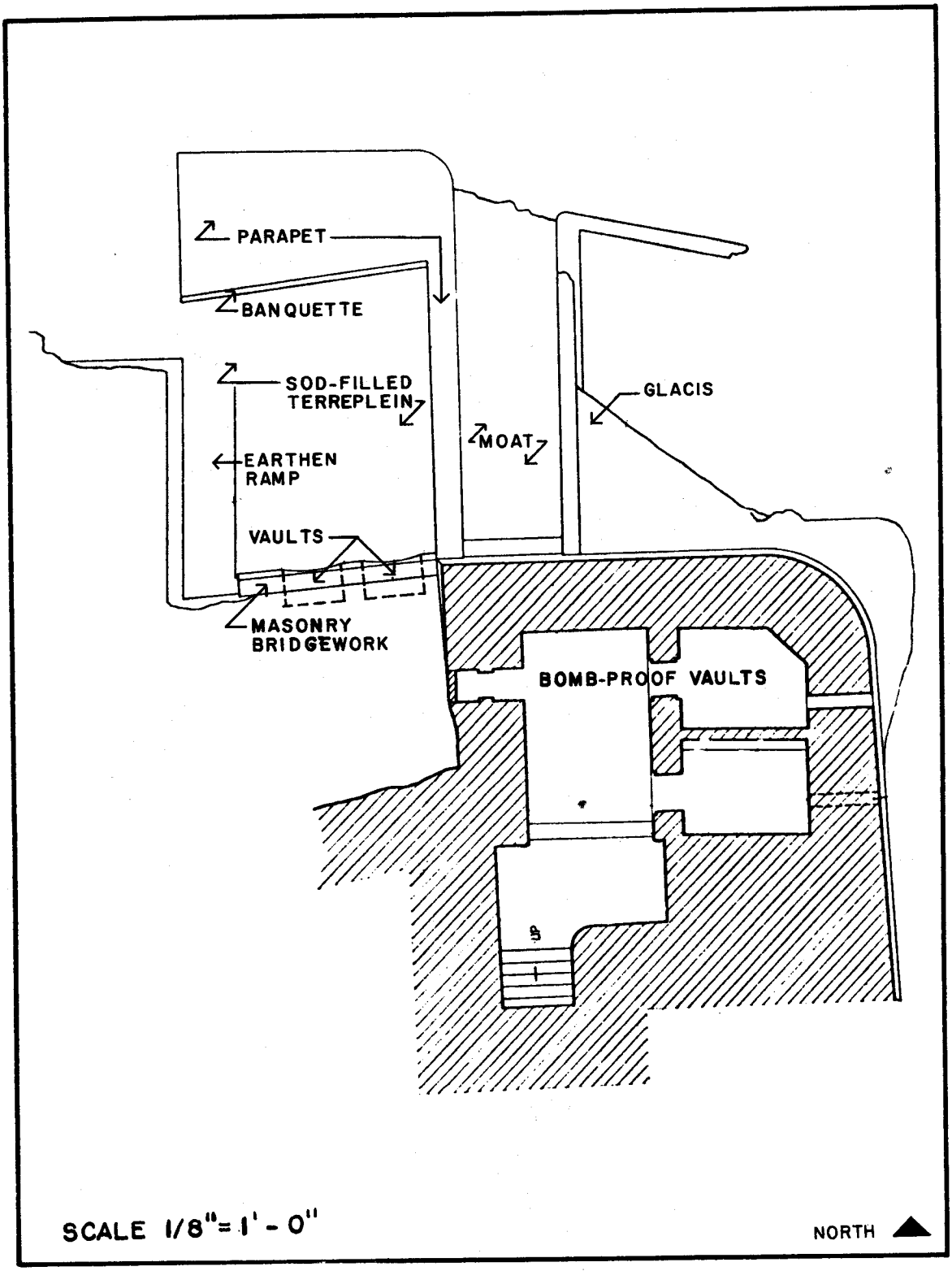


Figure 15.2. Plan of la Princesa detailing the north moat with individual elements labeled. HABS drawing (1963) annotated by Jana Gross (1989).

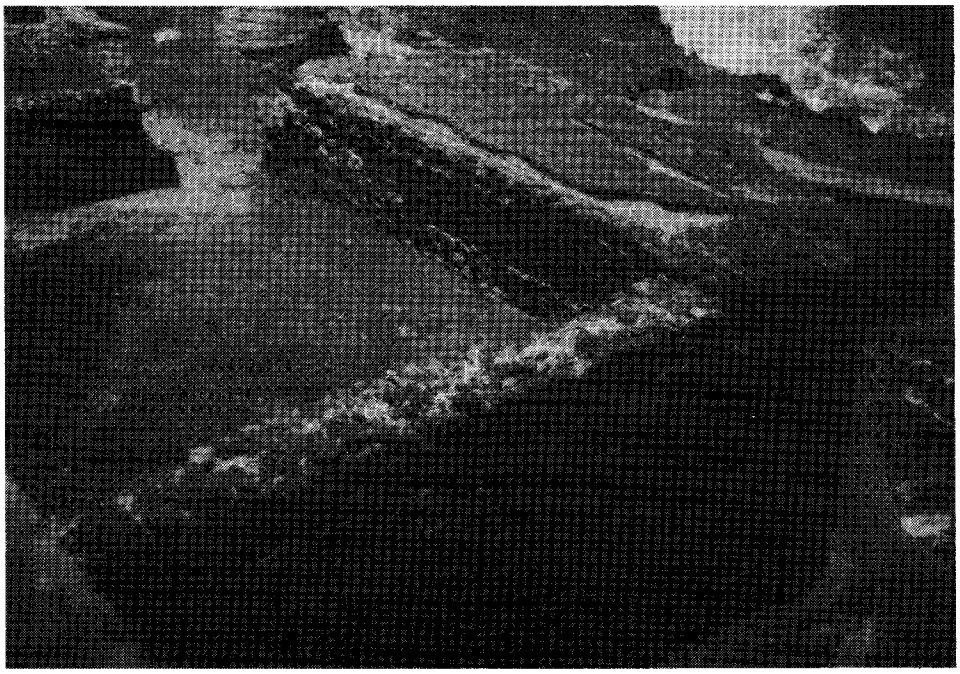


Figure 15.3. View overlooking north moat to parapet and sod-filled terreplein. Photo by Richard Crisson, 1986.

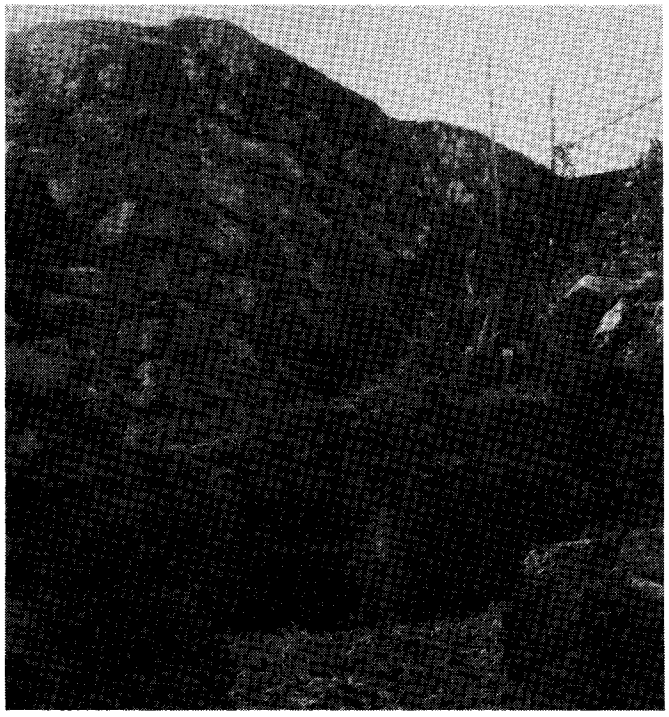


Figure 15.4. View from sod-covered terreplein looking south towards underground vaults and north parapet. Photo by Richard Crisson, 1986.

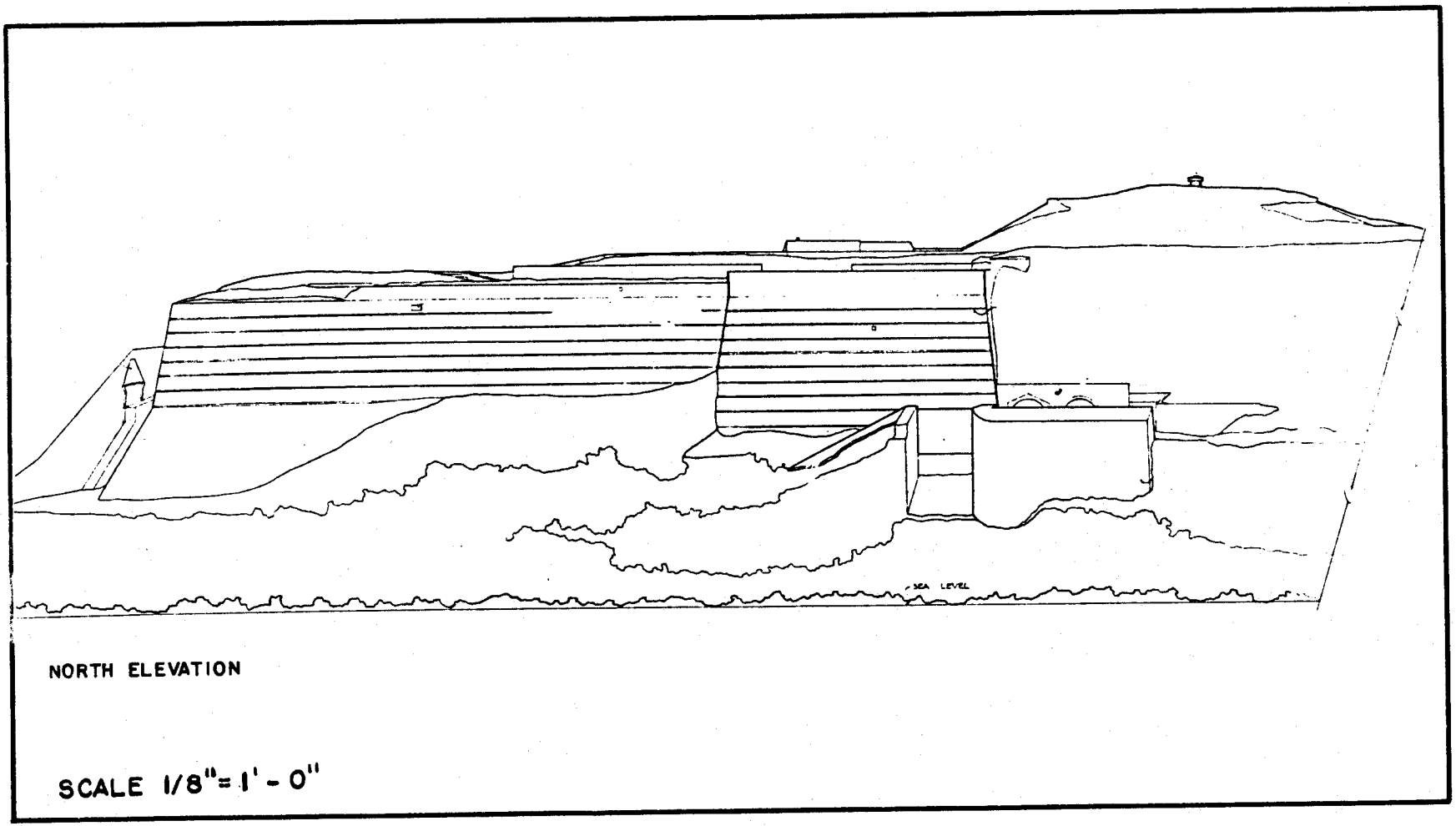


Figure 15.5. North elevation of la Princesa. Drawing by HABS, 1963.

scaling the wall. There are several drains and slit-like window openings, mostly in the easterly wall.

A significant characteristic of these walls was removed when the parapets were cut down almost to the level of the terreplein in ca. 1896. Five embrasures facing east and the parapet infill are barely discernible (fig. 15.6). Inside the parapet is a banquette varying in height. Cut stones are used for gun pads at each embrasure. The terreplein is of hormigón.

At the parapet's eastern end a portion of a brick-paved banquette survives. A small, circular, conical-roofed sentry post is located at this southeast end; it is of brick and rubble stone.

The sloping south parapet is constructed of rubble and still contains the two surviving eighteenth-century embrasures facing southeast (fig. 15.7). However, both embrasures were modified in the late nineteenth century by constructing a pair of latrines in one and a stairway and doorway in the other.

The dry moat on the south originates on the east, above the shore and adjacent to the east parapet. It follows a southwesterly direction and breaks more sharply south at the west end parapet to eventually meet the main moat of el Abanico. At the sharp bend southward are remnants within the walls of notches designed to contain a gate. Much of the moat maintains its essential character dating to the ca. 1783 period. At the south end, however, are fragments of a ca. 1896 cistern. The sod-based moat varies in width and narrows at the cistern end. The cistern's only surviving elements are the three side walls that are covered with a smooth hydraulic cement. (See fig. 15.8.)

Both the scarp and counterscarp walls of the moat are steeply battered and of stonerubble construction. The scarp wall is topped by a stuccoed edge. The area beyond the wall is sodded and forms a glacis-like slope in front of la Princesa and el Abanico.

The interior elements of la Princesa are illustrated in figure 15.6. The interior battery (for four guns) dates from 1783 but was modernized in 1897, resulting in the destruction of the earlier features. In its place, four new gun positions were built facing north on an east to west axis. Only one of these survives: gun position No. 1, at the far east. This position was used for a 24-cm howitzer cannon. An integral surviving feature of the gun position is the adjacent traverse with its double bombproof.

The traverse (fig. 15.9) is a large, rectangular feature built low into the ground to the southwest of the 1897 gun

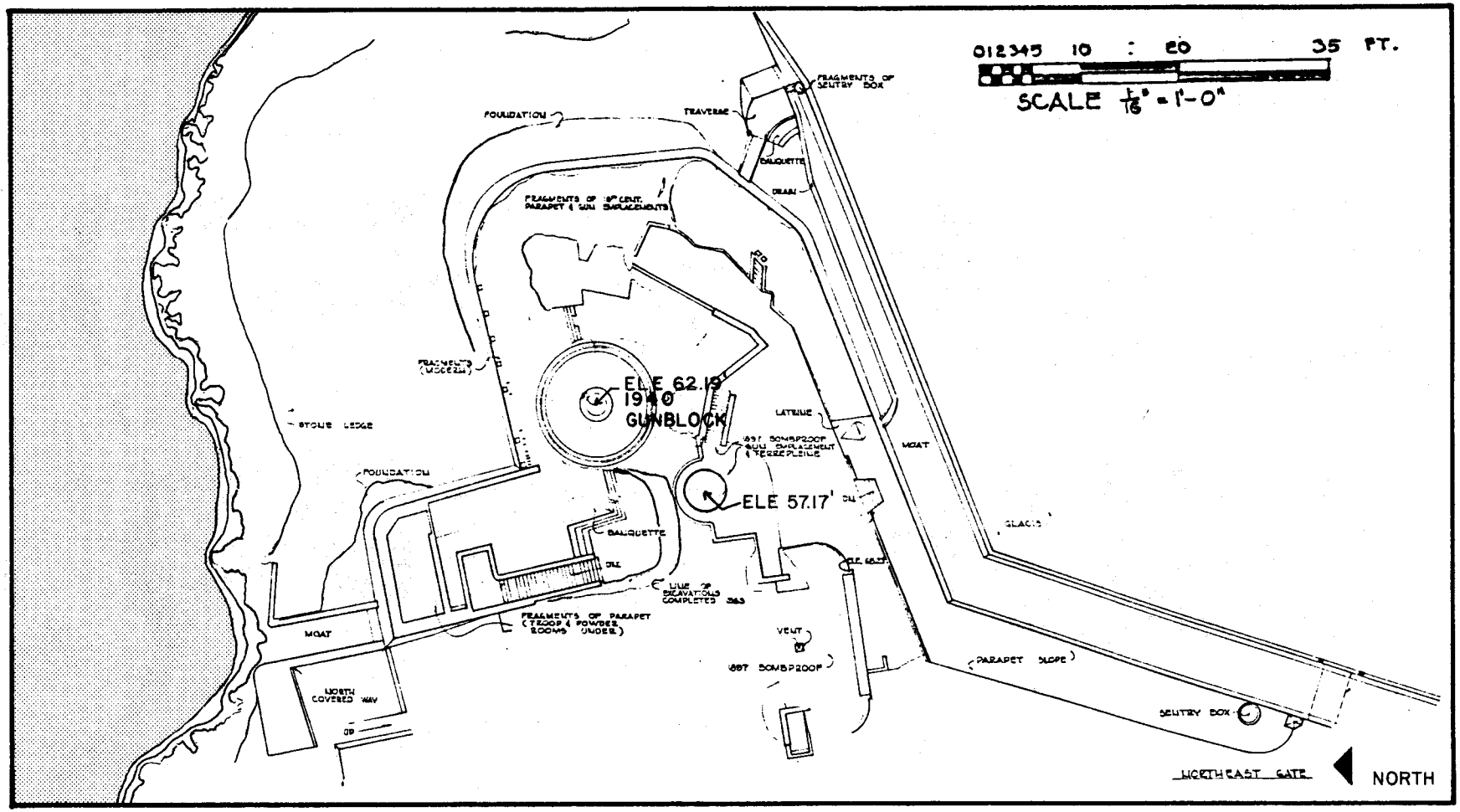


Figure 15.6. Plan of la Princesa. HABS drawing (1963) annotated by Jana Gross (1989).

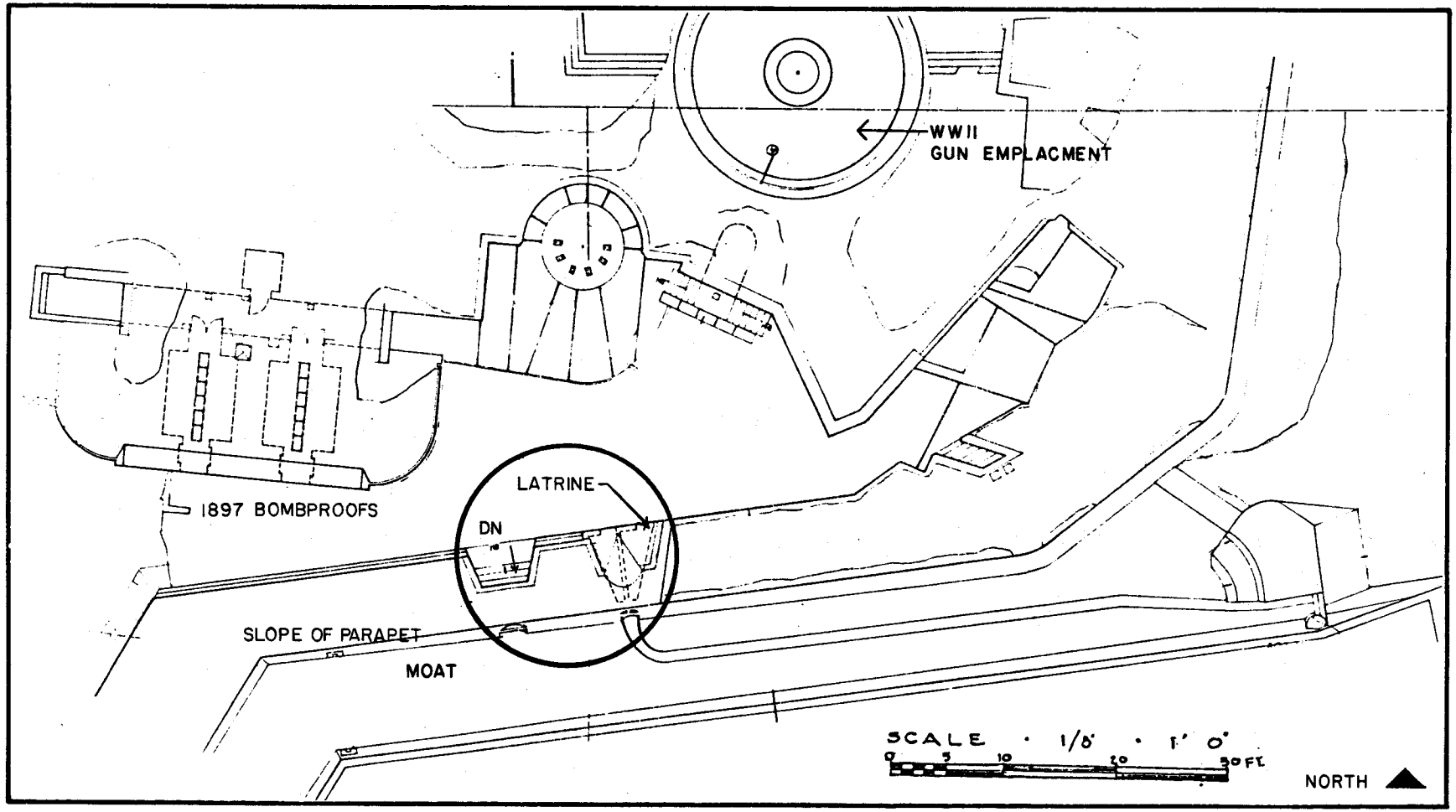


Figure 15.7. Detail of plan of la Princesa with converted embrasures circled. HABS drawing (1963) annotated by Jana Gross (1989).

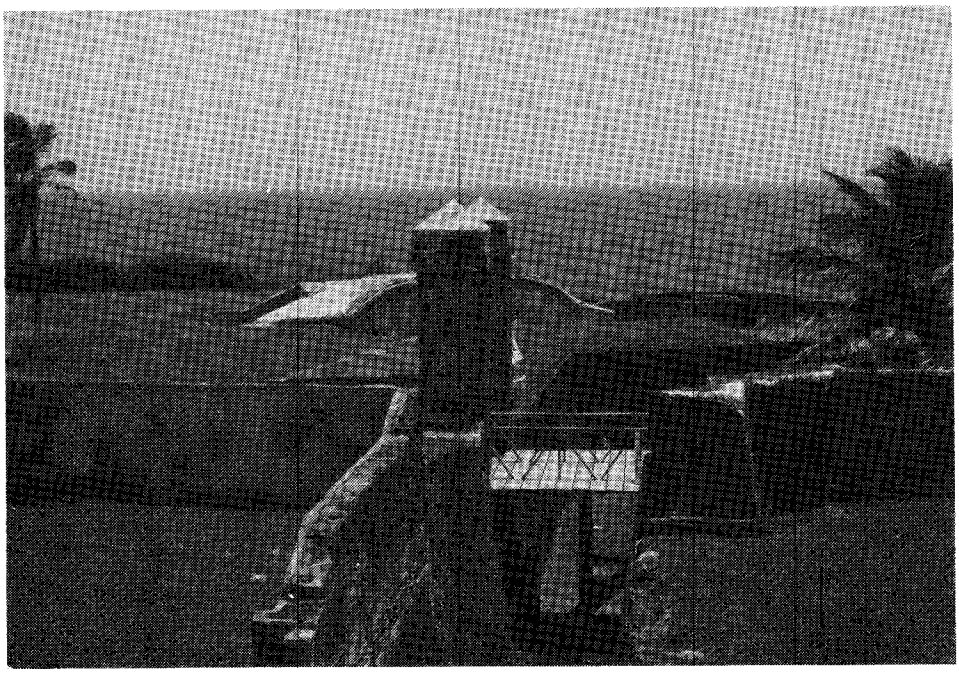


Figure 15.8. View from el Abanico looking north. Northeast Gate of el Abanico in foreground, bombproofs and gun emplacement of la Princesa in background. Photo by Richard Crisson, 1986.



Figure 15.9. South elevation of remaining 1897 bombproof at la Princesa. Photo by Richard Crisson, 1986.

emplacement. It provides la Princesa with one of its distinctivearchitectural features: the domed roof that rises above the terreplein and is the highest point of la Princesa. The southeast corner of the traverse is rounded and its brick and rubble walls are stuccoed. The curved roof has a small projecting cornice containing a shallow built-in gutter. Its highest point, about 80 feet above sea level, is the square vent over the double bombproofs (fig. 15.5). The roof, originally sod-covered, is now covered with stucco. Red brick pavers are partially exposed. Some of the brick is stamped "MTC".

Each bombproof is vaulted. They were designed to store munitions (projectiles and cartridge bags). The extant east bombproof consists of three chambers: two chambers on the south and one chamber to the north separated by a six-foot wide covered passage (fig. 15.10). Two arched doorways access the southern chambers and have a slightly projecting stylized quoin and voussoirs. North doorways of the same chamber are of black welded steel with deep reveals. The interior walls of the vaulted chambers are plain, with whitewashed or painted plaster surfaces. The floor is concrete with a center drain. The vaulted rooms are unused. No visible evidence remains of the 1903-04 electric lighting, nor of any other mechanical system.

To the west of this bombproof is a wide stairway in an L-shaped configuration. The lower section of the stairway may be original, but the upper section is of post-1963 concrete. This stair provides access to the higher terrain leading to Santa Teresa and eventually to San Cristóbal on the west.

Southwest of the double bombproof is a high modern concrete retaining wall with a pipe drain and another L-shaped stairway. This stairway does not appear in the 1963 HABS drawings and is attached to the south (1783) parapet. It provides direct access to el Abanico. Again, the terrain is much higher due to post-1949 infill. Originally, the terrain was ramped and contained a service road constructed ca. 1896. No visible evidence remains of the paved road nor of its concrete gutters, although an archeological investigations would most likely unearth evidence for its existence.

On the east side of the gun position within the north parapet is a small u-shaped recess (fig. 15.11). The recess is accessed by two small concrete stairways: one leading east and the other west. This feature would have provided cover for soldiers stationed at gun position no. 1. One of four circular gun blocks installed in 1940-41 remains extant at the far east of the parapet, northeast of the 1897 gun emplacements and bombproof. It is constrcted of concrete and has an iron cog track within its outer edge.

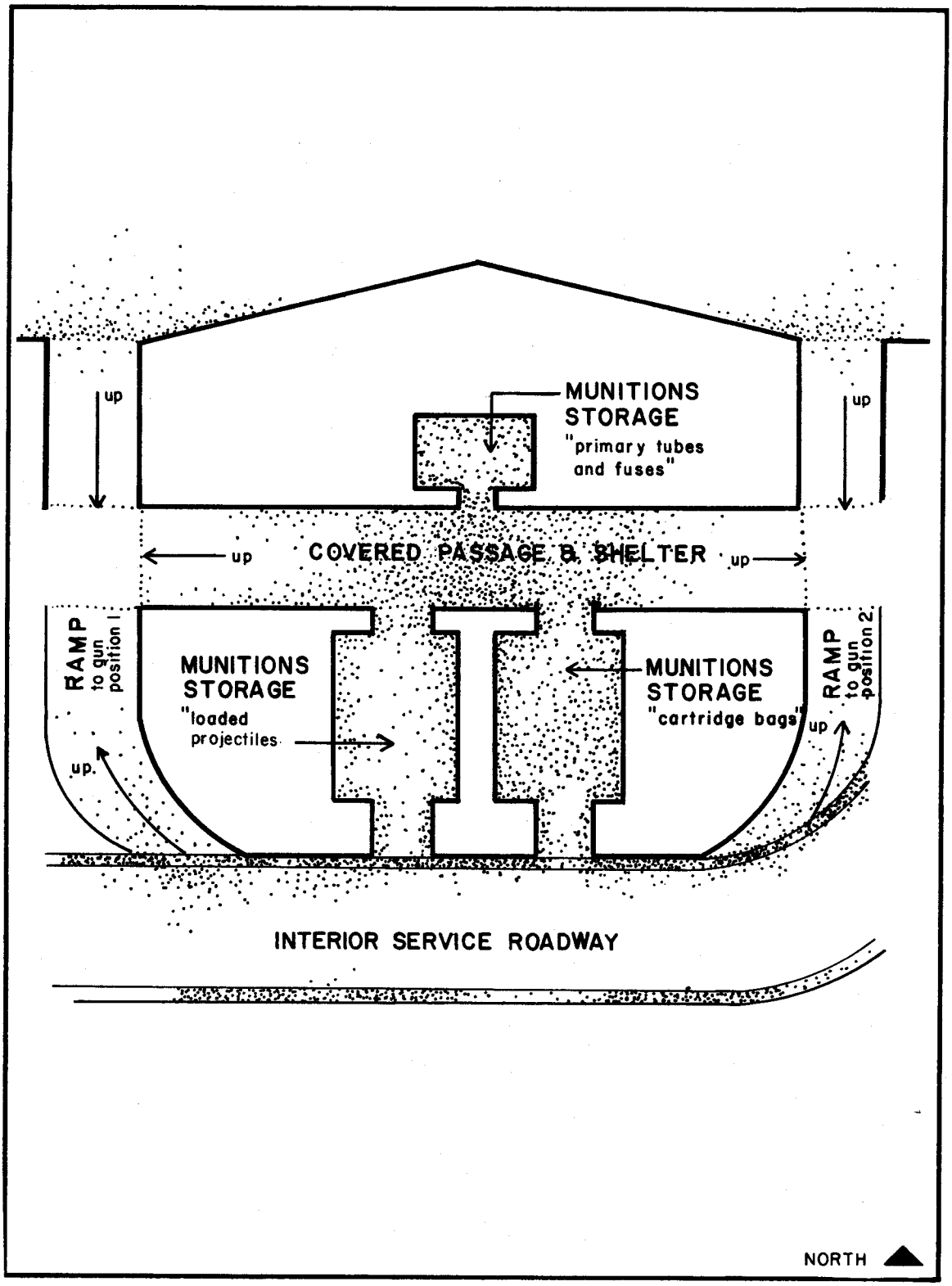


Figure 15.10. Detail of east bombproof located between gun positions 1 and 2. Sketch by Barbara Yokum (1989) is based on the drawing obtained by Colonel Goethals in 1898. (San Juan NHS Arhives.)

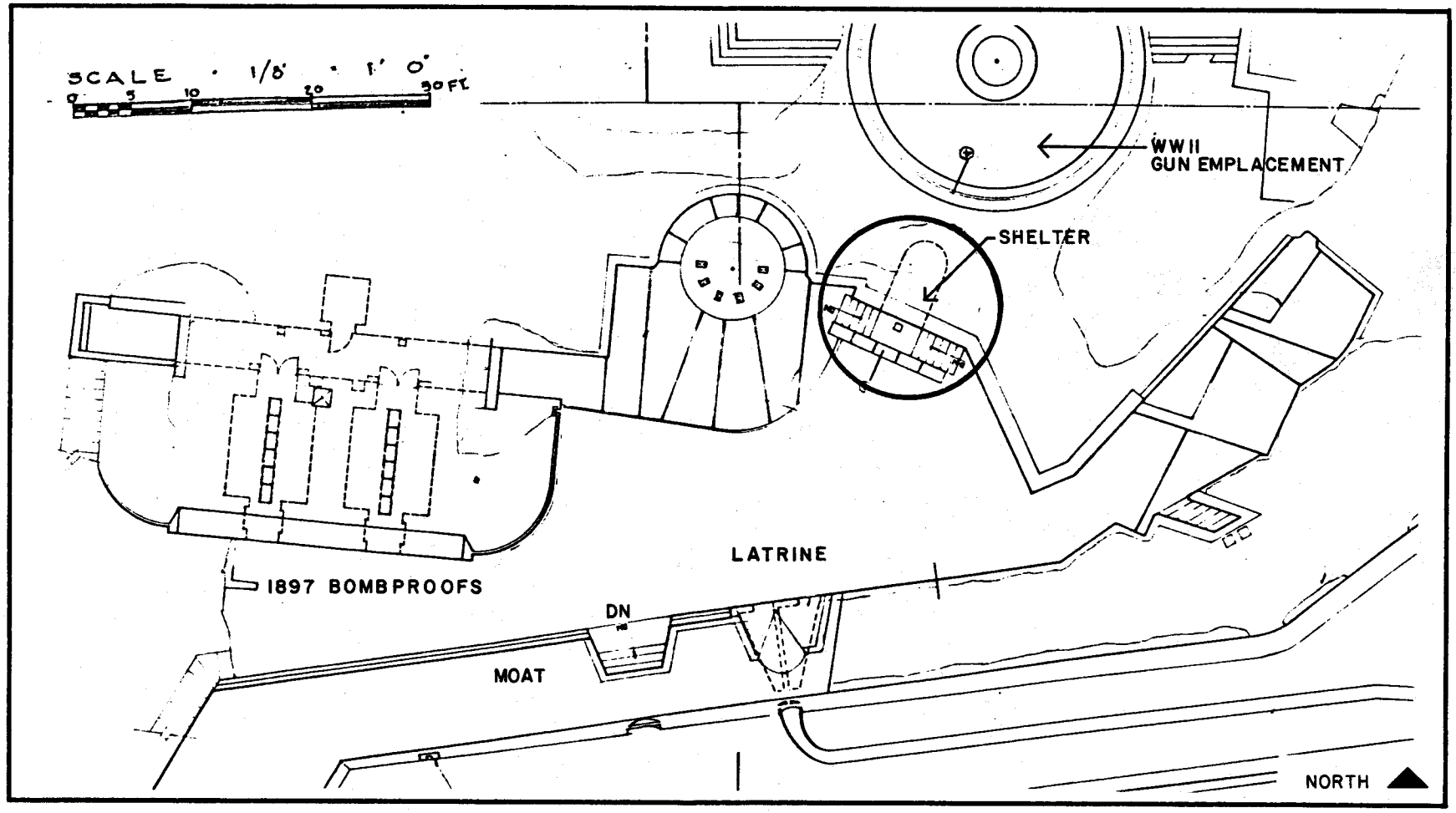


Figure 15.11. Detail of la Princesa plan with u-shaped shelter for soldiers stationed at gun position 1 circled. Drawing by HABS, 1963.

Structural Evolution

Period 1: 1625-1765

Based on available documentation, the site of la Princesa was undeveloped in this period. The 1765 plan of existing conditions by Thomas O'Daly shows the area covered with vegetation and situated about 20 varas [55.6 feet] above sea level.[1]

Period 2: 1765-1809

The outwork to the northeast of San Cristóbal, known originally as Fuerte de la Princesa was constructed sometime between 1779 and 1783. Its strategic function was "to remedy the defect of the irregularity of the [north] coast."[2] This coast has steep cliffs that could not be observed nor defended from the existing fortifications.

The design of la Princesa has been attributed to Engineer Thomas O'Daly.[3] This claim, however, is unsubstantiated. No records on the actual construction exist because the military engineers ceased sending reports to Spain after June 1779. The apparent reason was the risk involved due to the existing state of war between England and her North American colonies.[4] The first description of the completed fort was provided by Engineer Juan Francisco Mestre. Mestre's technical report was dated September 13th, 1783, and details all construction work (including la Princesa) that had occurred since June 17, 1779. (See fig. 15.12.) Accompanying his report were plans and profiles. Further details on the existing work were included in the report of the Junta (a military administrative board in Spain) dated 1771, Mestre's later report and plan dated 1792, and a report and plan by Engineer Felipe Ramírez dated 1793 and 1795.[5] A description of the new fort based on a compilation of these documents follows.

La Princesa was approached from San Cristóbal through a covered way located at its west end. The covered way was mentioned in Mestre's report and included in the plan, both dated 1783.

Proceeding clockwise from the covered way was a fortified area projecting from the steep north cliff. The purpose of this feature was to obstruct the passage of intruders invading from the east land front and along the north coast. It was composed of a deep moat cut in the live rock with a parapet wall and sod-covered terreplein located on its west side. The

only access to this defense position from the east land front was through a vault located just south of the moat beneath the main (north) parapet 60 feet above. The vault itself was reached by a long steep stairway. This vault functioned not only as a postern, but was also used "by the troops quartered in the fort, the official Guard Corps . . . ," and for the storage of powder.[6] In spite of this work, it was observed that during periods of calm, passage was possible around the moat and parapet by way of the sea. To correct this, "construction was executed on a stonework tajamar (breakwater), very solid and totally protected from the land front."[7] This feature is labeled "e" on the 1783 plan and was most likely the structure on the east side of the moat.

At the far east end of the fort was located a battery of seven guns in the parapet wall. Although not described in Mestre's early report, five embrasures pointing towards the land front and two pointing towards el Abanico were clearly illustrated in the 1783 plan. Later reports dated 1791 and 1792 describe "five cannon" and "two of small caliber" located here. The east parapet wall itself was detailed on a section dated 1783 in which the exterior of the wall was shown built upon steps cut in the sloped terrain.

On the southeast side of the fort was a moat described in great detail by Mestre in 1783.

> . . . a wide and deep moat [that] extends from the north covered way of el Abanico to the cliff of the east beach. A station or post was established at the east end of the moat to watch the beach area and prevent the escalade of the cliff. The [east] face of the fort was defended from this post with musket fire. The defenders . . . had the retreat towards el Abanico by the same moat, where for greater security, a palisade with gate was constructed at point d [on the plan].[8]

The moat, however, was considered "incomplete" and "defective" based on later reports dated 1791 and 1792. Proposals were made to improve the defensive capability of the east front, but the outcome of these proposals is unknown.

To the south of the moat, on the east side, earth was removed and a ramp to the beach formed. According to Mestre in 1783, the ramp was covered with sod to prevent erosion. This feature was labeled "f" on the plan of 1783 and "R" on the plan of 1795. (See figs. 15.12 and 15.13.)

Toward the center of the fort another battery of guns to supplement the previously described battery at the east parapet

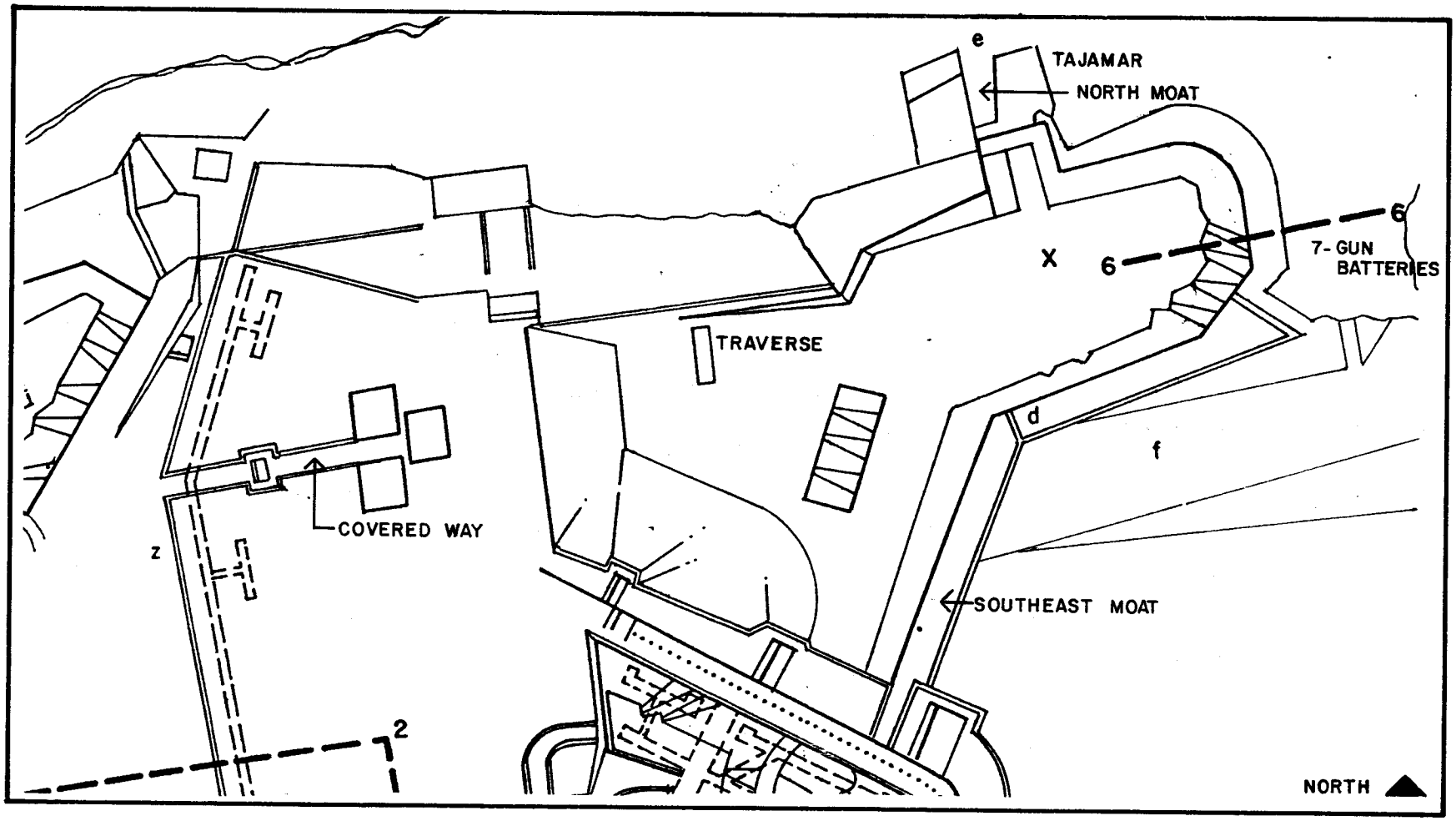


Figure 15.12. Detail of Mestre's 1783 plan showing la Princesa. Tracing of original by Torres-Reyes in Construction History of San Cristóbal, 1965.



Figure 15.13. Plan and profile of la Princesa by Felípe Ramirez, September 28, 1795. (San Juan NHS Archives.)

wall was located. This interior battery was not described in Mestre's report of 1783, but a parapet wall with three embrasures was shown in the 1783 plan. Also depicted but not described, was a rectangular traverse serving as a protective barrier from eastern attack. The embrasures were aimed towards the land front at the southeast. Possibly one more embrasure was added to the parapet because in 1791 the Junta noted that,

> . . . in the interior is seen a battery of four [guns] which defend the intermediate of its right flank and that of el Abanico . . .[9]

Similarly, the plan of 1795 describes feature "O" as a "battery of four howitzers."

Additional information on the original construction of la Princesa is also available by examining extant historic fabric. At this site, the least altered examples of eighteenth-century work are located along the fortified area on the north coast. These include the sod-covered terreplein adjacent to the moat and the vault south of the moat. Construction materials include mamposteria with fragments of stone and brick, cut stone, and bricks. Rubble was used for the walls; cut stone for foundations, at corners, and at doorway openings; and bricks at arched openings. Samples were removed from several areas.*

Period 3: 1809-1837

No documentation was found for la Princesa during this period.

Period 4: 1837-1868

La Princesa was documented for this period by the 1839 model of San Cristóbal. Conditions illustrated by the model were unchanged from those shown in the maps of 1783, 1792, and 1795 with the following exceptions: not included in the model were the covered way at the west end of the fort, the tajamar adjacent to the north moat, and the interior battery parapet wall. Possibly these were oversights on the part of the model maker rather than a true representation of existing conditions.[10]

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*SAJU 15 M01, SAJU 15 M02a, SAJU 15 M02b, SAJU 15 M04.

Period 5: 1868-1898

The interior battery of La Princesa, known as la batería de la Princesa during this time, was completely modernized by the Spanish in 1897. The details of the project were written in an 1896 report by Engineer Angel Maria Rocall and Captain Francisco Canizares. Also documenting the project were a plan showing existing and new work and a south elevation of the new battery dated ca. 1897 (fig. 15.14). Descriptions of the "as built" conditions of the battery were found in the inspection report prepared by the U. S. Army in the autumn of 1898. A summary of the work as proposed and carried out follows.[11]

Four new gun positions were built along the east-west axis of la Princesa. These were oriented towards the north rather than towards the land front as in the eighteenth century. For clarity, the positions were labeled 1 through 4 (east to west) in the project description of 1896.

Alterations to the existing ancient battery were necessary in order to build the new gun positions and roads. These preparations were described in detail in the 1896 report. An eighteenth-century traverse located just west of a cistern (date unknown) was demolished to make room for gun position 3. The cistern became the vaulted chamber within the gun position's bombproof. Demolition of the upper portion of the old north and east parapet walls was also necessary to enable unobstructed firing of the new guns. Excavation of the earthen glacis between la Princesa and el Abanico was required to allow proper grading of the new road. It was determined that the materials obtained from this demolition work could be used to form the new footings and parapet walls.

The four gun platforms were constructed by first excavating up to 1.9 meters (approx. 6.2 feet) at east gun positions 1 and 2 and up to 1.10 meters (approx. 3.6 feet) at west gun positions 3 and 4. These holes were then filled with rubble and leveled with concrete. Metal sheets and bolts were affixed to the concrete platforms at gun positions 1 and 2 in order to attach two 24-cm howitzers. Tracks were affixed at gun positions 3 and 4 for two 15-cm cannon. The 1898 inspection report specified that the cannon were in fact "15-cm Ordonez rifles on front-pintle carriages," each gun emplacement was about 33 feet wide by 23 feet deep, and each platform a different elevation above the sea.[12] The 1896 report described the new parapet walls as 12 meters (39.37 feet) thick. Those corresponding to the cannon only were solid concrete and covered with sod. No concrete was used for the walls corresponding to the howitzer positions.

Communicating between the new gun positions were three traverses. The 1898 inspection report noted the two end

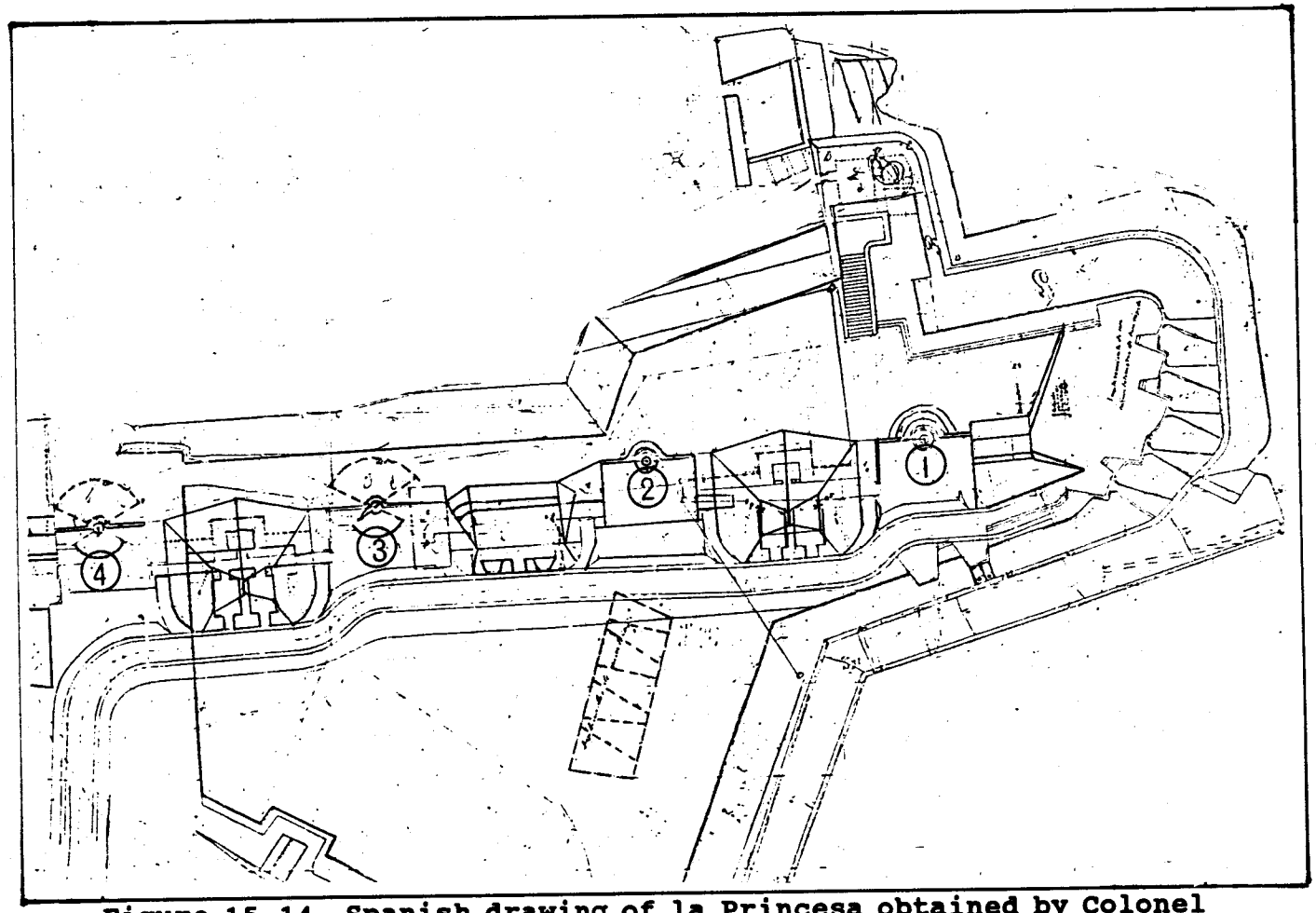


Figure 15.14. Spanish drawing of la Princesa obtained by Colonel Goethals in 1898 showing the new battery. (San Juan NHS Archives.)

traverses to be 39 feet wide by 33 feet deep and the centraltraverse to be 6 feet 6 inches wider. The south elevation (dated ca. 1897) showed the eastern and middle traverses with ramps, and the western traverse with steps that led to the gun positions. The traverses were to serve as a protected shelter for the gunmen, and in the case of the east and west traverses, as a safe passage between gun positions. Within each of the three traverses is one or more bombproof vaults, generally referred to as "bombproofs." (See fig. 15.10.)

The two end bombproofs (east and west) were designed to store munitions and the middle bombproof to function as an infirmary. During times of war, the east vault supplied munitions to the howitzers at gun positions 1 and 2. The west vault supplied munitions to the cannon at positions 3 and 4. When not involved in war, munitions were stored in the Guardhouse at el Abanico. Rubble and concrete were used to construct all three. The foundation and walls not exposed to fire were composed of rubble faced with concrete. Areas exposed to fire were all of concrete construction. Floors were concrete pavement. The type of concrete specified throughout was hydraulic concrete no. 7. All exposed roofs and walls were covered with sod for camouflage and to help prevent humidity.[13] Over the doorways of the south chambers were windows for ventilation that were enclosed by grilles and metal screens. All of the doors were pine, the frames ausubo, and the locks bronze.[14]

Lighting for the chambers was a difficult problem due to the explosive nature of the materials stored therein. Three lamps set into wall cavities were proposed in 1896 to illuminate both the passageway and the interior chambers. The cavities would be enclosed with glass, fixed in wood frames, and buffered from shaking by rubber strips. Proposed locations for the three cavities were above the doorway of the north chamber and in the walls of the south chambers. The two south chamber lamps would be fixed to minimize risk of explosion. The passageway lamp would be movable. It is unknown if the proposal was realized.[15]

The middle bombproof was located in the traverse between gun positions 2 and 3. It was used as an infirmary and a dormitory during times of war. Unlike the end bombproofs, it was comprised of one large chamber and has no passageway. Instead, doorways in the east and west end walls gave access to the gun esplanades. In the south wall there were three openings, a center doorway flanked by two large windows that overlooked the interior service roadway. As in the end bombproofs, pine, ausubo, and bronze were used for the doors and windows.

As previously mentioned, the bombproofs also served as shelters to the gun operators when under enemy fire and not

needed on the esplanades. The configuration of the bombproofs allowed gun positions 1 and 4 only one shelter each (within the end bombproofs). Gun positions 2 and 3 were situated between two bombproofs with access to both. To improve this situation, two additional shelters were proposed: one to the east of gun position 1 and another to the west of gun position 4. Based on the structures remaining today, it appears that the east shelter was built as proposed. Presumably the west shelter was also built. But neither documentation nor physical evidence was found to confirm this.

Exterior communication between gun positions was by means of a new road located on the south side of the new gun positions. (See fig. 15.14.) This road ran in a westerly direction from gun position 1 to gun position 4 where it then turned south towards el Abanico. The bombproof chambers and the gun esplanades were both accessible from the roadway. The esplanades were accessed by means of ramps directly connected to the road. The road was paved with concrete, as was the area between gun position 1 and the east parapet wall. Draining the roadway were gutters located on either side.

A new latrine was built at la Princesa "in the parapet" wall adjacent to the southwest moat. Running water was provided periodically by runoff from the interior road. Water was channeled from the road's gutters into a drain that emptied through the scupper hole of the latrine and into the moat. Remnants of this concrete latrine exist today. Two samples of the "hydraulic concrete" used during this late-nineteenth-century construction were removed in 1986.* Graffiti in this area is dated 1914.

Paint samples were also removed from these same locations. A sample from the concrete stucco on the old parapet wall has a thin yellow finish similar to a pigmented whitewash. Inside the south chamber, a sample from the plastered wall was found to have first been finished with two layers of an unpigmented whitewash.** The exact date of the exterior finish could not be determined. Finishing of the interior was first documented in 1901 when the magazines were "whitewashed." However, the earliest finishes may date to the 1890s period.

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*SAJU 15 M05, SAJU 15 M06.

**SAJU 15 P01, SAJU 15 P02.

Period 6: 1898-1987

Minor repairs and improvements were made in the first decade of the twentieth century by the U. S. Army. Proposed in February 1901 and funded shortly thereafter, were repairs including the whitewashing of Princesa's magazines (east and west bombproofs).[16] Work accomplished in 1902 included repairing the walls and hanging a new door.[17] In 1903-04, electric lighting was installed at la Princesa and six lights added to the magazines.[18] A report written in 1908 indicates that the Army had ceased to use the area. Correspondence of the same date states that la Princesa was patrolled daily and that brass and copper fixtures (of an unspecified function) had been removed for safe keeping.[19]

La Princesa became a vital area once again during World War I. In 1917, it was decided to make the area "combat ready." To this end, minor repairs were made to the magazines, 116 cubic yards of concrete was laid at Gun Position 3, and an Armstrong gun emplaced.[20]

The most significant alteration occurred in January of 1930 when construction of ten reinforced concrete structures to house military personnel commenced. Preparatory work involved destroying most of the 1895-97 battery with dynamite and hauling away the debris. Removed at this time were gun positions 2, 3, and 4; the center traverse and center bombproof that had housed the infirmary; the west traverse and west end bombproof that had stored munitions for the cannon emplaced at positions 3 and 4; and the shelter on the far west side of gun position 4. Left standing were gun position 1, the east traverse and east end bombproof, and the small shelter on the far east side of gun position one. New buildings constructed in the immediate vicinity of la Princesa battery were building no. 227 (garage) at former gun position 2, no. 225 (house) at former gun position 3, and no. 224 (house) at former gun position 4. Four additional houses were constructed along the north parapet and four were built just west of the entrance to el Abanico. Houses were built in two rows along a new road providing vehicular access. (See figs. 15.15 and 15.16.) Installed beneath the pavement were water lines, electrical conduit, and pipe drains.[21]

By the 1930s, the entire area east of San Cristóbal's main moat was mislabeled by the Army "La Princesa Fort." This error is seen in both plans and in the written documentation.[22]

La Princesa was rehabilitated again during 1940-41 in preparation for World War II. Four modern emplacements for 155-mm guns were constructed along the north coast. The exact locations of these gunblocks were illustrated in a later "as built" plan dated 1949 (fig. 15.17). Three emplacements were

sited towards the east end of la Princesa and one at the far west end. Also undertaken at this time was the rehabilitation of the existing magazines. These would have included the east bombproof and the east shelter that formerly serviced gun position 1 in the late 1890s. One alteration involved the installation of welded steel door frames anchored to the existing masonry walls.[23]



Figure 15.15. Aerial view of fort showing new army housing on portions of la Princesa and Santa Teresa, ca. 1938-40. (San Juan NHS Archives.)

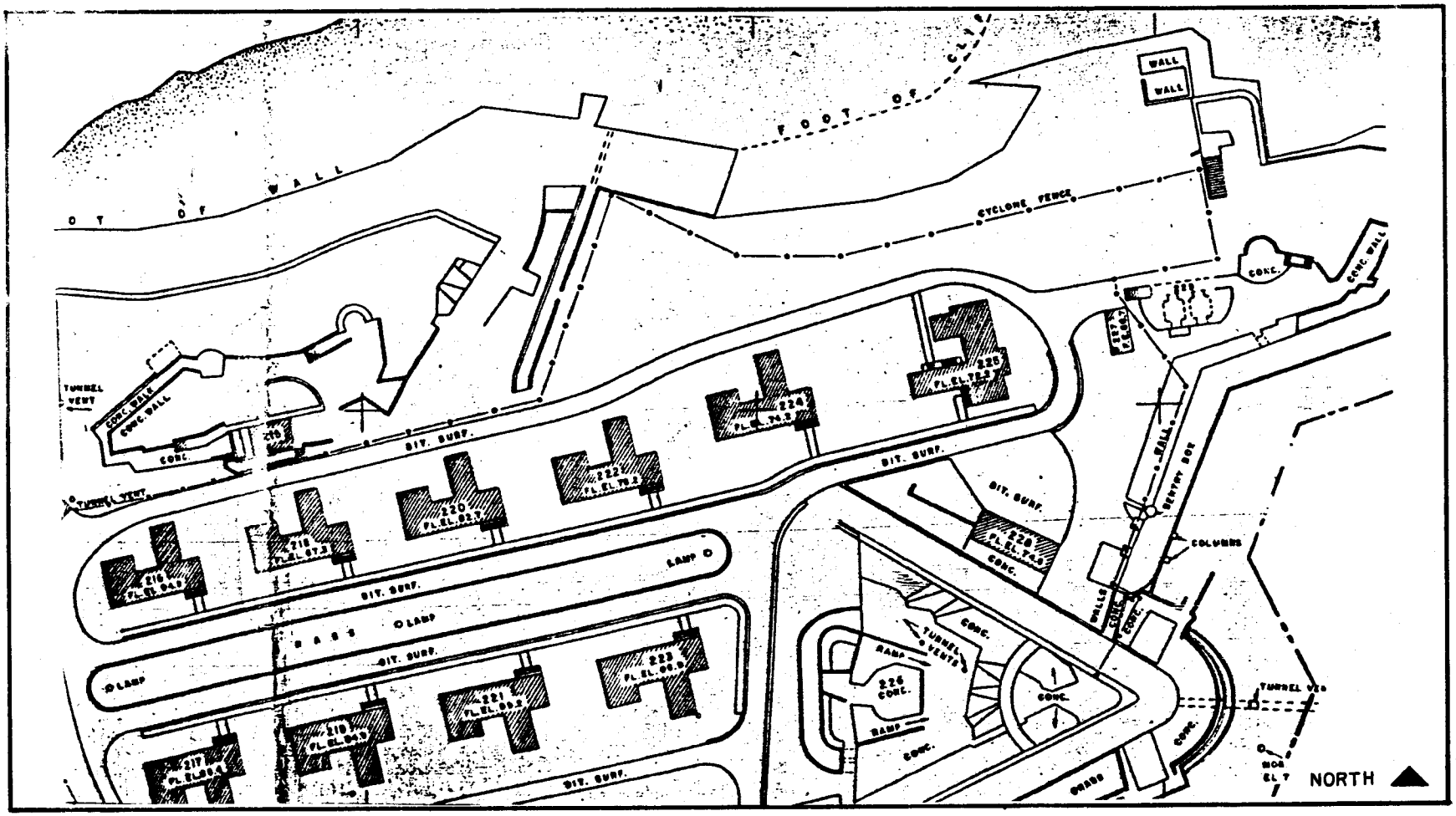


Figure 15.16. Plan showing new army housing on portions of la Princesa, 1949. (San Juan NHS Archives.)

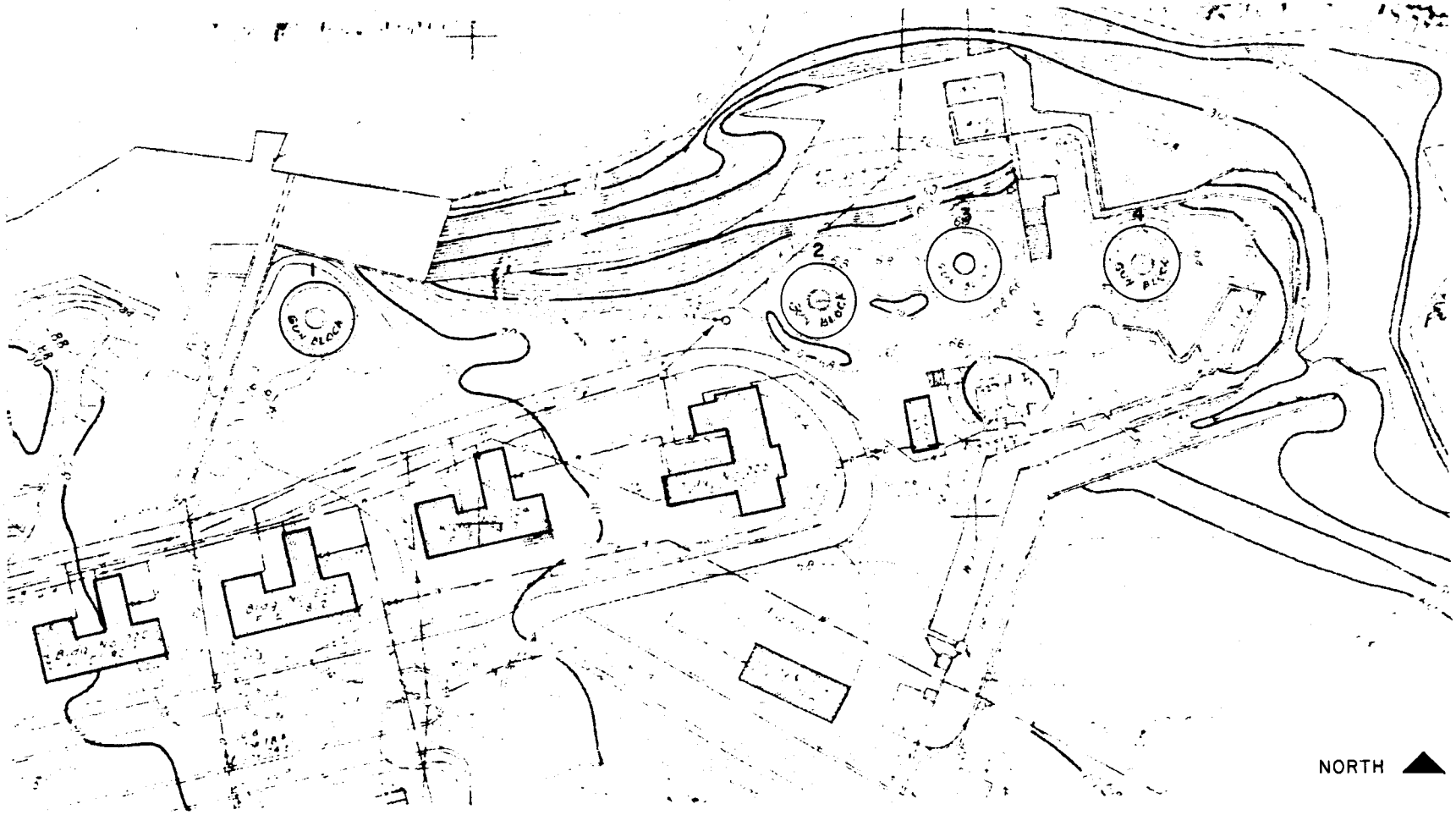


Figure 15.17. Detail of plan showing impact of 1930's housing and World War II gun blocks on la Princesa, 1949. (San Juan NHS Archives.)

Other details are not known. Possibly enclosed at this time was the early staircase leading from the battery to the original eighteenth-century north vaults. By 1943, it was noted that this staircase had been "sealed off by more recent construction."[24]

A chain link fence enclosed the la Princesa housing project by the late-1940s. It was most likely installed sometime after World War II when the four gun emplacements were no longer in use. The fence created a barrier between the now unused eastern end of la Princesa and the housing development to the west. This fence also bordered the north cliff to the west of the stairs and the west side and south end of the southeast moat.[25]

In 1953, repairs were made to the damaged sea walls at "Battery Princesa."[26] Three years later, in a survey report on the fortification walls dated 1956, additional problem areas were identified at the north cliff and the southeast moat. Riprap fill was recommended for the north wall and cement restoration work for the moat walls.[27] There is no record of whether or not the recommendations were followed at this time.

The existing conditions of la Princesa were recorded photographically in January 1960 by Jack Boucher of HABS. (See fig. 15.18.) Seven sheets of measured drawings were prepared by HABS three years later. These drawings and photographs recorded only those areas of la Princesa not impacted by the 1930 military housing project. The 1940's chain link fence was not shown, although it was still extant based on other photographs taken at this time. The area was labeled by HABS, "Fuerte La Princesa."[28]

The year 1963 is also when extensive repair and excavation work was undertaken as part of the Accelerated Public Works program (fig. 15.19). From February through June, both a crew of masons and a labor crew were employed. The mason's crew focused on the "south wall" (most likely the southeast moat), patching and repairing approximately 9,000 square feet of masonry. The labor crew worked to uncover buried features at a Princesa. Approximately 390 cubic yards of earth were removed, "exposing World War II anti-aircraft gun track and the remains of the original embrasures and gun decks of the Bastion [sic]."[29] It is possible that more of the site's features, particularly to the north and west, are still extant buried below ground.

Demolition of the 1930 military housing was first addressed in 1976 when the NPS initiated 106 compliance procedures. These houses were described as "badly deteriorated . . . [and] . . . beyond salvage." The goal of the NPS was to "return an integral part of Fort San Cristóbal to a more historical

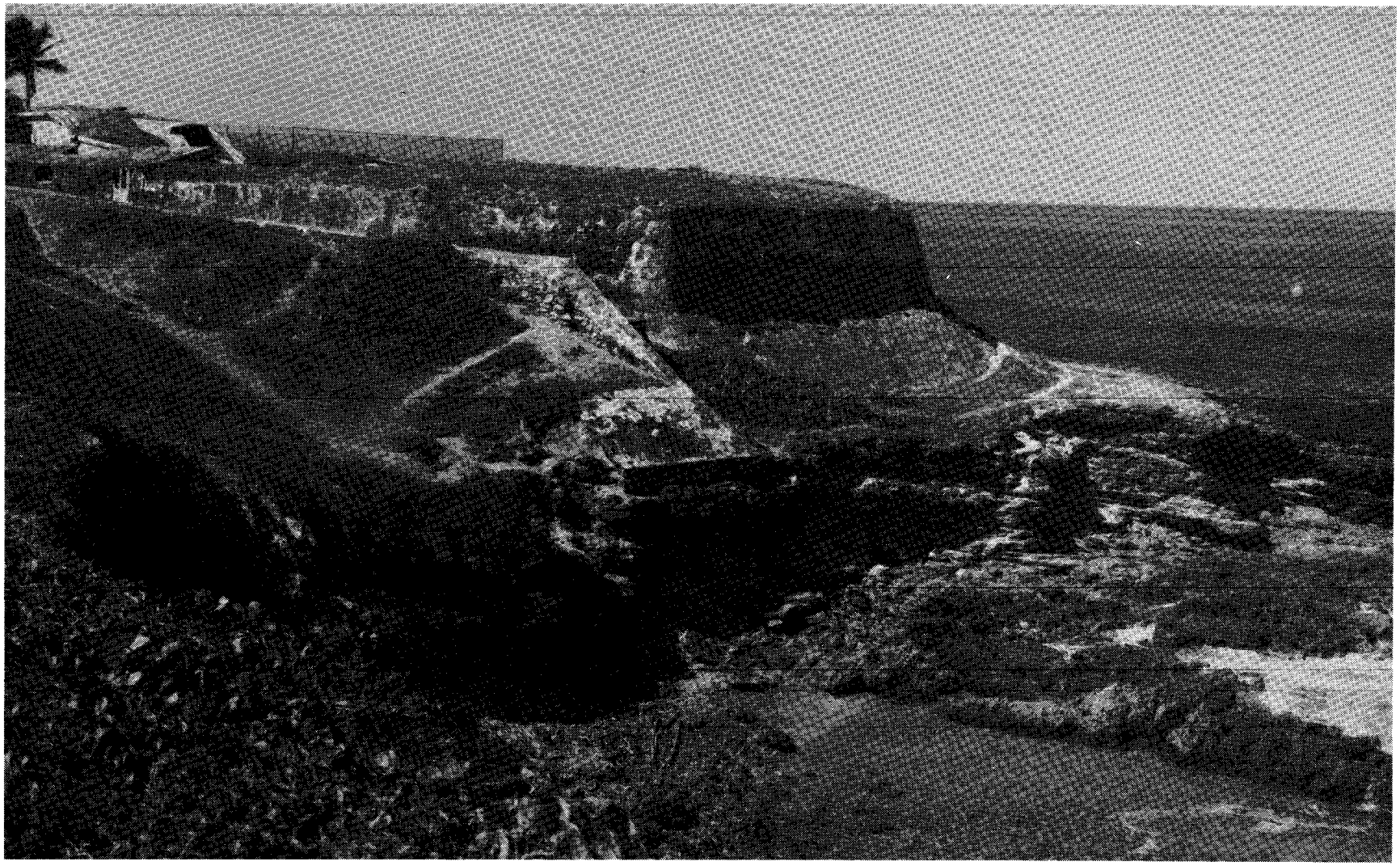
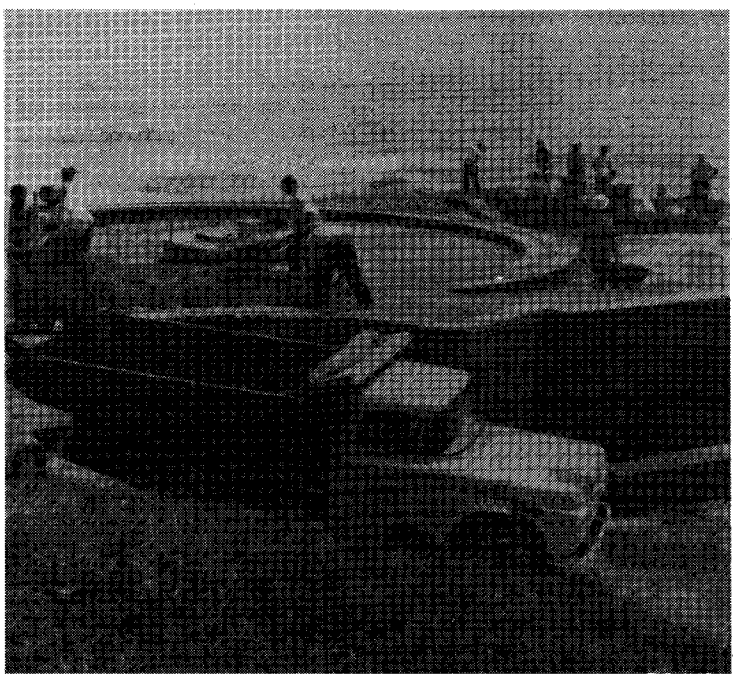


Figure 15.18. View of la Princesa looking northwest. HABS photo by Jack Boucher, January 1960.



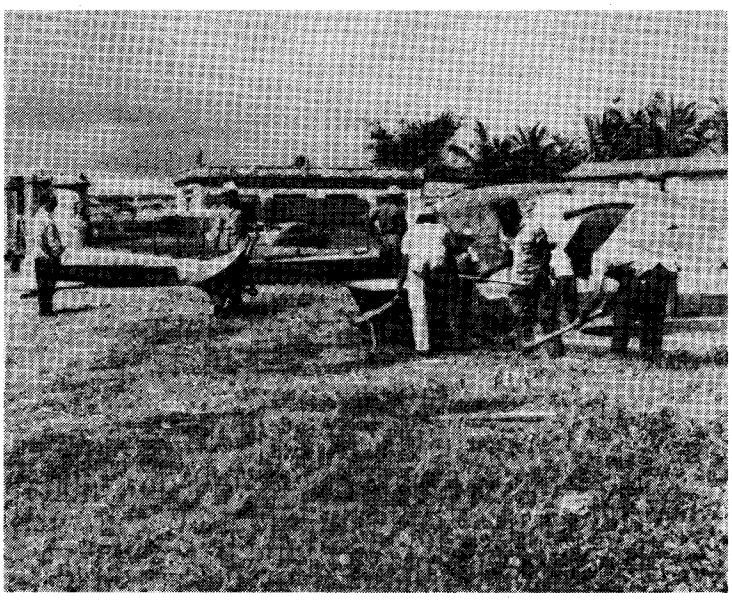


Figure 15.19. Excavation work at la Princesa by the Accelerated Public Works program in May, 1963. (San Juan NHS Archives.)

appearance." It was proposed that the following "non-historic" features be removed: houses, garages, asphalt paving, curbs, concrete walks, retaining walls, lamp posts and fire hydrants. No disturbance to the adjacent historic fortifications was anticipated. Prior todemolition, it was proposed that an archaeological investigation be made. Landscaping would be done after demolition. Final approval of the work was granted in August 1976.[30] Exactly when the housing was removed is not known. No archaeology report has been located.

In 1977, a proposal to repair the outworks of San Cristóbal on a recurring basis was approved. The 106 compliance statement describes this work as follows:

> 1. Repair all masonry wall surfaces, steps, ramps and platforms with approved materials and formulas under the direction of an historic architect.
>
> 2a. Replace missing doors, gates, windows and shutters with replicas of the originals as determined and designated by an historic architect.
>
> 2b. Repair original damaged components with same kind of material if available or substitute approved by the historic architect. Every effort will be made to retain as much of the original components as possible.[31]

As a result of this approval, all future repairs and replacement components overseen by an "historic architect" would not require 106 compliance.

Permission to relocate the ca. 1940's "6 foot high mesh wire fence" was requested in 1981. This was the same fence that had originally enclosed the military housing demolished in the late 1970s. Problems with vandals at the east end of la Princesa prompted the request to move the fence to the outer east perimeter and thus enclose the area.[32] Although no record of the work has been found, approval was apparently granted since the fence is located at the east perimeter of la Princesa today.

Presently, Fuerte la Princesa remains unused. This part of San Cristóbal is not open to visitors. Clearly seen from San Cristóbal, however, it is interpreted visually from afar.

Conditions

La Princesa is solidly constructed but only in fair to poor condition. Erosion, weathering, biological activity, and staining are evident on the roof of the nineteenth-century bombproof. The twentieth-century iron gunblock's track is rusting. Constant wave action undermines the lower sea wall and moat to the north.

The north moat and its ancillary structures are generally of sandstone rubble laid with a red beige mortar. Banquettes are of brick. Very little of the original stucco remains. The conditions are poor, with much erosion, loss of material, and incompatible use of rock infill. A steep slope up to the main level of la Princesa is planted with lush vegetation. The 1986 structural report on San Cristóbal confirmed that much of this front is badly deteriorated and exposed to constant wave action. Seaweed, barnacles and ocean debris make it difficult to differentiate between man-made walls and the natural rock ledge that serves as a foundation for la Princesa.

The condition of the north coast foundations was assessed in a report dated 1975. Wave action was noted to have caused severe erosion and undercutting in the lower walls. Structural failure was predicted to be the eventual result of continued deterioration. Recommendations included filling the undercut areas with grout-filled bags and building a concrete revetment forward of the wall.[33] No records of subsequent work were found.

The north coast walls of la Princesa were examined once again in 1986. The lower concrete sea wall was then observed by Civil Engineer Todd Rutenbeck to be in generally good condition. However, similar to conditions in 1975, wave action was found to be undercutting the foundation. As before, filling of the undercut areas with concrete was recommended.[34] No action has yet been taken.

The overall condition of the original bombproof vaults beneath the main parapet is poor: exposed stone and brick is badly weathered; brick pavers are almost entirely missing; vaults are damp; whitewashed surfaces inside the vaults are stained and have biological growth and efflorescence; metal surfaces are rusted due to salt corrosion.

On the stairway accessing the vaults approximately 95% of the bricks are now missing. The stuccoed cheek walls are of brick and stone rubble. Sections of stucco are deteriorated to expose the subsurface conditions.

On the north parapet, 1940's modifications including the construction of a circular gun block, are in poor condition

with weathered and stained concrete and a heavily rusted iron track.

The south parapet is in better condition than the north and east parapets because of its more protected location. However, original stucco barely survives and the subsurface stone and rubble material is weathered to a spongelike appearance. Portland cement patches and other repairs are readily apparent within the two south-facing embrasures. Biological activity is present on many of the horizontal surfaces. Abutting the south parapet is the dry south moat. It is primarily in good condition although weathered and stained.

NOTES

1. A copy of O'Daly's plan showing the existing conditions in 1765 is included in Volume I, no. 6 of this report.

2. Report by Juan Francisco Mestre dated November 17, 1792. National Archives, Records of the Spanish Governors of Puerto Rico, Record Group 186. A microfilm copy is in the library at San Juan NHS.

3. In 1963, HABS wrote, "[Fuerte La Princesa] was built 1779-1783 under the direction of Military Engineer Thomas O'Daly . . . ," sheet 1 of 7 drawings.

4. Ricardo Torres-Reyes, "Construction History of San Cristóbal: 1634-1800," NPS report, San Juan National Historic Site, June 1965, p. 97.

5. The reports dated 9/13/1783, 5/30/1791, 11/17/1792, and 11/16/1793, are in the National Archives, Records of the Spanish Governors of Puerto Rico, Record Group 186. Microfilm copies are in the library at San Juan NHS. Copies of the plans dated 1783, 1792 and 1795 are in the "Construction History" report by Torres-Reyes, unpaginated.

6. Ibid.

7. Ibid.

8. Ibid.

9. Ibid.

10. A copy of the 1839 model is now in the visitor information center at San Cristobal.

11. "Memoria descriptva del proyecto de modificacion de la bateria de la Princesa . . .," May 5, 1896, with attachment dated October 6, 1896. A transcription that is partly typewritten and partly handwritten is in the library at San Juan NHS. Both drawings are dated ca. 1897, untitled, and in the drawing collection of San Juan NHS. The plan is drawing no. NHS SJ.-9775 (formerly Drawer 107 sheet 2-13) and was labeled by the Library of Congress, "La Princesa General Plan of Battery and Accessories." The elevation is drawing no. 107-2-14 and was labeled by the Library of Congress, "La Princesa General Elevation of Battery." A summary of the 1898 inspection report by Major Crosby and Colonel Goethals is included on pages 37-38 of the historic structure report by Edwin C. Bearss, San Juan Fortifications 1898-1958 (U.S. Dept. of the Interior, NPS, Feb. 1984).

12. Edwin Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of the Interior, NPS, February 1984), p. 37.

13. See note 11. Information gleaned from same sources.

14. See note 11.

15. Ibid.

16. Ibid., pp. 78-79. Original reference is to correspondence in the National Archives dated Feb. 13, Feb. 28, and April 10, 1901.

17. Ibid., p. 82. Original reference is to a report entitled Executive Documents.

18. Ibid., pp. 134-135. Original reference is to correspondence in the National Archives dated 1903.

19. Ibid., pp. 100-101. Original reference is to correspondence in the National Archives dated Jan. 31 and Feb. 17, 1908.

20. Ibid., pp. 145-148. Original reference to the concrete and minor repairs is found in a letter dated April 20, 1918. The Armstrong gun is described in a letter dated Dec. 10, 1917. Both are in the National Archives.

21. Ibid., pp. 315-317. Descriptions of the remaining fortifications and placements of the new buildings were determined by comparing the ca. 1897 plan with plans from the 1940s. A description of the utilities located beneath the pavement was included on page 406 of the 1956 "Survey Report on Fortification Walls, Fort Brooke," by the U.S. Army Corps of Engineers.

22. Two plans that label the entire eastern outworks "La Princesa Fort" are dated 1939 and were prepared to accompany Specification No. F-28-5. Both are in the drawing collection of San Juan NHS and are numbered NHS SJ. 9053 and NHS SJ. 9060. The written description for Specification No. F-28-6 as summarized on p. 265 of Bearss' San Juan Fortifications is likewise in error.

23. Bearss, pp. 339-343. The plan dated 1949 is in the drawing collection of San Juan NHS, "As Built Survey, Fort Brooke," location no. FC6-DR4-ENV117.

24. Edward A. Hoyt, 2nd Lt., A History of the Harbor Defenses of San Juan, P.R., Under Spain, 1509-1898 (San Juan: Antilles Coast Artillery Command, 1943), p. 145.

25. The fence first appears in an undated plan entitled "Fort Brooke As Built" by the U.S. Army Office of the Engineer, in the drawing collection of San Juan NHS, location no. FC1-DR4-ENV020. It appears to date to the late 1940s.

26. Bearss, pp. 399-400. Specific details on the repair work in 1953 were not found by Bearss.

27. U.S. Army Corps of Engineers, "Survey Report on Fortification Walls, Fort Brook" (1956), p. 406.

28. The two HABS photographs reviewed for this report are labeled, "No. 56: La Princesa Moat Viewed From El Abanico," and "No. 65: La Princesa Battery Viewed From the East." More views are undoubtedly on file at HABS or the Library of Congress. The drawings are entitled "Fuerte La Princesa, Castillo de San Cristobal." A short report with the same tile was also prepared for HABS at this time by Ricardo Torres-Reyes and F. Blair Reeves, July 1963.

29. Thomas R. Frost, Architect, "APW Day Labor," completion report included in San Juan NHS file folder "D24 Accelerated Public Works APW-3, San Cristobal and Outwork, El Morro." Three photographs of work in progress are in the photo collection of San Juan NHS. These are dated May 1963 and were taken by Casenave for El Mundo. It is not known if the photos or an article were subsequently published.

30. "Section 106 Compliance Statement: Effect of Demolishing and Removing Contemporary Military Quarters from la Princesa Outworks of Fort San Cristobal, San Juan National Historic Site, San Juan, Puerto Rico," enclosed with a letter dated June 29, 1976, from the Southeast Regional Director to the SHPO of Puerto Rico. Included were three photographs showing existing conditions. A ruling of "no adverse effect" was received from both the SHPO (7/13/1976) and from the Advisory Council on Historic Preservation (8/11/1976). The park was given approval to proceed with the project when funds were available in a memo from the regional office dated 8/18/1976.

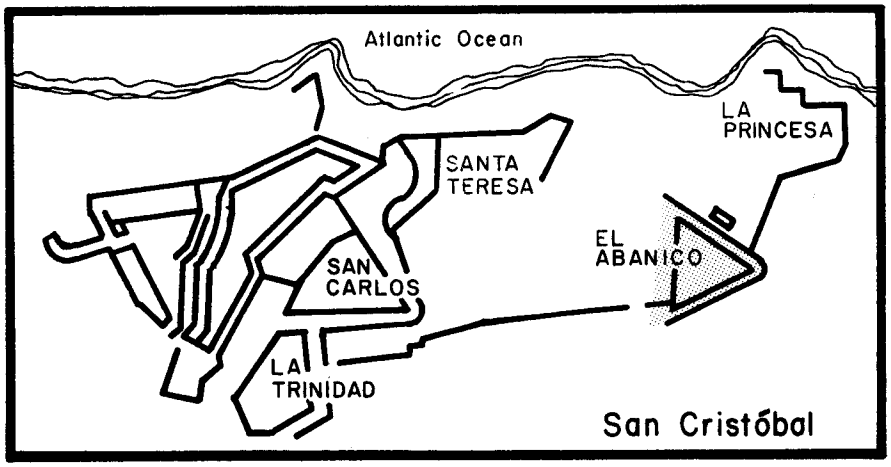
31. "Section 106 Compliance Statement: Repair Fort San Cristobal Outworks, San Juan National Historic Site," 1977. A ruling of "no adverse effect" was received from both the SHPO (5/16/1977).

32. Memorandum dated 5/14/1981 from the park to the Southeast Regional Director, Folder 57217 "Relocation Fence La Princesa," in the files at San Juan NHS.

33. National Park Service - Southeast Regional Office and U.S. Army Corps of Engineers, "Foundation Condition Appraisal and Improvements Recommended," (1975), pp. 7 & 19. Photographs of

existing conditions are included in Appendix A, figures 5 through 10. A copy of the report is in the files at San Juan NHS.

34. Todd Rutenbeck, Civil Engineer, "Structural Inspection of Castillo San Cristobal, San Juan, Puerto Rico," Denver: Bureau of Reclamation, Engineering & Research Center, October 1, 1986.



CHAPTER 16

FORT OF THE FAN (FUERTE DEL ABANICO)

Description

The outwork of el Abanico is located due east of San Cristóbal and south of la Princesa, on a low hill overlooking the north coast and the modern city of San Juan. It was designed to be a natural extension of the terrain and is oriented to face the original land front. Historically known as Fuerte del Abanico (Fort of the Fan), it was built between 1779-1783. The design of el Abanico was dictated by a crossfire pattern for the three gun emplacements in the "fan battery." Although it is similar in design to a ravelin, (a projecting outwork forming a salient angle), it is actually a small fort detached from the principal fortification and can be considered a redoubt. (Fig. 16.1, 16.2, 16.3.)

In plan, el Abanico is an equilateral triangle located on a natural rise of strategic importance. El Abanico completed the north to south boundary of San Cristóbal: the third line of defense. For purposes of this study, discussion of el Abanico will be arranged in a roughly west to east direction. The features to be discussed include the covered way at the entrance (B), the gorge (entrance area) with its moat (D, C), the north and south ramps, the "fan battery", the north and south terrepleins, the main moat (H), the dry moat at the southwest (A), the moat's covered way (K), and the glacis. (See fig. 16.4, 16.5.)

The original entrance to el Abanico was from the west by means of a covered way from San Carlos and San Cristóbal. Constructed out of natural rock, this two-sided passageway is

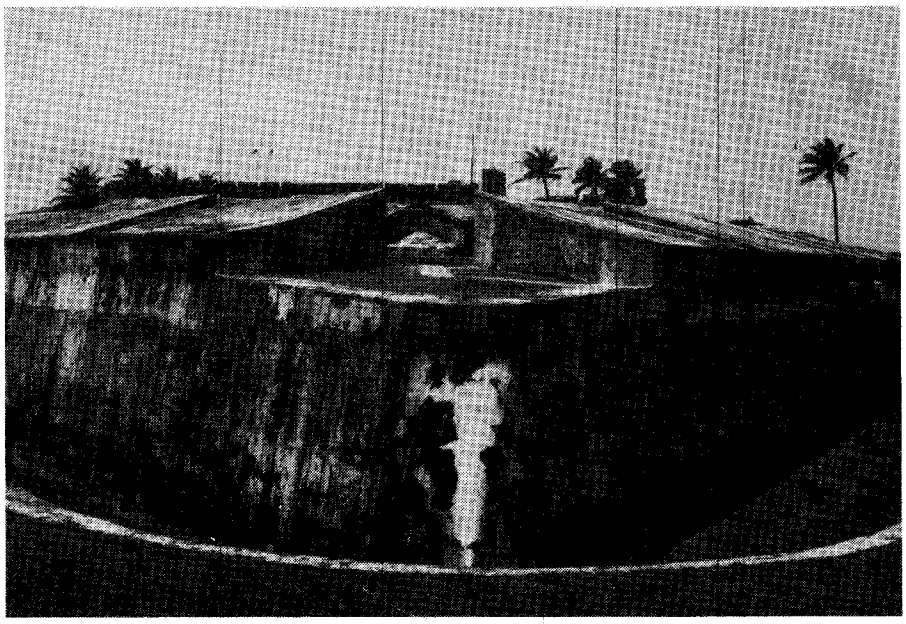


Figure 16.1. East elevation of scarp wall and parapet slopes, el Abanico. Photo by Richard Crisson, 1986.

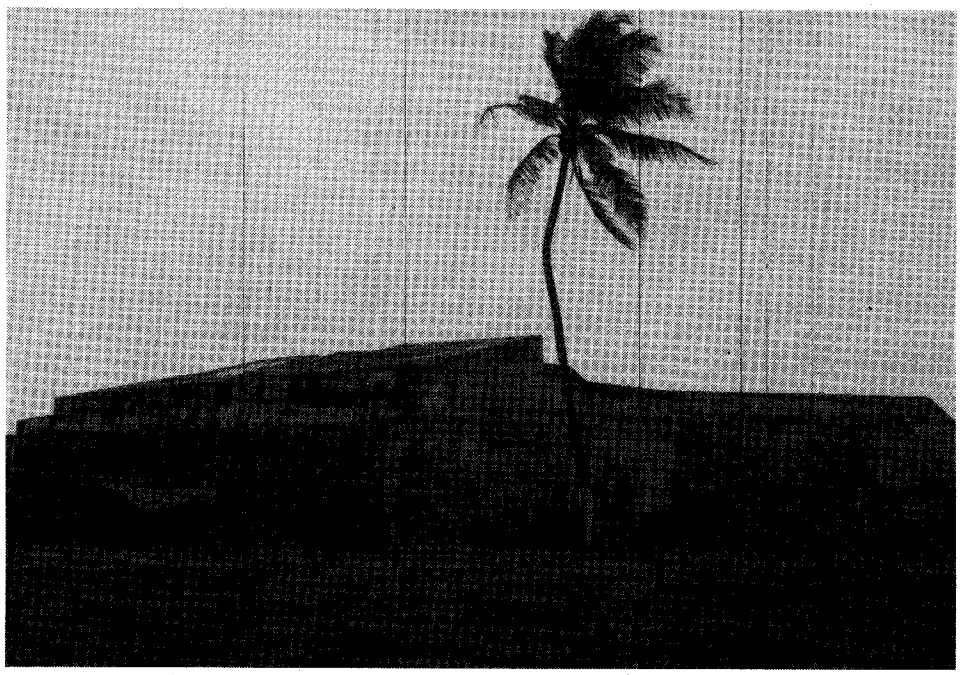


Figure 16.2. North and west elevations of el Abanico. Photo by Richard Crisson, 1986.

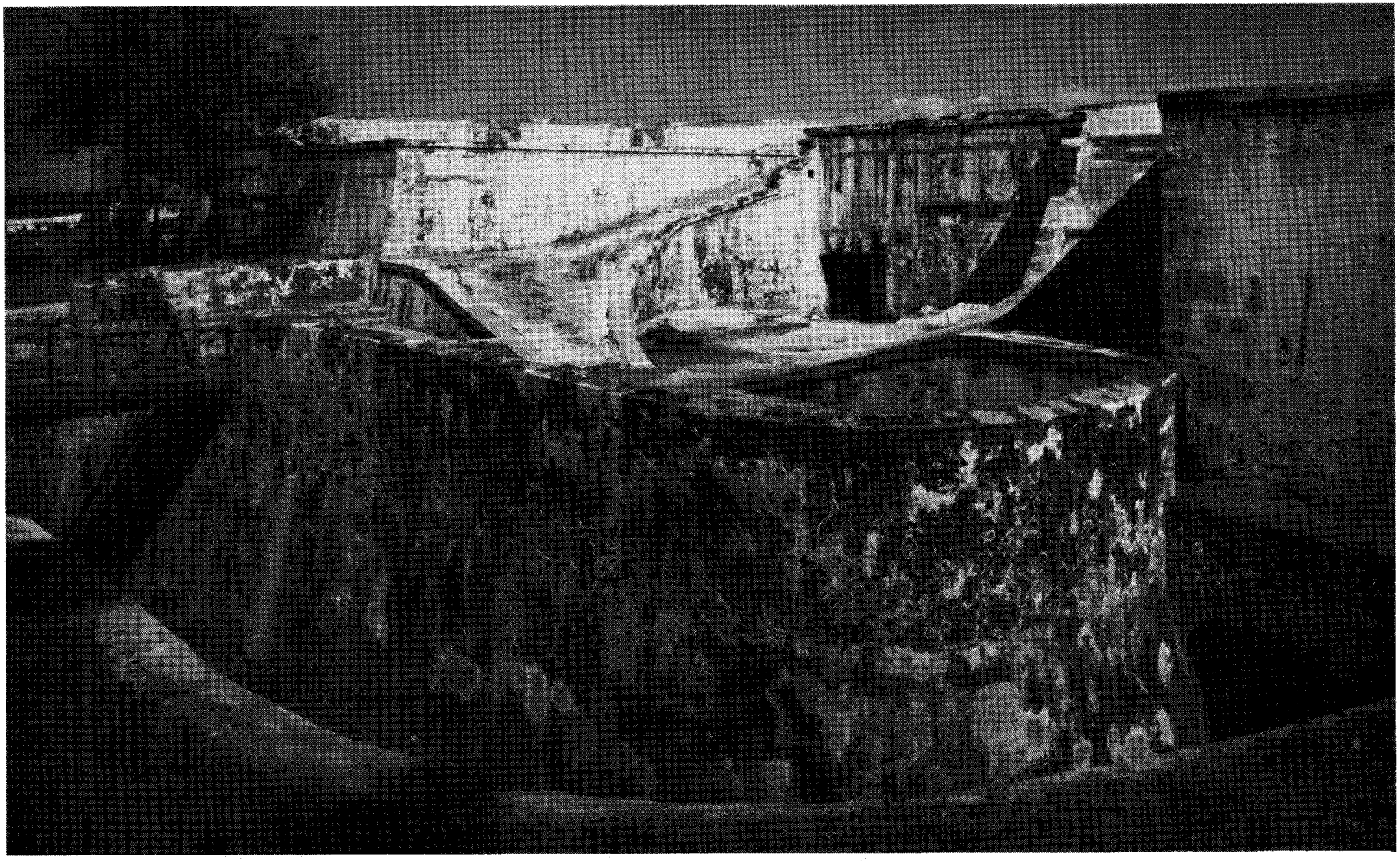


Figure 16.3. View of el Abanico looking northeast showing the gorge's moat and ramps to the upper parapets. Photo by HABS, January 1960.

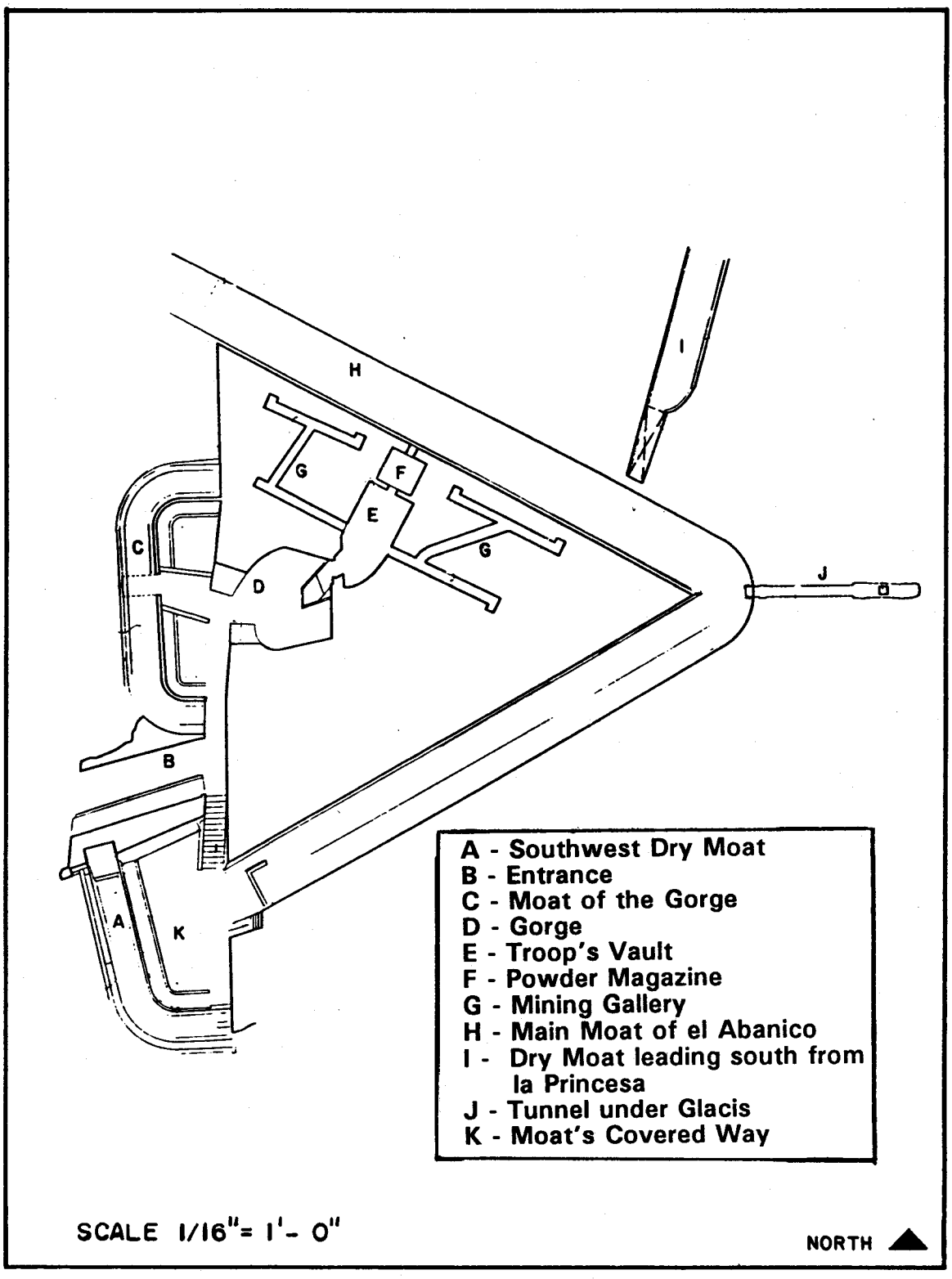


Figure 16.4. Plan of el Abanico with selected elements labeled. Detail of HABS plan (1963) as annotated by Jana Gross (1989).

Figure 16.5. Plan of el Abanico by HABS, 1963.

now only partly extant. On the south side is a sloping parapet wall with a two-stepped banquette. A gate and sentry box were built into this south parapet ca. 1896. From that time, the main vehicular approach to el Abanico was through this gate.

North of the entrance covered way, a small sod-covered bridge provides access to the gorge (or throat) of el Abanico. The bridge spans the southern end of the moat fronting the gorge and is supported by a double vault. On the opposite side of the bridge (the west scarp wall) evidence remains of a stone wall pocket for a gate.

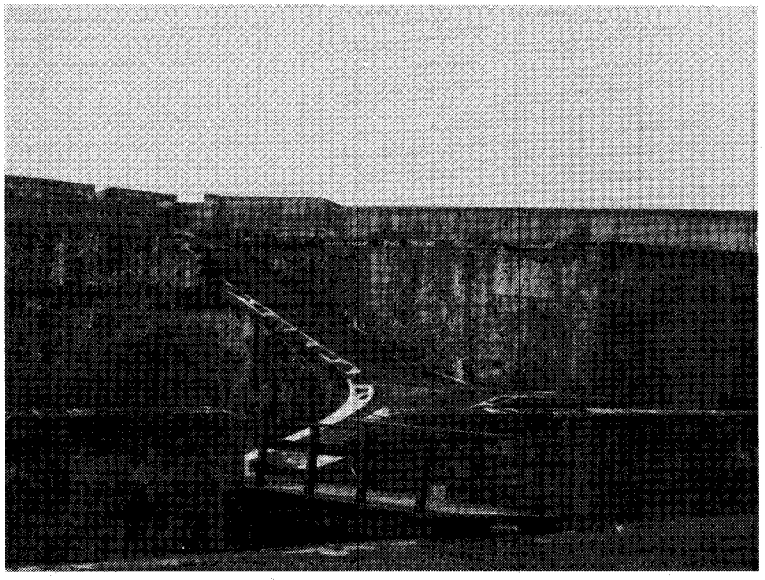


Figure 16.6. West elevation of el Abanico showing wooden bridge over the gorge, the parade, and the south ramp to the upper terreplein. Photo by Richard Crisson, 1986.

Today, a wooden bridge spans the moat at the center of the gorge (fig. 16.6). It was probably installed by the NPS Ca. 1960. An earth and sod ramp leads down to the covered with sod.

The curved north and south ramps of el Abanico rise approximately 16 feet from the level of the gorge to the level of the terreplein of the fan battery and is designed to create an overlapping effect in plan. Both ramps are similar in shape and construction. The retaining walls are of rubble masonry covered with stucco. The upper walls of the ramps contain the upper north and south terrepleins. Numerous inscriptions, dates, names and ship sketches are scratched into these wall surfaces. Some were scratched into the still-wet stucco and thus date from the original construction. (See fig. 16.7).

The central part of the gorge is continued within the curved ramps. The wall farther east contains the entrance to the troops vault, powder room and mining galleries. The entrance has a segmental stone arch with a stucco surround and projecting keystone. Evidence remains of faux ashlar depicting

quoins and voussoirs. The terreplein of the gorge is ramped directly in front of this doorway. Modern steel-plate doors are in place though the original doors were much wider.

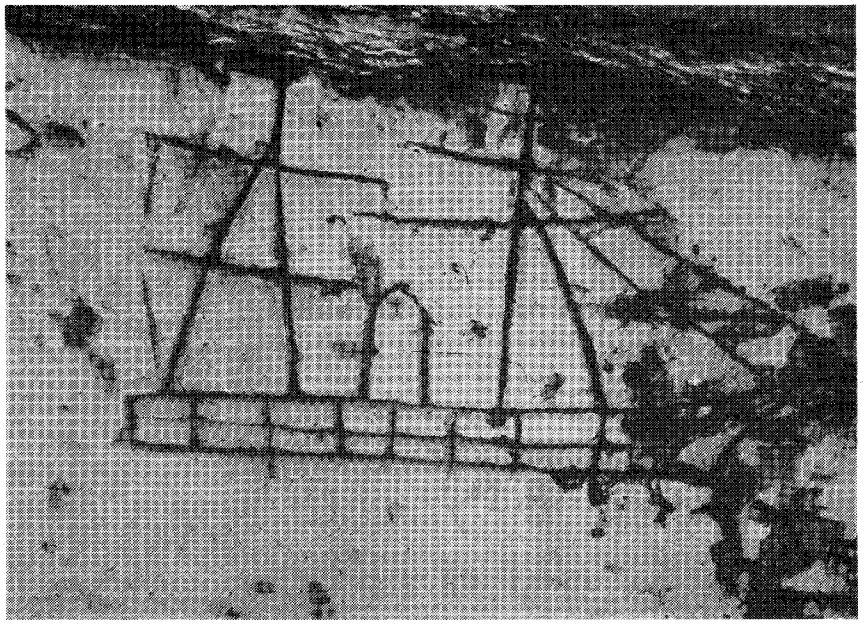


Figure 16.7. Graffiti on the north wall of the terreplein at el Abanico. Photo by Richard Crisson, 1986.

The upper sections of ramp cheek walls are surmounted by two neo-classical scrolled brackets of hewn stone. They connect the higher projecting parapet of the fan battery terreplein. The scroll of the north ramp is pierced by a square drain hole.

The ramps adjoin terrepleins on the north and south and the fan battery on the east. The north and south walls of the triangle thus formed are the scarp walls of the main moat. North and south terrepleins are of similar materials, construction, conditions. The major difference is that the north terreplein is jogged to contain two embrasures facing northeast.

The north terreplein is two feet lower than the fan battery an has a wide ramp which would have permitted artillery to be moved between the five gun emplacements. A vent hole projects through the floor to the mining galleries below. In late 1986, this vent was sealed from above because it was considered hazardous.

The south terreplein is more rectangular and has a straight, wide, and sloping parapet facing south. Separated from the fan battery by two risers, it also has a single-step banquette. A circular indentation occurs at the northwest corner. The floor is hormigón and has a drain hole facing west. It is apparent that a feature once located here has been removed; it is not possible to determine its former appearance.

The fan battery comprises the upper east section of el Abanico. It is composed of a terreplein, three embrasures with sloping parapets, a moat, and a single embrasure at the salient angle. This fan battery represented an imposing front to the enemy approaching from the east. The three embrasures permitted cross-firing through the one common embrasure at the east. Sloping, wedge-shaped merlons separate each embrasure. Raised observation platforms separate the gun emplacements. The emplacements themselves are paved with stone covered with stucco. A gutter along the eastern perimeter drains the terreplein. A tall vent projects from the mining galleries below and is attached to the east parapet. A hole just to the west of this vent may indicate the location of an earlier flagpole. On the west side there is a low, projecting wall with a cut sandstone cap with brick chinking and a covering of stucco.

East of the triple embrasures, separating the single and rifle embrasures, is a v-shaped dry moat. It curves to follow the shape of the parapet and is about 8 feet deep. The base is paved with brick and the sides are covered with stucco. Drain holes at the north and south empty into the main moat of el Abanico. A twentieth-century wooden bridge spans the dry moat from the southern end of the terreplein to the common embrasure.

Construction of the parapet walls of the fan battery is similar to that described for the ramp walls. The sloping parapet walls are stucco over earth and rubble fill.

The main moat surrounds the fort on the south and north, joining at the east salient angle. The moat is comprised of a counterscarp wall rising to meet the covered way that surrounds the fort, and by a scarp wall rising at the salient angle. The scarp wall of el Abanico (rubble stone and brick) extends for over 205 feet in both directions from the salient angle. White stucco with a yellow ochre coating covers most surfaces.

On the upper scarp wall's northwest corner fraise, 12 inches on center, originally projected outward from the wall to prevent scaling by the enemy. Cement patches and approximately five holes with embedded wood fragments serve as evidence.

Several openings penetrate the scarp wall. These include, drain holes at the southwest corner, at the center of the north and south walls, and at the northeast corner. The only window opening is on the north scarp and was used to ventilate the powder room under the fan battery. The opening is square and contains an iron grille.

The counterscarp wall is also steeply battered, and is parallel to the scarp. The entrance to the mining gallery is at the easterly junction; the doorway has a segmental stone arch with stone quoins and voussoirs. In 1963, HABS indicated that the bar and strap iron gate with the sliding bolt were "modern". It may in fact date from the work performed between 1959-1962. The entrance sits within a stone and brick well that allows the gate to swing out.

The grassy floor of the moat is generally level. At the center is a rubble base, originally designed to support a vertical wood palisade, none of which survives. Two additional features can be interpreted by way of fragmentary evidence: a wall niche at the southwest corner for a gate to the moat and a masonry traverse adjacent to this gate. At the northwest end of the moat, features were obliterated when a paved road was constructed ca. 1896. At present, the moat inclines up to the higher glacis that leads to San Cristóbal.

Another feature of the main moat is the separate dry moat located at the southwest corner. It is L-shaped, curving south and east with a sod base. It has a two-stepped banquette with a rowlock course of bull nose bricks on each tread. The banquette was interrupted at the south corner to allow passage over the moat via a bridge. Only the bridge and stone rubble pier remain of this feature.

The west wall of this moat was modified by constructing a concrete cement retaining wall to separate the driveway to the south gate. The lower wall survives intact and is constructed of stone and brick rubble.

The last feature of the main moat is the southwest stairway providing access from the moat to the entrance covered way. The stairway, with twelve wide brick treads, ascends about 11 feet.

A dominant feature of el Abanico is the wide covered way that surrounds the main moat on its two main flanks. The outer wall, or parapet, protects a stepped banquette that in part survives. The primary purpose of the covered way and its distinctively placed traverses was to protect the soldiers in a retreat from <u>enfilade</u> fire. The parapet walls were intended to take the brunt of an attack and thus became an extension of the glacis that extends to the east and south.

The covered way can be directly accessed from the main moat by way of a steep stairway at the southwest part of the moat. Although only two brick pavers survive, this stairway is similar in design to the other stairway just described. A masonry pier survives at the head of the stairs, indicative of the gate once located there.

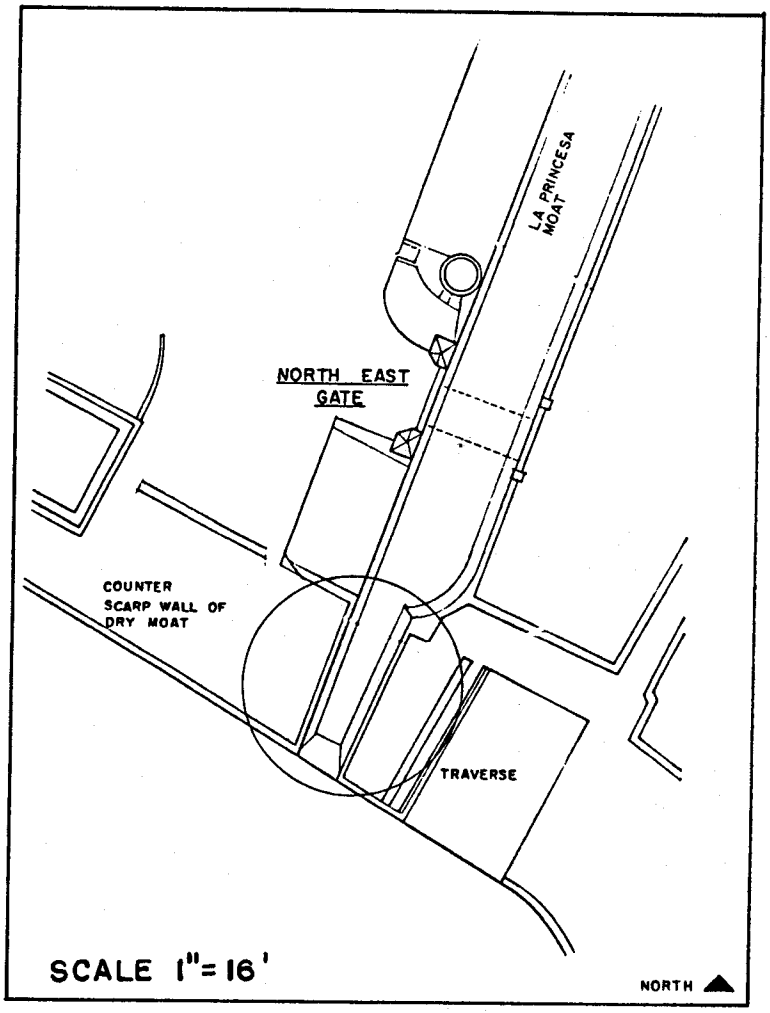


Figure 16.8. Northeast corner of el Abanico's moat showing how a portion of la Princesa's moat was enclosed at this point to form a cistern. Detail of HABS drawing, 1963.

The covered way is the most altered feature at el Abanico. The north section is interrupted by a narrow portion of moat extending from la Princesa (fig. 16.8). This part of la Princesa's moat was turned into a cistern by enclosing the walls with hydraulic cement in ca. 1896. Three of the sides survive. A bridge once spanned the moat and its location at the southern end is still easily discerned. To the east of this bridge was the original exit to the glacis.

The west, partially in the covered way, is the Guardhouse of el Abanico built ca. 1896. To construct this building, one of the five traverses of the covered way was demolished. Originally there were two traverses in the south covered way and three in the north covered way; only the northeasterly one of the last three survives. (The Guardhouse is discussed in Chapter 17.)

The interior elements of el Abanico are located off the gorge under the north terreplein, and partly under the fan battery. The primary interior spaces include the troops' vault (Room A), the powder magazine (Room B), and two corresponds to the one used by HABS in 1963. The troops' vault has an elliptical ceiling. Both walls and ceiling were painted; the floor is probably a twentieth-century concrete slab.

Room B (the powder magazine) is entered through the troops' vault and has a small window opening with an iron grille. The floor is cement over earth and the walls and ceiling were painted.

Two vaulted mining galleries open off of Room A, both with iron grille doors set within a recessed pointed arch. The easterly tunnel is an extended "Z" in plan and approximately 45 feet long. The easterly tunnel is a "T"in plan and about 37 feet long. Both galleries have ventilation shafts extending to the terreplein above.

A secondary interior feature is the mining gallery extending under the glacis at the salient angle of el Abanico. The interior of this mining gallery (tunnel) is narrow, low, damp, and dark. Although one vent is visible, a 1949 plan indicated the existence of three vents. Originally excavated through natural rock, a cave-in about 30 feet from the entrance now blocks full access. The vaulted ceiling is of brick originally covered with stucco; the floor is earthen. The interior is characterized by elliptical vaults of brick covered with stucco. All tunnels have recessed niches to accommodate explosives.

No mechanical or utility systems exist within el Abanico. During an inspection in late 1986, the interior spaces were used to store building parts and historical artifacts such as lampposts, louvered shutters and wrought-iron hardware.

Structural Evolution

Period 1: 1625-1765

The site of el Abanico appears to have been undeveloped in this period based on the available documentation. The plan of existing conditions by Thomas O'Daly (1765) shows the area to be covered with vegetation.[1]

Period 2: 1765-1809

El Abanico was constructed between 1779 and 1783. A report dated 1792 noted that its strategic function was to occupy a high point in the terrain so that invaders could not overtake it.[2]

A plan of San Cristóbal executed sometime after 1765 and before 1772 indicated that construction was contemplated during this time. (See Volume I, no. 10 of this report.) In this plan the site of el Abanico was labeled feature "V" and described as a "Hill on which a Fort is projected."[3]

Construction did not actually begin until early 1779. The site was then known as Redoubt No. 2 according to the construction reports of Thomas O'Daly. Originally, building materials were fierta y fagina (earth and fagot).[4] Unfortunately, these reports sent to Spain were terminated for a number of years beginning in June 1779 due to the state of war that existed between England her North American colonies. By the time of Juan Francisco Mestre's report of September 13th, 1783, el Abanico was completed as a permanent masonry fortification.[5] The probable reason for the change of materials from earth to masonry was that the temporary fortifications were being destroyed by the frequent rains and winds.[6]

The appearance of el Abanico in 1783 was documented by Mestre's 1783 report, plan, and two sections: Profiles No. 1 and No. 3 (figs. 16.9, 16.10, 16.11). The fort has survived virtually unchanged over the years.[7]

El Abanico was approached from the west by means by a covered way. Mestre indicated in his report of 1783 that this feature was constructed by excavating in the terrain that was composed of tufa, a soft porous rock. Profile No. 3, a section of the covered way, showed the following details: on either side of the protected passageway was a banquette three steps in height, upon each banquette and adjacent to the interior wall was a row of vertical

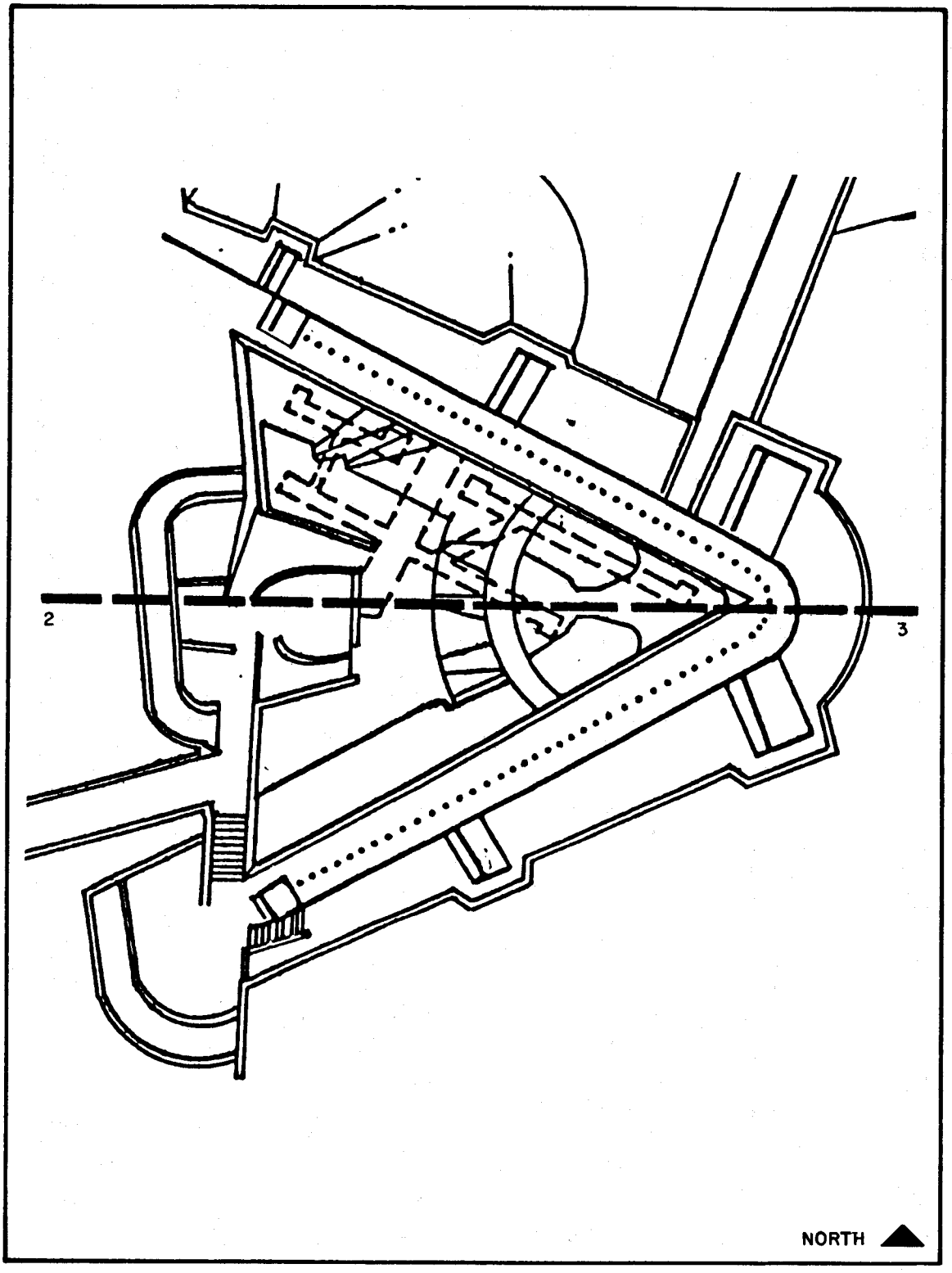


Figure 16.9. Detail of Juan Mestre's plan, September 13, 1783. Drawing by Jana Gross (1989) based on a tracing of the original by Ricardo Torres-Reyes (1965).

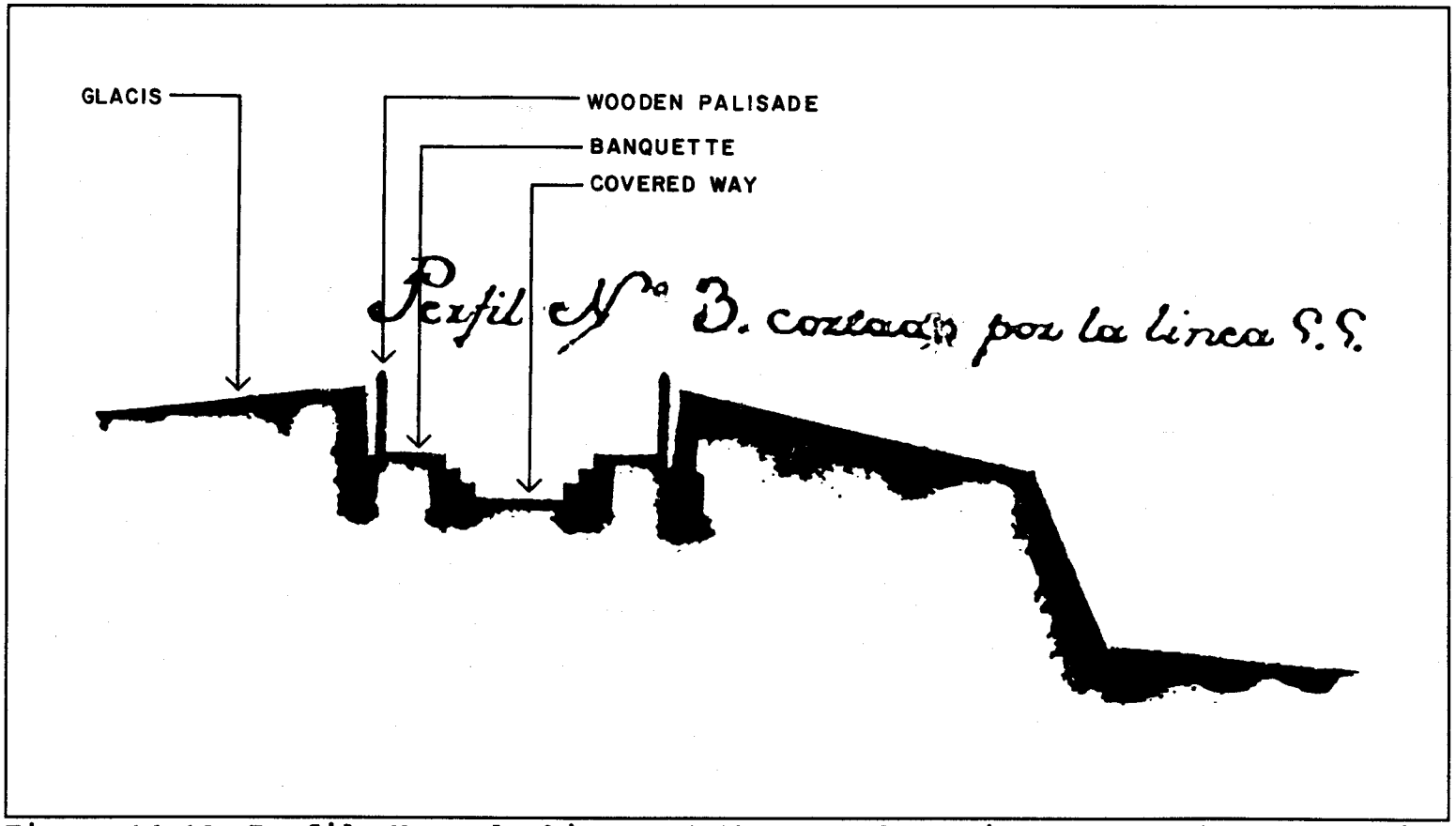


Figure 16.10. Profile No. 3 looking east through el Abanico's covered way. Drawing by Juan Mestre, September 13, 1783.

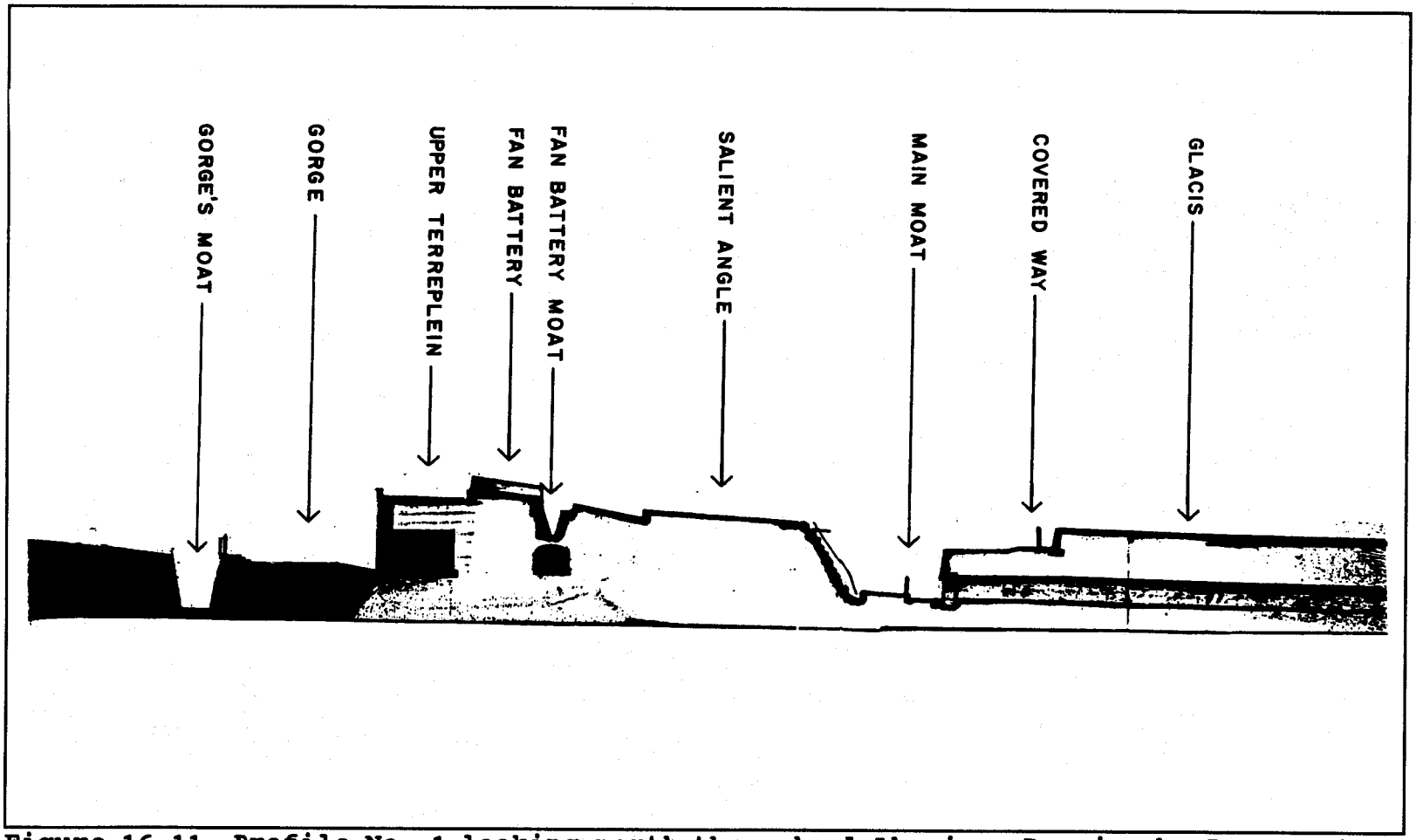


Figure 16.11. Profile No. 1 looking north through el Abanico. Drawing by Juan Mestre, September 13, 1783. Labeled by Jana Gross, 1989.

palisades, and the terrain on the south side was cut at a sharp angle to prevent scaling the wall.

The east end of the covered way terminated at the exterior southwest wall of el Abanico. To the north, a bridge shown on the 1783 plan gave access to the gorge of el Abanico.* The bridge spanned the U-shaped moat of el Abanico, crossing at its southeast end. The moat bounded the gorge at its west side. Mestre in his 1783 report, described it as "a good moat" and Profile No. 1 showed it as deep and narrow. This was a dry moat even though the terreplein of the gorge drained here.

The gorge was enclosed by the previously described moat to the east by ramps on the north and south sides, and by the side of the hill, the tambour, on the east side.[8] The only access to the gorge was by means of the bridge that crossed the moat at its southeast end. Adjacent to the moat on the west side of the gorge was a banquette three steps high. On top of the banquette was a palisade in front of a narrow wall. These features were clearly illustrated in Profile No. 1 that showed the narrow wall as an upward extension of the moat's scarp wall. In the east wall of the gorge was the entrance to the underground vault for the troops, the powder magazine, and the mining galleries. Remaining fragments of stucco at the doorway retained evidence of a faux quoins and voussoirs finish.[9] The terreplein of the gorge sloped in a gentle descent towards this doorway.

The ramps on the north and south sides of the gorge were shown on the 1783 plan of el Abanico. The eighteenth-century north ramp curved upwards to the level of the upper east terreplein and the south ramp ended at the lower level of the south terreplein. The stucco-covered retaining walls were scored at the west corners to resemble quoins. There were decorative copings at the top of both ramps. In 1986, samples of this stucco, samples of paint on the decorative copings, and samples of the existing paved surface of the ramps were removed and examined.**

The upper east terreplein at the head of the north ramp was an integral part of the fan battery. Mestre, in his 1783 report, described this feature as:

> A Battery of three Cannon in the form of a Fan all going out (firing) through one common embrasure constructed in the flanking angle, according to the method of Mr. Trincano.[10]

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*SAJU 16 M13, red-orange mortar from this bridge.

**SAJU 16 M01, SAJU 16 M14, SAJU 16 P01, SAJU 16 P05.

The layout of this battery was illustrated by the plan and Profile No. 1, both likewise dated 1783. Three embrasures for the three cannon were located in the curved parapet wall on the east side of the upper east terreplein. The common embrasure was located to the east in the salient angle. Separating the curved parapet wall from the salient angle was a small curved moat with sloping walls forming a v-shape in section. Access through the parapet wall and across the moat to the salient angle was possible by means of a narrow passageway and bridge on the south side.*

The upper north terreplein was adjacent to and slightly lower than the east terreplein. A short ramp connecting the two levels may date to this period. The parapet wall on the north side had two jogs on its interior side as illustrated in the 1783 plan. No embrasures were shown in the plan, nor were embrasures described by Mestre in his report. Previous studies have concluded that the two embrasures extant in the jogs in the north parapet today were not original.[11] An alternate explanation may be that these side embrasures were considered of lesser importance than the fan battery and therefore, were not mentioned.

The upper south terreplein was directly accessible from the lower gorge by means of the south ramp. The 1783 plan showed few details of the south terreplein except for the wide parapet wall on its south side. Unlike the north parapet, the interior side of the south parapet had no jogs.

Beneath the upper north and east terrepleins were the vault for the troops, the powder magazine, and the mining galleries. As previously described, these were entered through the doorway in the east wall of the gorge. The layout of the chambers was shown on the 1783 plan by dashed lines. The legend of the plan described these as:

> Vault for Troops and Powder magazine, everything bomb-proof, and some mine chambers located in the face that looks to the north.[12]

Profile No. 1, a section looking north, also illustrated the large vault and the southeast branch of the east mining gallery. (See fig. 16.11.) The interior chambers today are

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*SAJU 16 M07, removed from parapet wall. (Identical to stucco sample SAJU 16 M01 from ramp wall.) SAJU 16 M06, brick dust mortar removed from north wall of common embrasure.

presumably little changed from these "as built" conditions of 1783.*

Surrounding el Abanico on its north and south sides was the wide main moat. Access to the southwest end of this moat was down a flight of steps located to the south of the gorge's bridge. A gate was most likely located at the top of the stairs based on a niche in the adjacent east wall recorded by HABS in 1963. The stairs were shown in the plan of 1783 constructed of brick measuring 2 inches by 6 inches by 12 inches.**

At the foot of the brick stairway and to the east was the southwest entrance to el Abanico's main moat. The 1783 plan indicated that this entrance was protected by a traverse, the foundation of which remains today. Passage around this traverse was through a narrow opening between the traverse and the scarp wall of the moat. A gate was most likely located here based on remaining fragments in the scarp wall. The floor of the moat was in two levels and divided down the center by a vertical palisade as seen in Profile No. 1 of 1783 (fig. 16.11). The higher level was located on the scarp side of the moat and the lower level on the counterscarp side. The center palisade was apparently embedded in masonry based on remaining fragments. A row of horizontal pikes in the upper scarp wall was also documented in Profile No. 1 and confirmed by the remaining evidence of patched holes and wood fragments.

Both the scarp and the counterscarp walls were stuccoed (according to HABS), with the stucco at the west corners of the scarp walls scored to resemble quoins. A sample removed in 1986 from one of the scored joints was found to have been blackened with a pigmented finish at an unknown date.*** A doorway to the countermining gallery was located in the east angle of the counterscarp wall based on the 1783 plan and Profile No. 1.

The southwest entrance of the main moat was further protected by a small moat labeled "c" on the 1783 plan and described as the "southwest moat of el Abanico."[13] Mestre noted that the moat "c" was "12 feet wide by 14 feet deep."[14] The plan showed the moat, curved in shape, with a bridge located at this southeast end. Originally, a masonry pier supported the bridge (based on extant remnants).

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*SAJU 16 M05, east gallery wall. SAJU 16 P02, east gallery wall.

**SAJU 16 M02, removed from mortar joints of stairs.

***SAJU 16 P04.

Surrounding el Abanico's main moat on the exterior side was a wide covered way. As seen in the plan of 1783, access to the covered way was by means of a stairway located at its southwest end. A gate supported by masonry posts was apparently located at the top of the stairs based on one surviving post. Five traverses were shown on the covered way in the 1783 plan: two on the south side and three on the north side. A palisade was located on the covered way a short distance from the exterior parapet wall. This placement appears to have created a narrow communication passage between the palisade and the parapet. Cutting across the north side of the covered way in the 1783 plan was the south end of the la Princesa moat. This moat was crossed by a bridge. To the east of la Princesa's moat was an exit to the glacis. No evidence of a gate, either documentary or physical, is known for this location.

On the exterior side of the moat's covered way was the glacis. This glacis was the terrain beyond the covered way and served as its parapet. (See fig. 16.11.) Profile No. 1 showed the terrain as flat, lacking the usual slope characteristic of a typical glacis.[15]

A third countermining gallery was located beneath the moat's covered way and the glacis to the east of el Abanico. As previously described, the entrance to the gallery was in the east angle of the main moat's counterscarp. A section through the gallery looking north was included in Profile No. 1. Mestre, in his report of 1783 wrote,

> At the Capital (front) of this work has been continued a Countermining Gallery . . . opened in the soft stone without a lining in which will be formed blasting holes. . .[16]

The gallery was apparently not completed in 1783. In a later report, dated 1791, it was suggested that the gallery "be continued" so it could be used to "blow up this land" and to "warn (away) the enemy."[17] Another study stated that this additional work involved the addition of branches to the north and south, and was probably never carried out.[18] It has also been conjectured that the gallery at one time led to the San Geronimo Powder Magazine.[19] No documentation has been found to substantiate this theory.

The earliest graffiti found at el Abanico is the date "1783" scratched somewhere in the exterior stucco finish. This graffiti was photographed by Fred Gjessing in 1959.[20] Unfortunately, the exact location was not recorded, nor was it found in 1986. It is doubtful that this was a correct date as the walls were stuccoed sometime between 1824 and 1832.

Another plan of San Cristóbal and its outworks was prepared by Mestre in 1792. El Abanico was labeled "z" on the plan. Conditions at this time appear unchanged from those in 1783.[21]

A finish used for the preservation of the wood elements of el Abanico was recorded by Engineer Ignacio Mascaro in 1808. Mascaro noted that the palisades and gates, built with the hardest woods of the island, were treated regularly with a mixture of liquid pitch, tallow, and red ocher.[22] None of the original palisades or gates remain today so this could not be confirmed by paint analysis. However, paint samples removed from other eighteenth-century wood elements (such as shutters) on the Plaza de Armas of San Cristóbal were observed to have dark resinous early finishes. This resin may have been the "liquid pitch" described in 1808.

Period 3: 1809-1837

Very little is known about el Abanico during this period. One potentially valuable source of information that was not examined for this study is a watercolor dated ca. 1824. This painting, is located in the map division of the Library of Congress in Washington, D.C. It is said to show el Abanico "from the east, with the city on (sic) background." The colors have been described a "cool and pleasing with pastel shades, . . ."[23] This colored view may document the early use of yellow whitewash on the stucco walls and the red ocher preservative used on the palisades and gates.

Period 4: 1837-1868

El Abanico was documented during this period by the model of San Cristóbal and its outworks dated 1839 (fig. 16.12).[24] Omitted from this model were certain details including the banquettes, stairway steps, palisades, gates, and wooden bridges. Also omitted, most likely inadvertently, were the two traverses in the main moat and one traverse on the northeast side of the covered way. The model was important, however, because it recorded for the first time the two embrasures in the north parapet wall and the permanent nature of the two bridges spanning the gorge's moat and the southwest moat. With the possible exception of the two north embrasures, no changes appear to have been made since 1783.

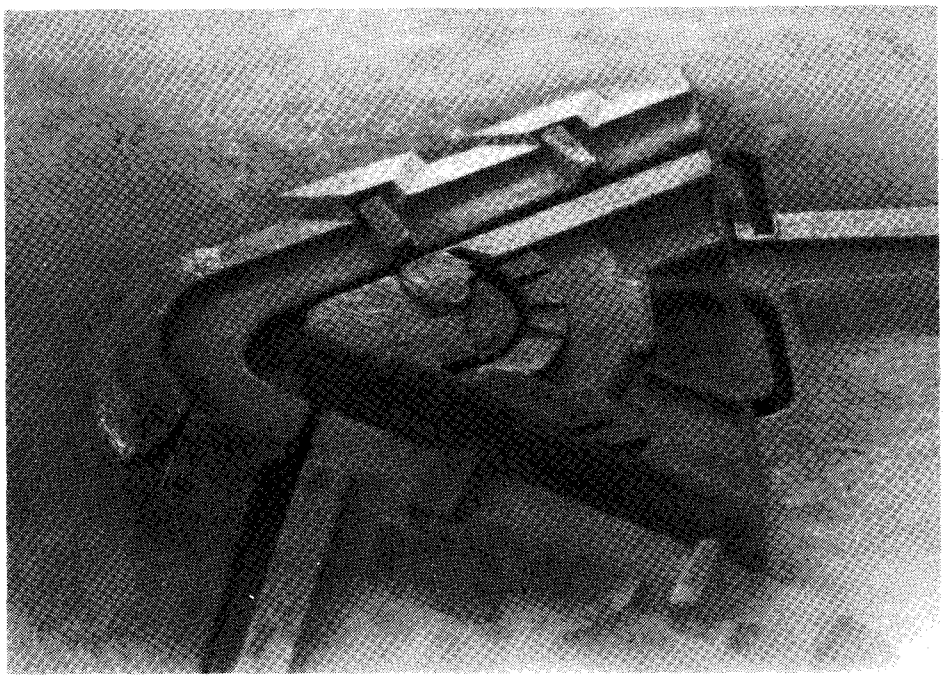


Figure 16.12. Detail of 1839 model showing the Fuerte del Abanico. This model located at San Juan NHS.

Graffiti continued to be scratched into the exterior stuccoed walls during this period. One inscription dated "1848" was found in 1986 on the south wall of the gorge's south ramp.

One other possible source of information for this period that was not available for this report is a plan dated 1861 by Manuel Castro. Only Castro's drawings of the Plaza de Armas were available. The plan, referenced in the earlier study on the fort, is entitled Plano de la Plaza de San Juan Bautista de Puerto Rico. Supposedly, it includes information on the countermining gallery beneath the fort. Specifically, the gallery as observed in 1861 remained unchanged from its original appearance in 1783.[25] Therefore, plans to continue the gallery in 1791 were probably not carried out.

Period 5: 1868-1898

The earliest known documentation for this period was a plan from ca. 1880. The plan was referenced in an earlier study on el Abanico but was not available for this report. Of particular interest in this plan was the unexplained absence of the two embrasures in the north parapet wall. No other details are described.[26]

Many changes were made to el Abanico as part of the project to modernize the la Princesa Battery (detailed in a 1896 report). Built at this time were the Guardhouse, the Northeast Gate, the South Gate, the interior service road, and a cistern. The Guardhouse was sited on the north side of the main moat's covered way and required the demolition of one traverse. The Northeast Gate was part of the temporary construction roadway and crossed the la Princesa moat to the north of the main moat's covered way. The South Gate is believed to have been part of the new interior service road and was located in the south parapet wall of the entrance covered way. The interior road appears to have run in a north-south direction and passed to the west of the gorge's moat. The cistern was located in the south end of the la Princesa moat where it cut into el Abanico's covered way. See Chapters 17, 18, and 19, regarding the Guardhouse, the Northeast Gate, and the South Gate of el Abanico.

Specific details on the construction of the cistern were found in the 1896 report. The report described the cistern as follows:

> To serve both the artillery and the watchman (in the Guardhouse) is projected a cistern . . . taking advantage of the scarp and counterscarp walls, closing this with two (new) walls . . . The walls will be covered with ground hydraulic (cement) and this cistern will be covered by a vault with a drill and yoke to allow water removal by hand. (The water) will be moved by a hand pump and corresponding pipes to reach the esplanade to service (the guns at la Princesa). The cistern will get all the rain waters from the parapet and gorge of the (el Abanico) battery, from the wooden bridge which provides access to the way, up to the embrasures which today exist on the east of the battery, . . . (and) the water falling on the roof of the Warehouse for firearms(Guardhouse).[27]

The list of construction materials included as an addendum to the report, itemized two new walls, a masonry vault of bricks, hydraulic cement no. 7 for the base, hydraulic surfacing in the interior, concrete paving no. 8, and a brass pump.

The earliest known photograph of el Abanico (fig. 16.13) was taken in 1898 by William Freeman Halstead of the New York Tribune. This was a panoramic view of el Abanico and la Princesa facing west. The low parapet walls and common embrasure of the original fort and several structures

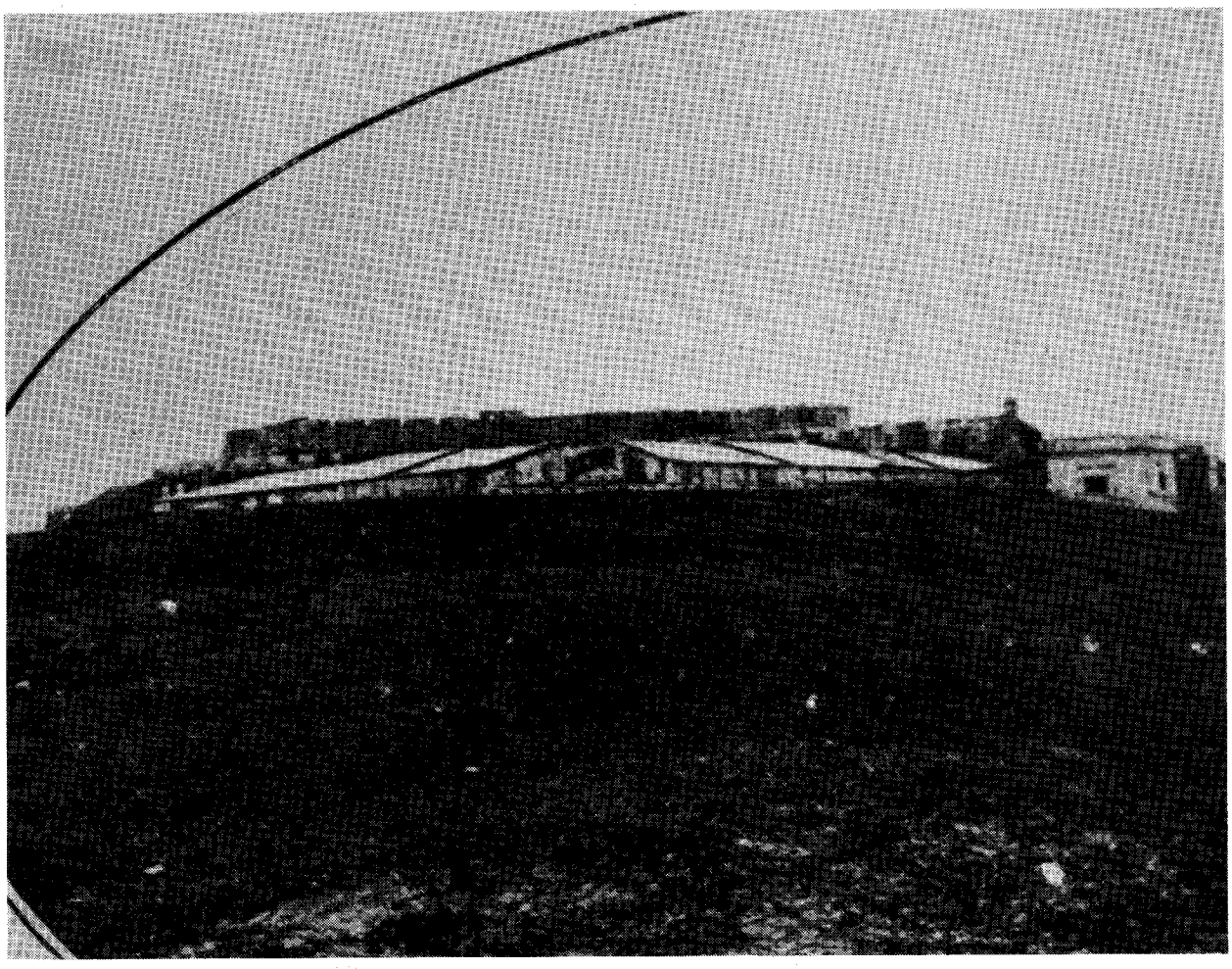


Figure 16.13. Panoramic view of el Abanico taken in 1898 by William Freeman Halstead before the American occupation. (Crónica de la Guerra Hispanoamericana en Puerto Rico, 1972 reprint of 1922 original.)

constructed in the 1890s (Guardhouse, the Northeast Gate, and the South Gate) were visible.[28]

Period 6: 1898-1987

Repairs and minor alternations have been made to el Abanico by both the U.S. Department of the Army and the NPS. In 1901, a recommendation was made by the Army to construct a "small brick retaining wall and change in approach ramp at entrance to battery Abanico magazine" and a "new bridge (12 foot span) across gorge ditch . . . of I-beams and planks." Funding was allotted shortly thereafter and the work presumably carried out.[29] This work involved building a new entrance on the west side of the gorge. The most damaging aspect of the new approach was the required demolition of original building fabric including portions of both the moat's projecting scarp wall and the banquette on the gorge side. The new entrance enabled direct access to the gorge from the existing 1890's interior service road to the west.

Work accomplished in fiscal year 1902 involved rebuilding a wooden bridge and repairing old traverses.[30] The exact locations of both the bridge and the traverses were not specified.

Proposed for fiscal year 1903 was a "cement wash for interior of Battery Abanico - $50.00."[31] It is not known if this was approved or carried out.

A military housing project was built in 1930 to the northwest of el Abanico. This housing had no direct impact on the outwork. The closest building was located to the west of the gorge's moat on the opposite side of the service road. By the 1940s, a chain-link fence enclosed the housing and cut across the northwest side of the moat's covered way.[32]

Extensive repairs were apparently made to el Abanico in 1938-40 as part of "Specification no. F-28-6." This work focused on the upper terreplein of the fort and the main moat. On the terreplein, it was specified to "repair firing steps, replacing brick trim where destroyed, resurface steps and platforms as needed. Clean and restore paving on patio to prevent seepage into underground rooms and tunnels." For the main moat, the specification states "remove all vegetation, clean, point, patch and reface such portions as necessary of wall forming moat around el Abanico."[33] No records were found that document the actual work accomplished.

The mining gallery beneath el Abanico was in deteriorated condition by 1943. A history published in that year notes "a

portion of it has fallen in a short distance from el Abanico."[34] The area behind the cave-in appears to have survived, however, based on "recent explorations (that) indicate . . . it continues beyond this point."[35]

It is interesting to note that by 1949, the Army had assigned a building number (226) to el Abanico similar to other structures at San Cristóbal and the outworks. Detailed in a drawing of that date are one "tunnel vent" and two "tunnel Holes" in the location of the missing gallery beneath the fort. The vent is sited towards the west and the two holes to the east.[36]

The glacis of el Abanico was apparently used in the 1950s, based on a U. S. Army photo dated February 8, 1954. An earlier study of el Abanico described this view as showing "some tents located on the front glacis and what appears to be a temporary building along the covered way."[37] This photograph could not be found in the photo collection of San Juan NHS in 1986.

A survey of the city walls, including el Abanico, was prepared by the U. S Army Corps of Engineers in 1956. This survey documented existing deteriorated conditions and made recommendations for repairs. The northwest corner of the north terreplein had apparently settled and recommendation item "12b" was to fill and restore to grade. Stucco loss had occurred in the northwest end of the main moat and item "12c" recommended restoring the stucco. In the moat's covered way, the gap in the interior east parapet wall needed to be restored and plastered (item "12"). In addition, the exterior parapet wall on the northwest side required restoration (item "12d").[38] No documentation has been found to indicate that any repair work was done following this survey.

Not until three years after the 1956 survey was rehabilitation work undertaken by the NPS, most likely as part of a cooperative agreement with the U. S. Army. This work (accomplished under appropriation number 14X1035), was started April 9th, 1959 and completed in May 1962 for a total cost of $18,781.74. One reason for this large project was to experiment with restoration techniques in order to establish cost data for future estimating.[39]

The project was supervised by Historical Architect Fred Gjessing and carried out under the immediate direction of a local carpenter-foreman experienced in restoration, three masons with two helpers, one carpenter, and six to seven laborers. The work done at this time was as follows: vegetation was stripped from approximately 8,000 square feet of masonry surfaces, exposed masonry and stucco surfaces were then repaired, cracks and flaws covering about 2,400 square feet were grouted and deteriorated stucco was replaced. In

some ares, detailed color effects were achieved with colored mortars (such as a red mortar used at the embrasure openings). Stuccoed walls were then painted light buff and red. Repairs were also made to walks and steps and the drainage systems cleared. Noted at this time (but not repaired) was damaged pavement in the salient angle of the fan battery. The cistern in the north side of the covered way, described as "modern" although built in the 1890s, was demolished. A new wooden bridge was built over the gorge's moat on the west side. Lastly, a new boundary fence and gate were installed.[40]

Several complaints about the quality of the above described workmanship were made in 1960. In January it was noted that architectural details had been lost that should have been retained or restored; no specific examples were given. The restoration work in general was also appraised as "inferior." Six months later it was pointed out that the mortar used for patching was a different color than the existing surface thus creating a "pox-like appearance." The suggested treatment was to paint the walls with two or more coats of cement paint similar in color to the original walls.[41] It is not known if this recommendation was followed.

El Abanico was photographed by HABS in 1960 and measured by HABS in 1963. (See fig. 16.3, 16.5.) Also accomplished in 1963 was work in the main moat and on the east glacis of el Abanico. This work was done by a day labor force under the Accelerated Public Works program. Deposited in the moat were 550 cubic yards of earth "in order to raise the level of the moat to the top of the wall foundations of that fort."[42] Presumably this earth, originally excavated from la Trinidad, was placed at the scarp wall of the moat. Transported to the east glacis from Santa Teresa were 960 cubic yards of earth. The glacis was described as having been "partially destroyed" over the years.[43]

Additional rehabilitation work was contemplated in 1965. An historic structure report, historical data section, was prepared in that year for the stated purpose of gathering information for the reconstruction of several missing original features such as palisades, traverses, bridges, and gates.[44] No reconstruction work, however, appears to have followed.

More than ten years later, in 1977, Section 106 approval was obtained to repair the outworks of San Cristóbal on a recurring basis if supervised by a historical architect. Therefore, no approval was requested for the drain excavation work at el Abanico in 1982. The work was documented by four photographs taken by Gerardo Parrilla, Facility Manager of San Juan NHS, and by color slides in the collection of the NPS Southeast Regional Office. These show a trench excavated in the pavement of the fan battery's east salient angle. The trench ran in an easterly direction from the fan battery's moat

and after a short distance swerves to the north. The caption for one photograph indicates that an "old brick drain (was) discovered" during the progress of work.[45] No measured drawings or other written descriptions of this old drain have been found.

Conditions

El Abanico is extremely important for surviving virtually intact from the late-nineteenth century. Minor changes occurred in ca. 1896 during the modifications at la Princesa and undocumented changes have been the loss of original features due mostly to obsolescence and erosion. Missing features include bridges, gates, palisades, and traverses.

El Abanico is solidly constructed and in good condition. Erosion, weathering, biological activity, and staining are all present in varying degrees of severity.

Despite its generally good condition , there are several elements of deterioration due largely to moisture and weathering that should be noted. For example, the scarp wall of the gorge's dry moat has three large vertical cracks - - perhaps caused by an earthquake -- that were repaired after 1956 and before 1963. A square drain hole in the scarp under the bridge provides the only drain for the gorge. There is much deterioration and weathering of bricks, stone, and stucco; staining and biological activity are common.

The fan battery parapets display the characteristic spongelike appearance of differential weathering. The slopes have weeds growing in pockets. Black stains and concrete patches are also evident. A large Portland cement patch across the single embrasure is indicative of the work done in 1982 to uncover and repair a concealed brick gutter draining the terreplein of the salient angel into the north scarp wall and into the main moat of el Abanico.

Various vertical cracks are evident but seem to be on the stucco surface only in the main moat's scarp walls. Biological growth and stains are prevalent. Weathered stone, stains, and minor cracks also characterize the walls of the southwest moat.

In the mining galleries, conditions are fair but very damp with peeling plaster and paint. ant or termite tunnels are attached to the walls and ceilings. In the gallery extending from the salient angle. conditions are very poor and hazardous with much plaster, brick and stone erosion. A thorough structural evaluation indicating the exact length, direction, and condition of this tunnel is recommended.

NOTES

1. A copy of O'Daly's plan showing the existing conditions in 1765 is included in Volume I, no. 6 of this report.

2. Reports by the Junta dated May 30, 1791, and September 8, 1792, noted that El Abanico was of poor usefulness regarding artillery and defense but should continue to be maintained against invaders because it occupied a dominant height near San Cristóbal. National Archives, Records of the Spanish Governors of Puerto Rico, Record Group 186. Microfilm copy at San Juan NHS.

3. This undated (ca. 1765-1773) plan is included in Volume I, no. 9 of this report.

4. Ricardo Torres-Reyes, "Construction History of San Cristóbal: 1634- 1800," NPS report, San Juan NHS, June 1965, p. 96. Original reference is to reports by Thomas O'Daly dated 1778 and 1779.

5. Ibid., pp. 97-98.

6. Report by Mestre 9/13/1783 as included in Torres-Reyes.

7. Ibid. The plan and profiles are both dated 1783. Mestre stated that the purpose of his report was to inform the King of Spain "how much has been worked outside . . . the original (1765) scope of work to improve defenses." The documents prepared by the HABS in 1963 were a set of measured drawings and a short report, both entitled "Fuerte El Abanico, Castillo de San Cristóbal." The mortar and paint samples were removed in 1986 and analyzed by the author.

8. Report by the Junta May 30, 1791.

9. Ibid., p. 14.

10. Report by Mestre 9/13/1783.

"Flanking" seems to be an incorrect description for the angle that in fact is situated in front of the three embrasures. However, when viewed in with north oriented at the top, the angle is situated to the right of the three embrasures or in the flanking position.

"Mr. Trincano" was a French military writer who originated the idea of convergent fire.

11. HABS,. "Fuerte el Abanico" (1963) pp. 3-4, and Torres-Reyes, "El Abanico Fort" (1965), p. 13.

12. Plan by Mestre 9/13/1783. Mestre also noted in his report of the same date that el Abanico had "its good alut and power magazine, (bomb-)proofed."

13. Plan by Mestre 9/13/1783.

14. Report by Mestre 9/13/1783.

15. Torres-Reyes, "El Abanico Fort," pp. 9-10.

16. Report by Mestre 9/13/1783.

17. Report by the Junta 5/30/1791.

18. Torres-Reyes, "El Abanico Fort," p. 12. Torres-Reyes also notes on page 9 that the "passage" was about 230 feet long based on scaling off of the 1783 profile.

19. Edward A. Hoyt, 2nd Lt., A History of the Harbor Defenses of San Juan, Puerto Rico, Under Spain, 1509-1898 (San Juan: Antilles Coast Artillery Command, 1943), pp. 145-146.

20. Photograph No. 33, "Rehabilitation of El Abanico Bastion, San Juan National Historic Site," by Frederik Gjessing, Sept. 29, 1959.

21. Plan by Mestre dated November 17, 1792, is included in Volume I, no. 23 of this report.

22. Torres-Reyes, "El Abanico Fort," p. 12. Original reference is to two reports by Engineer Ignacio Mascaro dated June 30 and December 31, 1808, in the National Archives.

23. Ricardo Torres-Reyes, "General survey of archival material and museum items related to San Juan National Historic Site held by the Library of Congress and the National Archives" (7/89/62), p. 4.

24. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at the Museo del Ejercito, Madrid, Spain.

25. Torres-Reyes, "El Abanico Fort," p. 12 and p. 24 (see note 19).

26. Ricardo Torres-Reyes and F. Blair Reeves, "Fuerte El Abanico, Castillo de San Cristóbal" (HABS report, July 1963), p. 4.

27. "Memoria descriptiva del proyecto de modificación de la batería de la Princesa . . .," May 5, 1896, with attachment dated October 6, 1896. A transcription that is partly typewritten and partly handwritten is in the library at San Juan NHS.

28. Angel Rivero, Crónica de la Guerra Hispanoamericana en Puerto Rico (Barcelona: Editorial Edil, Inc., 1972), p. 23. This is a reprint of the original book published in 1922.

29. Edwin C. Bearss, San Juan Fortifications 1898-1958 (U.S. Department of the Interior, NPS, Feb. 1984), pp. 78-79. Original reference is to correspondence in the National Archives.

30. Ibid., p. 82.

31. Ibid., p. 84.

32. Ibid., pp. 315-317. The fence is shown on a plan from the late-1940s entitled "Fort Brooke As Built" by the U.S. Army Office of the Engineer, in the drawing collection of San Juan NHS, locator no. FC1- DR4-ENVO20.

33. Ibid., p. 265, and Torres-Reyes, "El Abanico Fort," p. 14.

34. Hoyt, A History of the Harbor Defenses, p. 145.

35. Ibid.

36. Plan dated 1949 and entitled, "As Built Survey Fort Brooke," drawing collection San Juan National Historic Site, location no. FC1-DR4-ENVO20.

37. Torres-Reyes and Reeves, "Fuerte El Abanico" (1963), p. 5 (see note 6).

38. U.S. Army Corps of Engineers, "Survey Report on Fortification Walls, Fort Brooke" (1956), pp. 9-11, Plate 1, and Figs. 3 and 4.

39. "Rehabilitation of El Abanico Fort" on the standard NPS one page form "Completion Report of Construction Project" signed July 1962; and a memo dated January 28, 1960, from the Supervising Architect of Historic Structures (Charles Peterson) to the Acting Chief of EODS. Both documents are in the files at San Juan NHS.

40. Ibid.

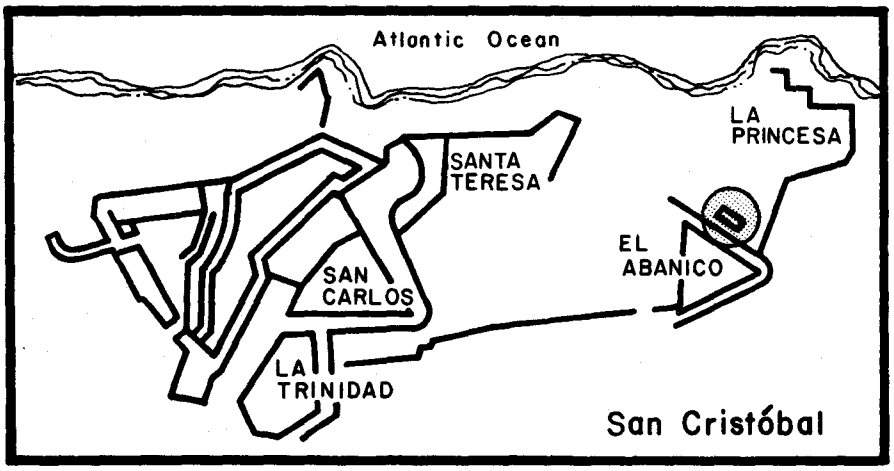
41. Memo dated 1/28/1960 from Supervising Architect to Acting Chief, EODC, and memo dated 7/30/1960 from the Region One Regional Director to the Superintendent of San Juan.

42. Thomas R. Frost, Architect, "APW Day Labor" completion report. In the files at San Juan National Historic Site, file folder "D24 Accelerated Public Works APW-3, San Cristóbal and Outwork, El Morro."

43. Ibid.

44. Torres-Reyes, "El Abanico Fort," pp. 1 and 14.

45. The photographs are stapled to one page and are in the files (not the photo collection) of San Juan NHS.



CHAPTER 17

THE GUARDHOUSE AT EL ABANICO

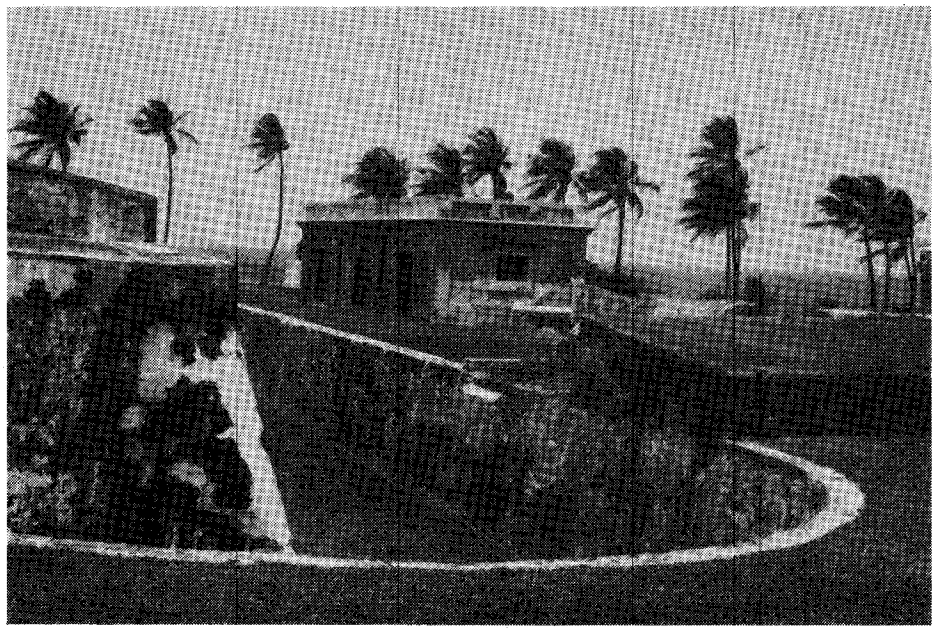
Description

The Guardhouse at el Abanico faces north towards la Princesa and the Atlantic Ocean. The building is strategically located to control access to la Princesa; the Northeast Gate is a few feet away. Constructed in 1896, the building was designed as an Edifico para Fuegos de Armas y Plantón (building for firearms and sentry). Its name has been simplified for use in this report.

Stylistically the building is similar to other garrison structures, with elements of nineteenth-century neoclassical architecture. It has articulated window and door openings, and a projecting cornice with parapet. The building sits on a shallow base and the corners project slightly. The construction materials and the building's intended uses were thoroughly described by Spanish military engineers in 1896. (See figs. 17.1 - 17.3.)

All of the walls are constructed of masonry, consisting of rubble stone and brick with a red-beige mortar. The rubble is used as infill with a laid brick framework. Bricks are used for the base, corners, door and window architraves, cornice, and roof parapet. All of this is covered with cement stucco.

Actual subterranean conditions are unknown. The building is sited on the earth-filled covered way and on one of the original rubble-masonry traverses within the covered way. It is possible that the Guardhouse is built on a rubble stone



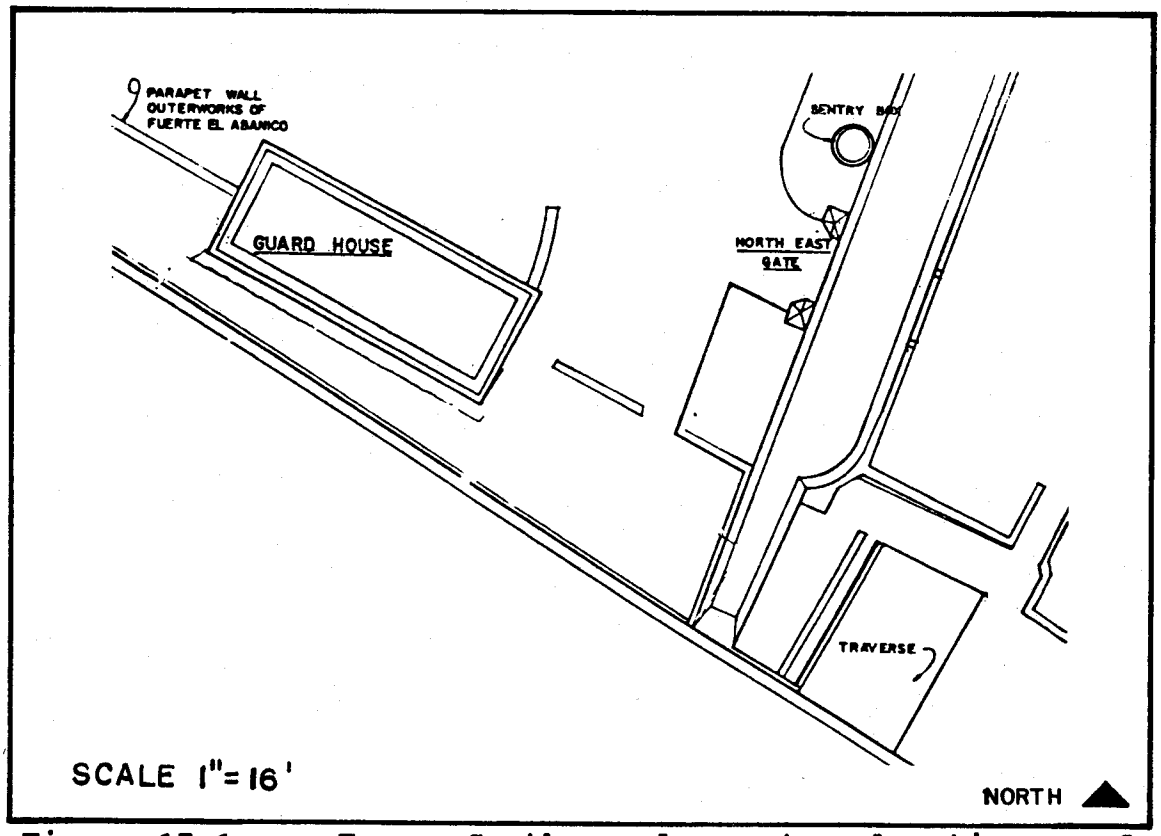


Figure 17.1. **Top: South and east elevations of Guardhouse at el Abanico. Photo by Richard Crisson, 1986.**

Bottom: HABS site plan showing location of Guardhouse at el Abanico, 1963.

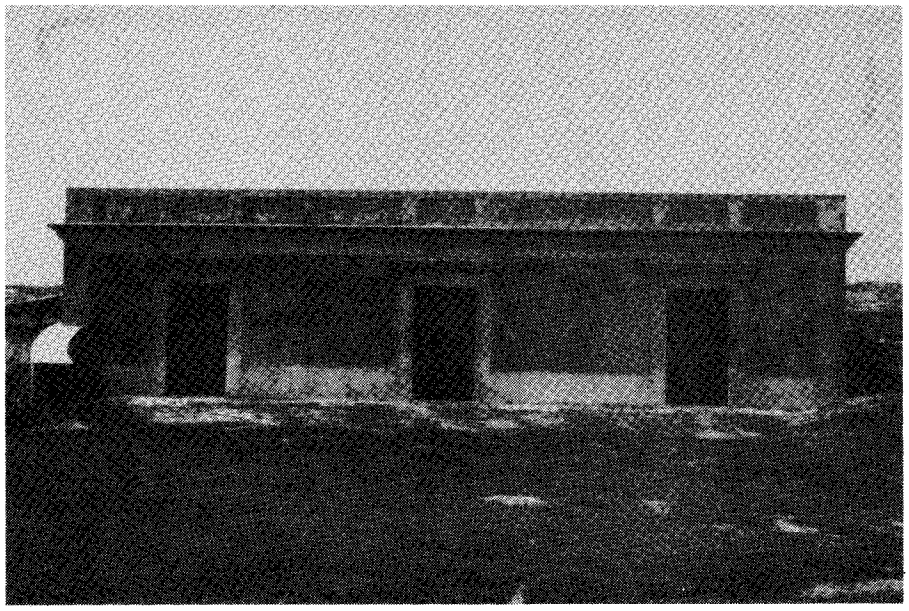


Figure 17.2. North elevation of Guardhouse at el Abanico. Photo by Richard Crisson, 1986.

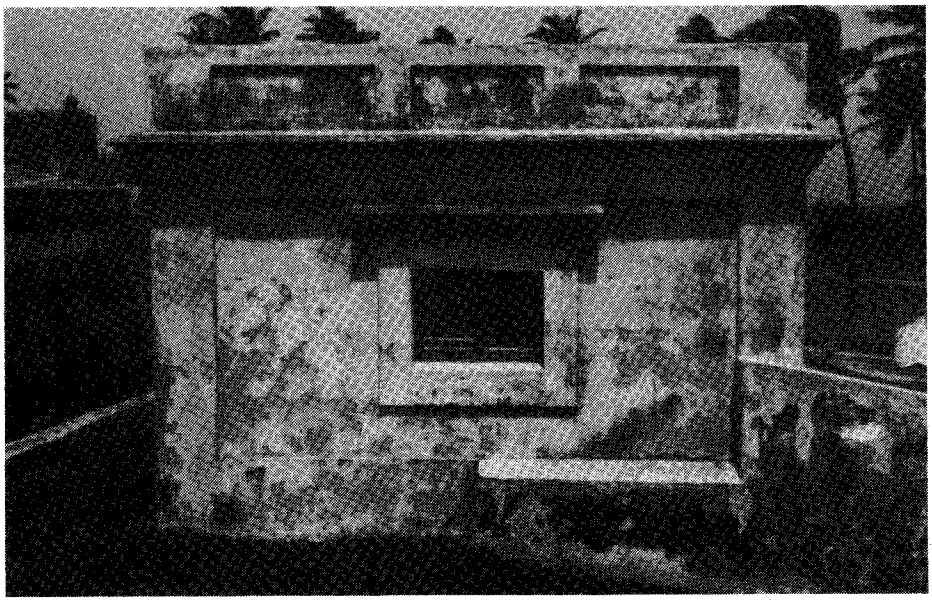


Figure 17.3. East elevation of Guardhouse at el Abanico. Photo by Richard Crisson, 1986.

foundation. This is confirmed both in the original 1896 list of materials and in the 1963 Historical Data Section for HABS.

There are two masonry retaining walls abutting the Guardhouse: one at the northeast corner and one off the west elevation. The first is slightly curved, sloped, and covered with a cement stucco. The second is significant for being a portion of the original parapet wall that protected the ca. 1783 covered way. This wall is of rubble stone and has a brick banquette. On the north side is the sod-covered slope that originally protected the covered way and is part of the glacis.

The building's main (north) facade was considerably altered when the building was converted in 1930 into a four-car garage with four bays. It was restored to its original configuration by the NPS in the early 1980s. It now has three doorways facing north. The south elevation has three identical doorways, possibly original.

The east elevation has one small window opening. It is probably original and would have been part of the observation post as it provided good visibility toward la Princesa and the Northeast Gate. The west elevation is similar in size and also has a small square window. This window, however, is not original and may date to ca. 1930. All doors and windows have been numbered (east to west on the north, and west to east on the south) as part of this study. (See fig. 17.4.) North and south elevation doors, nos. 1-3 and nos. 4-6, all have flat stuccoed architraves and detailed caps. They vary slightly in width. The same architrave and cap is found on the original east-facing window opening 102. Window opening 101 has no decorative features. All of the paired wooden doors, louvered windows, and iron hardware date from the 1980-83 restoration. Door 2 is planked, and the remaining doorways and window openings 101 and 102 have stained mahogany fixed-louvered shutters.

The flat masonry roof is of ausubo wood vigas with 1/2 inch corner beads. These support modern wooden purlins surmounted by brick pavers embedded in lime mortar. It is topped with 3 inches of light weight concrete. The roof gradually pitches toward the two wall drains located on the south parapet.

The interior is subdivided by masonry partitions into two smaller rooms at the east and west flanking a larger central room. The small rooms are intended to be used as restrooms and the larger one as a visitor center. Vigas, purlins, and ceiling brick are exposed. There are no interior decorative elements.

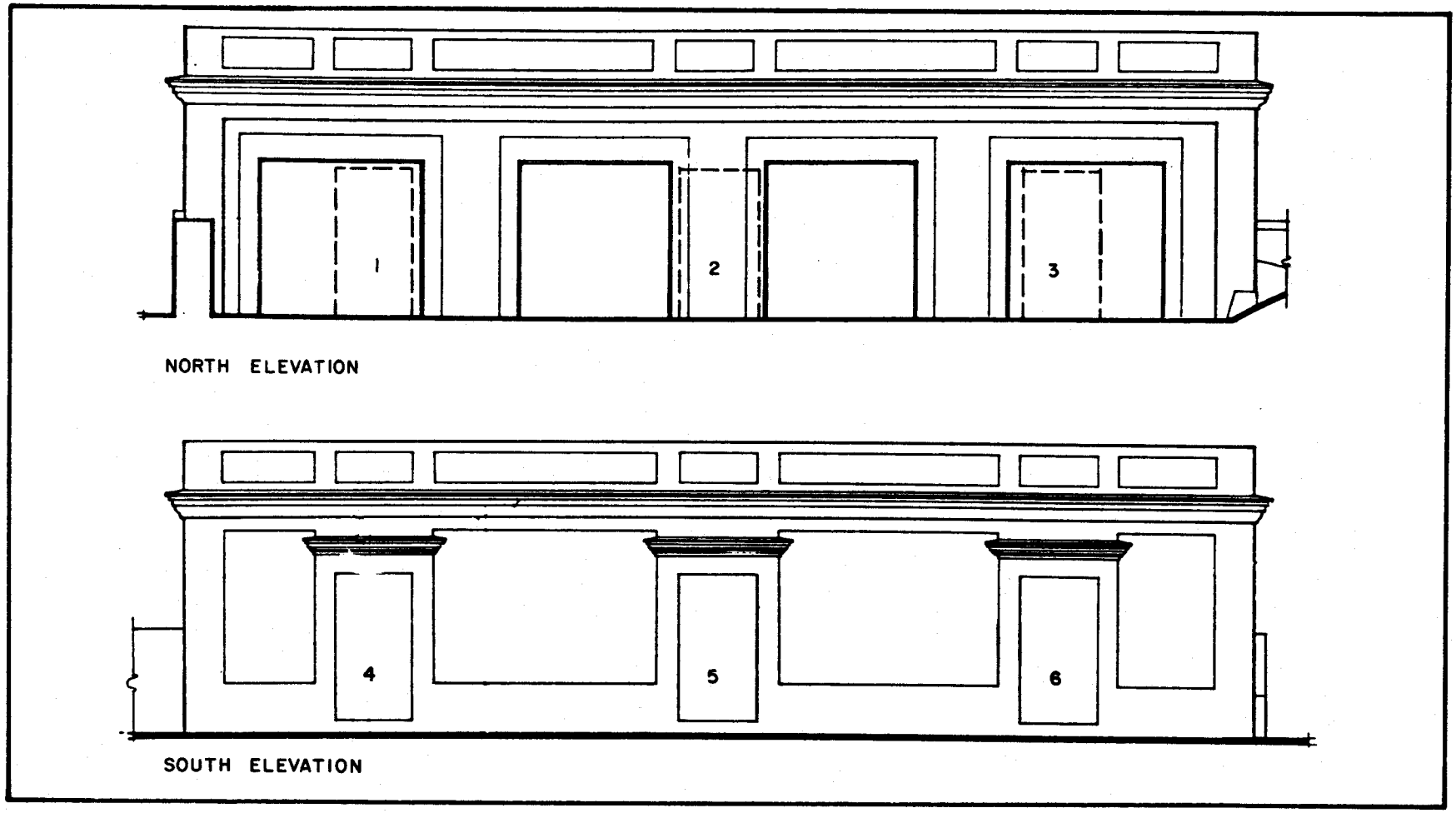


Figure 17.4. North and south elevations with openings numbered. HABS drawing (1963) annotated by Jana Gross (1989). Dotted lines indicate current openings.

Structural Evolution

Period 1: 1625-1765

No structure was on the site during these years based on the available documentation. O'Daly's plan of existing conditions in 1765 showed the area covered with vegetation.[1]

Period 2: 1765-1809

El Abanico was constructed sometime between 1779 and 1783. Located on its northeast and southeast sides was a covered way with traverses illustrated by the plan of 1783.[2] It was on the north side of the northeast covered way that the building known today as the Guardhouse was eventually built. Throughout this period, however, the covered way remained unaltered.

Period 3: 1809-1837

The covered way and traverses of el Abanico appear to have been unchanged in these years.

Period 4: 1809-1837

The site of the Guardhouse is clearly documented during this period by the 1839 scale model of San Cristóbal and its outworks. This model shows the covered way and its traverses sightly altered although unchanged in the vicinity of the future Guardhouse. Shown on the exterior side of the covered way was a parapet wall.[3]

Period 5: 1868-1898

Plans to build the Guardhouse were first introduced in a report dated May 1896. Construction probably started shortly thereafter since a list of materials for the structure was included in an attached report dated October 1896. These two documents refer to the building as the <u>edifico para fuegos de armas y plantón</u> (building for firearms and sentry).[4]

Construction of the building was part of the 1890s modernization project for la Princesa. It was recognized that

the present arrangement of storing munitions in the new bombproof vaults between the gun positions at la Princesa was suitable only for short periods (as during times of war). Longer storage would cause deterioration due to the high humidity. It was therefore proposed to build a new structure to house the munitions during times of peace. This building would not need to be bombproof as during times of war the munitions would be removed to the bombproof vaults.

The proposed design described in May 1896 was for a building with a flat roof divided by two partitions into three rooms. In two of the rooms would be stored the munitions. In the third would be a space for a sentry to guard the battery. Each storage room would have a "door in front and a window for light and ventilation."[5] The room for the watchman would have a door and two windows.

The materials list of October 1896 documents the actual construction. "Crushed" stone was obtained from the demolition of the parapet wall of el Abanico's covered way. "Ordinary" rubble was used for the footings. A molding was run on the face of the building. The roof was flat and supported by ausubo vigas and framework. Cast iron pipes were specified but their function not explained. Door and window shutters were noted to be two leaves of pine with ausubo frames and bronze hardware. Three coats of oil paint in three coats was specified for the frames and windows; no mention is made of the doors. "Coloring to the lime on interior and exterior walls"[6] may refer to either coloring the plaster or stucco before it was applied to the walls, but more likely to painting walls with a pigmented whitewash.

The building first appears in the plan of la Princesa dated 1897 (fig. 17.5). Its outline was superimposed over the earlier covered way and one traverse of el Abanico. The outline was not revealing. Discernable features included the rectangular shape of the structure, three openings in the north wall, and a north-south partition wall positioned equidistant between the west and middle openings of the north wall. No openings were drawn in the west wall. Features that cannot be distinguished due to the light rendering of the drawing were: openings at the east and south walls, and the second interior partition wall.[7]

More specific details on the original construction and appearance of the Guardhouse may be ascertained based on a physical examination of the building itself. This was done in 1963 by HABS who recorded their findings in a short report and three measured drawings.[8] Although many changes had been made to the building by 1963, much original fabric remained. Their observations were as follows.

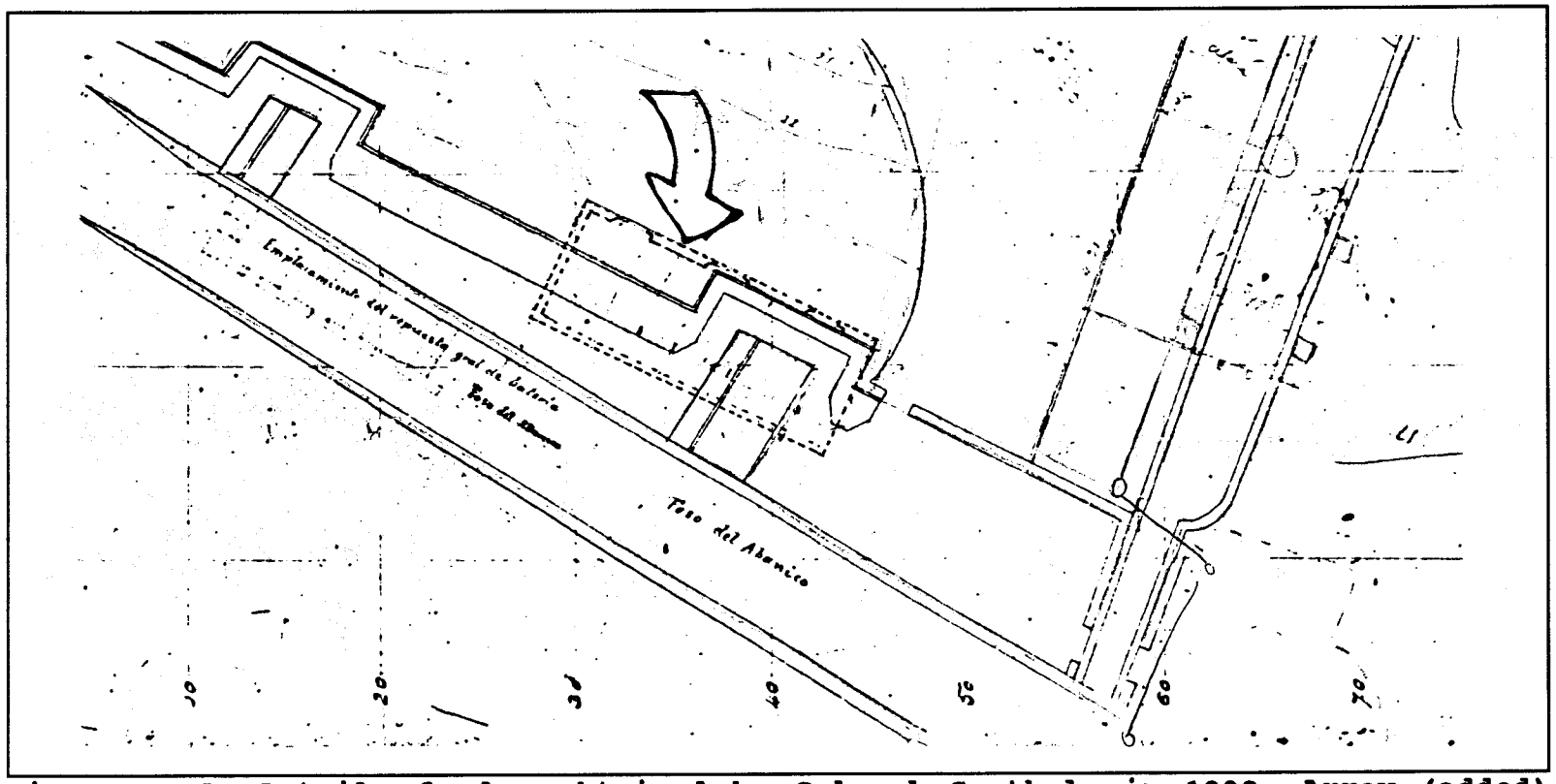


Figure 17.5. Detail of plan obtained by Colonel Goethals in 1898. Arrow (added) points to location of new Guardhouse. (San Juan NHS Archives.)

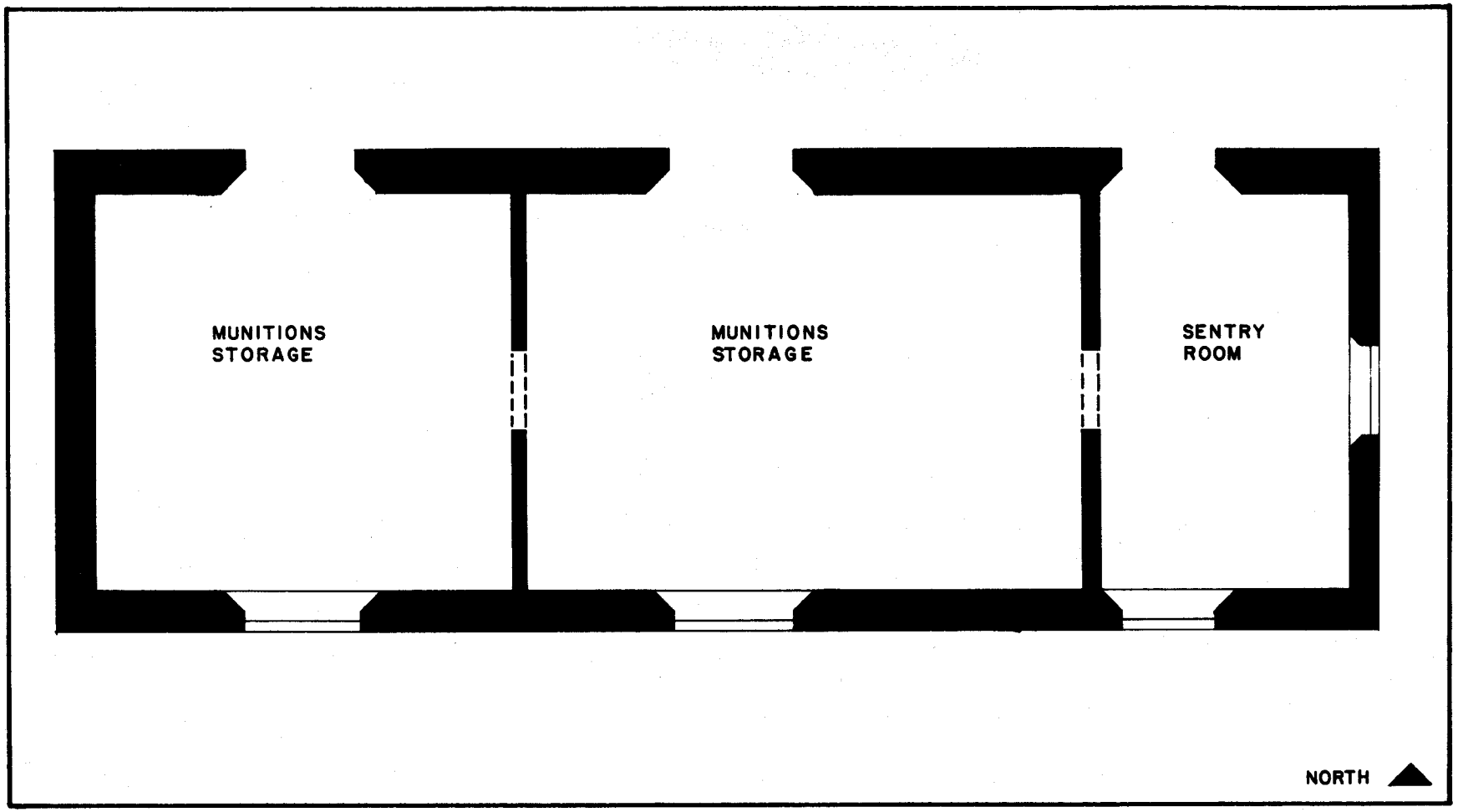


Figure 17.6. Conjectured original floor plan of the Guardhouse at el Abanico, ca. 1898. Drawing by Barbara Yokum, 1987.

The structure as originally built was a rectangular one-story masonry building (fig. 17.6). The walls were composed of brick, and brick and rubble stone. Brick was used at the base of the building, at the four corners, at the door and window openings, as leveling courses within the walls, and at the cornice and roof parapet. Rubble infilled the remaining spaces. The exterior was covered with stucco and the interior with plaster. The roof was supported by vigas of blue-black color. Spanning the beams were purlins covered with three layers of roofing tiles laid with lime mortar. Each tile measured 11 1/2 inches long by 5 1/2 inches wide by 7/8 inches thick. Drainage off the roof was through exterior iron downspouts located on the south facade. Water drained to a cistern located in the moat between el Abanico and la Princesa.

Known original openings were the three doorways in the (rear) south facade and one window in the east facade. These had exterior stucco-covered surrounds and cornices. The doorways of the front north facade were formerly "windows".[9]

The first known photograph of the completed structure was taken in early 1898 by William Freeman Halstead for the New York Herald. This was a panoramic view of the San Cristóbal outworks looking towards the west. The Guardhouse was a part of the scene and both the east facade and a portion of the north facade are visible. The building was rectangular with a flat roof and a window opening in the east wall. It is not possible to ascertain the types of openings in the north wall due to the presence of a low wall at the northeast corner of the building. The exterior finish appeared smooth and light in color.[10]

Period 6: 1898-1987

Two major changes occurred to the Guardhouse in this period. First, the building was converted to a garage sometime between 1922 and 1947 while under the jurisdiction of the U.S. Department of the Army (1898-1961). Second, considerable stabilization and preservation work was done in the early 1980s by the NPS (1961-present).

The building was recorded in March 1899 by Captain Hodges who included it in a plan of San Cristóbal and its outworks. This plan shows the outline of the building, but no details.[11]

Electrical lighting was first provided in 1902. At that time, one light was installed in the "Battery Princesa Guardhouse."[12]

The photograph referred to by HABS that shows the north facade is found on page 81 of the Crónica de la Guerra Hispano-

<u>americana en Puerto Rico</u> published in 1922 (fig. 17.7).[13] Only the east end of the north facade was visible in this view. Unfortunately, it was not possible to distinguish if these openings were windows or doorways due to the poor quality of the reproduction that was examined for this report.

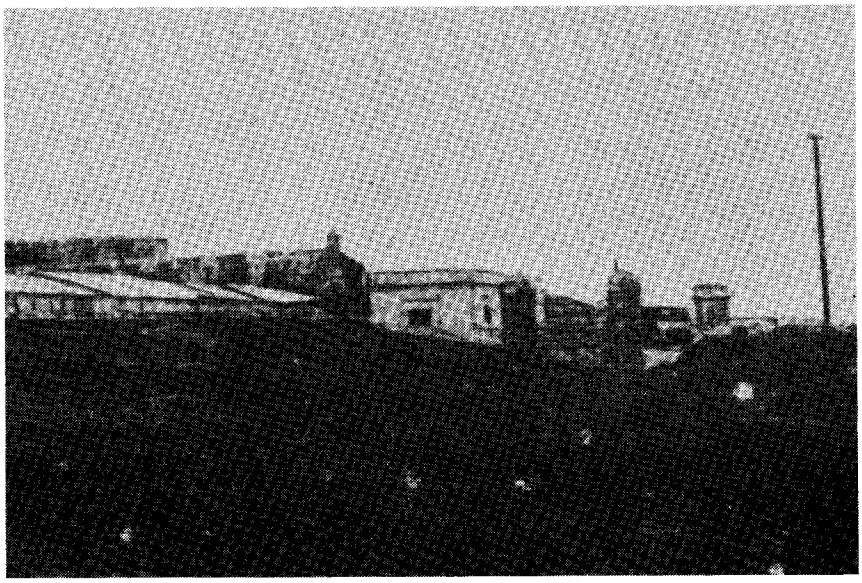


Figure 17.7. Detail of photo with Guardhouse in center. Photo by William Freeman Halstead, 1898. (<u>Crónica de la Guerra Hispanoamericana en Puerto Rico</u>, 1922.)

One would expect doorways on the front of the building based on the original design proposal. Perhaps additional documentation will one day be found to clarify this detail. The window in the west facade appeared to a later addition; it was smaller than the window in the east facade and lacked the exterior surround and cornice characteristic of the original openings.

By 1947, the Guardhouse had become a garage; in that year it was labeled building number "269: Garage (4 cars)."[14] The most likely time for this conversion was 1930 when new housing and a new road were constructed nearby to the northwest.[15] Alterations probably made at this time and documented more than thirty years later by HABS, involved both the exterior and the interior. Outside, the original openings in the north facade were replaced by four wide doorways to accommodate the "4 cars." Possibly added at this time were the small window in the west facade and the concrete slab over the original roofing tiles. Inside, the original west interior partition wall that divided the munitions storage area into two rooms was probably removed. Whether or not the concrete floor extant in 1963 was original is uncertain. The latter is a possibility because concrete floors were installed in the vaults between the gun positions at la Princesa battery about the same time as work at the Guardhouse. HABS labeled the floor "modern" in 1963.[16]

A general plan dated 1949 documents the materials used to pave the exterior surfaces adjacent to the building. To the

north was "asphalt" paving, and to the south "conc," probably meaning "concrete." The plan indicated that the building number had changed by this time and was then labeled "Bldg. No. 228."[17]

As previously mentioned, HABS recorded the Guard House at el Abanico in three measured drawings and a short report in 1963. At that time, the structure was unused and in a state of disrepair. The large garage doorways in the north facade were covered with chain link fencing. The east window was boarded over. Both the back south doorways and the west window were enclosed with masonry. One section of the roof, located above the small east room, had collapsed. Of the original iron downspouts, only fragments remained. Inside, the doorway in the remaining east partition wall was partly covered with boards.[18]

At this time, HABS found the interior divided into two rooms and the walls plastered. The interior partition wall, probably original, was identified at that time as "masonry." In it was one doorway. The smaller of the two rooms was located on the east side of the building and was most likely the sentry's room. This was determined by a painted wood cornice and evidence (i.e., nail holes in the vigas) of a plastered ceiling. The larger room to the west was probably the original munitions storage area. No evidence was mentioned by HABS of the other partition wall that was described in the original design proposal. It must have been removed sometime before 1963. In this large room, HABS noted that the vigas, purlins, and tiles of the ceiling showed evidence of a whitewash finish. Two samples of the original mortar used in the construction were removed in 1986.*

Despite the poor condition of the building in 1963, no repair work was done for almost twenty years. An advanced state of deterioration was recorded in 1977 by two photographs: one of the north and east exterior walls and the other of the south and east walls. These photographs were included in a "106 Compliance Statement" proposal to do recurring work at the San Cristóbal outworks. They showed the exterior stucco walls badly weathered, exposing the brick and rubble materials of the walls. Large stains darkened the south wall at the location of the missing downspouts. The enclosures had been removed from the north doorways and east window, exposing the interior to the weather and intruders.[19]

The 1977 proposal was apparently approved because in 1980 repair work commenced on the Guardhouse without an additional "106" compliance. This work was part of NPS contract number

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*SAJU 16 M09, removed from interior rubble wall. SAJU 16 M011, removed from stuccoed exterior.

CX-5000-0-1008, "Stabilization of Guard House and Sentry Box." The contract was awarded on September 30th, 1980 to Milton Guzman Construction Corporation of Hato Rey, Puerto Rico. Monitoring the progress of the contract as the contracting officer's representative was Gerardo Parilla of the San Juan National Historic Site. NPS architects involved with the project were Ron Bishop, John Garner, and Donald Seale of the Southeast Regional Office. The contract continued through January 1983 and cost a total of $124,772.90 (including change orders) for work at both the Guardhouse and the sentry box.[20]

The specifications for the contract described the job as "preservation" with the aim of "halting further deterioration and providing structural safety . . . [without] . . . significant rebuilding." A later floor plan indicated that in fact the interior space would be adaptively reused as a visitor center and rest rooms.[21] The work finally accomplished involved demolition, repairs, and reconstruction. The one feature that was retained was the concrete slab flooring.

The first phase of the project was to remove post-historic and deteriorated building fabric. Modern materials that were taken out were the masonry infill at the south doorways and west window and later cement stucco. Deteriorated portions of the building that were removed were about 1,253 square feet of loose plaster and stucco, the entire roof including the beams, and the east interior partition wall. The demolition phase of the work was recorded by two photographs taken on October 29th, 1981 (figs. 17.8, 17.9) doorways and windows are open, the roof is off, and the east partition is wall gone.[22]

The exterior walls left standing required both reconstruction work and repairs. Some portions of the exterior cornice needed to be rebuilt and other portions repaired. Most extensively reworked were the openings in the front north wall. Here, three new doorways were designed to correspond both in size and placement to those in the opposite south wall. Since these doorways replaced the four large ca. 1930 garage doorways, large areas of infill material were required for the wall. All of the walls required stucco patching outside and plaster patching inside. The mortar mix provided to the contractor on June 5th, 1981 was presumably used on the wall surfaces. This "lime mortar mix" called for 1 part white Portland cement, 3 parts high plasticity lime, and 10-12 parts fine washed sand, all measured by volume.[23]

The door and window shutters, the roof, and the interior partition walls were completely reconstructed. The exterior shutters were of fixed-louver design and constructed of mahogany. The design for this building was largely conjectural as no usable physical or photographic evidence of the original configuration remained. It is believed that at this time early

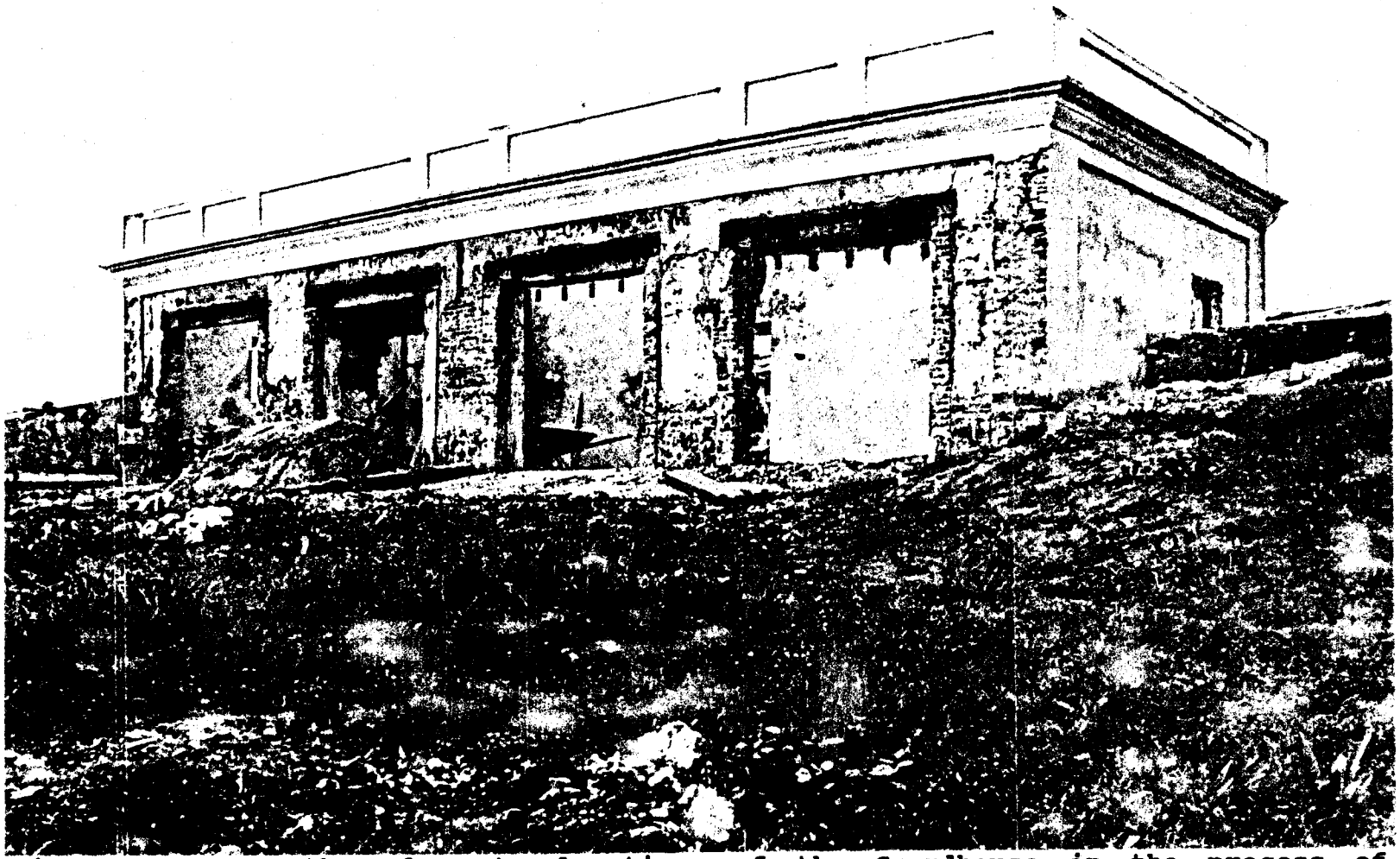


Figure 17.8. North and west elevations of the Guardhouse in the process of restoration, October 29, 1981. (San Juan NHS Archives.)



Figure 17.9. Interior of the Guardhouse looking southeast in the process of restoration, October 29, 1981. (San Juan NHS Archives.)

NOTES

1. A copy of O'Daly's plan showing the existing conditions in 1765 is included in Volume I, no. 6 in this report.

2. The plan dated 1783 by Juan Francisco Mestre is included in Volume I, no. 18 in this report.

3. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at Museo del Ejercito, Madrid, Spain.

4. "Memoria descriptiva del proyecto de modificación de la batería de la Princesa . . .," May 5, 1896, with attachment dated October 6, 1896. A transcription that is partly typewritten and partly handwritten is in the library at San Juan NHS.

5. Ibid.

6. Ibid.

7. The "ca. 1897" plan is undated and untitled and in the drawing collection of San Juan NHS. This is one of the plans obtained by Col. Goethals from the Spanish before the evacuation from Puerto Rico in 1898. The Library of Congress entitled the plan "La Princesa General Plan of Battery and Accessories." It was formerly labeled "Drawer 107 sheet 2-13." The current locator number is FC7-DR7-ENV134.

8. The report by HABS is four pages long and was prepared in July 1963 by Ricardo Torres-Reyes and F. Blair Reeves. The drawings were also prepared in the summer of 1963. Both are entitled "Guard House, Fuerte El Abanico, Castillo de San Cristóbal."

9. An investigation by HABS in 1963 identified original openings.

10. Ibid., p. 23.

11. Plan by Capt. Hodges, March 1899, included as Exhibit X in "El Abanico Fort," a National Park Service historic structure report by Ricardo Torres-Reyes, April 1965.

12. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of the Interior, NPS, Feb. 1984), p. 134.

13. Angel Rivero, Crónica de la Guerra Hispanoamericana en Puerto Rico (Barcelona: Editorial Edil, Inc., 1972), p. 81. This is a reprint of the original book published in 1922.

14. Ibid., and plan dated 1947 and entitled, "General Layout Fort Brooke and Vicinity." The plan is included on pp. 432-433 of the historic structure report by Edwin C. Bearss, San Juan Fortifications.

15. Bearss, San Juan Fortifications, pp. 315-317, describes the construction of the new housing.

16. See note 8.

17. Plan dated 1949 and entitled "As Built Survey Fort Brooke," drawing collection San Juan NHS, location no. FC1-DR4-ENV020.

18. See note 8.

19. "Section 106 Compliance Statement: Repair Fort San Cristóbal Outworks, San Juan National Historic Site," 1977.

20. All information on the 1980-1983 work was obtained from the contract file at San Juan NHS. Documents in this file include the specifications, drawings, change orders, unit price contracts, contract performance evaluation report, project status memos, correspondence, and photographs.

21. The NPS Draft General Management Plan for San Juan NHS dated 12/1984, p. 37, states that the building "will be continuously staffed to provide information and orientation . . . comfort facilities will also be provided."

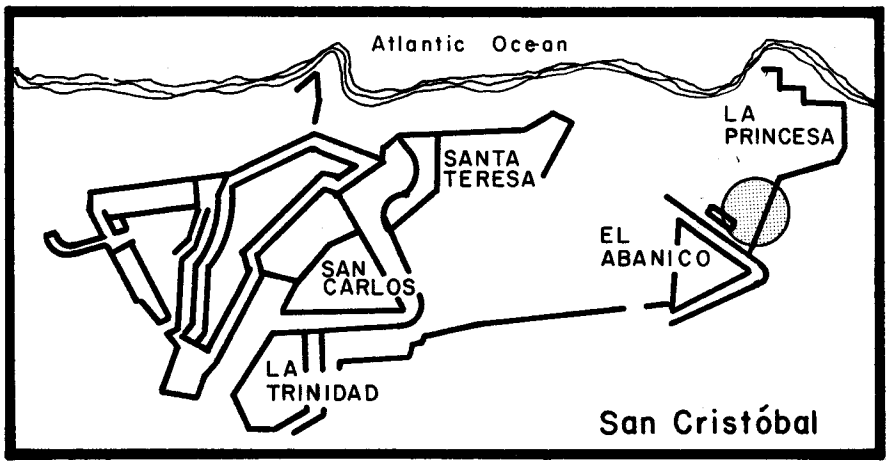
22. Ibid.

23. Ibid., letter dated June 5, 1981, from the contracting officer to Milton Guzman Construction Company.

24. Specifications, "Stabilization of Guard House and Sentry Box," section 01010, page 2 of 3.

25. Handwritten note from Gerardo Parrilla to Garcia dated 12/29/82, in the contract file. "Garcia" was most likely Superintendent Garcia, San Juan NHS.

26. Seven photographs in the contract file, San Juan NHS.



CHAPTER 18

THE NORTHEAST GATE OF EL ABANICO

Description

The Northeast Gate of el Abanico is comprised of the following elements: a pair of five-sided masonry gateposts, a modern wooden bridge spanning the dry moat, a pair of secondary gateposts, and a sentry box. It is located at the southern end of the moat between el Abanico and la Princesa (figs. 18.1 - 18.3).

When originally constructed in 1896, the gate provided access from the east to the glacis of San Cristóbal and to la Princesa. It is set into the scarp of the moat and parapet wall between la Princesa and el Abanico. Although la Princesa had been built between 1779-1783, it was extensively modified and reconstructed in ca. 1896. The Northeast Gate was apparently designed to allow materials for construction and heavy artillery to enter la Princesa. It is almost identical to the South Gate of el Abanico (Chapter 19).

The two imposing primary gateposts are about 16 feet tall and are constructed of dressed sandstone in an ashlar pattern. The posts have heavy stepped cornices with steep sloping caps; both are built of brick covered with a stucco finish. Wood brackets are set into the reveal of the cornice of each gatepost. The brackets have sockets to receive the reverse pintle of a now-missing gate.

The small square secondary gateposts are located across the modern plank bridge above the counterscarp wall of the

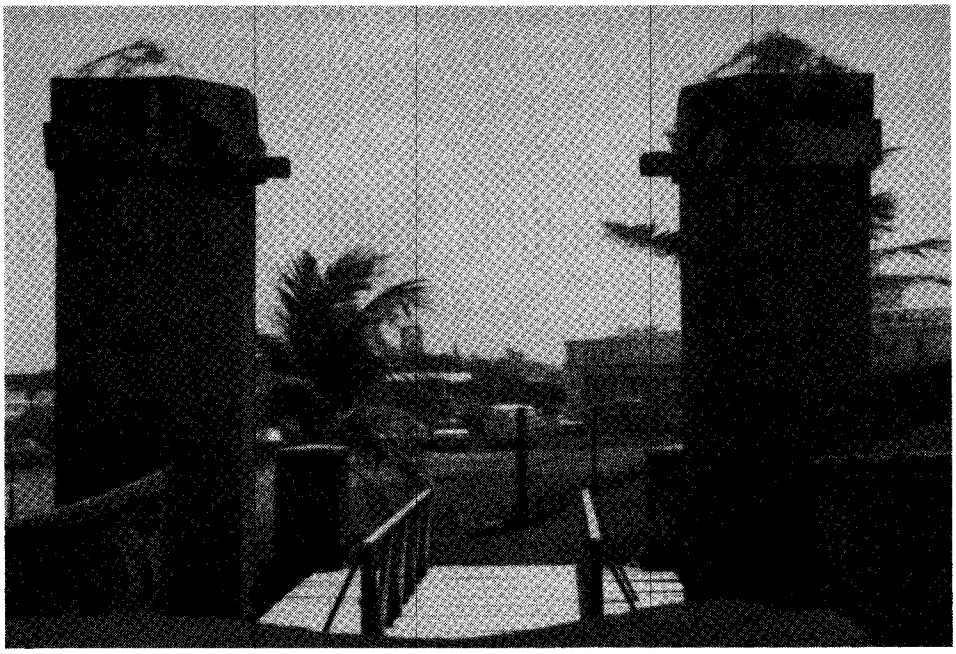


Figure 18.1. View of gate posts of Northeast Gate at el Abanico looking east. Photo by Richard Crisson, 1986.

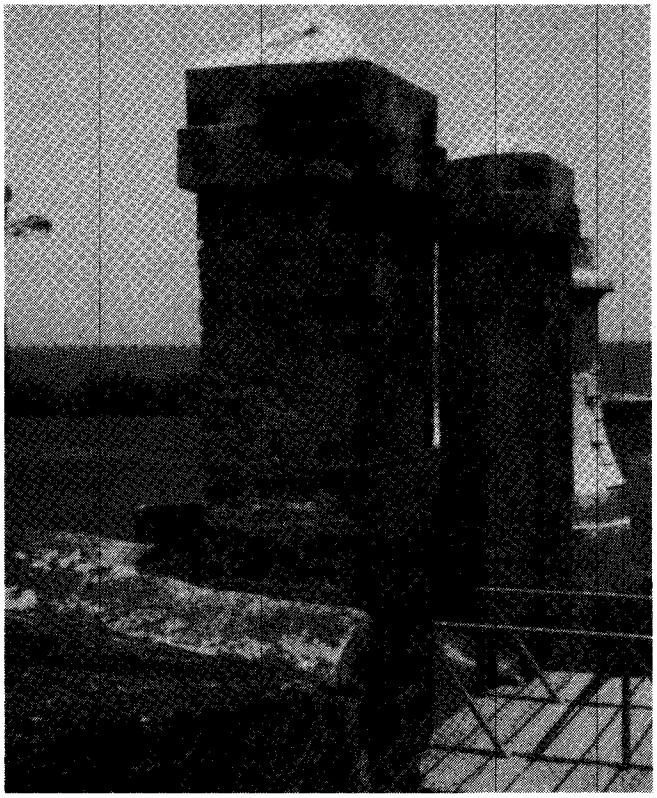


Figure 18.2. View of gate posts of Northeast Gate looking north. Photo by Richard Crisson, 1986.

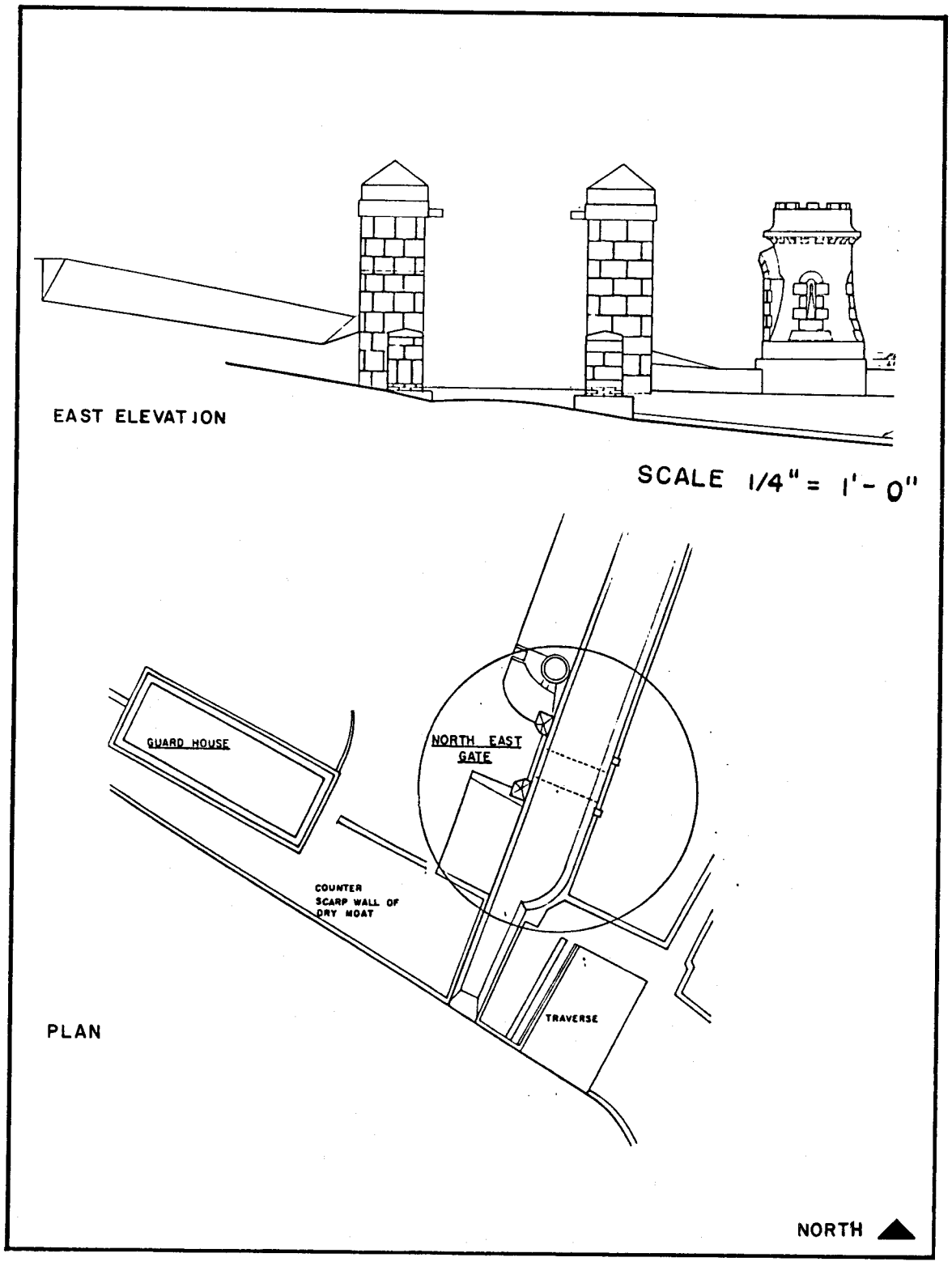


Figure 18.3. HABS drawings of east elevation and site plan of el Abanico's Northeast Gate, 1963.

moat. The cut sandstone and brick posts are about 4 feet tall. A gently sloped cap is covered with cement stucco (fig. 18.4).

The cylindrical masonry sentry box, set into the parapet wall to the north of the gateposts, forms a notable decorative element of the gate. The sentry box is of masonry and has a flattened dome roof with a small crenelated top and a projecting cornice. Its side walls flair out to a projecing round base.

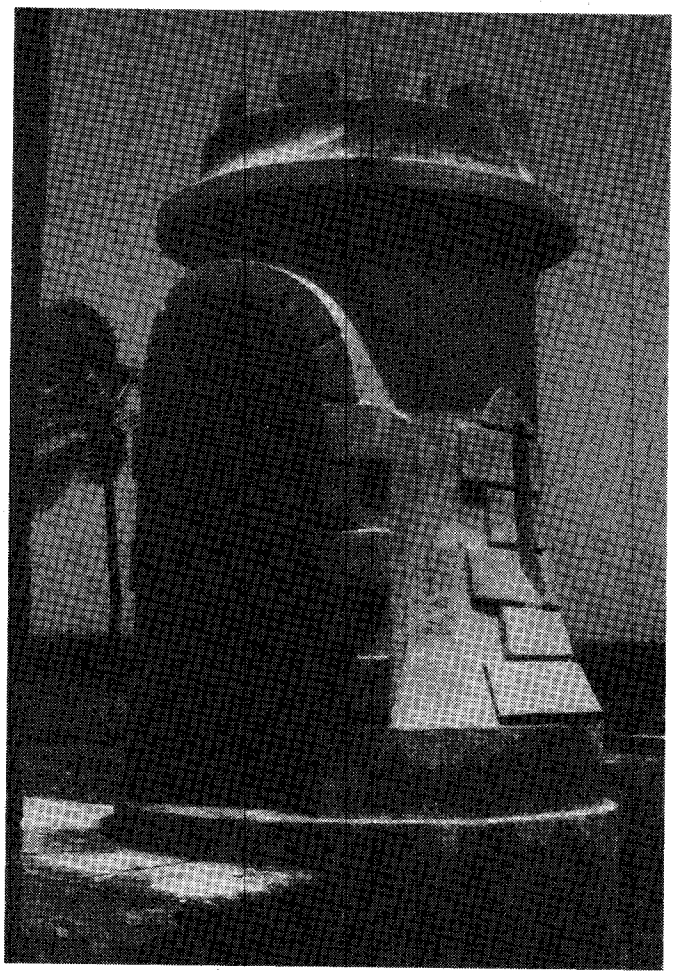


Figure 18.4. South elevation of sentry box. Photo by Richard Crisson, 1986.

The wall is of load-bearing masonry and consists of bricks laid in mortar and stuccoed with Portland cement. Surmounting the wall is a projecting cornice with modillions. The cornice has a flattened ovolo molding and fascia, supporting a small crenelated parapet. This conceals the flattened masonry dome roof. Roof drainage is provided via a small drain hole on the northwest side of the parapet.

The sentry box has one south-facing arched doorway and three arched, slit-like windows at eye level facing north, east, and west. All of the openings have decorative quoins, voussoirs, and rusticated arches.

Structural Evolution

Period 1: 1625-1765

No structures were on the site of the Northeast Gate during these years based on the available documentation. Thomas O'Daly's plan of existing conditions in 1765 showed the area covered with vegetaion.[1]

Period 2: 1765-1809

El Abanico and la Princesa were constructed sometime between 1779 and 1783. One feature of the outworks was a moat on the southeast side of la Princesa that extended at its south end into the covered way of el Abanico. This moat, along with a bridge spanning it at the covered way, were illustrated in the plan by Mestre dated 1783. The site of the Northeast Gate was north of this early bridge.[2]

Period 3: 1809-1837

No references to the Northeast Gate at el Abanico appear in available documentation during this period.

Period 4: 1837-1868

The site of the Northeast Gate is documented during this period by the model of San Cristóbal and its outworks dated 1839. Conditions appear unchanged from 1783 with no bridge crossing the moat in this location. It is interesting to note that the earlier bridge at the covered way was not shown in the model.[3]

Period 5: 1868-1898

A bridge was built across la Princesa's moat in ca. 1896 as part of a temporary construction roadway used in the modernization of la Princesa. Both the roadway and the bridge were described in a report on the modernization dated 1896.[4]

This provisional roadway was built as a means to transport both construction materials and artillery to la Princesa. The roadway circled around the south side of el Abanico and eventually crossed la Princesa's moat north of the covered way. Presumably this occurred at the present site of the Northeast Gate. The bridge constructed at this time was described in the 1896 report in great detail:

> The wooden bridge is as follows: the width of the moat has been dived in three sections by means of two ridges sitting on a properly bonded footing. These ridges support the framework of beams and planks, as well as the handrail and skirtboard. This bridge is already constructed . . . The bridge is the same width as the roadway, and over it has passed the cannons and howitzers.[5]

The 1896 report does not describe a gate per se. Nor was a gate or bridge included in the ca. 1897 plan of the new la Princesa although the moat was clearly shown.[6]

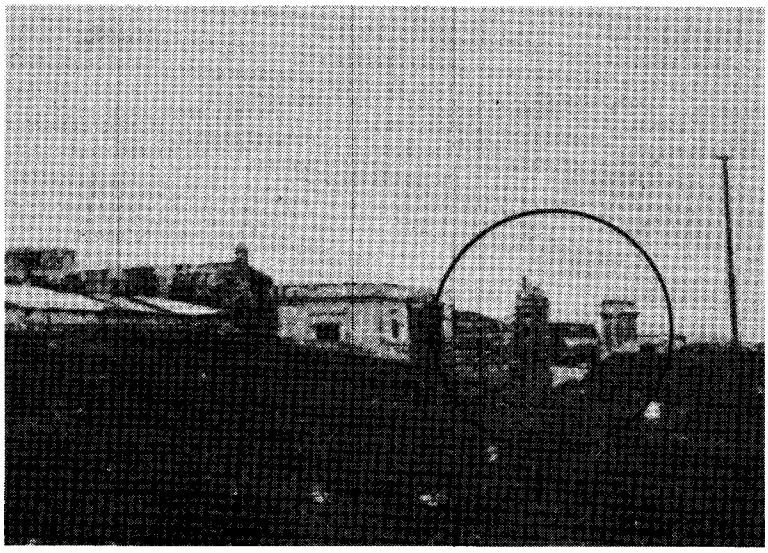


Figure 18.5. Detail of 1898 photo by William Halstead with gate circled. (San Juan NHS Archives.)

The earliest documentation of the gateposts and sentry box is a photograph (fig. 18.5) taken in 1898 by William Freeman Halstead for the New York Herald. This panoramic view clearly shows the east sides of both the posts and the sentry box. Though a gate is in place between the two large posts, its design is difficult to discern. Both the large posts and the sentry box are similar to their appearance today. The bridge is not visible in this view.[7]

Further confirmation that the sentry box was built before October 1898 is provided by physical evidence. THe design of the sentry box is identical to the sentry box at the South Gate that has been dated based on graffiti written withing days of the official American occupation of Puerto Rico.[8] American

occupation of Puerto Rico began October 17, 1898; the South Gate graffiti is dated October 19, 1898.

Period 6: 1898-1987

The most significant changes made to the Northeast Gate during this period were the replacement of the original bridge and removal of the gates. Also accomplished were extensive repairs to the sentry box.

In March 1899, the location of the bridge over the moat was shown in a plan by Captain Hodges. Not included were the gate posts and sentry box, most likely because the purpose of the plan was to show existing armaments.[9]

An early twentieth-century photograph (fig. 18.6) of the Northeast Gate was published in 1922.[10] Although undated, it is possible to roughly identify the view as having been taken sometime after ca. 1901-1904 based on the electrical wiring present.[11] Both pairs of gateposts and the sentry box were clearly visible. Positioned across the moat and between the posts was a bridge that appears to be constructed of wood including the plank deck and side railings. Supporting the railing were cross braces; three located on each side of the bridge. Attached to the large gateposts was a gate. This gate had two leaves and was of a picket design. The top of the gate was not straight across but sloped towards the middle, thus forming a shallow "V" configuration. To the north of the gate was the sentry box.

In the late 1940s, a cyclone (chain link) fence was installed around the perimeter of the la Princesa housing project built in 1930.[12] This fence was located on the west side of the Northeast Gate.[13] After its installation, the Northeast Gate was no longer used as a thoroughfare. An elevation dated 1956 further showed that the earlier picket gate had been replaced by modern fencing.

HABS recorded the existing conditions of the Northeast Gate in 1963. Their findings were recorded in a short report and in three sheets of measured drawings (see fig. 18.4). Presumably none of the elements of the Northeast Gate had been extensively rebuilt. It remained in almost its original condition. Two pairs of gateposts were located at the bridge, one on either side of the la Princesa moat. In each of the larger posts, one wooden bracket with a socket to receive the stile of a gate remained. A copper plate attached to the brackets provided additional strength to the wood. The sentry box was sited to the north of the large

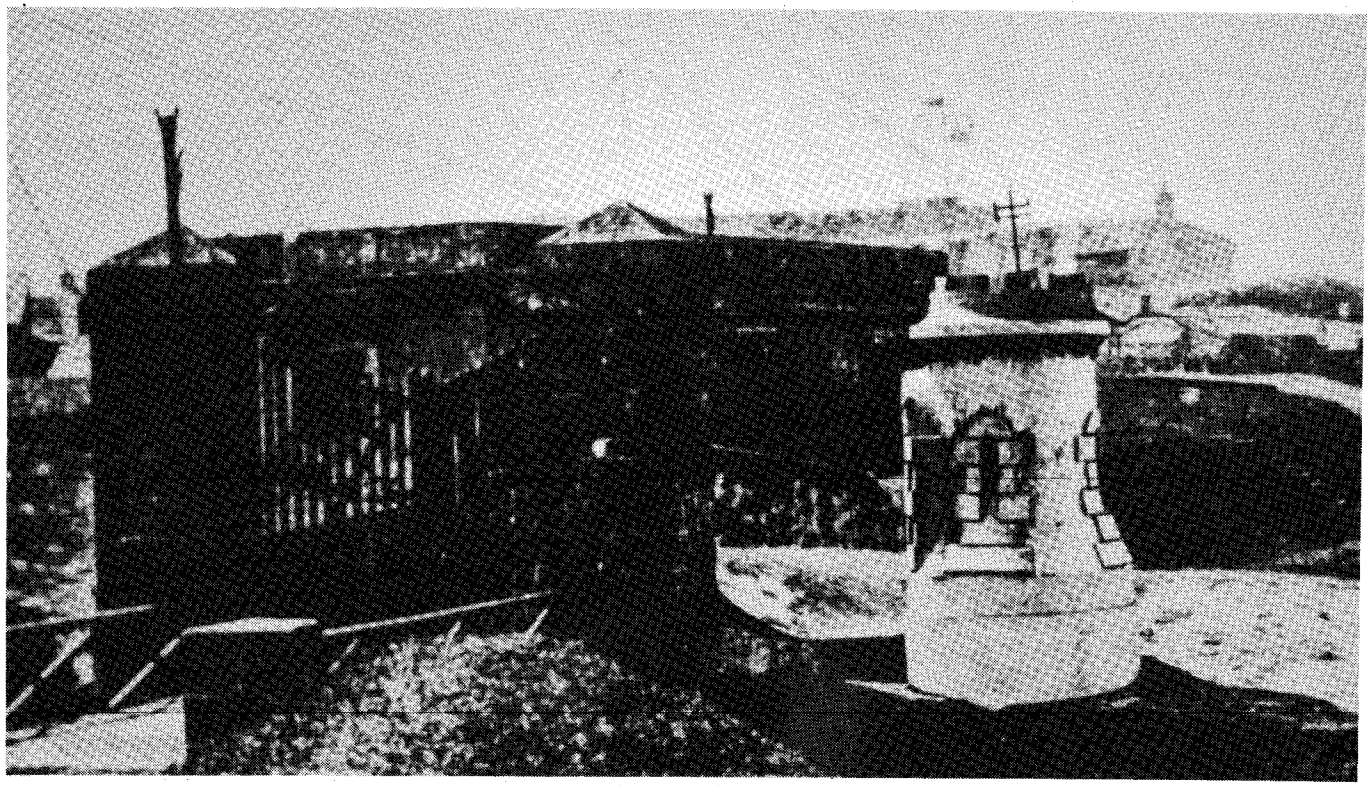


Figure 18.6. Detail of post-1904 photo of Northeast Gate looking west. (Crónica de la Guerra Hispanoamerican en Puerto Rico, 1922.)

gate posts. It was cylindrical in shape with a flat domeroof.[14]

By this time, the earlier bridge was replaced by "a modern wood bridge" and the gate itself was missing. Located beneath the bridge were an electrical conduit and a water pipe, both probably installed in the 1930s for the new military housing project at la Princesa. The small posts on the east side of the moat are described as having "sloping caps." These caps may have been added sometime after the photograph published in 1922. The photograph seems to show a flat cap on the north post.[15]

The deteriorated condition of the sentry box was recorded in a photograph dated 1977. This photograph (fig. 18.7) was included in a "106 Compliance Statement" proposal to do repair work at the San Cristóbal outworks.[16] The photograph showed the stucco on the west side of the sentry box missing in large sections and the bricks beneath exposed. The proposal was apparently approved because three years later the sentry box was repaired.

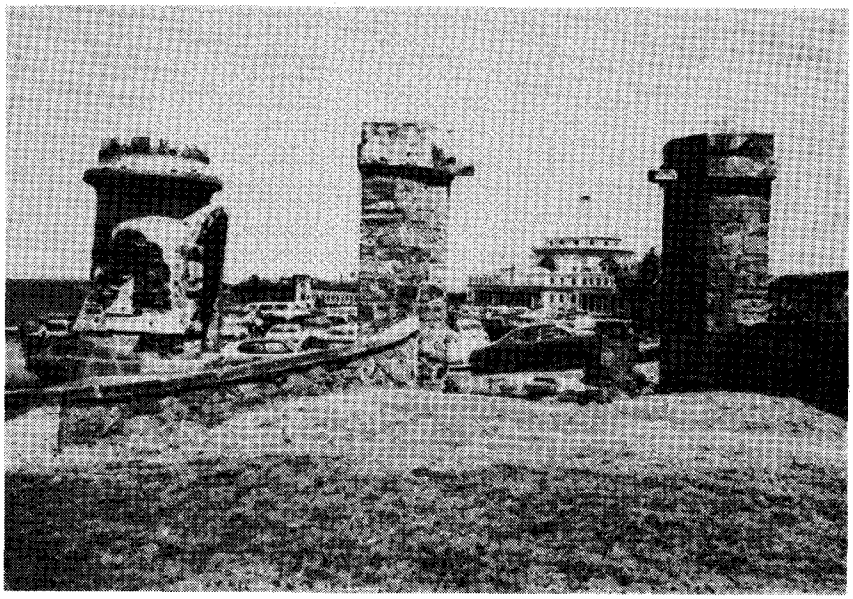


Figure 18.7. West elevation of Northeast Gate and sentry box prior to restoration. (San Juan NHS Archives.)

Repair of the sentry box was accomplished under NPS contract number CX-5000-0-1008, "Stabilization of Guard House and Sentry Box." The contract was awarded September 30, 1980 to Milton Guzman Construction Corporation of Hato Rey, Puerto Rico. Monitoring the progress of the contract as the contracting officer's representative was Gerardo Parilla of the San Juan National Historic Site. NPS architects involved with the project were Ron Bishop and John Garner of the Southeast Regional Office. Work on the sentry box continued through 1981. The total cost for the entire contract was $124,772.90. Of that amount, $2,900 was expended on the sentry box.[17]

NOTES

1. A copy of O'Daly's plan showing the existing conditions in 1765 is included in Volume I, Nos. 6, 7.

2. Ricardo-Torres, "El Abanico Fort, San Juan National Historic Site," a NPS historic structure report, historical data section, April 1965, pp. 2 and 7. The plan dated 1783 by Juan Mestre is included in Volume I, No. 18.

3. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at the Museo del Ejercito, Madrid, Spain.

4. 'Memoria descriptiva del proyecto de modificación de la batería de la Princesa...," May 5, 1896, with attachment dated October 6, 1896. A transcription that is partly typewritten and partly handwritten is in the library at San Juan NHS.

5. Ibid.

6. The "ca. 1897" plan is undated and untitled and in the drawing collection of San Juan NHS. This is one of the plans obtained by Col. Goethals from the Spanish before the evacuation from Puerto Rico in 1898. The Library of Congress entitled the plan "La Princesa General Plan of Battery and Accessories." It was formerly labeled "Drawer 107 sheet 2-13." The current locator number is FC7-DR7-ENV134.

7. Angel Rivero, Crónica de la Guerra Hispanoamericana en Puerto Rico (Barcelona: Editorial Edil, Inc., 1972), p. 23. This is a reprint of the original book published in 1922.

8. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of the Interior, NPS, Feb. 1984), p. 71.

9. The 1899 plan by Hodges is included as Exhibit X in the NPS report, "El Abanico Fort," by Torres-Reyes.

10. Rivero, Crónica de la Guerra, p. 81.

11. Bearss, San Juan Fortifications, pp. 131-135.

12. The fence first appears in an undated plan (thought to date to the late 1940s) entitled "Fort Brooke As Built" by the U.S. Army Office of the Engineer, in the drawing collection of San Juan NHS, locator no. FC1-DR4-ENV020.

13. The drawing was prepared in 1956 by the U.S. Army Corps of Engineers for the "Survey Report of Fortification Walls," in the drawing collection of San Juan NHS, drawing no. NHS-SJ.9197, and locator no. FC3-DR3-ENV071.

14. The report by HABS is five pages long and was prepared in July 1963 by Ricardo Torres-Reyes and F. Blair Reeves. The drawings were also prepared in the summer of 1963. Both are entitled "Northeast Gate, Fuerte El Abanico, Castillo de San Cristobal." Note that the spelling on the drawings is "North-East."

15. See note 8.

16. "Section 106 Compliance Statement: Repair Fort San Cristobal Outworks, San Juan National Historic Site," 1977.

17. All information on contract CX-5000-0-1008 was obtained from the contract file at San Juan NHS. Documents in this file include the specifications, unit price contracts, contract performance evaluation report, project status memos, correspondence and photographs.

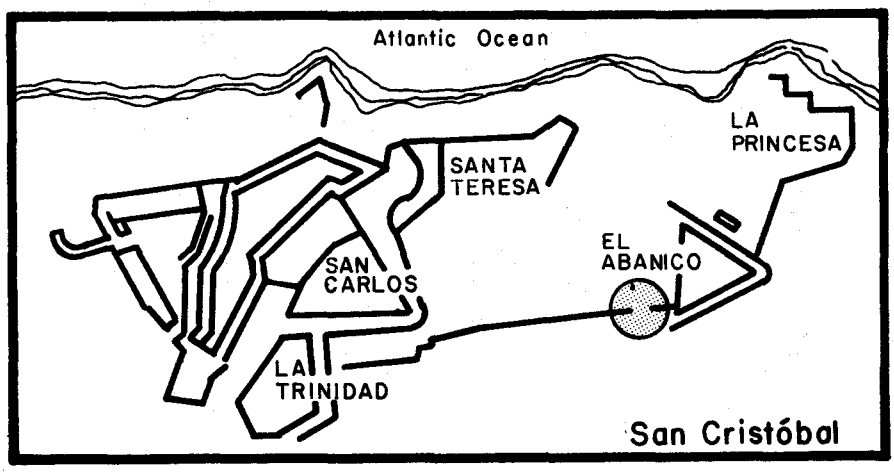
18. Ibid., letter dated June 5, 1981 from the contracting officer to Milton Guzman Construction Company.

19. Ibid., memo dated December 11, 1981.

20. Ibid., letter dated December 30, 1981.

21. The photographs are also included in the contract file.

22. Information on relocating the fence is included both in the contract folder and in "Folder 57217: Relocation Fence La Princesa," in the files at San Juan NHS.



CHAPTER 19

THE SOUTH GATE AT EL ABANICO

Description

The South Gate of el Abanico consists of two five-sided masonry gateposts and a detached cylindrical masonry sentry box. It was built around 1896 as a new and permanent entrance to la Princesa and el Abanico (ca. 1779-1783). The structure is located within the south parapet of the entrance covered way of el Abanico (fig. 19.1, 19.2).

The two gateposts are approximately 17 feet tall. They are built of dressed sandstone in an ashlar pattern. The posts are surmounted by hewn stone caps comprised of a cyma reversa cornice, a stepped pyramid, a curved polygon, and topped by a ball finial.

Both gates and hardware are missing. However, square Portland cement patches are located below the cornice and probably indicate where wood brackets extended out to support the gates in a similar manner to the Northeast Gate's posts.

The sentry box is located west of the gateposts and is approximately 11 feet tall. Distinctively shaped and topped by a parapet, the sentry box is built of bricks and covered with cement stucco. It is identical in design to the sentry box at the Northeast Gate (Chapter 18). The 12 inch side walls flare out to meet a slightly projecting round base. An overhanging modillioned cornice surmounts the walls. A flattened ovolo molding and fascia support the crenelated parapet top. This conceals the flat dome roof that contains the easterly roof drain.

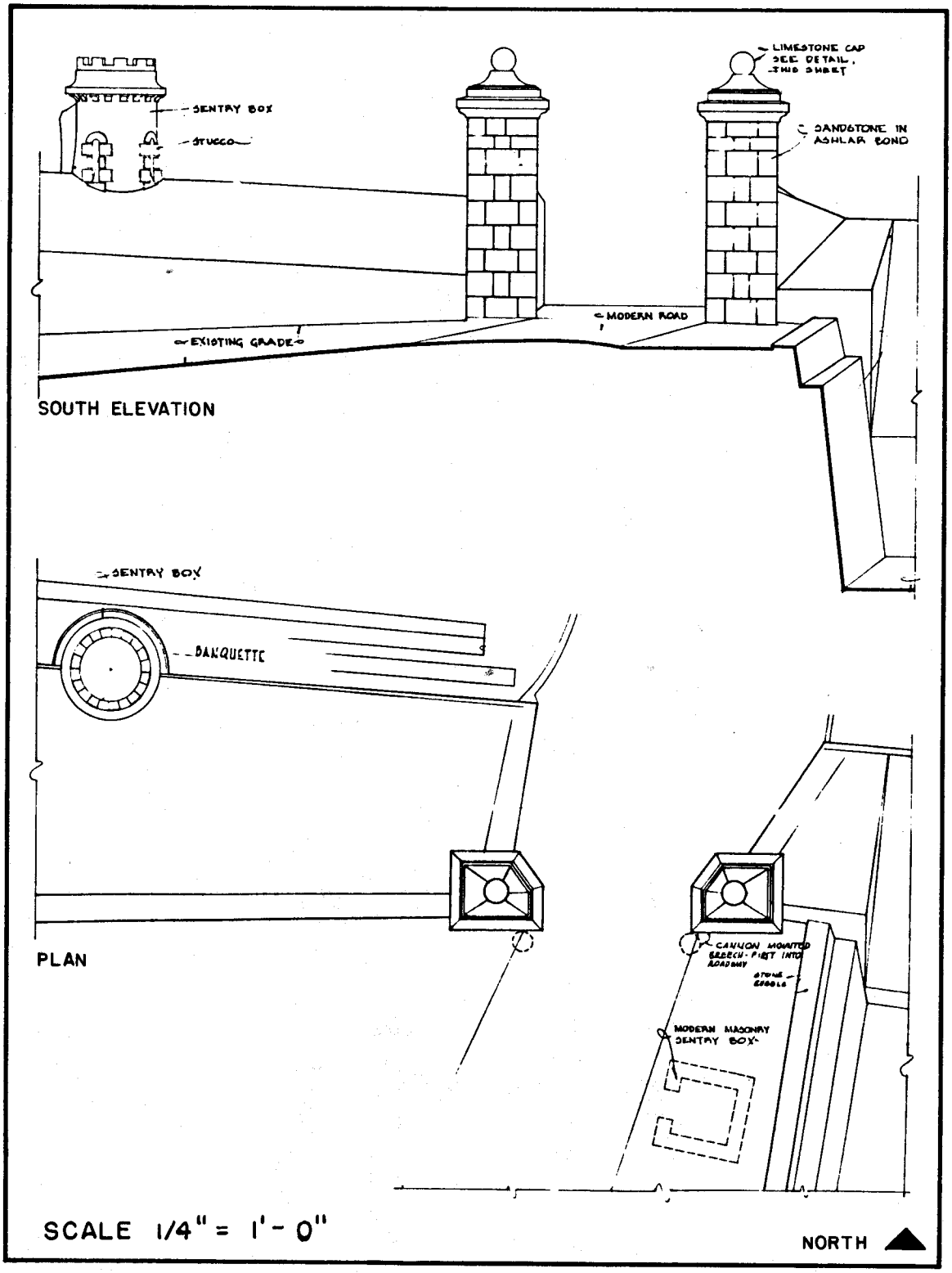


Figure 19.1. South elevation and plan of el Abanico's South Gate. Drawing by HABS, 1963.

An arched doorway faces northwest. Windows are located on the north, south, and west. All of the door and window openings have decorative quoins and voussoirs.

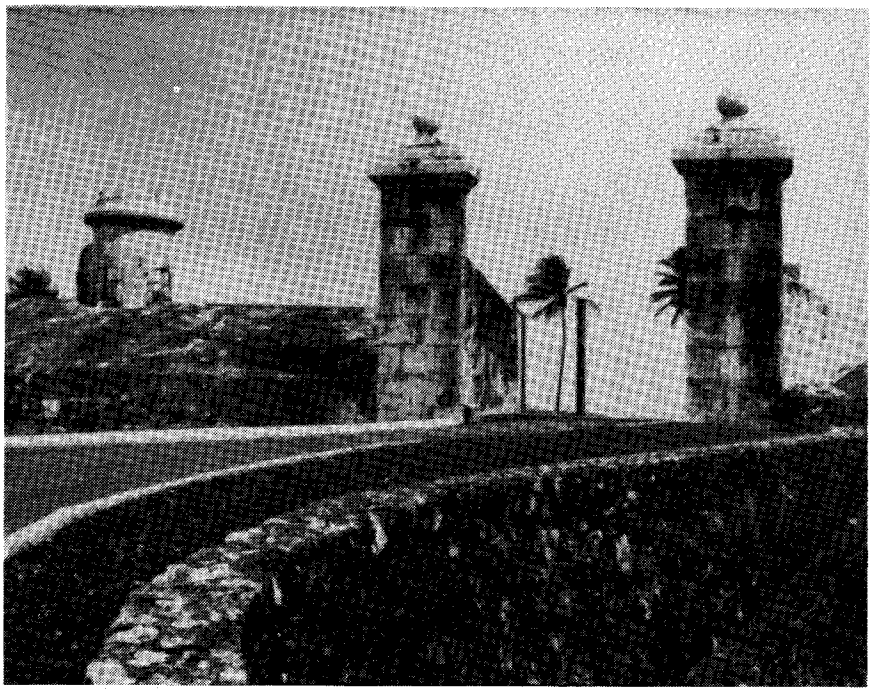


FIgure 19.2. South elevation of the South Gate and sentry box of el Abanico. Photo by Richard Crisson, 1986.

Original plaster still remains on the interior and displays a chronology of graffiti with the earliest inscription dated 1898. Two samples of original mortar were obtained in 1986 from the gatepost and the sentry box. The use of hydraulic concrete at this time is corroborated by the report dated 1896 on the building of la Princesa battery.[1*]

*SAJU 16 M03, SAJU 16 M04.

Structural Evolution

Period 1: 1625-1765

No structures were on the site of the South Gate during these years based on the available documentation. Thomas O'Daly's plan of existing conditions in 1765 shows the area covered with vegetation.[2]

Period 2: 1765-1809

El Abanico was constructed sometime between 1779 and 1783. One feature of el Abanico was a covered way that enabled direct communication with the main moat of San Cristóbal. This was located on the south side of el Abanico as illustrated in Mestre's plan of 1783 (fig. 19.3). It was in the south parapet wall of this covered way that the South Gate would eventually be located. During this period, the gate did not exist.[3]

Period 3: 1809-1837

No references to the South Gate appear in the available documentation during this period.

Period 4: 1837-1868

The site of the South Gate is documented during this period by the model of San Cristóbal and its outworks dated 1839. In this model, no gate interrupted the continuity of the el Abanico covered way.[4]

Period 5: 1868-1898

Construction of the South Gate and sentry box appears to have taken place sometime before October 1898. Its construction most likely coincided with the 1890's modernization of la Princesa.

The earliest documented evidence of the gateposts was a photograph (fig. 19.4) taken in early 1898 by William Freeman Halstead for the New York Herald. All that may be seen of the posts in this distant shot were the distinctive balls of the caps. Not seen in this view was the south sentry box. It was most likely extant at this time (and simply out of

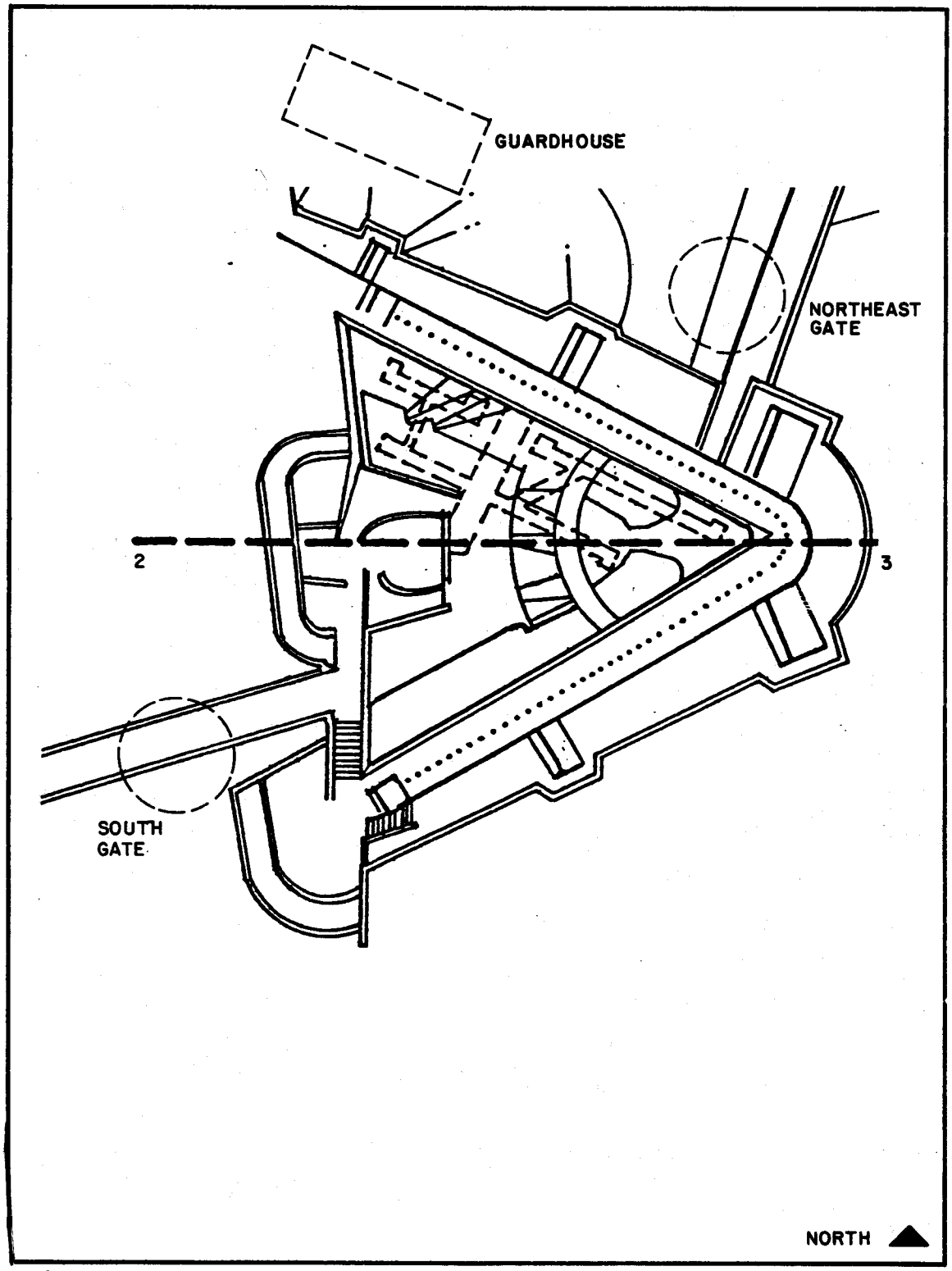


Figure 19.3. Detail of Juan Mestre's September 13, 1783 plan showing site of future South Gate, Northeast Gate, and Guardhouse. Tracing of original by Torres-Reyes (1965) annotated by Jana Gross (1989).

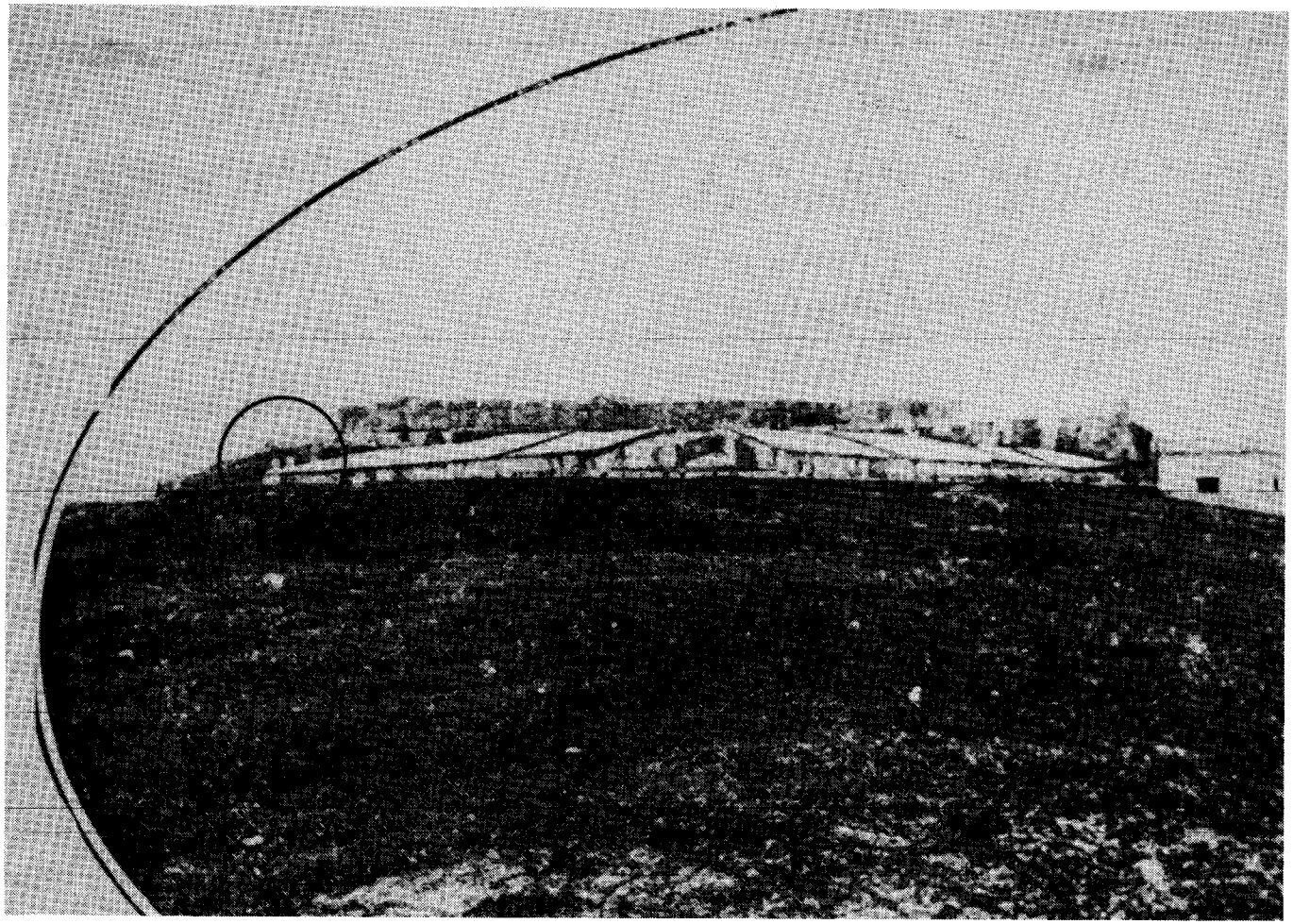


Figure 19.4. Detail of 1898 photo by William F. Halstead, gate posts circled. (Page 23, Crónica de la Guerra Hispanamericana en Puerto Rico, 1922.)

view), as another sentry box of identical design was located at the Northeast Gate at this time.[5]

Further confirmation that the sentry box was built before October 1898 is provided by physical evidence. In 1986, the interior walls were observed to have names and dates written on them. Two of the earliest inscriptions are: "Oct. 19th 1898 - Battery [?] 5th Artillery," and "C. Smith Bat G 5th Art." Battery G of the 5th U.S. Artillery was the first troop stationed in the San Cristóbal barracks following takeover by the United States in 1898. The troops arrived in San Juan on October 17, 1898.[6] Based on this information and assuming that the graffiti is authentic, this targets the date of construction as sometime before October 1898.

No documentation on the actual construction of the gateposts and sentry box has been located. Presumably this gate provided access to the newly modernized battery of la Princesa by means of a new interior service road illustrated in a plan of la Princesa dated ca. 1896 (fig. 19.5). This road was oriented behind the new gun positions and along the east-west axis of the battery. At the west end of the battery, the road turned towards the

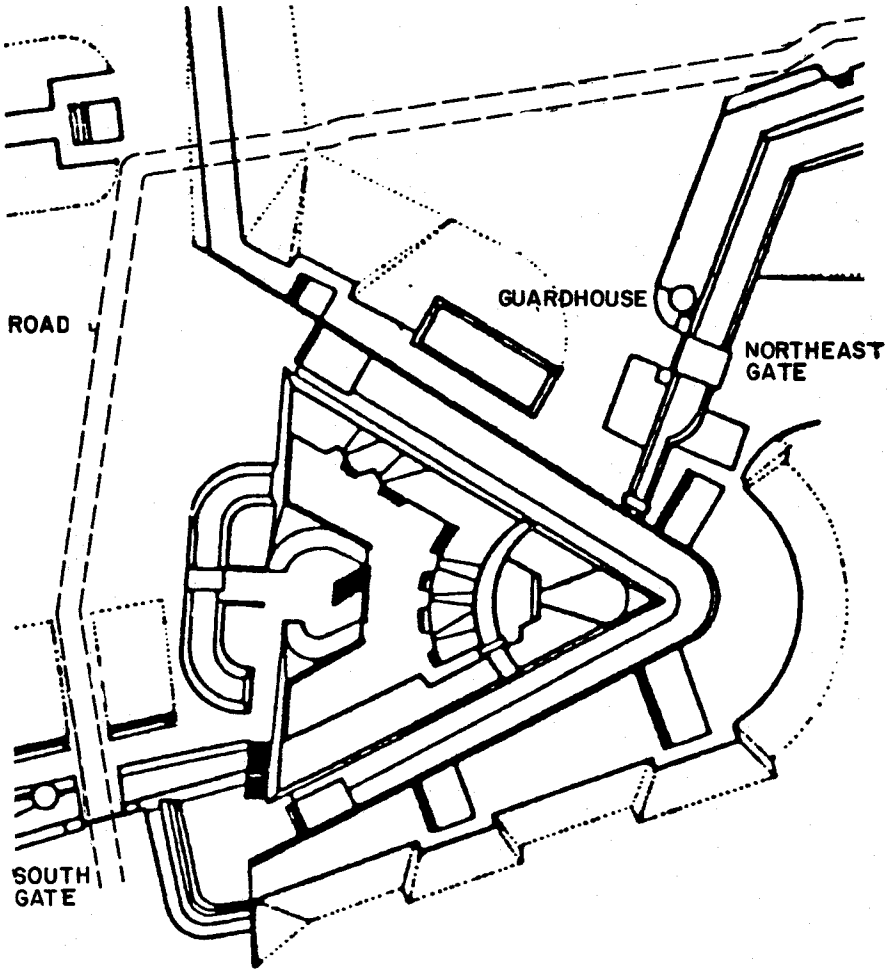


Figure 19.5. Detail of new service road illustrated on 1896 plan transferred to modern plan of fort. (Original unavailable.)

south in the direction of the South Gate. Unfortunately, the plan does not continue as far south as the gate, but it seems likely that the road may have passed through it. Unlike the provisional road that passed through the Northeast Gate and was used to construct the battery, the service road was a permanent feature. It was probably used to transport munitions, supplies and troops.[7]

Period 6: 1898-1987

The gateposts and the sentry box have remained essentially unchanged since their original construction in the 1890s. The one major exception was the removal of the early gate sometime before 1963.

Captain Hodges recorded the overall existing configuration of San Cristóbal and its outworks in a plan dated March 1899.[8] The South Gate and its sentry box were left out. A possible reason for this omission is that the emphasis of the plan was on the armaments of the fortification.

Little is known about the evolution of the South Gate in the first half of the twentieth century. Certainly the volume of traffic through the gate would have increased following the building of the military housing project at la Princesa in 1930.[9] A plan from the late 1940s and an undated photo (fig. 19.6) indicated that a guardhouse had earlier been added outside of the South Gate on the east side of the road.[10] Exactly when this small structure was constructed is not known.

HABS recorded the existing conditions of the gate and sentry box in the summer of 1963.[11] The small guardhouse to the south was still standing and described as a modern "rectangular masonry box, stucco over brick."[12] The gates had been removed from the posts by this time, modern light fixtures installed, and two cannon emplaced. Two patched holes in the masonry posts where the wood brackets had received the gate stiles were all that remained of the gates. Iron eyelets on the flanking walls to the north were used to hold the gates open. Modern electrical lighting brackets deemed "of no importance"[13] were located on the south elevation of the gateposts. Two iron cannon were on the south side and in front of the gateposts. These had been sunk breech-first into the road surface and appear to have functioned as decorative bumper guards for the posts.

Alterations made after 1963 and prior to 1986 involved the removal of modern twentieth-century fabric. The small guardhouse was demolished after 1976.[14] Also removed, (but not documented), were the modern lighting fixtures and the two cannon in front of the gateposts.

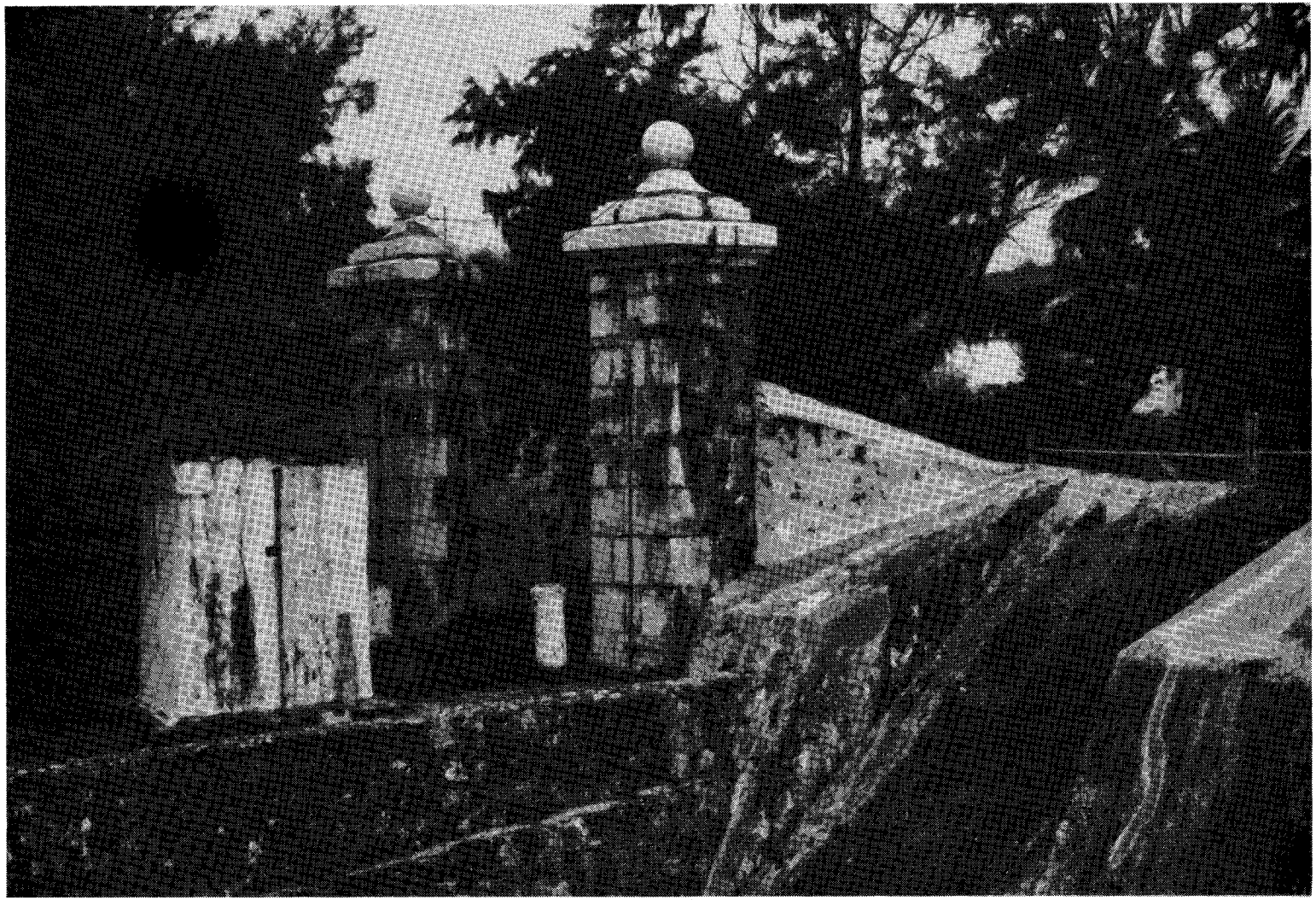


Figure 19.6. Undated photo, ca. late 1940s-1976, showing South Gate with small guardhouse. (San Juan NHS Archives.)

Conditions

The South Gate at el Abanico appears to be in good condition, although unlike the Northeast Gate, it has not been stabilized or restored. The hanging gates were removed sometime before the HABS survey of 1963.

The unit is comprised of various materials: brick, cut stone, and hewn stone. Although the gates and their hardware have been removed, no major repairs have been performed. The interior of the sentry box still retains 1898 graffiti and the entire unit's character is essentially unchanged from the late-nineteenth century. Exceptions include an overhead ceiling fixture in the sentry box that has been recently removed, and a rusting conduit once imbedded in the wall that is now exposed due to cracked plaster. The interior of the sentry box is damp and stained, but otherwise in good condition.

The gateposts are in good condition, although stained and worn stones are evident, especially at the east post and at the two finials. No evidence of stucco remains on the posts.

The South Gate today is used occasionally by the park as a vehicular entryway to the glacis between San Cristóbal and la Princesa and el Abanico. It is not used by visitors, however, since this part of San Cristóbal is not open to the public.

NOTES

1. "Memoria descriptiva . . . ," May 5 and Oct. 6, 1896.

2. A copy of O'Daly's plan showing the existing conditions in 1765 is included in Volume I, no 6 of this report.

3. Ricardo Torres-Reyes, "El Abanico Fort, San Juan National Historic Site," a NPS Historic Structure Report, historical data section, April 1965, pp. 2 and 11.

4. A copy of the original model, commissioned by the King of Spain from city architect Manuel Sicardo, is on display in the Visitor Information Center at San Cristóbal. The original model has been dated to 1839 and is on display at Museo del Ejercito, Madrid, Spain.

5. Angel Rivero, Crónica de la Guerra Hispanoamericana en Puerto Rico (Barcelona: Editorial Edil, Inc., 1972), p. 23. This is a reprint of the original book published in 1922.

6. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Department of the Interior, NPS, Feb. 1984), p. 71.

7. "Memoria descriptiva del proyecto de modificación de la batería de la Princesa . . . ," May 5, 1896, with attachment dated October 6, 1896. A transcription that is partly typewritten and partly handwritten is in the library at San Juan NHS. Also, undated (ca. 1897) and untitled is a plan in the drawing collection of San Juan NHS that shows the La Princesa battery, formerly labeled "Drawer 107 sheet 2-13," with current locator number FC7-DR7-ENV134.

8. The 1899 plan by Hodges is included as Exhibit X in the NPS report, "El Abanico Fort" by Torres-Reyes.

9. Bearss, San Juan Fortifications 1898-1958, pp. 315-317.

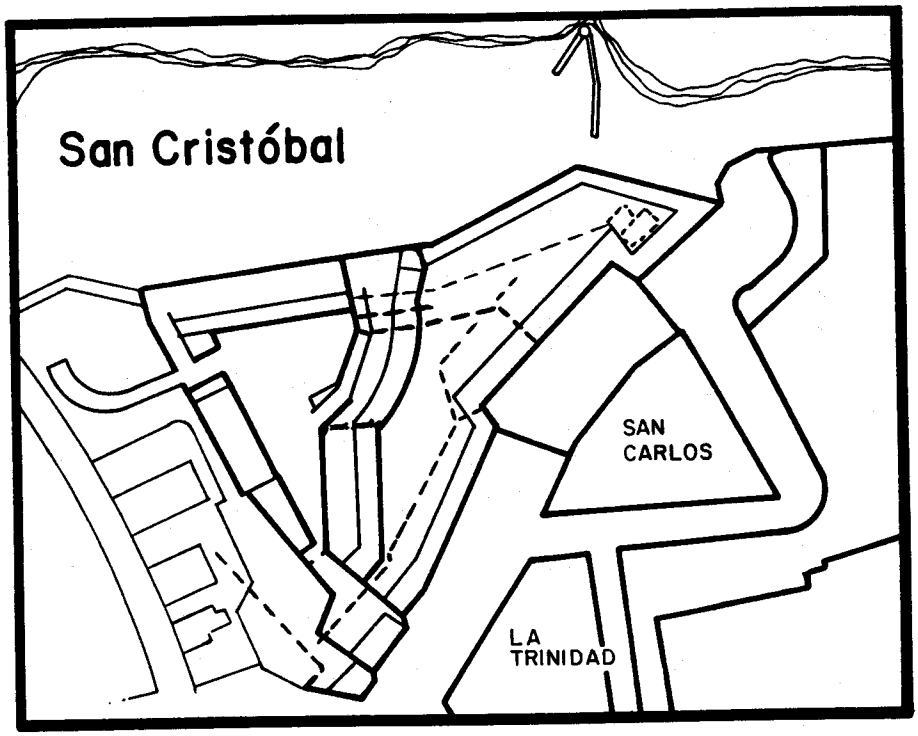
10. The undated plan, thought to date to the late 1940s, is entitled "Fort Brooke As Built" by the U.S. Army Office of the Engineer," in the drawing collection of San Juan NHS, locator no. FC1-DR4-ENV020.

11. Torres-Reyes, "South Gate, Fuerte El Abanico."

12. Ibid., p. 3.

13. Ibid.

14. "Section 106 Compliance Statement: Effect of Demolishing and Removing Contemporary Military Quarters From La Princesa Outworks of Fort San Cristobal . . . ," 1976.



CHAPTER 20

THE TUNNELS

Description

TUNNEL 1

The underground passage, Tunnel 1, is the longest and most northerly tunnel of San Cristóbal. It was originally designed as a countermining gallery for defensive purposes. It is located at the northwest corner of the Plaza de Armas and runs beneath the gallery of the North Casemates, el Caballero, and the North Bastion, and extends to the main (dry) moat of San Cristóbal. (See fig. 20.1.) Starting on grade with the Plaza, it slopes gently down from west to east. At its terminus is a casemate with an embrasured doorway that provides access to the moat. The tunnel was used for military purposes by the Spanish during the Spanish-American War and as late as World War II by the U.S. Army. It was restored and modified in the 1930s and 1940s.

The interior of Tunnel 1 is divided into four basic parts: the west entrance vault (about 52 feet long); the main vaulted shaft, or gallery, winding in an easterly direction (approximately 280 feet long); the east rectangular casemate with its embrasured doorway; and the short vaulted gallery, now called the dungeon, that proceeds in a southeasterly direction

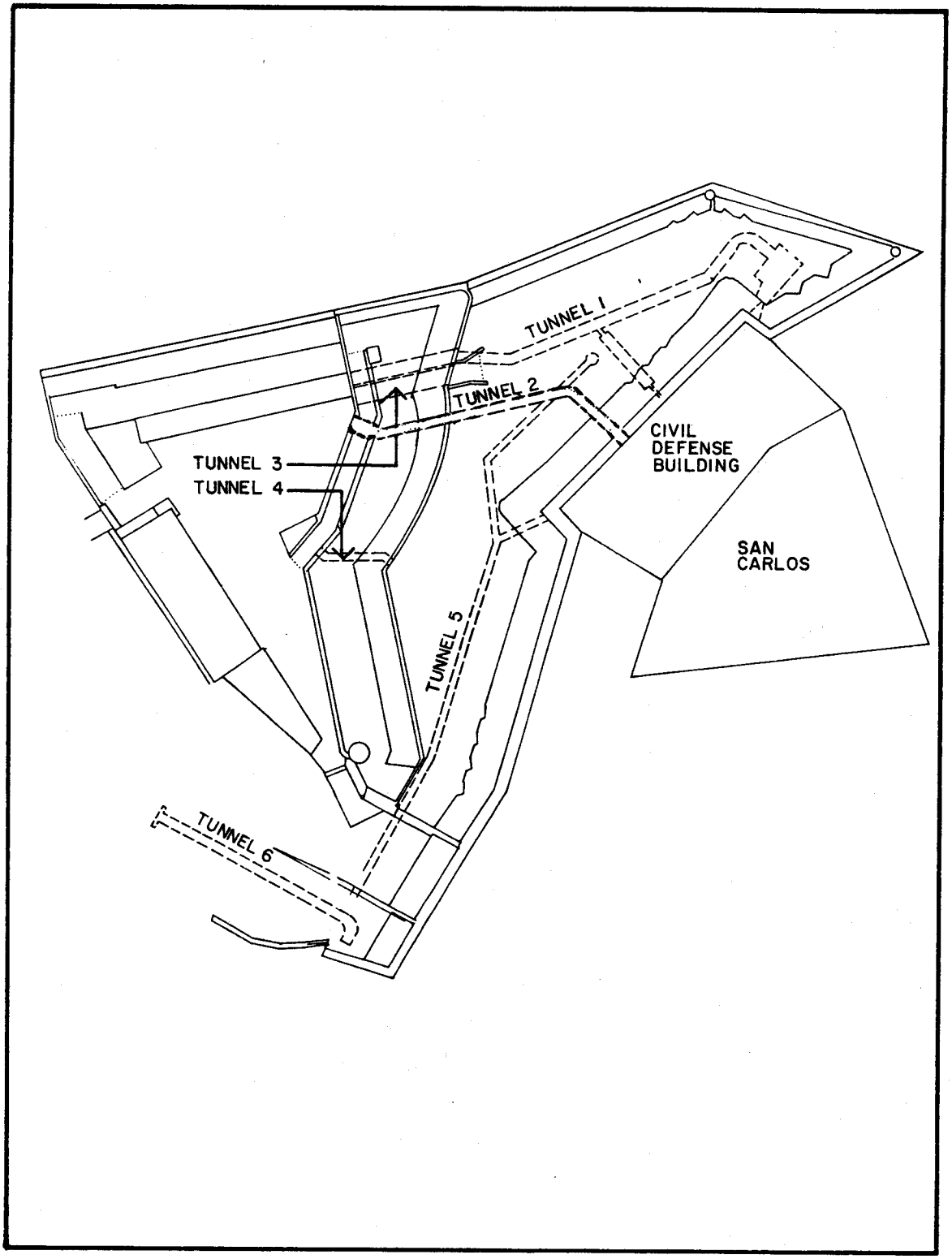


Figure 20.1. Plan of San Cristóbal with location of Tunnels 1-5 highlighted. Drawing by Jana Gross, 1989.

at nearly a 90 degree angle from the main east-west gallery.

Exterior elements of this tunnel include doorways at both east and west ends and the window of the dungeon. At the (west) entrance to the tunnel is a plainly-detailed arched doorway with a wrought iron grille enclosure. Both grille and hardware appear to date to the 1960s. Directly above the archway is a relief of the symbolic mortar bomb with flame; it represents the countermining function of the gallery. At the east end of the tunnel is the ca. 1942 rectangular doorway located within the 1769 embrasure opening. Modern wooden steps lead from the moat to this doorway, now featuring a 1960's wrought iron grille and hardware.

Two brick-lined shafts are located in the center of the main gallery. The smaller square shaft was constructed as a ventilator during the 1938-39 gallery reconstruction. The larger round shaft to the east was constructed in ca. 1897 in order to supply munitions to the gun emplacements above. Both openings are further described as part of the narrative for the North Bastion (Chapter 10).

The flooring of the main gallery and dungeon consists mostly of hard packed earth. The east and west rooms are paved with unpainted Portland cement; the paving probably dates to the 1930s remodeling of the tunnel by the U.S. Army.

The north and south walls of the gallery have a series of small shallow niches, known as mining slots, from floor to ceiling. These were for positioning the wooden planks that allowed powder to be stored in a series of compartments in order to blow-up the tunnel during an enemy invasion. Another series of deep, short, and less frequent niches on the north wall, were designed as places for soldiers to crouch or remain hidden from the line of fire.

Entry to the countermining vault, or dungeon as it is known today, is through a low opening with a wrought iron grille with hardware. The opening is located at the center of the south wall of the main gallery. The end wall, with its window facing southeast, is also of rubble stone and probably dates to 1769 when this tunnel was blocked and its function changed. It is likely that it was originally used as a shorter path to the moat of San Cristóbal. On the east wall of the dungeon are drawings of Spanish galleons.

Utility and mechanical systems for Tunnel 1 include only an electrical system. Although the tunnel and dungeon were first illuminated in 1938-39, it is apparent that new wiring and lighting fixtures have been installed more recently by the NPS. Illumination consists of incandescent lights concealed within the niches of the main gallery and spotlights in the dungeon

that illuminate the ship drawings. The most recent work was the installation of several modern "colonial" light fixtures in highly visible locations around the east casemate.

TUNNEL 2

Tunnel 2 runs parallel, east to west, with Tunnels 1 and 3 and is entered from the west, off of the eastern side of the Plaza de Armas. Approximately half the size of Tunnel 1, it runs beneath the ramp to el Caballero, and under el Caballero and the North Bastion extending to the main moat of San Cristóbal. (See fig. 20.1.) Tunnel 2 was the principal entrance to San Cristóbal from the outworks on the east and could be used defensively as a countermining gallery to block access by an enemy invader.

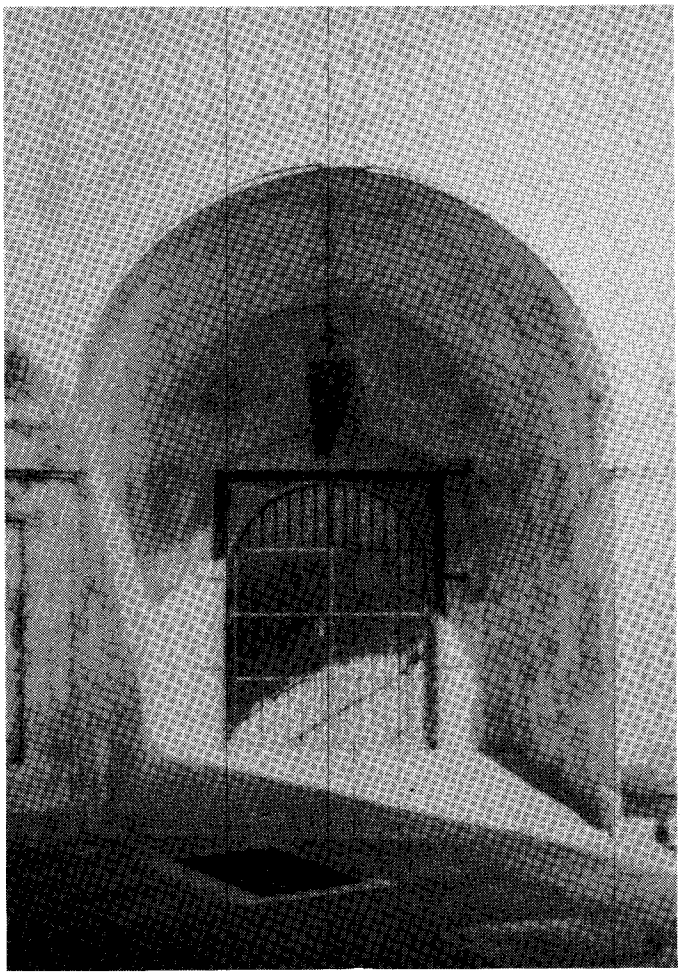


Figure 20.2. West opening to Tunnel. Photo by Richard Crisson, 1986.

The construction of the Joint Operations Center for Army, Navy, and Marine Corps in the moat necessitated moving certain features in the moat and obliterating a major portion of Tunnel 2's postern. The 1940's changes are still extant and the aforesaid structure is known as Building 213. It is used by the Civil Defense of Puerto Rico under the terms of an agreement with the NPS.

Because the tunnel is an underground element, its only exterior feature is the entry vault and doorway facing west under the ramp to el Caballero (fig. 20.2). A flat pilaster, broken at the springing line, supports a flat arch surround with a keystone that frames the tunnel opening. It is covered with cement stucco and whitewash. A long centered patch indicates where an electric conduit has been removed. The entrance way to the tunnel is denoted by a smaller archway with

an iron grille recessed several feet in the opening. It is similar to other grilles installed by the NPS in the 1960s. Of greater interest is the heavy square wooden frame fixed immediately outside of the arched opening, probably dating to the eighteenth century.

Directly above the grilled enclosure is a bas-relief plaster mortar bomb painted black similar to that at Tunnel 1. It is probably original and symbolized the secondary use of the tunnel as a countermining gallery.

No exterior features survive at the eastern terminus due to the filling-in of the moat. The interior of Tunnel 2 can be divided into two parts: the tunnel, and the surviving postern section at the east. The postern section terminates at a ca. 1942 steel door (painted black), with a wheel-like operating mechanism. This outer doorway is in line with the outside edge of the curtain wall of San Cristóbal. The inner square doorway is in line with the inner edge of the curtain wall. Decorative wall treatments, including a smooth, yellow-tinted lime plaster scored with black lines to simulate stone coursing, are found in the postern area.

A rudimentary electrical system is found in Tunnel 2. It was first illuminated during 1938-39 and some of the wiring seems to date to this period. In recent years, some ceiling fixtures and conduit have been removed and patched with Portland cement. The tunnel is not adequately illuminated, but ceiling and wall fixtures adjacent to the postern remain for security reasons.

TUNNEL 3

The ramped underground passage, Tunnel 3, is located between Tunnels 1 and 2. (See fig. 20.1.) It is the widest of the tunnels and had the significant function of providing access from the Plaza de Armas to the North Bastion. Artillery and supplies were carried up this ramp to the numerous embrasures of this key defensive bastion.

The ramp appears solidly-constructed, of rubble stone and cut sandstone. The ramp is relatively short, steep, and wide in order to accommodate artillery pieces. Wood and bronze hinges at the east end, and wall niches designed to accommodate the opened gates, are clues of its eighteenth-century function.

Tunnel 3 has only two exterior features (fig. 20.3): a large arched opening facing west and a lower segmental arched gateway opening to the east. The entrance to Tunnel 3 is located under the ramp up to el Caballero. The arched opening corresponds to the interior barrel vault. The architrave consists of a wide flat band, broken by a projecting band at



**Figure 20.3. Left: West entrance to Tunnel 3.
Right: Upper east entrance to Tunnel.
Photos by Richard Crisson, 1986.**

the springline and by a small keystone at its apex. A small modern wall-mounted plaque assists in the interpretation of the ramp.

The east-facing gateway is characterized by being slightly shorter with an exterior segmental arch. The opening is framed with cut sandstone blocks, fitted tightly with small brick chinks and lime mortar.

Immediately beyond this are cut stone jambs with wood and bronze hinges. The wood is embedded into the stone; the bronze socket is of the cappuchine type. Niches, or wall pockets, allowed the inward-opening doors to remain flush with the wall.

Outside the east gateway are two retaining walls. These walls are constructed of stone blocks with rounded capstones. The two low retaining walls contain the exterior portion of the ramp that extends into the terreplein.

The interior of the tunnel is a barrel-vaulted ramp, 13 feet wide and almost 90 feet long (fig. 20.4). There is a grade difference of about 16 feet between the Plaza level and the upper terreplein.

The floor is paved with various surfaces: a small section of smooth, probably original, sandstone strips; small sections of hormigón; and large areas of twentieth-century Portland cement plaster. Some of the latter are chiseled to prevent slipping. Other patches adjacent to the south wall may indicate a former trench. A square concrete cover, flush with the floor, may be related to the underground drainage system. The vault has not been electrified.

TUNNEL 4

Tunnel 4 is also a covered ramp entered from the base of the ramp to el Caballero at the west side of the Plaza de Armas. Parallel with Tunnels 1, 2, and 3, it is the southernmost of these features. It lies just north of the Troops' Quarters and directly beneath el Caballero. (See fig. 20.1.) The interior plan of Tunnel 4 is in the shape of an elongated "S". It was designed to enable troops quick access from the Plaza de Armas to the multi-embrasured San Cristóbal Rampart and South Bastion.

Tunnel 4 has two exterior features: the east and the west entrance. The west arched opening (fig. 20.5) is void of ornamentation and entirely stuccoed with Portland cement. There is a low step down to the ramp of el Caballero.

The eastern end is considerably more detailed, consisting of cut sandstone blocks. The threshold is of stone, almost

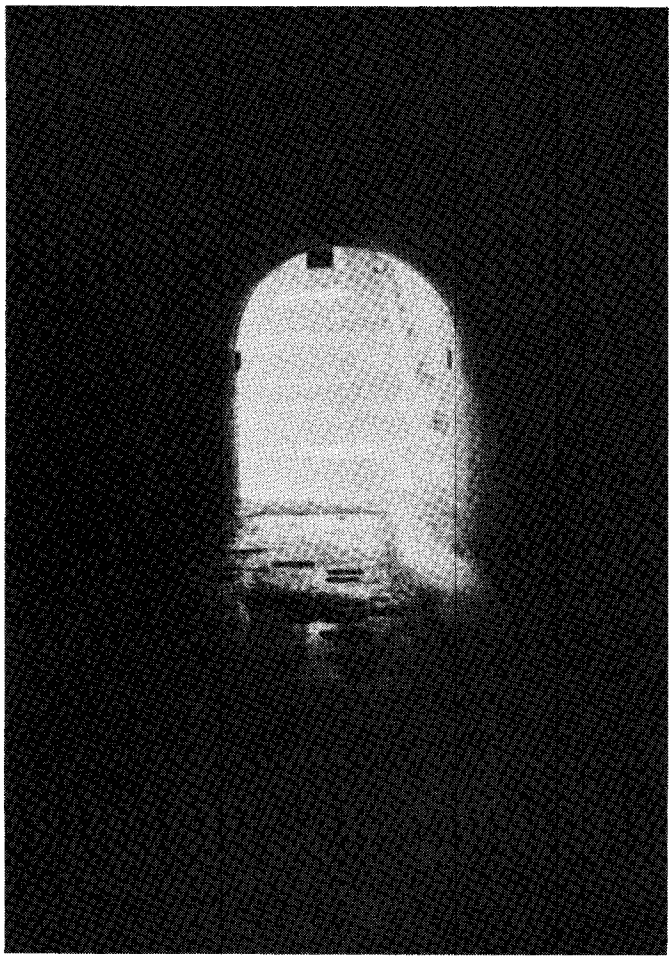


Figure 20.4. Interior of Tunnel 3 looking down to the Plaza. Photo by Richard Crisson, 1986.

flush with the terreplein of the South Bastion. If there ever was an actual postern gate, no evidence of hardware remains.

The ceiling is vaulted and consists of stretcher brick. Much of the ceiling, like the walls, is covered with plaster. The ceiling is also whitewashed. The floor is paved with a hard poured cementitious material intersected with three strips of well-worn sandstone. At the lower end, the poured paving has been chiseled to prevent slipping. The ramp has not been electrified.

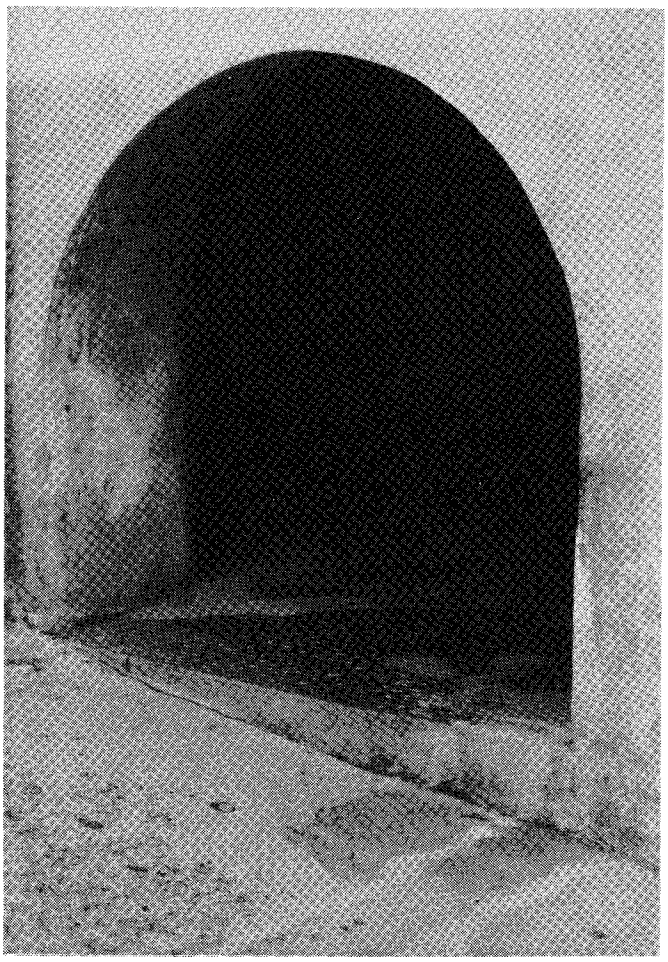


Figure 20.5. Lower northwest entry to Tunnel 4. Photo by Richard Crisson, 1986.

TUNNEL 5

Tunnel 5 (see fig. 20.1) is a countermining gallery located directly beneath the eastern defense of San Cristóbal. It runs in a northeasterly direction below the level of the principal moat with a bifurcation south of the intersection of the South Bastion and the curtain wall. This branch is a smaller countermining gallery extending east and terminating in six ascending stone steps at the inner face of the stone retaining wall. Within the wall is a small rectangular opening that served as an air passage for ventilation of the countermining gallery, as a listening post for enemy mining activity, and/or as an opening through which a gun could be fired. The opening is concealed today. Tunnel 5 originally vented to the north wall of the North Bastion. Presently this northern segment of the tunnel is inaccessible. It was sealed after a collapse in the early twentieth century.

Access to Tunnel 5 is gained from the lower battery of the South Bastion through a flat, arched, stone portal with splayed jambs and a brick lintel (now stuccoed with cement). This opening is presently covered by modern steel plate doors (fig.

20.6). A wooden inner frame installed in 1938, presumably to accommodate the earlier metal doors, obscures the location of the original door frame. The tunnel itself is a full barrel vault constructed in part of handmade brick laid in a running bond (fig. 20.7). The brick vault rests on rubble sandstone walls. Brick and stone are parged with a red stucco. At the first (east) bend in the tunnel, construction changes from brick and rubble to that carved from bedrock. Here, the tunnel slopes downward considerably.

An early illumination system is evidenced by a continuous series of holes 50 inches above the tunnel floor with iron remains accompanied by soot stains above. This suggests that iron holders with fat or wax candles (tapers) were used to light the tunnel.

TUNNEL 6

Tunnel 6 (see fig. 20.1, 20.8) was designed as a sortie gate that allowed troops stationed in the main moat to make covert entrances and exits. The tunnel is located south of the lower batteries of the South Bastion and runs in a northwest-southeast direction. Access is gained through an entrance adjoining the Superintendent's residence (Building 210-211), to the west of San Cristóbal off Calle Norzagaray. It is a straight-run tunnel approximately 171 feet in length and is terminated by a sharp, right-angled bend to the southwest that presently exits onto Calle Norzagaray.

The present entrance to the tunnel is an elaborate triple finialed portal that serves as both the ornamental entrance and the retaining wall for the tunnel cut into the southwestern slope of the pomerium. The tunnel itself is a steeply sloped, full barrel vault constructed with stone walls and brick vaulting, both of which are presently covered with a white cement stucco. The walls of the upper tunnel possess a rich collection of early nineteenth-century graffiti, both pictorial and written. The floor is cement.

Mortise evidence of a second internal doorway can be observed some feet into the tunnel from the entrance and appears to suggest that a large pair of swinging doors were once installed. A series of mining slots of uniform spacing run the length of the tunnel to the southwest bend, and a large circular air shaft pierces the vault approximately half way down its length.

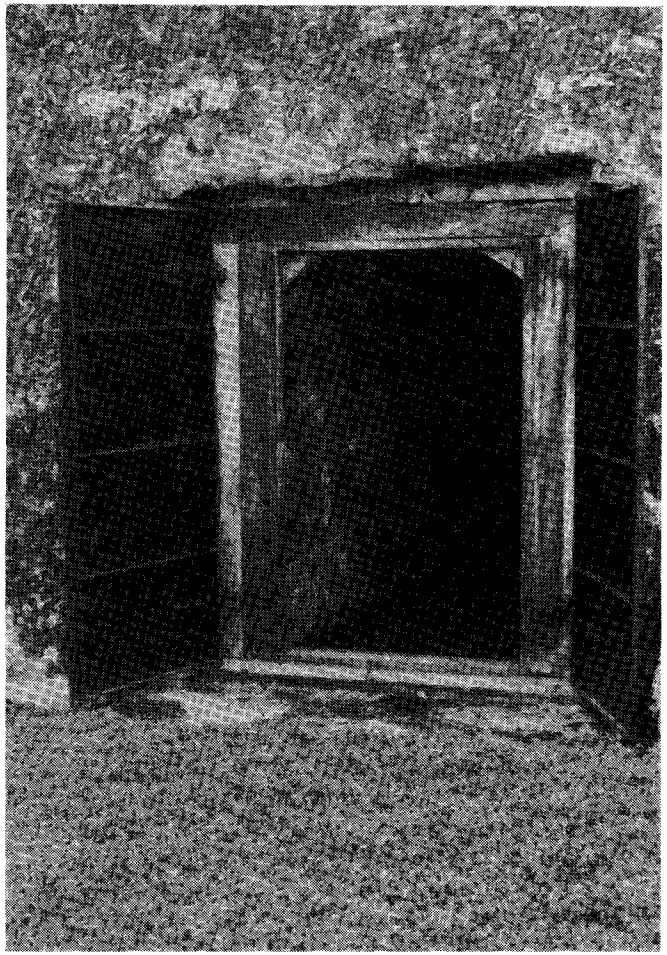


Figure 20.6. Entrance to Tunnel 5 from South Bastion. Photo by CPR, 1986.

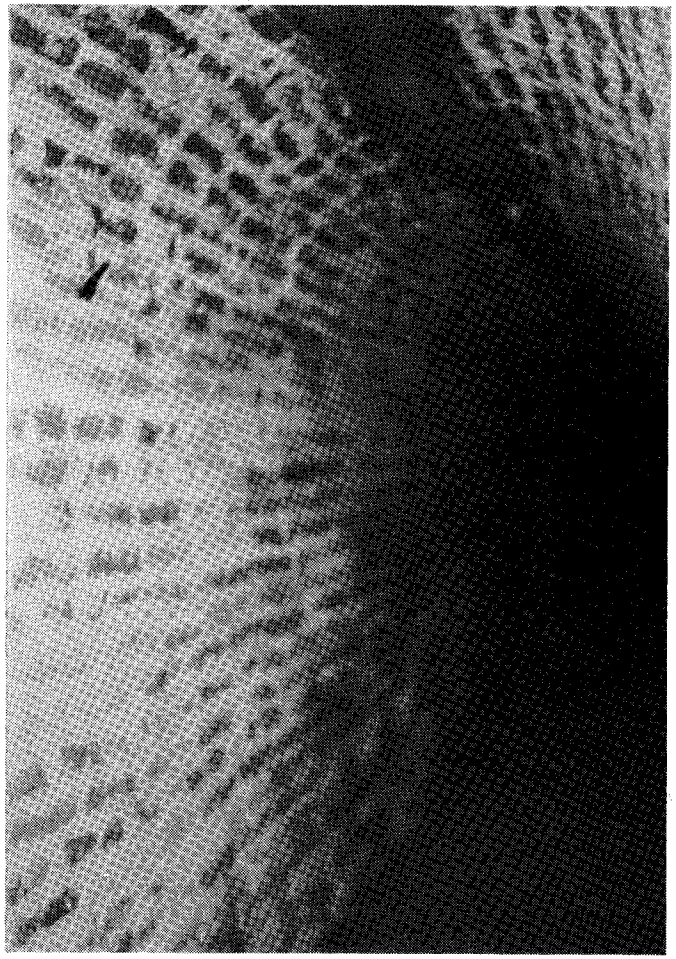


Figure 20.7. Interior of Tunnel 5. Photo by CPR, 1986.

Beyond the southwest bend is a large, cut stone portal of flat, arched construction. This double-sided portal spans the width of the south flanking wall of the South Bastion and originally held two pairs of folding doors (one pair on each side). These doors were pivot-hinged into a wooden lintel. The stonework of the portal retains an ocher painted stucco with scored ashlar joints highlighted in black.

The extreme end of the tunnel (south of the portal) is of modern reinforced concrete construction, possibly of a late-nineteenth century date and allows egress up a flight of cement steps onto Calle Norzagaray.

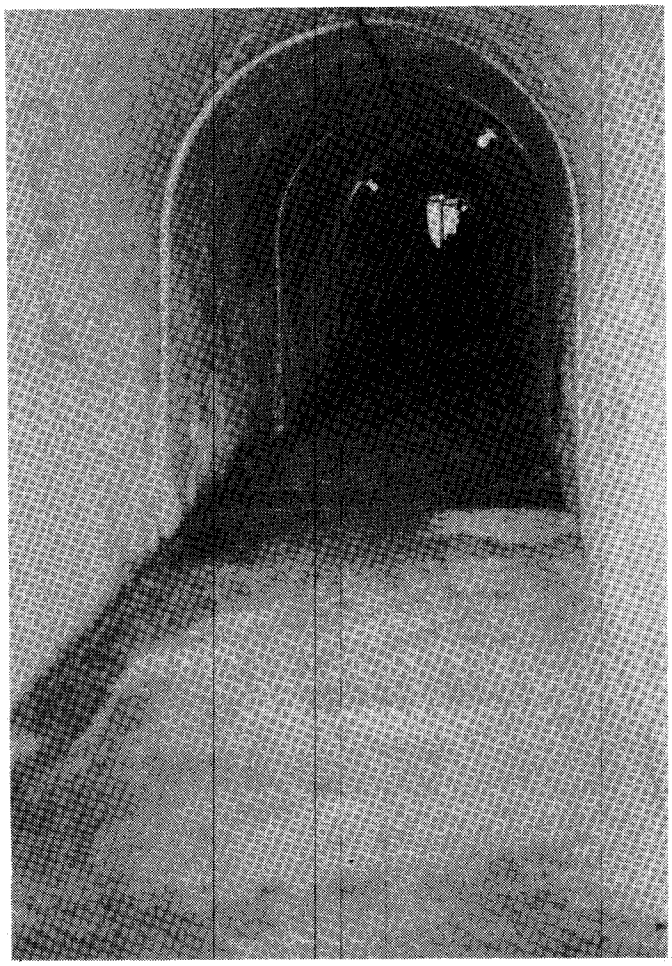


Figure 20.8. Interior of Tunnel 6. Photo by CPR, 1986.

Structural Evolution

Period 1: 1625-1765

TUNNEL 1

As best as can be determined Tunnel 1 incorporated existing building fabric when it was built in 1769. The oldest portions of the tunnel include some sections of the long south wall and the short spur known today as the dungeon. These two features may date to the original construction of San Cristóbal, ca. 1634-1644. The south wall certainly was constructed by 1678 based on a map of that date.[1] The exact date of the dungeon is less certain, although by 1769 it was considered antigua (old).[2] The names "tunnel" and "dungeon" both date to the twentieth century. Lacking historical names for these features, the modern terminology will be used for this period.

Approximately 180 feet of the tunnel's south wall comprise what was originally the north wall of the fort, known today as the North Bastion. This is illustrated graphically in a 1769 section (fig. 20.9) by Engineer Thomas O'Daly. Here, in Profile No. 2, the new tunnel was joined to feature "P" described as the "old wall of the northern part of the Castle . . . "[3] This wall was built using a lime mortar containing brick dust.*

Very little early documentation was found on the dungeon with the exception of the 1769 reference. The late historian Ricardo Torres-Reyes conjectured that it was a seventeenth-century work "which probably gave access to the main moat before 1765."[4] The structure of the walls suggests that this short tunnel was built at a different time than the north wall of the fort. This is apparent by the manner in which the east and west dungeon walls are joined to this fort wall. At the junction, the walls were built up to, but not integral with, the fort wall. Possibly the building of the short tunnel was an earlier or a later phase in the original construction of the fort's north front.

Remaining evidence of construction techniques and materials in the dungeon provides additional information on this feature. The vaulted ceiling appears to have been constructed by first building a temporary interior framework and then laying upon it rubble masonry and mortar from above. Long poles, such as native bamboo, must have been part of this upper framework as

*SAJU TI M03, removed from south side of tunnel wall. Similar to SAJU 11 M03a, removed from east parapet wall of el Espigón.

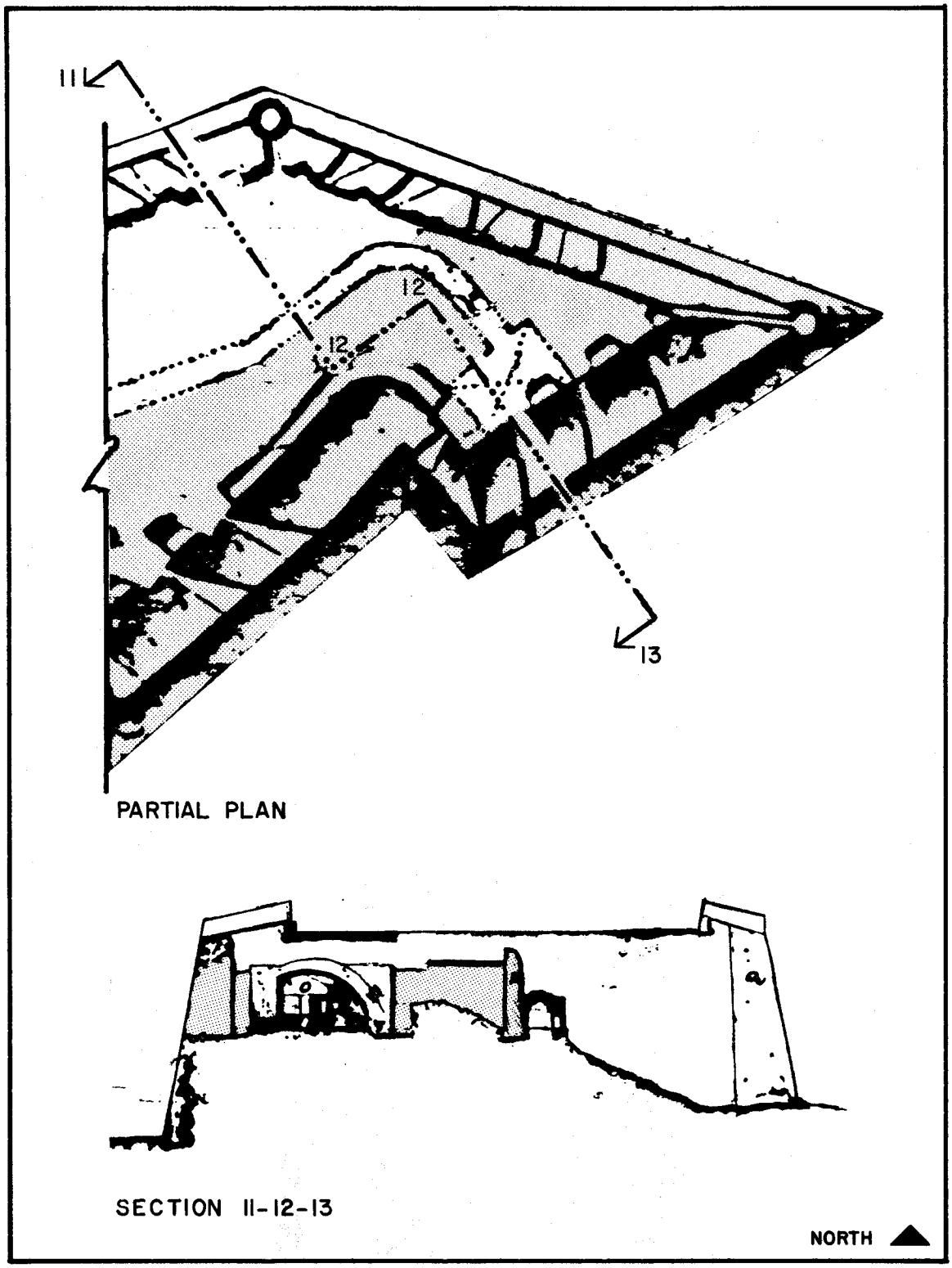


Figure 20.9. Profile No. 2 looking west at cut line 11, 12, 13, on the 1769 plan by Thomas O'Daly. Shaded areas added to illustrate existing works.

their impression may still be seen in the mortar at the ceiling.*

Both San Cristóbal's documentary and physical evidence suggest that the north wall of Tunnel 1 (i.e., the south wall of the tunnel) and the dungeon were built in the seventeenth century, although the dungeon was constructed at a different time than the wall.

TUNNEL 2

Tunnel 2 was excavated after 1765 beneath two features built in this period: el Caballero and the San Cristóbal rampart. Both features appear in the early plan dated 1678 and may date to the original construction of San Cristóbal, ca. 1634-1644, on the "hill of San Cristóbal."[5]

TUNNEL 3

As with Tunnel 1, documentation suggests that Tunnel 3 incorporated existing building fabric when it was constructed in 1769. The oldest portion of this tunnel is its south wall: the original exterior north wall of el Caballero. This was clearly illustrated in Engineer Thomas O'Daly's plan of 1769 that superimposed the outline of the old Caballero on the new state of the works, including Tunnel 3. El Caballero may date to the original construction of San Cristóbal, ca. 1634-44, and was shown as an existing structure on the map of 1678.[6] One mortar sample was extracted from the old north wall in 1986 in hopes of identifying seventeenth-century material. Unfortunately, the sample appears to be later, perhaps indicating that the wall was refaced when the tunnel was built in the mid-eighteenth century.**

TUNNEL 4

As best as can be determined, no part of Tunnel 4 was constructed in this period. It is not shown in either the 1765 plan of existing conditions or the later 1769 plan. However, when built in ca. 1770-71,[7] the eastern half of the tunnel was located within the base of the seventeenth century Caballero. This was determined by superimposing the old configuration of el Caballero (as shown in the 1765 plan) on the as-built location of Tunnel 4. Further confirmation is provided by a mortar sample removed from the tunnel at the approximate

*SAJU T1 M04, mortar removed from ceiling. SAJU T1 M02, stucco removed from lower east wall.

**SAJU T-3 M01

location of el Caballero's exterior east wall.* In general appearance and composition it is very similar to a sample from el Espigón dated ca. 1678-1702.

TUNNELS 5 and 6

No references to Tunnel 5 and Tunnel 6 appear in available documentation during this period.

Period 2: 1765-1809

TUNNEL 1

As mentioned previously, it was during this period that Tunnel 1 was created by building new walls, excavating a casemate in the old North Bastion, and incorporating the existing tunnel to the moat (the dungeon). This was done as part of the modernization project for San Cristóbal first proposed in 1765. While Tunnel 1 was not in the original 1765 proposal, it did appear in the plan dated 1769. The tunnel at this time was known as the galería (gallery), the large room at the east end as the casamata (casemate) and the existing tunnel as the boveda antigua (old vault). These english names will be used for this period.

Construction of the new gallery was an integral part of various other construction activities at San Cristóbal. These included the extension of the old Caballero to the north and the widening and raising of the North Bastion. By 1769, the north extension to el Caballero was well underway and the North Bastion work almost completed.[8] Coincidentally, the new gallery and its component parts, being located beneath these structures, appear to have been completed.

The gallery is documented for the first time in Thomas O'Daly's plan of 1769 (fig. 20.10). Here, it is labeled "E" and described as:

> Communication gallery to the Casemate; it can serve as a countermine to blow up the Breach which can be made in the North Bastion and part of the curtain and likewise to incommode the foothold the Enemy intends to make above.[9]

The gallery ran in an easterly direction from the northwest corner of the Plaza to a point beneath the North Bastion. This was a dead end with no exit.

*SAJU T-3 M03b

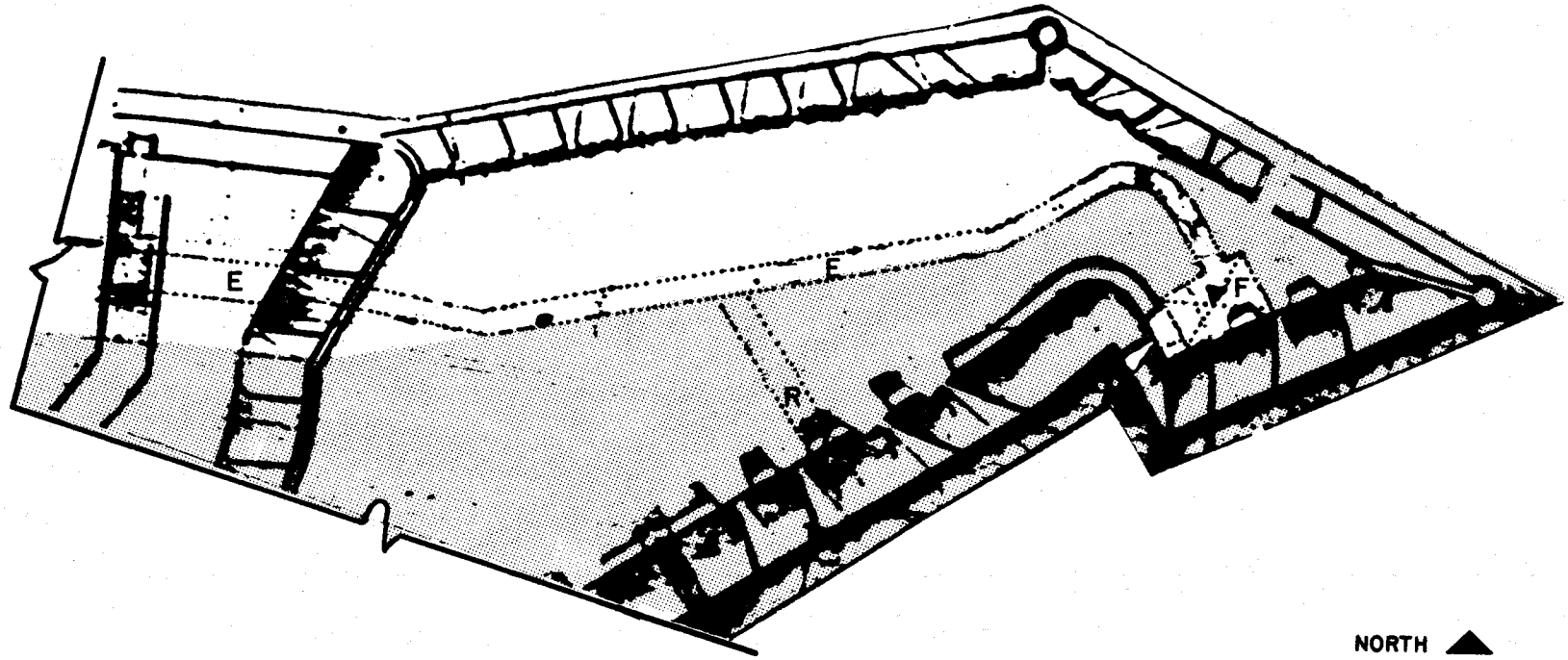


Figure 20.10. Detail of 1769 plan by O'Daly showing Tunnel 1. Shaded area added to illustrate existing works in 1765.

Construction of the gallery was complex, incorporating both new and existing works. An understanding of their construction may be achieved by close study of the 1769 plan as it compares with the earlier 1765 plan and existing conditions today. The west end of the gallery at the Plaza level was new construction in 1769, located in the base of the north extension to el Caballero. Opening off it in the north wall were two doorways to the new powder magazines still under construction. Another doorway in the east wall led to the gallery. (The mortar bomb located above this doorway no doubt signified its use as a countermining tunnel.) The portion of the gallery that continued on the east side of the doorway for approximately 18 feet was still located beneath the new north extension to el Caballero. For the next 220 feet, the gallery continued beneath the newly widened terreplein of the North Bastion. The first 35 feet under the North Bastion comprised all new construction. The mortar used in these walls was a beige color lime mix containing a small amount of sea shells.* Farther on, beginning at a slight bend, the gallery followed along the outside of the old north wall of the fort. This wall was then utilized as the new gallery's interior south wall as illustrated in the 1769 elevation labeled "Profile No. 2." This continued for about 185 feet. Towards the east end, the gallery veered sharply to the south. At this location an opening was broken in the old fort wall and construction continued by excavating beneath the old North Bastion. After a short distance, the gallery opened into a new casemate.[10]

The casemate was labeled feature "F" in O'Daly's 1769 plan and is described as:

> [Bomb]-proofed casemate to defend the Moat and Postern and to supplement the small capacity of the Flank which allows only one Embrasure and because of its height does not defend a portion of the Moat.[11]

This casemate was the south terminus of the gallery and was excavated beneath the existing North Bastion. The plan showed one embrasure opening in the southwest wall of the casemate facing the moat. Not illustrated, but described in the 1769 legend, was "a countermine well constructed in the farthest part of Casemate F" that was to communicate with the lower gallery "T" still under construction. Later plans locate this well within the northwest wall of the casemate.[12]

* Based on sample SAJU T1 M01, removed in 1986 from the west end of the south wall.

The dungeon (old vault) is labeled feature "R" in the 1769 plan and is described as: "Old vault which is allowed to remain for countermining."[13]

Two changes made at this time affected the old vault. The first was the closing of the exit to the moat with a rubble wall with a slit window opening. A mortar sample was obtained in 1987 from this existing wall.* The other change was the raising of the terreplein above the vault.[14] A similar mortar seems to have been used. While raising the terreplein did not directly alter the vault, some mortar from this work appears to have seeped through the ceiling at the south wall and onto the floor.**

The gallery, casemate, and old vault were illustrated in the maps of both 1773 and 1783. No changes were apparent in these years. Additional information, however, may be gleaned from a report dated 1783 that says "in this gallery there is a sentry."[15]

It is possible that during this time the ships were drawn on the east wall of the dungeon (extant today). The earliest known account of these drawings is dated 1943:

> This room served as a dungeon and here condemned persons were held imprisoned. On the walls are painted seven great galleons which were drawn in by a Spanish artillery captain doomed to die for participation in a mutiny.[16]

No verification of this story nor any historic references to a "dungeon" have been found. The drawings themselves, however, provide some historical data. Drawn in black with dark red, the type of ship portrayed is similar to a galleon, a heavy square-rigged sailing ship dating from the fifteenth to early eighteenth centuries. It was a ship commonly used by the Spanish for both war and commerce. Flying from the masts is the Spanish military flag used from the sixteenth through the eighteenth centuries.[17] Based on this information, it is conceivable that the drawings were executed in the 1600 or 1700s. However, it is also possible that they were sketched at a later date by someone with a knowledge of historic Spanish sailing vessels. Nevertheless, they enhance the legends and stories associated with the dungeon. Closer inspection of this feature was not possible as they are now protected by a sheet

*SAJU T1 M05

**SAJU T1 M06, sample removed from the floor. Nearly identical to SAJU T1 M05. Both dated to ca. 1769.

of plexiglass. A thorough examination and recommendations by a professional conservator is recommended.

TUNNEL 2

As part of the 1765 modernization project for San Cristóbal, a tunnel was built to serve as a passageway between the Plaza de Armas and the outworks to the east. Construction was underway in 1769 and probably completed by 1771. Tunnel 2 was known in this period as the comunicación subterraneo . . . a la Poterna (underground communication to the postern), and the Poterna [con] galería . . . para contramina (postern [with] gallery for countermining).

Tunnel 2 was documented for the first time in Engineer Thomas O'Daly's drawings dated 1769 (fig. 20.11, 20.12). In plan it was labeled feature "I" and described as:

> Underground communication from the interior of the Castle to the Postern. This work is done as far as the place which the Plan indicates, and although it penetrates through rock, this being of such poor consistency, it is overcome with a brick vault.[18]

Color coding indicated the extent of completion in 1769. Unfortunately, the colored version of the plan was not available for this study so the exact status of the work could not be determined. It may be surmised, however, that excavation work commenced by 1769.[19]

The plan of 1769 and accompanying section (labeled Profile No. 1) provided a picture of the project as envisioned and eventually built. Three basic areas were apparent. First was an entrance vault off the Plaza located beneath the ramp to el Caballero. The vault was rectangular with a floor on the same level as the Plaza. It was undoubtedly an integral part of the ramp construction completed in 1771. Second, was a long tunnel located beneath the old Caballero and the San Cristóbal rampart. It ran in a straight easterly direction until its intersection with tunnel "T" that runs below it. Here the tunnel turned to the south and continued in a southeasterly direction. Its entire length was sloped downward towards the east. At the far east end, it terminated in the third area; the postern. This postern was the exterior opening in the curtain wall that gave access to the moat. Although not yet completed at this time, based on the section, passage across the moat would eventually be through a caponier.[20] The floor of the caponier would be at a lower level than the moat, thus providing protection from enemy fire. Directly on the other side of the moat was San Carlos Ravelin.

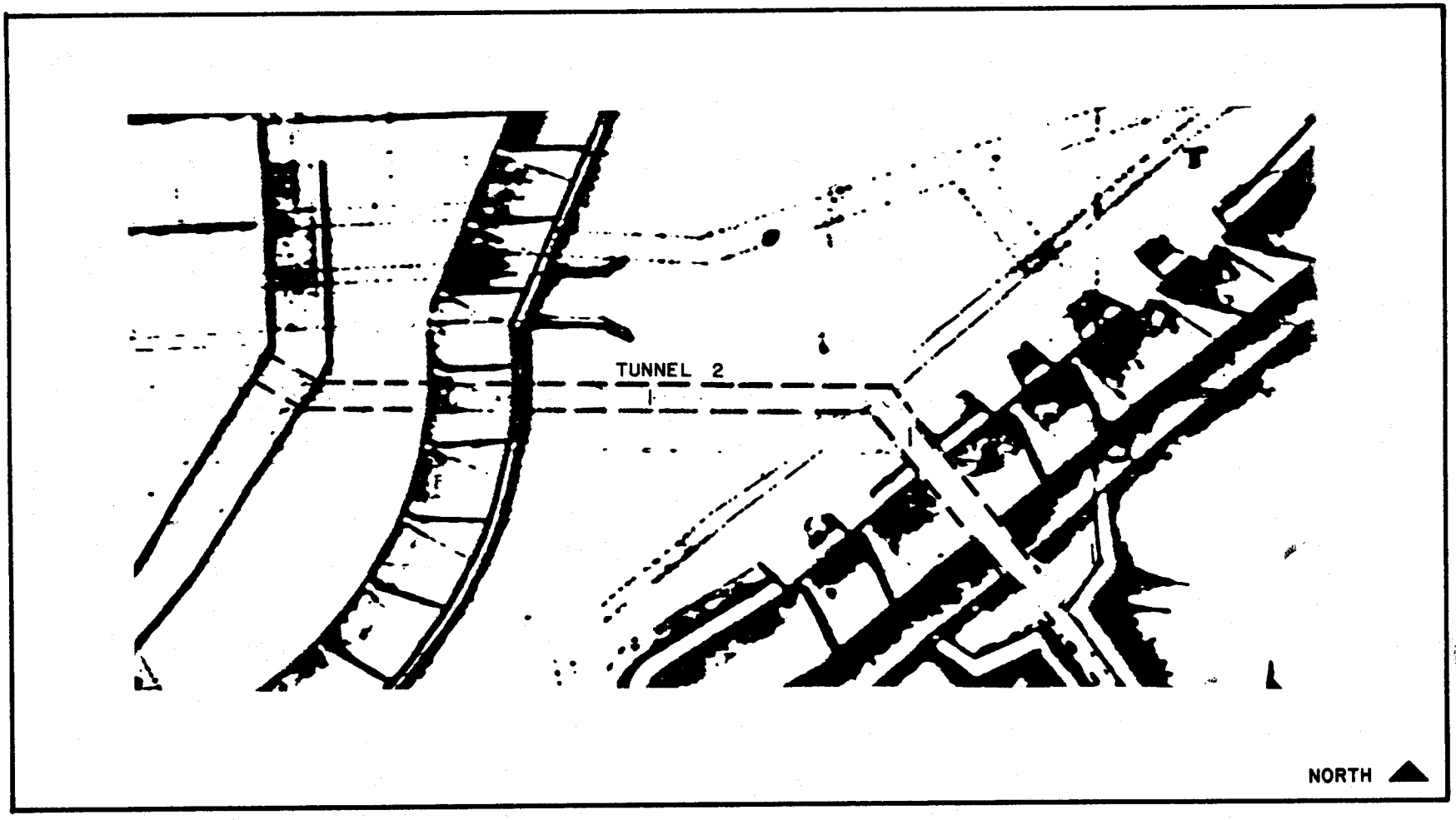


Figure 20.11. Detail of O'Daly plan showing Tunnel 2, January 15, 1769.

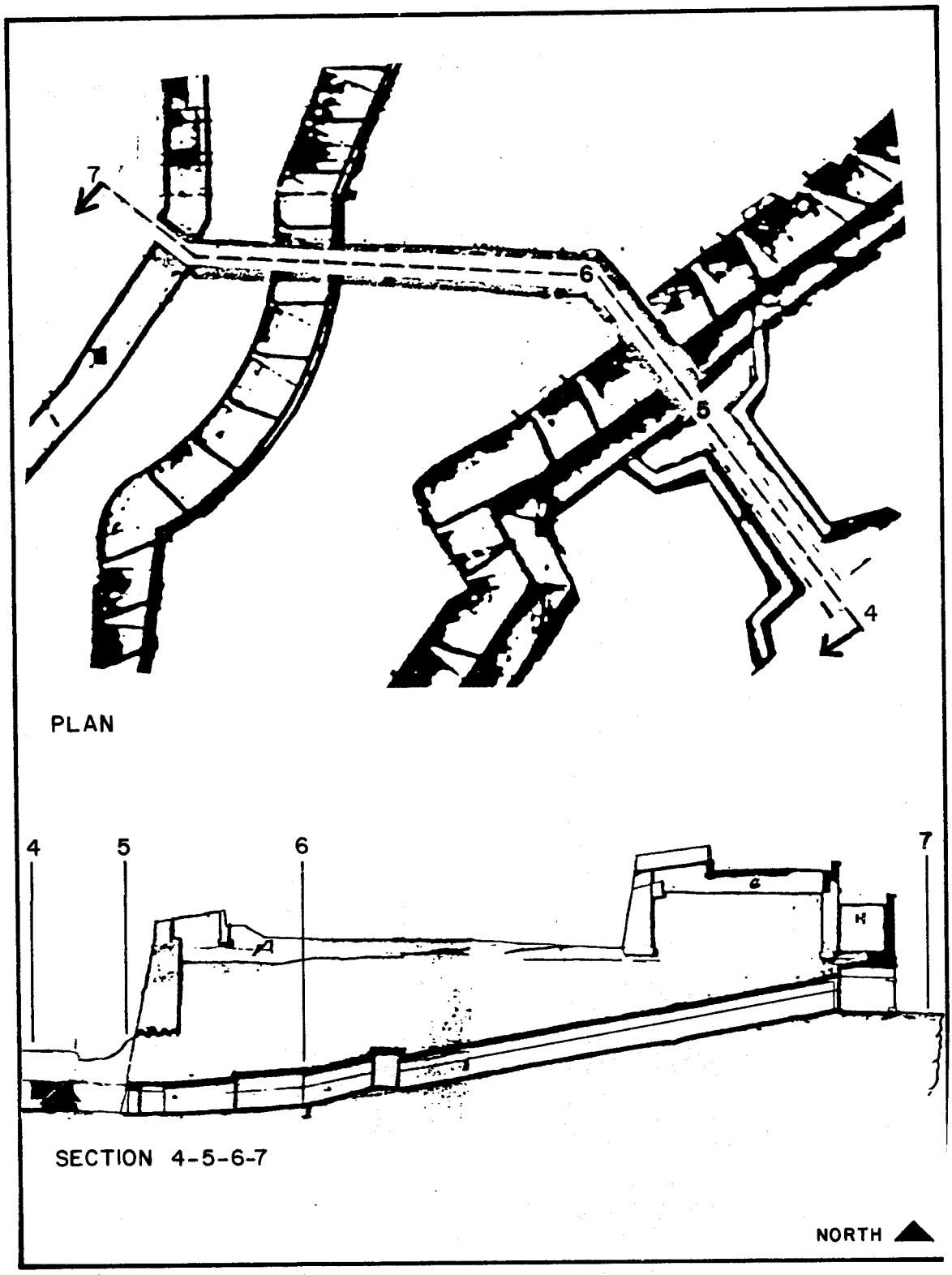


Figure 20.12. Profile No. 1 looking south at cut line 4, 5, 6, 7, on 1769 plan by O'Daly.

According to construction reports, the caponier and two narrow gates were completed in March 1771.[21] Presumably, the passage to the Plaza was likewise completed and open for use at this time.

The appearance of the completed postern tunnel was included in O'Daly's 1773 plan, west elevation, and section (fig. 20.13). The feature was labeled "K.K." and described as, "Postern whose gallery can also be used for countermining."[22] In plan, the layout was unchanged from that illustrated in 1769. The west elevation showed the entrance to the vault off the Plaza de Armas as a large arched opening located in the ramp wall to el Caballero. The section (looking north) showed a small room of rectangular shape at the east end of the tunnel. This room, located within the moat curtain wall, was the postern.

In the entrance vault off of the Plaza was an arched doorway to the tunnel in the interior east end wall. Above this doorway was the bas-relief symbol of a mortar bomb. Another possible early feature at this doorway was a wooden door frame with cutouts in both jambs for door hinges. These cutouts were evidence that double doors hung in the doorway, each supported by seven cappuchine hinges. Similar hinges of ca. eighteenth-century design may still be seen in use today at San Cristóbal. One paint sample was removed from this door frame in hopes of confirming its antiquity.*

Documentation on the tunnel indicates that it was dug out of a poor consistency rock thereby necessitating a brick liner for the ceiling vault. Based on conditions today it appears that the walls were also surfaced--not with bricks but with a rubble construction composed of stone and brick fragments. Both the walls and ceiling were then plastered using a beige color lime mortar. Four samples of this plaster were removed from the north and the south walls at various locations in the tunnel.** In one location, graffiti dated 1865 and 1871 was found on the wall. The plasters were observed to be similar to other samples examined from the Plaza structures dating to the 1769-1771 construction period.

Construction materials used in the postern at the east end of the tunnel differ from those in the tunnel itself. The postern is here defined to be that section of the tunnel that

*SAJU T2 P02, based on comparison with other woodwork paint samples from the Plaza, it is likely that the earliest white paint layers date to the latter half of the 19th century.

**SAJU T2 M01, SAJU T2 M02, SAJU T2 M04, SAJU T2 M05.

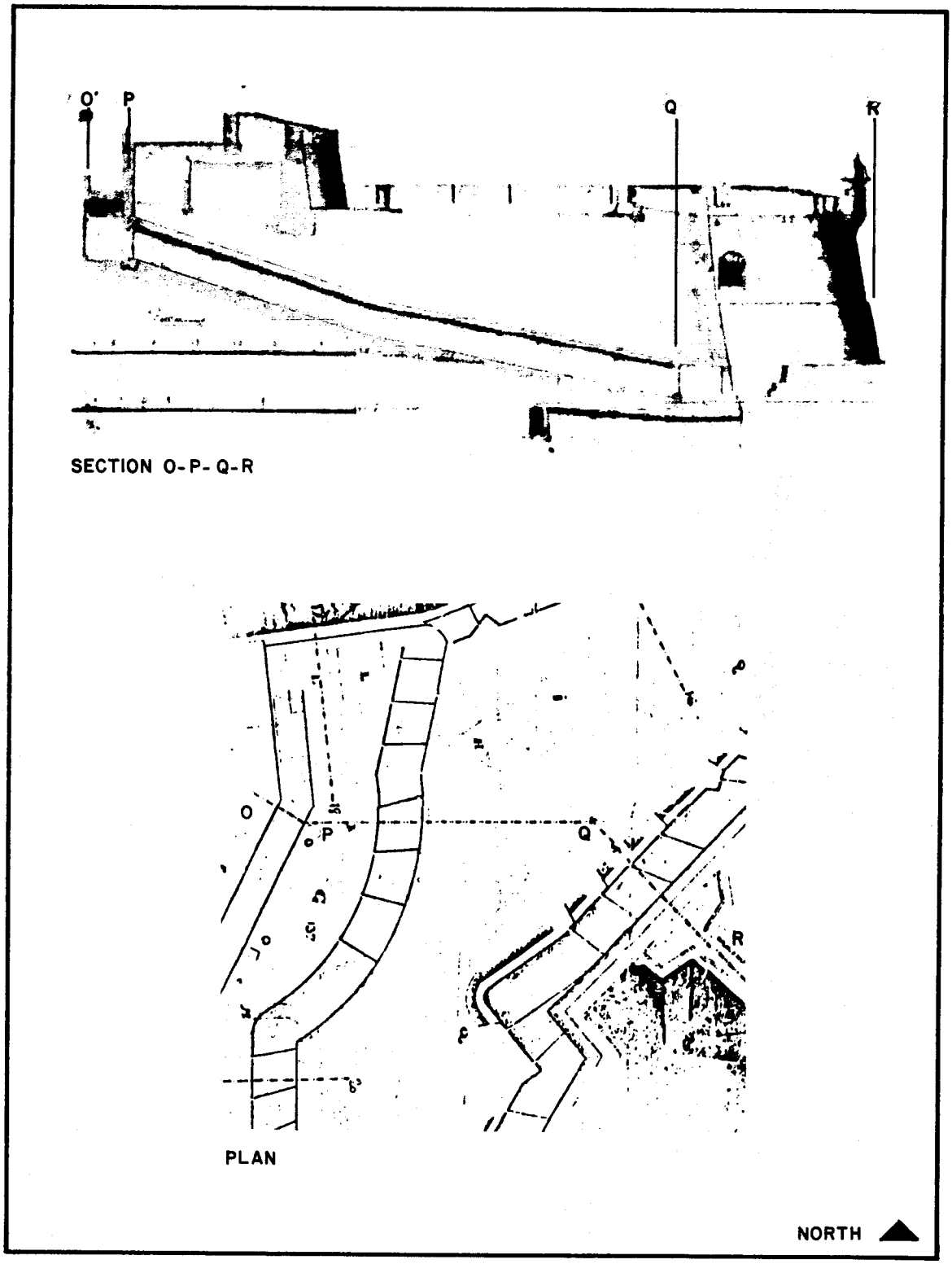


Figure 20.13. Section looking north through cut line o, p, q, r, s and showing Tunnel 2. Drawing by O'Daly, 1773.

is located within the curtain wall of the moat. The walls and ceiling were composed of cut sandstone blocks and were originally covered with a thin coat of white plaster.* At some time, perhaps in the eighteenth century, this surface was paintedyellow and the stone joints highlighted with black pencilled lines.[23]** Traces of this decorative treatment remain today.

TUNNEL 3

The building of Tunnel 3 was part of the modernization project for San Cristóbal first proposed in 1765. It was not included in the original 1765 proposal but it did appear in the plan dated 1769 (fig. 20.14). It was known during this period as Puebra (gate) or Puebra del Castillo (gate of the Castle).

Thomas O'Daly's 1769 plan labeled Tunnel 3 as feature "G." It was described in the legend as, "Gate with [bomb-] proofed vault and a gentle ascent."[24] Presumably both the gate and vault were complete by this time. The plan illustrated feature "G" as a short tunnel beneath the new north extension of el Caballero. It was oriented in a straight west-east direction and connected the new Plaza de Armas with the newly widened section of the North Bastion. The "gentle ascent" was apparently achieved by continuing the upward slope of the ramp beyond the east end of the vault. The plan showed the ramp continuing for a short distance within the terreplein of the fort. Illustrated on either side of the ramp at the terreplein were retaining walls.

These conditions were unchanged four years later when O'Daly drew another plan (fig. 20.15) of San Cristóbal in 1773. Tunnel 3 was then labeled feature "H" and described as the "Gate of the Castle." The notes further explained that the Gate was "newly constructed."[25] An elevation of the same date illustrated the west entrance off of the Plaza. This was shown as a large arched opening in the wall beneath the ramp to el Caballero.

TUNNEL 4

The first known documented reference to Tunnel 4 is O'Daly's plan of 1773 (fig. 20.16); it was labeled feature "M" and described as the Poterna del Caballero (postern under the Cavalier). Like Tunnel 3, Tunnel 4 was shown as a passageway connecting the Plaza de Armas with the east terreplein of the fort. The elevation, also dated 1773, showed the west entrance

*SAJU T2 M03

**SAJU T2 P01

as a small arched opening located at the foot of the ramp to el Caballero.[26]

The construction of Tunnel 4 must have involved a combination of new work and new excavation within an existing structure. The work on the new western half most likely commenced after the ramp to el Caballero was built (ca. 1769) and at the same time as the adjacent Troops' Quarters was being built (ca. 1770-71). Excavation into el Caballero's southeast wall would have occurred at about the midpoint of the tunnel. The passage eventually emerged through the old curved east wall at the terreplein that had been raised about 3 pies [33.6 inches] by 1769.[27]

Additional details on the original construction and materials are provided by an examination of the remaining historic fabric today.* The ceiling of the passage is vaulted up to, but not including, the exit at the east end. At the east end of the tunnel, where it passes through the old curved wall of el Caballero, the ceiling is flat and cut sandstone blocks were used for walls and ceiling. The east exterior opening is square-cut. The west opening is arched. The date "1773" is inscribed in the plaster in the middle of the south wall.

TUNNEL 5

As early as 1766-68 construction records indicated that Tunnel 5, a long countermining gallery, was being "cut by chisel in the natural rock under the terreplein of the Bastions, running below the level of the castle's moat in a south-northeast direction to planned to end in the inaccessible precipice under the North Bastion."[28] Here, only an air passage for ventilation of the whole gallery would remain. The importance and function of this tunnel is gleaned from these construction records that state that because the countermine was below the level of the moat, branches could be pushed forward to catch the enemy miner from below.s and its distance from the facing of the fort preserves it to be ruined at the time that the breach is made with cannon or mine. Finally from this gallery is gained the importance of being able to communicate safely with all the countermines of the exterior works".[29]

*SAJU T4 M01, SAJU T4 M02, SAJU T4 M03a.

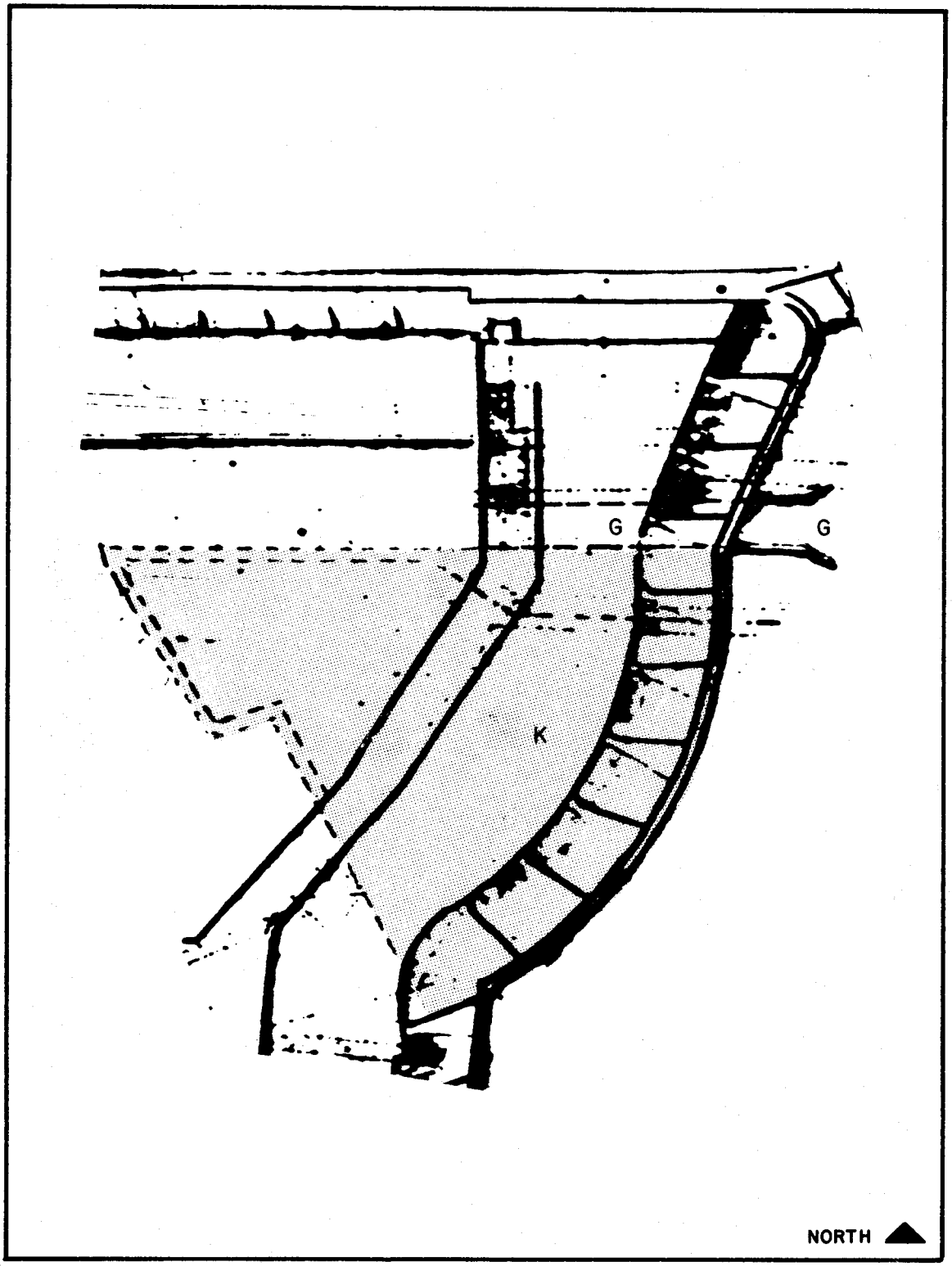


Figure 20.14. Detail of 1769 plan by O'Daly showing relationship of Tunnel 3 ("G") to original Caballero ("K").

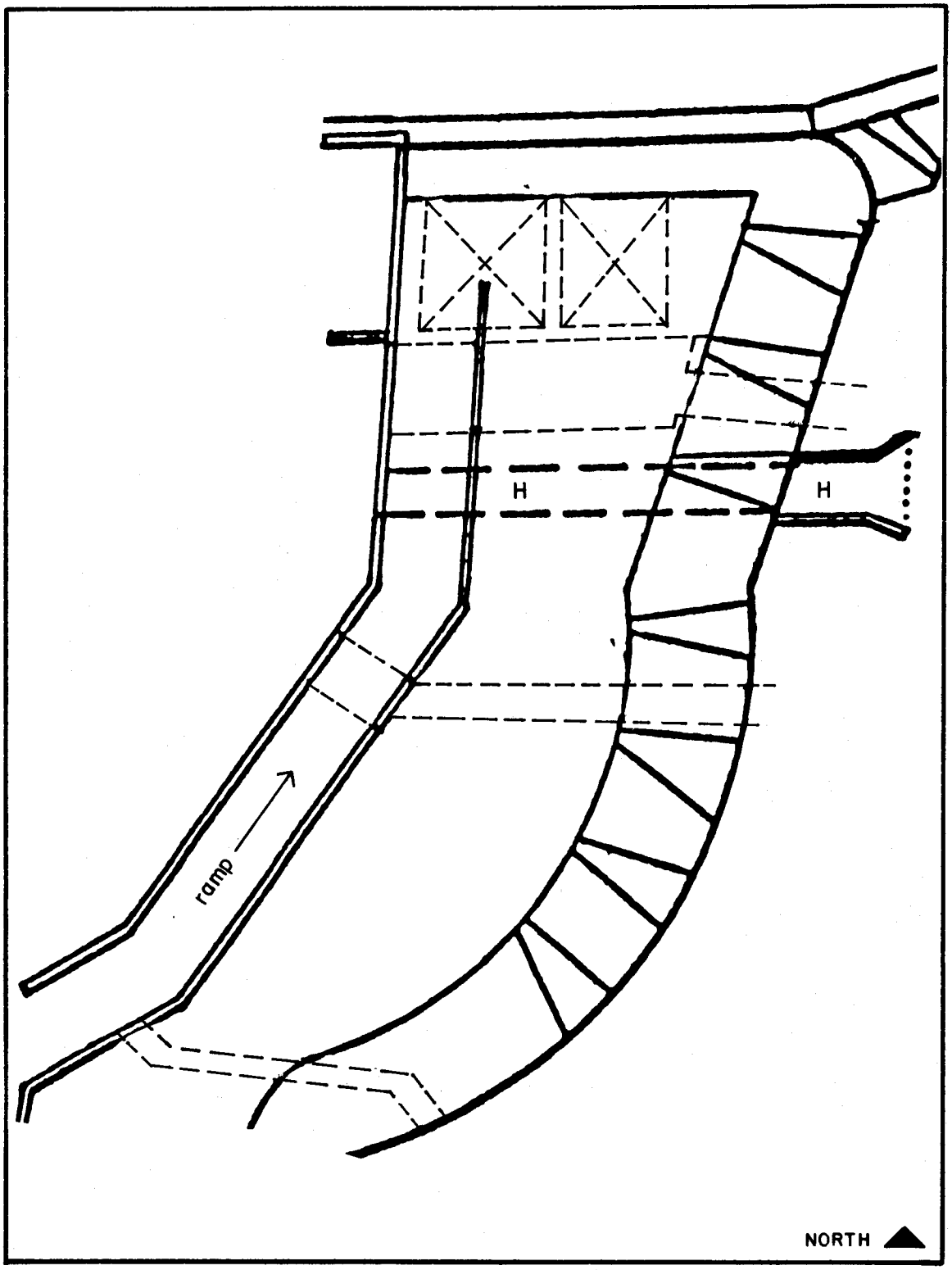


Figure 20.15. Detail of August 8, 1773 plan by O'Daly with Tunnel 3 labeled "H". Tracing of original drawing by Torres-Reyes (1965) annotated by Jana Gross (1989).

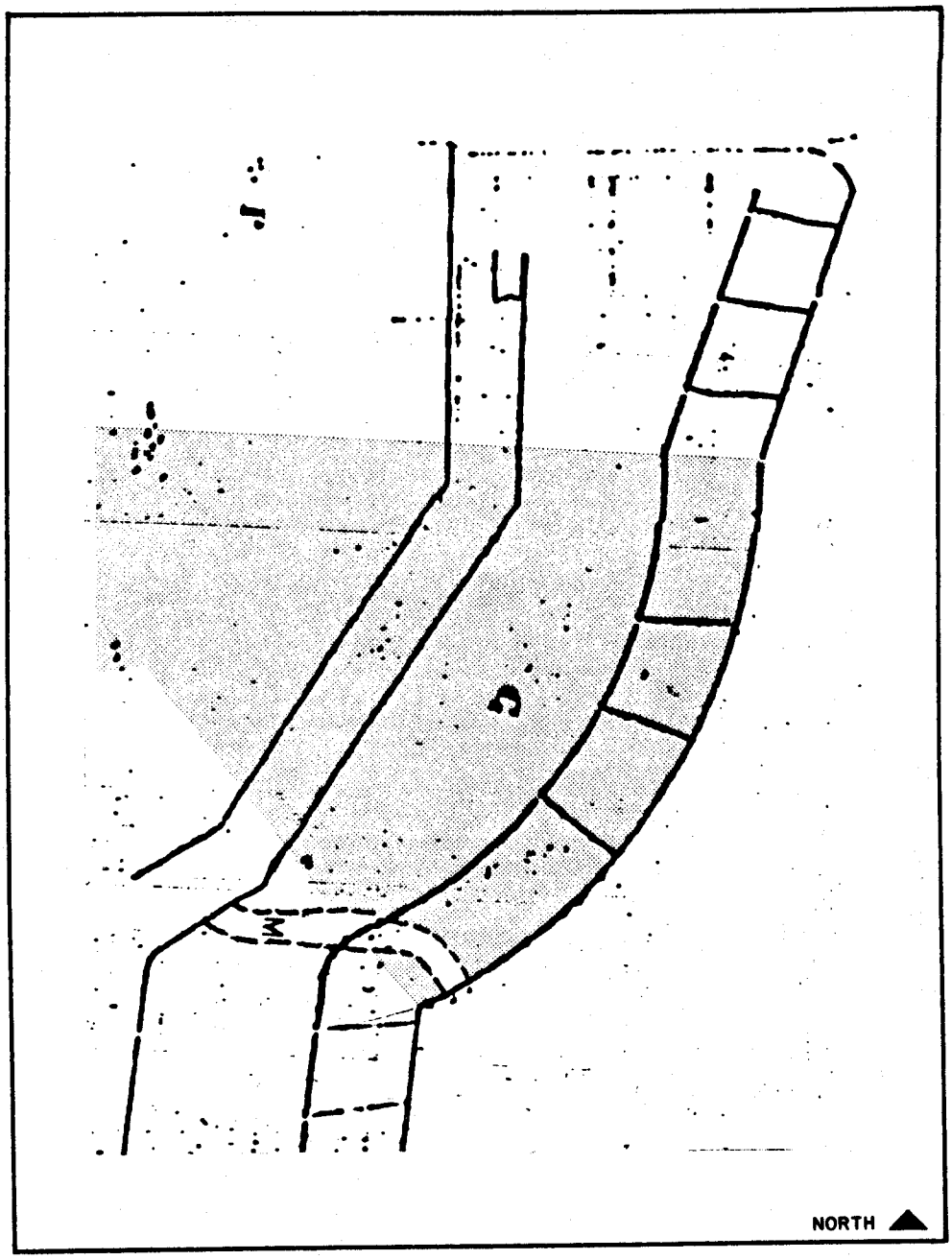


Figure 20.16. Detail of August 8, 1773 plan by O'Daly showing Tunnel 4 ("M") and its relationship to the original Caballero ("G").

O'Daly's Plan of 1769 (fig. 20.17) showed the tunnels in the works with "S", the executed portion of the countermining gallery, running only to the meeting of the curtain and the north flank of the South Bastion. The letter "T" on the same plan represented:

> . . . [the] design where the work of the gallery is being continued and runs under the communication of the moat postern. In the North Bastion it will communicate with a countermine well constructed in the farthest part of casemate F.[30]

The tunnel is sealed today, but this listening well and communication with Tunnel 5 can be seen in the sections of 1773.

O'Daly's plan of 1773 (fig. 20.18) showed Tunnel 5 in its completed form and labeled letter "QQ", "a countermining gallery that ran along the front of the castle and that ends in the north face of the North Bastion". (See Appendix A-10 for complete legend and plan.)

TUNNEL 6

The first reference to Tunnel 6 is found in construction records of 1772. O'Daly's accounts are recounted by historian Ricardo Torres-Reyes

> . . . a gate or sallyport was cut under the terreplein in the left flank of Santiago Gate curtain, with access to the main moat. The gate, in the form of a short gallery, avoided the inconvenience of opening Santiago Gate during the critical time of a siege attack.[31]

The tunnel appeared for the first time on O'Daly's plan of 1773. (See fig. 20.18.) Although indicated in dotted lines, this plan clearly illustrated the tunnel's location, orientation, and relationship to the entire defense system.

Although the tunnel as shown in Mestre's plan of 1783 (fig. 20.19) appeared unmodified, the plan is of interest as it clearly showed the location of the tunnel's emergence into the sloping pomerium to the west of the fort, and did not indicate that any buildings were constructed in this area.

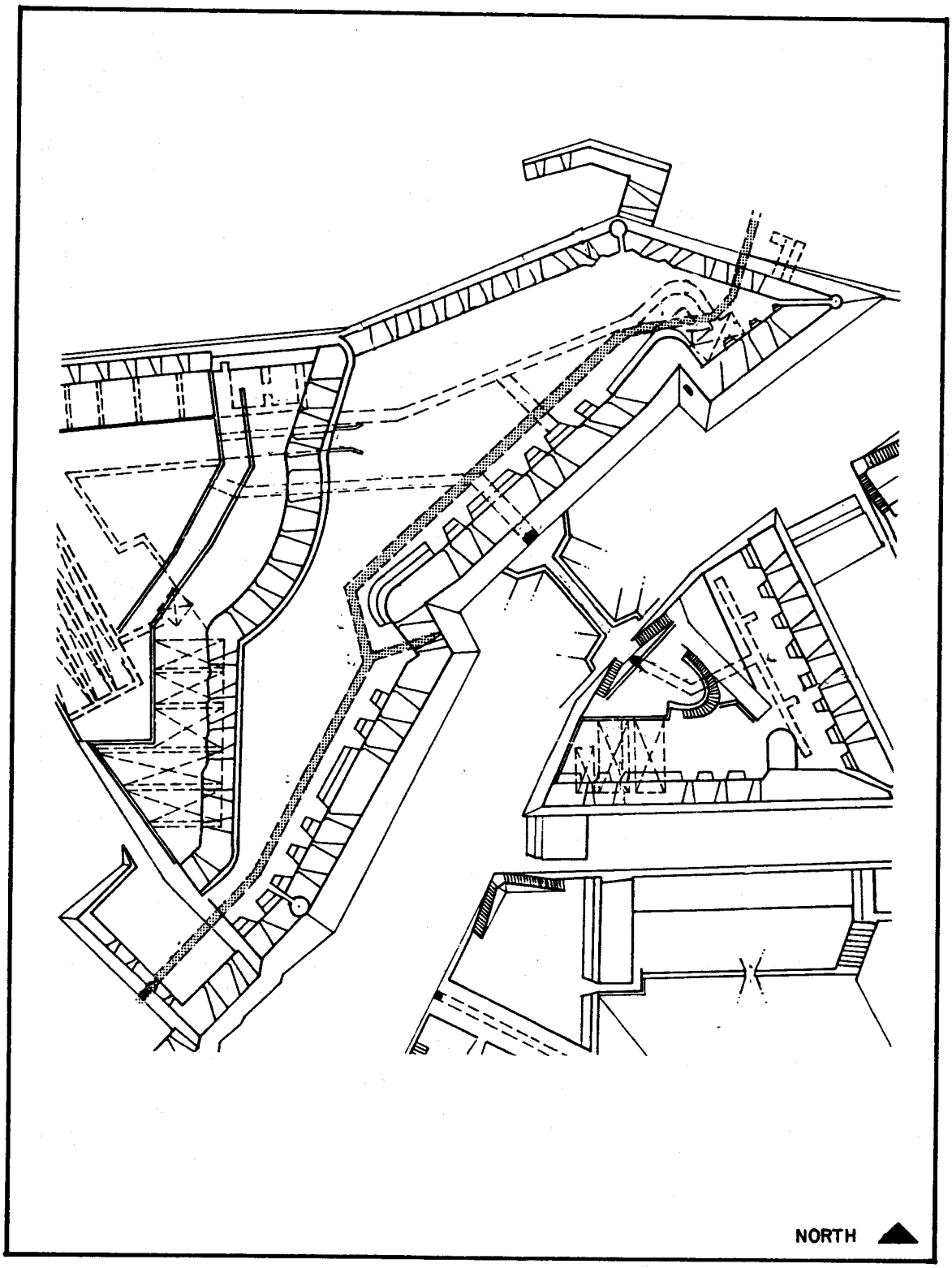


Figure 20.17. Detail of proposed plan by O'Daly, January 15, 1769 with Tunnels 5 and 6 highlighted. Tracing of original drawing by Torres-Reyes (1965) annotated by Jana Gross (1989).

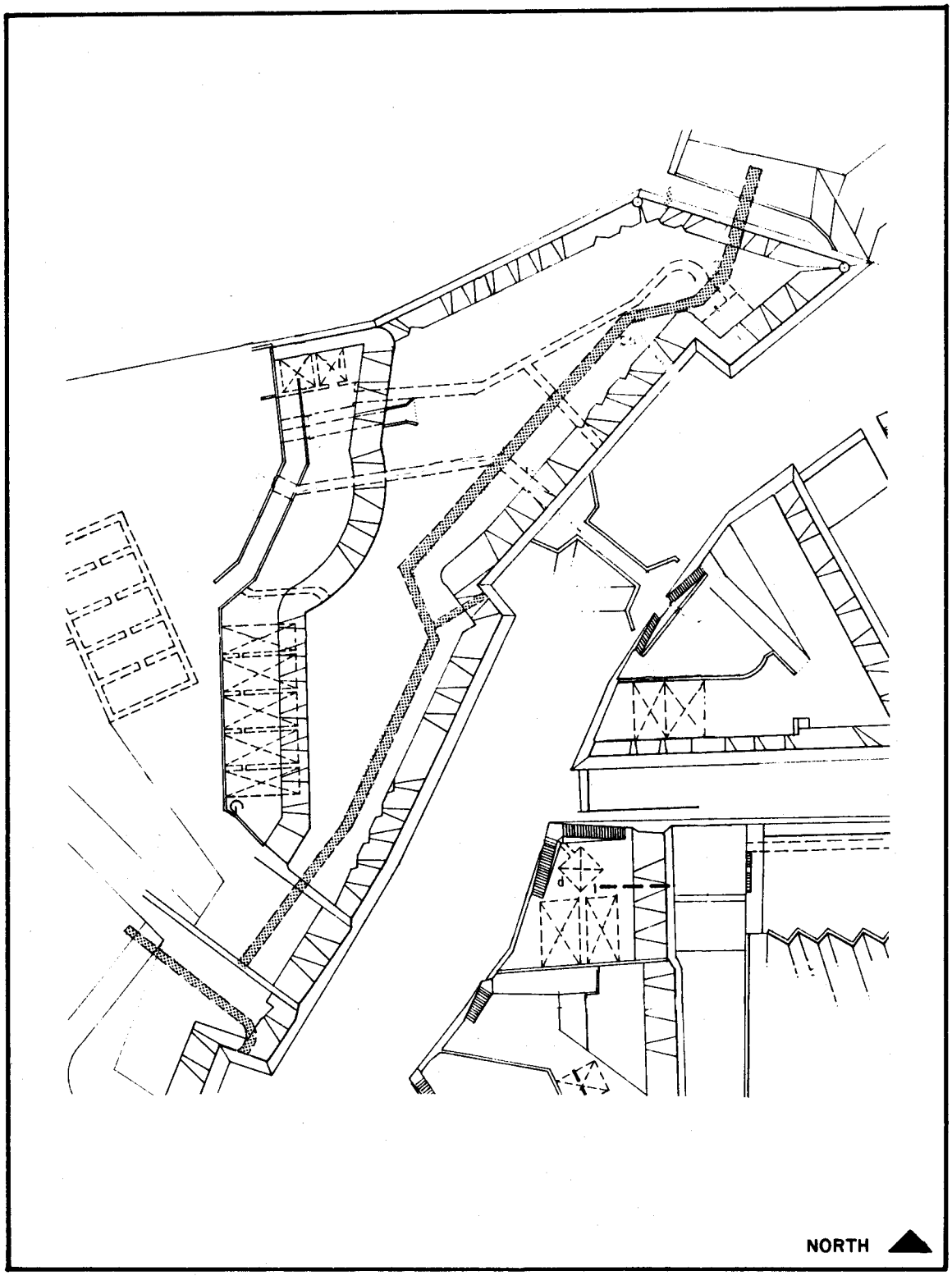


Figure 20.18. Detail of O'Daly plan, August 8, 1773 with Tunnels 5 and 6 highlighted. Tracing of original drawing by Torres-Reyes (1965) annotated by Jana Gross (1989).

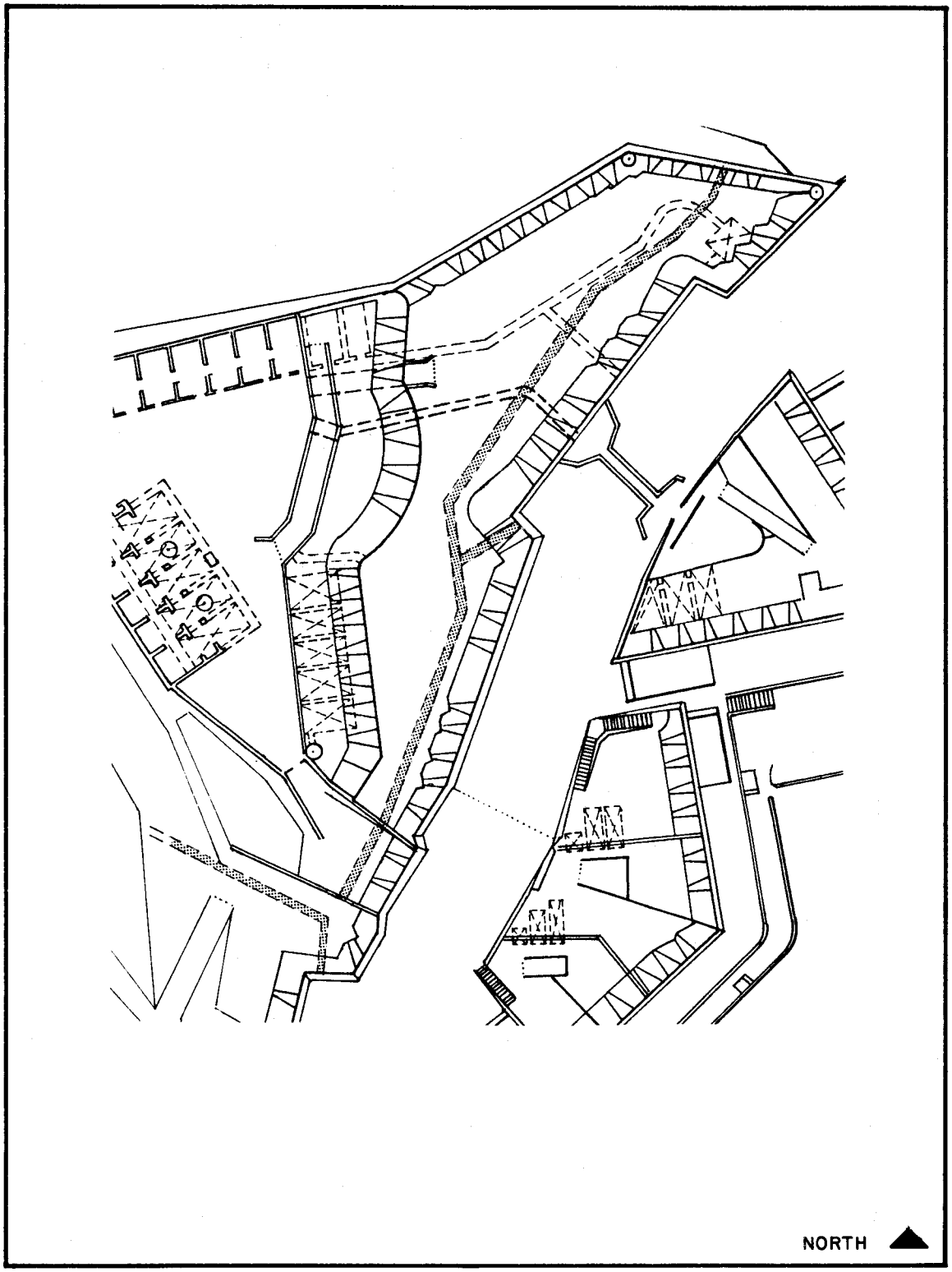


Figure 20.19. Detail of Mestre plan, September 13, 1783 with Tunnels 5 and 6 highlighted. Tracing of original drawing by Torres-Reyes (1965) annotated by Jana Gross (1989).

Period 3: 1809-1837

No references to any of the tunnels (Tunnels 1 - 6) appear in the available documentation during this period.

Period 4: 1837-1868

TUNNEL 1

Documentation of the west plaza entrance to Tunnel 1 is provided by the 1839 model of San Cristóbal and the 1861 drawings by Manuel Castro.[32] The model shows this opening was arched with no embellishments. More detailing was provided in 1861.

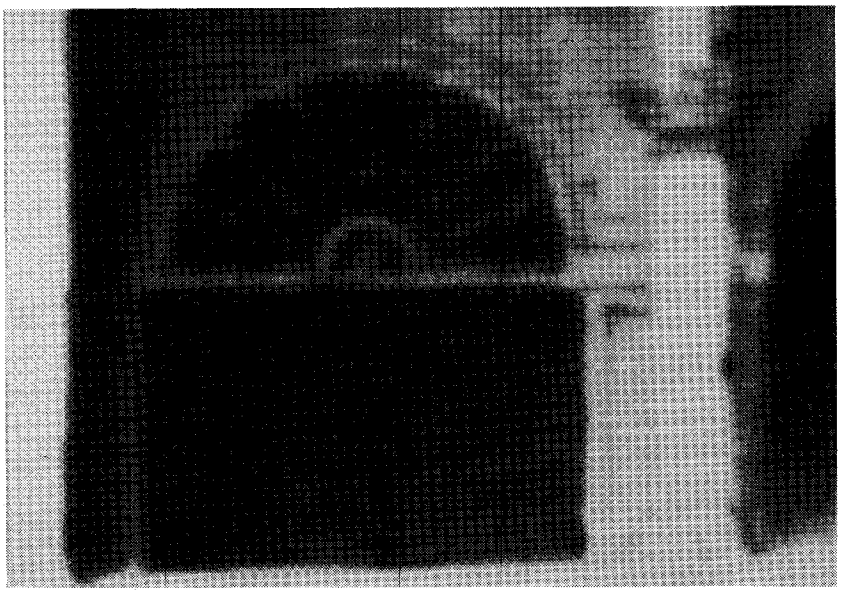


Figure 20.20. Detail of 1861 elevation drawing by Manuel Castro showing west entrance by Tunnel 1. (San Juan NHS Archives.)

In his east elevation (fig. 20.20) of the Plaza, Castro sketched the gallery entrance in great detail. Most notable was a fanlight in the arched portion of the opening with seven turned spindles. To either side of the gallery entrance were engaged pilasters. Both the outlines of the pilasters and the fanlight were colored white. Whether or not the fanlight actually existed cannot be confirmed as no photographs or other descriptions of it have been found. No evidence of it remains today.

In 1861, the first floor plan of San Cristóbal showed the faint outlines of the tunnel's gallery and casemate. No significant differences from the eighteenth-century conditions were apparent. Not shown, however, was the old vault (dungeon). As the feature was known to have been extant in 1769, the reason for its omission in 1861 is not known.

TUNNEL 2

The Plaza entrance to Tunnel 2 is illustrated during this period by the 1839 model of San Cristóbal and by the 1861 drawings by Manuel Castro.[33]

In the 1839 model, the entrance in el Caballero's exterior ramp wall was unchanged from conditions shown in the 1773 elevation. However, conditions had changed by 1861. Castro illustrated the large arched opening enclosed except for one small rectangular doorway with a transom above (fig. 20.21). Between the doorway and the transom was an oval-shaped motif. Within this oval was writing or a design (it could not be identified). Photographs taken in the twentieth century show this opening as Castro drew it.[34]

TUNNEL 3

Minimal information on Tunnel 3 is obtainable from the 1839 model. However, it was clearly represented by the west opening in the ramp wall, the east opening in el Caballero's east wall, and the ramp and retaining walls in the east terreplein.

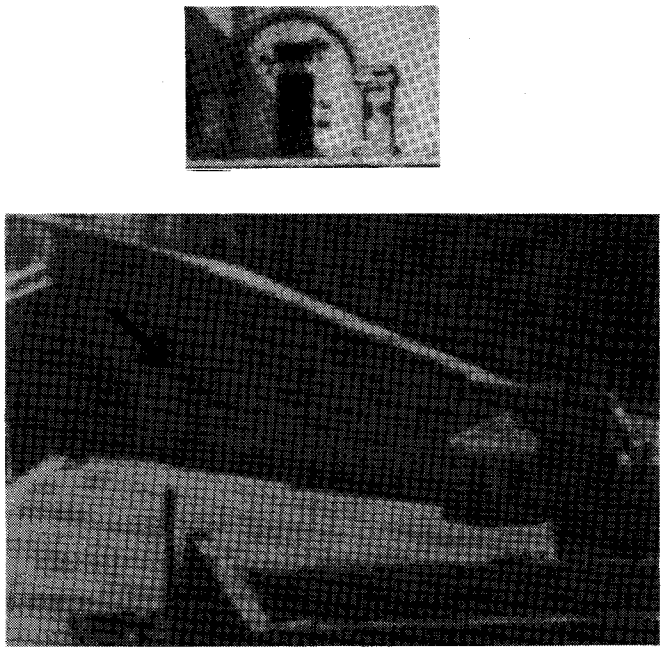


Figure 20.21. Entrance to Tunnel 2 by Castro, 1861 (above), and photographed by U.S. Army in 1942. (San Juan Archives.)

Considerably more detail was seen in Castro's drawings. Castro represented the tunnel in a plan, an elevation, and a section. In general, conditions appear unchanged from those in 1769 and 1773. Information not previously recorded included the exterior pilasters at the west entrance, the slope of the ramp, and the masonry joints in the top of the east ramp retaining walls. Not shown was a view of the east gate doors, although door jambs appeared to be drawn on the plan and section (fig. 20.22).[35]

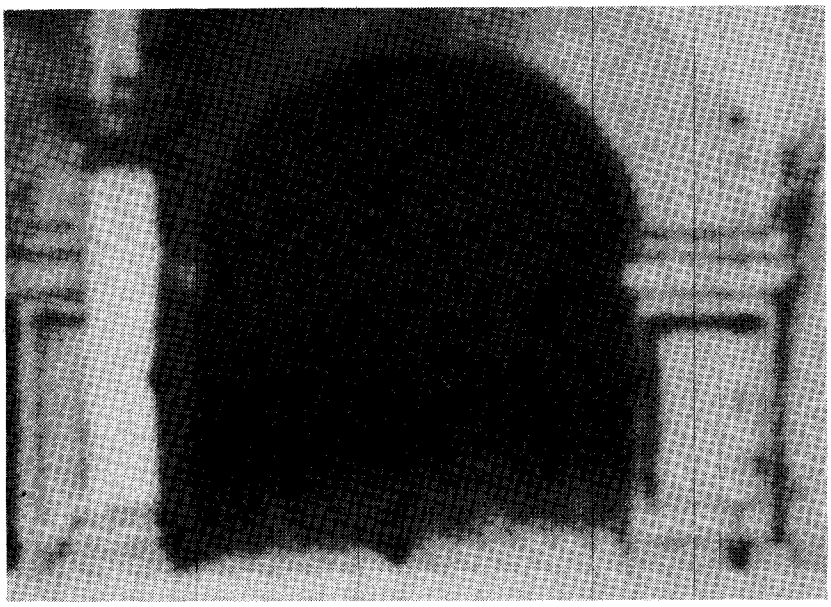


Figure 20.22. Entrance to Tunnel 3 as seen in the elevation by Manuel Castro, 1861. (San Juan NHS Archives.)

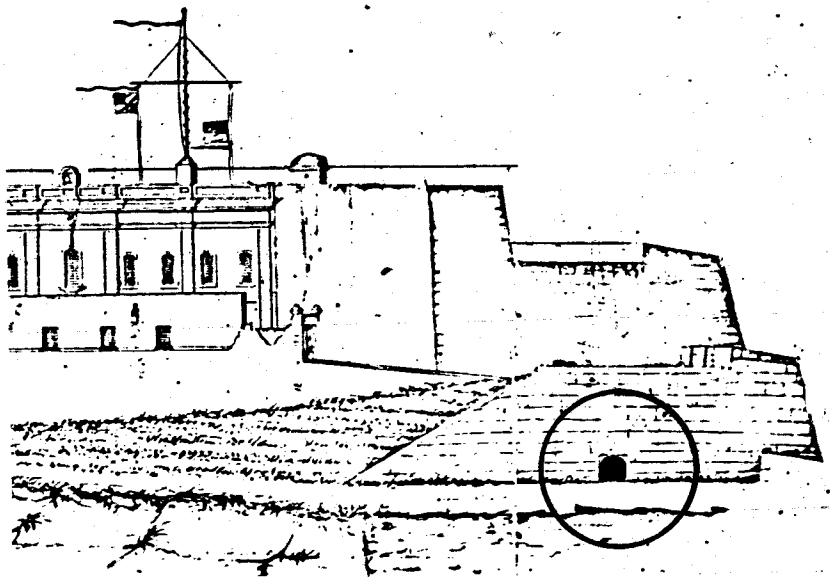


Figure 20.23. Detail of west elevation by Manuel Castro, 1861, showing opening to Tunnel 6.

TUNNEL 4

Conditions of Tunnel 4 appear unchanged from those recorded in 1773.[36]

TUNNEL 5

On Castro's west elevation of 1861 (fig. 20.23), the entry to Tunnel 5 was nearly square in shape with no door shown. The curve of the vault was visible. On two of Castro's 1861 plans (Plano de la Plaza de San Juan Bautista de Puerto Rico and Planta Del Castillo de San Cristóbal Que Pasa Por Las Bovedas Bajas Del Patio) Tunnel 5 appeared to end just north of its crossing the communication gallery to the covered way.

TUNNEL 6

Also illustrated on Castro's "Plano de la Plaza de San Juan Bautista de Puerto Rico" were four buildings (at least two of which were used as artillery stores at this time) in the area to the west of the fort where the tunnel emerges. The enclosed patio area surrounding this end of the tunnel created by the construction of these buildings was seen for the first time.

Period 5: 1868-1878

No references to Tunnels 1 - 4 appear in the available documentation during this period.

During this period, Tunnel 5 appears unmodified from the 1861 illustrations.

A War Department drawing believed to date to 1898 (unavailable for illustration) indicated the addition, or first graphic representation, of an air vent into Tunnel 6 near its western termination.[37]

Period 6: 1898-1987

TUNNEL 1

During this period, San Cristóbal was administered by the U. S. Department of the Army from October 1898 through 1960. Since September 1961 it has been under the jurisdiction of the NPS. Under the U. S. Army, Tunnel 1 was extensively restored in the late-1930s and remodeled in the 1940s. It was in the twentieth century that it became commonly known as a tunnel and the old vault as the dungeon.

The subterranean elements of San Cristóbal were recorded in an untitled plan dated 1899.[38] Illustrated therein were the gallery, casemate, and vault of Tunnel 1. Configurations appear unchanged from the eighteenth century.

During the invasion by the United States in 1898, the gallery was used by the Spanish as a magazine. Ammunition for two guns emplaced on the North Bastion above was passed through "a circular well" situated between the guns.[39] While this brick-lined well may have been an early ventilation shaft, no documentation on its existence before 1898 exists. Therefore, it has been dated ca. 1897. The well was illustrated in a plan (fig. 20.24) obtained by a Colonel Goethals in 1898.

Work accomplished in 1938-39 was included as part of Job SW-8 "Exploration and Restoration of Subterranean Passages," and Specification No. F-28-5. Tunnel 1 was then referred to as "Tunnel A," the "Admiral's Tunnel," and "Tunnel No. 1." Under Job SW-8, the entire length of the tunnel was cleared out, temporary electric lights installed, a wooden door frame built at the entrance, and the casemate shaft cleared out to bedrock.[40] (See fig. 20.25.) Under Specification No. F-28-5, a morepermanent electrical system for illumination was installed and one brick ventilator built. Wiring for the lights was in a metal pipe conduit that was attached to the ceiling as illustrated in a photograph and plan that accompanied the specification. The fixtures for the lights were directly attached to the conduit at the ceiling. Exactly which of the two brick ventilators existing today was referred to in the specification could not be ascertained.[41]

In the winter of 1941-42, the casemate was remodeled when radar equipment was installed on the terreplein above. The casemate was then "converted into two rooms to house the generator and transmitter and operating personnel." Also installed at this time were two new ventilators in the terreplein.[42] Although not documented, this may have been when the countermining shaft in the northeast wall was closed in. By 1943, the shaft was referred to in the past tense.[43]

Yet another change was made to the casemate in 1942 when the Joint Operations Center building was constructed in the main moat.[44] The roof of this building reached to the embrasure opening in the southwest wall that was enlarged to a doorway. This doorway, signified by an arrow and the note "to tunnel," may be seen in a plan of San Cristóbal dated July 6, 1949.[45]

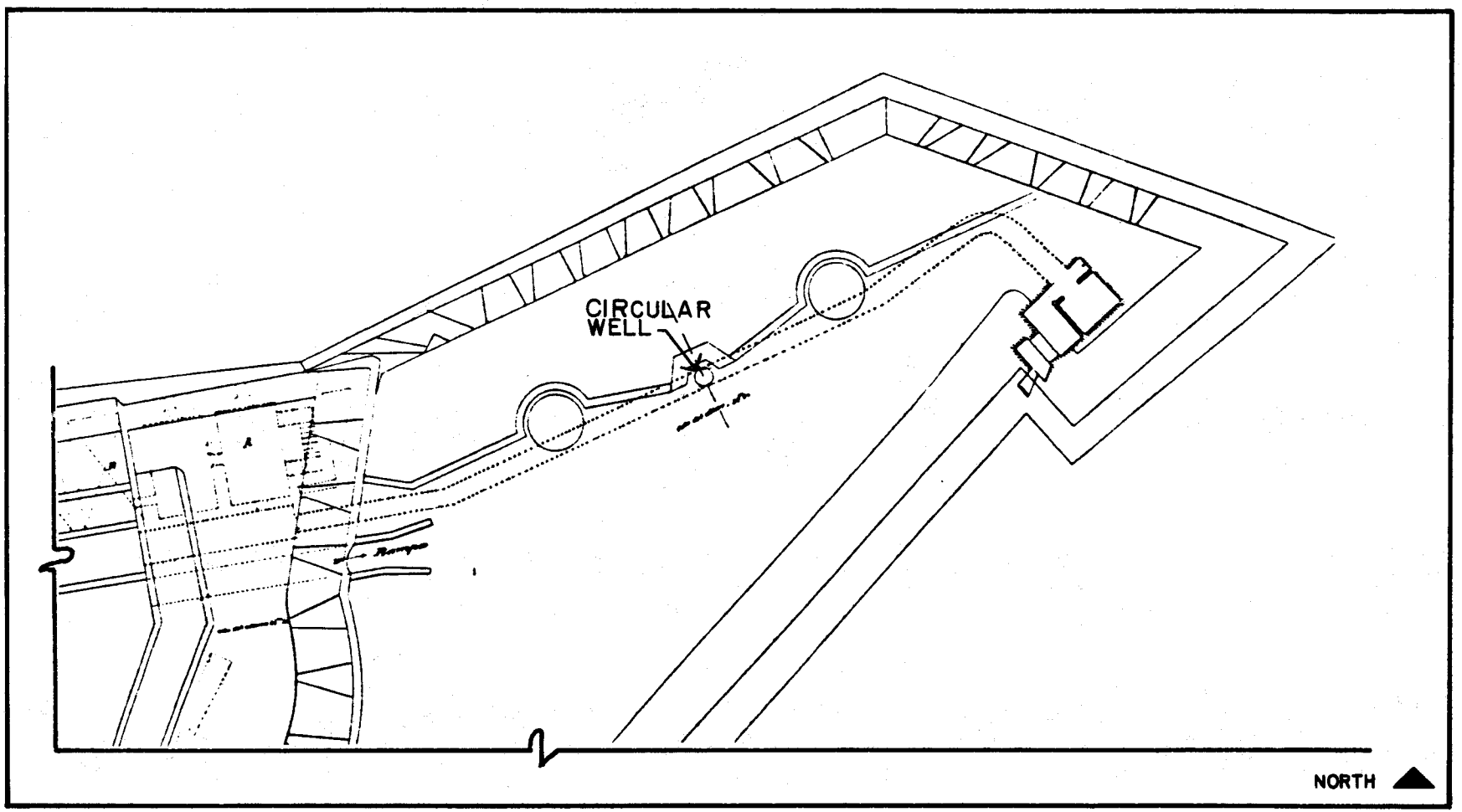


Figure 20.24. Detail of ca. 1897 plan obtained by Colonel Goethals in 1898 showing "circular well" at Tunnel 1. (San Juan NHS Archives.)

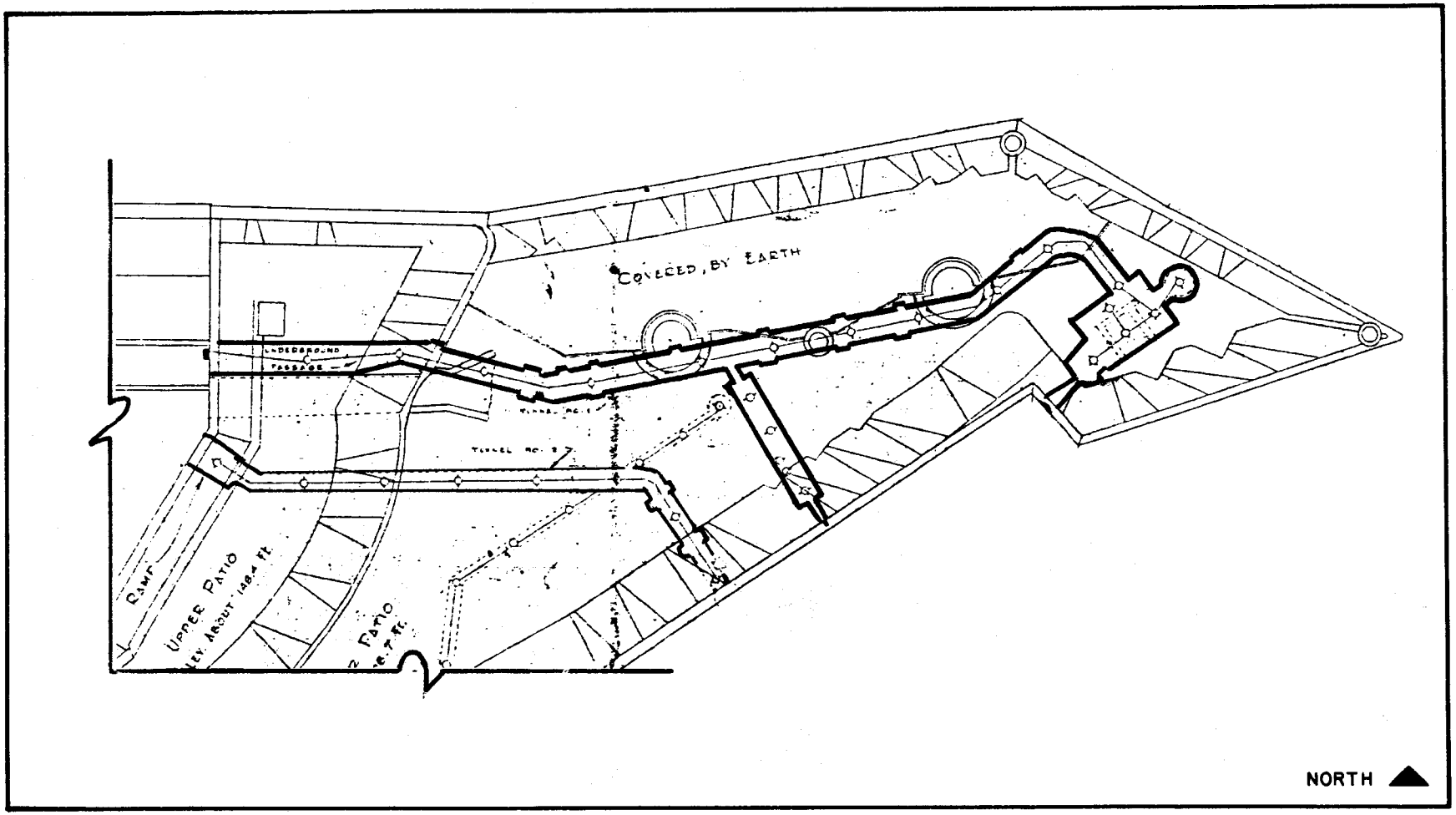


Figure 20.25. Detail of plan dated 1938-39 entitled "Electrical System for Tunnels Illumination." (San Juan NHS collection.)

Concern for the structural integrity of the dungeon appears to have begun in the late-1960s. It was then that a piece of wood was placed on a crack in the southwest corner of the wall to check for possible movement. This monitor was dated May 26, 1969, and is extant today. Another crack was later fitted with a "telltale" monitor dated June 24, 1983. No records on the results of monitoring these two cracks have been located.

Several changes have been made in Tunnel 1 for which no documentation was found. All are modern and most likely carried by the NPS. They include the iron grille doors at east and west entrances; the updated electrical lighting system that conceals light fixtures in wall niches; and the plexiglass panel in dungeon to protect ship drawings.

TUNNEL 2

It was during this period that the primary function of Tunnel 2 as an exit to the outworks changed. In addition, other alterations were made by the U. S. Army (1898-1961), and by the NPS (1961-present). The Army referred to this tunnel as both "the postern gate tunnel" and "tunnel no. 2."

In 1938-39, work was done as part of Job SW-8, "Exploration and Restoration of Subterranean Passages," and Specification No. F-28-5". Job SW-8 involved general cleaning of "the postern gate tunnel" and breaking through of the outside entrance, presumably at the east end. A temporary gate was installed and brick and masonry steps constructed to prevent water from entering. The brick lining was repaired and electrical lighting installed in "tunnel no. 2" as part of Specification No. F-28-5. The remains of this lighting system and the plan that accompanied the specification (fig. 20.25) indicate that both the conduit for the wiring and the lights were located in the ceiling.[46]

The moat exit was blocked off in 1942. In this year, a large reinforced concrete structure was built in the moat between the curtain wall and San Carlos Ravelin: the Joint Operations Center for the Army, Navy, and Marine Corps.[47] The postern doorways at the east end of the tunnel were retained and used for the entrance to the new structure. The steel doors now in place may date to this time. By 1949, the structure was referred to as "building 213."[48] Today, it is used by the Department of Civil Defense.

In 1963, the enclosure at the Plaza entrance illustrated by Castro in 1861 was removed under a program known as the Accelerated Public Works Program. Two photographs of the newly-opened entrance vault that are included in a completion report are captioned, "Plaza de Armas San Cristóbal showing corrected conditions during process of work." (See fig. 20.26.)

portion of Tunnel 5 were considerably reconstructed with modern machine-pressed brick laid in a grey Portland cement mortar at this time. One exception to this reworking was the length between the bifurcation and the sharp bend to the northeast. The specification referred to work done specifically on Tunnel 5 (formerly known as Tunnel B or No.3) as follows

> . . . tunnel has been completed to within about 50 feet of its entire length. Timber trusses to support overhead and sides have been installed to complete excavation of this tunnel. The excavation of the short branch to the right has been practically completed. Temporary lights have been installed for the full length of the tunnel. New ausubo door frame has been installed and temporary door has been hung".[56]

TUNNEL 6

Army Corps 1938-39 plans of the fortifications (fig. 20.28) illustrated mining slots cut in the walls of Tunnel 6.[57] Although not previously indicated on available plans, these slots probably date to the original construction of the tunnel as there would be no logical reason for their modern installation.

Although no specific reference to Tunnel 6 was found, it is likely that the Army Corps worked on this tunnel during their extensive repair and restoration work of the tunnels of San Cristóbal during 1938.

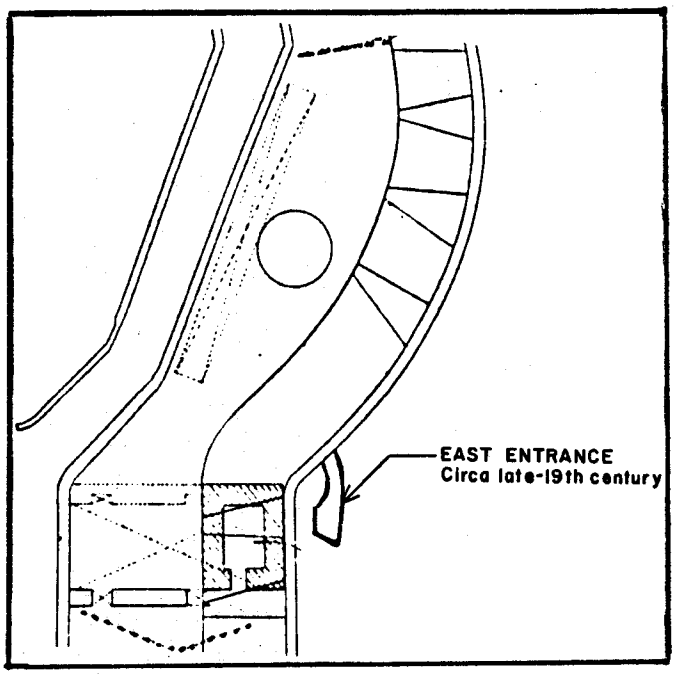


Figure 20.28. Late-19th century wall at east entrance to Tunnel 4. Plan, ca. 1897. (San Juan NHS Archives.)

Conditions

The interior of Tunnel 1 is in relatively good condition, though there are serious concerns for structural stability in the dungeon. Apparent structural cracks are being monitored to identify the severity and source of the problem. The situation was evaluated by Civil Engineer Todd Rutenbeck in July 1986. Mr. Rutenbeck returned in January of the following year to install seven additional monitoring gauges. These were located in the following areas: numbers 1 through 4, west wall south end; number 5, west wall near the doorway; number 6, lintel above the doorway; and, number 7, gap between ceiling and wall above the doorway. These gauges are now read and recorded once a month by the park's maintenance staff.[58]

Tunnel 1 is well-maintained and used to provide access not only to San Carlos and la Trinidad, but also to the outworks of Santa Teresa, la Princesa and el Abanico. The NPS interprets the tunnel and dungeon on a daily basis via guided tours and wall-mounted plaques.

Tunnel 2 is well-maintained and used daily -- not by visitors, or for interpretation -- but by park employees taking a shortcut through the Civil Defense office to the parking area in the moat between San Cristóbal and San Carlos. Conditions are damp and several continuous drips have caused calcium deposits and the formation of algae. This condition is most noticeable at the postern entrance.

Other than periodic resurfacing and the loss of its wooden gates, Tunnel 3 has survived unmodified in form since the eighteenth century. There are, however, several areas of deterioration. For example, on the east-facing gateway the sandstone is now weathered and has a spongy appearance. Retaining walls outside of this gateway are also worn and appear spongy. Damp conditions on the vaulted ceiling within the tunnel have led to leaching and the associated formation of biographical growth and staining.

Tunnel 4 appears to be in fair condition. Subsurface conditions of the original construction are readily apparent due to plaster and stucco loss. Materials include cut sandstone around doorway openings, stone rubble for walls, and brick for the vaulted ceiling. The floor is of stucco and stone. All of the surfaces are in good condition. On the interior of the vaulted tunnel calcium deposits, black stains and algae are evident due to excessive moisture seeping in from the terreplein above.

Tunnel 5 is basically in stable condition with minor problems affecting surface materials. For the most part conditions relate to the extremely damp environment within the

tunnel, an underground gallery that is never exposed to the drying action of sunlight and wind. Patching repairs seen along the base of the tunnel's walls may indicate previous cavity erosion related to excessive moisture. A narrow cement patch that runs along the apex of the tunnel's vault, covers the area where a lighting conduit (installed during 1938-40 restoration work) once ran. Although at present there are no signs of biological activity, it is probable that the tunnel was cleared of vegetation in the twentieth century as has been reported for similar tunnels.

The present condition of Tunnel 6 is basically good with only minor surface problems. Because the tunnel is underground, protected from exposure to the elements, it is not surprising that its walls show a high degree of dampness with associated biological activity and leaching deposits. However, neither condition is severe. As previously mentioned, this short tunnel was parged with cement by the early-nineteenth century, and much of it remains in place. There are, however, areas of fabric loss that are concentrated at areas more exposed to impact such as the springing of the vault and the base of the walls. The flat cut stone portal at the southern extreme of the tunnel is sound, although it suffers from minor surface abrasion.

NOTES

1. The early construction of San Cristóbal was described by Ricardo Torres-Reyes in "Construction History of San Cristóbal: 1634-1800," NPS report, San Juan National Historic Site, June 1965, pp. 1-10. A copy of the 1678 map is included in this report in Volume I, no. 1.

2. Reference to the "old" vault is found in the legend to Thomas O'Daly's plan of San Cristóbal dated 1769. Here, the dungeon is labeled "R" and described as, "old vault which is allowed to remain for countermining."

3. Both the 1769 profile and a translation of the legend may be found in Volume I, no. 8.

4. Torres-Reyes, p. 52.

5. Ibid., p. 6.

6. Copies of the plans for both 1678 and 1769 are included in this report in Volume I, nos. 1 and 8.

7. The construction date of ca. 1770-71 is not specifically documented for Tunnel 4. It is conjectured that Tunnel 4 would have been built at the same time as the adjacent Troops' Quarters, ca. 1770-71.

8. The legend to the 1769 plan by Thomas O'Daly noted that by January 15, the north magazines (H) "lack[ed] vaults," and that the North Bastion (C) "widening . . . [was] entirely finished . . . lacking only the esplanades and 4 embrasures . . ."

9. Thomas O'Daly, plan of San Cristóbal, January 15, 1769. A copy is included in Volume I, no. 8 of this report.

10. The approximate measurements mentioned in this paragraph were scaled off the plan dated May 1939 and entitled "Historical Fortifications: San Cristóbal Fort & Vicinity Proposed Repairs," (drawing no. NHS-SJ. 9060) -- scale, 1 inch = 30 feet.

11. See note no. 6.

12. A plan dated 1938 identified this as a "28 foot shaft." It was incorrectly conjectured in 1943 to be the possible "access to the Haunted Sentry Box [el Espigón] that juts out into the sea from this section of the fort."

13. Ibid.

14. Of these two changes in the old vault (dungeon), only the raising of the terreplein is documented. In O'Daly's 1769 plan, the North Bastion is labeled "B" and described as having been "raised 9 pies [feet] without including the parapet."

15. Report by Casanova, 1783, National Archives R.G. 186. Microfilm copy at San Juan NHS.

16. Edward A. Hoyt, 2nd Lt., A History of the Harbor Defenses of San Juan, P.R., Under Spain, 1509-1898 (San Juan: Antilles Coast Artillery Command, 1943), p. 140.

17. Information on the design of the galleon was obtained from William Bayreuther, Curator of the Constitution Museum in Boston, MA. Also consulted was Hector Marin, Park Ranger, San Juan NHS. Dates for the galleon is from Webster's Seventh New Collegiate Dictionary (Springfield, G.C. Merriam Co., 1963), p. 342. A description of the Spanish military flag is in The Forts: Los Fuertes (Santurce: Papel, Inc., n.d.), p. 12.

18. A copy of O'Daly's 1769 plan is included in Volume I, no. 8 of this report.

19. See note 1.

20. The caponier is shown as feature "V" on the 1769 plan. That it was not yet started is indicated by the section (Profile No. 1) also dated 1769. This shows both the level of the moat and the depth of "the terrain which should be reduced to form the main moat Caponier [D]."

21. Torres-Reyes, Construction History, p. 71. Original reference is to Thomas O'Daly's report dated March 15, 1771.

22. A copy of O'Daly's 1773 plan is included in Volume I, no. 17 of this report.

23. Decorative treatment of the stone mortar joints at the Officers' Quarters and the Troops' Quarters stair tower is described in Chapter 10, Period 2, of this report.

24. The 1769 plan by O'Daly is included in Volume I, no. 8 of this report.

25. The 1773 plan by O'Daly is included in Appendix A-11.

26. Ibid.

27. The construction date of the lower ramp to el Caballero is based on O'Daly's plan of 1769. Construction dates for the Troops' Quarters is based on the original quarterly reports described by Torres-Reyes in the NPS report, "Construction

History of San Cristóbal: 1634-1800," June 1965, pp. 66 and 69. Excavation beneath the old Caballero is conjectural and based on a comparison of the existing 1765 plan with later modernization plan of 1773. Raising of the east terreplein is documented by the plan of San Cristóbal dated 1769.

28. As translated by Torres-Reyes in Construction History, p. 43.

29. Ibid., p. 43.

30. Ibid.

31. Ibid., pp. 78-79.

32. A copy of the 1839 model is now in the visitor information center at San Cristóbal. Castro's 1861 drawings are included in this report in Appendix A-17.

33. 1839 model, see note 32.

34. One photograph also shows el Caballero fire control station (1942) under construction and is in the photo collection of San Juan NHS. Another was published in the newspaper El Mundo for July 11th 1962, and is in the files at San Juan NHS.

35. 1839 model, see note 32.

36. Ibid.

37. Plan without a date made by the U.S. War Department. Drawing No. 27360,381.

38. Plan without title in the drawing collection of San Juan NHS, drawing no. NHS SJ 9796.

39. Edwin C. Bearss, Historic Structure Report Historical Data Section: San Juan Fortifications 1898-1958 (U.S. Dept. of the Interior, NPS, Feb. 1984), p. 35. Original reference is to a report dated 1898 by Major Crosby and Colonel Goethals entitled "Notes on the Defenses of San Juan, Puerto Rico," National Archives, RG 77.

40. The casemate shaft is described in 1938-39 as measuring 8 feet in diameter by 60 feet deep. It appears on a plan of that date entitled "Electrical System for Tunnels Illumination," San Juan NHS.

41. The work included in Job SW-8 and Specification No. F-28-5 is described in Bearss' San Juan Fortifications, pp. 276 and 287. The photograph showing the overhead electrical lighting is untitled and undated, and is in the photo collection of San Juan

NHS. The drawing is entitled, "San Juan Puerto Rico Historical Fortifications & Vicinity: Electrical System For Tunnels Illumination" (to accompany Specification No. F-28-5), in the drawing collection of San Juan NHS, drawing no. NHS S.J. 9053.

42. Bearss, p. 368. Original reference is to a drawing of San Cristóbal dated Dec. 19, 1941.

43. Hoyt, p. 140. Hoyt says, "On the left of the casemate entering from the tunnel there was at one time a deep well."

44. Bearss, p. 375. The former Joint Operations Center building is used today by the Department of Civil Defense. It is still known by its 1940's name, "Building No. 213," according to Park Ranger Hector Marin, San Juan NHS.

45. The plan dated 1949 is entitled, "As Built Survey: Fort Brooke, San Juan Puerto Rico" by the Corps of Engineers. A copy is in the drawing collection of San Juan NHS, location number FC 6-DR4-ENV117.

46. Bearss, pp. 277 and 287. The electrical plan that accompanied F-28-5 is titled "San Juan Puerto Rico Historical Fortifications & Vicinity: Electrical System for Tunnels Illumination," in the drawing collection of San Juan NHS, drawing no. NHS SJ 9053.

47. Ibid., p. 375.

48. See note 45.

49. "Completion Report of Accelerated Public Works, San Juan National Historic Site," in the files of San Juan NHS.

50. The photograph, with "1971" pencilled on the back, is in the photo collection of San Juan NHS.

51. Nine drawings examined for this study include Tunnel 3. All are in the drawing collection of San Juan NHS. Of these nine, the four that label Tunnel 3 are the following:

ca. 1897 Plan without title, obtained from the Spanish by Colonel Goethals before the evacuation in 1898 (107-2-9).

1901 "Quarters at Fort San Cristóbal . . . as they exist February 12th, 1901," location no. FC7-DR3-ENV134.

1935 "Plan of Proposed Repairs to Fort San Cristóbal," drawing no. NHS-SJ. 9754 and location no. FC7-DR5-ENV141.

1938-9 "San Juan Puerto Rico Historical Fortifications San Cristóbal Fort and Vicinity: Proposed Repairs," (to accompany specification no. F-28-5), drawing no. NHS-SJ.9060.

52. "Completion Report", see note 49.

53. See note 51.

54. The following drawings are in the drawing collection of San Juan NHS.

ca. 1897 Plan without title, obtained by Colonel Goethals from the Spanish before the invasion in 1898 (107-2-9).

1940 "Fort San Cristóbal: San Juan, Puerto Rico," HABS, Survey no. P.R. 47.

1949 "As Built Survey: Fort Brooke, San Juan, Puerto Rico," location no. FC6-DR4-ENV117.

55. See Specification no. F-28-5 in Bearss, Historic Structure Report Historical Data Section, pp. 262-263. Original reference is to a document entitled "Completion Report, Repair of Historical Fortifications, Military Reservation, San Juan, P.R.", April 1938 to May 28, 1940, files SAJU.

56. Ibid., pp. 276-277.

57. These 1938-40 plans are in the drawing collection of San Juan NHS under the title "San Juan, Puerto Rico Historical Fortifications, San Cristóbal Fort and Vicinity: Proposal Repairs," (to accompany Specifications No. F-28-5), drawing No. NHS-SJ 9060.

58. Todd Rutenbeck, Civil Engineer, "Structural Inspection of Castillo San Cristóbal, San Juan, Puerto Rico," Denver: Bureau of Reclamation Engineering and Research Center, October 1, 1986. Telephone conversation with T. Rutenbeck 4/24/87.