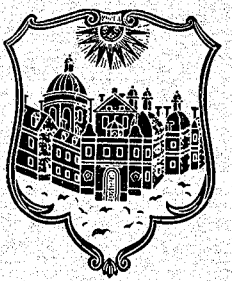
ARCHAEOLOGICAL INVESTIGATION OF THE PRINCESS ESTATE

ST. EUSTATIUS, NETHERLANDS ANTILLES

AN INTERIM REPORT



THE COLLEGE OF WILLIAM AND MARY

ARCHAEOLOGICAL INVESTIGATION OF

THE PRINCESS ESTATE

ST. EUSTATIUS, NETHERLANDS ANTILLES

AN INTERIM REPORT ON THE SUPPOSED JEWISH MIKVE

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Prepared for the Government of St. Eustatius

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INTRODUCTION

The Princess Estate is a large tract of land located on the east side of Oranjestad. Possible future development of this land necessitated an archaeological survey. Students and staff from the College of William and Mary Archaeological Field School in Historical Archaeology and Ethnography spent the summer of 1986 surveying the estate and excavating one prominent building located on the west edge of the property. This building, designated by the site number SE220, was thought locally to be the remains of a Jewish mikvah. This report deals with the description and analysis of the archaeological information from SE220.

The specific purposes of the research of the SE220 building was to scientifically explore the space within the building and to study and evaluate the architectural features found. No historical documents concerning the building are known to exist. It was hoped that such research could help to explain the true function and date of the structure.

This Interim Report summarizes the 1986 field work at the SE220 building located on the Princess Estate. It should be noted that any comparative evidence utilized in this report is selective and not exhaustive; that treatment awaits the final report.

This report was prepared for the Government of St. Eustatius, who provided funds for the research.

CHAPTER 1. ARCHAEOLOGICAL EVIDENCE: A DESCRIPTION

The building, with its main axis oriented north-south, is set into a hill which slopes gently from east to west. The west elevation of the building is therefore more fully exposed than the east wall, a factor which probably has functional significance. As revealed archaeologically, the building was rectangular in shape, having maximum interior dimensions of 56.3 ft. (north-south) by 28.2 ft. (east-west), with walls averaging c.1.5 ft. in width.

The building basically consists of one large room, herein called Room 1, with various types of construction within it- Features 1-4 - and a smaller room, herein called Room 2, with other features (Features 5-8) on the north side. (Figures 1,3,4). Rooms and features will be described in detail below.

Room 1, the main room of the building, has interior measurements of 43.2 ft. (north-south) by 28.2 ft. Systematically placed archaeological trenches revealed interior stone and/or brick structural remains (Features 1-4), evidence of flooring, and possible joist supports or footings along the west and north walls.

The space designated as Room 2 is situated on the north end of the building. The room was originally rectangular in shape, measuring 20.5 ft. (east-west) by 11.5 ft. (north-south). Features 5, 6, and 7 post-date the construction of Room 2, but are contemporary with the operation of the overall building.

ROOM 1, FEATURE 1

Feature 1 is a long and narrow structure, oriented east-west, located inside and parallel to the south interior wall of the building (Room 1). It consists of two basic components: A). the main linear body of the structure, which is in turn composed of a series of architectural sub-features; B). a stone channel that connects with the east end and curves to a north-south orientation; C). a platform-like structure in the southeast corner of the building.

FEATURE 1A articulates with or lies against the west wall of the building, stopping 4.6 ft. short of the east building wall. Overall maximum measurements of Feature 1A are 20.8 ft. by 4.4 ft. The feature is made up of the following sub-features, each of which will be described in detail: 1). two convergent stone walls which formed a semi-circle at the east end and support circular stone and mortar configurations; 2). an uneven, hardened clay floor with slots connected to openings in the south wall; 3). a stone walled box at the west end with an extension that angles under the west wall of Room 1. (Figures 1,5-8).

Before discussing the characteristics of the structure, a word about the fill or debris found within the structure[1] Three levels of fill were found, each sharing similar contents but

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[1]Sue Sanders, "The Furnace, SE220, St. Eustatius, N.A." (unpublished paper, William and Mary Archaeological Field School, 1986).

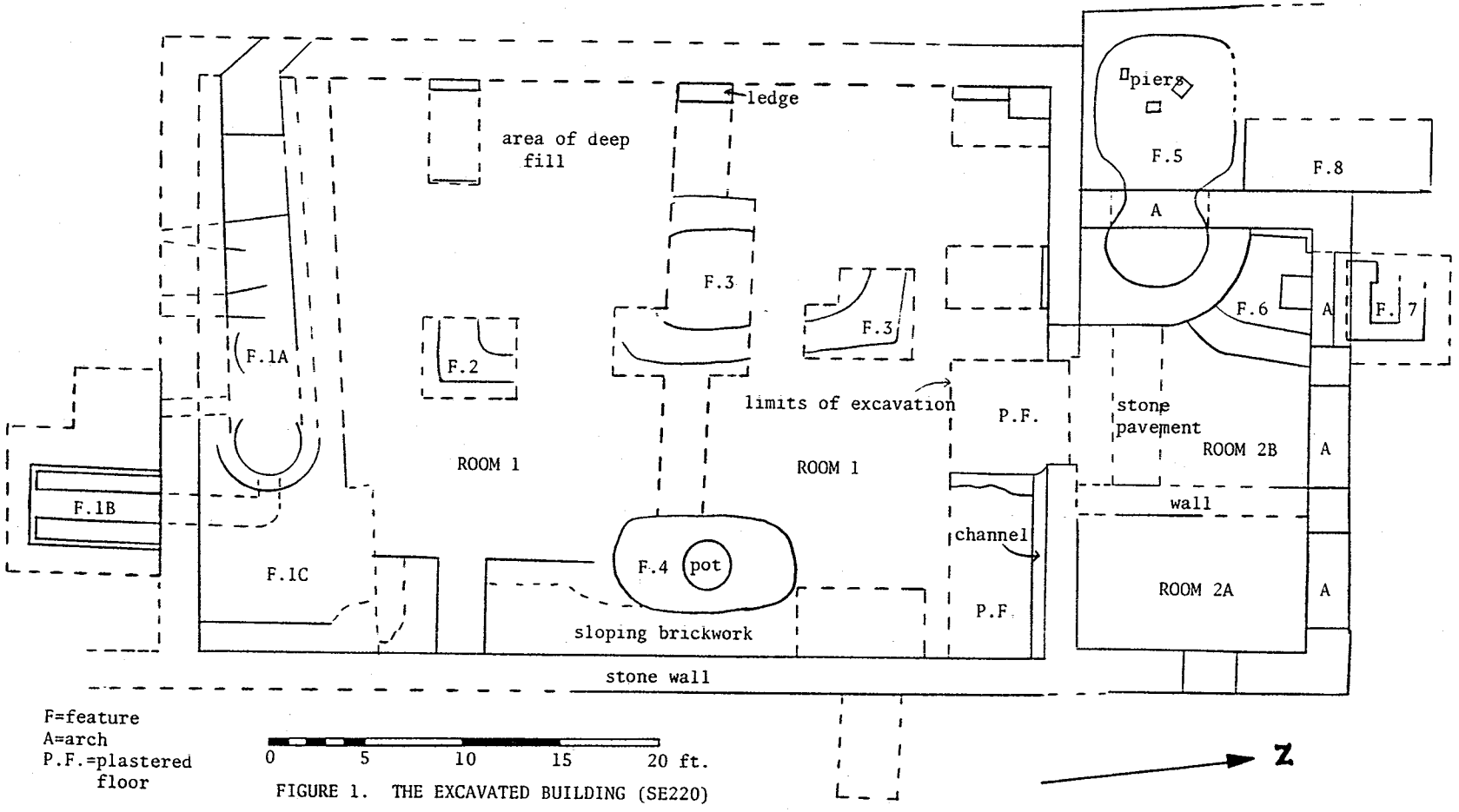

FIGURE 1. THE EXCAVATED BUILDING (SE220)

distinguishable by slight variations in greyish color. There was relatively little soil in the fill, as it was mainly rubble ranging from fist-sized stones to very large faced stones. The fill was very loose and had a tendency to cave in with the slightest provocation. Large quantities of yellow and red bricks, red bisque earthenware tiles (both curved and flat in a wide variety of sizes and shapes, a large concentration of nails and nail fragments in the eastern end of the feature, and a very large quantity of iron fragments were found in the middle of Feature 1A. Approximately 360 cubic feet of fill contained 62 pieces of glass (mostly from one green case bottle) and only 9 pieces of ceramics - porcelain, pearlware, creamware and stoneware.

Stone Walls. As previously mentioned, the south wall of Feature 1A is built against the interior edge of the south wall of the main building, so that both walls of Feature 1A are distinct from the building walls. The east curved wall of Feature 1A joins a "platform" area, to be discussed as Feature 1C.

The south wall of Feature 1A is thus parallel to the main building. The north wall of Feature 1A converges slightly towards the south and thus the two walls of Feature 1A are not parallel. The interior width of the structure narrows from 4.4 ft. (east end) to 2.9 ft. (west end).

Both walls are made of squared blocks of volcanic stone, of different sizes, with the interior face flat. The maximum number

of visible courses are four.

Whereas the west ends of the wall continue to the west building wall (Room 1) and abuts this wall, the east walls join together to form a nicely constructed semi-circle or rounded end.

At various places along the top of each wall, there is evidence that stones were set at an angle to slope inward. The maximum overhang (toward the interior) from the vertical wall is c.0.6 ft.

The south wall of Feature 1A is interrupted four times by regularly constructed opening through the wall. Opening #1, situated three feet from the curved east end of Feature 1A, measures 1.2 ft. square by 3.5 ft. in depth, whereas Opening #2, situated 4.0 ft. to the west, measures 1.1 ft. by 1.2 by 3.5, and Opening #3, 2.3 ft. distant, measures 0.8 ft. by 1.2 by 3.5 ft. All openings penetrate both the south wall of Feature 1A and the south wall of the building (Room 1). (Figure 8).

A fourth opening occurs in the middle of the curved stone wall and connects with Feature 1B. It will be described as part of Feature 1B.

Floor. The "floor" area between the stone walls appears to be hardened clay that is uneven in surface characteristics. The center area of the floor is fairly level from the east curved wall to the Opening #3 area. In an area 0.5-0.7 ft. wide along both the north and south walls, the floor slopes upward, as if clay had been intentionally packed in this manner to perhaps better seal the floor-stone wall boundary.

At a point some 12 ft. west of the curved east wall, a short wall, made of roughly cut and fitted stones, is present. The wall rises a maximum of 1.2 ft. above the floor. (Figures 7,9).

From this wall for a distance of 4.4 ft. to the west, the floor slopes downward (and westward) to a point c.0.4 ft. below the original or lower floor level. Near this point a stone walled box begins.

Box. A 3-walled box, with the fourth wall being the lower portion of the west building wall (Room 1), measures nearly 3 ft. square and up to 3.4 ft. deep. The walls were constructed of up to 5 courses of faced stone with some brick interspersed. The floor consists of cobbles imbedded in clay. The floor stones and stones of the east wall are fire-blackened. (Figures 1,9).

An arched-opening or tunnel-like feature extends at an angle of c.45 degrees towards the northwest from the stone walled box under and through the west building wall. The lowest level or floor is at the same level as the box cobble floor. The arched opening, constructed of two courses of stone, is 2.5 ft. in height by 1.6 ft. The arched roof is made of red and yellow bricks laid lengthwise on edge. Although the opposite end of the arched opening was not traced, it presumably is to be found on the exterior of the west building wall (below present ground level).

FEATURE 1B. The rectangular opening in the curving east wall of Feature 1A is one end of a channel-like structure that veers at a right-angle from a short east-west track to a longer

north-south orientation. (Figures 6,10). In other words, the channel leaves Feature 1A and, in a short distance, turns towards the south. From its north and western terminus, it goes underground beneath Feature 1C and under and through the south building wall, to a point 7 ft. south of the building. Feature 1B was essentially two parallel stone walls, each 1.9 ft. high, topped by horizontal stone lintels to form a roofed channel. The base of the channel is plastered to give a smooth surface. The base or floor slopes slightly downhill from north to south. The channel is 1.5 ft. in width and 22 ft. in total north-south length. Both channel walls rest on a flat foundation of stone.

FEATURE 1C. Situated between Feature 1A and the east building wall (Room 1) is a slightly higher, relatively flat area constructed of rocks and mortar. This "platform", which is over 4 ft. higher than the floor of Feature 1A and 2.5 ft. above the supposed floor level of Room 1, is incomplete on its north side. The platform is separated from the east wall of Room 1 by a narrow (1.4 ft.) and lower (0.5 ft.) corridor, which is also made of rocks and mortar with a relatively flat upper surface. (Figures 11,13).

ROOM 1, FEATURE 2

A 4 by 5 ft. excavation unit, placed some 4 ft. to the north of Feature 1A, revealed what appears to have been the southeast corner of a structure. (Figure 12). The wall, only partially excavated, was constructed from rough stone set in mortar. The

structure, of which this wall would have been a part, could have been no larger than c.8 ft. (north-south) by 10 ft. (east-west), as the areas beyond this distance were excavated or tested with no additional remains of Feature 2 being found.

ROOM 1, FEATURE 3

Some 5 ft. north of Feature 2 and 7 ft. west of Feature 4, an oval-shaped structure was partially excavated. Stone walls, 1.65 ft. wide, presently consist of two courses of fixed, squared blocks with rubble on the interior. The maximum height of the highest or eastern wall is presently 2.05 ft. The walls enclose a 4.8 ft. by 11 ft. area which is floored with rough stone that has a 0.1 ft. thick layer of plastered lime over it. There is no evidence of this lime on the interior wall surfaces. The limed floor is 2.1 feet below the original floor level of Room 1. (Figure 13).

ROOM 1, FEATURE 4

One of the most noticeable and distinctive features present inside the main building (Room 1) is an oval-shaped brick structure built into the ground. (Figures 1,13-18). It is located on the east side of Room 1 some two feet from the east building wall. The interior of Feature 4 measures 9.2 ft. in length (north-south) by 4.5 to 4.9 ft. in width. The one-half brick-wide walls are constructed of 4 to 6 courses of yellow brick, set

and mortared on edge, with narrow sides out. The floor, also made of yellow bricks set on edge, slopes inward at a c.25 degree angle towards the center of the oval, at which point there is a large cast iron pot set into the brick floor, extending 1.6 ft. below the lowest part of the floor. (Figures 16-18).

The depth of Feature 4, from top brick wall rim to the floor surface, varies due to the sloping floor. Depths are as follows at the points indicated: at south wall - 2.8 ft.; at the north wall - 3.4 ft.; at east wall - 3.6 ft.; at west wall - 3.9 ft. The rim of the iron pot is at the same level as the lowest level of the brick floor - 4.3 ft. below the top surface of Feature 4. The base of the iron pot is 5.9 ft. below the top of Feature 4. The actual dimensions of the iron pot are 2.6 ft. in diameter and 1.6 ft. in maximum depth.

Estimated volume of Feature 4 is 991 U.S. gallons or 3,751 liters. In addition, the iron pot could have held another 55 gallons, for a total Feature 4 capacity of 1,046 if filled to the top rim.

The supposed floor level of the building was nearly 2.5 ft. below the rim or top surface of Feature 4.

A number of other interesting structural features are to be found in the immediate vicinity of the oval brick construction. To the east, between Feature 4 and the east foundation wall, is a sloping brick pavement that extends for a north-south distance of some 32 ft. (Figures 13-15). The pavement, with remnants of a thin limed covering observable in some areas, slopes downward

from the east foundation wall toward the oval Feature 4. The slope is generally one-half foot in two to three horizontal feet. There is also a definite north (high) to south (low) slope on that portion of the brick pavement situated between the north wall of Room 1 and the brick oval structure.

The portion of the brick pavement that is adjacent to the north wall of Room 1 is actually separated from that wall by a narrow gutter-like channel. (Figure 1). This channel, which parallels the interior of the north wall, is 0.65-0.8 ft. wide and only 0.1 ft deep. The surface of the drain and the brick pavement have a thin coating of lime. The channel slopes downward from east to west - a drop of 0.45 ft. in 9 horizontal feet - while the brick pavement in this area dips slightly in two directions - from west to east on the western one-half and from east to west on the eastern one-half.

Both the channel and the brick pavement extend westward from the east building wall of Room 1 to the doorway in the north wall; the pavement ends in a stone step, which in turn descends to a level plaster surface at floor level. The latter plaster floor is at the same level at the stone floor pavement in Room 2.

There was no evidence of a brick pavement immediately to the west of the oval brick structure (Feature 4).

ROOM 1, OTHER FEATURES

Four excavation units were placed inside the west and north foundation walls of Room 1. (Figure 12). In all four units a

shelf projects c.0.5 ft. beyond the building wall. This shelf actually represents a wider foundation wall which supports the narrower building wall. The upper surface of this foundation wall is about 0.8 ft. below the general floor level of Room 1.

Whereas subsoil or sterile soils were reached in most excavation trenches at a relatively shallow depth, trenches 1 and 2 in the west one-quarter of Room 1 uncovered a deep deposit of rubble and mortar fill to a depth of c.6.2 ft. below present ground surface (or nearly 5 ft. below the top of the foundation wall). The eastern boundary of this deep fill deposit has yet to be traced, but it probably does not extend beyond the west edges of Features 2 and 3.

ROOM 2

As previously mentioned, Room 2, situated at the north end of the building, measured 20.5 ft. (east-west) by 11.5 ft. The main features now discernable, Features 5-7, post-date the original construction of Room 2, but are contemporary with the operation of the overall building. Room 2 will first be described in its original form, i.e., without Features 5-7.

A 6 ft. wide wall divides Rooms 1 and 2, with an off-center doorway 5.0 ft. wide linking the two rooms. Whereas the west wall (or southwest corner) of Room 2 abuts the north wall of Room 1, the Room 2 east wall (at the southeast corner) construction ties in; with the north wall of Room 1, establishing the contemporeneity of Rooms 1 and 2.

The east wall of Room 2, 2.1 ft. in width, survives to a maximum height of 9 courses of stone, or 7.3 ft. above present ground surface. Although the east edge of the wall is in line with the east wall of Room 1, the west edge of said wall does not, veering some 0.3 ft. to the west, i.e., at a slight angle with the west edge of the east wall of Room 1. A window opening, 2.8 ft. (north-south) by 2.1 ft (height unknown), is off-center in the east wall. The bottom of the opening is nearly three feet above the interior floor level. (Figure 21).

The north wall of Room 2 is bisected by three openings, each of which is surmounted by a brick arch. (Figures 1,4). The exterior brick surface of each arch was at one time limed. The maximum height of each opening is estimated to have been c.7.1 ft. (stone floor level to arch). The east opening, 5 ft. in width, exhibits two iron pintles set into the exterior side of the north wall, one pintle on each side of the opening (spaced 5.6 ft. apart). Immediately inside of each pintle the corner stones of the opening have been recessed to accommodate a wooden shutter.

The central opening, basically the same size, does not have evidence of pintles and/or insets in the stones.

The west opening is presently slightly narrower, measuring 4.5 ft. in width. Features 6 and 7, built into the opening, terminated the usage of the opening as a doorway.

A fourth opening with arch interrupts the west wall of Room 2 near the point of contact with the north wall of Room 1. The

width of this opening is 4.0 ft.

The four openings described above must have functioned as doorways, given the fact that windows, as witnessed in the east wall, were much smaller in size with a definite sill. No sills were present in the four openings.

It is hypothesized that during initial use of the building the four arched openings served as passages through the walls of Room 2, or gaps through which people and supplies/products could enter or exit. Sometimes later in time Features 5-8 were built and thereby the two westernmost doorways became blocked and unusable. The central doorway of the north wall thereby became the main northerly entrance-exit of the structure.

It is also hypothesized that the east portion of Room 2 may have served as a separate room (Room 2A) because of the following circumstances: 1). during excavation of Room 2, a buried limestone wall, 1.35 ft. wide, was found to run north-south from the stone wall between the central and east openings to the north wall of Room 1. This may have been the west wall of Room 2A, which would have measured 11.5 ft. (north-south) by 6.5 ft. The window in the east wall and the opening in the wall, with pintles and inset for shutters or door, would have formed an integral part of Room 2A. If Room 2A really existed as such, then Room 2B measured 11.5 ft. (north-south) by 12.65 ft. (prior to construction of Features 5-6).

Room 2B had a nicely constructed floor constructed of volcanic stones laid very flat. (Figures 19-20). The stone floor

level is c.1.5 ft. below present ground surface. It is presumed that the stone floor was present in Room 2A as well.

ROOM 2, FEATURES 5,6,7,8

Features 5-8 are seemingly a related group of features or construction, all of which were built into or against Rooms 1 and 2 at a time after the rooms themselves had been built. However, it is believed that Features 5-8 were utilized in related activities and were essentially contemporaneous with the features found in Room 1. All four features are situated in the northwest area of the building. Feature 6 is the only feature entirely within the confines of Room 2. Feature 5 is both inside and outside Room 2; Features 7 and 8 lie outside of Room 2. Both Features 5 and 6 are enclosed, irregularly shaped spaces with no entrances.

A description of individual features in Room 2 follows.

ROOM 2, FEATURE 5

In plan, Feature 5 has two connecting lobe-shaped open areas formed by curvilinear, surrounding walls (a 12 ft. long gap on the north side of the west lobe is due to recent destruction). (Figures 1,20,23-26,29). The eastern or smaller lobe, built into both Room 2 and the west wall opening of the Room 2 west wall, measures 5.0 ft. (north-south) by c.4.0 ft.; the west lobe, constructed outside of Room 2 and more squarish in shape, measures 7.4 ft. (east-west) by 6.8 ft. Maximum measurements of

the entire interior space is 11.4 ft. (east-west) by 6.8 ft. The juncture between both lobes is narrowest (3.1 ft.) under the west wall of Room 2.

Only a portion of the interior west side of Feature 5 was archaeologically excavated. At 2.6 ft. below present ground surface, a flat, limed or plastered floor was encountered; the floor presumably extends the entire length of the structure. The floor surface is 1.77 ft. below the stone floor pavement in Room 2B.

Three brick piers were found, each mortared to the floor, forming a triangular area with piers 2-3 feet apart. Each pier rises nearly one foot above the floor level.

The walls surrounding the bi-lobed space are 0.85 ft. in width. The south wall abuts or rests against the north wall of Room 1. All walls of Feature 5 are complete, with the tops of the walls sloping inward at a c.45 degree angle. The interior walls and slopes are limed to form a smooth surface. The maximum height of the walls, to the lowest or interior point of the slope, is 6.5 ft. Thus, Feature 5 was a structure without doorways that measured 6.5 ft. in depth.

ROOM 2, FEATURE 6

Feature 6 is an enclosed space of irregular shape that is bounded by the west wall of Room 2B, the north wall of Feature 5, a non-interrupted wall on the east, and a wall built into the west arched opening of the north wall of Room 2B. (Figures 20,23-

25,27). As with Feature 5, Feature 6 had no entranceway. The only entryway, if required, would presumably have been over the east wall.

The interior space of Feature 6 has maximum measurements of 4.6 ft. (east-west) by 4.5 ft. A 1.7 ft. square pillar, made of yellow brick covered with lime, abuts the north wall and rises 1.6 ft. above a plaster floor. The top surface of the pillar has a slightly raised circular area of lime c.1.2 ft. in diameter. A level plaster floor is present within the entire area of Feature 6; the floor is slightly higher (0.35 ft.) in elevation than the stone floor of Room 2 and much higher (by 2.1 ft.) than the plaster floor of Feature 5.

A plaster shelf, 0.35 ft. wide, is present along the west wall of Feature 6, at a point 3.75 feet above the plaster floor.

The walls that contain and form Feature 6 are a varied lot, as previously mentioned. The north wall is in-filled within the westernmost door opening of the Room 2 north wall. Made of stone and brick, it is 1.1 ft. wide with the top surface situated at nearly 4 ft. above the floor of Feature 6. The top surface of the wall is limed and slopes gently from south to north.

The east wall is 1.5 ft. wide, limed, and was constructed of courses of stone and red and yellow Dutch brick. The majority of wall surfaces slope at c.45 degree angles from east to west, or toward the interior of Feature 6; the interior height of the wall and the maximum depth of Feature 6 is 3.2 feet.

The south wall of Feature 6 is formed by the wall of Feature

5, already described; the west wall is the northwest corner of the Room 2 west wall.

ROOM 2, FEATURE 7

Feature 7 can be described as a U-shaped stone structure measuring some 4 ft. square. (Figures 1,22,28). The feature is parallel with Room 21, although outside of it. The south edge of Feature 7 extends slightly into and under the western door opening of Room 2, and is one-half foot distant from the Feature 6 north wall edge.

Low (2 ft.) walls on three sides of Feature 7 define an interior rectanguloid space measuring nearly 2 ft. (east-west) by 1.3 ft. A narrower opening on the west side is only one foot in width. The center of the interior is c.1.6 ft. north of the Room 2 wall. The interior floor is limed and evidence of ashes were found there during excavation.

A limed floor may have been present around or outside of Feature 7, slightly higher than the interior floor of Room 2.

ROOM 2, FEATURE 8

A little over three feet west of Feature 7 and adjacent to both the north side of Feature 5 and the west side of Room 2 is a stairway-like feature. (Figure 1). The overall dimensions are presently 9.4 ft. (north-south) by c.4 ft wide (stone has been robbed so an accurate width is impossible to ascertain) by 7 ft. in height (above present ground surface). Constructed of a

faced-stone exterior with a core rubble interior, narrow step-like shelves extend up the north face. Each "step" measures 0.9 ft. horizontally and 0.7-0.8 ft. vertically; nine "steps" possibly reached an elevation equal to the top of the presently preserved top of the Room 2 north wall.

CHAPTER 2. THE BUILDING AS A MIKVAH

History of the Jews

Information concerning the once flourishing community of Jews on Statia is sketchy at best. According to Dr. J. Hartog, Jews probably first went there in the 17th C.[1] By 1722, Statia had 1,204 inhabitants, of which four families or 21 people were Jewish.[2] In 1730 and after, there was a small but steady flow of Jews from Amsterdam and other areas.[3] In 1737, the Jewish community sought permission to build a synagogue on Statia; permission was granted and the structure was built in the middle of Oranjestad. The synagogue was inaugurated in 1739 and the Jewish congregation was called Honen Dalim - he who shows mercy to the poor.[4]

By 1781, 101 Jewish men and their wives and children- perhaps 350 Jews in all - lived on Statia.[5] Because of the large size of the population, Statian Jews were granted the same liberties as Christians by the State General of the Netherlands.

The majority of Jews on Statia were Sephardic Jews whose forefathers had come from Spain and Portugal. A minority were Ashkenazic Jews from Central and Eastern Europe.[6]

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[1]J. Hartog, The Jews and St. Eustatius, The Eighteenth Century Jewish Congregation Honen Dalim and Description of the Old Cemetery, (Aruba, N.A., 1976), 1.

[2]Ibid., 2.
[3]Ibid., 4.
[4]Ibid., 5.
[5]J. Hartog, History of St. Eustatius, (Aruba, DeWit Stores N.V., 1976), 56.
[6]Ibid., 58.

By 1790 the Jewish population had declined to 157 people and by the late 1790's most of the Jewish merchants had left Statia. The census of 1818 showed there were only 5 Jews left on the island; the last Jew on Statia died in 1846.[7]

At the peak of Statian population - c.1780-1790 - Jews therefore may have represented perhaps a little more than 10% of the white population of c.3,000 people.[8]

It is unfortunate that so little is known about the Jews of St. Eustatius. The only readily identifiable Jewish architectural entities on Statia today are the synagogue, built in 1738-1739, and the Jewish cemetery, with identifiable tombstones ranging in date from 1742 to 1825.[9] No other structures or areas can be positively identified as having been Jewish. Nothing is known about Jewish settlement patterns on the island, although many Jews may have had living quarters in their warehouses in the Lower Town. No historical documentation survives or has been found that relates to any Jewish building on the island.

The synagogue is located in the center of Oranjestad, while the cemetery is situated on the east of the periphery of town. The Princess Estate and the building under investigation is located to the immediate east of the cemetery.

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[7]Hartog, The Jews and St. Eustatius...., 14-16.

[8]Patricia L. Kandle, "St. Eustatius: Acculturation in a Dutch Caribbean Colony" (unpublished Master's thesis, Dept. of Anthropology, College of William and Mary, 1985), Figure 5.

[9]Hartog, The Jews and St. Eustatius..., 17. The other book by Hartog, History..., 59, says that the latest tombstone is 1843.

It is probable that the Jewish congregation on Statia had a mikvah as well as a synagogue. First of all, what is a mikvah and secondly, where was it located on Statia?

Characteristics of a Mikvah

Information concerning the mikvah is extremely difficult to find. Most books that deal with synagogues do not mention the mikvah.[10] However, one very useful book by Rabbi Aryeh Kaplan provides the information concerning mikvahs summarized below.[11]

The Hebrew word mikvah means a "pool" or "gathering" of water.

A typical mikvah or bath is usually about chest high and is large enough for three or four people to stand in comfortably. For easy access, there are stairs leading into the water of the mikvah.

If you look more closely, you will see a small hole, two or three inches in diameter, just below the water line of one wall of the pool. This hole may appear insignificant, but it is what actually gives this pool its status as a mikvah.

Just opposite this small hole, you will notice a removable cover over a Bor or "pit," which is the essential part of the mikvah. This Bor is a small pool by itself, and it is filled with natural rain water. The rain water must enter the Bor in essentially a natural manner...under certain conditions, spring water or melted snow or ice can also be used.

There are two other requirements for the Bor aside from containing natural rain water. First, it must contain at least forty Sa'ah. The Sa'ah is an ancient Biblical measurement, equivalent to approximately five gallons of water, so that the mikvah contains approximately 200 gallons of rain water.

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[10]For example, the following works do not deal with mikvahs at all: Carol Herselle Krinsky, Synagogues of Europe, Architecture, History, Meaning, (Cambridge, MIT Press, 1985); Azriel Eisenberg, The Synagogue Through the Ages, (New York, Bloch Publishing Co., 1974); Don A. Halperin, The Ancient Synagogues of the Iberian Peninsula, (Gainesville, University of Florida Press, 1969).

[11]Aryeh Kaplan, Waters of Eden, The Mystery of the Mikvah, (New York, National Conference of Synagogue Youth, Union of Orthodox Jewish Congregations of America, 1976).

The second requirement is that the Bor must be built directly into the ground. It cannot consist of any kind of vessel that can be disconnected and carried away, such as a barrel, vat or tub. Under some conditions, however, it can be built directly into the upper story of a building.

The Bor itself can be used for a mikvah, but since it is very difficult to change its water, it is most often used as a source to give another pool connected to it the status of a mikvah. This larger pool can be filled in any convenient manner from the ordinary city water supply, and its water can be changed as often as desirable. The only requirement is that it be connected to the water of the Bor by an opening at least two inches in diameter. By connecting the two pools and allowing their waters to mingle we give the water in the larger pool the status of the water in the smaller pool. This process of intermingling the waters of the two pools is known as Hasakah...

There are three basic areas where immersion in the mikvah is required by Jewish law:

1. After a woman has her monthly period, she may not be intimate with her husband until she immerses in the mikvah. This involves a Biblical law of the utmost severity.

2. Immersion in a mikvah is an integral part of conversion to Judaism. Without immersion, conversion is not valid. This is required of men and women alike.

3. Pots, dishes and other eating utensils manufactured by a non-Jew must also be "converted" by immersion in a mikvah before they can be used on a Jewish table. This is a special law in its own right.....

Besides these, there are other times when it is customary to used the mikvah. For example, it is an established custom to immerse before Yom Kippur as a sign of purity and repentance. Many Chasidim immerse before the Sabbath in order to sensitize themselves to the holiness of the day. In this general context, immersion in a mikvah is a process of spiritual purification and cleansing.

There are six necessary conditions that a body of water must fulfill before it can have the status of mikvah.

1. The mikvah must consist of water. No other liquid can be used.

2. The mikvah must either be built into the ground, or be an integral part of a building attached to the ground. It cannot consist of any vessel that can be disconnected and carried away, such as a tub, vat or barrel.

3. The water of a mikvah cannot be running or flowing. The only exception to this rule is a natural spring, or a river whose water is derived mainly from springs.

4. The water of the mikvah cannot be drawn. That is, it cannot be brought to the mikvah through direct human intervention.

5. The water cannot be channeled to the mikvah through anything that can become unclean. For this reason, it cannot

flow to the mikvah through pipes or vessels made of metal, clay or wood.

6. The mikvah must contain at least 40 Sa'ah (approximately 200 gallons).

A mikvah must be a pool of water in which there is no flow whatsoever.

Once a pool has the status of a mikvah, one can add as much water as one desires, in any manner whatsoever.

The original mikvah is a small pool, which is referred to as the Bor or "pit," alluding to the "pit" mentioned in the Torah. This is filled with natural rain water, fulfilling the six conditions mentioned above. Next to the Bor is a larger pool, connected to the Bor by an adequate sized hole. This larger pool is filled with ordinary tap water, but as soon as the water covers the hole, the two pools "kiss" and are connected as one. This larger pool then also becomes a mikvah, and it is generally used for immersion.

The Torah specifies that "he shall wash all his flesh in the water." This indicates that the entire body must come in contact with the water of the mikvah.

The mikvah must be large enough for any person to immerse his/herself in it.

The above passages from the Waters of Eden book provide some essential insights into the importance of a mikvah in Judaism and also some physical characteristics and requirements of a mikvah. With the above information in mind, the second question alluded to previously can be asked - if a mikvah was essential to any Jewish congregation, where was the mikvah located on Statia?

In 1973, a group of volunteers known as the Caribbean Mitsvah Corp, under the guidance of Rabbi Leo Abrami, "...discovered a Mikvah or ceremonial bath on the estate Princess near the [Jewish] cemetery.[12] Since that time, the building under investigation in 1986, known as SE220, has been known locally as the Jewish mikvah. The evidence for and against this identification will now be presented.

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[12]Hartog, History..., 59, and Hartog, The Jews..., 6.

As no historical records concerning the mikvah have yet been found, the only evidence for SE220 being a mikvah is the identification of this structure as a mikvah by Rabbi Leo Abrami and/or associates.[13] This identification has been perpetuated without critical review in various books published on the history of St. Eustatius.[14]

In 1973, the Caribbean Mitsvah Corp cleared some or all of the SE220 area, but they seemingly concentrated on the oval brick area (Feature 4), which is identified in published photographs as a "Mikvah or Jewish ritual [or ceremonial] bath."[15] Photographs of the standing ruins of SE220, also taken in 1973, are labeled as "ruins of the bathhouse."[16]

In sum, only two points can be advanced to identify SE220 as a Jewish mikvah:

1). Rabbi Leo Abrami and/or associates identified the oval brick feature as a mikvah primarily because it looked like a bath; there was no scientific investigation or research;

2). The so-called mikvah was built very close to a definite Jewish area, the cemetery. Therefore, close proximity seemingly makes the structure identifiable as a Jewish structure as well.

In 1973, there was no attempt to study the whole structure (SE220) in a scientific manner; the objective of the Caribbean

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[13]Letters written by Rabbi Abrami or others on the subject of the supposed mikvah on Statia exist, but they have not been made available to the author.

[14]Books by Hartog, op.cit.

[15]Hartog, History..., 61, and Hartog, The Jews..., 8.

[16]Hartog, The Jews..., 12,13.

Mitsvah Corp was to clear brush from known or supposed Jewish sites.

The first scientific study of the entire site was in 1986 by the William and Mary Field School. This is an important point, as archaeological excavation of the entire complex revealed all features within the building as well as the relationships of these features to one-another.

A careful study of the entire building and its features strongly suggests that SE220 was not Jewish in origin nor was it a mikvah. The reasons for this negative hypothesis are as follows:

1). No documentary evidence has been found to date that identifies SE220 as a Jewish mikvah;

2). the position of SE220 near the Jewish cemetery argues against the mikvah interpretation, as mikvah structures were apparently never located near cemeteries.[17]

3). the size of the "bath house" structure and mikvah are much too large, for the size of the Jewish population of Statia in the 18th century. The supposed mikvah at the Mikve Israel Synagogue in Curacao is no larger than a bathtub; the mikvah of Amsterdam (the Netherlands) is about one-quarter the size of the supposed "bath house" of Statia, yet the Jewish population of Amsterdam was much larger.[18]

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[17]Interview with Rene D. L. Maduro, Mikve Israel Synagogue, Willemstad, Curacao, July, 1986.

[18]Interview with Rene D. L. Maduro, Mikve Israel Synagogue, Willemstad, Curacao, July, 1986.

4). the totality of features found archaeologically within SE220 indicates that the building was used for industrial and not religious purposes. The use of arches in construction does not mean the structure was a non-industrial building; other known industrial buildings on Statia and other West Indian islands often utilize an eye-pleasing and functional arch construction. Furthermore, all features in SE220 appear to be part of an integrated industrial process and therefore contemporary.

5). the oval brick feature, identified as the mikvah in 1973, is an integral part of an industrial "assembly line", to be discussed in the next chapter. Also, several inherent features of this oval brick structure make it difficult to interpret as a mikvah. These are: a). there is no evidence of a Bor, as described previously; b). the oval feature is overly large in size, having a maximum capacity of nearly 1,000 gallons; c).the oval feature is very difficult to get into and almost impossible to stand in, given the fact that the floor is not flat and slopes inward at a relatively steep angle (c.25 degrees); d). the presence of a 55 gallon cast iron pot at the bottom of the feature makes no sense at all if the feature was a mikvah.[19] The presence of the pot, the angling floor, and the deep depth of the feature would make the feature extremely dangerous and nearly impossible to stand in when the feature was partially or wholly filled with water. After all, the purpose of any mikvah was not

[19]Rene Maduro of Mikve Israel said the presence of an iron pot in a mikvah made no sense whatsoever; he therefore thought the structure in question was not a mikvah.

to drown oneself, but to purify and cleanse oneself.

6). Based upon the type of ceramics found within the fill of certain features, the SE220 building seemingly dates to the 19th century. Very few, if any, 18th century artifacts were uncovered. The building therefore is later in date than the Jewish population who supposedly built the building. The majority of Jews had left Statia by 1800.

CHAPTER 3. THE BUILDING AS SUGAR BOILING HOUSE

In Chapter 2, evidence was presented that strongly suggests that the building designated as SE220 was not a Jewish mikvah. The question then remains as to the true function of the building. The hypothesis which best explains the size, shape and characteristics of SE220 is as follows: the building was a sugar boiling house. Evidence for this hypothesis will be presented below after a short summary of the history of sugar production in St. Eustatius, followed by more extensive explanation of sugar processing techniques. The latter information will present a basis for the evaluation of the SE220 remains.

Brief History of Sugar

Sugar was "the most valuable commodity in all of the world's trade of the eighteenth century."[1] Sugar became a valuable consumer good and it also became the focal point of extensive and profitable relationships between countries of Europe, Africa, the West Indies and the North American colonies.

Sugar production was important on Statia as on most other West Indian islands.[2] Today numerous ruins of once plentiful

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[1]Richard Sheridan, Sugar and Slavery: An Economic History of the British West Indies, 1623-1775, (Lexington, Univ. of Kentucky Press, 1974), 25.

[2]see Richard S. Dunn, Sugar and Slaves, The Rise of the Planter Class in the English West Indies, 1624-1713, (New York, W.W. Norton and Company, 1972).

sugar plantations dot the island. Descendants of planters from British sugar plantations settled on Statia.[3] The Dutch introduced a Javanese variety of sugar cane to Statia in the 1750's.

Around 1770, Statia produced c.600,000 lbs. of sugar annually; but it exported 20 million pounds by trans-shipping sugar from the French and Spanish islands.[4] By 1781, Statian sugar planters were producing c.600 hogsheads of sugar annually, but this may be a low figure, due to the lack of information on sugar production. By 1800, the entire southeastern portion of Statia was reportedly being cultivated. In 1816, c.500 tons of sugar were produced, and about one-half that amount in 1828. A map of 1830 shows 38 plantations; in 1855, Statia exported over L65,000 worth of goods, including sugar, rum and vegetables. From 1819 to 1862, Statian sugar works produced 400,000 to 500,000 pounds of sugar per year, 10,000 gallons of rum, and 1,000 gallons of molasses.[5] Some attempts at operating sugar works were even tried in the early 20th century. Sugar was imported after c.1923. In sum, one can say that the main period of cash-cropping of sugar ended in 1863, with the official abolition of slavery.

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[3]Unless otherwise noted, this summary of sugar production on St. Eustatius is taken from Linda G. France, "Sugar Manufacturing in the West Indies: A Study of Innovation and Variation" (unpublished Master's thesis, Dept. of Anthropology, College of William and Mary, 1984).

[4]Hartog, History of St. Eustatius, 36-37.

[5]John Y. and Dorothy L. Kuer, Windward Children, A Study in Human Ecology of the Three Dutch Windward Islands in the Caribbean, (Assen, Royal Van Gorcum, Ltd, 1960).

It is thus well-established that sugar production on Statia was an important economic activity. Only one plantation has been extensively studied to date, namely the 19th century remains of English Quarter.[6] In such establishments, sugar cane juice was processed into sugar.

The Processing of Sugar

How was sugar actually produced at these plantations on Statia?[7] The following discussion summarizes the steps involved in the manufacture of sugar.

The place where the sugar cane juice was gathered, clarified and concentrated was known as the boiling room or sugar house, a basic part of the sugar factory. The changes in it up to the 1840's were more nominal than real.[8]

There were five general steps used in the processing of sugar: 1). milling or extracting juice from the cane; 2). clarification or priming the juice with an agent like lime; 3). boiling or evaporation in order to crystallize the juice; 4). cooling the crystallized mass; and 5). drying, packing, and draining the sugar. Additional steps were necessary in the manufacture of rum.

1). Extraction. The sugar mill was the universal method of

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[6]France 1984.

[7]Unless otherwise noted, for the purposes of this interim report the information on sugar processing is taken from France 1984.

[8]Manuael Moreno Fraginals, The Sugarmill, The Socioeconomic Complex of Sugar in Cuba, 1760-1860, (New York, Monthly Review Press, 1976), 106.

extracting the juice from the cane; it usually consisted of three rollers arranged in a horizontal or vertical position. The cylinders comprising the vertical mill were 30 to 40 inches in length and 20 to 25 inches in diameter. They were geared at the top with the moving power applied to the cylinder in the middle. The cylinders drew the cane forward; a plate of iron placed in the bottom of the frame holding the cylinders formed a pan. Cane was fed into the mill by hand.[9] When pressed through a roller, the juice of the cane would flow into a form of trough or gutter which would carry the juice to the processing area of the factory.

2). Clarification. The extracted juice would be transmitted in a trough by means of gravity from the mill to a cistern or catchment located in the sugar boiling house.

"Seventeenth century planters used a three-roller mill, in which the center roller turned against the two outer ones. This enabled a miller to feed the canes through one set of rollers to his colleague who returned them through the second set. The dark brown cane juice flowed down the rollers into a trough and was piped into a cistern in the boiling house."[10]

The juice would flow into a cistern, usually a 500-600 gallon holding tank of wooden, lead-sheet lined boxes. Clarification began here, the first stage in the conversion of the juice into sugar.

"Its object was to cleanse the juice of all impurities such as pith, rind and wax and to separate it from the albuminous and gummy matters that were dissolved in it. Various means were

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[9]J. Carlyle Sitterson, Sugar Country, The Cane Sugar Industry in the South, 1753-1950, (Univ. of Kentucky Press, 1953), 137.

[10]Dunn 1972, 192.

employed to separate the coarser impurities from the juice. In some cases the juice dropped into the vat through a wire sieve. In other sugar-houses there was in the vat a gauze division through which the juice flowed."[11] The remainder of the clarification process, along with evaporation, took place in the kettles.

3). Boiling. The clarified sugar juice was next ladled into the boiling area. A typical 18th century sugarmill usually had a series of copper kettles mounted in a furnace.

"Within the boiling house, a battery of four or five great copper kettles hung over a furnace. These coppers were carefully scaled in size. On Bybrook Plantation in Jamaica, for instance, the four coppers held 180, 120, 80, and 30 gallons. It was the job of the boiler, the most valued laborer on the plantation staff, to ladle freshly extracted juice from a cistern into the first copper, skim off the impurities that arose to the surface, and ladle the remaining liquid into the second copper. As the juice passed into progressively smaller, hotter coppers, with constant skimming and evaporation it began to turn thick, ropey, and dark brown in color. A gallon of juice contracted into; a pound of muscovado sugar. The final, smallest copper had the thickest bottom and hottest fire. The boiler "tempered" the bubbling syrup with lime to promote granulation, and when he thought it on the point of crystallization he made his "strike"- dampened the fire and ladled the sugar into a cooling cistern. The boiler had to be something of an artist, fore there was no sure way of telling whether the sugar had been tempered enough or too much, or when it was ready to strike. He had to endure suffocating heat and stench, and his work was more hazardous than milling."[12]

Fraginals makes the following comments based upon Cuban evidence:

"...the standard eighteenth century method of cooking the juice was the so-called "Spanish train," a series of kettles ranging from larger to smaller through which the syrups passed as they evaporated. The kettles diminished in size in ratio to the lessening volume of the concentrate, which moved continuously onward to the next smaller kettle. In the last one - the teache or strike pan - it reached the "sugaring point." The only difference between the teache and the other kettles was its

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[11]Sitterson, 1953, 140.
[12]Dunn, 1972, 194.

smaller size.

The "Spanish train" involved a separate furnace for each kettle, a system greatly accelerating concentration but requiring an enormous expenditure of fuel...In the Sugar Islands...rapid deforestation demanded a radical changes of method. There they tried putting all the kettles in a line, heating them from one furnace. The fuel was fed to a furnace under the first kettle, and the other received the heat diffused from it along the line. This was a slower process than the "Spanish train," but it compensated by its much greater economy in the use of energy. It had another great advantage: it could function exclusively with bagasse [dried sugar cane stalks, already de-juiced] as fuel."[13]

The kettles, made of copper or cast iron, were set with precision in a solid body of masonry, usually two and a half to three feet above the floor. Kettles ranged in size from 52 to 72 inches in diameter for the largest and 33 to 54 inches for the smallest. The largest kettle, located at the end nearest the mill, was called the **grande**, the second the **flambeau**, the third the **syrup**, and the fourth the **battery**.[14] The furnace, located under the **battery**, was maintained at a uniform heat, day and night, during the milling season.

"The **grande** was charged by lifting the gate from the vats. From 6 to 24 cubic inches of slaked lime were added to two or three gallons of juice, forming a milk. This milk was thoroughly stirred into; the contents of the **grande**. As the heat of the juice increased, a greenish grey scum formed on the surface, becoming quite thick as the temperature reached 200 degrees. When a watery vapor forced itself through the scum, it was time for skimming. This was done with shallow skimmers, often of copper, ten or twelve inches wide and attached to long wooden handles. The scum was thrown into an adjoining vat, from which it was carried outside by means of a gutter. The skimming was completed in ten or twelve minutes, and the juice was then said to be clarified and ready to be ladled into the **flambeau**.

Meanwhile the **flambeau** and **syrup**, filled with juice which had come from the **grande**, began to boil and throw up scum not removed in the **grande**. This scum was pushed with wooden oars

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[13]Fraginals, 1976, 38.
[14]Sitterson, 1953, 141.

backward into the **flambeau** over the saddle separating the kettles. If the juice had been well clarified when it went into the **flambeau**, it would be almost transparent, a pale yellowish wine in color.... The juice was ladled from kettle to kettle by wooden buckets holding five to eight gallons.

To ascertain when the syrup had attained the proper consistency for granulation or for being struck, it was common practice to thrust a large copper spoon with wooden handle into the **battery**. If when the spoon was withdrawn, the syrup had a grained appearance and was so thick that it covered the spoon in a film and drained from it slowly, it had been cooked sufficiently.[15]

4). Cooling. The last stage of the sugar manufacturing process was granulation. In Louisiana, the cooling process lasted about 6-14 hours.[16] The teache syrup, after striking, was ladled, troughed or poured into holding tanks. These cypress tanks measured from 6-7 feet long, 4-5 feet wide, and from 12-14 feet deep. The first strike would fill the tank only two or three inches deep. This mass would be stirred and allowed to stand until a thick crust appeared. Next, the mass would be stirred again and then allowed to stand until almost hard. The next three strikes would be poured on top successively, following the same procedure.

In the West Indies, coolers were made of wood or copper, measuring 5-10 feet long, 3-5 feet wide and from 12-16 inches deep.[17]

5). Drying, Packing, Draining. After cooling, the sugar was cut and shoveled into buckets, then carried and poured into hogsheads. A curing house or area would be built on two levels,

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[15]Sitterson, 1953, 141-143.
[16]Sitterson, 1953, Chapter VII.
[17]France, 1984, 119.

the top holding the draining hogsheads or molds on beams. A cistern would be located underneath, "lined with cement." The molasses would drip into the cistern, there to sit awaiting storage for shipment to the United States or Europe or distillation as rum. Roaches, rats, and vermin would also fall into these cistern, aiding fermentation. Draining required from 20 to 30 days, and when finished, an average of 40 to 45 gallons had drained from each hogshead.[18]

"Once the sugar was boiled there were two ways of curing it to make it fit for sale. the most common method in the English islands was to make muscovado, golden brown sugar, which needed further refining in England before it could be offered to the general public. In Barbados the planters also made clayed sugar,white and semi-refined, which brought a considerably higher price. Even when making muscovado, the early English planters took considerable trouble with their curing and followed a more complex procedure than their successors in the eighteenth century. When the sugar had granulated and cooled for about twelve hours after boiling, they packed it into earthenware pots and placed the pots in the curing house on earthenware pans called drips. The curing house was kept as hot and close as possible in order to dry out the sugar; some planters set a fire in the center aisle. Even a small planter needed several hundred sugar pots. These vessels, shaped like large flower pots with holes in the bottom, were designed to drain the molasses from the sugar. Each pot had its bottom hole plugged for forty-eight hours, then unplugged, and the molasses that poured out was collected and taken to the distillery to make into rum. the planters kept their potted sugar drying and draining in the curing house for about a month. When they finally knocked it out of the pots, it had hardened into cone-shaped loaves. They cut away the frothy top end and the molasses-saturated bottom end from each loaf and reboiled them. The central two-thirds of the loaf - well-drained muscovado - was spread in the sun, packed into hogsheads, and stored in a warehouse for shipment to England.

"To make white sugar, the planters followed the same procedure as with muscovado except that they sealed the top of each pot with a well-moistened claycap, several inches thick. Water from the clay gradually seeped through the pot and

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[18]Sitterson, 1953, 144.

dissolved so much of the molasses that the sugar turned white and soft."[19]

Rum is essentially fermented molasses. Molasses would be allowed to stand in stone or wooden cisterns for 48 hours to 12 days. After fermentation, the liquid would be conveyed to a copper still sitting over a fire. Next, the liquid would be boiled to separate the wash from the liquor.

"The final component in the sugar works was a distillery for manufacturing rum...The English planters in the West Indies were apparently the first sugarmakers to discover how to distill molasses and other sugar by-products into a potent alcoholic drink with a sweetly burnished taste. Finding a profitable vent for molasses was a great boon to the sugar planters, for great quantities of this thick syrup were removed from the sugar during the curing process. A hogshead of muscovado might yield one hundred gallons of molasses...Nearly every planter had a still house equipped with a pot still, worm, and receiver. The planter mixed a solution of molasses, inferior can juice, and skimmings from the boiling coppers in a large vat and let them ferment for about a week...Once fermented the liquid was heated and vaporized in the still and recondensed into rum."[20]

SE220 As A Sugar Boiling House

All sugar factories in the Caribbean had much in common, but as with any hand-made product, there was variation in specific industrial techniques, architecture, and so forth. However, it is the author's contention that the processes and buildings associated with sugar production, as described in the examples given in the present chapter, fit well with the various features excavated in SE220. There is little doubt that SE220 functioned as a sugar boiling house, probably in the 19th century. The

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[19]Dunn, 1972, 195-6.
[20]Dunn, 1972, 196-7.

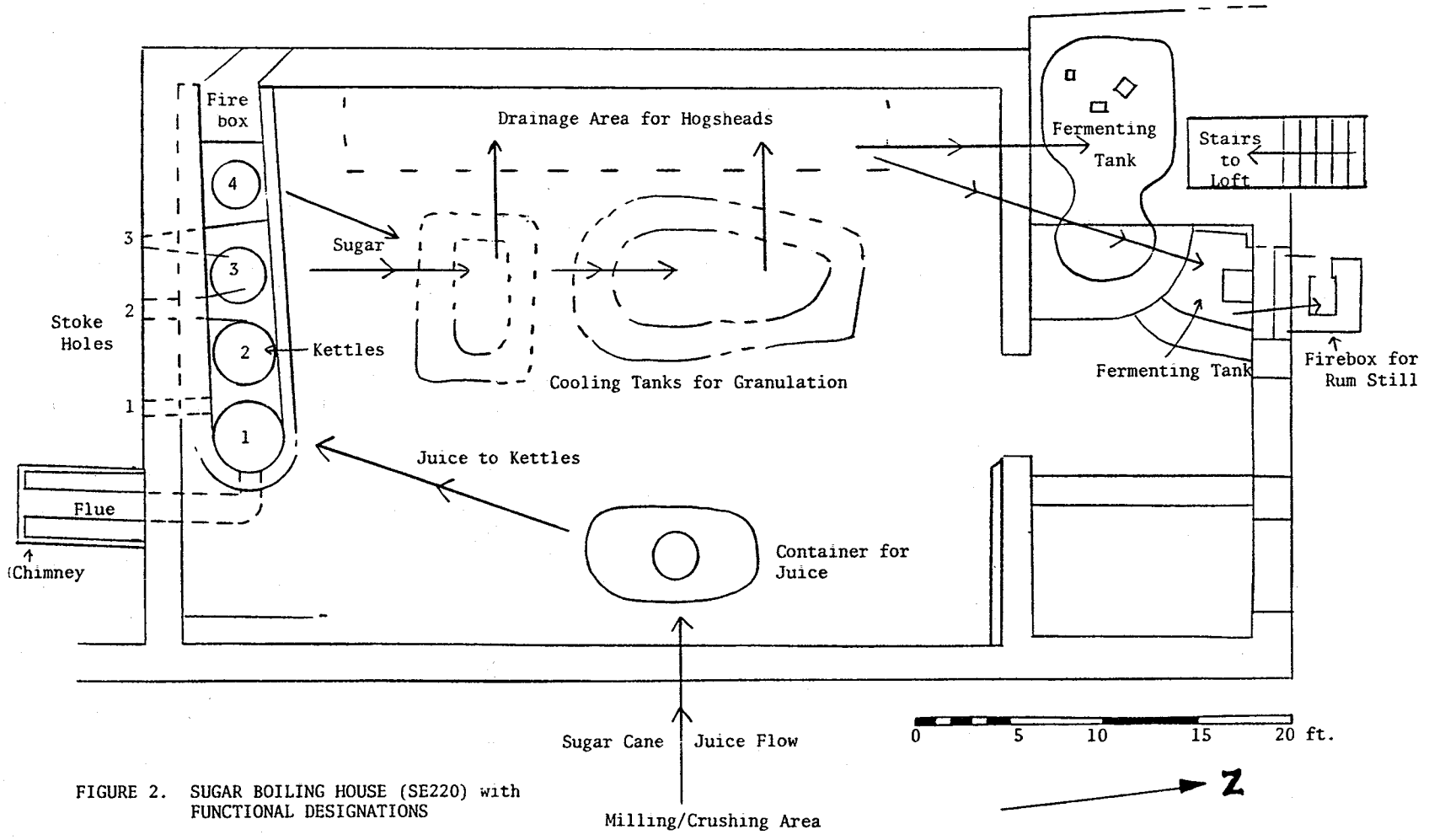

FIGURE 2. SUGAR BOILING HOUSE (SE220) with FUNCTIONAL DESIGNATIONS

entire building, with arched doorways, had been carefully constructed, as had many sugar houses throughout the West Indies.[21]

The various features of SE220, as outlined in Chapter 1, will now be described as to supposed function. (Figure 2).

Feature 1: a furnace or boiler for heating the sugar juice in kettles. **Feature 1A** was the boiler that supported the kettles, at the west end of which was the firebox (Figures 5-9); **Feature 1B** was a flue and chimney (now gone) from which the smoke and gases from the fire escaped (Figure 10); **Feature 1C** was a platform of unknown function (Figure 11).

Discussion of Feature 1: this long structure provided the mechanisms by which the sugar juice was boiled and thereby converted into a mass near granulation. The main body, built of solid stone walls, probably supported four kettles of decreasing diameter; in fact, the walls of the structure narrow as they proceed westward. The eastern-most kettle was the largest. Two short pieces of curving wall at the east end of the boiler are preserved; these were supports for the **grande** kettle.

The deep box at the west end of the boiler was the firebox, where either bagasse or wood was burned to produce the heat. The passageway leading beneath the west wall of Room 1 may have been

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[21]For example, the sugar house studied recently on Montserrat was a beautiful, well built structure. See Lydia Mihelic Pulsipher and Conrad M. Goodwin, "A Sugar-Boiling House at Galways: An Irish Sugar Plantation in Monserrat, West Indies," Post-Medieval Archaeology, Volume 16, pp.21-28, (London, 1982).

a stoke hole, loading door and draft mechanism. Three squarish openings in the south wall of the boiler were stoke holes as well (Figure 8). The hot air produced at the west end (firebox) circulated beneath the kettles supported above the floor and eventually passed through the flue at the east end of the boiler. The flue makes a right angle turn to the south, which at one time connected to a vertical chimney, now destroyed. A description from the sugar country of Louisiana fits the SE220 flue almost perfectly:

> "The furnace was under the **battery** [the last or smallest kettle, situated on the west end of the SE220 furnace or boiler] with the door and ashpit on the outside of the building. The flue from the furnace passed under the kettles and at the end of the set turned at right angles and went outside, where it rose in an independent chimney to a height at least equal to the horizontal circuit of the flue."[22]

Features 2 and 3: cooling tanks built to promote cooling and granulation of the struck sugar juice in the boiler. (Figures 12,13).

Discussion: Features 2 and 3, relatively shallow in depth, would have received the syrupy sugar juice from the **battery** or final kettle. From these cooling tanks the brown sugar would have been shoveled into hogsheads as previously described.

As mentioned in Chapter 1, a great depth of fill was discerned in the area between Features 2 and 3 and the west wall of Room 1. Perhaps this area will turn out to be a deeper room or cistern, into which hogsheads were drained.

Feature 4: a tank for holding or containing sugar juice.

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[22]Sitterson, 1953, 141.

(Figures 13-19).

Discussion: this deep structure received sugar juice from the mill, which was probably located to the immediate east of Feature 4, outside of the building. The slope of the hill from east to west made gravity flow of the sugar cane juice possible from mill (east) into the holding tank by means of a gutter or channel. Feature 4 could have held up to 1,000 gallons of juice, or the equivalent of c.25 hogsheads. Some scum and debris was undoubtedly scooped from the juice at this point. The iron pot at the bottom was apparently an innovation to this particular sugar mill. The sloping floor of the holding tank ensured that all juice would eventually gather in the pot, which could be easily scooped out using long-handled scoops. Possibly detritus settled into the iron pot as well.

The sloping pavement between the east wall of Room 1 and the holding tank (Feature 4) functioned to feed any spilled cane juice into the holding tank.

The contained sugar cane juice would have been ladled or carried in buckets from the holding tank to the first kettle in the boiler.

Features 5 through 8: these four interesting features in Room 2 functioned in the fermenting and distillation of rum. Features 5 and 6 were holding tanks for molasses (Figures 20,23-27). Feature 7 is the remnants of a small fireplace for heating a distilling apparatus (Figures 22,28). Feature 8 is the remnants of stairs, needed for distillation servicing.

Discussion: as previously described, rum is essentially fermented molasses that has been distilled. Features 5 and 6, having no entrances, most probably functioned as holding and fermenting tanks for molasses. Feature 7, a U-shaped stone wall, which contained evidence of ash, functioned as a fireplace. A still with vertical tubing rested upon and was heated by this fireplace. The regulation or servicing of the distilling apparatus was accomplished from a small loft above Room 2, reached by stairs (Feature 8).

Flow Of Sugar in the Building: as depicted in Figure 2, the mill was located to the immediate east of the holding tank (Feature 4). The mill was powered by vertical iron rollers, a few of which were found lying on the ground surface to the east of Feature 1C. (Figure 30).

Sugar juice would have flowed downhill through a gutter from the mill into the large brick oval holding tank (Feature 4), from which it would have been ladled or scooped into kettles positioned in the boiler (Feature 1), located a short distance to the south. The boiler was fired at the west end; hot air circulated beneath four kettles supported by the walls of the boiler and eventually went out the flue and chimney to the south, outside of the building. The kettles decreased in size from east to west, as is indicated by the converging boiler walls. The sugar juice reached a syrupy stage and was scooped into the cooling tanks (Features 2 and 3) in order for granulation to take place. The brown sugar was then loaded into hogsheads to drain;

this may have been done in the area to the immediate west of Features 2 and 3.

Room 2 contained various cisterns and apparatus to make rum. Features 5 and 6 once functioned as holding tanks where molasses was fermented; Feature 7 was a fire area for a rum still and Feature 8 was a stairway leading to an upper loft where the still could be serviced.

CHAPTER 4. CONCLUSIONS

From the evidence presented in the previous chapters, it is concluded that the building previously thought to have been a Jewish Mikvah was instead a sugar boiling house. The reasoning for this belief was presented in the previous chapter.

The presence of a large cistern and ruins of other structures, possibly domestic buildings, to the immediate north of the sugar boiling house (SE220) tends to reinforce this belief. The organization of buildings in this area is much like that found at English Quarter or Fair Play, only on a smaller scale.

A local informant also confirmed the author's interpretation.[1] He related that the building had been a sugar boiling house; he remembered seeing, in his youth, a standing chimney (our Feature 1B) and one or more iron kettles still sitting in the boiler. The informant was born in 1914 and remembers the building from the 1920's period. He also confirmed the presence of stairs which led upstairs to a small loft.

Another fairly obvious reason for the interpretation as a sugar boiling house was the presence of three iron rollers or cane crushers just outside the southeast corner of the building. Although they could have been dumped there from elsewhere on the island, the presence of the rollers, when coupled with other

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[1]Interviews with Mr. Euson, June and July, 1986.

evidence, lends support to the sugar boiling house interpretation.

There is no concrete evidence at all for the interpretation of the SE220 structure as a Mikvah. There is no evidence whatsoever that the building ever had anything to do with Jews. Feature 4 (holding tank) was not a bath, for reasons presented in previous chapters.

It is highly probable that any Jewish Mikvah present on St. Eustatius was located in or near the Synagogue or in someone's home; it was not located in the building under investigation (SE220).

FIGURES 3 - 30