An Archaeological Definitive Field Investigation of the Area for the AFISO Tower at the Airport, St. Eustatius

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Cover Photo: The tracked excavator excavating a trench (Photo: SECAR Staff).
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1. Introduction

The St. Eustatius Center for Archaeological Research was contracted to conduct a definitive field investigation of the proposed area of the AFISO tower. The plan is to construct a new AFISO tower, as described in SECAR report no. 20190501. Based on the results of the first phase, a second phase for the proposed area of the AFISO tower was recommended. The results of the second phase are described in this report.

To restate the Monuments Law BES article 1: monuments can be movable and immovable property, which are at least 50 years old and that are perceived of general interest because of their beauty, artistic value, their meaning for science, the history of the country or the value for their people, including archaeological heritage. The definition of archaeological heritage is in this case: buildings, objects or remains that, independently or jointly, and whether in the context of the location, indicate human activities that took place in the past, that are older than fifty years (wetten.overheid.nl).

The first step in the archaeological process is described in SECAR report no. 20190501 and will not be included in this report again. This report contains the archaeological definitive field investigation of the proposed area of the AFISO tower. Definitive field investigations, in which the whole area is excavated, are conducted to determine the nature, size and locations of the archaeological heritage in the designated area.

1.1 The reason and objective of this research

The reason for this research is that development is going to take place in the area for the AFISO tower and due to the discovery of archaeological features described in SECAR report no. 20190501 (Fig. 1). The development of a new AFISO tower will have a negative impact on the archaeological remains.

Figure 1: Proposed plan for the new AFISO tower, passenger terminal and soak field with the accompanying septic tank plotted on Google Earth (after Rijkswaterstaat and earth.google.com).
The objective of this research is to completely excavate the area that is designated for the construction of the AFISO tower. The outcome of this research will provide us with a complete overview of the archaeological remains of the area. This archaeological heritage receives a value, on which a recommendation for preservation is based.

1.2 The research area

The planned area for development is almost in the middle of St. Eustatius, located on what is called the Cultuurvlakte. The AFISO tower is 6.59 by 6.17 meter, but the concrete foundation will be 11 by 11 meters (Fig. 2). This means that on the northern and southern side there will be an extra 2.21 meter and an extra 2.415 meter for the eastern and western side. However, this extension is problematic for the high voltage cables that are nearby in the ground. After a discussion with Rijkswaterstaat, the AFISO tower will be relocated 3.5 meters towards the current parking lot.

![Figure 2: The location of the AFISO tower (Source: after Rijkswaterstaat).](image)
2. Definitive Field Investigation

2.1 Introduction
During the first phase of the project, remnants of a colonial structure were uncovered in trench 2. Due to these remnants a recommendation was made to excavate the entire area determined for the construction of an AFISO tower. The concrete foundation of the AFISO tower will be 11 by 11 meters. However, due to the discovery of two white pipelines with a diameter of approximately 10 centimeters, the total surface area became smaller than the original 11 by 11. The site was excavated using a tracked excavator (Fig. 3). An archaeologist from SECAR was present to navigate the excavation with the excavator, to identify archaeological features and to make sure that no archaeological remains were destroyed.

Figure 3: The tracked excavator excavating the unit (Photo: SECAR Staff).

A Sokkia CX-105 Total Station was used to map the unit and its features. The points have been georeferenced by using the DP point on top of Signal Hill. Photographs were taken using a Nikon D5300 camera with a scale bar of 1 meter in length and a north arrow. Artefacts were collected per location in comparison to the structure and feature. A total of three profile sections were recorded, photographed, and drawn at a scale of 1:20. All the features have been documented by sectioning, photographing and drawing them at a scale of 1:20. Artefacts are conserved and stored at the SECAR storage facility.
2.2 Results
The definitive excavation of the entire area for the AFISO tower has resulted in the discovery of a molasses vat and an adjacent building, which could have been the curing house. Archaeological material, predominantly from the colonial period, was found in and around the discovered structures. Furthermore, the uncovered features originate from the colonial time period as well. An overview of unit 7 can be found in appendix 1. Below, unit 7 is plotted on Google Earth (Fig. 4).

Figure 4: Unit 7 plotted on Google Earth (after www.google.com).

Photographs of the unit are shown below (Fig. 11 – Fig. 18).
Figure 5: Photograph of the unit looking south (Photo: SECAR Staff).

Figure 6: Photograph of the unit looking east (Photo: SECAR Staff).
Figure 7: Photograph of the unit looking west (Photo: SECAR Staff).
Figure 8: Photograph of the unit looking from the top (Photo: SECAR Staff).
Features

In unit 7 a total of 10 features were found in the soil. (Fig. 9 – Fig. 18). The unit contained seven soil features (Features 13 – 19) and three structural features (Features 20 – 21). The latter structural features are interpreted as a possible molasses vat and curing house. Feature 13 and 14 were too shallow for further documentation. Below photographs are shown of the features and the sectioned features of unit 7 (Fig. 19 – Fig. 25). Drawings of the sectioned features are added in appendix 2.

Figure 19 – Figure 22 (clockwise, starting on the top left): Figure 19: Photograph of feature 13 and 14; Figure 20: Photograph of feature 15 – 19 (from left to right); Figure 21: Photograph of feature 20; Figure 22: Photograph of feature 21 and 22, of which the latter is the plastered surface area (Photos: SECAR Staff).
Figure 23 – Figure 25: Top: Sectioned features 15, 16 and 17 (starting from the left); bottom left: section of feature 18; bottom right: section of feature 19 (Photos: SECAR Staff).

**Profiles**

Profile drawings with a width of 1, 1.5 and 2 meters were made for east, west and south profile of the unit. These profile drawings are enclosed in appendix 2. Photographs were taken before drawing the profiles (Fig. 26 – Fig. 28).
Artefacts
The artefacts in unit 7 have been divided into four different contexts. Context 1 contains artefacts that have been found during the excavation process. Context 2 contains artefacts that have been found in the interior of the building, which is possibly a curing house. Context 3 contains artefacts that have been found inside the possible molasses vat. Context 4 contains artefacts that have been found in the feature that is visible in the profile (Fig. 27). These context numbers will be used from now on to describe the different groups. Context 1 contains a total of 41 artefacts, context 2 contains 23 artefacts, context 3 contains 12 artefacts and context 4 contains 9 artefacts.
The overall composition of the unit consists of glass (9.41%), ceramics (63.53%), metal (4.71%), organic (17.65%) and stone (3.53%). Based on the ceramics, a mean date or average date has been calculated for the whole of unit 7. The mean date for the entire unit is the year 1745. Table 1 shows the composition of all the different contexts of unit 7. Table 2 shows the mean date per context. Photographs of the artefacts can be seen in appendix 3.

Table 1: The composition of the different contexts.

<table>
<thead>
<tr>
<th>Context</th>
<th>Glass</th>
<th>Ceramics</th>
<th>Metal</th>
<th>Organic</th>
<th>Stone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context 1</td>
<td>12.20%</td>
<td>75.61%</td>
<td>0.00%</td>
<td>7.32%</td>
<td>4.88%</td>
</tr>
<tr>
<td>Context 2</td>
<td>0.00%</td>
<td>73.91%</td>
<td>4.35%</td>
<td>17.39%</td>
<td>4.35%</td>
</tr>
<tr>
<td>Context 3</td>
<td>25.00%</td>
<td>25.00%</td>
<td>25.00%</td>
<td>25.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>Context 4</td>
<td>11.11%</td>
<td>33.33%</td>
<td>0.00%</td>
<td>55.56%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>

Table 2: The mean dates for the different contexts.

<table>
<thead>
<tr>
<th>Mean Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Context 1</td>
</tr>
<tr>
<td>Context 2</td>
</tr>
<tr>
<td>Context 3</td>
</tr>
<tr>
<td>Context 4</td>
</tr>
</tbody>
</table>

The artifacts found during this project show a variety of shapes and function (Tab. 3).

Table 3: The numbers and percentages of each material group.

<table>
<thead>
<tr>
<th>Material group</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bone</td>
<td>4</td>
<td>4.71%</td>
</tr>
<tr>
<td>Bottle</td>
<td>11</td>
<td>12.94%</td>
</tr>
<tr>
<td>Bowl</td>
<td>4</td>
<td>4.71%</td>
</tr>
<tr>
<td>Cooking pot</td>
<td>1</td>
<td>1.18%</td>
</tr>
<tr>
<td>Indeterminate</td>
<td>21</td>
<td>18.82%</td>
</tr>
<tr>
<td>Jug</td>
<td>16</td>
<td>4.71%</td>
</tr>
<tr>
<td>Plate</td>
<td>4</td>
<td>8.24%</td>
</tr>
<tr>
<td>Roofing tile</td>
<td>7</td>
<td>8.24%</td>
</tr>
<tr>
<td>Shell</td>
<td>10</td>
<td>11.76%</td>
</tr>
<tr>
<td>Shell tool</td>
<td>1</td>
<td>1.18%</td>
</tr>
<tr>
<td>Soup plate</td>
<td>1</td>
<td>1.18%</td>
</tr>
<tr>
<td>Tobacco pipe</td>
<td>5</td>
<td>5.88%</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100%</td>
</tr>
</tbody>
</table>

Special finds such as the conch tool (*Lobatus gigas*) deserve some special attention (Fig. 29). This prehistoric conch shows clear marks on the edges of the conch. This conch could be a scraper.
Interpretation

The features and artefacts that were found in unit 7 reveal the remains of a historical sugar plantation. The structures can be interpreted as a curing house with an adjacent molasses vat. The latter structure is too small to be a cistern, but it is plastered all around. Furthermore, no bricks have been found which means that the structure did not have an arched vault like the majority of the cisterns (van Keulen 2018). The basin of the molasses vat looks identical to the one found at the sugar plantations Princess Estate and Fairplay. A molasses vat was usually attached to the curing house, as can be seen at the nearby sugar plantations such as Benner’s (Stelten 2011).

In SECAR report no. 20190501, the remains have been ascribed to the plantation owned by Law Salomons on the map of P.F. Martin made in the year 1781 (Fig. 30).
The plantation of Law Salomons is quite small and only shows two buildings, an animal mill and a few slave huts. Usually, a sugar plantation consists of an industrial complex, a great house, a cemetery, cisterns or wells, cane fields and slave quarters (Fig. 31). The industrial complex is subdivided into a cattle pen, cattle or windmill, a boiling house, a clarifier basin, a curing house, a molasses vat and, possibly, a rum distillery. Cattle such as oxen or donkeys were used to drive the mill that crushed the cane to retrieve the juice. Windmills, obviously, use the wind to crush the cane. This juice would then flow to the clarifier basin from which it was then ladled into a series of large metal basins called ‘coppers’ (although usually made of iron). These coppers were heated above a furnace. The coppers are located in multiple furnace basins in the boiling house. Ashes and lime would then be added to the coppers to get the impurities out of the cane juice. These impurities would then be scooped of by perhaps the most important slave of the plantation. After boiling, the obtained sugar syrup would then be transferred to the curing house in which it would be poured into conical clay moulds with nipples at the base. These clay moulds would then be placed on top of pots so that the syrup could drip down into it. Water was poured into the top of the mould for at least a month leaving behind muscovado sugar and molasses (in the pots) (Fig. 32). The molasses too could then be shipped off or distilled into rum. The molasses was usually contained in a molasses vat at the plantation.

Figure 31: Drawing by Jan Veltkamp depicting slaves working on a Statian sugar plantation around 1750. Source: National Maritime Museum, Amsterdam. The rum distillery is indicated with an ‘A’, the cattle mill with a ‘B’, the boiling house with a ‘C’ and the sugar cane with a ‘D’.
Figure 3: A sugar cone that is dripping molasses and a man drinking it. Source: pulcinellapasta.wordpress.com.

A great house would usually be located upwind from the sugar plantation to avoid its smell, but still within its visibility to keep an eye on the slaves. Often plantation owners or relatives were buried on their own property.

The archaeological material from unit 7 suggests that the plantation was only active during the 18th century, with most of the material coming from the period between 1725 and 1775. This is a shift in the time range of the first phase of the project (see SECAR report no. 20190501), of which most of the material came from the second half of the 18th century. Still it coincides with the cartographic evidence of the 19th century. The map made by Samuel Fahlberg in 1830 only shows the location of the Golden Rock plantation and Concordia Estate (Fig. 33). A map made by A.H. Bisschop-Grevelink that dates from the period 1839-1846 shows the same situation (Fig. 34).

Not a lot of tableware and cooking ware are found at the site. Furthermore, there is also not a lot of material that can be connected to the industrial complex of a sugar plantation, such as the sugar cones (Fig. 32). The scraper that was found might be a remnant of the prehistoric site of Golden Rock that is in the vicinity of the airport. The ceramic rooftiles that were found are an indication that there once was a roof on the building. Other material, such as the shells that have been found, were consumed and were a part of the diet.

The five features found inside the structure are interpreted as postholes (Fig. 20; Fig 23 – Fig. 25). A building would often have a wooden floor and posts would have to be put in the ground to hold up or support this wooden floor.
Figure 33: Map of St. Eustatius made by Samuel Fahlberg in 1830. The green rectangle shows the location of where the plantation used to be.

Figure 34: Map of St. Eustatius made by A.H. Bisschop-Grevelink between 1839 and 1846. The letter D stands for Golden Rock plantation and the letter G stands for Concordia Estate. The green rectangle shows the location of where the plantation used to be.

2.3 Recommendations

The research area contains the remains of a molasses vat and curing house. Both structures are in the location that is intended for the foundation of the proposed AFISO tower. Is it worth to preserve these remains in situ? For that we need to establish the value of the archaeological remains. Valuation of the archaeological sites is done with the use of one of the informative documents of the Stichting
Infrastructuur Kwaliteitsborging Bodembeheer (SIKB), Bijlage IV Waarderen van Vindplaatsen (www.sikb.nl).

First, the experiential value (belevingswaarde) of a site, based on the beauty (schoonheid) and reminder value (herinneringswaarde), is determined to see if it is worth preserving. Second, sites are being reviewed for their physical quality (fysieke kwaliteit). A monument, based on its physical quality, will be worth preserving if the criteria ‘integrity’ (gaafheid) and ‘conservation’ (conservering) together score five or six points (Tab. 4).

Third, with a mediocre to low score (four points or less), the substantive quality (inhoudelijke kwaliteit) criteria are examined to determine whether a site is still worthy of preservation. If it is to be expected that 'high' is scored on one of the substantive criteria, the site is also considered to be worthy of preservation. The purpose of this 'safety net' is to ensure that areas that are of limited physical quality, but which are nevertheless of great importance, fall out of the assessment.

Substantive quality can be divided into three steps:

- First, an assessment takes place on the first three substantive quality criteria; rarity (zeldzaamheid), information value (informatiewaarde) and ensemble value (ensemblewaarde). With an above-average score of seven points or more, the archaeological site is considered worth preserving.
- After this assessment, the criterium of representativeness (representativiteit) is assessed for sites with a lower substantive rating (less than seven points). If so, a proposal is made for a random sample to be categorized as a category.
- The other sites are not worth preserving.

Table 4: Establishing the value of a structure (www.sikb.nl).

<table>
<thead>
<tr>
<th>Waarden</th>
<th>Criteria</th>
<th>Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Hoog</td>
</tr>
<tr>
<td>Beleving</td>
<td>Schoonheid</td>
<td>Wordt niet gescroond</td>
</tr>
<tr>
<td>Fysieke kwaliteit</td>
<td>Gaafheid</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Conservering</td>
<td>3</td>
</tr>
<tr>
<td>Inhoudelijke kwaliteit</td>
<td>Zeldzaamheid</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Informatiewaarde</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Ensemblewaarde</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Representativiteit</td>
<td>N.v.t.</td>
</tr>
</tbody>
</table>

The determination of the value of these archaeological remains is necessary to decide whether they are worth preserving. The experiential value is based on the beauty and reminder value of the two structures. Beauty is based on the following parameters: visibility from the ground level as a landscape element, shape and structure, and relationship with the environment. All these parameters are considered low for this curing house and molasses vat, because all the structures are buried. The historic landscape of the plantation is completely gone, and the modern use of the landscape is completely different than its historical use. Reminder value is based on the connection with a factual historical event or the association with attributed quality or meaning. Again, the first parameter is relatively low for the structures due to the fact that there are no historical events known of that particular plantation. The second parameter is
considered medium, as a sugar plantation has the attributed association of slavery, which is still an important historical topic on the island that has caused for much debate.

The physical quality of both the structures is based on its integrity and conservation. The integrity concerns the presence of features, flawlessness features, spatial flawlessness, intact stratigraphy, movable property in situ, spatial relationship between movable property, spatial relationship between movable property and features, presence of anthropogenic biochemical residue and stability of the natural environment. Although the curing house and the molasses vat are both a very clear presence of human activity in the past, they both are in a poor state of conservation. Only a small part of the foundation is still present at the site. This small part consists of loose stones that is barely held together by mortar. Some archaeological material is found around the structures and can contribute to the interpretation of the curing house and molasses vat. Conservation is based on the preservation of artefacts (metal and other) and organic material. The preservation of artefacts is considered low, since most of the material consists of small fragments. This shows extensive evidence of trampling. Preservation of organic material is medium. Together, integrity and conservation score 2 points.

Therefore, the substantive quality is to be examined. Rarity is based on the number of comparable sites of good physical quality within the same period, region and based on the recent archaeological predictive model (Stelten et al. 2013). Up until today there are still many ruins of old sugar plantations on St. Eustatius and other lesser Antillean islands. Many of these ruins are in a better state of preservation than the ruins found at the airport. Therefore, a score of one is given.

The informational value of this curing house and molasses vat could hold Is based on earlier research in the same region that occurred more/less than five years ago and was complete or partial. Furthermore, it is based on recent and systematic research of the region and/or the archaeological period. Also, if it falls within the established research program of the university institute or the National Department for Cultural Heritage. The plantations on St. Eustatius have been the subject of research on multiple occasions (Barka 1996; Dell 1996; Gilmore and Goodrich 1999; Stelten 2012, 2013; van Keulen 2018). The preservation of this particular sugar plantation is low and, therefore, yields no additional information to the sugar plantations that have been subject to earlier research. A score of one is given.

The ensemble value is divided in an archaeological and landscape context. The archaeological context of the ensemble value is divided into a synchronous and diachronic context. Synchronous context meaning the occurrence of sites of the same period within the region and diachronic context meaning occurrence of sites of the following periods within the region. As mentioned before, St. Eustatius still has several old sugar plantations from different time periods. Landscape context is about the integrity of the historical geographical landscape, which is deemed to be very low. A score of two is given.

This comes down to a total of six points. This is lower than the required seven points for preservation. Therefore, the representativity of the curing house and molasses vat is discussed below. The three parameters for representativity are: characteristic for a specific area and/or period and the number of comparable sites of good physical quality from the same period within the same archaeological region of which the presence has been established and of which preservation is guaranteed. These archaeological remains are not characteristic for a specific area or period, because these sugar plantations producing sugar and byproducts are found all over the world from the 16th to the 19th century. Furthermore, there are sugar plantation ruins that are much better preserved on the island.
In short, based on this assessment, the archaeological remains score low on many aspects, therefore preservation is not recommended.
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Van Keulen, F. J. T.
Appendix 1 Overview Unit
Airport Project 2019
Excavated Trenches and Uncovered Features
Plan View
RS, FvK, AH
10 May 2019
Appendix 2 Overview of Sections and Profiles
Feature 15, 16, 17
1:20
AH
12 June 2019

#1: Yellow sandy volcanic ash (loose) with many small to medium sized rocks and some roots

#2: Light sandy dark grey volcanic ash (loose) with some roots

Feature 18
1:20
AH
12 June 2019

#1: Yellow sandy volcanic ash (loose) with many small to medium sized rocks and some roots

#2: Light sandy dark grey volcanic ash (loose) with some roots

Feature 19
1:20
AH
12 June 2019

#1: Yellow sandy volcanic ash (loose) with many small to medium sized rocks and some roots

#2: Light sandy dark grey volcanic ash (loose) with some roots
Trench Profile 1
1:20
AH
12 June 2019

#1: Grey light sandy volcanic ash (compact)

#2: Brownish grey light sandy volcanic ash (compact) with some roots

#3: Dark brown loamy sand (loose), with many inclusions and roots

#4: Beach sand for electrical wiring

Trench Profile 2
1:20
AH
12 June 2019

#5: Grey light sandy volcanic ash (loose) with some small inclusions

#6: Dark greyish brown sandy volcanic ash, containing much organic material and some medium-sized inclusions
Trench Profile 3
1:20
AH
12 June 2019

1: Grey light sandy volcanic ash
(compact)

2: Brownish grey light sandy
volcanic ash (compact) with
some roots

7: Dark greyish brown sandy
volcanic ash, containing much
organic material and some
medium-sized inclusions

7: Wall F20/ Mortar and rocks
Appendix 3 Artifact Photographs
Context 3

Context 4