THE RUINS AT BUSHIRIBANA, ARUBA CIRCA 1872

A PRELIMINARY INVESTIGATION INTO
ARUBA'S GOLD MINING HISTORY

October 1999

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Forward

As a professional architectural historian, I feel privileged to have been invited by the Aruban government to help research the history, significance and condition of these unique buildings and to produce this historic structure report.

The purpose of this document is to summarize what is known about the two complexes, Bushiribana and Balashi, in order to provide a resource for future preservation planning. The intent is to prevent the undertaking of unwise and counterproductive measures in the continuing process of preserving these potential tourist sites. The hope is that the buildings will remain intact to instruct and delight many generations to come.

For ease of handling the material to be presented, the report has been subdivided into three major parts. First the history background is explored in terms of the establishment of the colonial government, the gold mining process and the history of the company. The second part contains a description and assessment of each of the various parts and materials, exterior and interior. Finally, the preservation suggestions and work program of future needs is addressed.

Several people provided invaluable assistance during the course of this project:CVE volunteers included the writer-Helen Ross, and Robert Pearson, Andy Smith, Carl Berwanger, Bev Weidlin, Merle Learned, and Anne Hersh. Heart felt thanks go to retired chemist and chemical engineer, Ian C. MacCleod, who patiently answered our innumerable questions on the modern history of the island's gold extraction process.

Historical Background

Introduction

On Aruba there remain two gold smelters that transport the visitor back to an earlier time. The buildings are located at two sites, Bushiribana, c. 1872, on the north coast, and Balashi, c. 1899, in the island's interior. Bushiribana is smaller in size and plan when compared with Balashi and is significant as being the first permanently established mechanized gold processing plant in the Caribbean and for its role in the transition of gold processing technology. The plan of the main building is basically L-shaped. The known subsidiary features, primarily foundations of buildings, are found west and south of the site. The other resources, which depict zinc processing and power application, are located north and south of the main building. The crusher plant or stamp mill is optimally sited in a manner to capitalize on the prevailing winds and proximity to the rich Kadushi vein.

The designer of the Bushiribana gold smelter is unknown but it has been suggested that an English architect had some influence. As yet there is no documentary evidence for direct association with any known architects. It is known that the foreman was local bricklayer, Alexander Donati.

The Dutch and the Discovery of Gold

In an effort to compete with the Spanish fleet in the Caribbean Sea, the Dutch settled in Curacao in 1634. Within a couple of years in the spring of 1636 the neighboring islands of Bonaire and Aruba were occupied as well. During the course of the next couple of centuries, the Dutch government endeavored to exploit the islands in numerous ways. Mostly agricultural in nature, cattle- and horse breeding were attempted in the early periods of occupation. Through the years, increasing numbers of settlers were allowed to inhabit the island.

In March 1824 gold was discovered at a spot called Lagabai near Rooi Fluit on the North coast. The gold discovered turned out to be alluvial. It was contained in lumps of stone in pure condition, either in small or in big pieces. Within several years of the discovery, the Dutch government had dispatched guards, declared the gold out-of-bounds, and issued regulations for the soil concessions on Aruba. Eventually systematic research led to the discovery of gold ore in the western part of the island, most notably at Tibushi.

Until the mid-1850s the gold was harvested by two methods. The first manner was to dig clay from the arroyos and allow it to dry in the sun. Then after it had hardened it was beaten. The hard bits that didn't get pulverized were set aside. The pulverized clay was then placed on large cloths and agitated in the wind. The debris, small gold pieces, was retained. The other method was simply putting the clay or soil in large vessels of water and capturing the gold that sank to the bottom.

The Company

The appearance of machinery aided dramatically in the production and yield of gold on the island. In 1872, the first modern substantial mining and processing concession had been acquired by the London-based Aruba Island Gold Mining Company, Ltd. from the colonial government of Curacao which had granted the rights in June 1868 for a period of thirty five years. A stamp mill, furnaces, zinc tanks, tramworks and other necessary machinery were erected for processing and transporting the raw and final products.

This company operated from 1872 to 1882. The ore was mined from the Ceru Plat and Kristalberg. From there it was transported to the gold smelter, after processing the final product was shipped overland, approximately six miles on a company-built road, to the company-built pier at Fort Abao harbor. Between 1878 and 1880 the firm had processed 2,938 tons of ore which produced 2,075 ounces of fine gold. For a short time from 1883 to 1890, there was no gold production. Another company, the Aruba Agency Company, Ltd. of London resumed the rather expensive mining process in 1889.

In the last decade of its operation, the Bushiribana smelter had varied success with its gold extraction processes. By mid decade a new cyanide process was used whereby the treated ore was recovered by a solution of calcium cyanide and lime. This method had proven very effective at the South Africa gold mines. The improved process allowed for an extraction of almost 90%; however, it required new adjustments to the machinery and burdened the company ever greater.

In January 1899, a new London-based company was established: the Aruba Gold Concessions Ltd. A forty-year concession had been obtained. The new entity left the smelter at Bushiribana and proceeded to construct a state of the art operation at Balashi. By 1903 there were several furnaces, an ore crusher, and various tanks for the cyanide, refining, and precipitation processes, an electrical plant and a railroad. Soon thereafter, another outfit possessed the plant. It was known as the Aruba Gold Maatschappij. The company proceeded to process over 395 kilos of gold between 1909 and 1916. The operations ceased with the advent of World War I, as the material used for processing became unavailable.

Existing Conditions

Bushiribana

Introduction

In essence Bushiribana is a stone masonry structure of but a single room. On the exterior the soaring but deteriorating walls laid in blocks of natural stone are punctuated by one door and four windows. The composition is one of rugged stability and balance depending upon asymmetrical precision and juxtaposition of light and shadow for much of its appealing effect. The interior exhibits stepped platforms of unknown utility which offer contrast against the walls of precise and measured openings.

In recent years the building has received preventative care from the Aruban government. The condition of the fabric reflects the sporadic yet careful attention. Scrutiny of the components during the week of our stay has revealed a few problems requiring immediate attention. The continued erosion wall condition could foster serious deterioration unless some remedial action is undertaken. The door and window openings have been violated and work is needed to restore their integrity.

The building has been measured and examined in total and in parts. The condition of the components has been noted and the history of past preservation activity where known, described. Any recommended remedial action or maintenance procedure is noted for the material discussed. The exterior components are first discussed from the

roofline down to the stone foundation. The interior elements are then treated from the ground level up to the rocks at the top. Lastly, the landscape features are addressed.

EXTERIOR

The form of the original roof is believed to have been flat wood frame supported on horizontal posts, of which postholes are still visible in the south elevation walls. Because of its temporary nature, the material most likely lasted for the duration of the operations, until 1899. For nearly a century the interior and the walls have been exposed to the elements.

Exterior Stonework

This stone has been described in various reports as syenite and granite. It was quarried from the nearby boulders that are strewn over the island. The mill was erected with the nearby stone after it was cut into blocks. The larger weight-bearing stones are situated at corners and at the lower elevations. As the walls rise higher the blocks are less thick and voluminous in size.

Proper identification of the material and the nature of its chemical constituents are highly recommended. Only when the stone is properly identified and can the deterioration process be understood. Furthermore, the stone cannot be cleaned without a basic knowledge of its chemical properties.

Windows

The four original large window openings that remain are essentially intact. On the exterior a thin stone sill defines each opening. With the exception of the southernmost window on the east wall, which is missing its lintel and subsequent infill, the other windows exhibit patches both above and below the opening. Such patches, when properly applied, are practically invisible and bond effectively to the stone base. Cementitious patching should be undertaken only to correct a safety hazard or to prevent moisture intrusion, not for cosmetic purposes.

Total replacement of a stone element should be considered when the original is so defective that structural failure impends or moisture penetration threatens the integrity of the fabric. The replacement part must be custom cut to match the original element in shape, size and surface characteristics. As nearly as close to the original form is recommended as can be determined from all available evidence.

Under the present state of art it is not recommended that any repairs or replacements of stone elements be undertaken using epoxy materials with one possible exception. Where minor pieces of the stonework have been broken off, they may be cemented back in place using a small amount of epoxy adhesive. Under normal circumstances the epoxy material will provide a tight, durable joint unobtrusive to the eye and superior to the results achieved using other means. Such repairs should be considered a temporary means of maintaining the stone until complete replacement of the element becomes necessary.

Doors

There is a single door opening at the northern elevation. Its threshold is a concrete step. It is unknown when this concrete element was installed, but it seems reasonable that they were created at or around the same time the stone wall repairs were made.

INTERIOR

The entire interior space has been exposed to weather and human contact. It is easily accessed by the pedestrian door entry at the north elevation. The view from here is that one is at the lowest level of a series of four platforms. These platforms rise in height to the top of the landform that the crushing plant is built into. Each platform is comprised of a stone foundation wall. Layers of dirt fill acts as a floor. However, one of the platforms floor surfaces is sunken and functions as a pit instead. The interior's purpose and function is unclear. Directly opposite the entryway, approximately 10 meters away, is a thick core of cut stone and mysterious openings. Rows of large irregular stone

alternate with smaller, flatter stones and rocks that act as mortar. At this ground level the walls are intermittently marked with numerous names and figures of spray painted graffiti.

APPURTENANCES

Tank Storage

Located north and east of the main elevation, near the ocean, is a five-sided, stone walled, low lying feature once used for the storage of zinc. Here in three round tanks, after crushing the gold would have been combined in a water and zinc solution so that the two would bond to one another. The walls are built into the limestone rock and some appear to have a coat of rough plaster. Exposure to the elements, especially the winds, has reduced the once sharp and finished detail to this feature.

Building Foundations

Situated west and south of the crusher plant are the low and crumbling stone foundations of six buildings (C-H), see plan sheet 1. They range in dimensions from the smallest 5.3 meters by 8.0 meters (C) to the largest that measures 19.3 meters by 31.6 meters (E). Most likely the buildings housed a laboratory and the site managers and engineers. Many of the local laborers would have lived with their families in nearby dwellings.

Foundation Ruins

A row of square ruins (I) run parallel to the existing road and is perpendicular to the south facing elevation of the crusher plant. The dimension of one is mirrored six times. Each one with a size of 3.7 meters by 3.7 meters. The wall thickness is approximately .64 meters and there is a distance of 19 meters between each one. These features may have served as the foundations for windmills which supplied the power for the crushing operations.

Landscape Rehabilitation

Over the years little attention has been paid to the grounds around the crushing plant and the road south and west. The ocean encroached from the northeast and the area between the building and the roads tended to be sparsely overgrown with cacti varieties. Since the main building is constructed into a rock outcropping, there is little evidence of vegetation infiltration.

A more complex design problem is the landscape setting beyond the crusher plant and incorporating some of the sites' features. Provision for automobile access and parking with the minimum intrusion on the landscape is necessary. Perhaps the government can arrange to relocate the existing road south of the site because it is currently traversing potential archaeological components. A new roadbed could be laid thereby missing the windmill foundation ruins and other as yet unknown locations and allow for a grand entrance to the smelter.

In order to keep automobiles from impinging upon the historic setting, parking should be situated as far away from the main building as the limits of the property allow. Walking from the parking lot to the crusher plant, a visitor could read display boards of the interpreted site. Maintenance and development of an interpretation plan should include the approach to the landscape. Additional areas of the surrounding grounds could be expanded as the need arose.

Future Considerations

Introduction

Today, due to approximately a century of little or no care, Bushiribana stands in poor condition. There is a lot to be done to ensure its preservation for years to come. To ensure that all preservation activities are properly focused it is recommended that the Aruban government adopt a mission statement of preservation philosophy. Recommendations for points to be considered are discussed in the next section. The last section is a work program of suggested preservation procedures responding to deficiencies detected during this research project.

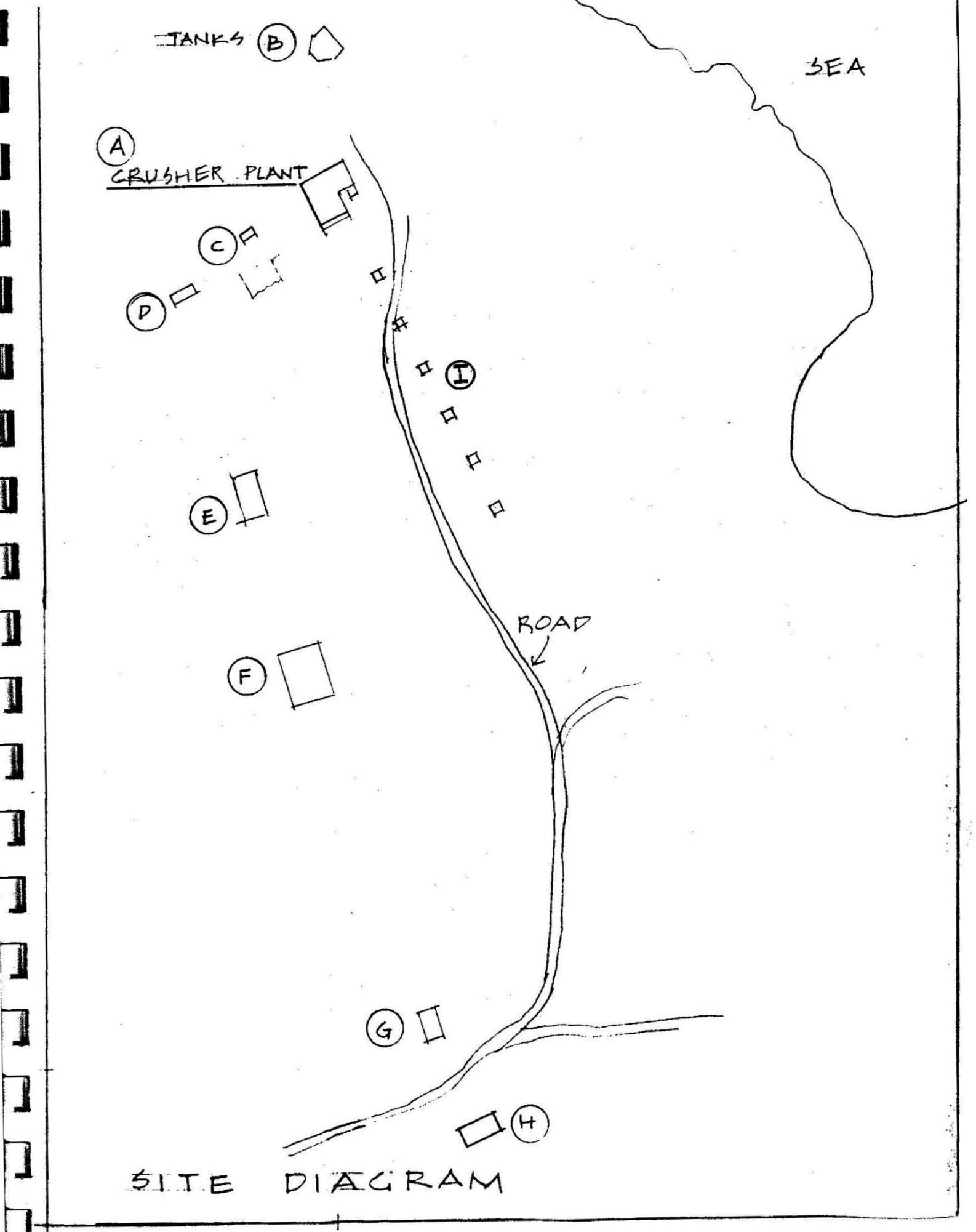
Preservation Philosophy

Suggested components of the proposed mission statement would acknowledge that the Bushiribana site is the earliest remaining industrial related structure on the island of Aruba. The Monumentenbureau must make a commitment to the preservation of this precious property. The subscription to the use of preservation techniques of the highest order should be administered in the most professional manner. Preservation of the original fabric should occur where possible and replacement in kind where not possible. There should be no treatment on historic fabric which is irreversible. The immediate goal is to stabilize the site as it now stands. The ultimate goal is to return the interior to its appearance prior to the time of the disestablishment as is possible.

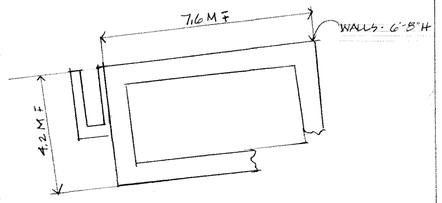
Work Program

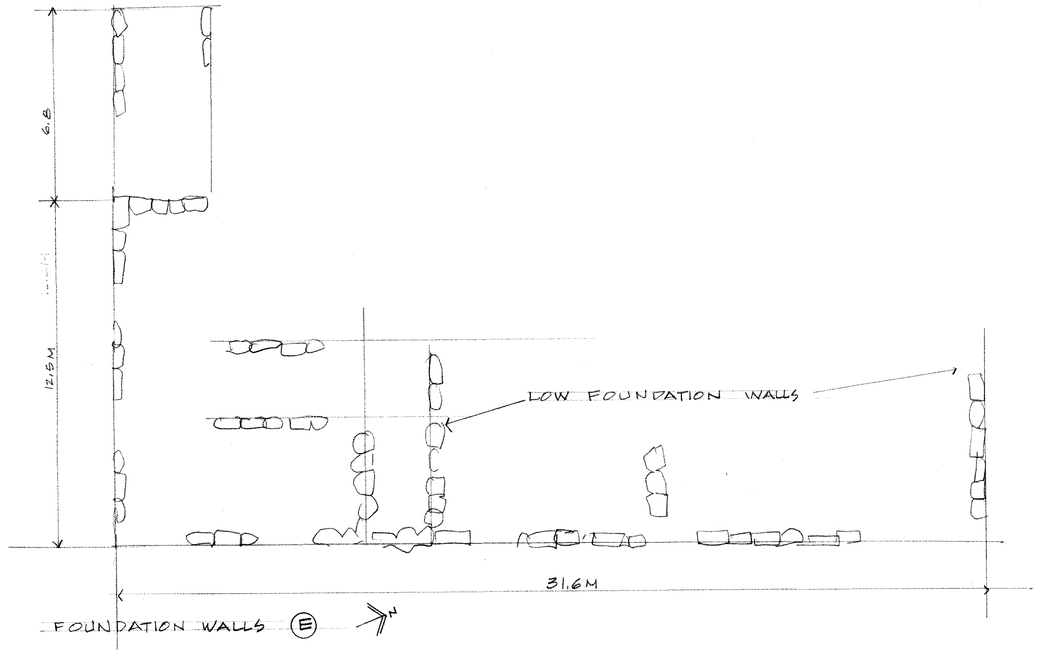
The project should include a plan, design, and stabilization of the Bushiribana structure in its current status and condition. It will be conducted in phases. Phase I must include stabilization of the structure. At present it is at risk and immediate action should be designed to prevent water from entering the building; prevent further movement in the structure; and to discourage human intrusion until this site can be developed into a historical site for visitation in a passive park-like setting. Solutions to these problems should be considered temporary, but should be effective in accomplishing the initial goal of arresting losses to the building fabric. Prompt action will provide the time needed to undertake necessary documentation and planning steps without the urgency of impending disaster. Phase I also will include the planning and documentation of the site. Documentation will be completed to evaluate and validate integrity and significance of the complex, all of which must precede the formulation of an appropriate mission statement for the site. Building costs included will be for archaeological survey of the property; measured drawings of the building; documentary search and review of known archives; site plan and topographic map; and soil testing near the building. All of this information should be concurrent with a planning analysis and management plan. Design of the building rehabilitation and site development for public use can be initiated at this time. When the Phase I project is completed, a passive park atmosphere could be introduced into this remote and rugged, but yet historic setting.

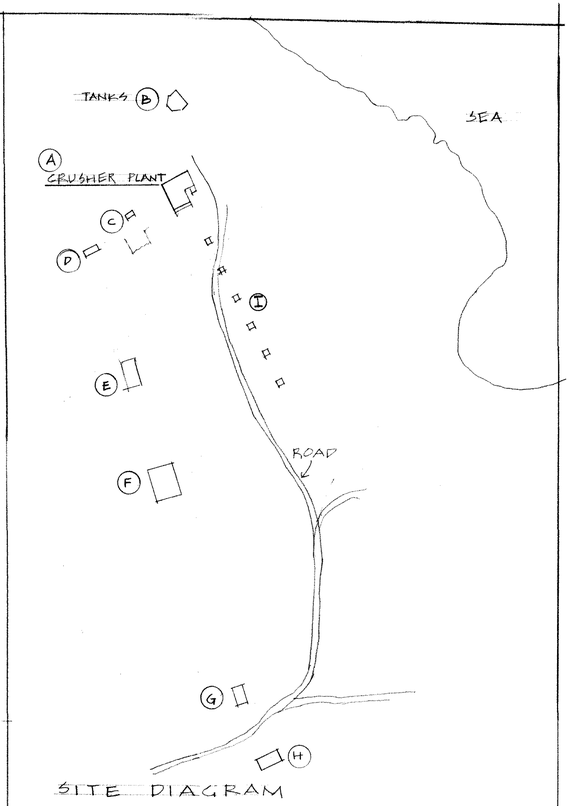
As for the Balashi smelter and ruins, further studies need to determine the types and chemical constitutions of the stone and mortar. Identification of the most endangered or fragile areas must happen before a program of stabilization occurs. Site interpretation would greatly enhance the visitor's experience. Historic research and documentation can be used to recreate with sign boards the myriad of processes that happened here.



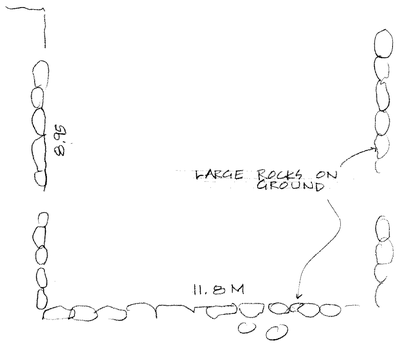
SITE DIAGRAM



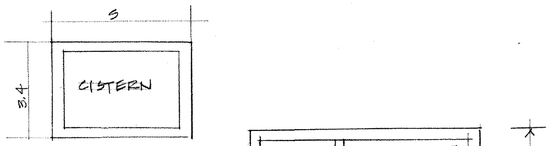


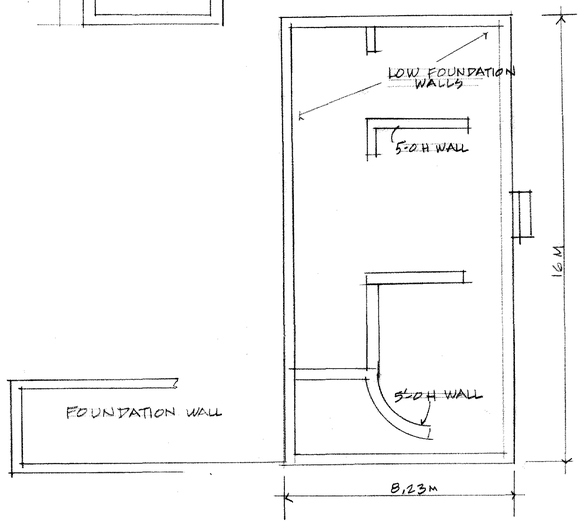


SITE DIAGRAM

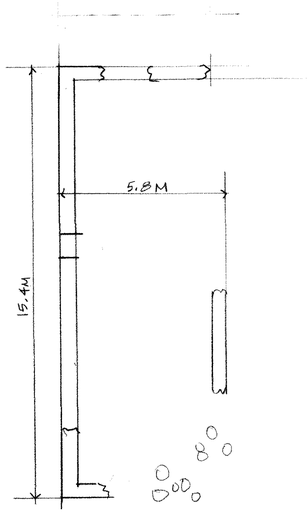


WALLS & RUINS (C)

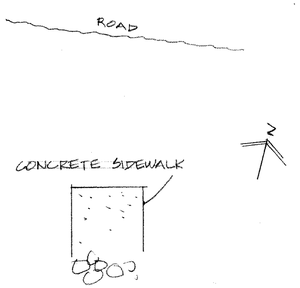


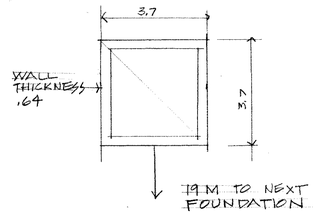


WALLS (F)



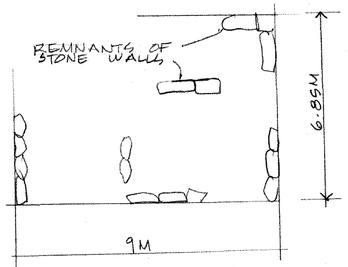
WALLS (G)



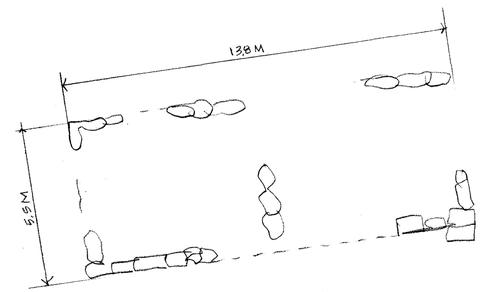


RUIN (I)

THERE ARE 6 OF THESE 19 M APART



FOUNDATION WALLS (H)



FOUNDATION WALL (D)

SITE PLAN DIAGRAM, RUINS

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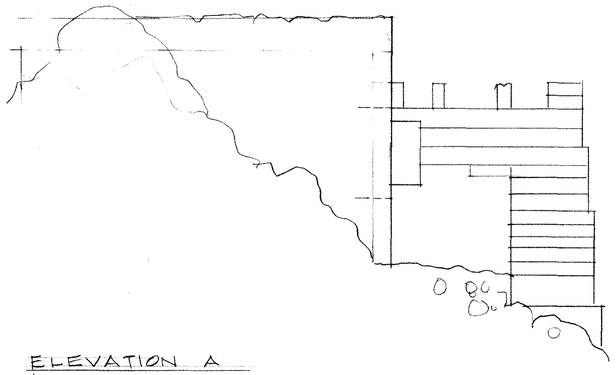
BUSHIRIBANA GOLD MINE ARUBA

PREPARED FOR THE MONUMENTENBUREAU, ARUBA

CARIBBEAN VOLUNTEER EXPEDITIONS
Box 388, Corning New York 14830 607-962-7846

VOLUNTEERS: AH, HR RP, AS, CB, BW, ML

SHEET 1



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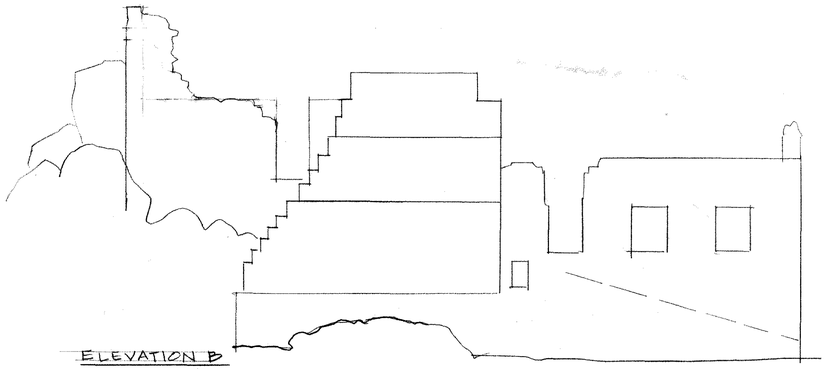
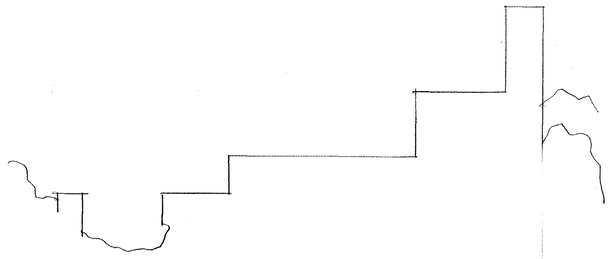


ELEVATION B



SECTION C-C
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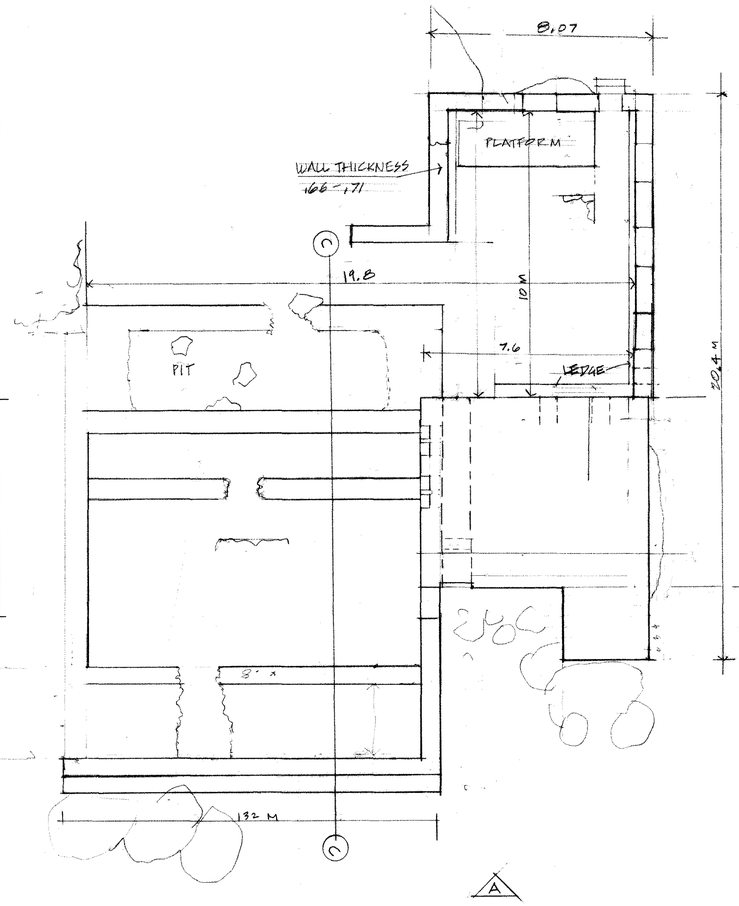

FLOOR PLAN (A)
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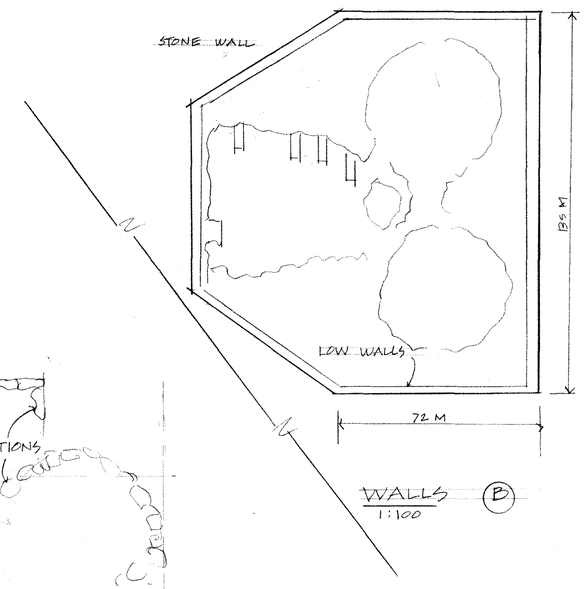

WALLS (B)
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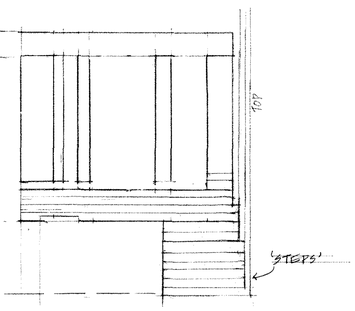

TOP VIEW
SCALE 1:100

CRUSHER PLANT

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BUSHIRIBANA GOLD MINE ARUBA
PREPARED FOR THE MONUMENTENBUREAU, ARUBA

SHEET 2

CARIBBEAN VOLUNTEER EXPEDITIONS
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VOLUNTEERS: AH, HR
RP, AS, CB, BW, ML

BUSHIRIBANA GOLD MINE BUILDING A- CRUSHER PLANT

BUSHIRIBANA GOLD MINE BUILDING A- CRUSHER PLANT

BUSHIRIBANA GOLD MINE RUINS B AND C

BUSHIRIBANA GOLD MINE RUINS E, F, G, H

F

H

E

G