ILE DE LA PASSE

REPORT 2

BASIC ARCHITECTURAL SURVEY OF STANDING STRUCTURES

The Shot Furnace and Powder House built by the French.

Geoffrey and Françoise Summers

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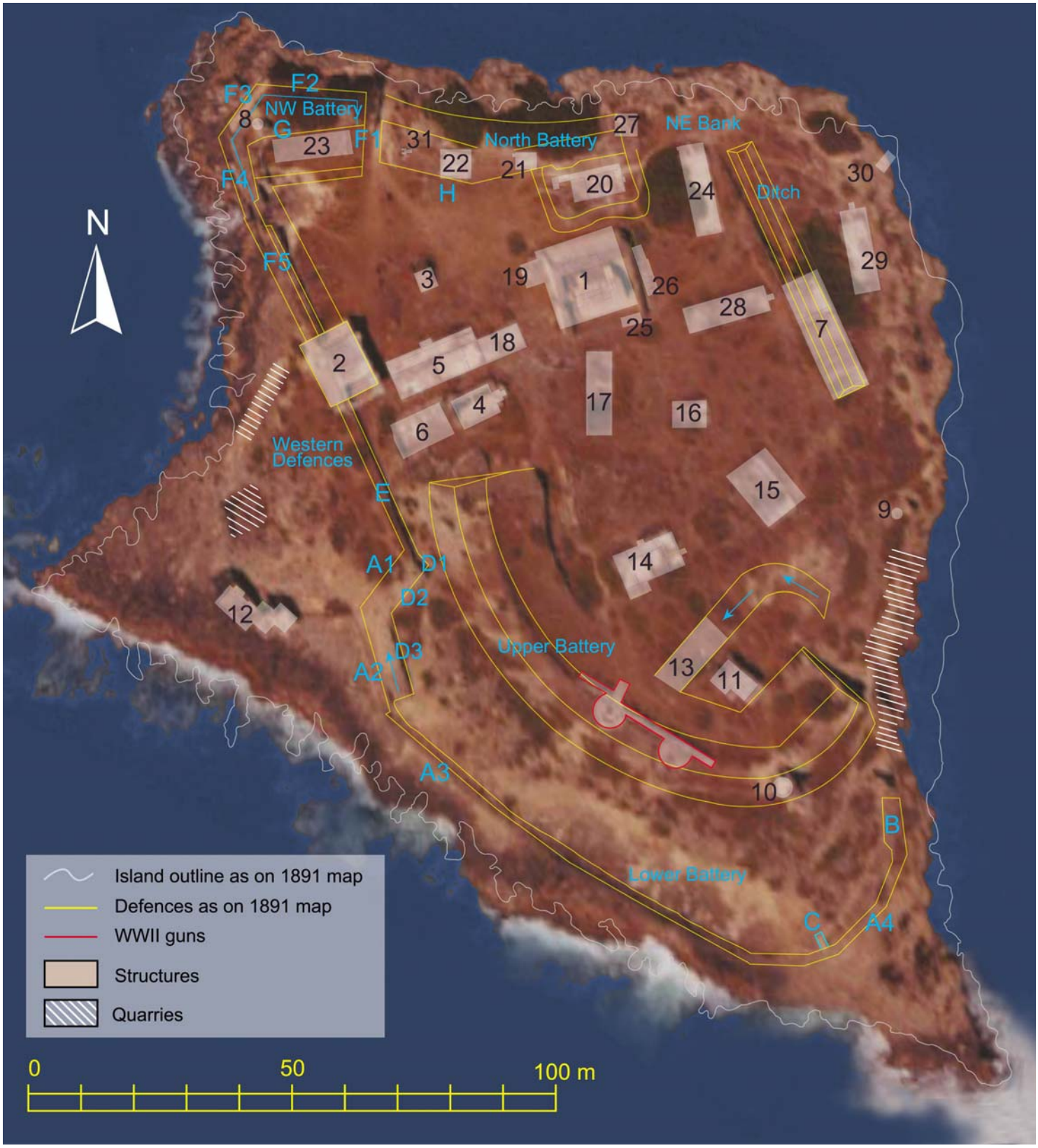
Cover picture: *The Shot Furnace and Powder House built by the French. (02jv1210)*



Map of Ile de la Passe created from an aerial photograph stretched over the 1891 plan.

INTRODUCTION

THE SURVEY

This report is concerned with the standing, roofed, buildings and the cistern, that is, Structures 1 to 4 and 7 to 12. Each one of the structures on the island has been documented in the *Archaeological and Architectural Report*, thus there is some repetition. This *Basic Architectural Survey* has, however, a different purpose and therefore takes a different form. The primary purpose of this report is to serve as a basis for drawing up policies concerning conservation and restoration of the monuments and, where appropriate, to make recommendations concerning future Cultural Resource Management (CRM). Here we are not concerned with discussion of the evidence for chronological sequences or for absolute dating, except in the few instances where the date of a particular feature bears on decisions that will need to be taken in relation to positive action.

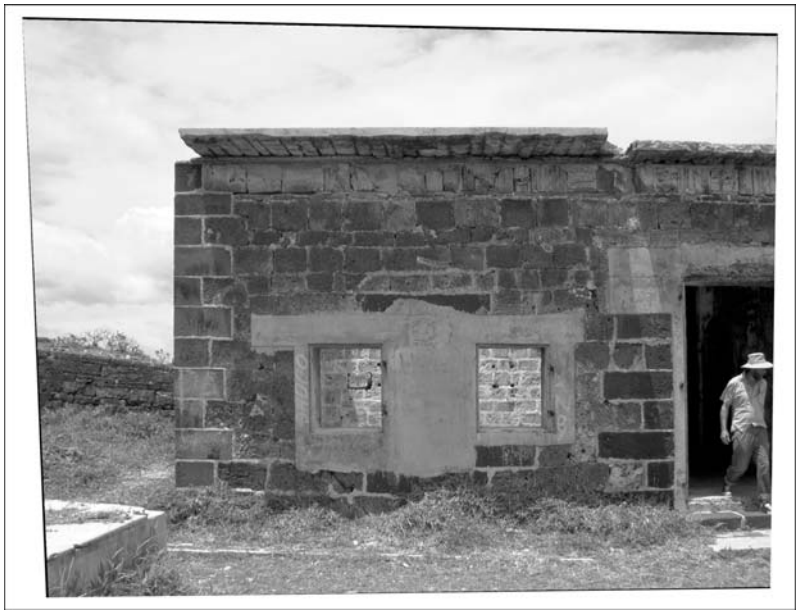
Methods

The results of the Basic Architectural Survey are presented graphically in considerable detail. The data was collected during a short period of recording on site followed by intensive processing in the office. The tools and techniques available to us have made it possible to produce plans, sections and elevations from a limited number of measurements. The use of programmes, such as AERIAL for photo-rectification and Photomedeller for 3D Modelling, has produced detailed documentation from digital photographs. Digital recording and the creation of virtual 3D models is also of great value in both the study of the monuments and in the dissemination of information on the World Wide Web. It should be noted that conservation, restoration and future adaptation of monuments will require careful planning and analysis before any action is taken, and contingency plans should be laid in case of emergency.

Our reports illustrate samples of the results. The techniques could be exploited more extensively so as to include detailed architectural survey of all standing structures, thereby building on this first season of basic architectural survey. It is strongly recommended that the next field campaign continues development of the approach that has been adopted so as to compile a fully comprehensive record of all remains.

A few control points, either features or small chalk crosses, allows a photograph to be rectified so that details can be drawn in AutoCAD or traced by hand. (01jv0707)

Digital photograph of part of the front elevation of the Storehouse. (02jv0115)



Rectified photograph of the wall surface, using AERIAL 5 software with the coordinates of control points, all in the same plane, plotted in AutoCAD.

The rectified photograph is imported into AutoCAD where details from the selected elevation plane can be digitised. The green crosses are the control points used in the rectification process.

STANDING BUILDINGS

THE POWDER HOUSE

The Powder House, Structure 1, as seen from the Upper Battery. (02jv0316)

Description

The Powder House, Structure 1, is the finest standing building on the island. It consists of a single barrel vaulted room with four external buttresses. The sidewalls, buttresses and barrel vault were constructed first and the end walls then butted against them. It is to be noted that the basalt arches are not in line with the buttresses. The latter were simply returns of the side walls that gave them the strength and stability required to support the vault. The Powder House is surrounded by an enclosing wall

The walls of both the building and the enclosure are covered with graffiti, many dating from the 1840s, which are of very considerable interest.

Materials

French:

- Cut blocks, roof slates and rubble of fossilised coral;
- Basalt ashlar;
- Off-white lime mortar, pink lime mortar with crushed brick for vault and roof, coral rubble fill above vault;
- 'Argamasse' binder and cover for the roof;
- Plain lime mortar for walls with traces of pink mortar indicating repointing of wall faces in various places;
- Lime mortar rendering inside.

WW II:

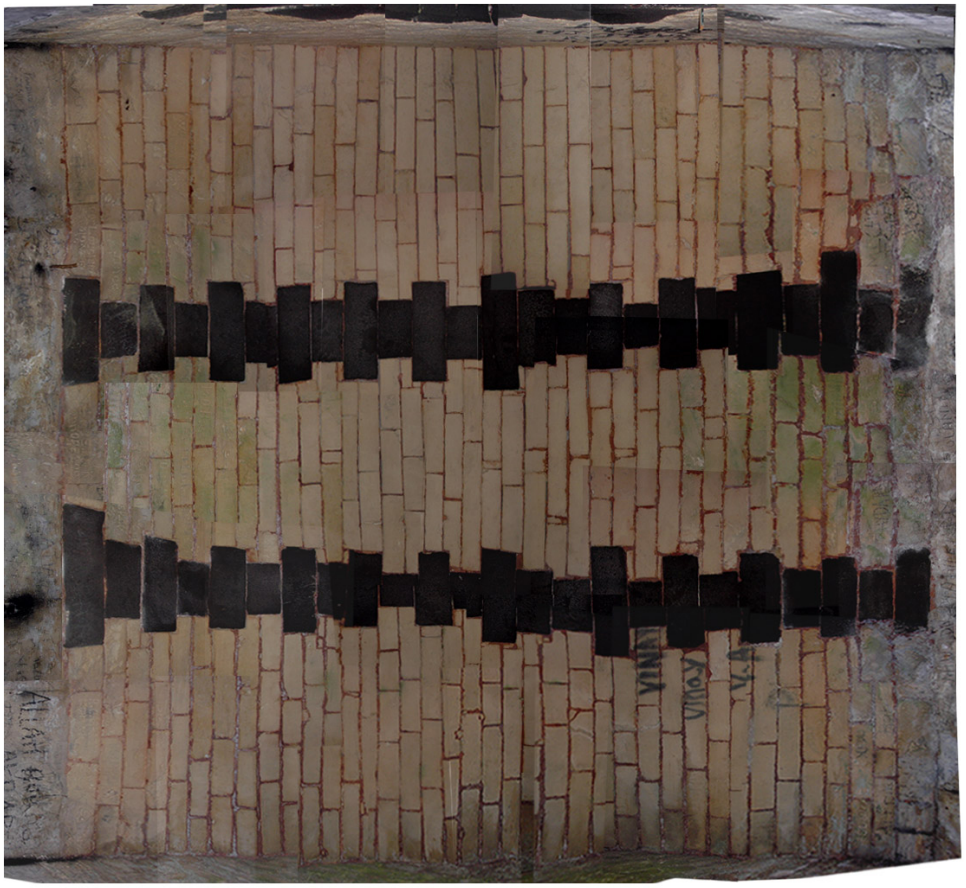
- Concrete;
- Portland cement;
- Iron fittings.

- ***Architectural Features***
- Side walls of vaulted room, made of coral blocks and basalt quoins;
- Buttresses, also made of coral with basalt corner blocks and bonded into each end of the side walls;
- End walls to the vaulted room, butted against the end and buttresses of the side walls;
- Barrel vault composed of coral blocks with strengthening basalt arches supporting a roof with a pitch of about 45º;
- Coral slate roof sealed with argamasse;
- As befits a building designed to store barrels of gunpowder, the Powder House has little natural lighting.
- Basalt lined door in the West façade of the enclosing wall;
- Basalt lined door with basalt arch on the West façade of vaulted room;
- Basalt lined window with basalt arch, on the Eastern façade of the vaulted room;
- Aeration vents in side walls (see p 8 for plan and section) comprising a square void with small slit openings on either side and a central basalt block;
- Rusty remains of iron door and window fittings have survived, some obviously in use during the WWII occupation as indicated by the presence of Portland cement mortar. Stubs from 12 iron bars at an average of 5cm spacing remain embedded in the sill and arch of the window;
- Rectangular enclosing wall made of coral blocks and basalt corner blocks, top of wall sloping outside, each stretch of wall varies in thickness, the levelled base, with a 6cm offset, has a build up of three course of blocks at the lowest north-east corner.

Special Architectural Features

The barrel vault, with its basalt arches, supporting the pitched roof is of notable architectural interest.

The side vents, with a central basalt block designed to stop any projectile entering through the opening and keeping out heavy wind driven rain, are also of interest.



Flattened view of the Powder House barrel vault created in Photoshop from digital photographs.

Dimensions

The enclosing wall was built within a rectangle measuring 15.70 x 15.60m. Although intended to be symmetric, slight distortion occurred during the laying out of the building. The inside measurements of the vaulted room is 6.84m by 4.20m and its maximum height is 4.25m. Other basic dimensions are given on the following table, plans and sections.

Description	***Dimensions***	***Area***
	metres	**m^2**
Overall enclosure	15.60 by 15.60 average	243.4
Wall thicknesses	1.48, front 1.99, NW side 0.77, rear 0.80, SE wall	
Enclosure wall height	3.20, inside face 2.95, external face by door	
Enclosure door	0.98 by 2.03 high	
Building (excluding buttresses)	6.20 by 8.47	52.5
Floor to ceiling (max)	4.25	
Floor to top of roof	6.17	
Wall thickness	0.80 and 0.83, end walls 1.00, side walls	
Buttresses	1.47 thick 1.30 long	
Vaulted room	6.84 by 4.20	28.73
Front door	0.84 by 2.10 high	
Rear window	0.67 by 0.85 max. height 2.05 cill height	
Side vents	0.10 by 0.50 high 0.27 by 0.27 central block	

Date

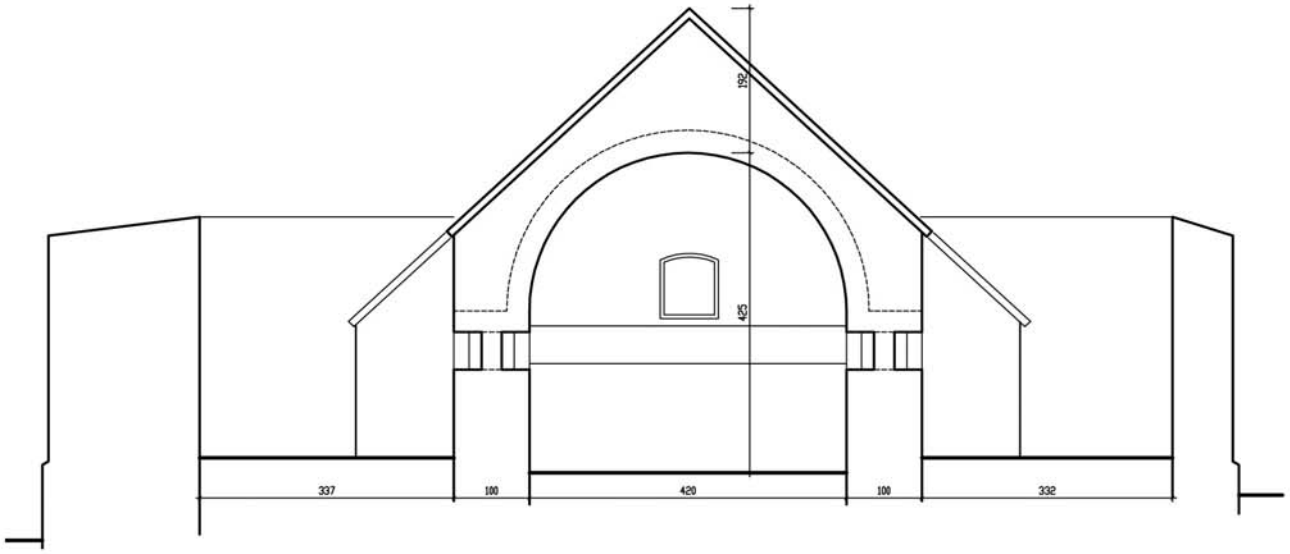
First phase of construction is French, appearing on the earliest available map. Subsequent alterations, including repairs, new floor, new internal rendering and external concrete surfaces with drainage, seem to have occurred during the WW II period.

Present Condition

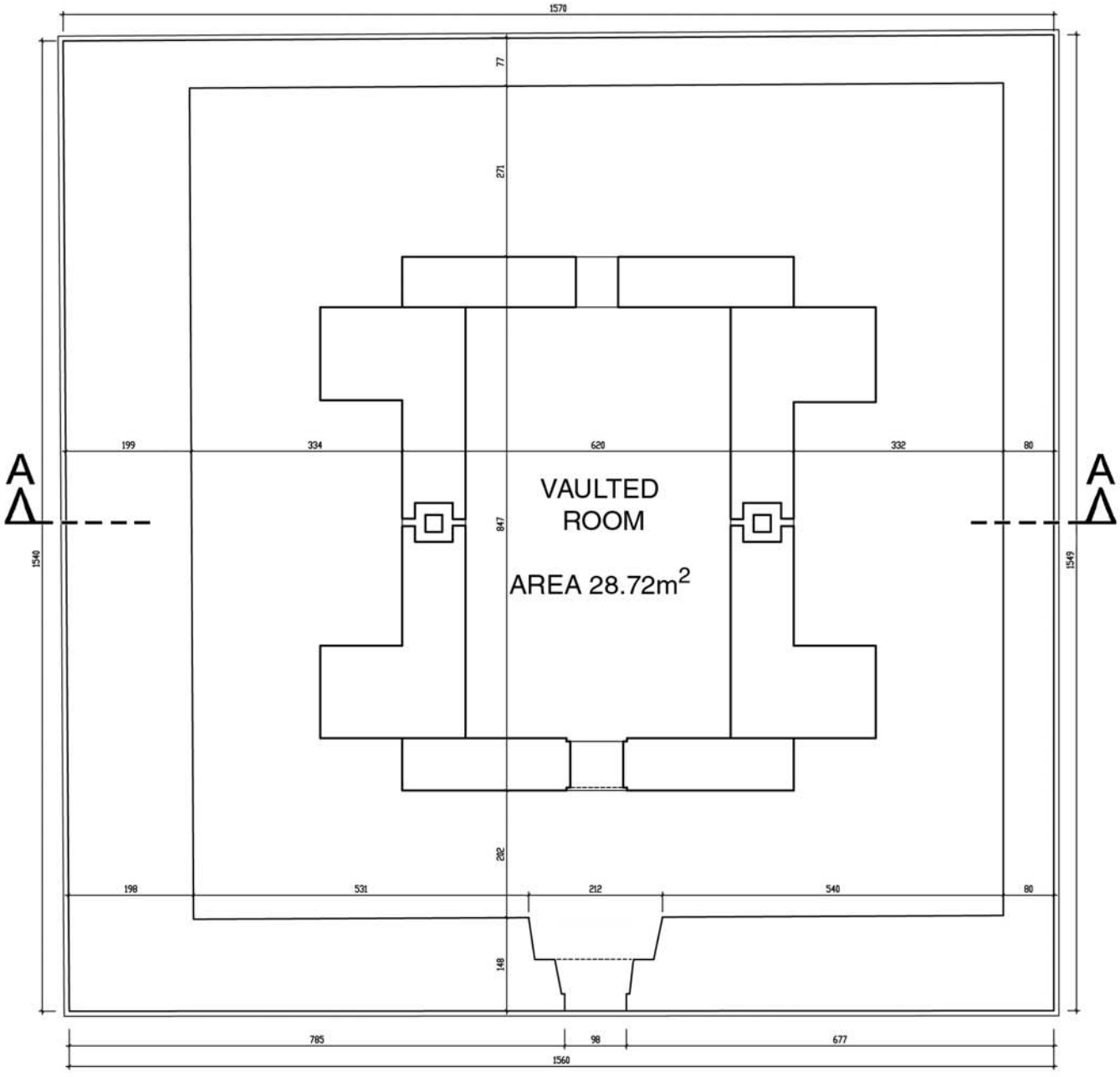
The building is generally in good condition requiring only minor repairs. The sloping top of the enclosing walls was levelled in places, presumably to house water tanks for WWII washing facilities. The weathering of the coral, a soft material, is unavoidable. In some places where fires have been lit, the surface of the coral has cracked and peeled off. More recent graffiti are unsightly.

Recommendations

The Powder House is clearly the most important structure on Ile de la Passe and its preservation should be closely monitored. Minor repairs are needed to some corners of the roof. The top of the enclosure wall, where it was levelled to seat WW II water tanks, needs to be examined. Further damage caused by fires lit in proximity of walls must be prevented. There is no immediate need to replace doors and windows. Nothing that would distract the visitor from fully appreciating the unique architectural features and qualities of the Powder House should be imposed on or inside this structure. Expert advice will be needed if recent painted graffiti are to be removed.



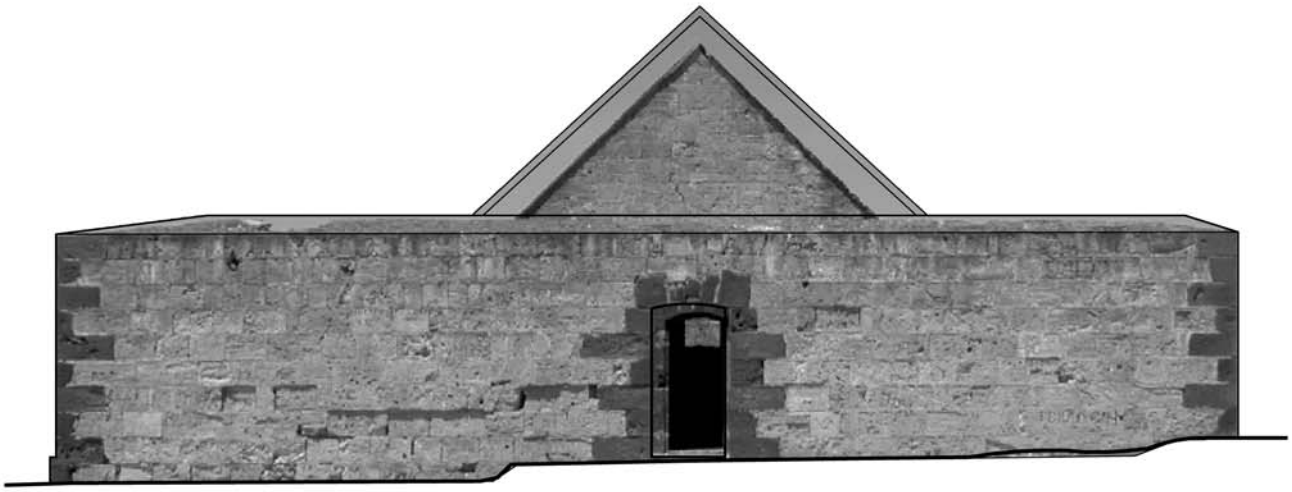
SECTION AA



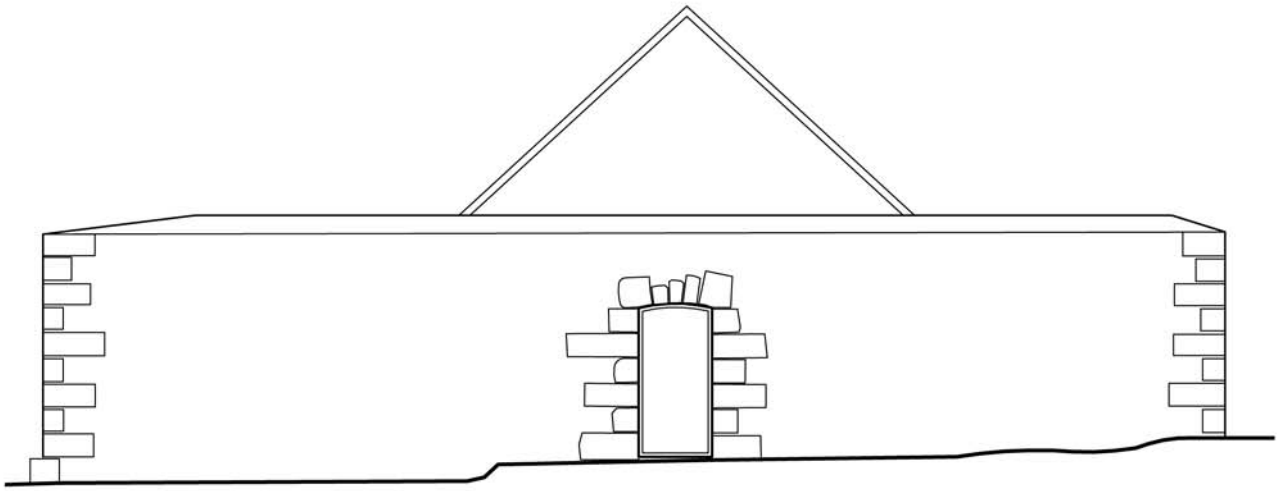
PLAN

STRUCTURE 1 - POWDER HOUSE

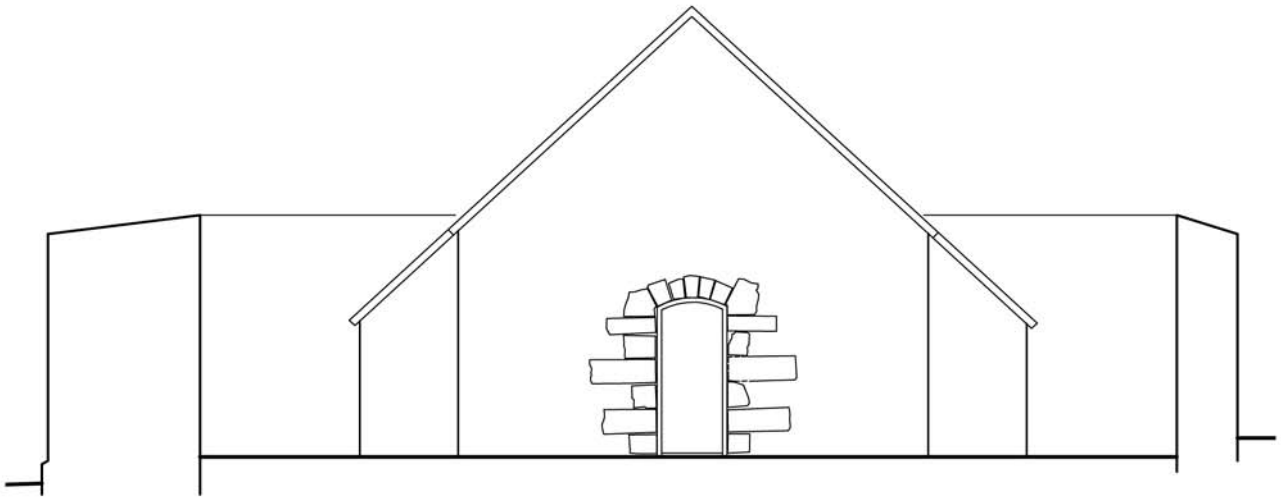
0 1 2 3 4 5 m.



FRONT ELEVATION OF ENCLOSING WALL WITH PHOTO



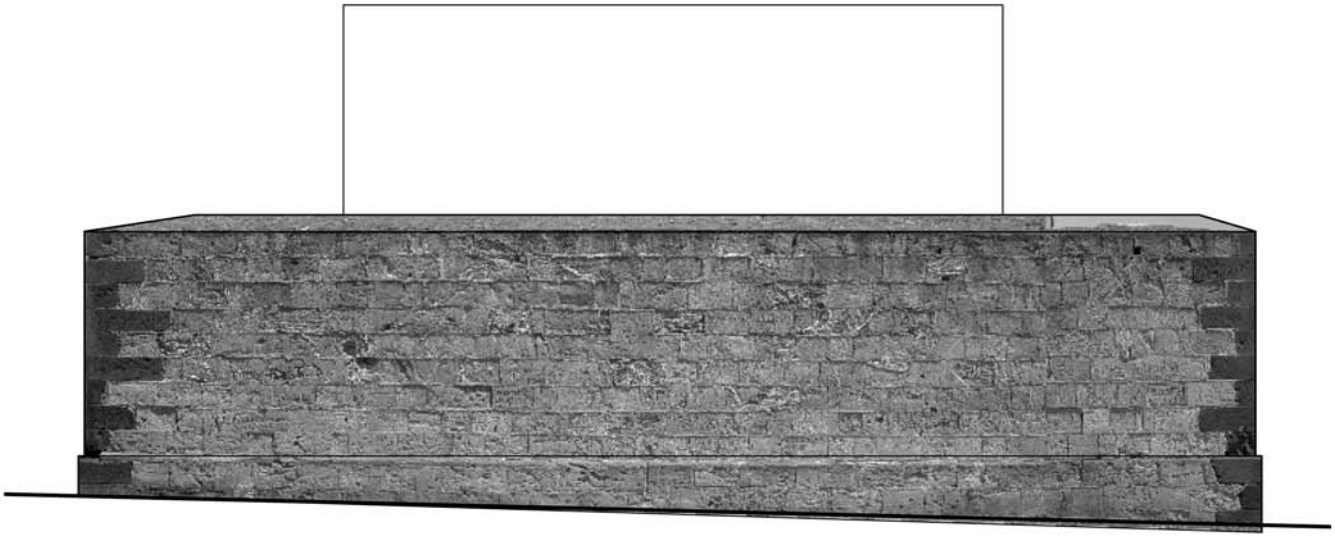
FRONT ELEVATION OF ENCLOSING WALL



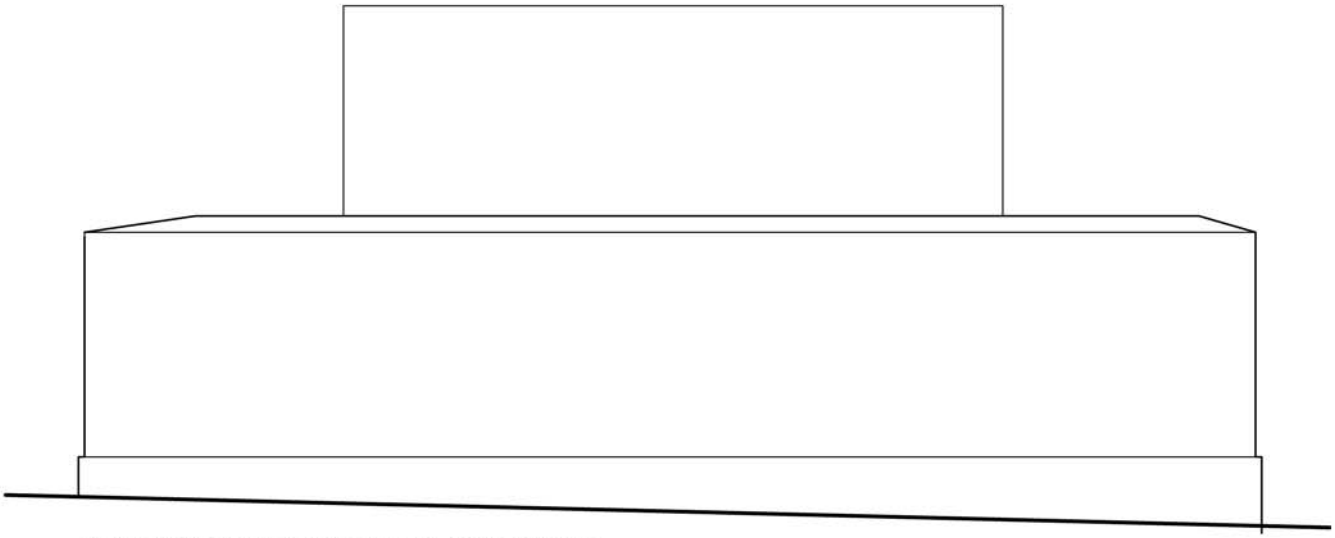
FRONT ELEVATION

STRUCTURE 1 - POWDER HOUSE

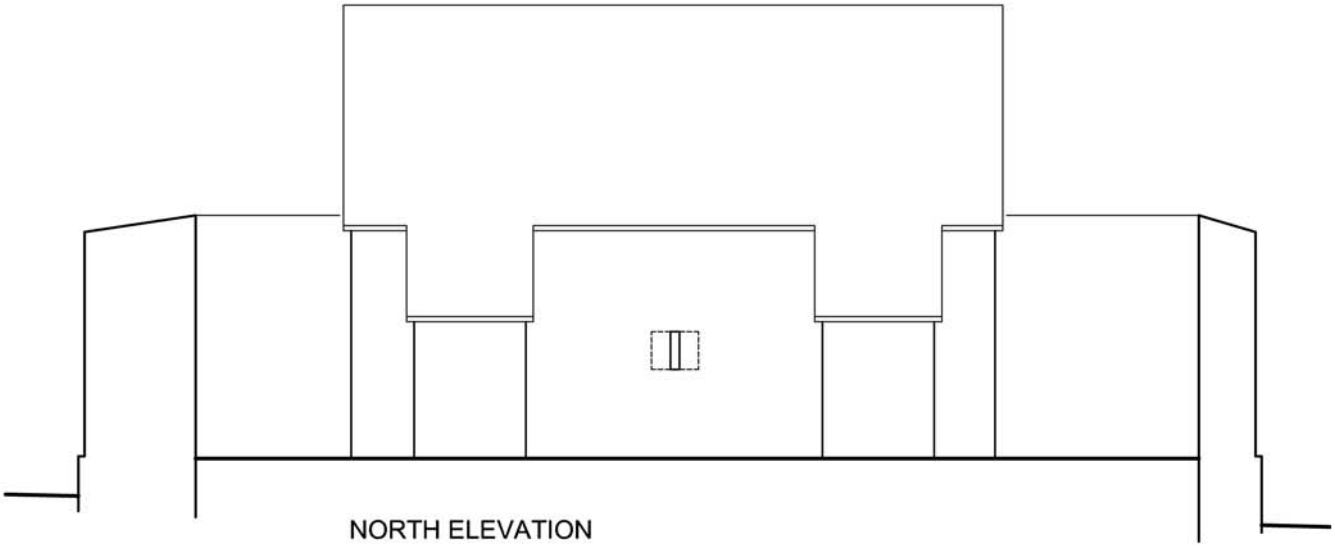
0 1 2 3 4 5 m



NORTH ELEVATION OF ENCLOSING WALL WITH PHOTO



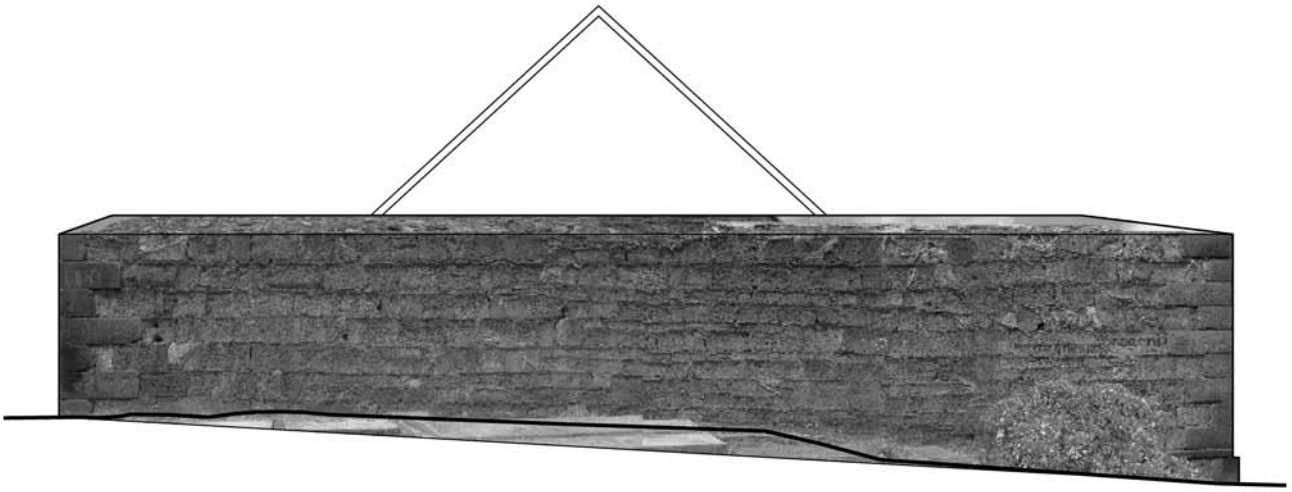
NORTH ELEVATION OF ENCLOSING WALL



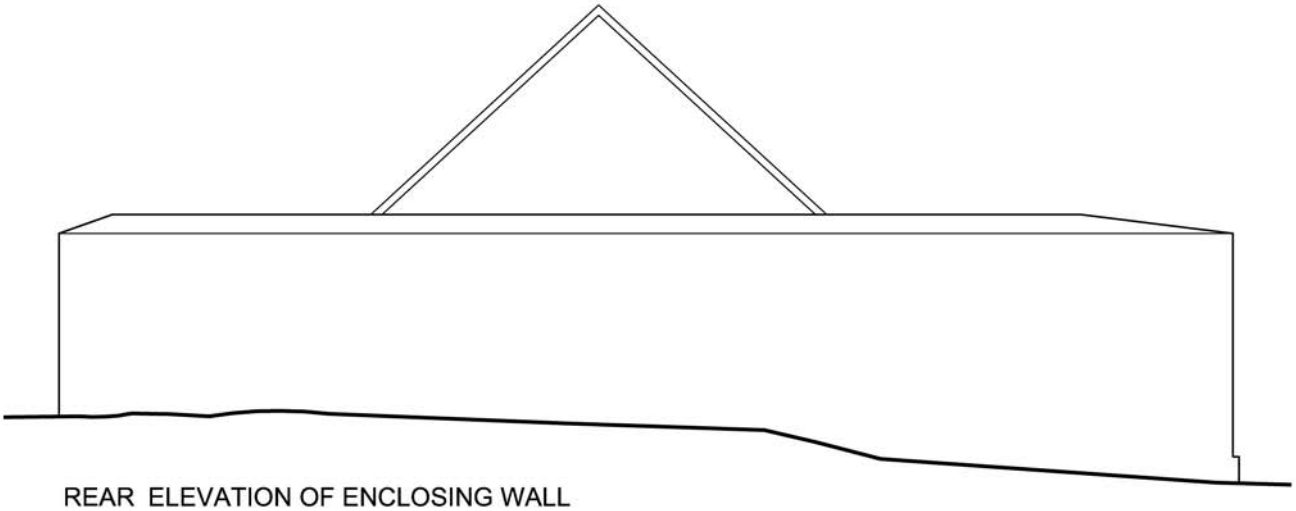
NORTH ELEVATION

STRUCTURE 1 - POWDER HOUSE

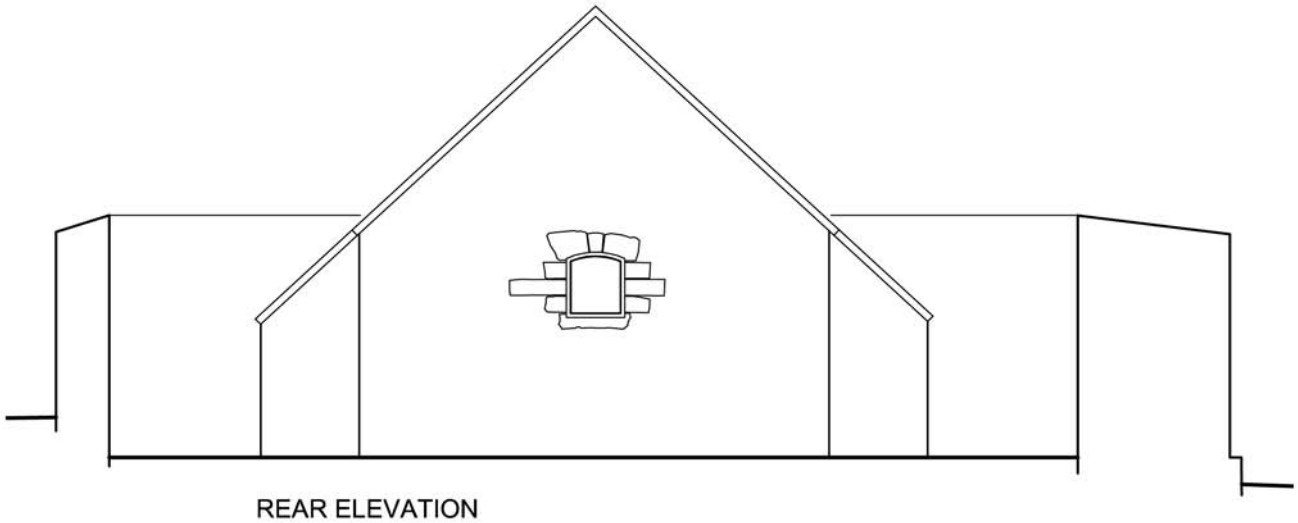
0 1 2 3 4 5 m



REAR ELEVATION OF ENCLOSING WALL WITH PHOTO



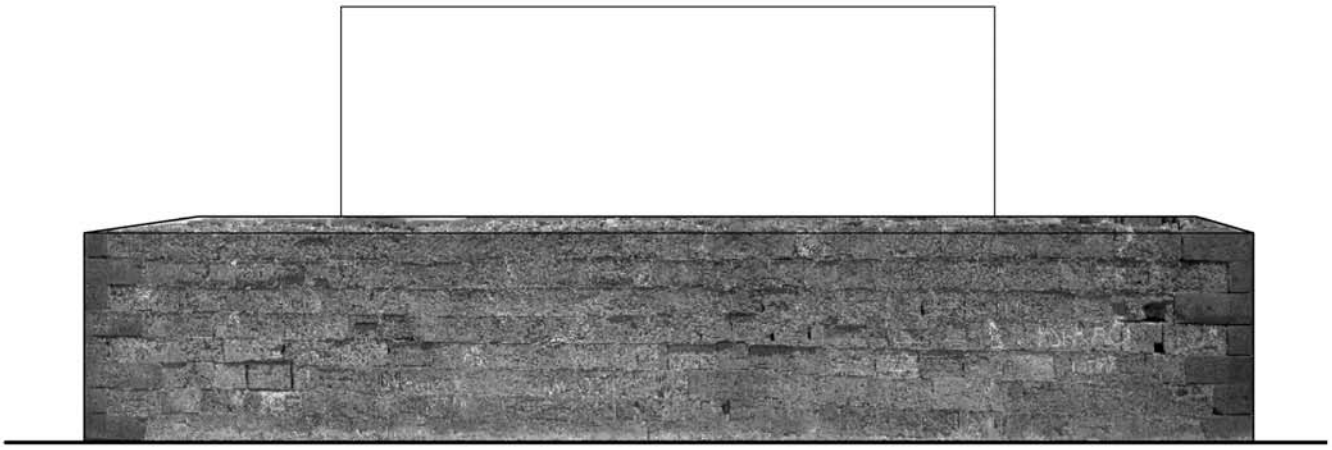
REAR ELEVATION OF ENCLOSING WALL



REAR ELEVATION

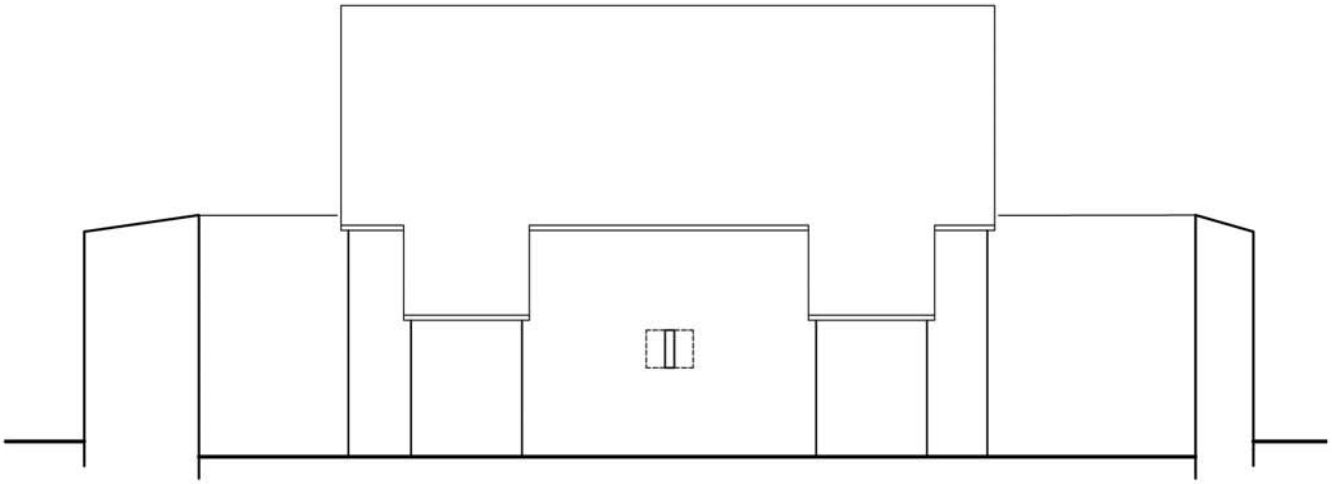
STRUCTURE 1 - POWDER HOUSE

0 1 2 3 4 5 m



SOUTH ELEVATION OF ENCLOSING WALL WITH PHOTO

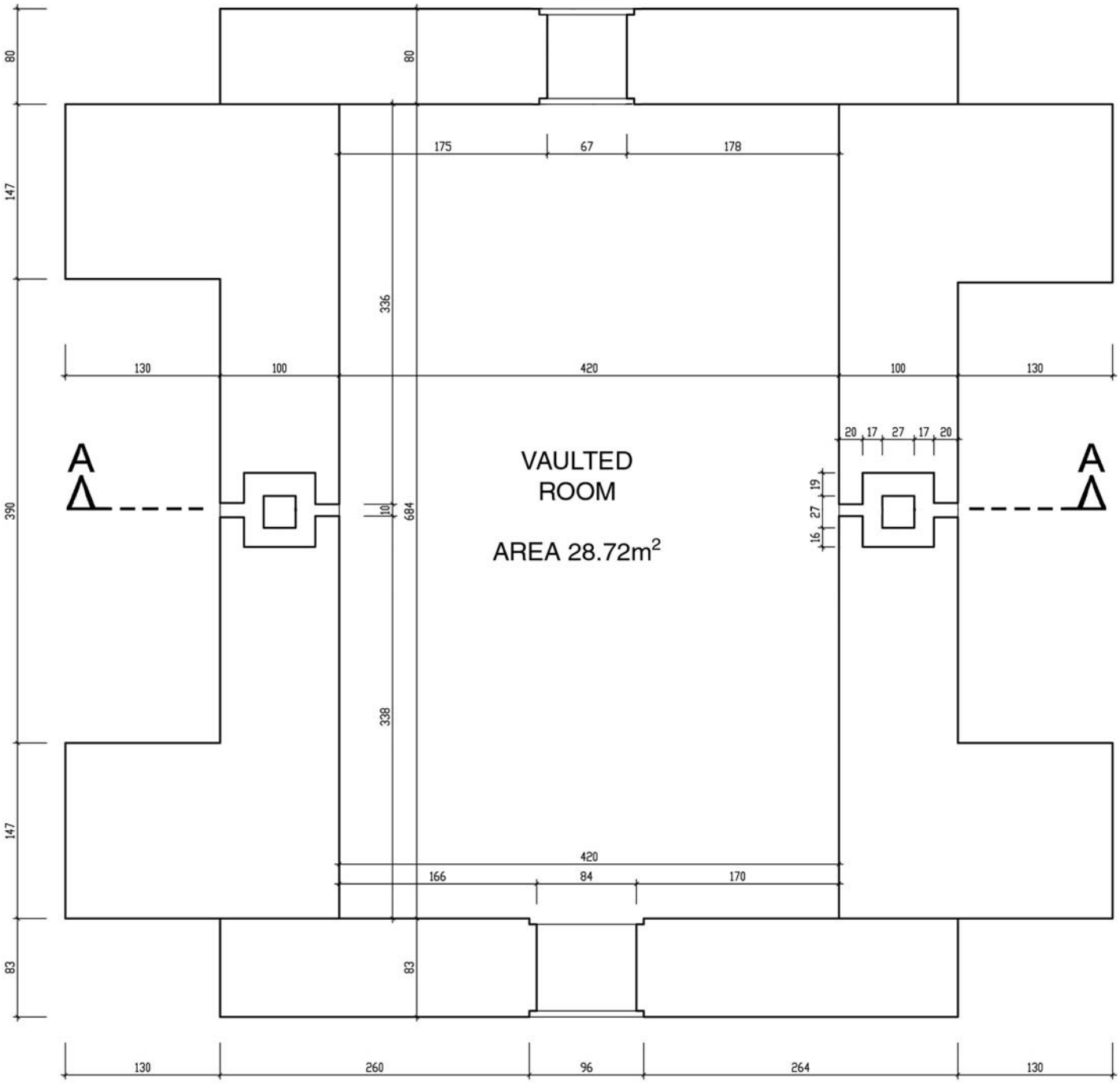
SOUTH ELEVATION OF ENCLOSING WALL



SOUTH ELEVATION

STRUCTURE 1 - POWDER HOUSE

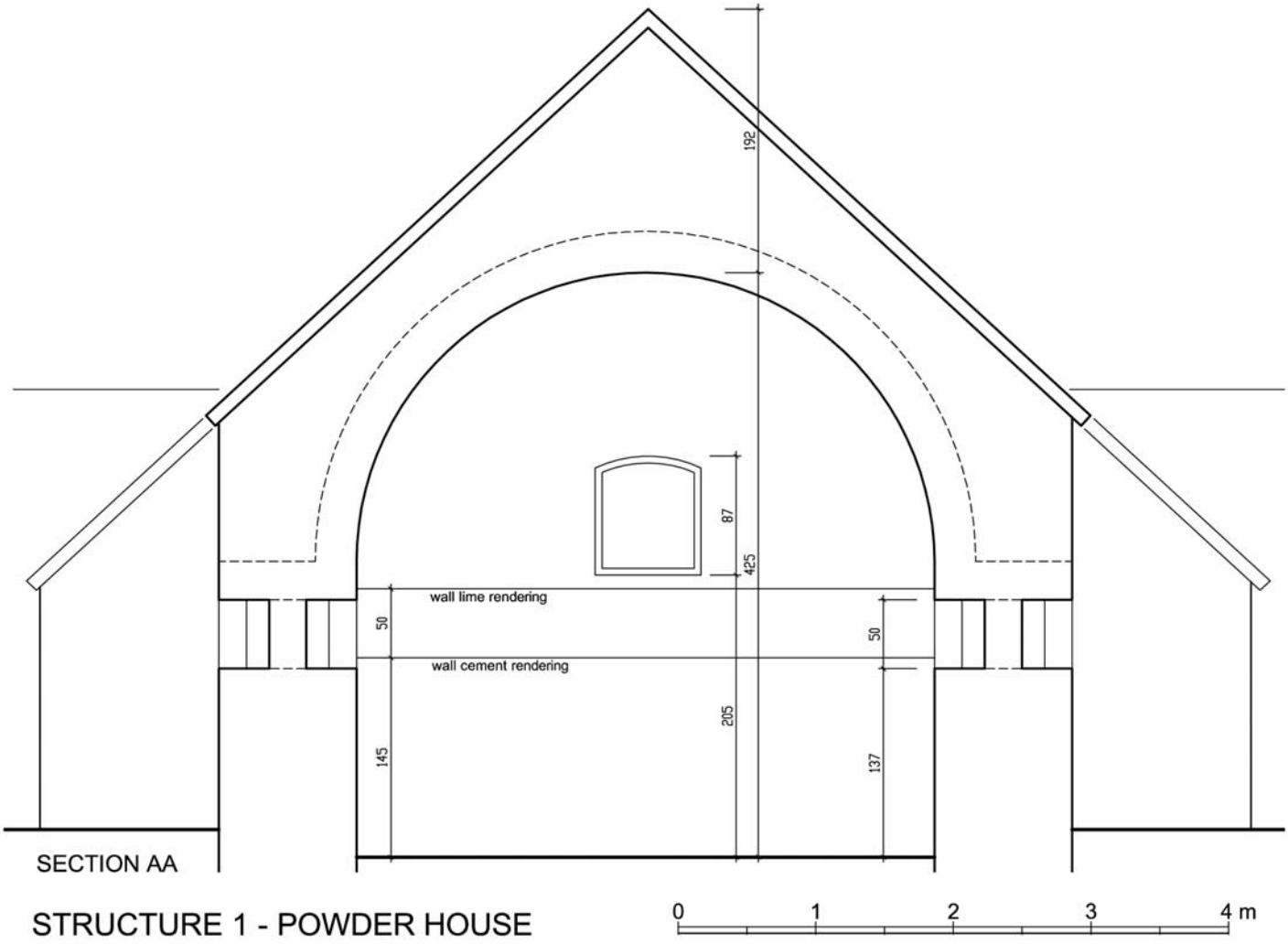
0 1 2 3 4 5 m



PLAN

STRUCTURE 1 - POWDER HOUSE

0 1 2 3 4 m



STRUCTURE 1 - POWDER HOUSE

Rectified photo of entrance door to vaulted room imported into AutoCAD with digitised drawing of basalt blocks superimposed.
(Not printed to scale)

Rectified photo of rear window to vaulted room imported into AutoCAD with digitised drawing of basalt blocks superimposed.
(Not printed to scale)

THE STOREHOUSE

The Storehouse as seen from the Upper Battery showing the broken concrete roof. (02JV0308)

Description

The Storehouse, Structure 2, is a rectangular building integrated in the Western Defences. The original French building had an imposing symmetrical façade and, according to the map, no internal divisions. In WW II the façade was remodelled, the interior was partitioned and provided with a new roof and floor, and plinths built to seat generators.

Materials

French:

- Cut blocks of fossilised coral;
- Basalt ashlar with drafted margins;
- Off-white lime mortar;
- 'Argamasse' binder and cover for the roof,

WW II:

- Concrete;
- Portland cement;
- Iron reinforcement
- Iron fittings

Architectural Features

- Ashlar walls of coral blocks with, on the front façade, basalt quoins, frames for the door and windows, and ends of roof drain at sides;
- Back wall seems to be built over the running defensive wall, at roof level a rubble core can be distinguished from the outer perimeter walls, top of wall slopes down outwards;
- No traces of the original roof exist, the present concrete roof is in very poor condition, a portion of roof over the southern room has been removed as it was considered unsafe;

- The overhanging eaves of the reinforced concrete slab, which replaced the original flat roof supported by timber beams, only survive in places;
- A gutter, part of the original roof construction, with basalt end blocks drains the roof;

Northern part of roof showing rubble core of back wall and gutter between original back wall and WW II concrete roof. (02cn0104)

Gutter with basalt end block. (02cn0105)

- A single door in the centre of the front façade has a basalt block lining, but the basalt arch was replaced by a WW II concrete lintel and the width of the door was slightly reduced by concrete jambs;
- Some of the basalt blocks surrounding the single window on each side of the door are still in place, but the windows were blocked with concrete and two new windows were opened up on each side, making a total of four;
- Vents on each of the two sidewalls underneath the roof were blocked with concrete;
- Basalt steps remain in place and perhaps indicate the lower level of the floor before the concrete floor was made, the lower step was extended with concrete;
- Plinth for generators installed during WW II;
- Cable ducts with 2.5cm by 2.5cm (1" by 1") rebate for the cover.

Special Architectural Features

The rubble filled "casemate" construction of the thick back wall and its structural relationships to the linear defences on either side, is of particular interest and requires further study and detailed recording.

Careful observation of the WW II remodelled front elevation of the building reveals its original French form. The remaining basalt blocks were part of the lining and lintels of the two original windows. Both of the original window openings were blocked and a new pair of concrete lined windows replaced each of them.

Dimensions

The overall outside dimension of the building is 12.95m by 9.50m. The inside of the Storehouse as built by the French, slightly short of perfect symmetry, measures 11.50m by 5.27m and its area is of 60.6m^2. The present floor to ceiling height is 3.92m. Other basic dimensions are given on the following table, plans and sections.

Description	***Dimensions***		*Area*	
	metres	**feet and inches**	**m^2**	**sq ft**
Overall	12.95 by 9.50	42' 6" by 31' 2"	123	1328.7
Floor to ceiling height	3.77	12' 4"		
Wall thickness	0.69, front 0.73, side 3.54, rear 0.31, partitions	2' 3", front 2' 5", side 11' 7", rear 1', partitions		
French store room	11.50 by 5.27	37' 9" by 17' 4"	60.6	654.5
Room 1	4.22 by 5.23	13' 10" by 17' 2"	22.1	238.4
Room 2	4.22 by 5.17	13' 10" by 16' 11"	21.8	235.6
Entrance hall	2.44 by 5.20	8' by 17' 1"	12.7	137.0
Front door	1.52 by 2.42 high	5' by 7'11"		
Windows in Room 1	0.76 by 0.92 high	2' 6" by 3'		
Windows in Room 2	0.76 by 0.92 high	2' 6" by 3'		
Internal doors	1.53 wide 2.44 high (max.)	5' wide 8' high (max.)		
Plinth for generators	0.92 by 2.92 0.33 high	3' by 9' 7" 1' 1" high		
Cable ducts	0.22 wide 0.15 deep	9" wide 6" deep		
Step: Basalt tread	 1.80 by 0.33, 0.17 rise	 5' 11" by 1' 1" 7" rise		

Date

First phase of construction is French. Subsequent alterations, including repairs, new roof, new floor, new internal partition, are thought to have been made during the WW II period. British use as a prison in the 19th Century has not left obvious signs of conversion.

Present Condition

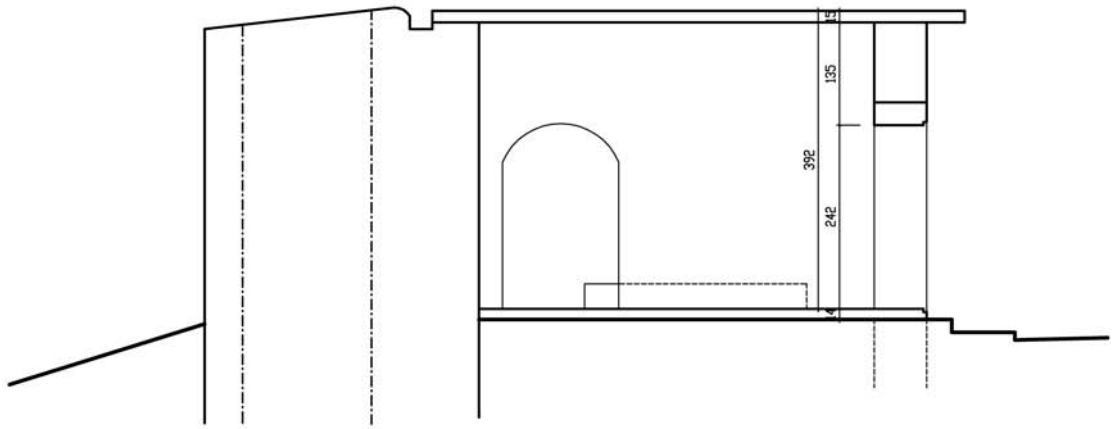
The reinforced concrete roof is in a dangerous state and the remaining portions will have to be carefully removed so as to avoid damage to the walls. Concrete partition walls also reveal advanced corrosion of reinforcement.

Recommendations

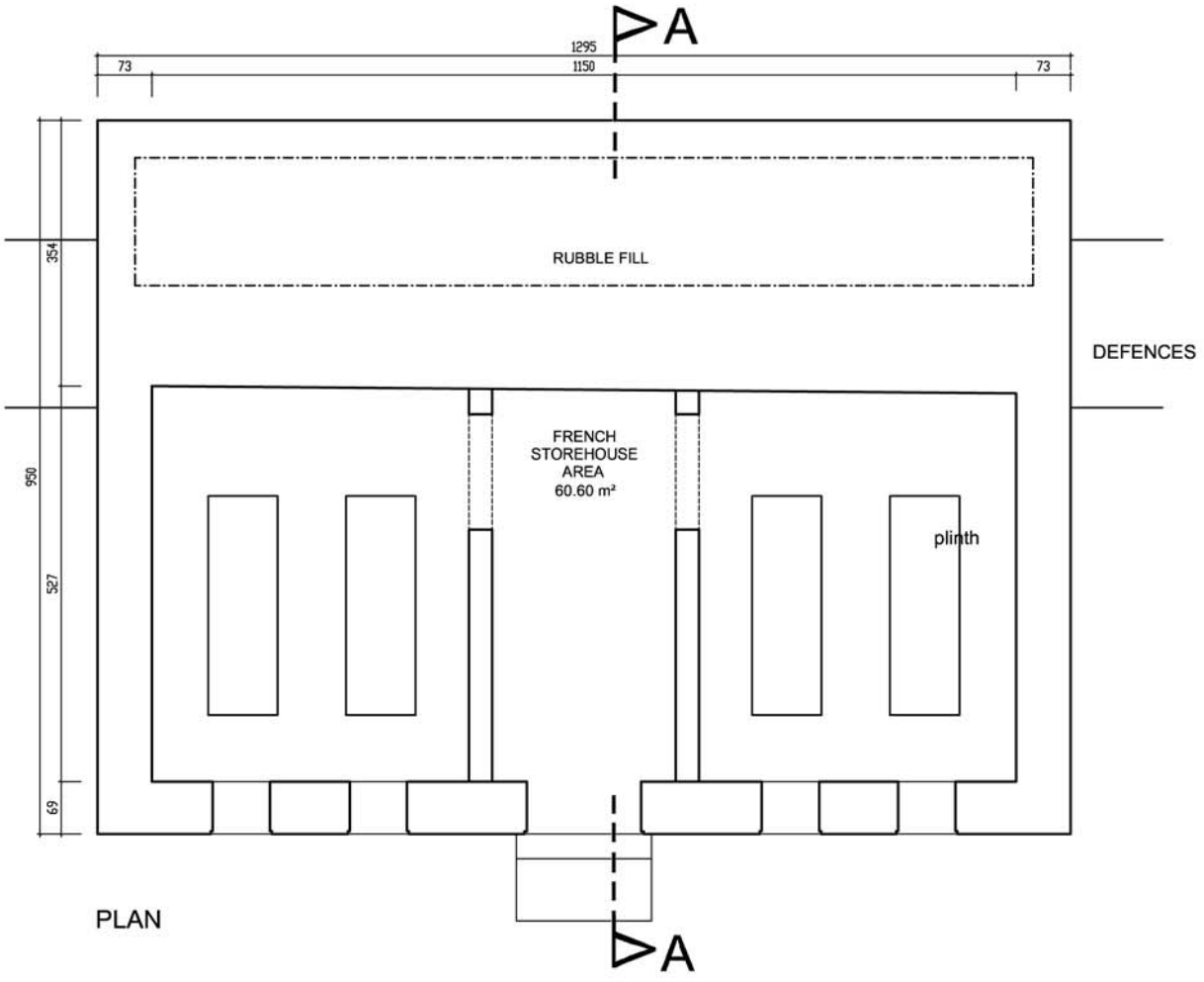
The advice of a structural engineer is urgently needed for action to be taken on the reinforced concrete.

An architectural study needs to be done on the different ways to convert the structure so that it may perform some new function as discussed in *Report 3, Management, Development and Research: Recommendations and Proposals.*

Further study of the building and perhaps sample analysis of mortars may reveal the answers to some unsolved questions related to the original French roof and the construction details of the back wall over the defences.



SECTION AA

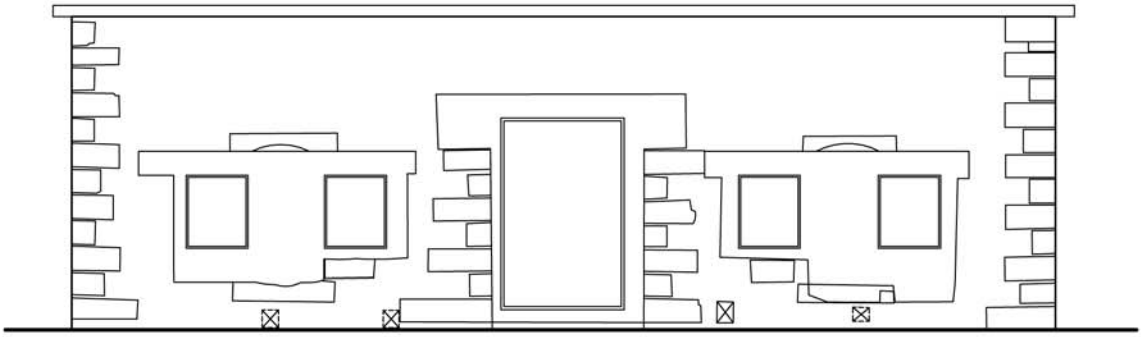


PLAN

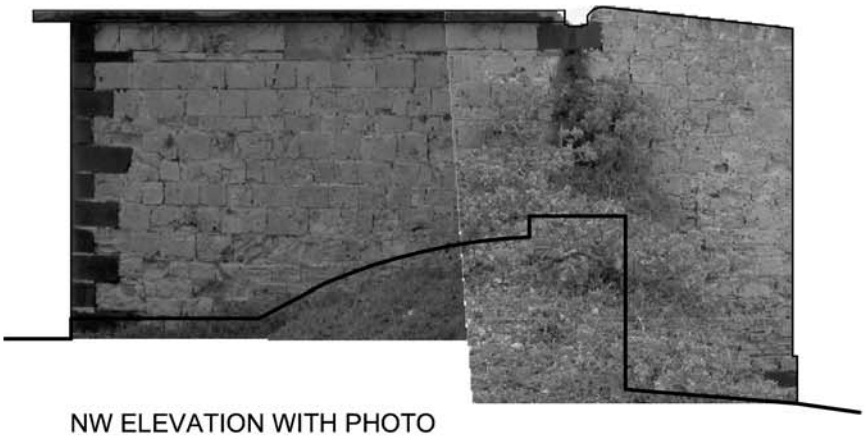
STRUCTURE 2 - STOREHOUSE

0 1 2 3 4 5 m

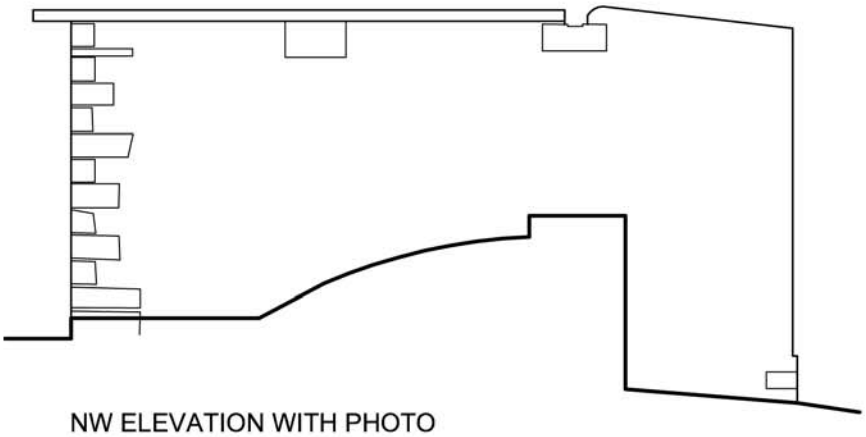
FRONT ELEVATION WITH PHOTO



FRONT ELEVATION



NW ELEVATION WITH PHOTO

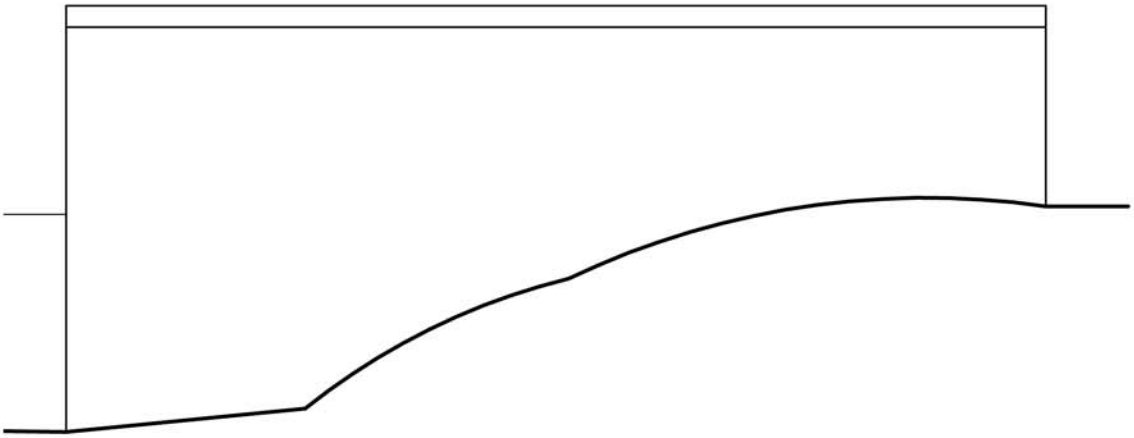


NW ELEVATION WITH PHOTO

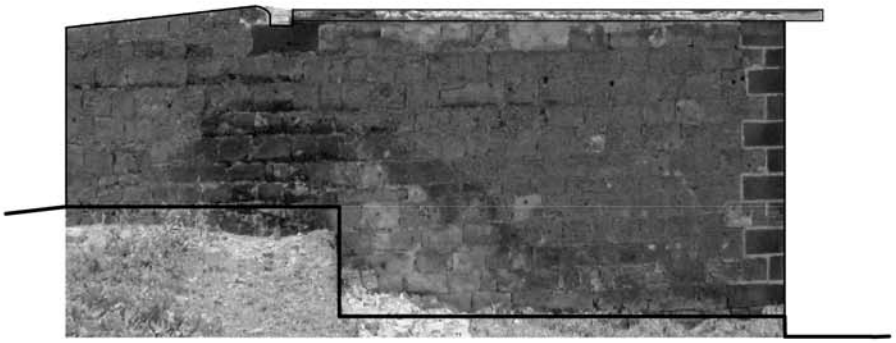
STRUCTURE 2 - STOREHOUSE

0 1 2 3 4 5 m

REAR ELEVATION WITH PHOTO



REAR ELEVATION



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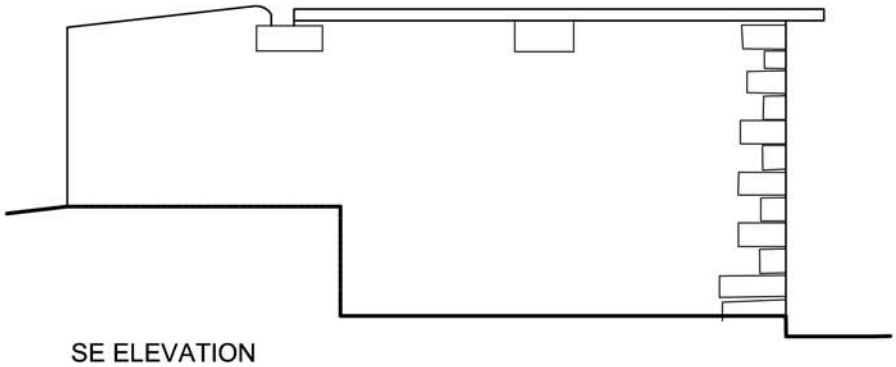
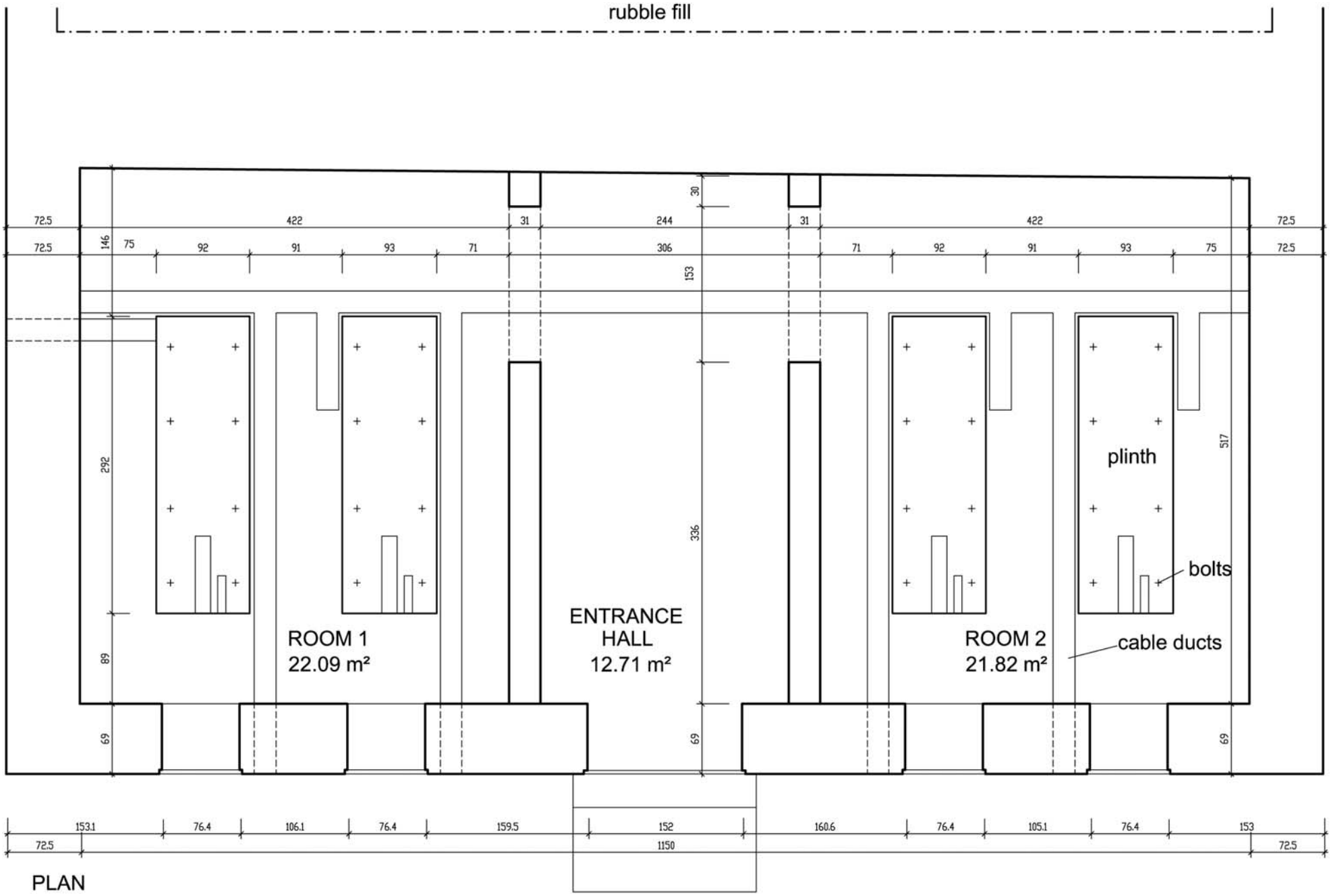


SE ELEVATION

STRUCTURE 2 - STOREHOUSE

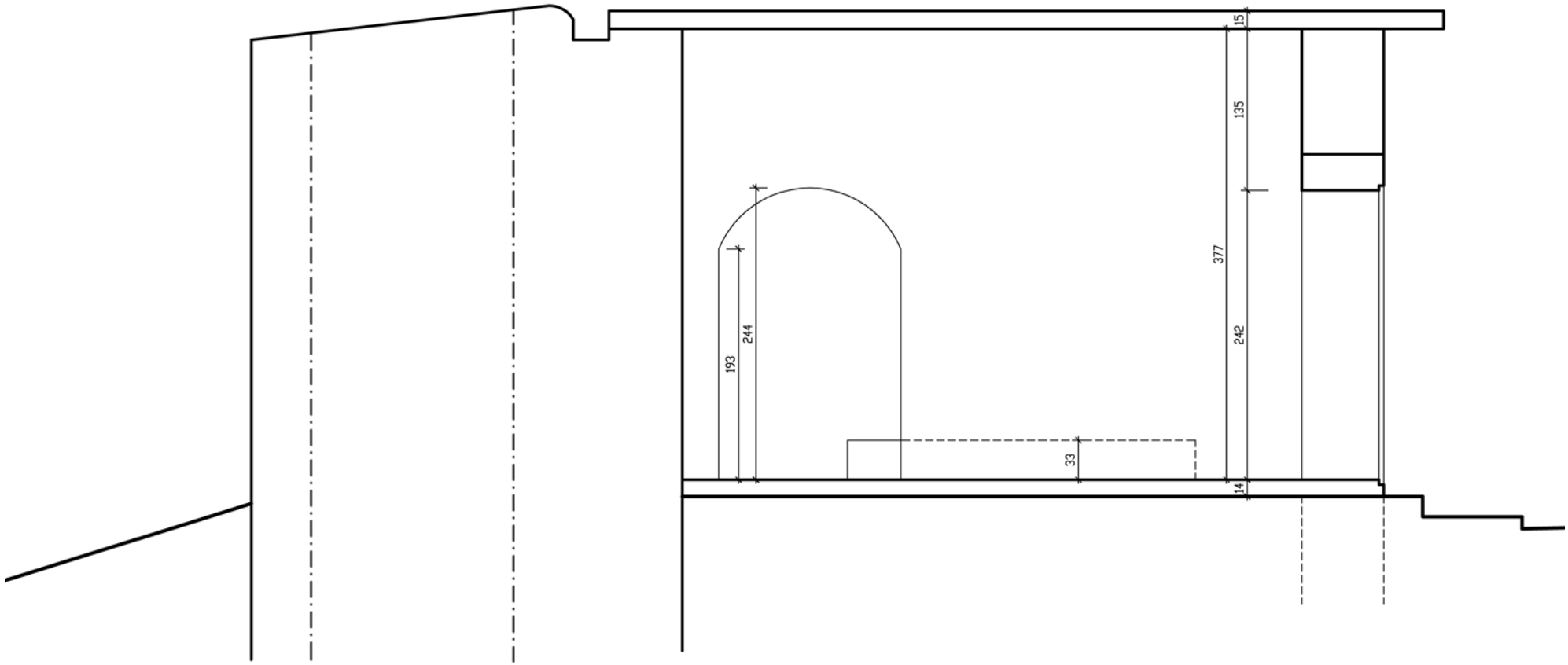
0 1 2 3 4 5 m



PLAN

STRUCTURE 2 - STOREHOUSE

0 1 2 3 4 5 m



SECTION AA

STRUCTURE 2 - STOREHOUSE

0 1 2 3 4 5 m

THE SHOT FURNACE

The Shot Furnace, built by the French Period, has suffered damage; its restoration will need specialist and professional care. (02jv1023)

Description

The Hot Shot Furnace, Structure 3, is a small but prominent structure centrally placed between the Storehouse and the Powder House on one axis and between the Landing Point and the Upper Battery on the other. This important structure contains the finest examples of masonry on the island.

There are slight traces of earlier built structures beneath.

The reverberating furnace, i.e. a furnace that was designed so that the heat from the fire was reflected back into the centre of the chamber, was tended from the large opening at the front, and provided with a brick-lined chimney at the rear of the fire chamber. The front faces the Upper Battery and also the prevailing wind. The sides of the main chamber were lined with red brick, but the nature of the original chamber ceiling is uncertain.

Shot would have been fed into the rear of the furnace via a chest-high conduit on one side. Hot shot could then be rolled out of two forward conduits, one on either side, onto cantilevered basalt receptacles.

Materials

Pre Furnace

Small fossilised coral stones.

Furnace

- Basalt ashlar with drafted margins, some of which is spolia;
- Smaller cut basalt blocks;
- Basalt chips for chinking;
- Lime mortar;
- Smooth mortared roof, probably 'argamasse';
- Later repointing and repair with cement mortar;

- Kiln fired red-brick lining;
- Remains of badly corroded iron fittings.

Modern

Portland cement repair.

Architectural Features

- Base, resting on one course of earlier foundation and bedrock, offset by 5cm;
- Tapering walls made of basalt ashlar, some with drafted margins;
- 'Argamasse' hipped roof with a change of pitch;
- One conduit adajacent to the back wall for feeding in shot;
- Two outlet conduits, one on each side, for extracting hot shot;
- Each side wall has a stone bracket supporting a projecting block, 40cm by 40cm, with circular depression to receive hot cannon balls;
- Fifth side blocks from the bottom course have an acute angle, thus acting as the base of an arch allowing the coarse rubble and mortar construction of the roof to span a distance slightly more than one metre;
- Opening with vertical sides but arch, probably a flattened one, has collapsed;
- Remnants of brick lining of the chamber;
- Chimney lined with red bricks;
- Iron rails and fittings at an advanced stage of corrosion.

Special Architectural Features

The structure itself is of special interest, having been modelled to suit a very specific function. The blocks placed on each side by the outlets to receive the hot shot have been beautifully carved out of basalt.

Dimensions

The Shot Furnace is a relatively small structure with an overall size of 3.90m by 3.56m. Table, plans and sections give all the significant dimensions.

Description	*Area*	
	metres	**m^2**
Overall base	3.56 by 3.90	13.9
Floor to top of roof	2.30	
Chamber	1.16 by 2.70	
Cannonball exit	0.40 by 0.40	
Bricks	0.20 x 0.09 x 0.04	

Date

French, probably belonging to a late phase in the development of the French period defences when to Lower Battery was replaced by the Upper Battery. Pre-furnace foundations presumably belong to structures shown on early French plans of the island.

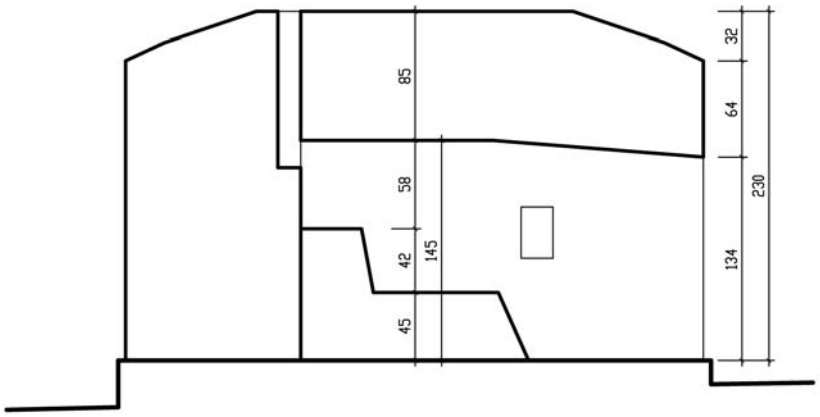
Present Condition

An important portion of the ceiling has collapsed and more is in danger of collapsing. The base of the rear wall is in a bad state as a result of campfires that have been set against it. The west wall has been underpinned with concrete in the recent past. Some of the basalt has cracked, presumably as a result of heat when the furnace was in use. Other stones have been dislodged by visitors. Much of the brick lining is missing. The original ironwork is in a very poor state.

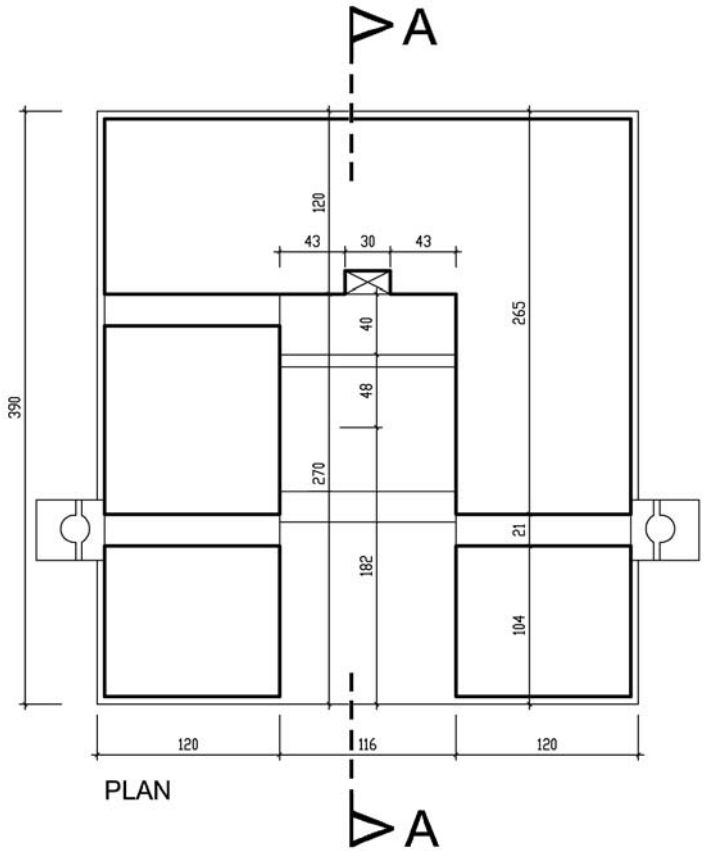
Of the earlier structure beneath, what little remains is most fragile.

Recommendations

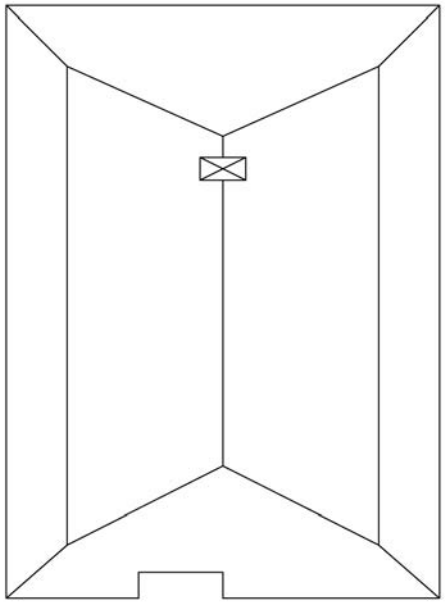
The repair and restoration has to be preceded by detailed documentation and recording. A study of literature sources and archive materials might help to understand better this very complex construction. Repair and restoration work should be carried out by specialists and experts. This is a building of great importance and interest. Any temporary shoring should be done with great care.



SECTION AA

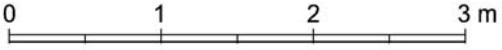


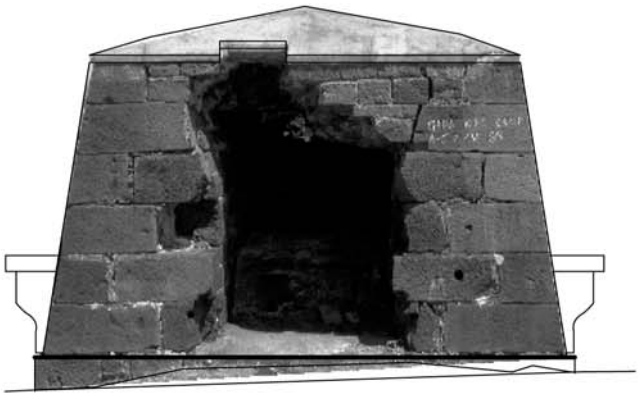
PLAN



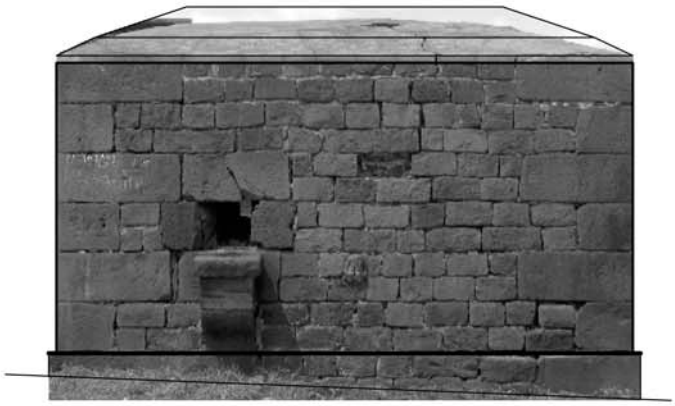
ROOF PLAN

STRUCTURE 3 - SHOT FURNACE

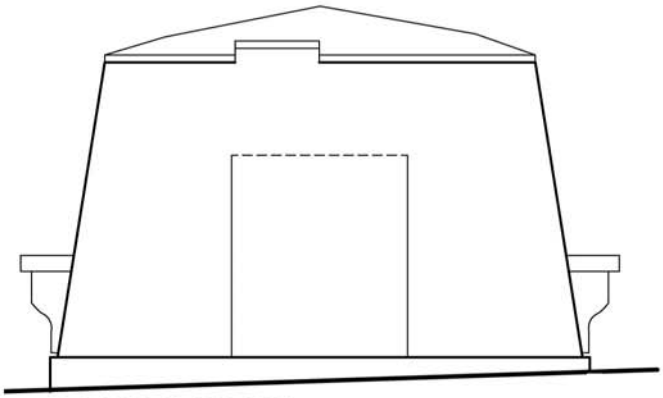




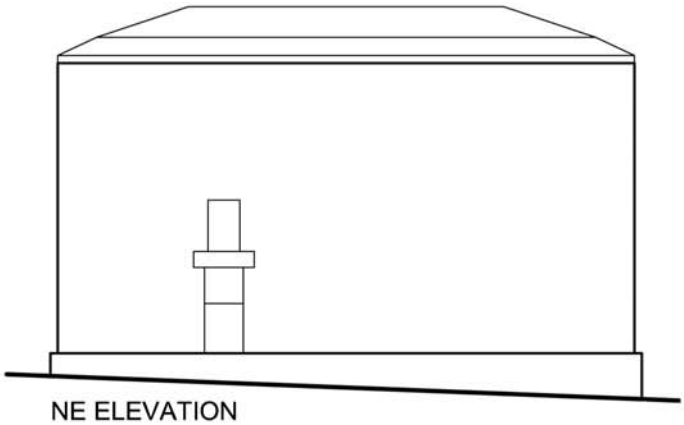
FRONT ELEVATION WITH PHOTO



NE ELEVATION WITH PHOTO

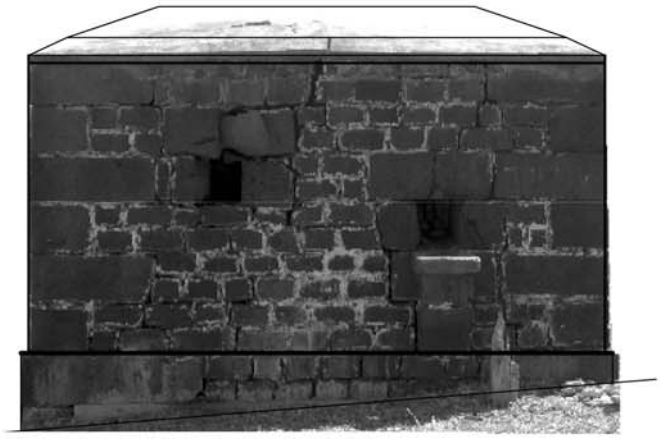


FRONT ELEVATION

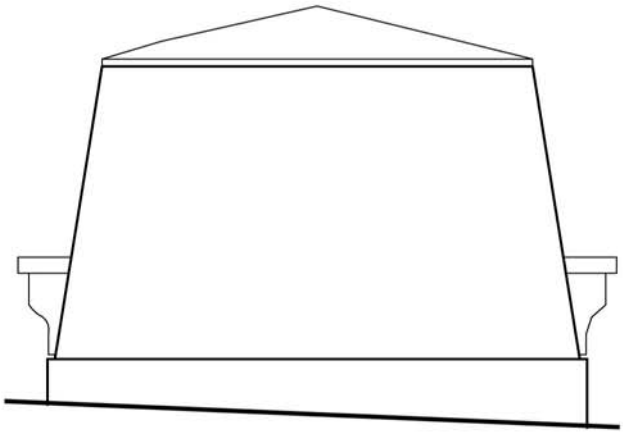


NE ELEVATION

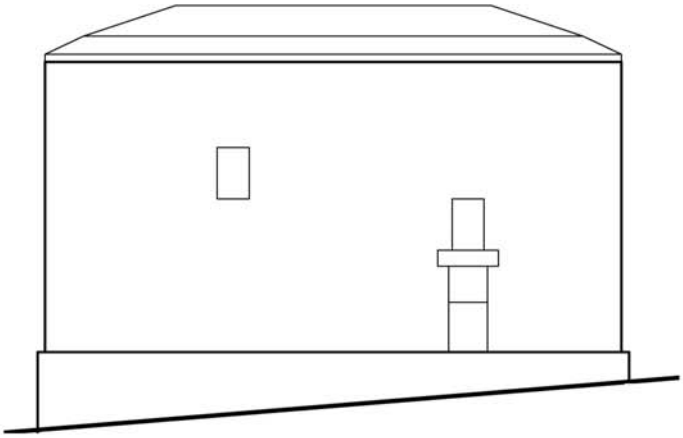
REAR ELEVATION WITH PHOTO



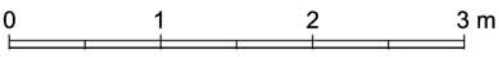
SW ELEVATION WITH PHOTO



REAR ELEVATION



SW ELEVATION



STRUCTURE 3 - SHOT FURNACE

THE CISTERN

The Cistern photographed from the Upper Battery. (02jv0308)

Description

The Cistern, Structure 4, was filled by run-off from the roof of the barrack Building, structure 5. The British archives quotes its capacity as being 11.000 gallons (41.64m^3). Although repaired and altered several times the structure retains most of its original features. These include a sump associated with the inlet of water from the Barracks roof and, probably, from the roof of the cistern itself, semi-circular housing for a pump mechanism and an associated outlet sump, and basalt overflow spouts (blocked).

Materials

- Dug into the coral bedrock;
- Basalt ashlar quoins;
- Basalt walling;
- Waterproofing mortar lining inside the tank, originally with lime but likely to have been resurfaced and repaired more than once, lastly in the WWII with Portland cement mortar;
- Very probably lined with kiln fired red brick.

Architectural Features

- Steps, on the east side, coming up to a sump where water was raised;
- Semi-circular groves on the internal face of the tank side leading up to the sump on the east side;
- Settling tank on the north side where the inlet was;
- Two spout like projections on the west side, a red brick blockage allowing for a pipe and later blocked with cement mortar;
- Two spout like projections on the south side, similar to those on the west side;
- Low internal partition;
- Steps leading down from partition inside the eastern portion of the tank;
- Surrounding wall made of basalt;

Special Architectural Features

Both inlet and outlet deserve a more detailed study and some cleaning up would reveal more of the construction details.

The function of the spout-like features remains unresolved. Some research in the archives or available literature might give us some clues.

Dimensions

The Cistern internal dimensions are 7.8m by 3.90m and its maximum depth is 2.71m. Other dimensions are given in the following table, plan and section.

Description	**metres**	**m^2**	**m^3**
Overall	9.87 by 5.95	58.7	
Internal	7.8 by 3.90	30.4	80
Depth	2.71, maximum 2.50, minimum		
Surround width	1 approx.		
Surround height	1 average		
Partition	0.40 by 0.96 high		

Date

Built by the French, appearing on the earliest available maps, and reused by the British in the 19th and 20 Centuries.

Present Condition

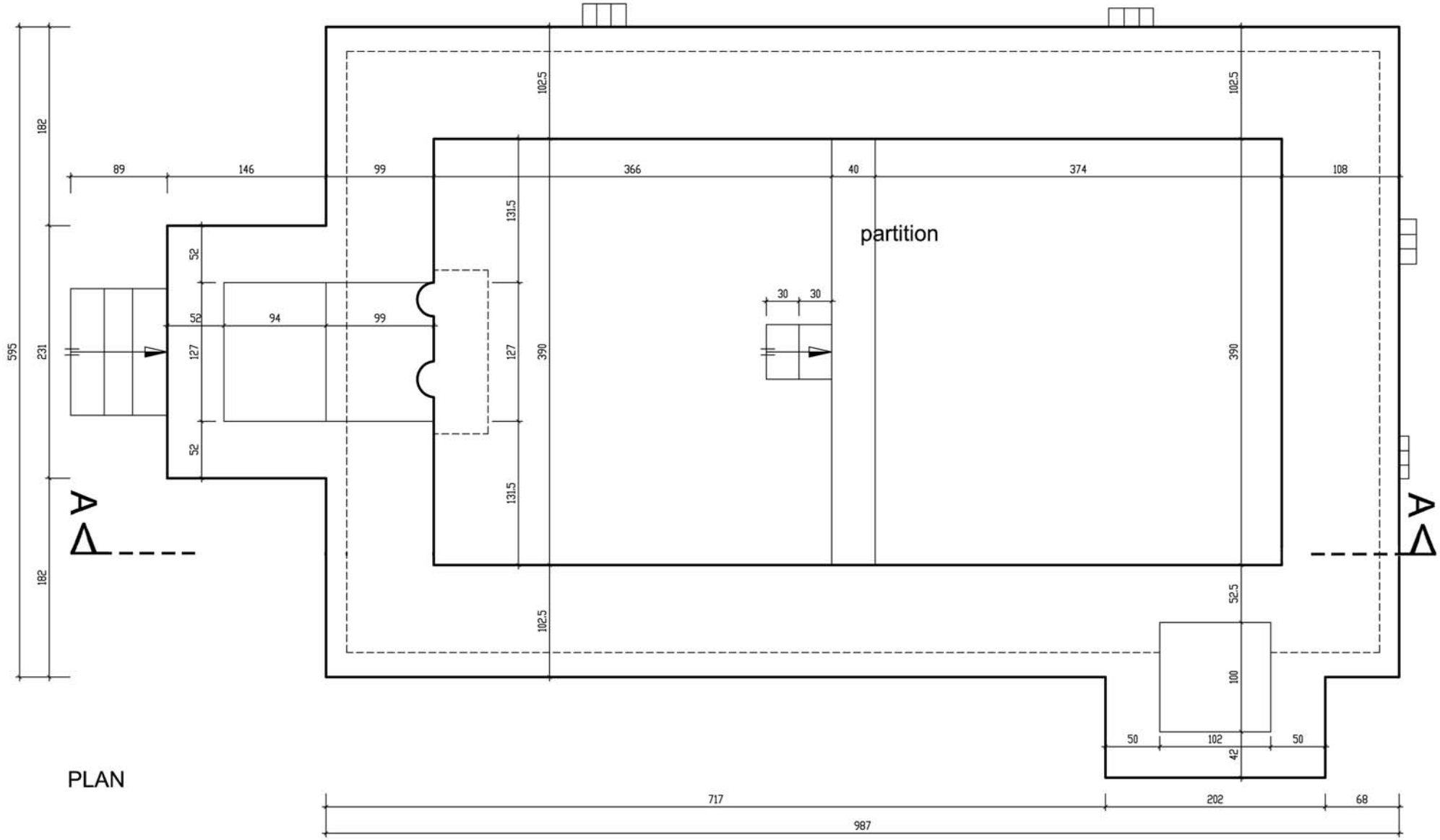
The cistern is in an overall remarkably good state of preservation. A few blocks along the upper course have been displaced and some of the rendering has cracked and broken away.

Recommendations

The proper functioning of such a reservoir was of vital importance to those posted on the island for any period of time. The surviving evidence could perhaps be supplemented by archival research which would shed light on some unresolved questions. Making the cistern operational again is an attractive option and more research should be done on the way it functioned in the past. Although the original scheme on the French map indicates a structure without a roof, it is known to have had a pitched shingle roof by 1837. A new shingle roof would be an enormous asset.

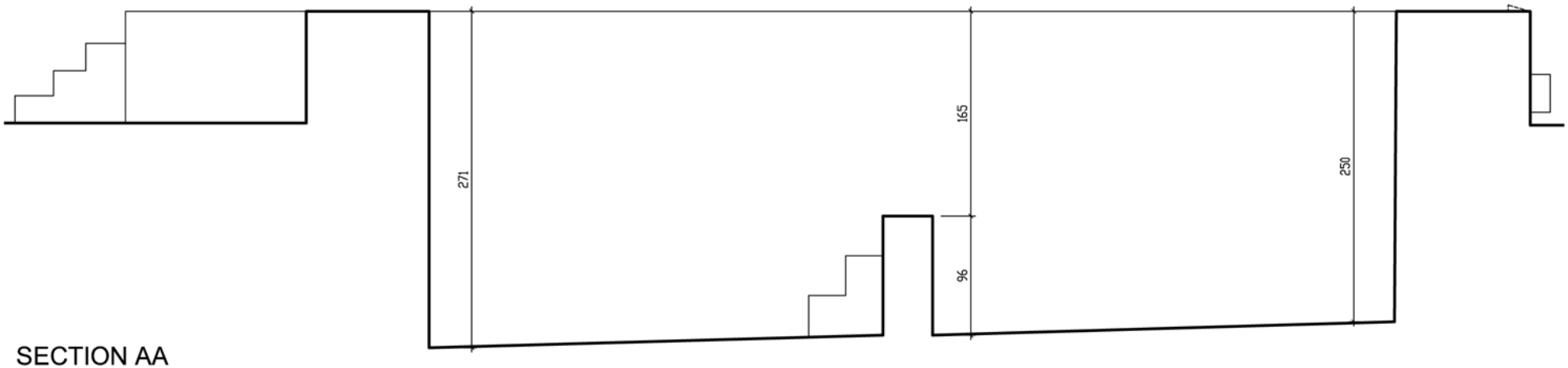
The displaced blocks, most of them lying nearby, should be put back in their original positions and mortar, of an appropriate composition, used to repair the surface rendering.

South-west corner of the cistern where blocks from the uppermost course should replaced and vegetation carefully removed. The blocked basalt 'spout' shows a red brick blockage with a circular hole perhaps allowing for a pipe and later blocked by a cement mortar. (02jv2107)



PLAN

STRUCTURE 4 - CISTERN

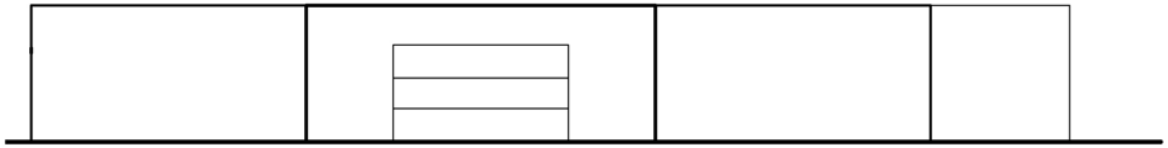


SECTION AA

STRUCTURE 4 - CISTERN

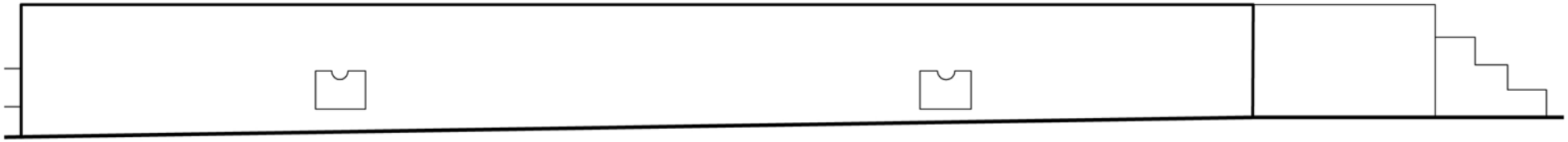
0 1 2 3 4 5 m

FRONT ELEVATION WITH PHOTO



FRONT ELEVATION

SIDE ELEVATION WITH PHOTO



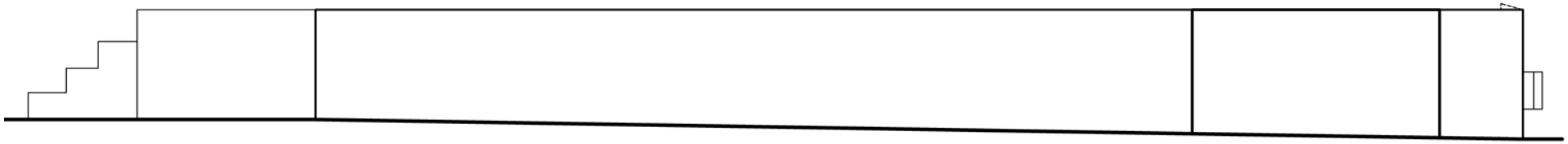
SIDE ELEVATION

STRUCTURE 4 - CISTERN

REAR ELEVATION WITH PHOTO

REAR ELEVATION

SIDE ELEVATION WITH PHOTO



SIDE ELEVATION

STRUCTURE 4 - CISTERN

0 1 2 3 4 5 m

THE UNDERGROUND GENERATOR HALLS

The Underground Generator Halls have a single entrance, ventilation is provided by rows of small vents under each of the roof slabs. (02cn0415)

Description

The Underground Generator Halls were built in the "Ditch" on the north-east side of the islet, so as to be hidden from view. The reinforced concrete structure comprises three contiguous halls, each the same size and containing identical pairs of concrete generator plinths.

Vertical grills along the top of the side and rear walls provided some aeration. The flat roofs step down from back to front and there is a circular hole in the highest slab. The rock-cutting in which the halls were constructed has sloping sides, so that the floor area is considerably less that that of the roof.

Materials

- Cut into coral;
- Portland cement;
- Reinforced concrete walls;
- Reinforced concrete roof slabs;
- Iron fittings.

Architectural Features

- Three reinforced roofs stepping down;
- Concrete lining to the existing ditch sloping sides;
- Vertical vents in upper walling;
- Single doorway;
- Pairs of concrete plinths for electricity generators in each of the three rooms;
- Concrete drain along rear wall beneath the roof.

Special Architectural Features

The building shows an interesting transformation of an existing feature, the ditch. The reinforced concrete lining to the side of the ditch have been made to retain its inclination.

Dimensions

The overall dimensions of the building is 22.62m by 7.13m. The table, plan and section below include other dimensions.

Description	***Dimensions***		*Area*	
	metres	**feet and inches**	**m^2**	**sq ft**
Overall roof	22.62 by 7.13	74' 3' by 23' 5"	161.3	1741.8
Room roof 1	7.88 by 7.13	25' 10" by 23' 5"	56.2	606.8
Room roof 2	7.38 by 7.13	24' 3" by 23' 5"	53.5	577.5
Room roof 3	7.38 by 7.13	24' 3" by 23' 5"	53.3	576.0
Floor to ceiling 3	3.7	12' 2"	161.3	1741.8

Date

World War II, built in an earlier rock-cut ditch.

Present Condition

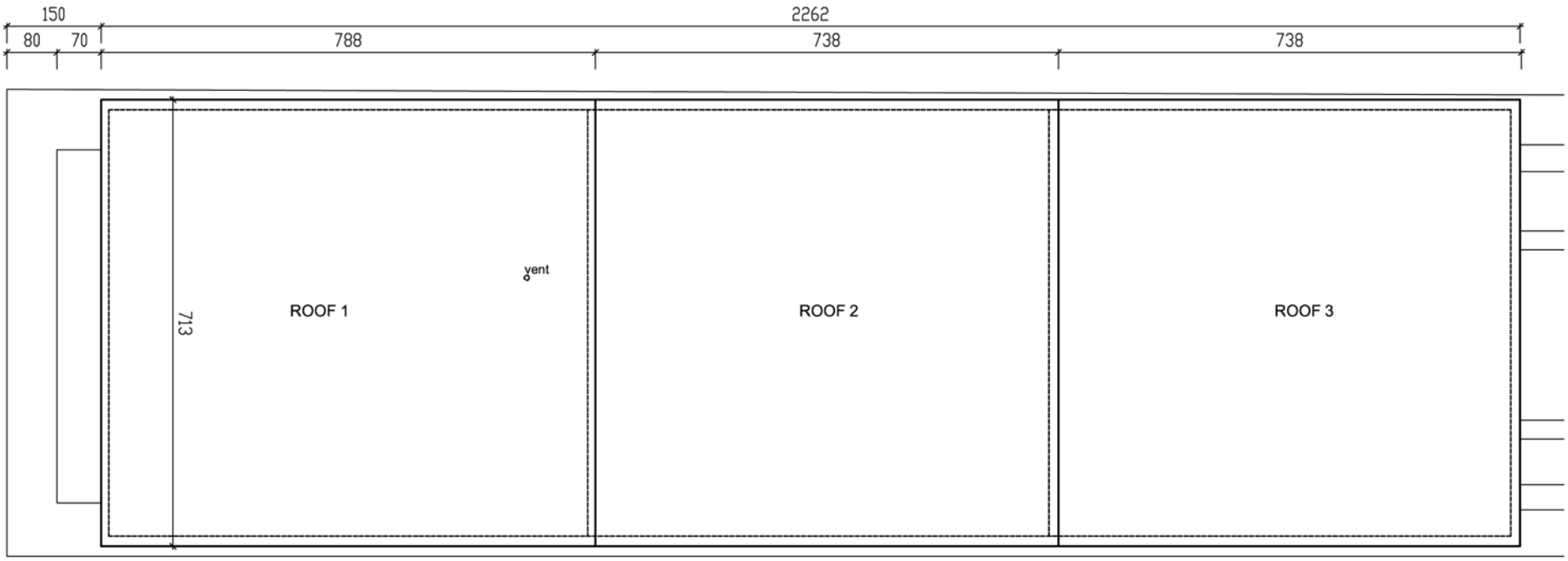
The reinforced concrete structure is in a serious condition because the reinforcement is corroding. As the metal corrodes it expands and splits the concrete in which it is embedded. The interior, in January 2002, was foul.

Recommendations

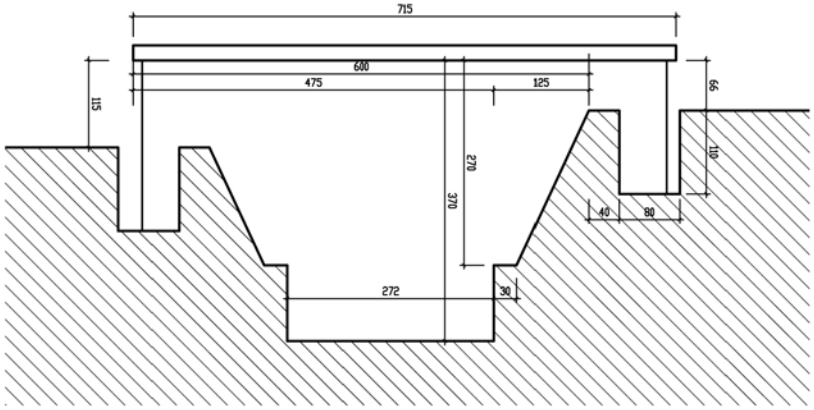
A structural engineer is required to assess the strength and safety of the concrete walls and roof, and to make recommendations accordingly.

Some assessment of water intake through the vents and door under cyclonic weather conditions also needs to be made and drainage needs to be investigated. If the structure can be made safe it could be utilised as part of a visitor centre but investigation regarding the drainage of water, especially in cyclonic conditions, will have to be made.

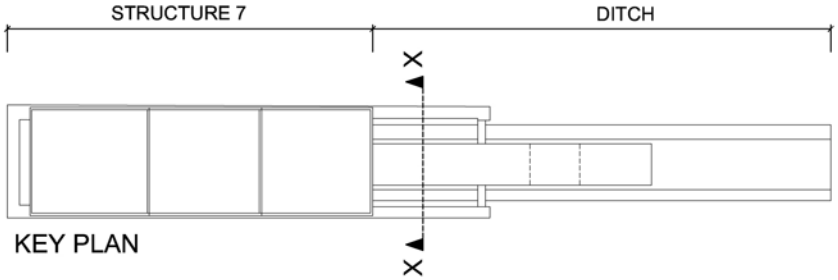
Concrete drain and vents under the southernmost roof slab. (01jv0115)



PLAN



SECTION THROUGH DITCH



KEY PLAN

STRUCTURE 7 - GENERATOR HALL

0 1 2 3 4 5 m

THE NORTH-WEST SENTRY POST

The North-West Sentry Post built on top of the North West Defences. (02jv0217)

Description

The North-West Sentry post is a small circular structure built on top of the North-West Battery.

Materials

- Coral blocks;
- Some basalt blocks in the lower courses;
- Basalt door lintel;
- Lime mortar.

Architectural Features

- Walls of coral blocks with some basalt blocks;
- Door with basalt lintel;
- Two small slit windows, diametrically opposed;
- Domed roof with central coral keyed slab;

Special Architectural Features

The dome is of interest. Further study should record in more detail its components so as to clarify construction techniques.

Rear view of North-West Sentry Post showing one of the small windows. The random mixture of coral and basalt blocks is to be noted.

Dimensions

This small cylindrical structure is 2m wide. Table, plan and sections follow.

Description	**metres**	**m^2**
Diameter	2.00	12.6
Internal diameter	1.00	3.1
Floor to ceiling (max.)	2.33	
Wall thickness	0.50	
Door	0.65 by 2.02 high	
Slit windows	0.10 by 0.12 (int.) and 0.23 (ext.)	

Date

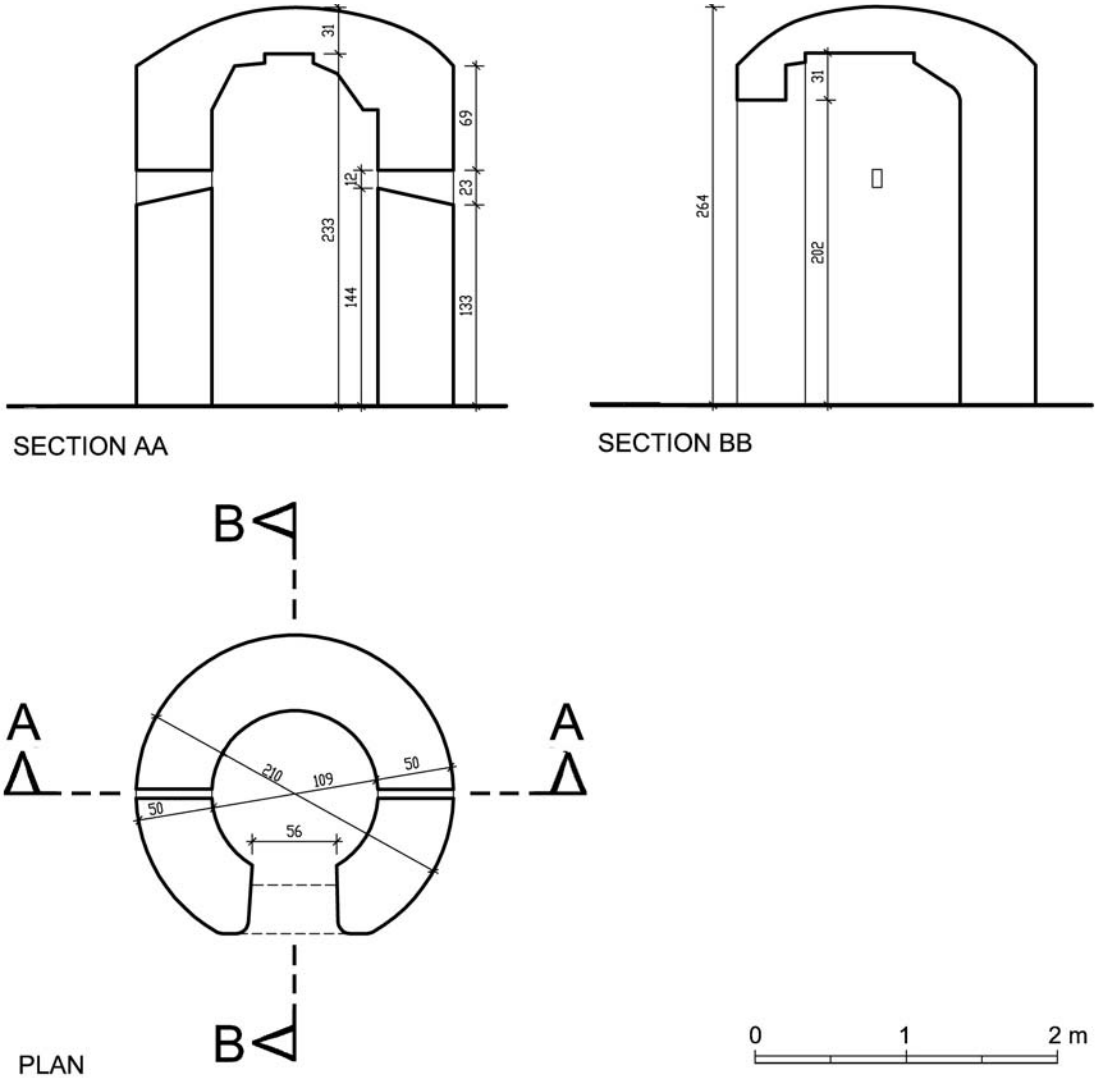
Presumably late French period, they do not appear on the French or English maps. Measurements indicate a metric, therefore French, system.

Present Condition

One side of the door has been recently vandalised.

Recommendations

Repair of the door is an urgent requirement.



STRUCTURE 8 - NW SENTRY POST

THE EAST SENTRY POST

The East Sentry Post. (02jv1603)

Description

The East Sentry Post, Structure 9, is also a small nearly circular structure with a flattened entrance façade.

Materials

- Coral blocks;
- Basalt door lintel.

Architectural Features

- Walls made of coral blocks;
- Door, with basalt lintel;
- Two small slit windows, diametrically opposite;
- Inclined vault.

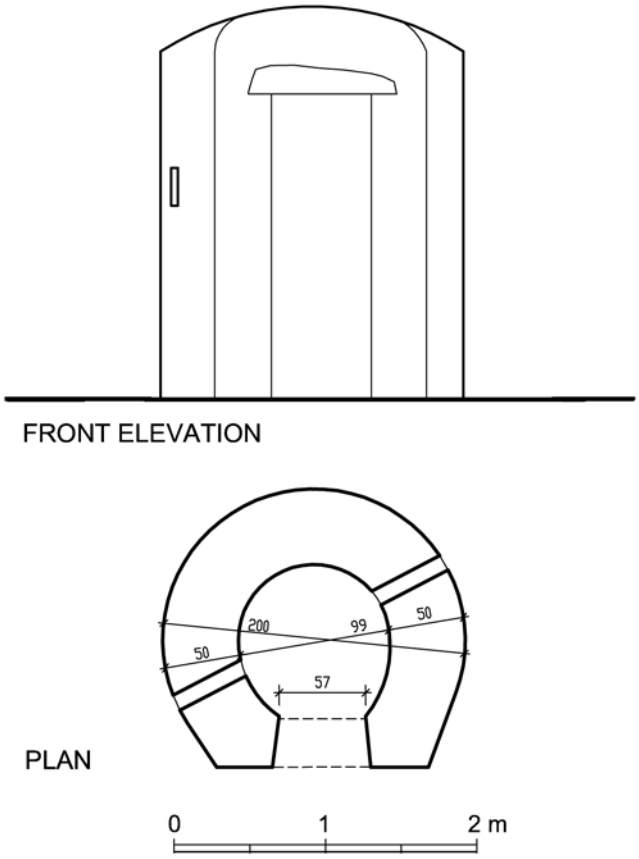
Special Architectural Features

The small inclined vault is of interest and the roofing technique should be studied in more detail.

Dimensions

The external diameter is 2m and dimensions are given below.

Description	**metres**	**m^2**
Diameter	2.0	12.6
Internal diameter	1.0	3.1
Floor to ceiling (max.)	2.30	
Wall thickness	0.50	
Door	0.57 by 2.00 high	
Windows	0.12 by 0.07	



STRUCTURE 9 - EAST SENTRY POST

Date

Same as the North-West Sentry Post, presumably late French but not shown on French or English maps.

Present Condition

Very good.

Recommendations

Provided surveillance deters any detrimental action, such as lighting fires inside or scratching of names, there is no action to be undertaken.

Eastern side. (02jv1612)

Western side. (02jv1617)

THE OBSERVATION TOWER

The Observation Tower with its partially collapsed roof. (02jv0401)

Description

The Observation Tower, Structure 10, was built on top of the southern end of the Upper Battery. The tower is circular, two storied, with a single entrance at ground level. There are two periods: the first, the showing evidence for several stages of construction, is built of basalt on a concrete slab, the second comprises WW II alterations and a new concrete slab roof capped by a low rubble cone.

Materials

Phase 1

- Basalt;
- Concrete precast tie blocks;
- Lime concrete and mortar;
- Concrete slab base;
- Timber floor, now gone;
- Iron Fittings;
-

Phase 2

- Portland cement mortar and concrete;
- Concrete ring beam;
- Reinforced concrete roof slab;
- Coral rubble and mortar conical roof capping;
- Steel I-beams;
- Iron fittings;
- Whitewash.

Architectural Features

- Walls incorporating curved basalt ashlar;
- Iron I-beams supporting the cantilevered portion of the reinforced concrete slab roof;
- Conical rubble cap to roof,
- Large opening at the highest level;
- Windows blocked in WW II;
- Vents integral to the original basalt wall;
- Wooden first floor;
- Iron fittings for doors, windows, stairs or ladder.

Vent with bars. (02jv0922)

Special Architectural Features

The Tower shows a sequence of construction which conceal many clues to the pre-WWII period of occupation. Once the mystery unravelled, it could be explained to visitors and would add to the interest of a visit. Its past role as an Observation Tower could easily be adapted to that of a viewing platform.

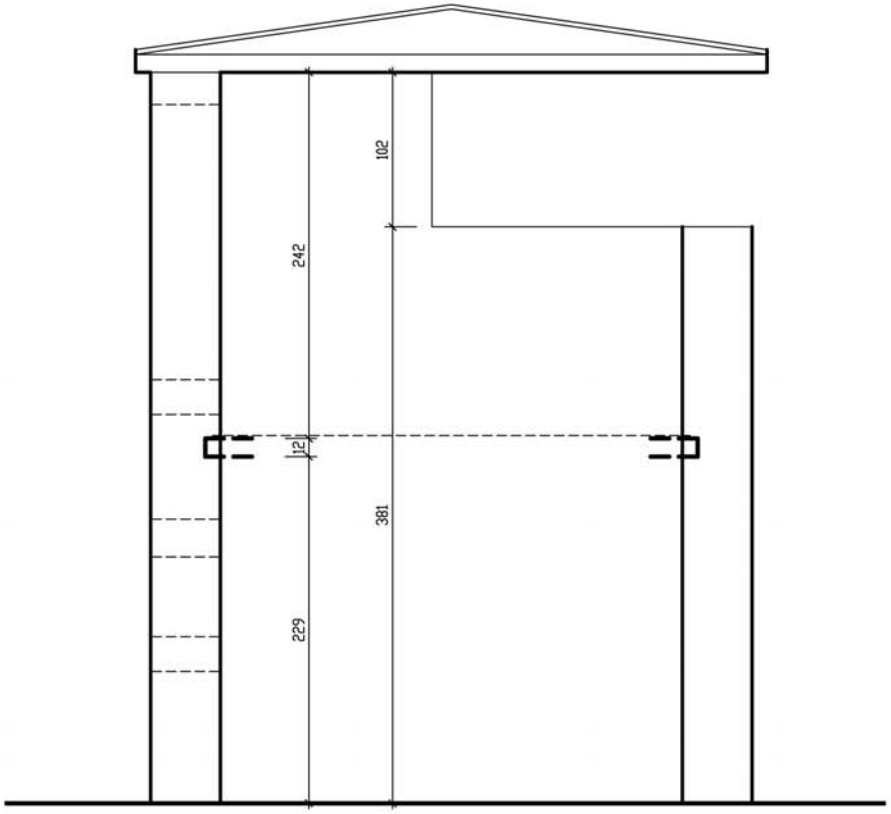
Concrete tie block over vent with traces of first floor timbers above. (02jv0920)

Traces of first floor timbers, blocked window and iron beam. (02jv0915)

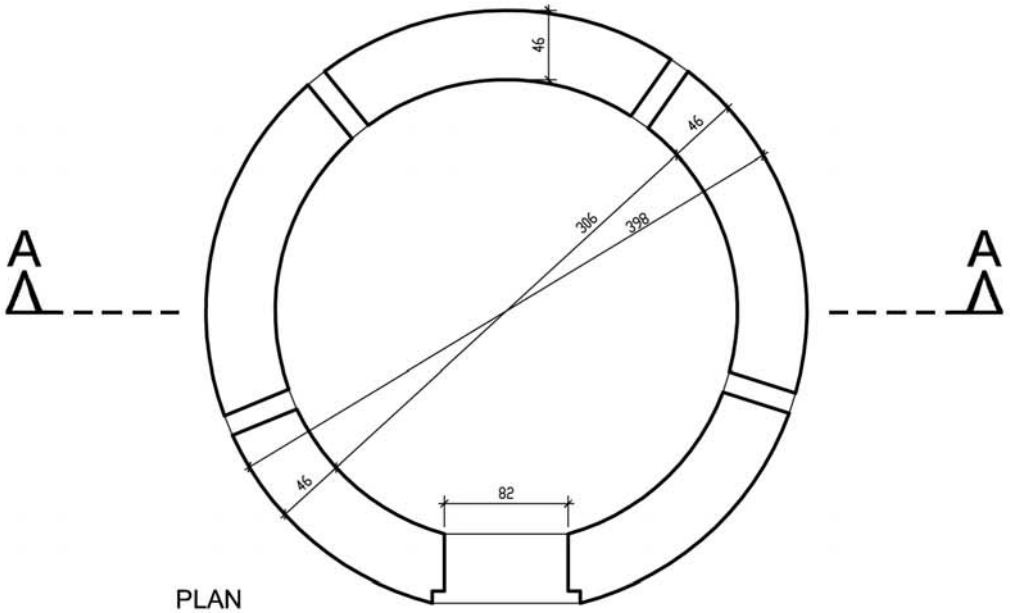
Dimensions

This circular structure with an external diameter of 3.06m and a floor to ceiling height of 4.83m comprised two storeys. Details are given below.

Description	***Dimensions***		*Area*	
	metres	**feet and inches**	**m^2**	**sq ft**
External diameter	3.98	13'	12.4	134
Internal diameter	3.06	10'	7.4	79.4
Floor to ceiling height	4.83	15' 10"		
Floor to first floor	2.41	8'		
Wall thickness	0.46	1' 6"		
Door	0.82 by 1.95 high	2' 8" by 6' 5"		
Window	1.02 high	3 4" high		
Vents	0.20 by 0.14	8" by 6"		
Tie blocks	0.23 by 0.23 by 0.46	9" by 9" by 1' 6"		



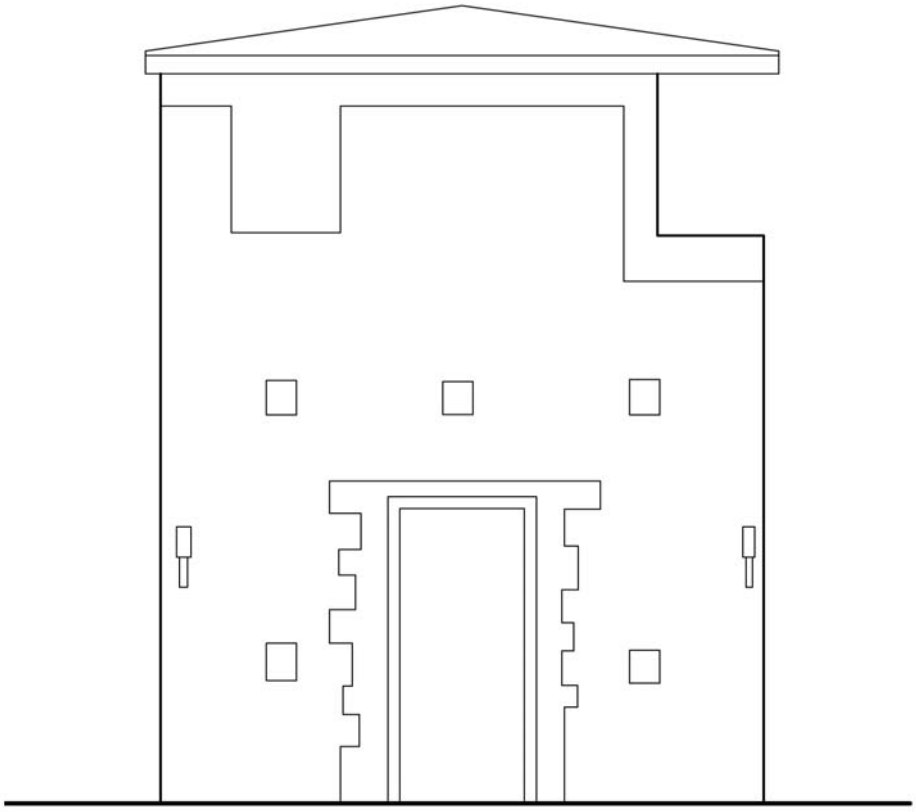
SECTION AA



PLAN

0 1 2 3 m

STRUCTURE 10 - OBSERVATION TOWER



FRONT ELEVATION

0 1 2 3 m

STRUCTURE 10 - OBSERVATION TOWER

Date

The Observation Tower was built after 1891 and before WW II as part of a new system that included the Central Building and the Western, Searchlight, Building.

Present Condition

The roof has partially collapsed, cracking the upper part of the wall which otherwise appears to be structurally sound. The wooden floor, at the first storey level, has been completely removed. Remains of iron fittings on the wall indicate the position of stairs or a ladder and other installations.

Recommendations

As it stands the Observation Tower presents a danger to visitors. The concrete roof slab and steel beams should be completely removed and a new roof erected. A number of alternatives for the new roof are possible and the choice will depend on the final scheme chosen for the adaptation of the tower to a new function. This is discussed in *Report 3; Management Development and Research: Recommendations and Proposals.*

A structural engineer must be consulted over the steps to be taken regarding the roof, especially if the concrete slab was to be partially removed as a temporary measure awaiting sufficient finances to implement the complete refurbishing of the tower,

THE CENTRAL BUILDING

The Central Building. (02cn0423)

Description

The Central Building, Structure 11, is located between the southern stretch of the Upper Battery and the Platform 13. There are two periods: the first, Room 1; is built of basalt ashlar with cement tie beams on a concrete slab; the second, WW II, period comprises Room 2, built of uncoursed basalt with hollow precast concrete corner blocks, alterations to Room 1 and a new reinforced concrete ring beam and roof. There is no direct communication between the two rooms, both of which were provided with a large WW II window.

Materials

Phase 1

- Basalt blocks;
- Uncut basalt;
- Lime concrete and mortar;
- Concrete slab base;
- Precast tie blocks;
- Iron fittings
-

Phase 2

- Basalt;
- Portland cement mortar and concrete;
- Concrete ring beam;
- Reinforced concrete;
- Precast hollow blocks;
- Iron fittings.

Architectural Features

- Basalt ashlar wall with precast concrete tie blocks in the third course from the floor;
- Uncoursed basalt wall with precast concrete corner blocks;
- Door in Room 1 with concrete jambs and lintel indicating a later remodelling of the first phase;
- Door in Room 2;
- Window in Room 1, remodelled to same size as that in Room 2 during the WW II period, with concrete sides filling up where basalt blocks were removed;
- Window, 149cm wide and 56cm high, in Room 2;
- Concrete ring beam;
- Single reinforced concrete roof slab;
- Small circular roof vent in each room.

Special Architectural Features

The Central Building was constructed in two distinct phases, each of which contains materials and stylistic characteristics which are of chronological interest.

Description	***Dimensions***		*Area*	
	metres	**feet and inches**	**m^2**	**sq ft**
Overall	7.50 by 5.51	24' 7" by 18' 1"	41.3	446.3
Room 1	3.14 by 3.22	10' 4" by 10' 7'	10.1	109.2
Room 2	3.05 by 4.55	10' by 14' 11"	13.9	150
Floor to ceiling	2.58	8' 6"		
Wall thicknesses Room 1 Room	 0.38 0.48	 1' 3" 1' 9"		
Door, Room 1	0.76 by 1.95 high	2' 6" by 6' 5" high		
Door, Room 2	0.92 by 2.01 high	3' by 6' 7"		
Windows Cill height	1.47 by 0.56 high 1.76	4' 10" by 1' 10" 5' 9"		
Tie blocks	0.30 by 0.30 by 0.38	1' by 1' by 1' 3"		
Hollow blocks	0.61 by 0.40 by 0.30	2' by 1' 6" by 1'		
Roof vents diameter depth	 0.15 0.27	 6" 11"		

Date

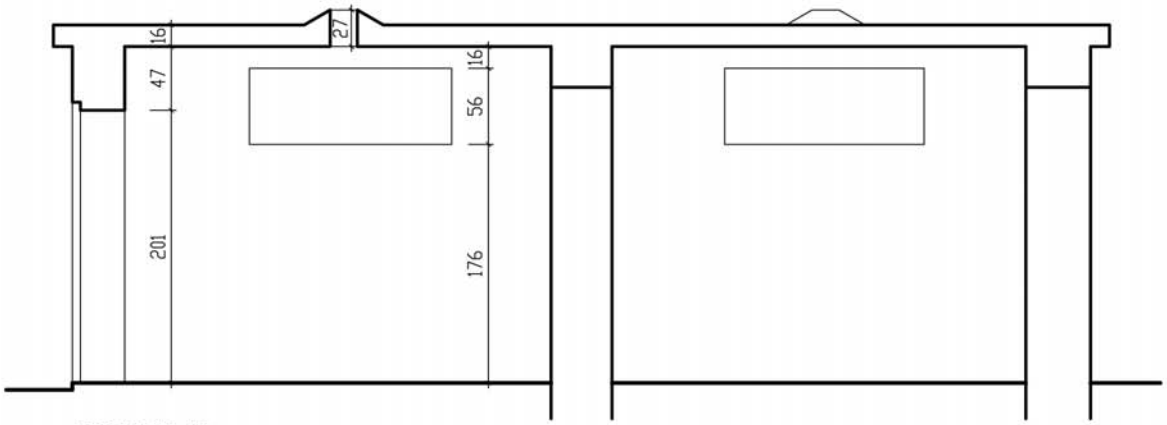
The first phase of the Central Building was built after 1891 and before WW II as part of a new system that included the Observation Tower and the Western, Searchlight, Building. In WW II a second, larger room was added and other alterations were made.

Present Condition

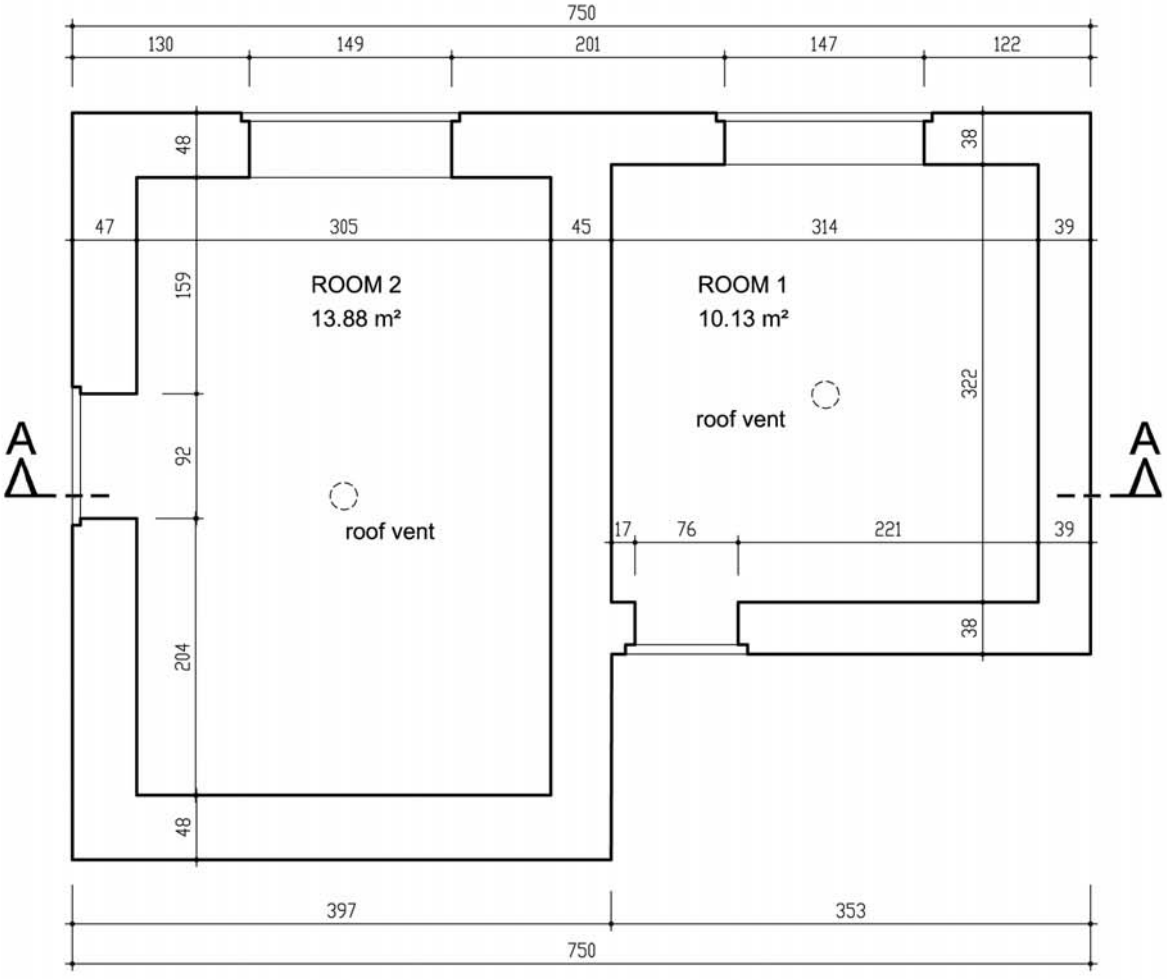
The Central Building is structurally in good condition.

Recommendations

Surveillance will ensure that further damage does not occur. There is a question over the strength and long term safety of the reinforced concrete roof. Expert opinion is required concerning the prevention of further deterioration of the reinforcement. The building could be refurbished, including the provision of doors and shutters, as suggested in the *Report 3; Management Development and Research: Recommendations and Proposals*.

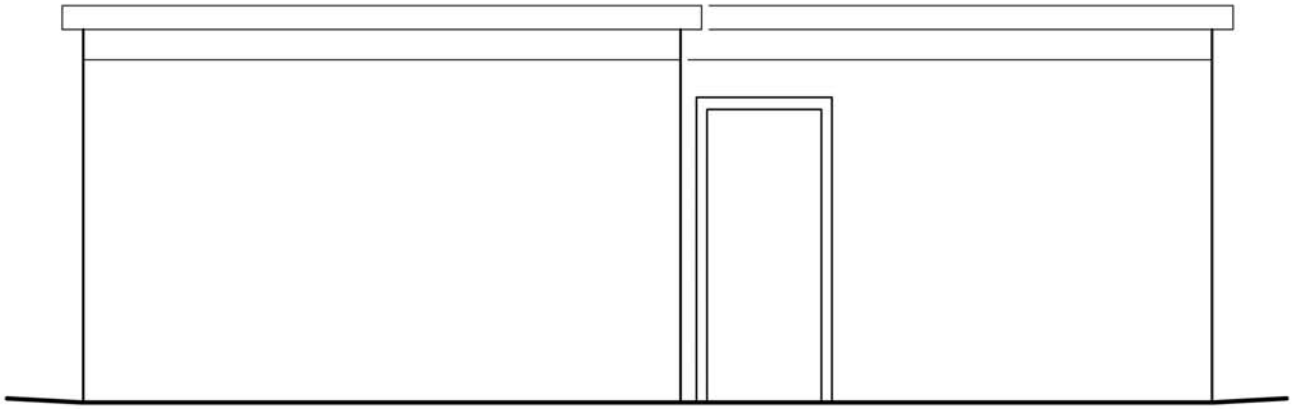


SECTION AA



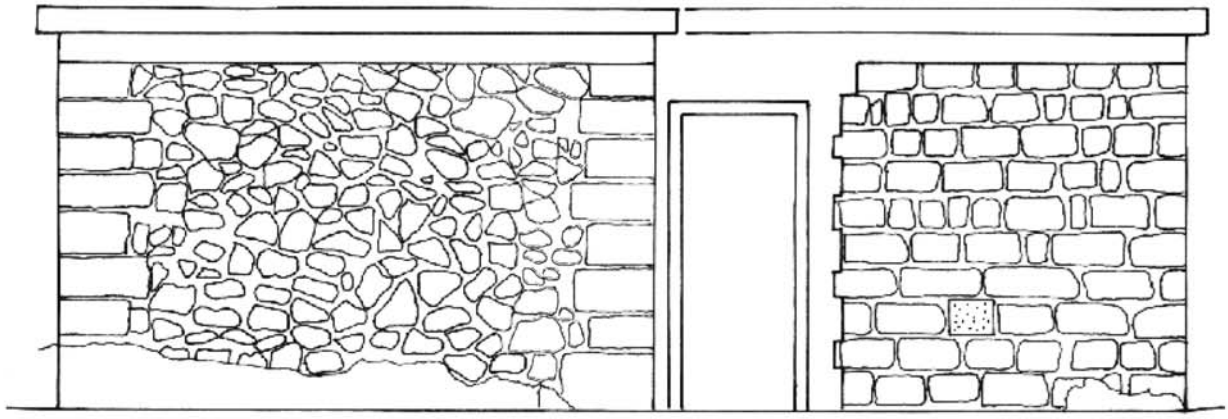
PLAN

STRUCTURE 11 - CENTRAL BUILDING



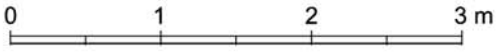
FRONT ELEVATION

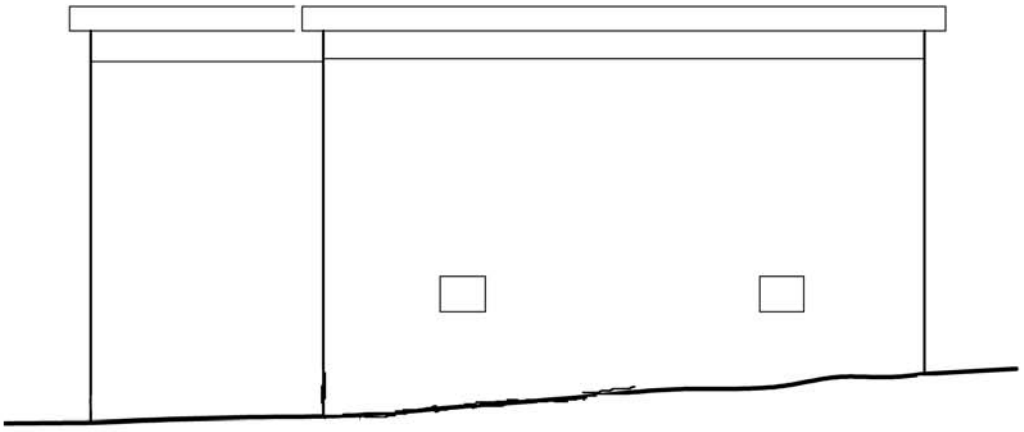
FRONT ELEVATION WITH PHOTO



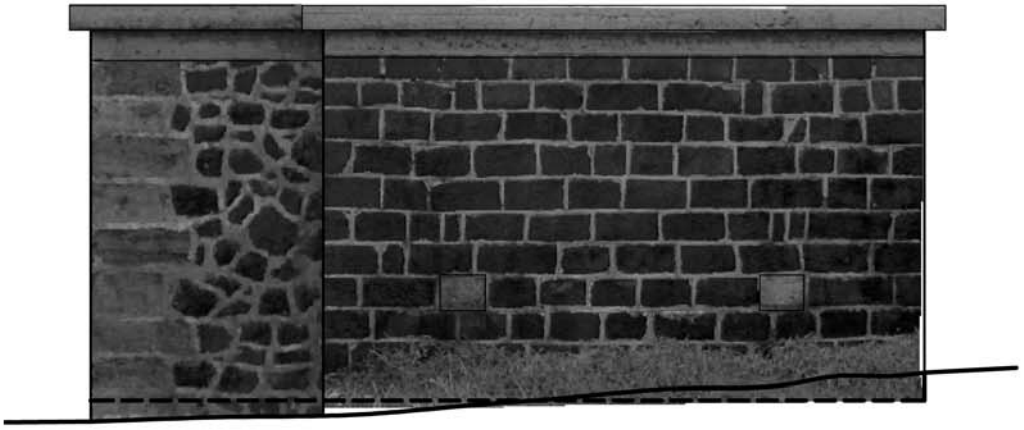
FRONT ELEVATION DRAWN FROM PHOTO

STRUCTURE 11 - CENTRAL BUILDING

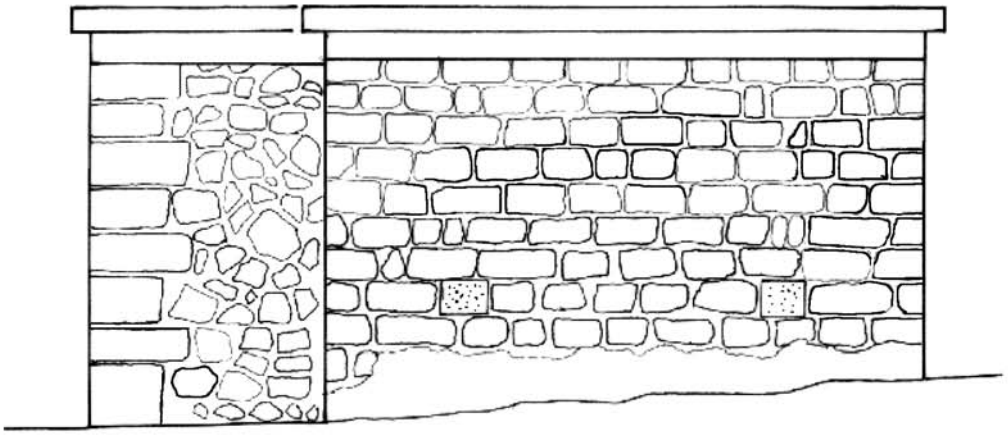




SE ELEVATION

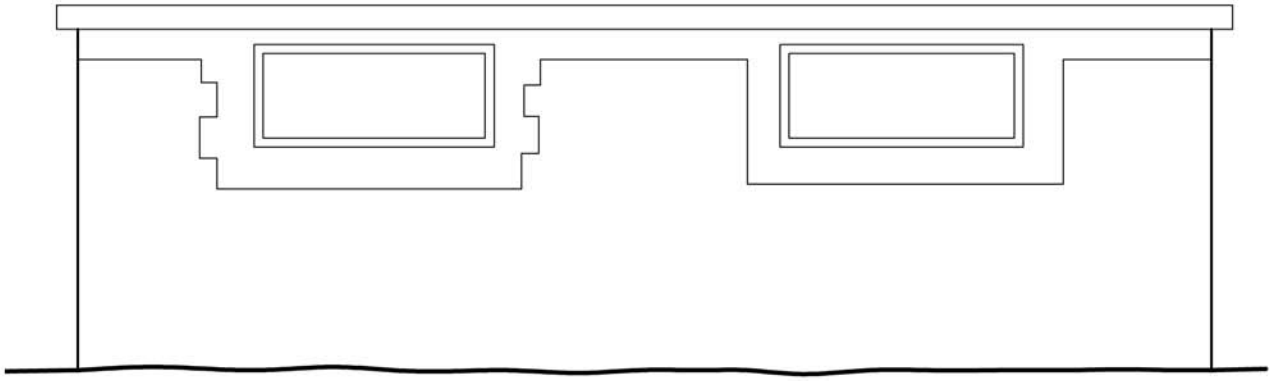


SE ELEVATION WITH PHOTO



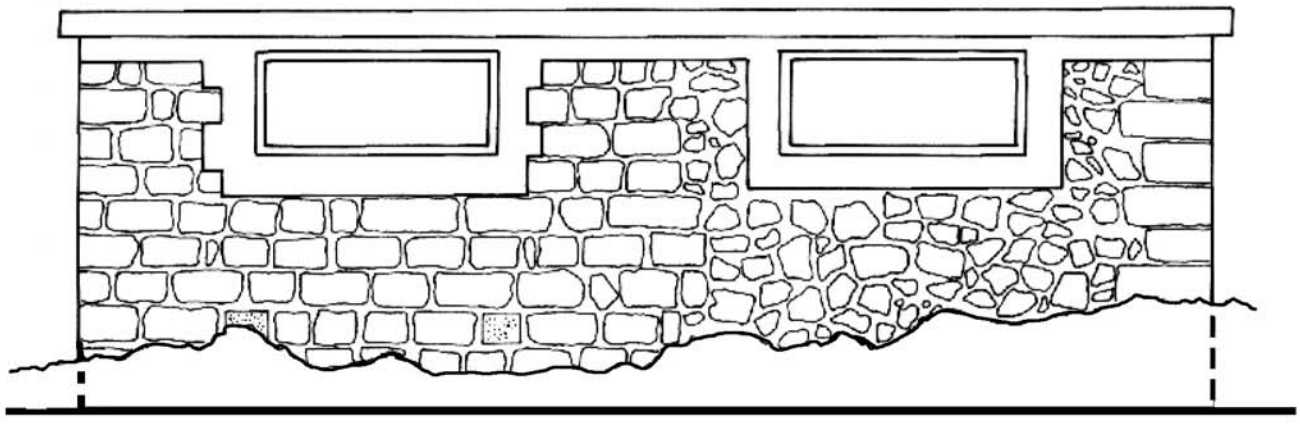
SE ELEVATION DRAWN FROM PHOTO

STRUCTURE 11 - CENTRAL BUILDING



REAR ELEVATION

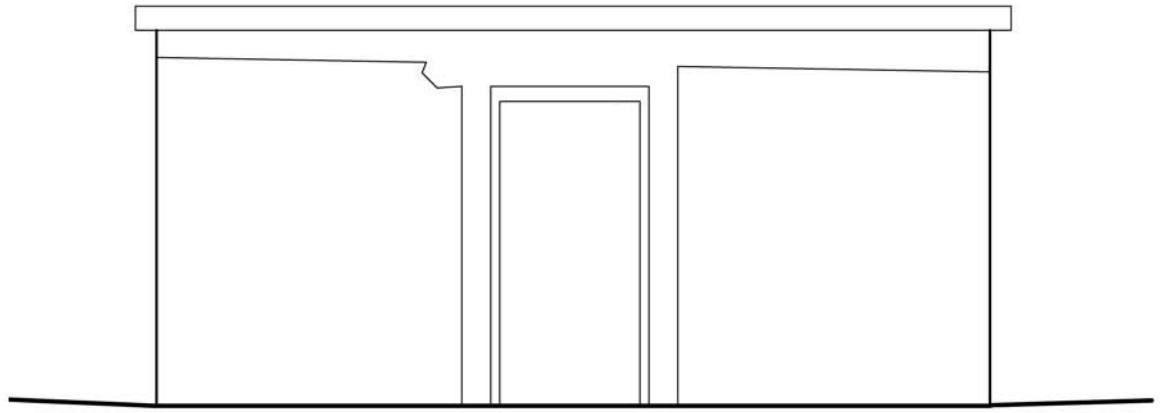
REAR ELEVATION WITH PHOTO



REAR ELEVATION DRAWN FROM PHOTO

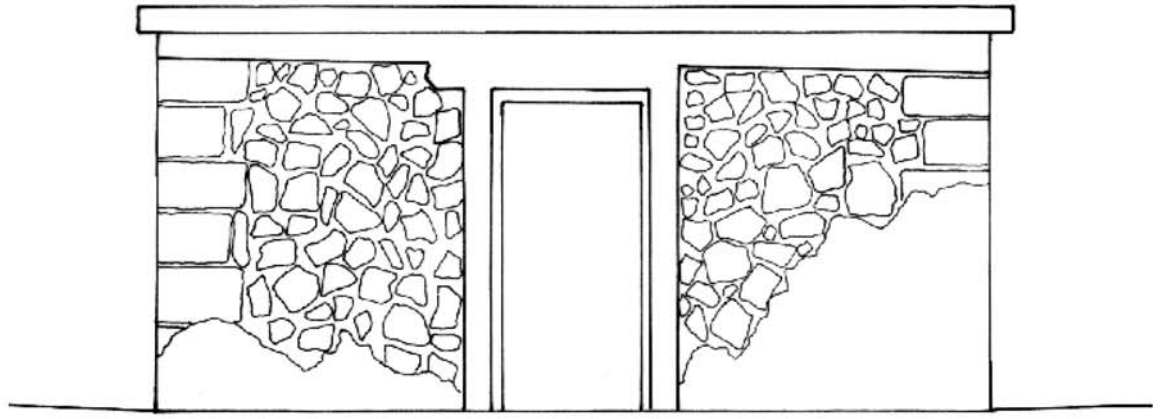
STRUCTURE 11 - CENTRAL BUILDING

0 1 2 3 m



NW ELEVATION

NW ELEVATION WITH PHOTO



NW ELEVATION DRAWN FROM PHOTO

STRUCTURE 11 - CENTRAL BUILDING

THE WESTERN OR SEARCHLIGHT BUILDING

The Western or Searchlight Building overlooking the pass. (02cn0427)

Description

The Western or Searchlight Building, Structure 12, is situated on the western edge of the island, overlooking the pass. It is a single storey building stone building with a lime concrete slab floor on a raised foundation platform of stone. There is an offset at the top of the foundation. WW II alterations include a reinforced concrete ring beam and roof, a concrete floor with inset electric cable ducts, adaptations to the windows and the addition of concrete steps. Room 1, comprising two intersecting rectangles of equal size, is at a higher level than the rest of the building. The three set back planes of the seaward elevation allows a wider angle of view over the pass.

Materials

Original

- Basalt ashlar;
- Uncut basalt;
- Precast tie blocks;
- Lime mortars and concrete.
-

WW II

- Portland cement;
- Reinforced concrete;
- Iron Fittings.

Architectural Features

- Basalt ashlar walls with concrete precast tie blocks;
- Doors leading into each room from outside, 5 feet wide double leaved;
- Door between Room 2 and Room 3, 2 feet 6 inches wide single leaf;
- Window in each room overlooking the pass, concrete blockage altering the original wide windows to narrow windows with sides angled to maximize the view;
- Small inclined vents in all walls, each with a basalt keystone;
- Concrete ring beam.

- Reinforced concrete roof slabs built with corrugated shuttering;
- Roof vents which may be related to the searchlight as would indicate the position of cable ducts on the floor;
- Cable ducts in all rooms;
- Concrete steps leading to all three entrances.

Special Architectural Features

The inclined vents are of interest and there should be a study focusing on their construction and function.

The precast tie blocks, also present in the Observation Tower and the Central Building, are taxanomic chronologyical indicators.

Description	***Dimensions***		*Area*	
	metres	**feet and inches**	**m^2**	**sq ft**
Overall (max.)	8.33 by 13.64	27' 4" by 44' 9"	61.5	664.0
Internal area			43.1	1129.7
Room 1			19.6	212.1
Room 2	3.22 by 3.47	10' 7" by 11' 5"	11.2	120.6
Room 3	3.55 by 3.47	11' 8" by 11' 5"	12.3	133.0
Floor to ceiling	2.45	8'		
Wall thickness standard Room 1, side Room 3 side	 0.40 0.34 0.46	 1' 4" 1' 2" 1' 6"		
External doors	1.55	5' 1"		
Internal door	0.75	2' 6"		
Windows	1.56 high	5' 1"		
Tie blocks (average)	0.23 by 0.23 by 0.40	9" by 9" by 1' 4"		
Cable ducts width	15.5 by deep 0.12	6" by 5" deep		
Diameter roof vent	0.15	6"		
Steps treads, room 1 tread, room 2 treads, room 3	 0.26 0.30 0.30	 10' 1' 1'		

Date

The Western or Searchlight Building was constructed, along with the Observation Tower and the Central Building, after 1891. Alterations were made in WW II.

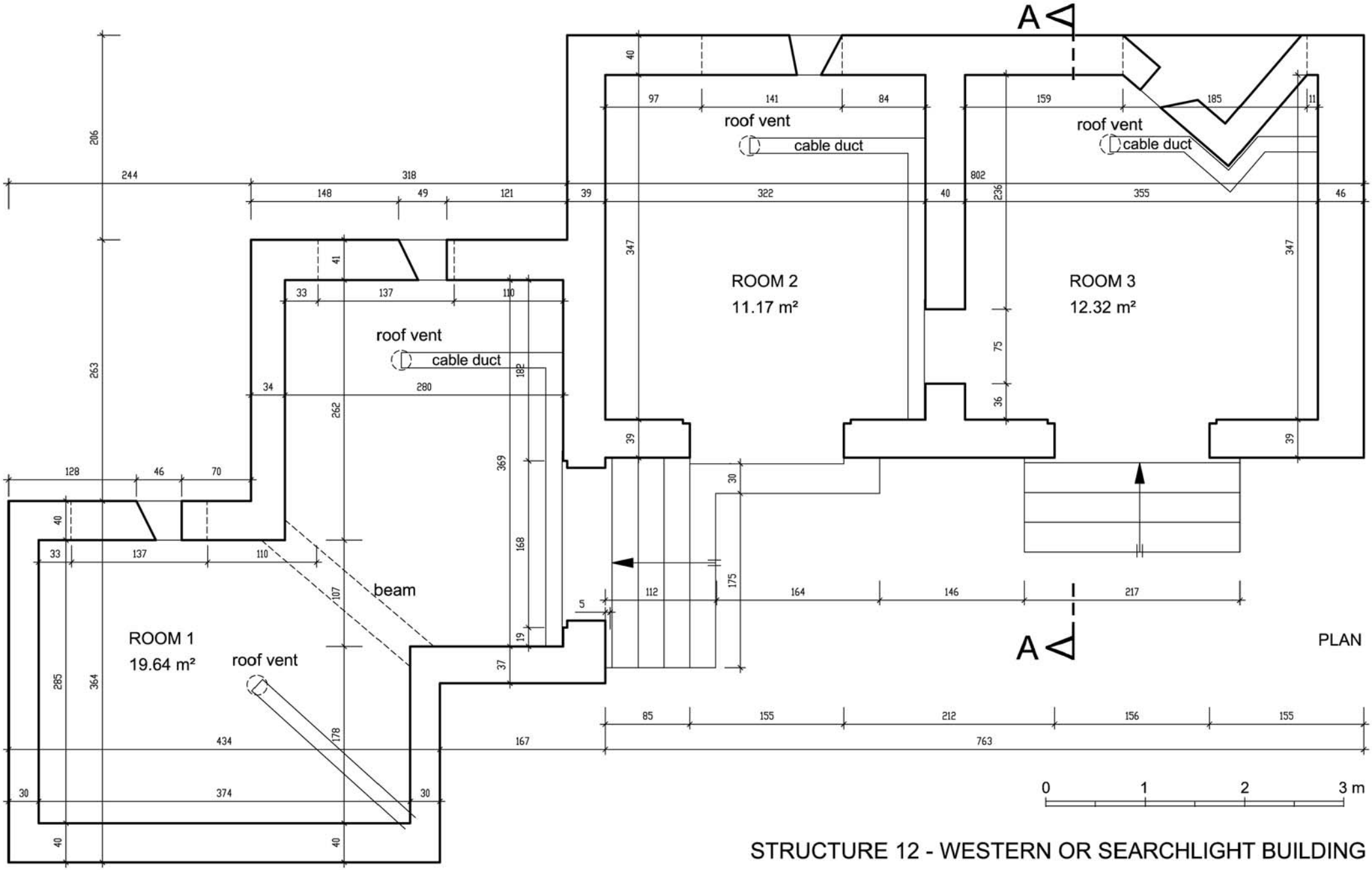
Present Condition

The walls appear to be structurally sound, although some of the blocks have been displaced over the inclined vents. The roof is in poor condition and some of the reinforcement has been exposed, showing advanced stage of corrosion.

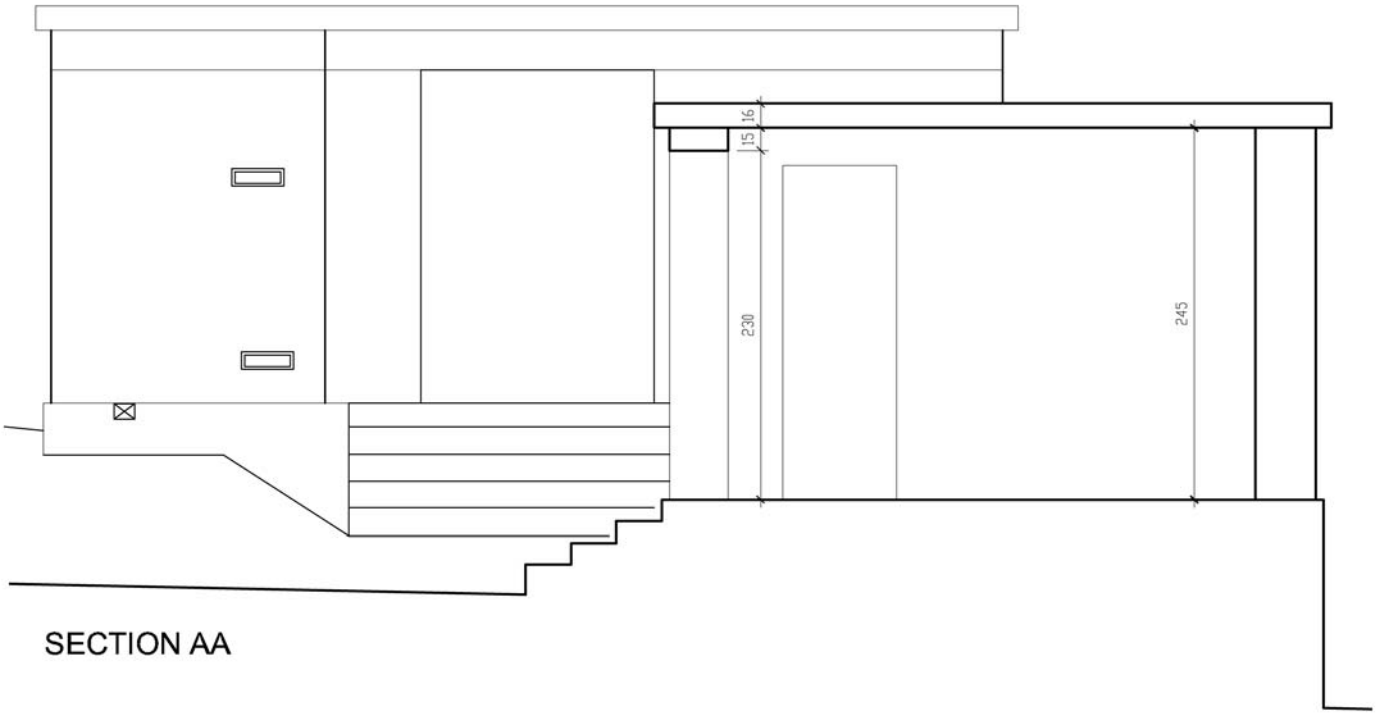
Recommendations

A structural engineer should advise on whether the roof has retained its structural soundness and can be repaired or whether a new roof is needed. Walls should be repaired and perhaps repointed when studies have defined an appropriate mortar, possibly a lime mortar.

The building could be adapted to a new function as discussed in *Report 3; Management Development and Research: Recommendations and Proposals*.



STRUCTURE 12 - WESTERN OR SEARCHLIGHT BUILDING



SECTION AA

STRUCTURE 12 - WESTERN OR SEARCHLIGHT BUILDING

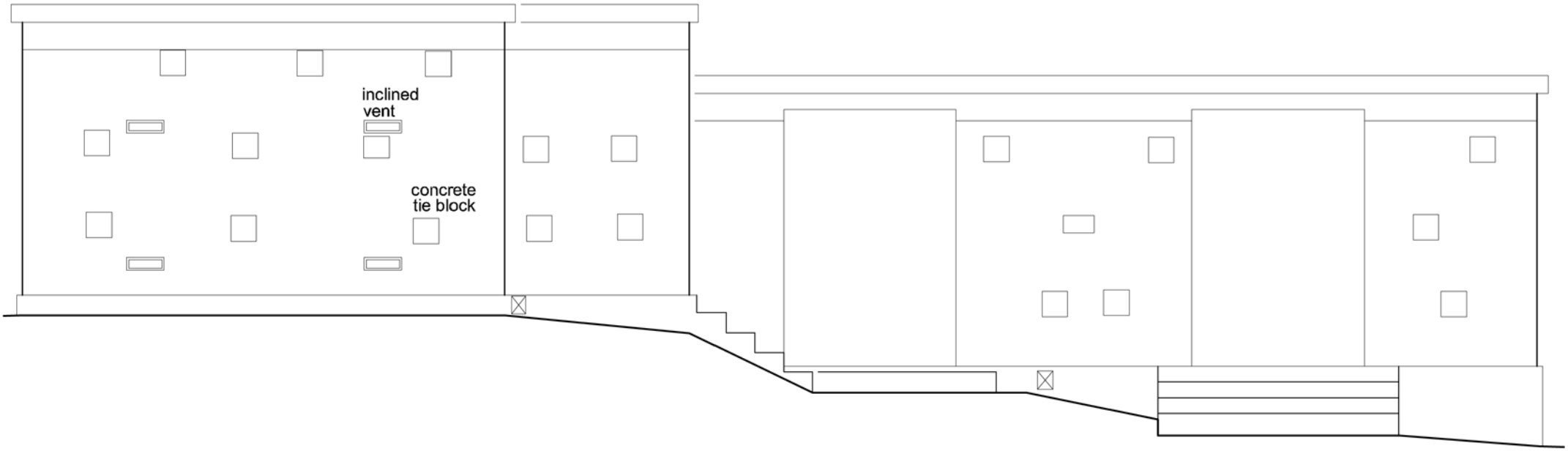
Concrete tie blocks and inclined vent.

A broken vent reveals construction details.

FRONT ELEVATION WITH PHOTO

STRUCTURE 12 - WESTERN OR SEARCHLIGHT BUILDING

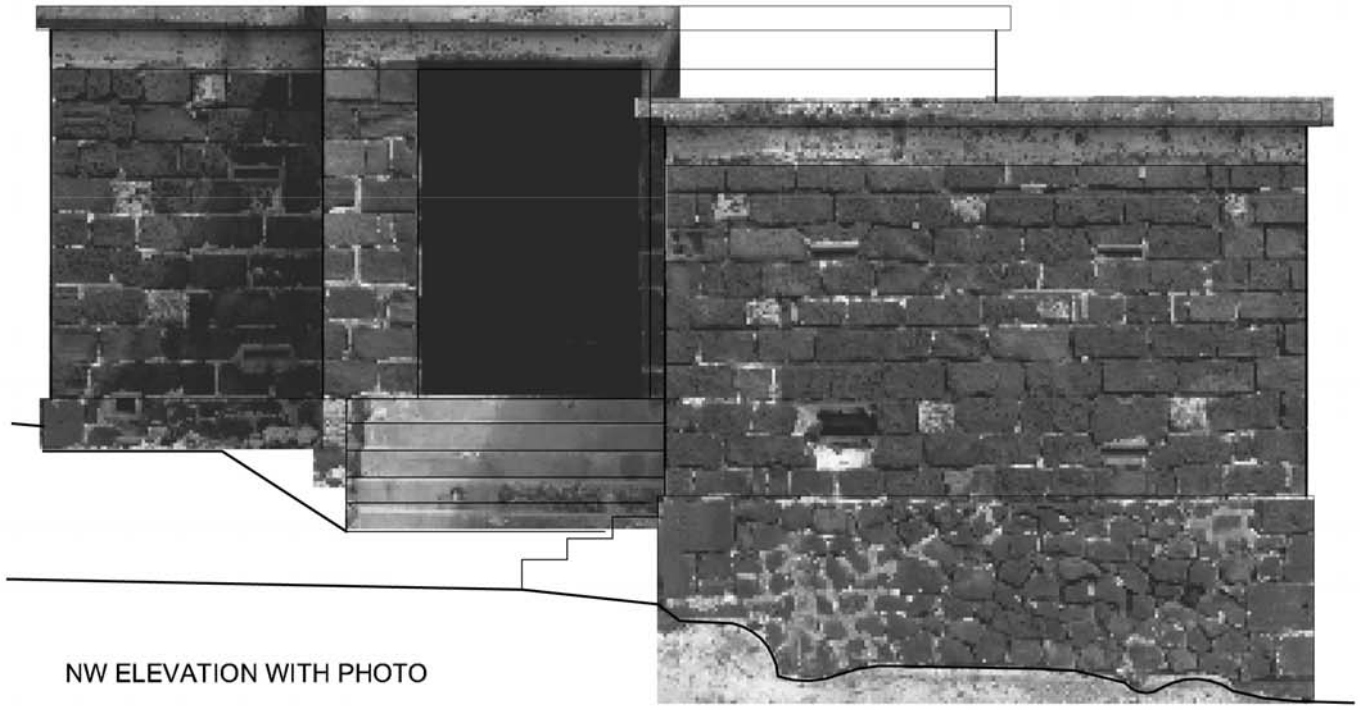
0 1 2 3 m



FRONT ELEVATION

STRUCTURE 12 - WESTERN OR SEARCHLIGHT BUILDING

0 1 2 3 m



NW ELEVATION WITH PHOTO

NW ELEVATION

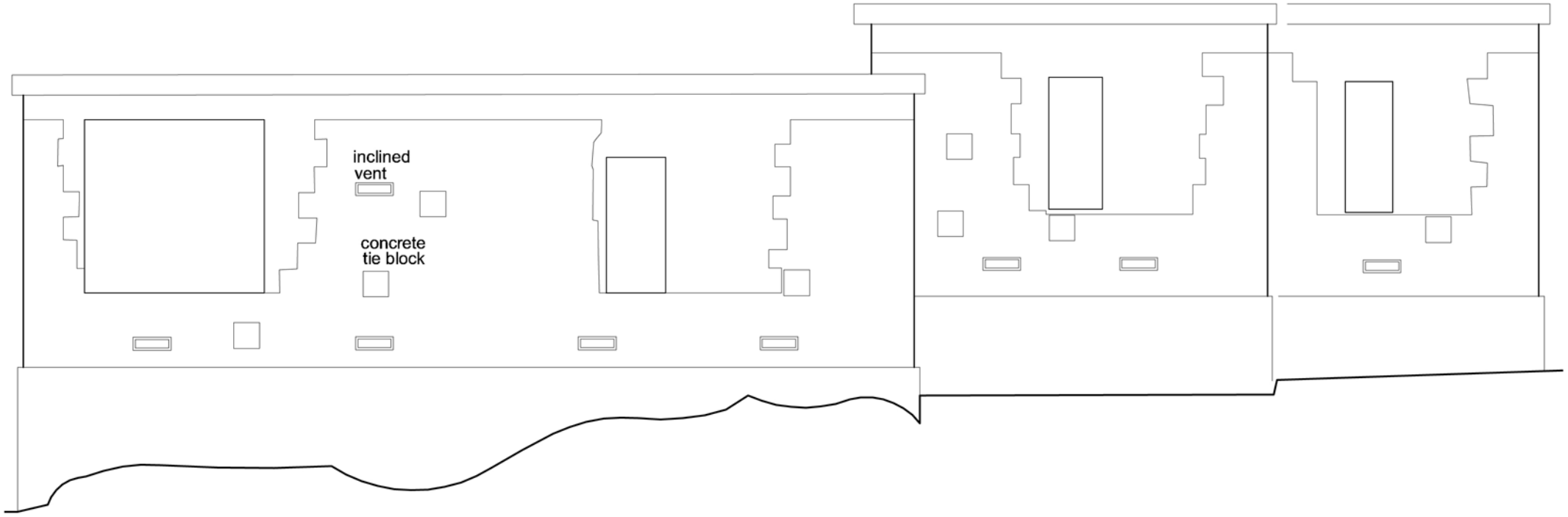
0 1 2 3 m

STRUCTURE 12 - WESTERN OR SEARCHLIGHT BUILDING

REAR ELEVATION WITH PHOTO

STRUCTURE 12 - WESTERN OR SEARCHLIGHT BUILDING

0 1 2 3 m

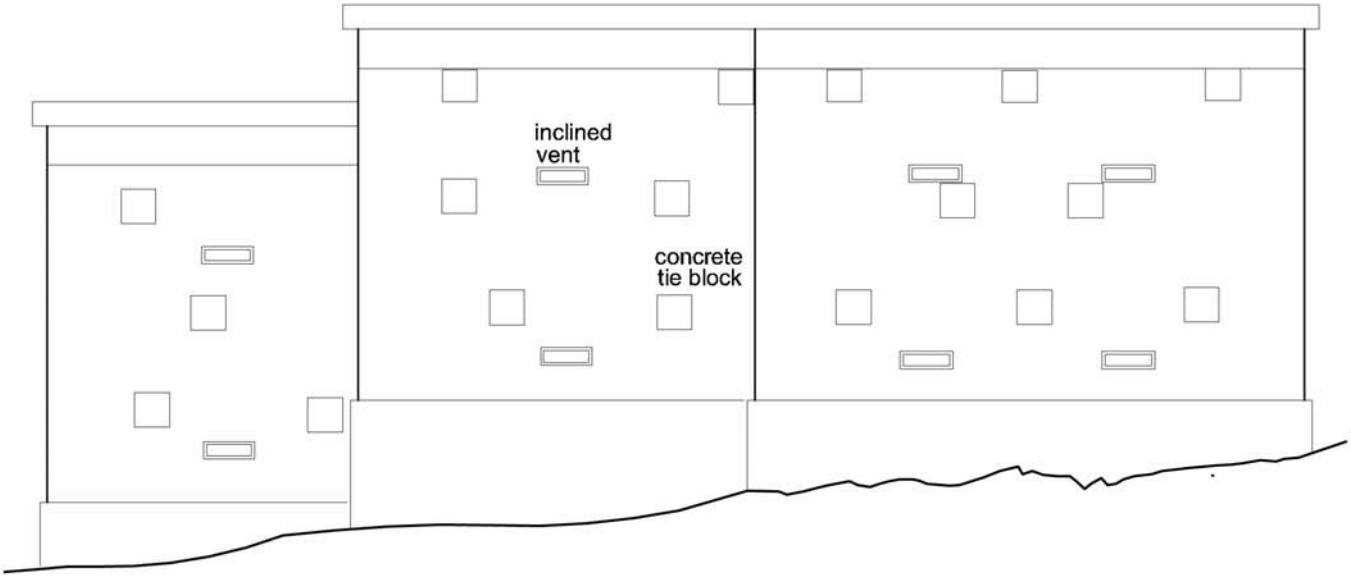


REAR ELEVATION

STRUCTURE 12 - WESTERN OR SEARCHLIGHT BUILDING

0 1 2 3 m

SE ELEVATION WITH PHOTO



SE ELEVATION

0 1 2 3 m

STRUCTURE 12 - WESTERN OR SEARCHLIGHT BUILDING

OVERVIEW

PROPOSED PLAN OF ACTION

Proposals and recommendations for future action are discussed in detail in *Report 3: Management Development and Research: Recommendations and Proposals*, but a plan of action regarding further architectural studies is outlined below:

1. Study by structural engineer to report on state of reinforced concrete roofs and walls;
2. Action to deal with the urgent matters, especially those concerning the safety of visitors;
3. Repair and restoration of buildings to prevent further damage and deterioration;
4. Further architectural studies to complete the documentation of all features;
5. Architectural proposals for the adaptation of selected buildings

GENERAL CONCLUSIONS

This Basic Architectural Study of the buildings on Ile de la Passe provides general descriptions, architectural drawings, and annotated digital images. The Report also describes the present condition of the standing structures and, where it was considered to be helpful, comments on safety and certain recommendations regarding conservation and restoration. The report thus forms a basis around which it will be possible to formulate specific programs for the sustainable development of this unique cultural asset that will both ensure the long-term preservation of the monuments and, at the same time, will make Ile de la Passe a focal point in the development and management of the islets of Grand Port.

The National Heritage Trust organised a visit to the island in January 2002. (02jv2301)