THE FLORIANA LINES

The Entrenched Bastion on the enceinte composed of St. Philip's Bastion, St. James' Bastion and St. Luke's Bastion.

'The Conservation of the Baroque Heritage'

Denis A. Darmanin

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Diploma in Baroque Architecture
International Institute for Baroque Studies,
University of Malta.
Tutor: Arch. Hermann Bonnici

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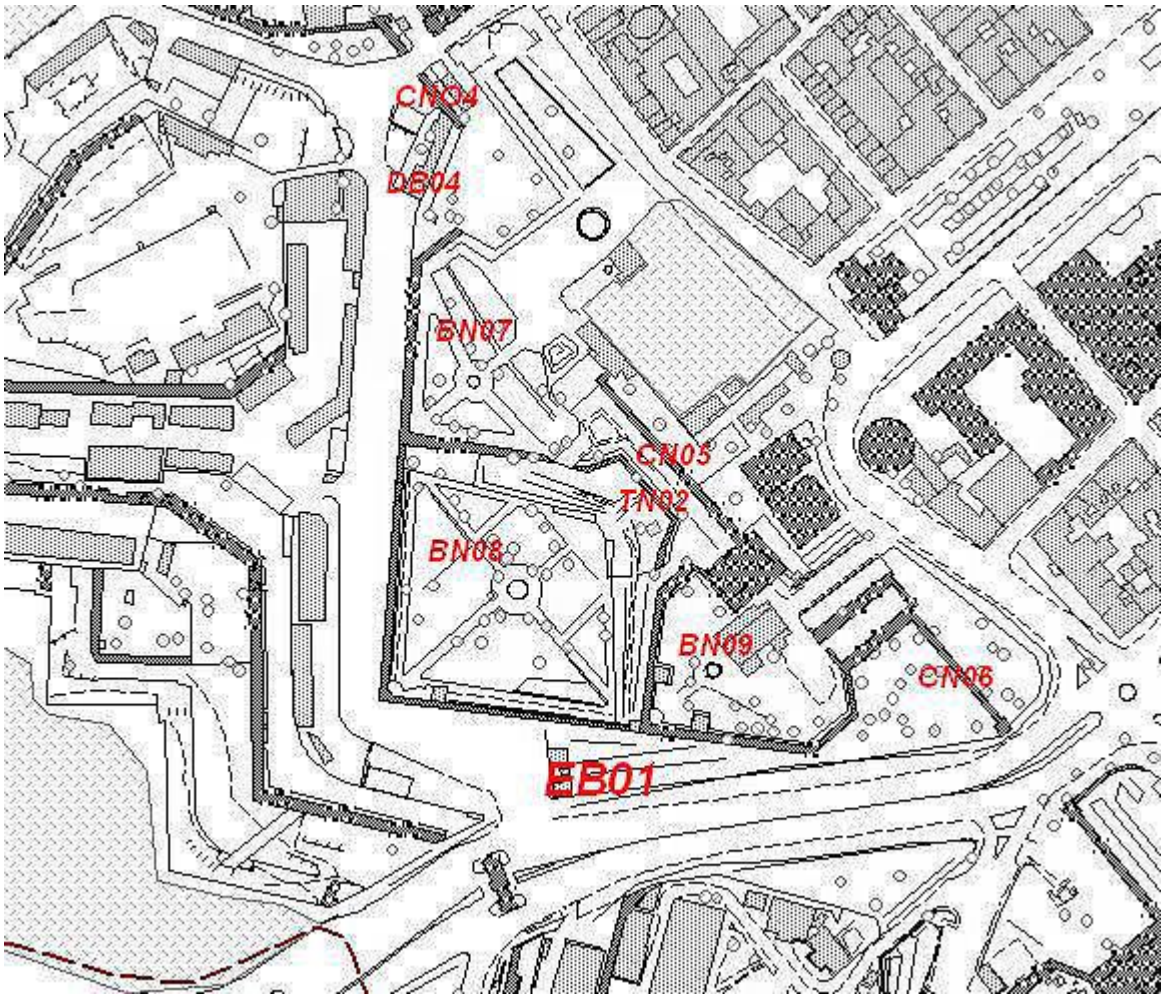


EB01 – Entrenched Bastion

LEGEND:

BN07 - St. James' Bastion (Argotti Gardens)
BN08 - St. St. Philip's Garden
BN09 - St. Luke's Bastion (Scouts' HQ)
DB04 - Demi Bastion
CN04 - Notre Dame Curtain
CN05 - Curtain
CN06 - St. Anne's Curtain

BRIEF HISTORY[1]:

The Floriana Lines were planned as an extended outer works to give additional protection to Valletta. The design was of the Italian military engineer Pietro Paolo Floriani, who was commissioned by the reigning Grand Master Antoine de Paule (1622-1636).

The main line of defence consisted of two large bastions and two demi-bastions, a *fausse-breye* that extended beyond the two ravelins, which was protected by four lunettes.

Fig. 1 Model of statue of Floriani by Chris Ebejer[2].

The horn-works and crown-works on the inner harbour area at Marsa were not designed by Floriani (1585-1638) but later in 1721 by Antonio Valperga, who also built the Cotonera Lines.

Little changes were made to the Lines when the British had taken over Malta in 1800. The next noted changes were obviously those made by the British between 1846 and 1859, mainly following the report on the state of the defences by Lieutenant Colonel JH Lefroy, RA.

[1] Spiteri S.C., ***British Military Architecture in Malta***, the author, Malta, 1996.
[2] http://www.freewebs.com/ebejerc/projects.htm

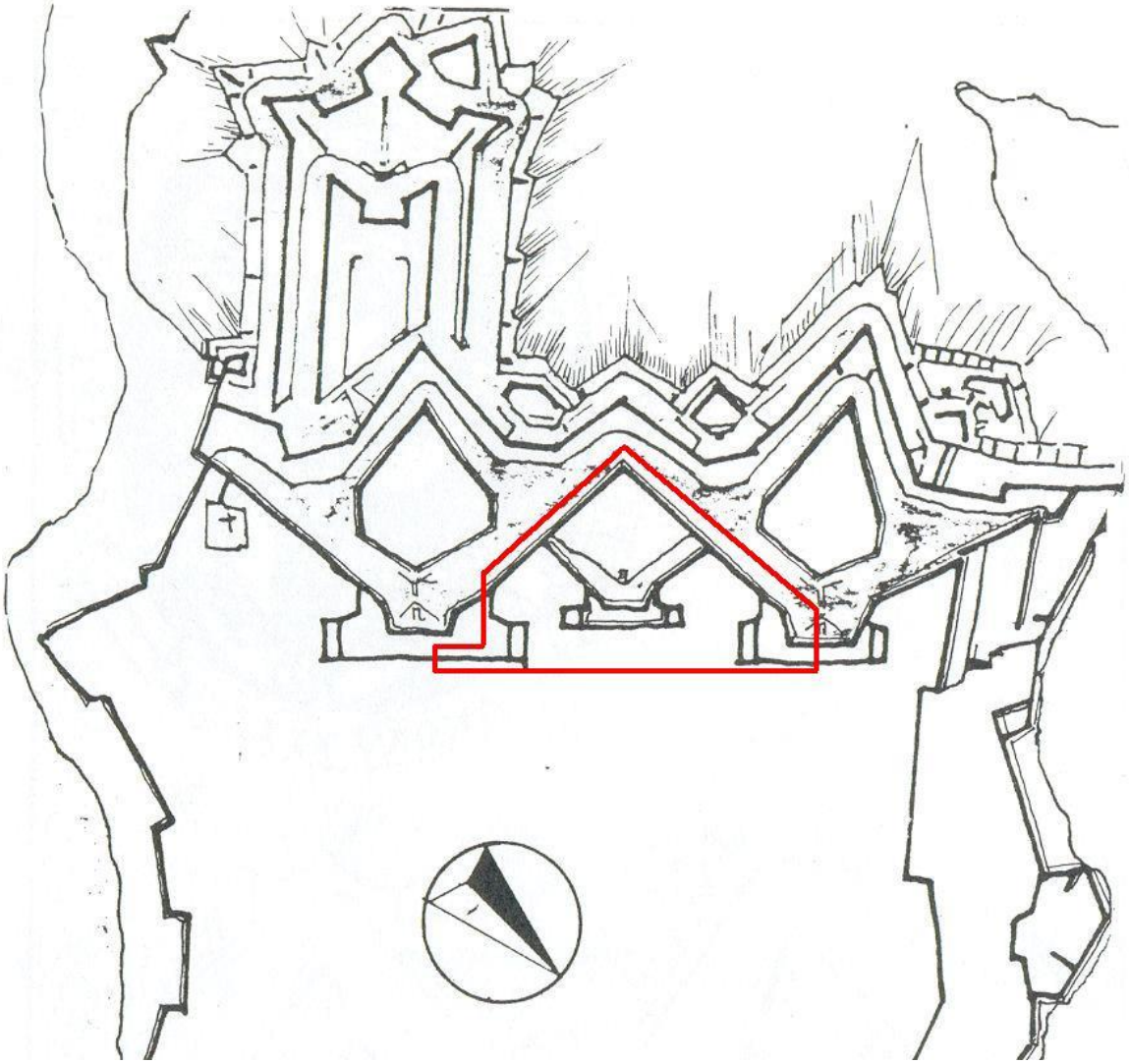


Fig. 2: Plan of the Floriana land front with entrenched bastion and sections of curtains being documented, outlined in red[3].

The most significant changes along the Floriana *enceinte* and which was slowly applied to most existing fortifications were the changing of the parapets to accommodate the new traversing carriage. This change introduced an important feature in the construction of the embrasures; the stepped or toothed quoins, which rendered the faces and flair more withstanding to the terrific vibrations cause when firing the guns and structural durability if bombarded.

[3] Spiteri S.C., ***British Military Architecture in Malta***, the author, Malta, 1996.

THE ENTRENCHED BASTION [4]:

The subject of this documentary study is the entrenched bastion in the centre of the Floriana landfront outerworks. Prior to the construction of the hornworks, this part of the enceinte was the bulwark of the defences; flanked by two demi bastions on each side, two ravelins and further outerworks.

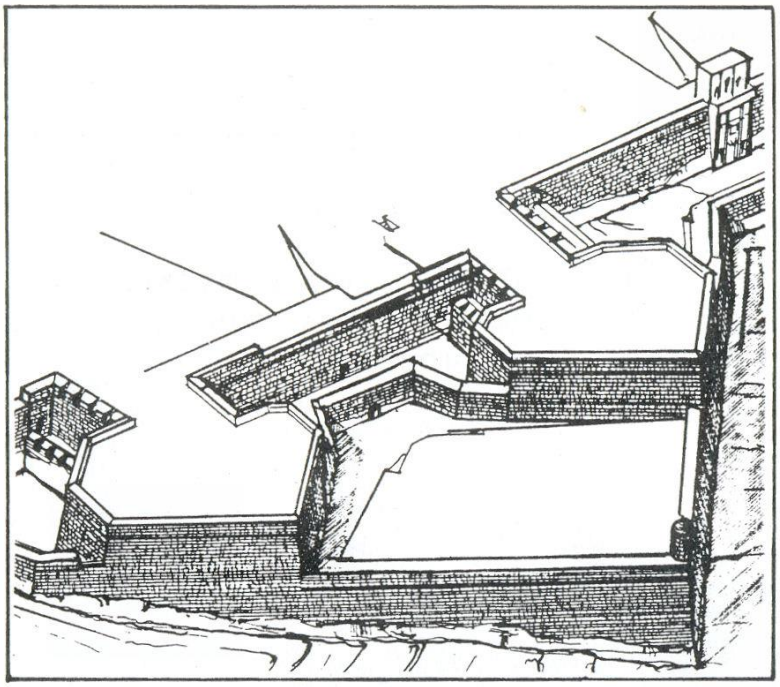


Fig. 4: Drawing of the entrenched bastion without embrasures[5].

This large centre-bastion consists of three bastions; St. Philip's which is at the salient, St Luke's and St. James'; the latter being higher to offer second tire of defences and cover to St. Philip's Bastion. The entrenched bastion projected from St. Anne's Curtain to the left and Notre dame Curtain to the right. Both these curtains had ornate Baroque gates which were demolished; St. Anne's in 1879 and Notre Dame in ……

[4] Spiteri S.C., ***Fortress of the Knights***, Book Distributors Ltd., 2001
[4] Spiteri S.C., ***The Knights' Fortifications***, Print Services Ltd., 1990

St. Philip's Bastion is separated from the other two bastions by means of an entrenchment; a ditch within the bastion complex itself, having a Bastionated tenille to protect the curtain and sally port at centre of the un-named curtain.

Each of the higher bastions was also armed with four piazze bassi; two for artillery of the outer flanks and two for musketry on the insides to cover the sally port.

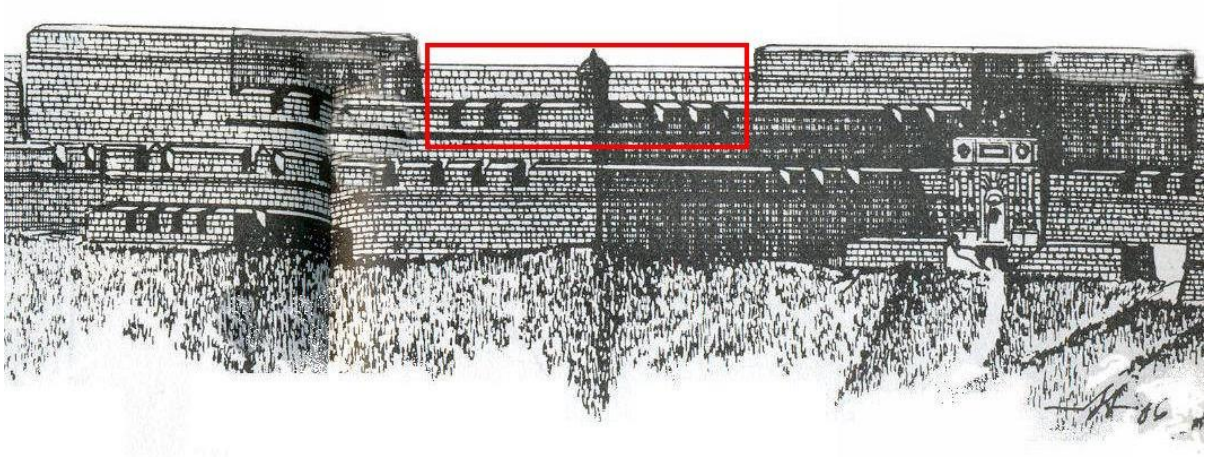


Fig. 5: Section of the Floriana land front with the entrenched bastion at centre and Portes des Bombes to right. Note échauguette and six embrasures framed in red[6].

As already stated, the entrenched bastion was included in various structural modifications for military purpose made throughout the years, especially during the first half of the 19th century. In 1774, the Bailiff the Order of Fra Ignatius de Argote constructed a botanical garden and herbarium, since known as *Argotti* Gardens. Although retaining their strategic importance, the next alterations came when the bastions were converted into gardens in 1848. Other changes were made when various buildings were erected at the rear by the road, as well as a tunnel for passage by the Malta Railway was excavated under the entrenched bastion and the Floriana station exited through the gorge behind the tenille. The last major changes were made after the Second World War, when sections that were damaged or destroyed by enemy bombs were rebuilt; some not faithful to the original.

[6] Spiteri S.C., ***The Knights' Fortifications***, Print Services Ltd., 1990

THE 'MALTESE STONE' - COMPOSITION AND DETERIORATION[7]:

Malta's three main types of stone are the Upper Coralline Limestone, Globigerina Limestone and Lower Coralline Limestone, which are found in this order with Greensand and Blue clay in between.

Globigerina limestone is of a sedimentary origin, which was formed under the sea from sand and calcareous deposits and is relatively a 'young' stone. Lower Globigerina Limestone is the primary building material in Malta. The intensive use of this limestone in most buildings, vernacular architecture and monuments on this island is due to the availability of this type of stone and that is so easily quarried. Most of the prehistoric temples, fortifications and dwellings are all built of this fragile stone. The island's majestic Baroque palaces and churches, as well as the kilometres of fortifications which have been standing for hundreds of years are now showing considerable damage.

The weathering process of this tertiary limestone in general has been explained as a sequence of steps, from the formation of a thick and compact superficial crust, to the loss of this crust, to the initiation of alveolar weathering. This alveolar weathering assumes frequently extreme dimensions. As a consequence of the marine environment of in which Malta stands, salt crystallization in the stone's pores has been recognized as main weathering process responsible for the deterioration of the buildings and monuments, due to water entering the stone's capillaries and helping the salt crystals to grow and from pollution. Deterioration is a continuous process even if the stone is in a favourable environment. This is generally in the form of powdering, flaking, alveolar decay, weathering and erosion. In damp internal locations, the effect can be of crystallisation by the salt on the exterior of the stone and various forms of biological growth.

[7] Course notes by Arch. Hermann Bonnici – Diploma in Baroque Architecture, UoM, 2008.

ANALIYTICAL RECORDING OF DETERIORATION:

The deterioration of the entrenched bastion is ongoing and has been so for over a century. The masonry element of the entrenched bastion as built by the Order of St. John was not greatly altered by the British. Their first major changes were all concentrated on the parapets; both to totally remove existing embrasures and the échauguette on the salient of St. Philip's bastion and erecting supporting magazines/artillery stores, and to alter existing rear embrasures to accommodate traversing guns and carriages. Other structural were the gate system of the sally port leading to St. Philip's Bastion and the new magazine and mortar battery at the gorge of the same bastion.

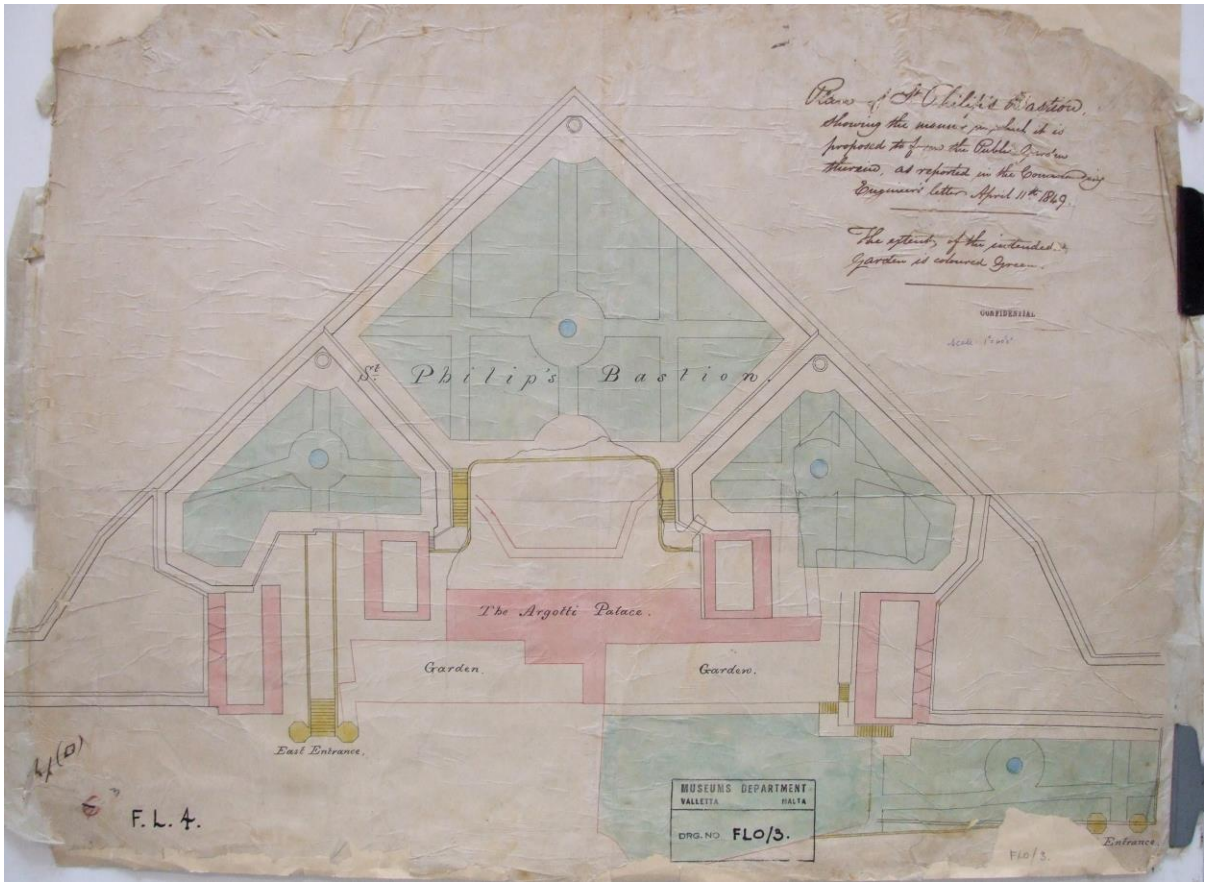


Fig. 6: Plan of the garden system intended for the three bastions in 1848[8].

[8] Floriana: FLO/3, National Archives of Malta.

DESCRIPTION AND DETAILS OF DETERIORATION:

These descriptions are in accordance and sequence of the Excel Spreadsheet, the corresponding Word Documents and their photographic folders. However, due to the size and diversity, as well as comparable deterioration throughout the entrenched bastion, repetitiveness is being avoided.

St. Philip's Bastion

The scarps of St. Philip's Bastion consist of a lower section of rock-hewn limestone, with the remainder being masonry blocks of various sizes. The parapet and cordon are likely an early 19th century modification, considering that the original trace built by the Order had three embrasures and an échauguette at the salient (Fig. 5). The same applies for the right scarp.

The sections of rock-hewn scarp emerging from the ditch are badly deteriorated due to composition differences in strata and formations, especially where fissured. Their principal deterioration is powdering due to weathering and salts, however, some of the strata is breaking and crumbling either due to the mass and weight that it is supporting or because the deterioration process here is quicker than in the rest of the surrounding rock due to the rock being much friable. There have been a number of interventions in the past, mainly the use of masonry blocks to occupy the void left by the deteriorated fabric.

The masonry blocks are also in an advanced state of deterioration, mainly due to their age and location. Although many of these blocks were likely to have been quarried on location and have lasted for so long, they have long been showing signs of powdering, alveolar erosion, exfoliation and cracking. Other deterioration is caused by the growth of capers and other shrubs in the mortar joints. Many of the mortar joints are void of any pointing.

Fig. 7: The salient end of St. Philip's left scarp.

Fig. 8: Fragmented rock strata on left scarp.

Fig. 10. Crumbled masonry on left scarp.

Fig. 11: Delamination, powdering, crust and growth.

Due to being very close to Portes des Bombes, this scarp receives and high amount of pollution from vehicular emissions, resulting in black encrustation which covers a large percentage of the surface area. This form of pollution was previously due to the fortifications' proximity to the grand harbour and the soot omitted by ship's chimneys and the post war power station at Marsa.

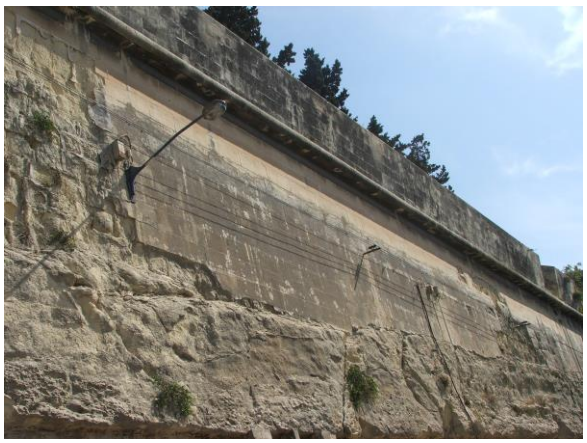


Fig. 12: A replaced section of the left scarp and parapet showing algae growth and encrustation. Or was this section damaged during WW2?

Fig. 13: The heavily encrusted right scarp.

Similar deterioration is much evident on the right scarp, which on the other hand faces the strong North Westerly winds. The masonry and rock-hewn elements do not have as much as a deteriorated surface as on the left scarp, but they have a higher concentration of deposits and encrustation. This could also be because this side only has about a third of the face composed of masonry. The stone blocks can be noted as well into the stage of loosing their patina and delamination is evident in many parts; to the extent that it is quite possible that the skin and patina are detached from the rest of the stone.

Fig. 14: Rich deposits of encrustation on the right face, which has fallen where the stone or rock is powdering.

Fig. 15: Faster deteriorating weaker strata and accretions on the rock-hewn lower face.

The parapet and cordon are a later replacement and their masonry is more recent and just as subject to the same conditions.

The cordon, parapet and embrasures are less effected by powdering and similar deterioration, possibly because they are replacements of the originals. Another contributing factor could be that being easily accessed, they were regularly maintained by the former DOE Maintenance Unit[9].

Fig. 13: Black crust and growth on parapet and cordon and accretions on scarp.

Fig. 14: Algae growth and encrustation within the parapet and gun-ring set in upper coralline limestone.

Another cause of deterioration is being caused by the viewing platform constructed on the salient point where the former en-barbette, sliding carriage gun was located. The gun platform, expense magazine and the side of the magazine/artillery store have been covered by this accretion. The fill inside the platform is serving as water catchment and the moisture in penetrating into the parapet's and magazine's masonry.

At some particular time, most of the banquette around the parapet was removed and replaced by flower beds. Apart from no impervious material having been placed between the fill and walls, trees were planted that have now grown and their trunks

[9] DOE (Department of Environment) Maintenance Unit. A unit of civilian employees employed by the British Services with an annual budget of £Mlt 1,000,000, and were responsible of continuous maintenance of the fortifications. Their HQ was at the former RE's Depot in Vittoriosa. They were disbanded in 1979.

protrude from the corner of the parapet's base and the ground. It is obvious that both the trunk and roots are causing damage. The exposed stone that remains from the banquette is powdering in most places.

Fig. 15: Concrete and other accretions along the parapet and inside the expense magazine.

Fig. 16: The remains of the banquette and trees growing in such a delicate location.

There are two embrasures at the rear of each side of the parapet on this bastion. They are located just before the gorge. Although the embrasures and merlon on the left flank also have a banquette, its masonry somehow doesn't look as 'old' as the surrounding masonry.

Fig. 17: The two left embrasures with the only section of banquette.

Fig. 18: The two left embrasures hidden behind trees.

Fig. 19: Rear showing algae growth.

Fig. 20: Algae and lichen growth on parapet well as accretions and slight breakage.

Fig. 21: Cheek of the second embrasure with as algae at upper and external levels and breakage.

Fig. 22: broken and crumbling stone and cheeks caused by rusted safety mesh.

Fig. 23: Right embrasures heavily encrusted with lichens and algae.

The two embrasures on the right are not exposed to traffic as much as those on the left but are also suffering their share of deterioration. The cheeks are heavily encrusted with pollution and also bio-deterioration. Algae and lichen growth is very evident on all the masonry features. The metal mesh once placed for safety has rusted and caused the thin stone at the opening of the crenellations to break. One mesh has fallen off its stays.

Fig. 24: Broken stone due to rust expansion and early alveolar decay.

Fig. 25: Alveolar decay, black crust and growth on cheek.

The banquette on the left side looks quite later than the rest of its environment but no records of its construction were located. Some of the stones are large and of the same measurements as the parapet. Algae growth is very evident, even on the pozzolana floor, while pollution is always evident.

Figs 26 and 27: The banquette with heavy deposits of encrustation, algae, lichens and some growth.

Two batardeaux are located in the ditch that separates St. Philip's Bastion from the other two higher bastions at the rear. The one on the right is badly buried close to its apex in soil and other garden waste that was dumped in this section of the ditch and in which trees have grown.

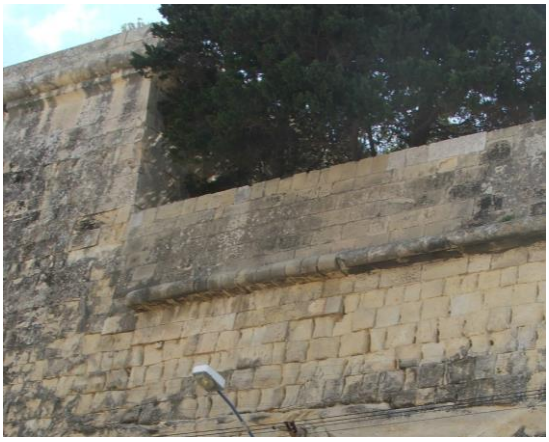


Fig. 28: Powdering and bio-deterioration on the external face of right batardeau.

Fig. 29: Trees growing in gorge by batardeau. Heavy powdering and voided mortar joints.

The batardeau on the left face has been partially altered. A machinegun post was erected on its rear section abutting St. Luke's Bastion. There is also a dame in the middle which is uncertain whether this is also an original British addition or erected when the machinegun post was built. The roof is made of reinforced concrete. Some algae were noted on the edge of the apex but it's mostly covered with lichens and fungi.

Fig. 30: Face section of left batardeau.

Fig. 31: Lichen and fungi on the internal slope.

Fig. 32: Lichen and crust on dame.

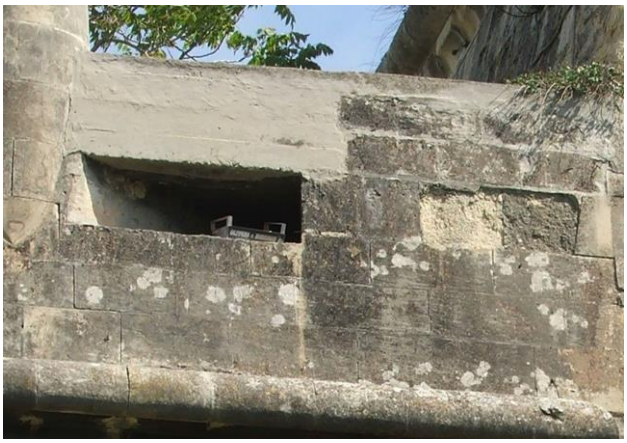
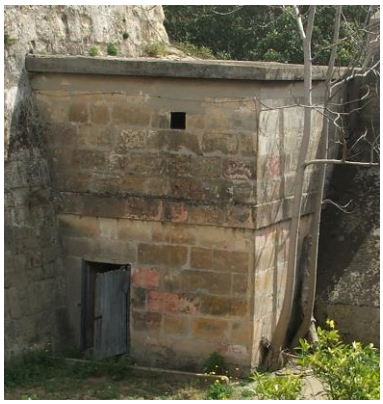


Fig. 33: Black crust, lichen, algae and delamination on face of machinegun post




Figs. 34 and 35: Machinegun post structure showing Lichen, algae and fungal growth.

There is only one magazine on this bastion, situated along the left parapet. Many of the masonry blocks at front have shifted due to plants and their roots.

Fig. 36: Magazine with growth and open joints.

Fig. 37: Close-up of damage.

Fig. 38: Plant roots penetrating into magazine.

Fig. 39: Breakage due to accretions.

The counterscarp is not exposed to sunlight as much as the rest of the bastion and growth due to dampness is very present. Moss is the most common, with patches of lichens and algae. The stairs on each side are similarly effected. The underground magazine at centre is in a very good condition internally and only has minor breakage, mainly on the edges of the airing holes and loopholes. The magazine itself is in an excellent condition of preservation.

Fig. 40: Lichen, algae and accretions on left of counterscarp.

Fig. 41: Lichen, algae and fungi on left stairs and counterscarp.

Fig. 42: Algae, lichen and breakage. Also signs of stone discolouration probably due to fires having been lit against the corner.

Along the left scarp of St. Luke's Bastion, *Ficus Nitida* trees were planted along the base of the lower section which have now grown to enormous proportion that they're practically hiding the beauty of the fortifications behind them, as well as creating a micro climate in the relatively small gap that remains; when existing at all. They also serve as a shelter for birds and pigeons to roost in the crevices on the scarp. Furthermore, they act as wind-breakers and shield flaking and powdered material from the masonry to remain trapped on ledges and in return to absorb moisture which is transmitted to the stone through its capillaries. However, in some places the same trees do not allow rain to hit the faces and therefore black encrustation is not washed off by natural causes.

These trees are a visual intrusion and should be replaced with others that are more appropriate and especially of a controlled height. The argument is simple; which is the most important element, the trees or the fortifications? These trees are non-endemic and can be planted anywhere but fortifications are static and are our treasured patrimony! This problem has been properly attended to with relations to fortifications in a number of similar European locations[10].

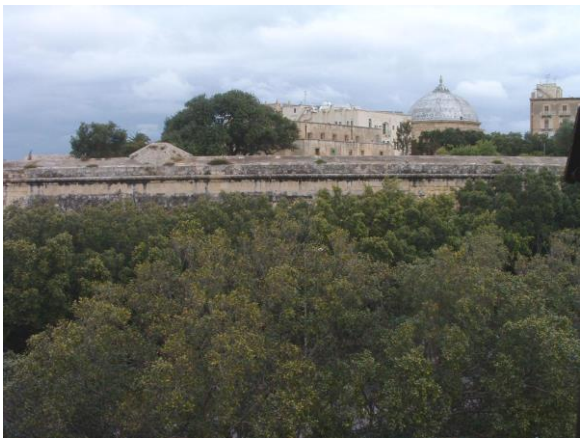


Fig. 43: *Ficus* trees having grown as high as the cordon.

Fig. 44: Alveolar and other erosion, black crust and algae along face, cordon and parapet.

[10] Europa Nostra

This deterioration process is repeated on the left flank and shoulder of St. Luke's Bastion where a type of parabolic catchment exits and therefore subject to wind, heat and moisture. Hardly any of the original masonry remains unaffected, mainly by powdering or exfoliation. However, the tool marks of the rock face have somehow survived. Quoins on the shoulder have also suffered as once the stone cracks, it falls and becomes lost. This section had once been extensively plastered with a lime base coat, of which a good percentage remains. Most has fallen off but a fair percentage has calcified into the limestone and only lost certain materials.

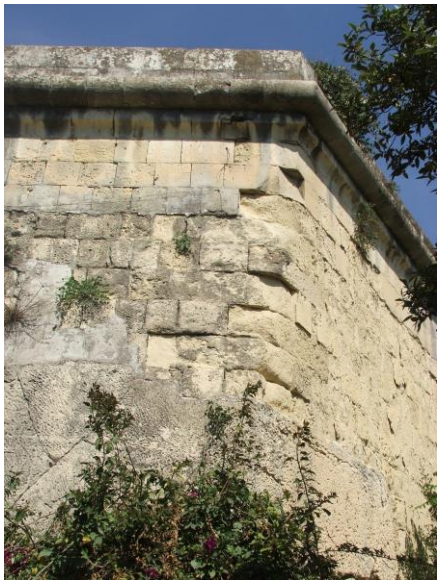


Fig. 45: Deterioration on flank and shoulder.

Fig. 46: Exfoliation and powdering.

Fig. 47: Old plaster on deteriorated masonry.

Fig. 48: The right scarp.

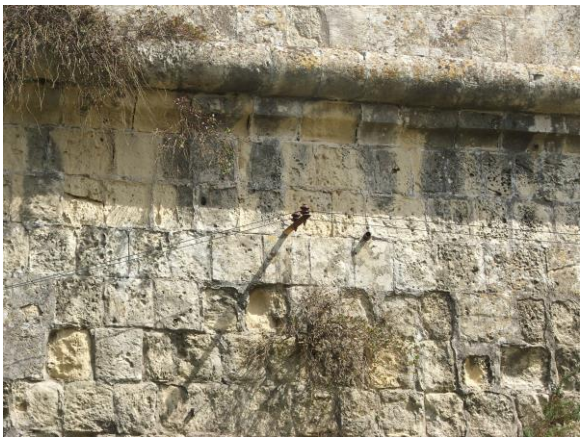


Fig. 49: Algae, black crust, growth and accretions along the right scarp.

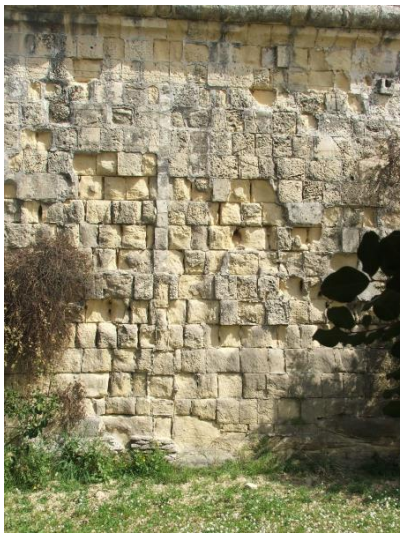
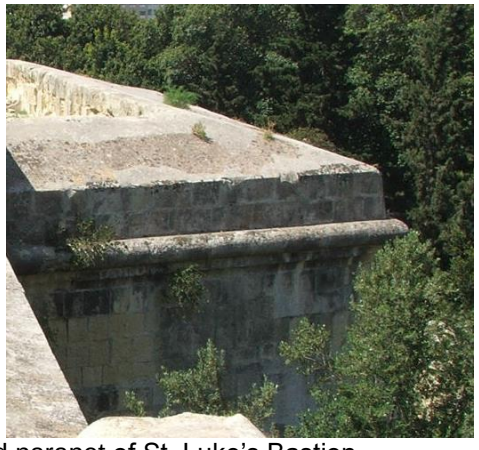


Fig. 50: Extensive powdering and exfoliation on scarp.

Fig. 51: Close-up showing capped water or cable trunking.



Figs. 52 and 53: Right flank, shoulder, cordon and parapet of St. Luke's Bastion.
Very little deterioration but Lichen and algae growth and encrustation are more evident

St. James' Bastion

This bastion was probably the first to have seen conversion for botanical use when Fra Igntius de Argote De Gusman erected his private villa there in 1774. In 1805, Malta's first professor of natural history, the Carmelite Carlo Giacinto (Corolus Hyacinthus), added a collection of exotic plants and trees and opened the garden to the public. In 1848, the whole entrenched bastion was converted into a public garden, albeit the artillery installations.

St. James' is probably the most altered from the three bastions with the primary reason being its conversion to a botanical garden. However, it seems, as records could not be traced, that the right flank facing Notre Dame Gate and Ravelin had been badly damaged during the war and the reconstruction was quite poor and unfaithful.

The left scarp is not as badly deteriorated as other bastions. It has a number of small fissures running along joints for a number of courses, powdering that is extensive in individual stones and the usual exfoliation and alveolar erosion, which is expected from such old masonry. Being close to trees, shrubs and other growth have a firm presence on the scarp and cordon, especially since left unchecked for years.

Left flank and shoulder.

The left flank and should are much more deteriorated, possibly because they for m a side of the parabolic section of the entrenchment where the tenille is located. Wind is captured in this section and contributes to the deterioration of the fabric.

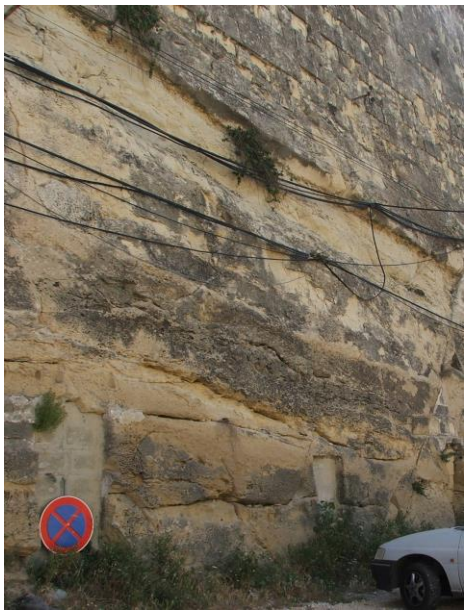
The lower rock formation here is badly eroded and the strata have a very fragile band. The quoins on the shoulder are either rounded or chipped. Alveolar erosion is much evident on the flank, especially near the orillion, while the cordon has many broken sections. From just below the cordon up to the parapet's crest, black encrustation and some biological soiling is evident.

These same conditions are evident in the right scarp where the same atmospheric conditions common to St. Philip's Bastion prevail. The scarp is heavily encrusted with pollution as well as other encrustation, which are difficult to identify due to their high location. However, they are more likely to be caused by omissions as it tends to exist more on the underside of ledges and less evident of the powdering rock face.

Exfoliation, breakage and powdering are extant, as well as some fungal growth.

St. James' Bastion's heavily polluted right scarp.

Fungal growth, black crust and eroded stone.



Powdering of the rock formation, pollution from vehicular omissions and electrical cables suspended on rusted metal brackets.

Missing banquette and trees planted in a sensitive location. Parapet is heavily plastered.

The parapet along the scarps, shoulders and the salient differs. Predominant is the grey colour of pollution and some growth, but the missing banquette is very evident; just as much as its remaining jutting stones that are powdering. In the place of the banquette, trees were planted which are now a danger to the masonry due to their close proximity to the parapet and their roots to the joints.

There are other past interventions within the parapet, such as heavy plastering and even some stone replacement. The sections of parapet by the orillions on either side were either changed built to suite the garden aspect of the bastion or were not as robust as on the fighting side and given an apex.

Parapet with heavy plastering and algae growth.

Dislodged quoins and voided mortar joints.

The orillion and *piazza bassa* on the right of St. James' Bastion were incorporated in the Villa Argote and later in the botanical garden's glass house. Some of the parapet was altered to accommodate the glass house's foundations and also given rustic cladding.

The Argotti glass house in the 1920s[11].

Masonry on the orillion's face is much the same as on the shoulder; exfoliation, cracking and breaking, and heavy powdering. The *piazza bassa* is in a reasonable good state due to given attention for its inclusion with the herbarium. The stones

[11] http://www.my-malta.com

separating the loop-holes are badly deteriorated and the face and crest are infested with creeping shrubs which are also effecting the capping stones.

Underground stores and pump room.

Eroded and infested musketry loopholes.

Location of former piazza bassa.

Post war restoration and bulging masonry.

The former artillery *piazza bassa* on the opposite side was destroyed by the war. Shrapnel pock-marks are still evident. In its place, the orillion was changed into a shoulder and a mixture of the old and new stones were used. It seems that either by settlement or by moisture expansion, this part of the bastion is bulging outwards at the middle, where the masonry is dangerously eroded and crumbling. No attempt was made to match the size of the stones. The lower rock hewn face has remained well, albeit some powdering from weathering. In the corner, there is a doorway which is either presumed to have once been some underground store or a connecting passage. It is now filled with earth but worth investigating.

The parapet of the former orillion was replaced by a low balustrade wall to embellish the garden's perimeter.

St. James' Bastion in 1848 prior to the building of the Wesleyan Church the artillery piazza bassa and bastioned tenille[12].

[12] Floriana, Drg. No. FLO/4 (NAM),

St. Luke's Bastion

Panoramic view of St. Luke's Bastion.

St. Luke's Bastion is a mirror image of St. James' Bastion to the right. It was one of the three gardens designed in 1848. On May 8, 1932, it was inaugurated as Head Quarters of the Scouts Association in Malta. Along with other adjacent structures, the hall suffered severe damage during the war and was rebuilt by German prisoners of war and opened on September 4, 1948[13]. Its entrance is the famous archway that commemorates General Sir Walter Norris Congreve.

The left trace of St. Luke's bastion.

[13] http://www.maltascout.org.mt/historical%20chronology.htm

The right scarp of St. Luke's Bastion is hidden behind large *Ficus Nitida* planted below and only the upper section is visible. The part hidden behind the trees is in constant shade and possibly suffers from some form of micro-climate. Exfoliation and powdering, even in the rock-hewn face, is greater here than in other place, to the extent that much of the powder remains entrapped due to the trees and retains humidity, as well as aiding plant growth.

Delamination, black crust, powdering and growth.

Only few areas of the masonry's patina remain.

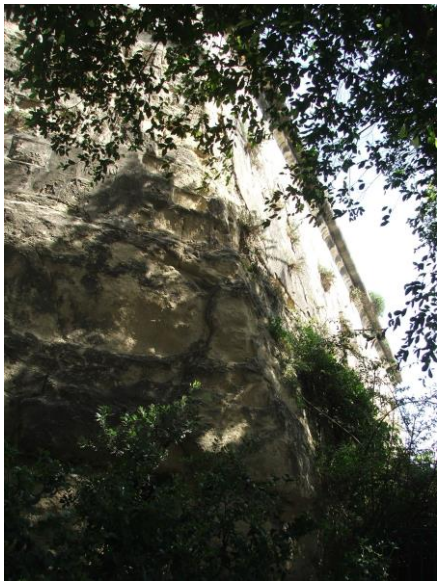
Just like on the scarp, deterioration is constant in the flank, shoulder and orillion. Delamination, powdering and breakage occur all along and possibly due to once having a tenille and a solid curtain that caught the wind and heat, until the curtain was breeched for traffic. Even the quoins on the shoulder are badly broken and eroded than in other places.

It seems that at some time, possibly when St. Anne's Gate was demolished, deterioration was rife and the entire should and orillion were rendered to resemble masonry with courses and joints. Large sections of this plaster have fallen and where it remains, it is voided at the rear or full of limestone powder from the decay.

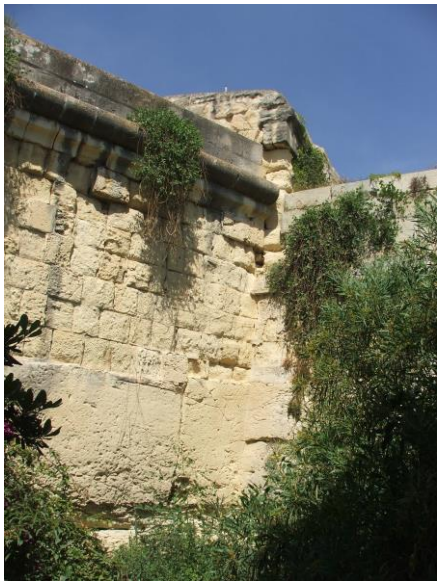
For some reason, the rock face at the base of the orillion still retains hacking marks from when it was coarsely dressed, unless it's from when the tenille was removed!

Flank with rendering from below cordon to rock.

Badly broken and eroded quoins on shoulder.



Tree hidden base of shoulder.



Corner where orillion meets *piazza bassa*.

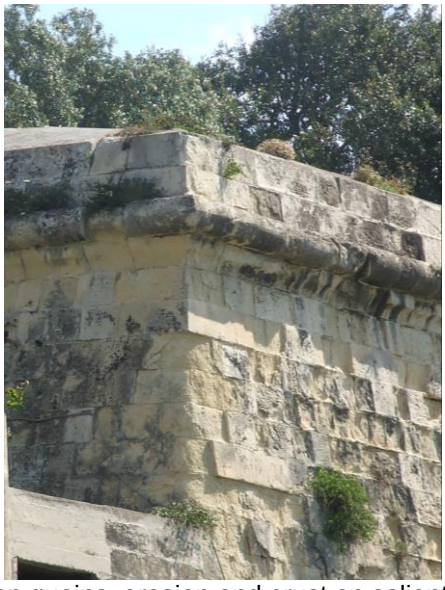
The right scarp, shoulder and orillion are just as badly effected but are more exposed to weathering due to facing the open and not restricted to a busy arterial road as on the left.

Somehow, erosion seems to effect the section of scarp within the ditch more that the section above the ditch, possibly because of wind channeling and not being exposed to the sun as much as the rest. However, the flank is not as badly eroded due to different orientation.

The right scarp – lower section more eroded.

Polluted right shoulder and biological soiling.

Decayed section of scarp with cable trunking.



Broken quoins, erosion and crust on salient.

The masonry on the parapet and cordon are much better on the exterior possibly to being more recent. The crest was well maintained till some years ago, but lately is loosing to lack of regular maintenance.

Internally, the parapet spots various damage resulting from war, alterations, bad practice and neglect. On the parapet on both orillions, strong evidence of pointing with the use of cement and coarse sand has been noted. The left section is also heavily pock-marked with shrapnel dating from the war. When the banquette was

removed, trees were planted along the parapet, which now have thick trunk and strong roots and are a constant danger to the parapet.

Cement pointing on corner of left shoulder.

Trees in a sensitive corner and cement pointing.

Algae, Lichens and shrubs growing on crest.

Erosion, cladding and rendering inside parapet.

Shrapnel damage on orillion's parapet.

The bastion also has two magazines that a reasonably kept and also a gun emplacement with an expense magazine. The magazines are the standard early 19th century introduced by the British army, already covered on St. Philip's Bastion. The gun platform itself is of Upper Coralline Limestone and pozzolana not deteriorated to an extent, other to rust from the iron tracer and pivot. A strong infestation of algae and lichen growth is evident on the small section of banquette, the platform and the crest of the parapet in the area. The parapet here also has many badly eroded stones.

The gun platform on salient point.

Expense magazine and banquette.

The left magazine has heavy biological growth and vegetation on its pitched roof, some black encrustation in its shielded parts and a strong presence of alveolar erosion of the side walls.

Alveolar erosion of the the right side.

Biological and vegetation growth on bomb proofing.

Identical deterioration on the right magazine.

The right piazza bassa on this battery is a spacious artillery platform. Possibly due to development during the first half of the 20th century or war damage, an artillery store cannot be located. The boundary wall with entrance along St Anne's Curtain is badly eroded and so is the masonry on the blocked doorway. The wall is capped with concrete. The embrasures and parapet are also badly eroded by various forms deterioration, while the exterior and mouths are overgrown with trees, moss, bougainvillea and other plants.

Badly eroded parapet and missing banquette.

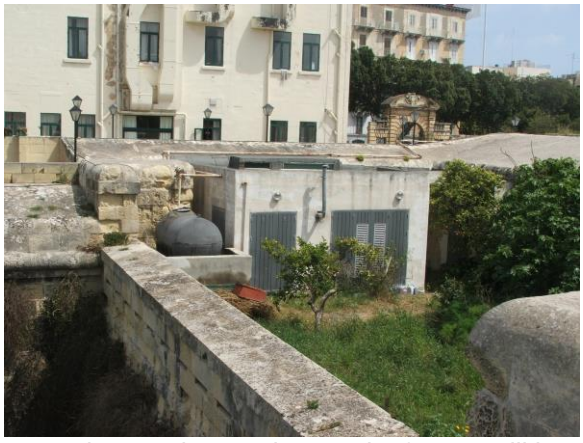
Battery hidden behind growth.

Dislodged quoins on the face of an embrasure.

Badly deteriorated wall and blocked doorway.

The other piazza bassa on the right is for musketry and is within the grounds occupied by the Senior Citizens' Home, therefore, it has been modified and adapted for their use. Earlier interventions were made when the Wesleyan Collage was built. The magazine and shelter have been converted into stores and other buildings have been erected abutting the original fabric.

Eroded masonry and biological growth on loopholes.



Accretions and extensions to the former utilities.

The exterior masonry is heavily encrusted with pollution and biological growth. A dense growth of lichens exists on the capping stones above the loopholes. Alveolar erosion has effected many of the loopholes, especially to the right.

The vaulted passage

It is uncertain as to what purpose this passage had originally served as it is blocked at its present deepest point. Its shape and angle hint that it was either a connecting tunnel to lower sections of the entrenchment or some form of hidden sally port. There are a number of features along the walls and also a blocked shaft in the vaulted roof. Due to uncontrolled water run-off into the tunnel and abandon, heavy deterioration due to humidity is present on both the voussoirs and the ground.

The badly deteriorated and rubbish infested entrance.

A biological sludge mixed with the patina.

Moss and deterioration on the masonry fabric.

The entrenchment

The entrenchment consists of a number of features but mainly the bastioned tenille. In the late 19th century, much of the ditch was converted into a citrus orchard. With the arrival of the railway in Malta, the Floriana Station was excavated beneath St.Philip's Bastion with a sloping ramp leading to it on the left of the ditch behind the tenille and completed in 1882[14]. Various structural alterations were made, including many metal accretions, trunking in the bastion and tenille walls, rock excavation, added structures, rendering using concrete and other works. The soot for the railway engine added to the pollution encrustation in this area.

Aperture created in the ditch for the railway.

Moss encrusted walls, neglect and debris.

Accretions and past developments in ditch to accommodate railway station's requirements.

[14] "***THE MALTA RAILWAY***" by Joseph Bonnici and Michael **Cassar, t**he Authors, Malta, 1988.

The Bastioned Tenille

The bastioned tenille is located in the entrenchment to shield the curtain and sally port. Probably either at around 1848 or 1880's, the bastion above had a wall erected around the gorge, filled with soil and the banquette area converted into part of the orchard, which remains till now.

Much of the right claw of the tenille is badly suffering from broken, eroded and dislodged masonry, and many stone have fallen into the drop-ditch. Apart from the heavy vegetation that growing on the crest, the trees that grew in the 'orchard' have caused great fissures in the structure.

The drop ditch on this side also had a wall built on its outer edge to close off the ditch within the tenille for security. The left side is mainly rock-hewn and the tenille suffered alterations due to the railway station works.

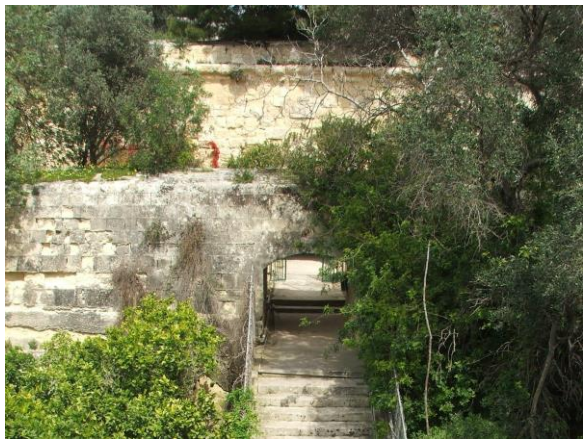
The left claw heavily overgrown with trees.

Fissure, broken stone and mass deterioration.

Right claw with plants, crust and biological growth.

Close-up of the drop-ditch on the left.

The tenille also has an arched passage, partially rock-hewn, in front of the sally port. Its masonry and rock have advanced deterioration inside the arch and various biological growth on the façade and rear.



Broken stone, accretions, erosion, encrustation and growth on façade.

(Unnamed) Curtain

Also referred to as St. Philip's Curtain, this curtain is what separates the entrenched bastion the city of Floriana. It isn't a continuation of neither St. Anne's Curtain nor Notre Dame Curtain as its alignment differs and is actually part of the entrenched bastion complex. Both ends of the curtain have been modified by development and the ramp leading to the sally port was likely to have been altered with the railway station's requirements.

The face of the curtain is probably the most eroded face from the entire entrenched bastion. Many of the stones are powdering, exfoliating and breaking up after cracking. I am qualified enough to state the reason, but its either due to the poor quality of the stone or because its location has made it subject to the 'wet-dry' process and due to the salt crystals being kept active and breaking the stone. Its bottle-neck location also makes it vulnerable to wind effect.

The deteriorated masonry face of the curtain.

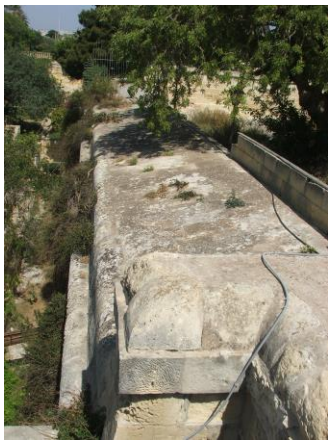
Excavations, trunking, cement and growth.

Just like the tenille and ditch, the curtain has also seen some modification in its left corner, again due to the railway station. The ramp probably had a section excavated from the rock face, trunking for water pipes and cables were cut into the face, metal accretions, cement rendering and alcoves and shelters excavated at ditch level. Some of the glazed terracotta drains that even show on the face, seem to be

cracked or leaking as soiled water and moss can be clearly seen along the face. This water is also feeding the infestation of caper and other plants in this corner and on the face of the musketry *piazza bassa*. This same corner is still showing signs of the soot deposits that were left by the locomotive engine, even after so many decades. It seems that this staining is more evident effected in the rock-hewn face.

A little of everything; Alveolar erosion, powdering stone and rock face, broken or leaking water drains, concrete rendering and intense plant growth.

Trunking, black crust, biological and plant growth, excavated shelters and concrete on the rock-hewn face.



The parapet has a mixture of plant and biological growth, especially on the crest. The cordon has heavy deposits of black crust on the lower side and lichens on the exposed surface. It also has many cracked or broken stones especially at the mortar joints.

Plant and biological growth on the left end of parapet.

The parapet on curtain; plants, biological growth and stone deterioration.

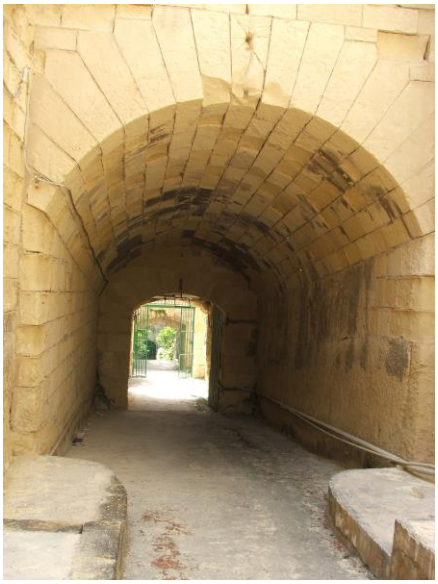
The Sally Port

The sally port is a hidden passageway or gate, usually in a curtain, for the defender to rush out on surprise attacks on the enemy. This curtain has one of the few remaining sally ports, if not gateways, on the Floriana enceinte. Although somewhat altered by the British, it remains faithful to the purpose for which it was built.

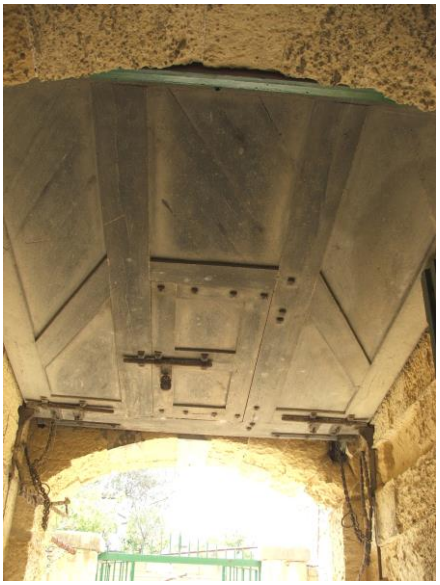
The original British mid-19th century gate with wicket gate and mechanism is still *in situ* and is a treasure. It is the only of its kind in Malta, and have not encountered records of similar in the United Kingdom. It cries out to be restored for posterity.

Eroded and broken masonry and accretions on curtain and cordon above the sally port.

View of sally port from tenille.



Vault, ramp and gate from within.



Early Victorian 'rising gate'.

Eroded masonry and rusting fittings.

Alveolar erosion and tubular accretions.

Gate's metal fittings and the powdering voussoirs.

The curtains masonry on the face around the sally port is heavily eroded and badly powdering in most places. Even the voussoirs of the arch itself and the vault, are just as eroded and those of the vault are voided and without mortar. The lower rock-hewn section is also eroded and alveolar erosion is also common here. There are numerous accretions, especially pipelines and cables, and other metal fittings have caused the stone to crack and break.

The same applies to the ramp and its walls. Its floor was covered with concrete and large concrete stepped platforms erected on the side. The ramp serves as a waterway when it rains, which all eventually ends down in the railway tunnel.

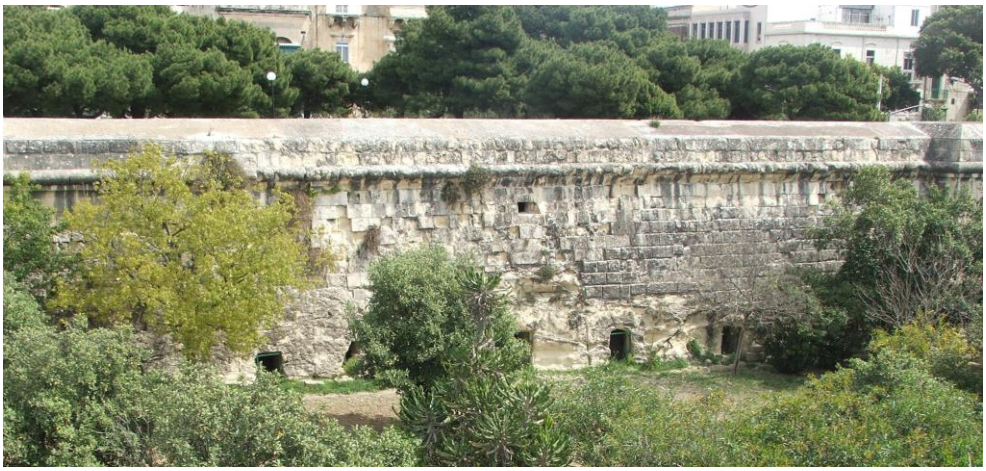
St. Anne's Curtain

This section of St. Anne's Curtain within my studies lies on the left of the entrenched bastion and is just a section of the original curtain, which along with its tenille, was demolished in 1879.

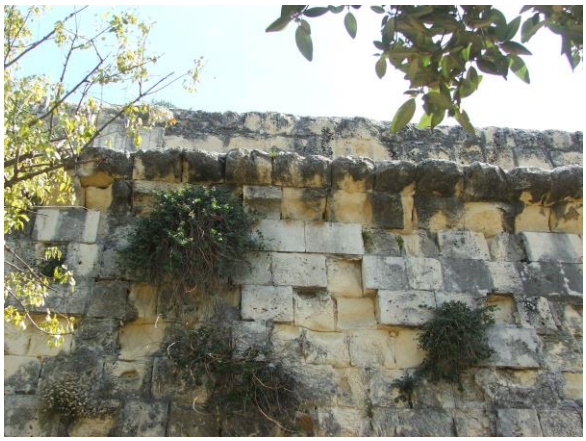
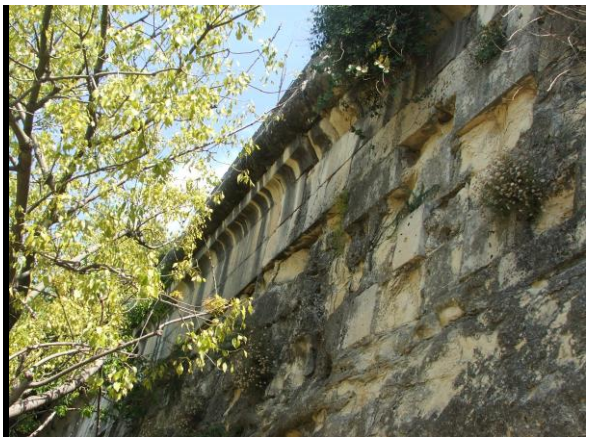
The existing end on this section of curtain is a type of monolithic pilaster with supposed features that correspond to the fortifications, built in the early 1880s. Numerous shrapnel pock marks on the pilaster bears evidence to damage sustained during the last war. The masonry filling between the breach and the pilaster has been rusticated and does not match the remainder of the face. Somehow, similar stones were then used to repair the rest of the face, which together with 19th century alterations, contribute to heavy replacements of the original fabric.

The remainder of the masonry is also deteriorated and bears identical conditions as the rest of the bastion.

An interesting featured discovered at the base of the curtain is the remains of a rock-hewn well. Although well blocked, some stones have since come loose and the pozzolana rendered sides are visible. Someone must have used it as an animal shelter during the curtain's construction, as a tying hoop (*mrabat*) is still visible inside.



The various interventions and types of deterioration on St. Anne's Curtain.

Deteriorated masonry, breakage, heavy black crust and plant growth on face, cordon and parapet.

Black crust and biological growth of later stones.

Lichen growth on the pozzolana on crest.

Eroded stones on the outline of a well on façade.

Pollution encrusted recent alterations on parapet.

Alterations on this section of the curtain seem to have been ongoing as various types of masonry have been noted; even those from late 20th century. An interesting feature noted were mason's marks on three on the stones on the crest of the parapet. Cement has also been used in pointing, especially along the parapet's internal face.

Mason's marks visible beneath encrustation.

Cement pointing on the parapet's old fabric.

Lichen growth and graffiti on end pilaster's crest.

Metal staves and barbed wire on parapet.

Notre Dame Curtain

The situation on this section of Notre Dame Curtain is very similar to that of the right flank of St. Luke's bastion. Various structural alterations were made to the curtain when the gate was demolished; although there were others earlier when water tanks were built behind this wall by the British.

Once Notre Dame Gate was demolished, only the pedestrian doorway was retained on this section, although it has a strong resemblance to a Guard Room, with an external British architectural style. The flank of this section was restored some years ago by the Works Department.

When the curtain was rebuilt after suffering severe damage during the war, it was just as an ordinary wall with balustrades rather than a parapet, set above a copy of the cordon. The stones used were the then standard '*kantun tad-disa*' and the original rock-hewn remains were used as foundations. These stones have since deteriorated and show extensive signs of powdering, alveolar erosion, loss of mortar from joints and black encrustation.

The space between the remains of the tenille and this wall has been serving as a manure pit and the acids from this animal excrement are seeping into the lower wall.

Deterioration on the modern 'curtain' face.

Manure pit in ditch near *Triq Notre Dame*.

Remaining section of Notre Dame Gate.

Deterioration and graffiti on masonry.

The Demi-Bastion

Not much remains of the demi-bastion below St. James' Bastion and is probably the result of damage sustained during World War Two and later neglect.

Most remaining is the scarp as is mainly rock hewn. Of the masonry parapet, just a few random courses of deteriorated stones remain and a section of which indicates to have been part of a cheek of an embrasure. The rock face is badly weathered and eroded and fissured, as well as having loose cable hanging from it. The remainder of the ground it covers, is either overgrown with shrubs and trees, or was built-up in the times of the British services but now looks neglected.

Badly eroded rock hewn face remaining stones.

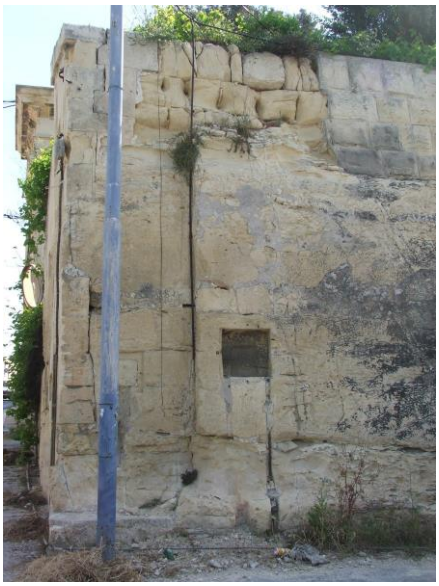
Overgrown grounds and remain of embrasure.

Badly eroded stones and overgrown with plants.

The tenille and glacis

A section of the tenille that stood in front of Notre Dame Curtain and gate also remain. It is mainly rock-hewn and is a continuation of the demi-bastion. The covered way is extant, although in a worse condition towards the demi-bastion.

The Works Department had recently restored the side facing the road where the tenille was cut during road widening, nut come of the same stones on the corner are a disaster. The fifty centimeters of masonry has voided joints, missing stones and other unacceptable damages.



The edge by the road badly requiring maintenance.

Black crust, crumbling masonry and plants.

Plants and creepers growing on the friable rock.

The rock hewn face is heavily encrusted with pollution and little bacterial growth. A room was built abutting the face and the rock beyond it is more fragile and has plants and creepers growing from the fissured strata. Also, a number of shelters were excavated in the rock. The parapet is a mixture of the original masonry and late 19th century rusticated blocks, which are both badly deteriorated and unstable.

Sections of the plant infested parapet, probably missing some courses, broken stones, and pollution.

Badly damaged side of parapet by demi-bastion overgrown with plants and trees.

Notre Dame Gate had two small rock-hewn sections of glacis funneling outward from the tenille's archway. The part on the left side remains intact along with its covered way, albeit some damage.

Other to plant growth, the rock and masonry are heavily covered with encrustations from pollution. The masonry on the covered way are cracked and have voided mortar joints. Some lichen growth was detected. The rocky slope is also subject to rubber mark from tires of vehicles that are parked on it, as well as some oil that drips from their engines.

Conclusion

We should be seriously ashamed to have let our fortifications fall into such neglect as shown by my section of the Floriana enceinte. It is doubtful if any restoration would have been commenced, as with the case of Sa Maison, if the European Union hadn't made certain funding available. It is further doubtful whether this money will serve for the entire restoration work of all the fortifications proposed to benefit.

And what about maintenance? It seems that this is something non-existent in this country!

The Sally Port leading to St. Philip's Bastion, the magazine beneath the garden and the remains of the Floriana Railway Station can be restored to offer a unique cultural and historical attraction. Not a touristic venue; even though it seems that tourists care for what we have more that we do! This part of the Floriana fortification seems to have been caught in a time lock and luckily the fabric remains very faithful in its originality. It is ideal for a multi-epoch heritage trail.

Interpretation is very lacking and not a sign exists that explains anything about the part of the fortifications where the person stands.

However, just as much, vigilance is required as vandalism seems to have increased recently. Since being handed to private enterprise, little care is being given by this consortium to the historical fabric as they claim that it is not within their remit. Historic fountains in these gardens are just stagnant pools or even dirt encrusted and their bowls have become bed for weeds to grow in.

Magazines used as stores are regularly being broken into and recently even the railway tunnel has had its share of vandalism.

Please, let's stop fooling ourselves and really start caring!

Sustainability

No comment!