STAGE TWO: CONCEPT REPORT

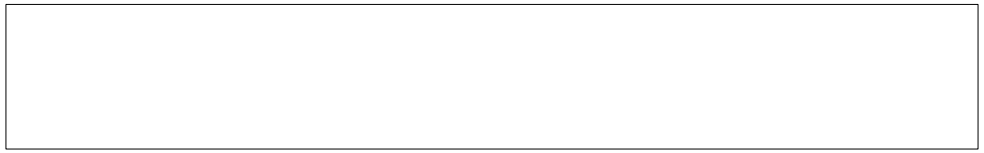
GROOTE SCHUUR ESTATE MUSEUM

OVERALL ASSESSMENT & IDENTIFICATION OF KEY PRIORITY AREAS AND REPAIR & MAINTENANCE CONCEPT

Groote Schuur Estate, Rondebosch,
Cape Town, Erf 46165.

COEGA DEVELOPMENT CORPORATION

public works & infrastructure
Department:
Public Works and Infrastructure
REPUBLIC OF SOUTH AFRICA



ISSUE & REVISION RECORD (This Stage two report

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1. INTRODUCTION

This report, previously volume one in draft, comprises the stage two concept report and should be read together with Vol 2 to 5. This report provides an overview of High-Level Conditional assessment from a heritage and architectural perspective, as well as an overview of the history, and heritage significance of each of the relevant structures and environ. Concept recommendations are provided alongside general guidelines and specifications for repair maintenance and conservation, as well as the QS cost estimate.

Volume: 2 Considers and assesses the dilapidation of the Ground Floor Groote Schuur Estate North Wing Interior and First Floor Groote Schuur Estate North Wing Interior survey. Each defective element and condition per room are identified. Specific recommendations are provided alongside High-level Integrated Conditional Assessment and Recommendations linked to Volume:1 Sections 4.0 and 5.0.

Volume: 3 Considers and assesses the dilapidation of the Ground Floor Groote Schuur Estate South Wing Interior and First Floor Groote Schuur Estate South Wing Interior survey. Each defective element and condition per room are identified. Specific recommendations are provided alongside High-level Integrated Conditional Assessment and Recommendations linked to Volume:1 Sections 4.0 and 5.0.

Volume: 4 Considers and assesses the dilapidation of the Elevations, Environ, and Outbuildings survey. Each defective element and condition are identified. Specific recommendations are provided alongside High-level Integrated Conditional Assessment and Recommendations linked to Volume 1 Sections 4.0 and 5.0.

Volume: 5 Considers and assesses the dilapidation of the Roof, including the Truss, Gable, Valley and Dormer Junctions. Each defective element and condition per element are identified.

Specific recommendations are provided alongside High-level Integrated Conditional Assessment and Recommendations linked to Volume:1 Sections 4.0 and 5.0.

1.1. Scope of Work

The scope of work is to assess the Groote Schuur Estate Museum, to prepare a detailed Condition Assessment with a detailed Decanting and Storage Plan, together with a Method Statement and Risk Register. Provide a detailed scope of remedial and maintenance actions for the Museum.

1.2. Statutory Framework

1.2.1. National Heritage Resources Act, 1999 (NHRA)

Prior to the enactment of the NHRA, Groote Schuur Estate Museum and outbuildings were declared a National Monument by gazette notice 946 on 4th June 1993, corrected by notice 416 of 1994. All previous National Monuments were automatically graded as Provincial Heritage Sites under Sect 58 [11] of the NHRA and are therefore protected under Sect 27 of the Act. Therefore, Groote Schuur Estate Museum is formally protected under Section 27 of The National Heritage Resources Act (Act 25/1999) (NHRA).

- Old NMA (National Monuments Act NO. 28 OF 1969) Status - National Monument.
- City of Cape Town Grading – Grade II PHS (Provincial Heritage Site).
- SAHRA Inventory Grade - Grade II PHS (Provincial Heritage Site).

Note also that the collection is a specially Declared Heritage Object in terms of Section 32 of the NHRA. SAHRA must issue a Permit for any removal, conservation, repair or disposal of any item in the Collection.

Gazette Number 18436

Notice Number 1538

Defined as " the cultural-history collection known as the Groote Schuur collection, housed at the Groote Schur manor house, Cape Town..This process must be factored into the approvals and permitting process ahead, tough it is anticipated that extensive interaction with the Curatorial Team will be needed.

1.2.2. Rhodes Will Act

Rhodes Will Act of 1910, amended in 1985, limits the areas that may be built upon on the Estate, what the appearance of buildings on the Estate may look like, prohibits the construction of residential buildings in certain areas, and declares the Groote Schuur House a museum. It also declares the Museum and grounds around the Museum to be open to the public, subject to conditions imposed by the State President.

RHODES' WILL (GROOTE SCHUUR DEVOLUTION) ACT

NO. 9 OF 1910

[ASSENTED TO 26 DECEMBER, 1910]

[DATE OF COMMENCEMENT: 30 DECEMBER, 1910]

(Signed by the Governor-General in English)

as amended by

Rhodes' Will (Groote Schuur Devolution) Amendment Act No. 55 of 1985

'Clause 1A. Power of State President in relation to certain properties included in the Groote Schuur Estates – Notwithstanding the provisions of sections 1 and 2 of this Act or of clauses 13 and 14 of the Will of the testator, the State President may –

a. grant permission that the residence known as De Groote Schuur also be used for the purposes of establishing and maintaining a museum;

b. place a portion of Erf 44214, Cape Town, in extent approximately 13 hectares, at the disposal of any person to be utilized as a park, open to all members of the public, subject to such conditions as the State President may determine from time to time,

but the said residence and the said portion of the said erf shall remain vested in the State President.'

Figure 1. Rhodes Will Act

1.3. Methodology

The site and building and its wider context have been conducted using the following methods:

- Photographic survey (Interior and exterior of the building alongside out buildings context and landscaping).
- Drone survey (Roof and wider aerial environ context).
- Historic and contemporary writing, maps, aerial photography and image search online and in published materials.
- HB Architects GSE CMP study review.
- Consultation with Rayda Becker (GSE Museum Curator).

1.4. Assumptions and Limitations

No limitations were experienced in the compilation of this report.

1.5. Statement of Independence

Rennie Scurr Adendorff has no legal ties to COEGA Development Corporation, or any other professionals involved in this proposal. There is no financial gain tied to any positive comment or outcome. Professional fees for the compilation of this report are paid by the applicant but are not linked to any desired outcome.

1.6. Previous Work Undertaken

c. 2005 - 2007

Limited Remedial work on the Groote Schuur Museum was carried out between 2005 and 2007, as detailed in the GSE Museum and Outbuildings: Architectural and Heritage Description Report (Vol 3) by HB Architects. The report also states that no maintenance plan was established for ongoing monitoring at that time. As a result, since then, significant issues requiring urgent attention have emerged.

A detailed scope of work was outlined in the report. The following areas were identified as requiring intervention: Roofing issues, Damp Issues in the Drawing Room, Billiard Room / Staff Rooms and Kitchen Courtyard.

Other aspects of the Museum requiring intervention include: Dehumidification, Electrical Reticulation, Fire Protection, Firearms display, Leather Restoration, Wood preservation, Windows, Floors, Rhodes Collection and room uses, and Water provision. Works to be undertaken in the garden include interventions to the Terraces, Hydrangea Horseshoe and Wolwegat Pond.

2015

In 2015 a Compulsory Repair Order Application was submitted to HWC (Heritage Western Cape) by HB Architects. The application has since lapsed. No work was implemented in this regard.

1.7. Summary of Findings

This report as well as the related studies by HB Architects does not find any potentially catastrophic failures evident. However, it does identify many areas requiring very urgent short- to medium-term attention in order to prevent more serious problems from developing.

These relate to general repairs and maintenance. The urgent short - to medium-term areas are identified in Chapter 4. CONDITIONAL ASSESSMENT and 4.2 Priority Areas Identified ' Cat A'.

Section 4.0 and 5.0, Integrated Conditional Assessment and Recommendations. The Priority Areas are identified and categorized as follows:

CATEGORY	TIMEFRAME
' Cat a '	6 months to 1 year
' Cat b '	1 to 3 years.
' Cat c '	3 to 5 years

2. SITE DESCRIPTION

2.1. Broader Site Description

The Groote Schuur Estate property is approximately 65 ha, predominantly east-facing and made up of several erven, of which Erf 44214 Cape Town is the largest. It is the consolidation of several properties originally owned by C J Rhodes. The state procured additional properties and added them to the landholding during the first three or four decades of the 20th century.

The estate is situated within and surrounded on three sides by the suburban fabric of Rondebosch, about fifteen minutes drive from the centre of Cape Town, where the National Houses of Parliament are situated. The remaining western edge is formed by the M3 freeway, with Table Mountain National Park, a UNESCO World Heritage Site, immediately beyond. This part of the Park was also part of C J Rhode's estate, and the last ruins of his zoo are situated close to the gates at the top of The Grange (a c.1870s entrance axis), which crosses the freeway and leads to Rhodes Memorial.

The southernmost corner of UCT intersects the northwestern corner of the site. The UCT connection is related to Rhodes property encompassing Upper Campus as far as, and including, Groote Schuur Hospital. The Estate is in short distance south from a bend in the Main Road, where Stanhope Road, which crosses the Liesbeeck River nearby, intersects it almost perpendicularly. It was at this intersection of two tracks that converged in 'het Ronde Bossen', where, in 1657, Jan van Riebeeck stood with a small band of Dutch settlers, and fourteen parcels of land were allocated to those settlers. The European colonisation of Southern Africa had begun.

It was also at this time that 'de Schuur' - by and large the now-Groote Schuur Estate - was established by the Vereenigde Oos-Indische Compagnie [VOC]as a barn [schuur] where the newly established farmers could deliver their goods for transporting back to the fort in Cape Town. Just over three and a half centuries later, the area, now called Rondebosch, had grown into a wealthy suburb of Cape Town. Rondebosch has an interesting mix of land uses that has emerged over time. Groote Schuur Estate remains one of the last extensive parcels of largely undeveloped land in Rondebosch.

2.2. Context Site Description

Approximately half the area is taken up with the Museum and its associated gardens: the terraces above the house, the avenue of stone pines, the once-glorious Hydrangea Horseshoe, and the less formal gardens around Wolwegat and to the west, between the Museum and Genadendal.

The area beyond the stone pines and the hydrangea garden is fenced off and is called 'Koeikamp'. It was formerly an agricultural area where cows and vegetables for the households were grown. It is now unused, and overgrown and is a fire hazard in summer with its long, dry grass and senescent trees.

Now largely out of sight and out of use is The Glen, a very shady deep kloof that bisects the northern half of the estate from the southern half. Two springs are found at the head of the Glen and allow for water flowing out of The Glen all year round. The stream emerges into a pond, formally called Wolwegat, which has been there since the earliest VOC days. The Museum is not aligned to the historic Avenue but is rather offset by its own access road which connects the Grange and back to the Avenue below the museum.

2.3. Architecture Description

The building is a large, ornate double-storey 'Cape Revival' dwelling, typical of Baker's work, with two offset rectangular wings, the main reception room wing has generous verandas front and back, and the second wing, being more service-orientated, is built around a small courtyard. A third – a long, single-storey flanking wing - containing utility rooms, serves as a retaining structure to the service wing.

Baker's reworking of traditional Cape architectural elements is seen in full display here - ornate gables, mouldings, twisted chimneys, large 'cottage pane' windows with solid panel shutters, French doors, elaborate staircases and finely detailed and crafted Burmese teak interior joinery abound. Period elements from around the world reflecting early Colonial architecture were acquired to create an 'authentic' Cape feel. Apart from the insertion of some bathrooms upstairs into existing staff rooms, the building remains very much as Rhodes left it to the State in 1905.

2.4. Outbuildings and Landscape

2.4.1. Terraces

The most significant built landscape features on the Estate are the earth-filled retaining terraces which create level platforms for planting or outdoor recreational areas. The most notable are the canna-filled terraces, previously lined with blue plumbago, at the Groote Schuur Museum – these terraces are set out on the front door - backdoor axis, and successfully integrate the homestead into the quite steeply sloping topography around the Museum. The terraces lead past a croquet pitch on the left, and a bowling green on the right, now unkempt and losing definition.

Beyond the terraces is the historic avenue of stone pines which further reinforces the Homestead into the landscape, leading the eye up to Devil's Peak beyond. These terraces were designed by Sir Herbert Baker under instruction from C J Rhodes.

2.4.2. Tennis Court

There are a number of tennis courts on the Estate - one at the Museum, one at Genadendal, one at Highstead, and a further shared court in the lower corner near the Klipper Road/Main Road corner. All are in disrepair, and none have been used for about twenty years.

2.4.3. Pools

There are three swimming pools on the Estate. The pool at the Museum was built in the Verwoerd era and, although in good condition, is never used. Consideration should be given to its removal During the 2025 survey, the pool's condition reflected neglect and signs of general wear and tear defects.

2.4.4. Hydrangea Horseshoe

Although not formally a built feature, the Hydrangea Horseshoe was constructed under C J Rhodes' instruction. It is a formal, horseshoeshaped landscape feature, carved into a dell slightly above and away from the Museum. The hydrangea beds are lined with a stone edging, and the lowest, straight edge is contained by a pergola over a walkway that leads to an ornamental stair leading to nowhere. The pergola appears to have been built in the 1960's, and is architecturally not suited to the style of the garden and the stairs, and should be removed.

Figure 2. Locality Map (CoCT EGS Viewer 2024).

3. HERITAGE SIGNIFICANCE

3.1. Background

The Estate is the official Cape Town residence for the President and Deputy President of the Republic of South Africa. It also acco modates a number of ministerial residences and associated staff, security and services facilities.

For the past three and a half centuries, it has been centrally located on the economic and political stage of colonial history. Prior to the VOC settlers' claim of land ownership in the mid-1600's, the Estate was part of the seasonal migrant Khoekhoen pattern of life, centred around water sources, grazing areas and paths – traces of which have been all but erased from the landscape by the more formal establishment of Western European agricultural land-use systems.

The Estate, in its current cadastral configuration, is the result of a series of property claims, expansions, consolidations and subdivisions, some of which date back to the earliest days of European settlement. In the late 1800s, the land was part of the vast landholding reaching from the lower slopes of Table Mountain and Devil's Peak to Constantia Nek which belonged to Cecil John Rhodes.

The area of the Estate between The Avenue [which bisects the Estate roughly along a north-south axis, and Rhodes Drive (now the M3 freeway) was bequeathed by Rhodes in his Will 'to provide a suitable official residence for the First Minister in that Government [Federal States of South Africa] befitting the dignity of his position'As that particular form of government was never implemented, the Will was devolved by an Act of Parliament in 1910 to substitute the Prime Minister for the First Minister, and the Union of South Africa in lieu of the Federal States of South Africa. This Act was amended in 1985 to declare 'De Groote Schuur as a museum' with a certain portion of land accessible to the public, within conditions defined by the State President.

After the election of the post-apartheid government in 1994, the residence of the President was relocated to Genadendal, formerly Westbrooke, situated directly below The Avenue from Groote Schuur. The Estate therefore has been the official residence of the country's incumbent head of state - within the various political structures – since circa 1910.

Given its long history associated with governance in South Africa, its location on the lower slopes of Devil's Peak, largely undeveloped, and the rich layering of all aspects of our history, it is undeniably a heritage resource of the highest order and must be managed as such.

3.2. Comparative Image Study

Comparative Image Study analysis of Groote Schuur Estate during the Rhodes era and the 2025 Conditional Assessment Survey site visit.

Figure 3. Groote Schuur Estate Museum East Elevation (Groote Schuur archive, 1901-1902).

Figure 4. Groote Schuur Estate Museum East Elevation (RSA, 2025).

Figure 5. Groote Schuur Estate Museum East Elevation (Groote Schuur archive, 1901-1902).

Figure 6. Groote Schuur Estate Museum East Elevation (RSA, 2025).

Figure 7. Entrance Hall / Vestibule (Groote Schuur archive, 1901-1902).

Figure 8. Entrance Hall / Vestibule (RSA, 2025).

Figure 9. Ante Room 2 (Groote Schuur archive, 1901-1902).

Figure 10. Ante Room 1 (RSA, 2025).

Figure 11. Library (Groote Schuur archive, 1901-1902).

Figure 12. Library (RSA, 2025).

Figure 13. Staircase Hall (Groote Schuur archive, 1901-1902).

Figure 14. Staircase Hall (RSA, 2025).

Figure 15. Library (Groote Schuur archive, 1901-1902).

Figure 16. Library (RSA, 2025).

Figure 17. Drawing Room 1 (Groote Schuur archive, 1901-1902).

Figure 18. Drawing Room 1 (RSA, 2025).

Figure 19. Family Room (Groote Schuur archive, 1901-1902).

Figure 20. Family Room (RSA, 2025).

Figure 21. Kitchen (Groote Schuur archive, 1901-1902).

Figure 22. Kitchen (RSA, 2025).

Figure 23. Family Room (Groote Schuur archive, 1901-1902).

Figure 24. Family Room (RSA, 2025).

Figure 25. Main Staircase - First Floor (GSEM Archive, 1901-1902).

Figure 26. Main Staircase - First Floor (RSA, 2025).

Figure 27. Rhodes Bedroom (Groote Schuur archive, 1901-1902).

Figure 28. Rhodes Bedroom (RSA, 2025).

Figure 29. Guest Bedroom (Groote Schuur archive, 1901-1902).

Figure 30. Guest Bedroom (RSA, 2025).

Figure 31. Bedroom 1 (Groote Schuur archive, 1901-1902).

Figure 32. Bedroom 1 (RSA, 2025).

Figure 33. Rhodes Bathroom (Groote Schuur archive, 1901-1902).

Figure 34. Rhodes Bathroom (RSA, 2025).

Figure 35. Rhodes Granite Bathtub (Groote Schuur archive, 1901-1902).

Figure 36. Rhodes Granite Bathtub (RSA, 2025).

Figure 37. Groote Schuur's Terraced Garden with Table Mountain and Devil's Peak vistas (GSEM Archive, 1901-1902).

Figure 38. Groote Schuur's Terraced Garden with Table Mountain and Devil's Peak vistas (RSA, 2025).

Figure 39. North west view with roof terrace (GSEM Archive, 1901-1902).

Figure 40. North west view with roof terrace (RSA, 2025).

Figure 41. North west perspective view (GSEM Archive, 1901-1902).

Figure 42. North west perspective view (RSA, 2025).

Figure 43. Hydrangea horseshoe landscape with Devil's Peak vistas (GSEM Archive, 1901-1902).

Figure 44. Hydrangea horseshoe landscape with Devil's Peak vistas (RSA, 2025).

3.3. Heritage Assessment

The Groote Schuur CMP (HB Architects, 2013), outlines the heritage significance of the Groote Schuur Estate in terms of Section 3.3 of the NHRA which provides the means to assess the ways in which resources can hold special value.

The CMP finds the site to reflect very early colonial settlement patterns and that its historical importance within early Cape political and economic systems is appropriately embedded in its current museum function. This longstanding prominence and continued civic function lends it high significance in terms of historical pattern.

Related to this aspect, the site further demonstrates a particular class of place, with the Museum in its cultural landscape displaying both permanence and flexibility as a set piece within changing political and economic regimes. These aspects also speak to the social and cultural associations of the site, which has seen it central to the politics of power from the VOC until the end of apartheid.

The site holds extraordinarily high significance in terms of its association with the life/work of people of importance in South African history, starting with its connection to the highest echelons of VOC governance, through to Rhodes, and to all heads of state from Smuts' Union government to the last National Party government, until its final use as a residence immediately post-apartheid when Jacob Zuma lived there as Vice President. Groote Schuur was also the site of negotiations to end political conflict in South Africa resulting in the Groote Schuur Minute of 4 May 1990.

The social history of the property also includes association with the history of slavery, with direct associations with the use of slaves on the estate during the VOC period.

The structure displays particular aesthetic character, as a substantial residential building with characteristic Herbert Baker design. Interiors display creative achievement for the period, with detailing specifically deployed to depict Rhodes' notions of the cultures that influenced the Cape.

The site is also holds rarity value for its large scale retention of pre-colonial and early Colonial cultural landscape. This is enhanced by its association with World War 2, and modern South African political changes during the transition to Democracy.

The site holds high potential to yield information both in terms of archaeological and historical investigations.

3.4. Vulnerability

The natural landscape is being compromised by:

- damaged or missing infrastructural water services [stormwater, sewers and water supply] so that leaking and/or overflowing causes erosion and damage;
- uncontrolled growth of invasive alien vegetation, some of which poses a real fire threat to the Estate;
- careless or inappropriate planting of trees, shrubs and flowerbeds so that the expected standards for a Presidential Estate are not being met;
- badly controlled irrigation [either too much or too little].

3.5. Formal Statement of Significance

As can be seen from the Heritage Assessment, the Groote Schuur Museum and its surrounds are highly significant for a number of reasons – it clearly retains the earliest VOC historical pattern and agricultural qualities, is an excellent example of an internationally recognized architect, Sir Herbert Baker, has been owned and occupied by historically important personalities, and most significantly, it has been the official Cape Town residence of the Prime Minister [and then State President] since it was devolved to the State in 1910 until 1994, when Genadendal became the official residence.

The historic open spaces, built landscape, and buildings and structures reflect the unfolding changes over time. The Estate offers a rich and encompassing palimpsest of the history of the Cape.

Figure 45. City of Cape Town Grading Map as at 2025 (CoCT EGS Viewer 2025).

4. CONCEPT REPORT: SCOPE OF WORK

4.1. Overview

The condition assessment continues on the 2015 Compulsory Repair Order by HB Architects to HWC (Heritage Western Cape) which has since lapsed and the Remedial work undertaken circa 2005 (GSE Museum and Outbuildings - Architectural and Heritage Description). The application identified the following items as requiring urgent and remedial work.

Terracotta roof tiles, roof structure, weathered exterior walls, weather-facing joinery in disrepair, roof terrace, marble floor tiles, new drain system behind staff room and structural repair and agricultural drain to garden terraces. Interior works included: the leather wallpaper, dehumidification system and the replacement of the water-based fire protection system.

The defects identified by the HB Architects Compulsory Repair Order are broadly agreed with and adhered to but are expanded in this RSA report. The 2025 RSA condition assessment streamlines the process and provides the heritage and architectural input/ comment/ balance to these items.

Items and elements of critical action are identified here in the Stage 2 Report with general guidelines for repair, maintenance and recommendations at a broader scale. Volume 2 to 5 details items and elements at a site and building scale, showing, inter alia the found material conditions. The broader general guidelines for repair, maintenance and recommendations here in are cross-referenced to Volumes 2 to 5. Specific repair, maintenance and recommendations are addressed in respective volumes.

Cat "A+": suggests that "CRITICAL" action is required,

and the defect constitutes an emergency, ie an immediate or short-term threat of collapse, severe water ingress, safety issue etc. Such items must be prioritised and a team capacitated to implement urgent and immediate remedial action without delay of procurement processes.

"Cat A": pertains to items with a timeframe of "immediate" meaning within say 6 months to 1 year, depending on the item. "Immediate" should constitute urgent items, ie items that cannot be left unattended to without serious consequence.

"Cat B": to be undertaken to mitigate future failures. This can also constitute preventative maintenance. Timeframe 1 to 3 years.

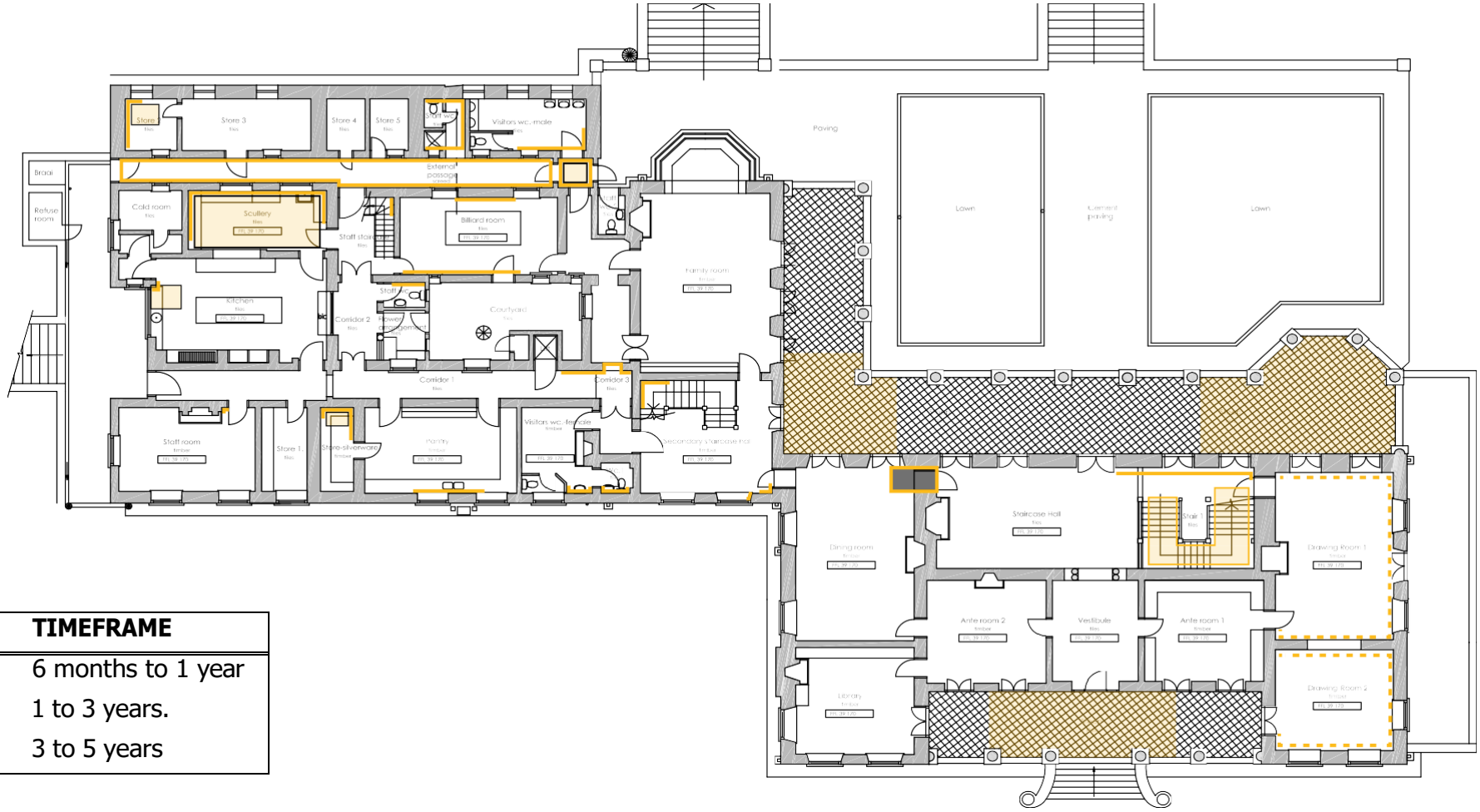
"Cat C": Items of general architectural, aesthetic and H&S nature. Suggest these items be classified as items recommended to be attended to within a medium-term horizon of 3 to 5 years. Some items may be able to be done later than this, but this can only be done as part of an ongoing maintenance review done during this 5-year period which might suggest work can hold over to a second five-year period.

Notwithstanding these three categories, all work could ideally be undertaken in one restoration and repair contract, should funding become available. There are practical and operational benefits to doing the work in an integrated manner.

The three categories identified highlight the degree of urgency to attend to items. However, the also suggest a logical process of staging the work sequence to ensure that, for example, roof work is completed before interior painting is done. The finalisation and approval of the work plan supplied by the Turn-Key Contractor is an essential component of the process.

Underlying all this is an acknowledgement that the ageing structure, potentially accelerating decay due to environmental conditions, the increased use of the building, successive alterations and successive repairs and maintenance all naturally take a toll on the building's condition and underscore the need for planned preventative maintenance.

4.2. High Level Priority Areas Identified



CATEGORY	TIMEFRAME
'Cat a'	6 months to 1 year
'Cat b'	1 to 3 years.
'Cat c'	3 to 5 years

N

ground floor plan
scale 1:100

Key

Wallpaper
Refer to Vol 1: 5.19 for Assessment & Recommendations

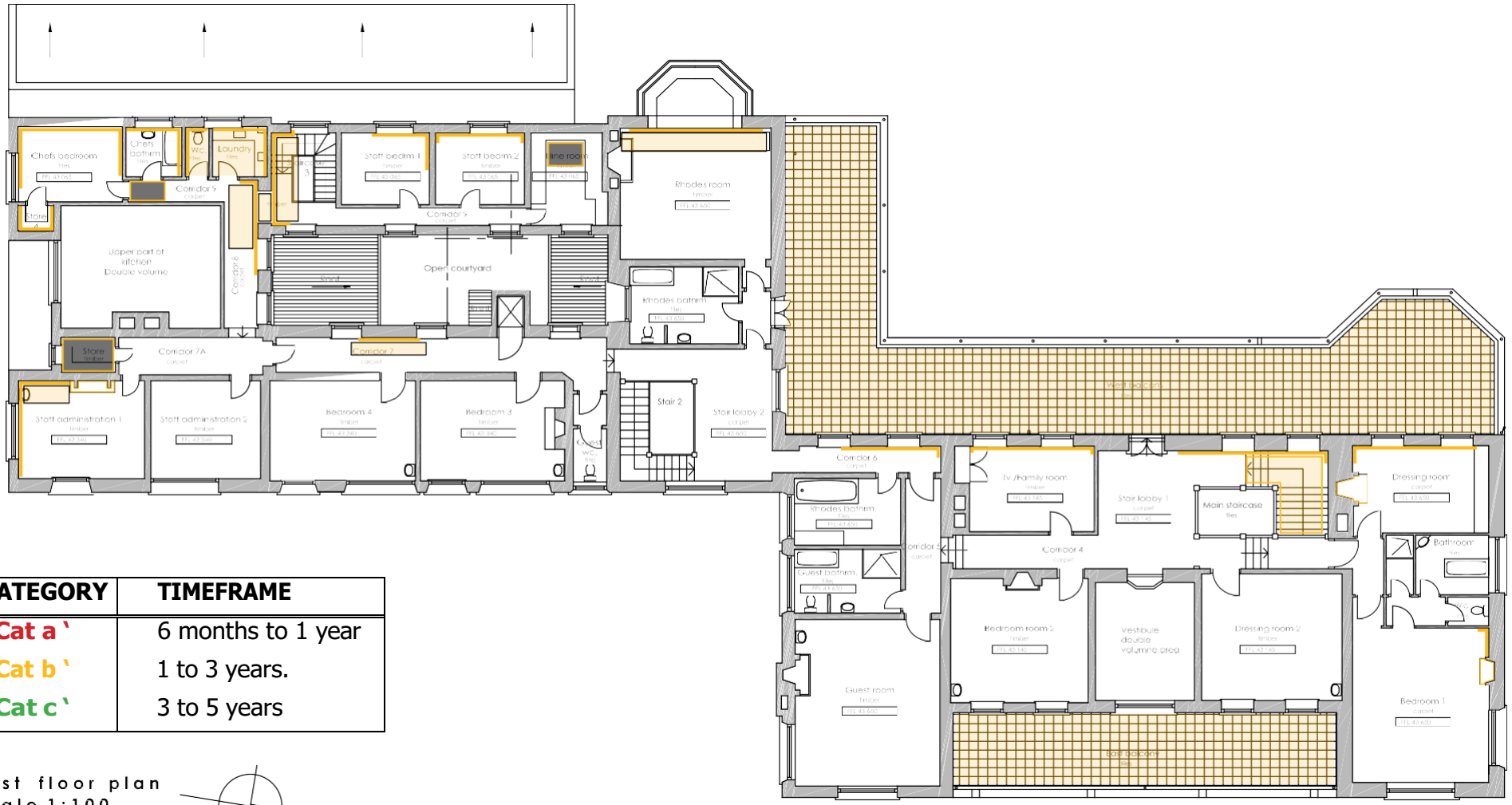
Plaster Wall
Refer to Vol 1: 5.3 for Assessment & Recommendations

Tilled Floors
Refer to Vol 1: 5.4 for Assessment & Recommendations

Carpet
Refer to Vol 1: 5.4 for Assessment & Recommendations

Timber Floor
Refer to Vol 1: 5.4 for Assessment & Recommendations

Ceiling
Refer to Vol 1: 5.8 for Assessment & Recommendations



CATEGORY	TIMEFRAME
' Cat a '	6 months to 1 year
' Cat b '	1 to 3 years.
' Cat c '	3 to 5 years

first floor plan
scale 1:100

Key

Wallpaper
Refer to Vol 1: 5.19 for Assessment & Recommendations

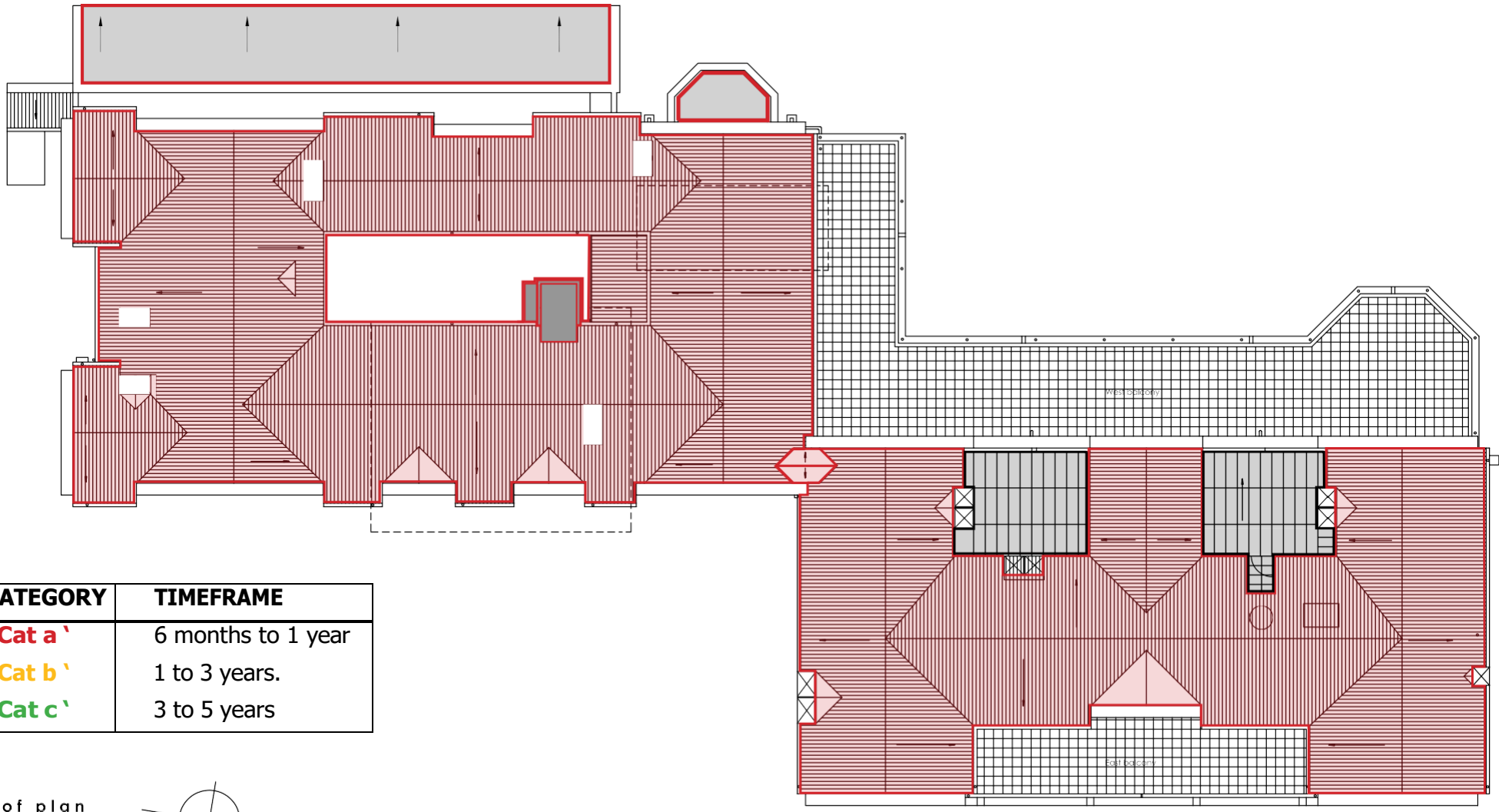
Plaster Wall
Refer to Vol 1: 5.3 for Assessment & Recommendations

Terracoat Tiles
Refer to Vol 1: 5.4 for Assessment & Recommendations

Carpet
Refer to Vol 1: 5.4 for Assessment & Recommendations

Timber Floor
Refer to Vol 1: 5.4 for Assessment & Recommendations

Ceiling
Refer to Vol 1: 5.8 for Assessment & Recommendations



CATEGORY	TIMEFRAME
' Cat a '	6 months to 1 year
' Cat b '	1 to 3 years.
' Cat c '	3 to 5 years

roof plan
scale 1:100

N

Key

Tiled Roof
Refer to Vol 1: 5.1 for Assessment & Recommendations

Flat Roof
Refer to Vol 1: 5.1 for Assessment & Recommendations

Key

Masonry paving
Refer to Vol 1: 5.15 for Assessment & Recommendations

Flagstone paving
Refer to Vol 1: 5.20 for Assessment & Recommendations

Out buildings and structures
Hard landscaping - repair of terrace walls, pool, outhouse, steps, pergola etc

Retaining walls
Refer to Vol 1: 5.3 & 5.15 for Assessment & Recommendations

Wall repair
Refer to Vol 1: 5.3 & Vol 4 for Assessment & Recommendations

Rain water channelsst
Refer to Vol 1: 5.20 for Assessment & Recommendations

Storm water drain
Refer to Vol 1: 5.20 for Assessment & Recommendations

CATEGORY	TIMEFRAME
' Cat a '	6 months to 1 year
' Cat b '	1 to 3 years.
' Cat c '	3 to 5 years

5. INTEGRATED ASSESSMENT AND RECOMMENDATIONS

Herbert Baker's architecture can be termed Arts and Crafts, in line with the architecture of Edwin Lutyens, who was designing with a similar philosophy in England at the same time. The integrated assessment and recommendations are compiled with reference to the (GSE CMP VOLUME 2) CHAPTER 6: CONSERVATION APPLICATION: TECHNICAL and GSE Museum and Outbuildings - Architectural and Heritage Description.

5.1. Roof

Groote Schuur Estate Museum is characterised by Flattish rectangular fired terracotta roof tiles on hipped and gable roofs with some flat-roofed areas.

5.1.1. Red terracotta / Imported Broseley tiles Assessment

- Current defects to the roof include, Broken tiles, slippage. Accumulation of dirt, moss growth, mould and fungus.

5.1.2. Red terracotta / Imported Broseley tiles Recommenda tions

- Clean and remove the accumulation of dirt on roof tiles.
- Remove and clean the accumulation of leaves and dirt in rainwater goods.
- Replace damaged roof tiles and repair those that can be refixed or used.
- Allowance for 50% new tiles and 50% reused tiles all relaid with new battens.
- Clean out roof space, beetle treatment and roof insulation. Specialist work to gable and dormer junctions and valleys.

5.1.3. Flat roof assessment

Flat roofs to the above buildings may be covered in waterproof concrete slabs, long-span secret fixed sheet metal roof sheeting or waterproof timber board roofs.

- Lead roof, flashing and waterproofing, corrosion, peeling and overall deterioration.

5.1.4. Flat roof recommendations

- Repair and waterproofing of concrete flat roofs and screed. Restoration of folded seam lead roofs and timber repair.
- Visible surfaces must be neatly finished and flashings and waterproofing to be of the highest quality and finish, especially if viewed from an upper storey.

5.1.5. Terrace assessment

Terracotta tiles in fair condition. Defects include: General wear & tear, discolouring, accumulation of moss growth between tiles, and stains. Broken and cracked tiles.

5.1.6. Terrace recommendations

Take out terracotta tiles and waterproofing. Lay new waterproofing and followed by salvaged and new terracotta tiles to match.

5.1.7. Balustrade and Metalwork assessment

Chain railing & Balustrade. General wear & tear.

5.1.8. Balustrade and Metalwork recommendations

Copper brazing, repair and redecoration of chain railing balustrade.

5.2. Rainwater goods

Original rainwater goods cast iron.

5.2.1. Rainwater goods assessment

- Steel box gutter - rust, pitting, and cracks. Discoloration and general wear and tear.
- Downpipes - rust, paint peeling and paint discolouration.

5.2.2. Rainwater goods recommendations

- Original cast iron gutters and downpipes to be restored and re-installed.
- Cast iron repair and relining, manufacture of new galvanised special profile to match where damaged or missing.
- Copper brazing and repair to edge capping and rainwater spouts.

5.3. Walls

Walls are traditionally constructed of semi-fired clay bricks with lime mortar, varying in thickness between 230mm - 460mm. Internal walls may be half brick or lathe and plaster.

Foundations are typically small rocks and stones filled into a trench between 450 - 600mm below ground level. There is usually no damp proofing [although occasionally there is a tar bed at the same level as the underside of the floor joists].

The walls are typically finished with a coat of lime plaster, externally originally limewashed.

Because the walls are built with lime mortar, water ingress causes damage very quickly. Leaking roofs allows water from above, cracked, crazed or missing plaster from the sides, and water ponding against the wall, from below. Paint and plaster in poor condition allows moisture in across large areas.

Although the lime plaster and limewash are fragile and require much maintenance, it is imperative that they are not replaced with high Portland cement content plaster and acrylic paint - it is critically important that the walls 'breathe' through the semi-permeable outer layer of lime plaster and limewash or cheap contractor's PVA. Externally, hard cement plaster and impervious paints cause the substrate to become friable, and the plaster destroys the substrate within a few years.

5.3.1. Walls assessment

External

- Discoloration of paint, accumulation of dust, rust stains.

Internal

- Cracked, crazed and missing plaster.
- Water ingress, dampness, loose, peeling plaster and paint alongside stained walls.
- Leather wallpaper damaged due to water ingress.
- Burmese teak timber paneling in good condition.

5.3.2. Walls recommendations

External

- Allowance for removal of defective cement plaster and application of lime plaster with attention to subfloor breather systems externally.
- Removal of all existing coatings down to original sound or new lime plaster. Apply specialist breathable paint coatings such as Keim or Breathcote compatible with heritage fabric.

TYPICAL PLASTER SPECIFICATIONS

1. The walls should be carefully examined for any cracks, settlement or leaning and a structural engineer consulted in conjunction with a conservation/ heritage-skilled architect.
2. No cement to be used in any mortar, plaster, repair work or building work.
3. No cementitious base coats or bonding layers should be used.
4. Mix for lime mortar and lime plaster - 3 sand: 1 lime to be used throughout.
5. Bagged builders' lime can be used, but pre-mixed sand/ lime is now also commercially available ex Cape Lime Company (CLC) to better ensure consistency.
6. No surface cementitious fillers or repair work to be done, lime putty (either manufactured on site or, more easily, purchased from Midas Paints) can be used for repair of minor cracks and blemishes.
7. The walls should be brushed down and dampened prior to plastering, taking care to avoid working in the heat of the day or direct sunlight.
8. A weak limewater "slurry coat" to aid adhesion may be advisable or necessary depending on trial applications.
9. It is recommended that a specialist from Cape Lime Company be requested to visit the site and confirm this specification and procedure.
10. All loose and flaking paint and limewash on remaining plaster surfaces to be scraped off with a view to applying a specialist, breathable mineral paint such as Keim. This will require much testing on site to verify the extent of adhering paint that can be removed without damaging underlying historic plaster surfaces.
11. This testing and confirmation of specifications must be allowed for in the process.
12. Refer to attached technical info on Keim mineral paints (Section9.3)

5.3.3. Internal Walls

- **Walls**

Removal of defective, damaged plaster and paint. Application of lime plaster.

Removal of defective coating down to original sound or new lime plaster. Apply specialist breathable paint coatings such as Keim or Breathcote compatible with heritage fabric.

- **Leather wallpaper**

Repair and restore damaged leather panelling once dry conditions are established. Expert conservators are required.

- **Teak Timber Paneling**

Rub down, clean and apply appropriate oil treatment.

5.4. Floors

5.4.1. Floor assessment

- **Timber** flooring is in fair condition. General defects include: scratches, fading and gaps. Critical defects in corridor 7A Store,

Corridor 9 and Chefs bedroom.

- **Carpet** in fair condition. Critical wear and tear. Defects include rippling, stains and bad odour. Critical defects in Main staircase.
- **Marble Checkerboard** floor in fair condition. General wear and tear, staining, cracks, spalling and loss of shine. Critical defects in Main entrance stoep.

5.4.2. Floor recommendations

- **Marble Checkerboard -** Repair marble floor, replace eroded tiles with matching tiles, polish and seal. General defects on the main entrance stoep.
- **Carpet -** The Main Entrance Hall staircase carpet over the timber flooring requires appropriate repair/ replacement.
- **Timber -** Clean down, lightly hand sand and apply appropriate oil sealant treatment.

5.4.3. Skirting

5.4.4. Dutch / Delft tiles

Dutch / Delft tiles patterned with flowers, children's games and animal etc. motifs dating back to the mid- seventeenth century.

5.4.5. Delft tiles skirting assessment

- Delft tiles in fair condition general wear and tear.

5.4.6. Delft tiles skirting recommendations

Repair marble floor, replace eroded tiles with matching tiles, polish and seal. General defects on the main entrance stoep.

5.4.7. Teak Timber Skirting

Refere to room by room schedules.

5.4.8. Teak Timber assessment

- Skirting is in fair condition with general wear and tear.

5.4.9. Teak Timber recommendations

- Clean down, lightly hand sand and apply appropriate oil sealant treatment.

5.4.10. Marble skirting

5.4.11. Marble skirting assessment

- Skirting in fair condition general wear and tear.

5.4.12. Marble skirting recommendations

- Repair and replace where necessary.

5.5. JOINERY

Doors, windows and shutters:

Doors and windows were only varnished internally if constructed of good timber such as Burmese teak, oak or other hardwood.

The museum's doors and windows are made of Very fine Burmese teak joinery throughout.

5.5.1. Joinery assessment

- Timber windows, doors and shutters top layer/ sealant peeling. Outside.

5.5.2. Joinery recommendations

- Complete overhaul of all teak windows inside and out including sanding down, removal of glazing and film, timber repair, lead and copper cills and head flashings, minimum 5 coats Rubbol, glazing, Sika sealant and putty glazing.
- **Internal doors -** Clean, and apply appropriate oil sealant treatment to all doors and service hinges and ironmogery.

5.6. WINDOWS (GLAZING)

5.6.1. Glazing assessment

- Glazing film coating peeling. Broken window pane.

5.6.2. Glazing recommendations

- Removal of glazing and film, as well as Sika sealant and putty glazing.

5.7. CEILINGS

More ornate ceilings were flat-finished lathe-and-plaster ceilings with ornate plaster ceiling roses, festoons and elaborate plaster cornices.

Generally the ceiling is predominantly lath and gypsum plaster ceilings, some vaulted, with large, simple geometry cornices.

Heavy ceilings which are either beamed with dark ceiling boards between or covered with Jacobean plaster strapwork reproduced in wood.

The ceiling is made predominantly lath and gypsum plaster, some vaulted, with large, simple geometry cornices.

5.7.1. Ceiling assessment

- **Timber -** Beamed with dark ceiling boards in between ceilings is in good condition.
- **Plaster Ceiling -** Lath and gypsum plaster ceilings in fair condition. Critical defects in Corridor 9. General defects include: Ingress of water and dampness. Loose, peeling paint and plaster alongside stains on the ceiling.

5.7.2. Ceiling recommendations

- **Timber -** Clean, and apply appropriate oil treatment.
- **Plaster Ceiling -** Removal of defective and damaged plaster and paint. Application of new plaster and paint. Scrape down and repair water damage areas.

5.8. IRONMONGERY

5.8.1. Ironmongery assessment

- Ironmongery is in fair condition. General wear and tear.

5.8.2. Ironmongery recommendations

- Retain as much of the original ironmongery as possible and restore back to working condition.
- Servicing and repair of all brass ironmongery, replacement of missing to match.

5.9. DEHUMIDIFICATION

5.9.1. Humidifier assessment

- Several unused humidifiers are stored in Corridor 1A.
- The humidifier in the Library was not operating during the site survey.

5.9.2. Humidifier recommendations

- Service and repair all dehumidifiers.
- Allowance for HVAC and ventilation to service areas, showers etc.

5.10. ELECTRICAL RETICULATION:

- Rewire house taking care to reuse historic switches, conduit routes etc, retube into existing runs only where essential, compliance work to DBs and lift.

5.11. FIRE SERVICES

- Allowance for new fire detection system. Fire equipment servicing and upgrade allowance for gas in selected areas.

5.12. FIREARMS DISPLAY

According to the HB Architects GSE Museum and Outbuildings - Architectural and Heritage Description. A Gun safety cabinet and suitable/appropriate burglar-proofing were installed in the display room in terms of current firearms legislation. A new gun cabinet is required in terms of current regulation. Security consultants is to be engaged.

5.13. FABRIC AND UPHOLSTERY

c.1980s works to the fabric and upholstery were undertaken. HB Architects recommended that worn c.1980s fabric and upholstery be replaced with circa Rhodes era fabrics and a single upstairs room be kept in the 1980s style. The RSA Survey generally supports these recommendations but notes that a more detailed reassessment is necessary in stage 3/4. Any work should be conducted under the supervision of experienced service providers and conservators.

5.14. LANDSCAPING (TERRACE)

5.14.1. Terrace assessment

- Cracks and damage to structural elements.
- Discoloration of paint and plaster.
- Brick steps (General wear and tear)

5.14.2. Terrace recommendations

- Repair cracks and damage to structural engineers specifictions.
- Allowance for removal of defective cement plaster and application of lime plaster with attention to subfloor breather systems externally.
- Removal of all existing coatings down to original sound or new lime plaster. Apply specialist breathable paint coatings such as Keim or Breathcote compatible with heritage fabric.

5.15. HYDRANGEA HORSESHOE

Although not formally a built feature, the Hydrangea Horseshoe was constructed under C J Rhodes' instruction. It is a formal, horseshoe-shaped landscape feature.

5.15.1. Hydrangea Horseshoe Assessment

- Hydrangea Horseshoe is unkempt and forgotten.

5.15.2. Hydrangea Horseshoe Recommendations

- Attention to perimeter rainwater channels, road level, and reshape to ensure runoff.
- Re-establish formal hydrangea garden, formal paths and pergolas and historically suitable garden furniture.
- Irrigation systems and water usage should be established that are environmentally considerate and sustainable.
- Suitable garden lighting to be restored and introduced
-

5.16. PERGOLA

The pergola appears to have been reconstructed recently. The walkway leads to an ornamental stair leading to a dead end. The element is architecturally not suited to the style of the garden and the stairs and should be removed (c.2013 HB Architects). In principle this report agrees with the recommendations, a detailed assessment is required with a landscaping plan.

5.16.1. Pergola assessment

- **Timber** pergola structure is in fair condition.
- **Pavers** in fair condition, general wear and tear. Accumulation of leaves and rubble.
- **Pergola pillars -** General wear and tear

5.16.2. Pergola Recommendations

- Attention to perimeter rainwater channels, road level, and re-shape to ensure runoff.
- Repair and paint pergola pillars and make good.
- Remove weeds growing through joints, rubble and dirt and dispose of as waste. Sweep all hard surfaces, and clean out accumulated debris and dirt with the appropriate equipment.

5.17. SCULPTURE, ART AND MEMORIALS

Recommendations based on the HB Architects GSE CMP Volume 2_Landscape Management Guidelines

- Sweep and clean the bases and pedestals of sculptures, landscape art and memorials. Make use of suitable equipment for the task to ensure that sculpture, art and memorials are not damaged.
- Note sculpture, art and memorials in need of cleaning, repair or restorations and report these in writing via correct channels to the Supervising officer for referral to small civil works teams.

5.18. ARTIFACTS AND MOVABLE ITEAMS

During a consultation with the GSE Curator Dr Rayda Becker, it was recommended that no artefacts or movable items should be moved off-site.

It is recommended that a specialist curatorial team, with assistance and input from Iziko Museums, and with Permitting by SAHRA given that the collection is Declared in terms of the NHRA, undertake the following:

- Decant all heritage objects in an orderly and professional manner.
- Keep detailed logs and records.
- Securely store all removed loose items, art, objects and furniture, in air-conditioned and humidity controlled containers.
- This container bank should preferably be located nearby, on-site in an enclosed and secure precinct.
- Regular monitoring and recording takes place while in storage to ensure protocols are effective and adequate.
- The curatorial team should be responsible for re-instating objects after the repair and restoration work is completed.
- The heritage architect, monitoring conservation agent as well as the curatorial team must sign off on the decanting process prior to any construction or repair work commencing.

The following professionals will be required

1. Architect (with a proved track record and experience in dealing with buildings of very high significance).
2. Heritage Practitioner (this role could be fulfilled by 1

above).

3. Structural Engineer (with expertise in heritage buildings).
4. Quantity Surveyor.
5. Mechanical Engineer – Fire.
6. Electrical Engineer.
7. Wet services engineer – (for detailed assessment of piping and infrastructure).

Consultation with experienced art historians, curators and specialist technical professionals as outlined will likely be required as well.

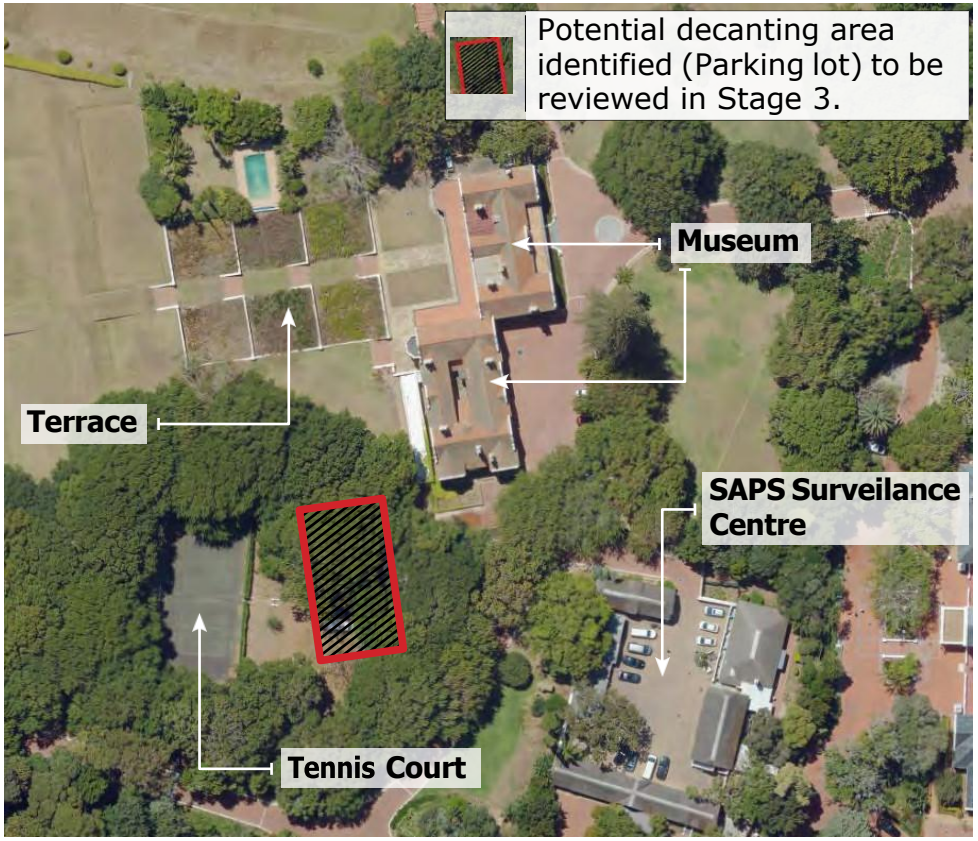


Figure 46. RSA (2025) 2025 Aerial Photograph, (After - City of Cape Town Map Viewer, EGISViewer).

5.19. HARD SURFACES

5.19.1. Hard surface assessment

Flagstone Pavers are in fair condition, general wear and tear. Defects include: Weeds growing between joints. Accumulation of leaves, and rubble and stains.

5.19.2. Hard surface recommendations

- Take up and lay new external sandstone paving to relace modern tiles
- Attention to perimter rain water channels, road level reshape to ensure run off

6. GENERAL GUIDELINES FOR REPAIR MAINTENANCE AND CONSERVATION

The guidelines are cross-referenced to the HB Architects (GSE CMP VOLUME 2) CHAPTER 5: CONSERVATION APPLICATION: GENERAL. The guidelines are only referenced in the RSA Conditional Assessment Report and broadly in agreement. The repair, maintenance and works to satisfy legal requirements. Works undertaken and approach should ensure the continued existence and use of the building.

The following principles can serve as a basis:

- Employ appropriately skilled and experienced consultants and specialists to undertake the work;
- Thorough research and documenting of elements (e.g. floors, ironmongery etc.), artifacts movement and relocation etc, before starting repair and maintenance actions.

6.1. Minimum Intervention

Works undertaken should be based on respect for the existing fabric and should, therefore, involve minimum intervention.

- Evidence contained in the fabric of a building should not be tampered with or destroyed.
- Alterations affected over time should be respected since they show the evolution of the structure over time.
- Where possible, interventions should be made in such a way that, were they to be undone at a future date, the original fabric will again be visible.

6.2. New Work

- Contemporary design is acceptable provided that it harmonizes with the existing historical character and scale and does not overwhelm it.
- New designs should be compatible with regard to the size, material, texture, colour and character of the historical building and its surroundings.

6.3. Documentation

- Photographs should be taken before, during and after intervention activities to provide a clear record of how the building has been worked on.
- Detailed information concerning replacements, e.g. gutters or cast-iron work, should be retained for reference purposes during future works activities.

7. GROOTE SCHUUR ESTATE: GENERAL GUIDELINES FOR REPAIR MAINTENANCE AND CONSERVATION

The Groote Schuur Estate guidelines are cross-referenced to the HB Architects (GSE CMP VOLUME 2) CHAPTER 5: Groote Schuur Estate: Highly Significant Heritage Resources General Conservation Guidelines

The guidelines are only referenced in the RSA Conditional Assessment Report and broadly in agreement. These Guidelines apply to: The Museum including the landscape features such as the terraces, the Hydrangea Horseshoe, ponds, paths and steps, gardens and mature trees;

7.1. GSEM: General Guidelines for Repair Maintenance and Conservation

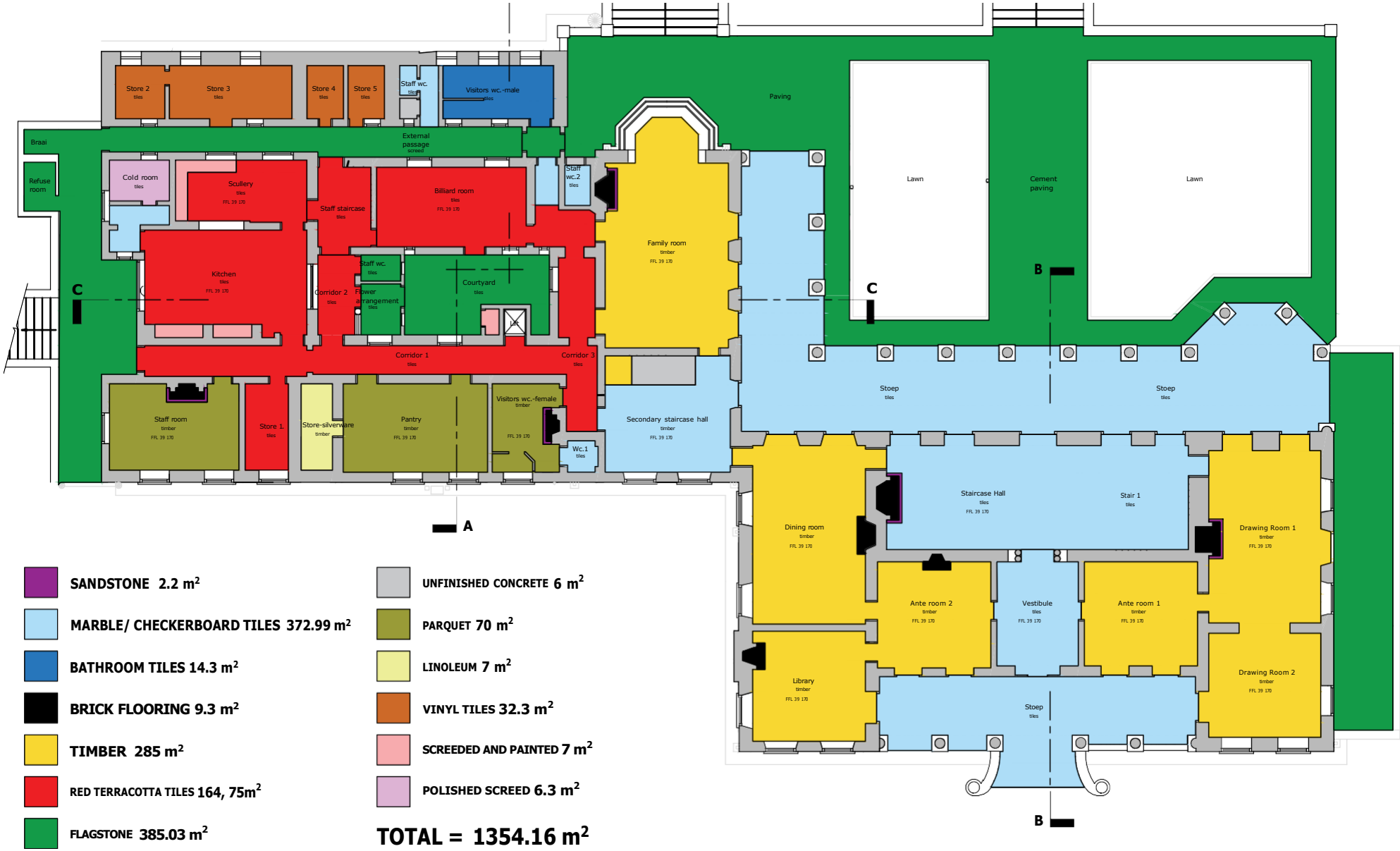
Category	No	Instruction	Explanation
MANAGEMENT	A1	**Cautious Approach**	
		Cautious approach: do as much as necessary, but as little as possible for ANY work to original fabric, spaces or places.	A cautious approach of changing as much as necessary but as little as possible is the central tenet for approaching any work on Groote Schuur Estate. Conservation is based on a respect for the existing fabric, use, associations and meanings of a place.
	A2	**Knowledge, skills and techniques**	
		Only consultants, contractors and specialists with approved skills and experience endorsed by the relevant heritage authorities may work on buildings and places which are highly significant heritage resources.	
	A3	**Direction, supervision and implementation**	
		Competent direction and supervision must be maintained for all aspects of work on buildings and places that have high heritage significance: maintenance, repairs and replacement, and particularly to new work.	
	A4	**Conservation**	
		Preserve original fabric by approved conservation methods unless it is damaged or worn out beyond maintenance or repair.	*Fabric* means all the physical material of the *place* including components, fixtures, contents, and objects.
			Fabric includes building interiors and sub-surface remains, as well as excavated material. Fabric defines spaces. and these are important elements of the significance of the place.
		For original fabric to be conserved, it is imperative that traditional materials and techniques with respect to thatching, repairing old brickwork, plastering and lime-washing are applied.	

Category	No	Instruction	Explanation
EXISTING	B1	**Maintenance**	
		Maintain all the parts of the building in a good state of repair.	*Maintenance* means the continuous protective care of the fabric and setting of buildings, structures, places, spaces and landscaping on Groote Schuur Estate, and is to be distinguished from repair or replacement.
		Maintenance includes regular inspection, cleaning and surface treatment of fabric eg painting, limewashing, varnishing, waxing etc.	
	B2	**Repair/Replace/Reconstruct**	
		Repair any item or fabric as soon as it is discovered to prevent further damage or loss.	Repair means to make good damage caused by wear-and-tear, and accidental incident [eg broken glass], with identical material.
		Replace fabric which, through age, which is beyond maintenance, with identical fabric so there is no *visible* or *material* alteration to material eg lime plaster with lime plaster, thatch with thatch, terracotta tiles with terracotta tiles.	If non-identical material is used as replacement, then the fabric is considered altered, which is not permissible in conservation policy.
		Replacement of original fabric which is damaged or worn beyond repair with other material because of total lack of availability or extortionate cost of the original material is only permissible after consultation and approval by the relevant heritage authorities	
		Remove intrusive or insensitive accretions that have no heritage significance	
		Restore any object or element that is damaged by accident.	*Restoration* means returning the existing *fabric* of a *place* to a known earlier state by removing accretions or by reassembling existing components without the introduction of new material.
			Restoration is appropriate only if there is sufficient evidence of an earlier state of the *fabric*.
		Reconstruct any object or element only if the original material is damaged beyond repair by adding replacement material. Reconstructed work must be identifiable on close inspection	*Reconstruction* means returning a *place* to a known earlier state and is distinguished from *restoration* by the introduction of new material into the *fabric*. New material may include recycled material salvaged from other places. No 'fake' conjectural reconstruction of historical buildings, landscapes or structures. Any reconstruction may only be based on firm evidence of an earlier state of the fabric.

Category	No	Instruction	Explanation
EXISTING	B3	**Change/Adaptation**	
		When change is being considered, a range of options should be explored to seek the option which minimizes the reduction of cultural significance.	*Adaptation* means modifying a *place* to suit the existing *use* or a proposed use.
		Changes must be considered temporary and must be reversible without reducing any *cultural significance*.	
		Do not remove, damage or alter any original fabric in the process of adapting a building to a new use. This includes the removal of internal walls and the breaking of openings for doorways and windows unless the express approval of the relevant heritage authorities is obtained. If such interventions are required, then the adaptation is inappropriate	
	B4	**Removal of intrusive fabric**	
		Fabric that that has no cultural significance and is visually and spatially invasive, may be removed.	
		Intrusive fabric is to be removed, altered or mitigated to lessen the impact on adjacent cultural significance	
NEW WORK	C1	**New work**	
		New work may only take place in areas which have been identified as appropriate.	No new residences may be built in the Rhodes Will Area. Any buildings built in the Rhodes Will Area must be accessible to the public.
		New work may not compromise the authenticity of any historical structure, nor may it interfere with the 'sense of place'.	
		The design or architecture of new work must be a contemporary interpretation of the Baker buildings on the Estate as per Rhodes Will.	
		New work must be highly sympathetic in terms of its siting, orientation along the contours, bulk, form, scale, character, colour, texture and material which must be similar to existing fabric.	
		Imitation is not permitted.	
		Design which contrasts with the existing fabric is not permitted.	
		Design based on other regions, styles, periods, patterns or origins is not permitted.	

Category	No	Instruction	Explanation
EMERGENCY	D1	**Emergency work**	
		Emergency work constitutes any work done to preserve any fabric that has being threatened by, or has been damaged by, extreme natural events or human action, where the simplest and most effective response to the threat or action may be undertaken without requiring statutory process if such lack of action will result in catastrophic failure.	

8.3. Material Identification



SANDSTONE 2.2 m²

MARBLE/ CHECKERBOARD TILES 372.99 m²

BATHROOM TILES 14.3 m²

BRICK FLOORING 9.3 m²

TIMBER 285 m²

RED TERRACOTTA TILES 164, 75m²

FLAGSTONE 385.03 m²

UNFINISHED CONCRETE 6 m²

PARQUET 70 m²

LINOLEUM 7 m²

VINYL TILES 32.3 m²

SCREEDED AND PAINTED 7 m²

POLISHED SCREED 6.3 m²

TOTAL = 1354.16 m²

ground floor plan **scale 1:100**

SANDSTONE 0.8 m²

MARBLE/ CHECKERBOARD TILES 29 m²

BATHROOM TILES 42 m²

BRICK FLOORING 6.2 m²

TIMBER 404 m²

CARPET OVER TIMBER 117.2 m²

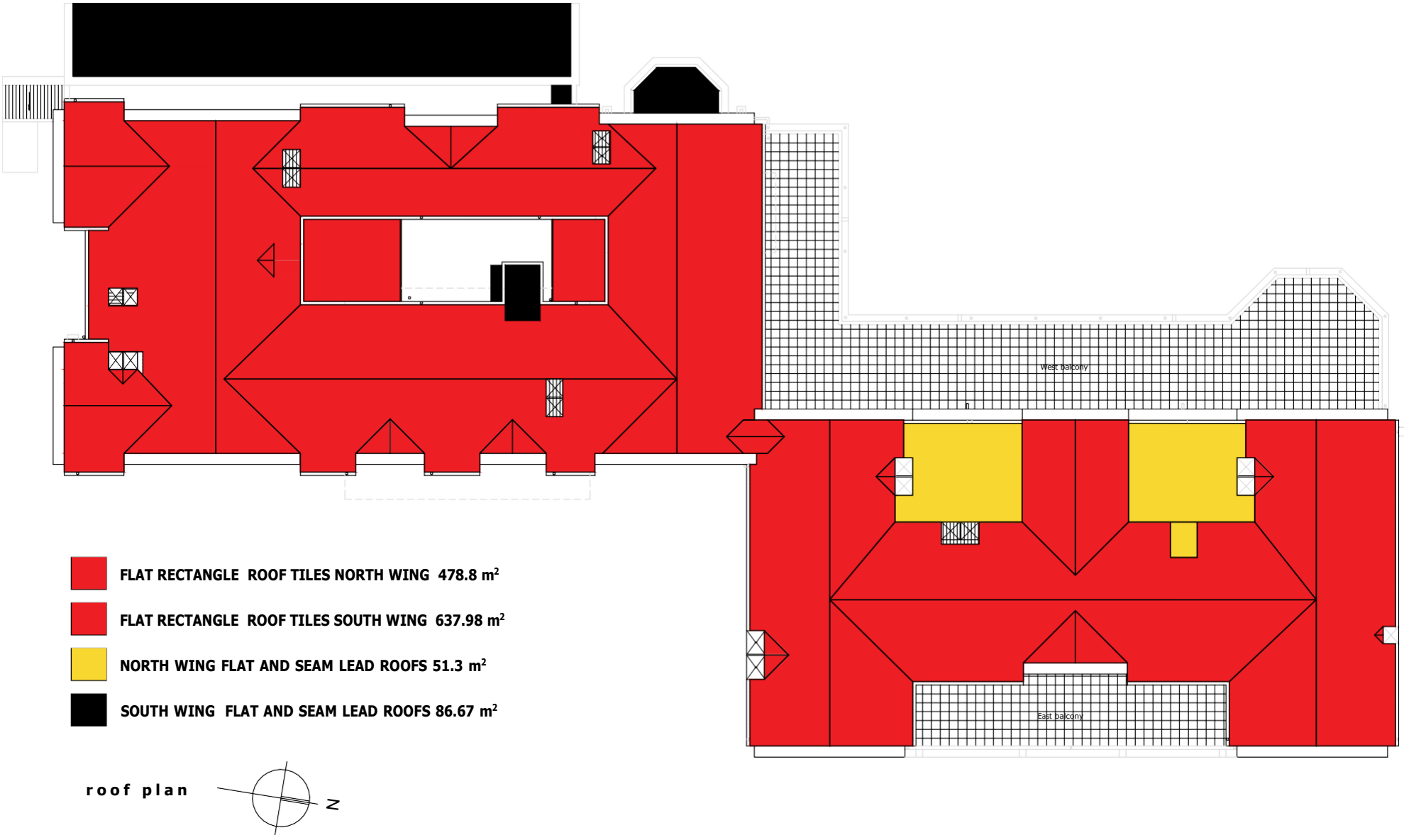
RED TERRACOTTA TILES 202.8 m²

TOTAL = 802 m²

first floor plan

scale 1:100

N


West balcony
East balcony
FLAT RECTANGLE ROOF TILES NORTH WING 478.8 m²
FLAT RECTANGLE ROOF TILES SOUTH WING 637.98 m²
NORTH WING FLAT AND SEAM LEAD ROOFS 51.3 m²
SOUTH WING FLAT AND SEAM LEAD ROOFS 86.67 m²
N

roof plan

8.4. Area Summaries

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
4															
5		**Ground Floor**													
6															
7		**Ground Floor - South Wing**													
8		Room Name				Perimeter		Ave. H	Perimeter x H = Surface Area				Area		
9															
10		Staff room				25,07		4,05	101,5335				26,71		
11		Store 1				13,59		3,92	53,2728				9,11		
12		Store-silverware				12,59		3,92	49,3528				6,97		
13		Pantry				24,24		3,92	95,0208				31,22		
14		Visitors wc.-female				24,48		3,92	95,9616				16,41		
15		Secondary staircase hall				26,28		3,92	103,0176				35,47		
16		Corridor 1				21,23		4,05	85,9815				13,36		
17		Corridor 2				12,89		3,37	43,4393				9,05		
18		Corridor 3				43,07		3,92	168,8344				25,92		
19		Corridor 4				32,9		3,25	106,925				16,6		
20		Kitchen				31,06		6,977	216,70562				41,23		
21		Cold room				22,42		3,37	75,5554				11,08		
22		Scullery				20,91		3,8	79,458				19,6		
23		Staff staircase				15,23		4,3	65,489				11,52		
24		Staff wc.				7,229		3,37	24,36173				2,62		
25		Flower Arrangement				9,79		3,37	32,9923				5,21		
26		Billiard room				25,146		3,645	91,65717				29,59		
27		Family room				34,9		4,23	147,627				67,38		
28		Staff wc.2				7,25		3,645	26,42625				2,88		
29		Visitors wc.-male				24,09		2,2	52,998				17,21		
30		Staff wc.				14,32		2,3	32,936				5,03		
31		Store 5				9,58		2,3	22,034				5,16		
32		Store 4				9,58		2,3	22,034				4,93		
33		Store 3				20,1		2,3	46,23				16,19		
34		Store 2				11,43		2,3	26,289				6,39		
35															

36															
37		**Total**				**499,375**			**1866,13277**				**436,84**		
38															
39															
40		**Ground Floor - North Wing**													
41		Room Name				Perimeter		Ave. H	Perimeter x H = Surface Area				Area		
42															
43		Library				26,23		3,65	95,7395				31,22		
44		Ante room 2				25,77		3,65	94,0605				30,85		
45		Vestibule				20,9		7,25	151,525				22,17		
46		Ante room 1				23,7		3,65	86,505				29,99		
47		Drawing Room 2				26,38		3,65	96,287				29,49		
48		Drawing Room 1				38,68		3,65	141,182				52,43		
49		Stair 1 - Staircase Hall				48,79		3,65	178,0835				82,04		
50		Dining room				34,85		3,65	127,2025				52,18		
51															
52															
53		**Total**				**245,3**			**970,585**				**330,37**		
54															

	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG
4															
5		**First Floor**													
6															
7		**First Floor - South Wing**													
8		Room Name				Perimeter		Ave. H	Perimeter x H = Surface Area				Area		
9															
10		Secondary staircase hall lobby				25,76		3,976	102,42176				30,12		
11		Rhodes Bathrm				17,6		3,976	69,9776				14,58		
12		Rhodes Room				31,8		3,976	126,4368				45,84		
13		Guest Wc				11,5		9,376	107,824				5,15		
14		Bedroom 3				22,3		3,976	88,6648				25		
15		Bedroom 4				21,1		3,976	83,8936				25,68		
16		Staff Administration 2				17,5		3,85	67,375				18,88		
17		Staff Administration 1				20,39		3,85	78,5015				21,58		
18		Store 1				8		3,051	24,408				3,32		
19		Corridor 7				34,98		2,682	93,81636				22,22		
20		Corridor 7A				16,8		3,051	51,2568				10,37		
21		Corridor 8				13,7		3,147	43,1139				6,43		
22		Corridor 9				16		3,147	50,352				6,85		
23		Corridor 9A				27,07		3,147	85,18929				15,18		
24		Store 2				5,26		3,25	17,095				1,67		
25		Chefs Bedroom				15,49		3,25	50,3425				13,73		
26		Chefs Bathrm				9,45		3,25	30,7125				4,9		
27		WC				6,3		3,25	20,475				2,08		
28		Laundry				9,36		3,25	30,42				4.81		
29		Staff Bedrm 1				13,98		3,003	41,98194				11,12		
30		Staff Bedrm 2				14		3,003	42,042				11,22		
31		Linen Room				14,9		3,003	44,7447				11,94		
32		Rhodes Room Lobby				7,59		2,492	18,91428				3,04		
33															
34															
35															
36															
37		**Total**				**380,83**			**1369,95933**				**310,9**		

First Floor -North Wing			
Room Name	Perimeter	Ave. H	Perimeter x H = Surface Area	Area
Bedroom 1	36,2	3,85	139,37	43,17
Bathroom	11,7	3,85	45,045	7,656
Shower	7,46	3,85	28,721	2,88
WC	11,76	3,85	45,276	5,25
Dressing Room	22,1	3,85	85,085	21,41
Bedroom 2	24	3,25	78	31,21
Vestibule Double Volume	19,1		0	
Bedroom 3	24,7	3,25	80,275	30,04
Main Staircase Lobby	31,8	3,125	99,375	41,948
Corridor 4	16,2	3,25	52,65	9,36
Tv / Family Room	20,15	3,25	65,4875	18,76
Guest Room	28,48	3,85	109,648	42,536
Guest Bathrm	16,06	3,85	61,831	11,8
Corridor 5	15,3	3,25	49,725	8,768
Rhodes Bathrm	14,88	3,85	57,288	12,52
Corridor 6	17,86	3,85	68,761	7,86
Total	**317,75**		**1066,5375**	**295,168**

Ground and First floor total areas

	Perimeter	Ave. H	Perimeter x H = Surface Area	Area
Ground Floor South Wing	499,375		1866,13277	436,84
Ground Floor North Wing	245,3		970,585	330,37
Ground Floor Total	744,675		2836,71777	767,21
First Floor South Wing	380,83		1369,95933	310,9
First Floor North Wing	317,75		1066,5375	295,168
First Floor Total	698,58		2436,49683	606,068
OVERALL TOTAL	1443,255		5273,2146	1373,278

Elevations

South Wing

Elevation	Surface Area	Surface Area Excluding Openings

East Elevation

	Surface Area	Surface Area Excluding Openings
East Elevation	389	331
East Elevation Refuse Area	16,35	15,26
East Elevation Courtyard	72,4	64,24
East Elevation External Passage	68	59
Total	**545,75**	**469,5**

South Elevation

	Surface Area	Surface Area Excluding Openings
South Elevation	141,2	111,54
South Elevation (flanking wing/ Utility Rooms)	3	
South Elevation Courtyard		
South Elevation Courtyard Lift	21,3	19
South Elevation External Passage	13	11
South Elevation Bay Window	4	2
	20,4	6
Total	**202,9**	**149,54**

35															
36															
37															
38															
39		**West Elevation**													
40						Surface Area				Surface Area Excluding Openings					
41		West Elevation External Passage				286				229					
42		West Elevation Refuse Area				22									
43		West Elevation Courtyard				74				68,4					
44		West Elevation Courtyard (flanking wing/ Utility Rooms)				36				34					
45															
46															
47															
48		**Total**				**418**				**331,4**					
49															
50															
51															
52															
53		**North Elevation**													
54						Surface Area				Surface Area Excluding Openings					
55		North Elevation				137				97					
56		North Elevation Courtyard				21				14					
57		North Elevation External Passage				4				2					
58															
59		**Total**				**162**				**113**					
60															

	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
3														
4		**Elevations**												
5														
6		**North Wing**												
7		**Elevation**				**Surface Area**				**Surface Area Excluding Openings**				
8														
9														
10														
11														
12		**East Elevation**												
13						Surface Area				Surface Area Excluding Openings				
14		East Elevation North Wing				323				261				
15														
16		**Total**				**323**				**261**				
17														
18														
19														
20		**South Elevation**												
21						Surface Area				Surface Area Excluding Openings				
22		South Elevation				113				97				
23		South Elevation Stoep				49				44				
24														
25		**Total**				**162**				**141**				
26														
27														
28														
29														
30		**West Elevation**												
31						Surface Area				Surface Area Excluding Openings				
32		West Elevation				321				252				
33														

34															
35		**Total**					**321**				**252**				
36															
37															
38															
39															
40															
41		**North Elevation**													
42						Surface Area				Surface Area Excluding Openings					
43		North Elevation				122				101					
44		North Elevation Stoep				51				46					
45															
46		**Total**				**173**				**147**					
47															

	B	C	D	E	F	G	H	I	J	K	L	M	N	O
62														
63														
64		**South & North Wing Elevations Total Surface Area**												
65														
66						Surface Area				Surface Area Excluding Openings				
67														
68		South Wing Total Area				1328,65				1063,44				
69		North Wing Total Area				979				801				
70														
71														
72		**Total**				**2307,65**				**1864,44**				
73														
74														

	B	C	D	E	F	G	H	I	J	K
3										
4		**Roof Area**								
5										
6		North Wing								
7										
8		Clay Broseley Tiles								
9			Area		Roof Pitch		Surface Area			
10										
11		A	52,05		1,47		76,5135			
12		B	35,61		1,47		52,3467			
13		C	120,64		1,47		177,3408			
14		D	27,84		1,47		40,9248			
15		E	37,25		1,47		54,7575			
16		F	52,35		1,47		76,9545			
17										
18		**Total**					**478,8378**			
19										
20										
21		Roof Area								
22										
23		**Flat and seam lead roofs**								
24			Area		Roof Pitch		Surface Area			
25		1	1,92		1,003		1,92576			
26		2	24,85		1,003		24,92455			
27		3	24,41		1,003		24,48323			
28										
29		**Total**					**51,33354**			
30										

	B	C	D	E	F	G	H	I	J	K
31										
32		**Roof Area**								
33										
34		South Wing								
35										
36		Clay Broseley Tiles								
37			Area		Roof Pitch		Surface Area			
38										
39		A	55,16		1,47		81,0852			
40		B	31		1,47		45,57			
41		C	118,406		1,47		174,05682			
42		D	8,695		1,158		10,06881			
43		E	70,76		1,47		104,0172			
44		F	16,145		1,065		17,194425			
45		G	41,14		1,47		60,4758			
46		H	60,26		1,47		88,5822			
47		I	19,24		1,47		28,2828			
48		J	19,49		1,47		28,6503			
49										
50		**Total**					**637,983555**			
51										
52										
53		**Roof Area**								
54										
55		**Flat and seam lead roofs**								
56			Area		Roof Pitch		Surface Area			
57										
58		1	5,57		1,003		5,58671			
59		2	6,71		1,003		6,73013			
60		3	74,14		1,003		74,36242			
61										
62		**Total**					**86,67926**			
63										

	B	C	D	E	F	G	H	I	J	K
64										
65		**Total Roof Area**								
66										
67										
68		North Wing Clay Broseley Tiles					478,8378			
69		North Wing Flat and seam lead roofs					51,33354			
70		South Wing Clay Broseley Tiles					637,983555			
71		South Wing Flat and seam lead roofs					86,67926			
72										
73										
74		**Total Area**					**1254,834155**			
75										
76										

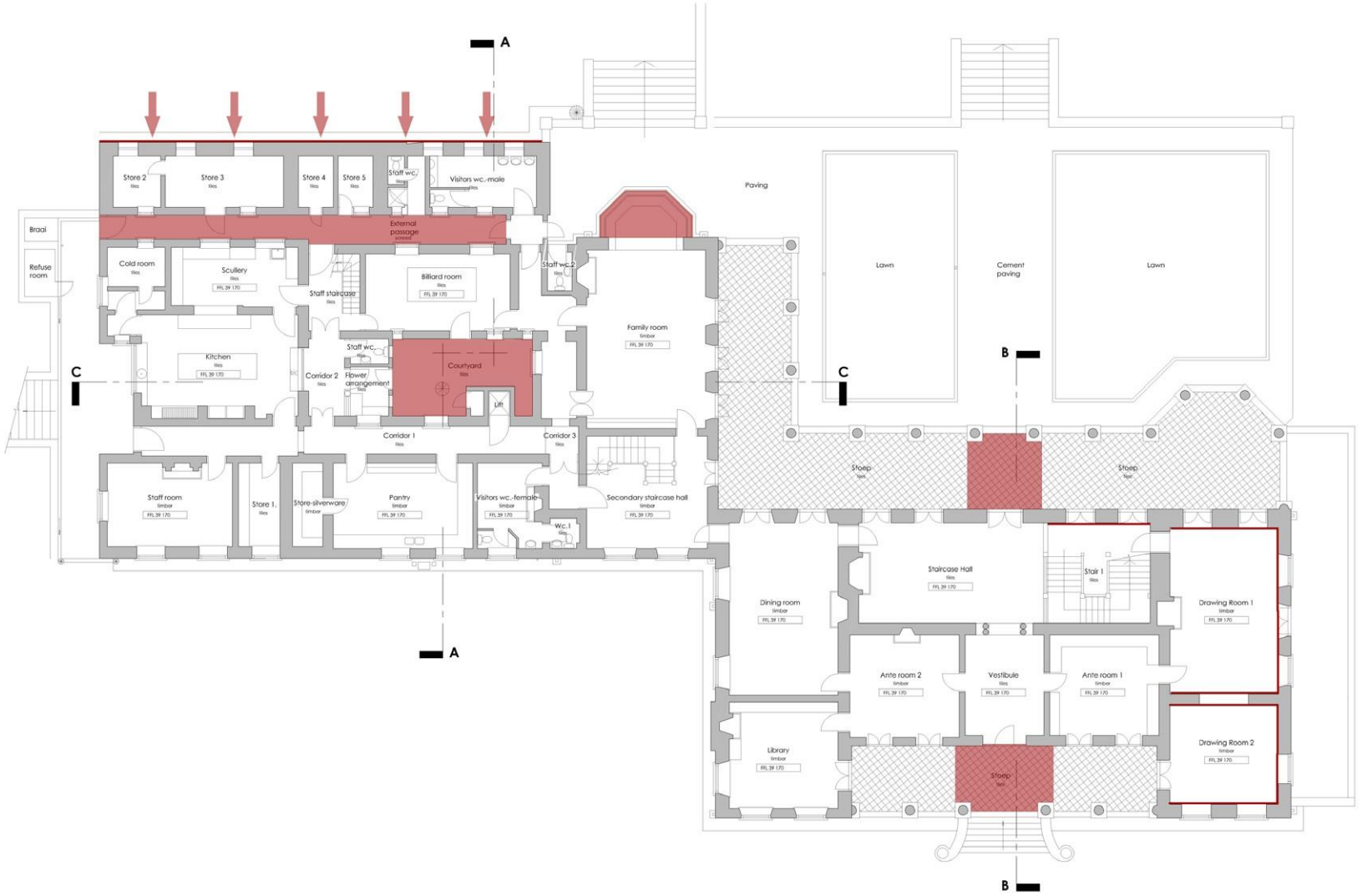
	C	D	E	F	G	H	I	J	K	L	M	N	O
6													
7		**RECREATIONAL POOL SITE INTERIO**											
8		Room Name				Perimeter		Ave. H	Surface Area		Area		
9													
10		Female Toilet				3,8		2,425	9,215		0,7		
11		Female Change Room				4,4		2,425	10,67		0,8		
12		Male Toilets				3,8		2,425	9,215		0,7		
13		Male Change Room				4,4		2,425	10,67		0,8		
14													
15		**Total**				**16,4**			**39,77**		**3**		
16													
17													
18													
19		**RECREATIONAL POOL SITE SURFACE AREA TOTAL**											
20		Room Name				Perimeter		Ave. H	Surface Area		Area		
21													
22		RECREATIONAL POOL SITE INTERIO				16,4		2,425	39,77		3		
23		RECREATIONAL POOL SITE EXTERIO				10,86		3,5	38,01				
24		BOMB SHELTER INTERIO				34,8		2,8	97,44		26		
25													
26													
27		**Total**				**27,26**			**77,78**		**29**		
28													
29													

O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB
		RECREATIONAL POOL SITE EXTERIO											
		Room Name				Perimeter		Ave. H	Surface Area		Area		
		Exterio Wall Surface Area				10,86		3,5	38,01				
		Total				**10,86**			**38,01**		**0**		
		BOMB SHELTER											
		Room Name				Perimeter		Ave. H	Surface Area		Area		
		Bomb Shelter Interio				34,8		2,8	97,44		26		
		Total				**34,8**			**97,44**		**26**		

Terraced Wall Areas

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
2															
3		**Terraced Wall**													
4															
5		Room Name				Length		Ave. Width	Area	Ave. Height		Area X Height = Surface Area			
6															
7		Level 1				74		0,545	40,33	1,2		48,396			
8		Level 2				66		0,545	35,97	1,2		43,164			
9		Level 3				66		0,545	35,97	1,2		43,164			
10		Level 4				40		0,545	21,8	1,2		26,16			
11															
12															
13		**Total**				**246**				**4,8**		**160,884**			
14															
15															

9. CMP DRAWINGS



ground floor plan

external reference files: 2.1.100.dwg

scale 1:100

N

1 0 5 10

scale in meters

CONFIDENTIAL DOCUMENT

FOR INFORMATION ONLY

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Building Drawn	Date:	Oct. 2009

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cc no 2003 / 020795 / 23

CLIENT: **DEPARTMENT OF PUBLIC WORKS**

PROJECT: **GROOTE SCHUUR ESTATE INTEGRATED CONSERVATION & MANAGEMENT PLAN WCS 042964**

DRAWING: **AREA 2: MUSEUM MUSEUM**

GROUND FLOOR PLAN

SCALE	DATE	DRAWN	CHECKED
1:100@A1	APR 2010	D.A.O.	S.H.

PROJ. NO	DRAWING NO	REV
2701	AB-2.1.100	-

first floor plan

external reference files: 2.1.101.dwg

scale 1:100

N

1 0 5 10

scale in meters

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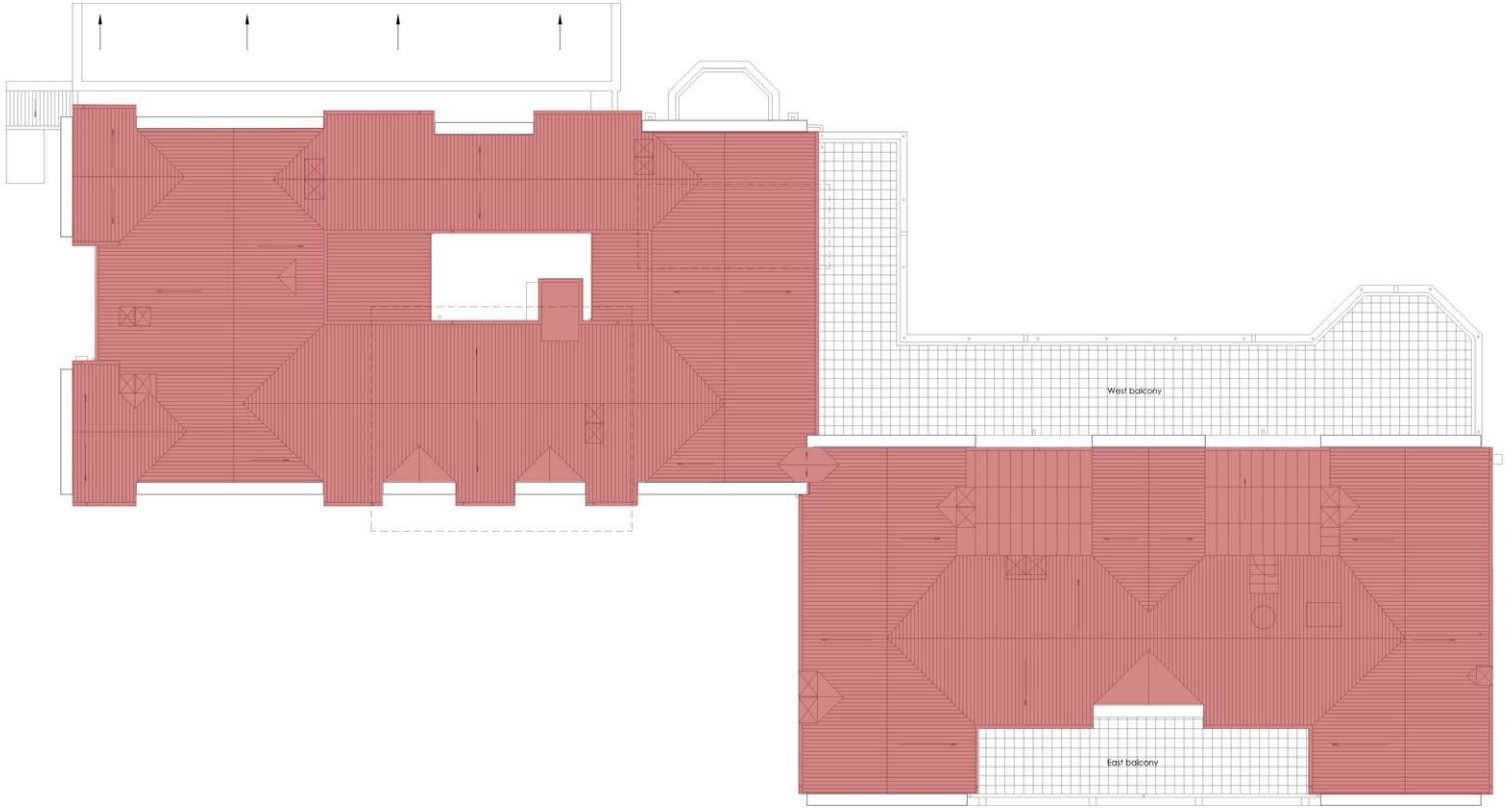
DEPARTMENT OF PUBLIC WORKS

GROOTE SCHUUR ESTATE
INTEGRATED CONSERVATION & MANAGEMENT PLAN
WCS 042964

AREA 2: MUSEUM
MUSEUM

FIRST FLOOR PLAN

1:100@A1	APR 2010	D.A.O.	S.H.
2701	AB-2.1.101		-



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GROOTE SCHUUR ESTATE
INTEGRATED CONSERVATION & MANAGEMENT PLAN
WCS 042964

AREA 2: MUSEUM
MUSEUM

ROOF PLAN

SCALE	DATE	DRAWN	CHECKED
1:100@A1	APR 2010	D.A.O.	S.H.
PROJ. NO.	DRAWING NO.		REV.
2701	AB-2.1.102		.

roof plan

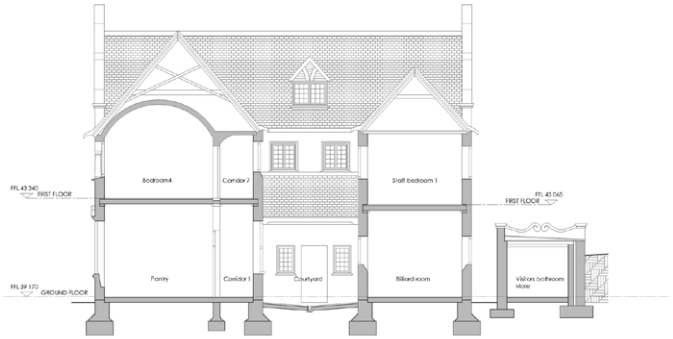
external reference files: 2.1.102.dwg

scale 1:100

N

1 0 5 10

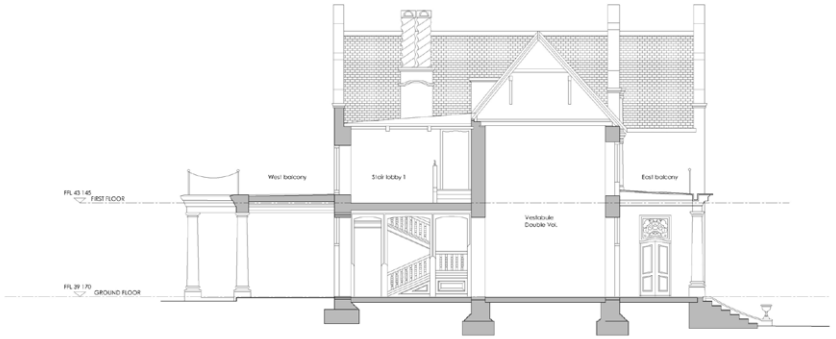
scale in meters



section A - A

external reference files: 2.1.300.dwg

scale 1:100



section B - B

external reference files: 2.1.300.dwg

scale 1:100

section C - C

external reference files: 2.1.300.dwg

scale 1:100

1 0 5 10

scale in meters

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PROJECT
GROOTE SCHUUR ESTATE
INTEGRATED CONSERVATION & MANAGEMENT PLAN
WCS 042964

DRAWING
AREA 2: MUSEUM
MUSEUM
SECTION A - A, B - B & C - C

SCALE	DATE	DRAWN	CHECKED
1:100@A1	APR 2010	D.A.O.	S.H.
PROJ. NO.	DRAWING NO.	REV.	
2701	AB-2.1.200	-	

north elevation **scale 1:100**

external reference files: 2.1.300.dwg

south elevation **scale 1:100**

external reference files: 2.1.300.dwg

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Building Drawn	Date:	Nov. 2009

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GROOTE SCHUUR ESTATE
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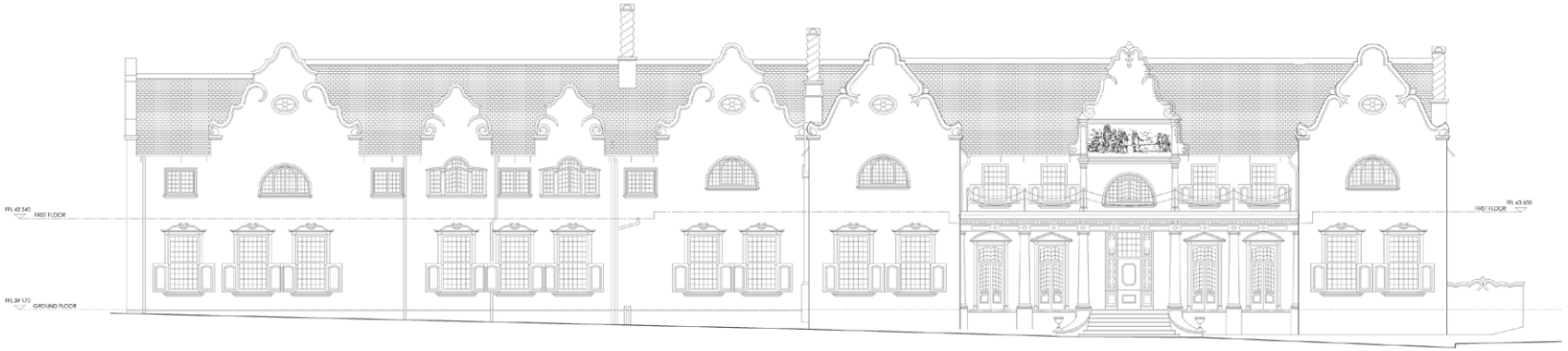
WCS 042964

AREA 2: MUSEUM
MUSEUM

NORTH & SOUTH ELEVATIONS

SCALE	DATE	DRAWN	CHECKED
1:100@A1	APR 2010	D.A.O.	S.H.
PROJ. NO	DRAWING NO	REV	
2701	AB-2.1.300	-	

1 0 5 10
scale in meters



east elevation scale 1:100

external reference files: 2.1.300.dwg

west elevation scale 1:100

external reference files: 2.1.300.dwg

1 0 5 10

scale in meters

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Building Drawn	Date:	Nov. 2009

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cc no 2003 / 032795 / 23

CLIENT: **DEPARTMENT OF PUBLIC WORKS**

PROJECT: **GROOTE SCHUUR ESTATE**
INTEGRATED CONSERVATION & MANAGEMENT PLAN
WCS 042964

DRAWING: **AREA 2: MUSEUM**
MUSEUM

EAST & WEST ELEVATIONS

SCALE	DATE	DRAWN	CHECKED
1:100@A1	APR 2010	D.A.O.	S.H.
JOB No. 2701	DRAWING NO. AB-2.1.301	REV. .	

DRAWING FILE: AB-2.1.301.DWG

10. MATERIAL & PRODUCT SPECIFICATIONS & REFERENCES

10.1. Historic Specifications

A valuable historic document has been located and provided by the Curator which includes much information on the historic materials and specifications used at the time. This is an extremely useful reference document and should be consulted by the Professional Team when drawing up the detailed specifcations.

Bound Volume
Estimate Variations and Accounts
Residence Furniture
Rt. Hon C J Rhodes
Groote Schuur
Rondebosch

The document is dated 1897, 1898, 1899
Selected portions have been copied and referenced for this document. The schedule includes valuable records of the granite bath, imported fittings, materials and so on.

- Notes that Fishhoek stone was used. (the sandstone quarry in Fish Hoek was known to be used in turn of the century construction in Cape Town).

- The use of Broseley tiles is confirmed – described as "best quality Broseley tiles of approved colour".

- Internal plaster described as "approved white lime and clean sand in the proportion of 1 of lime to three of sand and to be made up at ;east 3 weeks before being used." This ration accords with specifications listed elsewhere in our Stage 2 report.

- External plaster is described as " 2 parts best Portland Cement and 4 parts clean sharp sand free from all salt or earthy matter". As noted elsewhere in our report, the contemporary use of Portland cement is not recommended due to its hardness and the use of lime based plaster with no cement is advocated.

10.2. Conservation Specifications – Lime Mortar and Plaster

TYPICAL PLASTER SPECIFICATIONS

1. The walls should be carefully examined for any cracks, settlement or leaning and a structural engineer consulted in conjunction with a conservation/ heritage-skilled architect.
2. No cement to be used in any mortar, plaster, repair work or building work.
3. No cementitious base coats or bonding layers should be used.
4. Mix for lime mortar and lime plaster - 3 sand: 1 lime to be used throughout.
5. Bagged builders' lime can be used, but pre-mixed sand/ lime is now also commercially available ex Cape Lime Company (CLC) to better ensure consistency.
6. No surface cementitious fillers or repair work to be done, lime putty (either manufactured on site or, more easily, purchased from Midas Paints) can be used for repair of minor cracks and blemishes.
7. The walls should be brushed down and dampened prior to plastering, taking care to avoid working in the heat of the day or direct sunlight.
8. A weak limewater "slurry coat" to aid adhesion may be advisable or necessary depending on trial applications.
9. It is recommended that a specialist from Cape Lime Company be requested to visit the site and confirm this specification and procedure.
10. All loose and flaking paint and limewash on remaining plaster surfaces to be scraped off with a view to applying a specialist, breathable mineral paint such as Keim. This will require much testing on site to verify the extent of adhering paint that can be removed without damaging underlying historic plaster surfaces.
11. This testing and confirmation of specifications must be allowed for in the process.
12. Refer to attached technical info on Keim mineral paints (Section9.3)

Removal of hard cement plaster (external, only in limited areas where defective)

Hard cement (modern, repaired) plaster is the cause of many issues in heritage structures.

Removal of modern hard plaster is advised as and when work is being done in an area, although unnecessarily invasive work is not advised.

Hard plaster should not be removed where this damages the underlying fabric unduly.

Hard plaster removal (on friable substrates):

10.3. Contractor to allow for angle grinder cutting at regular neat parallel matching depth lines 100mm apart to match hard plaster depth (eg average 15mm deep). Include for hand bolster and chisel careful chopping to hack off hard plaster with minimal deep spalling to underlying historic un-fired brickwork, clay or similar fabric.

Crack repair in plaster and brickwork

Preparation for areas of unsound plaster: Chop off defective areas carefully by hand.

Minor cracks: Clean out and fill with Lime Putty Plaster (site manufactured or by Midas SA).

Medium cracks: (2-4mm wide): Remove plaster for 150mm along both sides of crack. Place 300mm wide strip of fibreglass mesh across crack and fix with gms wire staples at close ccs.

Large cracks: Architect and/or Structural Engineer to inspect, and to specify remedial action.
Mesh reinforcing: May be applied to one or both sides of very soft or badly cracked walls. The areas, mesh type/s, and detailed fixing and plastering specifications to be confirmed after plaster stripping.
Mesh: Mesh or similar glass-fibre matting or stainless steel weld-mesh as advised by Architect or Engineer.
Fixing: Wire anchor ties, doubled No 10 galvanised wire, either right through wall through drilled holes, or grouted min 150mm into wall; at approx. 600m ccs horizontally and vertically; OR 150mm galvanised clout nails with gms washers (driven in at the joints, if the wall is of hard stone).

Preparation for areas of unsound exterior plaster or water damaged interior plaster

Chop off defective areas carefully by hand.

- Minor cracks: Clean out and fill with Lime Putty Plaster or exterior filler (if external wall).
- Medium cracks: (2-4mm wide): Remove plaster for 150mm along both sides of crack. Place 300mm wide strip of fibreglass mesh across crack and fix with gms wire staples at close ccs.
- Large cracks: Architect and/or Structural Engineer to inspect, and to specify remedial action.
- Mesh reinforcing: May be applied to one or both sides of very soft or badly cracked walls. The areas, mesh type/s, and detailed fixing and plastering specifications to be confirmed after plaster stripping.
- Mesh: glass-fibre matting or gms /stainless steel weld-mesh; or gms chicken mesh as advised by Conservation Architect or Engineer.
- Fixing: Wire anchor ties, doubled No 10 galvanised wire, either right through wall through drilled holes, or grouted min 150mm into wall; at approx. 600m ccs horizontally and vertically; or 150mm galvanised clout nails with g.m.s. washers (driven in at the joints, if the wall is of hard stone.

Lime-putty surface repair

Apply lime putty (either made on site using unslaked lime, or pre-manufactured by specialist paint manufacturer).
Lime putty to be used for minor cracks and surface filler. Avoid using gypsum or cementitious based products and hard filler etc, which are all too hard for older walls.

Pure lime plaster

- Actual site conditions must be checked and the degree of any cement plaster already evident needs to be very carefully considered.
- Given that site conditions and raw materials vary, the following specifications are to be used only as a yardstick for formulating actual mixes which are to be verified only after site testing.
- Lime mortars and plasters are to be used in old and historic walls. It is recommended that cement is not generally to be used: except possibly in instances where plaster patching is abutting existing intact cement-plastered walls. However, even in such cases, there is generally benefit in using pure lime plaster.
- The walls should be carefully examined for any cracks, settlement or leaning and a structural engineer consulted in conjunction with a conservation/ heritage-skilled architect.

- No cement to be used in any mortar, plaster, repair work or building work to historic walls.
- Use of cement for concrete foundations for new walls (or required underpinning etc) where required is obviously acceptable.
- No cementitious base coats or bonding layers should be used.
- Mix for lime mortar and lime plaster - 3 sand: 1 lime to be used throughout.
- Some clean local Clay may be added into mortar and render mixes in certain instances to improve adhesion and material compatibility e.g. where applying scratch coats to soft wall substrates.

NB: Too much clay with the sand will result in excessive plaster cracking; the proportion of clay to sand should not exceed 35% by volume of the clay/sand mix. The clay must be added to the sand and well mixed through before mixing in the builder's lime.

- Bagged builders' lime can be used, but pre-mixed sand/ lime is now also commercially available to better ensure consistency.
- No surface cementitious fillers or repair work to be done, lime putty (either manufactured on site or, more easily, purchased from specialist paint manufacturer) can be used for repair of minor cracks and blemishes.
- The walls should be brushed down and dampened prior to plastering, taking care to avoid working in the heat of the day or direct sunlight.
- A weak limewater "slurry coat" to aid adhesion may be advisable or necessary depending on trial applications.

It is recommended that a specialist lime expert be requested to visit the site and confirm this specification and procedure.

Plastering method: Clean down wall of loose debris.
Applying a lime-based slurry, including an approved bonding agent, may be recommended.
Apply one or two layers of plaster to thoroughly dampened substrate – wall to be dampened well for 2 days before applying plaster (mesh to be in first layer of plaster). No plaster layer to be thicker than 15 - 20mm. The applied, semi-set plaster to be scraped to a plane surface with a screed board, then wood-floated only. Ensure slow plaster curing; dampen with fine spray for 2 or 3 days. Cracking is more likely if plaster is applied/ cured in hot sun or strong wind.

Premixed Lime

Certain lime manufacturers now supply to industry premixed lime sand mix which avoids site errors in the lime process and/ or in lime sand mixing.
Suitable products include breathable heritage and hemp plaster/ mortar
Clean the wall from any loose plaster or material and brush off excessive dust with a black brush.
Rebuild fallen or cracked areas with pre-mix and bricks where necessary.
Apply a weak "watery" lime mix (I lime: 4 water) and damp it with a wet block brush.
Apply breathable plaster once the surface is dry, according to manufacturer's specifications.

Method Statement and mix specification for using lime in Heritage Buildings

Hydrated Lime – (pressure hydrated dolomitic lime) (SABS 523)
Sand – clean well graded building sand, free from organic

sand clay

Heritage Mix Ratio for Plaster (interior & exterior) and Mortar:

By volume:

1 lime: 3 sand

Add water to achieve preferred slump (take note that a 'too wet' mix will tend to cause sagging cracks)

Mixing of Materials:

Mix dry materials to uniform colour before adding water

When dry mix has uniform colour add water and mix again to get correct slump of plaster/mortar

Preparation:

Ensure that surface is free from any loose material

Remove any old cement-based plaster as far possible without damaging brickwork

Clean with soft brush until surface is as dust free

Apply water to soft dry porous masonry to minimize suction

Raw surface must be prepared with the lime water method/ thin "milky water" whitewash lime mix, to make sure a firm surface is present before lime plaster is applied.

Application:

For plasters a 'push-on' or 'throw-on' method can be used depending on the skill of the artisan.

Plaster should be applied in two coats. The first scratch coat should be applied (10-15mm) and should be left for a week to carbonate. The second coat should be applied in a layer thinner than the first between (5-7mm) thick.

Floating must be done after bleeding water has disappeared and surface becomes firm (floating bleeding water back into the surface will cause a thin whitish layer on the surface which will delaminated upon drying.

Wall finish can be floated or sponged

Curing and After Care:

Lime sets by absorbing CO2 from the atmosphere

Higher humid condition is favourable for lime to set and accelerate setting of lime

Expose finished plaster and mortar to as much as possible atmospheric air (leave windows and doors open when inside plaster has been done)

Curing must be done by wetting wall with mist sprayers or by hanging hessian 15mm away from wall, like a curtain, and keeping it wet

Curing of lime plaster & mortars must be done for 2 weeks after building / repair work

Lime plaster with a small amount of cement added

Until relatively recently it has been accepted practice to use lime plaster with a small amount of cement added. Current thinking is to avoid even a small percentage of cement due to the hardness and chemical effect of the cement.

However, in certain circumstances (more recent walls, walls with areas of cement-based plaster evident etc) it MAY be acceptable to use these mixes. This is to be pre-approved by heritage architect on site. and: 3 lime: I cement.

Mineral paint coatings (KEIM)

- In buildings of very high significance and where the age and integrity of the plaster, patina is paramount a Mineral

painsystem may be most practical.

- Traditional lime paint is related to mineral silicate paint, however both coatings in their composition are not related to the dispersion type coatings above which is a form of a dispersion paint and is another potential product specification.
- From an "historical" point of view, the alternative to lime paint is silicate based paint.
- Mineral based products are acknowledged internationally for long term protection (15-100 years plus) with low future maintenance in mind and the highest possible protection in terms of counter acting an buildings natural deterioration process.
- Interior Spec: Primer plus 2 coats mineral paint.
- Exterior. Where issues exist with limewash, either failing or not performing optimally, it may be that the moisture loads are too high in the structure resulting in high maintenance.
- On such heritage buildings lime wash may not be the right approach anymore.
- The lime wash should be removed, the existing render repaired and 'worked´ over with restoration render and mesh as per manufacturer's speciation.
- Horizontal areas such as parapet walls (gables) and window sills to be treated with water repellent primer.
- Thereafter, the entire building should be primed and finished as per manufacturer's specification.
- With that approach, the heritage building's deterioration process would be slowed down substantially, allowing less stress on the plaster and brickwork.
- Also, the future maintenance is brought to a minimum with a possible re-paint cycle of approximately 15/20 years +.

NOTE: Mineral paint is an imported and specialist product that has the potential to be used in many but not all applications. As such, having this as a BoQ option is advisable.

10.4. Product Specifications

- Keim Mineral Paint

CONSERVATION

Building conservation is essential to protect an irreplaceable part of our cultural heritage from deterioration, neglect, unsympathetic changes and unnecessary destruction. KEIM Mineral Paints understand that, when it is necessary to redecorate and restore older and historic buildings, it is important to ensure that it is done in a manner that protects and preserves the building. The paint material choice is as important a decision as choosing the right decorator.

Conventional acrylic paints merely coat the surface and create a film around the substrate. This film forming coating does not allow moisture vapour to pass through it, which can result in the formation of blisters which may lead to cracking and flaking paint finishes. If moisture vapour is unable to pass through the surface, this can lead to elevated moisture levels within the substrate eventually leading to friability and damage. This is a common problem in older buildings, in particular where a variety of coatings are likely to have been applied over the years.

Roffey Park, Colgate, West Sussex, Grade II Listed

CONSERVATION

Old and historic buildings can suffer from a multitude of problems, which are fairly common. Typical problems to be addressed when redecorating are:

SUBSTRATE CONDITION - As buildings move over time, cracks and damage can occur within the structure. By the very nature of old buildings, it is common to find a build up of algae and fungal growth which, if left untreated, will affect the structure and appearance of the property.

Prior to redecoration and refurbishment it is important to identify and rectify the underlying cause of the damage, to ensure that any work carried out is not simply 'painting over the cracks'.

PEELING PAINT - Moisture build up behind film forming paints saturates the underlying substrate, causing paint to blister and flake, leading to damage to the fabric of the building itself. The use of breathable mineral paint enables humidity contained in building structures to be quickly released unhindered into the environment, avoiding moisture build up between the coating and substrate.

By refurbishing and redecorating using specialised products and materials that are in keeping with the original building, these problems can be dealt with effectively to give beautiful long lasting and protective finishes.

KEIM MINERAL PAINTS

KEIM Mineral Paints are an ideal solution for redecorating in building conservation.

KEIM MINERAL PAINTS ARE:

- Extremely long life and durable, sustainable materials
- Highly breathable
- Environmentally friendly - made from natural materials
- Water-based
- Low VOC and solvent free
- UV stable and fade free
- Highly light reflective
- Incombustible
- Odourless
- Available in a wide range of colours
- Resistant to mould and fungal growth
- Suitable for unpainted and previously painted surfaces

Mineral paints, unlike conventional acrylic paints, form a permanent crystalline bond with the underlying substrate, rather than a purely adhesive bond. This retains the breathability of the substrate and ensures that moisture vapour continues to pass through the substrate unimpeded, with no risk of blistering and cracking of the paint finish. This ensures that KEIM Mineral Paints provide an extremely long term decorative solution which works in harmony with buildings.

KEIM MINERAL PAINTS

KEIM Mineral Paints have been used for many conservation projects, a few of which are featured in this booklet, and materials have been accepted by English Heritage, The National Trust, Historic Scotland and CADW.

Our experienced staff and comprehensive support service provides:

- Colour cards and swatches
- Brush-out and liquid colour samples
- Free of charge colour matching service
- Free of charge site inspections
-
- Proposal reports detailing pre-treatment and product recommendations
- On site assistance to painters and decorators
- A wide range of complimentary products and systems for repair and pre-treatment of surfaces

Summerhill House, Tunbridge Wells, Grade II Listed; Ledbury Heritage Centre, Worcestershire, Grade I Listed

PRODUCTS: EXTERNAL PAINT SYSTEMS

KEIM offer a range of high quality, breathable external paint systems:

KEIM SOLDALIT/KEIM SOLDALIT ME - a highly developed multi purpose exterior sol silicate paint system based on a combination of silica sol and potassium silicate binding agents. KEIM Soldalit/ME is suitable for application on to a variety of unpainted and existing previously painted surfaces, combining the benefits of a classic mineral paint with simplicity of application. KEIM Soldalit ME variant gives increased resistance to mould and fungal growth.

KEIM GRANITAL– a classic mineral, matt finish silicate based paint for use on all forms of mineral substrates.

KEIM ROYALAN - a mineral silicate based paint system developed to withstand harsh climatic conditions, ideally suited for use in exposed locations and those subject to continual pollutants and contaminants.

Lode Road, Cambridge , Grade II Listed

PRODUCTS: INTERNAL PAINT SYSTEMS

KEIM offer a range of high quality, breathable internal paint systems:

KEIM ECOSIL-ME - a truly environmentally friendly mineral paint for interior application. KEIM Ecosil-ME is the only internal silicate paint which optimises air quality, using photo-catalytic pigments to reduce noxious gases and odours by transforming them into natural substances. Certified Allergy Safe and proven to kill bacteria.

KEIM OPTIL - a premium quality sol-silicate paint specifically formulated for elegant interior applications, giving intense, lightfast colour shades.

St Malachy's Church, Belfast, Grade A Listed

PRODUCTS: RENDER & REPAIR SYSTEMS

KEIM Mineral Paints offer a range of mineral repair and filler materials.

KEIM SPACHTEL & KEIM DOLOMITSPACHTEL are ready to use silicate fillers suitable for small crack repair and surface equalisation onto external (KEIM Spachtel) and internal (KEIM Dolomitspachtel) surfaces.

KEIM UNIVERSAL RENDER is a dry bagged hydrated lime based ready-to-use renovation render for use on all mineral substrates both externally and internally. KEIM Universal Render is extremely breathable and also flexible, reducing the need for expansion joints. KEIM Universal Render Fine is also available for a smoother finish.

LIME RENDER & WHY BUILDINGS NEED TO BREATHE

KEIM MINERAL PAINTS

THE NEED FOR BUILDINGS TO BREATHE

Before the twentieth century, building techniques and materials were very different from those used today and it is important that traditional properties are able to 'breathe', to allow moisture inherent in a solid wall construction to evaporate from the external stonework or render. Many older buildings suffer from damp problems, cracking or hollow render and flaking paint caused by trapped moisture.

It is important that materials used for repair and redecoration are suitable for use on older, traditional buildings. Hard cement renders and many masonry paints do not allow the moisture that is continually being absorbed into the building to evaporate easily. This can result in damp, cold walls, condensation, flaking paint, rotten joists and other timber fittings, increased heating bills and dampness on the internal walls. Chemical damp course injections, tanking and even dry lining are often proposed as solutions but they do not address the basic requirement of an older building and its need to breathe. The combination of sealing the external and internal walls can lead to a dramatic rise in the moisture levels in the wall, causing severe damage to the structure.

LIME BASED MATERIALS

Lime is the base product widely used to produce mortars, plasters and limewashes for traditional buildings. Lime has distinct advantages over cement based alternatives for external rendering of traditional properties. Lime is less dense and more vapour permeable than cement based materials and does not trap water in the substrate which is the leading cause of decay in all buildings. Lime materials accommodate general movement better than harder cement based alternatives and are closer in strength to many of the types of stone and brick used in traditional construction and therefore do not exacerbate their deterioration.

Instead of using lime materials, many traditional buildings are repaired and renovated using harder, impermeable materials designed for modern buildings which use completely different construction methods. The result is often worsened damp problems. The simple advantage of using a lime render is that it allows the walls to diffuse any water vapour that penetrates into them, referred to as the free passage of moisture vapour.

MODERN USE OF LIME MATERIALS

Whilst lime is commonly accepted for use onto older and more traditional buildings, it still has its place in new build construction and as new technologies are employed they can create a versatile and modern equivalent to conventional cement renders.

Products such as Fibrelime, which is a traditional plaster mix with improved modern fibres for durability, and KEIM Universal Render, which is a hydrated lime mix with excellent flexibility and breathability, mean that it is possible to enjoy the look, feel and durability of a traditional render finish with a more durable modern performance.

DECORATING LIME BASED MATERIALS

The role of an external coating is to decorate and enhance the appearance of a building. The chosen materials should also provide protection to the underlying substrate not only from varying climate conditions but also from potentially harmful environmental pollution.

As lime renders are so porous, any coating must allow for the free passage of moisture vapour from the substrate, whilst at the same time preventing the ingress of moisture. As already identified, if this does not happen then moisture can become trapped within the masonry which increases the risk of damage from frost, due to the expansion and contraction of the moisture as it freezes and thaws. The paint coatings themselves can also fail if the substrate is continually damp as blisters can form which result in flaking and peeling coatings. Problems may also occur in very damp substrates caused by the migration of soluble salts which can crystallise, damaging the masonry under the force that this crystallisation creates within the pores.

CHOOSING THE RIGHT COATING

Selecting the right material to achieve a protective and permeable coating is paramount. It is useful to understand how different coating systems work. In simple terms a coating either sticks to the surface to which it is applied, creating a film, or it soaks into the substrate in a physical or chemical manner.

MODERN MASONRY & INTERNAL EMULSION PAINTS

Many modern masonry paints and internal emulsion paints simply stick to underlying material and are usually manufactured from organic polymers and petrochemicals, which form a skin, or film, that has permeability lower than that of the underlying material. They typically have negligible breathability, causing problems with trapped moisture for both the substrate and coatings. In addition to the potential substrate damage, unsightly, peeling and flaking paint coatings significantly reduce the protection of the coating and can result in even more water being able to penetrate into the substrate.

Organic based paint systems also fail due to the action of UV light from solar radiation which causes degradation of the coating. This initially results in a loss of colour and then eventually embrittlement of the paint, causing cracking and failure.

One of the other concerns is due to the high alkalinity of a lime render, applying an acidic, acrylic based paint system can cause a reaction, called 'Saponification' where moisture in the substrate causes the acid and alkali to react to each other producing a waxy/soapy substance which rapidly deteriorates the paint coatings.

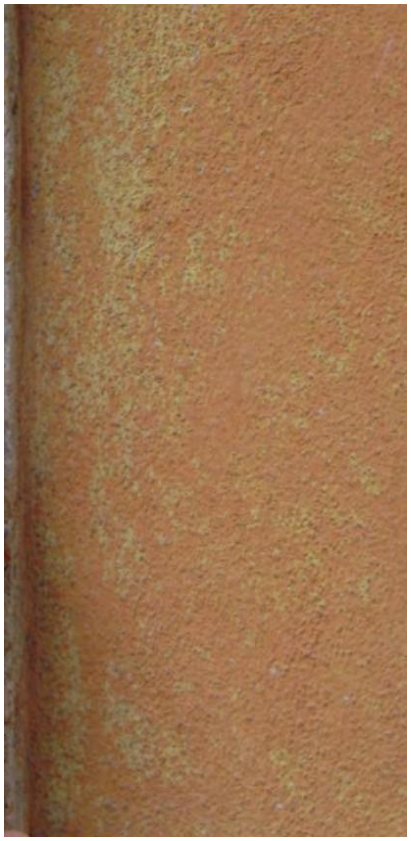
LIMEWASH

Limewash is a traditional coating which provides a breathable, decorative finish that soaks into the underlying material to which it is applied. The material is primarily composed of slaked lime (calcium hydroxide) sometimes with other organic additives. As a coating for lime-based render, limestone and stucco, limewash is in many ways comparable in nature to that of the underlying material, with similar porosity, alkalinity (pH value) and coefficient of thermal expansion. In the past, periodic redecoration of building facades with limewashes every few years was common-place and based upon availability of raw materials and experience of local contractors.

The increase in pollution since the industrial revolution, especially acid rain, causes very rapid degradation of external limewash facades. Limewash typically provides protection for the surface as a 'sacrificial' coating, in that it is destroyed more rapidly than the material below.

One other concern with limewash is its ability to shed driven rain water, especially in our changing climate of persistent rainfall, this can lead to excess water ingress in some buildings.
(Research by Orsi-Contini 2012)

Limewash is most commonly used for historic buildings which are rendered or constructed of limestone masonry, cob or wattle and daub, where there is a need to maintain the historic appearance and where it is accepted that regular maintenance and re-application will be required.

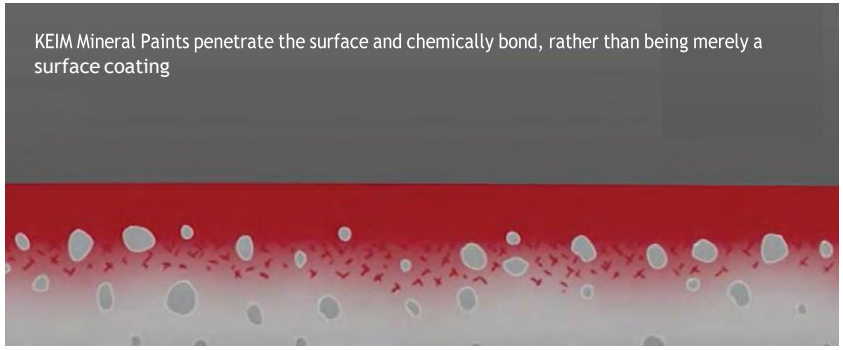


KEIM MINERAL PAINTS

Silicate paints, such as KEIM Mineral Paints, bond in a similar way to limewash, by soaking into the surface. In addition the potassium silicate binder of the mineral paint chemically reacts with the substrate to form an insoluble microcrystalline silicate bond. The microcrystalline structure has a pore size that allows the free passage of vapour, but the pores are small enough to prevent the ingress of driven rain. KEIM Mineral Paints provide an integral, water resistant, breathable protective and decorative finish.

KEIM Mineral Paints are made with natural silicate fillers and earth oxide colour pigments that are unaffected by the action of UV degradation.

The microcrystalline structure is comparable to that of the mineral structure to which it is applied and it has a comparable coefficient of thermal expansion. The insoluble silicates formed in the chemical reaction are resistant to strong acid and alkali attack.



KEIM Mineral Paints penetrate the surface and chemically bond, rather than being merely a surface coating

COMPARISON: PROTECTION & VAPOUR PERMEABILITY

Independent tests have been carried out by one of our customers, who specialises in lime render. Sample panels of lime render were used- one unpainted, one coated with a traditional lime wash, one with a conventional acrylic paint and the fourth with KEIM Granital.

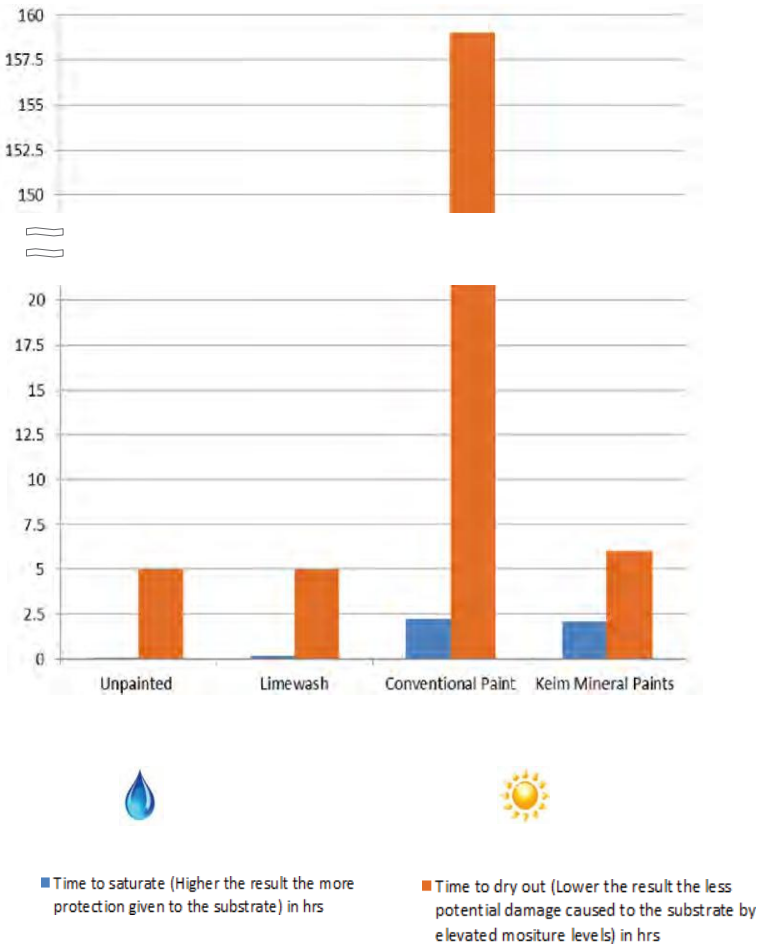
The samples were completely submerged into water and the time measured for them to saturate by water penetration. The samples were then allowed to dry out and the time measured for the moisture to evaporate and allow the surface to completely dry (back to the original starting weight).

The results show, that as expected, the unpainted surface saturated instantly as it had no protection, highlighting why protective coatings can be so important. The sample however was able to dry out quickly as there was no restriction on the breathability. The limewash sample saturated nearly as quickly as the unpainted sample demonstrating that limewash offers very little protection, but, again as with the unpainted sample, it does not impede the drying out process. The acrylic paint took much longer to saturate as the paint gives protection to the surface, but took over 159 hours to dry out showing how impermeable the coating is and how long moisture can remain trapped in the substrate if it is not able to breathe out.

The KEIM Granital (exterior mineral paint) samples demonstrated that the mineral paint provided a high degree of surface protection, similar to a conventional paint, but still allowed the surface to breathe and dry out quickly, similar to the uncoated/limewash samples, avoiding potential damage which can be caused by prolonged substrate saturation.

(Results Overleaf)

RESULTS OF THE PERMEABILITY TESTING



THE IDEAL SOLUTION

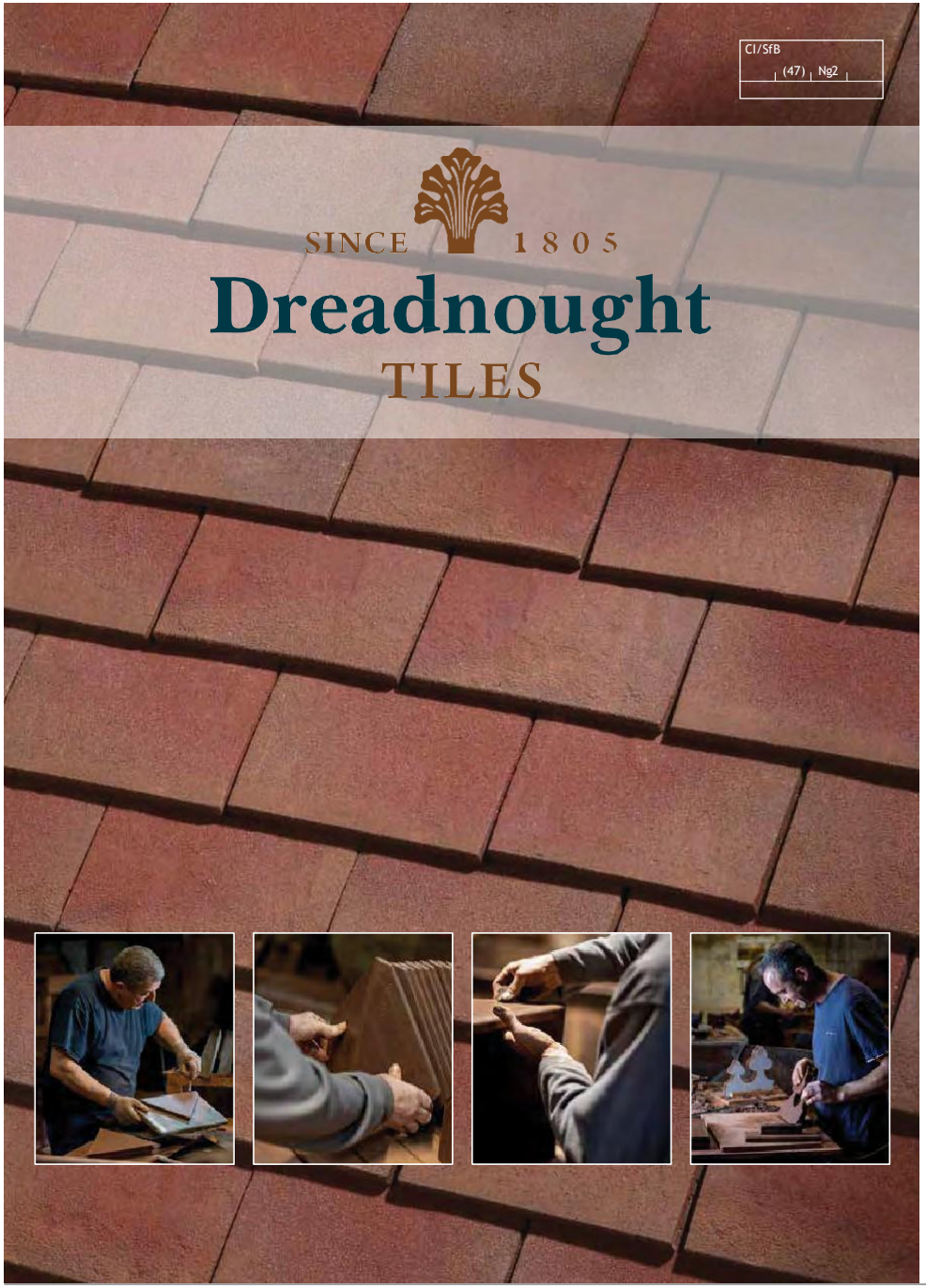
As a breathable protective coating, KEIM Mineral Paints offer an excellent alternative to both conventional masonry paints and limewash, and can provide for much longer life expectancies than either system. Typically limewashes require maintenance every few years and film-forming paint systems every 5-10 years.

For historic buildings the need to provide the most durable long-term protection will often be the prime consideration, particularly where scaffolding will be required for maintenance. There are documented examples of KEIM Mineral Paints systems performing well on lime based render facades in Germany, Switzerland and Norway

In the example right, KEIM Soldalit and KEIM Design Lasur were used at Hannington Hall, Oxford. The finish is ideal for the lime rendered substrate but also available in a colourwash finish which can replicate a limewash type effect for periods in excess of 100 years.

For further information and assistance about KEIM Mineral Paints please contact the sales office on 01952 231250 or info@keimpaints.co.uk.

- Broseley Tiles



Dreadnought Tradition

Dreadnought's expertise is contained in a tile works that was established in 1805 and developed by four generations of the same family management throughout the last century. This has fostered a consistent long-term philosophy and a truly traditional product.

Clay Tiles Specialists - 3 Ranges

Dreadnought manufacture 3 ranges of traditional plain clay roof tiles:

- Dreadnought machine made tiles
- Rustic handcrafted tiles
- Classic handmade roof tiles

in addition to a range of ornamental tiles and complementary roofing components and fittings.

True Clay Colour

Dreadnought Tiles are recognised for their true clay colours. The natural shades, ranging from blues and brindles to browns and reds, are produced through the delicate control of the kiln atmosphere with no applied surface stains or pigments added. They have a warmth and subtlety that cannot be matched by artificial means. Dreadnought's natural clay colours are rich and mellow and will improve with age. The colour will last for the lifetime of the tile and will not fade as it is fired into the body of the tile rather than applied as a surface coating.

Single Camber

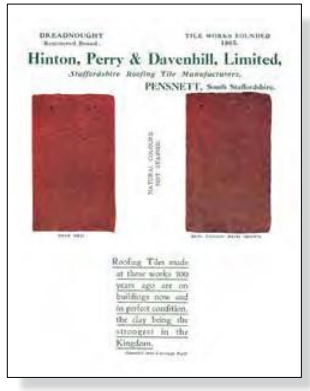
Our 3 ranges of plain clay tiles retain the traditional single camber shape, giving a quality and established look to the roof. Double camber is not a traditional feature of plain clay roof tiles and it adds a regimented ripple pattern across the surface of the roof while single camber does not.

The Environment

Plain Clay tiles carry an A+ rating for best environmental practice in the BRE Green Guide to Specification. We take our environmental commitments seriously and make sure that we exceed all relevant legislation. Our company runs an Environmental Management System accredited to ISO 14001:2015 and over recent years £5 million has been spent within the plant to improve our energy and production efficiency.

Quality Assurance

Dreadnought tiles conform to BS EN 1304:2013 and are manufactured under a Quality Management System which meets the requirements of ISO:9001 2015.



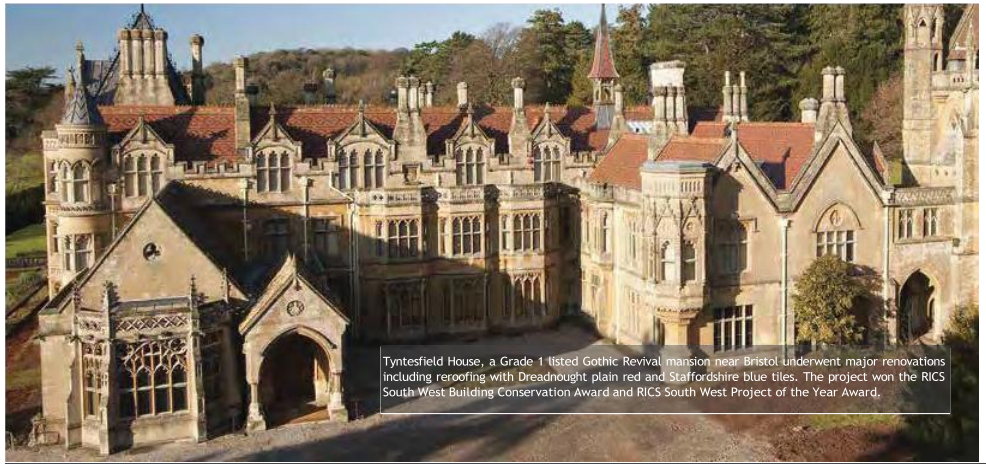
Dreadnought have always believed in the beauty of natural clay colour; the company's first colour brochure published in the 1920's clearly states "Natural colours not stained."

The Governor General's residence, Government House in Wellington New Zealand was reroofed in a mixed blend of 80% plum red tiles and 20% brown antique tiles. The original Perfecta tiles, made in the early 1900's were fired in coal fired kilns where colour control was not as exact as it is today, so the 20% brown antique tiles were mixed in with the red tiles to match the original appearance.

This development by Kevin McCloud's HAB Housing is both rural and contemporary and Dreadnought's dark heather Rustic roof tiles tone well with the brown and buff brickwork whilst blending seamlessly with the solar pv panels.

Bluebird, an AJ Award winning supported HARP housing project by SKArchitects uses a number of Dreadnought's clay tile colours to bring the individual properties to life as well as bespoke "debossed" tiles.

The use of Dreadnought's red blue blend tiles on this quality development at Duchy Field, Bletchingdon by ZeroC demonstrates clearly the value of selecting quality materials for the exterior envelope.



Tyntesfield House, a Grade 1 listed Gothic Revival mansion near Bristol underwent major renovations including reroofing with Dreadnought plain red and Staffordshire blue tiles. The project won the RICS South West Building Conservation Award and RICS South West Project of the Year Award.

Three new curved crescent terraces at Kings College Cambridge by Feilden Clegg Bradley Studios feature Staffordshire blue handmade tiles. The roofs not only curve along the horizontal, but also along the vertical, where the pitch increases, becoming almost 90 degrees at the eaves. The project was designed to Passivhaus standards with a 100 year design life and material choice was therefore very important. It was an AJ Winner 2023 for Housing Projects.

Contents

"The Dreadnought product is excellent, with dimensional, colour and textural quality consistent throughout."

Gary Worsfold,
Gary Worsfold Architecture Ltd.

5

Brown Antique

Smoothfaced/Sandfaced

A traditional natural mixture of rich red, brown and blue multi-coloured tiles that adds character to any building. These varied colours are produced by skilled control of the burning process and cannot be reproduced by artificial means.

Left: Brown antique tiles give a traditional appearance to the redevelopment of Shanklin Manor, IOW. Ornamental detailing has been restored with the use of bands of club tiles, bonnet hips and ornamental finials.

Bottom left: Fox Homes used brown antique plain smooth and club tiles and other natural materials to create this quality new build home.

10

Above: Dreadnought's brown antique clay roof tiles were used to sympathetically restore the roof on the Grade II listed Engine Room at Walthamstow Wetlands in East London

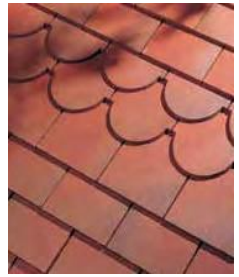
Right: This former lodge house in Shropshire has been renovated and reroofed using brown antique sanded fishtail ornamental tiles

Bottom: Brown antique smoothfaced tiles on a luxury Octagon home.

Country Brown

Smoothfaced/Sandfaced

Natural multi-coloured red and brown tiles produced without any artificial stains or pigments. A softer lighter colour, which is popular in the south of the country.



Above Left: Private House, Nr Malvern, Worcs.
The country brown smoothfaced tiles on this intricate roof are neatly broken up by 3 bands of blue brindle tiles and topped off with half round ridges and ball top finials.

Bottom Left: Re-roofing Contract - Boormans Oasts, Hadlow, Kent.
The natural red and brown colours of country brown provide not only an attractive roof, but major cost saving over handmade tiles. This demonstrates that it is not necessary to incur the expense of handmade tiles to enjoy the best aesthetics.

Above: New homes at Audley's Chalfont Dene luxury retirement village use country brown sanded tiles with half round ridges, valley tiles and bonnet hips.

Bottom Left: An Adrian James project in Oxford uses Dreadnought country brown sanded tiles together with mansard tiles, cloaked verges and external angles to extend down on to the vertical.

Red/Blue Blend

Smoothfaced/Sandfaced

This is achieved by skilled control of the burning process to produce the traditional naturally occurring random hues of authentic multi-coloured clay tiles; colours that cannot be replicated artificially with applied surface stains and pigments. The colours within this blend are rich and varied with purples & blues merging with reds and vibrant terracotta's.

"The subtle tones, shadow lines and organic nature of this tile subtly add contrast and interest."

Gary Worsfold,
Gary Worsfold Architecture Ltd.

Top: Red blue blend tiles on a Quantum Homes Development at Forest Road Poole.

Left: One of two new turrets at the Argent Centre in Birmingham's Jewellery Quarter which were believed to be in the original design from 1863. Red blue blend sanded tiles were selected by Oliver Architecture as they best represent the subtle colour variation that tiles in the 19th Century would have had. This project has been celebrated by the Victorian Society winning West Midlands Group Conservation Award as well as being shortlisted for Best Heritage Tiled Roof at the 2022 Pitched Roofing Awards.

Top: Dreadnought's red blue tiles on Moseley Hospital. The use of cloaked verges and half round ridges as a "dry fix" produces a neat finish.

Left: Red blue blend tiles sit well with the red brick on this quality development by Quantum Homes

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Red

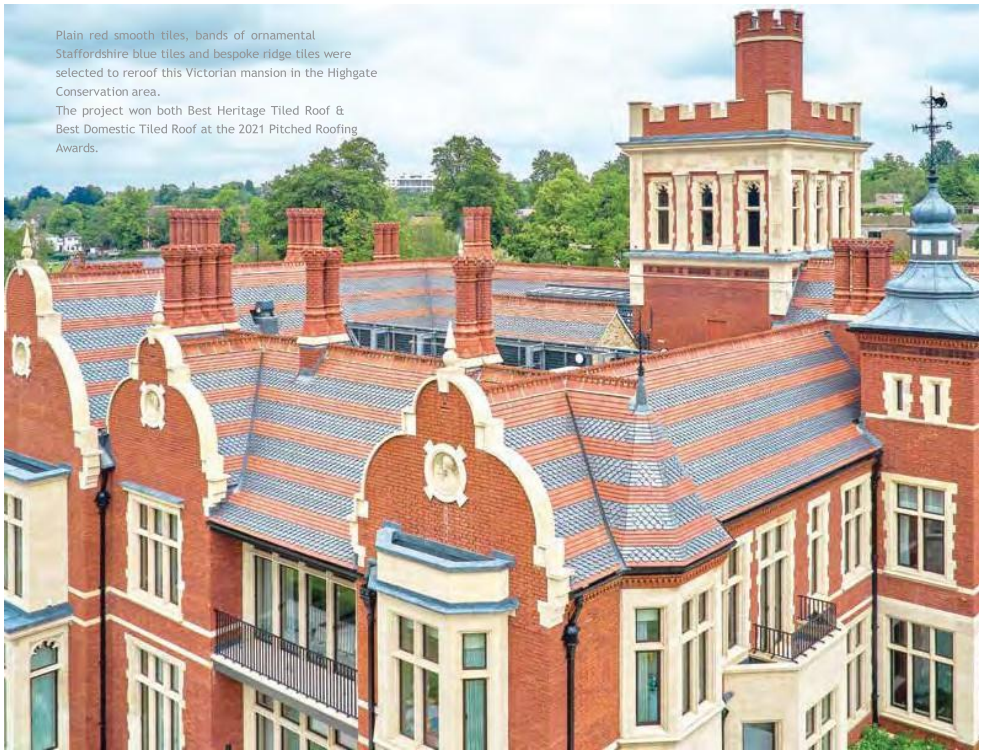
Smoothfaced/Sandfaced

Perhaps, the best known and most widely used natural colour produced from Etruria Marl. Ideal for matching and repairs, the traditional red smoothfaced single camber tile is widely stocked by roofing merchants throughout areas where clay tiles are established. Red sandfaced tiles give a softer appearance, and are chosen more frequently in the South.

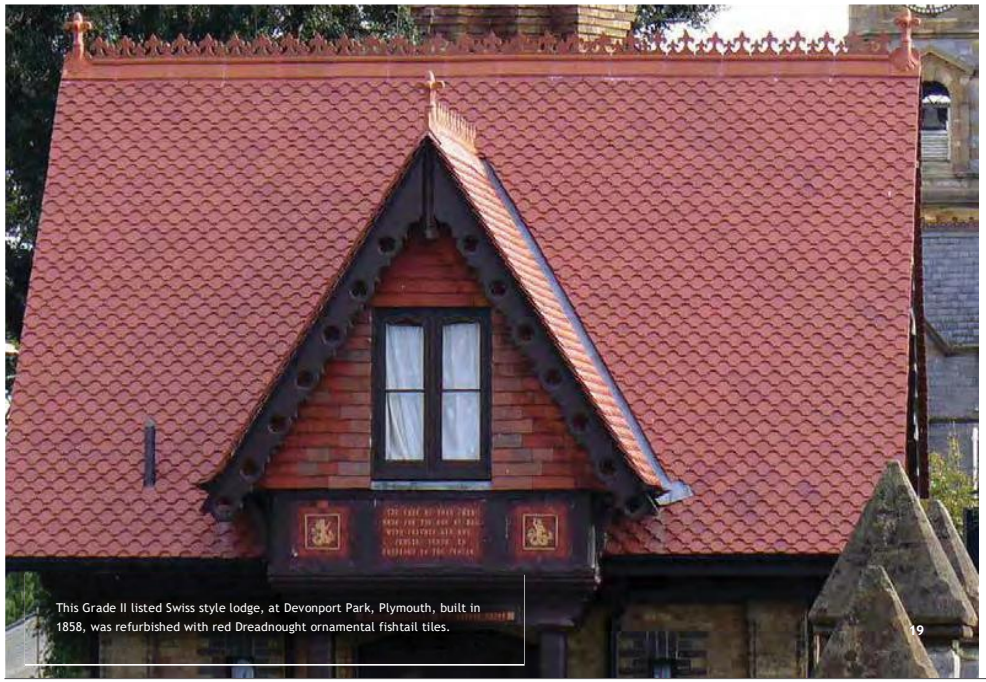
Above left: Red sandfaced tiles feature on this 2023 RIBA Small Project of the Year Award Winner by James Alder Architects. External angles, cloaked verges and monoridges were used to form a wrap over the contemporary wedge shaped extension.

Left: Roding Valley High School, Loughton, Essex.
This red sandfaced roof complements the buff and red brickwork. The large expanse of roof is broken up by the use of 5 bands of ornamental tiles, in alternating courses of club and fishtail tiles. The roof is topped with 2 hole ornamental ridges.

18



Plain red smooth tiles, bands of ornamental Staffordshire blue tiles and bespoke ridge tiles were selected to reroof this Victorian mansion in the Highgate Conservation area.
The project won both Best Heritage Tiled Roof & Best Domestic Tiled Roof at the 2021 Pitched Roofing Awards.



This Grade II listed Swiss style lodge, at Devonport Park, Plymouth, built in 1858, was refurbished with red Dreadnought ornamental fishtail tiles.

19

Plum Red

Smoothfaced

In the late 19th and early 20th century, deep red smoothfaced machine made tiles were particularly popular on dominant civic buildings, churches and similar projects.

Most current red clay tiles tend to be of a more pink appearance than tiles produced a century ago. However, the Dreadnought plum red smoothfaced traditional single camber tiles provide a colour and finish indistinguishable from traditional tiles of old.

Above: St John The Evangelist Church Dulwich, plum red with bands of country brown tiles in a mix of club and fishtail ornamental tiles, together with purpose-made hips.

Right: Mossley Hill Hospital Liverpool Plum red tiles were used to re-roof this Nineteenth Century Hospital, special interlocking ridge tiles were made to match the originals.

Left and Lower right: Plum red tiles for the roof and vertical were specified for the re-roofing of Clementsbury, Brickendon on a listed stud farm built in 1902. Crested ridges
and finials were made to order to match the originals.

20

Classic Handmade Range

Dreadnought Classic tiles are handmade with variations in texture and shape that impart a special character to a roof. These tiles are all naturally coloured without the use of surface stains or coloured sands as we passionately believe in the superior aesthetic of true burnt clay colours to produce a roof with an old world charm. Dreadnought Classics are very similar in appearance to Dreadnought Handmade tiles produced between 1805 and 1984. They are available in 5 colours, Staffordshire blue, dark heather, purple brown, bronze and deep red.

Left: Purple brown
Top middle: Staffordshire blue
Bottom middle: Deep red
Top right: Dark heather
Bottom right: Bronze.

A Dreadnought Classic handmade clay roof is one of the most beautiful and charming roofs you can own.

Bronze handmade tiles

Mixed Colour Blends

Dreadnoughts are made for blending!

Dreadnought tile colours are natural and permanent, produced through the delicate control of the kiln atmosphere with no applied surface stains or coloured sands. The subtle, uncontrived colour variation within each tile make all 3 Dreadnought tile ranges lend themselves particularly well to blending. Whereas mixing artificial colours can look regimented and clumsy, mixing Dreadnought colours produces a natural blend of compatible shades. All our colours exhibit the varied properties of natural burnt clay colours and by mixing different Dreadnought colours together, you can create your own distinctive roof.

Right: This new building at a Berkshire school is set within parkland and needed to fit in alongside the fine Georgian house of the main school. A mixed blend of brown brindle and country brown (60:40) was used to create this stunning roofscape.

affs blue handmade tiles were specified by
elden Clegg Bradley Studios for this new
stainable accommodation at Stephen Taylor
ourt, Kings College Cambridge. With a
esign life of over 100 years, this project was
Winner at the Housing Design Awards 2023

Above: A mixed blend of Dreadnought handmade deep red, bronze and purple brown arrowhead tiles clad a modern extension to a historic building.
28

Your local area manager can help you to select your tiles and create a blend that matches in with your other building materials. With over 200 years experience in manufacturing clay tiles, we have found that the more successful blends are those where there is a dominance of one colour rather than a 50:50 mix. Our sales office can advise on different mixes that have been popular and can also provide sites where tile mixes can be seen.

Collingwood Blend

Smoothfaced/Sandfaced

A mixed blend of 70% brown brindle/brown heather and 30% country brown, the Collingwood blend is a product of Dreadnought's long experience of blending roof tile colours.

Left: The Collingwood blend sits in harmony with the oak frame on this award winning building.

Trafalgar Blend

A mixed blend of 33% brown brindle/brown heather 33% country brown 33% brown antique. The Trafalgar blend creates an elegant roof of distinctive character. Below it is matched with natural sandstone to create a beautiful building in harmony with its surroundings.

Above: Trafalgar blend, on a private house near Bridport.

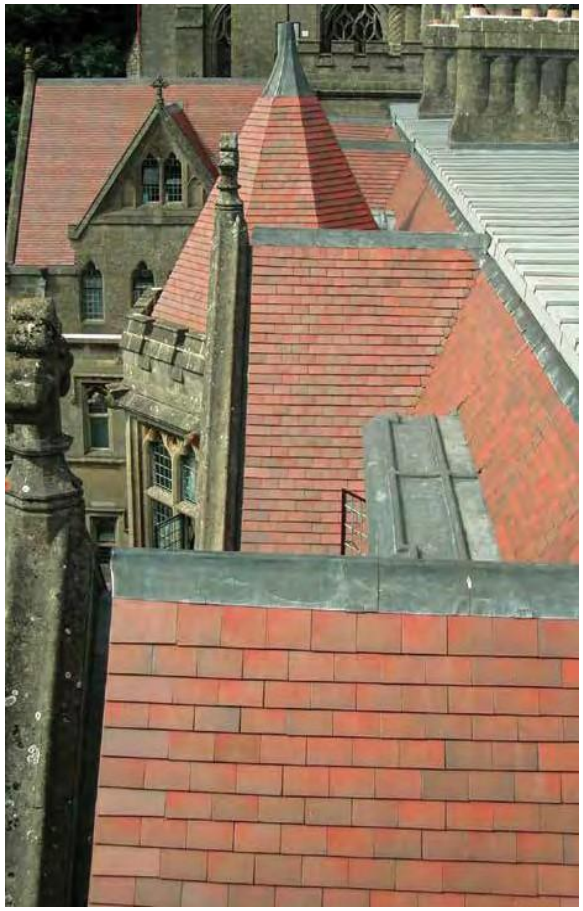
All blends can be supplied on pallets in a predetermined mix with the right proportions of quantities and colours, in either a smoothfaced of sandfaced finish. When the tiles are pre-mixed, valuable time is saved on site and additional savings are made as waste is reduced when laying. They are also available unmixed.

Heritage

Dreadnought offer a heritage service to reproduce tiles, fittings and ornamental components for re-roofing projects. Our skilled craftsmen have an unrivalled depth of experience to create bespoke clay pieces for the most demanding applications.

The key to renovating or extending an old roof successfully is to replace or match "like with like". The traditional character of Dreadnought tiles, makes them an appropriate replacement for the many brands of manufacture that are no longer available. Dreadnought are also often used to match up brands whose names continue to exist today, but whose appearance and character have been radically altered by changes in the manufacturing process. If a single Dreadnought colour does not provide a satisfactory match to the originals, then often a combination of tile colours will provide a close copy.

The Classic handmade range are a very close match to the original Dreadnought tiles made in 1805, and their irregularity of texture give the roof an established look from the moment they are laid.



Above: Traditional single camber country brown smoothfaced tiles were chosen for the re-roofing of Downside Abbey and this project was highly commended at Clay Roofing Awards.

Left: Where old and tired bespoke features require a like for like replacement, our team of dedicated, skilled craftsmen can help.

Above: Dreadnought's Staffordshire blue plain and ornamental fishtail tiles at St Mary's Bushbury. Winner best Heritage Roof at 2018 Pitched Roofing Awards.

Right: These slotted roll top ornamental ridges pictured have a groove in their length to take specially made inserts. These inserts are bedded into the roll using mortar. Any shape of insert can be manufactured and here you can see some examples of various shapes we have made.

11" x 7" tiles

Matching like with like can involve the use of 11"x7" tiles which are available in the Dreadnought Classic range of colours. English Heritage are keen that new rather than old 11"x7" tiles are used to reduce theft from existing roofs.

Design Techniques

Why Plain Tiles?

The small size of plain tiles provides the versatility for the architect to design roofscapes that contain infinite interest. Hips, valleys, dormer windows, towers and vertical cladding are roof features that embellish a gable to gable roof surface, producing shadows that break up potentially monotonous areas of roof. Large format tiles simply do not offer this flexibility.

Staffordshire blue machine-made tiles were chosen by a pioneering self builder at Graven Hill and the project featured on Grand Designs "The Street". The project won best Small Project at 2020 UK Roofing Awards.

Often solar panels detract from the aesthetic of the roof but our Staffordshire blue plain clay tiles are a close colour match for the panels and by using special fittings, the solar panels can be fitted flush with the tiles. Fitted this way, the panels do not dominate or compromise the appearance of a roof, but they still provide all the benefits of generating your own energy.

Ornamental Tiles

Complex roof details were common in Victorian architecture. Ornamental tiles, ridges and finials and intricately cut barge boards were used to break up hard straight edges.

Ornamental tiles were either laid in bands or in diamond patterns. They were used to add interest to large expanses of roof or vertical cladding. Dreadnought offer 4 ornamental patterns - fishtail, club, spade and arrowhead. A popular and visually attractive combination is the use of club and fishtail laid in the pattern - club/fishtail/club.

Above: Ornamental tiles in red blue blend and Staffordshire blue were used to recreate the polychromatic diaper pattern on this Gothic Revival church.

Ornamental Ridges

Interest can also be added to roofs by highlighting the ridgeline via the use of ornamental ridges. (See p.37).

Finials

Finishing touches can be provided by the use of finials. These need not be elaborate and very often the occasional use of a scroll finial does add a subtle finish to a roof.

Above: This Victorian house was re-roofed using a mixture of brown brindle and country brown tiles with ornamental club tiles to match the original. Ornamental finials and ridge tiles were hand-made to match the originals.

Below: The use of ornamental tiles and different colours for the vertical tiling produces a striking entrance to this supermarket.

Ventilation

High insulation requirements and changes in construction practices have produced increased condensation in the roofspace. This has led to the introduction of mandatory requirements for ventilation in the roof which are laid out in the white paper BS5250:2011+A1: 2016. Dreadnought offer a range of discrete but effective ventilation products that will not interfere with the aesthetics of your clay tiled roof.

Above: Tileline tile vents providing discreet high level ventilation in the roof space

The amount of ventilation that is required in a roof depends on whether it is a cold roof (where there is a cold uninhabited loftspace above the insulation) or a warm roof (where the roof has become part of the living space and has small or no voids above sloping insulation). Cold roofs have always been the most common roof construction though warm roofs are becoming increasingly popular. Another consideration is the type of underlay that is being used, whether it is vapour permeable or impermeable.

The new European Standard BS EN 5534 requires all ridge tiles to be mechanically fixed whether they are used on the ridge or the hip line. Some roofers and architects prefer the traditional look of a regular mortar bedded ridge or hip, and can choose to use both a mechanical fixing as well as mortar to be compliant (as shown in the image below). But whether you choose a dryfix or mortared ridge, will affect the ventilation options at ridge level. Generally speaking, ventilation is required both at high and low level and Dreadnought offer a range of options for ventilating your roof without disturbing the roofline. As clay tiles are largely specified for the aesthetic contribution they make, this is key: early ventilation products and some cheap solutions still available today are made of incompatible materials and are ugly and prominent.

The Dreadnought Tileline ventilation systems are discrete and integrate seamlessly with the tiles; they do not disturb the design of the roof. Our ventilation products not only match the colour of the tiles, but also lie flush with the tiling or the ridge line.

Call or email us for a comprehensive ventilation and/or fixing specification for your new roof.

Above: A mechanically fixed mortar bedded ridge

Self-Build

Dreadnought are recognised as the roof tile of choice for the discerning self builder. Our tiles have been repeatedly acclaimed with the best Self Build Clay Roof Award. Since the roof is frequently the dominant external feature of a self build home, accounting for up to two thirds of the appearance, it is important that the roof is a statement of quality.

The choice of roof tile can impact heavily upon the character and value of a property. The beauty of natural clay colours is unrivalled; an appearance that mellows and improves with age.

Select your own colour blend

The natural colours of Dreadnought tiles lend themselves particularly well to blending together. The subtle uncontrived colour variation within each tile makes a blend of tiles work so effectively, whereas with tiles that are coloured with surface stains the effect is more regimented. Your local area manager can assist you in creating a blend to help you match up to other building materials. Once you are satisfied with the blend, samples can be provided to submit to planning, architects etc. We have a comprehensive list of sites where our tiles can be seen on existing roofs, as this is the best way to see the difference. A Quantity Estimation Service is freely available from drawings and we would be pleased to discuss aspects of roof design, including the use of ventilation, ornamental components and nailing specifications. We aim to provide you with an excellent service and a truly British quality clay product.

Contact us to find out where tiles can be viewed in your local area.

Handmade Roof Components

Ridges

The apex of a roof can be given a sharp or soft outline by using different ridge profiles. The most commonly used is the half round ridge and a similar soft appearance is obtained with a hog back ridge. An angle ridge provides a sharp apex and this can be broken up by using capped angle ridges or a special ornamental profile. A baby half-round ridge (165mm diameter) can be used on porches or canopies. The end of a ridge-line can be neatly finished with a stop end or hip end and all ridge tiles must be mechanically fixed.

Hips

Arris Hips: These are pitch specific and give a sharp definition to the profile of the roof. Standard roof pitches are for 35, 40, 45 and 50°. Hips for other pitches can be made as specials.

Bonnet Hips: These are not pitch specific and provide a rounded and softer profile to a roof. They do not fit close to the hip tile beneath them and mortar bedding must be used to fill the space between one hip tile and the one beneath.

Valleys

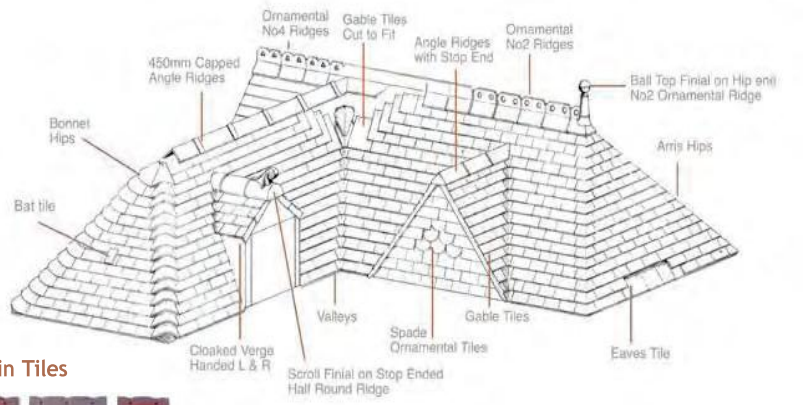
Valley tiles are pitch specific and Dreadnought make a standard range of valley tiles for 35, 40, 45 and 50° roofs. Valley tiles for other pitches can be made as specials. They are held in place by the two adjacent plain tiles both of which are twice nailed. This provides a sound and visually attractive form of valley covering.

Cloaked verge

These offer a dry-fix, mortar-free solution to the verge of a roof. They are left and right handed and nailed in place to provide a neat and attractive solution at the end of gables and dormers. They are quick and easy to install and unlike a traditional mortared verge, do not requirement maintenance over time.

External & internal angles

These are handed left and right and are used in vertical tiling,up the interior or exterior corners.



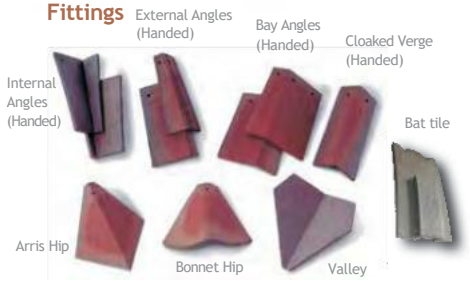
Plain Tiles

Eave Tile 215 x 165 | Gable Tile 265 x 248 | Standard Tile 265 x 165

Ornamental tiles

Club | Fishtail | Club Gable | Spade | Arrowhead

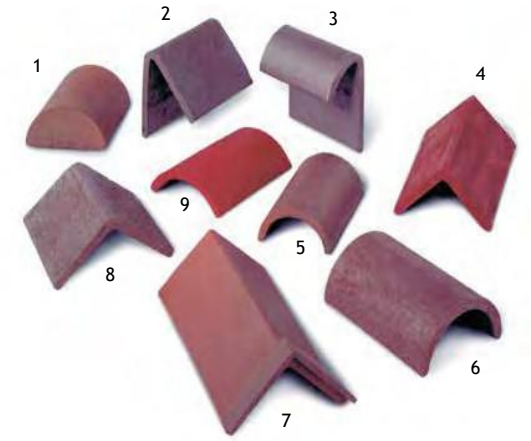
Fittings



Ridges

All Ridges at 300mm unless stated as 450mm

1. Stop End Half Round Ridge
2. Angle Mono Ridge
3. Half Round Mono Ridge
4. 300mm or 450mm Angle Ridge
5. Baby Half Round Ridge
6. Half Round Ridge
7. 300mm or 450mm Capped Angle Ridge
8. Hogback Ridge
9. 'Third' Round Ridge



Ornamental Ridges

1. Chamfered Crested Ridge
2. Two Hole Ornamental Ridge
3. 450mm Roll Top Ridge
4. Clover Leaf Ornamental Ridge
5. Three Aperture Crested Ridge
6. Cocks Comb Ornamental Ridge

Ornamental Finials

1. Stop End No.2 Ridge with Ball Top Finial
2. Hip End No.4 Ridge with Ball Top Finial
3. Octagonal Capping Piece with Pagoda Finial
4. No.4 Ridge with Fleur de Lys Finial
5. Half Round Ridge with Fleur de Lys Finial
6. Hip End No.2 Ridge with Scroll Finial
7. Half Round Ridge with Scroll Finial
8. Hip End Half Round Ridge with Scroll Finial used with Bonnet Hip

Technical Specification and Sales Support Services

Specification

Dreadnought tiles should be laid in accordance with BS 5534 2014 Code of Practice for 'Slating and Tiling' and to the Standards of 'Workmanship on Building Sites' contained in BS 8000 Part 6 'Workmanship on Building Sites'.

Technical specification sheets, declarations of performance and environmental data are available from our website **www.dreadnought-tiles.co.uk**

Roof Estimation

Our estimating department is available to extract quantities promptly from elevation drawings and roof plans provided to them. The service is of particular benefit to Self-Builders.

Fixing Specification

For rafter pitches below 60 degrees, tiles must be fixed with 2 nails to each tile in at least every 5th course. At verges and abutments and at each side of hips and valleys the end tiles in every course must be fixed with 2 nails. All tiles in the first two courses at eaves and the two top courses must be fixed with two nails. At pitches above 60 degrees, all tiles must be fixed with two nails.

All ridge tiles, including ridge tiles used down the hips are required to be mechanically fixed. Contact us or see our website for information on Dreadnought ventilation products that allow for mechanical fixing of ridge tiles whilst also providing ventilation in the roof.

However, BS 5534 2014 +A2:2018 requires additional nailing in some designs and locations to take account of the forces imposed by the wind. Our technical services department can provide a full nailing specification on receipt of certain data including:-

- The OS map reference or
- postcode of the site.
- Height to the Ridge.
- Roof Pitch.
- Building Width and Length.
- Town or Country Location.

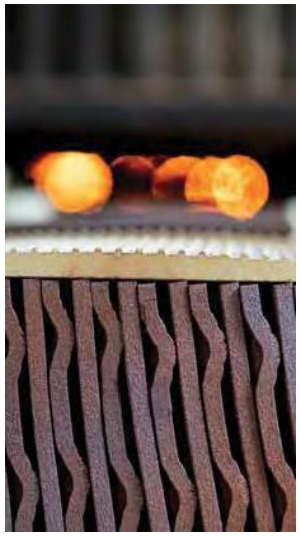
A form for completion is available on request.

Sales Support

Our one hundred year continuity of family ownership ensures an enthusiastic sales support team with unrivalled experience. You will find them easily accessible and ready to give advice from design stage to completion of a project. Their comprehensive records of completed site addresses are invaluable, enabling clients to see for themselves the total visual effect of a finished roof. This makes an additional contribution over and above the viewing of sample tiles and photographs in the vital process of roof tile selection. Remember a long history of proven satisfactory use in the UK's testing climate is a more vital factor in the selection of roof tiles than any other building component.

Quality Assurance

Dreadnought tiles conform to BS EN 1304:2013 and are manufactured under a Quality Management System, which meets the requirements of ISO:9001 2015.



Freeze Thaw Standards require plain clay tiles for use in the U.K. to withstand at least 150 freeze / thaw cycles under method E of European Standard EN 539-2:2013. At Dreadnought Tiles we regard this as too low for our climate and we therefore test our tiles to withstand in excess of 400 cycles.

Technical data

	Tiles	Eaves	Gables	Classic Tiles	Classic Eaves	Classic Gables
Size	265 x 165 mm	215 x 165 mm	265 x 248 mm	265 x 165 mm	215 x 165 mm	265 x 248 mm
Weight	1.19 kg	0.95 kg	1.8 kg	1.51 kg	1.2 kg	2.3 kg
Pattern	Traditional Single Camber	Traditional Single Camber	Traditional Single Camber	Handmade	Handmade	Handmade
Material	Etruria Marl	Etruria Marl	Etruria Marl	Etruria Marl	Etruria Marl	Etruria Marl
Number on a Pallet	1000	1300	650	730	900	500
Pallet Weight	1190kg	1235kg	1170kg	1102kg	1180kg	1150kg

	Pitched Roofs	Vertical
Minimum Lap	65 mm	35 mm
Maximum Gauge	100 mm	115 mm
Approx. Weight At Maximum Gauge	71 kg/m² or 90 kg/m² for Classic Tiles	63 kg/m² or 80 kg/m² for Classic Tiles
Nails	38 x 2.65 mm alloy	38 x 2.65 mm alloy
Battens	38 x 25 mm	38 x 25 mm
Minimum Pitch	35 degree	

	Quantity Guide
Tiles @100mm gauge	60/sq metre
115mm gauge	53/sq metre
Eaves/Tops	6/lineal metre
Gable (tile and half)	5/lineal metre of verge
Hips and valleys	10/lineal metre of main rafter
Ridges	Supplied in 300mm and 450mm lengths

Roof pitch must be quoted when ordering hips and valleys

Relevant Fixing Standards	
BS 5534 2014 +A2:2018	Code of Practice for Slating and Tiling
BS 8000-6 2013 BS 8000-0:2014	Workmanship on Building Sites
BS EN 1991-1-4: 2005+A1:2010	UK National Annex to Eurocode 1 - Actions on Structures - Part 1-4: General actions - wind actions

Relevant Manufacturing Standards 'Clay Roof Tiles for Discontinuous Laying'	
BS EN 1304	Product Definitions and Specifications
BS EN 1024	Determination of Geometric Characteristics
BS EN 539-1	Part 1. Impermeability Test
BS EN 539-2	Part 2. Test for Frost Resistance
BS EN 538	Flexural Strength Test

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10.5. Specialist Quotes Obtained Previously

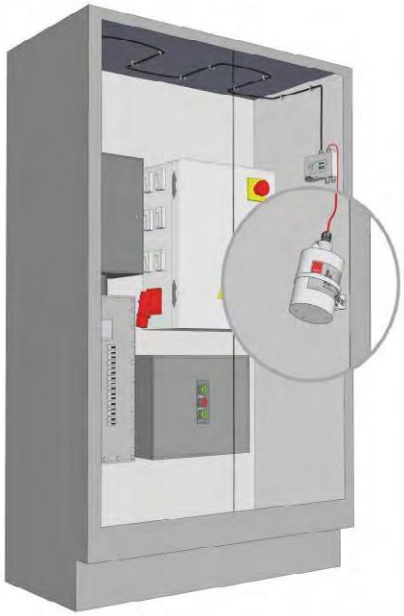
The on-site files contain a wealth of material related to maintenance work (proposed, and some undertaken) over the years. Although all the work now must be approached and costed afresh, these records should be referenced and consulted for consistency and to avoid duplication of work.

Spanish Gilt Leather tile wall panels (17th and 19th Century)

The Leather Conservation Centre
Northampton, UK
lcc@northampton.co.uk

Bronze Tableau, Wrought Iron Grilles and other specialist mterials
South African Institute for Objects Conservation
https://www.sainst.org

FirePro.



Protecting Key Assets

At FirePro we design and manufacture flexible, efficient and effective fire suppression systems with an at-the-cutting-edge of condensed aerosol fire extinguishing technology compound at their core.

The modular, pre-engineered FirePro condensed aerosol generators efficiently and effectively protect conventional, as well as, specially-designed projects. Moreover, they find use in applications once considered to be technically or financially challenging for other technologies.

We currently protect key assets in more than 110 countries.

Multiple Applications

- Electrical Switchgear & Panels
- Electrical Rooms
- Transformer Rooms / Substations
- Diesel Generators
- Battery Rooms
- Energy Storage Systems (Li-Ion)
- Storage Areas
- Marine Applications
- Rolling Stock
- Machinery / Plant Rooms
- Vehicle Engine Bays

Our commitment to maintain the highest achievable engineering and manufacturing standards as well as superior performance, is attested by the number of internationally acknowledged Certificates, Listings and Approvals attained from the leading and most respected Organisations worldwide.

The Technology

All FirePro systems use the latest generation of our FPC solid compound. When activated, the FPC undergoes a transformation into a rapidly expanding extremely effective and efficient fire extinguishing condensed aerosol. The generated aerosol is propagated and evenly distributed in the enclosure under protection using its own momentum. Fire extinguishing is accomplished by the interruption of the chemical chain reactions occurring in the flame, without oxygen depletion.

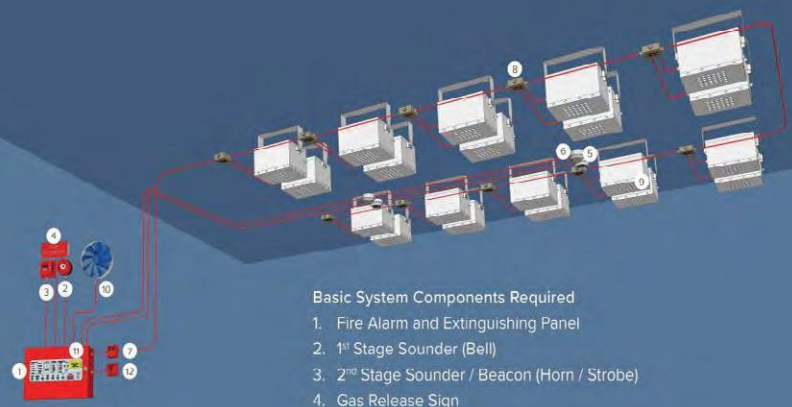
FirePro aerosol technology is based on environmentally friendly Potassium salts and was developed after many years of research & development. FirePro generators are EPA SNAP listed for Normally Occupied spaces, as well as certified by numerous organizations for their environmental and eco-friendly nature.

- Certified 15-year product life
- Non Pressurized
- O_2 Non-Oxygen Depleting
- HFC FREE HFC-free
- CFC FREE CFC-free
- Zero Global Warming Potential
- EPA SNAP ODS Listed Alternative
- O_3 Zero Ozone Depletion Potential
- ISO Manufactured under ISO 9001 ISO 14001

SNAP · SIGNIFICANT • NEW • ALTERNATIVES • POLICY

DNV · ISO 9001 = ISO 14001

• GREEN LABEL •



Basic System Components Required

1. Fire Alarm and Extinguishing Panel
2. 1st Stage Sounder (Bell)
3. 2nd Stage Sounder / Beacon (Horn / Strobe)
4. Gas Release Sign
5. Panel input Zone 1, Smoke Detector
6. Panel input Zone 2, Heat Detector (RoR)
7. Extinguishant Disablement Switch (System Isolation Switch)
8. Sequential Activator
9. FirePro Condensed Aerosol Generators
10. Emergency Power-Off System
11. Manual Release Button
12. System Abort (Hold) Switch

Total Flooding Pre-engineered System Design

FirePro systems are designed in strict compliance with all relevant international standards: **ISO 15779, NFPA 2010, IMO/MSC 1270, UL 2775, EN 15276, AS 4487.**

FirePro engineered electrical parts, electronic control units & accessories, are fully certified for their compatibility; circuit monitoring is provided through sequential activator modules. FirePro condensed aerosol generators, panels and sequential activator modules are listed separately and independently. Moreover, they are certified as an integrated system.

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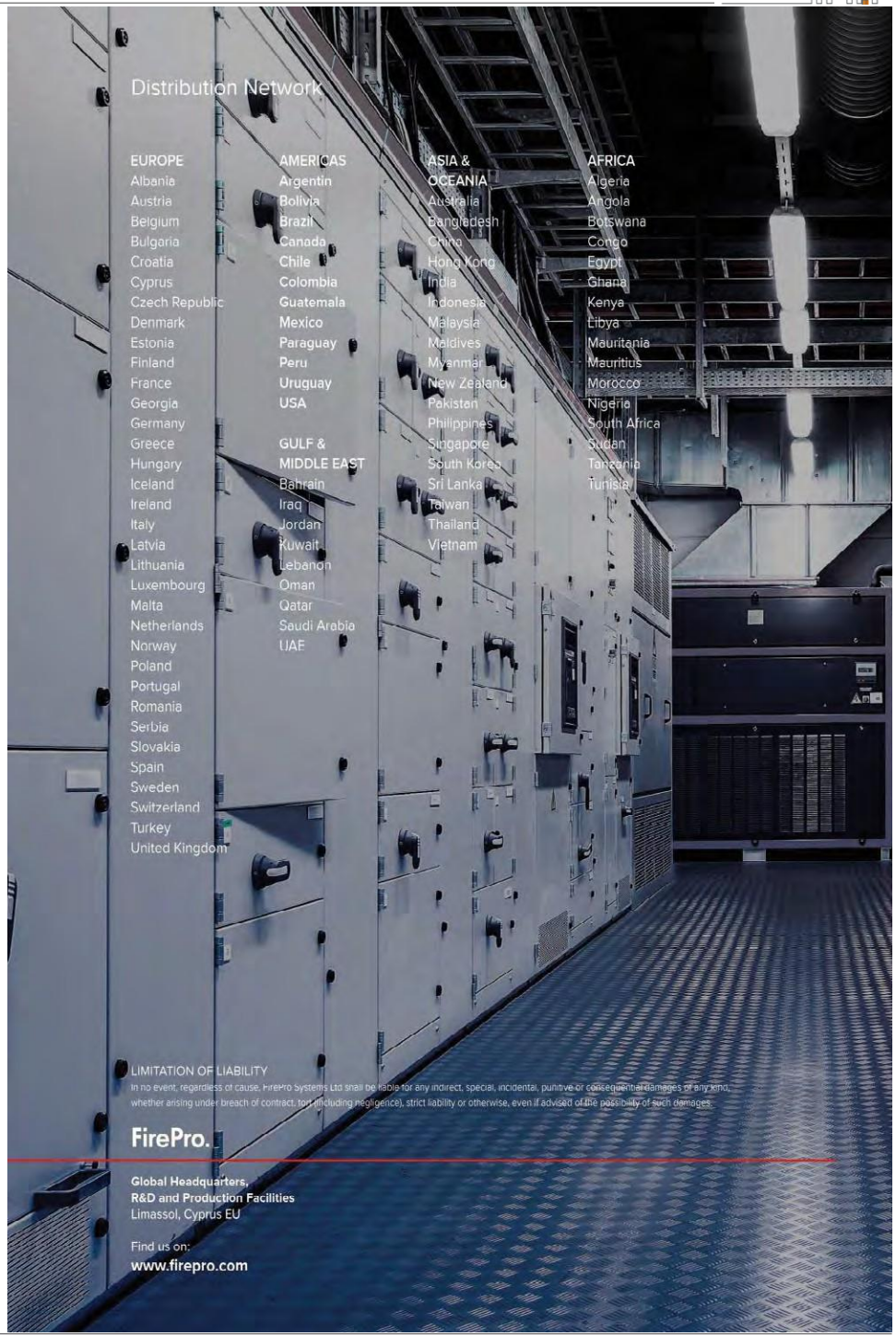

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11. DECANTING PLAN

Read together with 5.18

The guidelines for the decanting plan are embedded in Section 5.18.

- It is preferable to keep all items on site and not move them off site. This principle has been discussed with the curator Dr Rayda Bekker.

- Given that the full interior and exterior are to be renovated in one contract with the attendant vulnerabilities of opened roofs etc around the highly significant and valuable Objects Collection (registered as a Heritage Object in terms of the NHRA), it is not recommended to leave these items in-situ/ in rooms and to move them around the site works.

- If however the work is detailed in phases and/or becomes more limited, this should be re-appraised with Iziko, SAHRA, the conservation architect and the curator.

- A permit application to SAHRA is necessary for the removal and storage of the items, or for any repair or restoration thereof.
- The Turnkey contractor is responsible for the preparation and approval for the detailed decanting plan to be prepared as part of the Stage 3 work.

- The diagram and the suggested site area (see 5.18) is the suggested potential site area for the placement of the secure, temperature and humidity-controlled container units. However, this requires discussion and approval with wider stakeholders on site.

- The use of on site storage (as opposed to off-site at Wingfield for example) is suggested for reasons of control, management, location within a secure precinct and the overall need to protect this most significant resource.

- Allowance has been made in the programme for the decanting process which the Turnkey Contractor must manage, but with official and active engagement with and by the curatorial team and their designated specialists.

12. METHOD STATEMENT

This Stage 2 report sets out the scope of work, high level specifications and products to be used, costing and general procedures. Accompanying it (but not issued with the tender) is the Vol 2-5 Conditional Assessment suite of reports.

The Turnkey contractor is to fully appraise the site, building and general areas of decay and damage in drawing up the Stage 3 detailed documentation.

The Stage 3 documentation, should formally be submitted to HWC to obtain the necessary Section 27 permit. The team is to assess and discuss whether this is a minor works process or a full permit application. Given the extent and significance it is suggested that a full S27 Permit application is more appropriate.

A submission to SAHRA is required in terms of Section 32 of the NHRA for any removal, conservation, repair or disposal of any items in the collection.

It is likely and suggested that Stage 4 detailed specifications and documentation will need to be submitted to HWC, either as a condition of the Permit, or as a requirement to obtain the Permit.

The input, mentoring and reporting by an appropriately experienced architect with architectural heritage skills will be required on site throughout Stage 5 & 6.

13. AREAS OF RISK/REGISTER

Areas and risk:

- Damage, theft or loss of irreplaceable art and objects.
- The need to sequence work to ensure fully protected from weather at all times.
- The contractor must take whatever precaution is necessary to ensure there is no fire risk during construction. A fire protection and monitoring plan is to be provided.
- Imported materials – certain materials such as the Broseley roof tiles can only be obtained by importing from overseas.
- Timeous ordering is essential and careful management of certain regulations and procedures.
- The detailed assessment and the quality of tiles to be ordered (the Stage 2 report lists 50% new) is to be verified with appropriate roof specialists.
- Obviously much of the character of the roof derives from its lichen-covered, weathered appearance. The contractor must balance retaining this character with the need to ensure water-tightness and longevity.
- The contractor is to be aware that all interventions required are to be carefully handled and with due respect to the conservation required, and that "standard" building practices, specifications and procedures do not apply here.

14. RECOMMENDATIONS

14.1. The Turnkey Contractor is to obtain all necessary permits and approvals, as well as authorisations from DPWI, to enable the works to proceed.

14.2. At all times, the very high significance of the building, context and sense of place, must be borne in mind and inform all decisions.

14.3. Detailed records must be kept on site.

14.4. Monthly site reports should be lodged with HWC and SAHRA as necessary.

14.5. A fabric management and maintenance plan schedule is to be drawn up, preferably as an outcome of this contract.

14.6. This should feed into an updated Conservation Management Plan for this building and site area to be approved by HWC with actionable maintenance items over the next 5-10 years identified.

14.7. A close out summary report by the conservation architect is to be completed and submitted to HWC and SAHRA.

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