GUY TAYLOR ASSOCIATES

NEWARK / MANCHESTER / DERBY

Energy Efficient Retrofit Assessment

Newark Town Hall

August 2024

http://www.guytaylorassociates.co.uk

Project Information

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Client Information

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Contents

1.0 Introduction

1.0 Introduction

1.0.1 Brief

Guy Taylor Associates have been commissioned to undertake an Initial Assessment and Options Appraisal Study, to advise on possible methods to improve the operational energy efficiency within Newark Town Hall, in order to Reduce carbon emissions and fuel bills and to improve comfort levels.

1.0.2 Methodology

A 'whole building approach will be employed, based on best practice guidance provided by Historic England. Improvements proposed will be designed to:

- Avoid harm to the heritage significance;
- Provide effective, cost efficient, proportionate and sustainable solutions;
- Ensure a healthy and comfortable indoor environment for occupants;
- Minimise the risk of unintended consequence (e.g. the retention of moisture, which can cause issues with damp and mould growth etc).

In order to plan and deliver the most effective retrofit strategy it is vitally important to understand the building fully. Any approach should prioritise this and be based on the following principles:

- An understanding of the building and how it performs;
- An understanding of the significance of a historic building, including the contribution of its setting;
- Prioritising interventions that are proportionate, effective and sustainable; and
- Avoiding and minimising harm and the risk of maladaptation.

1.0.3 Scope of the Report

The first section of the report will focus on understanding the building including determining the original arrangements and assessing how the building is currently being used. This will include developing an understanding of:

- Building and physical context
- M&E installations
- Occupant levels and comfort
- Heritage significance (summarised)

Section two will then focus on assessing the opportunities availlable to take action to improve the performance and energy efficiency of the building, outlining green, amber and red actions in order to establish a priority list based on risk and return.

The report is then concluded with the outlining of potential next steps in order to develop the most appropriate interventions in more detail.

1.0.4 Limitations

This report is an initial exploration to inform the direction of the proposed retrofit strategy. It is not exhaustive and represents the first step of this process. Further discussion with key stakeholders and understanding of the detail of the operation of the building is required.

Assessments to establish the current performance issues with the building is based on limited discussions with a small number of users. As is the understanding of the existing building systems. Further focused discussions will be necessary to understand the detail of each of these key inputs.

2.0 Building Context and Situation

2.1 Physical Constraints & Climatic Context
2.2 Planned Improvement and Upgrades

2.1 Physical Constraints & Climatic Context

2.1.1 Location

Newark Town Hall occupies a prominent position on the market square in the centre of Newark-on-Trent. It sits to the west of the square and is orientated vaguely east - west with its long elevation orientated south-south west and the principle elevation east-south east.

2.1.2 Historical Significance

Newark Town Hall is Grade 1 listed and situated in a conservation area. It is an imposing and important civic building by John Carr of York expressing the Palladian approach to architecture fashionable at the time. Dating to 1774-6 with late C18 and mid C19 additions, the building is described by Pevsner as ‘a fine example of its type and period.’ (The Buildings of England: Nottinghamshire, 1979). Any changes to the building need to be considered an ‘improvement’ and all changes must be considered on a case-by-case basis. In some cases, the potential ‘heritage harm’ of modifications can be offset against public benefit, but the listed status is a potential barrier to some of the more common decarbonisation interventions, notably when involving the fabric of the building.

2.1.3 Architecture

The main town hall consists of four storeys, plus a basement, and adjoins the ‘Butter market’ shopping centre,. The Town hall dates from 1774, but has various additions, including colonnades that were added in 1995. The main structure is a solid wall construction built from white sandstone and brick, with a slate roof. The Colonnades are constructed from glass and steel.

2.1.4 Use

The building houses the Parish Council offices as well as business tenants (currently 2) and hosts multiple public and private functions including weddings. The Town hall also houses a museum and art gallery devoted to the history of Newark-on-Trent on the second floor. The building generally has 15-20 permanent occupants (council staff and tenants) along with any number of public attendees in the museum or function rooms.

2.1.5 Surrounding Context

The Town Hall is surrounded on three sides by neighbouring buildings, these are largely two storeys and are of various ages. The majority to the north likely to date from the C18 and C19 (possibly with remnants of earlier buildings). To the west is the former covered market now known as

the ‘Butter market’ shopping centre, built 1884. To the south the adjacent buildings are of a similar scale as those to the north with the exception of those to the east-most end of Stodman Street where the scale increases to 3 storeys plus attic. Buildings are generally more modern here dating to at the earliest the late C19 but largely early and mid-C20.

The Market Square sits to the east, this is open and without permanent structures.

2.1.6 Climate

Due to its height relative to the surrounding buildings, the Town Hall is exposed to prevailing weather on all four sides. The south-most elevations are all exposed to the sun and are not overshadowed by any adjacent buildings, as is the principle east elevation and the south facing roof slopes.

By the same measure it is also relatively exposed to the prevailing winds. Colder winter winds from the north and northeast have the ability to impact the north and east elevations, taking advantage of the large windows to these elevations which are generally single glazed and without draught proofing.

2.1.7 Access

Access is generally restricted due to its location. The principle access is via the main entrance on the principle east elevation in to the main lobby and undercroft. A secondary entrance accesses the undercroft from the adjacent covered market to the west, both of these are pedestrian access only.

A further private access is available to the south of the main hall through an archway beneath the ‘Narrow House’ and into the south courtyard. This is generally used for maintenance access and refuse.

2.2 Planned Improvements and Upgrades

2.2.1 Heating System

Heating is provided by gas boiler, the previous boiler was installed in 1990 (Image top right) and reached the end of its life. The boiler was very recently replaced with a more efficient alternative, this was commissioned in August 2024. It is likely that there is a hot water cylinder in the building although this was not observed during the visit and it is assumed that water and space heating are provided by the same system. Radiators are relatively small and often positioned directly under the windows. On the previous system it was recorded that there were no thermostatic or zonal heating controls in the building. It is unknown as to whether these were installed as planned alongside the heating system replacement.

2.2.2 Ballroom Air Handling Unit

There is a current, live tender invitation to assess, repair and oversee the ongoing maintenance and servicing of the air handling unit within the ballroom which has not been operational for a time. The Air Handling Unit was built by a company called AAF Easdale and was installed in 1989.

We understand that as part of the tender, tendering persons are invited to submit a ender submission for a wholly new system as an alternative

The air handling system is of its time and it may be considered that a modern alternative may be a more suitable option. We expect that existing vents and ducts could be utilised but heating and control systems operated from a more modern system.

2.2.3 Solar PV Installation

We understand funding is available for the installation of solar PV panels to the roof in order to provide low carbon electricity. This has not been progressed sufficiently to have any detail with regard to the size of array and type of panel etc, nor have conversations been held with the Local Planning Authority' Conservation Team with regards to the suitability of the installation of PV.

It should be noted that many major heritage bodies including Historic England are promoting the installation of solar PV on heritage assets where harm can be balanced with public benefit in accordance with the NPPF.

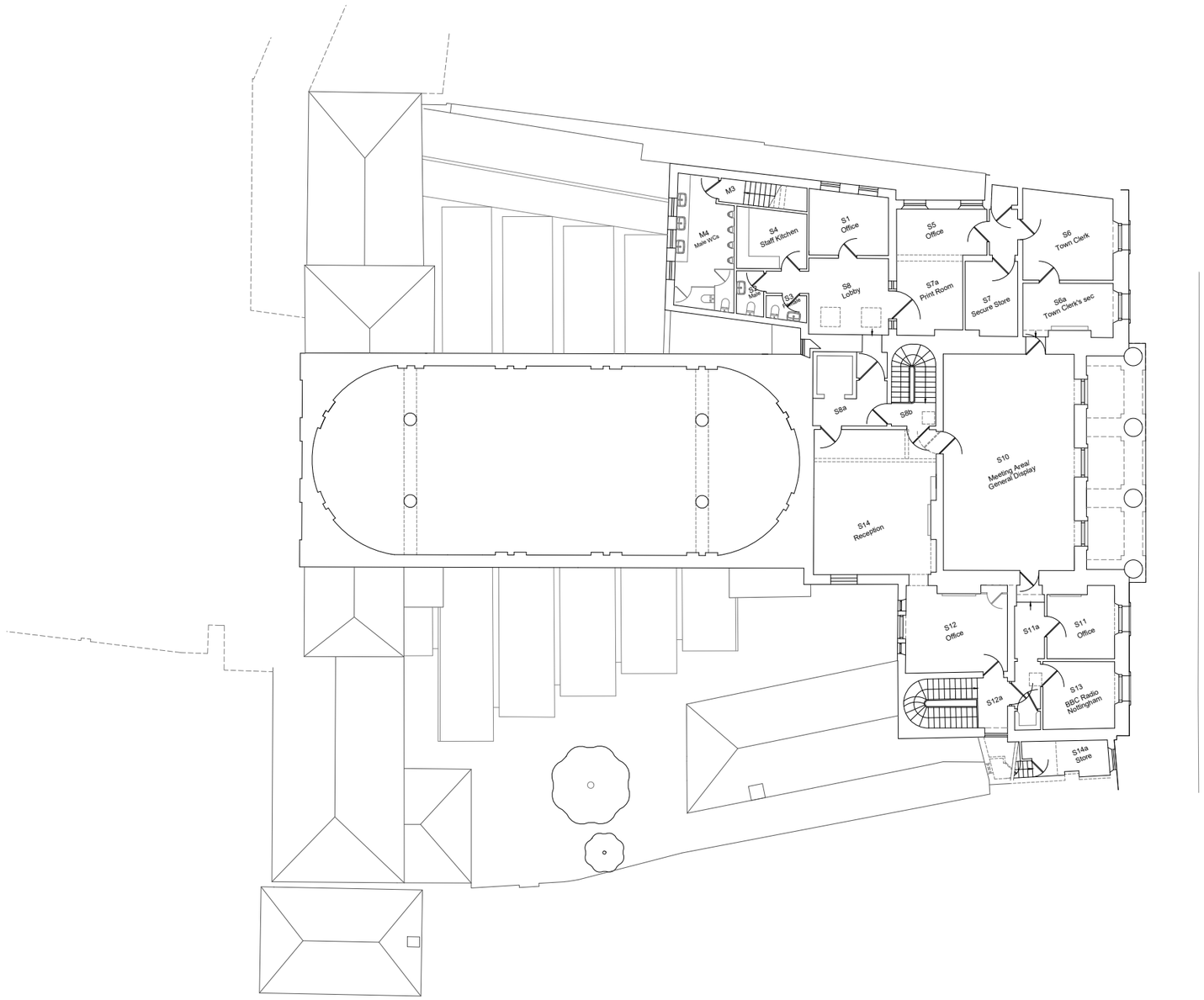
Encouragement should be taken from the recent decision from N&SDC to permit the installation of solar PV's on the Parish Church of St. Mary Magdalene nearby, also a Grade I listed building.

3.0 Existing Building Form and Condition

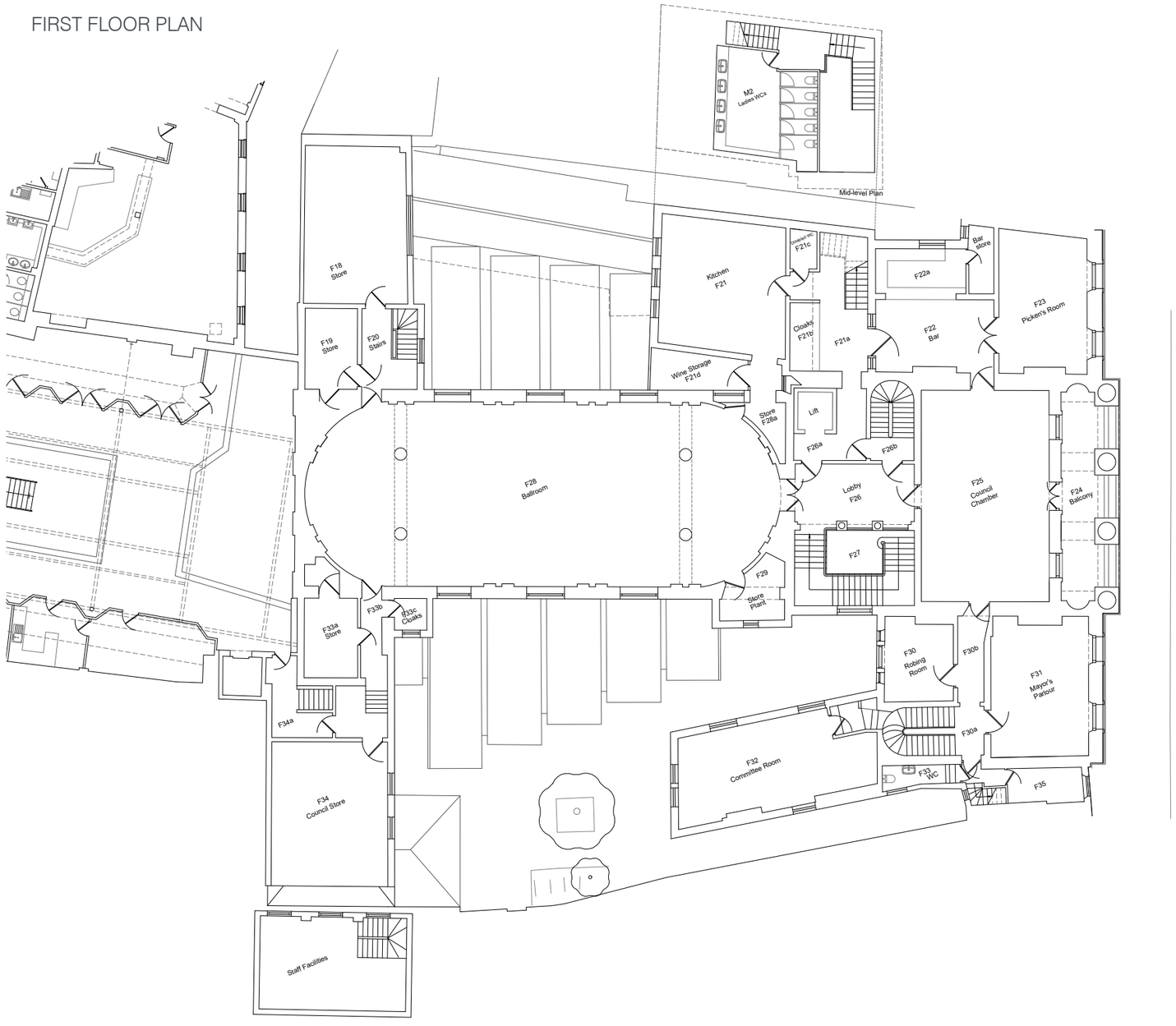
3.1 Existing Plans
3.2 Existing Building Condition
3.3 Existing Construction
3.4 Previous Retrofit Works

5.1 Existing Plans

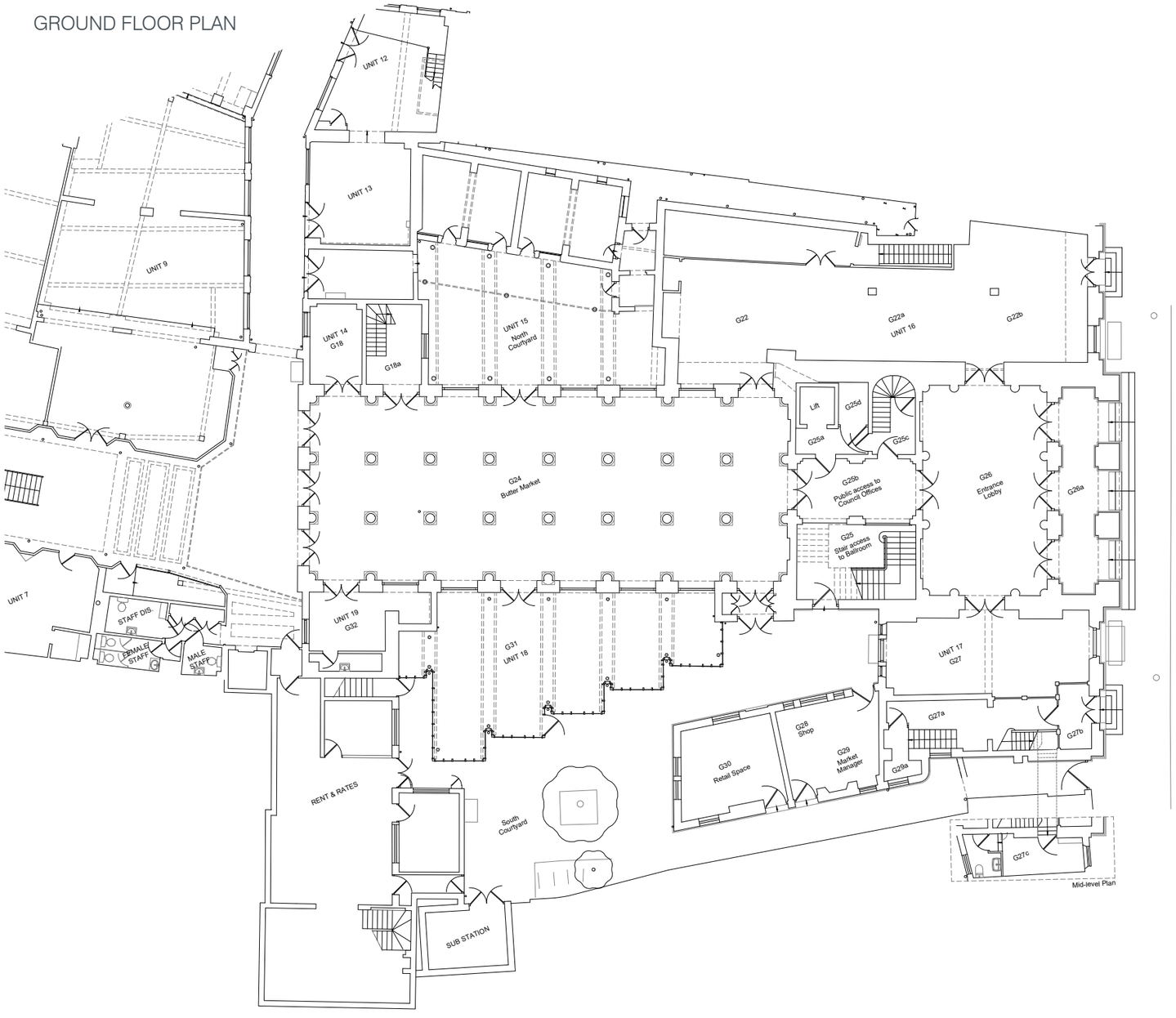
SECOND FLOOR PLAN



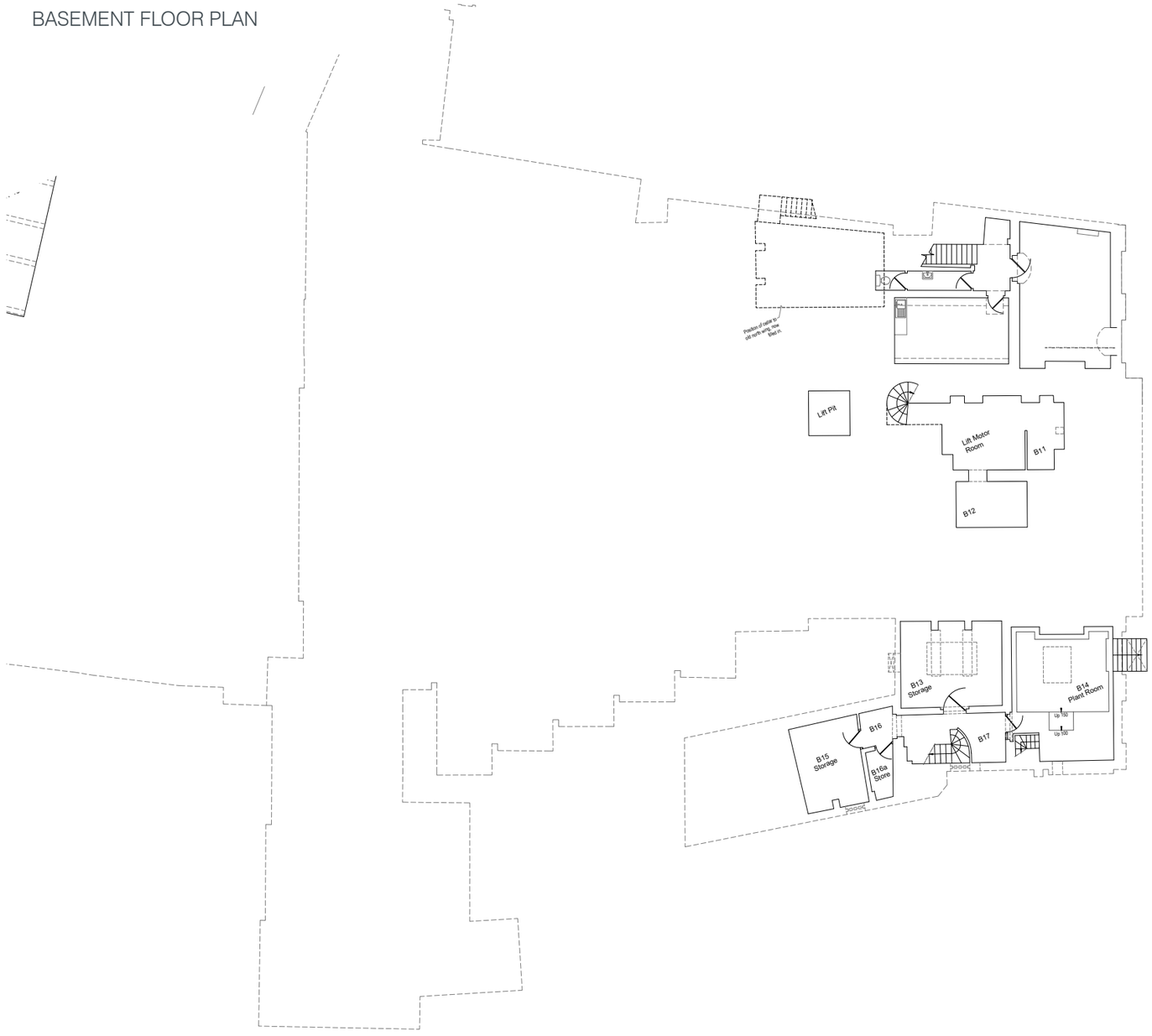
FIRST FLOOR PLAN



GROUND FLOOR PLAN



BASEMENT FLOOR PLAN



4.0 Significance and Building History

4.1 Description
4.2 History
4.3 Plan Evolution: Chronology
4.4 Adaptation Suitability Assessment

4.1 Description

DESCRIPTION OF THE TOWN HALL

The Town Hall lies on the western side of the Market Place, on the site of previous medieval buildings, including houses, a public house and a silversmiths.

The Market Place facade is executed in Mansfield White sandstone. It is three storeys in height, the ground floor being heavily rusticated, and of seven bays. The three central bays form a pedimented portico which is of the Roman Doric order and two full storeys in height. The columns are detached, the front wall of the portico being recessed to form a loggia or balcony. The elevation is surmounted by a frieze or triglyphs and metopes. To each side of the pediment is decorated with statues of Justice, a lion, a unicorn, and the town's coat of arms. This elevations has sufficient scale to allow the building to dominate the Market Place, providing the town with a dignified and impressive civic statement.

The plan in basically T-shaped but slightly asymmetric which is unusual, but not unheard of, for a Palladian building, and no doubt the result of the irregular and enclosed site.

The two side wings were designed as private houses. The central entrance leads into a sub-hall intended for use as a corn exchange. Beyond this is the main hall, colonnaded with Tuscan columns, and used as a Buttermarket. Cantilevered stone stairs lead to the Council's rooms. Behind the loggia lies the Council Chamber and above the Buttermarket is the Assembly Room, now known as a Ballroom. This is the focal point of the interior and is richly decorated with elaborate plasterwork in the Adam style. It is 80'x30'x30' in height; the two semi-circular apses being screened by full height Corinthian columns. The main ceiling sits above a plaster entablature including frieze of honeysuckle and urn motifs and has a quadrant coving. The side walls are punctuated with three semi-circular arched windows with an additional window at the far end. Between these are pairs of Corinthian pilasters.

The Town Hall cost upwards of £17,000 to complete.

4.2 History

THE BUILDING OF NEWARK TOWN HALL (1774-1776)

Newark in the late eighteenth century

George III reigned between 1760 and 1820 and towards the end of the eighteenth century the population of Newark was estimated as 7,000.

From the medieval period onwards the town's trading success was due to its location at the crossing of the Great North Road and the Fosseway. Stage-coaching began in the previous century and the town continued to thrive as a staging post. The town's inns and stables were numerous. The river traffic on the Trent continued to bring trade; carrying goods such as coal, wool, wheat and malt. A number of breweries and small manufacturers were operating. Newark was therefore a bustling market town.

Assemblies, the primary form of social interaction for polite society, were popular throughout the eighteenth century and began in private houses. However, dancing soon became an important element in the proceedings, and public assemblies were arranged in any available room of sufficient size. The earliest surviving purpose-built assembly room can be found at Stamford (circa 1727). The facilities depended very much on the fortunes and ambitions of the town, and were usually financed either by private subscribers or by incorporating them into a public building. Descriptions of assemblies can be found in novels of the day, particularly those by Jane Austen. The purpose of the assemblies was two-fold; to provide social discourse and to promote the social graces to local squires and small town society. These proceedings were overseen by a master of ceremonies.

THE COMMISSIONING OF THE TOWN HALL

The circumstances of John Cart's appointment as architect to the Town Corporation are not known. By the 1770s he was a highly fashionable and well known provincial architect, patronised by many of the gentry. Two local clients, the Duke of Kingston (Thoresby Lodge 1767-71) and the third Duke of Portland (alterations at Welbeck Abbey 1763-75) may have influenced Newark's choice. The Prince of Wales is also known to have taken an interest in John Carr's work. Carr was a freeman of the City of York and served his first term as Lord Mayor in 1770. This background would have made him eminently suitable to the town.

In January 1773 the Mayor and Aldermen of Newark petitioned Parliament to permit the sale of the estates of Brown and Phillipot to finance the building of a town hall and shambles, and the acquisition of land to enlarge the churchyard. The Act was passed by Parliament with expediency and in July and August 1773 land and properties were advertised for sale in Cresswell's Nottinghan and Newark Journal. The first stone was eventually laid in the same year by the Mayor, Mr Thomas Haslam.

NEWARK TOWN HALL 1776-2024

Since 1776, Newark Town Hall has served as the seat of the Mayor and the centre of the town's civic administration. Recognised as one of Newark's key landmarks, the building was officially designated a Grade I listed building in 1950, highlighting its historical and architectural importance.

The original building was designed as "two houses, shops and market house under the assembly rooms". The original design featured a civic building flanked by two townhouses, seamlessly integrated through a rusticated ground floor and a continuous entablature at the top. Each townhouse, with its finest room on the first floor overlooking the Market Place, includes its own entrance, staircase, and cellar, along with two or three rooms per floor and a rear yard.

However, due to issues in securing all the land which was required for John Carr's vision, the two flanking townhouses were built at different times. The house on the right appears to have been constructed around the same period as the central section being seen in Edward Eyre's sketch of 1789.While the house on the left, the most recent addition, was likely completed by 1789, although the exact dates remain uncertain.

The date when the houses were incorporated into the main civic building is also uncertain, though it is estimated to have occurred sometime between 1829 and 1879. Several openings now connect the three buildings, but the timing of each alteration remains unclear. Cornelius Brown writing in his publication '*The Annals of Newark*' (1879) sets out that "Fronting the market-place is a commodious room known as the council-chamber..[...]. Adjoining the chamber are two smaller rooms, used either as retiring rooms or for committee meetings". On the ground floor, the openings are located in the central niches of the entrance lobby, while on the first floor, in the Council Chamber, the openings appear to have been made by modifying the spaces where fireplaces once stood at each end of the council chamber.

Over the years, other alterations have been made to the building. A significant change was the establishment of the Borough Police Station in the right-hand townhouse in the C19. It seems that only part of the structure was repurposed for the station, with the first-floor rooms remaining part of the civic suite. Additional buildings were constructed at the rear, including a town gaol, which is still visible today. Other parts of the building were also utilised for law enforcement, with the Council Chamber serving as the venue for the Borough Petty Sessions and the Ballroom hosting the Quarter Sessions Courts. While the exact dates of the police station's operation are uncertain, it is evident from historic maps of 1883 and photographs from 1955 that it was present in some capacity during those periods.

In 1982, The Town Council acquired the freehold of the property by purchasing it from the District Council. The building needed extensive repairs, which were addressed through a public-private partnership formed in 1988.

Lovell Enterprise (Newark) Ltd acquired the unlisted Victorian Market Hall and leased the ground floor of the Town Hall to establish a new retail complex. The developer managed both the conversion of the Market Hall and part of the renovations of the Town Hall. The project was carried out by Lovell Enterprise (Newark) Ltd in collaboration with their architect, James Brotherhood and Associates, following the Town Council's recommendations, with Guy Taylor Associates providing consultancy services.

In 1989, Guy Taylor Associates were appointed as architects to oversee the Council's refurbishment of the Civic Suite and office accommodation within the Town Hall.

The project involved relocating the reception area, office accommodations, and staff facilities to the second floor, which required upgrading the structure of that level. It also included the restoration and refurbishment of the Civic Suite, including the ballroom, to a semblance of its Georgian splendour. Additionally, the project encompassed fitting out the shell of the new north wing and updating the building's services to contemporary standards, including heating, ventilation, lighting, power, security, fire protection, sanitation, and catering facilities, among other essential systems.

The Ballroom, last decorated in the early 1960s, was in need of significant repairs. The current heating system was inadequate, the decorative plasterwork was damaged, and the gold paint had tarnished.

Repairs and decoration to the room were undertaken using traditional materials and techniques. The Lincolnshire College of Art and Design (now The School of Applied Arts and Design, De Montfort University Lincoln) was invited to assist with the refurbishment of the Ballroom and Mayor's Parlour interiors. To accurately determine the original paint scheme, hundreds of minute paint samples were taken from surfaces and decorative elements. Although modern paint was used to restore the original colours, each shade was meticulously matched to those identified in the samples.

The aim was to restore the Ballroom as closely as possible to its original state. However, modern systems also needed to be integrated. A new ventilation and heating system was installed, with discreet inlet and outlet grilles placed in three of the four corners of the room. Additionally, variable lighting, power outlets, a sound system, blackout facilities, and other modern amenities were added to enhance the space while maintaining its historic character.

The remaining rooms on the first floor, part of the Civic Suite, also underwent refurbishment with the aim of restoring their Georgian-era appearance. As in the Ballroom, paint samples were meticulously collected from the Council Chamber, Mayor's Parlour, and Picken's Room to recreate the original colour schemes.

One of the rooms that saw the most significant transformation was the current bar. Previously used as a kitchen, the room had lost most of its original features. During the refurbishment, it was converted into a bar, with a focus on recreating the lost details such as the Venetian window and fireplace, alongside the installation of new bar fittings.

On the second floor, the previously unused space was refurbished to accommodate new offices, staff areas, and an exhibition space. Timber details, such as doors, skirting boards, and architraves, were replicated from the remaining original features on the floor. The work also included upgrading the floor structure in both the exhibition space and the adjacent suite of offices.

In the recently rebuilt north wing, featuring concrete floor slabs and stairs, all new services were strategically installed to minimize the impact on the original structure. This wing now houses public male and female restrooms, a disabled WC, a cloakroom, and a kitchen with catering facilities capable of serving banquets for over 200 guests. Access to the ballroom is provided via a glazed link.

As a result of this restoration, the project received a Europa Nostra Diploma of Merit in 1993.

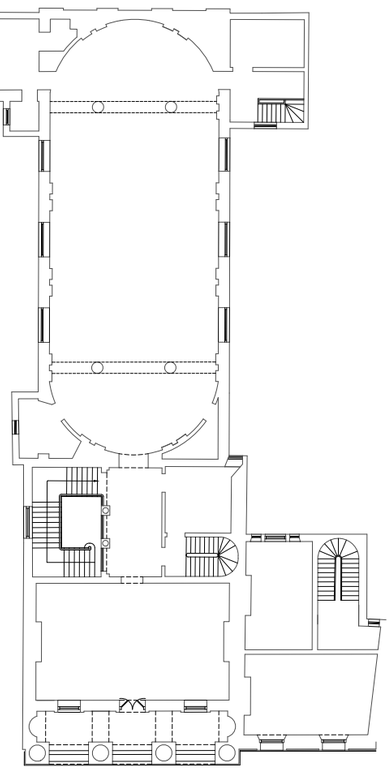
In 1999, Newark Town Council established a museum within the building, providing access to the public. Alongside the exhibit rooms on the first floor, visitors can explore the Fine Art Gallery, the Spotlight Gallery, and a Civic Gallery on the second floor.

In 2017, historic building consultants Powell Williams undertook a comprehensive exterior restoration of the building. This project involved repairs to the masonry, roofs, and windows on the elevations overlooking the Market Place, as well as general maintenance to ensure the building's long-term protection.

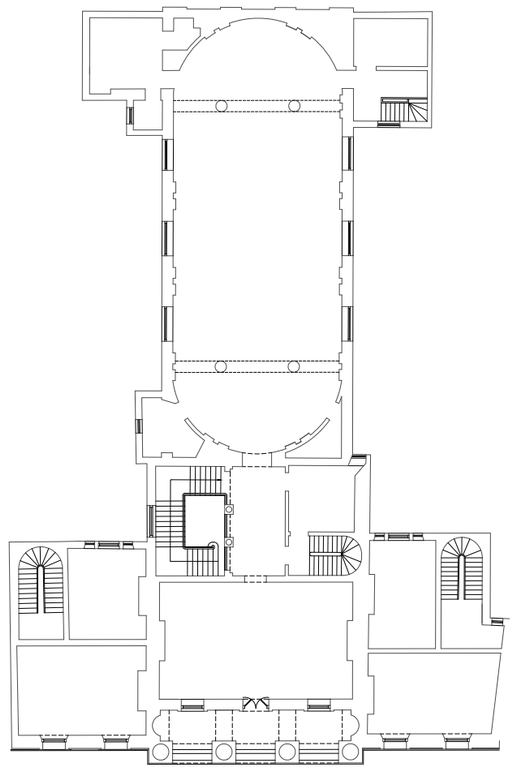
Nowadays, Newark Town Hall continues to serve as the official seat of the Mayor and houses the related offices. The building is open to the public, offering access to the Civic Suite and the exhibition area on the second floor. The Civic Suite can also be hired for a range of events, from small meetings to weddings.

4.3 Plan Evolution: Chronology

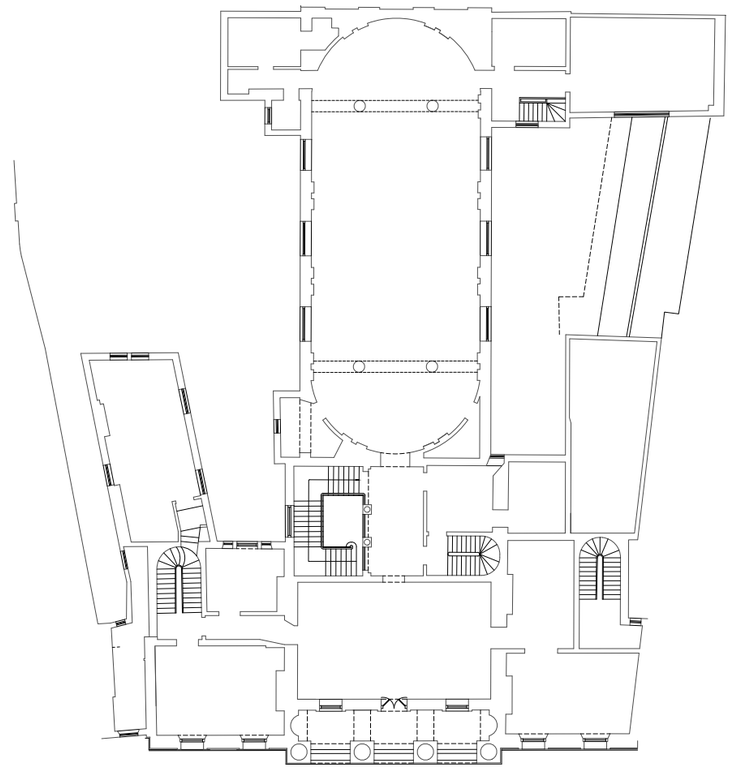
C1776



C1800



C1850



4.4 Adaptation Suitability Assessment

4.4.1 Potential for Change or Adaptation within the Building

This section will refer to the potential for change or adaptation within a building defined on the premise of avoidance of impact on significance identified in the report and the physical opportunity presented.

Adaptability will be graded on a 'traffic light principle' of red, amber, yellow, green:

Red
Original room of primary quality with little or no scope for change.

Amber
Substantially original room with some adaptations and scope for betterment.

Yellow
Secondary room with adaptations, scope for betterment and possible further adaptation to secure new use.

Green
Tertiary room with adaptations and with scope for further adaptations.

4.4.2 Potential for Conversion

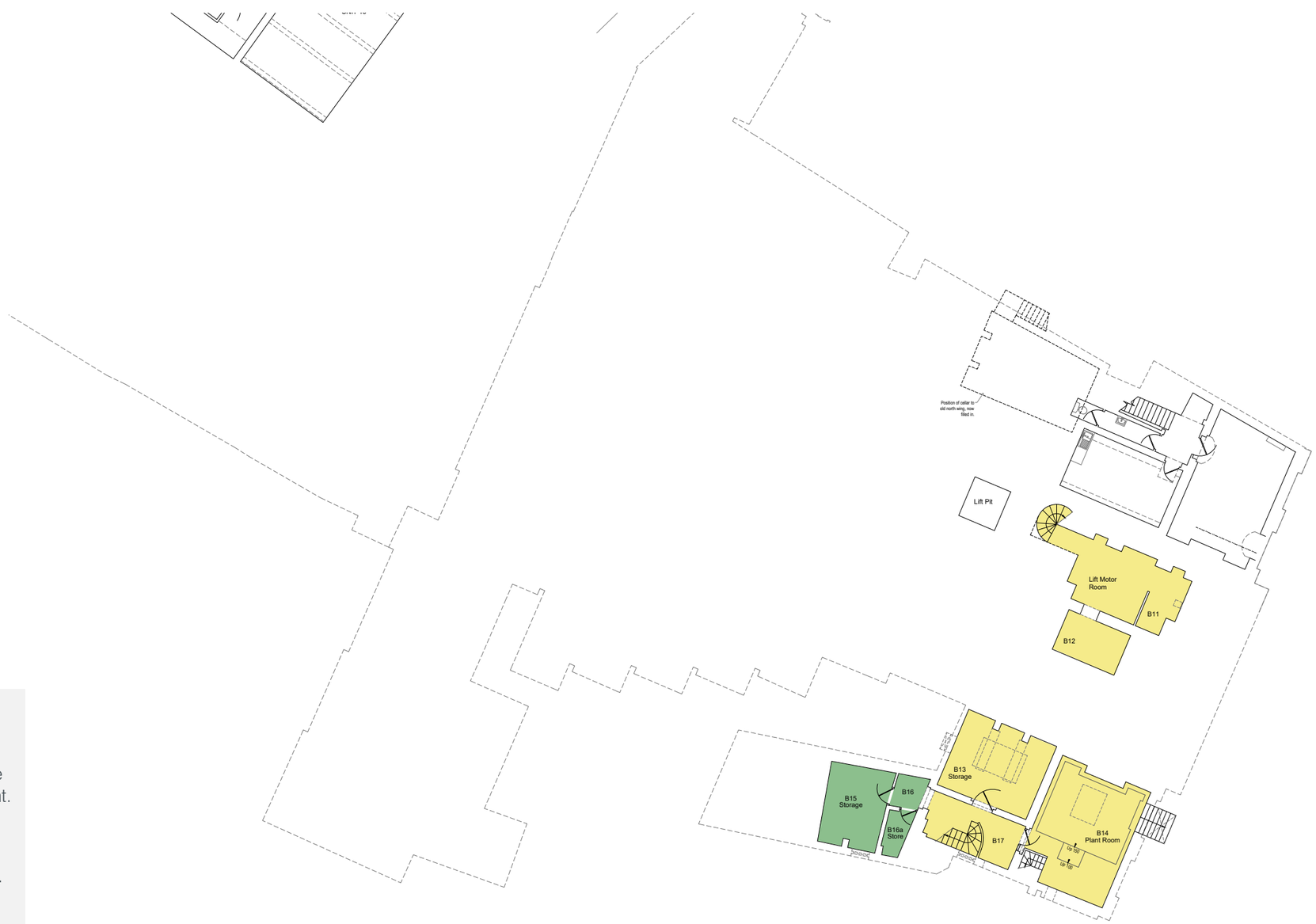
The default philosophy of conservation is that where existing fabric remains then ideally it should remain and be restored or repaired depending on its significance. Where fabric has been lost or is absent then replacement should be appropriate to use and form, not necessarily a copy but of 'good' design. Each element should be subject to a detailed feasibility to show the best fit of any new use and the maximum retention of existing fabric, such retention should ideally not be to the detriment of the proposed use in terms of practicality or compliance with current standards.

4.4.3 Conservation Policies

The conservation policies are an attempt to address the key defining issues and establish criteria for addressing the consolidation of the site and buildings. The following bullet point policies, whilst not binding, constitute a series of observations which should affect the approach to repair, retention, demolition or mitigation of impact upon the identified heritage significance of the site; any variation from these policies in a scheme of proposed development should be supported by appropriate statements of justification.

- The primary conservation concern is to retain the principal listed buildings in a form where the development of the site is conserved and their setting enhanced.
- To retain as much as practicable of the existing fabric without compromising future use.
- To recognise a preference for revealing the character of the site rather than simply retaining all fabric on the site.
- Where fabric is lost to replace it with appropriately designed new work.
- New development should have a contextual relevance to the site and the setting of the existing fabric, such that it can be seen as a good 'fit' rather than simply contemporary. It should have regard for mass and scale of existing buildings.
- Sustainability should be a key driver in the design of new development taking into account of new technologies, exploitation of thermal mass, low carbon footprints and low embodied energy.

BASEMENT PLAN



Original room of primary quality with little or no scope for change.

Substantially original room with some adaptations and scope for betterment.

Secondary room with adaptations, scope for betterment and possible further adaptation to secure new use.

Tertiary room with adaptations and with scope for further adaptations.

GROUND FLOOR PLAN

Original room of primary quality with little or no scope for change.

Substantially original room with some adaptations and scope for betterment.

Secondary room with adaptations, scope for betterment and possible further adaptation to secure new use.

Tertiary room with adaptations and with scope for further adaptations.

FIRST FLOOR PLAN

- Original room of primary quality with little or no scope for change.
- Substantially original room with some adaptations and scope for betterment.
- Secondary room with adaptations, scope for betterment and possible further adaptation to secure new use.
- Tertiary room with adaptations and with scope for further adaptations.

SECOND FLOOR PLAN

Original room of primary quality with little or no scope for change.

Substantially original room with some adaptations and scope for betterment.

Secondary room with adaptations, scope for betterment and possible further adaptation to secure new use.

Tertiary room with adaptations and with scope for further adaptations.

Basement Rooms

	First Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	B11 + B12	The basement area features exposed brick walls and floor. The room generally retains its original configuration and features; however, a lift motor room, along with other mechanical and electrical conduits and cables, has been installed in the space.	Key Features: Room proportions and finishes. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	B13 | Storage	The area has exposed brick walls and flooring and generally retains its original configuration and features. A door was added during the town hall's refurbishment at the end of the 20th century.	Key Features: Room proportions and finishes. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	B14 | Plant Room	The area features exposed brick walls and flooring and largely retains its original configuration and features. A door was added during the town hall's refurbishment at the end of the 20th century. Additionally, several mechanical and electrical services have been installed.	Key Features: Room proportions and finishes. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	B17	The area has exposed brick walls and flooring, new doors have been added during the town hall's refurbishment at the end of the 20th century.	Key Features: Room proportions and finishes. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions
	B15 | Storage B16 | Lobby B16a | Store	The original room has been altered, with presumed plasterboard linings added to the walls and ceiling, and new partitions created to form two separate rooms. These changes were made during the town hall's refurbishment at the end of the 20th century.	Key Features: - Opportunity: The room has no ortignal features, which allows for adaptation or interventions.

Ground Floor

	First Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	G24 | Butter Market	The room preserves its original architectural proportions and several key features, including a stone floor, tuscan columns along the aisles and round-arched side openings. The walls have exposed brick and the ceiling is coffered plasteredn.	Key Features: Walls, floor, columns, ceiling and openings. Opportunity: Being one of the building's main rooms, it should undergo minimal intervention.
	G26 | Entrance Lobby	The room retains its original proportions and features, including engaged stone columns of tuscan order and round-arched openings with niches. The floor is made of stone, complemented by a stone skirting board, while the ceiling is plastered. A modern, power-assisted glazed door provides access to the interior, while three doorways, each fitted with wrought iron grilles and gates, connect to the exterior.	Key Features: Walls, floor, pilasters, ceiling and openings. Opportunity: Being one of the building's main rooms, it should undergo minimal intervention.
	G25 | Staircase	This area retains its original proportions, though some alterations were made when the building was refurbished in the 1980s. The stone staircase, featuring a metal balustrade and timber handrail, dates from that period. Additionally, new glazing and round-arched automatic doors were installed.	Key Features: Wall and ceiling features, staircase. Opportunity: Being one of the building's main rooms, it should undergo minimal intervention.
	G25b | Access to Council Offices	The room retains its original proportions, featuring a groin-vaulted ceiling, stone flooring, and plastered walls adorned with skirting boards and cornices. Three of the arched openings are fitted with modern glazing, while the one leading to the butter market is made of timber and glass. The doors to the lift and staircase are timber-paneled.	Key Features: Walls, floor, ceiling and timber doors Opportunity: Being one of the building's main rooms, it should undergo minimal intervention.
	G25c | Staircase	Oval stairwell featuring dogleg stairs with winders and timber balustrades, complemented by a painted timber handrail. The walls are plastered, with painted timber skirting boards, and the floor is carpeted.	Key Features: Room proportions, staircase and its features. Opportunity: -
	G27a + G27b	The room has been modified to provide access to the first floor and an adjacent, independent room. The walls feature a combination of timber panelling and plaster, with detailed mouldings, including a skirting board, cornice, and dado rail in select areas. The staircases are fitted with timber balustrades and handrails. The room features a timber sash window from the original construction. All doors are panelled, with some incorporating glazing details that continue the design of the glazing on the timber panelling. The room has a stone floor and a plastered ceiling.	Key Features: Window and the wall and its features, part of the original structure, Opportunity: The room maintains some of its original features but allows for some adaptations.
	Unit 15	Former goal, dating from the mid-19th century, features brick walls and is a single-storey structure. It includes three high windows with bars and four timber prison doors, one of which is blocked, all topped with segmental arches. A new glazed roof has been added to the space between the goal and the butter market, though the original bars that once enclosed the top of the goal's exterior area are still visible. The remaining walls feature exposed brick, including the external wall of the former butter market. The floor is finished with timber planks.	Key Features: Structure and features of the former goal. Butter Market wall. Opportunity: The room maintains some of its original features but allows for some adaptations.
	G18 | Unit 14	Not surveyed.	
	G18a	Not surveyed.	

	First Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	G22a, G22b | Unit 16	Not surveyed.	
	G27 | Unit 17	Not surveyed.	
	G28 | Shop G29 | Market Manager	Not surveyed.	
	G30 | Retail Space	Not surveyed.	
	G32 | Unit 19	Not surveyed.	
	G22		
	G25a + G25d | Lift Lobby and Store	The space has been adapted to accommodate a lift. It features plain plastered walls with timber skirting boards, a plain plaster ceiling, and a carpeted floor.	Key Features: Doors and skirting board. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	G27c	This narrow room is part of a building that has been largely demolished, with the remaining section now attached to Newark Town Hall. The room has plain plaster walls with timber painted plain skirting boards. Timber frame sash windows and timber plain and panelled doors. Floor with carpet finish and plain ceiling.	Key Features: The room is notable because it is a remnant of a building that was truncated, resulting in a very narrow, distinctive structure that adds a unique character to the area. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	G29a | Store	The small storeroom, an extension to the original building, is in poor condition, with damage to sections of both the walls and ceiling.	Key Features: - Opportunity: The room has no original features, which allows for adaptation or interventions.

	First Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	Rent & Rates	Not surveyed.	
	Sub Station	Not surveyed.	
	G31 | Unit 18	Not surveyed.	

First Floor

	First Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	F23 | Picken's Room	The room preserves its original architectural proportions and several original features. The plastered walls are adorned with moulded picture rails, dado rails, and skirting boards, while the plastered ceiling is highlighted by a moulded cornice. The windows are timber-framed sash, with timber reveals and internal timber shutters. The access is made through a double timber panelled door with arched transom. The room has an ornamented fireplace with marble and timber surrounds. Floor features carpet finish.	Key Features: Wall and ceiling features, windows, doors and fireplace. Opportunity: Being one of the building's main rooms, with its original features preserved, it should undergo minimal intervention.
	F25 | Council Chamber	The room preserves its original architectural proportions and several original features. The walls are plastered and have moulded picture rails, dado rails, and skirting boards. The ceiling is adorned with an ornamented cornice, decorative frieze, and ceiling bosses. The windows are timber-framed sash with timber reveals and internal panelled shutters. The architraves are ornamented with cornices. Middle window has openable timber lower section, so it can be opened to access the balcony. The doors are panelled with detailed architrave and cornice with tryglyph frieze. Floor features carpet finish.	Key Features: Wall and ceiling features, windows and doors. Opportunity: Being one of the building's main rooms, with its original features preserved, it should undergo minimal intervention.
	F26 | Lobby F27 | Staircase	This area maintains its original proportions. The plastered walls have moulded skirting board and at the top there is a cornice. The doors are timber panelled with cornice above it. Over the staircase there is an arched timber sash window, and there are two doric columns on the landing. The stone staircase with metal balustrade and timber handrail was rebuilt during the refurbishment works of 1989-91.	Key Features: Wall and ceiling features, staircase, columns, window and doors. Opportunity: Being one of the building's main rooms, with its original features preserved, it should undergo minimal intervention.
	F28 | Ballroom	The ballroom has paired pilasters and domed apsidal ends, framed by pairs of grand Corinthian columns. The ceiling, coved and compartmented, was crafted by Kilminster of Derby. The floor is made of maple strip flooring. On each side wall, there is a central, marble fireplace. The front features four doors within intricately decorated surrounds, while the rear elevation is marked by two doors. The space is richly decorated, with seven arched windows providing natural light.	Key Features: Wall and ceiling features, columns, windows and doors. Opportunity: Being one of the building's main rooms, with its original features preserved, it should undergo minimal intervention.
	F31 | Mayor's Parlour	The room preserves its original architectural proportions and several original features. The plastered walls are adorned with moulded picture rails, dado rails, and skirting boards, while the plastered ceiling is highlighted by a moulded cornice. The windows are timber-framed sash, with timber reveals and internal timber shutters. The access is made through a panelled door. The room has an ornamented fireplace with marble surrounds. Floor features carpet finish.	Key Features: Wall and ceiling features, windows, door and fireplace. Opportunity: Being one of the building's main rooms, with its original features preserved, it should undergo minimal intervention.
	F22 | Bar	The room has seen several alterations over time. Initially, it was converted into a kitchen, likely when the original wall was opened and its proportions changed. During the refurbishment of 1989-1991, the room was transformed into a bar, with some lost details such as the Venetian window and fireplace recreated. New bar shutters were added to enclose the bar when not in use. The plastered walls are embellished with molded dado rails and skirting boards. The ceiling features a molded cornice, and the floor is covered with carpet.	Key Features: Wall and ceiling features, doors, window and fireplace. Opportunity: The room retains several original features and is located in the main area of the building, only allowing for careful adaptation or intervention.

	First Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	F30 | Office F30b | Corridor	The original proportions have been altered, as the room has been divided into a corridor and a room, now used as office. The walls are plastered, adorned with moulded dado rails and skirting boards. In F30 there's also a moulded picture rail on the walls and a venetian window. In both room the ceiling features a cornice and floor has carpet finish.	Key Features: Wall and ceiling features, window. Opportunity: The room maintains some of its original features but allows for some adaptations.
	F30a + F26b | Staircase	Oval stairwells with dogleg stairs incorporating winders and timber balustrades. F30a features a mahogany handrail, while F26b has a timber painted handrail. Both have plaster walls with painted timber skirting boards and carpet on the floor.	Key Features: Room proportions, staircase and its features. Opportunity: -
	F32 | Committee Room	The room is a later addition to the building, not part of the original John Carr design. An archway in the centre suggests that it was originally two separate rooms that have since been combined. The walls are plastered and feature moulded skirting boards. The room includes large timber sash windows with timber reveals, a plain plaster ceiling with a decorative cornice, a fireplace with timber surrounds, and a carpeted floor.	Key Features: Wall and ceiling features, windows, fireplace. Opportunity: The room maintains some of its original features but allows for some adaptations.
	F18 | Store	The space has painted brick walls, a timber casement window and a timber roof with exposed timber trusses. Part of the room is occupied by the ventilation equipment for the ballroom.	Key Features: Timber roof, window. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F20 | Stairs	The room has plain plaster walls with timber skirting board, complemented by a plain plaster ceiling. The window is timber-framed sash with moulded architrave and doors are panelled, one of which leads to the ballroom. The staircase features a timber balustrade and carpeted floor finish.	Key Features: Doors and window. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F22a | Bar	Originally part of the building, the room has been converted into a bar. The walls and ceiling are plastered with no added details. The floor and skirting boards are covered with vinyl, and the original windows have been repurposed into the bar's back wall.	Key Features: Windows. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F26a | Lift	The space has been adapted to accommodate a lift. It features plain plastered walls with timber skirting boards, a plain plaster ceiling, and a carpeted floor. The panelled doors are framed with moulded architraves.	Key Features: Doors and skirting board. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F28a | Store	The room has been modified, and a new opening was created to connect to a later-added extension where the kitchen is located. A panelled door links the room to the ballroom, while the remaining doors are modern additions. The walls are a combination of plain plaster and painted brick, and the floor is finished with vinyl.	Key Features: Door to the ballroom. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F29 | Store Plant		

	First Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	F33 | WC	This narrow room is part of a building that has been largely demolished, with the remaining section now adjoined to Newark Town Hall. It features plain plaster walls with timber skirting boards and a tiled splash back above the sink and toilet. The window is timber sash, and the floor is finished with vinyl.	Key Features: The room is notable because it is a remnant of a building that was truncated, resulting in a very narrow, distinctive structure that adds a unique character to the area. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F33a | Store	The room is part of the original building but has undergone several alterations. The plastered walls are finished with a dado rail and skirting board, while the ceiling is a modern addition. The floor is carpeted. An original timber panelled door connects the room to the storage area at the rear of the ballroom.	Key Features: Original wall features and door. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F35	This narrow room is part of a building that has been largely demolished, with the remaining section now adjoined to Newark Town Hall. The room is currently used as Robin Room, where Mayors put on their robes and chain for civic functions and visits. The room features walls covered in modern wallpaper, timber skirting boards, and a timber sash window. The floor is finished with carpeting.	Key Features: The room is notable because it is a remnant of a building that was truncated, resulting in a very narrow, distinctive structure that adds a unique character to the area. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	M2 | Ladies WCs	The WCs were installed in the late C20. The room features plain painted walls and ceiling, with timber counters and WC partitions. The flooring is finished with a combination of carpet and tiles.	Key Features: - Opportunity: The room has no original features, which allows for adaptation or interventions.
	F19 | Store	The original room has been modified and is now used as a plant room. The walls and ceiling are plastered, with the ceiling featuring a cornice.	Key Features: Original walls and cornice, which are part of the building's historic structure. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F21 | Kitchen	The room is part of an extension added to the original town hall building. It is currently used as a kitchen, with tiled walls, a plain ceiling, and a vinyl floor. The room features three timber sash windows, each fitted with a fly net.	Key Features: Windows. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.

	First Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	F21a | Lobby F21b | Cloaks	The room is part of an extension added to the original town hall building. The walls are a mix of plasterboard lining, plaster, and an exposed brick wall, which was the external wall of the original town hall building. The space features timber skirting boards, a plain ceiling, and a carpeted floor. The staircase has a timber balustrade, and the doors are paneled. A Venetian window/door connects to the bar in the original building.	Key Features: Exposed brick and plastered wall, which are part of the building's historic structure. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F21c | Disabled WC	The room is part of an extension added to the original town hall building. The room features walls with plaster and plasterboard lining, complemented by timber skirting boards. It has a plain ceiling, a vinyl floor, and a timber sash window.	Key Features: Window. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F21d | Storage	The space is currently used as a wine storage area, located between the external wall of the ballroom and the late 20th-century addition. A glazed roof was added to enclose the room, which features painted brick walls and a vinyl floor.	Key Features: Exposed brick wall, which are part of the building's historic structure. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F23c | Cloaks	The room, part of an extension built against the external walls of the ballroom, serves as a WC. It features plain plastered walls with timber skirting boards, a plain ceiling, and a timber sash window.	Key Features: The wall, part of the original structure, is to be conserved and maintained in good condition. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F33b	A portion of the room belongs to the original town hall building and features a paneled door that connects to the ballroom. It has plain plastered walls with timber skirting boards, a carpeted floor, and a modern timber staircase.	Key Features: Original wall features and door. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	F34 | Council Store	The storage room is part of a modern extension to the building. It features plain plaster walls and ceiling, along with timber-fixed windows.	Key Features: - Opportunity: The room has no original features, which allows for adaptation or interventions.

Second Floor

	Second Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	S10 | Meeting Area/General Display	The room, now housing the Newark Town Hall Museum & Art Gallery, preserves its original architectural proportions. The room has timber frame sash windows, featuring plain plaster reveals with moulded framing to the reveal. Plaster walls with picture rail and timber painted skirting board. Timber panelled doors with moulded architrave. Suspended timber floor with carpet finish. Plain ceiling, no mouldings.	Key Features: Room proportions, picture rail, window and doors. (all?) Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	S14 | Reception	Used as the reception area for the Museum & Art Gallery, the original proportions of the room are still discernible, although it has been extended to include adjacent space. A half-height modern partition divides the existing space. The room has high plain plastered ceilings, painted plaster walls with timber painted skirting board. Timber frame sash window, timber panelled door with moulded architrave and modern laminated floor finish. Fireplace with plain painted stone surround. Wall niches on either side of the fireplace, with one niche having been enclosed and repurposed as a cupboard.	Key Features: Room proportions, fireplace window and doors. (all?) Opportunity: Remove half-height modern partition. Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	S8b + S12a | Staircases	Oval stairwells with dogleg stairs incorporating winders and timber balustrades. S12 features a mahogany handrail, while S8b has a timber painted handrail. Both have plaster walls with painted timber skirting boards and carpet on the floor.	Key Features: Room proportions, staircase and its features. Opportunity: -
	S12	The room is part of the Museum & Art Gallery. It maintains its original proportions and its timber framed archway window. The walls are plastered, with painted timber skirting boards and there is a timber panelled door with moulded architrave. A new opening was created to connect to S14. The ceiling is high and plain and the floor is finished with modern laminate.	Key Features: Room proportions, window, door. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	S6 | Town Clerk S6a | | Town Clerk's sec	The original proportions have been altered, as the room has been divided into two offices. The existing rooms feature plain plaster walls with timber painted skirting board. Timber frame sash windows, featuring plain plaster reveals with moulded framing to the reveal. Timber panelled doors with moulded architrave. Fireplace breast, but there is no fireplace. Suspended timber floor with carpet finish. Plain ceiling, no mouldings.	Key Features: Windows; skirting boards. Opportunity: Reinstate original proportions and fireplace. Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	S5 | Office S7 | Secure Store S7a | Print Room	The original room has undergone several adaptations, resulting in the loss of its original proportions. The room has plain plaster walls with timber painted skirting boards. Timber frame sash windows, with timber reveal and cill, now fitted with modern fly screens. An arched timber door with sidelights, possibly adapted from an original window, serves as an entryway. Fireplace breast, but there is no fireplace. Floor with carpet finish. Plain ceiling features two skylights.	Key Features: Windows; skirting boards, archway door. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.

	Second Floor Rooms	Current	Conserving / reinstatement to original - Opportunities
	S11 | Office S11a | Corridor S13 | Office	The original proportions have been altered, as the room has been divided into two offices, a corridor, and a storage area. The rooms have plain plaster walls with timber painted skirting boards. Timber frame sash windows, featuring plain plaster reveals with moulded framing to the reveal. Timber panelled doors with moulded architrave. S11 has a fireplace with plain painted stone surround and a cupboard that houses the mechanism for the light fixture in the floor below. Suspended timber floor with carpet finish. Plain plaster ceiling, except in S13, which features suspended ceiling tiles.	Key Features: Windows, skirting boards, archway door. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	S14a | Store	This narrow room is part of a building that has been largely demolished, with the remaining section now attached to Newark Town Hall. The room has plain plaster walls with timber painted plain skirting boards. Timber frame sash windows and timber panelled doors. Floor with carpet finish and plain ceiling.	Key Features: The room is notable because it is a remnant of a building that was truncated, resulting in a very narrow, distinctive structure that adds a unique character to the area. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	S1 | Office	The room is part of an extension added to the original town hall building, constructed at a late C20. The space has low vaulted ceiling and plain plaster walls with timber painted skirting board. Timber frame sash windows, featuring plain plaster reveals. Timber panelled door with moulded architrave and floor with carpet finish.	Key Features: Windows, skirting boards. Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	S8 | Lobby	The room is part of an extension added to the original town hall building, constructed at a late C20. The room has plain plaster and exposed brick walls. There is an arched timber door with sidelights, possibly adapted from an original window, which connects with room S7a. There are timber panelled doors with moulded architraves, floor with carpet finish and a plain ceiling with two skylights. .	Key Features: Arched timber door, exposed brick wall (part of the original Town Hall building). Opportunity: Generally, the room has relatively fewer features which potential allows for adaptation or interventions.
	S2 | Female Wc S3 | Male WC S4 | Staff Kitchen	The room is part of an extension added to the original town hall building, constructed at a late C20. The rooms have plain plastered walls, with tiled surfaces above the kitchen counters and bathroom sinks. There are no windows, only a skylight in the kitchen. The floors and skirting boards are covered with vinyl flooring. Extractor fans have been installed in all rooms.	Key Features: - Opportunity: The room has no features, which allows for adaptation or interventions.
	M4 | Male WCs	The WCs were installed in the late C20. The room features plain painted walls and ceiling, with timber counters and WC partitions. The flooring is finished with a combination of carpet and tiles.	Key Features: - Opportunity: The room has no original features, which allows for adaptation or interventions.

5.0 Building Use and Occupations

5.1 Existing Occupancy: Introduction

5.1.1 Building use and patterns of occupation

Every heritage building is different, as are the needs and requirements of its occupants and users.

Alongside an understanding of the building's heritage significance, it is crucial to understand its occupation and patterns of use. The types of use, the amount of users and the frequency of use of the building as a whole as well as the individual rooms and spaces will dictate its comfort requirements, energy use and its carbon production. Only when this is fully understood can a scheme be developed to makes sure the needs are addressed sufficiently.

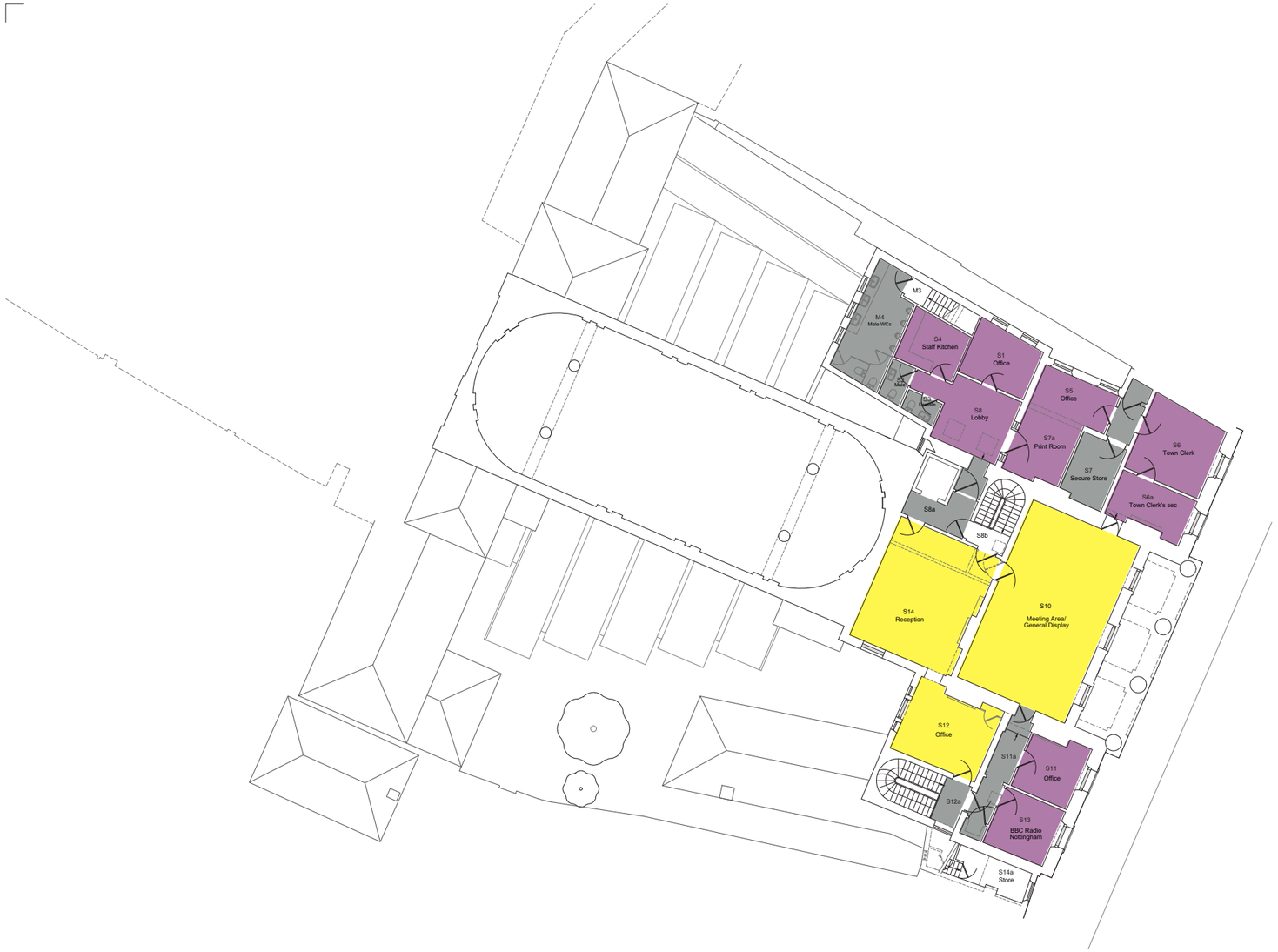
This section looks at the following in order to understand the current buildings use and users:

- Appraisal of existing occupancy, including the number of occupants and regular visitors; the hours of occupancy and business operations

- The types of occupants and their requirements and expectations for indoor environmental quality

- Any special considerations such as the presence of vulnerable persons or activities which require specific consideration

5.2 Types of Use



Second Floor

Colour key:

- OFFICES
- MUSEUM
- ANCILLARY

The second, top-most floor of the Town Hall is occupied largely by office spaces hosting the staff of the Town Council. These spaces are occupied with traditional office spaces (desks, computers, filing etc) along with support spaces such as printer rooms, server store, staff kitchen etc.

Alongside this the principle civic use at second floor is the Town Hall Museum which is characterised by larger spaces hosting a reception space and exhibition of artworks, sculpture and artefacts.

Aside from these there is ancillary, support spaces - largely to the rear of the north-most wing (added in the 1980's) which includes the toilets used by staff for the offices and accessed separately from first floor the toilets serving the civic spaces at first floor.

The floor is served by a central stair and lift core which exits in to the museum space one way and office space the other. A second stair to the south wing provides a secondary access to the office spaces to the south and serves as a secondary exit from the museum in case of emergency.

All spaces are occupied/used with the exception of the two office spaces to the south, although we understand this is temporary whilst a new museum curator is being recruited.

First Floor

Colour key:

- OFFICES
- COUNCIL CHAMBERS
- EVENTS & FUNCTIONS
- ANCILLARY

The first floor of the Town Hall hosts the principle chambers and committee rooms used by the Town Council. The main council chamber sits centrally within the east-most part of the plan, this is used for public Town Council meetings, public meetings, seminars and presentations and private functions and events. Either side of this is the Mayor's Chamber to the south and the Picken's Room to the north. These are both used for small scale meetings and discussions.

The main feature of the first floor is the large one-and-a-half storey ballroom to the west, this is used for presentations, events and functions; both public and private. In addition there are a number of spaces associated with the use of the ballroom and council spaces including the bar to the north, principle staircase to ground floor and the bridal room used when the ballroom plays host to weddings.

Again aside from these there is ancillary, support spaces - again these are largely to the rear of the north-most wing (added in the 1980's) and includes the commercial kitchen, toilets and to the rear of the ballroom storage spaces and plant rooms.

The floor is served by the same central stair and lift core which exits in to the main circulation space serving the council chambers and ballroom and the ancillary kitchen and toilet.

All spaces are used although the frequency and duration of use differs for the different spaces dependent upon their function.

Ground Floor

Colour key:

- OFFICES
- COMMERCIAL & RETAIL
- EVENTS & FUNCTIONS
- PUBLIC THOROUGHFARE
- ANCILLARY

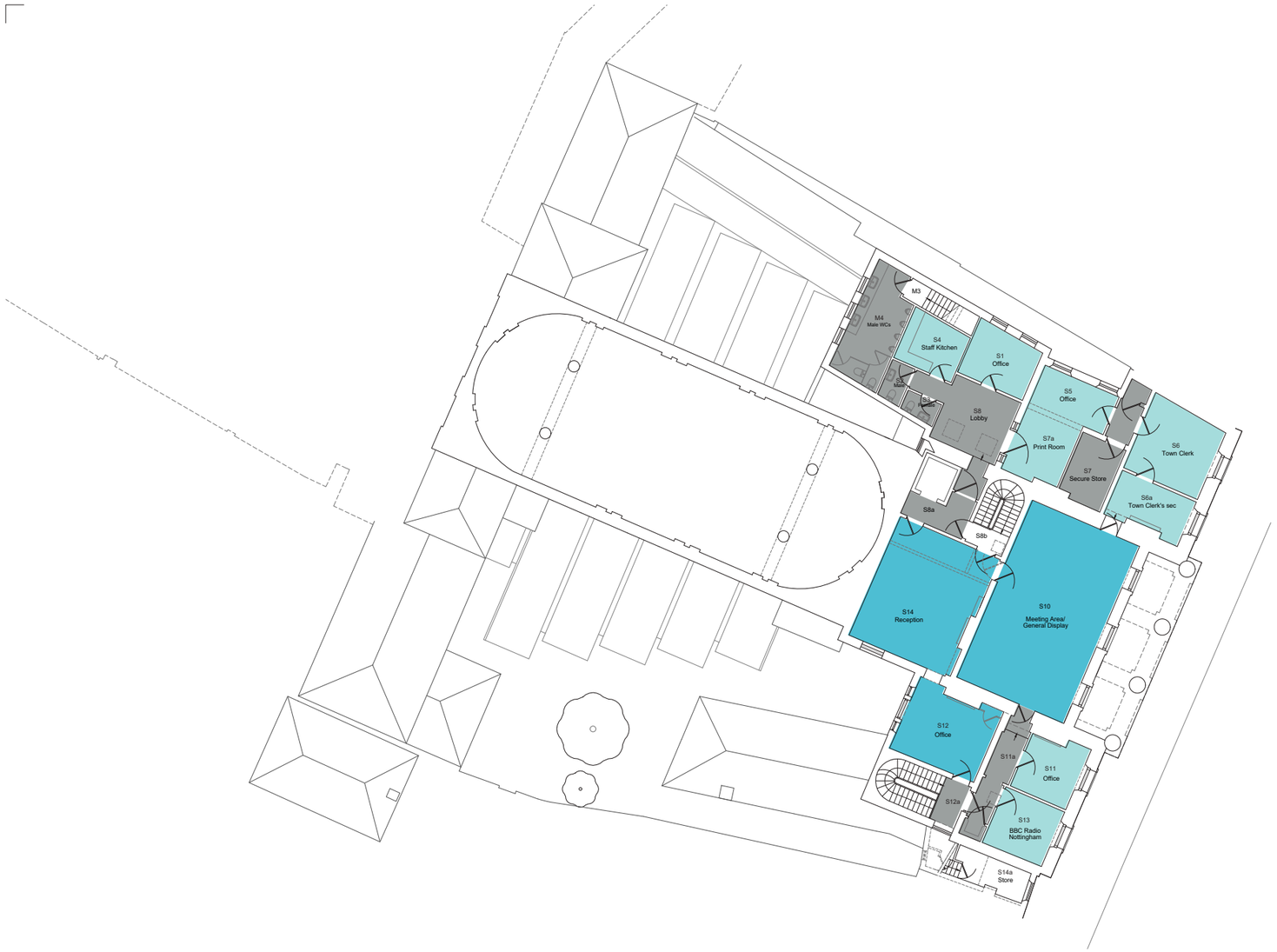
The ground floor of the Town Hall is defined by the colonnaded undercroft which acts as a public thoroughfare between the former covered market to the west and the market square to the east.

Alongside this, the ground floor of what was the north-most townhouse is occupied by a commercial retail unit currently occupied by a board game cafe. Behind this is the area which was formerly the town cells and adjacent yard, covered in the 80's and now a vacant commercial unit. To the south the former townhouse's ground floor is now a secondary access to the council chambers at first floor and plant spaces in the basement, with further spaces being recently used as office spaces for the town market.

The fully glazed extension added within the courtyard in the 980's is also vacant. A very small retail unit sits to the west of this.

Beyond this at the south-west most part of the building are the office spaces formerly occupied by the rents and rates department of the district council, we understand this space is now vacant.

5.3 Levels of Occupancy



Second Floor

Colour key:

- 1-4 people
- 5-14 people
- 15+ people
- No permanent occupants

First Floor

Colour key:

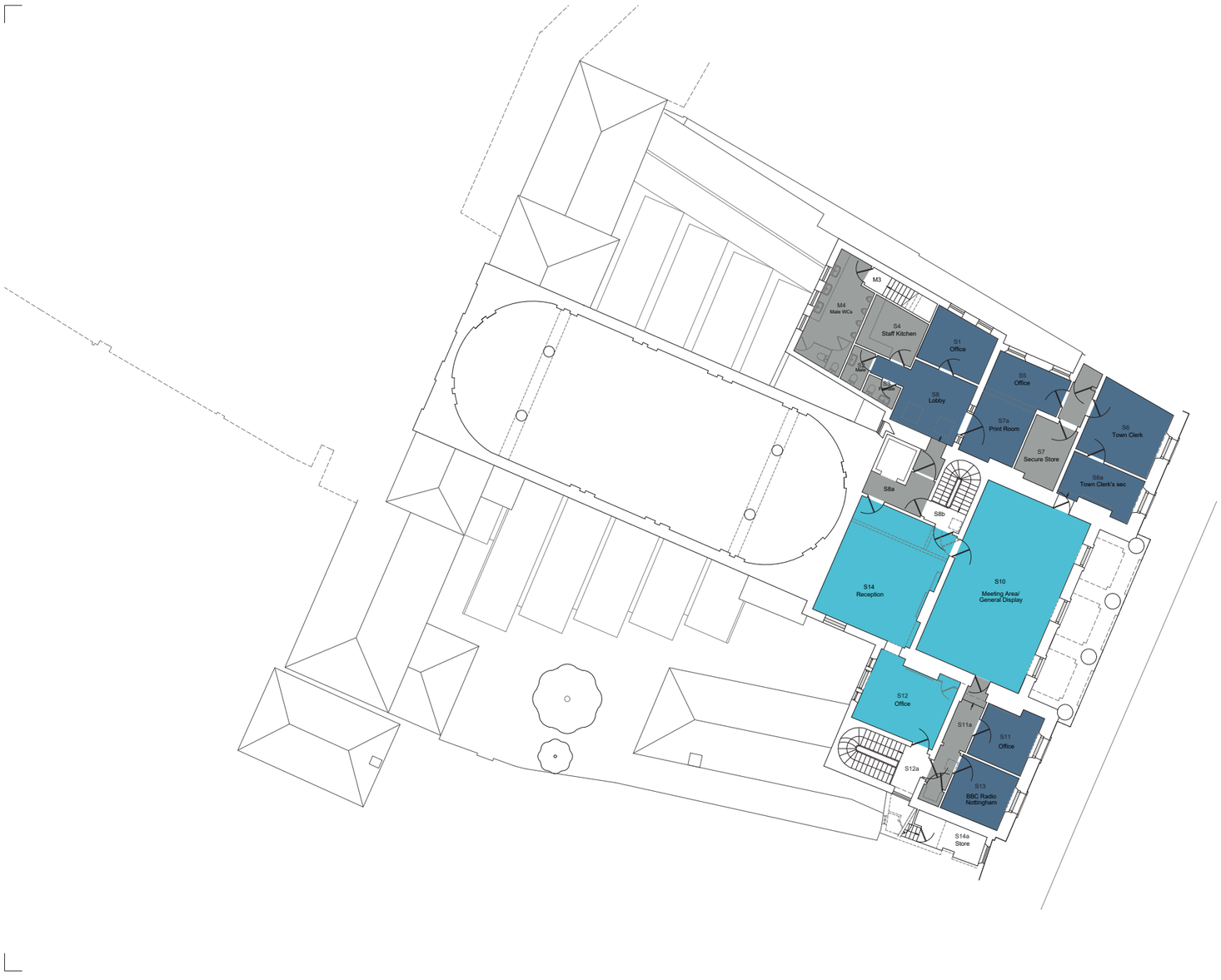
- 1-4 people
- 5-14 people
- 15+ people
- No permanent occupants

Ground Floor

Colour key:

- 1-4 people
- 5-14 people
- 15+ people
- No permanent occupants

5.4 Frequency of Occupancy



Second Floor

Colour key:

- Weekly or more
- Most days
- Every day
- No permanent occupants

First Floor

Colour key:

- Weekly or more
- Most days
- Every day
- No permanent occupants

Ground Floor

Colour key:

- Weekly or more
- Most days
- Every day
- No permanent occupants

5.5 Existing Occupancy: Summary

Newark Town Hall is a true, multi-use building. The uses are varied and each requires specific environments in order to support its use and users. The uses are summarised generally below, with the current user level and requirements set out:

OFFICE

Office use occurs on each of the above ground floors and in different parts of the building. Most of the office space associated with the operation of the Town Council is located on the second floor, towards the main frontage of the building. These offices are generally cellular and occupied by 1-2 persons on a daily basis. There is a single office on first floor occupied by the building management team, hosting 2 persons on a daily basis. Finally, at ground floor there are two areas of office spaces, the first towards the rear of the building is the former Rents & Rates offices which is now vacant and to the front within the south wing, office spaces used by the market.

Generally the office spaces are required to have good thermal comfort levels at all times. They must be evenly heated, well ventilated and have sufficient protection from overheating or adequate cooling. Generally as the spaces are used by few people but for long periods of time so heating can be steadier, lower running temperature but adjustable to suit individual preferences. Rooms should be well insulated to keep heat generated in but with good air-change rates to avoid stale air. Draughts must be excluded

MUSEUM

The museum spaces are located on the second floor only, towards the front of the building. The museum currently opens Wed-Fri 10.30am-1.00pm and Sat 10.30am-3.30pm. Due to the nature of the use it is possible that there are times when their are relatively few occupants and other times when their are higher numbers of users.

The spaces must be able to respond to these potential fluctuations but the comfort levels required for the users are far more moderate than for the office spaces. In addition it is not only the requirements of the users but the specific requirement of the items displayed. Some artefacts such as paintings will need reduced levels of humidity and an avoidance of direct sunlight. Generally ventilation and air changes should be good to avoid moisture and overheating.

COUNCIL CHAMBERS & CEREMONIAL SPACES

These rooms are exclusively located on the first floor towards the front part of the building. The spaces consist of committee rooms and council chambers including the Mayor's Parlour and Picken's Room which are large and have a relativity high number of users at any one time (up to 50 persons within the main council chamber), but a lower frequency of use (weekly/bi-weekly or greater).

Heating and venting levels must take into account this infrequency use and the high capacity of these rooms in order to provide adequate comfort for users.

EVENTS & FUNCTION SPACES

Again, exclusively located on the first floor, the spaces used for events and ceremonies include the Ballroom, bar space and the council chamber. These rooms are again used relatively infrequently (weekly) but by a very high number of users (up to 150 persons). Events include weddings, parties, conferences, presentations and conventions so a wide degree of uses and comfort requirements. All however need to take care to avoid both over and under heating. Heating and ventilation will need to react quickly to fluctuations as a result of either changes in capacity or activities, sometimes within the same event - think wedding were sit down meal could be followed by disco dancing.

RETAIL

At ground floor there are currenlty four retail units; one to th main frontage facing the market square occupied by a board game cafe, and three within the under-croft space including one in each of the glazed roof extensions added in he 1980's and a small unit at the front of the Rents & Rates office. The two units within the glazed extensions are vacant, whilst the other two units are occupied. As retail spaces the thermal comfort of these is less critical as people will be coming in and out of these. It is unknown whether these are on the same systems as the main Town Hall or whether each is served by its own.

6.0 Existing Building Services & Performance

6.1 Introduction

5.2.1 Understanding the Building and How it Performs

Every building performs differently depending on its location, orientation, design, construction, engineering services, and the way it is used, managed and maintained. All these factors influence energy use and the effectiveness of energy efficiency measures.

Most historic buildings are constructed differently from modern buildings in that they use traditional materials, have solid walls and are vapour permeable. It is essential any proposed works that affect the movement of moisture in a building, such as insulation, take full account of these differences.

This section looks at the assessment of the building's systems and how the building performs, with regards to thermal comfort, to ensure that interventions are compatible. Critical factors assessed include:

- Current Heating System(s)

- Current ventilation measures

- Performances of spaces in summer and winter

6.2 Existing Building Services: Heating

Second Floor

Colour key:

- Central Heating System - Radiators
- Blown Conduction System
- Electric Storage Heater
- No Heating

First Floor

Colour key:

- Central Heating System - Radiators
- Blown Conduction System
- Electric Storage Heater
- No Heating

Ballroom heated with radiators located around the room. In addition a ventilation and heating system provides heat and fresh air, and remove hot, stale, moisture laden air - this is currently not operational.

The Picken's Room heated by convector heater through ducts in the wall with bar store. A number of temporary electric space heaters were located within the room.

The bridal room has had an electric storage heater installed more recently.

The Mayor's Parlour heated by convector heater through ducts in the wall with Room F35. No other means of heating.

Ground Floor

Colour key:

- Central Heating System - Radiators
- Blown Conduction System
- Electric Storage Heater
- No Heating

Colonnade of the Buttermarket and front lobby are essentially external spaces and open to the outside most of the time. Large south glazing and glazed courtyard extension increases potential for heat gain but generally stays cool.

6.3 Existing Building Services: Ventilation

Second Floor

Colour key:

- Operable Windows
- No Ventilation
- Mechanical Extraction Ventilation
- Mechanical Ventilation System

First Floor

Colour key:

- Operable Windows
- No Ventilation
- Mechanical Extraction Ventilation
- Mechanical Ventilation System

Ballroom ventilation and heating system provides heat and fresh air, and remove hot, stale, moisture laden air - this is currently not operational. The system is now around 35 years old and is likely inefficient compared to modern mechanical ventilation and MVHR kit. Additionally windows can be opened to provide purge ventilation.

Ladies toilets, bar and kitchen all vented through mechanical extractors. The kitchen contains a number of industrial kitchen extract hoods to omit the stale air when cooking, it also benefits from openable windows.

Museum store benefits from four adjustable air vents within the wall leading to air bricks externally for ventilation. Windows cannot be opened due to presence of security bars.

Office space suffers from issues with overheating due to a number of factors including heat gain from window and lack of ventilation - specifically cross-ventilation. In addition this room does not benefit from curtains or blinds so afternoon sun cannot be controlled. The window is very large so solar heat gain is high.

Ground Floor

Colour key:

- Operable Windows
- No Ventilation
- Mechanical Extraction Ventilation
- Mechanical Ventilation System

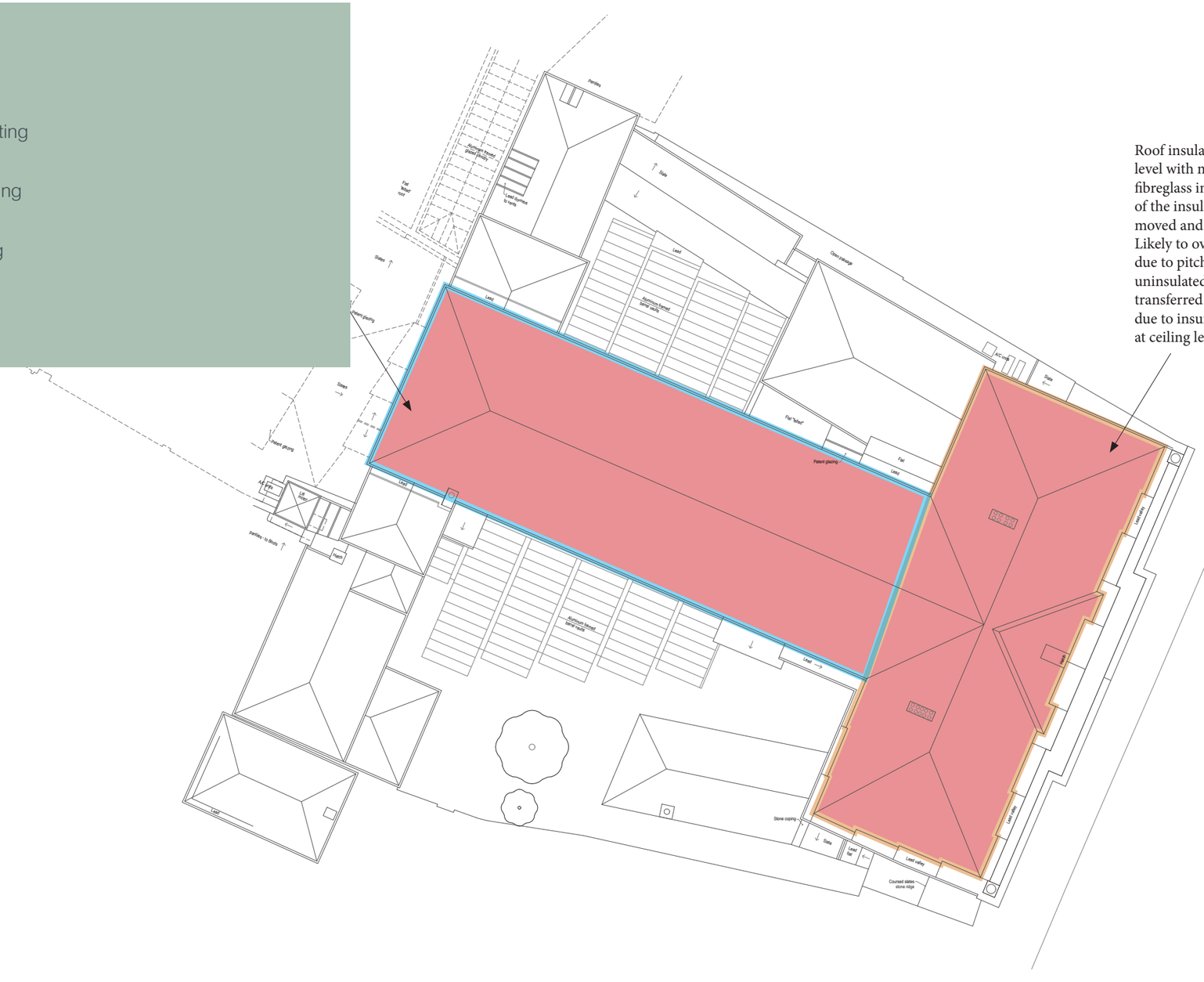
Colonnade of the Buttermarket and front lobby are essentially external spaces and open to the outside most of the time. Large south glazing and glazed courtyard extension increases potential for heat gain but generally stays cool.

6.4 Existing Building Performance: Summer

Roof

Colour key:

- Significant overheating
- Moderate overheating
- Limited overheating
- No overheating



Second Floor

Colour key:

- Significant Overheating
- Moderate overheating
- Limited overheating
- No overheating

Reduced level of overheating due to north facing orientation but still suffers from unwanted heat gain from adjacent rooms and above.

Store is currently used as a server room. Suffers from overheating due to heat produced by equipment as well as from adjacent rooms and above. No means of ventilation, cooling or extraction.

Rooms to the front suffer from overheating, this is likely to be due to a number of factors including heat gain from windows, lack of ventilation - specifically cross-ventilation, heat transmitted from the attic space and frequency, nature and time of use.

Rooms used by museum and gallery presents a series of issues related to overheating and sunlight penetration due to its orientation and window locations. This leads to overheating and potentially damaging conditions for the painting and artefacts. Windows fitted with blinds but overheating still an issue.

First Floor

Colour key:

- Significant Overheating
- Moderate overheating
- Limited overheating
- No overheating

Ballroom has very large windows on both the south and north elevations. The south facing windows introduce a lot of unwanted solar gain, this coupled with the fact that the ventilation system is old, likely inefficient and currently not working leads to issues with overheating. Windows have blinds but these are ineffective at reducing heat gain.

Kitchen generally stays cool apart from when in use due to the nature of the use. Industrial extract ventilation present.

Rooms to the front suffer from some overheating, this is likely to be due to a number of factors including heat gain from windows and lack of ventilation - specifically cross-ventilation. The Picken's Room and Mayor's Parlour benefit from both shutters and curtains to windows which can be closed to limit heat gain but using this also reduces ventilation capacity through openable windows. Maximum occupancy levels also contribute to heat gain.

Rooms to the rear of the ballroom including the museum store, the opposite store and the bridal room are generally unheated. The bridal room has had an electric storage heater installed more recently. The stores seem to function as required with no overheating and adequate levels of ventilation.

The Council Chamber suffer from some overheating, again this is likely to be due to heat gain from windows and lack of ventilation- specifically cross-ventilation during use. The room benefits from both shutters and curtains to windows which can be closed to limit heat gain but using this also reduces ventilation capacity through openable windows. Maximum occupancy levels of around 50 persons would also contribute significantly to heat gain.

Committee room benefits from windows with multiple orientations. North facing windows have secondary glazing, south and west facing windows have curtains. Generally room has an occupancy level of 18-20 persons. No issues with overheating reported although this is likely due to presence of both curtains to limit solar heat gain and north windows to allow light into room without overheating when curtains are closed on south and west windows.

Office space suffers from issues with overheating due to a number of factors including heat gain from window and lack of ventilation - specifically cross-ventilation. In addition this room does not benefit from curtains or blinds so afternoon sun cannot be controlled. The window is very large so solar heat gain is high.

Ground Floor

Colour key:

- Significant overheating
- Some overheating
- Moderate overheating
- Limited overheating

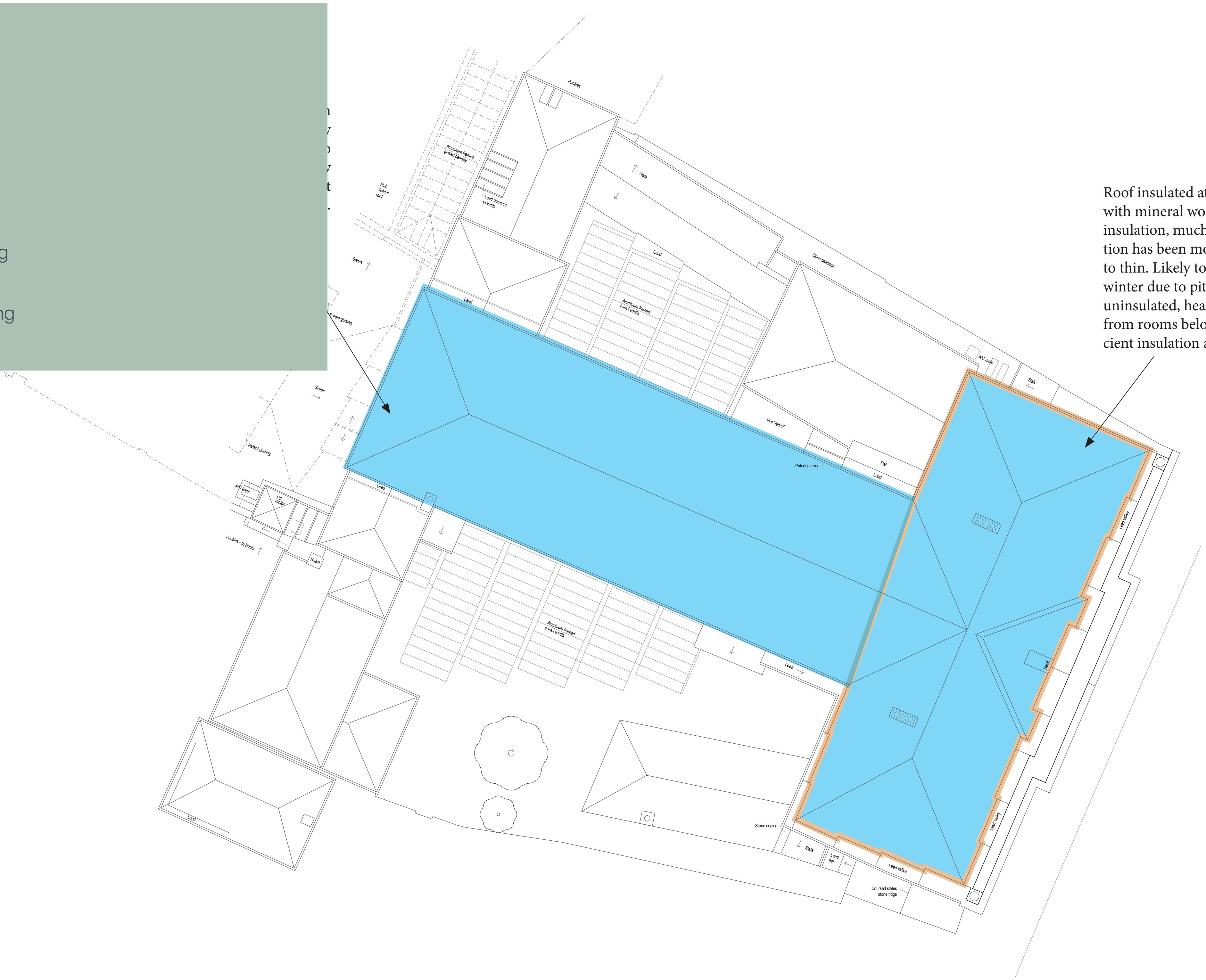
Colonnade of the Buttermarket and front lobby are essentially external spaces and open to the outside most of the time. Large south glazing and glazed courtyard extension increases potential for heat gain, The fabric of the original butter market should stay cool but heat gain from adjacent glazed space transfers into here.

6.5 Existing Building Performance: Winter

Roof

Colour key:

- No underheating
- Limited Underheating
- Moderate underheating
- Significant underheating



Roof insulated at ceiling level with mineral wool or fibreglass insulation, much of the insulation has been moved and seems to thin. Likely to be quite cold in winter due to pitch of roof being uninsulated, heat likely to be lost from rooms below due to insufficient insulation at ceiling level.

Second Floor

Colour key:

- No underheating
- Limited Underheating
- Moderate underheating
- Significant underheating

North facing orientation likely to lead to spaces being slow to heat up and having a high heat demand with no potential for direct solar heat gain. Spaces could feel cool and gain there is no background ventilation.

Store is currently used as a server room. Suffers from overheating due to heat produced by equipment as well as from adjacent rooms and above. No means of ventilation, cooling or extraction. Could some of this heat gain be used to heat adjacent spaces?

Rooms to the front suffer from some overheating in winter due to heat gain from windows of which is welcome but lack of to control this effectively, lack of background ventilation likely to mean that spaces are often unventilated for long periods of time due to cold drafts from openable windows not being preferable. This could lead to issues with condensation and damp during winter.

Rooms used by museum and gallery presents a series of issues related to overheating and sunlight penetration due to its orientation and window locations. This leads to overheating and potentially damaging conditions for the painting and artefacts. Windows fitted with blinds but overheating still an issue. Similar risk regarding damp and condensation due to lack of background ventilation.

First Floor

Colour key:

- No underheating
- Limited Underheating
- Moderate underheating
- Significant underheating

Ballroom has very large windows on both the south and north elevations. This is likely to lead to issues with both overheating due to solar hat gain and occupancy levels of up to 140 persons and lack of a functioning ventilation system and being slow to heat up due to heat loss

Rooms to the front suffer from some overheating, due to heat gain from windows all benefit from both shutters and curtains to windows which can be closed to limit heat gain as well as heat loss but using this also reduces ventilation capacity through openable windows. Rooms seem to lack radiators instead using a blown heating system. Portable radiators were present in the Picken's Room which suggest issues with winter heating levels being inadequate.

Rooms to the rear of the ballroom including the museum store, the opposite store and the bridal room are generally unheated. The bridal room has had an electric storage heater installed more recently. The stores seem to function as required with no overheating and adequate levels of ventilation.

The Council Chamber suffer from some overheating, again this is likely to be due to heat gain from windows and lack of ventilation- specifically cross-ventilation during use. The room benefits from both shutters and curtains to windows which can be closed to limit heat gain but using this also reduces ventilation capacity through openable windows. Maximum occupancy levels of around 50 persons would also contribute significantly to heat gain.

Committee room benefits from windows with multiple orientations. North facing windows have secondary glazing, south and west facing windows have curtains. Generally room has an occupancy level of 18-20 persons. No issues with overheating reported although this is likely due to presence of both curtains to limit solar heat gain and north windows to allow light into room without overheating when curtains are closed on south and west windows.

Office space suffers from issues with overheating due to a number of factors including heat gain from window and lack of ventilation - specifically cross-ventilation. In addition this room does not benefit from curtains or blinds so afternoon sun cannot be controlled. The window is very large so solar heat gain is high.

Ground Floor

Colour key:

- No underheating
- Limited Underheating
- Moderate underheating
- Significant underheating

Colonnade of the Buttermarket and front lobby are essentially external spaces and open to the outside most of the time. Large south glazing and glazed courtyard extension increases potential for heat gain but generally stays cool.

6.6 Building Performance Summary

As with many historic buildings, the way the building is used, the building's systems and the way the building performs have changed drastically since it was first constructed nearly 250 years ago. The number of uses within the building has grown and the expectations of the users is far different to that originally envisaged. In addition, the technology available and our understanding of the performance of buildings has evolved, even since the last major restoration works in the 1980's.

Due to this the heating, cooling and ventilation of the Town Hall are too basic and now somewhat old hat. In order to pursue methods of decarbonisation it will be necessary to update the way the building works and performs, this includes the buildings systems and its fabric where possible. The buildings heating system is powered generally by gas boilers which were recently replaced. Radiators are generally undersized and often positioned directly under the windows, which are single glazed and without draught-proofing. There are a number of other heating solutions evident in he building; The Picken's Room and Mayor's Parlour are served by electric convector heaters with inlet and outlet grilles, the bridal room has an electric panel heater and a number of temporary electric heaters were evident in various spaces around the building. We understand that currently there are no thermostatic or zonal heating controls in the building, however installation is planned alongside the heating system replacement. This will help to deliver a more controllable performance for the efficient heating of spaces but the heating delivery in each room needs improvement to avoid underheating in winter and improve the efficiency of the system.

Ventilation is largely through openable windows, with only the ballroom benefiting from any form of mechanical ventilation. The ballroom ventilation however is now 35 years old, inefficient and currently not operable. Ventialtion is one are where major improvements can be made to the comfort levels and efficiency. The building generally suffers from overheating. This is due to a number of factors including a lack of solar shading, a lack of insulation, limited ventilation or air management and the location of heat sensitive uses.

In addition the potential improvements to address heat loss such as secondary glazing, draught-proofing and improved insulation measures could have a negative impact on the air quality within spaces leading to difficulties with moisture and condensation within spaces. Mechanical ventilation, both background and purge, could help to better manage this whilst creating a better level of internal comfort for the users.

As discussed, the major issue with the building currently is overheating, mainly in summer. Reducing this will place less demand on the requirement for mechanical ventilation. In addition, better insulation and draught-proofing will limit winter heat loss and improve the efficiency of the heating of the building.

7.0 Opportunities Assessment

7.1 Strategy Introduction

7.1.1 Balancing heritage and sustainability

The roots of heritage conservation are inextricably linked with sustainability and climate adaptation.

The continued use of existing buildings, coupled with measures to improve energy efficiency, is a global priority. Replacing an existing building with a new one requires a considerable investment of 'embodied' carbon in materials, transport and construction. Therefore prolonging the life of our existing buildings and safeguarding their future, is an inherently sustainable approach.

In the case of identified heritage assets, replacement is not an option. Therefore we must seek ways to allow these buildings to function effectively and sustainably in order for their continued use to be viable.

In order to reduce carbon emissions and build climate resilience, we must continue to allow our built heritage to adapt and change, as it has done for generations.

Proposals that look to tackle the climate crisis, in a measured and considered way, are considered a public benefit.

7.1.2 A whole building approach

A whole building approach uses an understanding of a building in its context, to find balanced solutions that save energy, sustain heritage significance, and maintain a comfortable and healthy indoor environment. It considers the building as a system of interconnected materials, functions, users and services, with interventions designed to work together to deliver the maximum benefits, as effectively as possible.

A conventional approach to refurbishment is to change each element individually without considering the building as a whole. Dealing with different parts of the building in a piecemeal way, can result in negligible energy and carbon savings, potentially damage the building fabric, and lead to abortive work.

In order to successfully deliver energy savings and healthy, comfortable environments, a coordinated approach is needed for the whole building.

A whole building approach does not mean doing everything all at once, although this is certainly one option. Work can be carried out in phases, but a whole building approach ensures each phase is considered as part of the wider objectives and plan for the building, as well as taking into account potential risks, and ensuring one measure doesn't adversely effect the outcomes and performance of another measure.

7.1.3 Responsible retrofit hierarchy

The greenest, and cheapest energy, is the energy you don't use. Whilst there are no one-size-fits-all solutions for making energy and carbon reductions in heritage buildings, priority should always be given to measures that eliminate unnecessary energy wastage, through behavioural change, good building maintenance, efficient controls and equipment, and managing the building to its optimum performance.

Implementing 'minimal physical intervention' measures that mitigate the impact of unavoidable energy use are often low cost and easy to install, with limited impact on the heritage significance of a building, e.g., energy efficient lighting, basic heating controls, and better control settings.

Improving the building fabric by means of insulation, airtightness measures, and by minimising thermal bridging is likely to reduce heat loss and heat demand, and thus reduce the required capacity of the heating system.

These measures need to consider the movement of moisture and air, the permeability of the existing and proposed materials, and their impact on heritage significance.

Active systems (mechanical and electrical solutions that are zero carbon and renewable) are a vital part of achieving net zero carbon emissions. However, jumping to these measures without first seeking to reduce energy demand, could mean the new energy source will need to be larger and work harder, ultimately costing more to install and run.

The below outlines the hierarchy of a responsible retrofit. It is intended to act as a planning tool in the early stages of a project and help inform a whole building approach:

- **Eliminate** unnecessary energy wastage through behaviour change, addressing building defects, draughts, cracks and gaps
- **Mitigate** the impact of unavoidable energy use using efficient use of space, energy saving appliances and lighting, intelligent controls, zoning etc.
- **Improve** performance of fabric & services through insulating, upgrading, employing passive solutions and climate adaptations
- Implement **Active** systems including zero carbon energy solar panels, heat pumps etc.

7.2 Retrofit Strategy: ELIMINATE

The most effective way to reduce the carbon usage of a building is to engage with the users and instil a culture which has this at the forefront of operations. Many of these potential changes are known about and often already in-place. However ensuring that the users understand this and the role they can play is critical before making any more impact interventions.

These steps can include:

Encourage positive habits

Engage those using the building, discuss what positive habits they could adopt. Consider an information campaign to remind people how they can make a difference.

Occupant comfort

Expectations around occupant comfort vary. Engage occupants to understand what they need.

Shut windows and doors

Keeping windows and doors shut when heating is turned on will keep heat in and avoid energy wastage.

Eliminate areas of damp

Keeping the building in good condition and eliminating damp fabric, can reduce heat loss through external fabric by up to 30%.

Address gaps and cracks

Reducing uncontrolled infiltration of air through the building fabric will reduce heat loss.

Reduce draughts

Eliminating draughts and reducing uncontrolled air infiltration will reduce heat loss and feelings of cold.

Turn off lights and electrical items

Reduce energy use by switching things off when not in use.

Ensure all windows are fitted correctly

Properly fitted and sealed windows will reduce heat loss.

Reduce thermostats by 1°C

Turning your thermostat down by 1°C can reduce energy use by 10%.

Ensure plant and equipment is operating as required

7.3 Retrofit Strategy: MITIGATE

MITIGATE

Efficient use of space

Consider the environmental conditions of each space and how activities might be reorganised to suit those conditions.

Second Floor

Issue identified	Opportunities
OVERHEATING Office spaces to front of building overheat in summer and suffer from high levels of solar gain through windows. Lack of background ventilation and cross-ventilation contributes to this. Lack of roof insulation and position at the top of the building also increases heat gain from elsewhere in the building.	Office spaces could be relocated to avoid these issues into spaces that either do not overheat or have improved means of restricting solar gain and/or have improved opportunity for ventilation improvements. Additionally improvements could be made with regards to a holistic building ventilation strategy to exhaust hot air without it being trapped in the top floor rooms, additional insulation within the roof over would mitigate heat gain from above being transmitted into the office spaces.
Rooms affected: S1, S5, S6, S6a, S7a, S11, S13,	
DIRECT SUNLIGHT IN GALLERY SPACE UV light can cause damage to collections. The display area of the museum and reception feature large windows which are exposed to direct sunlight at different parts of the day and for most times of the year.	Blinds or shutters can be installed on windows to limit UV exposure. The museum and gallery use potentially benefits from the use of artificial lighting to provide controlled light on artefacts rather than harsh, potentially damaging natural light which can cause issues with reflection as well as the potential for damage from direct sunlight.
Rooms affected: S10, S14, S12	

First Floor

Issue identified

OVERHEATING

Principle Council Chambers to front of building including the Picken's Room and Mayor's Parlour have the potential to overheat in summer and suffer from high levels of solar gain through windows. Due to the high capacity of these rooms this exacerbates the issue. Lack of background ventilation contributes to this. Windows benefit from shutters, blinds and curtains so solar heat gain can be controlled although this blocks out natural light and views.

The office space F30 suffers afternoon overheating due to its orientation. The room does not benefit from blinds, shutters or curtains to prevent solar heat gain.

The Ballroom suffers from overheating due to a number of factors due to high capacity, nature of use, large south facing glazing, lack of shading, lack of insulation in roof above and presence of solid wall. IN addition the existing ventilation system is currently not working and likely to be inefficient compared to modern versions.

Rooms affected: F23, F25, F28, F30, F31

Opportunities

Opportunities for improvement are limited due to relative significance of these rooms, however improvements to ventilation could be made through introduction of a mechanical ventilation system with heat recovery and heating reusing the existing grilles/ducts of the existing convector heating system.

Curtains or blinds to room F30 would reduce the impact of solar heat gain.

The Ballroom would benefit from improved shading or similar interventions which could help to limit the solar heat gain from the south facing glazing. The Ventilation system needs to be assessed to understand the effectiveness, efficiency and whether replacement would provide both a reduction in overheating and a more efficient system.

UNDERHEATING IN WINTER

The Picken's Room and Mayor's Parlour do not contain radiators (which the Council Chamber does), instead using a convector type heater within adjacent spaces to heat the rooms through ducts in the walls. In winter these rooms are likely to suffer from issues with heating the spaces as evidenced by the high number of portable electric heaters observed in the Picken's Room. The large windows would also be a source of heat loss. The convector heaters are likely to be very inefficient methods of heating the spaces.

The Ballroom...

Rooms affected: F23, F25, F31

Opportunities for improvement are limited due to relative significance of these rooms, however improvements to heating could be made through introduction of a mechanical ventilation system with heat recovery and heating reusing the existing grilles/ducts of the existing convector heating system. Draughtproofing of windows and doors could be an effective way of minimising heat loss. Heavy curtains would also provide mitigation against heat loss through the large windows but could place a higher demand on energy due to a reliance on artificial lighting.

Keep heat in

Consider curtains, shutters, rugs and wall hanging to reduce heat loss.

Generally

Issue identified

HEAT LOSS THROUGH WINDOWS

Windows, with the exception of those to rooms F23, F25, F31, do not benefit from shutters or heavy curtains. There are only to windows within room F32 that benefit from retrofitted secondary glazing. All other windows are generally single glazed without any draughtproofing or draught seals.

Opportunities

There may be opportunities to introduce secondary glazing to more windows especially those within secondary or tertiary rooms with lesser window detailing which are north facing or heavily shadowed.

More windows could benefit from the installation of curtains where practical. Most windows could benefit from draughtproofing being added, providing there is sufficient ventilation within the room to prevent issues with damp and condensation through lack of air flow.

Efficient lighting

LED lights use 90% less energy than conventional halogen light bulbs. Switch all lights to energy efficient alternatives.

Generally

Issue identified	Opportunities
Generally it appears that many fittings have been changed to LED fittings.	Ensure all fittings are fitted with LED bulbs. Investigate any opportunities to improve the efficiency of light fittings including any external lights.

Switch to energy saving appliances

When appliances need replacing always look to switch to an energy saving alternative.

Generally

Issue identified	Opportunities
n/a - appliances not investigated.	Implement a scheme of replacing appliances with energy saving alternative when required.

Implement zoning strategy

Consider the use of each space and how the heating system operates. Avoid heating unused areas.

Generally

Issue identified	Opportunities
n/a - operation of existing heating system not investigated. Work required to understand existing zoning of heating system - if any.	Explore opportunities to implement better zoning of heating controls to respond to use, occupancy, capacity and volume of space to improve efficiency of heating system and avoid overheating or underheating spaces.

Intelligent controls

Installing light sensors, localised thermostats and metering systems can reduce energy loss.

Generally

Issue identified	Opportunities
LIGHTS ARE ALL SWITCHED All lights are currently operated by manual switches, this has the potential to lead to lights being left on even when areas are not in use.	Provide PIR sensors to those areas where use may be intermittent such as corridors or toilets. Investigate other opportunities for better operation of lighting to avoid unnecessary use of energy.
CONTROL OF HEATING SYSTEM inc THERMOSTATS n/a - operation of existing heating system not investigated. Work required to understand existing control of heating system - if any.	Explore opportunities to improve heating controls to respond to temperatures within spaces, to improve efficiency of heating system and avoid overheating or underheating spaces.

Building management systems

Good metering and BMS are a key part of improvising energy efficiency of a building. Providing ongoing performance data.

Generally

Issue identified	Opportunities
NO CURRENT BMS SYSTEM There is currently no BMS system with all heating, venting, cooling and lighting systems being independently controlled. This could lead to conflict between systems and result in spaces being overheated or underheated, or power being used inefficiently leading to higher costs and emissions associated with the systems operation within the building.	Investigate the viability and possibility of a holistic building management system to ensure the most efficient operation of heating, venting and cooling.

Insulate hot water pipes

Insulating services and hot water elements will reduce heat loss through pipe work, reducing energy used in heating.

Generally

Issue identified	Opportunities
none - all pipes seem to be well insulated with lagging etc.	

Efficient sanitary fittings

Installing water saving sanitary fittings can reduce energy use.

Generally

Issue identified	Opportunities
AGE OF EXISTING SANITARY FITTINGS The existing sanitary fittings date from the 1980's. These are likely to be less efficient than modern fittings.	Consider replacing sanitary fittings where practical. Ensure existing fittings are working in the most efficient way possible.

7.4 Retrofit Strategy: IMPROVE

IMPROVE

Maximise natural daylight

Opportunities to improve natural daylight will reduce reliance on electrical lighting and provide solar gains in winter, e.g. rooflights.

Generally

Issue identified	Opportunities
OVERHEATING Due to overheating, blinds, shutters and curtains are often closed to prevent solar gain contributing. This places a higher demand on artificial lighting. In addition poor ventilation and the slow response of the building fabric means that welcome winter solar gains are difficult to control and can lead to spaces being underheated or overheated.	Improve shading where possible through external canopies (potentially - subject to Listed Building Consent), more adaptable internal shutters, better quality blinds or Solar control film to block out UV radiation. Improve ventilation and look at controls or BMS to avoid overheating and the need to close blinds, curtains and shutters. Also look at the use of rooms which suffer from overheating and see if these uses can be located in a more suitable location to allow greater reliance on natural light.

Insulate roof or loft insulation

Insulate loft space and roof voids will reduce heat loss.

Generally

Issue identified	Opportunities
POOR LEVELS OR NO ROOF/LOFT INSULATION Some insulation is present within the roof space however this is likely to be insufficient in depth and has been moved and not replaced. There is no insulation in the section of roof above the Ballroom This will be a key cause of heat loss in winter.	Improve roof insulation levels generally at attic level. Provide a greater thickness of breathable, hygroscopic insulation at attic level with correct fitting and detailing at external junctions, installed in-line with best practice guidance. Options would include natural fibre based insulation such as sheep's wool, wood or hemp fibre insulation.

Wall and floor insulation

In heritage settings, external walls might need to be insulated internally. Consider opportunities to insulate floors.

Generally

Issue identified

NO WALL OR FLOOR INSULATION

The building due to its age and type of construction lacks insulation throughout. Uninsulated solid masonry walls are a primary source of heat loss in the building. This could also cause issues with condensation on external walls due to the surface being cold.

Opportunities

Generally, there is limited potential for wall insulation to be added to any part of the building.

Thermal bridges

Address weak points in the building envelope that allow heat loss through the fabric more quickly.

Generally

Issue identified

THERMAL BRIDGES

The building due to its age and type of construction lacks modern detailing with regards to thermal breaks including solid wall construction and lack of insulation.

Opportunities

Generally, there is limited potential for improvements with regards to thermal bridges. Opportunities may include limiting thermal flanking or bridging of attic insulation by correct detailing including turning insulation up walls etc.

Secondary glazing may help to limit thermal bridging at windows.

Upgrade windows

Depending on their significance, age and condition, consider viability of replacement or upgrade of windows.

Generally

Issue identified

SINGLE GLAZED WINDOWS

Windows are single glazed, with limited or no draughtproofing.

Opportunities

There is limited potential for upgrade or replacement of windows. Most windows are in a good or very good condition of repair but lack draughtproofing so there is scope to include this as part of any upgrade.

Given the high grade of listing there is very little potential to upgrade glazing or windows to include double or triple glazing.

Solar shading

Integrating solar shading like shutters or canopies can reduce overheating and reliance on air conditioning.

Second Floor

Issue identified

OVERHEATING

Office spaces to front of building overheat in summer and suffer from high levels of solar gain through windows. Solar shading would help to reduce this overheating. Opportunities would need to consider the high grade of listing and the relative visibility of each affected window in turn to understand potential for shading.

Rooms affected: S1, S5, S6, S6a, S7a, S11, S13,

Opportunities

Improve means of restricting solar gain. This could include installing internal shutters to the second floor windows serving the offices.

First Floor

Issue identified

DIRECT SUNLIGHT IN GALLERY SPACE

UV light can cause damage to collections. The display area of the museum and reception feature large windows which are exposed to direct sunlight at different parts of the day and for most times of the year.

Rooms affected: S10, S14, S12

Opportunities

Blinds or shutters can be installed on windows to limit UV exposure. The museum and gallery use potentially benefits from the use of artificial lighting to provide controlled light on artefacts rather than harsh, potentially damaging natural light which can cause issues with reflection as well as the potential for damage from direct sunlight.

OVERHEATING

Principle Council Chambers to front of building including the Picken's Room and Mayor's Parlour have the potential to overheat in summer and suffer from high levels of solar gain through windows.

Windows benefit from shutters, blinds and curtains so solar heat gain can be controlled although this blocks out natural light and views.

The office space F30 suffers afternoon overheating due to its orientation. The room does not benefit from blinds, shutters or curtains to prevent solar heat gain.

The Ballroom suffers from overheating due large south facing glazing, lack of shading.
Rooms affected: F23, F25, F28, F30, F31

Opportunities for improvement are limited due to relative significance of these rooms and presence of shutters etc.

Curtains or blinds to room F30 would reduce the impact of solar heat gain.

The Ballroom would benefit from improved shading or similar interventions which could help to limit the solar heat gain from the south facing glazing. This could be as shutters internally which given the size and location would be costly, heavy, difficult to install and difficult to operate. External canopies over the windows could be an alternative subject to Listed Building Consent.

7.5 Retrofit Strategy: ACTIVE

ACTIVE

Beyond the boundary

Consider the neighbouring development plans where resources and infrastructure can be shared with another site, as well as district heat networks, power purchase, agreements etc.

Generally

Issue identified

XXXX

Opportunities

Photovoltaics and solar hot water panels

Solar panels generate energy, reducing reliance on the national grid. Consider overshadowing of neighbouring properties.

Generally

Issue identified

NO SOLAR PANELS

There are currently no solar panels or microgeneration installed. We understand that the feasibility of installing solar PV's is being investigated within a separate strand of works.

Opportunities

Awaiting the outcome of separate feasibility study.

Battery storage

Integrating battery storage alongside solar panels can store on-site generated energy for when you need it.

Generally

Issue identified

NO BATTERY STORAGE

As there are no solar PV's currently there is no battery storage.

Opportunities

If solar photovoltaics are to be installed ,consider the integration of battery storage alongside these.

Ground source heat pump

These use heat from the earth to heat the building.

Generally

Issue identified

HEATING IS VIA GAS BOILERS

The existing heating is via gas boilers, these are less efficient and more polluting than more sustainable alternatives.

Opportunities

The original gas boilers installed in the 1980's have very recently been upgraded for more efficient condensing gas boilers. Due to this there is little chance of these being replaced any time soon.

Ground source heat pumps would not be a realistic alternative due to the site constraints.

Air source heat pump

These use heat from the air to heat the building. They can be less intrusive than gas boilers because they don’t need a flue.

Generally

Issue identified

HEATING IS VIA GAS BOILERS

The existing heating is via gas boilers, these are less efficient and more polluting than more sustainable alternatives.

Opportunities

The original gas boilers installed in the 1980's have very recently been upgraded for more efficient condensing gas boilers. Due to this there is little chance of these being replaced any time soon.

Air source heat pumps would represent an alternative if/when these new boilers need to be replaced.

Mechanical ventilation system

Mechanical ventilation and heat recovery systems may need to be considered, especially if natural ventilation is being reduced.

Second Floor

Issue identified	Opportunities
OVERHEATING Office spaces to front of building overheat in summer and suffer from high levels of solar gain through windows. Lack of background ventilation and cross-ventilation contributes to this. Rooms affected: S1, S5, S6, S6a, S7a, S11, S13,	Improvements could be made with regards to a holistic building ventilation strategy to exhaust hot air without it being trapped in the top floor rooms. Mechanical ventilation could be added on a room-by-room basis where degree of adaptability allows but this is less efficient.

First Floor

Issue identified	Opportunities
OVERHEATING Principle Council Chambers to front of building including the Picken's Room and Mayor's Parlour have the potential to overheat in summer and suffer from high levels of solar gain through windows. Due to the high capacity of these rooms this exacerbates the issue. Lack of background ventilation contributes to this.	Opportunities for improvement are limited due to relative significance of these rooms, however improvements to ventilation could be made through introduction of a mechanical ventilation system with heat recovery and heating reusing the existing grilles/ducts of the existing convector heating system.
The Ballroom suffers from overheating due to a number of factors due to high capacity, nature of use, large south facing glazing, lack of shading, lack of insulation in roof above and presence of solid wall. In addition the existing ventilation system is currently not working and likely to be inefficient compared to modern versions. Rooms affected: F23, F25, F28, F30, F31	The Ventilation system needs to be assessed to understand the effectiveness, efficiency and whether replacement would provide both a reduction in overheating and a more efficient system.

7.6 Summary

7.5.1 GREEN WORKS

These are generally easy to install/implement, relatively cheap and do not impact the significance of the building, and include:

- Ensure all light fittings are LED
- Install PIR Sensors to control lights in all bathrooms, corridors and other infrequently used spaces
- Ensure blinds or curtains are installed on all windows (1.). These can help address both summer overheating and winter heat loss (heavy curtains)
- Consider installation of solar film (2.) on all south, south-east and south-west facing windows to limit solar gain whilst retaining natural light
- Introduce secondary glazing (3.) to windows within secondary or tertiary rooms with lesser window detailing especially those which are north facing
- Implement strategy of replacing appliances with energy saving alternatives when they require replacement
- Implement zoning strategy for heating to avoid overheating or underheating spaces, ability to reduce temperature or switch off completely when rooms not in use
- Improve insulation level within attic especially above ballroom where the roof is currently uninsulated. Ensure insulation is breathable and hygroscopic, options include natural fibre based insulation such as sheep's wool, wood or hemp fibre insulation.
- Repair existing ventilation system within the ballroom to address overheating and air quality issues
- Add draught-proofing measures to all windows and doors (4.). It must be ensured that the risk of increased condensation through removal of ventilation via leaky windows is considered.

7.5.2 AMBER WORKS

These require some thought regarding the installation/ implementation, more costly and may have some minor impact on the significance of the building, and include:

- Look to relocate Town Council staff office space most impacted by overheating, potentially to the former rents and rates offices
- Replace the existing mechanical ventilation system within the ballroom, Picken's Room and Mayor's Parlour with more efficient alternatives that can provide ventilation, heating and cooling with heat recovery re-using existing ductwork and grilles (1.)
- Investigate the installation of a whole building management system (BMS) to control heating, cooling and venting based on data driven feedback.
- Consider removing water heating from existing boilers to an electric water heater (2.)
- Install shutters to windows which do not currently have these where possible (3.)
- Removal of glazed 1980's extension to the south in order to omit issues with overheating and the contribution of this to overheating issues withiin the former butter market. Draughtproof windows and doors in this area to be external doors/windows (4.)
- Upgrade radiators and space heaters to more efficient appliances

7.5.3 RED WORKS

These are generally more difficult to install/implement, relatively high cost and have the potential to impact the significance of the building, and include:

- Installation of Solar PV panels to the roof include battery storage (1.)
- Replacement of the existing boilers with low carbon alternative such as air source heat pump (2.) or biomass boiler in order to reduce the carbon output of the heating system
- Install mechanical ventilation throughout higher occupancy spaces
- Consider replacement of radiators with underfloor heating for larger principle rooms
- Consider external solar shading to ballroom's south windows (3.)
- Pursue installation of slim double glazed units to all windows (4.)
- Fabric upgrades where possible to install insulation internally to external walls and floors

7.6 Management of Risks

7.6.1 Identifying Relevant Risks

The roots of heritage conservation are inextricably linked with sustainability and climate adaptation.

The continued use of existing buildings, coupled with measures to improve energy efficiency, is a global priority. Replacing an existing building with a new one requires a considerable investment of 'embodied' carbon in materials, transport and construction. Therefore prolonging the life of our existing buildings and safeguarding their future, is an inherently sustainable approach.

In the case of identified heritage assets, replacement is not an option. Therefore we must seek ways to allow these buildings to function effectively and sustainably in order for their continued use to be viable.

In order to reduce carbon emissions and build climate resilience, we must continue to allow our built heritage to adapt and change, as it has done for generations.

Proposals that look to tackle the climate crisis, in a measured and considered way, are considered a public benefit.

7.6.2 Risk of Maladaptation

Heritage buildings require a different approach to retrofit than non-heritage buildings. As an important part of our evolving cultural heritage, they reflect the nature and history of the communities that created them, and those that followed. They add distinctiveness, meaning and quality to a place.

Whist carbon reduction and climate resilience measures present significant opportunities to ensure the continued enjoyment and relevance of these buildings, it is important to ensure these values are sustained for future generations.

In addition, historic and traditionally constructed buildings behave in a very different way to most modern buildings. Modern buildings depend on impermeable barriers to control the movement of moisture and air through the building fabric. In contrast, traditional forms of building construction typically of solid wall construction, take up moisture from their surroundings and release it according to environmental conditions. They also tend to have greater thermal mass than their modern counterparts, meaning they heat up and cool down more slowly.

This ability to passively regulate moisture and heat helps to even out fluctuations in humidity and temperature.

The interrelationship between heat and moisture in traditional buildings is complex. In a well-maintained building that is adequately heated and ventilated, the daily and seasonal cycles of wet, dry, hot and cold, balance out naturally. However, alterations to the building fabric that prevent this movement of air and moisture (for example through the application of impermeable materials, and excessively sealing the building up) can lead to problems of moisture accumulation, overheating, fabric damage and poor indoor environmental conditions.

Unfortunately, there have been many instances of bad energy efficiency retrofit projects that not only fail to improve a building's energy performance, but actually exacerbates issues or creates new problems where none existed previously, like poor indoor air quality and overheating.

No retrofit can be deemed successful, even if energy savings are achieved, if it results in an unhealthy, uncomfortable or unsafe environment for its occupants. Nor if it creates issues that cause building fabric damage, defects and decay, and subsequent loss or harm to a heritage building.

When planning energy efficiency improvements, particularly in a heritage building, it is important to understand the way the building is performing as an integrated environmental system in order to avoid unintended consequences, abortive work and unnecessary expense.

Furthermore, alterations to existing buildings also need to consider health and safety issues, like fire safety. Projects should ideally consider measures to improve fire safety as part of the planned works, considering any risks posed by new material choices,and new services.

These risks should not be considered a barrier to retrofit. All risks can be minimised if an informed, well planned and whole building approach is taken.

7.6.2 Statutory Consents

The NPPF sets out the Government's planning policies for England and how these should be applied in planning policies and documents. The NPPF reiterates that the purpose of the planning system is to "contribute to the achievement of sustainable development", acknowledging the role planning can play in securing radical reductions in greenhouse gas emissions and adapting to climate change.

Paragraph 8 of the NPPF states that sustainable development should include moving to a low carbon economy, and paragraph 152 provides that the planning system should support the transition to a low carbon future. There is National Planning Practice Guidance about mitigation and adaptation measures in the planning process to address the impacts of climate change.

The NPPF indicates that local authorities should plan for new development in ways which reduce greenhouse gas emissions consistently with the Government's zero carbon buildings policy and adopt nationally described standards.

The Department for Levelling Up, Housing, and Communities is currently updating the NPPF and a public consultation is in progress. On climate change, Chapter 14 proposes to attribute greater weight to energy efficiency improvements in existing buildings.

Some changes to improve energy efficiency or generate energy will constitute development and require planning permission, although certain types of development are permitted through the General Permitted Development Order. LPAs can remove these permitted development rights for particular types of works for specific buildings or areas using Article 4 Directions.

Works that would affect the special interest of a listed building (including internal works) will require listed building consent, irrespective of the need for planning permission. Some works to listed buildings, in response to climate change, will not affect their special interest and will not need listed building consent. Further advice on specific works where permission may be needed can be found in section 4. Scheduled monument consent is needed before undertaking any works to a scheduled monument.

<u>Works to listed buildings</u>

Listed buildings of the highest significance are recognised through being designated at Grade I or II*. These buildings are likely to be more sensitive to change and therefore may need different approaches. Similarly, there may be Grade II buildings - or parts of such buildings - which are more sensitive to change.

<u>Windows</u>

Draught-proofing of windows will almost invariably be acceptable.

- Draught-proofing - one of the simplest and most cost-effective means of improving a building's thermal performance - can usually be achieved with only a negligible effect on a building's special interest.
- Well maintained windows will be less draughty than windows in poor

repair. Before draught-proofing windows, it is always advisable to make sure they are in a good state of repair.

- Whilst draught-proofing works can entail the cutting of grooves in historic joinery to accommodate draught strips, this can generally be done in a way that does not harm the building's special interest.
- Exceptions are rare, but may include windows of exceptional delicacy, or windows which cannot be unobtrusively draughtproofed.
- Listed building consent is unlikely to be required for all other draughtproofing works.

Installation of **secondary glazing** to the windows will generally be acceptable.

- Secondary glazing will provide considerable improvements to thermal performance and energy conservation. In respect of multipane windows, it often outperforms double-glazing.
- In most cases, the impact of its installation on significance will only cause minimal harm to historic fabric and architectural interest, which will generally be acceptable in view of the benefits obtained.
- Exceptions may include interiors of exceptional architectural quality (such as the finest state rooms of a great house), buildings with historic shutters which would be damaged or rendered inoperative by the installation, and buildings with glazing of exceptional significance which should not be obscured. In many of these cases, temporary secondary glazing used seasonally will generally be acceptable.
- Listed building consent is unlikely to be required for all other secondary glazing works.

Installation of **slim-profile or vacuum double-glazing** within historic frames will generally be acceptable.

- The use of slim-profile or vacuum double-glazing can allow the installation of double-glazing in historic buildings alongside the retention of existing window frames.
- Many historic window frames will be capable of accommodating such glazing. Original glazing bars should be retained, and windows should be refurbished and draught proofed at the same time to fully benefit from double-glazing. Sash windows may need heavier weights to balance the increased weight of the glass.
- Exceptions in which such installations are unlikely to be acceptable will include windows which retain historic glass of interest, windows of historic or architectural interest whose frames / glazing bars cannot support slim-profile or vacuum double-glazing, and windows with leaded lights.
- Listed building consent is likely to be required, unless replacing panes in modern windows.

<u>Doors</u>

Draught-proofing of doors will generally be acceptable.

- The same considerations apply as for windows - see paragraph 78 above.

<u>Insulation</u>

Loft insulation will generally be acceptable.

- Loft insulation, when specified and installed appropriately, is a relatively easy way to improve a building's thermal performance.
- In buildings with open lofts, it is usually possible to lay removable insulating material between and over the ceiling joists.
- Exceptions will include the spraying adhesive foam insulation to the underside of the roof covering, as this is likely to harm the fabric of the building and is not easily removed.
- However insulation is installed, permeable materials should be used and the loft should remain ventilated to avoid condensation.
- Listed building consent is unlikely to be required, as the installation of insulation is unlikely to affect the special interest of the building, unless the works entail the loss of existing fabric or sprayed adhesive foam insulation

Insulation within the roof plane will be acceptable in some cases.

- Roof spaces can often be insulated above, between or below the rafters.
- Exceptions will include cases in which this would require the loss of historic plasterwork or obscure significant elements of the roof structure.
- Care needs to be taken when insulating above rafters to protect the historic character of the roof.
- However insulation is installed, permeable materials should be used and the roof should remain ventilated to avoid condensation.
- Listed building consent is normally required.

Insulation between, or under, floors will generally be acceptable.

- Insulation within the floor void - where the floorboards are removed, insulation fitted, and the boards replaced - will generally be acceptable provided it can be accommodated without changing floor levels and without undue harm to any historic floor surfaces.
- Underfloor insulation - for example where a timber ground floor is suspended over bare earth - will generally be acceptable, unless the underfloor layer or finishes are particularly significant and are directly impacted upon by the works.
- Insulating under solid floors may not be appropriate where surviving historic floor surfaces or other archaeological remains may exist just under the current floor, or where shallow foundations could be compromised.
- Where ceilings are of plain plaster with no cornice or decorative features, replacing the plaster and adding a layer of insulation to its underside may be acceptable if it is the least harmful practical way to insulate the space.
- Permeable materials should be used, and sufficient ventilation maintained.
- Listed building consent may be required; if in doubt, a Certificate of Lawfulness of Proposed Works should be sought.

Internal wall insulation will be acceptable in some cases.

- The special interest of most listed buildings owes much to the character of their interiors. This includes their finishes, such as historic plaster, joinery, cornices, chimneypieces and other fittings. The introduction of internal wall insulation will generally disrupt these, to harmful effect. Internal wall insulation may be acceptable in buildings whose historic interiors have been lost or largely compromised and in

some buildings whose interiors may not be sensitive to such changes.

- If it is appropriate to line previously unplastered internal walls as part of a conversion, then the opportunity to introduce insulation will exist.
- In the case of buildings of traditional construction, internal wall insulation may also lead to maladaptation, particularly through lack of ventilation, cold bridging and condensation on the wall. It is strongly recommended that permeable materials are used to avoid damage to the building, and specialist professional advice is sought for such buildings.
- Listed building consent is almost always required.
- External wall insulation is unlikely to be acceptable.

Mechanical ventilation and heat recovery systems

Mechanical ventilation and heat recovery systems may be acceptable in some cases.

- Improved insulation has the potential to cause humidity issues even when permeable materials have been used and passive ventilation measures installed. Installing mechanical ventilation and heat recovery systems can sometimes be the best way of managing this.
- The impact of these systems on the significance of a building can normally be minimised by careful siting of equipment and ductwork.
- Mechanical ventilation and heat recovery are unlikely to be appropriate in high quality historic interiors.
- Listed building consent is normally required, depending on extent and position.

Heating systems and heat pumps

Changing boilers, heating and hot water systems to low carbon alternatives, such as **heat pumps**, will generally be acceptable.

- Having an effective low carbon heating system is one of the best ways of enhancing an historic building's energy efficiency. In the majority of cases, replacement of existing systems will not cause harm to special interest.
- There may be very rare exceptions where the existing heating system, or components of it, has architectural or historic significance (for example, original cast- iron radiators) and remains functional.
- The impact of heat pumps can generally be minimised through careful siting, design and screening. Routing pipework may damage historic fabric, with additional archaeological considerations in some sites
- The opportunity should be taken to remove unsightly plant equipment made redundant by the heat pump, for instance oil tanks This can sometimes offset any harmful impact of installing a pump.
- Listed building consent is generally not required for replacement of boilers with more efficient versions. Listed building consent is normally required for the installation of heat pumps which are fixed to a building.
- The opportunity should be taken to remove unsightly plant equipment made redundant by the heat pump, for instance oil tanks. This can sometimes offset any harmful impact of installing a pump.
- Listed building consent is generally not required for replacement of boilers with more efficient versions. Listed building consent is normally required for the installation of heat pumps which are fixed to a building.

Photovoltaic and solar thermal panels

Installation of **photovoltaic and solar thermal panels** will be acceptable in some cases.

- Their installation can often be designed in a way that avoids harm to the special interest of listed buildings. Yet, they have the potential to be visually incongruous and harm a building's architectural qualities. Care is required, especially in considering the aesthetic impact of panels on significant views of the building.
- The physical work necessary to install and maintain panels (e.g. fixings, wiring and/or pipework) will generally not preclude their installation, provided care is taken not to harm special interest
- Specialist consideration should be given to the impact on the roof of the additional weight of the panels, weather-tightness and risks of fire.
- Certain buildings may require the sensitive installation of safe working systems, for example to enable panels to be maintained.
- Listed building consent is always required for the installation of photovoltaic and solar thermal panels.
- Below is a series of specific circumstances to take into account when considering proposals.
- Installation of panels will generally be acceptable if hidden from view.
- Locations which will normally have very minimal or no impact include valley roofs and behind parapets on flat or low-pitched roofs.
- Installation of panels will generally not be acceptable on principal roof slopes, if they would be visible and would detract from the building's special interest.
- As the front elevations of buildings are generally the most important and the most prominent, they will usually be the most sensitive place to site photovoltaic and solar thermal panels. In some cases, other elevations and their associated roof slopes will be equally, or more, sensitive.
- Exceptions may include buildings whose significance may be less sensitive to the installation of such panels (for example, certain industrial buildings). Steps should be taken to reduce the visual impact of panels in these locations as far as is possible. For example, using black frames, avoiding silvered or reflective panels and avoiding irregular or stepped panel layouts.
- Installation of panels on roof slopes of less prominence will generally be acceptable, even if they would be visible.
- Roof slopes of less prominence will generally provide the more acceptable place to install panels, as their impact will be limited.
- Roof slopes to subordinate parts of a complex building (for example,lower wings or rear ranges) may provide the most appropriate place for such installations: by respecting the hierarchy of the building in the location of installation, any harm to the building's special interest will be reduced.
- Exceptions may include highly graded listed buildings (Grade I and II*) whose significance may be such that the installation of panels on roof slopes of less prominence would not be appropriate.
- Mounting panels on outbuildings or land associated with a listed building, provided they are not of greater prominence, will generally be preferable to installation on the main building.
- The installation of panels away from the listed building can often be done without any direct harm to the building's special interest.
- However, consideration will still need to be given to the effect of an installation on the setting of the listed building.

- Where an installation can be made away from the listed building, and would cause no, or less, harm to its special interest, there will be less justification to install panels on the building itself.
- Consideration should be given to reducing the visual impact of ground mounted panels in the setting of listed buildings, for instance using hedges to screen them and designing unobtrusive security measures.
- Planning permission is required.

Other external works

Changing weather patterns, such as hotter summers and increased rainfall, may place additional pressures on building fabric.

There are a number of ways in which buildings can be adapted to deal with these issues. Those discussed are likely to need listed building consent and, if they materially affect the external appearance of a building, they are also likely to need planning permission.

8.0 Conclusion

8.1 Next Steps

8.1 Next Steps

7.1.1 Whole Building Retrofit Report

MES to undertake the following:

- To provide a Retrofit Assessment for Newark Town Hall, detailing the energy saving measures that would be required to bring it up to an initial “C” Rating and any further measures that would be required to potentially reach an “A” Rating.
- Measures considered will include solar PV and other renewable energy sources where appropriate
- Contributions of each measure to both energy consumption , running costs and carbon savings will be identified
- To note any emerging technology that should be considered appropriate in the longer term
- A structured investment plan (Medium Term Improvement Plan) for the building detailing in order in which any improvement measures should be undertaken
- Ensure future trends and timelines for changes in policy are considered
- Provide budget costings for each identified improvement measure

7.1.2 Further Studies

A number of the measures proposed will require further, potentially specialist studies in order to assess their suitability. Some of these studies will be restricted to feasibility studies or option appraisals internally whilst others will require consultation with the Local Planning Authority and their in-house Conservation Officers.

Key studies could include:

- Options studies for the relocation of office space from second floor to avoid overheating and potential to increase the museum offer including re-design of the exhibitions.
- Develop proposals for loft insulation improvement inc specification and detailing.
- Development of the installation of PV panels to roof with specialist installer, hold pre-application advice discussions with N&SDC Conservation team.
- Study for installation of secondary glazing inc design of units, detailing of installation and advice from N&SDC.
- Study for installation of draught-proofing to windows and doors inc detailing of installation and advice from N&SDC.
- Appointment of M&E engineer to assist with implementation of heating zoning, installation of PIR sensors, electric water heater, BMS system etc.
- Invite tenders for repair and on-going maintenance of air handling/ mechanical ventilation units inc that to the Ballroom, or alternatively develop replacement proposals (already underway).
- Additional advice from N&SDC Conservation team regarding other potential works inc external shading to ballroom windows, addition of solar control film to windows, replacement of glazing with slimline double glazing, installation of shutters to windows, addition of insulation to floors or internally to walls and installation of alternatie heating system including external units of air source heat pumps.
- Scheme for removal of glazed 1980’s extension to the south of the butter market within the undercroft, investigate options for replacment or improvements in this area.

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