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BUILDING SERVICES ASSESSMENT REPORT

Derbyshire CC Matlock

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1. Executive Summary

The Strategic Outline Business Case (SOBC) for County Hall was tasked with assessing the potential to reuse, re-purpose and/or reconfigure the existing Grade II listed County Hall in Matlock which currently functions as the headquarters of Derbyshire County Council. The complex is extensive and, by virtue of its scale and listed status, is very costly to operate and cannot be readily adapted to provide a modern, flexible workspace. The Council therefore tasked the team with identifying future options for the complex including potential workspace opportunities for a modern, flexible Council workspace.

BakerHicks were invited to attend County Hall where a visual survey was carried out while being escorted by the client. This report has been produced using information and photos obtained during the survey against the scope outlined within the HLM Architects document *County Hall Outline Business Case – Derbyshire County Council March 2023 Issue V9* and *OBC Area Schedule Matlock County Hall V6* spreadsheet which details the proposed areas for each building within each option.

This report has been structured to break down the various options which have been presented for County Hall. Each option has been assessed with regards to the condition of the existing infrastructure and an initial proposal of how each option could be serviced with regards to new incoming supplies and services within the new facilities. This will be illustrated within a Red, Amber & Green (RAG) status table which will identify high, medium and low levels of complexity/cost for each system.

1.1. Option Summary

Option 1

County Hall remains the same as existing although exiting M&E infrastructure is updated and maintained where necessary. There is a risk to Derbyshire County Council with this option as the extent of the works required to complete this option will not be fully understood until further intrusive investigations have been carried out.

Option 2

Derbyshire County Council move out of County Hall as the site is completely sold for re-development. This option provides the most potential revenue to Derbyshire County Council over the other options.

Option 3

Derbyshire County Council remains at County Hall, however a large portion will be sold for re-development. A large new office development will be constructed to accommodate council staff already located at County Hall. This will involve the installation of new M&E infrastructure to serve the new office installation.

Option 4

Derbyshire County Council remains at County Hall, however a large portion is sold for re-development. A smaller new office development will be constructed so as to accommodate a smaller portion of council staff already located at County Hall. This will involve the installation of new M&E infrastructure to serve the new office installation which will cost less than Option 3. However, more offsite office space will be required to accommodate members of staff moving out of County Hall, which is anticipated to be rented office space. This Option will provide more income to the council as more area of County Hall will be sold compared to Option 3.

1.2. Key Issues – Derby County Council

The key operational issues with each proposed option, in respect to the building services installation, are listed below:

Option 1

- All small, domestic sized boilers will need replacement within the next 5-10 years due to anecdotal issues.
- Increased maintenance required on heating and domestic systems to account of lack of investment over life span.
- Replacement of exiting 3No. Generators within South block Basement Level and within external plant building adjacent to the Lodge which feeds with new as these feed critical IT equipment and emergency planning.
- Replacement of transformer TX3 required as this at end of operational life.
- Additional maintenance costs due to any unforeseen system failures due to age of installation.
- Energy reduce / Net Zero Carbon will need to be implemented to reduce energy demand.

Option 2

- Relocation of IT Servers as the main comms room will now be repurposed – emergency provision to be re-provided.
- New office fit of rented space off site to be considered with this option

Option 3 & 4

- Majority of existing mechanical and electrical plant will need to be replaced with new to serve the new office where the council will be accommodated. This may include relocating or providing items of mechanical and electrical infrastructure in new proposed external plant buildings.
- New heating system will be required for the Bath House.
- Relocation of IT Servers as the main comms room will now be repurposed – emergency provision to be re-provided.

1.3. Key Issue - 3rd Party

The bullet points below highlight the key issues with each proposed option, in respect to the building services installation, that will have an impact on the 3rd party operators:

Option 1

- None as Derby Council will still occupy the council building.

Option 2

- Majority of existing mechanical and electrical plant will be required to be replaced with new.
- New external plantrooms will need to be created reducing usable footprint of new buildings and landscaping.
- Additional utilities will be required to be provided to support the segregation of the South Block to suit the proposed layout.

- New transformers will be required across the entire estate along with new spaces for them to be located.
- Low energy & sustainable sources of energy generation will need to be considered for this option to reduce electrical demand.

Option 3 & 4

- New external plantrooms will need to be created reducing usable footprint of new buildings and landscaping.
- Additional utilities will be required to be provided to support the segregation of the South Block to suit the proposed layout.
- New transformers will be required across the entire estate along with new spaces for them to be located (including the Bath House).
- Low energy & sustainable sources of energy generation will need to be considered for this option to reduce electrical demand.

2. Introduction

BakerHicks have been appointed to review the existing mechanical and electrical infrastructure serving the buildings identified within the SOBC and provide high level recommendations on a serving strategy based upon the four solutions.

The four distinct solutions were identified to take forwards for further testing in the Outline Business Case (OBC) as set out below and depicted in the following pages:

- Option 1 – Base case – This option looks at only the minimum expenditure necessary to make the building fit-for-purpose in its current use including backlog maintenance, continued operational expenditure and decarbonisation measures.
- Option 2 – Council offices are relocated off site. This option explores the potential for Derbyshire County Council relocating from the site entirely into leased premises elsewhere within the county. The site would then be developed by one or more third parties for a mixture of hospitality and residential use with the potential of some co-workspace depending on operator preferences.
- Option 3 – This option looks at the possibility of retaining a Council workspace presence as part of a mixed-use masterplan potential and bringing in third party operators to help develop other hospitality and residential offerings.
- Option 4 – Hybrid Option - some Council workspace is retained on site, but some roles are also decentralised to create a smaller workplace demand. This option is very similar to option 3 but with a smaller new build office requirement

3. Existing Site Constraints & Opportunities

General Overview

It was observed that substantial improvements would be required to elevate The Lodge to meet the desired standards, given the significant water and structural damage present within the premises.

Having reviewed the proposed drawings within the e-mail entitled "S12-1564-01 - Derbyshire CC Matlock SOC Plans" it was noted that the external plant buildings were detailed on these drawings e.g., generator building adjacent to The Lodge, Transformer TX2 building, and plant building located within the West carparks. These are however detailed on the existing site plan drawing, "12-1564-01-HLM-00-05-DR-A-00007 EXISTING SITE PLAN FIFTH FLOOR LEVEL"

The existing building holds Grade II listing status, and any future services installations must be approached with a sympathetic manner, to ensure that they do not contravene the listed status.

Mechanical

- Natural boilers are approaching the end of their economic life.
- The arrangement of the existing heating system is not complimentary for the proposed alterations.
- Lack of any mechanical ventilation across the entire site. New will be required for all areas.
- A single MCW pipe appears to feed the entire South Block. Separate utilities may need to be provided for the refurbishment works.
- Unknown service routings. During the site visit it was very difficult to trace the incoming services.

Electrical

- Transformer TX3 located in an external enclosure alongside the west facade opposite the former gym is approximately 50 years old and is due for replacement, this is a critical Transformer as it feeds the Councils Emergency Planning department. It is known by the FM team that transformer is at end of life and is due to be replaced.
- Three generators require replacing as they are approximately 60 years old. These include DCC 1 (107.5kVA) and DCC 2 (107.5kVA) which are located at Basement level of South Block which supply critical IT equipment and IT room mechanical services within the main data centre on the second floor of the South block. The 3rd generator DCC 4 (187.5kVA) is located adjacent to the Lodge which feeds a section of the Emergency planning switch board (Room 1038) on Basement level of the South block.
- There is a redundant generator which contains contaminated diesel located on the West side of the South Block near Transformer TX1 at Ground level. Although survey and review of this Generator is out of scope it should be noted that if this area forms part of the new works the generator installation will need to be decommissioned, stripped out and disposed of being a CDM/COSHH issue. There is an associated distribution board and control panel which are also redundant.
- All sub-main boards have been replaced over the last 25 years. However, the first boards that were replaced as part of this scheme (within the North Block) are now coming to the end of their design life and will therefore require replacement if they are required as part of the installation.
- Within all areas observed there are a mixture of recently replaced and very old distribution boards. If these old distribution boards are to be retained in the new installation, then they will need to be replaced.

- During the site survey we were unable to trace and locate external duct/cable routes around site. A full survey of existing underground services will be required so as to design any strip-out and proposed works.

4. Existing Utilities

Below is a record of the observations made during a site walk around on 3rd August 2023 by the BakerHicks engineers. We have included key comments which are supplemented by photographs located in the Appendixes

4.1. Lodge Building

Lodge Building	Description (Size / Load)	Comments
Water	Assumed Ø22mm unmetered supply	Unable to locate exact entry point into the building. Believed to be fed from the South Block Boiler House
Natural Gas	Incoming Ø32mm Metered Connection	Separate metered natural gas supply within the basement
Electricity	125A 230V metered supply	Supply from local authority (DNO).
Data	Redundant data cabinet located at 1 st floor connected back to South block via Cat 6 to a local data cabinet	Cable enters the lodge via bridge link from South Block

4.2. South Block

South Block	Description (Size / Load)	Comments
Water	Boiler House - Ø100mm East Wing – Ø15mm Old Library – Ø25mm Joiners Block – Ø22mm	There are several incoming MCW connections throughout the south block, not all metered These could all be supplied from the same incoming supply however we were unable to verify
Natural Gas	Boiler House – Ø200mm East Wing – Ø50mm Old Library – N/A Joiners Block – Ø150mm	Each incoming gas connection was supplied with its own meter All appear to have been supplied from the Town's gas supplied located in the roads externally
Electricity	West half of South block is fed from Transformer TX1 (500kVA) and East half from Transformer TX3 (300kVA) 1600A TPN supply from transformer TX1 to a main switch panel	Transformer TX1 is in good condition as it has been replaced within the last 10 years Transformer TX3 is at end of life and in need of replacement. Refer to section 3.0 for details

South Block	Description (Size / Load)	Comments
	1000A TPN supply from transformer TX3 to main switch panel Section of East Wing Main Switchboard within Emergency Planning (Room 1038 on Basement level is supported during mains failure conditions by a Standby generator located in plant buildings adjacent to The Lodge. The incoming supply is rated a 200A TPN. 2No. Generators (DCC 1 and DCC 2) located at Basement level of the South Block (refer to section 3.0 for details) back up critical IT equipment and IT room mechanical services within the main data centre on the second floor of the South block	
Data	Main site data centre located on the second floor of the West side of South Block. Fed from transformer TX 1. This data centre feeds various server rooms located around the South block and all other buildings around site. These server rooms (comms cabinets) are connected together on a fibre ring. The network is connected as a ring so in the event of a break the system will still remain operational in a radial configuration.	

4.3. Former Gym

System	Description (Size / Load)	Comments
Water	Ø60mm Incoming – Unmetered	Assumed that the supply is metered within the road rather than within the building itself
Natural Gas	Ø60mm - Metered	The existing natural gas supply is metered within the plant room serving two boilers
Electricity	Fed from Transformer TX3 250A TPN Supply from Emergency Planning (DB1A/2L1,2,3) - "OLD GYM 160A Tapped down to 112A" from label on main LV panel in Emergency Planning	Also labelled as 125A on test sheet but breakers installed is rated at 250A
Data	Server room containing small data cabinet for wireless (WAP) and wired data connections to outlets	

4.4. Co Op Building

System	Description (Size / Load)	Comments
Water	Two Ø15mm Incoming – Unmetered	Assumed that both supplies are meter within the road rather than within the building itself
Natural Gas	Ø60mm – Unmetered Ø15mm - Unmetered	Assumed that both supplies are metered within the building however, we were unable to locate it at the time of survey
Electricity	Fed from Transformer TX2 (500kVA) 100A SPN supply from Business Centre Panel Board	Unclear from survey what the supply to the Co-Op building is, 200A, 125A or 100A
Data	Server room containing small data cabinet for wireless (WAP) and wired data connections to outlets	

4.5. Audit Building

System	Description (Size / Load)	Comments
Water	Ø22mm - Unmetered	Assumed that the supply is meter within the road rather than within the building itself
Natural Gas	Ø35mm – Unmetered	As the Audit Building is separate, it is assumed the natural gas supply is metered somewhere within the property
Electricity	Fed from Transformer TX2 via 125A TPN MCCB in Business Centre ground floor panel board into a consumer unit located within the Audit Block	
Data	Server room containing small data cabinet for wireless (WAP) and wired data connections to outlets.	

4.6. Business Centre / Stables

System	Description (Size / Load)	Comments
Water	Ø15mm – Metered	The incoming MCW is metered within the plantroom. The MCW usage within the building is minimal compared to others
Natural Gas	Ø100mm - Unmetered	Assumed that the supply is meter within the building however, we were unable to identify this location during the survey
Electricity	Fed from Transformer TX2 <u>Business Centre</u> 1000A TPN Supply from Transformer TX2 <u>Stables</u> 125A TPN protected by a 100A MCCB in Business Centre ground floor panel board	

Data	Server room containing small data cabinet for wireless (WAP) and wired data connections to outlets	
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4.7. North Block

System	Size Description (Size / Load)	Comments
Water	Ø32mm – Unmetered Ø22mm – Unmetered	It has been assumed the building is supplied by a single metered connected. We were unable to identify the incoming location during the site survey
Natural Gas	Ø60mm – Metered Ø 100mm - Metered	Both plantrooms have their own, dedicated natural gas supply which is metered directly from the Town's Gas supply within the adjacent roadway
Electricity	Fed from Transformer TX1 630A TPN supply from main switch board for Transformer TX1- Ref DB3003	Supplied from South Block Main Switchgear room
Data	2No. server rooms containing data cabinets are located with the North block for wireless (WAP) and wired data connections to outlets	

4.8. Ancillary Buildings/Services

System	Size Description (Size / Load)	Comments
Water	N/A	
Natural Gas	N/A	
Electricity	Transformer TX2 located to the West side of car park Feeder pillar adjacent to bin storage area and compactor at the entrance to the car park - "Pillar car park" 100A TPN supply Feeder pillar to the South of South Block (assumed "Feeder pillar Bottom Lawn" for external supplies i.e., supplying garden area with general sockets fed from	Transformer TX2 appears to be in good working condition and is assumed to be less than 15 years old

System	Size Description (Size / Load)	Comments
	Emergency Planning in South Block – 125A tapped down to 100A TPN Supply fed from main LV panel within Emergency Planning within South Block Two generators located within plant building adjacent to the Lodge.1No. DCC 7 (61.2kVA) feeds IT equipment in room B228 of the South block. The second generator DCC 4 (187.5kVA) feeds a section of the main LV panel located with Emergency Planning, refer to section 3.0, 4.2 & 5.2.2 for details.	
Data	N/A	

5. Existing Building Services Systems

Below is an overview of the existing mechanical and electrical building services strategies within each building:

5.1. Mechanical Services

5.1.1. Lodge Building

System	Comments
Heating	Heat is generated via a domestic boiler which distributes LTHW around the building to several radiators located underneath external windows.
Cooling	No Cooling Present.
Ventilation	No Ventilation Present.
Domestic Water	Domestic hot water is generated via a single boiler located within a cabinet in the toilet area serving a single wash hand basin.
Above Ground Drainage	The wash hand basins and WCs within the building all discharge to a single external below ground connection.

5.1.2. South Block

System	Comments
Heating	<p>The south block has a number of plantrooms which have a combination of LTHW and steam boilers.</p> <p>The steam boiler system serves a large number of radiators, calorifiers and domestic hot water plate heat exchangers.</p> <p>The LTHW boilers serve AHU heating coils, wet radiators, domestic hot water cylinders and fan coil units around the building from a number of satellite plant rooms.</p>
Cooling	There are a number of single and multi-split DX units within the building serving rooms with high heat gains such as office spaces and server rooms.
Ventilation	<p>There are a number of supply air handling units serving the 'Old Library' at high and low level.</p> <p>There are also several other units spread out around the building however, the predominate means of ventilation through is natural ventilation via openable windows.</p>
Domestic Water	Domestic hot water is generated via the steam and LTHW boilers within the plant rooms around the building.

System	Comments
	These then serve a large number of calorifiers which store and distribute the hot water to the toilet cores and kitchenette areas throughout the South Block.
Above Ground Drainage	<p>The toilet cores throughout the building have a number of above ground Soil Vent Pipes.</p> <p>These then continue to connect to a large number of below ground connections.</p>

5.1.3. Former Gym

System	Comments
Heating	<p>Heat is generated by both natural gas boilers and local DX split refrigerant systems.</p> <p>The primary source is believed to be the two natural gas boilers which distributed LTHW around the building to several radiators located underneath external windows</p>
Cooling	Cooling is provided within this building within the main gym area. This is supplied by three external condensers located in the undercroft.
Ventilation	During the survey we were unable to identify any ventilation in the building as our survey was only external.
Domestic Water	Domestic hot water is generated via the two natural gas boilers within the plant room serving the hot outlets in the building.
Above Ground Drainage	The wash hand basins, showers and WCs within the building all discharge to a single external below ground connection.

5.1.4. Co Op Building

System	Comments
Heating	Heat is generated via a domestic boiler which distributed LTHW around the building to several radiators located underneath external windows.
Cooling	No cooling present.
Ventilation	No ventilation present.
Domestic Water	Domestic hot water is generated via a single boiler located within a cabinet in the toilet area serving a single wash hand basin.
Above Ground Drainage	The wash hand basins and WCs within the building all discharge to several external below ground connection.

5.1.5. Audit Building

System	Comments
Heating	Heat is generated via a domestic boiler which distributed LTHW around the building to several radiators located underneath external windows.
Cooling	No cooling present.
Ventilation	No ventilation present.
Domestic Water	Domestic hot water is generated via a single boiler located within a cabinet in the toilet area serving a single wash hand basin.
Above Ground Drainage	The wash hand basins and WCs within the building all discharge to a single below ground connection.

5.1.6. Business Centre / Stables

System	Comments
Heating	Heat is generated via a domestic boiler which distributed LTHW around the building to several radiators located on the external walls.
Cooling	Cooling is located within the print room of this building; it is served by one large external Denco condenser.
Ventilation	No ventilation witnessed during the survey.
Domestic Water	Domestic hot water is generated via a single boiler located within the basement plant room serving the outlets within the building.
Above Ground Drainage	No above ground drainage witnessed during the survey

5.1.7. North Block

System	Comments
Heating	Heat is generated in the building by 4no. LTHW boilers located in 2no. plantroom which can be accessed from the public highway. The LTHW boilers serve AHU heating coils, wet radiators, domestic hot water cylinders and fan coil units.
Cooling	No cooling present.
Ventilation	No ventilation witnessed during the survey. However, it has been assumed that the ventilation strategy is similar to the South Block, which is predominately natural ventilation with areas being served by a local air handling unit.

System	Comments
Domestic Water	Domestic hot water is generated via the LTHW boilers within the plant rooms around the building. These then serve a large number of calorifiers which store and distribute the hot water to the toilet cores and kitchenette areas throughout the North Block.
Above Ground Drainage	The toilet cores throughout the building have a number of above ground soil vent pipes. These then continue to connect to a large number of below ground connections.

5.2. Electrical Services

5.2.1. Lodge Building

System	Comments
LV Supply	Incoming supply by DNO is terminated into a single-phase consumer unit which final circuits to consumer services within the building. Consumer unit has 2No. spare ways and is assumed to be less than 10 years old and appears to be in good working condition
Transformers	None
Generators	None
UPS	No UPS identified during the survey
Fire Alarm	Wireless system linked to main network
Access Control	None
Lightning Protection	Assumed existing, not observed during site survey

5.2.2. South Block

System	Comments
LV Supply	Supply to the South Block is split between two main LV switch panels located in Emergency Planning room 1038 on the Basement level and within Sub-station TX1 in room 0135 on Ground level. South block contains a mixture of very old and new distribution boards.
Transformers	Fed from TX1 and TX3
Generators	2No. Generators located on Basement level back up the data centre within South Block, these generators are very old and require replacement, refer to section 3.0 Existing Site Constraints & Opportunities for more details
UPS	2No. UPS centrally located within South Block for backing up IT equipment within the data centre were identified during the site survey.
Fire Alarm	Mixture of wired and wireless system linked to main multiple fire alarm panels around the block which sit on the site network
Access Control	Yes
Lightning Protection	Assumed existing, not observed during site survey

5.2.3. Former Gym

System	Comments
LV Supply	250A TPN Supply from Emergency Planning (DB1A/2L1,2,3) - "OLD GYM 160A Tapped down to 112A" from label on main LV panel in Emergency Planning Distribution boards observed during survey are less than 10 years old and in good working condition
Transformers	Fed from TX3
Generators	None
UPS	No UPS identified during the survey
Fire Alarm	Although not observed during the site survey a wireless system is assumed linked to main network
Access Control	Access control is present within the building
Lightning Protection	Assumed existing, not observed during site survey

5.2.4. Co Op Building

System	Comments
LV Supply	100A SPN supplied from Business Centre Panel Board Panel board and DB's are old and in need to replacement.
Transformers	No, fed from TX2
Generators	None
UPS	No UPS identified during the survey
Fire Alarm	Wireless system linked to main network
Access Control	No Access control was identified during the survey
Lightning Protection	Assumed existing, not observed during site survey

5.2.5. Audit Building

System	Comments
LV Supply	125A TPN MCCB in Business Centre ground floor panel board Consumer units observed within the Audit block are old and due for replacement
Transformers	None, fed from TX2
Generators	None
UPS	No UPS identified during the survey
Fire Alarm	Wireless system linked to main network
Access Control	No Access control was identified during the survey
Lightning Protection	Assumed existing, not observed during site survey

5.2.6. Business Centre / Stables

System	Comments
LV Supply	Business Centre 1000A TPN Supply from Transformer TX2 Stables 125A TPN protected by a 100A MCCB in Business Centre ground floor panel board Panel board appears to be less than 10 years old in good working condition. 5No. Spare ways were present within the panel. No DB's were observed during the site survey.
Transformers	None, fed from TX2
Generators	None
UPS	No UPS identified during the survey
Fire Alarm	Wired Fire Alarm system back to main network
Access Control	Access control is present within these buildings
Lightning Protection	Assumed existing, not observed during site survey

5.2.7. North Block

System	Comments
LV Supply	630A TPN supply from main switch board for Transformer TX1- Ref DB3003 The Panel board and sub-main boards within the block are greater than 25 years old and require replacement.
Transformers	None, fed from TX1
Generators	None
UPS	No UPS identified during the survey
Fire Alarm	Wired system linked to main network
Access Control	No Access control was identified during the survey
Lightning Protection	Assumed existing, not observed during site survey

5.2.8. Ancillary Buildings/Services

System	Comments
LV Supply	2No. Feeder Pillars located 1No. adjacent to compactor at entrance to car park for external lighting and 1No. to the South of the South Block within central grassed area for Bottom lawn for general purpose external supplies. BakerHicks were unable to gain access inside of feeder pillars during the site survey.
Transformers	Transformer TX2 is located to the West side of the car park near the Business Centre.
Generators	2No. Generators located on Lower Basement level adjacent to the Lodge. 1No. backs up the Emergency Planning within South Block which is old and requires replacement (refer to section 3.0). 1No. generator backs up IT equipment and appears to be in good condition and are not due for replacement.
UPS	None
Fire Alarm	None
Access Control	None
Lightning Protection	Assumed that there is no lightning protection to this building due to its size and location adjacent larger structures.

6. New Utility Supplies

In this section of the report, we consider any new requirements for utilities based upon the 3no. referred refurbishment options.

6.1. Option 1

This option looks at only the minimum expenditure necessary to make the building fit-for-purpose in its current use including backlog maintenance, continued operational expenditure and decarbonisation measures. No new utility supplies required under this option.

6.2. Option 2

Option 2	Size / Load	Comments
Water	<p>North Block – Existing Sufficient.</p> <p>South Block -2no. New Ø50mm required</p> <p>Co-op – Assumed Existing Sufficient.</p> <p>Business / Stables – 2no. New Ø32mm required</p> <p>Audit – Assumed Existing Sufficient</p> <p>Lodge – Assumed Existing Sufficient</p>	
Natural Gas	N/A	In order to improve the sites long term resilience and dependence on Natural Gas, it is recommended that it is not considered for the redevelopment.
Electricity	<p>This option involves all areas being fully designed and fitted out by others. Therefore, the following has only been provided for 3rd party development cost.</p> <p>Full strip-out of all redundant electrical services. Add to all sections</p> <p>Residential - North Block – New 1No. 315kVA transformer which could be located within the plant area on the ground floor</p>	

Option 2	Size / Load	Comments
	<p>South Block (inc. Winter Gardens) – New 2No. 1000kVA transformers one to serve the East and of for the West.</p> <p>Co-op – Assumed Existing Sufficient.</p> <p>Business / Stables – Assumed Existing Sufficient.</p> <p>Audit – Assumed Existing Sufficient.</p> <p>Lodge – Assumed Existing Sufficient.</p> <p>2No. Existing 500kVA transformers could potentially be re-used subject to satisfactory condition testing, see section 7.3 for more details.</p>	
Data	<p>Option A</p> <p>A new data centre to be installed for the new facility feeding a fibre network with all new areas having their own comms room or data cabinet.</p> <p>Option B</p> <p>Each individual facility will require their own data infrastructure i.e., data centre.</p>	

6.3. Option 3

Option 3	Size / Load	Comments
Water	<p>North Block – Existing Sufficient.</p> <p>South Block -2no. New Ø50mm required</p> <p>Co-op – Existing Sufficient.</p> <p>Business / Stables – 2no. New Ø32mm required</p> <p>Audit - Existing Sufficient</p> <p>Lodge – Existing Sufficient</p> <p>New Council Building – New Ø32mm</p>	
Natural Gas	N/A	In order to improve the sites long term resilience and dependence on Natural Gas, it is recommended that it is not considered for the redevelopment.
Electricity	<p>Residential - North Block – New 1No. 315kVA transformer which could be located within the plant area on the ground floor</p> <p>South Block (inc. Winter Gardens) – New 2No. 1000kVA transformers one to serve the East and of for the West.</p> <p>New office accommodation - Co-op / Business / Stables – New 1No. 1000kVA transformer</p> <p>Additional office accommodation or additional support facilities to support hotel operations could be located within the old Bath House, which could require a new 315kVA transformer. There is a potential for the existing 500kVA transformer TX1 or TX2 (subject to satisfactory condition testing) to be re-used to supply this new office area.</p> <p>Audit – Potential Residential Development</p>	

	<p>Lodge – Not part of new works</p> <p>1No. existing 500kVA transformers could potentially be re-used subject to satisfactory condition testing (see section 7.3 for more details) which could mean smaller new transformers are required above.</p>	
Data	<p>Option A</p> <p>A new data centre to be installed for the new facility feeding a fibre network with all new areas having their own comms room or data cabinet.</p> <p>Option B</p> <p>Each individual facility will require their own data infrastructure i.e., data centre.</p>	

6.4. Option 4

Option 4	Size / Load	Comments
Water	<p>North Block - Existing Sufficient.</p> <p>South Block - 2no. New Ø50mm required</p> <p>Co-op – Existing Sufficient.</p> <p>Business / Stables – 2no. New Ø32mm required</p> <p>Audit - Existing Sufficient</p> <p>Lodge – Existing Sufficient</p> <p>New Council Building – New Ø32mm</p>	
Natural Gas	N/A	In order to improve the sites long term resilience and dependence on Natural Gas, it is recommended that it is not considered for the redevelopment.
Electricity	<p>Residential - North Block – New 1No. 315kVA transformer which could be located within the plant area on the ground floor</p> <p>South Block (inc. Winter Gardens) – New 2No. 1000kVA transformers one to serve the East and of for the West.</p> <p>New office accommodation - Co-op / Business / Stables – New 1No. 500kVA transformer</p> <p>Additional office accommodation or additional support facilities to support hotel operations could be located within the old Bath House, which could require a new 315kVA transformer. There is a potential for the existing 500kVA transformers TX1 or TX2 (subject to satisfactory condition testing) to be re-used to supply this new office area.</p>	

	<p>Audit – Potential Residential Development</p> <p>Lodge – Not part of new works</p> <p>1No. existing 500kVA transformers could potentially be re-used subject to satisfactory condition testing (see section 7.3 for more details) which could mean smaller new transformers are required above.</p>	
Data	<p>Option A</p> <p>A new data centre to be installed for the new facility feeding a fibre network with all new areas having their own comms room or data cabinet.</p> <p>Option B</p> <p>Each individual facility will require their own data infrastructure i.e., data centre.</p>	

7. Proposed Building Services Strategy

7.1. Option 1

This option looks at only the minimum expenditure necessary to make the building fit-for-purpose in its current use including backlog maintenance, continued operational expenditure and decarbonisation measures. Listed below are keys items which need to be considered within the cost plan to ensure the buildings remain functional for a number of years:

7.1.1. Mechanical

- All domestic sized, ideal Logic Boilers within Co-op, Audit, Stables, Lodge and South Block will need replacing in the next 5-10 years due to on-going failures and maintenance issues.
- North & South Block Air Handling Unit Serving & Filter Replacement.
- Chemical Treatment of all Heating Systems – All Buildings.
- Clean and Chlorination of the Domestic Hot and Cold-Water Systems – All Buildings.

7.1.2. Electrical

- Replace exiting 2No. Generators within South block Basement Level with new as these feed critical IT equipment.
- Transformer TX3 to be replaced with new.
- Any sub-main panels which are greater than 25 years old are to be replaced with new. This includes sub-main panels within North block.
- Any final distribution board which is not redundant and are still required which are at end of life will be replaced with new.

7.2. Option 2

7.2.1. North Block – Residential including retail areas and storage

General Note. RAG status within the following tables stands for Red (High), Amber (Medium) & Green (Low) and is referring to a comparison of the levels of complexity/cost of a design element.

North Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
Ventilation		Central air handling plant with heat recovery	Central plant space needed Spatial requirement for vertical risers and horizontal distribution. Individual units for each residential or hotel rooms	High
		Local extract fans and natural ventilation	New penetrations to be added into the side of the building. New double glazing will be required.	Low
Heating		Via VRF system	New external compounds will be required to house the air source heat pumps.	Medium

North Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
			Ceiling void within the rooms required to conceal services.	
Cooling		Via VRF system	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Medium
Domestic hot and cold water		Air Source Heat Pump	New external compounds will be required to house the air source heat pumps. Large cylinders centrally or dedicated unit per residential building / room	Low
Above ground foul drainage		As Existing.	Drainage pipework will need to be carefully routed to coordinate with the existing historic architecture	Low
LV distribution	Existing Transformer TX1 could be re-used to feed one of the new supplies to the residential areas.		An initial review has been carried out and it is proposed that No. new incoming HV supplies may be required to feed 1 new internal substation which could be located on the ground floor of the north block housing 1No. 315kVA transformer. There is a potential that one of the existing transformers TX1 or TX2 could be re-used for one of these supplies subject to satisfactory condition testing.	High
Lighting		General & Emergency Lighting	New general and emergency lighting throughout the new installation	Low
Small Power		Small power	A new small power installation to be designed and installed within the new area	Low
Data			New incoming data connection required. New data outlets will be required throughout the residential area	Medium

North Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
			back to a single fibre optic link which will be networked around this new residential area	
Fire Alarm	The existing system links back to the main network for the whole of County Hall, this is therefore not appropriate for the new system as a standalone system will be required by the future occupant	Fire Alarm System	A new dedicated fire alarm system will be required for the new residential installation. This could comprise of a master fire alarm panel within the entrance, with a repeater panel located elsewhere in the building. A new link to a call monitoring centre might be required and will therefore need to be allowed for.	Low
Security	No security located within this building currently	Access control and intruder alarm systems	It is unknown if the future developer of the residential fitout would require access control although it could be used in place of a traditional key system. It is proposed that an intruder alarm system may be required within the building. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	Low
CCTV	No CCTV located within this building currently	CCTV	It BakerHicks' opinion that CCTV would be required within the communal, entrance and retail areas of the building. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	Low
Lightning Protection	Existing system will have been installed to an old version of the British standard	Lightning Protection and bonding network	System will require inspection and testing by an LPS specialist with the potential for remedial works to be required to bring in line with current standards.	Medium

7.2.2. South Block – Spa / Hotel

South Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
Ventilation		Central air handling plant with heat recovery	Central plant space needed Spatial requirement for vertical risers and horizontal distribution. Individual units for each residential or hotel rooms	High
		Local extract fans and natural ventilation	New penetrations to be added into the side of the building. New double glazing will be required.	Low
Heating		Via VRF System	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Medium
Cooling		Via VRF System	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Medium
Domestic hot and cold water		Air Source Heat Pump	New external compounds will be required to house the air source heat pumps. Large cylinders centrally or dedicated unit per residential building / room	Low
Above ground foul drainage		As existing.	Drainage pipework will need to be carefully routed to coordinate with the existing historic architecture	Low
LV distribution	From initial estimates the existing infrastructure is not adequately sized to feed the hotel and event/performance block		An initial review has been carried out and it is proposed that 2No. new 1000kVA incoming HV supplies may be required to feed two new external substations. One for East and one for West side of	High

South Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
	Existing transformer TX1 could be re-used to feed one of the new supplies to the spa/hotel areas.		the new hotel/event performance facility. There is a potential that one of the existing transformers, TX1 could be re-used for one of these supplies subject to satisfactory condition testing, which would mean that smaller new transformers would be required.	
Lighting	Existing lighting within the South block is not appropriate for the new installation and therefore is required to be stripped out and replaced with new		New general and emergency lighting throughout the new installation	Low
Small Power	Existing small power installation within the South block is not appropriate for the new installation and therefore is required to be stripped out and replaced with new		A new small power installation to be designed and installed within the new area	Low
Data	The existing data centre will be re-located off site and therefore cannot be used in the new design.		New incoming data connection required. New data centre and comms rooms locate around the block will be required feeding new data outlets positioned to suit the new design	Medium
Fire Alarm	The existing system links back to the main network for the whole of County Hall, this is therefore not appropriate for the new system as a standalone system will be required by the future occupant	Fire Alarm System	A new dedicated fire alarm system will be required for the new residential installation. This could comprise of a master fire alarm panel within the entrance, with a repeater panel located elsewhere in the building. A new link to a call monitoring centre might be required and will therefore need to be allowed for.	Low
Security	Access control is located within this building currently although this will not be appropriate for the new building purpose.	Access control and intruder alarm systems	It is BakerHicks' opinion that a new access control system will need to be provided so as to provide the future occupant with their required level of security. It is proposed that an intruder alarm system may be required within the building. It is	Low

South Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
			assumed that the new occupant will be installing a new guest key type system for all bedrooms etc. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	
CCTV	CCTV located within this building will not be sufficient for the new installation	CCTV	It BakerHicks' opinion that CCTV would be required within the communal, entrance areas of the building. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	Low
Lightning Protection	Existing system will have been installed to an old version of the British standard	Lightning Protection and bonding network	System will require inspection and testing by an LPS specialist with the potential for remedial works to be required to bring in line with current standards.	Medium

7.2.3. Co-op – Unused - Potential Residential Development

Under Option 2, the existing Co-op is not retained and has not been considered for redevelopment.

7.2.4. Audit Building – Unused – Potential Residential Development

Under Option 2, the existing Audit Building is not retained and has not been considered for redevelopment.

7.2.5. Gym Block – Unused

Under Option 2, the existing Gym Block is not retained and has not been considered for redevelopment.

7.2.6. Business / Stables – Unused

Under Option 2, the existing Business / Stables Blocks are not retained and has not been considered for redevelopment.

7.2.7. Lodge Building – Unused

Under Option 2, the existing lodge building will be refurbished and absorbed into the footprint of the South block.

7.2.8. External Buildings/Services

Business / Stables	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
Ventilation		N/A	N/A	
Heating		External compounds will be required for the external ASHP condensers to be located. These can be fence off with a louvre type screening system.	Loss of external footprint.	Medium
Cooling		These can be fence off with a louvre type screening system.	Loss of external footprint.	Medium
LV distribution	Existing Feeder Pillars or Transformer TX2 could be used supplies new external lighting supplies, subject to a full intrusive survey.		If Transformer TX2 and feeder pillars are deemed not appropriate for re-use new supplies will need to be sourced from either internal DB's adjacent to new external lighting or for EV Chargers or new dedicated distribution board(s) may be required to be installed	High
Lighting	Existing external light will not be appropriate for the new installation and therefore will need to be stripped out and replaced	External lighting	New external lighting (inc. Emergency to muster points) will be required as part of the new design.	Low
Small Power	The supplies to the existing EV charger will be stripped out as there will no longer be required in their current locations.	EV Chargers	New supplies will need to be installed for the new EV chargers which could come from existing TX 2 if it is deem appropriate for re-use in the new installation.	Low
Data	None within existing infrastructure		New EV Chargers might require a data link and therefore new infrastructure will be required	Medium
Fire Alarm	N/A			
Security	N/A			
CCTV	Existing external CCTV may not be appropriate for the new usual of the site as there will be multiple occupants.	CCTV	New CCTV may be required to various parts of the new site which may be either monitored by the individual occupants' or centrally monitored for the whole site. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	Medium

Business / Stables	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
Lightning Protection	N/A			

7.3. Option 3 & 4

7.3.1. North Block – Residential

North Block		System description	Key Issues / Impact on building	RAG Status
Ventilation		Central air handling plant with heat recovery	Central plant space needed Spatial requirement for vertical risers and horizontal distribution. Individual units for each residential or hotel rooms	High
		Local extract fans and natural ventilation	New penetrations to be added into the side of the building. New double glazing will be required.	Low
Heating		Via VRF System	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Medium
Cooling		Via VRF System	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Medium
Domestic hot and cold water		Air Source Heat Pump	New external compounds will be required to house the air source heat pumps. Large cylinders centrally or dedicated unit per residential building / room	Low
Above ground foul drainage		As Existing.	Drainage pipework will need to be carefully routed to coordinate with the existing historic architecture	Low

North Block		System description	Key Issues / Impact on building	RAG Status
LV distribution	Existing Transformer TX1 could be re-used to feed one of the new supplies to the residential areas.		<p>An initial review has been carried out and it is proposed that No. new incoming HV supplies may be required to feed 1 new internal substation which could be located on the ground floor of the north block housing 1No. 315kVA transformer.</p> <p>There is a potential that one of the existing transformers TX1 or TX2 could be re-used for one of these supplies subject to satisfactory condition testing.</p>	High
Lighting		General & Emergency Lighting	New general and emergency lighting throughout the new installation	Low
Small Power		Small power	A new small power installation to be designed and installed within the new area	Low
Data			<p>New incoming data connection required.</p> <p>New data outlets will be required throughout the residential area back to a single fibre optic which will be networked around this new area</p>	Medium
Fire Alarm	The existing system links back to the main network for the whole of County Hall, this is therefore not appropriate for the new system as a standalone system will be required by the future occupant	Fire Alarm System	A new dedicated fire alarm system will be required for the new residential installation. This could comprise of a master fire alarm panel within the entrance, with a repeater panel located elsewhere in the building. A new link to a call monitoring centre might be required and will therefore need to be allowed for.	Low
Security	No security located within this building currently	Access control and intruder alarm systems	It is unknown if the future developer of the residential fitout would require access control although it could be used in place of a traditional key system. It is proposed that an intruder alarm system may be required within the building. A new link to somewhere	Low

North Block		System description	Key Issues / Impact on building	RAG Status
			on site or to a remote monitoring service will need to be allowed for.	
CCTV	No CCTV located within this building currently	CCTV	It BakerHicks' opinion that CCTV would be required within the communal, entrance and retail areas of the building. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	Low
Lightning Protection	Existing system will have been installed to an old version of the British standard	Lightning Protection and bonding network	System will require inspection and testing by an LPS specialist with the potential for remedial works to be required to bring in line with current standards.	Medium

7.3.2. South Block – Spa / Hotel

South Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
Ventilation		Central air handling plant with heat recovery	Central plant space needed Spatial requirement for vertical risers and horizontal distribution. Individual units for each residential or hotel rooms	High
		Local extract fans and natural ventilation	New penetrations to be added into the side of the building. New double glazing will be required.	Low
Heating		Via VRF System	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Medium
Cooling		Via VRF System	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Medium

South Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
Domestic hot and cold water		Air Source Heat Pump	New external compounds will be required to house the air source heat pumps. Large cylinders centrally or dedicated unit per residential building / room	Low
Above ground foul drainage		As Existing.	Drainage pipework will need to be carefully routed to coordinate with the existing historic architecture	Low
LV distribution	From initial estimates the existing infrastructure is not adequately sized to feed the hotel and event/performance block Existing transformer TX1 could be re-used to feed one of the new supplies to the spa/hotel areas.		An initial estimate has been carried out and it is proposed that 2No. new 1000kVA incoming supplies might be required to feed two new external substations. One for East and one for West side of the new hotel/event performance facility There is a potential that one of the existing transformers TX1, could be re-used for one of these supplies subject to satisfactory condition testing, which would mean that smaller new transformers would be required.	High
Lighting	Existing lighting within the South block is not appropriate for the new installation and therefore is required to be stripped out and replaced with new		New general and emergency lighting throughout the new installation	Low
Small Power	Existing small power installation within the South block is not appropriate for the new installation and therefore is required to be stripped out and replaced with new		A new small power installation to be designed and installed within the new area	Low
Data	The existing data centre will be re-located off site and therefore cannot be used in the new design.		New incoming data connection required. New data outlets will be required throughout the hotel which will be networked around the building and linked back to a single fibre optic incoming link.	Medium
Fire Alarm	The existing system links back to the main network for the whole of	Fire Alarm System	A new dedicated fire alarm system will be required for the new	Low

South Block	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
	County Hall, this is therefore not appropriate for the new system as a standalone system will be required by the future occupant		spa/hotel installation. This could comprise of a master fire alarm panel within the entrance, with a repeater panel located elsewhere in the building. A new link to a call monitoring centre might be required and will therefore need to be allowed for.	
Security	Access control is located within this building currently although this will not be appropriate for the new building purpose.	Access control and intruder alarm systems	It is BakerHicks' opinion that a new access control system will need to be provided so as to provide the future occupant with their required level of security. It is proposed that an intruder alarm system may be required within the building. It is assumed that the new occupant will be installing a new guest key type system for all bedrooms etc. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	Low
CCTV	CCTV located within this building will not be sufficient for the new installation	CCTV	It BakerHicks' opinion that CCTV would be required within the communal, entrance areas of the building. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	Low
Lightning Protection	Existing system will have been installed to an old version of the British standard	Lightning Protection and bonding network	System will require inspection and testing by an LPS specialist with the potential for remedial works to be required to bring in line with current standards.	Medium

7.3.3. Co-op – New Council Workspace

Under Option 3, the existing Co-Op Building considered for the new office workspace, therefore is covered in section 7.3.9 below.

7.3.4. Audit Building - Potential Residential Development

Under Option 3, the existing Audit Building is not retained and has not been considered for redevelopment.

7.3.5. Business / Stables – Unused

Under Option 3, the existing Business / Stables Buildings are not retained and has not been considered for redevelopment.

7.3.6. Gym Block – Unused

Under Options , the existing Gym Block is not retained and has not been considered for redevelopment.

7.3.7. Lodge Building

Under Option 3, the existing lodge building will be refurbished and absorbed into the footprint of the south block.

7.3.8. Ancillary Buildings/Services

Business / Stables	Existing Infrastructure	System description	Key Issues / Impact on building	RAG Status
Ventilation		N/A	N/A	
Heating		External compounds will be required for the external ASHP condensers to be located. These can be fence off with a louvre type screening system.	Loss of external footprint.	Medium
Cooling		These can be fence off with a louvre type screening system.	Loss of external footprint.	Medium
LV distribution	Existing Feeder Pillars or Transformer TX2 could be used supplies new external lighting supplies, subject to a full intrusive survey		If Transformer TX2 and feeder pillars are deemed not appropriate for re-use, new supplies will need to be sourced from either internal DB's adjacent to new external lighting or EV Chargers or a new dedicated distribution boards might be required to be installed	High
Lighting	Existing external light will not be appropriate for the new installation and therefore will need to be stripped out and replaced	External lighting	New external lighting (inc. Emergency to muster points) will be required as part of the new design.	Low
Small Power	The supplies to the existing EV charger will be stripped out as there will no longer be required in their current locations.	EV Chargers	New supplies will need to be installed for the new EV chargers which could come from existing TX 2 if it is deem appropriate for re-use in the new installation.	Low
Data	None within existing infrastructure		New EV Chargers might require a data link and therefore new infrastructure will be required	Medium
Fire Alarm	N/A			
Security	N/A			
CCTV	N/A			
Lightning Protection	N/A			

7.3.9. New Workspace

New Workspace		System description	Key Issues / Impact on building	RAG Status
Ventilation		MVHR Located in Ceiling Void	New ventilation system required, can be located within a proposed ceiling void to remove the requirement for any external plant space.	Low
		Local extract fans for toilet ventilation	System can easily be added to the	Low
Heating		Via VRF System	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Low
Cooling		Via VRF System	New external compounds will be required to house the air source heat pumps. Ceiling void within the rooms required to conceal services.	Low
Domestic hot and cold water		Electric Point of Use	IPS panelling to be used to conceal the heaters.	Low
Above ground foul drainage			Connecting to the below ground systems may require extensive Civil works to provide a new below ground connection.	Medium
LV distribution	Existing Transformer TX1 could be re-used for the new supply to the office installation. TX3 is due to be replaced as discussed in Section 3.0, this transformer will be stripped out as part of the new works		Option 3 - An initial review has been carried out and it is proposed that 1No. new 1000kVA incoming supplies may be required to feed the new offices on the old Business Centre/ Stables and Co-Op blocks. Option 4 - An initial review has been carried out and it is proposed that 1No. new 500kVA incoming supplies may be required to feed the new offices on the old Business Centre/ Stables and Co-Op blocks. Option 3 & 4 Additional office accommodation or additional support facilities to support hotel operations could be	High

New Workspace		System description	Key Issues / Impact on building	RAG Status
			located within the old Bath House. Could be supplied by a new 315kVA transformer. There is a potential for re-using an existing 500kVA transformer TX1 or TX2 subject to satisfactory condition testing. If this transformer however does not pass testing a new transformer will be required.	
Lighting	N/A		New general and emergency lighting throughout the new installation	Low
Small Power	N/A		A new small power installation to be designed and installed within the new area	Low
Data	N/A		New incoming data connection required. New data centre and comms rooms locate around the block will be required feeding new data outlets positioned to suit the new design	Medium
Fire Alarm	N/A	Fire Alarm System	A new dedicated fire alarm system will be required for the new residential installation. This could comprise of a master fire alarm panel within the entrance, with a repeater panel located elsewhere in the building. A new link to a call monitoring centre might be required and will therefore need to be allowed for	Low
Security	N/A	Access control and intruder alarm systems	It is BakerHicks' opinion that a new access control system may need to be provided so as to provide a level of security which the council may require. It is proposed that an intruder alarm system may be required within the building. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	Low
CCTV	N/A	CCTV	It BakerHicks' opinion that CCTV would be required within the	Low

New Workspace		System description	Key Issues / Impact on building	RAG Status
			communal, entrance areas of the building. A new link to somewhere on site or to a remote monitoring service will need to be allowed for.	
Lightning Protection	N/A	Lightning protection and bonding systems	A new lightning protection system may be required subject to a risk assessment being carried out during a future design stage.	Low

8. Sustainability

8.1. Energy and Sustainability Targets

There are no formal energy or sustainable targets for this project. However, the building services design will endeavour to reduce the operational energy and water consumption of the building wherever possible whilst achieving thermal comfort and achieving the client's requirements.

8.2. Energy Strategy

The building energy strategy is being developed using the following hierarchy:

- Reduce demand
- Meeting end use demand efficiently
- Supply form low-carbon and zero-carbon sources

Reduce demand

The building design will use a 'fabric first' approach that maximises passive design measures before considering the use of mechanical and electrical building services systems. This will help to reduce capital and operational costs, improve energy efficiency and reduce carbon emissions whilst reducing ongoing maintenance cost.

The design will aim to minimise the need for energy consumption through methods such as:

- Increased levels of thermal insulation to reduce heat loss
- Maximised airtightness to reduce unwanted infiltration
- Maximise natural daylighting to reduce lighting energy
- Control of glare and excessive solar gains to reduce the need for cooling
- Optimising natural ventilation

Meeting end use demand efficiently

The mechanical and electrical building services systems will incorporate energy efficient plant and equipment to meet the end use energy demand, including:

- Variable speed drives on all pumps and fans
- Pipework and ductwork designed using low-loss fittings and optimal velocities to maintain low pressure drops
- Mechanical ventilation with heat recovery
- Low energy LED lighting daylighting control systems
- Local point of use electric water heaters to minimise standing losses
- Low water usage fittings
- Energy metering to monitor energy use

Supply form low-carbon and zero-carbon sources

The following low and zero-carbon technologies have been considered to avoid using fossil fuels:

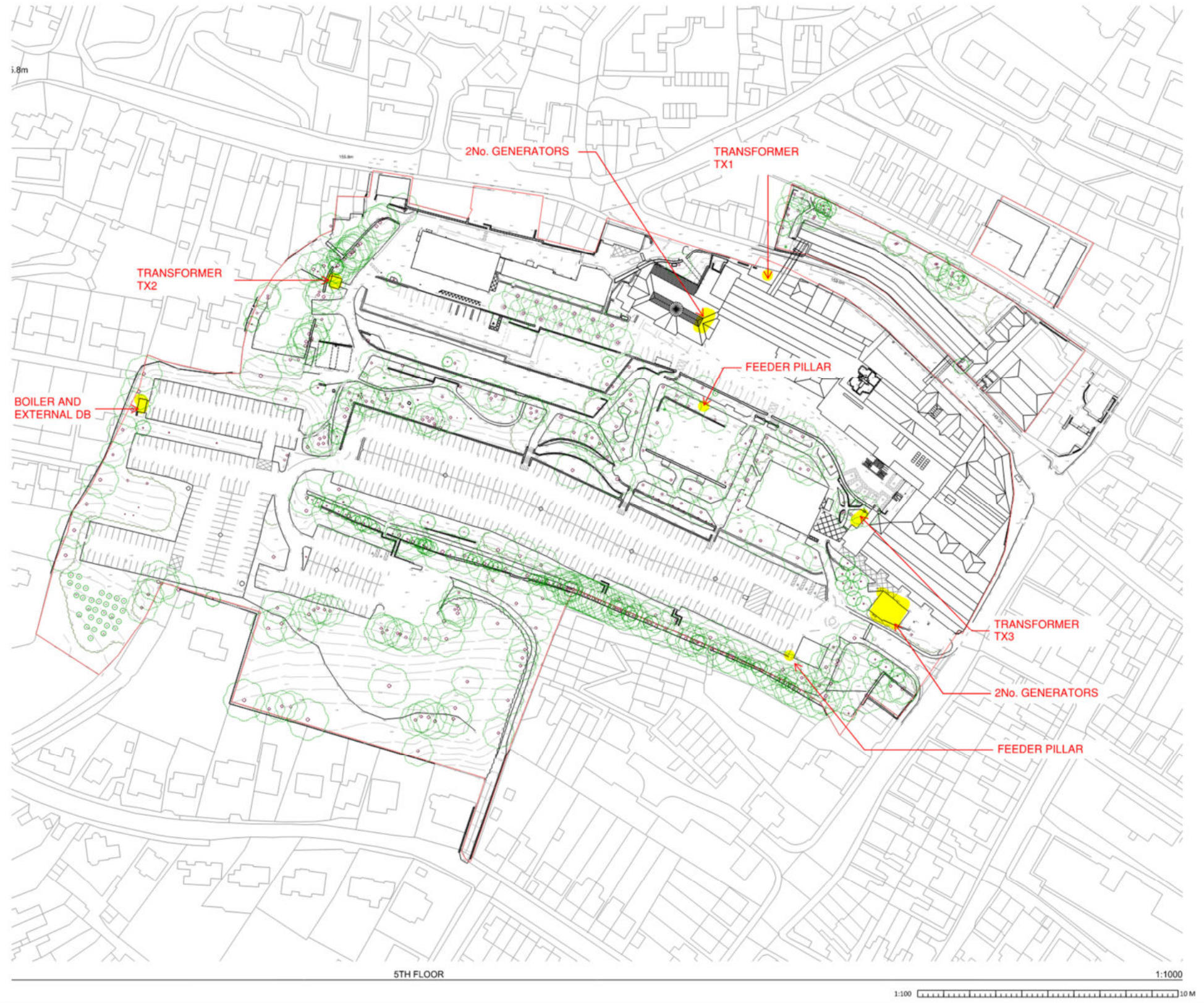
- Air source heat pumps supplied from electricity to provide space heating
- Solar water heating to generate domestic hot water

- Photovoltaics to generate electricity

There are limitations to what renewables can be installed at roof level without affecting the planning application, however these options will be discussed further with the design team.

9. Appendix

9.1. Existing External Plant Location Plan



9.2. Photos

Transformer TX1



Transformer TX2



Transformer TX3



Generators DCC 1 and DCC 2



Generators DCC 4



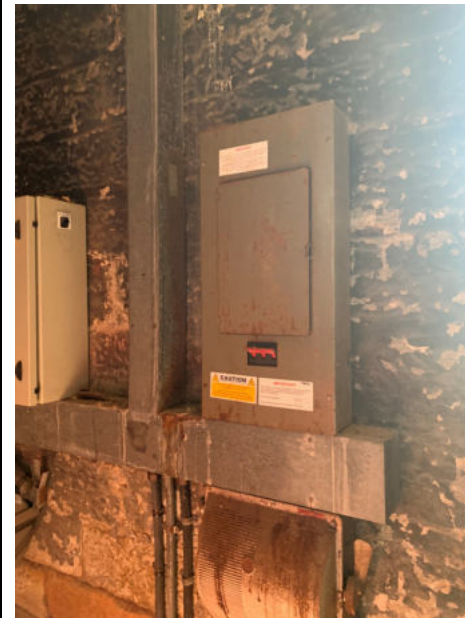
DCC 7



Contaminated Generator



Old & Redundant Distribution Boards within South Block



Old & Redundant switchgear within Co-Op Block



South Block UPS



North Block Main LV Switch Panel



South Block – Emergency Planning



The Lodge – Incoming supply from DNO



External Boiler House within in West car park



External Feeder Pillar – Entrance to car park



External Feeder Pillar – South Lawn



South Block Boiler House – Large Boiler



South Block - Boilers





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