



# Science Museum Group - Building ONE

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Collection Storage Facility

## Pre-Application Enquiry - Design & Access Statement

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Science Museum Group

**feasibility**

**SCIENCE  
MUSEUM  
GROUP**

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The background of the page is a photograph of a museum interior, overlaid with a semi-transparent blue filter. The image shows a large, curved aircraft fuselage section on display, supported by metal stands. The ceiling is high with visible structural beams and lights. The floor is polished and reflects the overhead lights.

# Section 1.0

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## Introduction

1.1 CLIENT & DESIGN TEAM

CLIENT



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1.2 INTRODUCTION

This document is submitted in support of a Pre-Application Enquiry for a new collections management facility to house objects for the Science Museum Group (SMG), at their site in Wroughton (SMGW).

SMGW is the large object and library and archives for the SMG. The site is not open for public access, though research visits can be arranged to use the library and archive facilities, or to view the storage collection, by appointment.

The new building will be a fit-for-purpose facility that will house and manage the SMG collection and accommodate managed public visits, support object conservation work and provide staff facilities. The building will utilise the existing vehicular access to the site and its functions will also be supported by the existing SMG operational buildings on the wider site.

The information in this statement includes a description of the proposed facility and development site, an analysis of the design approach and application drawing extracts showing the location of the facility and it’s layout.

Supporting documentation will be included with this pre-application request comprising-

- Planning Statement
- Heritage Statement
- Landscape and Visual Impact Assessment
- Ecological Report
- Transport Statement







## Section 2.0

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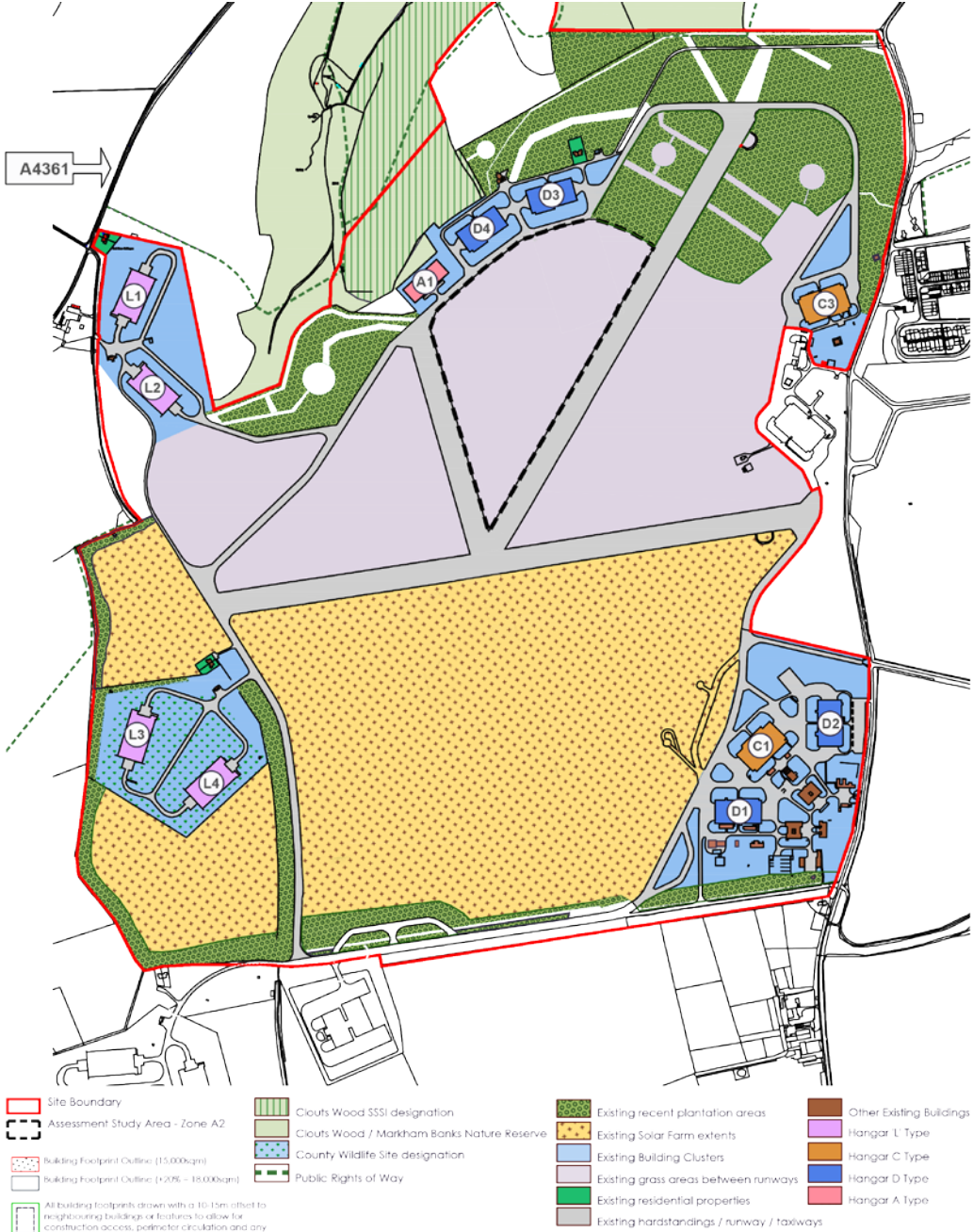
### The Site



2.1 SITE LOCATION



Aerial View



Extract from Science Museum Group One Collection Facility Client Technical Brief - Dated August 2017



Aerial view of solar farm



View of buildings A1, D4, D3



Building A1



Building D4



Motor Vehicle collection in Building D3



2.2 SITE LOCATION PLAN

PROJECT LOCATION

The facility will be located in the northern section of SMGW. A feasibility study has determined that this location takes best advantage of level ground, proximity to services and existing road network.

LOCAL CONTEXT

SMGW is located approximately 6.5 kilometres south of the centre of Swindon and 1.4 kilometres south of the intervening village of Wroughton.

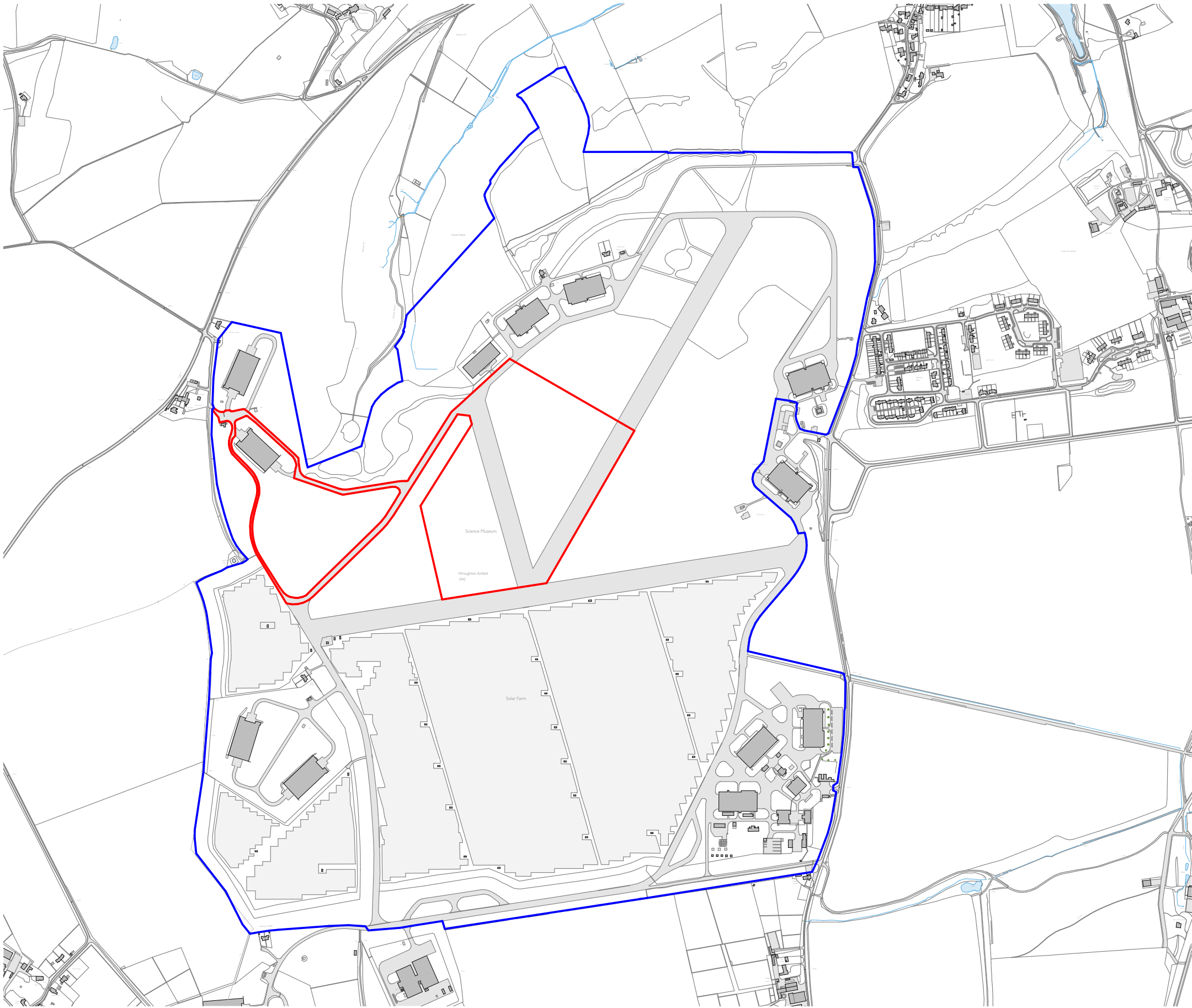
The site falls within the North Wessex Downs Area of Outstanding Natural Beauty.

The single access point to the site is from the north-west via the A4361 (Avebury-Wroughton) road, which, in turn, is within close proximity and well connected to both Junction 15 and 16 of the M4 motorway.

SITE CONTEXT

The main site is secured with a perimeter fence. The site is manned 24 hours a day, 7 days a week from Red Barn Gatehouse, in the north west of the site.

The development plot is predominantly flat improved grassland, bordered by disused concrete runways. The tarmac and concrete runways stretch to the edges of the plot and are connected by smaller perimeter roadways. The recent development of 73 hectares of solar panels now covers the western and southern parts of the main site.





2.3 SITE PHOTOGRAPHS



1.



2.



3.



4.



5.





## 2.4 HISTORICAL CONTEXT

### WROUGHTON AIRFIELD

The site was established in 1940 as an RAF airfield and consists of a number of runways and aircraft hangars. The hangars vary in construction: there are four of the 'L' type 'Blister' hangars (a steel framework with a concrete skin), four of the 'D' type hangars (steel reinforced concrete with an arching roof), and two 'C' type hangar (steel framework with an external cladding), within the land owned by SMG.

The Ministry of Defence commenced disposal of this site in 1979.

### SMG AT WROUGHTON

The Science Museum Group took ownership of the 545-acre site in 1979, and has used it since this time as the storage facility for the largest objects of the Science Museum Group collections.

Over 35,000 3D and 500,000 2D objects from the national collection are currently stored on site, within nine former aircraft hangars and a purpose-built store. The collection ranges from the first hovercraft to MRI scanners, and science publications to (de-activated) nuclear missiles. The collections here are particularly notable for the extensive collection of very large aircraft, road transport vehicles, agricultural machinery and industrial collections.

In 1994 the Museum opened a new purpose-built facility at Wroughton, providing an environmentally controlled building for the storage of objects.

Since 2000 the freehold of the majority of the site has been owned by Board of Trustees of the Science Museum.

Latterly SMG has undertaken a number of projects on site to refurbish hangars, construct award-winning innovative storage, work with universities and industry in research and development, and develop a large scale solar farm for electricity supply into the national grid. These projects along with extensive biodiversity enhancements have helped define the vision for SMGs long term use of the site.

The site is currently not open to the public due to the increased risks presented by the failing 1940s infrastructure and the lack of circulation space due to compression of the stores to enable additional collections to be accommodated.



Aerial photograph taken by the US Army Air Force in 1944



Boeing B17 at Wroughton Air Show - 1993



SMG large object storage within Aircraft Hangars



No 15 Maintenance Unit RAF Wroughton - 1968/69



Wroughton Air Show - 1992



Environmentally controlled purpose built storage facility





## Section 3.0

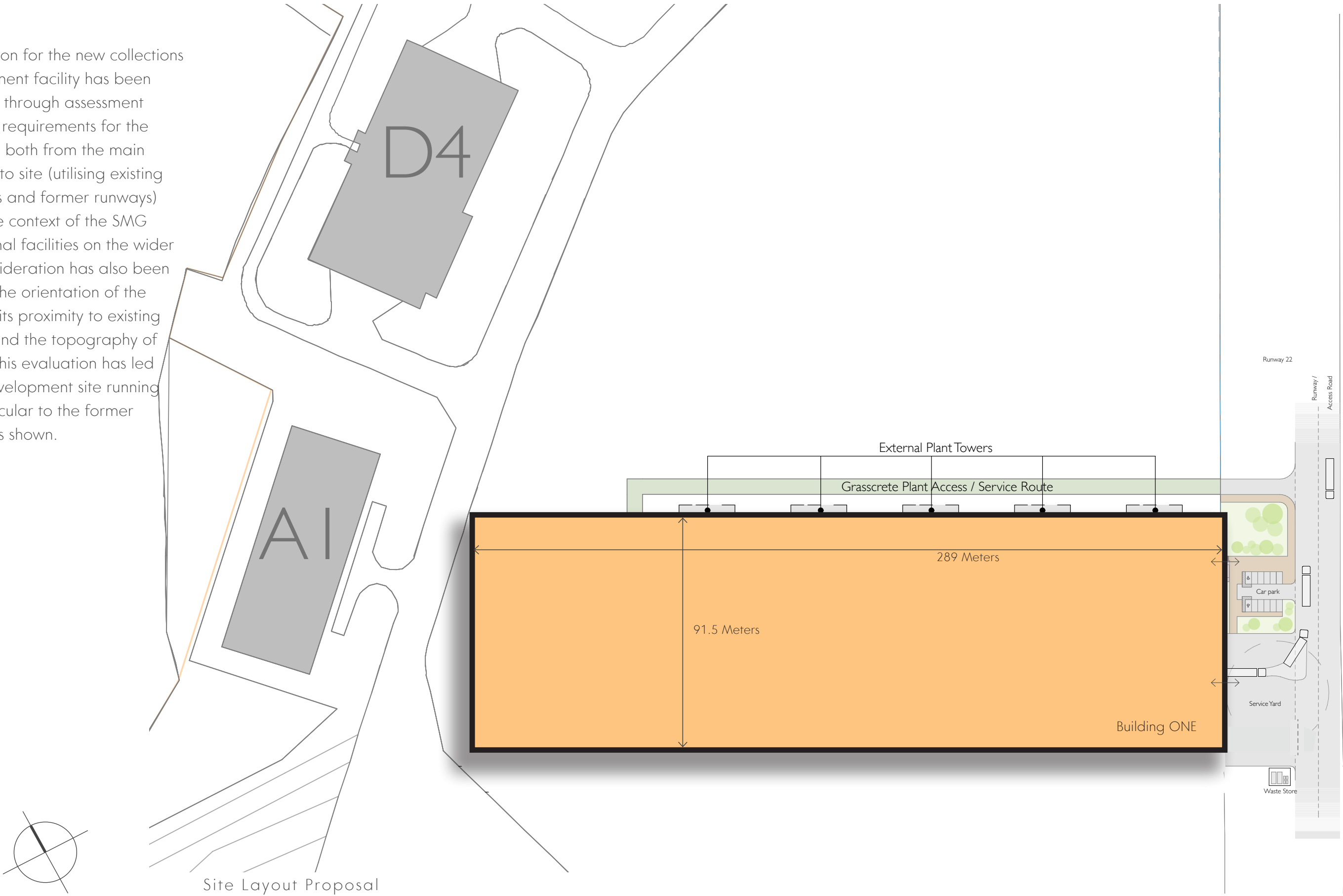
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### Design Principles – Building Location

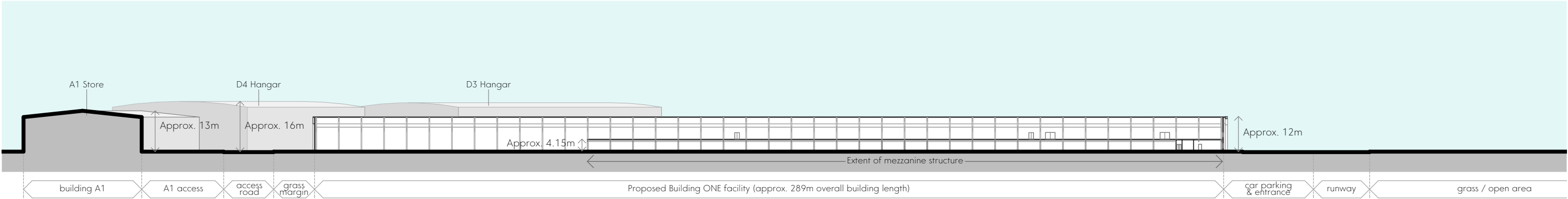
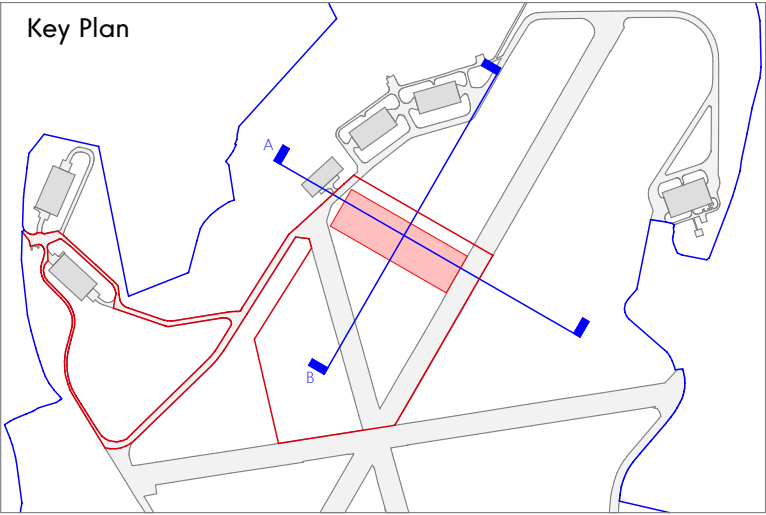


3.1 BUILDING LOCATION & DEVELOPMENT

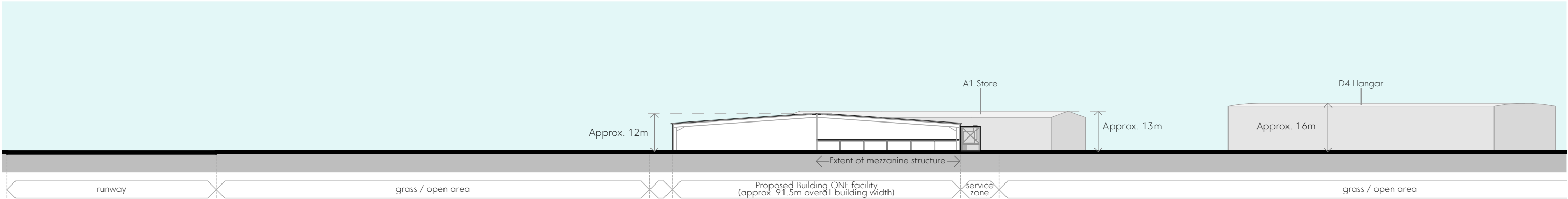
The location for the new collections management facility has been identified through assessment of access requirements for the building - both from the main entrance to site (utilising existing roadways and former runways) and in the context of the SMG operational facilities on the wider site. Consideration has also been given to the orientation of the building, its proximity to existing services and the topography of the site. This evaluation has led to the development site running perpendicular to the former runway as shown.



3.2 PROPOSED SITE SECTIONS



Site Section A



Site Section B





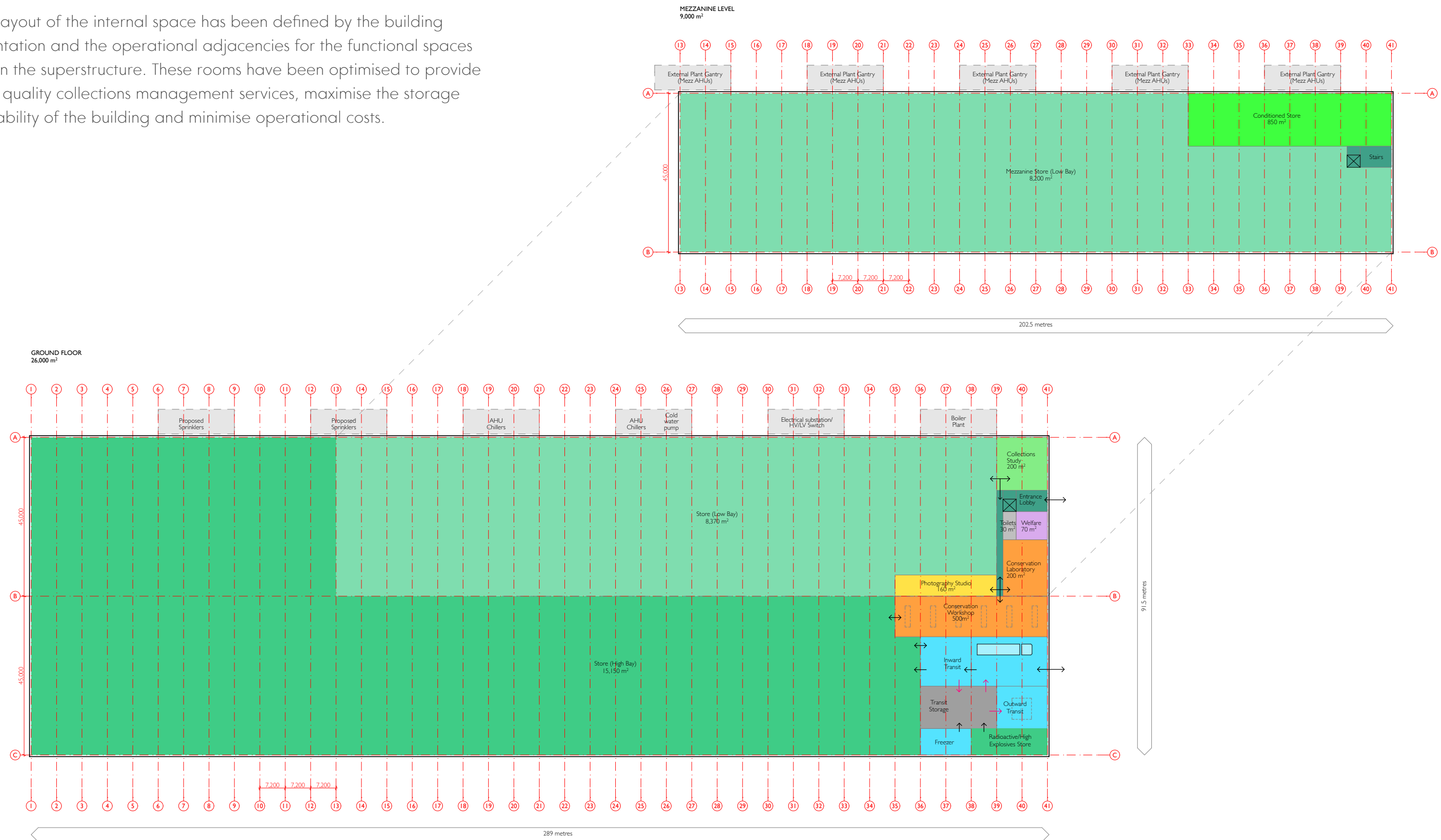
## Section 4.0

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### Design Principles – Building Layout

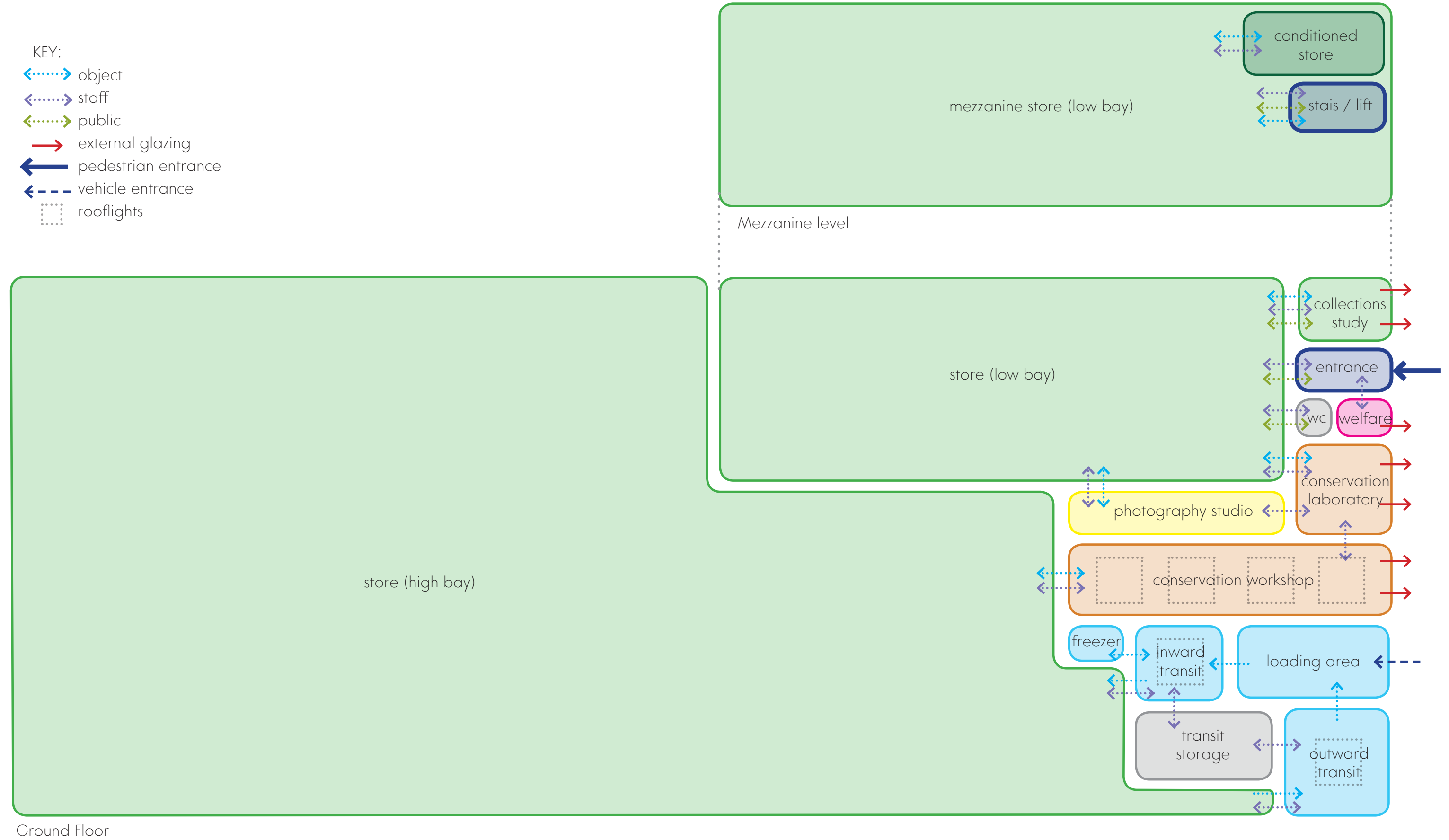
4.1 INTERNAL ACCOMMODATION LAYOUT

The layout of the internal space has been defined by the building orientation and the operational adjacencies for the functional spaces within the superstructure. These rooms have been optimised to provide high quality collections management services, maximise the storage capability of the building and minimise operational costs.

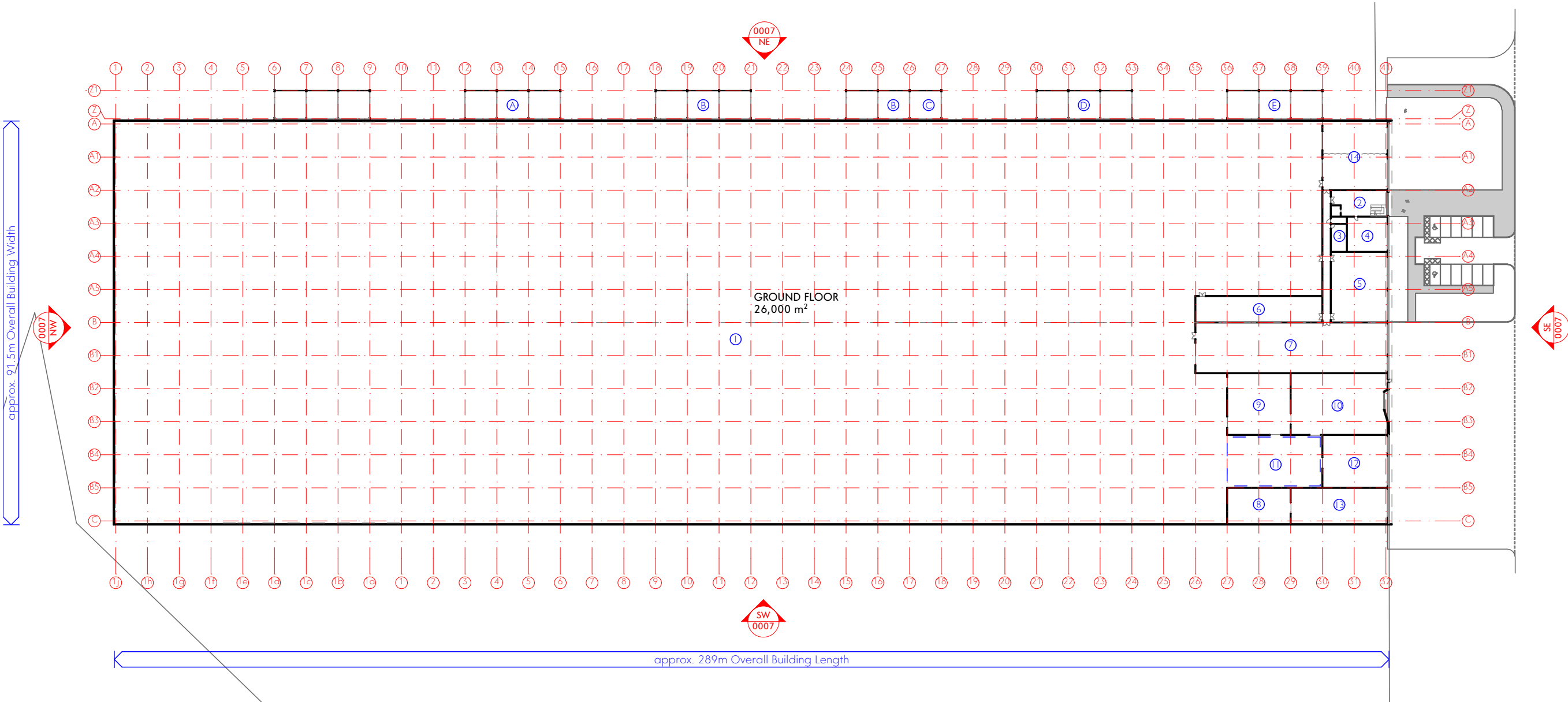




4.2 FUNCTIONAL ADJACENCIES



4.3 GROUND FLOOR PLAN



Ground Floor GA Plan

NOTES

Room Types:

1. Object Store (23,534m²)

2. Entrance Lobby (75m²)

3. Unisex & DDA toilets (30m²)

4. Staff Welfare Suite (70m²)

5. Conservation Laboratory (200m²)

6. Photography Studio (160m²)

7. Conservation Workshop (500m²)

8. Freezer (116m²)

9. Inward transit (250m²)

10. Loading bay (320m²)

11. Transit storage (260m²)

12. Outward transit (200m²)

13. Special Collections Store (160m²)

14. Collections Study (200m²)

External Plant Allocation:

A. Proposed Sprinkler

B. Chiller compound

C. Chilled Water Pump

D. Electrical Sub Station/HV/LV Switch rooms

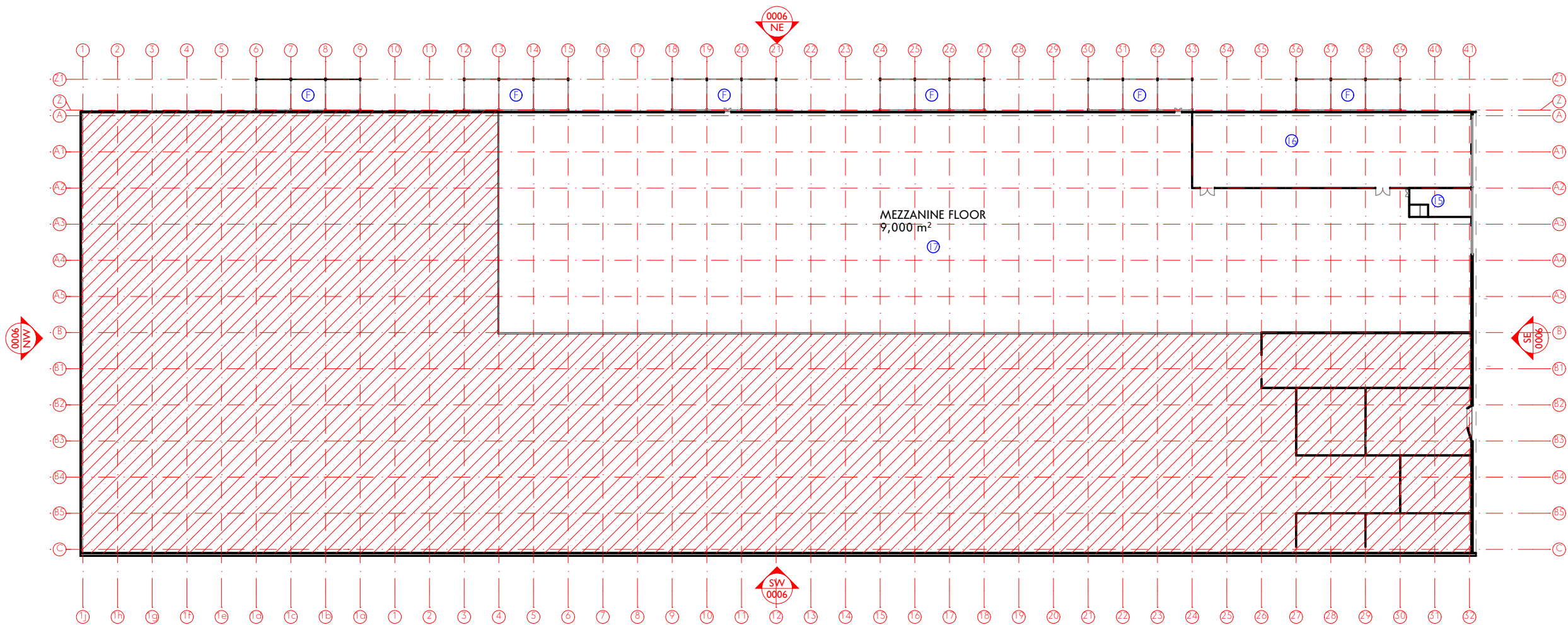
E. Boiler house

ALL PLANT LOCATIONS TO BE COORDINATED WITH BUILDING SERVICES ENGINEER

Transit storage Extents



4.4 MEZZANINE PLAN



Mezzanine Floor GA Plan

NOTES

Room Types:

15. Mezzanine lobby (65m<sup>2</sup>)

16. Conditioned Store (904m<sup>2</sup>)

17. Mezzanine Store (Low Bay) (8,200m<sup>2</sup>)

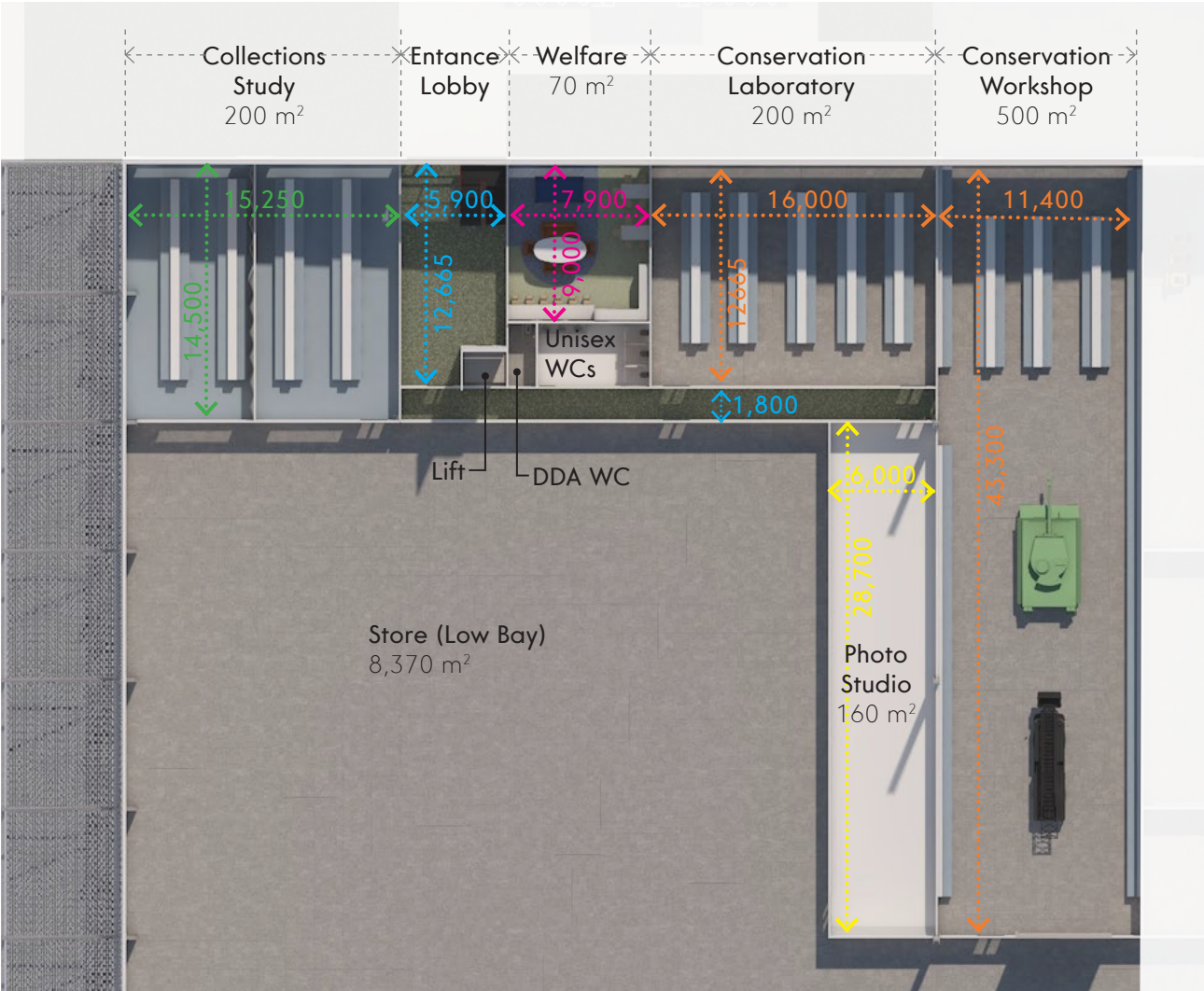
External Plant Allocation:

F. Air Handling Units

ALL PLANT LOCATIONS TO BE COORDINATED WITH BUILDING SERVICES ENGINEER

Void space

4.5 SUPPORT SPACE LAYOUT



Ground Floor



Mezzanine Level



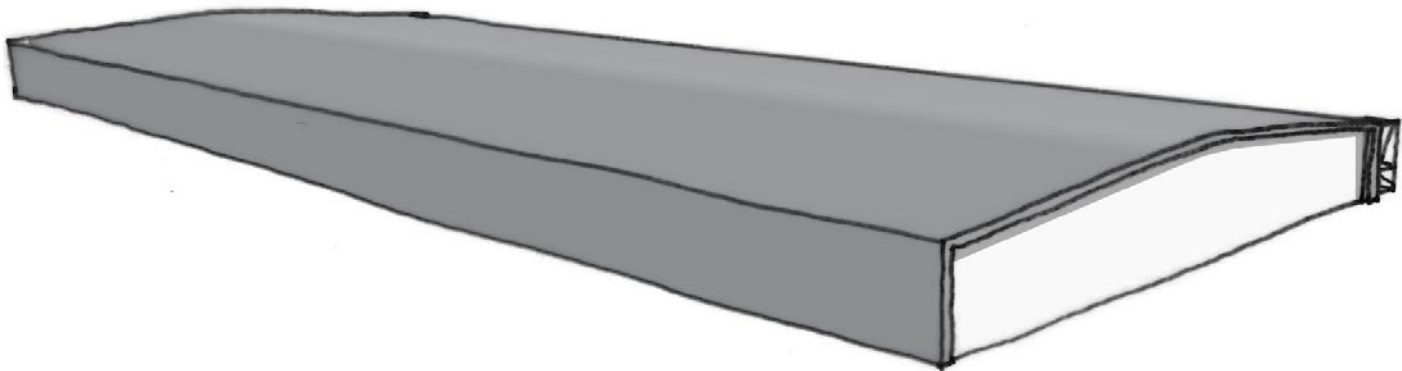
The background of the slide is a photograph of a museum interior, featuring a large aircraft fuselage on display. The image is overlaid with a solid blue color. The text is white and positioned on the left side of the slide.

## Section 5.0

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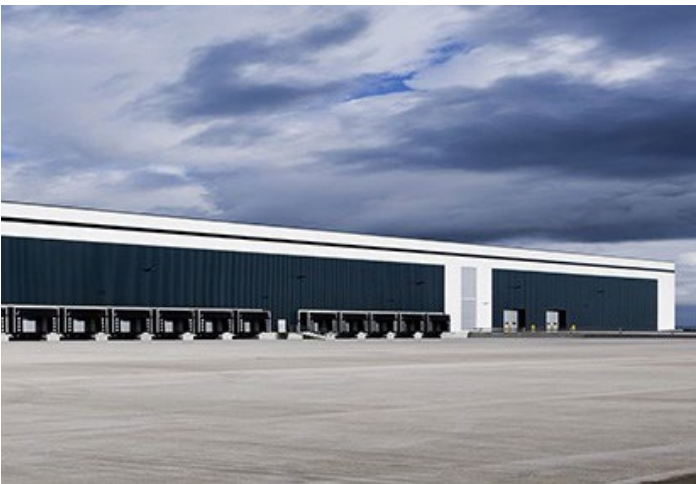
### Design Principles – Building Form

5.1 ROOF & FORM



ROOF & CLADDING

- Industry standard approaches to design of this building are essential to produce a cost effective structure for SMG.
- Constructed around a portal frame, a shallow sloping roof will fall from a ridge height of approximately 12m to an external eaves of approximately 8m.
- Longitudinal walls will be clad in the same fabric as the roof and wrap over the south-west and north-east elevations, Gable walls will be similar in colour and nature.
- The roof and external walls will likely be sinusoidal cladding in muted colours. Designed to blend in with the ground from the elevated viewpoints surrounding the site and minimise its visual impact.
- Highly focused proprietary warehouse materials are being used to create construction efficiencies, drive sustainability and maximise storage capacity.





## 5.2 EXTERNAL PLANT STRATEGY

### REQUIREMENTS

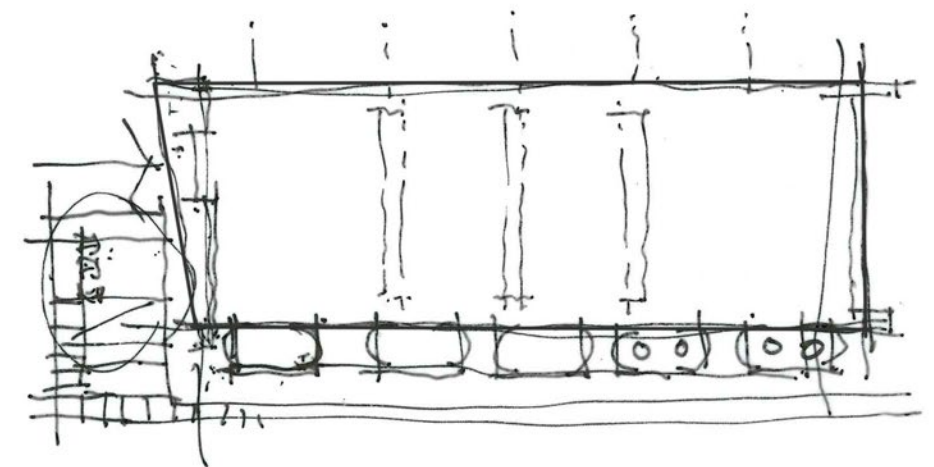
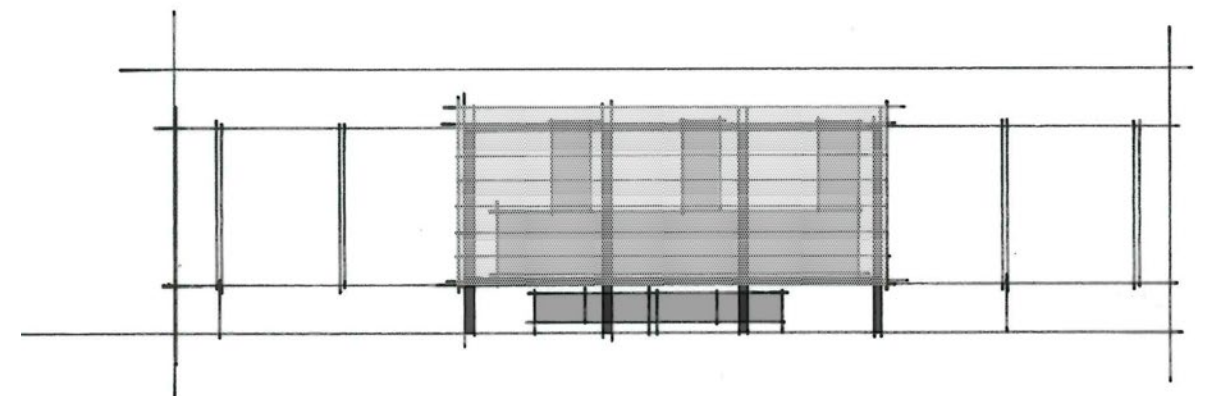
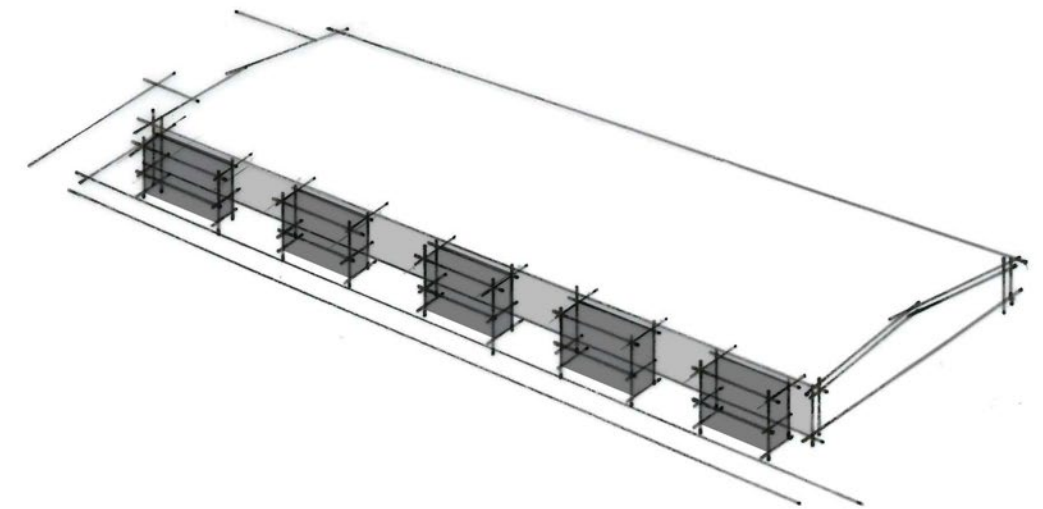
This building is being designed for the storage of collections protected under the National Heritage Act (1983). SMG has specific requirements to meet the needs of the collection. These include (amongst other elements): humidity control and an air-tight structure to provide an internal condition meeting the brief specifications; good levels of security; fire detection and minimised risk of leaks/water ingress. By installing the plant externally to the main structure of the building the following benefits are derived:

### ACCESS TO PLANT

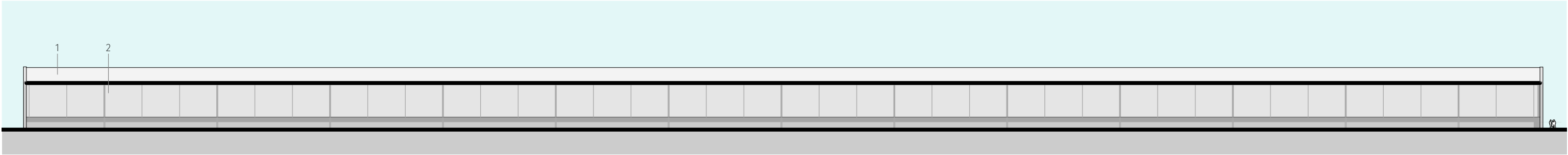
- Externally mounted plant and services can be easily installed, accessed, maintained and replaced from the perimeter of the building.
- This reduces the need for maintenance staff to enter the main building to maintain & service plant.
- Improves security of the collection by reducing the number of personnel who access the building for maintenance.

### EQUIPMENT, PERFORMANCE & SAFETY

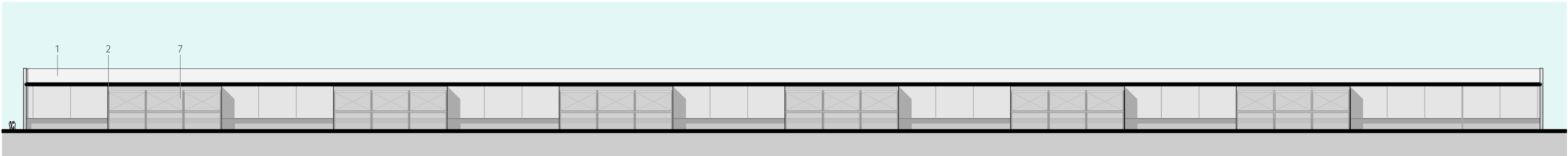
- Air handling units mounted externally have a ready supply of fresh air for intake, reducing the quantity of ducting and improving their performance.
- Minimises the number of penetrations to the building envelope, which improves the performance of the building envelope.
- Maximises the internal space for the storage of the collections.
- Reduces risk of damage to the collection caused by potential leaks & faults of the equipment, minimises fluctuations in humidity and helps to manage vermin and pest control.
- External plant is naturally ventilated – protecting against unwanted heat gain within the building and reducing the need for additional ventilation.
- Limits the risk of a fire inside the main store should a problem with the plant arise, improving safety for the objects and people. Removes the requirement for fire rated internal plant spaces / compartmentation of plant spaces.
- Fire escape from the internal collection stores and plant areas are kept separate. Direct fire escape for maintenance personnel from external plant areas.



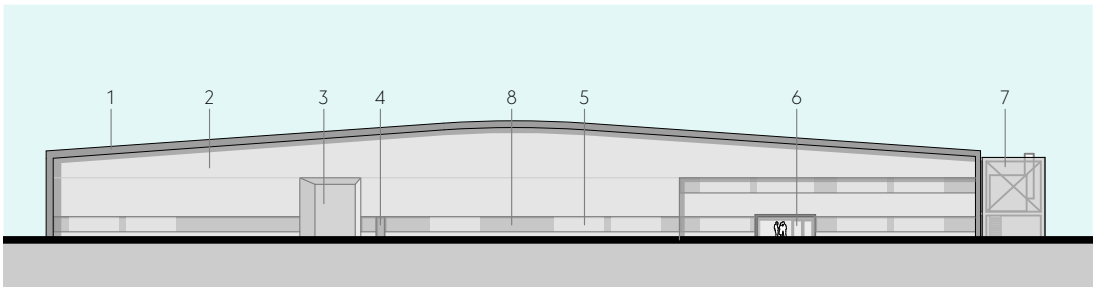
5.3 ELEVATIONS



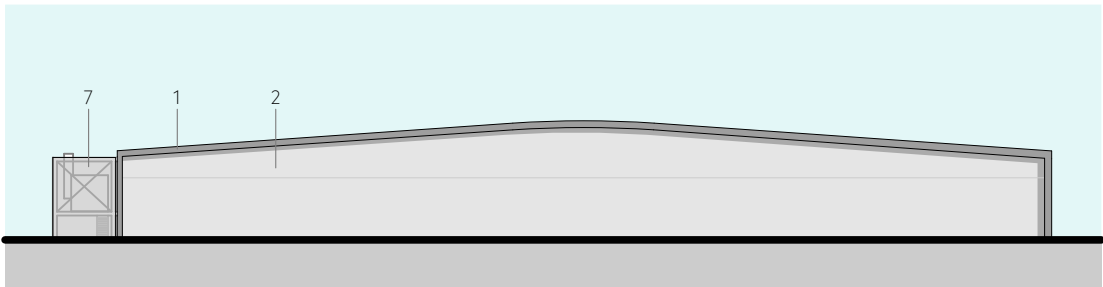
South-West Elevation



North-East Elevation



South-East Elevation



North-West Elevation

- KEY
- 1 Roof Covering
  - 2 Facade Cladding
  - 3 Loading Door
  - 4 Personnel Door
  - 5 Windows
  - 6 Pedestrian Entrance
  - 7 Plant Gantry
  - 8 Look-a-like panel band



5.4 3D PERSPECTIVE VIEW





## Section 6.0

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### External Spaces, Servicing & Access



## 6.1 EXTERNAL SPACES

The external spaces surrounding the facility will mainly be located in front of the South-East entrance elevation and consist of the following spaces:

- car parking facilities for staff and visitors
- service yard for object delivery vehicles and service vehicles
- pedestrian access routes
- limited external grassed areas

It is proposed that these spaces will be developed within the footprint of the existing runway to the South-East of the building.

## 6.2 SERVICE ACCESS

Service (including vehicles) access to the building will be via the existing site entrance at Red Barn Gate. People will be required to sign in at the main gate, before accessing the site through a secure barrier, in line with current site operations.

Service vehicle will be able to access the service yard at the front of the facility, with sufficient space for HGV turning and parking. A Grasscrete (or similar) service route will be provided parallel to the north-east facade of the building, providing access for service vehicles to plant gantries.

## 6.3 CAR PARKING & HIGHWAYS

Vehicle access to the site will be in line with current operations - signing in via the Red Barn Gate and along the existing vehicular routes. Car parking is proposed adjacent to the pedestrian entrance on the south-east side of the building. Car parking is provided predominantly for building staff. Visitors accessing the facility by appointment will park at the existing visitor area on site, before being escorted to the proposed building.

A total of 12no parking spaces are proposed, including 2no DDA spaces.

## 6.4 HGV LOADING

HGV access for the delivery and collection of objects to be stored in the facility will be in line with current site operations and as noted in the Service Access section (6.2).

HGVs will access the facility via the service yard. A large insulated sectional roller loading door is proposed on the south-east elevation, allowing delivery vehicle to drive into an air lock area located within the building. Within this airlock, the delivery vehicles will be loaded / unloaded via forklift, pallet truck or by hand (dependant on object size). Level access will be provided to allow the vehicles to drive into the airlock. Whilst deliveries are expected to be infrequent, the service yard allows sufficient space for HGV parking in the case that HGVs are queued / waiting for the air lock to be cleared to allow for vehicle access.

The existing access routes and proposed service yard are sufficiently sized for two 18-tonne HGVs. The proposed loading door and airlock space are also sufficiently sized for access for an 18-tonne HGV, with space for loading / unloading.

## 6.5 REFUSE STORAGE

A covered refuse storage area is proposed, adjacent to the grasscrete service route and the existing runway access, for waste storage and collection. The storage area consists of space for four Euro bins, as well as space for loading and un-loading two 18 cubic yard skips

## 6.6 EXTERNAL LIGHTING

Generally the service illuminance for the external lighting installation will be in accordance with the society of light and lighting (SLL) codes for lighting and with particular reference to the CIBSE lighting guide LG6: the outdoor environment.

Careful consideration will be given to the dark skies nature of the site, reducing light spill and the duration that lighting operates.

All luminaires will be of external quality, suitable for the installed environment and be of robust design and vandal resistant. Final selection of these luminaires will be in accordance with the architect's requirements.

Each escape door will be provided with emergency lighting externally above or adjacent to the door.

External lighting will be controlled via photoelectric cell and central time clock, where applicable motion sensing external systems will be used.

## 6.7 ACCESSIBILITY

The proposals will provide an inclusive environment for the widest range of users possible within the constraints of the project. The design includes the following key features which will facilitate and enhance disabled users experience of the building:

- Provision of accessible parking bay
- Level pedestrian access walkways to the building allow two way wheelchair use
- Pedestrian entrance with level thresholds to allow access for wheelchair users into the building.
- Fire escape exits with ramped access to current standards
- Provision of an accessible WC, in line with Approved Document M standards
- Provision of fixed induction loops to relevant spaces
- All access and egress routes will be step free, limiting the need for assisted evacuation
- Provision of a personnel lift, with sufficient space for wheelchair access (including assistance)
- Provision of disabled refuge and call point within the main stair lobby.



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