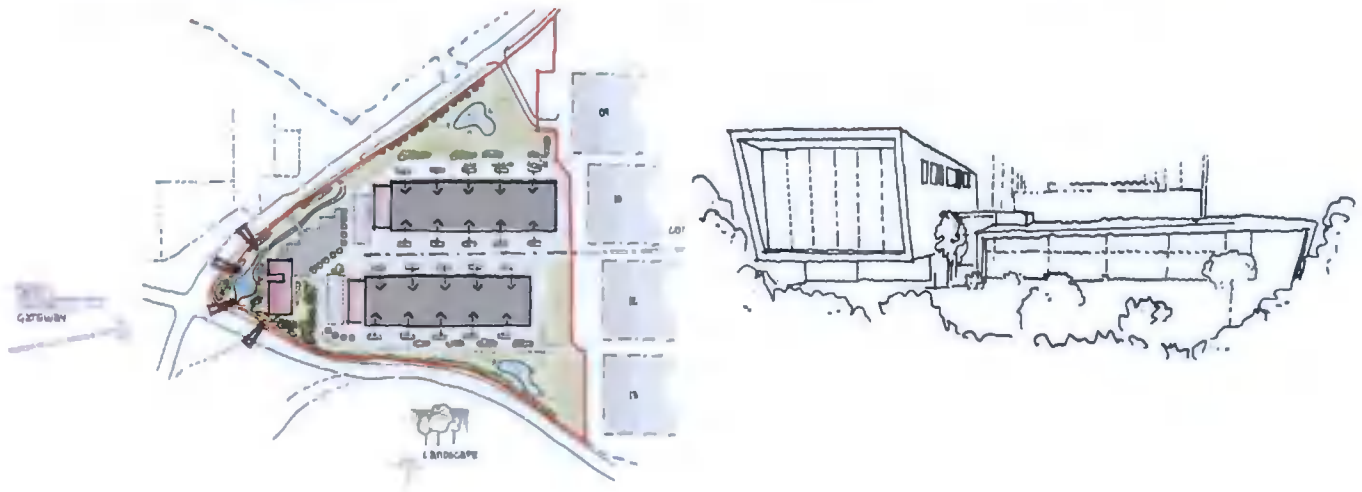
**Image has been updated from image taken from same viewpoint as previously submitted in application SD20A\0283*



Microsoft Ireland

Proposed Modifications to Previously Approved Scheme
Reg. Ref. SD20A\0283
(Proposed Central Administration Building,
2 No. Data Centres and Ancillary Works)

Grange Castle Business Park

Planning Submission

Architects Design Statement
AR-001-A

June 30th 2021

***NOTE 1:** ALL TEXT REVISED FROM PREVIOUSLY SUBMITTED ARCHITECTURAL DESIGN STATEMENT (AS PER APPROVED SCHEME SD20A\0283) IS SHOWN IN RED FONT. ALL OTHER TEXT IS INCLUDED FOR REFERENCE ONLY (AS PART OF PREVIOUS APPLICATION) – SECTIONS BELOW WHERE UPDATES HAVE BEEN INCLUDED TO **DESCRIBE THE SCOPE OF THIS APPLICATION** ARE SHOWN IN **RED FONT.**

Contents

NB: ALL ILLUSTRATIONS INCLUDED IN THIS REPORT ARE INDICATIVE ONLY, INFORMATION ON SUBMIITTED DRAWINGS TAKES PRECEDENCE IN THE EVENT OF ANY MINOR DISCREPENCY BETWEEN AN ILLUSTRATION AND THE RELEVENT SUBMITTED DRAWING

1.0 SITE CONTEXT & LOCATION

1.1 THE EXISTING SITE

Figure 1 – Subject site context

The site is located to the South West of Grange Castle Business Park in South County Dublin, with frontage along the New Nangor Road to the South and the Grange Castle Business Park Estate Road to the North. It is currently being acquired by Microsoft Ireland from South Dublin County Council.

The site is bounded to the East by the existing MS Data Centre Campus Site with one data centre to the south (DUB13) currently under construction. Access to the site is currently from the Northern internal estate road only. The access off the New Nangor Road to a private residence contained within the subject site shall be extinguished as part of the approved development SD20A\0283. Infrastructure for the Grange Castle Business Park has been developed and extended over the last two decades with the spine roads and associated services constructed in the late 1990's.

The site is located between the N4 and N7 national primary roads and is served by a good road network including good connectivity to the M50 and Dublin Airport and also the regional roads R120, R134 and R136 (The Grange Castle Road) and the road network through the Business Park.

Figure 2 Site Context to Adjacent Data Centres to the East

1.2 PREVIOUS LAND USES

Prior to the process of acquisition by Microsoft Ireland the site was composed primarily of four separate properties:

1. Used most recently as an overflow contractor's car park, previously a pitch and putt / footgolf course.

2. Triangular site (partly used for access and overflow contractor parking) formerly also a pitch and putt site, remainder unoccupied undeveloped agricultural site) comprising 4.35 hectares.

3 Private residence (unoccupied) comprising 0.25 hectares.

4. Residual portion to West of Planning Application MS Campus Data Centre Site (SD16A-0088).

5. Note that as per Approved Development SD20A\0283 the uses of the site for two Data Centres, Central Administration Building and associated works was permitted by SDCC.

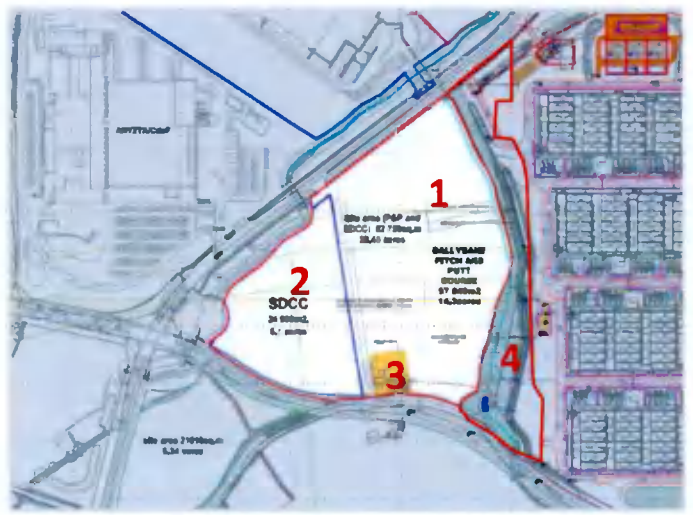


Figure 3 – Subject Site – Previous Uses

Before the above-mentioned uses, the site was used as agricultural lands.

1.3 ADJACENT SITE LAND USES

Most of the surrounding lands within the Business Park are occupied by industrial campuses including pharmaceutical, data centre and food manufacturing uses. Grifols Worldwide Operations Ltd have recently completed a biopharmaceutical development to the north of the site. Pfizer Irelands pharmaceutical campus is located to the east. In addition to Microsoft's main Data Centre Campus located immediately to the East, the company also has data centre facilities (DUB03-DUB05) located to the west. The Takeda Ireland and Aryzta (IAWS, Cuisine De France) facilities are located to the North West and West respectively. Kilcarbery Business Park is located to the east of the site.

1.4 SITE BOUNDARY PHOTOGRAPHS

View of existing stream to the West of the site

View of lower north/west boundary

View of north/west boundary

View at Western Corner of the site

View at bank of Wetland

View from New Nangor Road

2. PLANNING CONTEXT

2.1. ZONING

The subject site is located within the boundaries of South Dublin County Council. The site is zoned Objective EE: "To provide for enterprise and employment-related uses in South Dublin County Council Development Plan 2016-2022."

Under this zoning objective, Science and Technology Based Enterprises are permitted in principle. As the adjoining sites have been developed with a similar data centre use, it can be reasonably assumed that the zoning will support this use on the subject site.

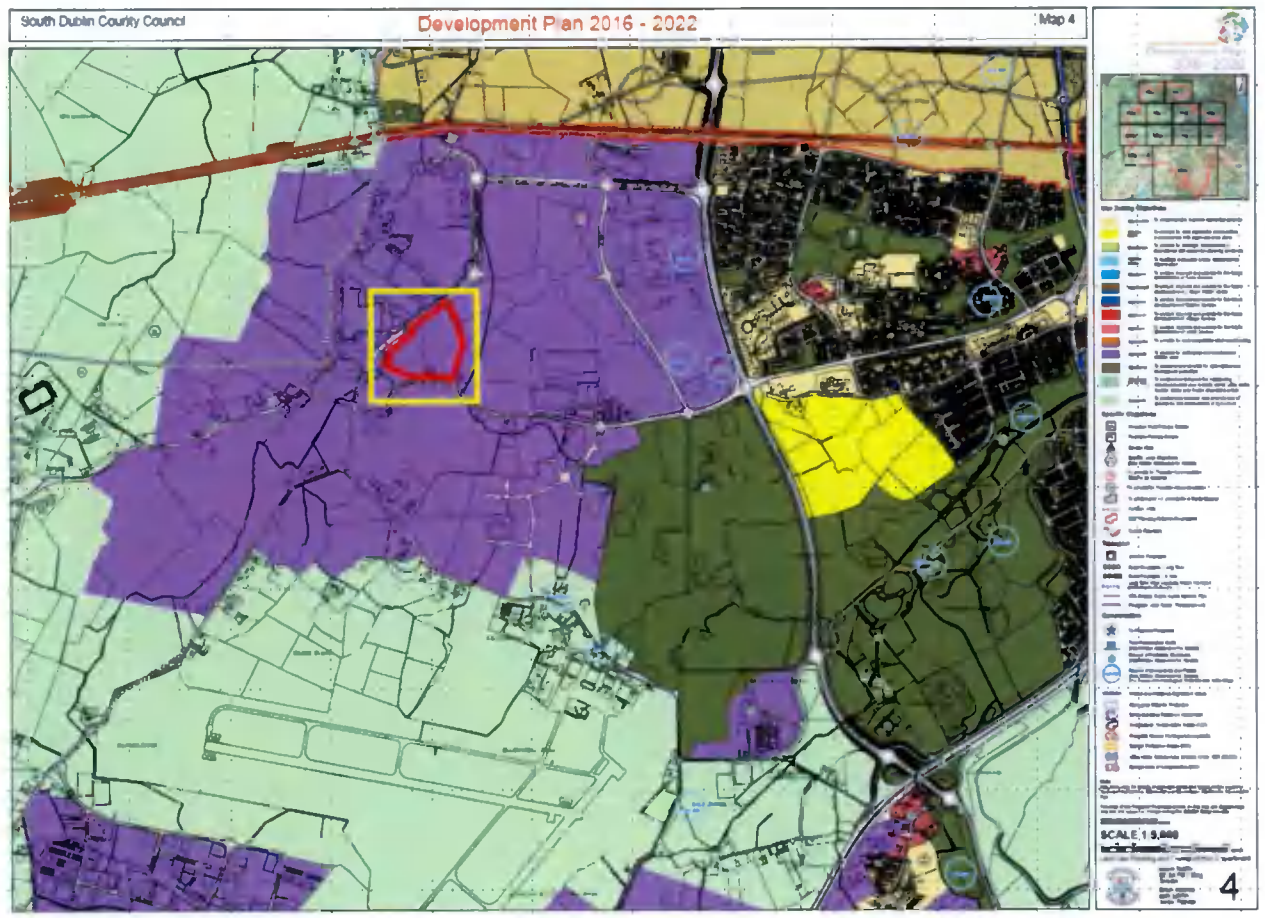


Figure 4 – Zoning Map

2.2. ESTABLISHED & APPROPRIATE USES

Over the last decade many Data Centre developments have been granted planning permission in the immediate environs of the subject site. To the immediate East of the site, we have the Microsoft Data Centre "Campus" development (Ref. D16A-0088) composed of 4 no. Data Centres. On the site immediately to the East of the "Campus Development" are 3 no. Microsoft Data Centres (DUB 06/07/08) constructed from 2015 onwards. Prior to these developments Microsoft constructed their first two data centres at Grange Castle (DUB3/04) on sites to the North West of the subject site with planning permissions granted from 2007 onward (Ref: SD07A/0632) The full planning history of Microsoft and other data centre applications at Grange Castle is contained within the Planning Report accompanying this submission.

Suffice to say that "data centre" has become a well-established and permissible building use within the immediate site context at Grange Castle Business Park.

It could also perhaps be argued that such a cluster of buildings of the same use could benefit from some diversity of function, particularly with regard to the emphasis on the "business" aspect or profile of Grange Business Park. To that end, the introduction of the proposed Central Administration Building shall provide a welcome addition to the dominant building use of "data centre" in this locality and locating this building at the point of entry to the Business Park shall serve to enhance the Park's identity as a centre for a broader range of business related use.

The existing point of entry to Grange Castle Business Park lacks any kind of architectural definition. This is in stark contrast to the large-scale volumes of the various buildings within the Park. A high-quality piece of architecture at the Park entrance would enhance the identity of the Park itself and provide some architectural presence addressing the new road junction and wetland water feature of the Griffeen River which bounds the subject site to the North.

A pre-planning meeting to discuss the proposed modifications to the previously approved development (SD20A\0283) was held on June 14th 2021. The meeting was chaired by Tracy McGibbon – Executive Planner with SDCC.

In terms of being a provider of employment it is anticipated that approximately 120 members of staff would be based within the Central Administration Building with an additional 72 spread across the proposed 2 no. data centres.

Figure 5 – View of existing entrance to Grange Castle Business Park from West (lacks definition & a distinct "Business Park" identity)

Figure 6 – View of proposed Central Administration Building including Staff Cafeteria Wing (as proposed) (image updated)

2.3. Previous Planning Conditions – SD20A\0283

"Prior to commencement" planning condition compliance submissions have either been lodged already in respect of application SD20A\0283 or will be submitted iminently. The scope of this planning application does not impact on the content of these submissions which are still valid in respect of SD20A\0283 and in respect of this application.

3. SITE ANALYSIS
3.1. SITE DESCRIPTION

The site is effectively "green field" with exception to one dwelling house and associated out buildings (to be demolished) fronting the New Nangor Road. The site could be described as triangular with its most visually prominent junction located (to the West) at the entrance to the Grange Castle Business Park. It has extensive frontage to the New Nangor Road to the South and to the Estate Road to the North. Its Eastern boundary is effectively internal as it adjoins the existing Microsoft Data Centre Campus.
The prominence of the Western corner presents great opportunities for a Gateway Building to further enhance the entrance and identity of the Business Park.

It is noted that the site contains landscape features (hedgerows & trees) of visual and ecological significance to its Northern and Eastern boundaries. In particular the Griffeen River forms a strong boundary feature to the north of the site. The river and the associated mature planting to its banks and all associated ecology are to be carefully protected as part of the approved development SD20A\0283 and the proposed development.

The North-Eastern section of the site has been altered in recent years with the diversion of an existing stream carried out by South Dublin County Council, however the hedgerows that formerly lined the banks of the stream are largely intact and again shall be retained and protected as part of the approved development SD20A\0283 and the proposed development.Part of the North-eastern area of the site have been hard-surfaced and utilised as a temporary Contractor's compound in recent times. Additional planting is proposed in the landscape design to further "thicken" the screening to the Estate Road, this is to screen the proposed relocated and expanded Water Treatment Plant to the north of the site. See revised landscape drawings by BSM (Drawings 6816_102 A & B)

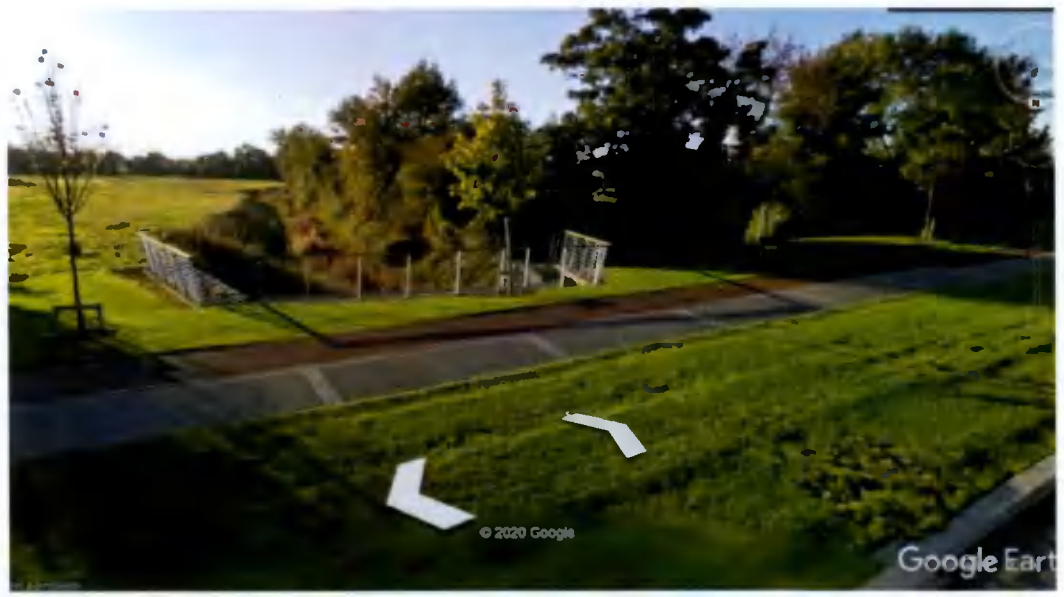


Figure 9 – Hedgerow & trees to North East of site to be retained

In terms of levels, the site is broadly flat with a slight fall (over a distance of some 300metres) along the southern (New Nangor Road) boundary toward the West of approx. 1.5m , the site also rises from North to South by approximately 2m.

The site has an extensive road frontage to the New Nangor Road to the South.
In recent times a stone and railing boundary wall has been completed to the southern boundary, this feature is to be protected & retained as part of the application.

Figures 10 – Views of existing boundary treatment to South (New Nangor Road)

3.2 CONSTRAINTS & OPPORTUNITIES

3.2.1 CONSTRAINTS

Fig. 11 Constraints

The site certainly offers more opportunities than constraints, nonetheless there were certain constraints imposed largely to do with existing site services and the requirement to satisfy the brief for prototype data centres. The attenuation area serving the existing DUB09 & DUB10 data centres would potentially clash with the proposed location for the proposed DUB14 (northern) data centre. For this reason it is proposed to relocate the attenuation area beneath the grassed area of the triangular North East Section of the site in the image below.

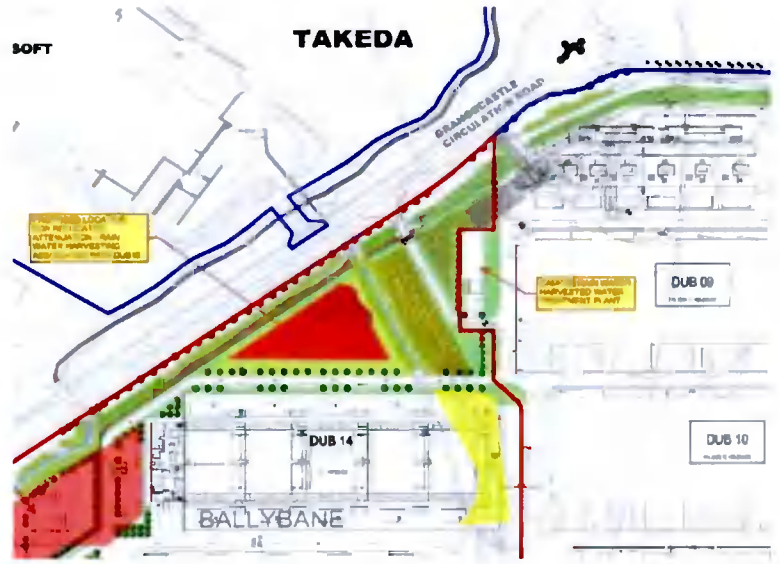


Figure 12 – Clash with Existing Attenuation (DUB14)

Yellow shaded area denotes existing attenuation zone for DUB09 / 10 would clash with building location for proposed DUB 14

Proposed zone for attenuation area for DUB09 / 10 (below ground)

Due to the prescribed dimensions (for operational reasons) for the DUB14 & 15 data centres, there would not have been sufficient space within the site to move DUB14 further West without clashing with boundary landscaping, therefore the decided approach was to relocate the attenuation to below the proposed grassed area to the North East zone of the site.

Similarly, below ground water attenuation services serving DUB12 and DUB 13 data centres affected the positioning of the proposed southern data centre (DUB15).

Figure 13 – Potential Clash with Existing Attenuation (DUB15)

Yellow shaded area denotes existing attenuation zone for DUB12/ 13 - this would clash with building location for originally proposed DUB 15

It was originally proposed that DUB15 would be located in a more easterly location as close as practicable to the existing DUB12 and the site boundary. However, the existence of underground attenuation pipes in the area shaded yellow (Figure 12) meant that the location for DUB15 needed to shift in a westerly direction by approximately 60m.

Protection of Griffeen

A stretch of the River Griffeen falls just outside of the site boundary to the North West. One key constraint in this area was to ensure that all development (including hard surfacing / car parking) was to be located at a distance greater than 10m from the top of the river bank.

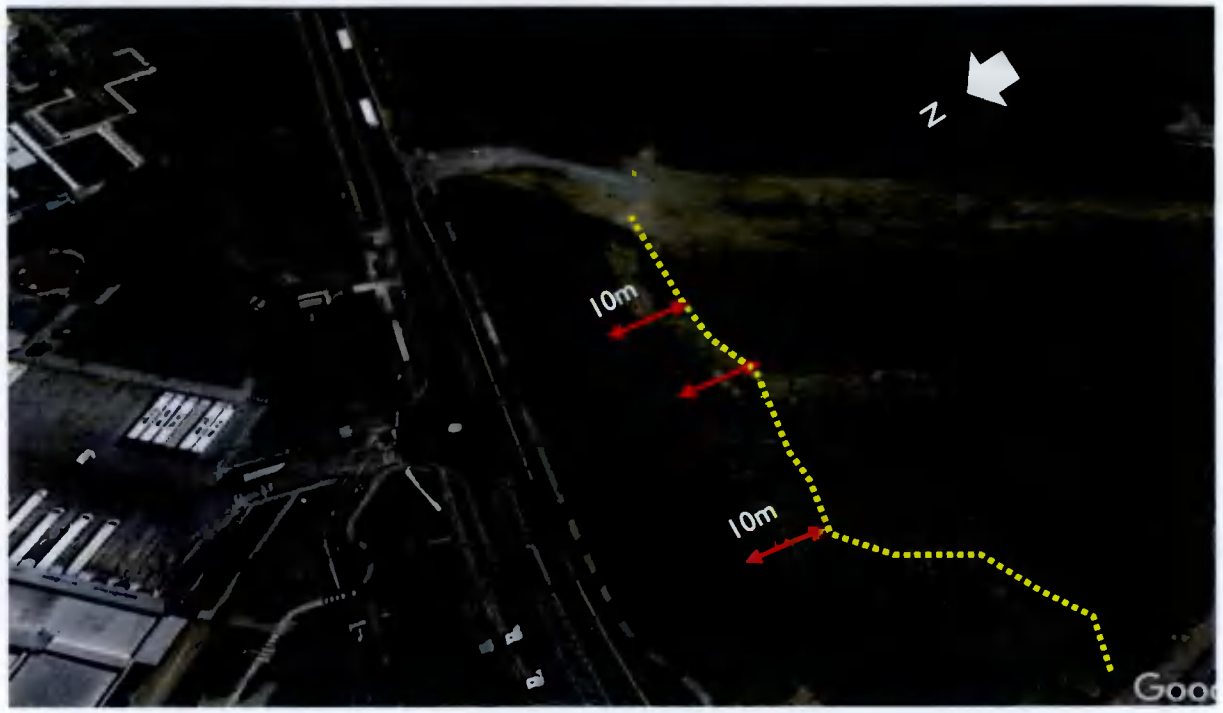


Fig. 14 Aerial View of Site Showing Griffeen & Banks – Note 10m offset

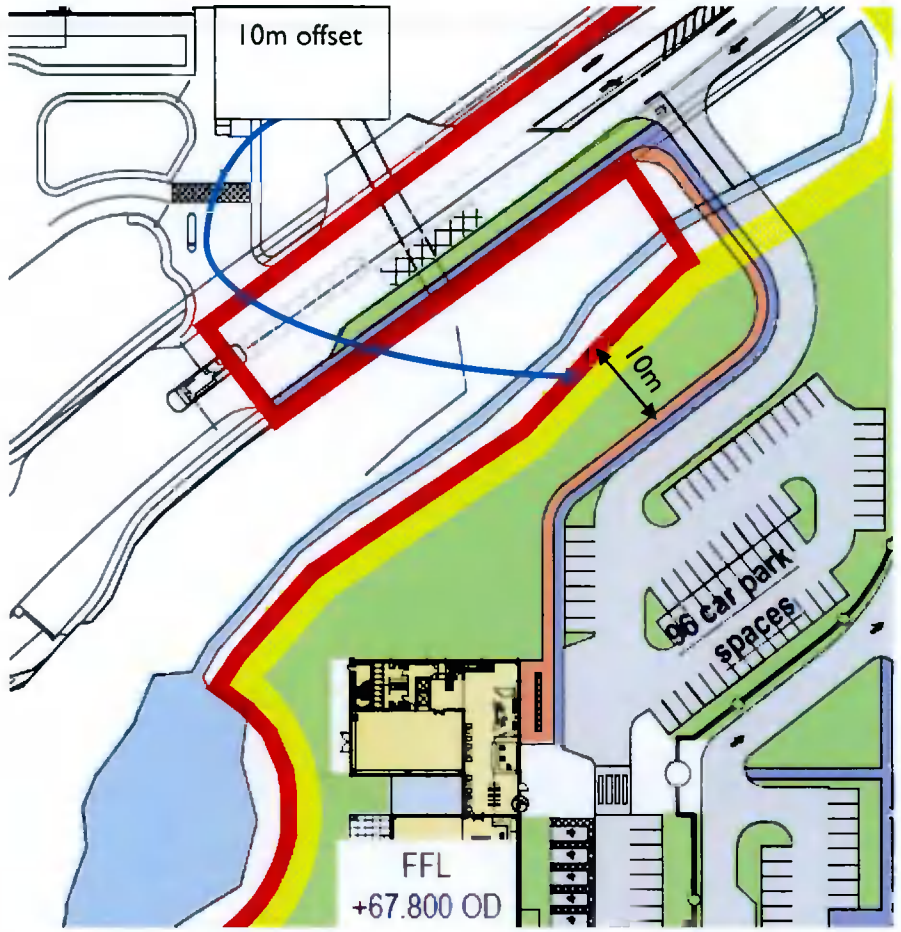


Fig. 15 Proposed Car Park Layout modified layout showing 10m landscaped margin set out from top of bank

Proposed Bridge Entrance Location

The approved development included a new vehicular entrance to the site which shall need to be formed with a new bridge structure over the Griffeen River. The proposed access location and works to the Grange Castle Business Park road network are as per the permitted development. We can confirm that the Commissioners of Public Works under Section 50 of the Arterial Drainage act have consented to the proposed bridge as of the 19th May 2021.

Alternative locations for the bridge were considered and in the development of the previous planning application proposals (SD20A\0283) and were deemed as unsuitable as the access arrangement to Arysta posed a constraint to the site's development in terms of access.

In addition (further to discussion at the Pre-Planning it further East and utilising the existing entrance to the temporary carpark.

Unfortunately this option would not facilitate the required turning radius into the Centralised Administration Building.

Another alternative location evaluated for the bridge entrance would be to utilise the existing emergency access point and construct a parallel access road outside the Data Centre secure fence line. This option was found to be unfeasible for the following reasons:

- Existing Emergency access/egress point would need to expanded.
- Increase in the extent of new road, utilities and lighting.
- Reduction in Landscape zone
- Clash with 5m wide SDCC wayleave
- Requirement for a substantial retaining wall along the Griffeen River

We can confirm that we have submitted a Section 50 application for the proposed bridge and the Commissioners of Public Works under Section 50 of the Arterial Drainage Act have consented to the proposed bridge as of the 19th May 2021.

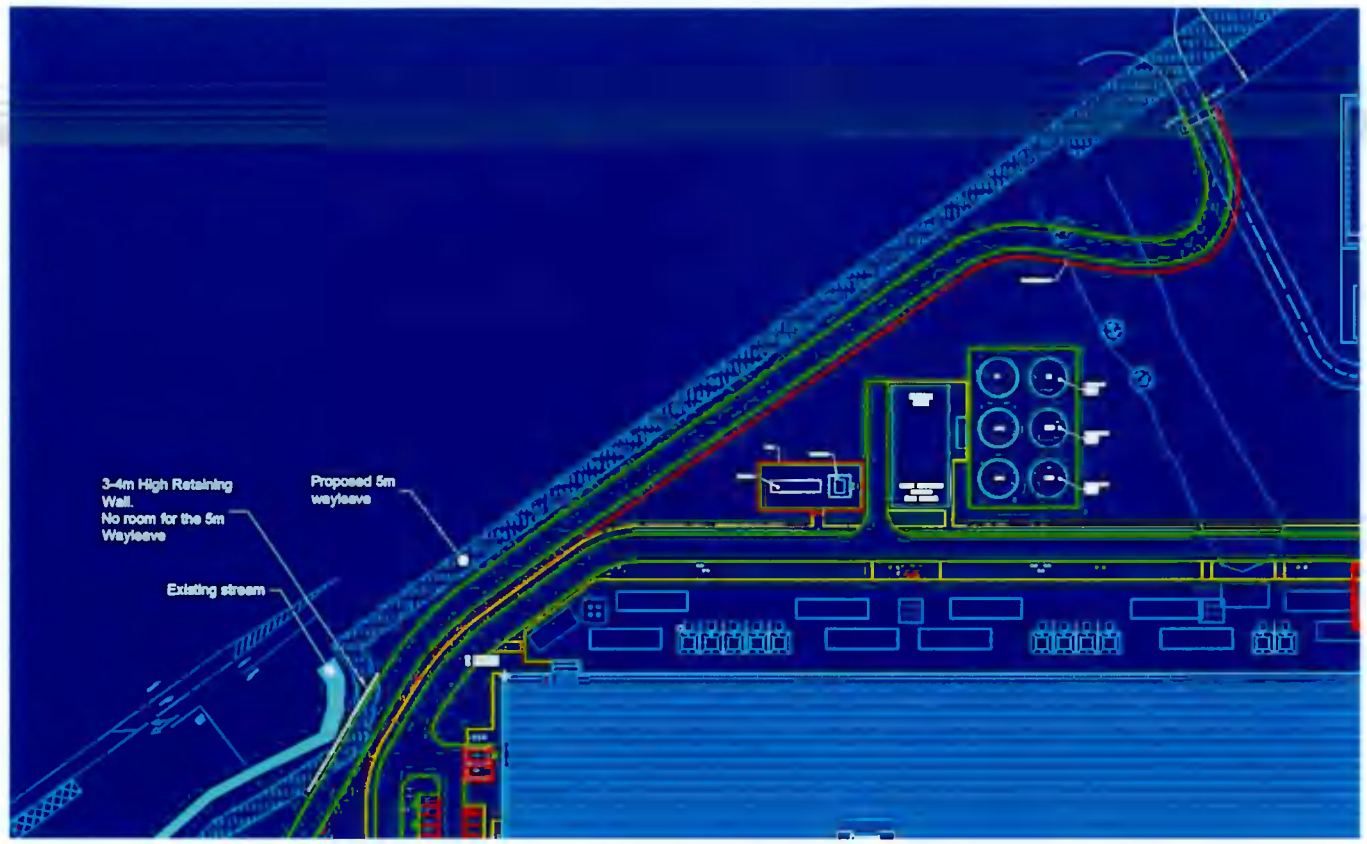


Fig. 16 Study showing the constraints preventing the feasibility of moving the Approved bridge to the East. (image updated)

Baldonnell Aerodrome Flight Path Restrictions on Building Heights

The site falls partially within the Department of Defence Inner Security Zone which sets limits on the heights of developments located within a certain radius of Baldonnell Military Aerodrome (see Fig. 17 – Extract from SDCC Current Development Plan Map showing Dept. of Defence Security Zone).

The highest elements of the proposed developments would be the external flues which expel certain emissions (created by the diesel generators) at high level. The nature and full extent of these emissions is fully detailed in the revised AWN Modelling Studies as provided as part of this planning application and EIAR submission.

Plans of the proposals including the proposed maximum heights of the flues (and proposed buildings) were issued to the Department of Defence to ascertain whether the proposed development would cause a concern. The response to our query is pasted in Fig. 18 whereby a maximum flue height of 30.75m (+98.00OD) was proposed. Robert Keane of the Department of Defence confirms that this would be acceptable – see e-mail correspondence. Note that the maximum flue heights of the proposed development have decreased in height by approximately 650mm from the heights in approved development SD20A\0283.

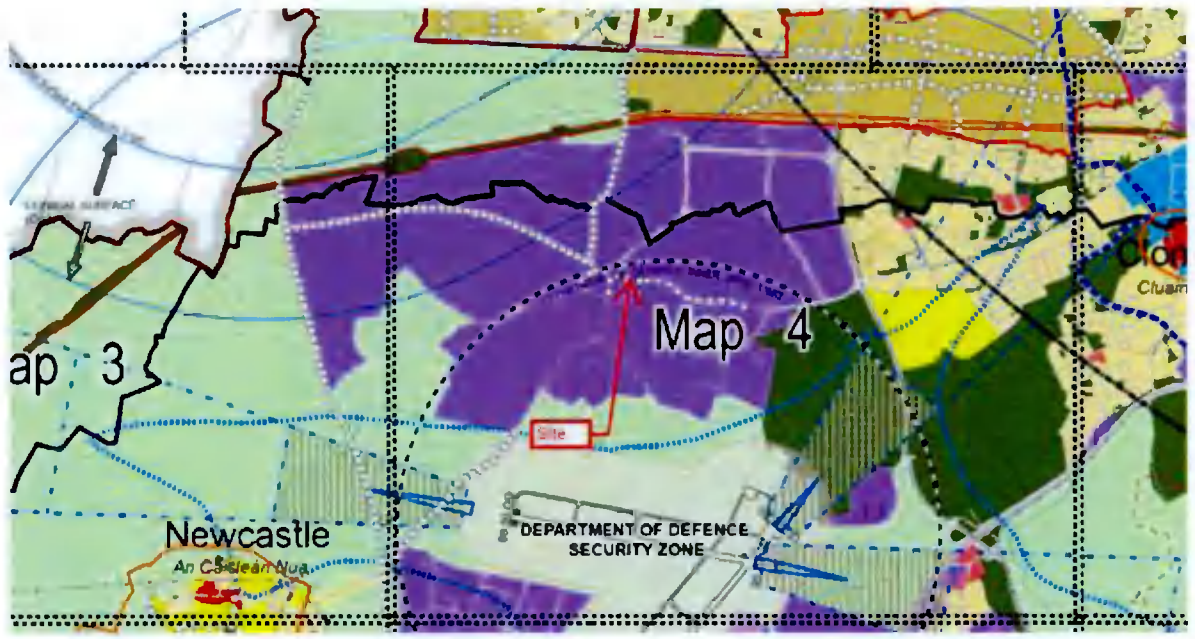
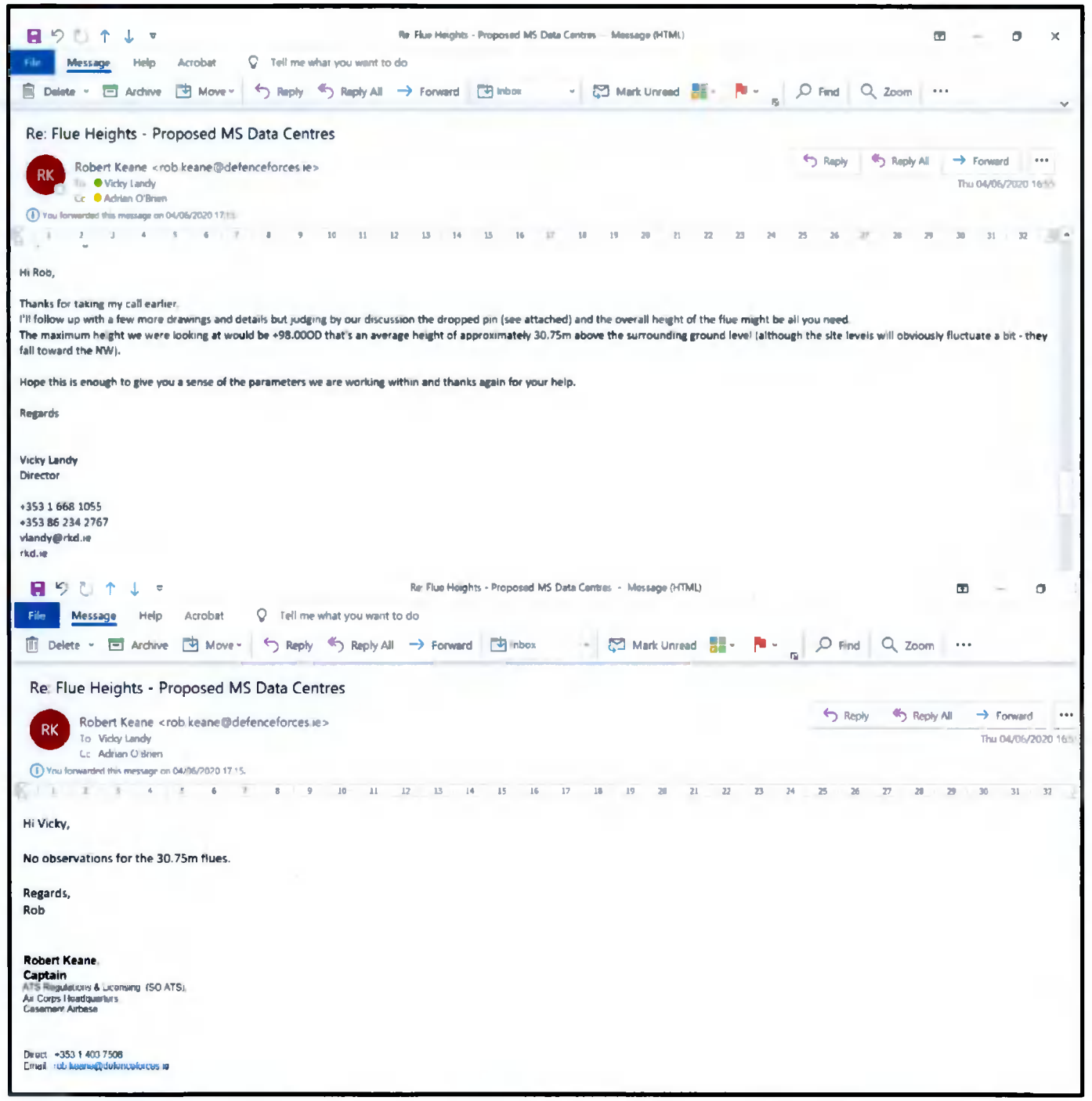


Fig. 17 Site Location shown on Extract from SDCC Current Development Plan Map showing Dept. of Defence Security Zone



Re: Flue Heights - Proposed MS Data Centres - Message (HTML)

Re: Flue Heights - Proposed MS Data Centres

Robert Keane <rob.keane@defenceforces.ie>
To Vicky Landy
Cc Adrian O'Brien

Hi Rob,

Thanks for taking my call earlier.
I'll follow up with a few more drawings and details but judging by our discussion the dropped pin (see attached) and the overall height of the flue might be all you need.
The maximum height we were looking at would be +98.000D that's an average height of approximately 30.75m above the surrounding ground level (although the site levels will obviously fluctuate a bit - they fall toward the NW).

Hope this is enough to give you a sense of the parameters we are working within and thanks again for your help.

Regards

Vicky Landy
Director

+353 1 668 1055
+353 86 234 2767
vlandy@rkd.ie
rkd.ie

Re: Flue Heights - Proposed MS Data Centres - Message (HTML)

Re: Flue Heights - Proposed MS Data Centres

Robert Keane <rob.keane@defenceforces.ie>
To Vicky Landy
Cc Adrian O'Brien

Hi Vicky,

No observations for the 30.75m flues.

Regards,
Rob

Robert Keane
Captain
Air Corps Headquarters
Casement Airbase

Direct: +353 1 400 7508

Fig. 18 E-mail Correspondence between RKD & Dept. of Defence RE. Proposed Heights of Flues within Flight Security Zone

3.2.2 Opportunities

Fig. 19 Site Opportunities

- Prominent corner location offers the opportunity to create a landmark building that will announce the entrance into Grange Castle Business Park.
- The wetland feature to the crossroads junction can be utilised to form an attractive foreground to the proposed new development.
- The Griffeen River and surrounding hedgerows to the north-east and west of the site forms strong natural boundary treatments which can be retained and incorporated into the landscape scheme while preserving the character of the site.
- The depth of the site (490m toward the East) is significant, this allows for the positioning of some plant items deep within the plant where they are less visually intrusive to the public domain.
- From an operational perspective the site is ideally located to avoid duplication of existing services and forms a continuation of the existing MS Campus located to the East of the site. This context puts the size and and scale of the proposed Data Centres very much in alignment within the existing built environment.

4.0 ALTERNATIVES CONSIDERED

4.1 ALTERNATIVE LOCATIONS

In advance of the preparation of this application Microsoft Ireland undertook a detailed assessment of a total of five no. sites (of which the subject site was one) towards determining the most appropriate location to establish the proposed two new Data Centre Facilities.

The other sites considered were:

- Newhall, Naas Co. Kildare
- Great Connell, Newbridge Co. Kildare
- Steelstown Co. Kildare
- Maynooth, Laraghbryan East, Co. Kildare

Detailed Site Due Diligence Studies and Risk Assessments were carried out on all locations. The findings of these reports contain too much detail to be appropriate for inclusion in this high-level report.
The site at Grange Castle emerged as the preferred option due to a lower risk evaluation than the other sites considered under the following headings:

- Site Test Fit Suitability
- Zoning
- Topography
- Archaeology
- Electrical Power Supply
- Water
- Fibre
- Cooling Water
- Roads
- Existing Overhead Cables
- Flora & Fauna
- Existing Water Features
- Ownership
- Permitting
- Flood Risk
- Site Access & Infrastructure

Having regard to these various environmental and development considerations, Grange Castle was considered the most appropriate location for the proposed data centres on account of the established data centre facilities in the vicinity of the site and suitable access and transport connections.

The approved development SD20A\0283 comprises effectively Phase 4 of the new data centre campus (commenced in Phase 1 with DUB06 facility). The existing site has adequate capacity to accommodate the extension and all necessary utilities and infrastructure are already in place. As such it was deemed the most suitable of the five no. sites evaluated.

Furthermore, we note that (operationally) the proposed data centres need to be located proximate to the existing data centres in order not to exceed the network lag time of 1.6 seconds for them to operate correctly.

Given the previous planning precedents and the built context now within the MS Grange Castle Data Centre Campus, it would appear that the full build-out of the MS controlled lands with the additional proposed 2 no. Data Centres is a logical strategy and would be considered appropriate to the context and in accordance with proper planning and sustainable development for the location.

The positioning of the proposed Central Administration at the entrance to the Business Park is deliberate and strategic as it is considered the most visually prominent location (within the MS controlled lands) and would provide an enhanced architectural identity to the Business Park.
Any other locations with the MS demise would have been less visible and impactful to the public realm and so were discounted as being less suitable options. It also is a sensible location strategically for Microsoft as it is located centrally within the masterplan of all of their Data Centres - to the south and East of the DUB03 & DUB04 Data Centres and to the West of the more recent Data Centre developments DUBS 06/07/08/09/10/12/13.

4.2 ALTERNATIVE DESIGN/LAYOUTS – DATA CENTRES

Under the direction of RKD Architects, a number of appraisals were carried out to determine the most effective design for the proposed two data centres, initially it was envisaged that two single storey Data Centres would be the full extent of the development i.e. the Gateway Administration building was not part of the proposed scope. Some images of these previous proposals are included below:

Single Storey Data Centres

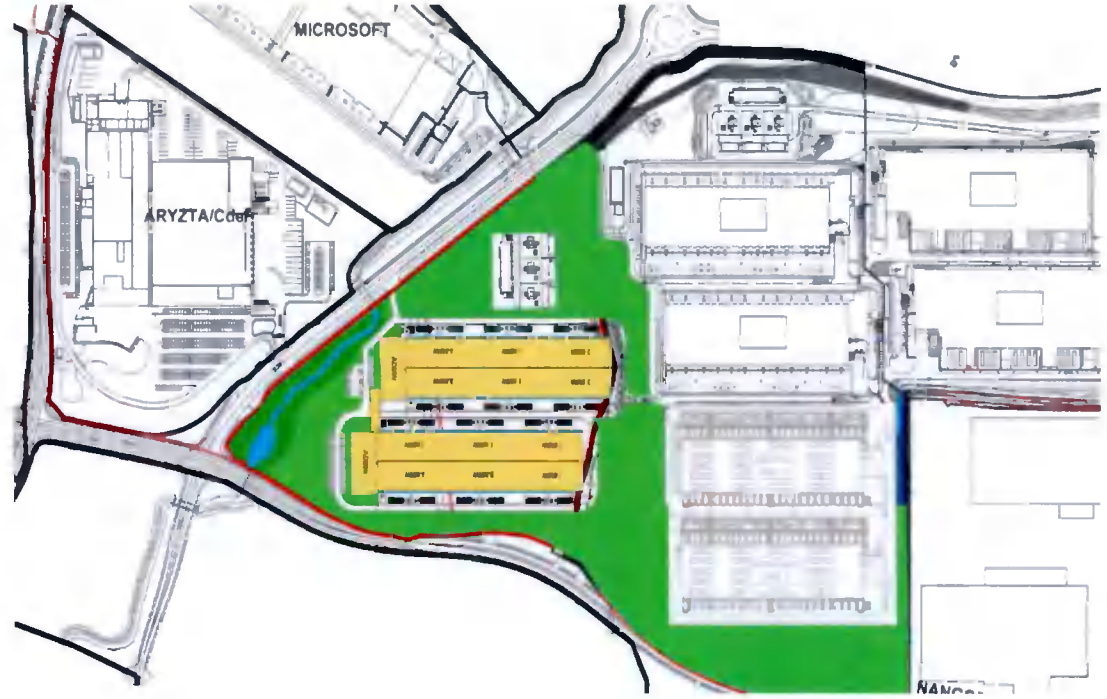


Figure 20

Option 1 – Two single storey data centres orientated East-West and sited in the centre of the site, giving ample surrounding space over to landscaping. The footprint of Data Centres is larger and less efficient than the design as currently proposed with significant visual impact to the New Nangor Road.

The positioning allows for a wide landscaped buffer zone around the data centres which supports the intention to create a parkland-like setting. However, the size and scale of the Data Centres results in a large centralised mass on the site that lacks permeability and visual engagement with the public realm. The New Nangor Road / Internal Park Road junction, the entrance to the business park in particular appears ignored with carparking the first visual point of interest past the wetland area.

The lack of a Gateway building as part of this proposal leaves the development lacking a focal point, both visually and in terms of a destination for employees to avail of Staff Cafeteria and welfare facilities. In addition, the new substation to the north of the data centres lacks integration with the rest of the development, which has been addressed by conceiving it as an extension to the existing substation to the North-east.

Double Storey Data Centres

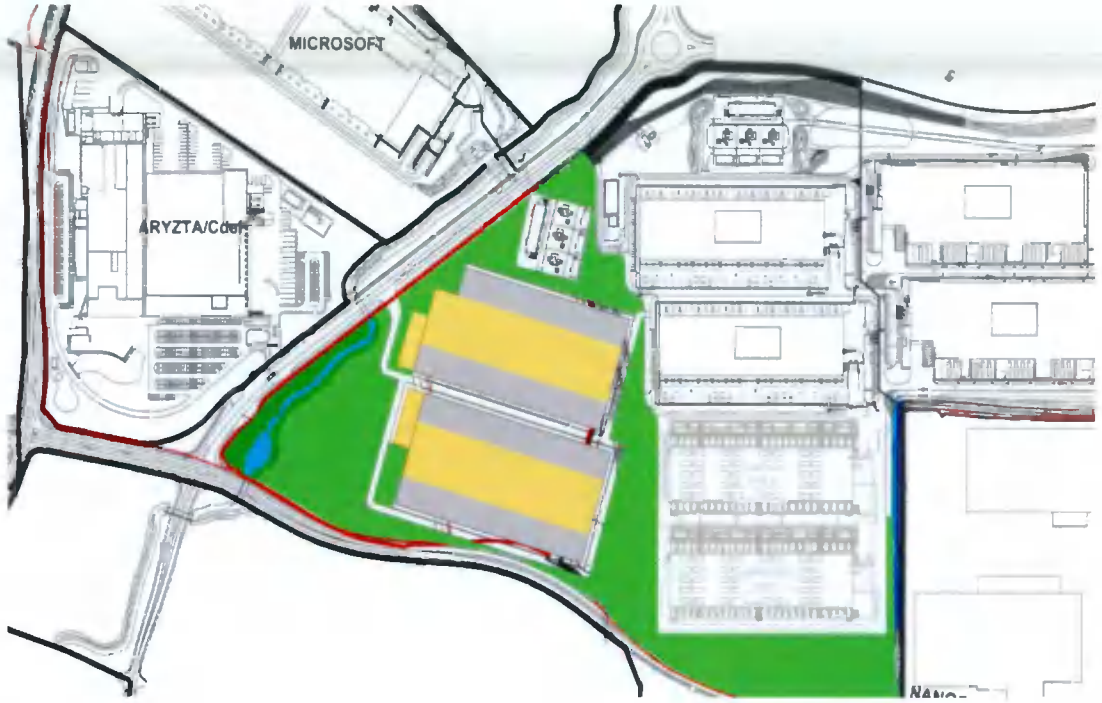


Figure 21

Option 2 – Two double storey data centres angled. Considered preferable to Option 1 as the footprint of the Data Centres has been reduced, nonetheless we concluded that this option still presented an unsatisfactory presence to the New Nangor Road / Internal Park Road junction with no Gateway Administration Building included.

The angling of the Data Centres would create a pinch point between the northern block and the existing Data Centres. Also, the southern boundary of the development would be left very close to the New Nangor road which would both increase its visual impact and potentially hinder the provision of an ecological corridor of sufficient width at the site edge.

The new substation is pushed further north where it would have greater visual prominence from the business campus road and this removes the meadow in this part of the site, left alone in Option 1. One significant positive is that while the more efficient Data Centre model reduces the footprint, the height of the double storey version also still compares favourably to the adjacent existing Data Centres.

Single Storey Data Centres and Admin. Office

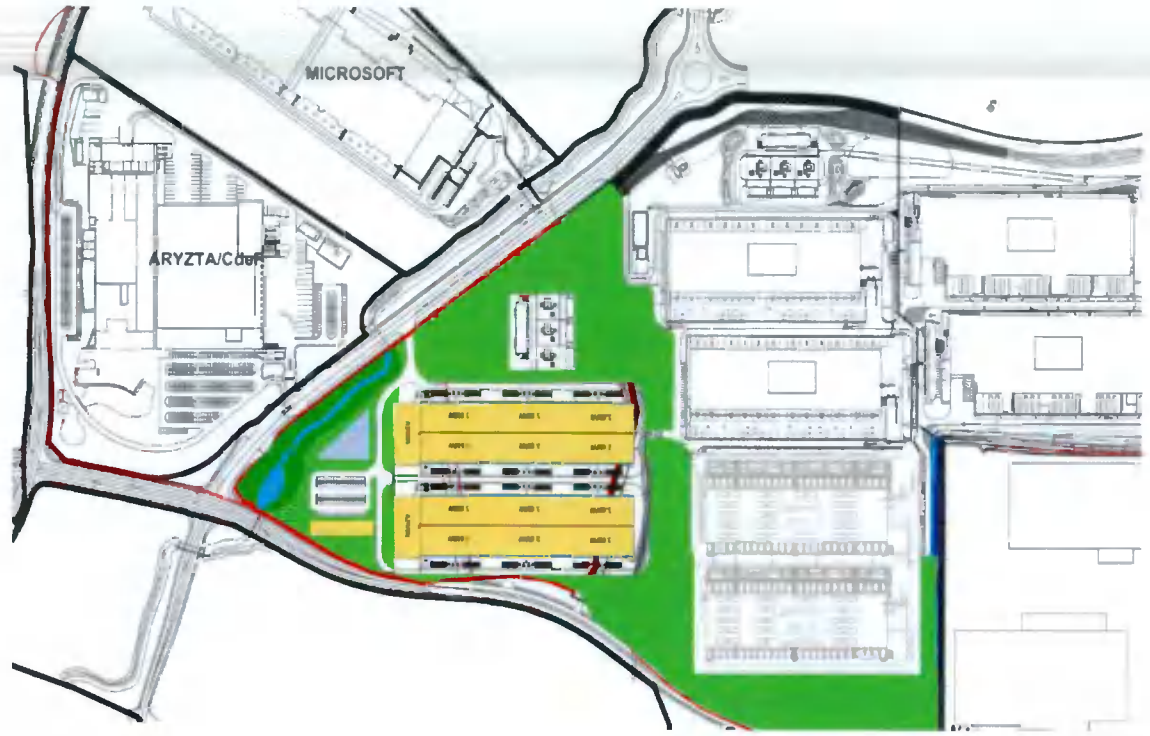


Figure 22

Option 3 – Two single storey data centres and small central administration block. This proposal introduced the concept of the central administration function serving the campus as a whole. It was felt, however, that the dominance in terms of size and scale of the proposed Data Centre Buildings would have dwarfed the proposed Administration Building, thus undermining its architectural presence and importance to the public realm. In addition, while the Administration Building faces the New Nangor Road, it does not address the junction and entrance of the business park which instead overlooks car parking.

Data Centre Options

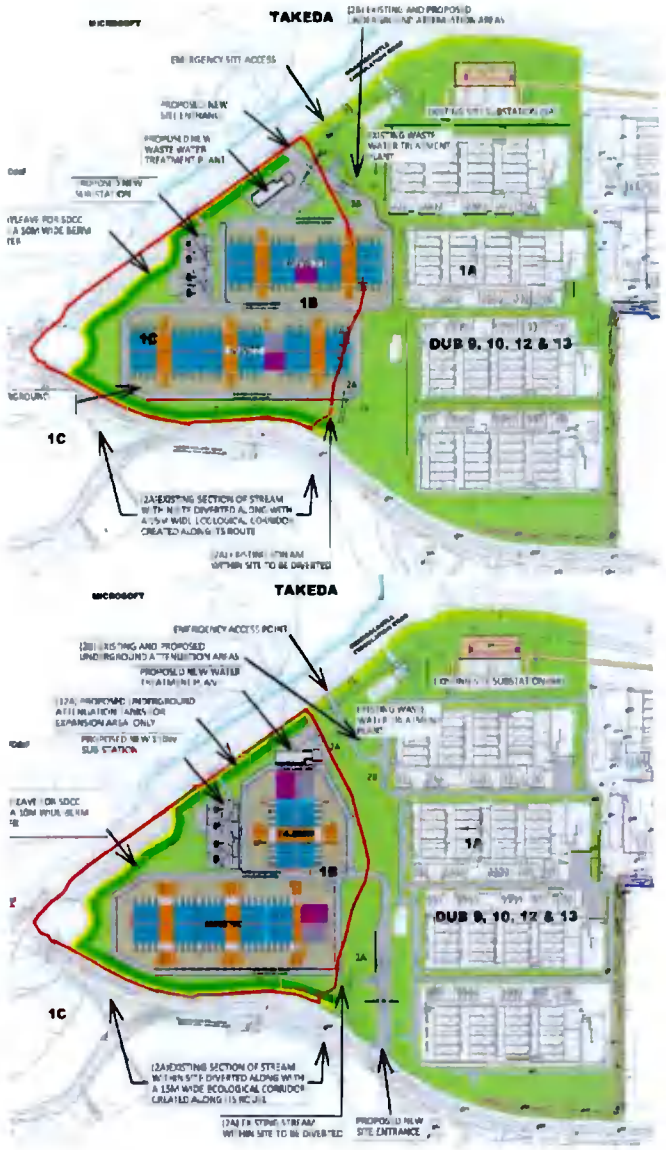


Figure 23

Options 4 & 5 – Further studies examined multiple combinations of Data Centre blocks of different capacities. These were discounted for a variety of reasons with the most prevalent being the lack of a Central Administration Building, public realm engagement, future-proofing capacity and the complication and inefficiencies inherent in constructing two different Data Centres of this scale.

4.3 Alternatives for Data Centres and including Central Administration Building

Double Storey Data Centres and Admin. Office

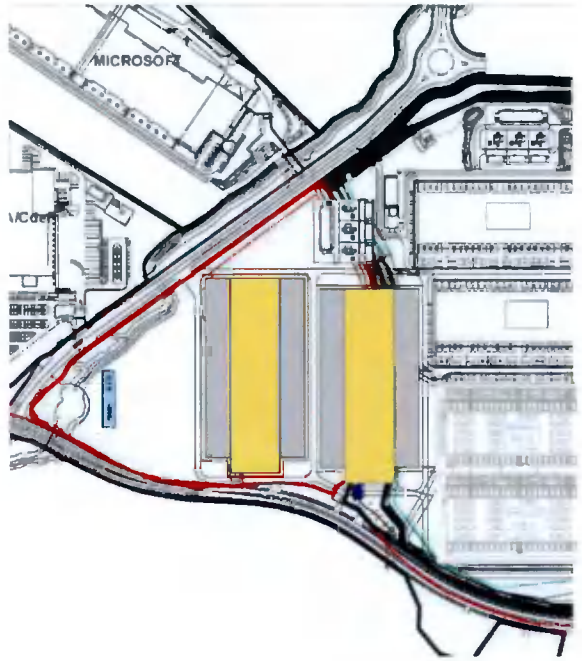


Figure 24

Figure 25

Option 6 – Two double storey data centres and small central administration block. By adjusting the orientation of the Data Centres this proposal activates the public faces of the development by locating of the facilities housing the most staff at the New Nangor Road, Internal Park Road and the park entrance at the junction of the two.

Each Data Centre features an Administration block containing offices and canteen facilities at one end, depicted in black in the above 3D image. These, along with the Central Administration block, would have greater scope for architectural expression than the main Data Centre facades and would provide a greater level of engagement with the public realm on each side of the site.

However, the Central Administration block still suffers from the same comparative scale issues in relation to the Data Centres as in Option 3. In addition, the size of the blocks created pinch points at the site boundaries, limiting the ability to create ecological corridors.

Double Storey Data Centres and Admin. Office

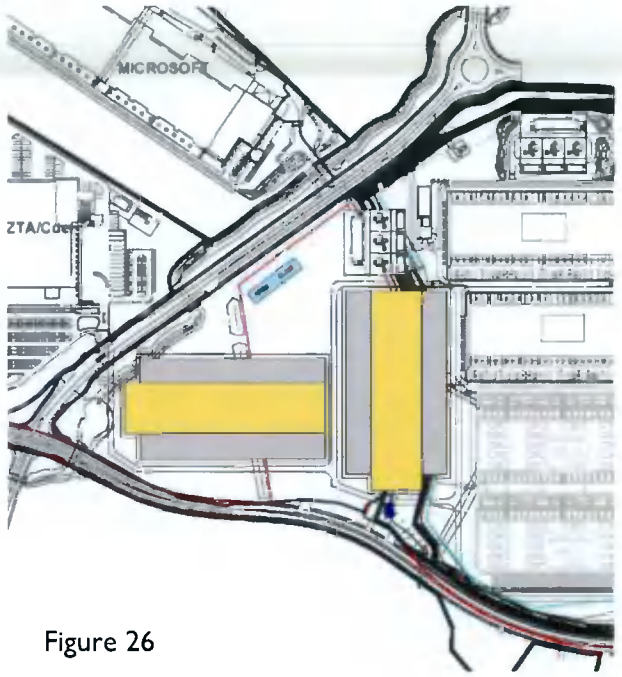


Figure 26

Figure 27

Option 7 – Two double storey data centres and small central administration block. By re-orientating one of the Data Centres and pulling the other to the West in place of the Central Admin. Block this proposal sought to create more space for an ecological corridor along the New Nangor Road.

As with Option 6 the proposal was ultimately discounted due the preference to locate the Central Admin. Block at the corner of the site, where it could address the entrance to the business park, the internal park road and the New Nangor Road all at once and act as a landmark building for the site and business park.

Double Storey Data Centres and Gateway Building

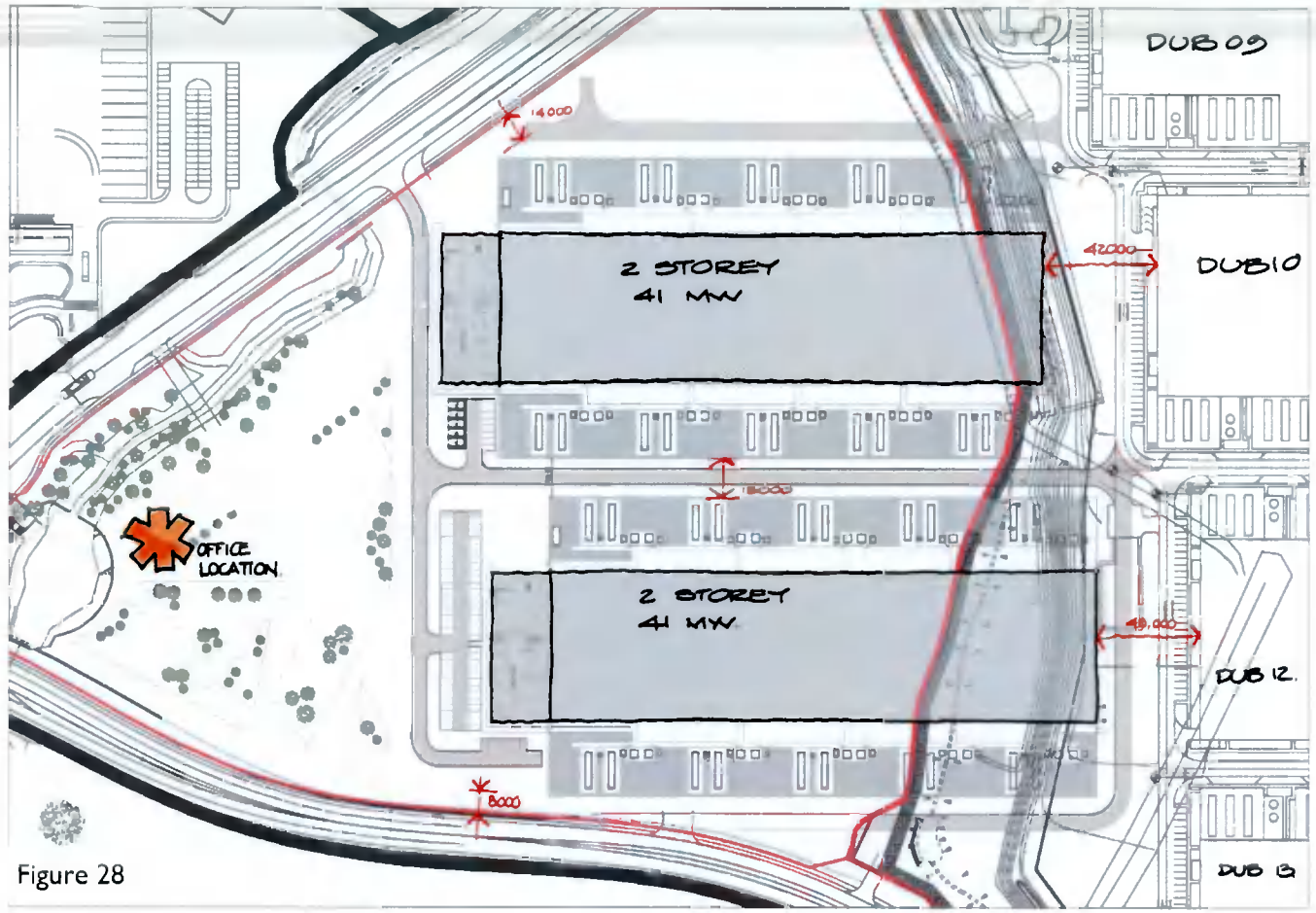


Figure 28

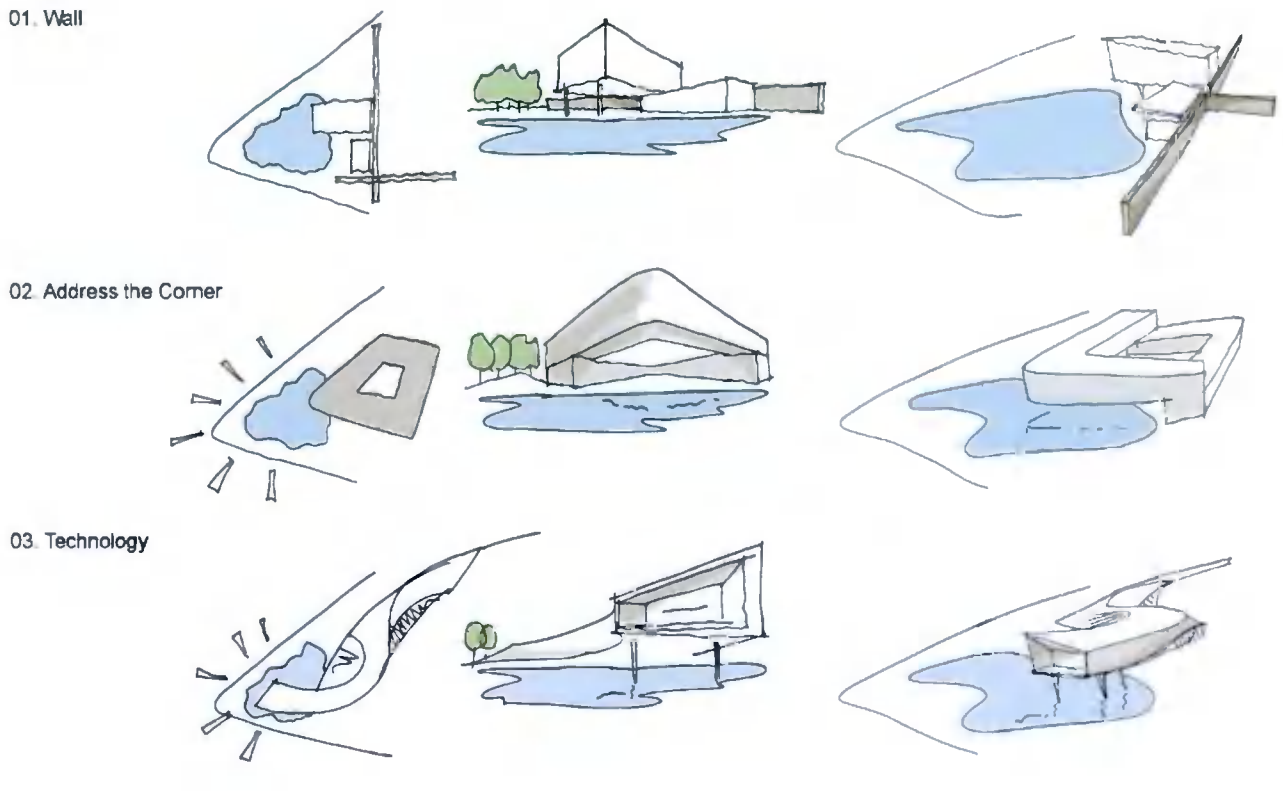
Option 8 – Two double storey data centres and a 'Gateway' Centralised administration office. This proposal settled on the proposal for a larger Admin. Block containing offices, Staff Cafeteria and welfare facilities for the entire campus. It would act as a visual and functional focal point for the site and its location at the gateway to the business park, surrounded by landscaping, would allow it to engage with the public realm on all three sides.

The model and orientation for the Data Centres was also refined, although it would emerge that an attenuation area under the Southern block would necessitate a shift to the West and a tightening of the site layout as per the final proposal.

The final building arrangement was derived from a series of site and functional studies as illustrated in the figures on the next page.

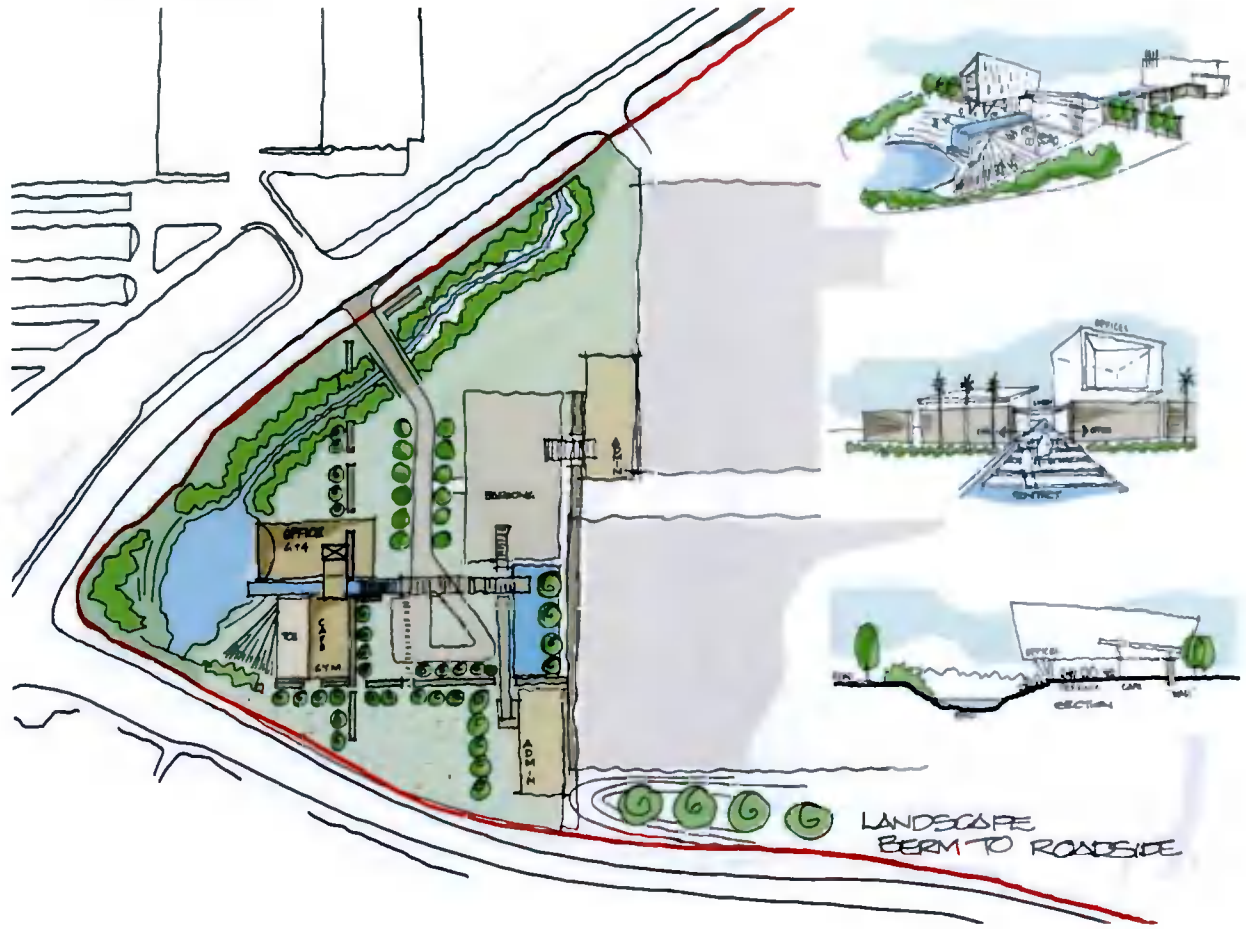
Various forms and elements were considered in relation to the Gateway Central Administration Building as is illustrated in diagrammatic form below.

Figure 29
Gateway Concepts



Given the prominent location and importance of the visual impact of this as a gateway building, a series of studies were carried out beginning with a standard 15.0m + 18.0m floor plates in simple block forms. Simple massing arrangements were carried out to produce a number of options. These were then refined into three concepts from which to determine the best solution for the site location and setting.

Figure 30
Wall and Pavilion Concept

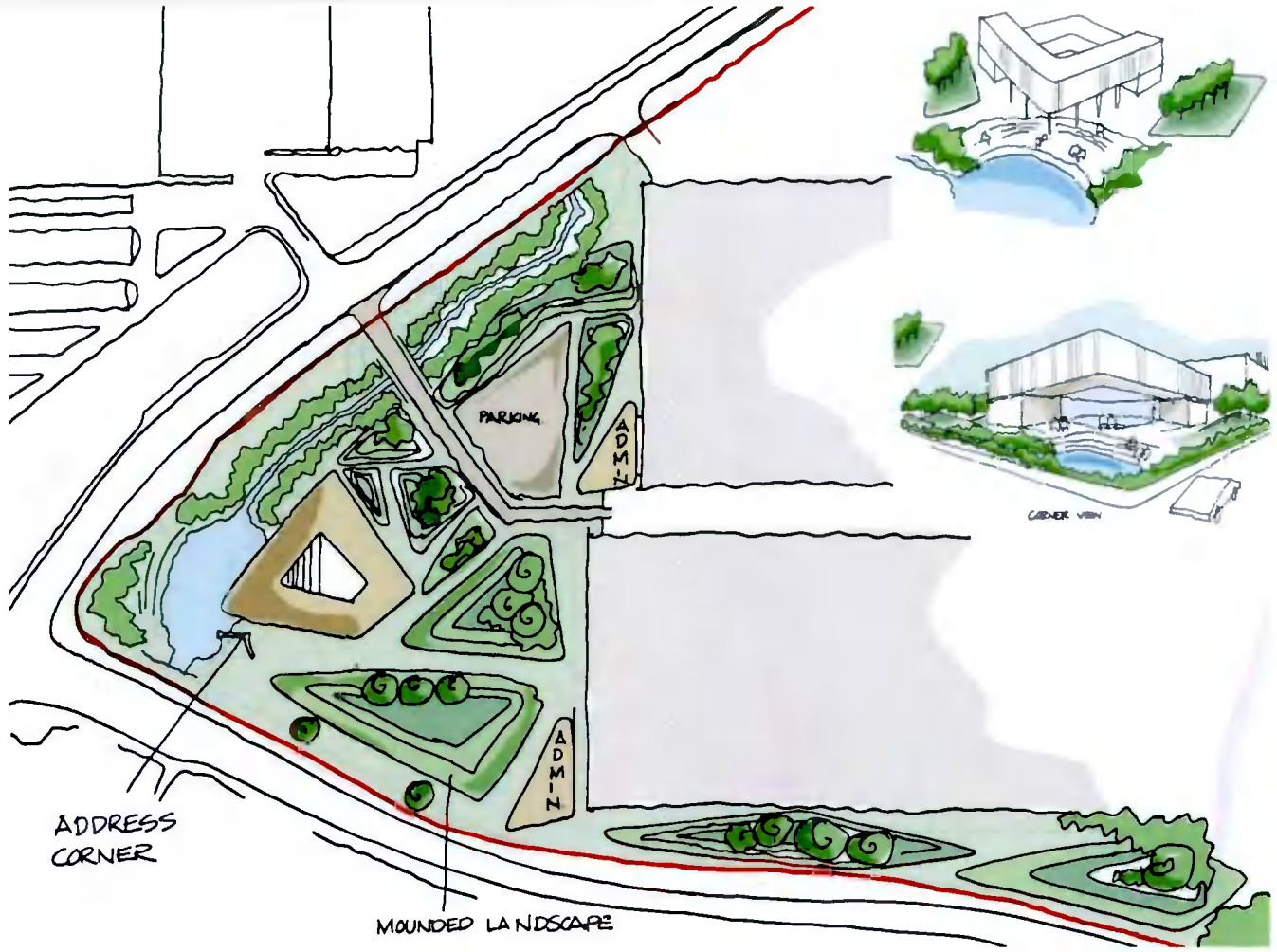


Option 1 – Proposal 01 was for landscape walls that define the spatial elements and provide a direct visual barrier to the remainder of the site.

The buildings themselves were envisioned as pavilions with a single level staff cafeteria t / amenity space opening to a terrace that flows down with a series of tiered steps to the pond below. This amenity pavilion would be balanced by the offices which overhang the terrace and wetlands. The Administration Blocks of the Data Centres would be located at the Western ends, centralising most of the staff on site.

The entrance was located between the office and staff cafeteria with a directional water feature to reflect the building within and lead the visitor through the building to the integrated landscape beyond.
The main office floor plates would be entered separately and raised to provide additional sheltered space and to convey additional presence to the street frontage. The 'wall' elements were deliberately solid in mass and continue out into the landscape to create a barrier where the buffer berms can terminate while allowing the corner to be opened up to the road junction.

Figure 31
Corner Concept

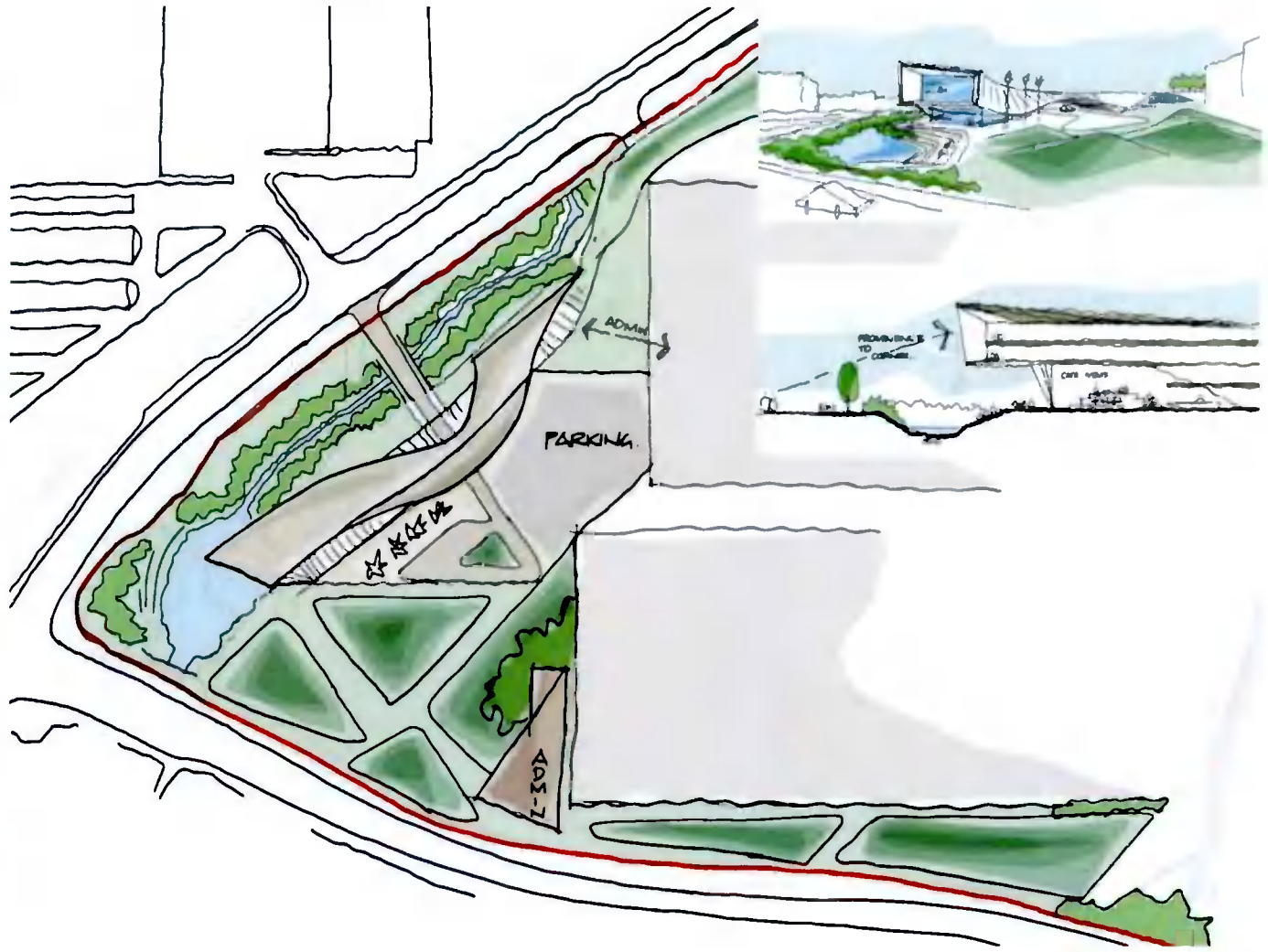


Option 2 – Proposal 02 building form was a simple courtyard typology which has been raised in the corner to give a greater presence to the street addressing all vantages of the road junction.

The raised area would be occupied by a glazed staff cafeteria / staff amenity area with access on each side from the courtyard through to the terrace and landscape features seating down to the wetlands. Landscape mounding is shown as an extension of the perimeter boundary berm treatment which can start to dissipate towards the corner opening this area more visually.

Responding to the site geometries and directly addressing the corner, this option is a striking entrance to the Business Park expressing the technological uses within. However, Option 1 was preferred both aesthetically and because it allowed for a separation of Office and staff cafeteria functions which could prove useful in the internal security arrangements of the campus. Also, flexibility was required at this point in the process with regard to the internal arrangement of the Office Building and the more regular floor plate of Option 1 was thought to offer greater workability in the brief.

Figure 32
Technology Concept



Option 3 – Took its lead from the technological advancements of the data industry with a dynamic embryonic form that sprouts from the boundary berms coming directly from the landform.

As lineal form the building rises up over the waterway to present a contemporary elevation to the road junction. The contiguous nature of the design permits the building itself to become a gateway to the site with the entrance passing through the form.

The organic character would be repeated on the administration block of the Data Centre which was proposed facing onto the New Nangor Road, as shown above. Again Option 1 was preferred for aesthetic and flexibility reasons.

5.0 Overview of Scope of Proposed Modifications to Previously approved scheme SD20A\0283

(Refer also to Statutory Notice Descriptions and Chapter 3 of EIAR)

Microsoft Operations Ireland Ltd is applying for PERMISSION for modifications and minor additions to previously approved scheme (Planning Register Reference SD20A\0283). The development will comprise the following changes to previously approved scheme SD20A\0283:

1 **Approved Central Administration Building (CAB):** Proposed relocation of building to the east by approx. 7m. Proposed reconfiguration and setting out of building plans at all levels (including roof level) resulting in increase in building footprint of approximately 170m2 (from 1,424m2 to 1,594m2) associated changes to building elevations (design and finishes).

- **Approved single-storey Cafeteria Element**: Proposed additional basement level below cafeteria to accommodate plant, proposed 9 no. rooflights (2.8 m diameter) and 9 no. rooflight (1.8m diameter), inclusion of MEP Plant on roof level including new flue extending approx. 1m above parapet.
- **Approved four-storey Office element:** Parapet at roof level to be raised by approx. 1.1m (increased from approved 19.5m in height to proposed 20.6m
- Overall increase in GIFA of 395m2
- Reconfiguration of area available for PV panels and sedum roof finish in order to accommodate required MEP equipment at roof levels

2 **Approved Data Centres** – DUB14 and DUB15: Proposed reconfiguration and setting out affecting building locations and plans at all levels (including roof level) resulting in reduction in overall building footprint (for each building) by 48m2 (from 13,442m2 to 13,394m2), associated changes to staircases design, building elevations (design and finishes. Increase in parapet height of Vent Houses (at roof level) by approx. 350mm and omission of previously proposed zone of sedum roof finish. Overall decrease in GIFA of 1,352m2 in respect of DUB 14 and decrease of 1,453m2 in respect of DUB 15. All plant equipment at ground level - reduced in height compared to approved layout so that the screening is deemed not required

3 **DUB 14:** Reduction in height of approved flues by approx. 650mm, reduction in number of flues from 11 no. approved to 8 no. proposed

3.a) **DUB 15:** Change to level of ground floor and associated increase in overall building height of approx. 700mm (parapet height increased from approved +83.0m O.D. to proposed +83.7m O.D.).

4 Reconfiguration of **associated external plant** at ground level (including generators / E-Houses & transformers) flues, omission of approved Modular Electrical Rooms (MERs) and associated screening serving approved Data Centres DUB14 &15.

5 Relocation, modifications to design and expansion of approved **Water Treatment Building and associated plant** to include: 4 no. Water Treatment Tanks, 2 sprinkler tanks and relocated approved pump house (contained in the main Water Treatment Plant building) and 1 generator with additional proposed flue stack (height 30.75) and 1 no. transformer.

6 **Gas Generator Compound** – Relocation & reconfiguration of previously approved gas generator compound including:

- Additional 4 no. generators (from 20 no. approved to 24 no. proposed)
- Omission of approved 5 no. E-houses
- Additional 7 no. electrical rooms
- Additional 7 no. flues (from 5 no. approved to 12 no. proposed)

7 **Modifications to approved layout of internal site roads, yards and footpaths.**

8 **Relocation** and modifications to design of **approved Sprinkler Tanks and Pump Houses:** Pump House serving DUB 14: relocated into proposed Water Treatment Building and compound, redesign of approved larger tank into proposed two smaller tanks. Pump House serving DUB 15: Relocated to south of DUB15 the north facilitate space for electrical equipment redesign of approved larger tank into proposed two smaller tanks.

9 Relocation of Approved Gas Networks Ireland (GNI) gas skid & compound including approved 3 no. kiosk buildings.

10 Modifications to approved car park layouts and landscaping design.

11 Modifications to location and design of approved bicycle shelters.

12 Modifications to site development works, including underground water and building services provision, landscaping, internal security and compound enclosure fencing, and associated works.

13 An Environmental Impact Assessment Report (EIAR) has been submitted with this application.

14 The application relates to a development which comprises an activity requiring an integrated pollution prevention and control (IE) licence.

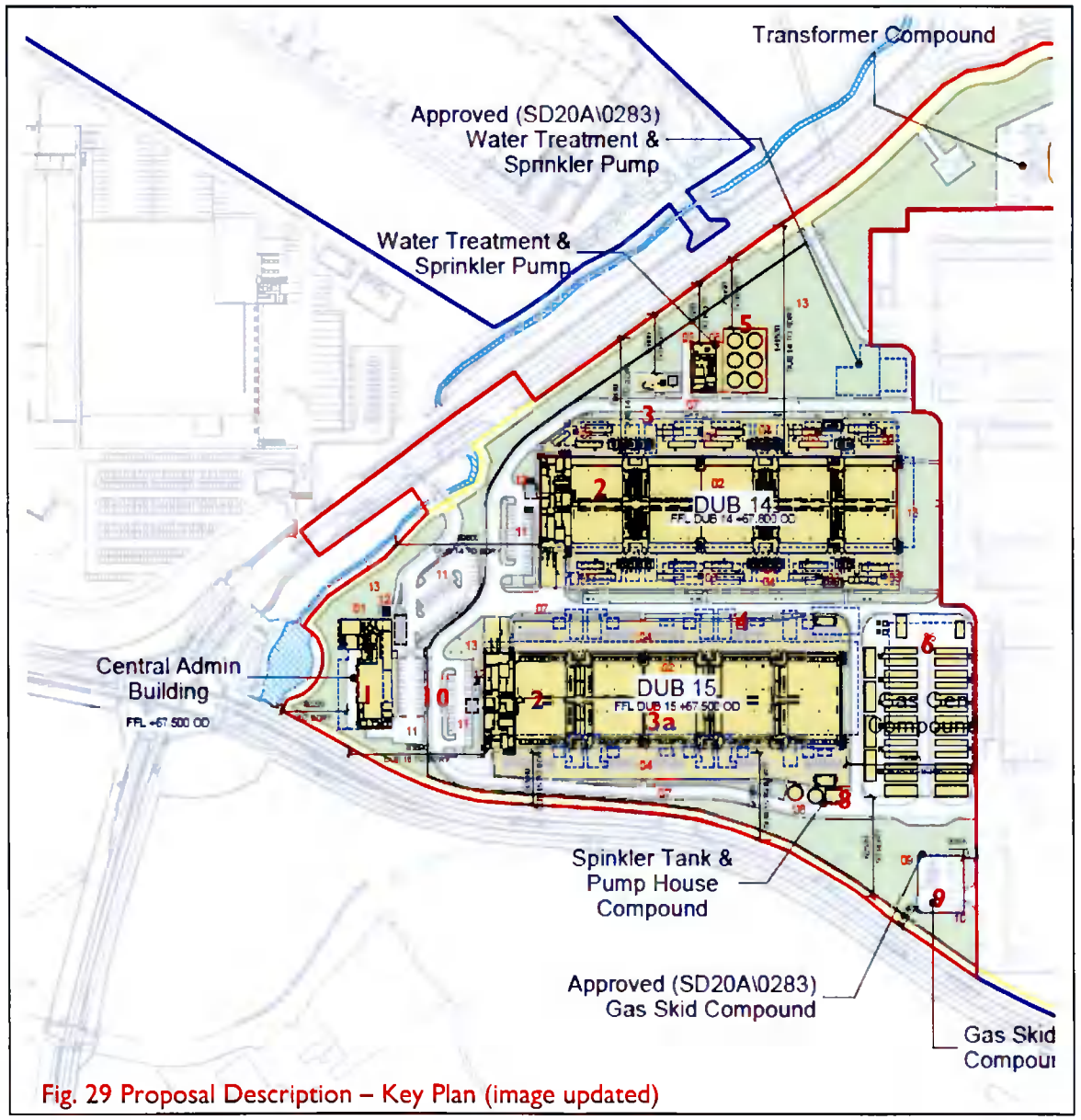


Fig. 29 Proposal Description – Key Plan (image updated)

SITE DEVELOPMENT STANDARDS

PROPOSED SITE COVERAGE: 21.773% (previously approved 23.279%) *
Proposed PLOT RATIO: 0,44036 (previously approved 0.45644) *

Excludes Temporary Contractors' Car Park Site in calculations i.e. site area calculated as 13.07ha

IE Licence:
The proposed operation of the gas generators may need to run for over 500 hours and will also be above the IED threshold which would therefore trigger the future requirement for an IE licence (formerly IPC licence).

5.01 Rationale Associated with Each Proposed Modification.

1. **Approved Central Administration Building (CAB):**
   - **Building moved to the east by approx. 7 m.** to allow for access to below ground services and have additional distance from boundary
   - **Increase of building footprint by approx. 170 m²** (from 1,424 m² to 1,594 m²) due to changes of plan layout (driven by MS user requirements) and developed design of MEP Equipment
   - **Design development - changes to building layouts & elevations (design and finishes).** Design Development for MEP Equipment and other services (Kitchen, etc.) - Improved internal layout for Office spaces and Cafeteria – inputs from Catering designers, gym operators, MS Users all taken into account.
   - **Approved four-storey Office element:**
     I. **Parapet at roof level to be raised by approx. 1.1m.** The façade parapet height is increased to ensure no visibility of Roof mounted ME Equipment, levels are coordinated with developed MEP Equipment design.
     II. Reduced PV panels area due to increased MEP area required on office roof.

   - **Approved Single Storey Cafeteria Wing:**
     III. **Added Skylights above Dining room** to reach minimum levels of natural illumination required.
     IV. **Design developed to include ME equipment** – Plan Layout updated to cater for MEP Equipment design update – flue projecting 1m above parapet level required for kitchen ventilation.
     V. **Added floor space to new basement level** and ground level for MEP Equipment.
     VI. **Reduced Green roof area,** due to skylight addition
     VII. **Increased parapet height to screen** MEP Equipment at roof level
2. **Approved Data Centres – DUB14 and DUB15:**
   - Reconfiguration of building footprints & reduction in area of approx. 48 m²
   - **Design development - changes to building layouts & elevations (design and finishes) as** part of natural design development and coordination occurred between approved planning application and proposed changes
   - **Omission of zone of sedum roof finish** due to increased underground attenuation being provided and the potential risk of water infiltration from green roof on MS mission-critical operations was deemed as to great a risk to MS Operations to be acceptable

3. **DUB 14: Reduction in height of approved flues by approx. 650 mm. Reduction of number of flues (from 11 to 8 no.)**
   Required as a result of M&E Design development.

3.a **DUB 15: Change to level of ground floor and associated increase in overall building height of approx. 700mm (parapet height increased from approved +83.0m O.D. to proposed +83.7m O.D.).**
Further Flood Risk Assessment analysis has been carried out in the months subsequent to the lodgement of the original application. This addendum to the original Flood Risk Assessment Report has been included within this application. A potential for flood risk to the South West corner of DUB 15 was identified (based on the "As approved" GF Level of 67.5m OD), in order to mitigate this risk the proposed GF level of DUB 15 has been raised to 68.0m OD. This factor (and design development of the cross section of the building) resulted in the overall main parapet height of the building being raised in height by approx. 700mm (parapet height increased from approved +83.0m O.D. to proposed +83.7m O.D.).

4 **Reconfiguration of associated external plant at ground level (including generators / E-Houses & transformers) flues, omission of approved Modular Electrical Rooms (MERs) and associated screening serving approved Data Centres DUB14 &15.**
M&E design development and liaison with equipment suppliers led to these modifications. All Equipment at ground level are reduced in height compared to approved layout so that the screening is deemed not required.

5 **Relocation, modifications to design and expansion of approved Water Treatment Building and associated plant to include: 4 no. Water Treatment Tanks, 2 sprinkler tanks and relocated approved pump house (contained in the main Water Treatment Plant building) and 1 generator with additional proposed flue stack (height 30.75m) and 1 no. transformer.**
This relocation was driven by the obstruction due to a huge quantity of existing electrical services below the previously approved location for the WTP. Design development accounts for the changes in the layout and amalgamation of one of the previously approved pumphouses into the facility.

6 **Gas Generator Compound – Relocation & reconfiguration of previously approved gas generator compound including:**
   - **Additional 4 no. generators (from 20 no. approved to 24 no. proposed)**
   - **Omission of approved 5 no. E-houses**
   - **Additional 7 no. electrical rooms**
   - **Additional 7 no. flues (from 5 no. approved to 12 no. proposed)**

Required as a result of M&E Design development.

7 **Modifications to approved layout of internal site roads, yards and footpaths.**
Required as a result of changes to building footprints & configurations and M&E design development.

8 **Relocation and modifications to design of approved Sprinkler Tanks and Pump Houses: Pump House serving DUB 14: relocated into proposed Water Treatment Building and compound, redesign of approved larger tank into proposed two smaller tanks. Pump House serving DUB 15: Relocated to south of DUB15 the north facilitate space for electrical equipment redesign of approved larger tank into proposed two smaller tanks.**
Required as a result of changes to building footprints & configurations and M&E design development.

9 **Relocation of Approved Gas Networks Ireland (GNI) gas skid & compound including approved 3 no. kiosk buildings.** Required as per (8) above.
10 **Modifications to approved car park layouts and landscaping design.** Required as per (8) above.
11 **Modifications to location and design of approved bicycle shelters.** Required as a result of changes to building footprint & configuration.
12 **Modifications to site development works, including underground water and building services provision, landscaping, internal security and compound enclosure fencing, and associated works.** Required as per (8) above.
13 **The remainder of the development (including permitted temporary construction car parking) to be carried out in accordance with parent permission SD20A/0283.**

5.1 Central Administration / MS Campus Gateway Building – Description of Proposed Modifications

5.2 Plans - Proposed Modifications

The Approved (and proposed) Central Administration Building is composed of two volumes:

- a lower single storey volume containing the cafeteria, the kitchen and the equipment required for the building services to work, divided between the ground floor and the MEP terrace at roof level.
- a four storey building containing office spaces with the main entrance lobby and a gym at ground floor

Overall Modifications Site Plan Modifications Description

- Building moved 7m East to allow for 10.5 m wide wayleave over the existing 450mm below ground foul sewer and 5 m wide wayleave for future utilities running along the inside of the site boundary wall
- Reduction of green roof area and PV panels area due to building's MEP Equipment design development
- Accessible parking spaces - revised layout
- Additional Electrical charging vehicles columns
- Increased building height due to raised parapet height at Office building to provide additional screening at MEP terrace due to equipment design development
- Bicycle shelter moved to side of CAB
- Double Height Volume between Office and cafeteria buildings reduced to single storey

Single Storey Staff Cafeteria Wing

Proposed modifications:

Basement Level

- Additional Basement level to accommodate additional plant space.

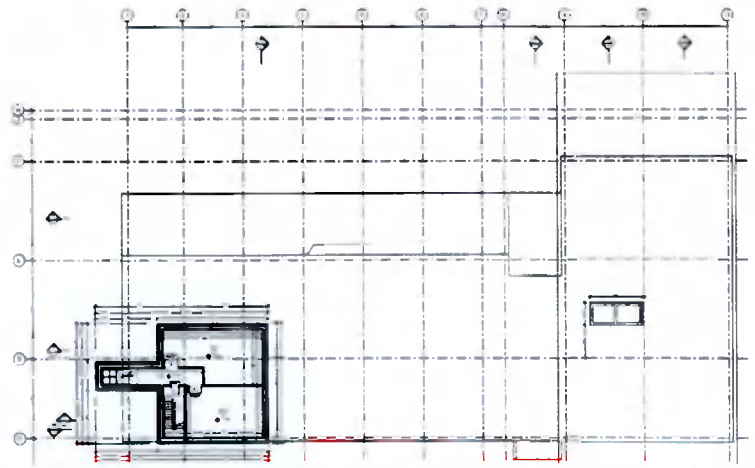


Fig. 30 C.A.B. Proposed Basement Plan (image updated)

Ground Floor

- Cafeteria building footprint extended south to accommodate additional plant space
- Relocation of kitchen/B.O.H. areas to provide improved servicing and realignment of elevations to suite
- Extended cafeteria area at the centre of the volume

Partial infill of indent between office and Cafeteria to relocate toilet block

- Stair blocks relocated to optimize escape routes and connections.

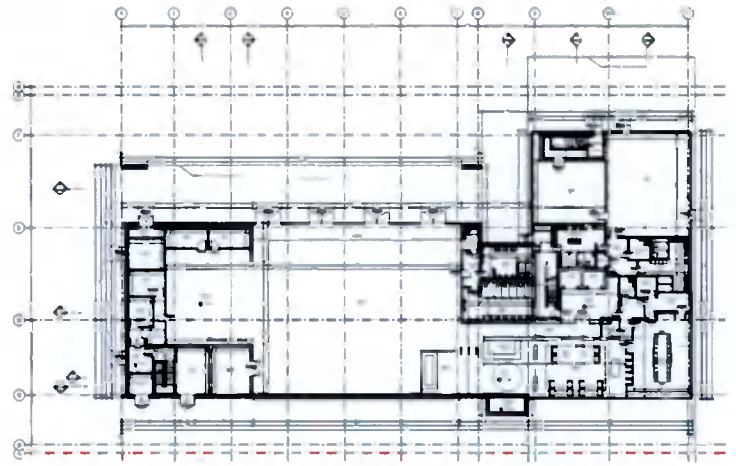


Fig. 31 C.A.B. Proposed Ground Floor Plan (image updated)

Cafeteria Roof Level

- Reduced Green Roof area to allow for skylights above cafeteria with the goal to provide additional natural light to the space
- Increased MEP terrace area
- Flue extending approximately 1m above parapet level

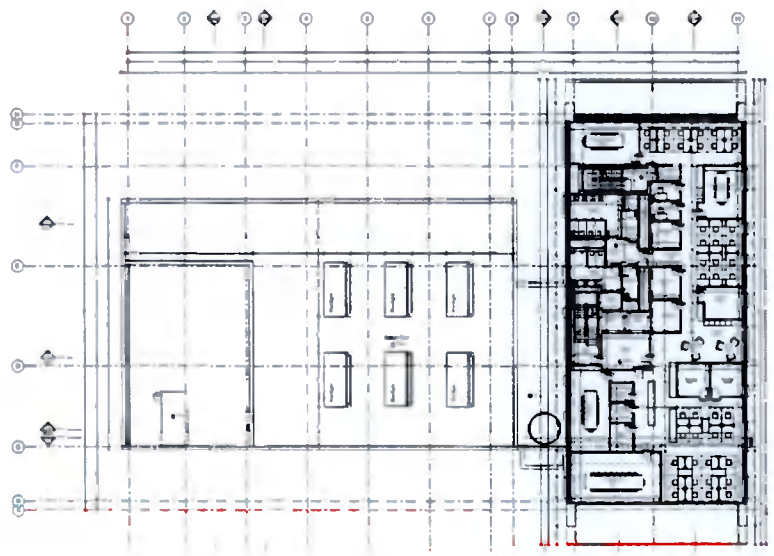


Fig. 32 C.A.B. Proposed 1st Floor (& Cafeteria Roof) Plan (image updated)

Four-Storey Office Wing

Overall Modifications
- Relocation of core resulting in realignment of glazing to office building
- Projecting envelope to East and West gables of Office building reduced by 0.5m.

Ground Floor (Level 01)
- Entrance lobby layout revised
- Overall footprint extended to the west beneath the office floor plate zone

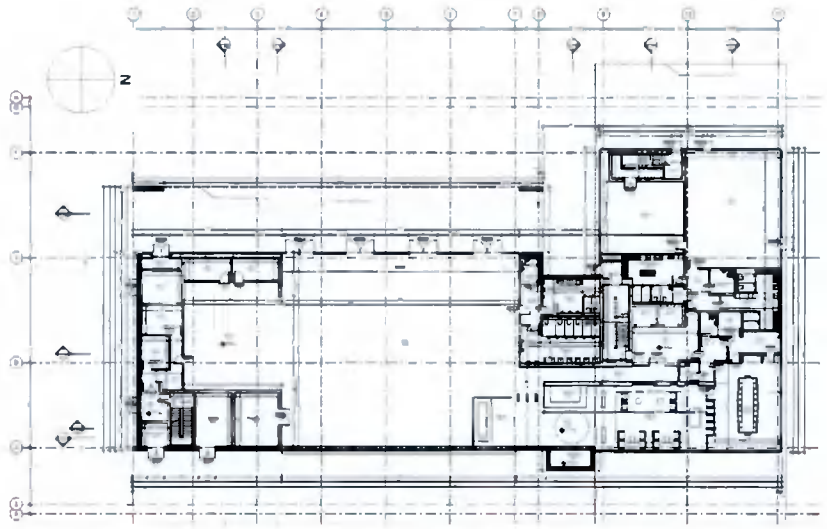


Fig. 33 C.A.B. Proposed Ground Floor Plan (Level 01) (image updated)

Level 02
- Relocation of core resulting in realignment of glazing to office building
- Projecting envelope to East and West gables of Office building reduced by 0.5m.

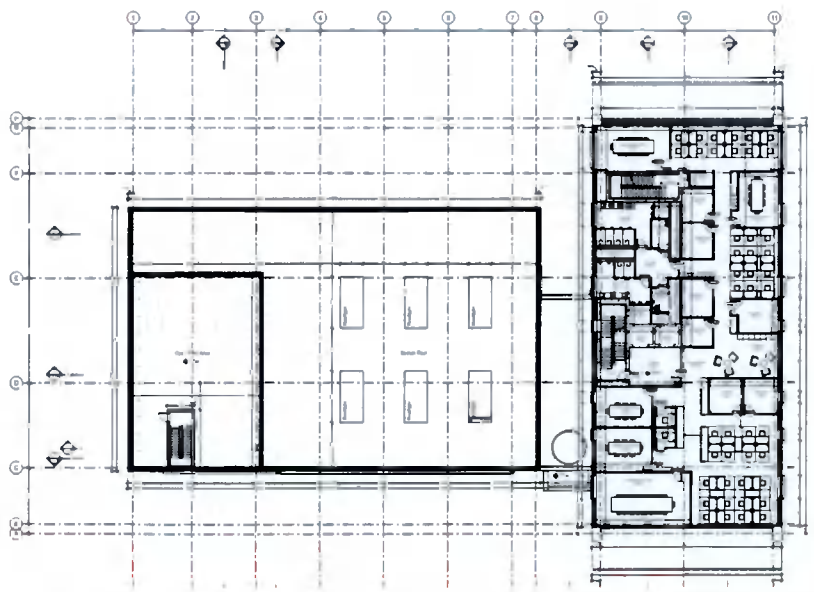


Fig. 34 C.A.B. Proposed 1st Floor Plan (Level 02) (image updated)

Level 03
- Relocation of core resulting in realignment of glazing to office building
- Projecting envelope to East and West gables of Office building reduced by 0.5m.

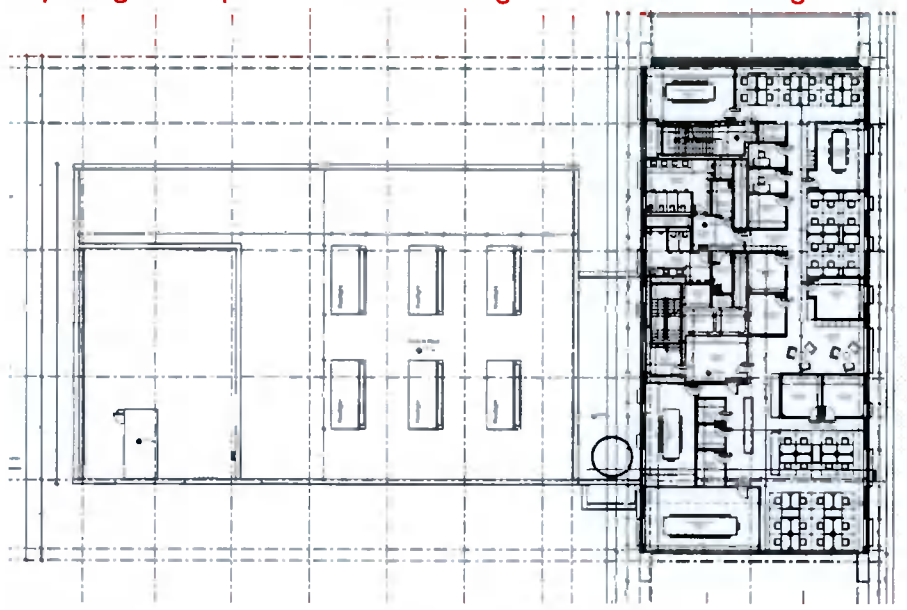


Fig. 35 C.A.B. Proposed 2nd Floor Plan (Level 03) (image updated)

Level 04
- Relocation of core resulting in realignment of glazing to office building
- Projecting envelope to East and West gables of Office building reduced by 0.5m.

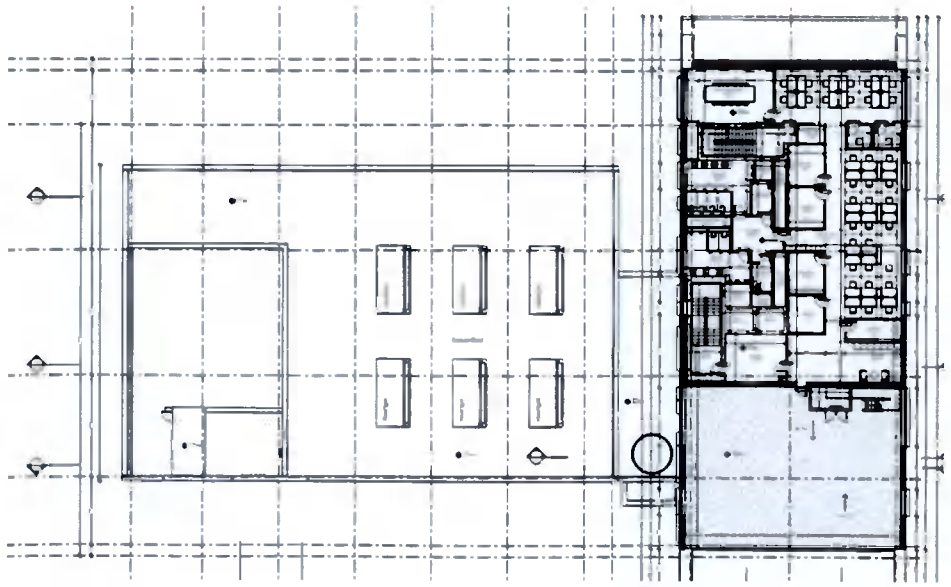


Fig. 36 C.A.B. Proposed 3rd Floor Plan (Level 04) (image updated)

Roof Level

- PV panels area revised (reduced in area) to cater for additional MEP equipment

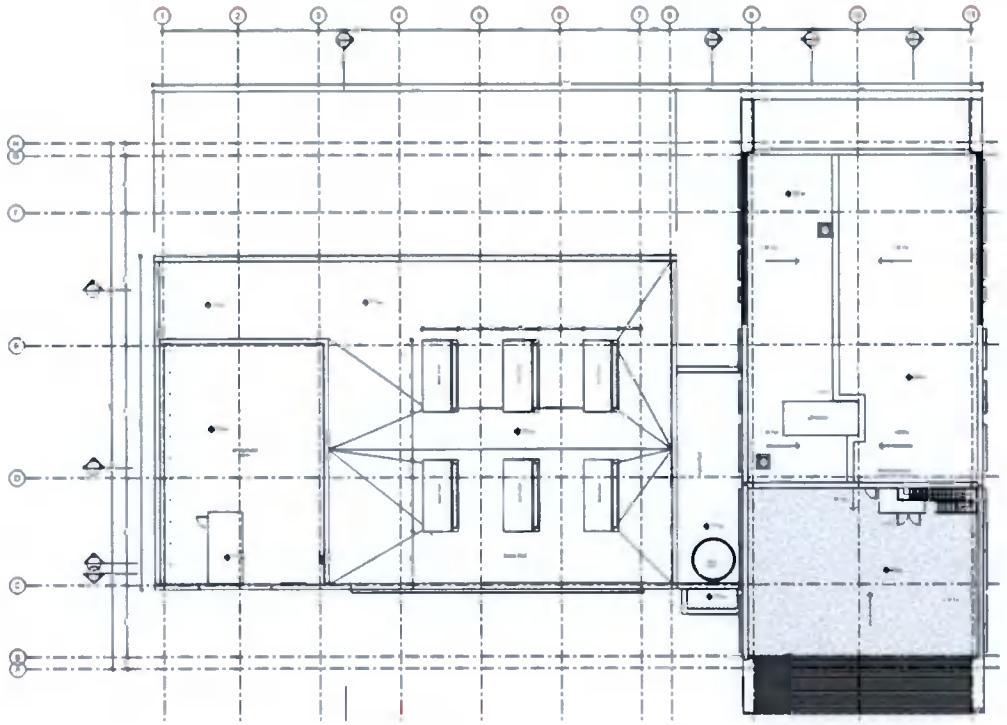


Fig. 37 C.A.B. Proposed Roof Plan (image updated)

5.3 Building & Site Entrance

The Central Administration Building is to be accessed (by pedestrian / vehicle & bicycle) primarily from the North via a new bridge over the Griffeen River linking the site with the Grange Castle Business Park Estate Road. A secondary pedestrian entrance (for Microsoft Data Centre staff only) is provided through the security fence to the East – linking up with the greater MS Data Centre campus.

FIG. 38 CENTRAL ADMINISTRATION BUILDING – SITE ENTRANCE

The entrance to the building itself is located on the East façade addressing the arrival points by vehicle and bicycle and the rest of the MS Data Centre Campus. The entrance is clad with glazing and stone and provides a link between the four-storey office structure and the staff cafeteria wing. The entrance is on axis with the main East/West pedestrian route.

FIG 39 CENTRAL ADMINISTRATION BUILDING – BUILDING ENTRANCE
(Image updated – for final proposed rooflight arrangement refer to drawings)

5.4 Height + Mass

The building's height varies across the three elements of its composition. The parapet height of the approved four-storey office element was approximately 19.5m above ground level, the revised proposed maximum height has increased by approximately 1.1m to 20.6m above ground level (an increase of approximately . The staff cafeteria wing has an angled roof height and the massing of this element is designed to reduce down from the higher scale of the four storey office block to a more human scale closer to the public realm of the Nangor Road and landscaped wetland area to the west of the site.

The office element has a deep overhang with a contrasting treatment to ground floor elevations (predominantly glazed) with a more a solid form. From 1st – 3rd floor above cladded in a contrasting darker cladding material. The proposed design has an increased parapet height to screen all MEP Equipment sitting on the roof Plant Terrace. The proposed building envelope rises from 19.6 m East to 20.6 m West.

The parapet level of the staff cafeteria wing as per the approved design rises (from north to south from 6.3m to 7.7m). The heights as currently proposed are rising from 6 m to 7.65 m The staff cafeteria primary volume is essentially a box form, this box is set within a framed structure which provides shelter and overhang to the south and west facing outdoor dining terraces. Although much reduced in comparative scale the framed structure echoes the form of the four-storey office element and also the Administrative function (Western gable facades) to the proposed Data Centres DUB 14 and DUB 15.

The height of the link piece (entrance element) is was indicated as 9.6m on the approved elevations – it is proposed to reduce this as part of this application to a maximum height of 5500 mm This piece forms a transition in the scale from the four-storey office element and the single storey staff cafeteria wing.

No additional mass is created by roof level external plant. External plant for the office block is recessed and concealed within the building's form at 3rd floor level. Similarly, for the single - storey staff cafeteria structure - the external plant is accessed by an internal stairs and is concealed behind the parapet level. Due to the progress in the external plant design development the parapet height has been increased by 1.1m to screen all the equipment and ducts so that none of the plants is visible from the site and the neighbouring areas.

The forms of all three components of the proposed Central Administration Building are all strong architectural pieces and work well as a composition breaking down the overall massing of approximately 3,915m2 of accommodation into a dynamic architectural scheme both as a "stand-alone" element and also as a transition in scale and massing up to the proposed large scale Data Centre buildings to the East (approximately 15.6m in height).

5.5 Section / Floor Levels

The ground floor level of the Central Administration Building is set at a height of 67.8m OD which ensures flood protection from a 1 in a 1000 year event of potential flooding from the adjacent Griffeen River.

The office element has a 2.7 m floor to ceiling height (floor to floor height of 4.2m) whereas the ground floor has a more generous floor to ceiling height of 4 m. The section conceals the external roof plant element.

The proposed maximum height of 89.4 O.D. is well below the maximum permissible height within the Baldonnel Aerodrome Secure Flight Zone of 98.00 O.D.

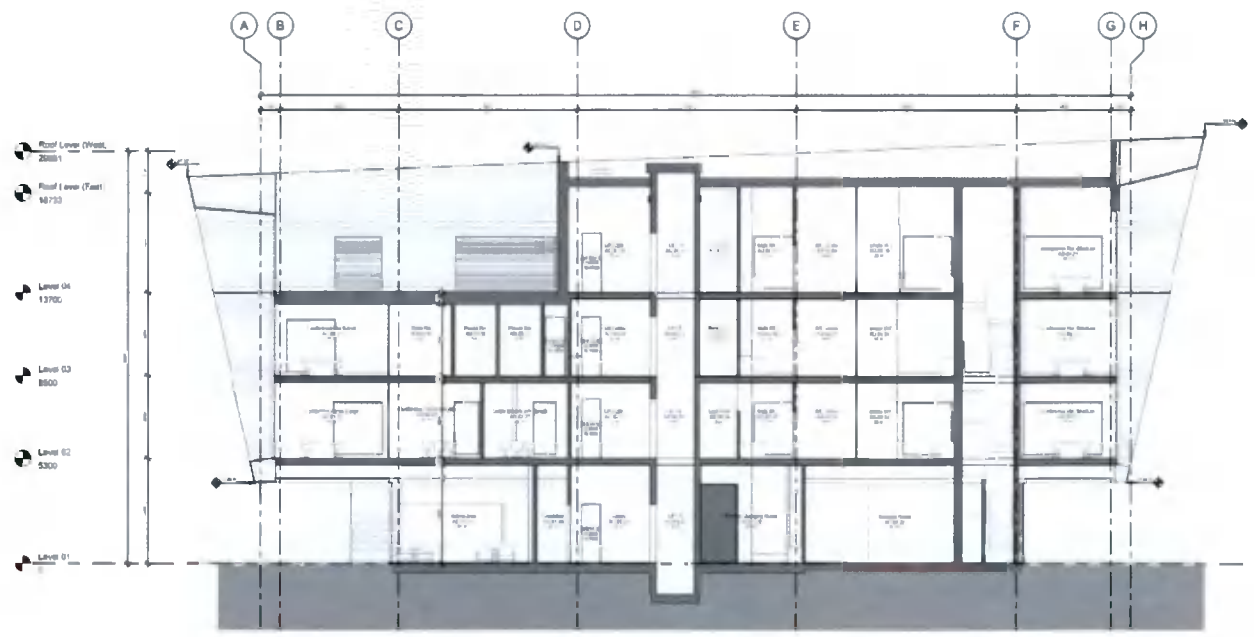


FIG. 40 CENTRAL ADMINISTRATION BUILDING – SECTION THROUGH OFFICE ELEMENT

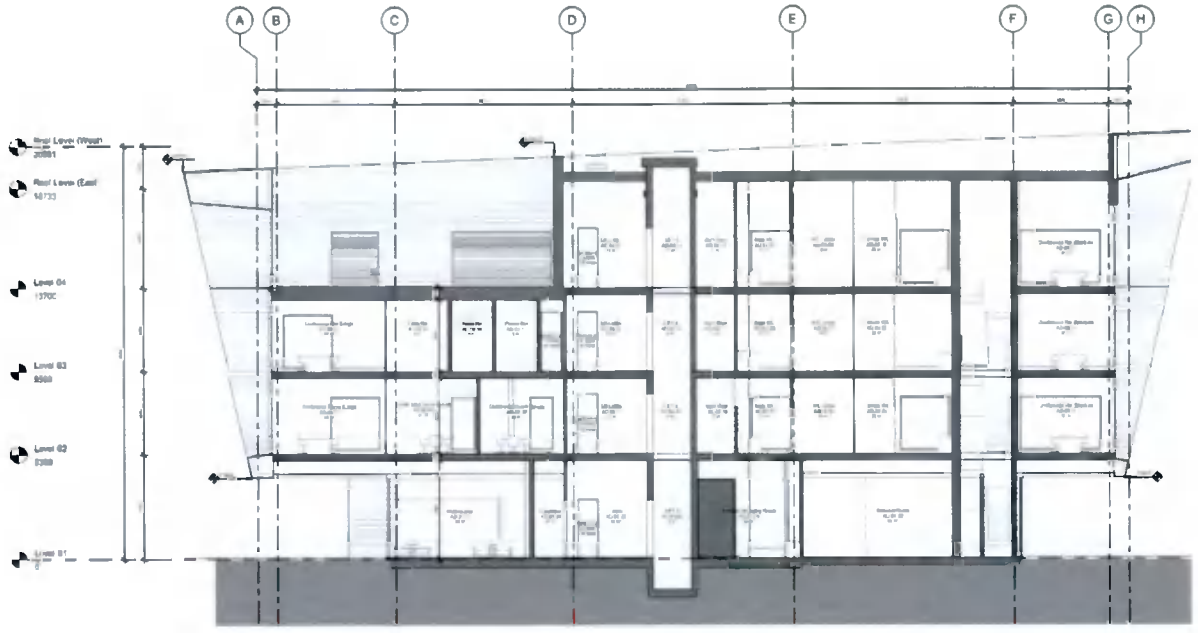


FIG. 41 CENTRAL ADMINISTRATION BUILDING – SECTION THROUGH OFFICE ELEMENT (Image updated)

A similar approach has been adopted for the staff cafeteria wing.

The proposed Cafeteria Plant Area has been moved to the South side of the roof so that it benefits from higher screening at the building side and plants are better connected to the equipment rooms at the ground floor.

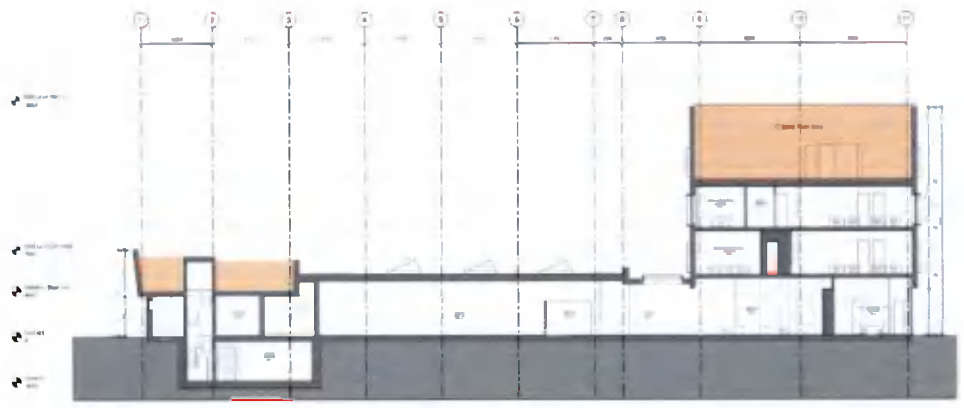


FIG. 42 CENTRAL ADMINISTRATION BUILDING – SECTION SHOWING PLANT ZONES (Image updated)

5.6 Façade Design

Due to the prominent nature of the site at the entrance to Grange Castle South, the appearance of the proposed buildings and their elevational treatment is defined by high-quality design and finishes, appropriate to a business campus identity.

5.6.1 Façade Composition

North Façade

The northern façade addresses the main point of entry off the Estate Road. It is proposed to keep the area directly in front of the northern façade as a soft landscaped "foreground". This façade is predominately a cladded wall with window openings expressed in an irregular pattern framed by extruded aluminium fins with a base material of an anodised aluminium rainscreen system set out with horizonal banding in contrasting shades of dark grey.

East Façade

The building is entered from the East, the façade is a mix of scales and forms with the entrance itself at a transitional scale (+5 m) between the 4-storey office element and the staff cafeteria wing. The office façade has large glazed screens at ground floor level to the reception area to create a sense of openness that the cantilevered cladded element above is "floating" above its base. The staff cafeteria wing is a more opaque element as its service rooms are located to the South including the concealed deliveries & waste compound

South Façade

Much consideration has been given to the South and West facing facades as they address the most visible boundaries of the development in terms of the public realm.

The South Facing façade features (in the foreground) the overhanging "gateway" frame which ties in with the East & West gable facades of the office element and the entrance facades to the Data Centres. The dynamic form of the staff cafeteria wing rises in elevation to its highest level to the southern façade.

The southern façade of the office element mirrors that of the northern elevation.

FIG. 43 CENTRAL ADMINISTRATION BUILDING – SOUTH & WEST ELEVATIONS (Image updated)

West Façade

The western façade overlooks the existing landscaped wetland feature between the proposed buildings and the traffic junction at the entrance of the Business Park.

This façade is deliberately as open and glazed as possible, presenting a permeable and enlivened façade at the point of entry.

FIG. 44 CENTRAL ADMINISTRATION BUILDING – WEST ELEVATION
Image updated – refer to submitted drawings for final proposed rooflight arrangement

5.6.2 Façade Materials

The proposed materials are called up on the images below and are generally unchanged from those indicated on the Approved Scheme SD20A 0283.

AS PROPOSED LEGEND:

1 EF1 Facade aluminium unsulated panels, RAL 9006

2 EF1.1Facade aluminium unsulated panels RAL 7043

3 EF2 Fire rated facade sandwich panels RAL 7043

4 EF3Fire rated facade sandwich panels RAL 9006

5 EF4stone facade tiles RAL 7045

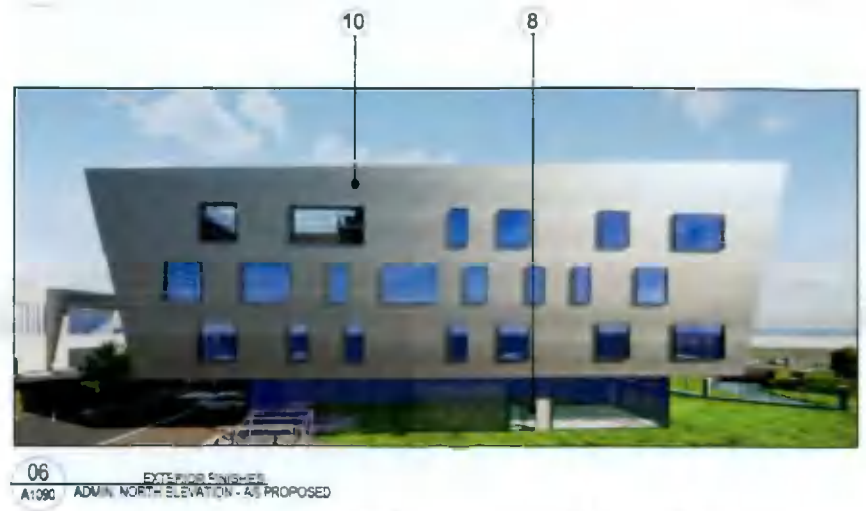
6 EF5 Metal boxing Panels

7 EF6 Facade Glazing System with vertical sun blinds

8 EF7 facade glazing system

9 EF8 louvre panels RAL 7043

10 EF9 insulated facade panels RAL 7043



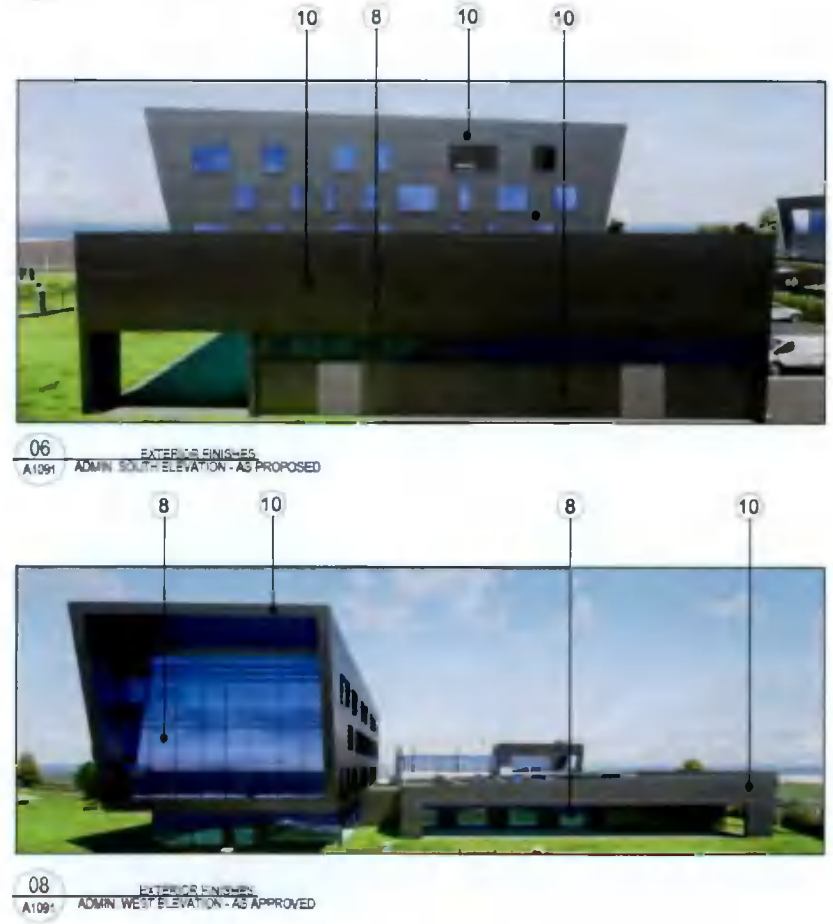


FIG. 45 CENTRAL ADMINISTRATION BUILDING – EXTERNAL MATERIALS & FINISHES Images updated

5.7 Roof Treatment

It is proposed that the primary base finish to the roofs of both the office and staff cafeteria elements shall be a bituminous membrane roof system with non combustible mineral insulation.

A sedum roof finish shall be provided to an area of the Cafeteria Roof (as indicated on drawings). which shall limit the amount of surface water run-off. The bituminous membrane is used to all other areas (for example roof surface under external plant). All rainwater discharging from roof areas shall be harvested via connection to the site's Rainwater Harvesting Plant. A quantum of circa. 200m² of PV collectors shall also be provided on the roof space.

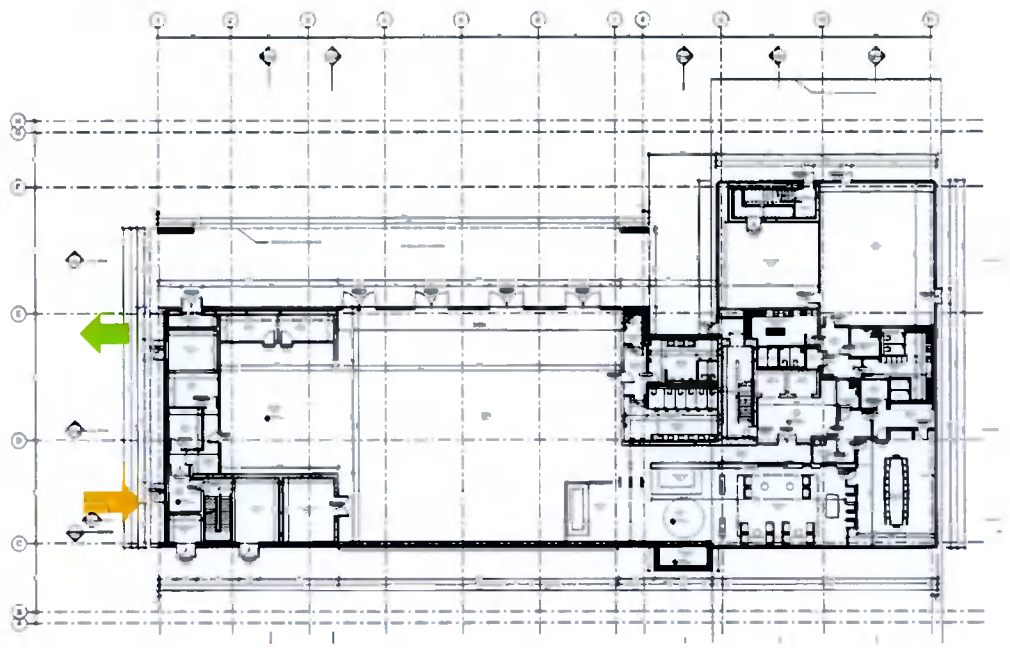


FIG. 49 DELIVERIES IN / WASTE OUT Image updated

5.8 Back of House Strategy

A dedicated-delivery and waste collection area is to be located to the South of the staff cafeteria wing and at a distance from the main public entrance. This enclosure holds waste from both the office element and the staff cafeteria wing.

6.1 DUB 14 & DUB 15 Proposed Data Centres - Overview

The basic two-storey "ballard" design for the proposed two data centres originated with Microsoft who have used this form internationally in other locations. This two-storey model reduces the overall footprint of the building while keeping the overall parapet height at a similar level to that of the existing Data Centres to the East. This is made possible by the gentle downward gradient of the natural site levels from East to West. The design of the building facades has been developed (from the original exemplar model) to take account of the aesthetics and materiality of the proposed Central Administration Building so that the overall development has design cohesion and continuity. The development of the updated Data Centre MEP design has improved the whole site layout allowing for the removal of the MER Rooms reducing the technical volumes in front of the Data Centre building and allowing for the removal of the flues from the electrical compound of the DUB15 building. The reduction of technical volumes at DUB14 and DUB15 electrical compound allow the removal of the screening at the electrical compound.

6.2 Plans – Proposed Modifications

Both DUB14 and DUB15 buildings are 222 m long (10 m shorter than the approved building) and 60 m wide (3 m wider than the approved design).

All plant equipment at both DUB14 and DUB 15 ground floor electrical compound has been revised and updated. The updated equipment has a lower impact on the elevation visuals particularly when viewed from the public domain (e.g. from the Nangor Road in the case of DUB 15)

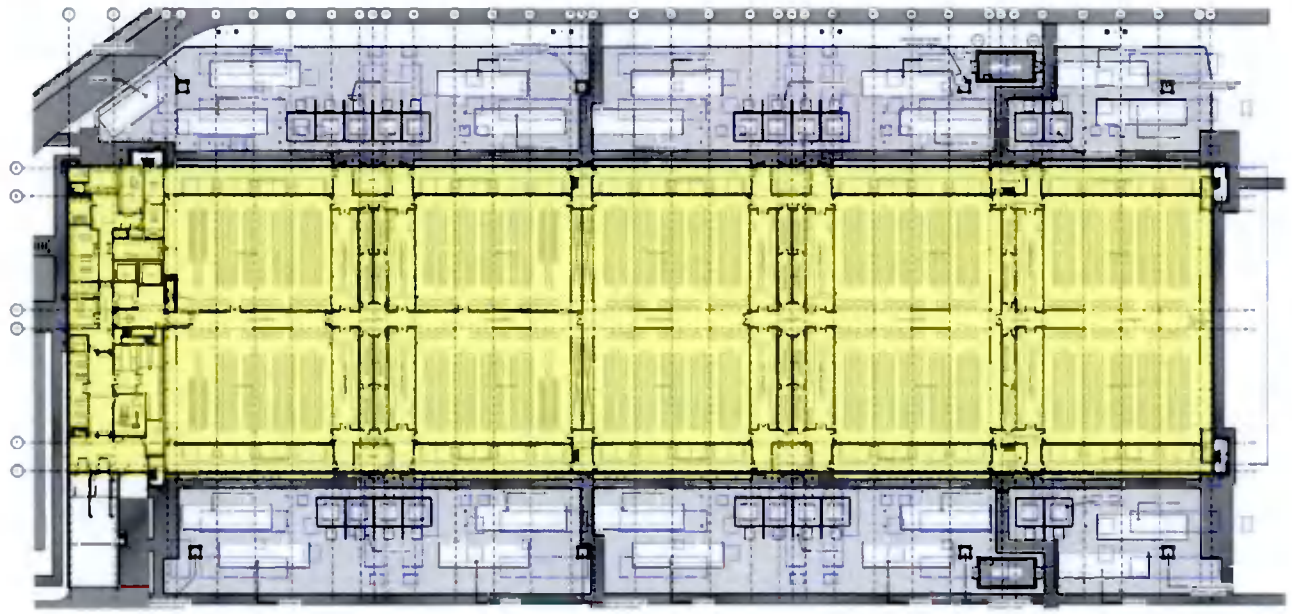


FIG. 50 DUB 14 – GROUND FLOOR – DESIGN MODIFICATIONS –
Outline of Approved Layout indicated with blue broken line for comparison purposes.

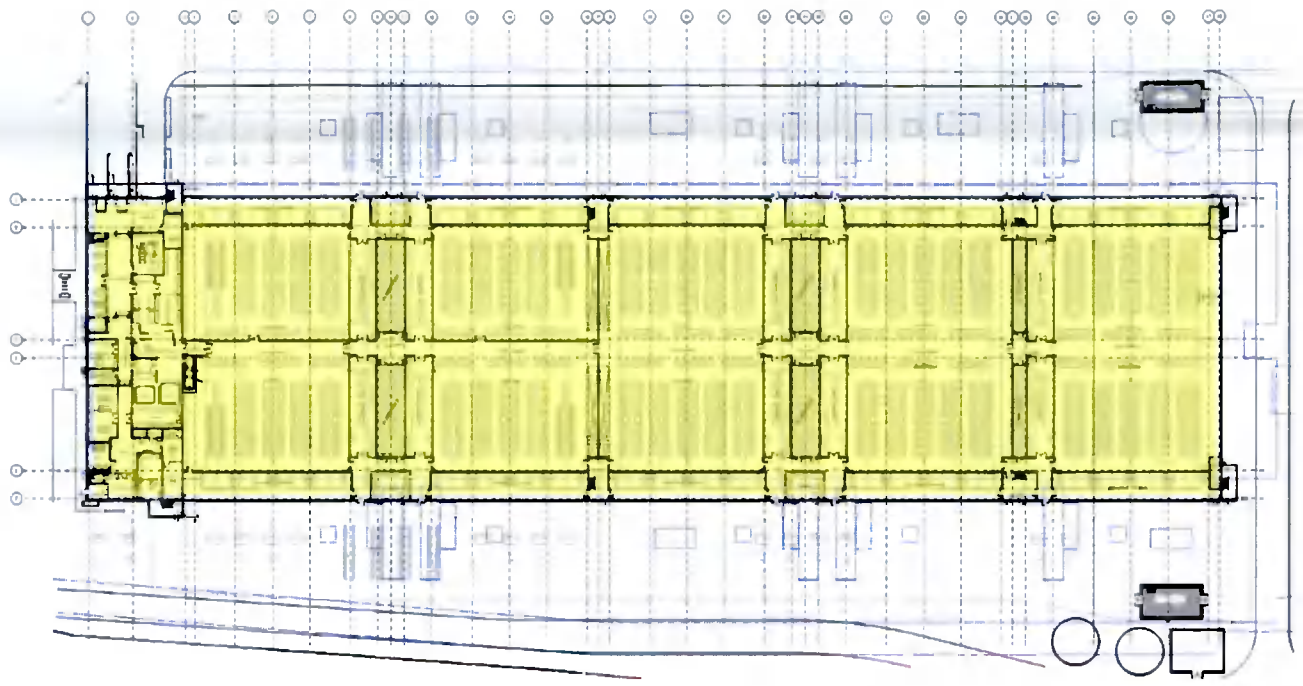


FIG. 51 DUB 15 – GROUND FLOOR – DESIGN MODIFICATIONS –
Outline of Approved Layout indicated with blue broken line for comparison purposes.

With regard to plant ancillary to the Data Centres, DUB 14 is to be powered via diesel generators located in within the plant compound to the north and south of the buildings including associated flues. (as approved height approximately 30.7m high) – The proposed flues height has been reduced by 650 mm to 30.15m. No flues or diesel generators are proposed for DUB 15 – one of the factors informing this decision was the intention to improve the visual impact of this building when viewed from the Nangor Road.

As per the Approved Development , DUB 15 is intended to be powered via gas generators which are to be located in a separate centralised gas compound to the East of the building which includes 12 no. gas flues grouped in the West and East side of the compound and to a lesser height (25m) than the proposed diesel generator flues adjacent to DUB 14.

6.3 Building Entrances

The building entrances for DUB 14 and 15 are located in the West facing gable facades facing the Central Administration Building. A small staff car parking area (35 and 37 no. spaces) serves each building. The entrances are set within the "framed" section of the Western elevation which aligns with the aesthetics of the both the office element and the staff cafeteria wing of the proposed Central Administration Building.

6.4 Height & Mass

Both Buildings parapets are set at 83.2 m O.D. (200 mm taller than approved buildings, with parapets at 83 m O.D.). At ridge (top of hot air extract chimneys) the proposed buildings are 86.487 O.D. (337 mm taller than the approved buildings 86.150 mm tall at ridge)

6.5 Section / Floor Levels

A detailed Flood Risk Assessment Report (Version Rev. 6 July2021) has been carried out and is submitted with this application. The findings of the report confirm the proposed site development is not within the 100- or 1000-year flood plains associated with the River Griffeen or the Baldonnell Stream and is not at risk from flooding. The 1:1000 event plus climate change design flood level is identified at 66.83 m OD. Allowing for a freeboard of at least 600 mm, the design flood level for the Highly Vulnerable parts of the development at the site should be 67.43. The lowest floor level associated with the proposed development is DUB 14 and the Central Administration Building with a finished floor level of 67.80m.

6.6 Façade Design

The mass of the large volume of the Data Centre long elevations has been broken up by variations in the façade profile and the range of materials used. The development in the Data Centre design removes the requirement for previously approved tall MER buildings and of the screening required to soften their visuals. The long elevation is broken down by using a darker grey colour to highlight vertically the façade at hot air exhaust chimneys and at staircase volumes. The aesthetic of the "frame" or gateway is employed again in the articulation of the West facing facades which address the Central Administration Building and house the administration and staff welfare functions of the Data Centre buildings themselves.

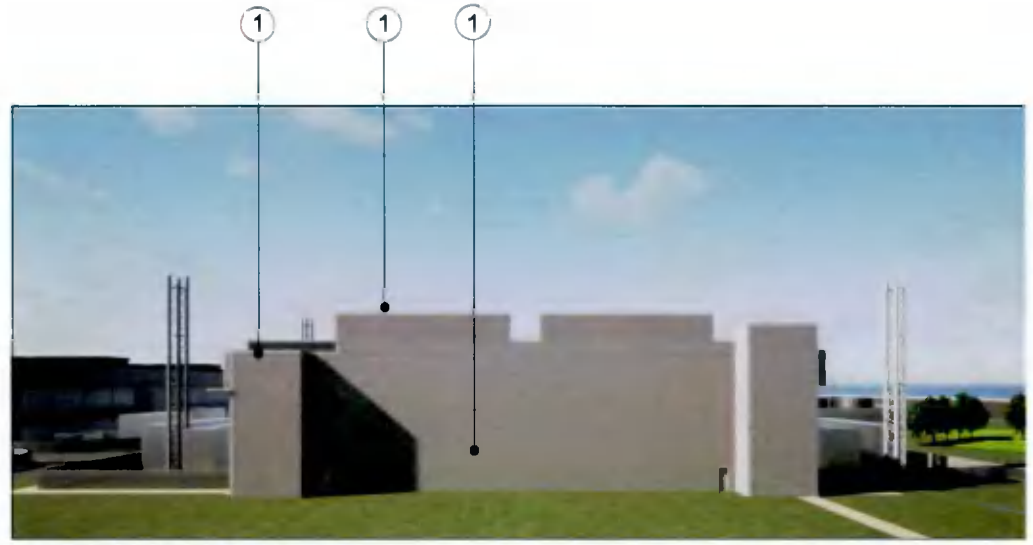
At first floor level, there is a strong corner feature with an external terrace service the staff canteen set back within the frame feature and highly visible to the public realm from the South West (DUB 15) and North West (DUB 14).

6.6.1 Façade Materials

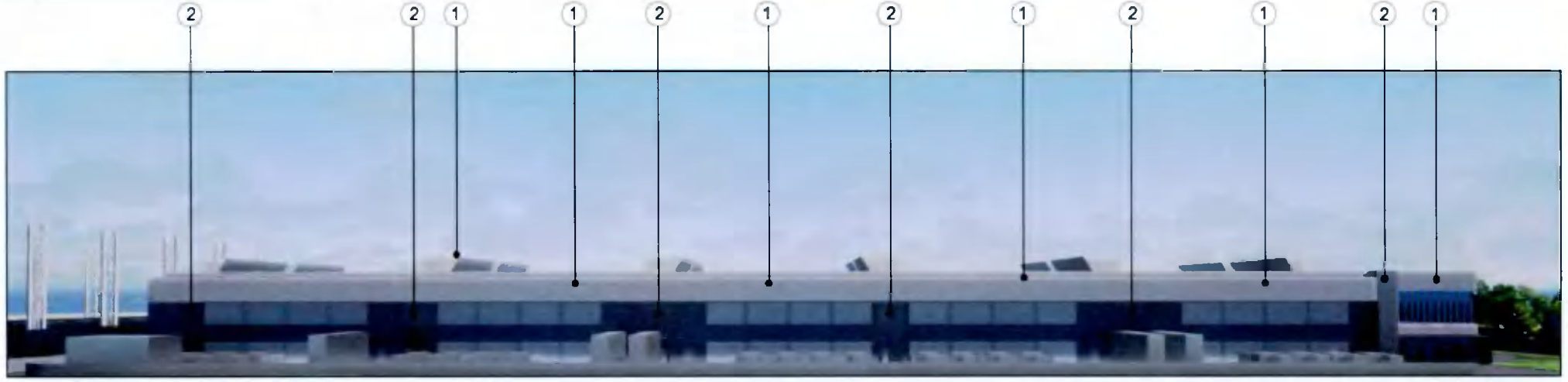
The proposed materials to be used on the Data Centre facades are called up on the images extracted on the legend and images overleaf.

FIG. 52 DATA CENTRES (DUB 14 / DUB 15) – EXTERNAL MATERIALS & FINISHES Images Updated

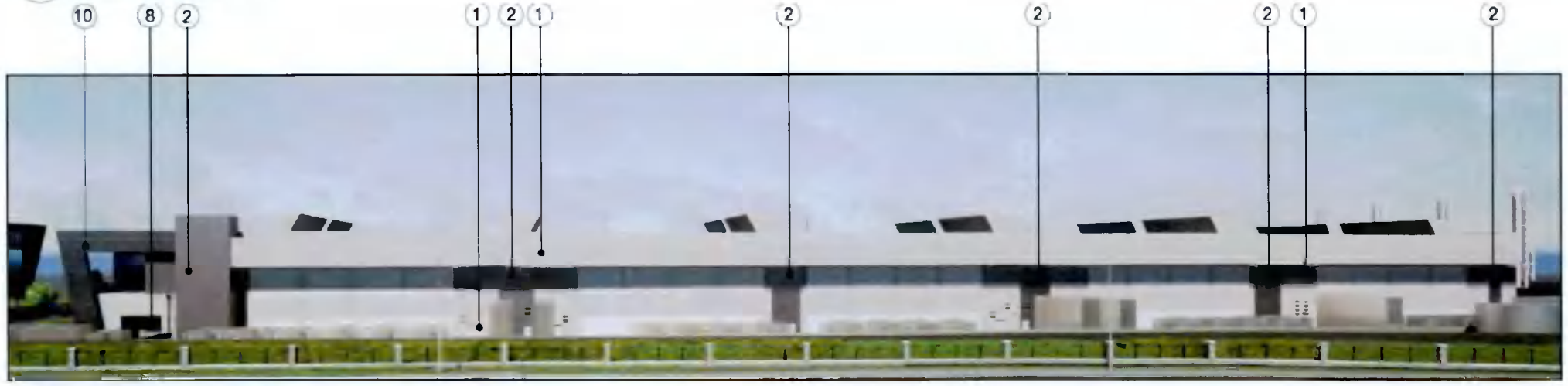
04 A1090 EXTERIOR FINISHES
DC WEST ELEVATION - AS PROPOSED



04 A1091 EXTERIOR FINISHES
DC EAST ELEVATION - AS PROPOSED



02 A1090 EXTERIOR FINISHES
DC NORTH ELEVATION - AS PROPOSED



02 A1091 EXTERIOR FINISHES
DC SOUTH ELEVATION - AS PROPOSED

AS PROPOSED LEGEND:

1 EF1 Facade aluminium unsulated panels, RAL 9006

2 EF1,1Facade aluminium unsulated panels RAL 7043

3 EF2 Fire rated facade sandwich panels RAL 7043

4 EF3Fire rated facade sandwich panels RAL 9006

5 EF4stone facade tiles RAL 7045

6 EF5 Metal boxing Panels

7 EF6 Facade Glazing System with vertical sun blinds

8 EF7 facade glazing system

9 EF8 louvre panels RAL 7043

10 EF9 insulated facade panels RAL 7043

6.7 Roof Treatment

All rainwater discharging from roof areas shall be harvested via connection to the site's Rainwater Harvesting Plant. The proposed, more compact Admin building layout results in a reduced roof surface area thereby also minimising any attenuation benefits of a green roof construction. The mission critical nature of the facility also prohibits its occupants from enjoying such a feature, improvements have therefore been proposed at ground level, within the accessible landscape realm, designed to provide a destinational 'green heart' for the Campus encompassing wellness principles in its planting selection.

6.8 Screening to Plant Compounds

Due to improvement in Data Centre cooling technology design there is no requirement for additional screening at Electrical Compounds because the size of the equipment is reduced to a scale such to not require any screening.

7.0 Screening of Gas Generator and Gas Networks Ireland Compounds & Structures

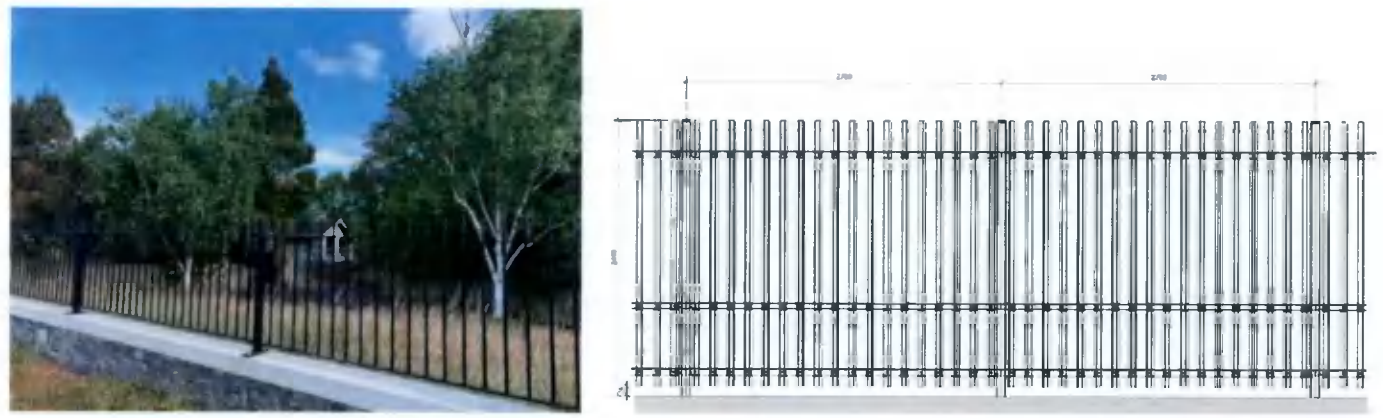
These elements are set back at a considerable distance from the public realm (Nangor Road to the South). They shall also be further screened via landscaping and berming (as detailed on the Landscape Design drawings and Site Sections). In addition, all plant elements shall be screened further by a 2.4m high black paladin fence and acoustic screening where required (gas generators compound) as indicated in illustration below.

TYPICAL 2.4M HIGH PALADIN FENCING

8.0 Boundary Treatment

See also Chapter 10 of Volume 1 EIAR (Landscape and Visual).

The south and western site boundaries have an existing boundary wall treatment in place - constructed by South Dublin County Council in recent times - and composed of a natural stone wall, cut stone capping and black railings (see image below). It is not proposed to interfere with this wall as part of the application.



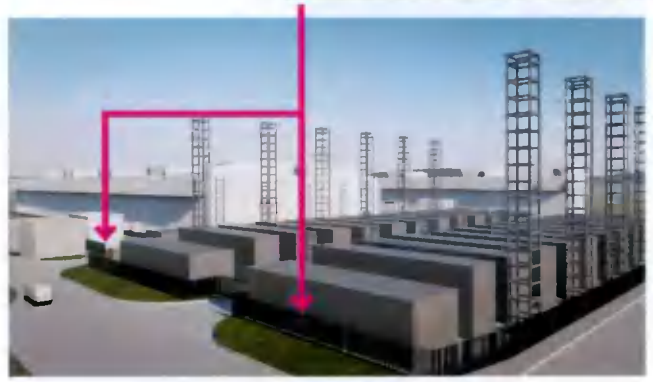
EXISTING BOUNDARY WALL

FIG. 55 BOUNDARY TREATMENT AND SECURITY FENCE

The northern boundary is formed substantially by the Griffeen River and screening by the existing trees and hedgerows which line the river valley.

A secure boundary (2.4m high black palisade security fence) is required to secure the Data Centre Zone of the site (to the East). This shall be set back typically from the site boundary by a distance of c. 14m and behind landscape planted berms (as further detailed on Landscaping drawings). The same fencing detail shall be used to separate the Central Administrative Building and associated car park from the Data Centre zone which is a continuation of the existing "secure zone" containing all of the existing MS Data Centres to the East.

FIG. 55 - Boundary Treatment and Security Fence



3D view of proposed gas generator compound from South East

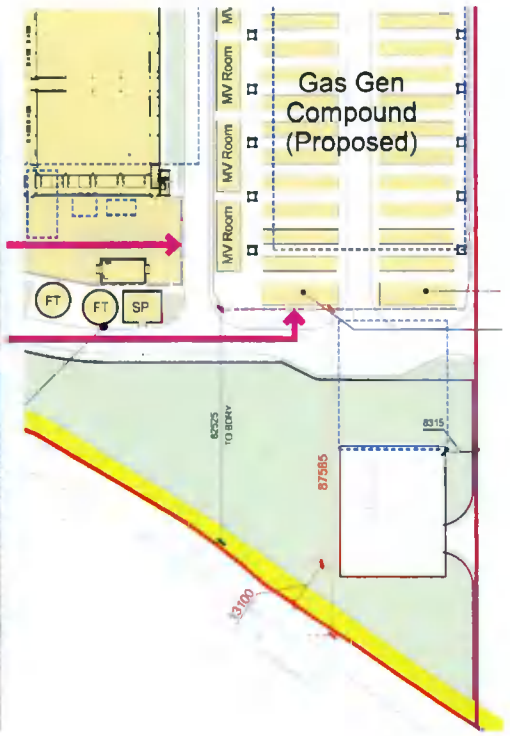


FIG. 55B FENCING TO GAS GENERATION COMOUND

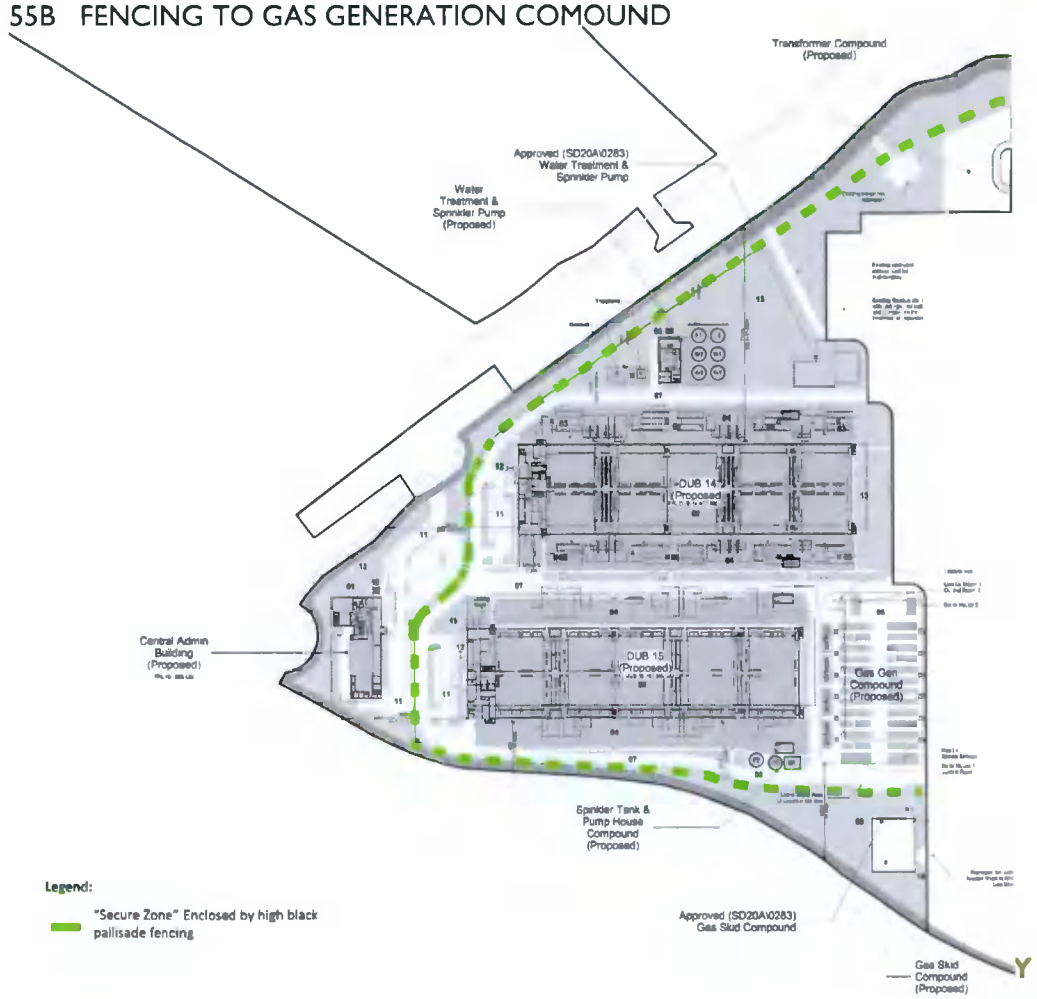


FIG. 56 LINE OF 2.4m HIGH BLACK PALLISADE FENCING FORMING "SECURE ZONE"

9.0 Site Access & Internal Site Circulation

There are two points of entry for vehicles:

1) **Access to proposed DUB 14 & DUB 15 Data Centres (Secure Zone)**

   Vehicle, bicycle and pedestrian access is via the existing MS Data Centre Entrance to the East of the site adjacent to DUB 06. The existing internal road and footpath network shall then be extended to link to the proposed two new Data Centres and their associated car and bicycle parking areas.

2) **Access to proposed Central Administration Building**

   Vehicle, bicycle and pedestrian access is via a proposed new entrance off the Grange Castle Business Park Estate Road to the North of the site via a proposed new bridge over the Griffeen River. The Central Administration Building is provided with its own dedicated car and bicycle parking areas.

There is no proposed internal vehicular link between the Secure Zone and the Central Administration Building. It is intended that a shuttle bus shall be provided by Microsoft to transport staff from the various Data Centres to the Central Administration Building allowing easy access to the staff cafeteria and gym facilities.

A pedestrian link on the East/West axis shall be provided between the Secure Zone and the Central Administration via a secure gate.

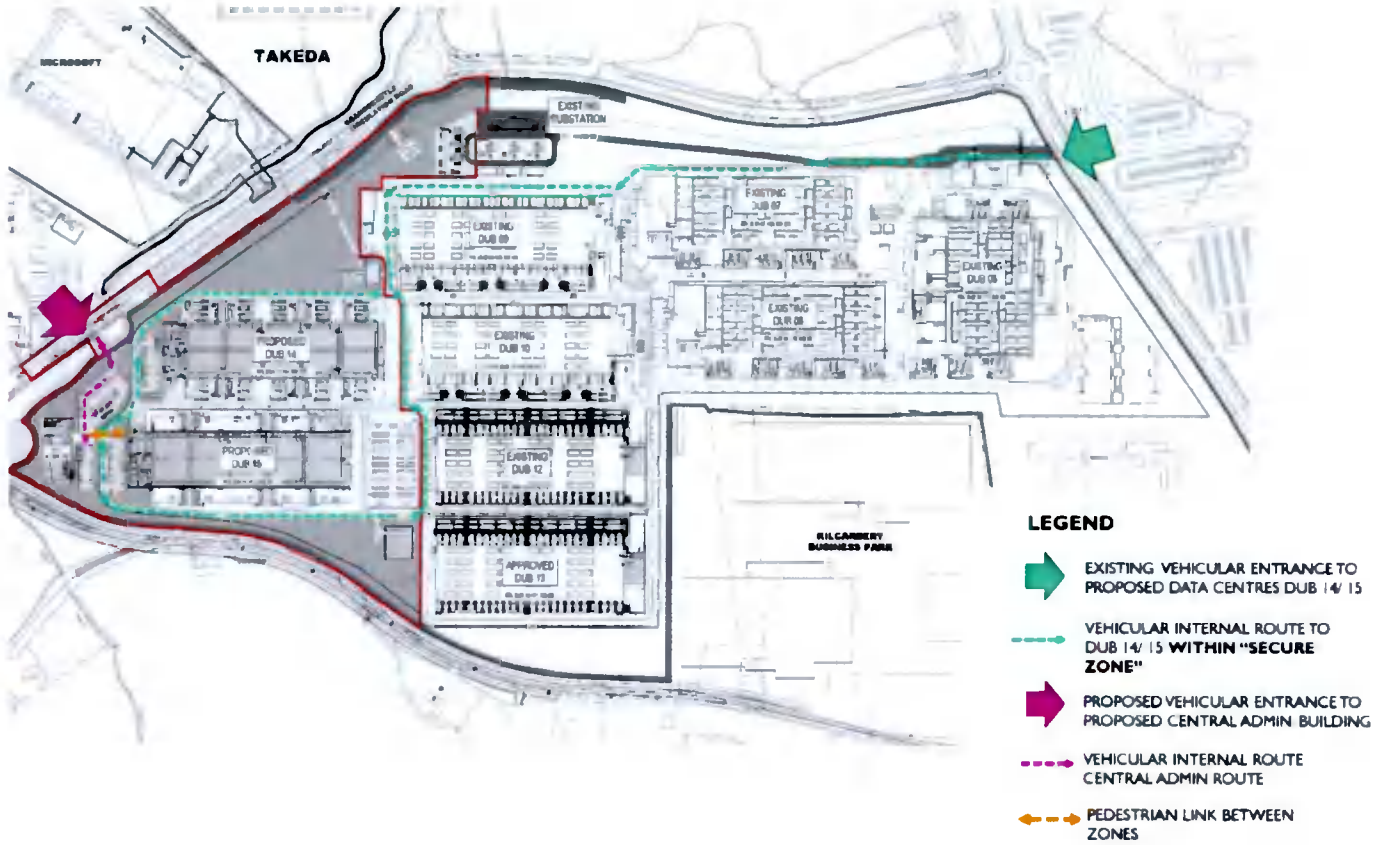


FIG. 58 VEHICULAR ENTRANCES AND ROUTES WITHIN SITE

10.0 Car & Bicycle Parking Strategy

10.1 Operational Car Parking

Data Centres

Table 11.23 of the current South Dublin County Council Development Plan sets out guidelines for maximum car parking allowances based on Land Use and Zoning. Although "Data Centre" is not identified expressly as a use category, the guideline for "Warehousing" is 1 parking space per 100m2 of GFA. Based on that calculation each Data Centre (26,720 m²) would have a maximum allowance of 268 no. spaces (536 no. in total). This high quantity of spaces would not be required based on the actual staffing numbers and shift patterns associated with the operation of the facilities. The quantity of car parking spaces calculated for the operation of each Data Centre is 36 no. therefore a total of 72no. spaces is to be provided including 4 no. accessible spaces.

Provision shall be made for a minimum of 10% of spaces to have electric charging points provided.

A covered bicycle parking (10 no. spaces minimum) area shall be included in the car park area for each Data Centre building.

FIG. 59 PROPOSED BICYCLE SHELTER AT ENTRANCE TO CENTRAL ADMIN BUILDING

Central Administration Building

The maximum car parking allowance has been calculated as follows:

1 per 50m² GFA Office Accommodation = 2,565m² =	51 Spaces
1 per 15m² Café / Staff cafeteria GFA = 830m² =	55 spaces
1 per 20m² Gym (Area of Gym inc. changing) = 230m² =	12 spaces
Total Maximum Spaces (Permissable)	**118 no. spaces**

Total proposed spaces = 96 no.

(Includes 5 no. accessible spaces)

Provision shall be made for a minimum of 10% of spaces to have electric charging points provided.

Sheltered Bicycle Parking is provided adjacent to all building entrances (see image below).

A minimum of 1 bicycle parking space per 5 no. staff shall be provided (24 no. minimum).

It is also intended that MS shall run a shuttle bus service running at regular intervals on a route that stops at each of the MS Data Centres and terminating at the Central Administration Building. This shall reduce localised vehicular traffic movements. A bus set down area and associated turning circles have been taken account of in the car park design.

10.2 Temporary Construction Operatives Car Parking

PROPOSAL DESCRIBED BELOW IS UNCHANGED FROM APPROVED SCHEME SD20A\0283 i.e. No CHANGE IS PROPOSED

We have included an area for temporary construction operatives surface car park as part of this planning application. The proposed site is indicated on Site Location and Site Layout drawings and is located to the North East of the site of the proposed Data Centres and Central Administration Building.

It is intended that 802 car parking spaces would be provided in this area with a shuttle bus set down area and turning circles accommodated into the layout proposed. A bus shelter is also included in the scope. Vehicular access shall be via the North West corner of the site from the existing road which links to the duel carriageway to the south of the road via a roundabout junction to the south west.

Lighting to this area shall be provided via mobile units and lighting levels shall be kept to the minimum that is practicable and the approach shall be sensitive to the pHNA Grand Canal corridor to the North.

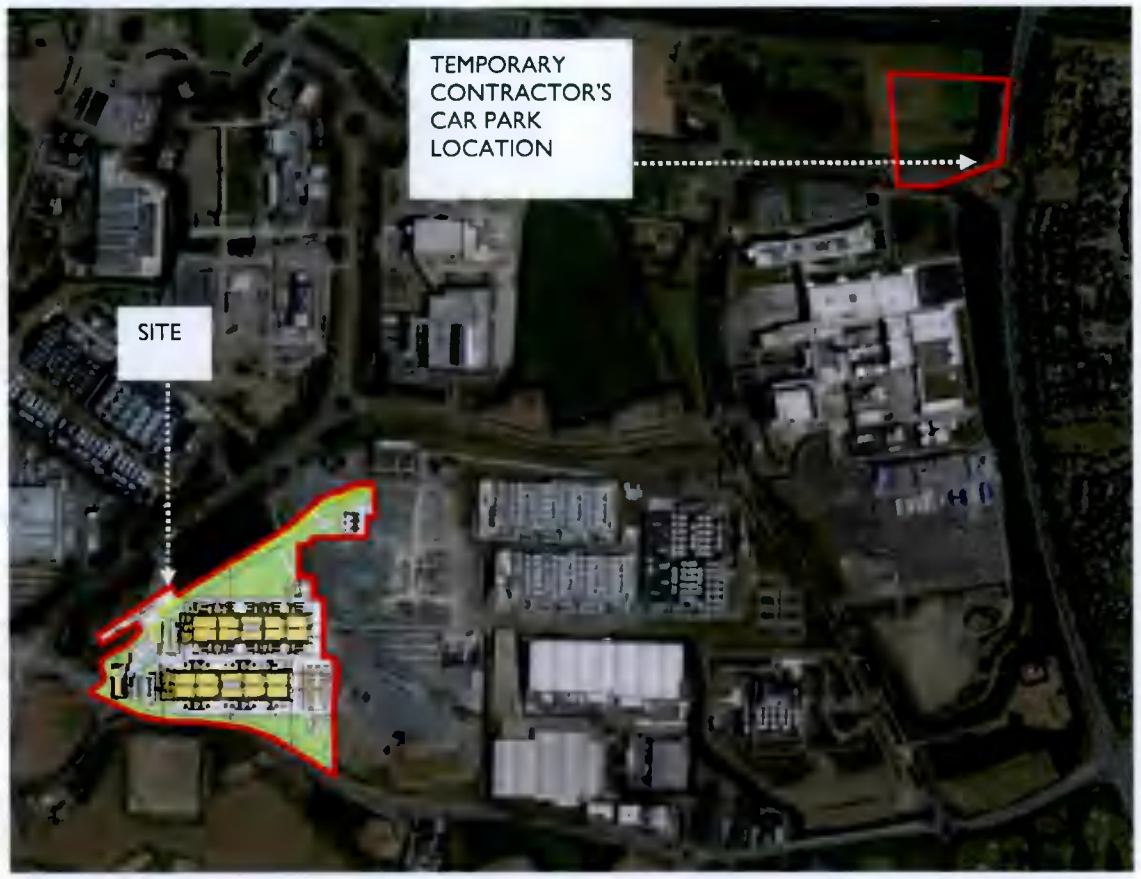


FIG.59 APPROVED TEMPORARY CONTRACTOR'S CARPARK LOCATION IN RELATION TO SUBJECT SITE

11 Sustainability

11.1 MICROSOFT – COMMITMENT TO ENVIRONMENTAL PRINCIPLES

Microsoft considers itself a global corporate citizen and as such seeks to develop principled pragmatic business approaches to challenging issues including the environmental challenges faced by society today. By working with its partners, customers, governments and leading environmental organisations Microsoft brings the power of information technology and cloud computing to bear in addressing the world's environmental challenges.

Microsoft is committed to software and technology innovation that helps people and organisations around the world address their environmental impact.

In this respect Microsoft intends to:

- minimize the environmental impact of its business operations and its products
- create technology solutions that help individuals and business around the world address their environmental impact.

Such aims are encapsulated in the recently published Microsoft 2015 Citizenship Report.

This report sets out the company's achievements as well as setting further goals in the following areas:

- Ethical Business Conduct and Governance
- Empowering Communities
- Human Rights
- Responsible Sourcing and Manufacturing
- Environmental Sustainability

11.2 Microsoft Environmental Goals 2030-2050

Microsoft environmental goals are based in seven principles, or elements, for the continuous innovation and to take additional steps on an ongoing basis:

i) Grounding in science and math. MI intends to address carbon issues grounded in ongoing scientific advances and an accurate reliance on the basic but fundamental mathematical concepts involved.

Microsoft intends to measure and be carbon negative by 2030 for all three scopes:

- Scope 1: the direct emissions that your activities create.
- Scope 2: the indirect emissions that come from the production of the electricity or heat you use.
- Scope 3: the indirect emissions that come from all the other activities in which you're engaged, including the emissions associated with producing the food you eat, or manufacturing the products that you buy.

ii) Taking responsibility for the carbon footprint, so by 2030 they intent to cut the emissions by more than half and remove more carbon than they emit each year.

a. By 2025, Microsoft will shift to 100% supply of renewable energy.
b. They will electrify their global campus operations vehicle fleet by 2030.
c. In July 2020, Microsoft will start phasing in their current internal carbon tax to cover our scope 3 emissions.
d. Starting in July, all business divisions will also pay an internal carbon fee for all their scope 3 emissions. This will both increase incentives across the company to reduce all scope 3 emissions and fund the added work to reduce their own scope 3 emissions and invest in carbon removal activities.
e. By July of 2021, Microsoft will begin to implement new procurement processes and tools to enable and incentivize their suppliers to reduce their scope 1, 2, and 3 emissions.
f. By 2030 Microsoft will remove more carbon than it emits, setting them on a path to remove by 2050 all the carbon the company has emitted either directly or by electrical consumption since it was founded in 1975.

iii) Investing for new carbon reduction and removal technology. Microsoft will invest in a new Climate Innovation Fund to accelerate the development of carbon reduction and removal technologies that will help the world become carbon negative.

iv) Empowering customers around the world. Microsoft will develop and deploy digital technology to help their suppliers and customers reduce their carbon footprints, through learnings and with the power of data science, artificial intelligence, and digital technology.

v) Ensuring effective transparency. Microsoft will publish an annual Environmental Sustainability Report that provides transparency on their progress, based on strong global reporting standards.

vi) Using their voice on carbon-related public policy issues. Microsoft will support new public

policy initiatives to accelerate carbon reduction and removal opportunities, and use their voices to speak out on four public policy issues:

- The need to expand global basic and applied research efforts on carbon, funded by governments, and reorient them towards targeted outcomes and enhanced cross-border collaboration to develop the breakthrough technologies needed to achieve net zero global emissions.
- The removal of regulatory barriers to help catalyse markets to enable carbon-reduction technologies to scale more quickly.
- The use of market and pricing mechanisms so people and businesses can make more informed carbon decisions.
- The empowerment of consumers through transparency based on universal standards to inform purchasers about the carbon content of goods and services.

vii) Enlisting employees. Encouraging the staff to participate in Microsoft's carbon reduction and removal efforts.

11.3 Microsoft Datacentres Volume Programme

Another remarkable initiative is the commitment to certify LEED Gold all new Microsoft's data centres through the LEED Volume Programme. Approved in 2017, the programme is responsible to streamline the sustainability standards of design and construction and permit Microsoft to apply LEED Certification in dozens of projects simultaneously, optimising time and resources.

All Microsoft's datacentres will save a minimum of 55% of energy use reduction, through efficient architecture and innovative building systems as will continuing to increase server efficiency. Adiabatic cooling systems use harvested rainwater, helping to reduce the demand for potable water to cool the building. The need of water use is also reduced through the reuse of rainwater for toilet and urinal flushing.

The landscaping of all new datacentres will not require irrigation after 2 years of planting, as only native and adapted plants will be specified.

Microsoft new datacentres will implement sedum roofs on the administration building roofs which will slow down storm water run-off and reduce the heat island effect. Selecting materials with high solar reflectance index for pavements, hardscape and roofs also impact on the temperature of the surfaces and reduces the heat island effect.

The external lighting of the Microsoft datacentres under the LEED Volume were designed to minimise the lighting pollution and increase night sky access, improve night-time visibility, and reduce the consequences of development for wildlife and people.

Microsoft will undertake an indoor air testing after construction and before occupancy of all new datacentres to ensure to MI staff that the building will be a healthy place to work.

A Life Cycle Assessment will be developed for each new Microsoft datacentres as an important tool to educate the design team on the environmental impacts of their decisions and compare different building strategies. The Life Cycle Assessment results provide the following environmental indicators: the global warming potential, depletion of the stratospheric ozone layer, acidification of land and water sources, eutrophication, formation of tropospheric ozone, depletion of non-renewable energy resources.

Microsoft have also pioneered a new concept to integrate fuel cells directly into server racks, which they expect to effectively cut data centre energy intensity in half by eliminating transmission losses and other inefficiencies.

Microsoft are continually working with industry partners to pilot and commercialize new energy technologies for the next generation of efficient data centre designs including at the data centre campus at Grange Castle Business Park. In turn this will further reduce their environmental footprint.

Allowance has been made on the campus for future connectivity to a district heating system and will be extended pending the availability of the Local Authority system.

11.4 Central Administration Building – LEED Platinum Target

The design of the proposed Central Administration Building and associated car park has targeted LEED Platinum as its future energy rating certification level.

With this goal in mind – the following issues have been addressed in the planning application proposals for this building and its immediate environs, see notes in blue to follow.

1. Location and Transportation
   - 1.1. Access to public transport
   - 1.2. Building entrance within 400m walking distance from bus stop. In addition, the site is adjacent to several bus other stops both within the Grange Castle Business Park and on the R134. The 7230 and 7714 bus stops are located on the business park estate road to the north of the Microsoft site. These bus stops are served by the Dublin Bus route which connects this business park site with Harristown, Glasnevin, Drumcondra, Dublin City Centre, St James Hospital, Bluebell, Clondalkin and Deansrath.
   - 1.3. Reduced parking footprint
     - 1.3.1. Do not exceed the minimum local code requirements for parking capacity – we have shown that under the Current Development plan a case could be made for 118 parking spaces, only 96 no. are proposed.
     - 1.3.2. Preferred parking for carpooling for 5% of total parking spaces – this could be accommodated under future building management procedures.
   - 1.4. Green parking
     - 1.4.1. Electrical charging stations (preferred location) – 2% of total parking spaces (10% proposed to be provided)
     - 1.4.2. Preferred parking for green vehicles (low emitting) – 5% of total parking spaces - this could be accommodated under future building management procedures.
   - 1.5. Bicycle facilities
     - 1.5.1. Bike racks for 5% of building occupants (safe, covered) – provided for 20%
     - 1.5.2. Bike racks for 2.5% of daily peak visitors (included in above)
     - 1.5.3. Shower/changing provision - Provide at least one on-site shower with changing facility for the first 100 regular building occupants and one additional shower for every 150 regular building occupants thereafter. Provided.
       - 1.1.1. Bike network? – Internal cycle paths shall connect to existing Business Park cycle path network.

2. Sustainable Sites
   - 2.1. Protect & restore habitat see Landscape Proposals which include for the following:
     - 2.1.1. Preserve and protect from all development and construction activity 40% of the greenfield area on the site, and
     - 2.1.2. Using native or adapted vegetation, restore 30% (including the building footprint) of all portions of the site identified as previously developed.
   - 2.2. Open Space - see Landscape Proposals which include for the following:
     - 2.2.1. Provide outdoor space greater than or equal to 30% of the total site area (including building footprint) - 37% provided.
     - 2.2.2. A minimum of 25% of that outdoor space must be vegetated (turf grass does not count as vegetation) or have overhead vegetated canopy.
     - 2.2.3. The outdoor space must be physically accessible and be one or more of the following:
       - a pedestrian-oriented paving or turf area with physical site elements that accommodate outdoor social activities;
       - a recreation-oriented paving or turf area with physical site elements that encourage physical activity;
       - a garden space with a diversity of vegetation types and species that provide opportunities for year-round visual interest;
       - a garden space dedicated to community gardens or urban food production;
   - 2.3. Rainwater Management – A full rainwater harvesting system is being provided.
     - 2.3.1. To reduce runoff volume and improve water quality by replicating the natural hydrology and water balance of the site based on historical conditions and undeveloped ecosystems in the region.
   - 2.4. Heat Island Effect
     - 2.4.1. Roof materials with solar reflectance index (SRI) of 82 or higher to be provided
     - 2.4.2. Paving materials with solar reflectance (SR) of 0.33 or higher to be provided
3. Water Efficiency
   - 3.1. Landscaping strategy – design includes for no irrigation
   - 3.2. Rainwater Harvesting provided –
   - 3.3. Water efficient sanitaryware can be considered in detail design.
4. Energy Efficiency
   - 4.1. PV collectors indicated on roof (approximately 200m2) passive/active systems for solar/glare, daylight harvesting can be developed at detail design stage.
5. Materials
   - 5.1. Use of materials with low embodied carbon (natural materials e.g. timber, stone; recycled materials, etc) shall be prioritised.
   - 5.2. Materials with Environmental Project Declarations (EPDs) shall be prioritised.
   - 5.3. (Interior materials) Low emitting materials: insulation, ceiling, flooring, composite wood, furniture, paints, coatings, adhesives, etc. shall be prioritised.
6. Indoor Environmental Quality
   - 6.1. Environmental Tobacco Smoke Control
     - 6.1.1. No smoking shall be allowed inside the building
     - 6.1.2. No smoking within 7.6 metres from entrances, doors, windows, and any air intake,
     - 6.1.3. Signage can be provided indicating the above in detail design
   - 6.2. Daylight
     - 6.2.1. Provide access to natural light – all spaces have access to natural light.
   - 6.3. Quality views
     - 6.3.1. Provide access to quality views - avoid obstructing views to the outdoors – high quality views are possible from all aspects of the building and in particular the cafeteria and gym areas.

12 Landscape & Ecology

The approach to landscape and ecology is fully described within the relevant chapters (5, 9 and 10) of the EIAR with inputs from landscape consultants Brady Shipman Martin and Ecologists – Moore. The approach taken has been to conserve and retain all of the existing boundary trees and hedgerows as much as possible.

13 Design References, Standards and Guidelines

The project will be carried out in compliance with the 1997-2020 Building Regulations and the 1997-2020 Building Control Regulations, Irish and European Standards, Codes of Practice and manufacturers ' instructions and guidelines. will be carried out in strict compliance with the Planning and Development Acts 2000-2019, the Planning and Development Regulations 2001-2019, the SDCC Development Plan 2016-2022 and with the detail contained in permissions, approvals or consents issued by the Planning Authority.

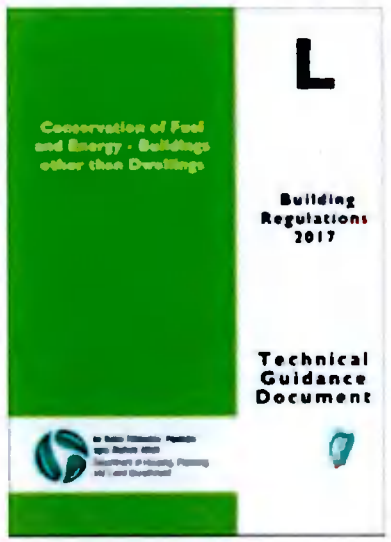
The design shall fully comply with all applicable safety, health, welfare and labour legislation. Project teams will be required to manage and conduct all design and construction activities so as to comply with the Safety, Health and Welfare at Work Act 2005 and with the Safety, Health and Welfare at Work (Construction) Regulations 2013-2020, and in particular to apply the General Principles of Prevention.

Without prejudice of any of the above requirements, performance benchmarking shall be as defined by the International Building Code (IBC) 2018 in alignment with the Client's global policy.

14 Energy Statement (ARUP M&E)

14.1 Technical Guidance Document Part L 2017 (HZEB)

The introduction of the updated Part L (energy) Building Regulations will be considered as part of the design process.



- Key initiatives including but not limited to the following:
- Incorporation of passive design measure where applicable, envelope air tightness, minimising solar gain, daylight, thermal mass
- Low energy artificial lighting installation and control
- Variable speed drives on pumps and fans where appropriate
- Reduced specific fan power at central ventilation plant
- High efficiency central plant heating & cooling plant
- Plant optimised at average running load as opposed to peak load
- High efficiency heat recovery devices to ventilation plant and EC direct drive motors

With respect to The Building Regulations for the data sore room (unheated space), technical Guidance Document (TGD) Part L notes that spaces with installed heat capacity of less than 10 W/m² are exempt from meeting the requirements of the TGD Part L document. As such the data storage operational space is exempt from TGD Part L 2017.

The ancillary office space and the central office building will be fully air-conditioned spaces and will meet the requirements of the TGD Part L 2017.

The ancillary office space associated to the data centre will be targeted to achieve BER B1 and the central office block will be targeted to BER A3. In both cases, this is usually possible by using heat pumps, photovoltaic panels or a combination of the aforementioned. Other renewable technologies such as solar hot water via air source heat pump will be considered.

14.2 DUB14/15 data storage facility

14.2.1 Data Centre Mechanical Cooling system

Considering the external ambient conditions in Dublin, the proposed design cooling system is based on a direct air system with evaporative system. The evaporative cooling is based on rigid media air coolers and fan walls

Therefore, DUB14/15 data centres do not require chillers/compressors to maintain the data storage room environmental conditions.

The space is cooled using outside air which the most efficient means of free cooling and conditioning the server space. The air handling units supply cooled air to the data hall where it is drawn through the server rows to cool the equipment. The warmer air is then directed to the AHU return plenum via a Hot Aisle containment system. The AHU mixes the hot air from the data hall with cooler outside air to meet the rooms supply air setpoint. When the outside air temperature is above the supply air temperature, the supply air is cooled using evaporative air coolers.

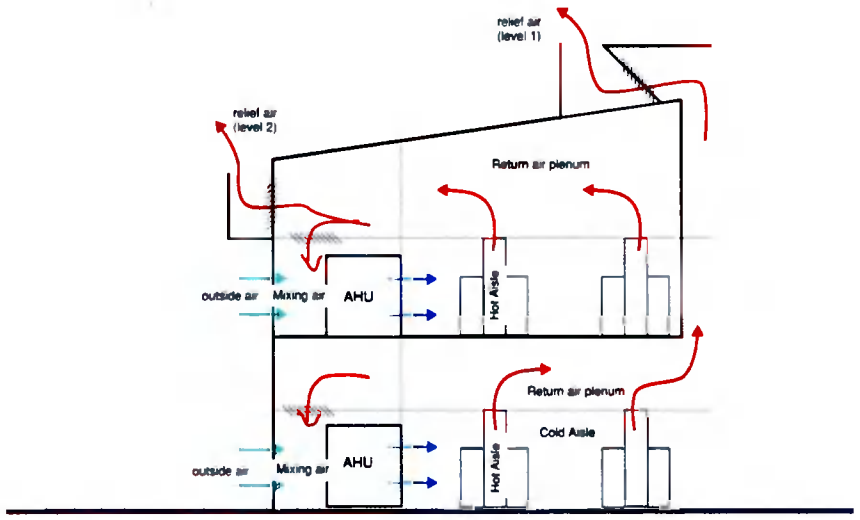


Figure 1 diagram principle for DUB14/15

The amount of heat rejected is dependent on the outside air temperature as during times of lower outdoor temperature the outdoor air is mixed with hot return air to achieve a constant supply air temperature. At winter low ambient temperatures, the data centre reuses up to 70% of the heat generated by the servers to heat the incoming air to the space.

14.2.2 Data Storage Room Environmental Conditions

To expand the use of the external outside air through the year, special considerations have been considered on the internal equipment conditions by expanding well the server intake temperature and humidity beyond the ASHRAE TC9.9 recommended environmental conditions. Therefore, water consumption will be minimised.

14.2.3 Demand Control / Variable Speed

In order to optimise the energy consumption associated to fans, the AHUs fans shall be monitored and control to ensure the plant is operating at maximum efficiency by reducing the fan speeds to minimum required to suit data centre environmental conditions.
Therefore, very significant savings are achieved under the design. As per consumption follows the affinity law, the power varies to the cube of the reduced flow rate (or fan speed). For instance, reducing 20 % flow rate would mean 50 % power consumption reduction

14.2.4 Direct Drive EC Fans

All air supply and extract systems serving the data storage rooms are provided with high efficiency direct drive fans. The EC direct drive fan is the most efficient fan solution available to facilitate demand control. These fans are lighter in weight and require less power than a traditional centrifugal fan with variable speed drive (VSD). Typically, savings of 10-20% in power consumption is achievable with an EC fan versus a centrifugal fan.

14.2.5 Rainwater Harvesting

Rainwater from the data centre roof shall be collected using a rainwater harvesting system and will then undergo treatment via a water plant to be used to serve data centre evaporative system (cooling system)

14.2.6 Data storage Ancillary Office - Mechanical

The ancillary office space attached to the data centre will be provided with a high efficiency VRV system.

The fresh air ventilation system will be served using heat recovery systems which will recover waste heat from the office spaces and re-use to pre-heat the air with the air handing unit.

Hot water demand for the building will be met using Air Source Heat Pumps. The hot water will be generated and stored in Hot Water Vessel prior to pumping to point of use.

Rainwater shall be harvested and re-used to ancillary data centre office building for WC and urinal cisterns.

14.3 Relevance to South Dublin Council Development Plan

The proposed systems noted above address the following key objectives relevant to SDCC but not limited

- Limiting emissions of greenhouse gases through energy efficiency,
- Spatial Energy Demand Analysis,
- Energy Performance of New Buildings.
- Energy and communications policy in sensitive landscapes which is relevant to this site.

14.4 Utility Supply

The proposed development will have a maximum operational electrical demand of 60MW each. The power requirements for the proposed development will be provided via a connection to an existing substation on the site and the utility 110 kv Substation (Corkagh) No additional external grid connections are required to facilitate the proposed development.
The proposed development will require the expansion of the existing customer yard within the substation to facilitate the addition of 3 No additional 110kv/20kV transformers
As the development is located in what is noted as a constrained area in terms of electrical grid capacity a standby gas generation plant is planned to meet the requirements of the utilities flexible demand policy. The capacity of the plant will be 60MW.

14.5 Standby Power

Diesel generators are provided on site to provide standby power in event of loss of the electrical supply Due to their infrequent usage, they do not represent a viable source for waste heat recovery. The gas plant which will be required to produce standby electricity for more sustained periods (circa between 500 - 2000 hours annual). This will be infrequent and irregular in response to grid incidents and thus is not viable in terms of waste heat recovery.

14.6 External Lighting

The external lighting has been designed in accordance with SI requirements of IS EN 1320 1 -2, using high efficiency LED lighting poles, with minimal building mounted luminaires.
The lighting design has been optimised to reduce glare, spillage or other light nuisance to adjacent sites and/or public roads.
The use of low energy LED lighting is in accordance with E4 Objective 1 of the South Dublin Count Council Development Plan.

14.7 Internal Lighting

Energy efficient lighting should avoid unnecessarily high illuminance, incorporate the most efficient luminaires. control gear and include effective lighting controls. These good practice design principles will be followed during the detailed design stage of the proposed development.
LED lighting will be utilised throughout for all internal areas as the most energy efficient and practical solutions, offering the lowest achievable Lighting Power Density (LPD).

The use of low energy LED lighting is in accordance with E4 Objective 1 of the South Dublin Count Council Development Plan.

14.8 Central Admin building. Mechanical & Electrical (CAB)

14.8.1 Air Conditioning

For the central admin block, the building will be provided with high efficiency air source heat pump which can supply simultaneously heating and cooling at the same time.

Figure 2 air source heat pump

The office environment will be controlled by a high efficiency fan coil system which deliveries both heating a cooling. Large glazed areas may require localised heating applications to ensure adequate temperatures and comfort condition are met for office occupants.

14.8.2 Min. fresh air

The fresh air ventilation system for the office area will be served using energy efficient Heat Recovery Units which will recover waste heat from the office spaces and re-use to pre-heat the air. This will reduce the overall energy consumption for this system.

14.8.3 Hot Water Generation

Hot water demand for the Office building will be met using Air Source Heat Pumps. The hot water will be generated and stored in Hot Water Vessel prior to pumping to point of use.

14.8.4 Rainwater Harvesting System

Rainwater shall be harvested from the centralized admin roof and undergo associated treatment for re-use to WC and urinal cisterns.

14.8.5 Lighting

LED lighting will be considered for internal areas as the most energy efficient and practical solutions, offering the lowest achievable Lighting Power Density (LPD). PIR occupancy control will be used for lighting throughout the development to automatically turn on/off light fixtures.
The use of low energy LED lighting is in accordance with E4 Objective 1 of the South Dublin Count Council Development Plan

14.8.6 PV panels

Provision for an array of PV panels shall be made to generate on site renewable energy, up to a peak of 30KWe. The on-site renewable electricity generation will be back-fed to the electrical general supply for the building, serving lighting, office area general services and office IT equipment. This is in line E7 Objective I of the South Dublin Count Council Development Plan.

15.0 Visual Impact Views

VIEWS - KEY PLAN

VIEW 1 – AS PROPOSED

VIEW 1 – AS APPROVED SD20A\0283

VIEW 2 – AS PROPOSED

VIEW 3 - AS PROPOSED (DUB 14 IN FOREGROUND)

VIEW 2 – AS APPROVED SD20A\0283

VIEW 3 - AS APPROVED SD20A\0283 (DUB 14 IN FOREGROUND)

VIEW 4 - AS PROPOSED

VIEW 5 - AS PROPOSED

VIEW 4 – AS APPROVED SD20A\0283

VIEW 5- AS APPROVED SD20A\0283

APPENDIX I
SCHEDULE OF AREAS

BUILDING / FUNCTION	Approved Area Sq. Metre (GFA)	Proposed Revised Areas Sq. Metre (GFA)	Difference +/- m2
Central Administration Building (1-4 storeys)	3,520	3,915	+395 m^2
DUB 14 Data Centre (2 storey)	28,072	26,720	-1,352 m^2
DUB 15 Data Centre (2 storey)	28,173	26,720	-1,453 m^2
Rain Water Harvesting (Single Storey)	74.6	N/A	-74.6 m^2
Sprinkler Tank Pump House (2 no. single storey) **Total area combined**	149.20	89.25	-59.95 m^2
Water Treatment Plant – includes one sprinkler pump house	-	413	+413 m^2
Gas Skid Buildings (3 no. single storey) **Total area combined**	134.4	134.4	
TOTAL PROPOSED NEW BUILDING GFA	**59,766**	**57,986**	**-1,769m^2**
Approved Demolition of Existing Dwelling and ancillary buildings (all single storey)	291	291	