Statutory Consultation 2022

Preliminary Environmental Information Report

Volume 3: Appendix 4.1

Construction Method Statement and Programme Report

Contents

Insets

1 INTRODUCTION

1.1.1 Luton Rising (a trading name of London Luton Airport Ltd) propose to increase the capacity of the airport to 32 million passengers per annum (mppa) (hereon referred to as the 'Proposed Development') as part of their Vision for Sustainable Growth 2020 to 2050 published in 2017.

1.1.2 This Construction Method Statement (CMS) sets out the construction methodologies, works and machinery required for the Proposed Development. This document will;

a. outline the main construction methods and phasing sequence to deliver the Proposed Development whilst minimising disruption to existing operations and the environment; and

b. outline current thinking on construction logistics and construction techniques including demolition and enabling works.

1.1.3 The CMS forms part of a suite of documents which support the DCO application for the Proposed Development. In addition to the CMS the **Draft Code of Construction Practice** [refer **Appendix 4.2** in Volume 3 of the Preliminary Environmental Information Report (PEIR)] sets out the requirements for managing the environmental effects of the construction works which are described in the CMS.

1.1.4 1.1.4 For works that take place on any premises owned or under the control of the operating airport, in addition to the DCO CoCP they will comply with construction works requirements as defined by the airport operator.

1.1.5 The construction methodology set out in the CMS has been used in the assessment reported in the **PEIR**.

1.1.6 This CMS is not intended to describe the construction of all buildings and structures of the Proposed Development. The CMS provides general construction methods that have been used for assessment purposes within the **PEIR**. Reference is also made to the Remediation Strategy for the former Eaton Green Landfill [refer **Appendix 17.5** Volume 3 of the PEIR].

2 CONSTRUCTION PHASES AND PROGRAMME

2.1 Introduction

2.1.1 This section identifies the key phases and elements of the construction of the Proposed Development.

2.1.2 The Proposed Development builds on the current operational airport with the construction of a new passenger terminal and additional aircraft stands to the north east of the runway.

2.1.3 This will take the overall passenger capacity from 18 mppa to 32 mppa. Noting that on 1 December 2021, the local planning authority (Luton Borough Council) resolved to grant permission for the current airport operator (LLAOL) to grow the airport up to 19 mppa, from its previous permitted cap of 18 mppa. Since then, the Secretary of State for Levelling up, Housing and Communities has issued a "holding direction" which prevents Luton Borough Council from issuing a final decision while the Secretary of State considers whether he should call-in and decide the 19 mppa planning application. Hence, all the assessment work to date has been undertaken using a 'baseline' of 18 mppa. Nonetheless, in anticipation of LLAOL's 19 mppa planning application, the preliminary environmental assessments included sensitivity analysis of the implications of the permitted cap increasing. As a result, the consultation assessments are considered to be sufficiently representative of the likely significant effects of expansion, whether the baseline is 18 mppa or 19 mppa. Where the change of the baseline does affect an assessment topic, in most cases it means that the 'core' assessments (using an 18 mppa baseline) report a marginally greater change than would be the case with a 19 mppa baseline. Further consideration will be given to updating the assessments after the consultation, alongside any other revisions made as a result of consultation feedback.

2.1.4 In addition to the above and to support the initial increase in demand, the existing infrastructure and supporting facilities will be improved in line with the phased growth in capacity of the airport.

2.1.5 Key elements of the Proposed Development include:

a. Extension and remodelling of the existing passenger terminal (Terminal 1) to increase the capacity;
b. New passenger terminal building and boarding piers (Terminal 2);
c. Earthworks to create an extension to the current airfield platform, material for these earthworks would be generated on site;
d. Airside facilities including new taxiways and aprons, together with relocated engine run-up bay and fire training facility;
e. Landside facilities, including buildings which support the operational, energy and servicing needs of the airport;
f. Enhancement of the existing surface access network, including a new dual carriageway road accessed via a new junction on the existing New Airport Way (A1081) to the new passenger terminal along with the provision of forecourt and car parking facilities;

g. Extension of the Luton Direct Air to Rail Transit (Luton DART) with a station serving the new passenger terminal;
h. Landscape and ecological improvements, including the replacement of existing open space; and
i. Further infrastructure enhancements and initiatives to support our goal of net zero carbon airport ground operations by 2040, with interventions to support carbon neutrality being delivered sooner including facilities for greater public transport usage, improved thermal efficiency, electric vehicle charging, on-site energy generation and storage, new aircraft fuel pipeline connection and storage facilities and sustainable surface and foul water management installations.

2.2 Project Construction Phases

2.2.1 The Proposed Development will deliver additional capacity to meet the forecast growth in demand in two construction phases related to increasing capacity at the existing terminal (Phase 1), and the construction of the new terminal (Phase 2).

2.2.2 Given the length of time over which the Proposed Development will be constructed, and the step change in passenger numbers from the end of Phase 1 to final full capacity, an interim assessment phase has also been considered to understand environmental effects over the time the Proposed Development is constructed while the airport remains in operation.

2.2.3 For the purposes of assessment, three assessment phases are considered, as follows:

a. Phase 1: Expansion of existing Terminal 1 (T1) to increase capacity from 18 to 21.5 mppa. It is currently anticipated that Phase 1 works will commence in 2025 and be complete by mid 2027;

b. Phase 2a: Construction of new Terminal 2 (T2) and associated facilities to increase capacity from 21.5 mppa to 27 mppa upon opening. It is currently anticipated that Phase 2a works will commence in early 2033 ending 2036 and will enable a step up in capacity in Q1 2037; and

c. Phase 2b: Expansion of T2 and associated facilities. It is currently anticipated that Phase 2b works will commence in 2037 and will deliver incremental capacity increases from 27 mppa to 32 mppa. T2 will have capacity for 12 mppa. The works will be complete to enable a step up in capacity in 2041.

2.2.4 Inset 2.1, below is a plan of the airport at the time of writing this report to allow comparison with the masterplan layouts for the proposed three assessment phases in the following sections.

Inset 2.1: Current Airport Layout

2.3 Phase 1

2.3.1 Phase 1 would be primarily centred around the expansion of the existing Terminal 1 (T1) and additional aircraft stands. The elements of Phase 1 would include the following:

a. Airfield (refer to inset 2.2, item 1):
   i. Additional four stands to be constructed on Foxtrot Taxiway as first element of the T2 apron;
   ii. Alteration of Engine Run Up Bay (ERUB) and 1no additional temporary stand adjacent to this area; and
   iii. Extension of Foxtrot taxiway to north.

Note: Temporary Drop off Zone (TDOZ) stands (4no) are to be built by the existing airport operator prior to this phase and are therefore not included.

b. Earthworks Platform (refer to insert 2.2, item 1):
   i. Localised earthworks to form 4no additional stands;

c. T1 Enhancements which may be adapted for future operational needs (refer to inset 2.2, item 2):
   i. Check in: additional 30 kiosks;
   ii. Security: additional two lanes and relocation of staff offices (approx. 360sqm);
   iii. Departure lounge: extension of the airside departure lounge in the southern/eastern corner and base of Pier B link (approx. 1,170sqm);
   iv. New bussing gate facility: new bussing gate facility on existing stand 61 (approx. 900sqm);
   v. Outbound baggage: “do minimum” solution; and
   vi. Immigration: extension of queue area and partial refurbishment of the hall.

d. Car Parking (refer to inset 2.2, item 3):
   i. Construction of new surface car park (P7);
   ii. Construction of new surface car park (P6);
   iii. Reduction of long stay car park (P5); and
   iv. Reconfiguration of car park P9.

e. Landside (refer to inset 2.2, item 5):
   i. New Century Park (NCP) warehouse; and
   ii. Extension of existing coach station.

f. Highways:
   i. Off-site highways works.

g. Demolition:

   i. Demolition of existing structures [as detailed on Site Clearance plan within Appendix D].

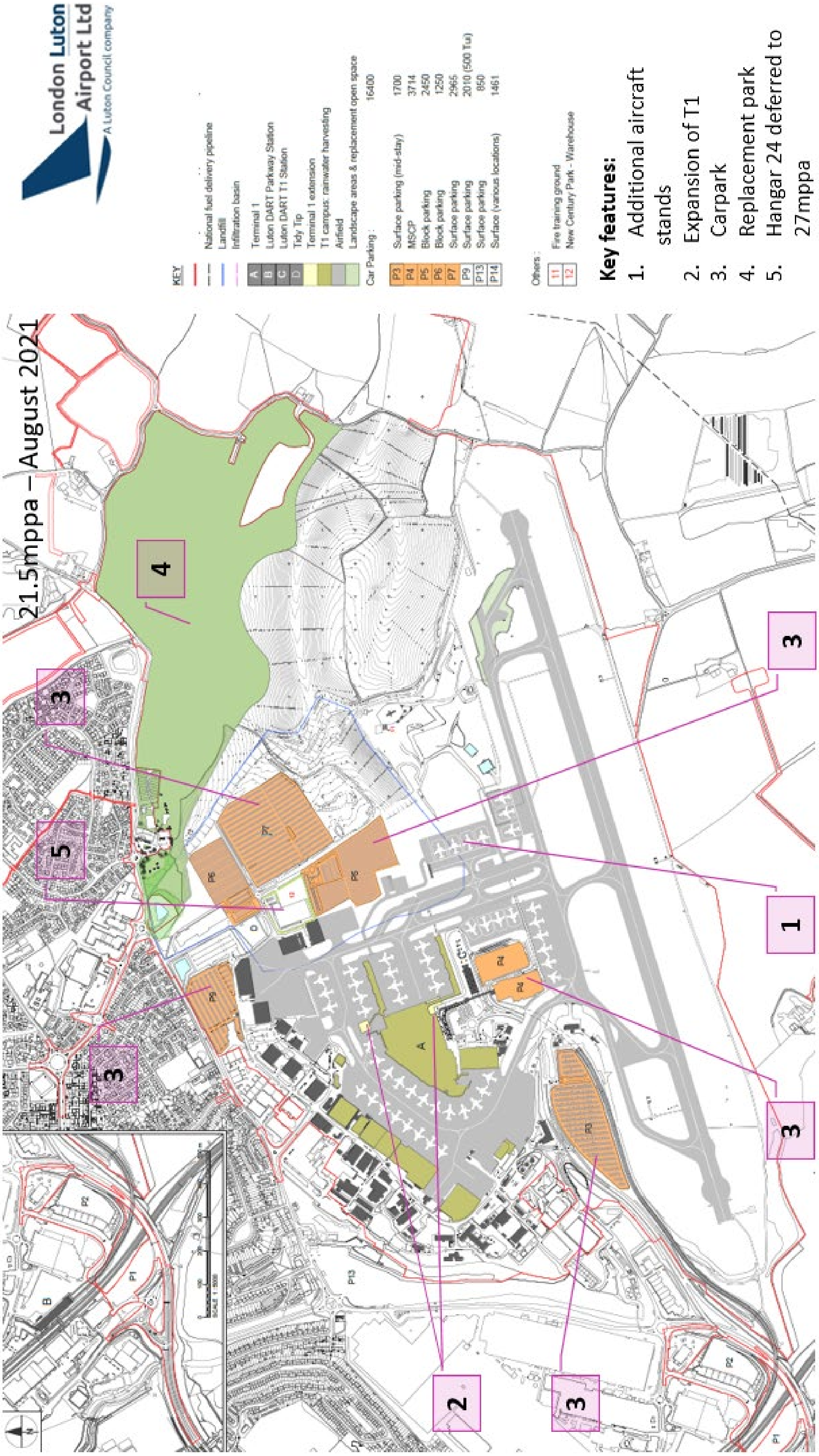
h. Utilities:

   i. Various service diversions including but not limited to; water, waste, gas, electricity, and telecommunications.

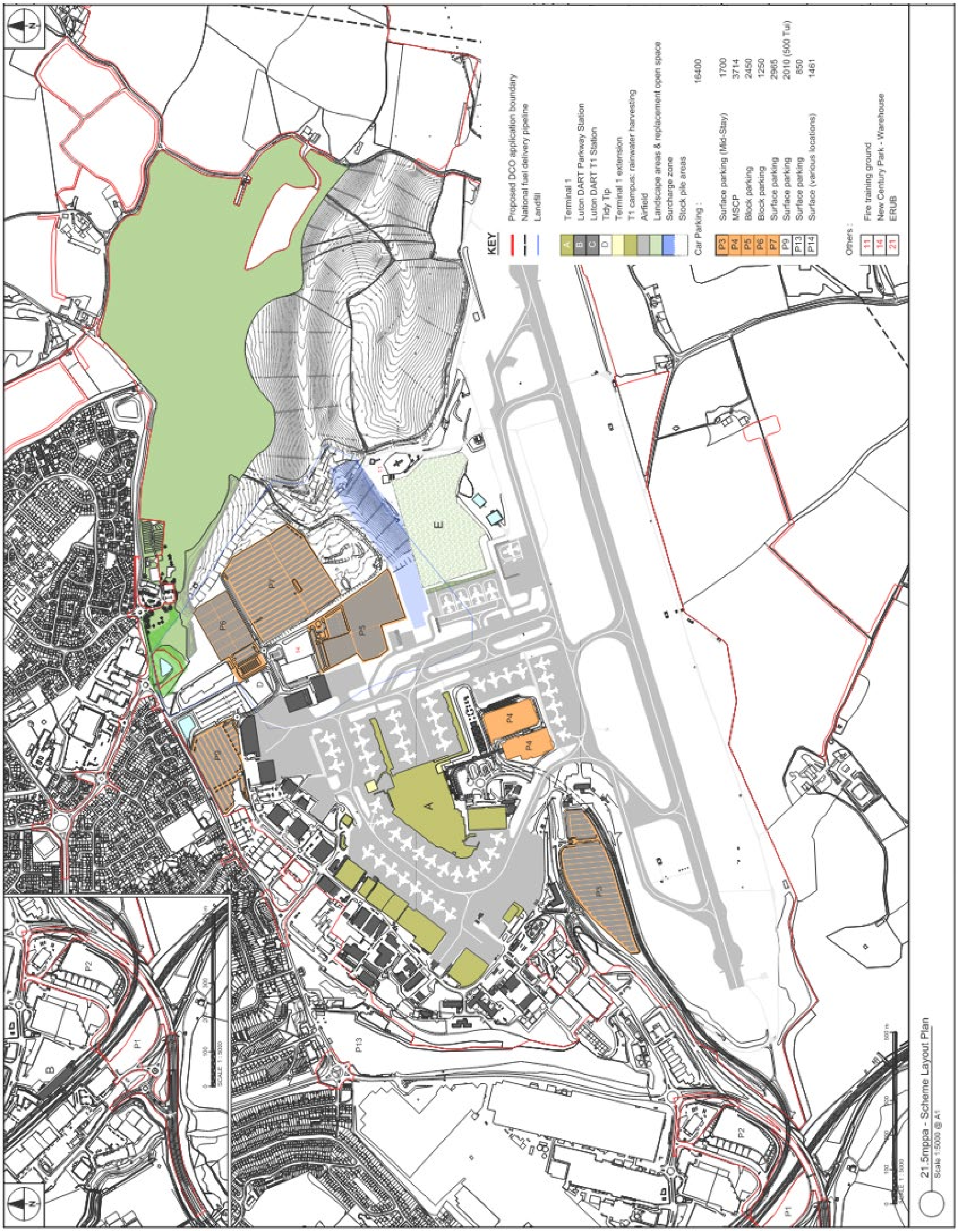
i. Parkland / Landscaping (refer to inset 2.2, item 4):

   i. Replacement open space: New Wigmore Valley Park;
   ii. Habitat creation measures;
   iii. Offsite visual impact mitigation; and
   iv. Landscaping.

Inset 2.2: Phase 1 Proposed Works



Inset 2.3: Phase 1 Masterplan



2.4 Phase 2a

2.4.1 Phase 2a increases the airport's capacity and would include the following:

a. Airfield (refer to inset 2.4, item 1):
   i. Expansion of the apron and construction of new aircraft stands (12 stands to bring the total to 16no. stands);
   ii. New rapid exit taxiways (RETs);
   iii. Realignment of the Alpha taxiway and provision of a second parallel taxiway;
   iv. Refurbish existing aircraft stands;
   v. Relocation of the ERUB;
   vi. New vehicle control post;
   vii. New drainage attenuation below the stands;
   viii. New airfield utility connections; and
   ix. Navaid improvements.

b. Earthworks Platform (refer to inset 2.4, item 2):
   i. Extension to the earthwork platform; and
   ii. Remediation of the effected landfill areas (plus decontamination).

c. T2 (refer to inset 2.4, item 3):
   i. Construction of new passenger terminal;
   ii. New west pier; and
   iii. Associated airport support facilities.

d. Landside (refer to inset 2.4, item 4 & 8):
   i. New emergency assembly area;
   ii. New forecourt drop-off;
   iii. New technical building (Hanger 24);
   iv. New coach station;
   v. New hotel: and
   vi. New Century Park offices.

e. Luton DART (refer to inset 2.4, item 6c):
   i. Extension of the Luton DART tunnels and new Luton DART station serving T2.

f. Car Parking (refer to inset 2.4, item 6):
   i. New multi storey staff car park (P1);
   ii. New staff car park (P2);
   iii. New decked mid / long stay car park (P5);

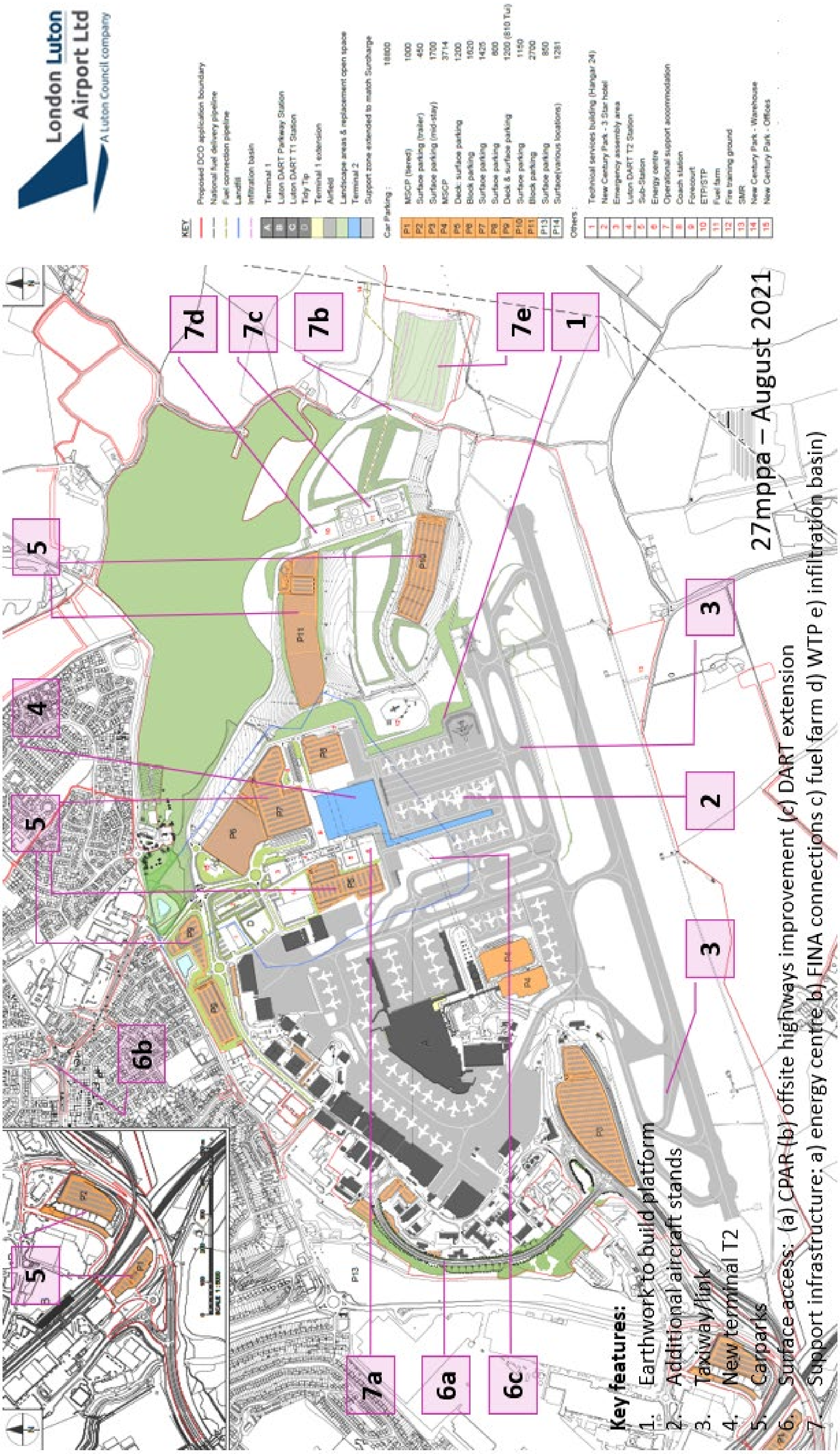
iv. Reduction of long stay car park (P6);
v. Reduction to surface mid stay car park (P7);
vi. New surface car park (P8);
vii. Decking to staff car park (P9);
viii. Construction of new surface mid and long stay car park (P10); and
ix. Construction of new long stay car park (P11).

g. Highways (refer to inset 2.4, item 6):
   i. Demolition of various buildings and hangars for the new Airport Access Road (AAR) (formerly known as CPAR) (6a);
   ii. Construct of the new AAR; and
   iii. Off-site highways works (6b).

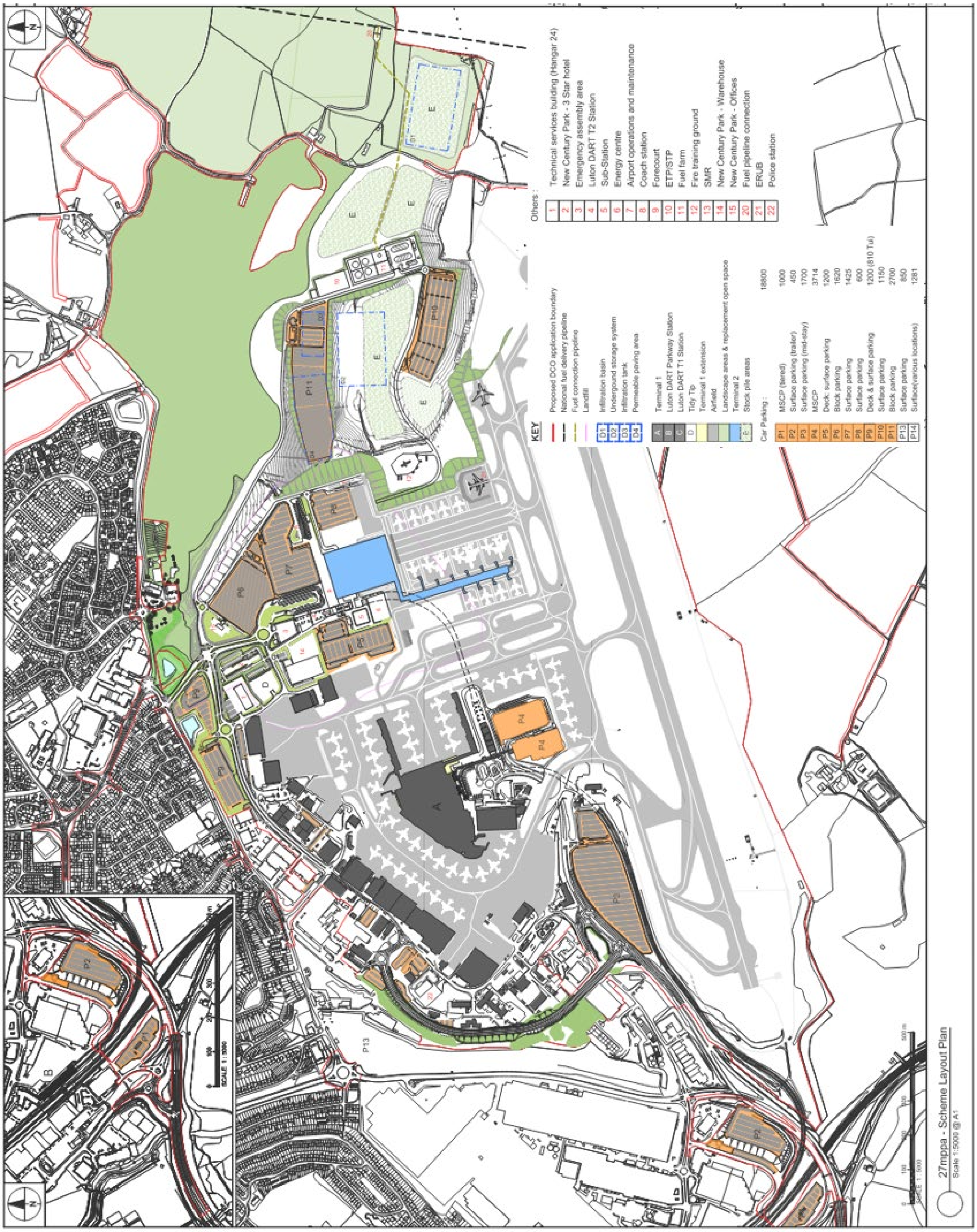
h. Utilities and Infrastructure (refer to inset 2.4, item 7):
   iv. New substation;
   v. New energy centre (refer to inset 2.4, item 7a);
   vi. New fuel storage facility and pipeline (refer to inset 2.4, item 7b & 7c);
   vii. New water / power / drainage connections;
   viii. New surface water drainage;
   ix. New Water Treatment Plant (WTP) (refer to inset 2.4, item 7d);
   x. New temporary sewer; and
   xi. New off-site soakaway (infiltration basin) (refer to inset 2.4, item 7e).

i. Landscaping
   i. Replacement Open Space Phase 2;
   ii. Landscape restoration works Phase 1; and
   iii. Public realm landscaping to T2 entrance area.

Inset 2.4: Phase 2a Proposed Works



Inset 2.5: Phase 2a Masterplan



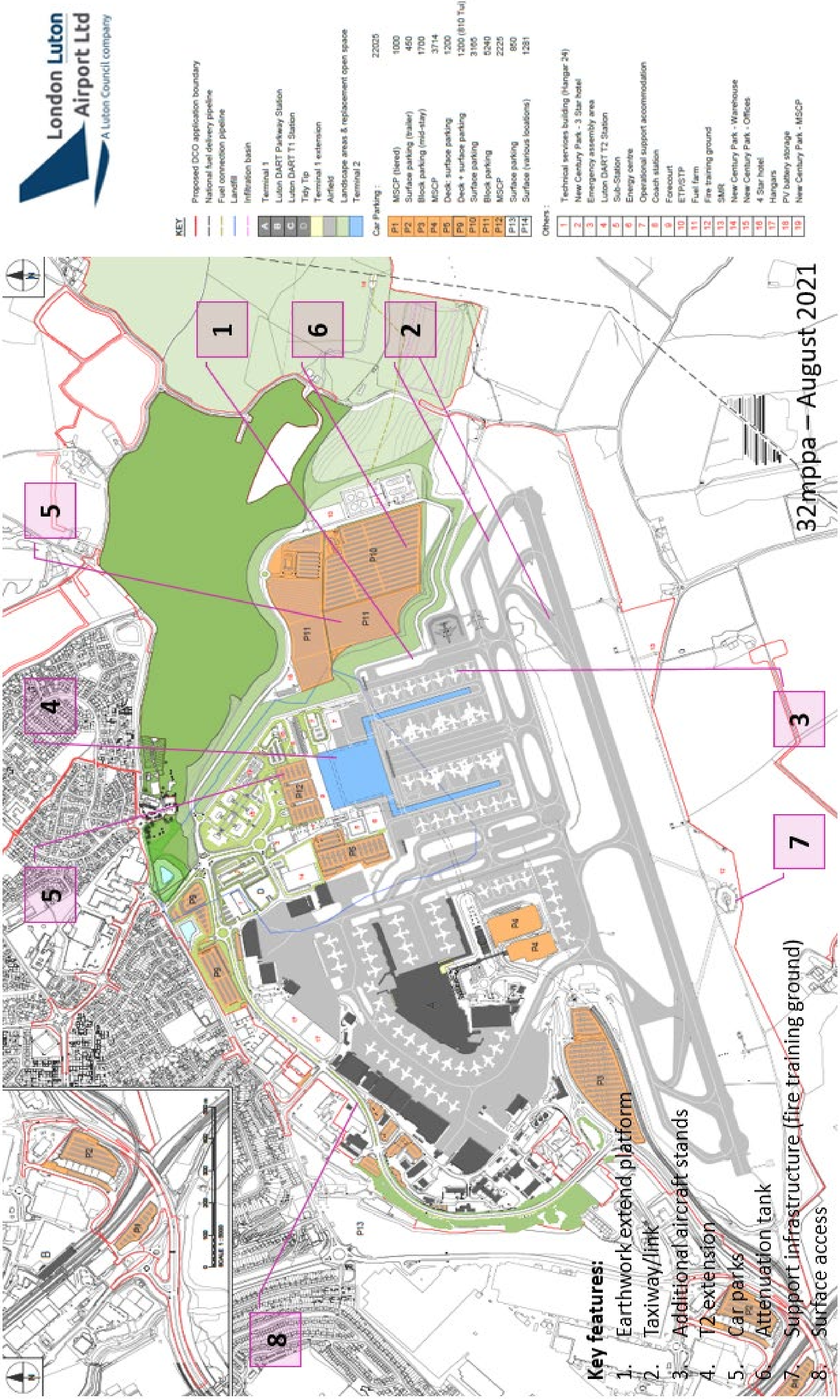
2.5 Phase 2b

2.5.1 The final phase of construction (Phase 2b) would increase the airport's capacity to 32 mppa. The elements of Phase 2b would include the following (see Inset 2.7: Phase 2b):

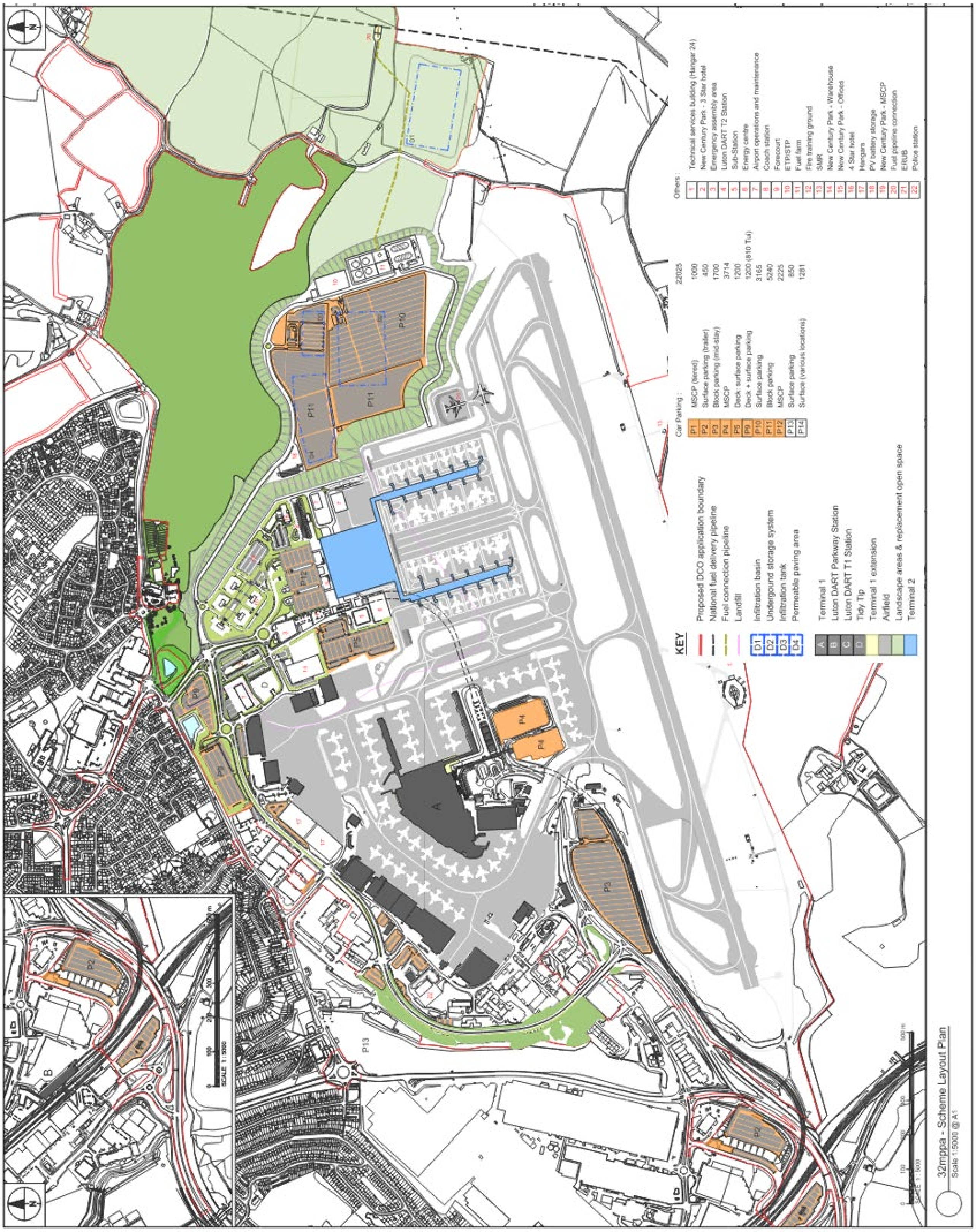
a. Airfield (refer to inset 2.6, item 3):
   i. New stands (additional 10 stands);
   ii. New taxiway connection to East;
   iii. ERUB is relocated into final location;
   iv. Drainage attenuation below the stands;
   v. Airfield utility connections;
   vi. Navaid improvements;
   vii. Airfield operations /security base;
   viii. Fire training ground relocation; and
   ix. Vehicle control post relocation.
b. Earthworks Platform (refer to inset 2.4, item 1):
   i. Extension to earthworks platform.
c. T2 (refer to inset 2.4, item 4):
   i. Extension of T2 and
   ii. New pier.
d. Car Parking (refer to inset 2.4, item 5):
   i. Replacement of T2 forecourt short / long stay car park with new short stay multi storey car park (P6);
   ii. New long stay car park (P7); and
   iii. New multi-storey car park.
e. Highways (refer to inset 2.4, item 8):
   i. Off-site highways works.
f. Landside:
   i. Expansion of forecourt drop-off;
   ii. New Century Park hotel;
   iii. New police station;
   iv. New catering / cargo warehouses;
   v. New hangars;
   vi. New waste & recycling centre;
   vii. Expansion of coach station; and
   viii. New PV battery storage centre.

g. Utilities and Infrastructure:
   i. Water / Power / Drainage connection; and
   ii. Drainage – surface water and foul water connection.
h. Landscaping:
   i. Replacement open space Phase 3;
   ii. Landscape restoration works Phase 2; and
   iii. Public realm landscaping to T2 entrance area and approach roads.

Inset 2.6: Phase 2b Proposed Works



Inset 2.7: Phase 2b Masterplan



2.6 Construction Programme

Key Dates

2.6.1 The key indicative dates for the Project would be as follows:

a. Development Consent Order received, and preconstruction conditions discharged in 2024;

b. Phase 1 construction starts: Q1-2025;

c. Phase 1 operational: Q2-2027;

d. Phase 2a construction starts: Q1-2033;

e. Phase 2a complete: Q4-2036;

f. Phase 2b construction starts: Q1-2037; and

g. Phase 2b complete: Q4-2040.

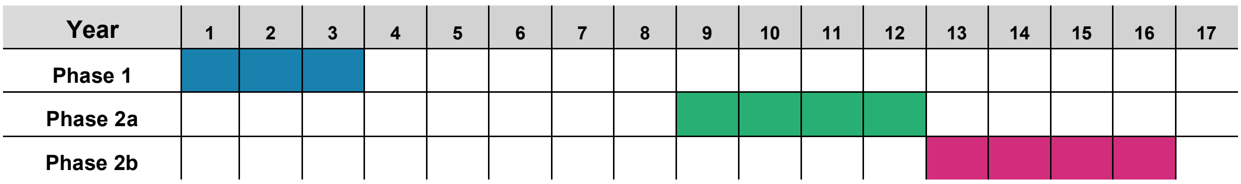
2.6.2 Dates taken from the construction schedule contained in Appendix A.

Outline Programme

2.6.3 The outline programme provides an indication of the overall construction programme. Construction activities are anticipated to be phased over a 16-year period and are subject the forecast passenger demand. A high-level summary programme is contained in Appendix A.

2.6.4 The period of significant construction is Phase 2a which includes the construction of T2.

Inset 2.8: Outline Programme



2.6.5 Phase 1 would involve the reconfiguration and improvement of the existing T1 and the construction of new aircraft stands to support the forecast passenger growth. This work is likely to be undertaken by the existing airport operator.

2.6.6 The Phase 2a works are assessed as commencing in year 9. It is during this phase that most of the proposed construction will take place with the construction of T2 and aircraft stands.

2.6.7 The delivery of Phase 2b is planned to take place from year 13 but is dependent on the forecast passenger demand. The phase expands on the completed Phase 2a by increasing the capacity of T2 and the construction of additional aircraft stands.

Critical Path

Phase 1

2.6.8 In Phase 1 the critical path would run through the environmental mitigation and the creation for the replacement open space. This is required to allow the construction of the new surface car parks P6 and P7 (refer to inset 2.2). This in turn allows the existing long stay car park P5 (refer to inset 2.2) to be truncated providing space for the earthworks and construction of the last three aircraft stands.

Phase 2a

2.6.9 In Phase 2a the critical path runs through construction of T2, its fitout and commissioning.

2.6.10 Running in parallel is the construction of the earthworks platform required for the new airfield and pier. Completion of the earthworks releases the landside construction and construction of the associated new infrastructure such as the fuel storage facility and the water treatment plant.

2.6.11 Early construction of the new AAR is advantageous due to the scale and complexity of the works. This requires vacant possession of the existing structures to be demolished. Construction of the new Hanger 24 is required to allow the existing hanger to be demolished.

Phase 2b

2.6.12 In Phase 2b the critical path would run through the extension of the earthwork platform. To enable the earthworks to commence the existing fire training ground needs to relocate to south of the runway.

2.6.13 Construction of the new earthwork platform is required to extend the airfield and construction of the new aircraft stands, construction of the new passage pier and for the relocation of the ERUB into its final position.

3 CONSTRUCTION PHASE 1

3.1 Key Construction Constraints & Interfaces

3.1.1 The objective of Phase 1 would be to maximise the capacity of the existing T1, provision of additional aircraft stands, undertake environmental mitigation and the re-provision of public open space. The first objective would be met by enhancing T1, increasing the number of aircraft stands and increasing the number of parking spaces. The second objective would be met by extending the existing Wigmore Valley Park.

3.1.2 The key construction constraints and interfaces for Phase 1 would include:

a. Granting of the Development Consent Order;
b. Interface with operational airport;
c. Interface with users of the existing public open space;
d. Interface with local residents and businesses; and
e. Interface with landowners.

3.2 Construction Programme & Phasing

3.2.1 The main construction activities in Phase 1 would be:

a. Site establishment;
b. Replacement of open space (Wigmore Valley Park), habitat creation, offsite visual impact mitigation and landscaping;
c. Utility diversions;
d. Bulk earthworks associated with the construction stands;
e. Construction of new aircraft stands (no.) alteration of engine ground running bay and 1 no additional temporary stand adjacent to this area and taxiways;
f. T1 enhancements;
g. Provision of new car parking facilities; and
h. Off-site highways improvements.

3.2.2 The phasing diagrams, contained in Appendix B, illustrate the key construction phases of Phase 1.

3.3 Construction Methodology

Site Establishment

3.3.1 It is anticipated that during this phase there will be several stand-alone site establishments and construction compounds both because of the dispersed nature of the proposed works. See Section 6.8 for further information on the site compound arrangements.

3.3.2 The potential satellite site locations are shown in the phasing diagrams in Appendix B and would include the following:

a. Construction Compound 1 (Replacement Open Space Wigmore Valley Park): Self-contained site compound area (approx.1500sqm) located close to the proposed replacement open space works. Providing welfare facilities for site operatives, material and equipment storage and operative car parking;

b. Construction Compound 2 (Earthworks and Airfield): A self-contained construction compound of approx. 2,000sqm already exists as it was used for the construction of Foxtrot taxiway. The compound is located to the south of the existing long stay car park (P5) to support the construction of the new aircraft stands and airfield works. The compound would provide welfare facilities for site operatives, materials receiving, equipment storage and operative car parking;

c. Construction Compound 3 (New Surface Car Parks P6 & P7): A self-contained construction compound (approx. 1,500sqm) located within the proposed new surface car parks (P6 & P7). Providing welfare facilities for site operatives, materials receiving, equipment storage and operative car parking;

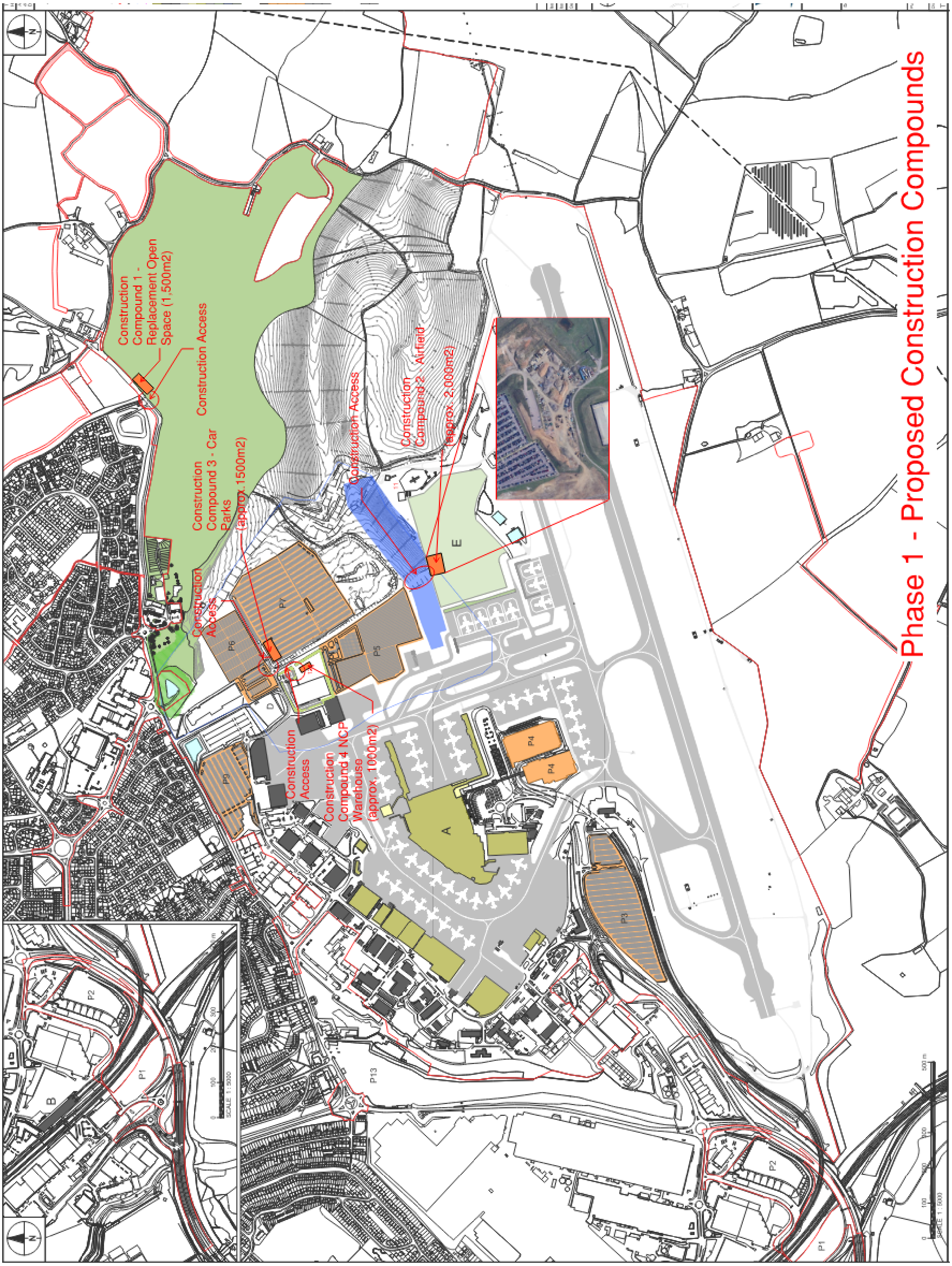
d. Construction Compound 4 (NCP Warehouse): A self-contained site compound located within car parking area of the proposed NCP warehouse (Area 12). Compound area will be approximately 1,000sqm and will provide welfare facilities for site operatives, materials receiving and equipment storage and operative car parking; and

e. T1 Enhancement: Located within the existing central terminal area (approx.1,000sqm) to support the terminal upgrade works. Providing welfare facilities for site operatives, materials receiving and equipment storage. It is assumed there will be no work car parking provided.

Table 3.1 Phase 1 Construction Compounds

Phase 1: Construction Compounds			
Name	**Location**	**Size (sqm)**	**Duration**
Compound 1	Wigmore Valley Replacement open space	1,500	24 months
Compound 2	Airfield	2,000	30 months
Compound 3	Car Parks P6 & P7	1,500	24 months
Compound 4	NCP Warehouse	1,000	18 months

Inset 3.1: Phase 1 Construction Compounds



3.3.3 A security fence and temporary haul roads would be installed around the works areas, segregating them from the public open space.

Inset 3.2: Typical Examples of Security Fencing and Site Hoarding from the Luton DART Project

Replacement Open Space (Wigmore Valley Park)

3.3.4 A key enabler for much of the Proposed Development is the re-provisioning of public open space to the east of the airport [**Figure 14.11** in Volume 4 of the PEIR]. This releases some of the existing public open space and the current Wigmore Valley Park.

3.3.5 The replacement open space would be developed in Phase 1 ahead of any earthworks taking place in Wigmore Valley Park. The replacement open space would retain the existing main entrance into Wigmore Valley Park, adjoining Wigmore Hall / Wigmore Pavilion, and would incorporate several of the enhanced facilities proposed in this area as part of New Century Park (i.e. the improved skate park and play facilities, the improved Wigmore Pavilion and most of the proposed surfaced footpaths).

3.3.6 A key part of the construction strategy would be ensuring that access to high quality open space is maintained throughout the Proposed Development.

3.3.7 The majority of the proposed works would involve turning current farmland into a park with environmental mitigation, vegetation clearance, landscaping and planting activities.

3.3.8 This work would be performed using a mix of civil construction and agricultural practices depending on the feature being created.

3.3.9 Typical agricultural works would include:

a. Ploughing fields for reseeding;
b. Hedging – planting and removing;
c. Tree – pruning, felling, and planting; and
d. Ditching – forming and cleaning.

3.3.10 Typical civil construction works would include:

a. Forming hard features such as paths and car parking;
b. Construction of new structures and street furniture;
c. Placement of earthworks materials to form landscaping bunds;
d. Play areas; and
e. Installation of new drainage and utilities.

Inset 3.3: Typical environmental mitigation, vegetation clearance and landscaping operations

Utility Diversions

3.3.11 Utility diversions would be required during this and subsequent phases, this section sets out a standard methodology.

Interface Schedule

3.3.12 An interface schedule would be developed to identify all existing and future services. For each service an owner would be identified to take that service from design, through construction, connection, commissioning, and handover. A representative from LLAOL would be allocated to each service, who along with the design engineer and interface owner would create an interface team.

3.3.13 The team would then plan and agree timing and method statements including any temporary measures to maintain services continuity for the airport operations along with contingency plans in case of any issues arising.

Underground Services

3.3.14 Before any work starts and in conjunction with the Luton Rising airfield engineering team and operations, the routing of existing services would be clearly identified and recorded using techniques such as cable detection tools, radar, signal generation tools or cameras. If there were any doubt, then trial holes or slip trenches would be dug by hand.

3.3.15 Work within the operational parts of the airfield would be conducted in compliance with the LLAOL Technical Services Department - Contractors Code of Practice that details the minimum health and safety standards and procedures.

3.3.16 Permits to work would be issued by airfield operations to the Lead Contractor and their subcontractors. A permit team would be established, who via the interface schedule, would plan and manage all permit to work activities.

3.3.17 Dependent upon airfield operational requirements and the proximity of work to aircraft and airfield operations, work may be required to be carried out during quiet periods or at night.

3.3.18 The work could involve trenching works, installation of pipework or ducts in the case of electrical, communications and control cables followed by back filling.

3.3.19 For water or fuel services, pipelines could be made up on-site and lifted into position in long lengths minimising making joints in the ground. This would enable testing of lengths before installation. Whilst trenches would have to be dug in long lengths, the pipelines could be preassembled at the same time and the overall installation could be more efficient.

3.3.20 Section of the existing Thames Water drain passing through the landfill site is to be grouted up.

Inset 3.4: Example fuel line and drainage installation

3.3.21 Boring techniques could be considered for services passing under existing taxiways, runways or apron to reduce the impact on airfield operations.

3.3.22 The requirement for earthwork support to the excavated service trenches would be dependent upon the ground conditions and depth. It could either be provided by trench boxes, trench sheeting or the battering back of the excavation. The proximity of trenches and hence available working space to the airfield operations would be a factor in deciding on the preferred system.

Bulk Earthworks

3.3.23 The earthworks in Phase 1 are limited to the construction of the 4no. additional aircraft stands adjacent to Foxtrot taxiway.

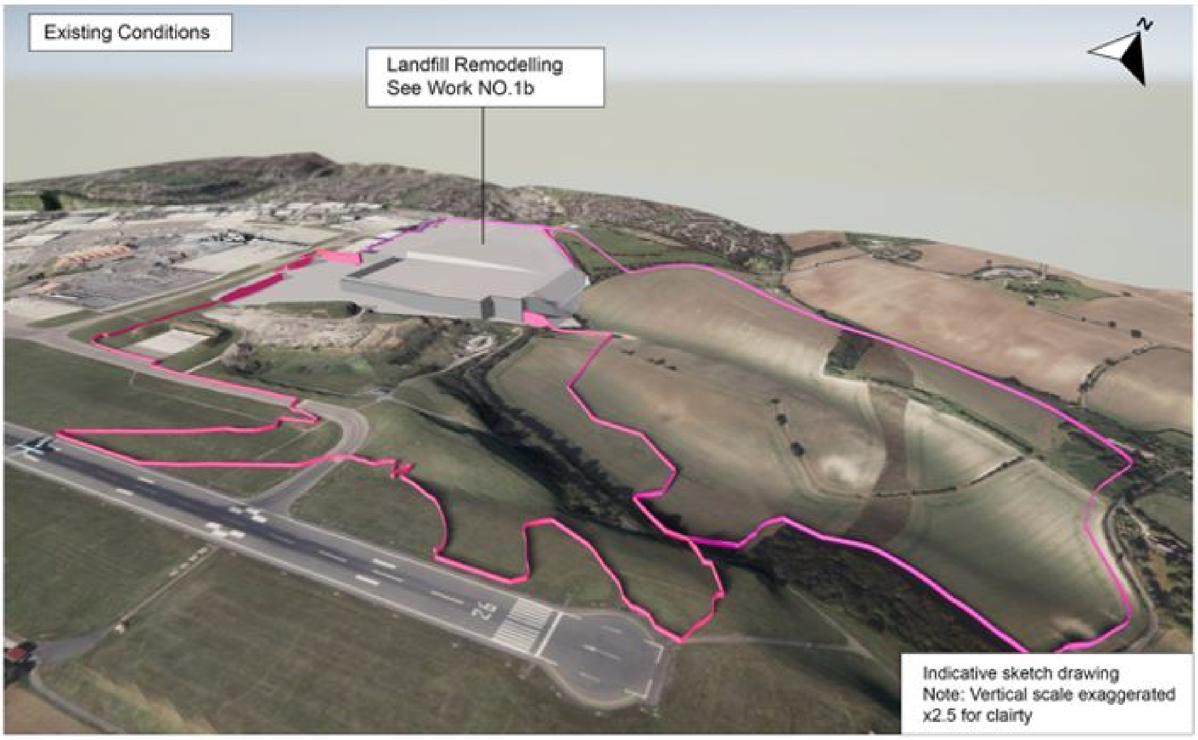
3.3.24 The bulk earthworks enables:

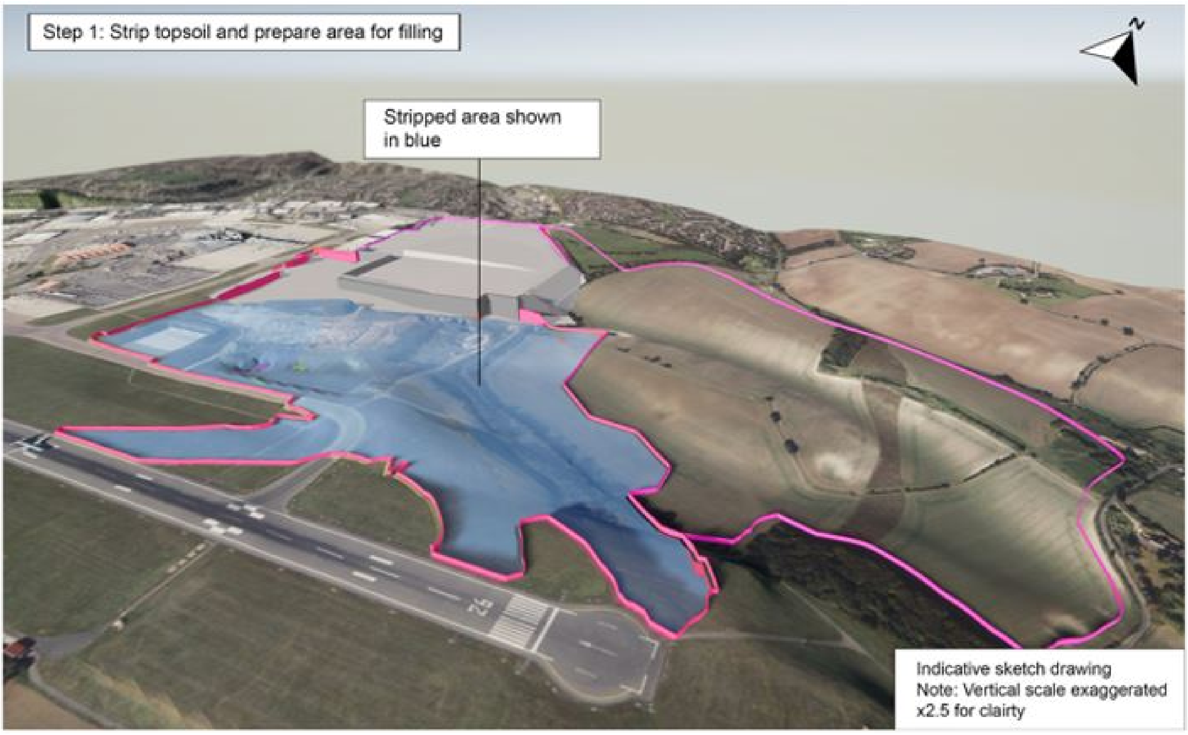
a. sufficient material to be won on site and to create a new landscape;

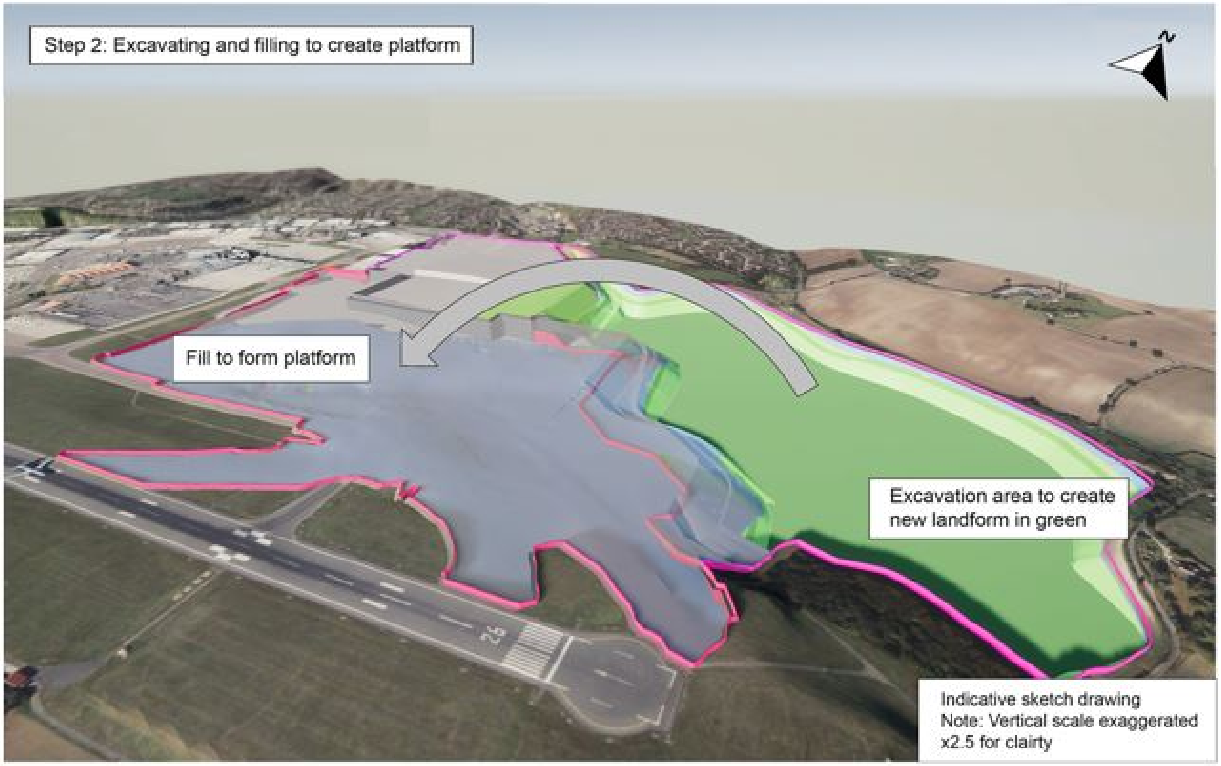
b. construction of a suitable platform so that the expanded airport will be level with the runway; and

c. the remodelled Eaton Green landfill to be suitable for development.

Inset 3.5: Illustrative earthworks sequence






Step 2: Excavating and filling to create platform
Fill to form platform
Excavation area to create
new landform in green
Indicative sketch drawing
Note: Vertical scale exaggerated
x2.5 for clairty


Step 3: Finished Platform and Landform
Indicative sketch drawing
Note: Vertical scale exaggerated
x2.5 for clairty

3.3.25 The table below indicates the total estimated earthwork quantities.

Table 3.2 Bulk Earthworks Volumes

	Phase 1	Phase 2a	Phase 2b	Total Volume
Materials (excavated)	**Cu M**	**Cu M**	**Cu M**	**Cu M**
Topsoil	0	39,000	93000	132,000
Clay	0	108,000	311,000	419,000
Chalk	0	238,000	923,000	1,161,000
Landfill	27,000	312,000	11,000	350,000
Other made ground	103,000	583,000	162,000	848,000
Excavation of suitable stockpile		30,000	146,000	176,000
Excavation of landscape stockpile		21,000	82,000	103,000
Materials (imported)				
Starter layer	12,000	60,000	41,000	113,000
Base drain	19,000	99,000	69,000	187,000
Gravel for gas collection layer	41,000	81,000	69,000	191,000
	202,000	1,571,000	1,907,000	3,680,000
How material is re-used				
Construction of Airside platform	108,000	675,000	1,345,000	2,128,000
Construction of Landside platform	0	217,000	5,000	222,000
Construction of Landside Cap	7,000	111,000	32,000	150,000
Landscaping	20,000	150,000	273,000	443,000
Stockpiled material for future use	21,000	82,000		103,000
Taken off site for disposal or recycling	3,000	32,000	2,000	37,000
Lost into formation	12,000	60,000	41000	113,000
Lost on compaction chalk	0	22,000	83,000	105,000
Lost on compaction landfill	2,000	16,000	1,000	19,000
Fill base of valley for carpark		48,000		48,000
Topsoil		13,000	31,000	44,000
Contingency (suitable stockpile)	30,000	146,000	93,000	269,000

	203,000	**1,572,000**	**1,906,000**	**3,681,000**

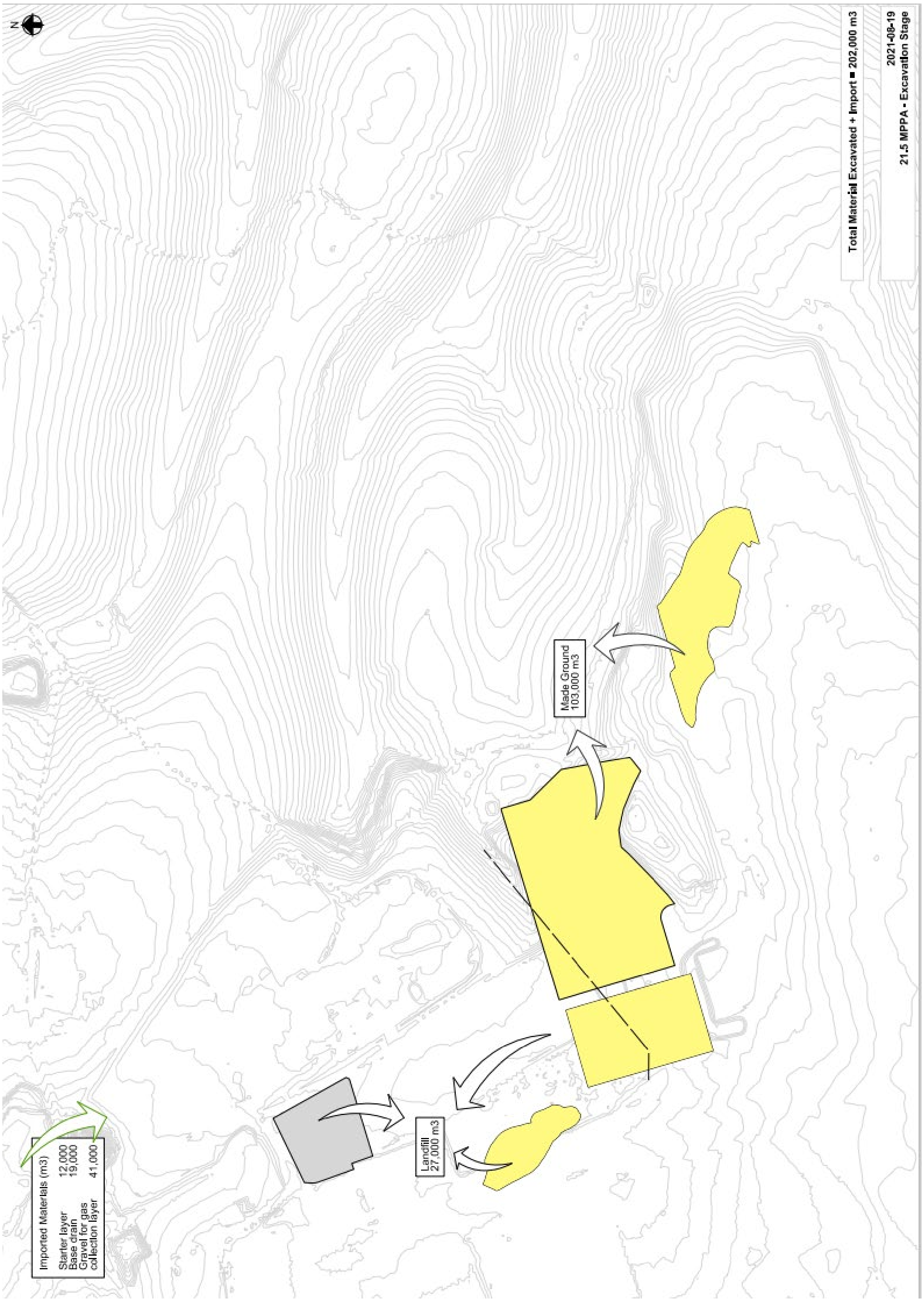
3.3.26 The estimated volume of earthworks in Phase 1 is as follows:

Table 3.3 Estimated Earthwork Volumes

Earthworks Material	Volume (Cu M)
Excavated (made ground)	131,000
Excavated (landfill)	27,000
Imported material	72,000
Placed material	200,000
Material removed from site	3,000

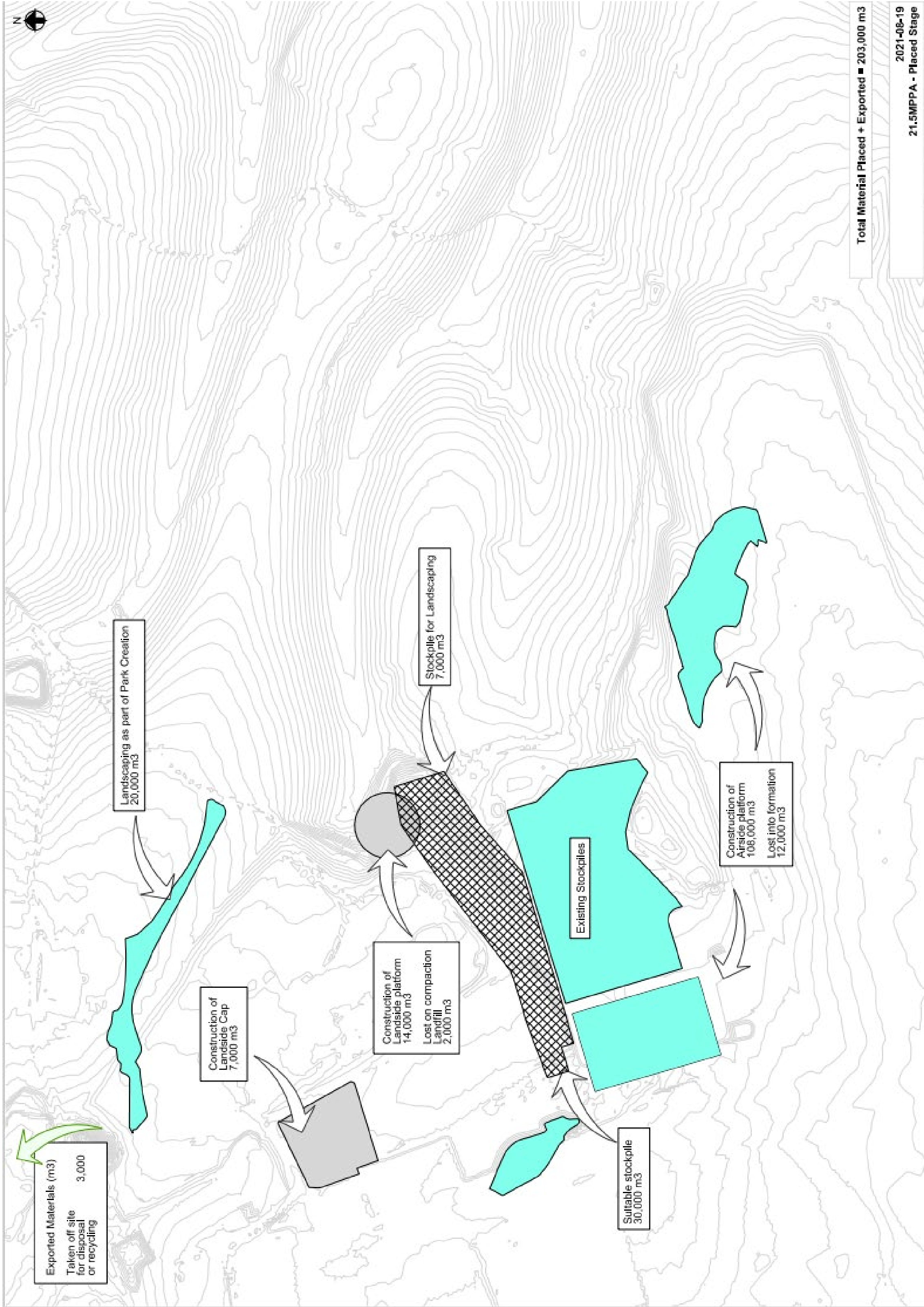
3.3.27 Inset 3.6: Phase 1 Earthworks (proposed areas of cut) shows areas of existing ground that would be cut. The ground would be excavated down to stable strata and the material would be deposited into temporary stockpiles.

Inset 3.6: Phase 1 Earthworks (proposed areas of cut)



3.3.28 Inset 3.7: Phase 1 Earthworks (proposed areas of cut and fill) shows areas of existing ground that excavated material would be deposited.

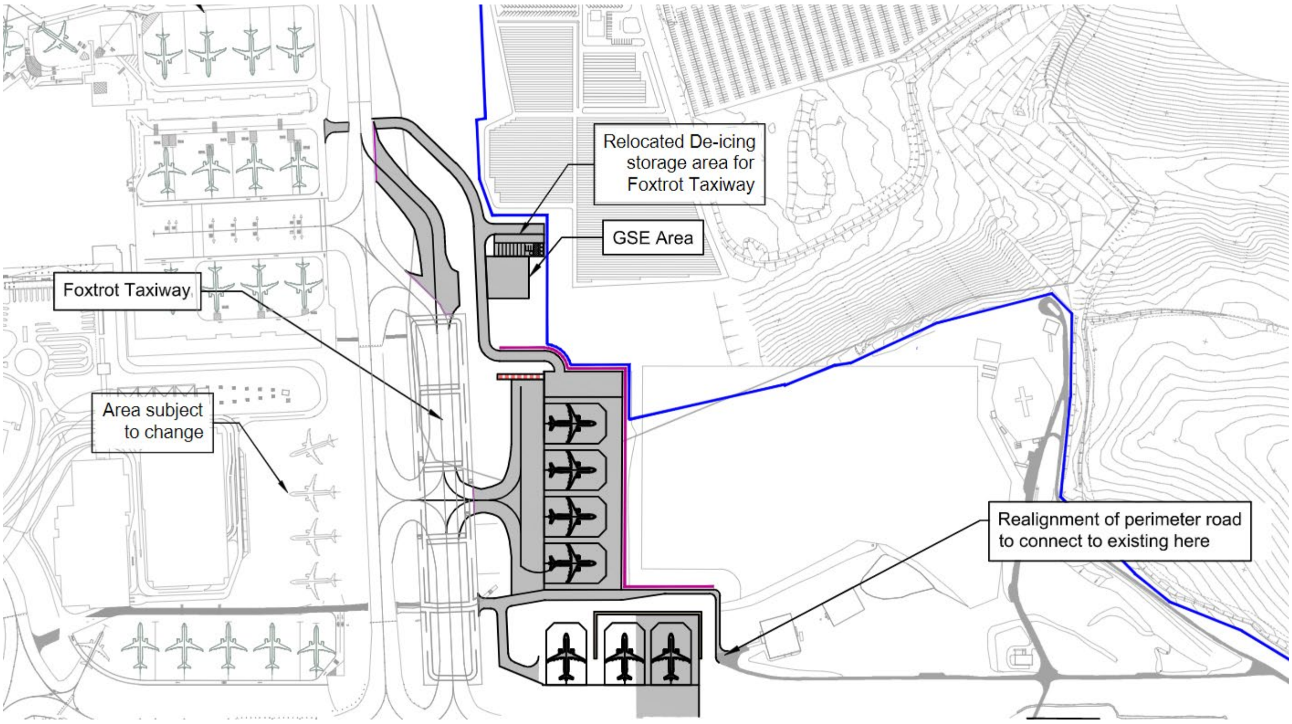
Inset 3.7: Phase 1 Earthworks (proposed area of fill)



New aircraft stands, apron and taxiways

3.3.29 In Phase 1, four new stands would be built on the new earthwork platform.

Inset 3.8: Phase 1 New taxiway and stand locations



3.3.30 Standard construction methods will be adopted for the construction of the new aircraft stands. The pavement construction types will typically be an asphalt surface to taxiways and pavement quality concrete to aircraft stands.

3.3.31 The ground would be prepared as part of the earthworks phase. Once complete installation of drainage runs and other airfield utilities would be incorporated into this work using similar methodologies to those described in 3.3.14.

3.3.32 In locations where hard pavement is provided within the location of the landfill site control of landfill gas will be achieved using an active gas protection system.

3.3.33 Construction of the concrete pavement areas are likely to be formed using slipped form paver machines. The concrete is spread, compacted and finished in a continuous operation.

Inset 3.9:Airfield concrete pavement and new temporary tarmac installation on Luton DART scheme

Car Parks

3.3.34 In Phase 1, as shown in the phasing diagrams, several new car parks are provided, and existing car park modified:

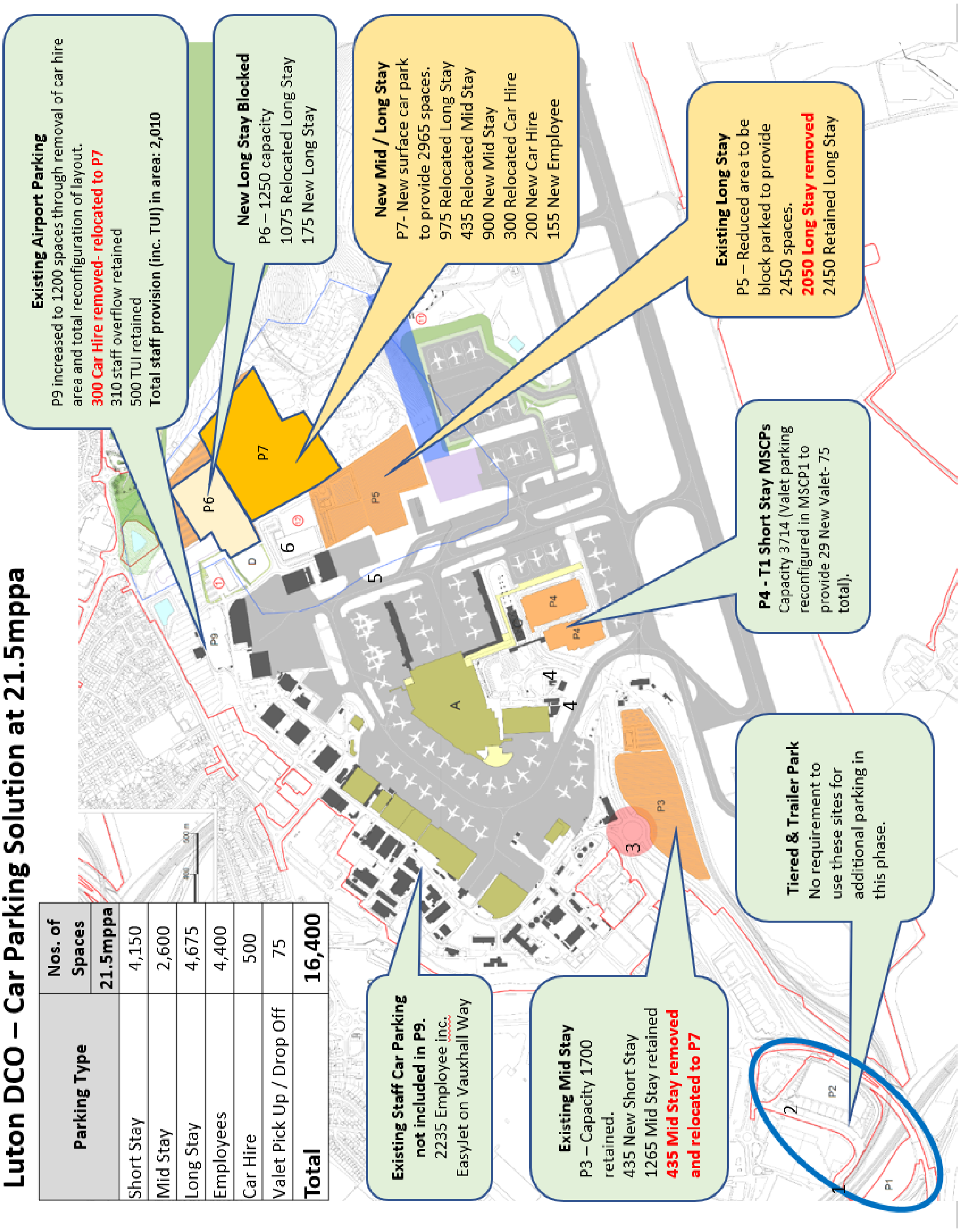
3.3.35 New car parks:

a. P6 (New long stay (blocked) car park) – New surface car park providing 1,250 spaces; and
b. P7 (New mid/long stay car park) – New surface car park providing 2,965 spaces.

3.3.36 Existing car parks:

a. P9 (Existing airport car park) – capacity increased to 1,200 spaces by relocation of car hire to P7.

Inset 3.10: Phase 1 Car Park Locations



3.3.37 P6 and P7 are new surface car parks and construction would be similar to the construction methodology adopted for roads.

3.3.38 Works will commence with earthworks to form a level sub-surface allowing placement of a sub-base material. Granular sub-base material will be delivered using 6-wheeled ridged tipper trucks.

3.3.39 The project has an opportunity to re-use existing materials on site (e.g. demolition and landfill) to form hydraulically bound materials (HBMs) which would reduce the volume of traditional granular sub-base material coming to site.

3.3.40 The material will be placed using 360-excavator and compacted using a vibrating roller. Localised tranches will be excavated for installation of drainage and utilities. At the same time kerbs will be placed.

3.3.41 A second layer of granular material known as road base is then placed which is followed by a bituminous primer coat and an asphaltic concrete binder course.

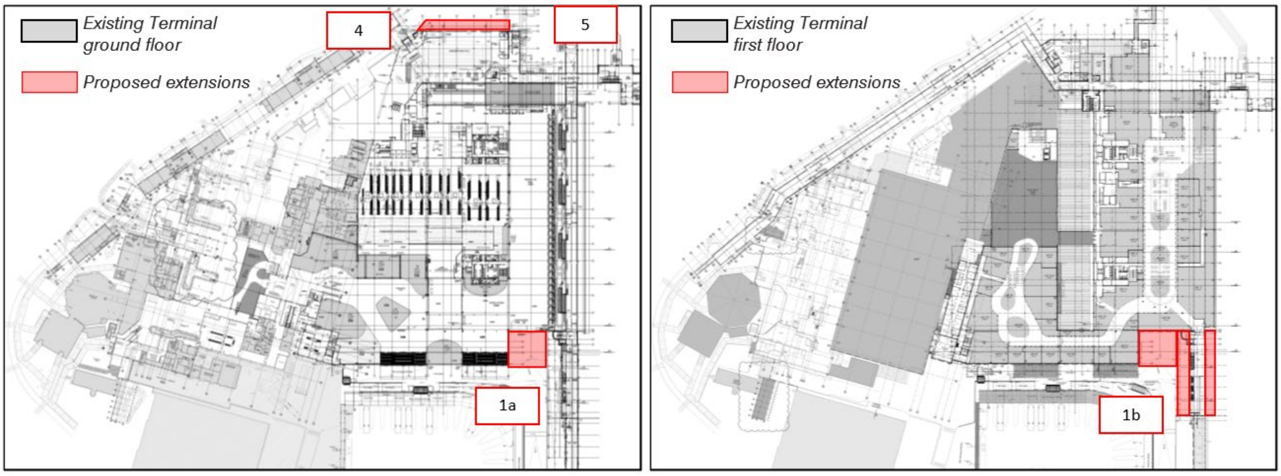
3.3.42 The final asphaltic concrete wearing course is laid using a paving machine and immediately rolled.

Terminal 1 Enhancements

3.3.43 T1 would be extended and reconfigured to provide additional passenger capacity. A set of potential solutions, which may be adapted for future operational needs, have been assessed in order to accommodate the future demand in T1 with the works including:

a. Check in: additional 30 kiosks;
b. Security (1a): additional 2 lanes and relocation of staff offices (approx. 360sqm);
c. Departure lounge (1b): extension of the airside departure lounge in the southern/eastern corner and base of Pier B link (approx. 1,170sqm);
d. New bussing gate facility (5): new bussing gate facility on existing stand 61 (approx. 900sqm);
e. Outbound baggage: minimal upgrades to baggage system; and
f. Immigration (4): extension of queue area and partial refurbishment of the hall.

Inset 3.11: Terminal 1 Enhancements



3.3.44 This work would be done in a sensitive manner in and around the existing terminal operations. Works may be phased to be carried during non-peak passenger periods and through the use of out-of-hours working (e.g. night-time).

3.3.45 The scope and nature of the works means a variety of construction techniques will be used. The majority of the work would be self-contained within the terminal.

3.3.46 Construction activities would be planned and coordinated with the existing airport operator.

All construction activities would comply with the requirements as defined by the airport operator in addition to the CoCP.

4 CONSTRUCTION PHASE 2A

4.1 Key Construction Constraints & Interfaces

4.1.1 The objective of Phase 2a is to increase the capacity of the airport by bringing a second terminal into operation.

4.1.2 The key construction constraints and interfaces for Phase 2 would include:

a. Interface with operational airport;
b. Interface with local residents and businesses; and
c. Interface with landowners.

4.2 Construction Programme & Phasing

4.2.1 The main construction activities in Phase 2a would be:

a. Bulk earthworks and landfill treatment;
b. Luton DART extension;
c. New passenger terminal building plus boarding pier;
d. New stands and apron / realignment of alpha taxiway;
e. Drainage and water treatment facilities;
f. New fuel storage facility;
g. New car parking provision;
h. Ground handling;
i. Security posts;
j. Landside – forecourt drop-off, coach station and energy centre;
k. Landscaping;
l. Demolition to clear route for access roads; and
m. Off-site highways (including AAR).

4.2.2 Phase 2a would commence with the bulk earthwork operation along with the drainage, underground utilities including water storage tanks, electrical services, fibre optics, and the Luton DART tunnel. In parallel construction of the new terminal would commence.

4.2.3 Other works would include the pier, concrete pavements, taxiways, aprons, and other associated airfield facilities including perimeter roads, signage, and markings.

4.2.4 The more complex construction areas such as the construction of the new Luton DART station and tunnel and the new terminal building are likely to be among the early construction sites.

4.2.5 The construction of the new ancillary buildings, long and short stay car parks, and associated airport landscaping, roads, pavements, would follow.

4.2.6 The phasing diagrams, contained in Appendix B, illustrate the key construction phases of Phase 2a.

4.3 Construction Methodology

Site Establishment

4.3.1 It is anticipated that during this phase, as in Phase 1, there will be a main works compound and several smaller stand-alone satellite site establishments/ construction compounds both because of the dispersed nature of the proposed works and due to works taking place over a long timescale. See 6.3 for further information on the site compound arrangements.

4.3.2 The potential satellite site locations are shown in the phasing diagrams in Appendix B and would include the following:

a. Construction Compound 1 (Main Works Compound for the airfield and terminal): Self-contained site compound area (approx. 25,000sqm) located adjacent to the new terminal to support the construction of the terminal, new aircraft stands, and airfield works. The compound would provide welfare facilities for site operatives, materials receiving, equipment storage and operative parking;

b. Construction Compound 2 (AAR): Self-contained site compound area (approx.8,000sqm) located in the former TUI staff car park to support construction of the eastern end of the new AAR.

c. Construction Compound 3 (Water Treatment Facilities and Fuel Farm): Located close to the proposed water treatment facilities and fuel farm. Self-contained site compound area (approx. 2,000sqm) Providing welfare facilities for site operatives, materials receiving and equipment storage;

d. Construction Compound 4 (Earthworks): Self-contained site compound area (approx. 10,000sqm). Providing welfare facilities for site operatives, materials receiving and equipment storage. On completion of the earthworks the compound would be reduced in size and used for the construction of the car park P11;

e. Construction Compound 5 (Car Park): Self-contained site compound area (approx. 1,000sqm). Providing welfare facilities for site operatives, materials receiving and equipment storage. On completion of the earthworks the compound would be reduced in size and used for the construction of the car park P10;

f. Construction Compound 6 (Luton DART Extension): Self-contained site compound area (approx. 3,000sqm) located close to the proposed Luton DART station construction. Providing welfare facilities for site operatives, material and equipment storage and car parking;

g. Construction Compound 7 (Luton DART Extension): A airside construction compound (approx. 2,000sqm) located close to the proposed Luton DART tunnel construction. Providing welfare facilities for site operatives, material and equipment storage and car parking;

h. Construction Compounds 8, 9, 10, 11 (AAR): Self-contained construction compound along the length of the proposed road; and

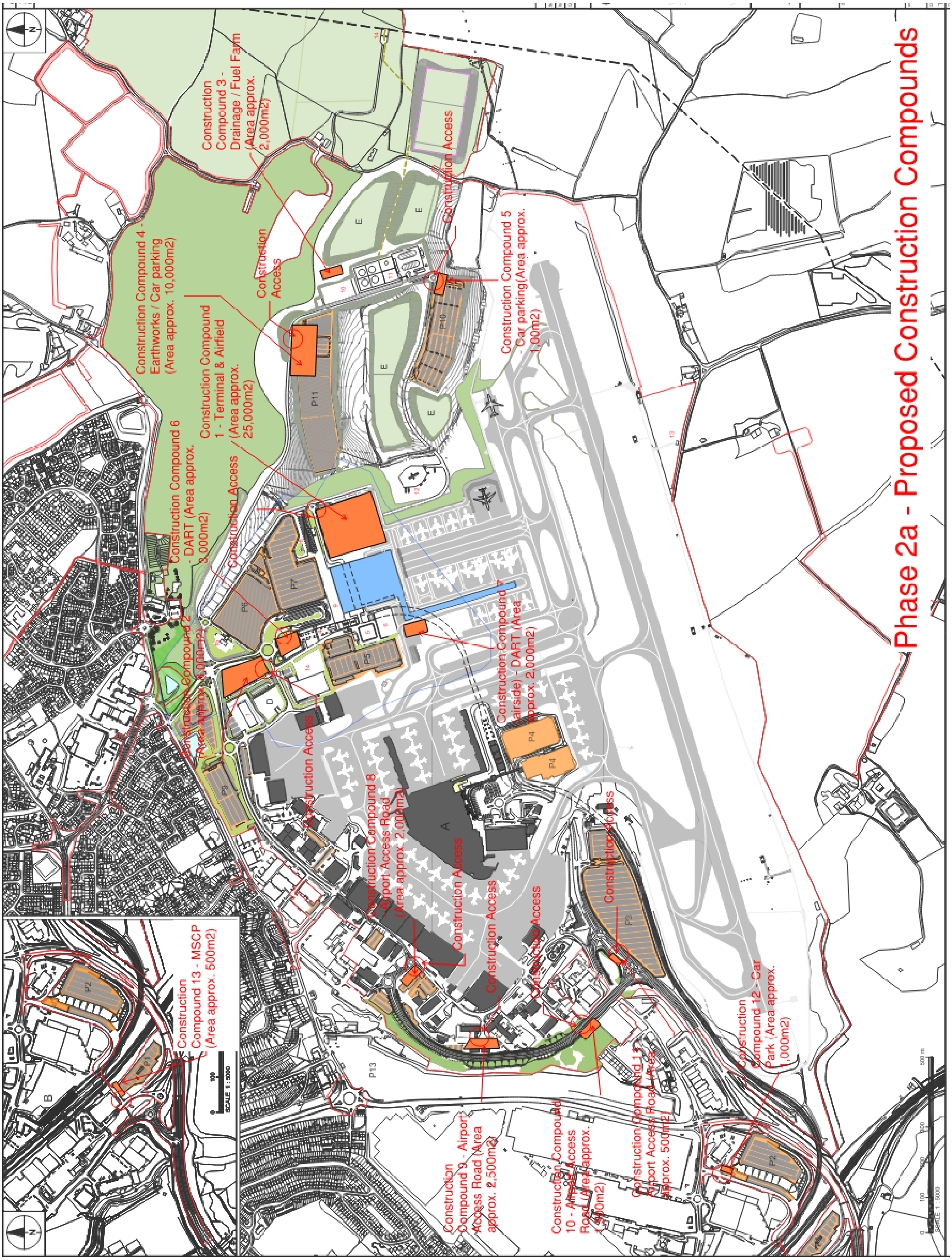
i. Construction Compounds 12 & 13 (Trailer and Tiered Car Parks): Construction compound located adjacent to the proposed trailer and/or tiered car parks. Providing welfare facilities for site operatives, materials receiving and equipment storage.

4.3.3 The main works compound would be constructed on part of the existing long stay car park, and would include some temporary buildings, areas of hard standing and a temporary processing facility to support the future landfill remediation works.

Table 4.1 Phase 2a Construction Compounds

Phase 2a: Construction Compounds			
Name	**Location**	**Size (m^2)**	**Duration**
Compound 1	Terminal & Airfield	25,000	48 months
Compound 2	Airport Access Road (East)	8,000	24 months
Compound 3	STP/ETP / Fuel Farm	2,000	24 months
Compound 4	Earthworks	10,000	24 months
Compound 5	Car park P10	1,000	12 months
Compound 6	Luton DART Extension	3,000	36 months
Compound 7	Luton DART Extension (Airside)	2,000	24 months
Compound 8	Airport Access Road (West)	2,000	24 months
Compound 9	Airport Access Road (West)	2,500	36 months
Compound 10	Airport Access Road (West)	1,500	24 months
Compound 11	Airport Access Road (West)	500	12 months
Compound 12	Car park P2	1,000	12 months
Compound 13	MSCP P1	500	18 months

Inset 4.1: Phase 2a Construction Compounds



4.3.4 A security fence and temporary haul roads would be installed around the initial works areas, segregating them from the public open space.

Demolition

4.3.5 This section sets out a standard demolition methodology to be adopt in each phase. In this phase the majority of the demolition work would be associated with the construction of the new AAR.

4.3.6 Refer to Appendix D for the schedule of buildings to be demolished in each phase.

4.3.7 Where possible demolition arisings will be retained on site and will be reused, recycled, and incorporated into the permanent works.

Pre-Demolition

4.3.8 The works site would be enclosed using a close boarded hoarding with separate access gates for personnel and for vehicles.

4.3.9 All incoming utilities would be identified, terminated, and removed to outside the building plot boundary. Cables, water, and gas pipes would be permanently isolated from their source of supply. Once area has been made safe the soft strip operations will commence.

Soft Strip

4.3.10 Typical soft strip activities would involve the following:

a. removing building services and fittings;
b. removal of any internal doors, windows, fixtures, and fittings;
c. removing internal partitions (masonry or plasterboard) typically by hand or via mechanical means for masonry; and
d. lifting and removing away any internal non-manufacturing process fixed plant and equipment, for example dock levellers, lifts, and hoists (it is expected that any process plant and equipment would have been removed by the previous occupants.)

4.3.11 All soft strip material would be sorted into waste streams for removal for the construction area. If removed off-site this will be via by covered skips or lorry. The expected waste streams could include timber, plasterboard, brick and masonry, metals, glass, and contaminated items.

External Building Envelope

4.3.12 If elements of the external building are to be salvaged, then the external building envelope would be dismantled with access being provided by mechanical access equipment. If not, then demolition will take place using 360-degree long reach excavator with hydraulic shears and pulveriser.

4.3.13 All items would be loaded and secured to skip or wagon for transport to off-site specialist recycling facility.

Building Structure

4.3.14 For this example, it is assumed that the building is of steel frame construction. However, the activities would be similar for masonry or reinforced concrete structures with an increased use of mechanical breaking methods.

4.3.15 If elements of the building structure are to be salvaged, then the building will be dismantled with elementals being taken down in a piece-meal process. If the building is not being salvaged, then standard demolition techniques will be used. This normally involves the use mechanical equipment such as 360-degree long-reach excavator with hydraulic shears and pulveriser. Elements of the structure will be cut or crushed and pulled to the ground in a controlled manner.

Inset 4.2: Typical Building Demolition

4.3.16 How intermediate floors are removed would be dependent upon their structure. It is assumed that they are not pre-stressed. It is preferable to lift sections of floor structure to the ground or waiting vehicle if possible, otherwise they would have to be demolished by mechanical methods.

4.3.17 Water damping would be used to suppress the dust produced during demolition by mechanical methods. The water would be delivered by a hose or spray cannon.

4.3.18 All items would be loaded and secured to skip or wagon for transport to off-site specialist recycling facility.

Ground Floor Slab and Foundations

4.3.19 It is assumed that existing ground floor slab would be a simple reinforced ground-bearing slab. This would be demolished by a 360-degree excavator with a hydraulic breaker. A mechanical excavator would collect the demolition arisings into a stockpile for loading into wagons for offsite disposal.

4.3.20 The foundations would be broken up and excavated to a set level in a similar manner to the ground floor slab. Consideration would be given to processing the demolition arisings and re-using them in the bulk earthworks.

Underground Utilities and Services

4.3.21 Any remaining underground utilities and services would be permanently isolated as required from under the ground floor slab and external areas to leave the site clear.

Demolition Schedule and Demolition Drawings

4.3.22 Refer to Appendix D for the schedule of building to be demolished and for the demolition drawings.

Bulk Earthworks

4.3.23 The bulk earthworks creates the earth platform required to support the physical infrastructure. This work will be both airside and landside.

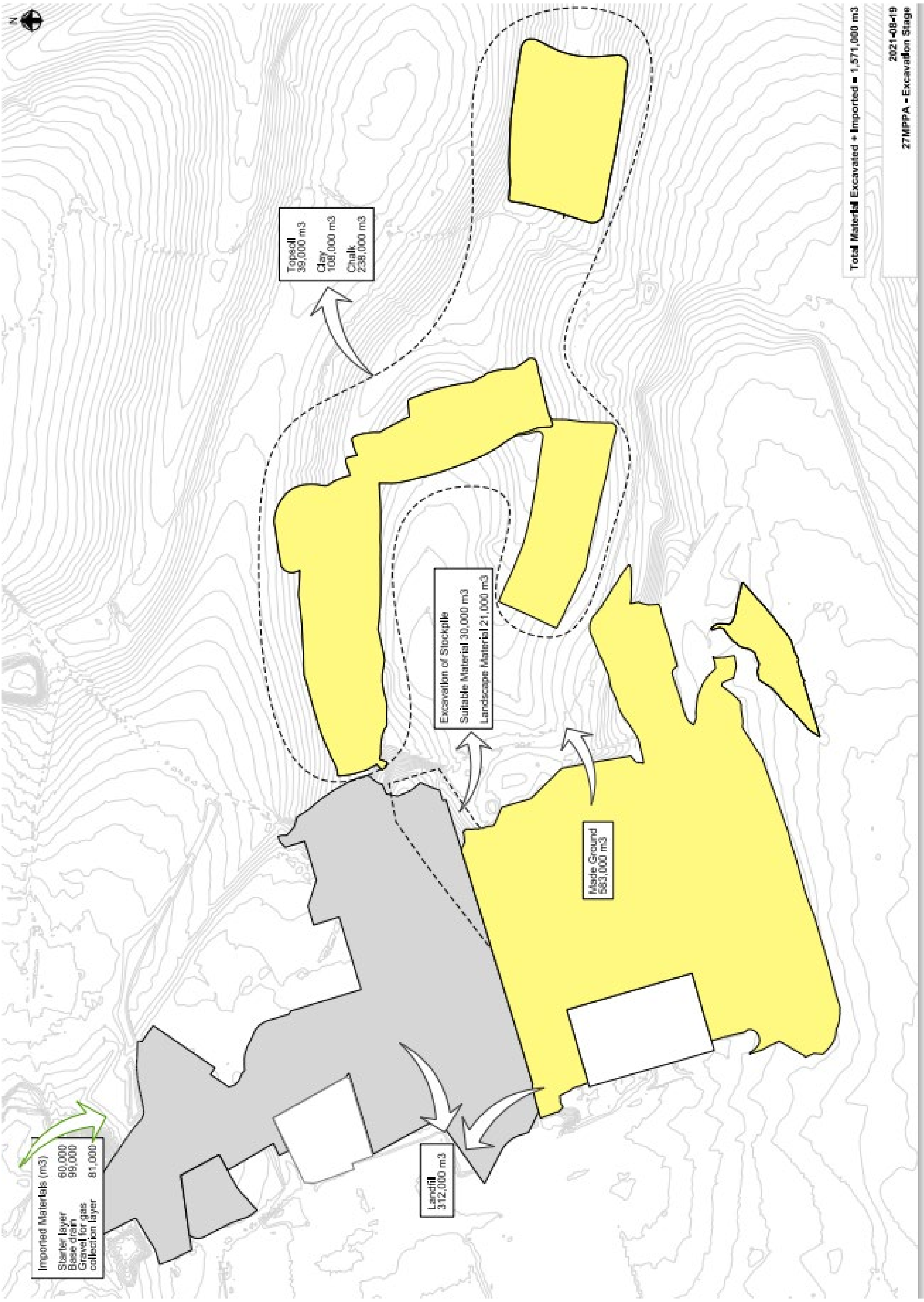
4.3.24 The estimate volume of the excavated earthwork in Phase 2a would be 1,331,000m3, this is more than can be handled in a single earth working season of work, so two seasons have been shown in the schedule.

Table 4.2 Estimate Earthwork Volume (Phase 2a)

Earthworks Material	Volume (Cu M)
Excavated (made ground)	1,019,000
Excavated (landfill)	312,000
Imported material	240,000
Placed material	1,540,000
Material removed from site	32,000

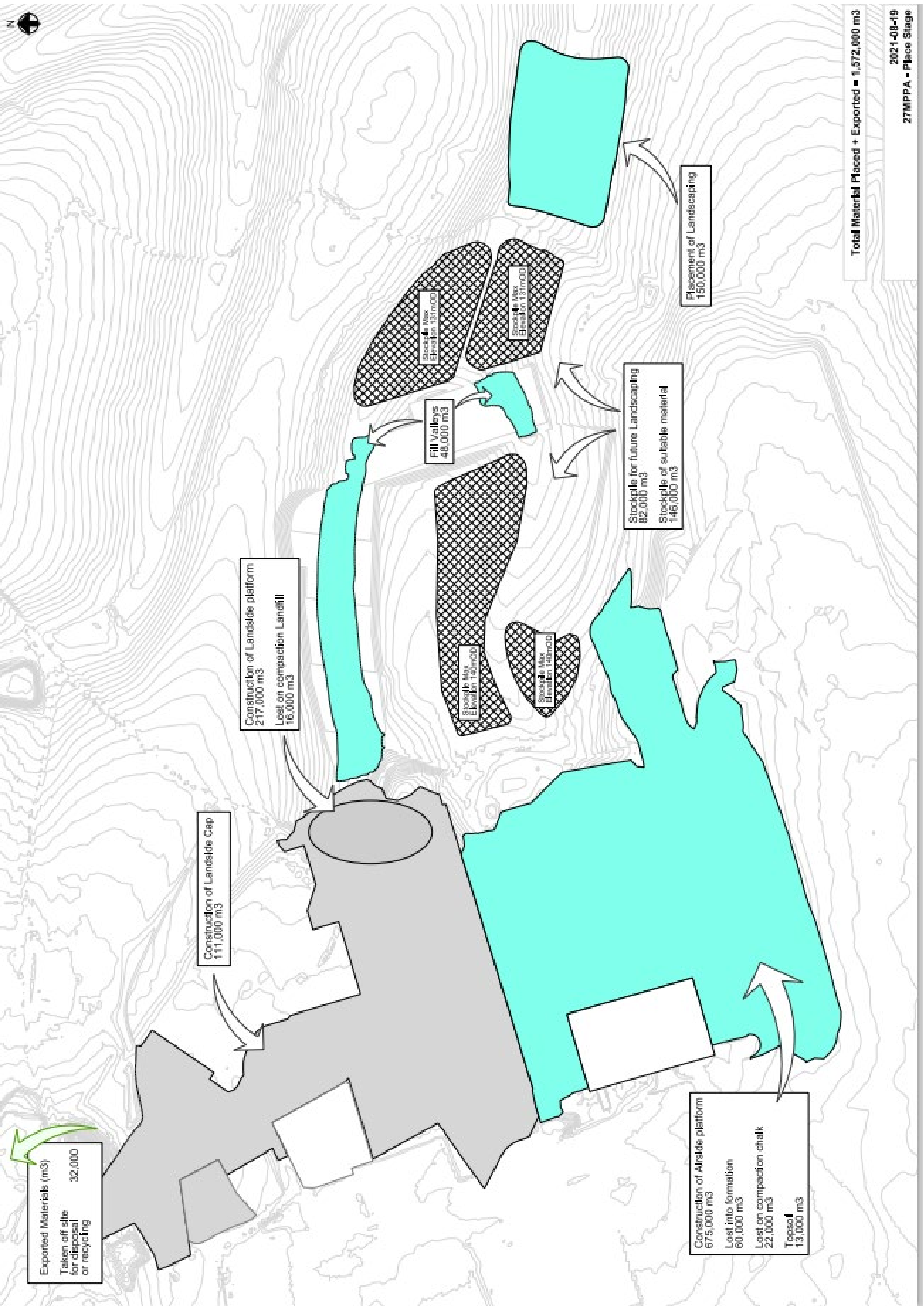
4.3.25 Inset 4.3: Phase 2a Earthworks (proposed areas of cut) below illustrate where material will be excavated from (cut) and deposited and where new material will be excavated from and used to fill the areas of cut.

Inset 4.3: Phase 2a Earthworks (proposed areas of cut)



4.3.26 Inset 4.4: Phase 2b Earthworks (proposed areas of fill) shows areas of existing ground that excavated material would be deposited.

Inset 4.5: Phase 2b Earthworks (proposed areas of fill)



4.3.27 The existing local site topography means the Proposed Development requires significant earthworks (cut and fill) activities to form a level construction platform. The intention would be to 'win' this material from areas of the estate and to avoid the importation of new fill material. This would significantly reduce the quantity of material needing to be transported to the Application Site.

4.3.28 The 'won' material could be a mix of existing earth stockpiles, sorted material from the landfill areas and clean excavated material. Combined with the use of novel ground improvement techniques and soil improvers would reduce the reliance on the use of cement.

4.3.29 Geotechnically unsuitable material would be retained on site and used in landscaping areas and to form landside platforms. Contaminated material would be removed from the proposed construction area.

4.3.30 Good quality excavated material would be transported using an all-terrain articulated dumper, to the proposed construction area where the material is deposited.

Inset 4.6:Typical Bulk Earth Working Plant: Clockwise from top left: a 40-tonne ejection dumper, specialist self-propelled soil stabilising machine, typical roller, and a GPS controlled bulldozer.

4.3.31 The deposited material would be spread using a GPS controlled dozer to achieve the grades and crossfalls. A cement binder could then be spread over the area using a specialist self-propelled soil stabilising machine. The mixed material would then be compacted using a heavy soil compactor.

4.3.32 The material would be placed in controlled engineered layers and this process would continue until the correct level is achieved.

4.3.33 Bulk earthworks are a weather dependant operation and is normally carried out during the summer months. A typical earthworks season runs from March to October.

4.3.34 For this reason, the earthworks are one of the longest duration activities within the schedule. The quantity of material that can be moved and placed in one season depends on the type of material and the distance travelled. It is reasonable to assume that the amount of material that can be moved in a single earthwork season (March to October) is 1,000,000m^3.

4.3.35 Given the proximity of the cut and fill areas, two main systems are presently envisaged to be feasible to transport the excavated material to the fill area. These comprise:

a. traditional trucks/dump trucks; or
b. a conveyor system, with a feed screening plant.

Inset 4.7: Clockwise from top left: a typical all-terrain articulated dump truck, bulk earthworks operation, a single belt conveyor system and multiple belt conveyor system

4.3.36 The first construction method, using all terrain articulated dumper trucks, is easier to deploy but requires careful management to ensure segregation vehicles and operatives. A network of construction haul roads will be established on site to enable plant to travel between ‘cut’ and ‘fill’ locations.

4.3.37 Haul roads will be a temporary construction and will require regular a spraying with water to prevent dust during summer months.

4.3.38 Autonomous/self-driving trucks could also be considered for this option. The use of hybrid electric vehicles could be also be considered.

4.3.39 Alternatively, the use of several static conveyor belt system could be used within the cut area. This system is ideal for transporting large quantities of material between two fixed points. The advantages of a conveyor system are:

a. safer transportation methodology;
b. reduced noise as conveyor units driven by electric motors;
c. reduced pollution from exhaust emissions;
d. less operatives on site; and
e. trucks not exposed to bad weather or night works.

4.3.40 A conveyor system could be used in this phase. It would reduce the overall number of truck movements; the system still requires machines to both load and transport un-loaded material. Machines will still be required to spread and compact material.

4.3.41 A feed hopper and screening plant is generally placed ahead of the conveyors near where the material is excavated. Hoppers can be placed within reach of the conveyor /screen-operating radius or, alternatively dump trucks can feed a dedicated stockpile at the screen, using a different machine to load the hopper /screen.

4.3.42 Once an area has been fully excavated, the conveyor belts need to be dismantled and re-located.

4.3.43 A water spray system is likely to be required during the screening phase, before excavated materials are placed on conveyor belts to suppress dust production. Additional water spray points may be required along the conveyor system to reduce dust further.

Eaton Green Landfill Site

4.3.44 A significant feature of the site is the former Eaton Green landfill site and efforts have been made to retain, as much as practical, the excavated landfill material on site.

4.3.45 The remediation strategy [refer **Appendix 17.5**,Volume 3 of the PEIR] describes the following:

a. the approach and guidance adopted in developing the strategy;
b. remediation process;
c. remediation methods;
d. management of landfill earthworks; and
e. monitoring requirements.

4.3.46 The Remediation Strategy has been developed in line with Environment Agency guidance and is based on the Environment Agency publication CLR 11 Model Procedures for the Management of Land Contamination.

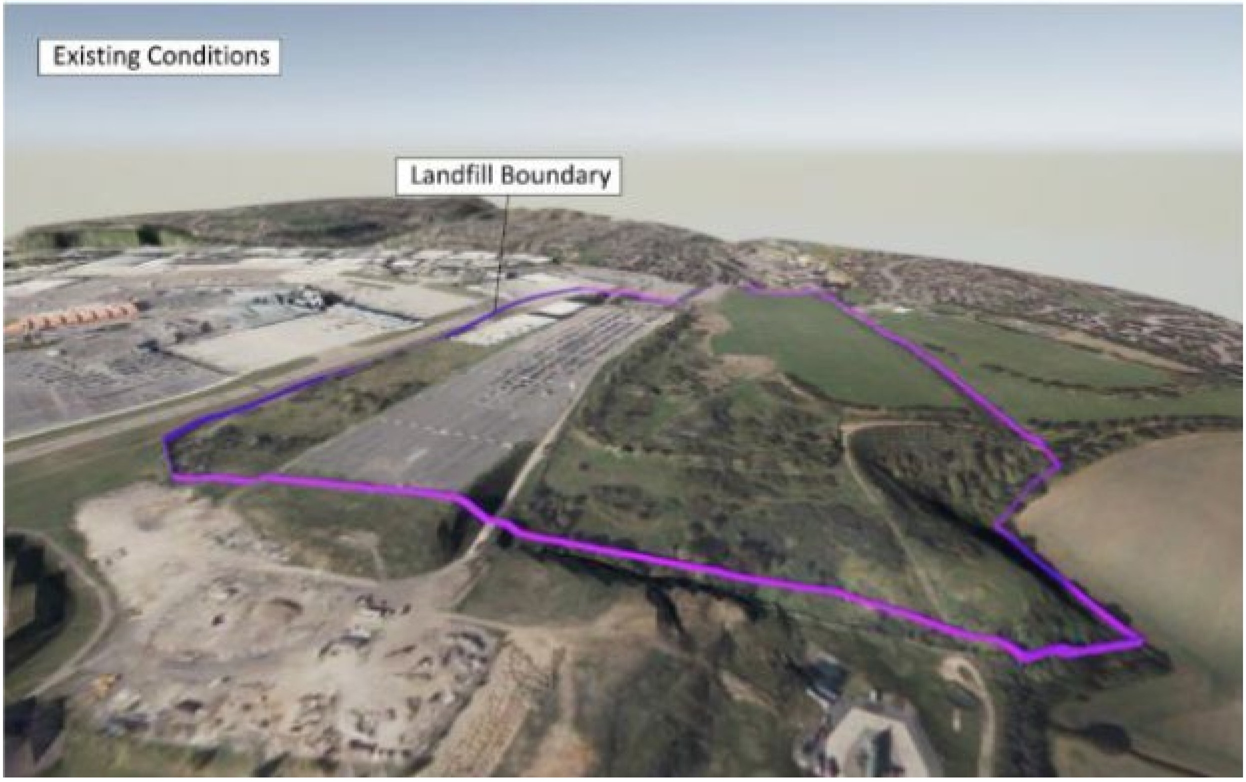
4.3.47 The landfill site occupies a significant portion of the site. The landfill site was operational from the 1930’s to the 1980’s. Within this 50-year timeframe, the waste production and consequent depositing is likely to be heterogeneous and may comprise hazardous materials which may not have been considered hazardous at the time.

4.3.48 The materials excavated from the landfill site are anticipated to widely comprise of made ground, landfill waste, topsoil, clay with flints, dry valley deposits and chalk. Of these, only the landfill waste is envisaged to require treatment.

4.3.49 Approximately 90% of the total volume of material to be excavated is expected to be processed on site for re-engineering and re-use in the Proposed Development.

4.3.50 Geotechnical data shows significant elements of the landfill material can be incorporated into the new earthwork platform.

Inset 4.8: Historic landfill boundary (purple line)



4.3.51 A substantial amount of landfill material (approx. 350,000m^3) is required to be excavated as part of the earthwork strategy. This material would be recovered and processed to improve its physical properties before reuse elsewhere in the development. No specific remediation is required to make this material suitable for use.

4.3.52 The landfill earthworks will be undertaken in a manner to ensure that no potential pollutant linkages (PPLs) are created and to achieve betterment of environmental conditions.

4.3.53 The re-engineered landfill material would be placed selectively within the development depending on its properties.

4.3.54 The landfill earthworks will predominately be undertaken under a bespoke waste recovery Environmental Permit.

4.3.55 The landfill processing and treatment would ensure that hazardous material can be isolated for removal from site. It is estimated that approximately 18,500m^3 could be hazardous material to be removed from site.

4.3.56 Landfill gas is a complex mixture of gases created by the action of microorganisms within a landfill. The volume of landfill gases depends on the age of the landfill, the decomposition status of the waste and the types of waste in the landfill. Recently buried waste would produce more gas than older waste. Landfills usually produce appreciable amounts of gas within one to three years.

4.3.57 Peak gas production normally occurs five to seven years after wastes are dumped. However, it is recognised that small quantities of gas may continue to be emitted from a landfill for 50 or more years.

Remediation of Landfill Material

4.3.58 The illustration below shows the sequence of works to the landfill.

4.3.59 Ground investigations have also shown a considerable portion of inorganic material, mainly resultant from construction and cover layer materials. The landfill contains both useable and un-useable materials:

a. Reusable Materials: The reusable material consists of soils (topsoil, clay with flints, dry valley deposits and chalk) and inorganic material such as plastic, ferrous, aluminium, construction waste, and glass. This equates to approximately 90% of the waste.

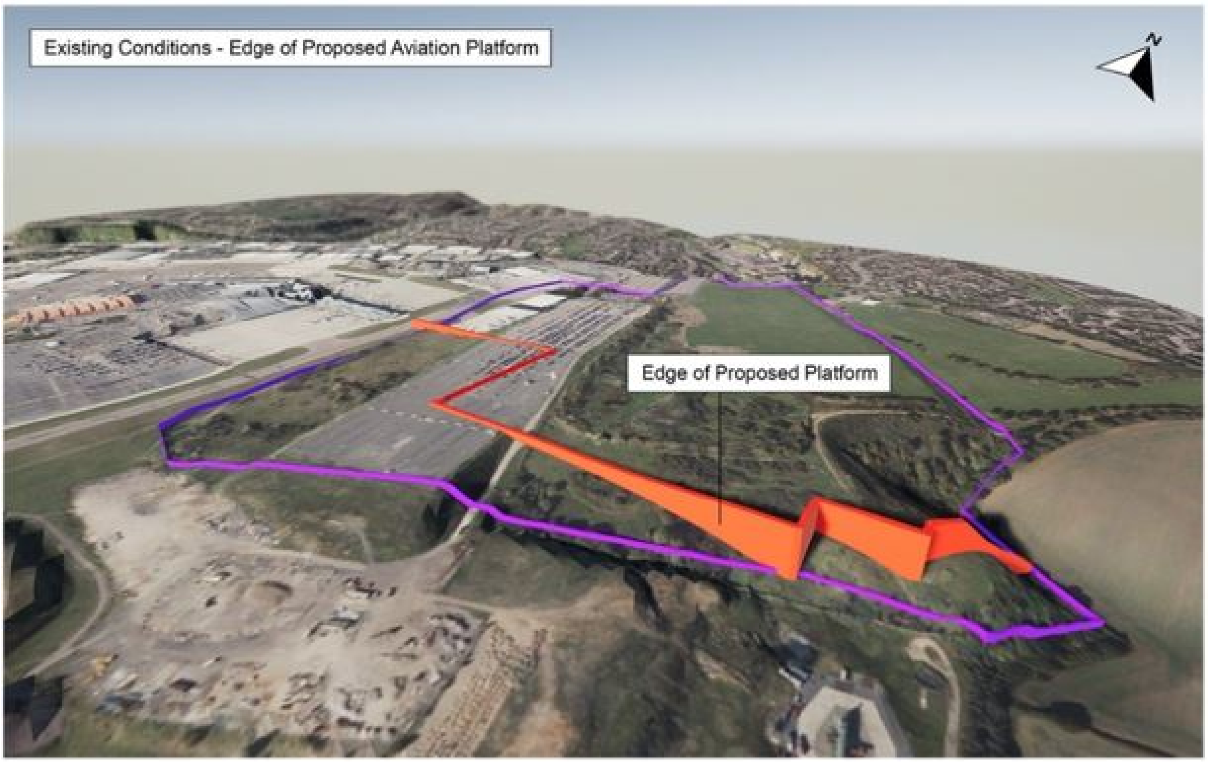
b. Non-Reusable Materials: The non-reusable material includes; mixed paper, news paper, cardboard, green garden waste and wood. This equates to approximately 10% of the waste.

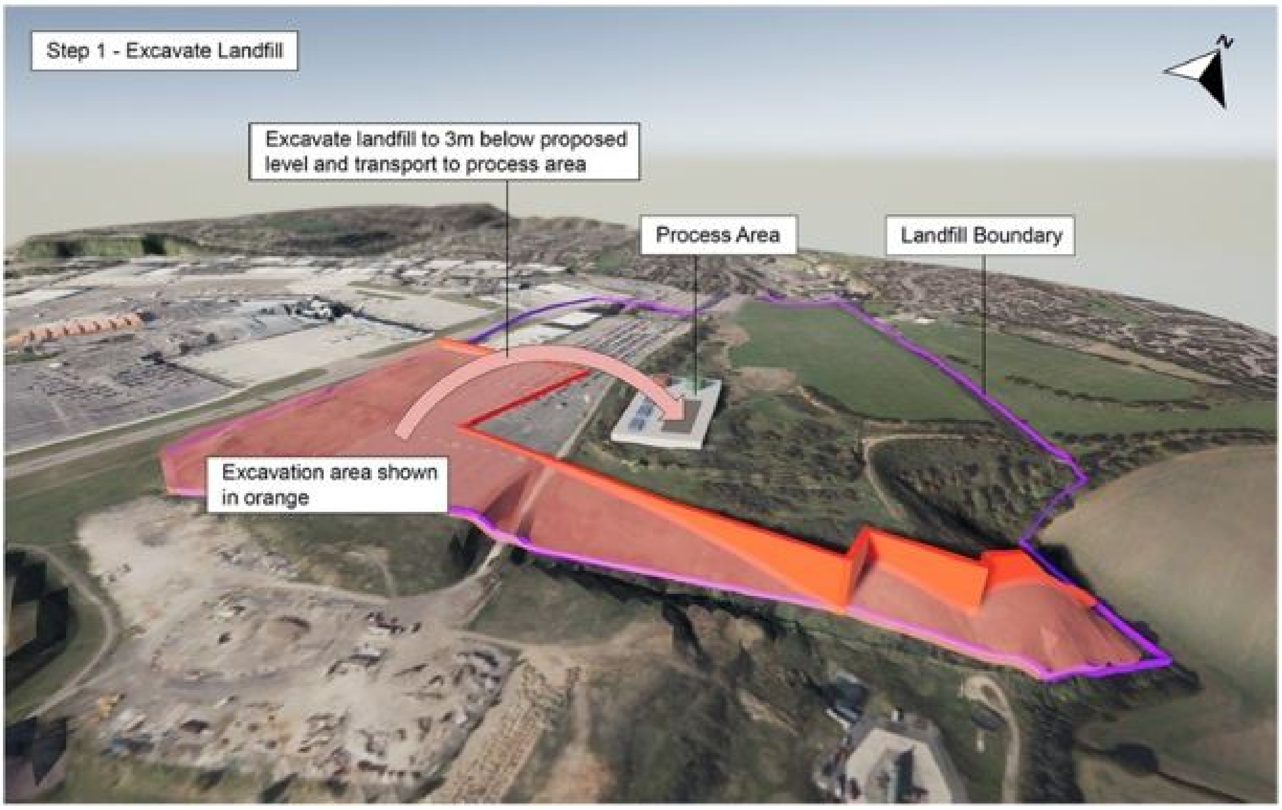
4.3.60 Of this 90% approximately 4% is ferrous and aluminium which could be extracted and recycled leaving approximately 86% of the material available for re-use in the Proposed Development.

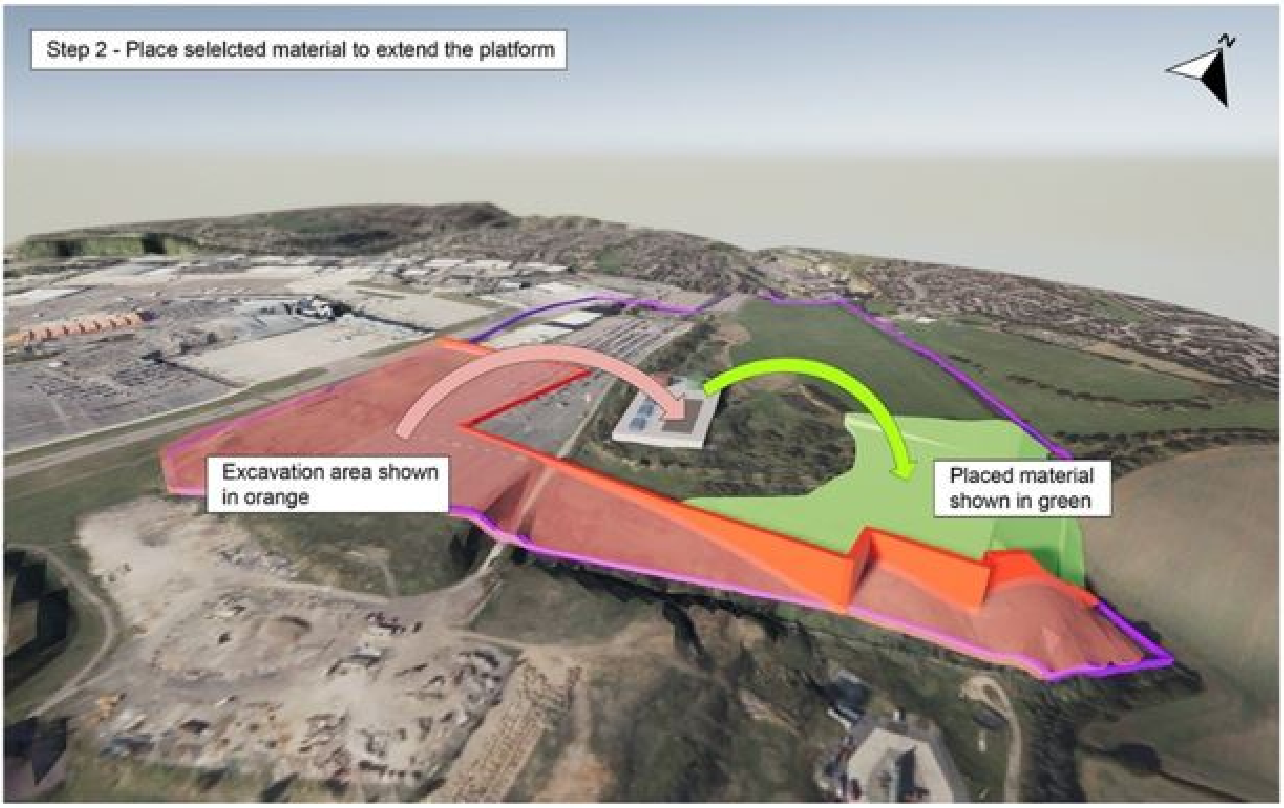
4.3.61 Of the remaining 10% the green garden and wood waste element could be processed on site by composting for reuse within areas of soft landscaping or blending with on-site soils. These equate to approximately 4% of the unsuitable waste.

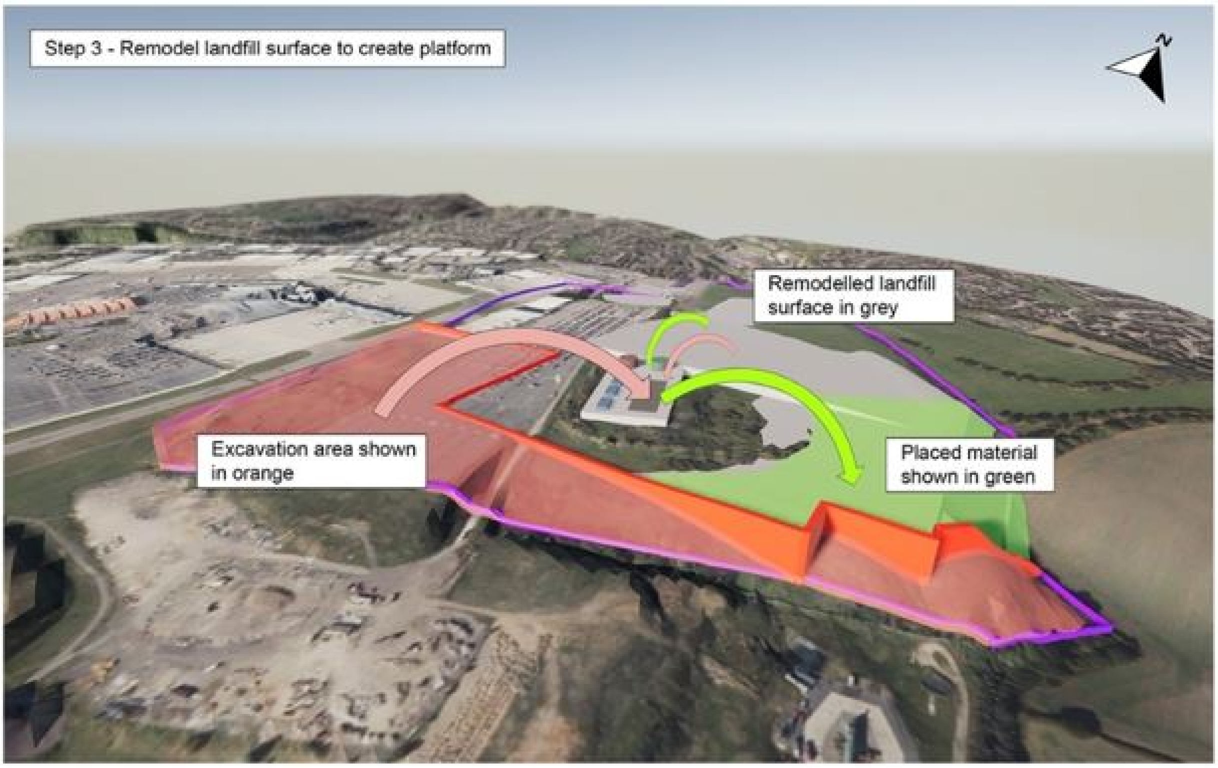
4.3.62 The excavated landfill material will be processed using a combination of mechanical screening and hand picking to sort and segregate the waste.

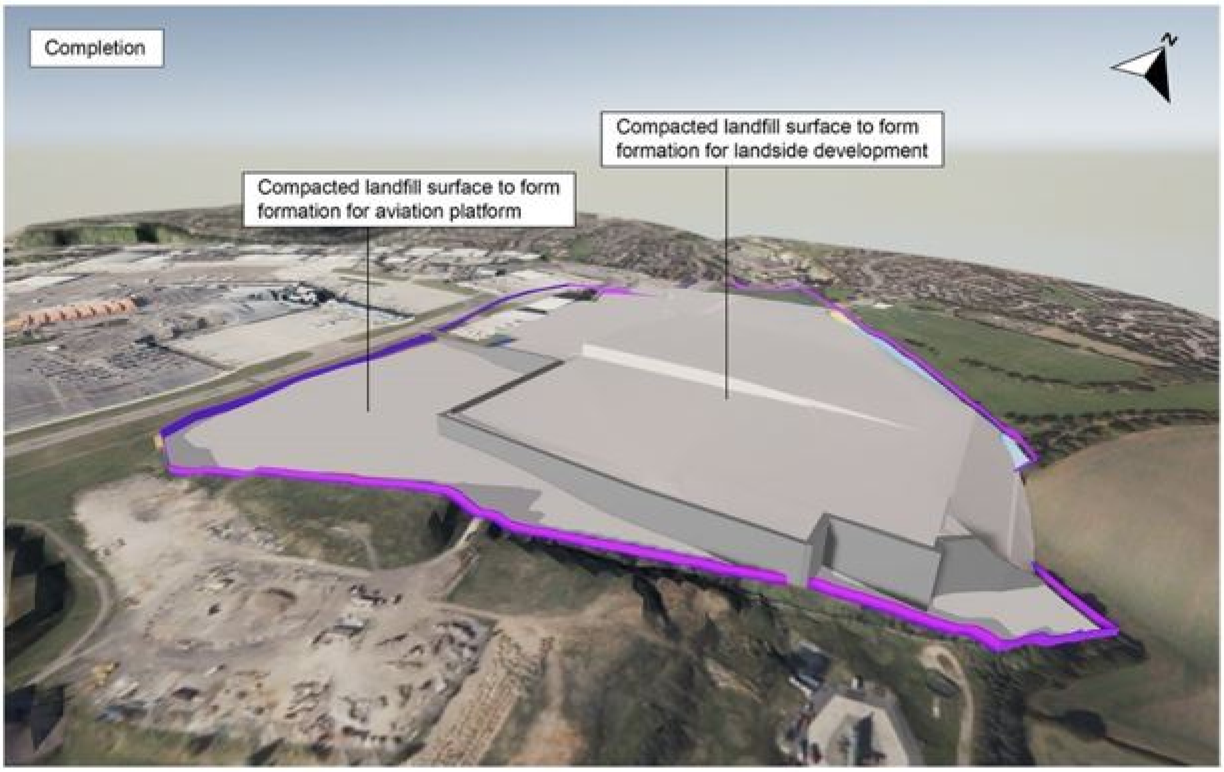
Inset 4.9: Illustrative sequence of works to the landfill




Step 1 - Excavate Landfill
Excavate landfill to 3m below proposed level and transport to process area
Process Area
Landfill Boundary
Excavation area shown in orange


Step 2 - Place selelcted material to extend the platform
Excavation area shown in orange
Placed material shown in green


Step 3 - Remodel landfill surface to create platform
Remodelled landfill surface in grey
Excavation area shown in orange
Placed material shown in green
N


Completion
Compacted landfill surface to form formation for landside development
Compacted landfill surface to form formation for aviation platform
N

4.3.63 An initial sorting will be carried out as the material is excavated. This would segregate materials that do not require processing and can be directly reused subject to meeting assessment criteria.

4.3.64 Excavated material that fail this initial sorting will then be sent mechanical screening and hand picking.

4.3.65 Mechanical treatment would include a shredding process prior to screening and sorting of the waste. The sorting system generally comprises conveyors, industrial magnets, eddy current separators, shredders, and other tailor-made systems.

4.3.66 The processed material would then be mixed with clean material to improve its geotechnical qualities;

4.3.67 All works would be undertaken in a dedicated processing area surrounded by solid hoarding with debris netting or under a temporary steel frame structure.

4.3.68 Given the risks associated with transporting the landfill material it is envisaged that excavated material will be transported to the treatment area by traditional trucks/dump trucks.

4.3.69 Where possible electric or hybrid plant would be used to reduce emissions in general as well as reducing the risk of exhaust emissions accumulating within excavations. Where electric plant is not available the plant will use low emission fuels.

4.3.70 The landfill treatment operation will involve liaison with the Environment Agency permitting and waste team, local authority contamination team and other stakeholders. The treatment of the landfill material will require a Mobile Treatment Environmental permit.

Terminal 2

4.3.71 The proposed T2 building is approximately 61,500sqm in area. In Phase 2a, approximately 50,000sqm would be built with the remaining 11,500sqm being constructed in Phase 2b.

4.3.72 Construction and fitout of the new passenger terminal building is on the critical path for Phase 2a.

4.3.73 Construction of T2 is anticipated to take four years including commissioning and operational readiness activation and transition (ORAT).

4.3.74 T2 is to be constructed over the existing landfill area. The building will require gas protection measures that could comprise:

a. a gas resistant membrane installed across the full building footprint; and
b. active pressure relief pathways or a passive gas dispersal layer.

4.3.75 As the existing landfill material lacks structural stability a portion of the landfill would be removed and replaced with granular fill. The excavated landfill material will be processed and retained on site for re-use.

4.3.76 Due to the structural instability of the area it is likely that a piled foundation solution will be used. Any construction work to the perimeter of the building would aim to minimise the footprint of the construction area.

4.3.77 The use of off-site fabrication and modularisation construction methods will be encouraged to minimise construction interfaces and to reduce the generation of construction waste. Off-site manufacturing could:

a. reduce deliveries to site;
b. reduce generation of construction waste;
c. reduce the number operatives on-site;
d. improve speed of construction
e. reduce health and safety risks; and
f. improve quality, as work would be undertaken in a factory environment.

Site Establishment

4.3.78 Close board hoarding would be erected around the proposed T2 building area. Access gates for vehicles would include a vehicle wheel wash and security arrangements. Whilst site accommodation would be provided in the contractors' compound, it is likely that local office and welfare facilities would be provided within the T2 site area. These local facilities would avoid the need for people to leave the terminal area for incidental requirements.

Ground and Substructure Work

4.3.79 All buildings for the Proposed Development made on the landfill platform will require a piled foundation solution. This includes the new terminal building, offices, hotels and multi-storey car park.

4.3.80 Sheet piling would be undertaken with percussion driven sheet piles; a typical setup is shown in Inset 4.9: Typical sheet piling operation (right photo using silent piler) Sheet piles would be delivered by HGV straight to the work face. A mobile crane would be used to off load the wagon and feed the piling machine.

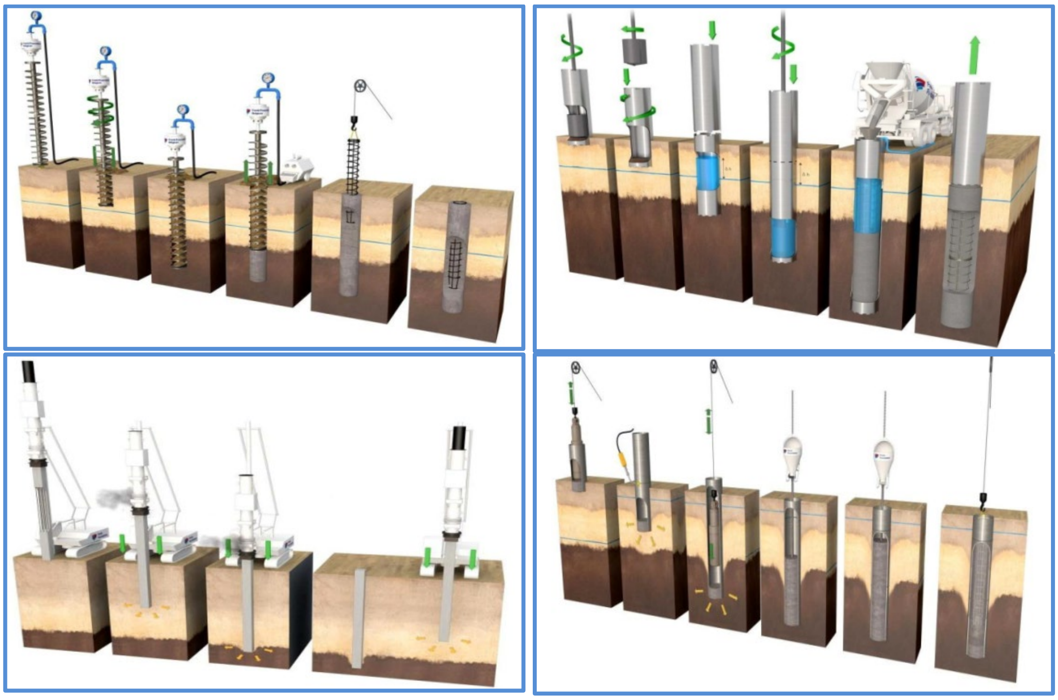
Inset 4.10: Typical sheet piling operation (right photo using silent piler)

4.3.81 Piling for the substructure could either be continuous flight augured (CFA) or rotary bored or driven precast piles. All have advantages and disadvantages.

The method chosen will be based upon the ground conditions, noise restrictions and logistics to minimise disturbance to the airport operations.

4.3.82 In-situ concrete is required for CFA, rotary bored and steel tube piles requiring individual deliveries.

Inset 4.11: Clockwise from top left: CFA, rotary bored, driven precast and driven steel tube piling techniques



Inset 4.12: Typical CFA piling operations

4.3.83 Pile cap and ground beams installation would follow the piling once enough piles had been installed and sampled randomised pile testing had proved positive. This sequence of working would then substantially dictate the sequence of substructure works and hence the sequences of the superstructure build. It is expected that the build would commence at and work away from the aircraft apron.

4.3.84 Typically, in-situ concrete is poured within shutters containing reinforcement especially when large structural loads are involved. However, opportunities to use precast concrete pile caps and ground beams could be explored. Either for the whole substructure or in designated lighter loaded areas, as loads may be prohibitive resulting in precast units being excessively large to transport and crane efficiently in some areas.

4.3.85 The principal advantage for precast ground beams is reduced schedule on-site, reduced labour effort, less trades on-site, and generally a cleaner activity reducing waste and promoting a clean and safe working environment.

4.3.86 Precast beams could be delivered direct from the factory to the work face avoiding multiple handling and lifted by crane directly into position. Some on-site storage could be permitted for sorting and stacking, though with planning the vehicle could be loaded to suit the build sequence, again reducing handling and storage.

Inset 4.13: Example of precast ground beams

4.3.87 Precast ground beams and/or pile caps are also well suited to the lighter loaded buildings for example the New Century Park buildings and the business aviation hangars.

Structural Frame (steel)

4.3.88 It is assumed that the terminal building would have a steel frame (Inset 4.13:Steel frame erection of new car park at the airport), alternatives could include a timber frame or a concrete frame used in whole or in part, however the methods and techniques discussed below could be applied to these methods.

4.3.89 The structural steel frame would be manufactured off site and delivered to site by articulated low loader vehicle. The steel work deliveries would be planned for just in time delivery to avoid storage on-site. The preference would be to erect the steel direct from the wagon to avoid double handling and storage with associated congestion on-site. Steel erection would be carried out by crane.

Inset 4.14:Steel frame erection of new car park at the airport

4.3.90 The piers would be erected after the aprons had been built. Consideration for preassembled modules would be explored. They could be lifted into position much like bridge trusses on motorways.

4.3.91 The steel work would be assembled in a prefabrication area on-site or alternatively, size permitting, off site at the structural steel fabricators factory. The steel modules would be lifted into place by mobile cranes, tower cranes may be impractical due to reach and weight limits.

4.3.92 The modules could be installed much quicker than erecting steel on-site and therefore coordination with the operations of the apron could be better managed to suit less active periods at the airport including night works. The modular solution could extend to include floor decks, roof decks and cladding with primary mechanical systems and electrical containment pre-installed.

4.3.93 A similar method was used for the South Gates passenger boarding area at Dublin Airport delivering 2,200sqm from 77 steel frame modules in 16 days.

Basement, Ground, and Intermediate Floors

4.3.94 The choice of intermediate concrete floor type would inform the erection method. There are two principal types, precast and in-situ concrete floors.

4.3.95 Precast concrete floors would be made of precast planks. These would be lifted onto the steel frame following the steel frame erection sequence. The steel frame and concrete floor sequence would need to be planned together to avoid future lifting and erection problems by 'boxing oneself into a corner'.

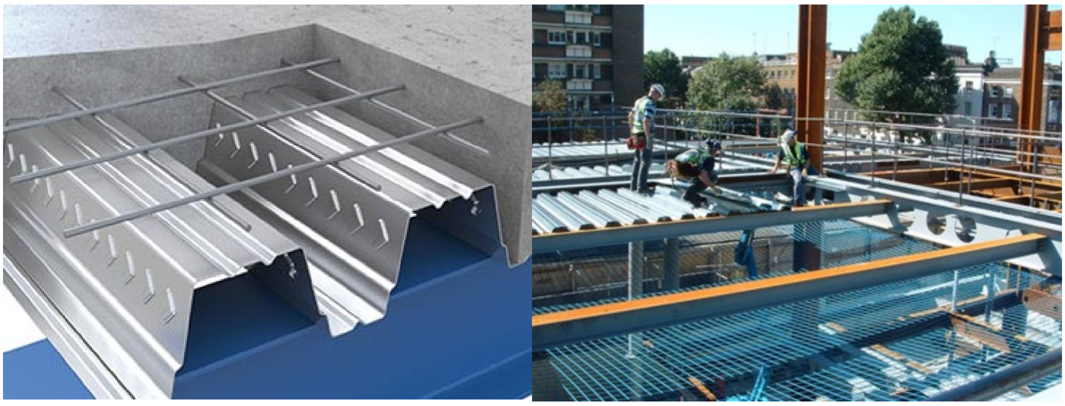
4.3.96 As the floors were erected edge protection handrails and kick boards would be installed to avoid any unprotected edges. Handrail and edge protection systems could be preinstalled prior to lifting the planks to reduce the working at height risks. There are industry standard proprietary systems for this technique. During the erection stage, operatives would use harnesses and/or work from a mobile elevating working platform (MEWP) until the edge protection was in place.

Inset 4.15:Typical installation method for precast concrete floor planks

4.3.97 Precast floors would typically have a screed finish installed once the building was weather tight as part of the building finishing trades. The screed finish would be coordinated with the fit out and finishes and installed as late as possible to avoid accidental damage. The screed would be pumped from the ground to the work area in a similar fashion to pumped concrete described below.

4.3.98 In situ concrete floors could also be an option where the concrete is poured onto hollow rib metal decking (Inset 4.15: Typical composite floor construction). The hollow rib metal decking would be installed by crane coordinated with the steel frame erection sequence. Ready installed edge details to retain the concrete during pouring could be used to reduce the need for working at height. Good practice is to install netting below the hollow rib floor installation to provide a fall arrest system, similarly for the roof installation.

Inset 4.16: Typical composite floor construction



4.3.99 The steel reinforcement bars would also be lifted by crane onto the hollow rib decking. The steel reinforcement fixing would commence once the risk of falling objects from overhead crane lifts was avoided by work sequencing. It would typically commence once the decking above had been installed to act as primary protection from falling objects. Concrete would be pumped from the ground and poured onto the hollow rib decking.

Inset 4.17:Typical concrete pump setup

4.3.100 The basement floor would be in situ cast concrete, again installed once the precast concrete floor or hollow rib deck has been installed above. If the concrete is to be substantially self-finished, the pouring of concrete would be coordinated with the building becoming weatherproof with wall and roof cladding.

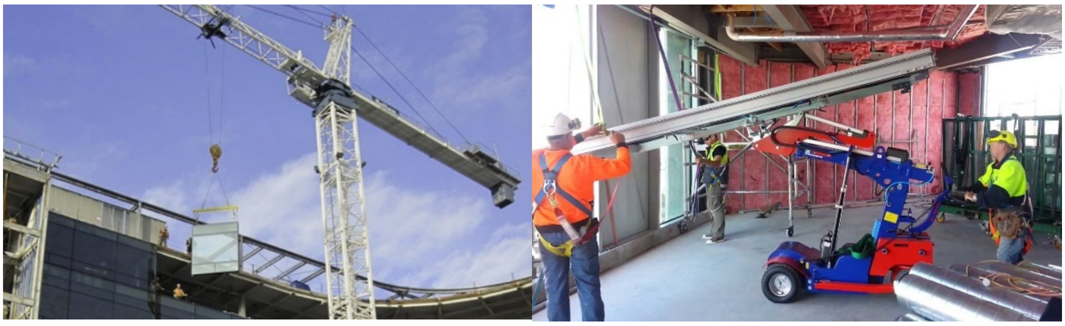
Roof and Wall Cladding

4.3.101 The roof cladding system, roof lights, smoke vents and other roof fittings would be installed in a similar manner to the installation of hollow rib decking described above. A crane would lift the cladding system into place. Netting fall arrest systems would have been installed below the roof cladding with edge protection handrails and kick boards erected to the roof perimeter.

4.3.102 Again, consideration could be given to preassembling the handrail system with the steel frame erection to avoid operatives having to erect the system after the frame thereby managing working at height risks. Roof installation would be sequenced with the progressive erection of the steel frame and intermediate floor component lifting to both minimise weather ingress and the risk of falling objects to enable the commencement of work faces below.

4.3.103 Wall cladding and curtain walling would be lifted by crane, particularly adjacent to airside operations and public areas, to minimise mechanical ground transportation of materials. This vertical transportation would also minimise the land take from the airport for construction operations in comparison to delivering materials by ground vehicle.

Inset 4.18:Crane lifting curtain walling and installation of glazing from inside



Mechanical and Electrical Systems

4.3.104 The modular installation of prefabricated mechanical and electrical services systems would be encouraged. Modules would be manufactured in a factory environment to minimise working at height, particularly in the departures and arrivals hall, and baggage reclaim. These systems would typically be installed onto a steel racking structure and installed by tower crane as the structural frame and floors are progressed. Joints would be prepared in advance at the factory for ready connection on-site.

4.3.105 Factory prefabrication would reduce work on site, allowing manufacture to be timed in parallel with the frame installation to reduce schedule and quality control risks. Testing could be carried out in the factory. This methodology was used on other new airport pier projects at Luton and Heathrow. Alternatively, the mechanical and electrical systems would be installed from a MEWP.

Inset 4.19: Off-site Fabricated Mechanical Systems

4.3.106 Consideration would also be given to prefabricated and precast lift shafts.

Internal Fit Out

4.3.107 Internal fit out of the building would proceed once the building was suitably weatherproof and would follow normal construction industry methods. Opportunities for modularisation and prefabrication could be explored, for example, washroom pods, have been successfully used on other projects.

Inset 4.20 Prefabricated washroom module exterior and interior

4.3.108 Similarly, check in desks, baggage conveyors, passport and security checking desk and kiosks etc. could all be delivered to site preassembled and lifted in place by forklift trucks, hoists or tele handlers. Concessionaires' shops and kiosks could similarly be substantially modularised and fitted out in a typical shop fitting methodology as used in shopping centres.

Luton DART Extension

4.3.109 The Luton DART extension would be a 500m long cut and cover tunnel running under the existing taxiway Delta and Foxtrot with a new passenger station outside of the new proposed passenger terminal. It would connect T1 to T2.

4.3.110 To ensure the new Luton DART structures are protected from landfill gas ingress it should be protected by a combination of:

a. appropriate structural detailing of the tunnel (to resist gas ingress);
b. an external gas membrane tanking of the tunnel; and
c. high level of internal ventilation will be provided.

4.3.111 In order to meet the current passenger demand at the airport, there is a requirement for two taxiways to always be open for aircraft movement. To maintain this requirement the construction of the Luton DART extension would require careful planning as set out below:

4.3.112 Part of the Luton DART extension would pass through the landfill and therefore would need to control leachate and gas management.

Construct cut & cover tunnel (Chainage 2+300m to 2+400m).

4.3.113 Start construction of temporary taxiway at the same time. The taxiway would be built on top of the new cut & cover tunnel section.

4.3.114 Once the sheet piling of chainage 2+300m to 2+400m has finished the chainage 2+400m to 2+500m tunnel construction would begin.

4.3.115 After the sheet piling of chainage 2+400m to 2+500m has finished the construction of chainage 2+500m to 2+600m would begin.

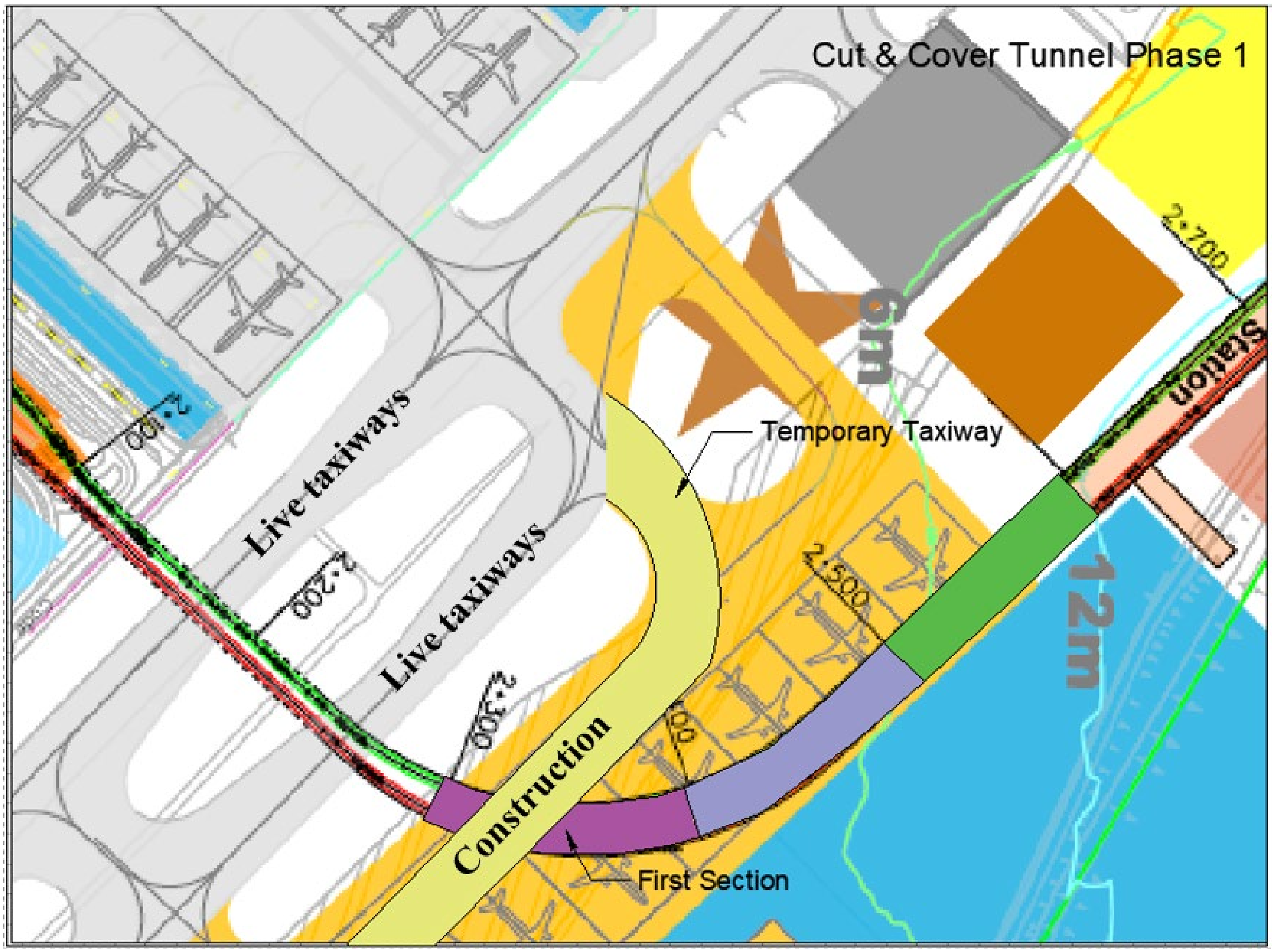
4.3.116 The construction of chainage 2+200m to 2+300m tunnel would begin once the temporary taxiway is operational.

4.3.117 The demolished taxiway section would be rebuilt over the new tunnel.

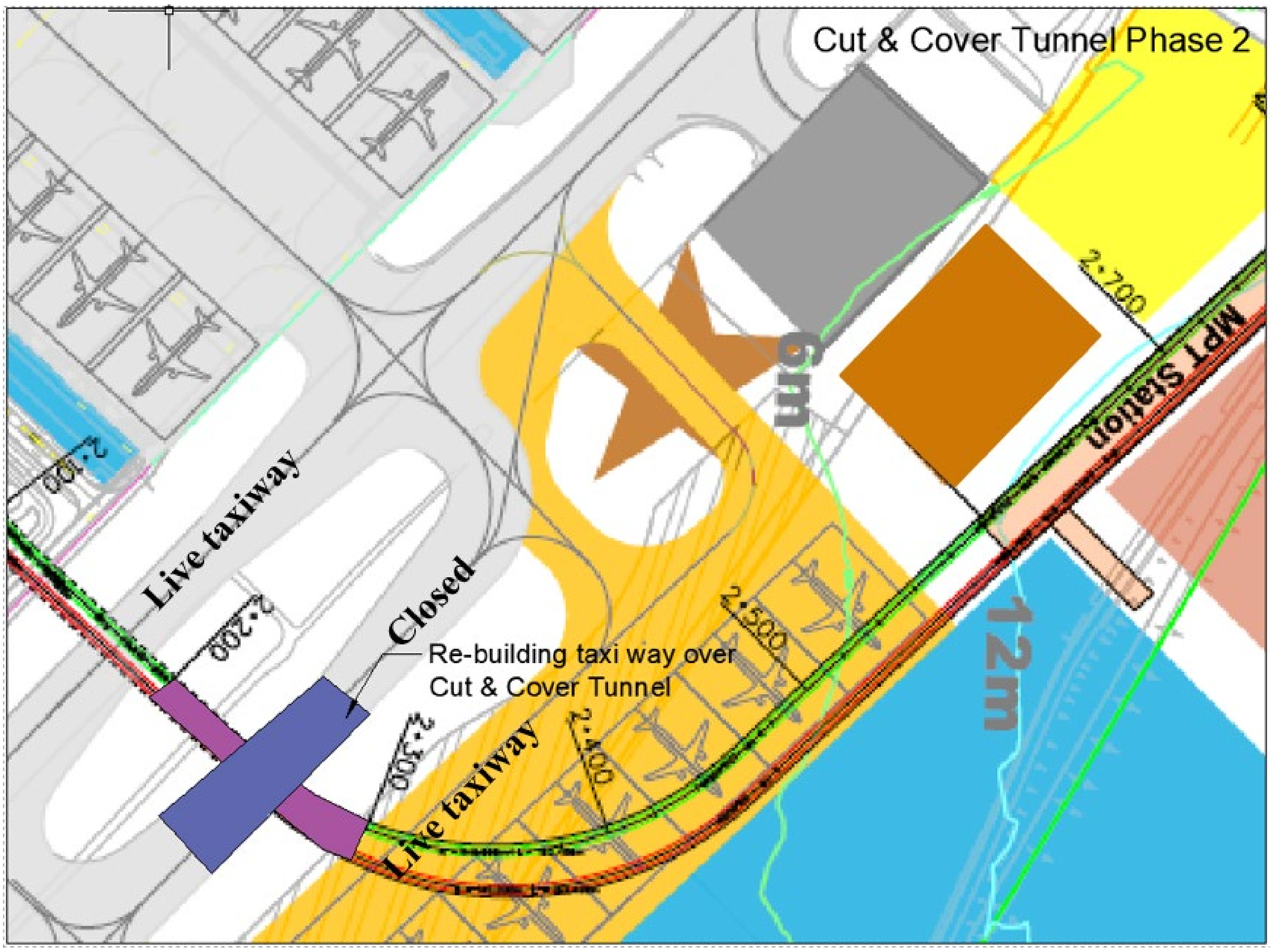
4.3.118 The construction of the final section of the tunnel (chainage 2+100m to 2+200m) would begin once the taxiway over the chainage 2+300m to 2+400m section of tunnel had been rebuilt.

4.3.119 Finally, the demolished Taxiway section over the final section would be rebuilt.

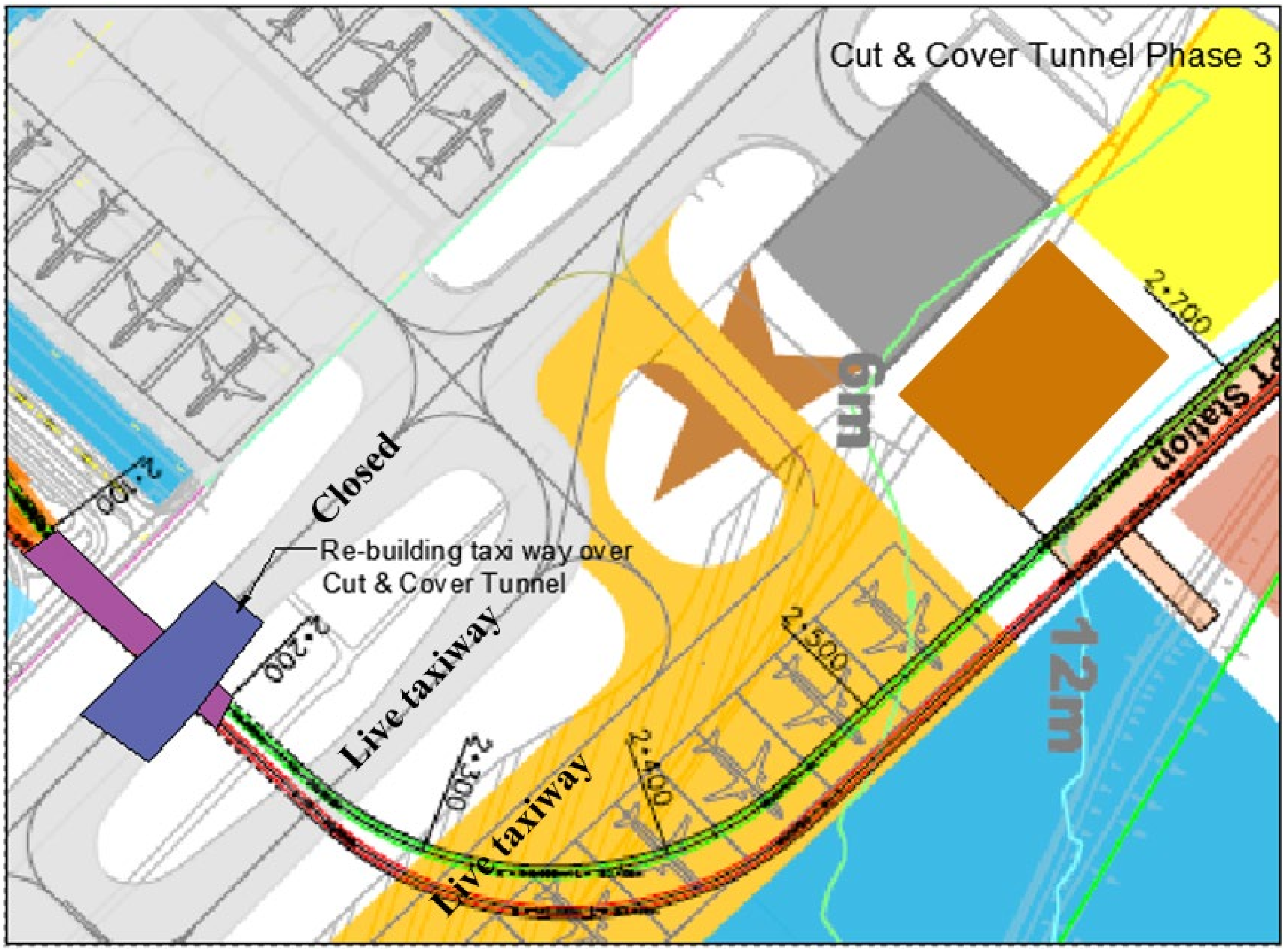
Inset 4.21: Luton DART Extension Phase 1 (chainage 2+300m to 2+400m)



Inset 4.22: Luton DART Extension Phase 2 (chainage 2+200m to 2+300m)



Inset 4.23: Luton DART Extension Phase 3 (chainage 2+100m to 2+200m)



4.3.120 Construction methods and techniques could follow one of two general methods;

a. open box construction; or
b. top-down construction.

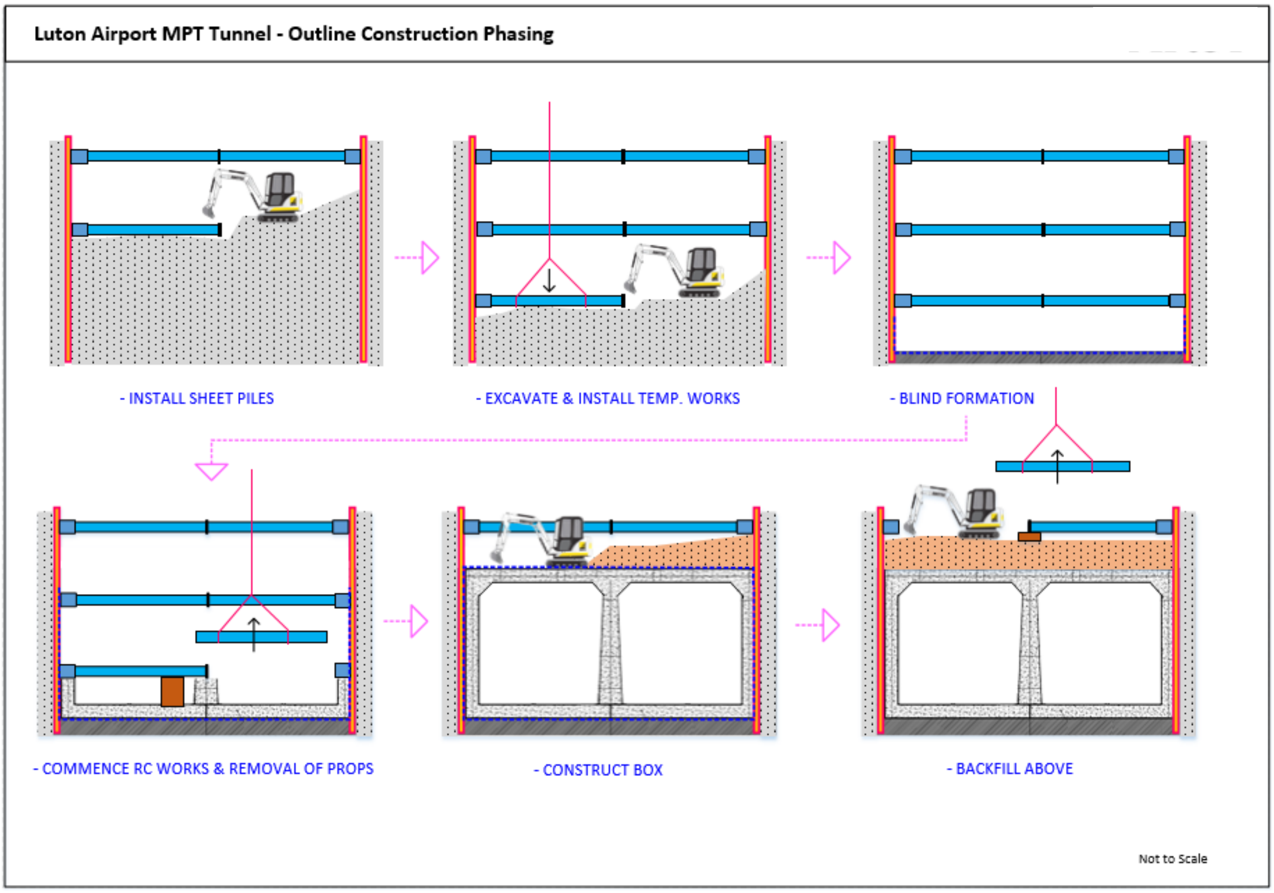
4.3.121 Both could use excavation techniques to minimise the need for over excavation and batters to maintain excavated slope stability, such as secant piling or sheet piling.

Inset 4.24: Open box and top-down construction on Luton DART scheme

Open Box Construction

4.3.122 The open box method would involve the driving of sheet piles to form the earthwork support during the tunnel excavation followed by progressive excavation with a propping system. The tunnel would be built from in situ concrete using the sheet piling as part of the shuttering system. The sheet piling would therefore be left in place as construction progressed with wall, floor and roof construction in conjunction with the removal of the props. The methodology is graphically depicted in Inset 4.24: Graphic of open box construction methodology.

Inset 4.25: Graphic of open box construction methodology



4.3.123 Bored concrete secant piling could be considered in lieu of the sheet piling. The secant piling would provide both the earthwork support system and the external structure of the tunnel. The secant piling could be designed to be structurally self-supporting and therefore obviate the need for the installation of, and working around, the shoring system. The secant piling would require a surface finish such as sprayed applied concrete and could be further faced in public areas with architectural treatments.

4.3.124 Once the reinforced concrete structure was finished, the tunnel roof structure formwork and reinforcement would be erected and cast. Alternatively, precast roof sections could be lowered onto the secant piles. The roof would then be waterproofed and protected and drainage systems installed. The backfill operation would then be carried out in layers to ensure proper compaction.

Inset 4.26: Sheet pile open box construction on first Luton DART scheme

4.3.125 A precast solution could be feasible. Sheet piling would be proposed to support the tunnel excavation if necessary, before precast wall panels, and pre-stressed pre-cast roof deck panels. Amongst the advantages of this technique could be reduced site works, less working at height to fix shutter and reinforcement bar, less wet trades including large numbers of concrete wagons to and from site and a cleaner construction technique, which is important when interfacing closely with aircraft operations.

Inset 4.27: Precast sections on first Luton DART scheme

Top-Down Construction

4.3.126 A top-down construction technique could be considered recognising the management of the interface between the Luton DART extension tunnel and the live airfield. Top-down construction is used successfully in congested areas including London. The principal advantage of this technique would be the ability to quickly reinstate the airfield.

4.3.127 A secant piled diaphragm wall would be installed with connection points installed for the roof and/or intermediate floors. A diaphragm secant pile wall could also be installed to act as intermediate support to manage the floor and roof spans.

4.3.128 The ground would be excavated below the soffit of the tunnel roof structure including an allowance for blinding for the in situ concrete slab. Alternatively, precast concrete slabs could be lowered onto the diaphragm wall to provide the roof structure. An access shaft would need to be allowed in the slab for machinery and materials.

4.3.129 Once the roof slab was installed, the ground could be backfilled, and taxiways or above ground structures could then be constructed whilst excavation of the tunnel commenced. Alternatively, an access ramp into the tunnel could be formed to enable the bulldozing of excavated material to an excavator to load wagons for disposal. Fume extract and fresh air systems would need to be considered to maintain a breathable environment.

Taxiway demolition

4.3.130 As part of the construction of the Luton DART extension, several sections of the existing taxiway would have to be demolished.

Inset 4.28: Taxiway demolition and reconstruction for first Luton DART scheme

4.3.131 The taxiway lighting would be decommissioned, ensuring continued operation of adjacent taxiway lighting in close coordination with the airport operator. Underground services would be identified from record drawings, surveys and trial holes and a strategy for their continued operation agreed, either by diversion or by protection works. Vehicle and machinery access routes would be agreed with the airport and red & white barriers would be erected to demark the construction areas.

4.3.132 Demolition work would mainly be ‘excavation’ in this case and would be carried out by 360-degree excavators with hydraulic breakers. Consideration would also be given to sawing the concrete with a diamond saw and prising/lifting the slabs from the ground. The material would be loaded by another machine into covered tipper wagons to minimise dust from stockpiles. Dust damping techniques may need to be considered to minimise dust in dry conditions.

4.3.133 Consideration would be given to crushing and recycling suitable materials to use in backfilling operations. Road sweepers and a housekeeping gang would be in constant operation to ensure the construction area and access routes were always kept clean to avoid the risk of debris entering the airfield.

Tunnel and station fit out

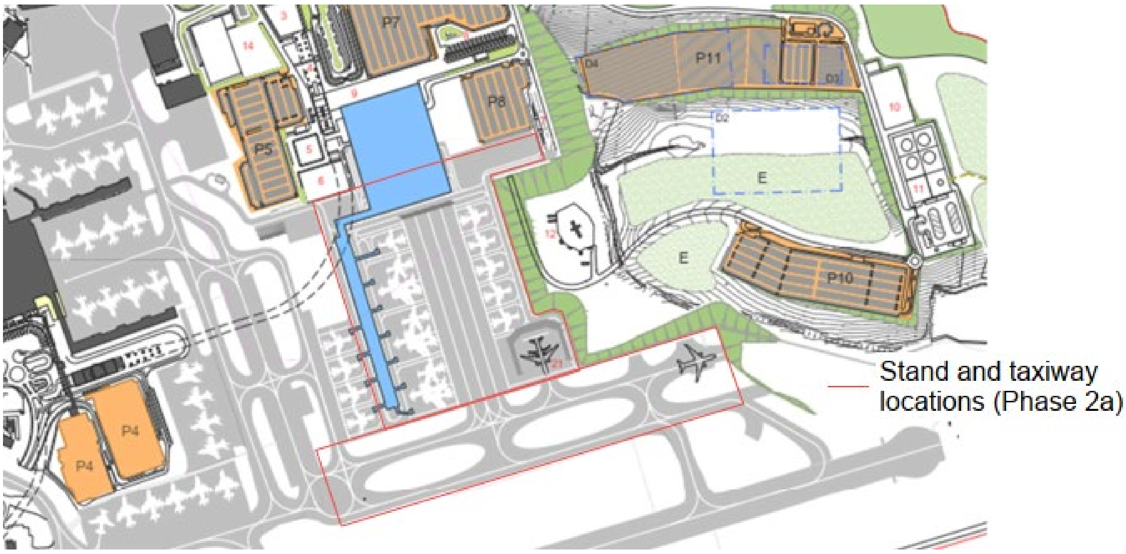
4.3.134 Once the tunnel was complete, the significant interface activities with the airfield would be substantially reduced. Mechanical and electrical works, rail and signalling works and architectural fit out works would commence inside the tunnel from dedicated access and egress points previously agreed and coordinated with airport operations.

4.3.135 Prefabrication and modularisation opportunities would be explored to minimise construction interfaces with the existing airfield operations. The benefits and forms this might take have been covered in previous sections.

New Apron and Stands

4.3.136 In Phase 2a, 12no. additional stands and engine run up bay are to be built on the new extended earthworks platform. The existing Taxiway Alpha will also be realigned and duelled.

Inset 4.29: New taxiway and stand locations



4.3.137 Standard construction methods would be used for the construction of the airfield hardstanding areas.

4.3.138 Careful consideration is to be given to the prevention of foreign object debris (FOD) which is any material that could cause damage to equipment, aircraft or injure personnel. FOD can include loose hardware, pavement fragment, building materials, rock, sand, and wildlife. Further information can be found in the LLAOL Contractors Code of Practice.

4.3.139 The ground would be prepared as part of the earthworks phase. The installation of drainage runs, fuel lines and other utilities would be incorporated into this work using similar methodologies as previously described.

Drainage and Water Treatment Facilities

Attenuation Tanks

4.3.140 The attenuation tanks would be a proprietary attenuation system installed in the ground, as shown in the image below.

Inset 4.30: Proprietary cylindrical attenuation system prior to backfill

4.3.141 The attenuation tanks would be excavated by 360-degree excavator with the excavation sides battered back to angles that would stabilise the slope to ensure safe construction. The excavated material could be treated if required for re-use elsewhere on the Proposed Development; the proprietary attenuation components would be backfilled with granular material.

4.3.142 The attenuation components would be delivered by articulated wagon and either stored on-site or deliveries coordinated to enable lifting straight from the vehicle thus avoiding double handling. They would, dependent upon the final build sequence and access, be lifted into position by an excavator, tele-handler or crane. After inspection, they would either be back filled as work progressed or, with suitable reach from excavator or crane, be backfilled once all the elements are installed.

Inset 4.31: Backfilling of proprietary attenuation system

Water treatment facilities

4.3.143 These facilities would be above ground located sufficiently far away from the runway to avoid conflict with airfield operations. However, to minimise construction time and hence associated risks to operations, modularisation and prefabrication opportunities should be examined.

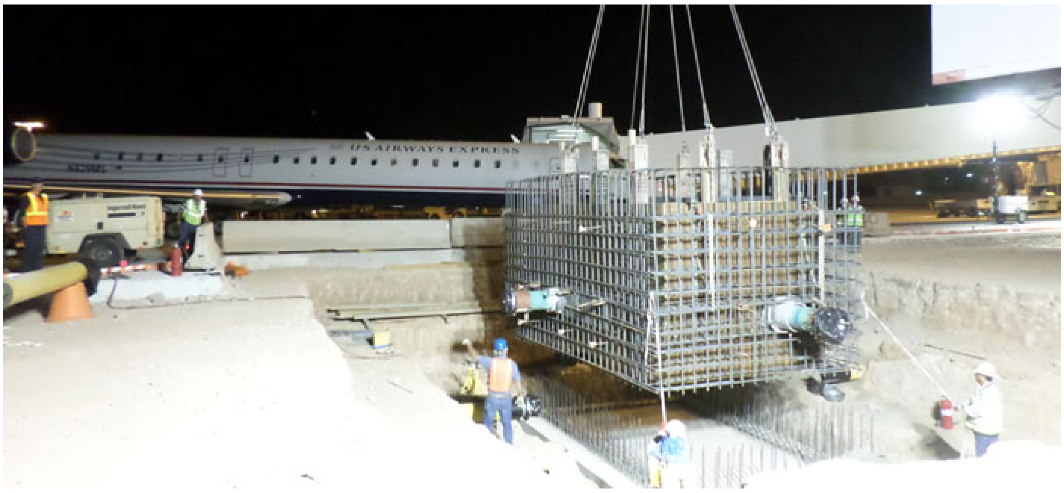
4.3.144 Modular buildings could be used for offices and control rooms, substantially fitted out prior to delivery and craned into position, with modules bolted together to form larger buildings. Pipework, valve sets, and manifolds could be made in an offsite factory and brought to site and lifted into place.

Fuel Storage Facility

4.3.145 Similar to the water treatment facilities it is recommended that modularisation and prefabrications opportunities should be examined for the mechanical and electrical elements of the fuel storage facility. Some examples, of previously prefabricated fuel storage modules on airport projects are shown below.

Inset 4.32: Example prefabricated fuel skid with valve chamber

Inset 4.33: Example installation of a prefabricated fuel skid with valve chamber



4.3.146 If a piled foundation is required this could be continuous flight auger piling rig with in-situ concrete for the foundation, ring beams and plinths. Opportunities for precast elements can be explored. An example of the ring beam construction is shown below.

Inset 4.34: Example ring beam construction for storage tank

4.3.147 The material type for the tanks should be considered to enable the tanks to be delivered in segments bolted together with gaskets and sealed on-site, similarly, the bund walls could be precast sections with gaskets and sealing on-site.

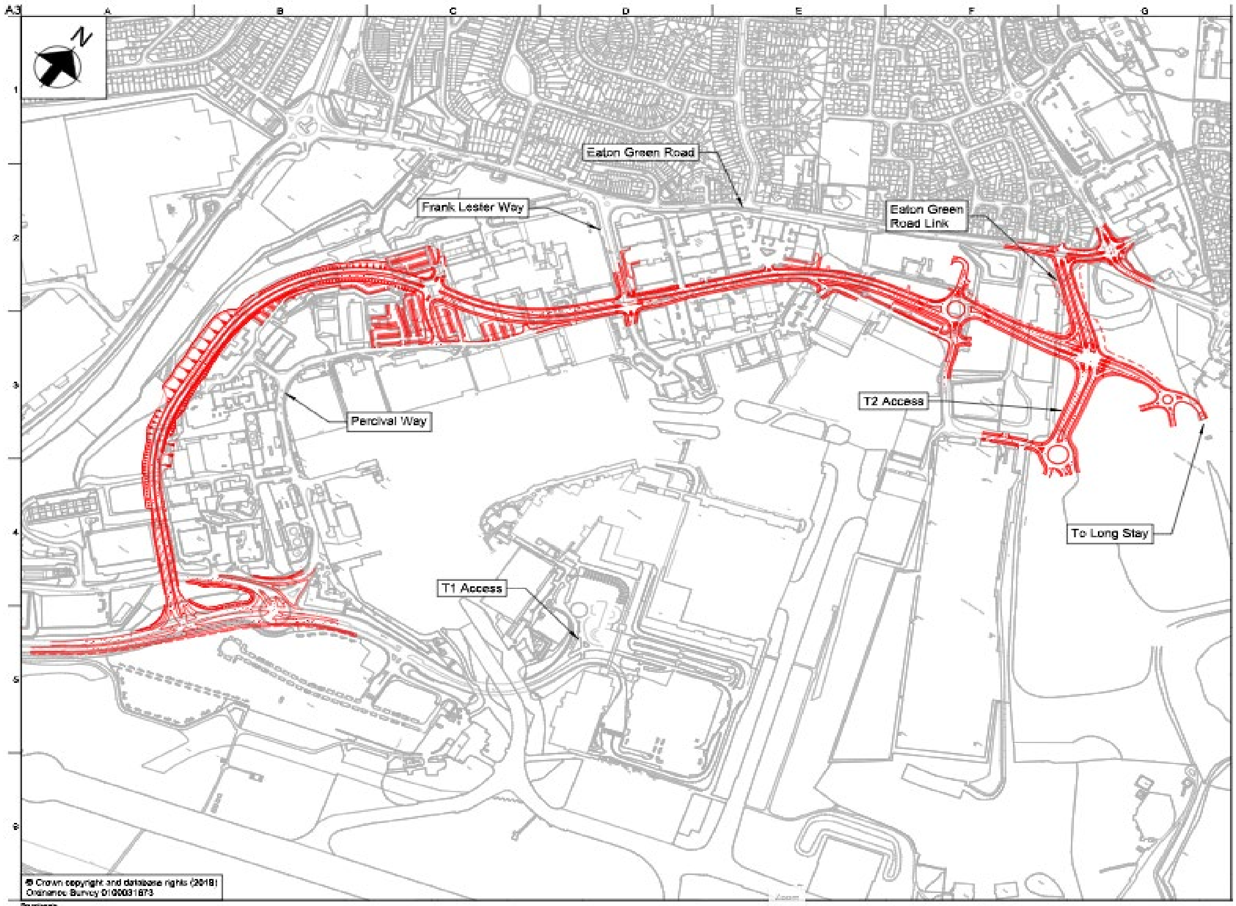
4.3.148 The aim of prefabrication, apart from improved schedule, is reducing construction activities and associated housekeeping, dust, noise, and vibration risks close to the airfield operations and aircraft.

Inset 4.35: Example storage tank under construction (larger than the proposed)

Airport Access Road

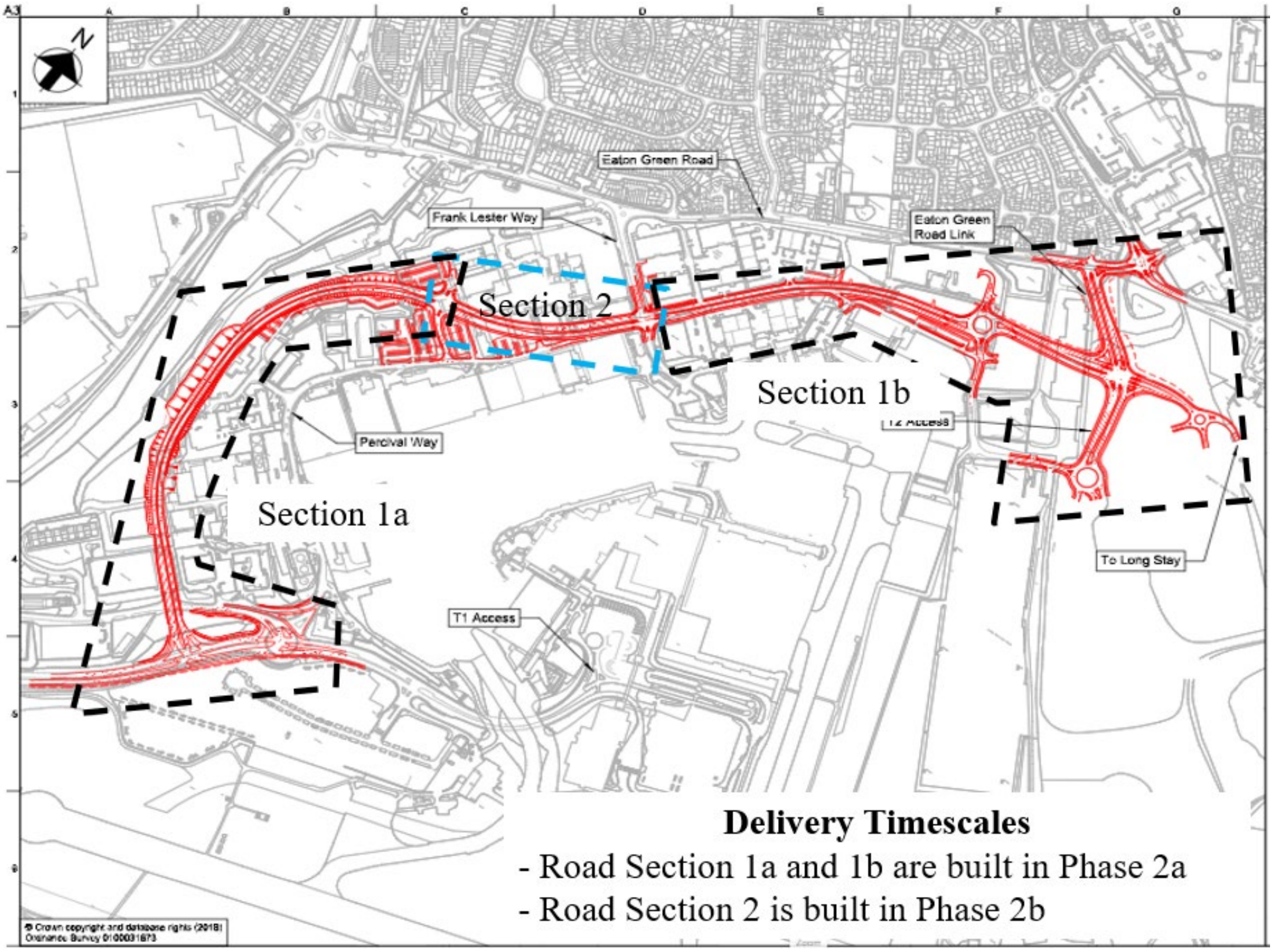
4.3.149 The AAR is a new access road linking the A1081 (Airport Way) to T2 and is planned to be built in two sections. The drawing below indicates the proposed road alignment (refer to inset 4.35 and 4.36).

Inset 4.36: Airport Access Road (proposed alignment)



4.3.150 The AAR would be construct in two sections with majority being constructed during Phase 2a, as shown below. The last section of the AAR is built in Phase 2b.

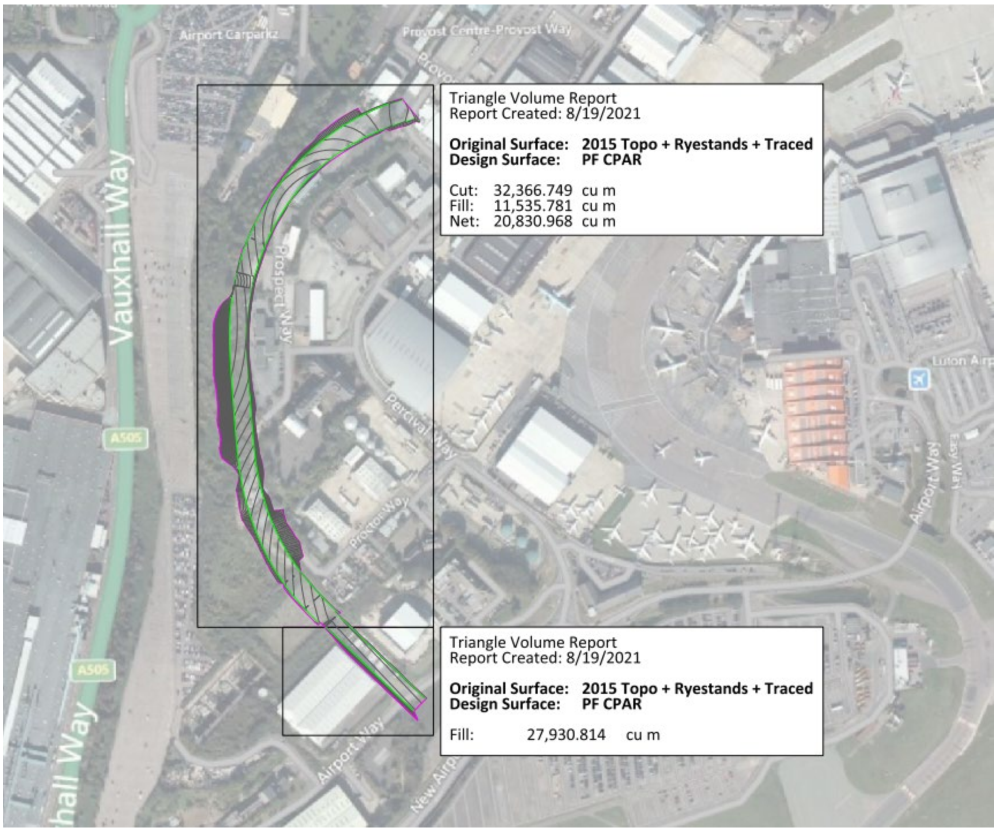
Inset 4.37: Airport Access Road (Construction Phases)



4.3.151 The extent of the existing structures that need to be demolished to enable construction of the new road is contained within Appendix D. The typical demolition methodologies are set out in the demolition section.

4.3.152 The estimated volume of earthworks in Section 1a of the AAR is 32,000m3 of cut and 11,500m3 of fill. While 28,000m3 of fill material would be required to construct the new embankment structure.

Inset 4.38: Airport Access Road (cut & fill) Section 1a



4.3.153 Following removal of the existing structures any remaining utilities or services will be removed, diverted, or protected. This allows preparation of the road formation to commence using 360-excavator.

4.3.154 A granular sub-base material will then be placed, spread, and compacted. The road formation will be trimmed for cambers, gradient, and cross falls.

4.3.155 A second layer of granular material known as road base is then placed in a similar method to the sub-base. This is followed by a bituminous primer coat and an asphaltic concrete binder course.

4.3.156 The project has an opportunity to re-use existing materials on site (e.g. demolition and landfill) to form HBMs which would reduce the volume of traditional granular sub-base material coming to site.

4.3.157 The asphaltic binder and wearing course are normally supplied by specialist supplier and delivered to site in tipper trucks. The tipper tricks are covered with tarpaulin to prevent heat loss.

4.3.158 The asphaltic concrete binder and wearing course is laid using a paving machine and immediately rolled.

Inset 4.39:Typical Road Paving Machine

Primary Infrastructure and Roads

4.3.159 Following removal of the existing structures any remaining utilities or services will be removed, diverted, or protected. This allows preparation of the road formation to commence using 360-excavator.

4.3.160 A granular sub-base material will then be placed, spread, and compacted. The road formation will be trimmed for cambers, gradient and cross falls.

4.3.161 A second layer of granular material known as road base is then placed in a similar method to the sub-base. This is followed by a bituminous primer coat and an asphaltic concrete binder course.

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4.3.164 The asphaltic concrete binder and wearing course is laid using a paving machine and immediately rolled.

Car Parks

4.3.165 In Phase 2a, as shown in the phasing diagrams, the car parking capacity is increased through the construction of new car parks and existing car park modified:

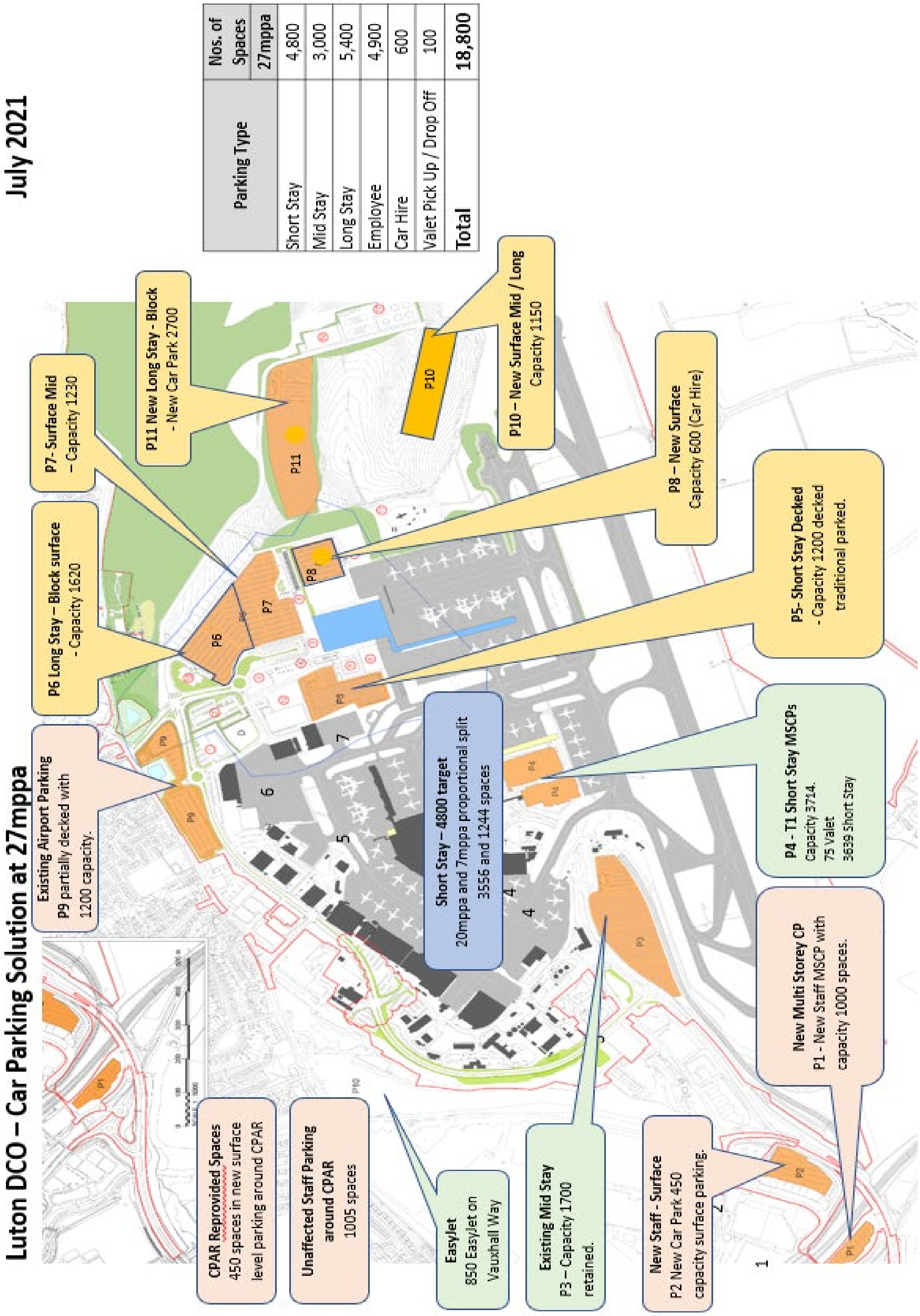
4.3.166 New car parks:

a. P1 (New multi-storey car park (MSCP)) – New MSCP on former tiered car park site providing 1,000 spaces;
b. P2 (New surface staff car park) – New surface car park on the former trailer park providing 450 space;
c. P8 (New surface car park) – New surface car providing 600 space;
d. P10 (New surface mid/long stay car park) – New surface car park providing 1,150 spaces; and
e. P11 (New surface long stay car park) – New surface car park providing 2,700 spaces.

4.3.167 Existing car parks:

a. P5 (Block parking) – car park reconfigured and decked;
b. P6 (Long stay car park) – car park reconfigured;
c. P7 (Mid stay car park) – car park reconfigured; and
d. P9 (Existing airport parking) reconfigured and decked.

Inset 4.40: Phase 2a Car Park Locations



Parking Type	Nos. of Spaces
	27mppa
Short Stay	4,800
Mid Stay	3,000
Long Stay	5,400
Employee	4,900
Car Hire	600
Valet Pick Up / Drop Off	100
Total	**18,800**

4.3.168 Typical car park construction methodologies would be used for a multi storey or deck car park which would involve a steel or concrete frame. For the block and surface parking a sub-base, drainage and finished surface would be installed

4.3.169 Several car parks will also require the addition of some small buildings to allow for hire car companies and security.

Terminal 1 refurbishment

4.3.170 Following the opening of T2 some elements of T1 maybe refurbished.

4.3.171 The precise scope of the T1 refurbishment has yet be defined. It is assumed that this work will be contained within the existing terminal building and will involve internal finishes and renewal of mechanical and electrical services.

4.3.172 The scope and nature of the works means that a variety of construction techniques will be used. Most of the work is likely to be self-contained.

4.3.173 Construction activities will be planned and coordinated with the existing airport operator.

5 CONSTRUCTION PHASE 2B

5.1 Key Construction Constraints & Interfaces

5.1.1 The objective of Phase 2b would be to increase the capacity of the airport to 32 mppa. This would primarily be achieved by expanding Terminal 2.

5.1.2 The key construction constraints and interfaces for Phase 2b would include:

a. interface with operational airport;
b. interface with local residents and businesses; and
c. interface with landowners.

5.2 Construction Programme & Phasing

5.2.1 The main construction activities in Phase 2b are:

a. expansion of Terminal 2;
b. relocation of the fire training ground;
c. new aircraft stands and apron;
d. relocation of ERUB;
e. new car parking provision;
f. new airside facilities including fire station, security centre and hangars; and
g. new landside facilities.

5.2.2 The construction methodologies used would be similar to the previous two phases.

5.2.3 The phasing diagrams, contained in Appendix B, illustrate the key construction phases of Phase 2b.

5.3 Construction Methodology

Site Establishment

5.3.1 During this Phase, as in Phases 1 and 2a, there will need to be main works compound and several smaller stand-alone satellite site establishments/construction compounds both because of the dispersed nature of the proposed works. See Section 6.8 (Proposed Construction Compounds) for further information on the site compound arrangements.

5.3.2 The potential satellite site locations are shown in the phasing diagrams contained in Appendix B, and would include the following:

a. Construction Compound 1 (Main Works Compound): Construction compound located adjacent to the existing T2 to support the construction of the new aircraft stands and airfield works. The compound is approx. 8,000sqm and would provide welfare facilities for site operatives, materials receiving, equipment storage and operative parking;

b. Construction Compound 2 (Earthworks); Located adjacent to the water treatment are with an approximate area 10,000sqm.

c. Construction Compound 3 (NCP Developments): Located within the former P7 car park. The compound is approx. 3,500sqm and would provide welfare facilities for site operatives, materials receiving, equipment storage;

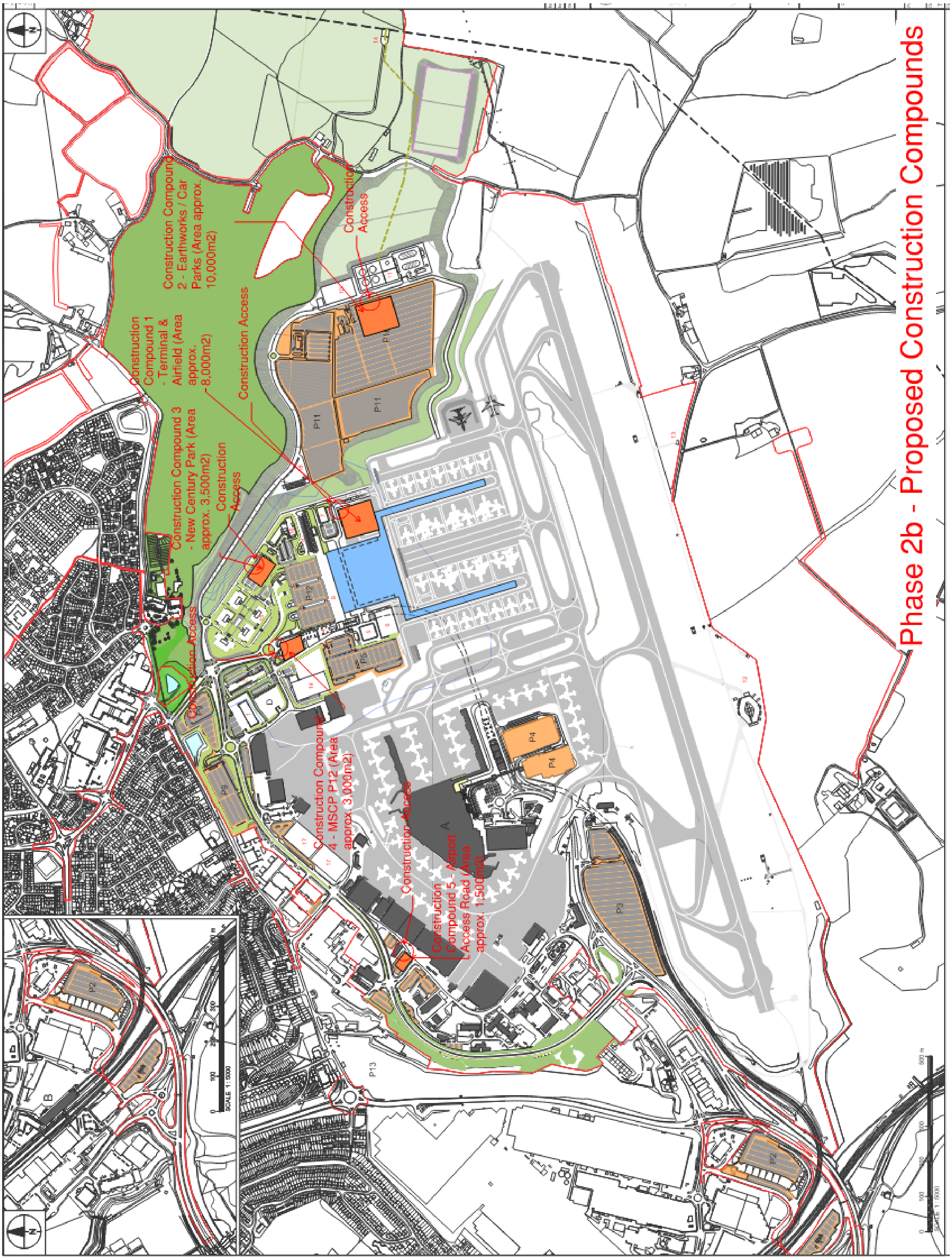
d. Construction Compound 4 (MSCP P12): Self-contained site compound area (approx. 3,000sqm) located close to the proposed Luton DART station construction. Providing welfare facilities for site operatives, material and equipment storage;

e. Construction Compounds 5 (Airport Access Road): A self-contained construction compound to the construct the central section of the AAR.

Table 5.1 Phase 3b Construction Compounds

Phase 2b: Construction Compounds			
Name	**Location**	**Size (m2)**	**Duration**
Compound 1	Terminal & Airfield	8,000	24 months
Compound 2	Earthworks	10,000	24 months
Compound 3	NCP Developments	3,500	24 months
Compound 4	MSCP P12	3,000	18 months
Compound 5	Airport Access Road (Central)	1,500	18 months

Inset 5.1: Phase 2b Construction Compounds



Bulk Earthworks

5.3.3 The bulk earthworks in Phase 2b extends the earth platform formed in Phase 2a. This work will be both airside and landside.

5.3.4 As can be seen in the Insets, the majority of earthworks in Phase 2b would be in expanding the airside platform further and preparing the ground for the car parks to the east.

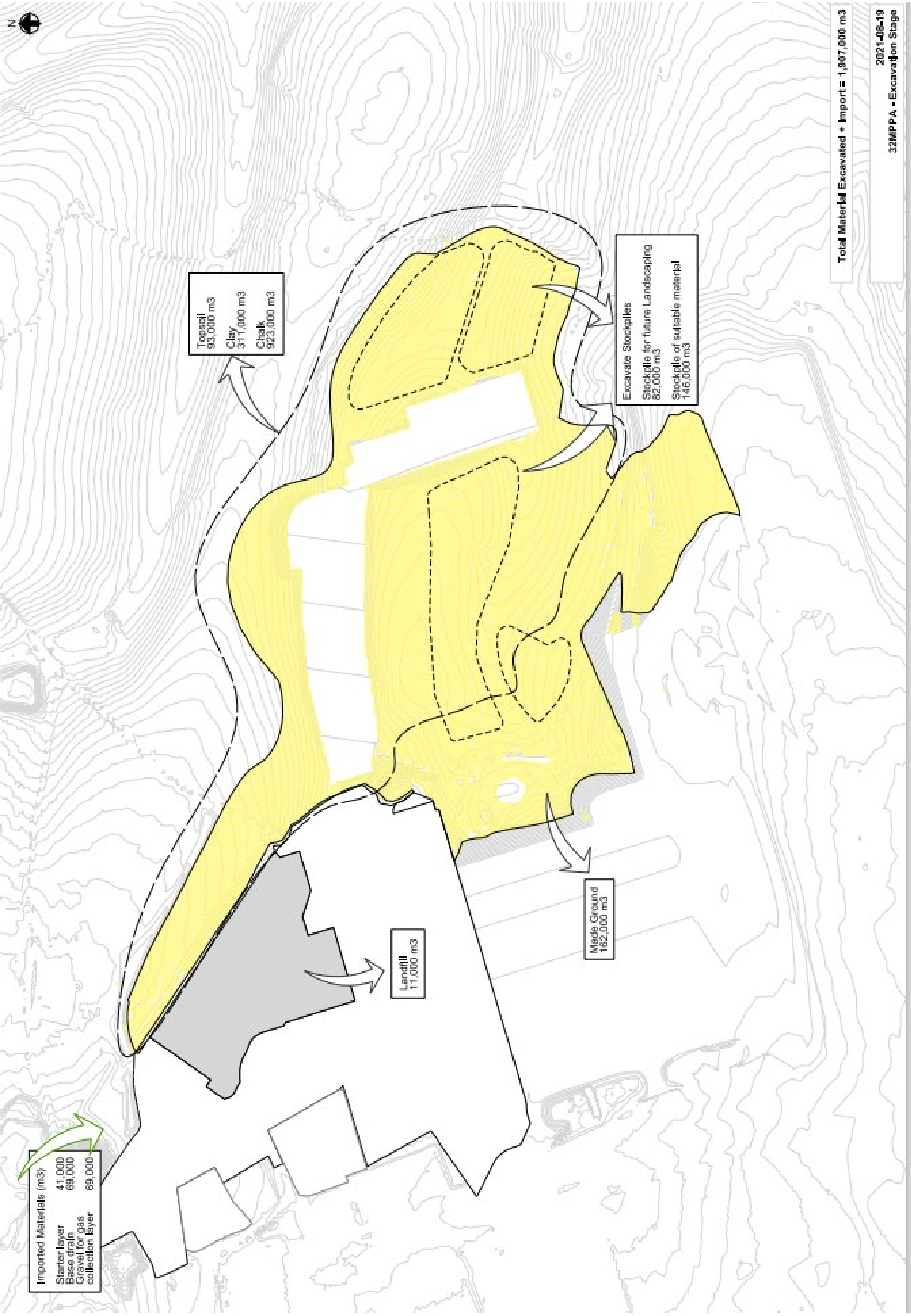
5.3.5 The volume of excavated earthworks in Phase 2b would be 1,739,000m^3 and this would take two seasons of work to complete. This is reflected in the schedule.

Table 5.2 Estimated Earthwork Volume (Phase 2b)

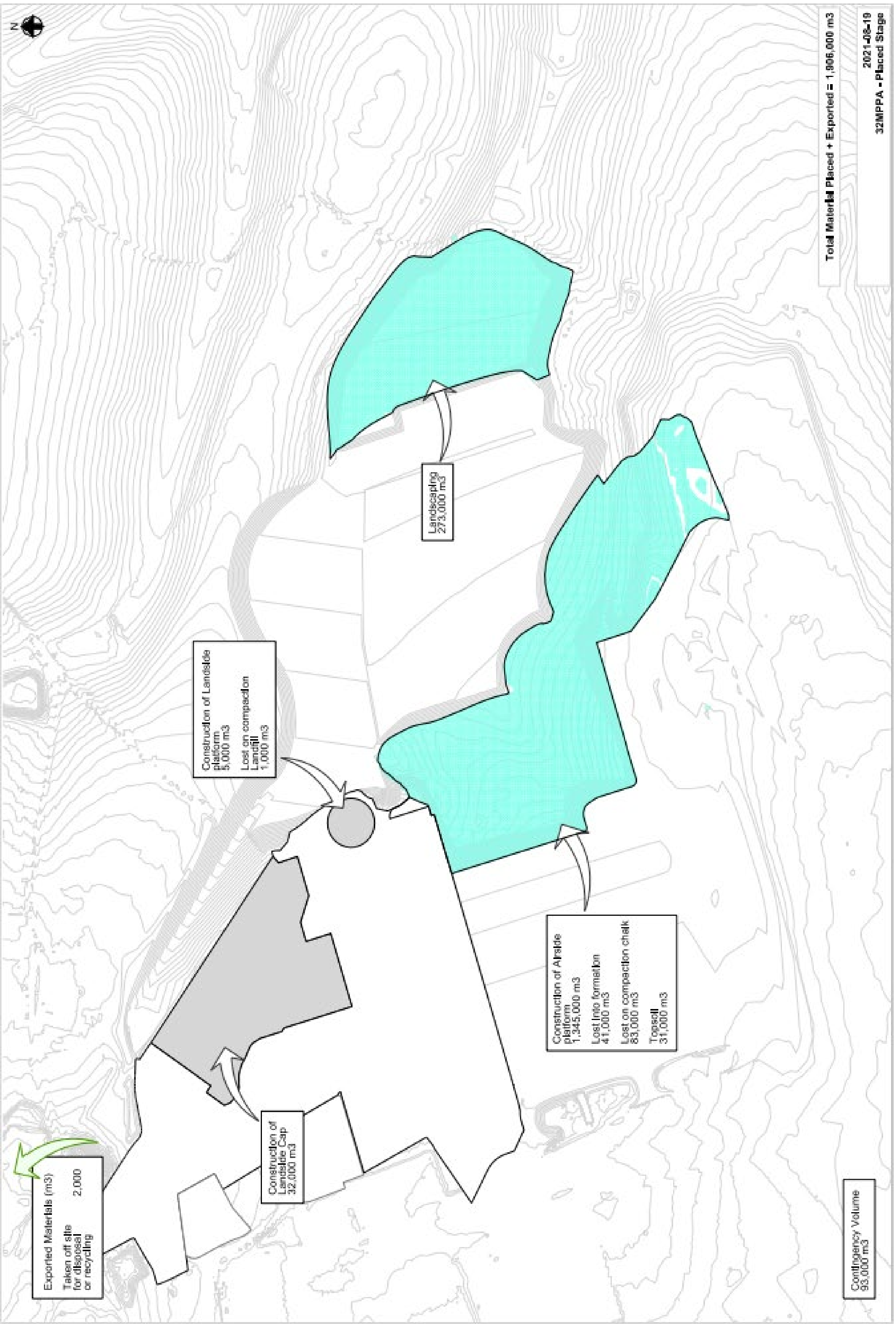
Earthworks Material	Volume (Cu M)
Excavated (made ground)	1,728,000
Excavated (landfill)	11,000
Imported material	179,000
Placed material	1,906,000
Material removed from site	2,000

5.3.6 A similar methodology will be adopted in Phase 2b as described in Phase 1.

Inset 5.2: Phase 2b Earthworks (proposed areas of cut)



Inset 5.3: Phase 2b Earthworks (proposed areas of fill)



Car Parking

5.3.7 As shown in the phasing diagrams three car parks would be constructed in Phase 2b.

5.3.8 New car parks:

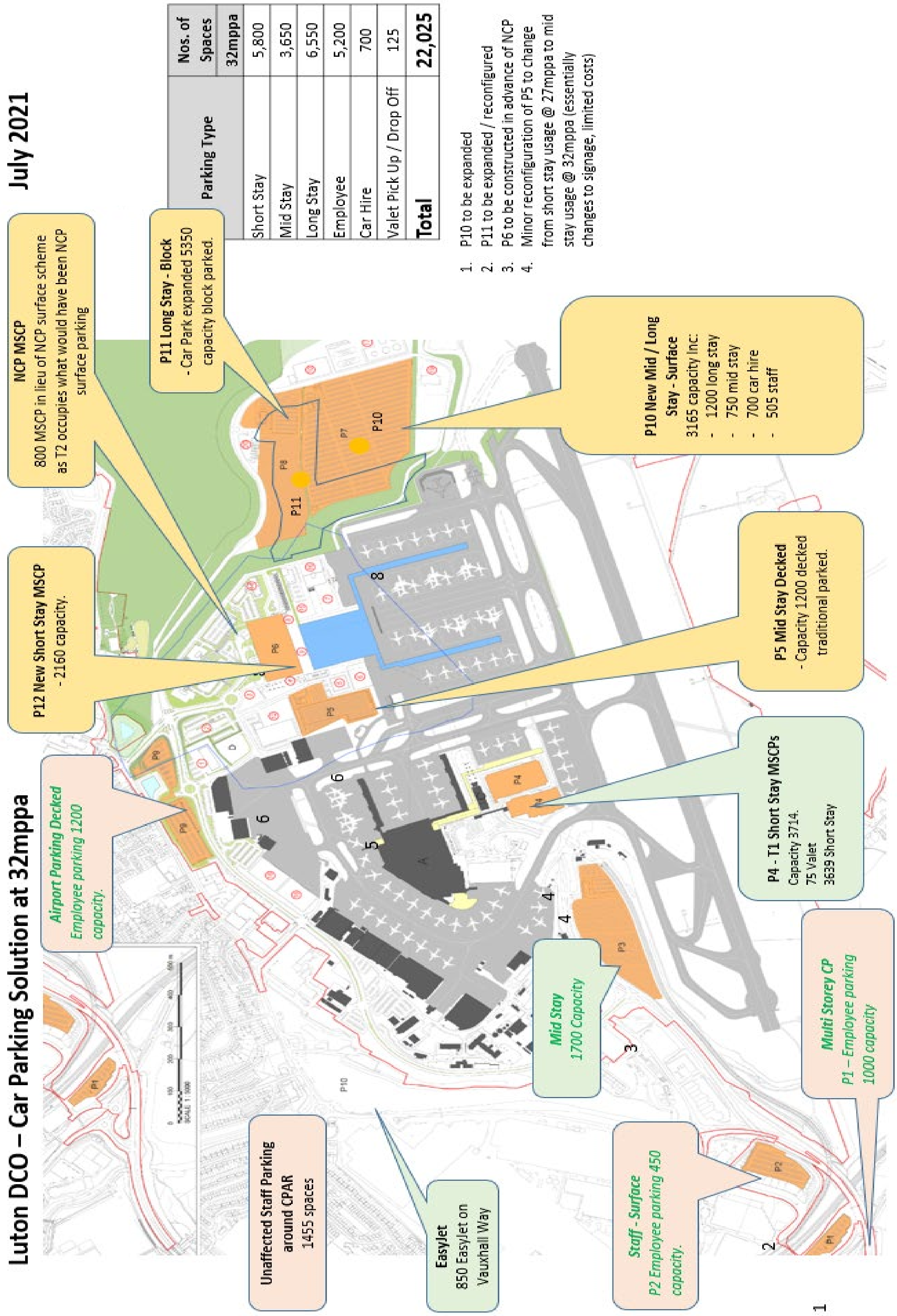
a. P12 (New multi-storey car park) – New MSCP providing 2160 spaces;

5.3.9 Existing car parks:

a. P6 – the old P6 long stay car park is removed, and the area is used for the New Century Park development and a new multi-storey car park (P12);
b. P7 – existing car park is removed;
c. P10 (Mid/long stay surface) – car park expanded; and
d. P11 (Long stay car park) - car park expanded.

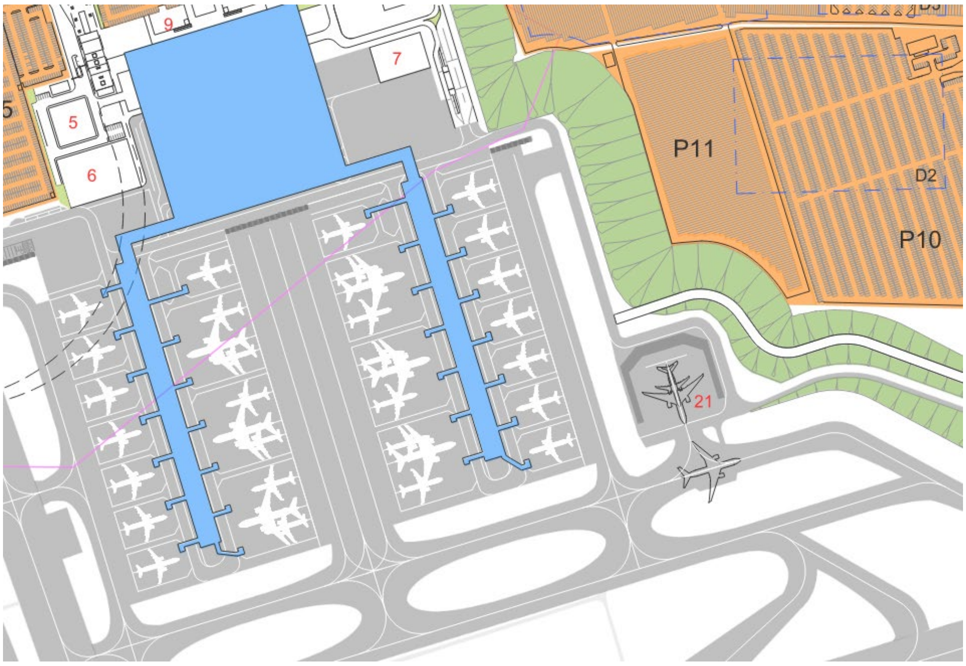
5.3.10 Typical car park construction methodologies would be used for a multi storey or deck car park which would involve a steel or concrete frame. For the block and surface parking a sub-base, drainage and finished surface would be installed.

Inset 5.4: Phase 3 Car Park Locations



New Apron and Stands

Inset 5.5: New taxiway and stand locations



5.3.11 In Phase 2b, several new stands would be built on the new earthworks' platform.

5.3.12 Standard construction methods would be used for the construction of the airfield hardstanding areas.

5.3.13 The ground would be prepared as part of the earthworks phase. The installation of drainage runs, fuel lines and other utilities would be incorporated into this work using similar methodologies to those described in Construction Phase 1

Fire Training Ground (relocation)

5.3.14 The existing fire training ground would remain operational until the new fire training ground was constructed. The existing specialist fire training ground facilities and fuselage would then be relocated.

Inset 5.6: Existing fire training ground

5.3.15 The time whilst the fuselage is out of use, would need to be agreed with the airport fire service.

5.3.16 The equipment would be disconnected from any utilities and the utilities permanently isolated. The equipment would be lifted by crane and transported to the designated storage location. Other equipment could also be re-used at the new fire training ground and stored. If this were not feasible it would be transported off site for disposal.

5.3.17 It would be recommended to contact specialist aircraft salvage companies to dispose of the fuselage. The fuselage would be either removed from site or broken up on-site as agreed with the aircraft salvage companies.

5.3.18 Demolition work would comprise of ‘breaking up and excavation’ work and would be carried out by 360-degree excavators with hydraulic breakers. Consideration would also be given to sawing the concrete with a diamond saw and prising / lifting the slabs from the ground. The material would be loaded by another machine into covered tipper wagons to minimise dust from stockpiles. Dust damping techniques may need to be considered to reduce dust in dry conditions.

5.3.19 Consideration would be given to crushing and recycling suitable materials to reuse in backfilling operations. Road sweepers and a housekeeping gang would be in constant operation to ensure the construction area and access routes were always kept clean.

5.3.20 It is not expected that the area would need close boarded hoarding, but it would be demarked by red & white barriers and access routes would be agreed with the airport operator ahead of work commencing on-site.

6 PROJECT LOGISTICS

6.1 Construction Management

6.1.1 This CMS forms part of a suite of documents which support the application for development consent. In addition to the CMS the Draft Code of Construction Practice [**Appendix 4.2** of Volume 3 of the PEIR] sets out the requirements for managing the environmental effects of the construction works which are described in the CMS. Those requirements are not repeated in the CMS.

6.1.2 The **Draft CoCP** details the control measures and standards to be implemented throughout the construction of the Proposed Development. Whilst multiple construction works will run concurrently throughout the Proposed Development, the final CoCP will act as the overarching document for all construction related activity.

6.1.3 The CoCP will present a consistent approach to the environmental management of construction activities for the entire Proposed Development.

6.1.4 It is likely that a Lead Contractor would be appointed to provide overall construction oversight and management of the works. The Lead Contractor may not be the same for each phase.

6.1.5 The Lead Contractor would be responsible for finalising the construction phasing for each Phase and for producing the construction schedule.

6.1.6 The Lead Contractor would coordinate the project delivery with multiple design teams and various construction oversight teams.

6.1.7 Arrangements would be agreed with the local planning authorities, client representatives, airport operator, regulators and the stakeholders including residential and commercial communities.

6.2 Health and Safety

Construction Arrangements

6.2.1 The Proposed Development would adopt a zero-harm policy that would mean no injury, ill health or incident to airport passengers, the local communities, airport employees and construction workers. This is a central thread in all construction and phasing planning of the works. All contractors shall comply with all relevant health and safety legislation such as the Health and Safety at Work Act 1974.

6.2.2 Health and safety requirements would be defined and cascaded down to its suppliers within the contractual arrangements, and they would adhere to these throughout the life of programme.

6.2.3 Luton Rising would require its supply chain to deliver their works to an exemplary standard for health, safety, and welfare performance.

6.2.4 Luton Rising intend to develop a behavioural safety programme in collaboration with their supply chain. In addition, Luton Rising would develop a set of health and safety performance indicators to measure and manage health and safety performance on the Proposed Development.

6.2.5 Luton Rising intend to establish a Safety Leadership Group consisting of senior executives and health and safety personnel from Luton Rising, LLAOL and key suppliers, that would meet quarterly to set the strategic health and safety direction and review performance.

6.2.6 The Safety Leadership Group would develop a health, safety, and welfare strategy to deliver key initiatives, including:

a. occupational health programme;

b. fair culture model;

c. positive reporting;

d. frontline leadership programme; and

e. setting lead and lag measures and performance metrics.

Construction (Design & Management) Regulations 2015

6.2.7 Luton Rising or LLAOL would act as the Construction (Design & Management) Regulations 2015 (CDM) Client as defined by CDM and would discharge its duties through its organisational arrangements.

6.2.8 Luton Rising or LLAOL would appoint its supply chain to deliver Principal Designer services for the Proposed Development.

6.2.9 The Principal Designer would manage and co-ordinate the design activities at the pre-construction phase. They would develop management arrangements which describe how they would deliver compliance with CDM.

6.2.10 Luton Rising or LLAOL would appoint is supply chain to deliver the Principal Contractor role.

6.2.11 Luton Rising or LLAOL would test these arrangements as part of delivering it CDM client duties.

LLAOL Contractors' Code of Practice

6.2.12 6.2.12 For works that take place on any premises owned or under the control of the operating airport, in addition to the DCO CoCP they will comply with construction works requirements as defined by the airport operator (LLAOL) who has a responsibility for construction activities that take place on any premises owned or under their control (e.g. operational areas of the airport). This includes the predesign, design, preconstruction, construction, and inspection phases.

6.2.13 LLAOL have their own requirements which have been drawn up in line with British Standard guidance notes, manufacturers and suppliers recommended procedures, good working practices, and all relevant legislation and regulations in force at the time the contract works would be undertaken. The purpose of these requirements is to detail the minimum Health and Safety standards and procedures that a contractor must adopt, whilst carrying out work, on any premises owned or under the control of LLAOL.

6.2.14 Apart from the Lead Contractors safety management system, a works specific health & safety plan is necessary, stating the procedures to be applied to the works within LLAOL premises. Details would include:

a. an appointed person and responsibilities together with airport contacts;
b. site and works organisations and arrangements; and
c. safe operation and maintenance of equipment; and emergency procedures and contingency plans where appropriate.

6.2.15 The detail of the plan would be determined by the level of risk and should ensure that the Lead Contractor complied with statutes and LLAOL standards. The plan should be written for and used as a site document. On completion of any work involving new or altered services or structures inside or outside of buildings, full "as built drawings" details should be passed from the Lead Contractor to the LLAOL Company Representative to enable airport record systems to be updated.

6.2.16 It would be the responsibility of all parties to:

a. develop internally or approve a construction safety plan that is compatible with the safety guidelines of theairport operator, which is in line with the safety plans of the airport and is in line with airport construction safety planning;
b. submit plans indicating how they intend to comply with the safety requirements of the Proposed Development;
c. convene at meetings with the Lead Contractor, consultant, airport employees to review and discuss project safety before beginning construction activity;
d. ensure contact information is accurate for each representative or point of contact identified in the safety plan;
e. hold weekly or, if necessary, daily safety meetings to coordinate activities;
f. notify users, especially aircraft rescue and fire-fighting personnel, of construction activity and conditions that may have the potential to impact operational safety of the airport or other methods, as appropriate. Convene a meeting for review and discussion if necessary;
g. ensure that construction personnel know the applicable airport procedures and of changes to those procedures that may affect their work;
h. ensure that Lead Contractors and subcontractors undergo training required by the safety plan;
i. develop and/or coordinate a construction vehicle plan with LLAOL, the airport traffic control tower and Lead Contractors. Include the vehicle plan in the safety plan;

j. ensure LLAOL and Lead Contractors comply with standards and procedures for vehicle lighting, marking, access, operation, and communication;

k. conduct frequent inspections to ensure Lead Contractors comply with the safety plan and that altered construction activities do not create potential safety hazards;

l. resolve safety deficiencies immediately;

m. ensure construction access complies with the security requirements; and

n. notify appropriate parties when conditions exist that invoke provisions of the safety plan (e.g., implementation of low-visibility operations).

6.2.17 In addition to the above the Lead Contractor's responsibilities also include to:

a. submit plans to the airport operator on how to comply with the safety requirements of the project;

b. have available a copy of the project safety plan;

c. comply with the safety plan associated with the construction project and ensure that construction personnel are familiar with safety procedures and regulations on the airport;

d. provide a point of contact who will coordinate an immediate response to correct any Construction-related activity that may adversely affect the operational safety of the airport;

e. provide a safety officer/construction inspector familiar with airport safety to monitor Construction activities;

f. restrict movement of construction vehicles to construction areas by flagging and barricading, erecting temporary fencing, or providing escorts, as appropriate; and

g. ensure that no construction employees, employees of subcontractors or suppliers, or other persons enter any part of the air operations areas from the construction site unless authorised.

6.3 Working Hours

6.3.1 The core working hours will be from 08:00 to 18:00 on weekdays (excluding bank holidays) and from 08:00 to 13:00 on Saturdays. Luton Rising will require that the Lead Contractors adhere to core working hours for each site as far as is reasonably practicable with additional working hours as outlined below or unless otherwise permitted under Section 61 of the Control of Pollution Act 1974.

6.3.2 Except in the case of an emergency, any work required to be undertaken outside core hours (not including repairs or maintenance) will be agreed with the local authority prior to undertaking the work under Section 61 of the Control of Pollution Act 1974.

Start-up and close down periods

6.3.3 To maximise productivity within the core hours, the Lead Contractors will require a period of up to one hour before and up to one hour after normal working hours for start-up and close-down of activities. This will include (but not be limited to) deliveries, movement to place of work, unloading, maintenance and general preparation work. This will not include operation of plant or machinery likely to cause a disturbance to local residents or businesses. These periods will not be considered an extension of core working hours.

Additional working hours

6.3.4 Some operations will be conducted on a 24 hour/seven days per week basis for safety or operational reasons, and to significantly reduce the duration of construction and associated effects of construction on local communities.

6.3.5 Operations that will require 24 hour, and seven days per week working could include, but are not limited to, the following:

a. construction of the Luton DART Tunnel and directly associated activities (such as removal of excavated material, supply of materials and maintenance of equipment); where reasonably practicable, material will be stockpiled within the site boundary for removal during core working hours;
b. construction works within operational airfield such as and not limited to utility diversions and taxiway construction that need to be carried out to keep the airport in operation during construction of the Proposed Development;
c. earthworks activities, which are season and weather dependent;
d. surveys (e.g. for wildlife or engineering purposes), which need to be carried out outside core working hours; and
e. other specific construction activities requiring extended working hours for reasons of engineering practicability, including major concrete pours, piling/ diaphragm wall works.

6.3.6 Where there are operational constraints, airside construction activities may be required outside of core working hours.

6.3.7 Large or unusual unloading activities may also be carried out outside of core working hours to avoid congestion risks in and around the airport and construction site.

6.3.8 Activities outside core working hours that could give rise to disturbance will be kept to a reasonably practicable minimum.

6.3.9 Repairs or maintenance of construction equipment that is required to be carried out outside core working hours will normally be carried out on Saturday afternoons between 13.00 and 18.00 or Sundays between 10:00 and 17:00. Only essential repairs or maintenance works will be undertaken on Sundays.

6.3.10 In the case of work required in response to an emergency or which, if not completed, would be unsafe or harmful to the works, staff, the public or the local environment, the relevant local authority will be informed as soon as reasonably practicable of the reasons for the works and their likely duration. This information will also be made available to the helpline, as described in the Draft Code of Construction Practice **[Appendix 4.2 of Volume 3 of the PEIR]]**. Examples of the type of work envisaged include where unexpectedly poor ground conditions, encountered while excavating, require immediate stabilisation.

6.4 Number of Operatives

Estimated Number of Operatives on Site

6.4.1 The number of site operative has been estimated against each of the phases with the peak number of operatives being estimated as follows:

a. Phase 1: 275 site operatives;
b. Phase 2a: 1,410 site operatives; and
c. Phase 2b: 700 site operatives.

Car Parking & Travel Distances

6.4.2 The table below shows a breakdown of operatives coming to site by car and by public transport and the distance travelled.

6.4.3 It is assumed that 60% of operatives will arrive to site by car and the majority live within 40 miles of Luton.

Table 6.1 Estimated Car Parking Numbers and Travel Distances

Construction Phase	**Phase 1**			**Phase 2a**				**Phase 2b**			
Year	**2025**	**2026**	**2027**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
Total No works days per year	57,200	71,500	24,050	127,400	221,650	366,600	262,600	90,350	172,250	184,600	40,300
Ave. No of site operatives per day	220	275	93	490	853	1,410	1,010	348	663	710	155
Car Parking Assumptions											
Parking on Site (60%)	132	165	56	294	512	846	606	209	398	426	93
Public Transport (40%)	88	110	37	196	341	564	404	139	265	284	62
Distance travelled to Site											
Distance <40 miles (80%)	106	132	44	235	409	677	485	167	318	341	74
Distance 40 to 80 miles (15%)	20	25	8	44	77	127	91	31	60	64	14
Distance 80 to 100 miles (5%)	7	8	3	15	26	42	30	10	20	21	5
Total Car Miles (single journey)											
Distance <40 miles (80%)	4,224	5,280	1,776	9,408	16,368	27,072	19,392	6,672	12,720	13,632	2,976
Distance 40 to 80 miles (15%)	1,584	1,980	666	3,528	6,138	10,152	7,272	2,502	4,770	5,112	1,116
Distance 80 to 100 miles (5%)	660	825	278	1,470	2,558	4,230	3,030	1,043	1,988	2,130	465
TOTAL car miles (Conservative assuming max value for each category and is a return journey) per day	**12,936**	**16,170**	**5,439**	**28,812**	**50,127**	**82,908**	**59,388**	**20,433**	**38,955**	**41,748**	**9,114**

6.5 Construction Logistics Plan

6.5.1 The Proposed Development is a large multi-faceted construction project with unique construction logistical challenges. The project has multiple construction sites that would become more constrained over time as new facilities are built. This means that the construction logistics strategy should respond to this changing environment. A primary challenge would be to balance the flow of construction vehicles and construction operatives while reducing the impact on airport operations and local residents. Construction logistics needs to consider traffic, people and logistics.

6.5.2 The construction logistics strategy would require further development as the design matures. It would need to be aligned with Construction Traffic Management Plan (CTMP) and the CoCP.

6.6 Specialist Logistics Contractor

6.6.1 It would be recommended that the project deploy an electronic Delivery Management System (DMS) to help control deliveries to site. This system could be managed by a specialist Logistics Contractor or by the Lead Contractor. All deliveries to site would be booked via the DMS and allocated a specific day and time slot. Failure to adhere to the time slot would be enforced and may result in a delivery being denied access to the site. The site would need to make it clear there would be no waiting on streets approaching the site.

6.6.2 A schedule of predicted deliveries, identifying size and frequency of vehicles, would be developed, and updated on a regular basis in conjunction with the Lead Contractors. Where practical, and subject to Lead Contractor(s) appointment, vehicle movements and deliveries would, where possible, be scheduled to reduce the impact on the weekday highway peak hours expected to be 08:00-09:30 and 16:30-18:00.

6.6.3 The schedule of deliveries would take cognisance of the daily peak airport passenger traffic flow. Again, where possible deliveries would be scheduled to avoid these peak times.

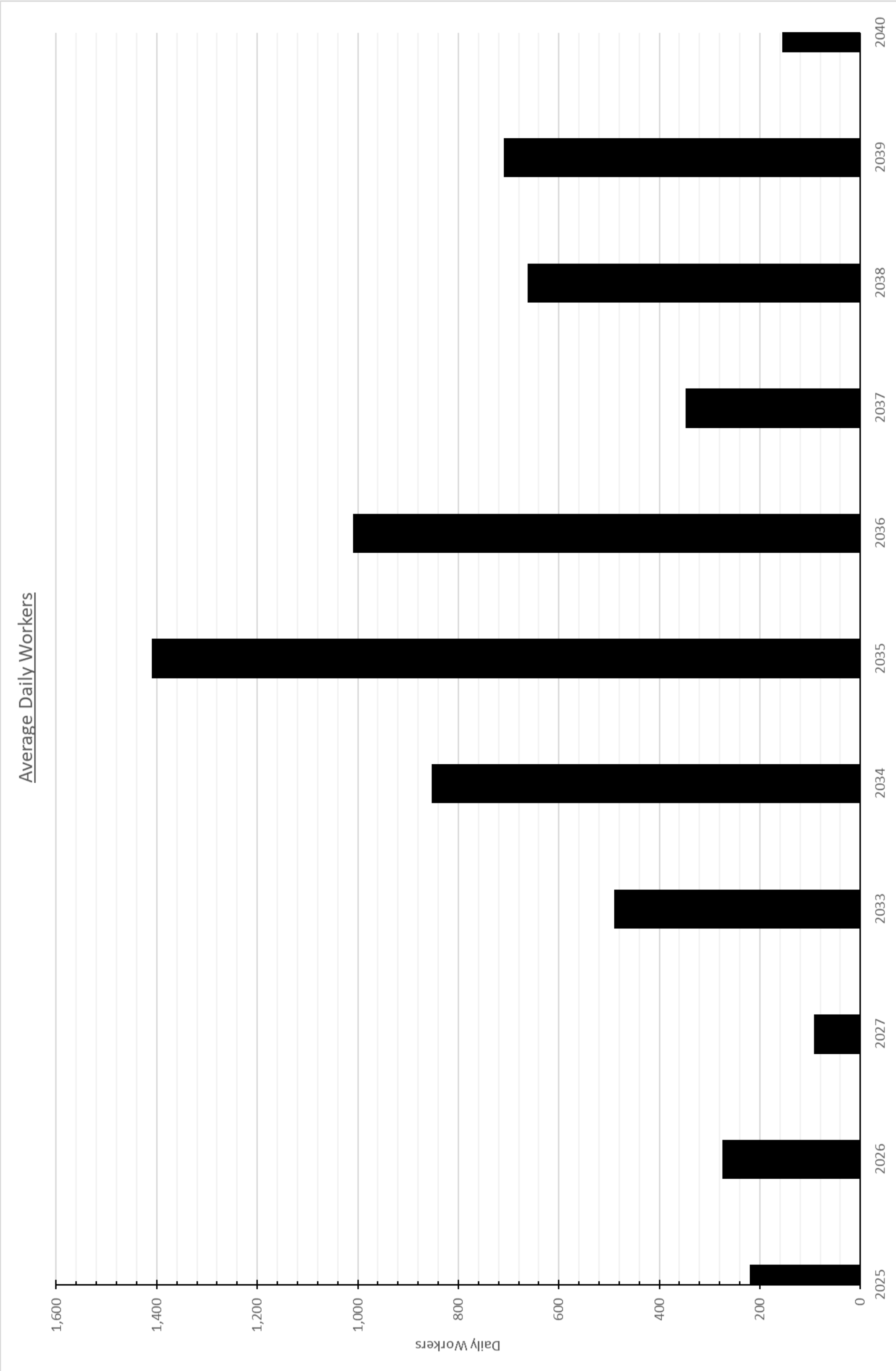
6.6.4 It is assumed that most construction deliveries would be during operational construction site hours. If deliveries are required to take place during ‘out of hours’, then further arrangements would be required.

6.7 Number of Construction Operatives

6.7.1 The number of operatives on site will vary with each Phase of the project but it would be expected to peak in Phase 2a during the construction of the terminal and ancillary buildings concurrently with the construction of the new airport apron and taxiways.

6.7.2 During this period, it is estimated that there would be a construction workforce of up to 1,400 as can be seen in the graph below Inset 6.1: Daily workforce numbers over time. The workforce would then reduce following the completion of the taxiways and would be largely localised during Phase 2b.

Inset 6.1: Daily workforce numbers over time



6.7.3 The construction works would be managed by a management team of approximately 200 (included in the above Insets), this includes project and construction management, engineering and design consultants, security and marshals.

6.7.4 A significant project such as this would attract construction operatives from around the UK. The distances travelled and modes of transport that they use has not been specifically addressed at this stage, other than the allowance for on-site car parking. Further work would be required to establish numbers with the supply chain, which would be dependent upon the contracting strategy.

6.7.5 We would expect that a large proportion of operative would be from London and the Home Counties area and thus anticipate an average 70-mile round trip using a car or van. We also anticipate that there would also be specialist contractors that could be based further away within the UK or mainland Europe.

6.7.6 A project the size of Proposed Development would require Construction Workforce Travel Plan (CWTP). There would be a need to provide on-site car parking for the contractors working on the project. Parking would not be allowed on any other part of the site and all Lead Contractors and sub-contractors on-site would be advised through their contract documentation that designated parking is available and that where possible site personnel and visitors should use public transport.

6.8 Proposed Construction Compounds

6.8.1 As the project is being delivered in three phases the strategy for compounds will vary between phases.

Phase 1 Construction Compounds

6.8.2 In Phase 1 a number of site compounds will be required for the different work locations (see Inset 3.1: Phase 1 Construction Compounds).

a. Compound 1: Wigmore Valley Park Works;
b. Compound 2: Airfield and earthworks; and
c. Compound 3: Car parks P6 & P7; and
d. Compound 4: NCP Warehouse.

6.8.3 The main compound would vary depending on the construction requirements, but would typically incorporate offices, equipment storage and maintenance, materials storage, staff accommodation, vehicle parking and welfare facilities among others. All compounds would be located to minimise disturbance to local communities and wider environmental receptors wherever practical.

Inset 6.2: Typical multi-storey site office block

Phase 2a Construction Compounds

6.8.4 It is anticipated that during this phase their will again be single main works compound and several smaller stand-alone satellite site establishments/construction compounds due to the dispersed nature of the proposed work sites.

6.8.5 Main Works Compound (earthworks, airfield and terminal): will be located within the area of the proposed terminal forecourt and used to support the construction of the bulk earthworks, terminal building, new aircraft stands, and airfield works. The compound would provide welfare facilities for site operatives, materials receiving, equipment storage and operative parking;

6.8.6 The potential satellite site locations are shown in Inset 4.1: Phase 2a Construction Compounds and would include the following:

a. Compound 1: Airfield and Terminal;
b. Compound 2: Airport Access Road;
c. Compound 3: Water Treatment Facilities and Fuel Farm;
d. Compound 4: Earthworks;
e. Compound 5: (Car Park);
f. Compound 6: Luton DART Extension;
g. Compound 7: Luton DART Extension (Airside);
h. Compounds 8, 9, 10, 11: Airport Access Road; and
i. Compounds 12 & 13: Trailer and Tiered Car Parks.

Phase 2b Construction Compounds

6.8.7 During this phase there will again need to be main works compound and several smaller stand-alone satellite site establishments/construction compounds both because of the dispersed nature of the proposed works.

6.8.8 The potential satellite site locations are shown in Inset 5.1: Phase 2b Construction Compounds, and would include the following:

a. Compound 1: Main Works Compound;
b. Compound 2: Earthworks;
c. Compound 3: NCP Developments;
d. Compound 4: MSCP P12;
e. Compound 5: Airport Access Road;

Compound Lighting

6.8.9 Compounds and works area shall be provided with adequate lights to ensure suitable illumination against local and national legislation. The level of illumination will be as follows:

a. general work areas: 50 lux;
b. general access areas (vehicle and pedestrian): 30 lux;
c. walkways and access routes for the movement people, machines, vehicles and materials handling: 20 lux;
d. works areas for tasks such as concreting, erecting shutters, scaffolding: 100 lux;
e. works areas requiring the use of power tools, circular saw, electrical works, plastering, painting and plumbing: 300 lux;
f. restrooms, changing areas: 150 lux; and
g. stores and stockyards: 30 lux.

6.9 Security

6.9.1 The project would control access to site through the use of control posts. Control posts would be at site entrances, which would provide security checks for materials and workforce entering and leaving the construction sites. These would be typically located in easy to access areas for both workers and construction vehicles and would be managed 24 hours a day, seven days a week.

6.9.2 Our intention would be to work with the local communities and the airport operators to align with existing security measures restrict and limit unauthorised access. Typical security measures may include:

a. security perimeter fencing or hoarding;
b. site security lighting along site perimeter and access points;
c. security guards and mobile patrols;
d. CCTV and infra-red surveillance and alarm systems where required;
e. consultation with local neighbours/stakeholders on site security matters;
f. consultation with local crime prevention officers on security proposals;

g. immobilisation of mechanical plant during out of hours; and
h. secure storage of hazardous materials such as fuel.

Site Hoardings

6.9.3 Perimeter fencing to the site and individual work faces would be carried out as an integral part of the security measures. Long term hoarding would be in timber closed boarded fencing around buildings, construction areas, demolition activities and compounds.

6.9.4 Larger areas such as earthmoving and overall site boundary could have chain link fencing. Shorter timescale activities could use Heras type temporary fencing. All fencing would be managed to ensure it remained in good condition. Where security fences abut the airside boundary they would comply with relevant regulations or specifications.

6.10 Concrete Batching Plant

6.10.1 A project of this size would normally require significant volumes of concrete, often being supplied by several off-site concrete plants and resulting in very high volumes of concrete mixer wagons to site.

6.10.2 Quality control of the concrete from the use of several off-site batching plants could be problematic risking the return of concrete and the slowing or stopping of critical concrete operations further risking quality problems.

6.10.3 An on-site batching plant would be considered given the high volumes of concrete for the project, especially for the Luton DART extension, Terminal 2 building and its piers, airfield aprons and the other airport buildings.

6.10.4 The batching plant could be located within the main construction compound. This will enable both vehicles using the public highway to access the plant for deliveries (cement and aggregate) and by on-site concrete plant using the local site haul roads.

Inset 6.3: Typical Concrete Batching Plant

6.10.5 Bulk deliveries of aggregate and cement would be delivered using the current road network.

6.10.6 Sand and aggregates are to be stored in a method that prevents discharge into surface water drains and local waterways.

6.10.7 The concrete batching plant is to be designed and operated to prevent dust and aggregates from being blown, swept or washed into gutters or surface water system.

6.10.8 Sand and aggregates should be delivered in a dampened state, using covered trucks. If the materials have dried out during transit they would be dampened again before being dumped into the storage bin to minimize dust emissions during unloading.

6.10.9 The truck loading bay is a potential source of dust and water pollution. Raw materials would be loaded into the truck agitators by either a telescopic chute (preferred) or a flexible sleeve to prevent spillage.

6.10.10 Wash down bays are to be connected to the local water management system to prevent contaminants such as cement, aggregate or concrete slurry from entering surface water drains.

6.10.11 The concrete batching plant water management and collection system should be able to recycle water.

6.11 Construction Traffic and Transport

Construction Traffic Management Plan

6.11.1 During construction works, impacts from construction traffic on the local community (including all local residents and businesses and their customers, visitors to the area, and users of the surrounding transport network) will be minimised by the Lead Contractors where reasonably practicable.

6.11.2 Construction related traffic movements will be managed by a Construction Traffic Management Plan (CTMP) and a Construction Workers Travel Plan (CWTP).

6.11.3 Traffic Management Working Group (TMWG) will be established with key stakeholders (including Luton Borough Council, National Highways and any other relevant local highway authorities) to co-ordinate the implementation and monitoring of the CTMP and CWTP.

6.11.4 The CTMP will set out how construction traffic will be managed and controlled in order to reduce the impact of construction traffic. The topics covered will include:

a. highway safety;
b. management of deliveries to the site;
c. practices to reduce the number of construction vehicles movements;
d. abnormal loads; and
e. protection of the public highway.

Construction Traffic Access Routes

6.11.5 The lead contractors will consult with local highway authorities regarding access routes that may be used by the Lead Contractors to access the construction sites.

6.11.6 The consultation will cover timing restrictions on the use of roads, route signage and approvals or consents necessary.

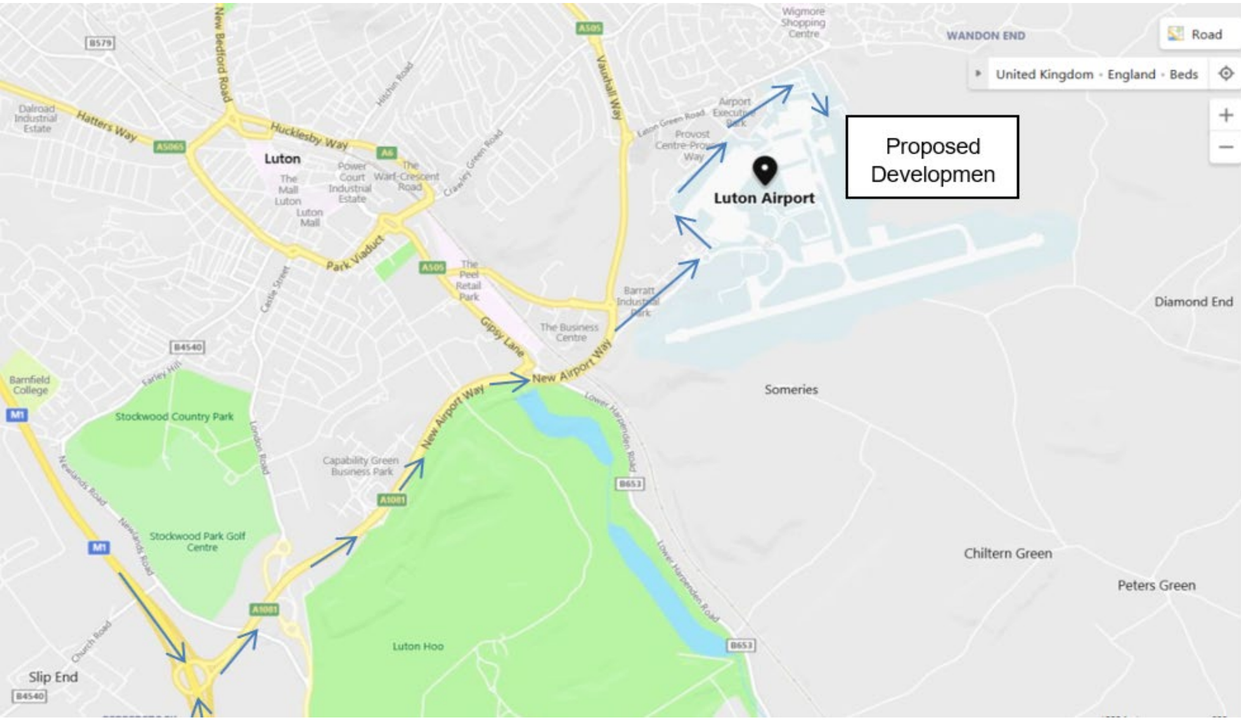
6.11.7 Access routes for construction traffic will be limited, as far as reasonably practicable, to the trunk road network and main roads on the local road network

6.11.8 For the early phases, it would be proposed that the entrance to the respective sites would be via President Way. This location has been selected as it would allow for a separate entrance and exit to site whilst utilising existing infrastructure.

6.11.9 For the later phases, the AAR would be used, dependent on timing and discussions with the local highway authority.

6.11.10 The primary access route to the site will be via junction 10 (M1), along the A1081 (New Airport Way), then via President Way or the AAR.

Inset 6.4: Primary Construction Traffic Access Route



6.11.11 Traffic management measures would be implemented near the construction site to reduce congestion. Closure of any local roads and footpaths would be minimised during construction planning. Adequate diversion routes and temporary access for site neighbours would be provided where required in consultation with the local communities and other road users.

6.11.12 Accessing the construction sites would initially lead to additional pressure on the local road network, resulting from the movement of construction personnel and materials. Signed dedicated construction access routes to the site would be identified and created, which all construction traffic will adhere to.

6.11.13 The appropriate design decisions would be made to reduce the pressure on the local network. For instance, the current proposal for the construction of the AAR carriageway considers sufficient space being available to enable traffic to continue to use the existing road during its construction.

Construction Deliveries

6.11.14 The peak level of deliveries will occur in Phase 2a and is estimated that on average approximately 150no. vehicles would be arriving at the site each day.

6.11.15 Deliveries would be arranged to minimise impacts on the road system as far as reasonably practical. Abnormal and special loads could be delivered outside standard working hours subject to the requirements and approval of the relevant local authorities and the police. Examples may include, but are not limited to, delivery of prefabricated buildings, transformers, mechanical and electrical units or other large or heavy plant.

6.11.16 Only contractors who are Fleet Operator Recognition Scheme (FORS) Gold accredited would be employed for the delivery of materials to the works. The FORS is a voluntary accreditation scheme for fleet operators which aims to raise the level of quality within fleet operations, and to demonstrate which operators are achieving exemplary levels of best practice in safety, efficiency, and environmental protection. Accreditation is only awarded to exceptional operators who have met exacting targets and will actively promote the FORS Standard to their supply chain. This would ensure that the fleets of vehicles are ultra-low or zero emission, and are driven safely with respect to pedestrians, cyclists and other vulnerable road users.

6.11.17 As a general principle, all deliveries to site would be off-loaded within the site boundary within designated areas. However, if it is required, either due to their timing on the programme or their physical size (e.g. major mechanical plant) it may be necessary to off load from pre-requested and temporarily put out of use car parking bay(s).

6.11.18 Where offloading is to occur on the roadside, which may include public footpaths and carriageways, agreement with the Local authority and the Airport authorities would be sought.

Construction Traffic Monitoring

6.11.19 The Lead Contractors will monitor traffic management schemes to maintain their effectiveness and condition and to provide for the safety of traffic, the public and construction staff during traffic management works and temporary traffic control measures.

6.11.20 The Lead Contractors will provide information regarding any delays to traffic due to construction works to the relevant highway authorities.

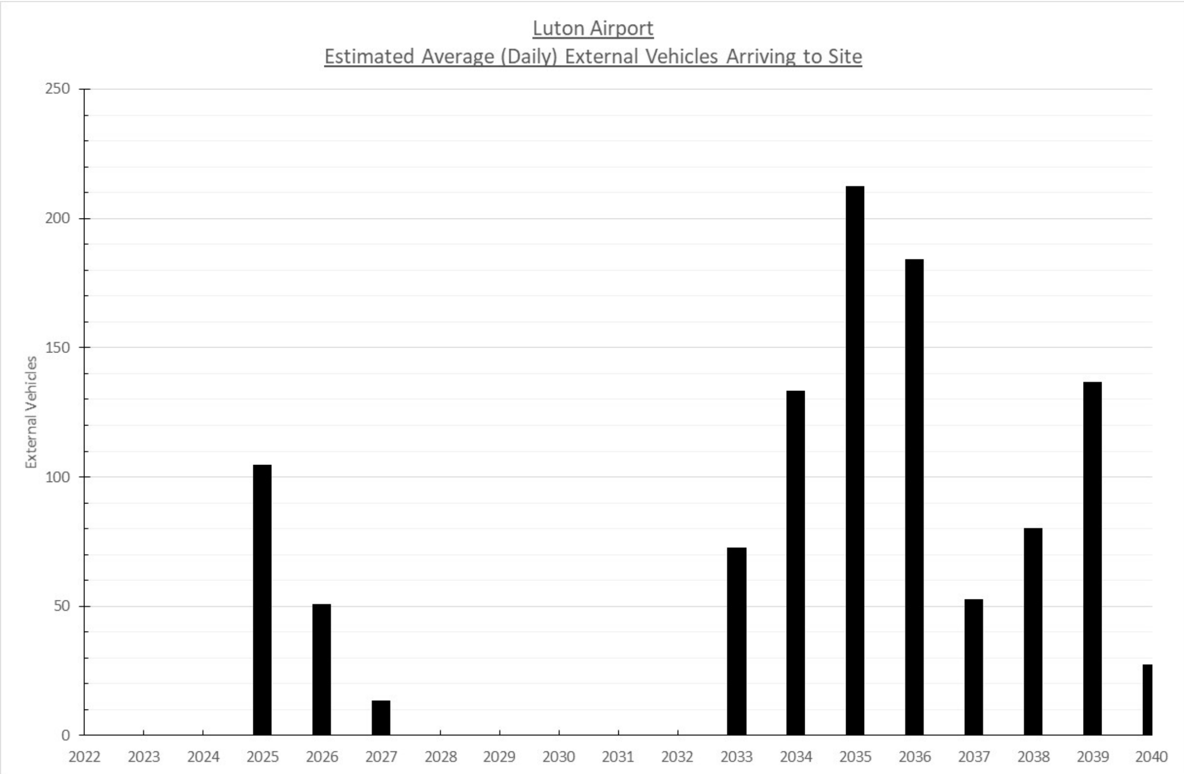
6.12 Construction Vehicle Numbers

External Construction Vehicles

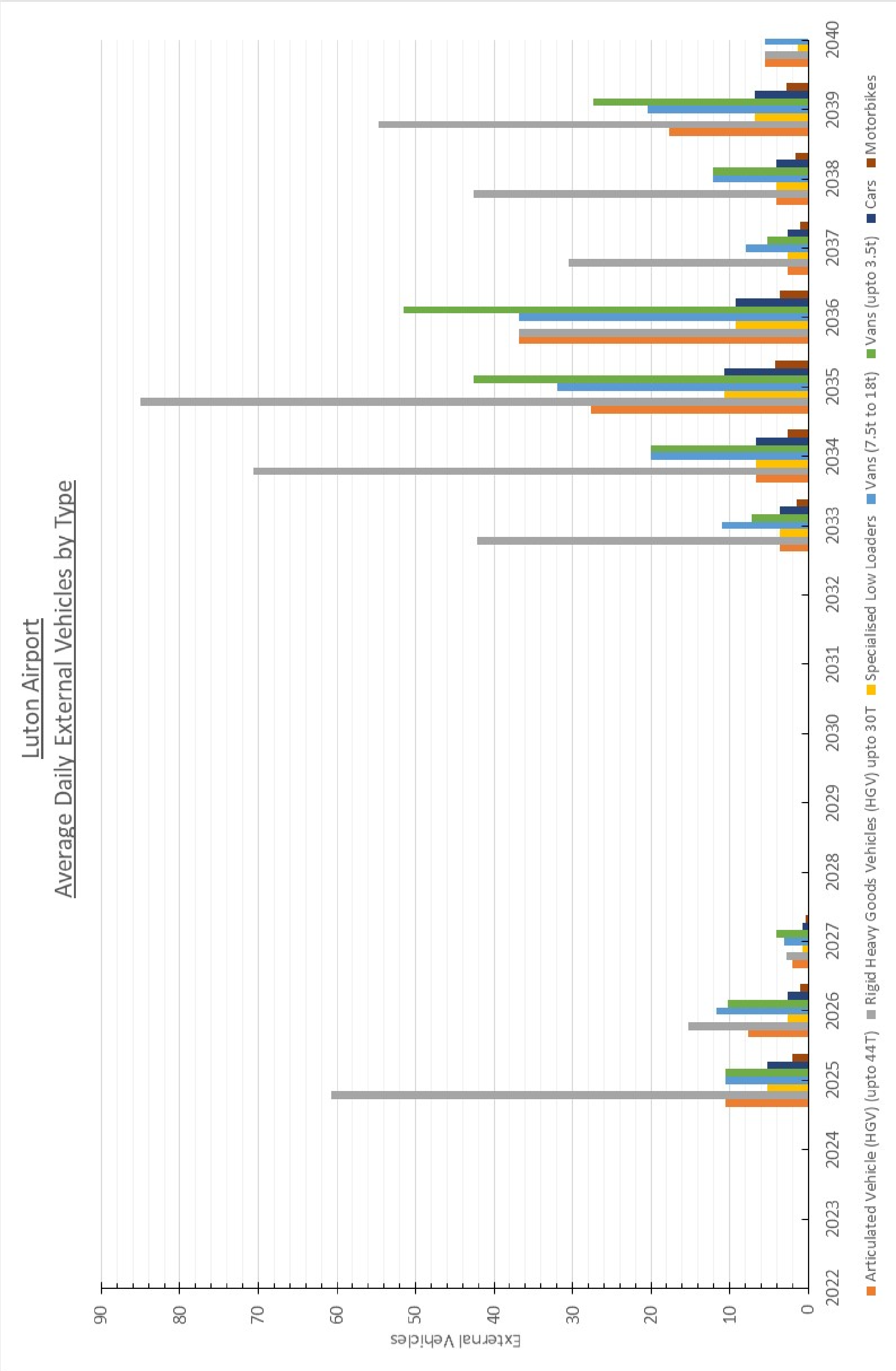
6.12.1 The number of construction vehicle movements would vary during the different construction phases. It is anticipated that at the peak of construction activity occurs 2035 and 2036. At peak of 210no. vehicles would be arriving at the site each day.

6.12.2 An initial assessment of the types of vehicles is shown below.

Inset 6.5: External vehicle traffic profile over time



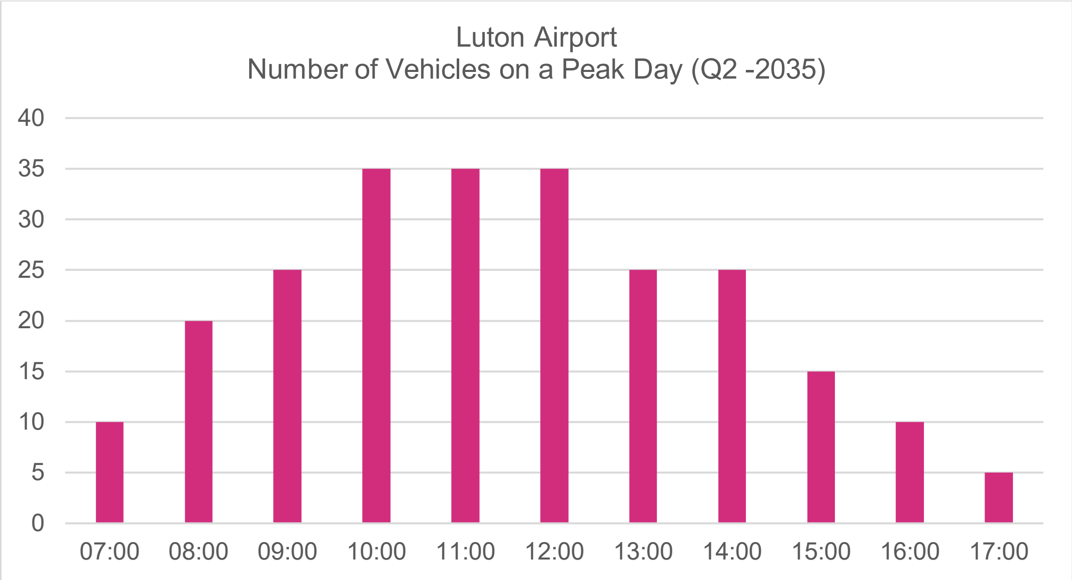
Inset 6.6: External vehicle traffic profile by type



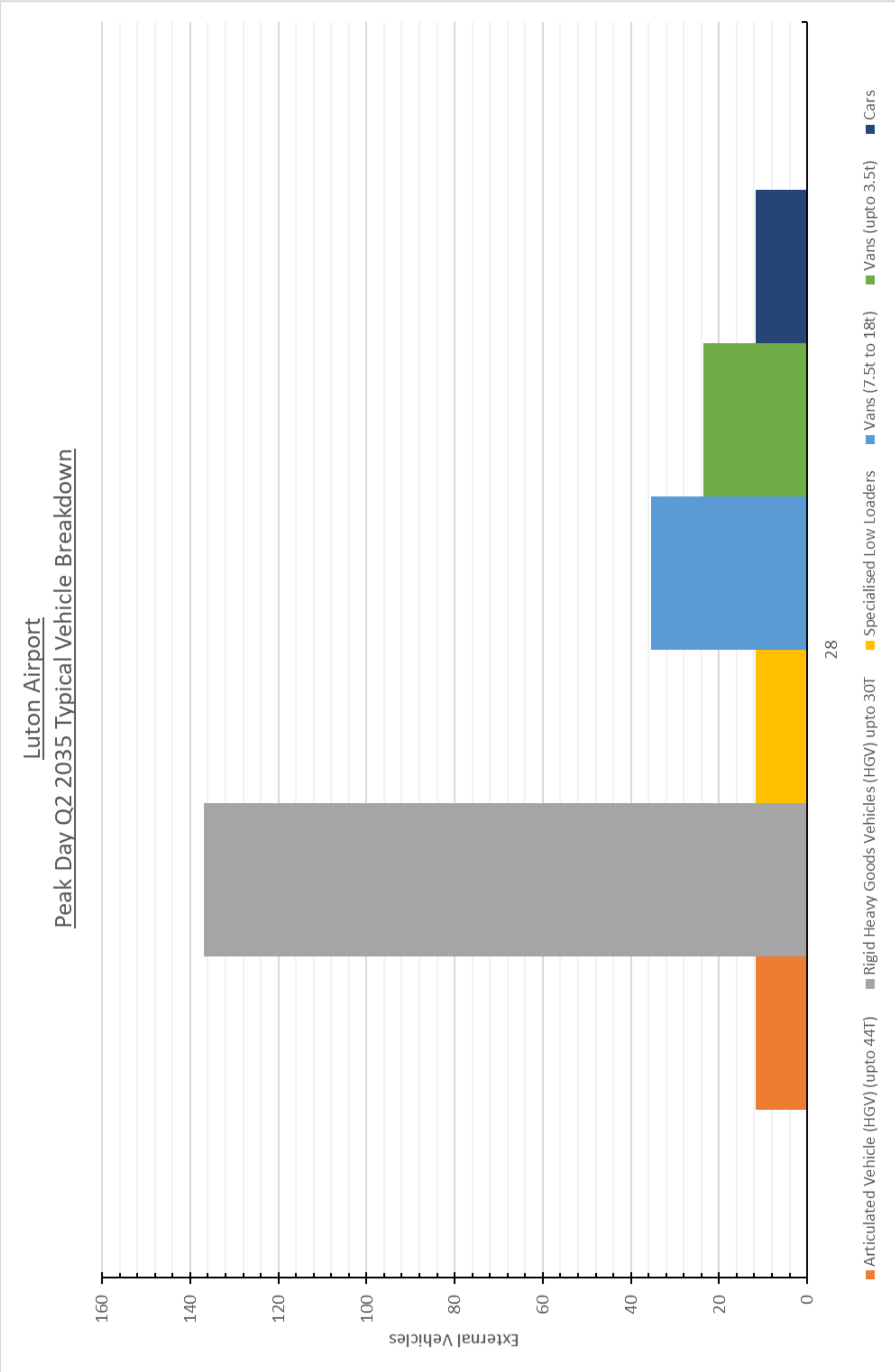
Construction Traffic (Peak Day)

6.12.3 The graphs below show a breakdown of construction vehicles arriving to site for a peak day (Q2-2035).

Inset 6.7: Typical Vehicle Arrivals of a Peak Day (Q2-2035)



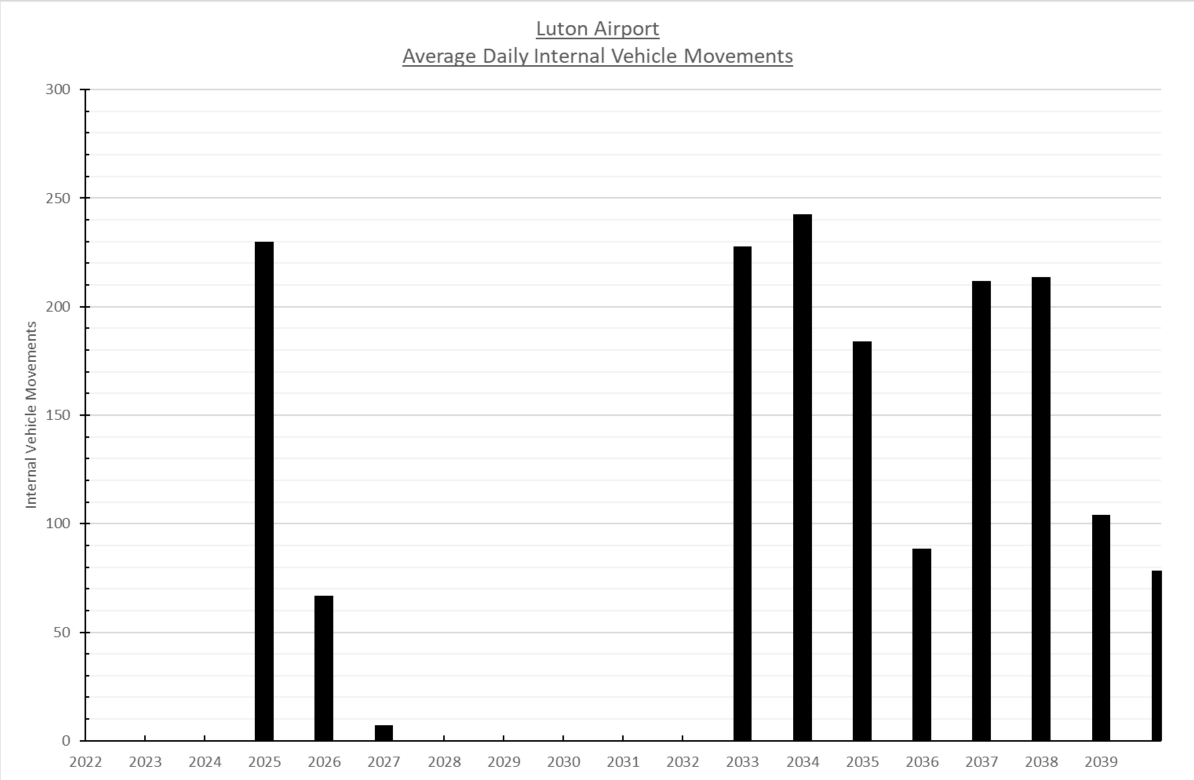
Inset 6.8: Vehicle Type for Peak Day (Q2-2035)



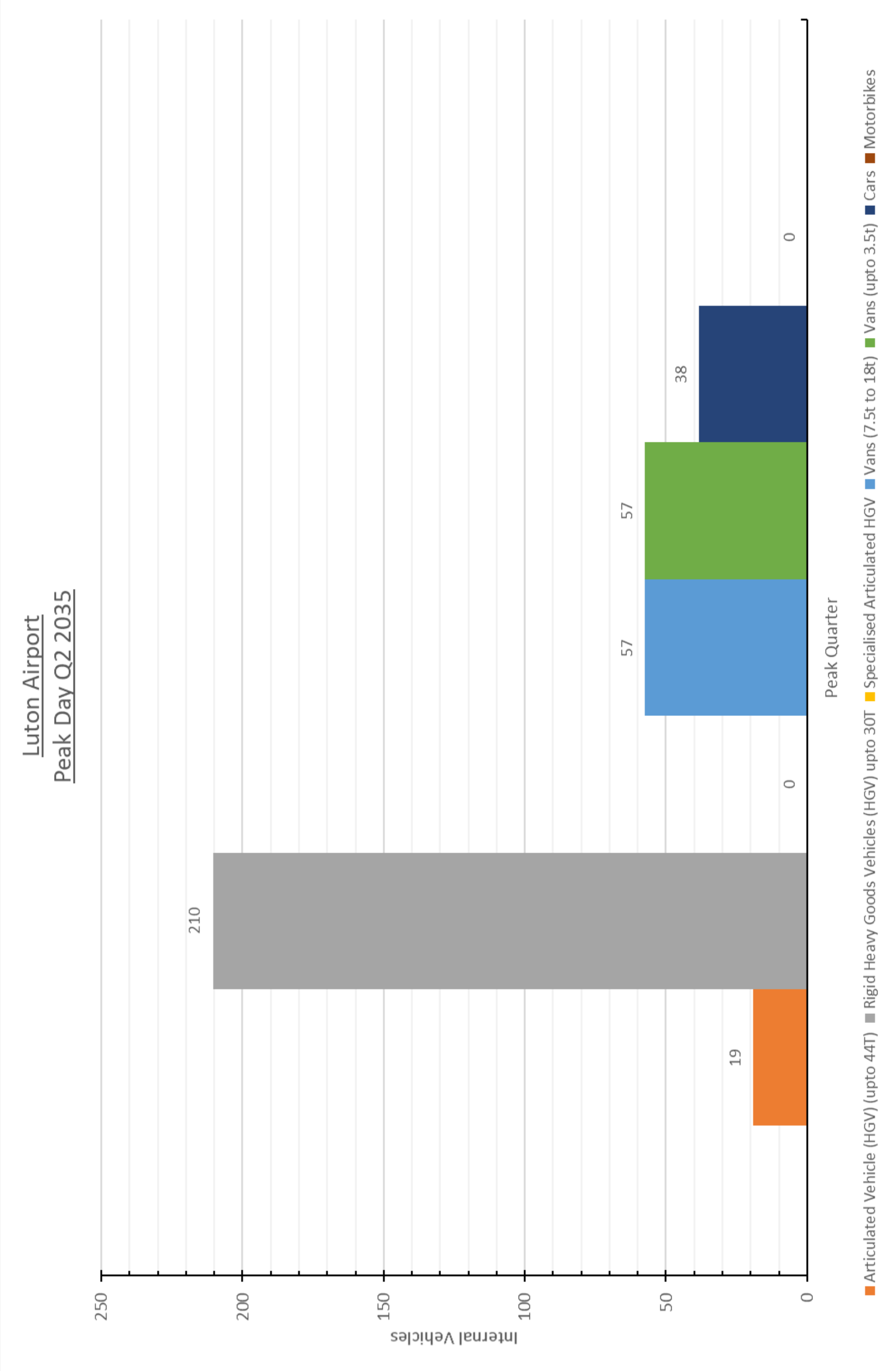
Internal Vehicle Movements

6.12.4 In a similar manner, the number of vehicle movements within the site boundaries over time has been estimated. These vehicle movements include earthmoving vehicles, excavators, material-handling equipment and associated plant.

Inset 6.9: Internal vehicle movements profile over time



Inset 6.10: Internal Vehicle Movement (Peak Day Q2-2035)



Construction Operative Car Parking

6.12.5 Based on the estimate for the number of operatives working on site it assumed that 60% will travel to Luton by car. The remaining 40% will arrive using public transport. The table below illustrates the number car spaces that will be required in each phase.

6.12.6 The peak number of operatives on site is 1410no. in 2035.

Table 6.2 Estimated Number of Worker Car Spaces

Construction Phase	**Phase 1**			**Phase 2a**				**Phase 2b**			
Year	**2025**	**2026**	**2027**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**
Parking on Site (60%)	132	165	56	294	512	846	606	209	398	426	93
Public Transport (40%)	88	110	37	196	341	564	404	139	265	284	62

6.13 Temporary Site Haul Roads

6.13.1 The project would involve a network of site-wide haul roads and where practicable would make use of any existing roads which have been closed off for public use.

6.13.2 Haul roads would be constructed using appropriate material and techniques.

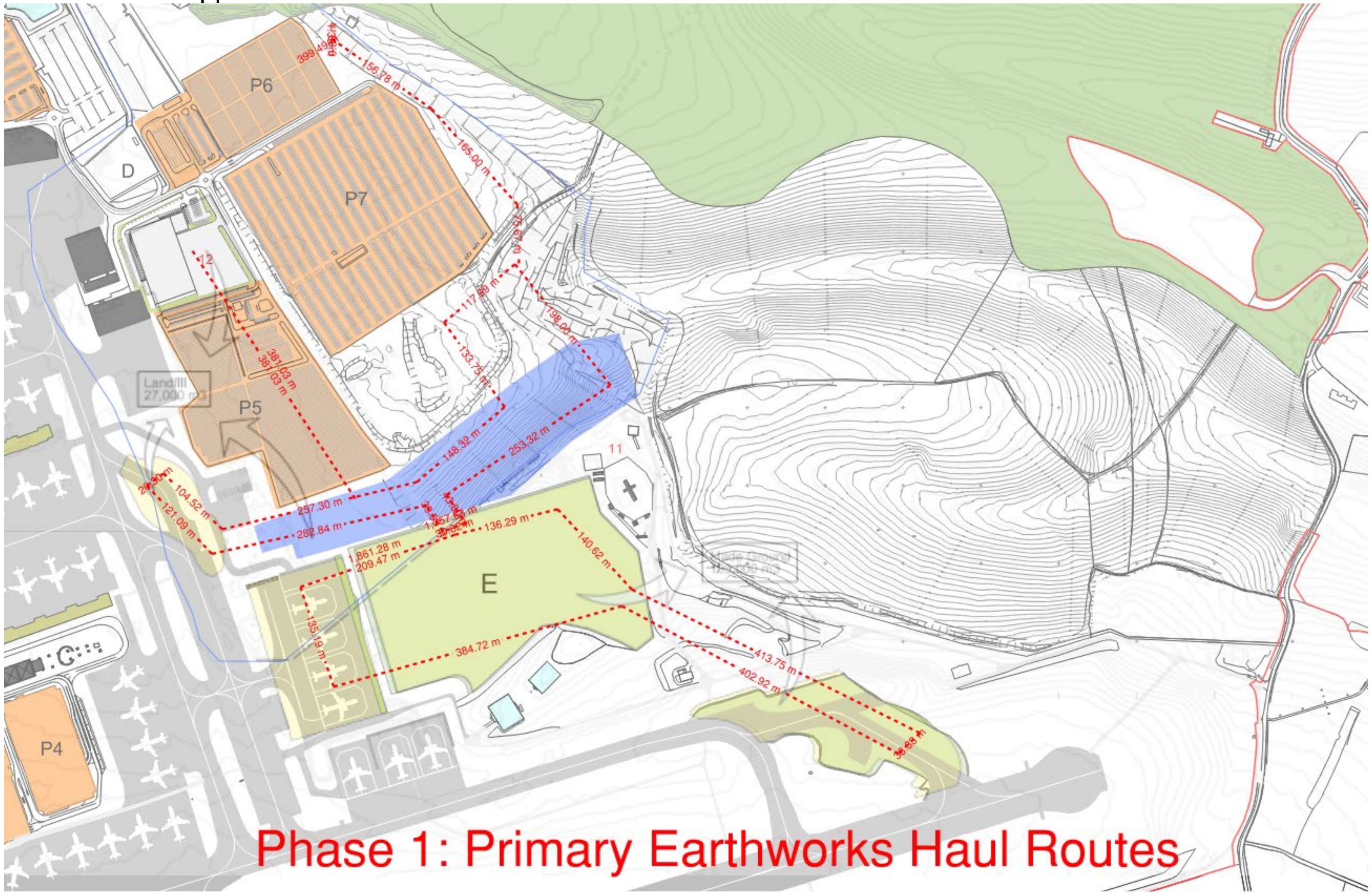
6.13.3 Haul road material would be laid using road construction techniques with mechanical earthmoving equipment such as bulldozers, graders and excavators.

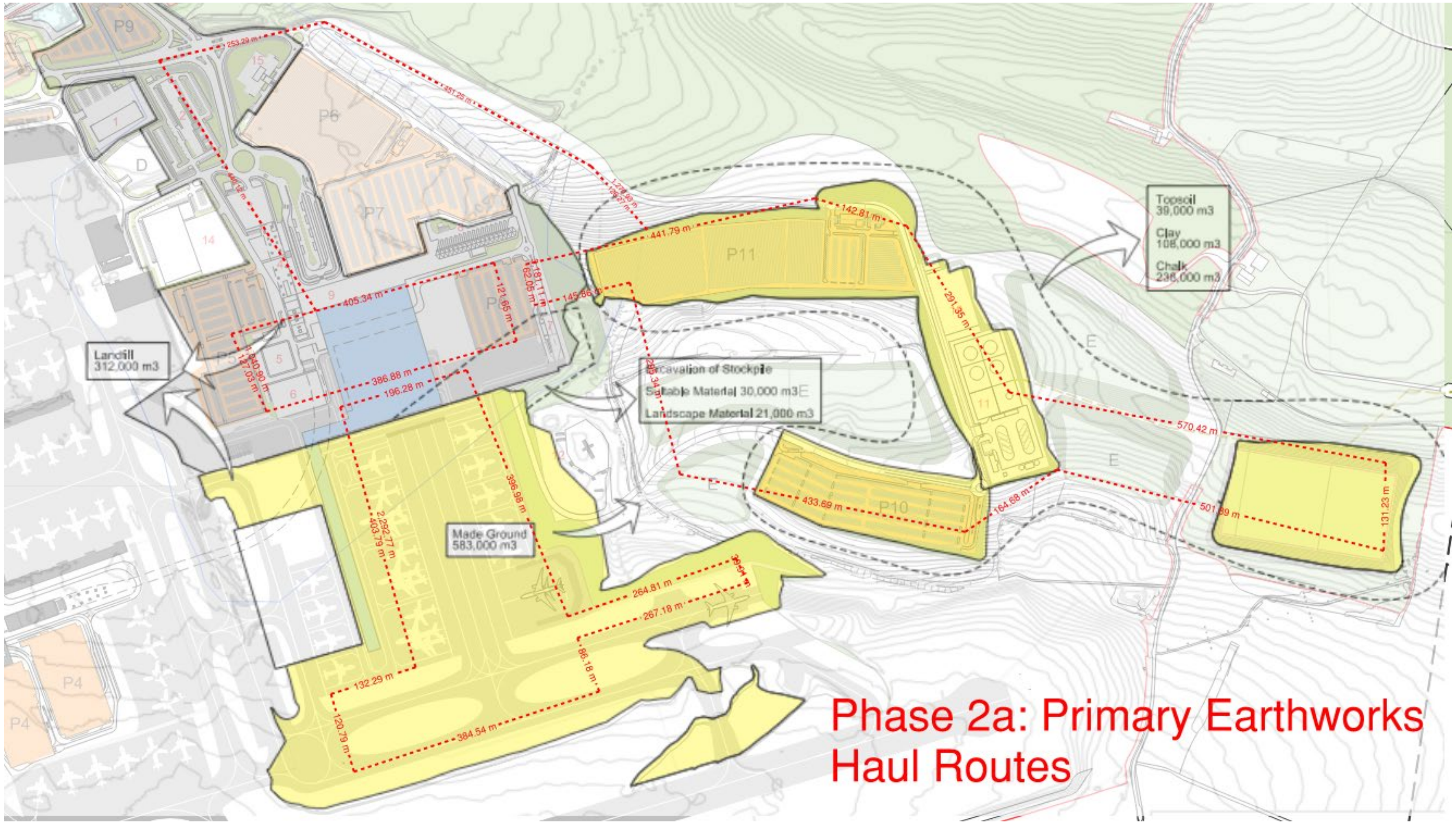
6.13.4 Road crossings would either be provided at grade or where required.

6.13.5 Any temporary bridge crossings would be constructed using either in situ concrete produced on-site at the concrete batching plant, precast concrete, steel or a combination of techniques.

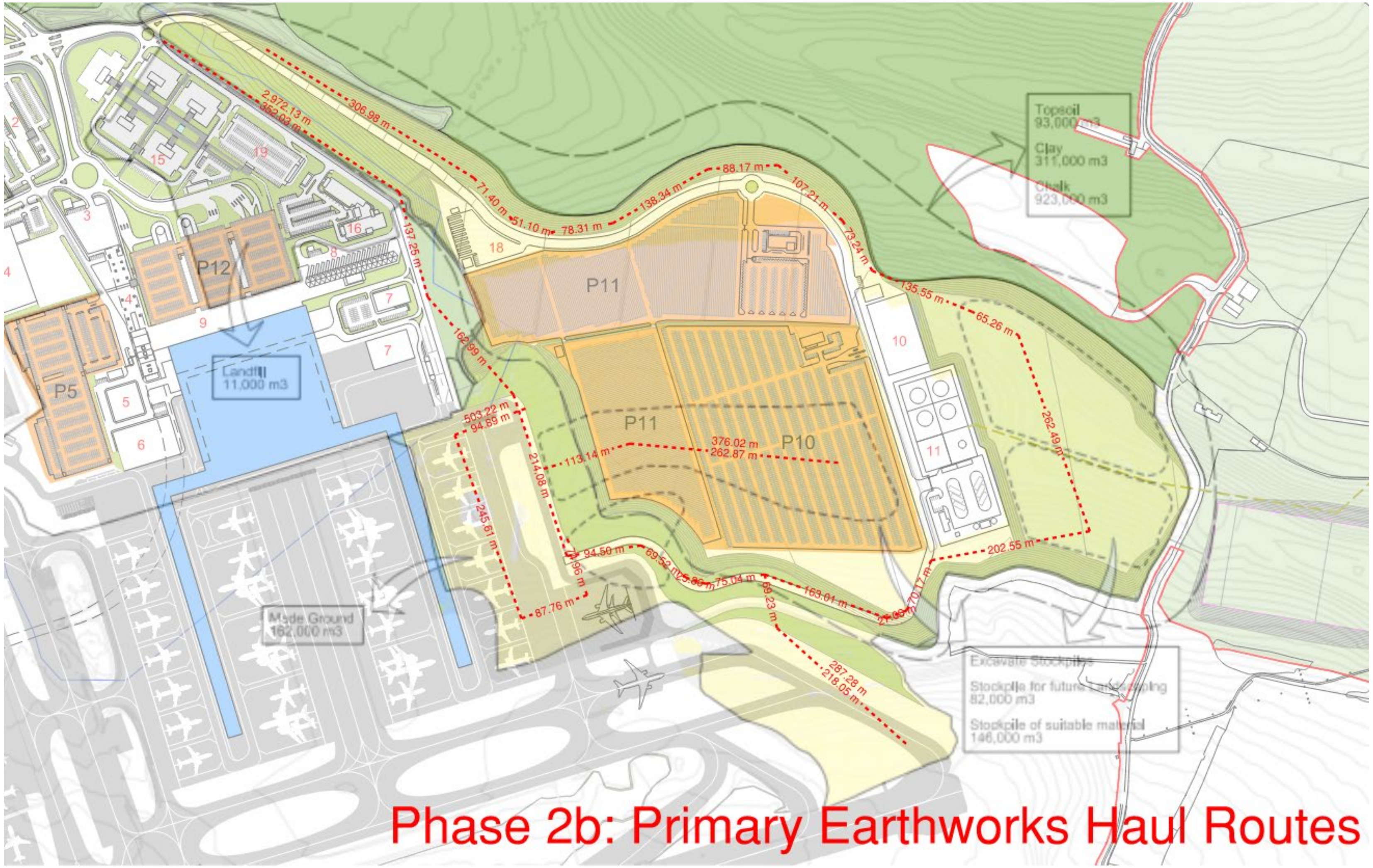
6.13.6 A preliminary assessment has been made of the lengths of the temporary site haul roads.

Table 6.3 Estimated Temporary Site Haul Road Lengths

Phase	Location and distance
1	Total distance approx. 4.3km 

2a	Total distance approx.20km
	

2b	Total distance approx. 12km



6.14 Construction Plant & Equipment

Non-road mobile machinery (NRMM)

6.14.1 Non-road mobile machinery is defined as any mobile machine or vehicle that is not solely intended for carrying passengers or good on the road and would typically include:

a. access platforms;
b. dumpers;
c. piling rigs;
d. excavators;
e. bulldozers;
f. forklifts;
g. compressors;
h. generators;
i. mobile cranes;
j. concrete pumps;
k. telehandlers;
l. mobile crushers; and
m. rollers.

Table 6.4 Summary of NRMM Equipment

Construction Phase	Works / Use	Phase 1	Phase 2a	Phase 2b	Est. No of Machines on site
360-hydraulic excavators (40T)	Bulk excavation, car park, airfield, landfill, DART, AAR, landside buildings	✓	✓	✓	**8**
360-hydraulic excavators (20T)	Excavation	✓	✓	✓	**26**
360-hydraulic long reach excavators	Demolition	✓	✓		**4**
Crusher	Demolition		✓		**1**
Rigid Heavy Goods Vehicles (HGV)	Excavated material removal, bulk aggregates, concrete deliveries.	✓	✓	✓	**60**
All terrain articulated dumper (40T)	Bulk earth works	✓	✓	✓	**39**

Dumper (9T)	General earthworks	✓	✓	✓	**26**
GPS Bulldozer	Bulk earthworks		✓	✓	**10**
Soil stabiliser	Bulk earthworks		✓	✓	**3**
Roller	Bulk earthworks	✓	✓	✓	**10**
Compressors	Demolition, concrete works, road works	✓	✓	✓	**36**
Concrete Paving Machine	Airfield – concrete pavement	✓	✓	✓	**1**
Asphalt paving machine	Roads and car parks	✓	✓	✓	**5**
Roller	Roads and car parks	✓	✓	✓	**2**
Telehandler Forklift	Materials handling		✓	✓	**25**
Tower Cranes	General lifting – foundation and superstructure		✓		**6**
Mobile Truck Mounted concrete pump	Building superstructure, concrete works		✓	✓	**10**
Concrete mixer truck	Electric concrete mixer truck	✓	✓	✓	**26**
Mobile Cranes (100T)	Erection steel work, lifting plant and equipment (ETP/STP)	✓	✓	✓	**11**
General waste skips	Removal of site waste	✓	✓	✓	**53**
Vans	Site transport, plant service, materials, general deliveries, etc.	✓	✓	✓	**24**
Cars	Couriers / site transport	✓	✓	✓	**38**
Access equipment (cherry pickers / MEWPs)	Personnel access for works at height	✓	✓	✓	**42**

Earthworks

6.14.2 The bulk earthworks are based upon 1,000,000m3 being the estimated maximum earth that can be moved in a single earthwork season, the following would be the expected earthmoving equipment requirement with an anticipated near 100% utilisation.

6.14.3 The earthwork moving equipment would include;

a. ten 40T dump trucks working on an estimated half hour turn around giving 16 truck movements per hour;

b. two GPS controlled dozers;
c. soil stabiliser machine;
d. two 40T excavator;
e. two 20T excavator;
f. two vibrating rollers; and
g. a series of spray cannons for dust control.

Primary Construction Plant

6.14.4 See Appendix F for breakdown of primary construction plant.

Craneage & Tall Equipment Plan

6.14.5 The project would require a range of different types of cranes such as tower cranes, crawler and mobile cranes. The size and duration of these cranes on site would vary with each project phase and location.

6.14.6 The main contractor shall comply with all legislation controlling the use of cranes and lifting equipment within the vicinity of an aerodrome, which includes:

a. Air Navigation Order;
b. CAP 168 Licensing of Aerodromes;
c. Code of Practice for the safe use of cranes (BS7121: Part 1, paragraph 9.3.3 Crane control in vicinity of Aerodromes); and
d. British Standard Institute Code of Practice for the safe use of cranes (BS 7121, Part 1).

6.14.7 Prior to works commencing on site the main contractor should develop a detailed craneage/tall construction equipment plan that as a minimum contains the following details:

a. exact location of cranes (as OS grid references);
b. maximum operation heights in meters Above Ordnance Datum (AOD), or the height of crane Above Ground Level (AGL);
c. type of crane or equipment to be used;
d. radius of jib /boom and area of operation;
e. dates and times of operation; and
f. details of appointed person.

6.14.8 It may be necessary for a safety case to be developed and approved by CAA prior to works commencing.

6.16 Environmental Management

Environment Management System

6.16.1 The Lead Contractors will have an Environmental Management System (EMS) that is certified to BS EN ISO 14001 (refer to the **Draft CoCP**). The management systems will set out processes, practices, and plans that enable the Lead Contractors to manage environmental impacts and increase their operating efficiency.

6.16.2 The key aim of EMS is to continually improve performance. The Lead Contractors will therefore ensure the EMS is regularly reviewed, audited, and updated.

6.16.3 Consideration of the environmental impacts would be imperative during all phases of construction to ensure that construction practices reduce the impact of noise, light, visual, air pollution and traffic.

6.16.4 Where possible, facilities to reduce nuisance would be employed and operations that may cause an impact would be located at a suitable distance from neighbours and appropriate mitigation measures adopted.

6.16.5 Different construction approaches would be considered and adopted to create acceptable conditions. For instance, dust suppression systems, noise and vibration limiters, protection of ecological features, surface water management and solutions to prevent tracking of dirt off site will be implemented.

6.16.6 Different construction approaches would be reviewed to establish where it may be possible to avoid or reduce impacts by utilising different methods of construction. For instance, design, manufacture and assembly solutions that streamline the delivery process, reducing material use and waste, are already being explored, with the aim of reducing construction traffic associated with material transfer across different work site locations.

Sustainable Construction

6.16.7 Sustainable construction methods would be explored as the design develops and encouraged within the supply chain. Where possible, construction techniques would be used which maximise the reuse of recycled materials while minimising water and energy consumption usage.

6.16.8 Luton Rising and the Lead Contractors will promote resource efficiency (covering waste minimisation and reuse, recycling, sustainable material specification, energy, and water) throughout all phases of construction works of the Proposed Development.

6.16.9 Luton Rising will coordinate with other local construction projects where possible and only contractors who use FORS accredited operators would be employed.

Waste Management

6.16.10 The Proposed Development would aim to minimise the volume of waste generated by applying the waste hierarchy – avoid, reduce, reuse, recycle –

and responsible disposal as set out in the Waste (England and Wales) Regulation 2011.

6.16.11 The Lead Contractors will act to minimise the waste generated from construction activities where reasonably practicable. This would include:

a. adherence to targets for diversion from landfill and recycling as defined in the Site Waste Management Plan (SWMP);
b. identifying further opportunities to minimise waste during detailed design activities;
c. measures such as careful storage of materials on site, minimisation of packaging and the use of re-usable packaging.

6.16.12 All waste streams that are likely to be produced would be identified and segregated, stating the quantities that are likely to be generated, and an approach would be set out for the controlled and sustainable management and disposal of all construction waste and how it is handled.

6.17 Contained Surface Water Drainage

6.17.1 Temporary site drainage will consider the following:

a. the impact of topsoil removal;
b. the phased nature and timescales for the works;
c. bulk earthworks operations; and
d. local topography.

6.17.2 Drainage methods would incorporate a multi-stage treatment approach using the following key principles:

a. using surface water runoff as a resource;
b. managing rainwater close to where it falls;
c. managing runoff on the surface;
d. promoting evapotranspiration;
e. slowing and storing runoff to mimic natural runoff characteristics;
f. reducing contamination of runoff through pollution prevention and controlling runoff at source;
g. treating runoff to reduce the risk of construction contaminants causing environmental pollution; and
h. providing a flexible and adaptable system capable of replicating, as far as practicable, existing conditions within the existing drainage catchments.

6.17.3 The treatment methods are described below and include:

a. soil management;
b. silt fences;
c. silt traps;

d. silt curtains;
e. vegetated channels;
f. swales;
g. sediment ponds; and
h. polyelectrolyte coagulant dosing

Soil management

6.17.4 Erosion and sedimentation loss during and after construction would be managed in accordance with good practice soil management.

Silt fences

6.17.5 Silt fences would be installed at the base of unseeded earthworks mounds and/or erosion control matting on the face of the mounds. Soil management and silt fences would, at source, provide an initial defence against the migration of sediment into the drainage system.

Silt traps, silt curtains and vegetated channels

6.17.6 The installation of silt traps, silt curtains and vegetated channels may be used at intervals along the ditch and support localised silt removal principally by slowing the velocity of flow.

6.17.7 The silt traps use fixed wells, below and outlet, which collects rainwater and allows the deposition of silt and sand.

6.17.8 Silt curtains provide a flexible impermeable barrier used to trap sediment in water bodies.

Swales

6.17.9 Swale installation would provide a shallow, broad and vegetated channel to store and/or convey runoff and remove potential pollutants.

Sediment ponds

6.17.10 The installation of sediment ponds would incorporate permeable berms and silt forebays sized to attenuate surface water flows and to allow suspended sediment to settle prior to discharge into any receiving watercourse.

Polyelectrolyte coagulant dosing

6.17.11 This method, where required, would treat surface water runoff where particulates are less than 0.002mm.

Drainage from buildings

6.17.12 Water from buildings would be collected through the temporary drainpipes installed on the lowest floor of buildings, routed to the temporary water collection pit, treated, and discharged by being pumped up to the accepted discharge point.

6.17.13 Rainwater going into buildings during the building construction and water used for the building construction would be collected in the temporary sump pit installed on the lowest floor of the building through the temporary drain line set in each place, pumped up by the transfer pump, treated, and transferred to ponds through the ditches.

6.17.14 Water from building construction would be treated as necessary at a tank outside the building before connecting to rainwater channels (i.e., if pH or amount of oil exceed the limit).

6.17.15 Drainage water collected in the sedimentation ponds would include runoff, which might include sediment and oil; therefore, water quality testing would be carried out to check the permitted value, provide necessary treatment before discharge.

Disposal of drainage silt

6.17.16 Silt generated from the drainage system would be re-used on the project, where it is suitable for use.

6.17.17 Where it is not suitable for use on site the silt would be taken off-site to an appropriate licensed facility. Currently the volume of silt to be generated is not known.

6.18 Water Environment

General

6.18.1 The Lead Contractors will implement appropriate measures throughout construction operations where construction-related activities will take place within or in proximity to surface water or groundwater sources. The measures will control the potential risks to the water environment, relating to water resources, water quantity and water quality.

Estimated Water Usage in Construction

6.18.2 The Lead Contractors will implement appropriate measures water efficiency measures during construction such as:

a. implementation of good housekeeping measures on construction site;
b. monitoring and tracking of water usage including sub-metering key areas such as welfare water and any water used for hydro-demolition or commissioning. Tracking of water usage over time to show where water is being used and will help identify leaks or inefficiencies;
c. use abstracted water and rainwater harvesting to offset mains or tankered water supplies;
d. use of water saving toilets and taps within all temporary site accommodation; and
e. specify the use water efficient plant and equipment within the supply chain.

Table 6.5 Examples Water Saving within Construction

Plant	Saving	Considerations
Dust suppression (general)	~90%	Avoid - high capacity 'rain guns and hoses Choose - misting/atomising systems which use less water and are more effective Consider - consider using non-potable water (ideally rainwater harvested on site)
Dust suppression (vehicles)	~90%	Avoid – use of high-pressure water jets diffused by a splash plate Choose – misting/atomising systems which use less water and are more effective
Road sweeping	~30%	Avoid - use of an open hose Ensure -operators are trained in water efficient practices, that vehicles have adjustable spray bars/nozzles and that any stand-alone washers are high pressure (low flow) with trigger controls Consider - water recirculation systems
Wheel washing	~40%	Avoid - manual wheel washing (except when the need is very limited) Choose - drive-on recirculating systems with a sensor-controlled shut off (where demand is ongoing) Ensure - Water top-up to settlement tank is controlled (e.g. a float valve), supply pressure reflects site conditions and that the filter in the settlement tank is kept clean to avoid overflows

Estimated Water Demand

6.18.3 An estimate of the potable demand and foul discharge (in m3) is contained in Appendix E. The tables below show the assumptions for calculating the potable water demand and the foul discharge.

Table 6.6 Assumption for Potable Water Demand

Estimated Potable Water								
Location / Operation	Unit / Rate	Litres	Quant	Total Litres		Working days per month	Total Litres per month	m3 of water per month
Offices & Compounds								
Welfare Facilities (inc canteen) & compound	l/per person per day	40	1200	48,000	per/d	22	1,056,000	1056
Wheel wash	l/per vehicle	40	50	2,000	per/d	22	44,000	44
Site Control posts	l/per person per day	40	10	400	per/d	30	12,000	12
Consolidation Centre	l/per vehicle	40	50	2,000	per/d	22	44,000	44
Waste Recovery Facility	l/per cycle	100	10	1,000	per/d	30	30,000	30
Concrete Batching								
Concrete batching plant	l/per m3 of concrete	200	6,600	1,320,000				1320
Washdown	l/per cycle	50	50	2,500	per/d	22	55,000	55
Dust Suppression	l/per tanker	1,000	4 per day	8,000	per/d	22	176,000	176
Bulk Earthworks								
Dust Supp. (earthworks) -10 machines	20l/min per machine	20	9600	96,000	per/d	22	2,112,000	2112
Stockpiling and Landscaping	10l/min per machine	10	4800	48,000	per/d	23	1,104,000	1104

Internal roads and Landscaping mitigation								
Dust Supp.	l/per tanker	2,000	4 per day	16,000	per/d	22	352,000	352
Road Sweeping	l/per tanker	2,000	4 per day	8,000	per/d	22	176,000	176
Internal roads and Landscaping mitigation								
Terminal building	ave site consumption (m3)						200,000	200
Airfield	ave site consumption (m3)						100,000	100
Commercial Development	ave site consumption (m3)						200,000	200

Table 6.7 Assumption Foul Water Discharge

Foul Water Discharge		
Location / Operation	% discharged	m3 of water per month
Offices & Compounds		
Welfare Facilities (inc. canteen) & compound	100%	1056
Wheel wash	0%	0
Site Control posts	100%	12
Consolidation Centre	50%	22
Waste Recovery Facility	0%	0
Concrete Batching		
Concrete batching plant	0%	0
Washdown	50%	27.5
Dust Suppression	0%	0
Bulk Earthworks		
Dust Suppression (earthworks) - 10 machines	0%	0
Stockpiling and Landscaping	0%	0
Internal roads and Landscaping mitigation		
Dust Suppression	0%	0
Road Sweeping	0%	0
Internal roads and Landscaping mitigation		
Terminal building	50%	100
Airfield	50%	50
Commercial Development	50%	100
	Total	**1368**

Surface Water and Ground Water

6.18.4 The Lead Contractors will manage construction operations in line with a Construction Surface Water Management Strategy (CSWMS) produced as part of their EMS, with the aim of protecting the quality of surface water resources from adverse effects and avoiding any avoid changes of level or volume that could increase in the likelihood of downstream flood risk or reduce the water resources available to a water dependent receptor.

6.18.5 The Lead Contractors adhere to site good practice and the Environment Agency's Groundwater protection: Principles and Practices (GP3).

6.18.6 The lead contractor shall put in place measures to control and prevent groundwater contamination during the construction of the works as described in the CoCP and in the Remediation Strategy.

6.18.7 Monitoring plans will be prepared and implemented as part of the Lead Contractors' EMS and will be consistent with the requirements in the Remediation Strategy, earthworks specification and the CoCP.

Flood Risk

6.18.8 The Lead Contractors will undertake all works associated with construction operations whilst being mindful of impacts to flood risk.

6.18.9 The Lead Contractors shall develop flood risk plans for the construction operations and will account for a broad range of topics including all construction areas located within Flood Zone 2 and 3, areas vulnerable to surface water and groundwater flooding, and other flood risk sources such as sewer flooding and reservoir flooding.

6.18.10 The Lead Contractors will ensure the effective planning of sites and the storing of materials in all flood risk plans. For all temporary and permanent works, a risk based precautionary approach will be adopted and specified in a risk assessment to be included in the CSWMS.

6.19 Removal of temporary structures and buildings

6.19.1 Following construction, temporary structures would be dismantled and removed.

6.19.2 Dismantling and removal of temporary construction structures and buildings includes the removal of:

a. concrete batching plant;
b. offices;
c. worker welfare facilities;
d. workshops;
e. security facilities; and
f. construction compounds.

6.19.3 The method for dismantling would include the following items:

a. removal of modular buildings including concrete batching plant, offices, worker welfare facilities, workshops and some security facilities using mobile cranes and elevated working platforms;
b. concrete foundations would be removed using mechanical earthmoving and demolition equipment; and
c. removal of construction compounds using mechanical earthmoving machinery.

6.19.4 Where temporary buildings can be reused, these would be taken off-site.

6.19.5 It is intended that where possible any structures demolished that contain concrete or brick would be crushed for reuse on-site. All other material that can be recycled would be either reused on-site or removed to be appropriately recycled.

6.19.6 Any areas affected by the removal of temporary infrastructure would, be restored to their former condition.

6.20 Removal of temporary infrastructure

6.20.1 Removal of temporary infrastructure as required includes the removal of:

a. compounds;
b. laydown areas;
c. car parking;
d. temporary construction utilities; and
e. haul and access roads.

6.20.2 Removal of temporary infrastructure would involve various techniques, predominantly the use of mechanical earthmoving and demolition equipment.

6.20.3 Where temporary infrastructure elements can be reused, these would be taken off-site.

6.20.4 It is intended that where possible any infrastructure demolished that contains concrete or brick would be crushed for reuse on-site.

6.20.5 All other material that can be recycled would be either reused on-site or removed to be appropriately recycled.

6.20.6 Any areas affected by the removal of temporary infrastructure would, be restored to their former condition.

6.21 Neighbours

6.21.1 It is recognised that there are several other projects both being planned and being delivered in and around the airport area, which may be impacted by the redevelopment works.

6.21.2 It is also recognised that there are other significant issues during the construction works that would need to be managed, including taxiway closures, access and security, low visibility closures, economic impacts, noise, dust, ecology, ground conditions, highway considerations and the local community.

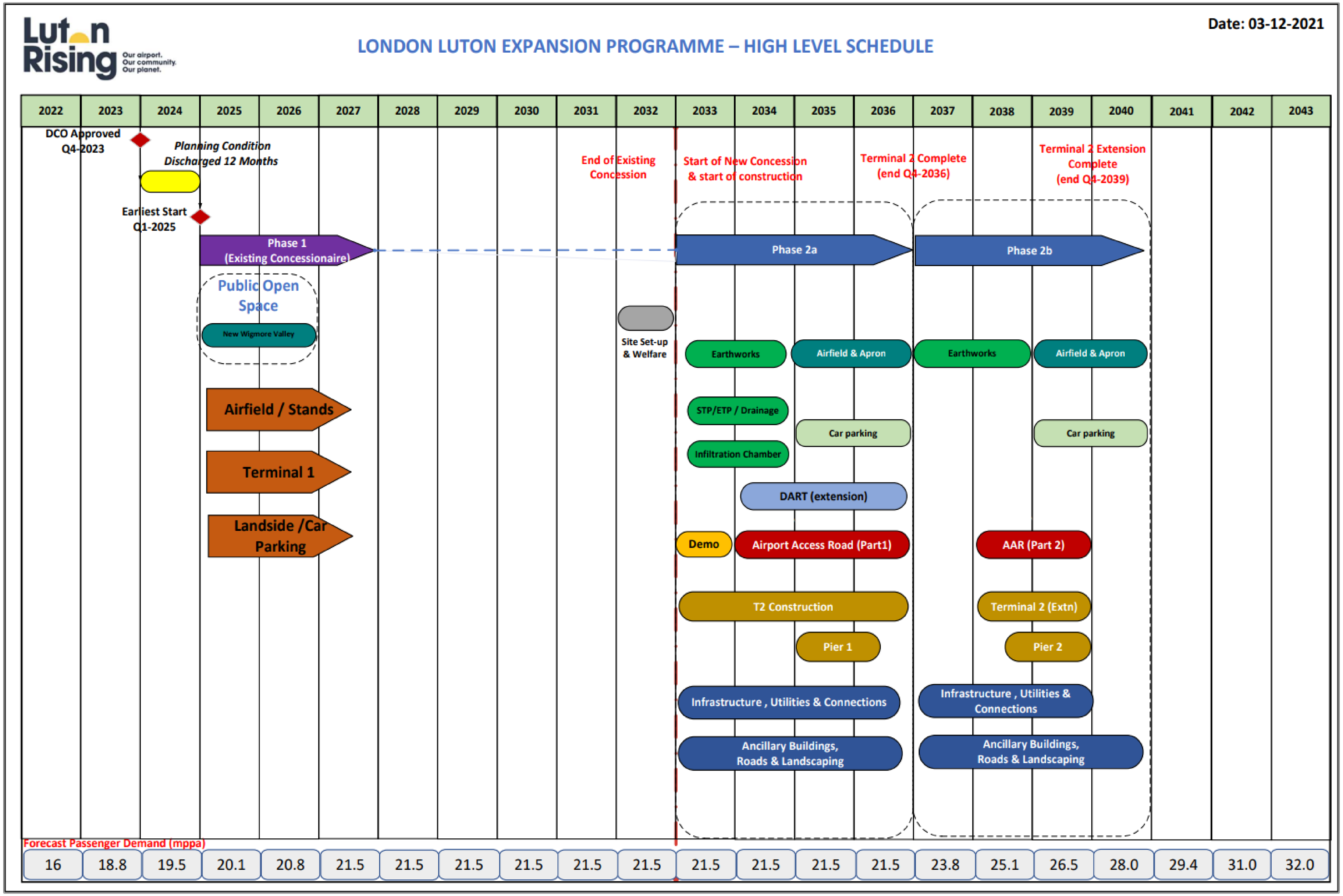
6.21.3 Separate liaison groups would be established to identify and manage the Proposed Development interfaces with the airport operator, local businesses and the local community.

GLOSSARY AND ABBREVIATIONS

Term/Abbreviation	Description
AAR	Airport Access Road (was known as CPAR)
BS	British Standard
BSI	British Standards Institution
CCS	Considerate Constructors Scheme
CoCP	Draft Code of Construction Practice
CMS	Construction Method Statement
CSWMS	Construction Surface Water Management Strategy
CTMP	Construction Traffic Management Plan
CWTP	Construction Workforce Travel Plan
DCO	Development Consent Order
Defra	Department for Environment, Food and Rural Affairs
DMS	Delivery Management System
EMS	Environmental Management System
ERUB	Engine Run-up Bay
FORS	Fleet Operator Recognition Scheme
HGV	Heavy goods vehicle
Highway Interventions	Junction and road improvement works included in the Proposed Development for which consent is being sought as part of the DCO Application
Home Counties	The home counties are the counties of England that surround London (although several of them do not border it). The counties generally included are Berkshire, Buckinghamshire, Essex, Hertfordshire, Kent, Surrey, and Sussex
Lead Contractors	A Lead Contractor on a construction/ work site responsible for planning, managing and co-ordinating themselves and all other contractors working on site
Luton Rising	A trading name of London Luton Airport Limited
LLAOL	London Luton Airport Operations Limited, the operator of London Luton Airport
Luton DART	Luton Direct Air Rail Transit
Main Application Site	The area to the east of Luton Airport where main works for the Proposed Development will take place. Excludes the Off-site Car Park and Highway Interventions.

Major accident	In the context of this assessment, means an uncontrolled event caused by a man-made activity or asset that may result in immediate or delayed serious damage to human health, welfare and/or environment and requires the use of resources beyond those of Luton Rising or its contractors to manage. It should be noted that malicious intent is not accidental.
MMP	Materials Management Plan
MPPA	Million Passengers Per Annum
NCP	New Century Park
NRMM	Non-road mobile machinery
Off-site Car Parks	The two locations to the south west of Luton Airport, outside of the airport boundary, where car parking is included in the Proposed Development
PEIR	Preliminary Environmental Information Report
PPG	Pollution Prevention Guideline These Environment Agency documents have been withdrawn, but still constitute relevant advice on good practice. Where stated, they should be referred to in the absence of alternative guidance documents.
PPE	Personal Protective Equipment
Proposed Development	All works for which consent is being sought as part of the DCO Application, including works at the Main Application Site; Off-site Car Parks and Highway Interventions.
PRoW	Public rights of way
RET's	Rapid Exit Taxiways
SWMP	Site Waste Management Plan
SWMS	Surface Water Management Strategy
TfL	Transport for London
TMWG	Traffic Management Working Group

Appendix A - Outline Programme


Luton Rising
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LONDON LUTON EXPANSION PROGRAMME – HIGH LEVEL SCHEDULE
Date: 03-12-2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
DCO Approved Q4-2023
Planning Condition Discharged 12 Months
Earliest Start Q1-2025
Phase 1 (Existing Concessionaire)
Public Open Space
New Wigmore Valley
Airfield / Stands
Terminal 1
Landside /Car Parking
End of Existing Concession
Site Set-up & Welfare
Start of New Concession & start of construction
Terminal 2 Complete (end Q4-2036)
Terminal 2 Extension Complete (end Q4-2039)
Phase 2a
Phase 2b
Earthworks
Airfield & Apron
Earthworks
Airfield & Apron
STP/ETP / Drainage
Car parking
Car parking
Infiltration Chamber
DART (extension)
Demo
Airport Access Road (Part1)
AAR (Part 2)
T2 Construction
Terminal 2 (Extn)
Pier 1
Pier 2
Infrastructure , Utilities & Connections
Infrastructure , Utilities & Connections
Ancillary Buildings, Roads & Landscaping
Ancillary Buildings, Roads & Landscaping
Forecast Passenger Demand (mppa)
16
18.8
19.5
20.1
20.8
21.5
21.5
21.5
21.5
21.5
21.5
21.5
21.5
21.5
21.5
23.8
25.1
26.5
28.0
29.4
31.0
32.0

Appendix B – Phasing Diagrams

Construction Phasing (Phase 1)

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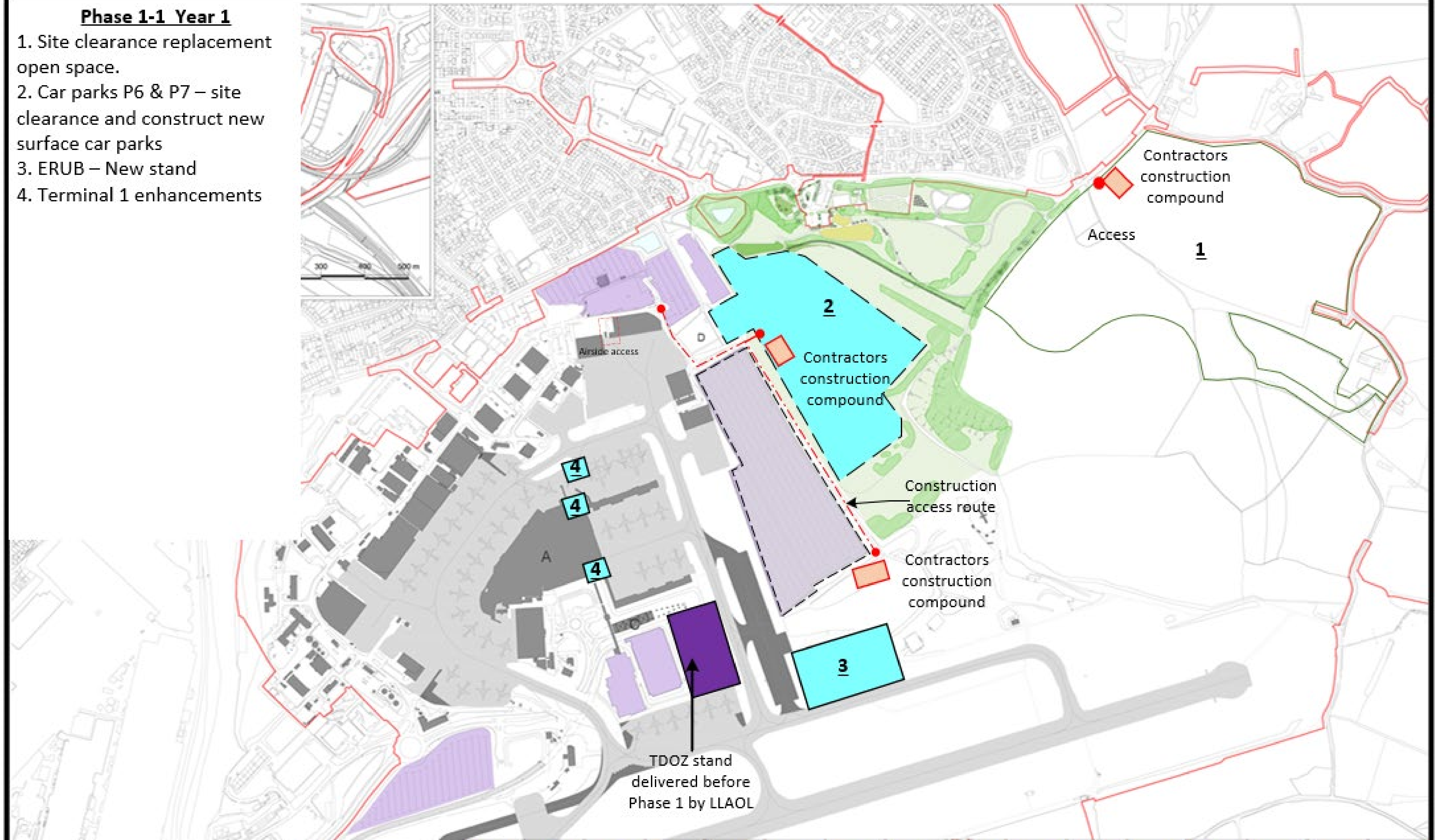
Phase 1-1 Year 1

1. Site clearance replacement open space.
2. Car parks P6 & P7 – site clearance and construct new surface car parks
3. ERUB – New stand
4. Terminal 1 enhancements



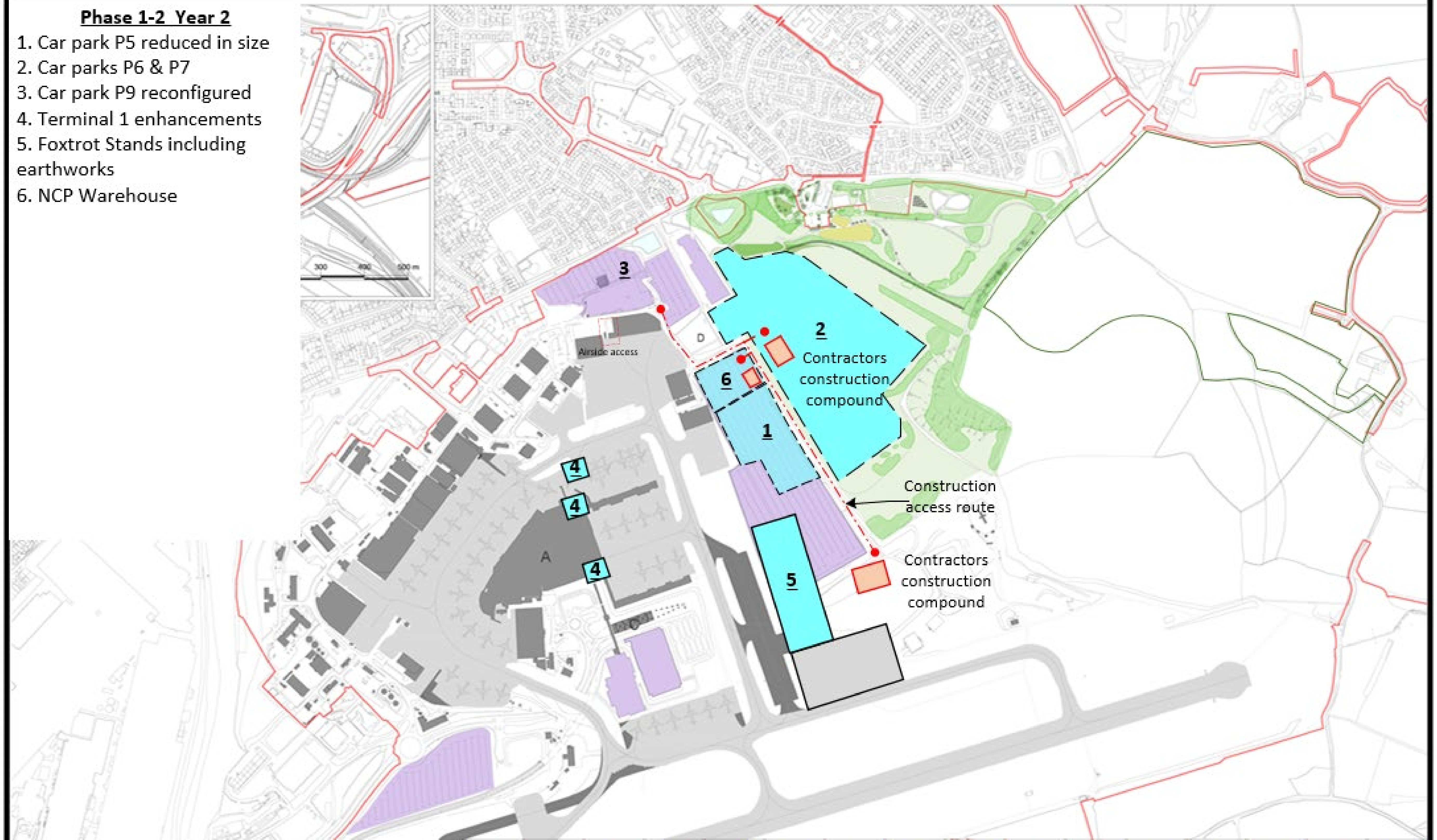
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16

Date 08-12-2021

Construction Phasing (Phase 1)

Phase 1-2 Year 2

1. Car park P5 reduced in size
2. Car parks P6 & P7
3. Car park P9 reconfigured
4. Terminal 1 enhancements
5. Foxtrot Stands including earthworks
6. NCP Warehouse



Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16

Date 08-12-2021

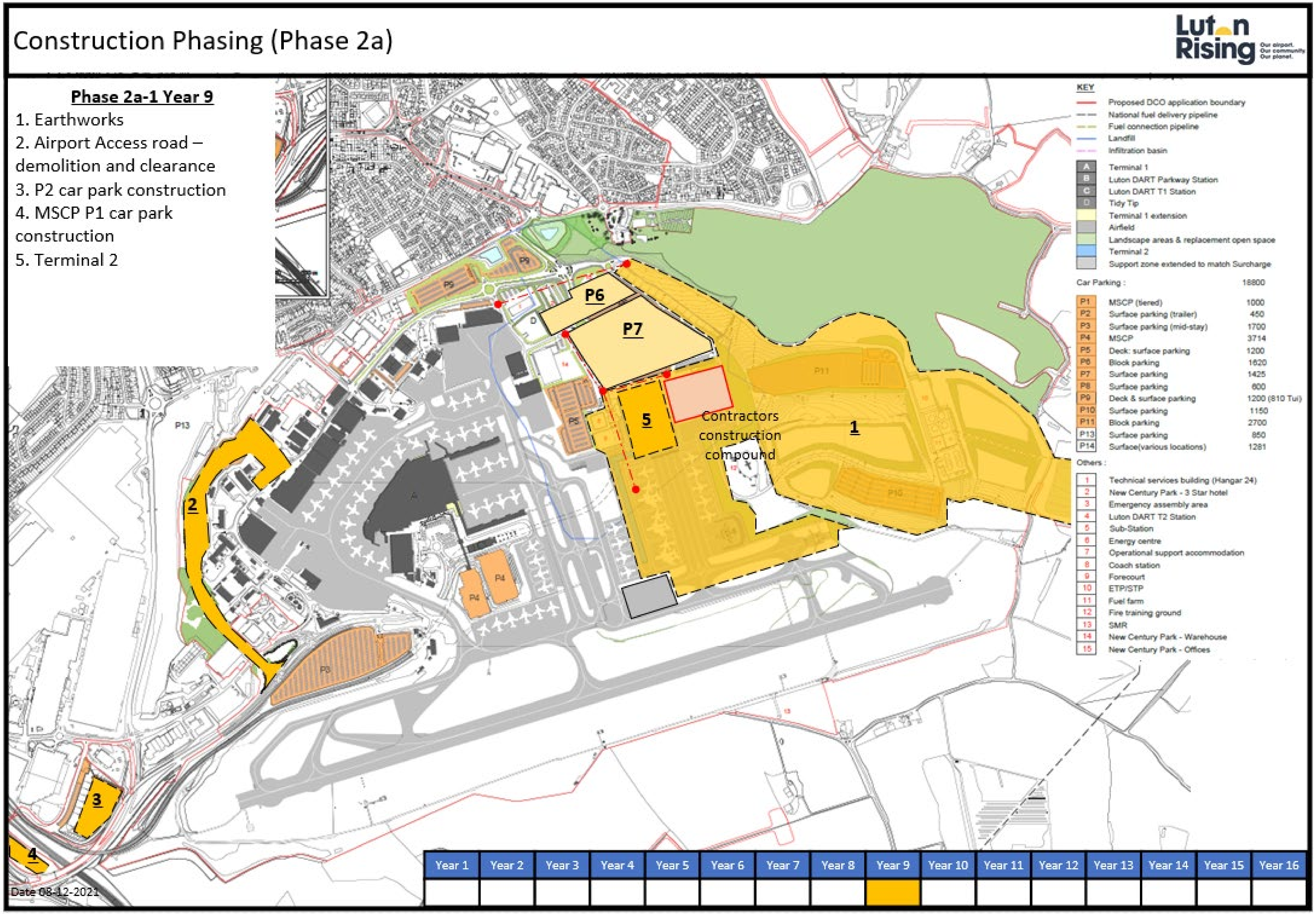
Construction Phasing (Phase 1)

Phase 1-3 Year 3

1. Complete airfield works

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16

Date 08-12-2021


Construction Phasing (Phase 2a)
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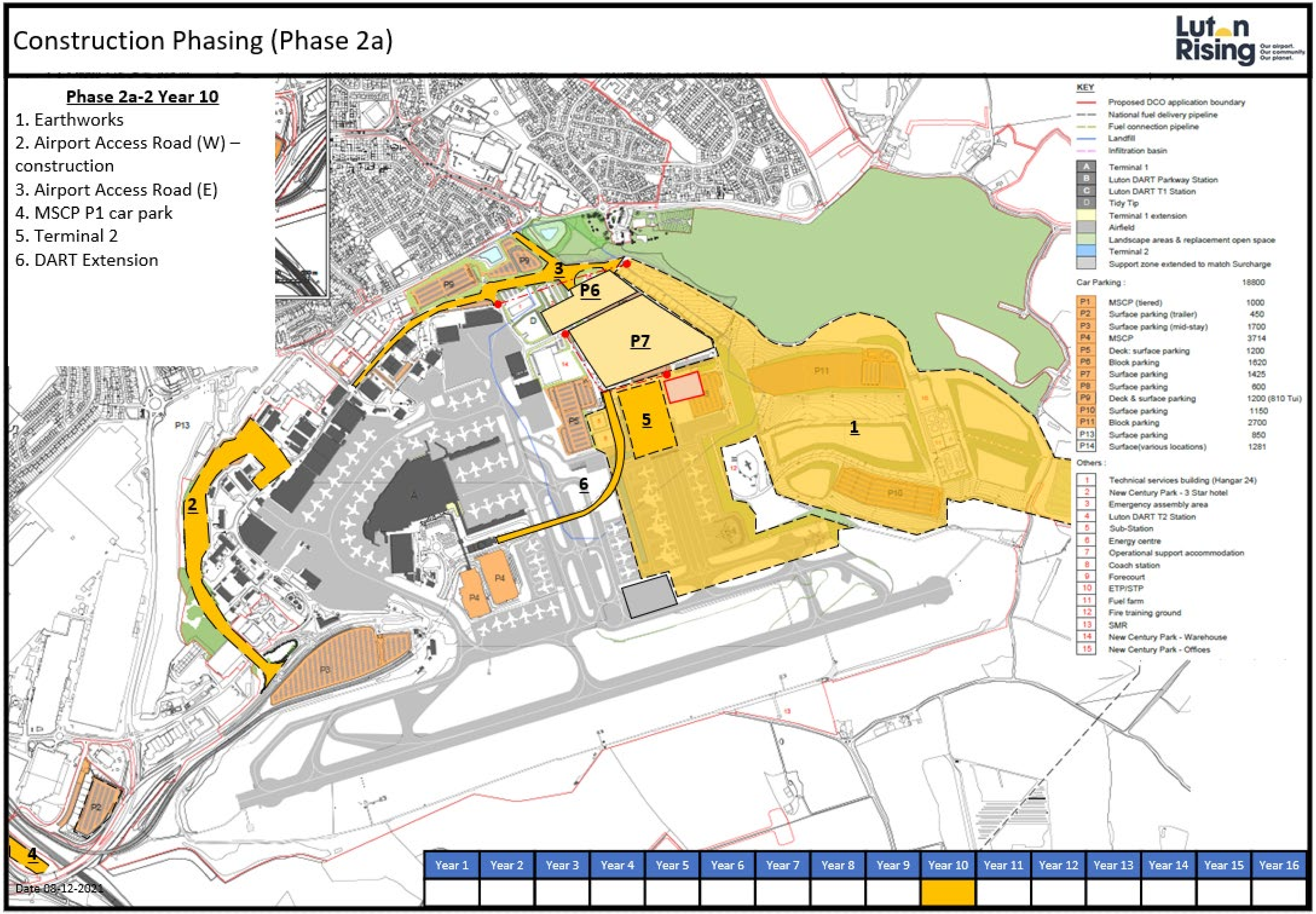
Phase 2a-1 Year 9
1. Earthworks
2. Airport Access road – demolition and clearance
3. P2 car park construction
4. MSCP P1 car park construction
5. Terminal 2
P6
P7
5
Contractors construction compound
1
2
3
4
P13
P4
P3
P5
P9
P10
P11
KEY
Proposed DCO application boundary
National fuel delivery pipeline
Fuel connection pipeline
Landfill
Infiltration basin
A Terminal 1
B Luton DART Parkway Station
C Luton DART T1 Station
D Tidy Tip
Terminal 1 extension
Airfield
Landscape areas & replacement open space
Terminal 2
Support zone extended to match Surcharge
Car Parking : 18800
P1 MSCP (tiered) 1000
P2 Surface parking (trailer) 450
P3 Surface parking (mid-stay) 1700
P4 MSCP 3714
P5 Deck: surface parking 1200
P6 Block parking 1620
P7 Surface parking 1425
P8 Surface parking 600
P9 Deck & surface parking 1200 (810 Tui)
P10 Surface parking 1150
P11 Block parking 2700
P13 Surface parking 850
P14 Surface(various locations) 1281
Others :
1 Technical services building (Hangar 24)
2 New Century Park - 3 Star hotel
3 Emergency assembly area
4 Luton DART T2 Station
5 Sub-Station
6 Energy centre
7 Operational support accommodation
8 Coach station
9 Forecourt
10 ETP/STP
11 Fuel farm
12 Fire training ground
13 SMR
14 New Century Park - Warehouse
15 New Century Park - Offices
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10
Year 11
Year 12
Year 13
Year 14
Year 15
Year 16
Date 08-12-2021


Construction Phasing (Phase 2a)
Luton Rising
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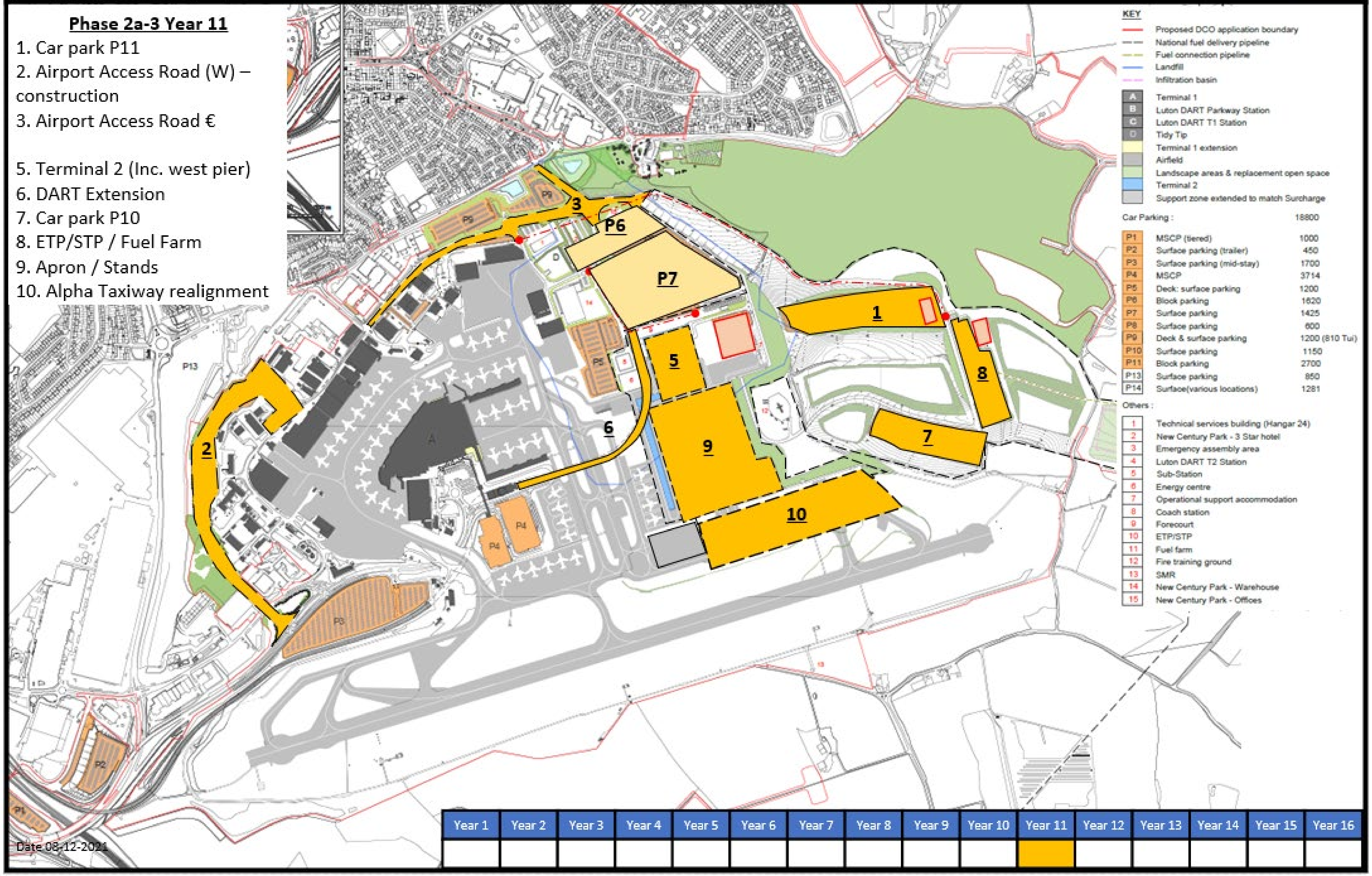
Phase 2a-2 Year 10
1. Earthworks
2. Airport Access Road (W) – construction
3. Airport Access Road (E)
4. MSCP P1 car park
5. Terminal 2
6. DART Extension
P6
P7
1
2
3
4
5
6
P1
P2
P3
P4
P5
P9
P10
P11
P13
A
D
KEY
Proposed DCO application boundary
National fuel delivery pipeline
Fuel connection pipeline
Landfill
Infiltration basin
A Terminal 1
B Luton DART Parkway Station
C Luton DART T1 Station
D Tidy Tip
Terminal 1 extension
Airfield
Landscape areas & replacement open space
Terminal 2
Support zone extended to match Surcharge
Car Parking : 18800
P1 MSCP (tiered) 1000
P2 Surface parking (trailer) 450
P3 Surface parking (mid-stay) 1700
P4 MSCP 3714
P5 Deck: surface parking 1200
P6 Block parking 1620
P7 Surface parking 1425
P8 Surface parking 600
P9 Deck & surface parking 1200 (810 Tui)
P10 Surface parking 1150
P11 Block parking 2700
P13 Surface parking 850
P14 Surface(various locations) 1281
Others :
1 Technical services building (Hangar 24)
2 New Century Park - 3 Star hotel
3 Emergency assembly area
4 Luton DART T2 Station
5 Sub-Station
6 Energy centre
7 Operational support accommodation
8 Coach station
9 Forecourt
10 ETP/STP
11 Fuel farm
12 Fire training ground
13 SMR
14 New Century Park - Warehouse
15 New Century Park - Offices
Year 1
Year 2
Year 3
Year 4
Year 5
Year 6
Year 7
Year 8
Year 9
Year 10
Year 11
Year 12
Year 13
Year 14
Year 15
Year 16
Date 08-12-2021

Construction Phasing (Phase 2a)

Phase 2a-3 Year 11

1. Car park P11
2. Airport Access Road (W) – construction
3. Airport Access Road €

5. Terminal 2 (Inc. west pier)
6. DART Extension
7. Car park P10
8. ETP/STP / Fuel Farm
9. Apron / Stands
10. Alpha Taxiway realignment

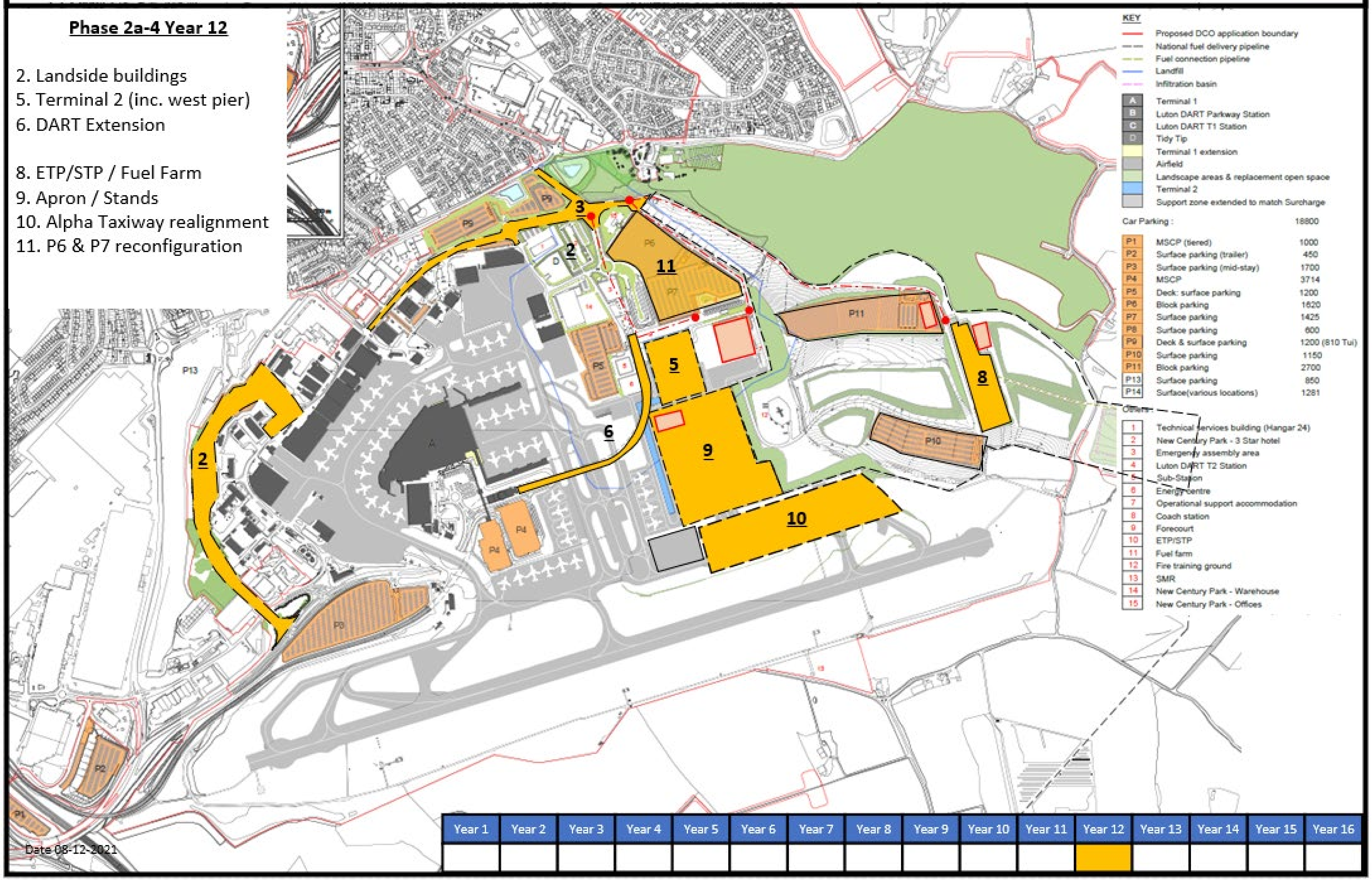


Construction Phasing (Phase 2a)

Phase 2a-4 Year 12

2. Landside buildings
5. Terminal 2 (inc. west pier)
6. DART Extension

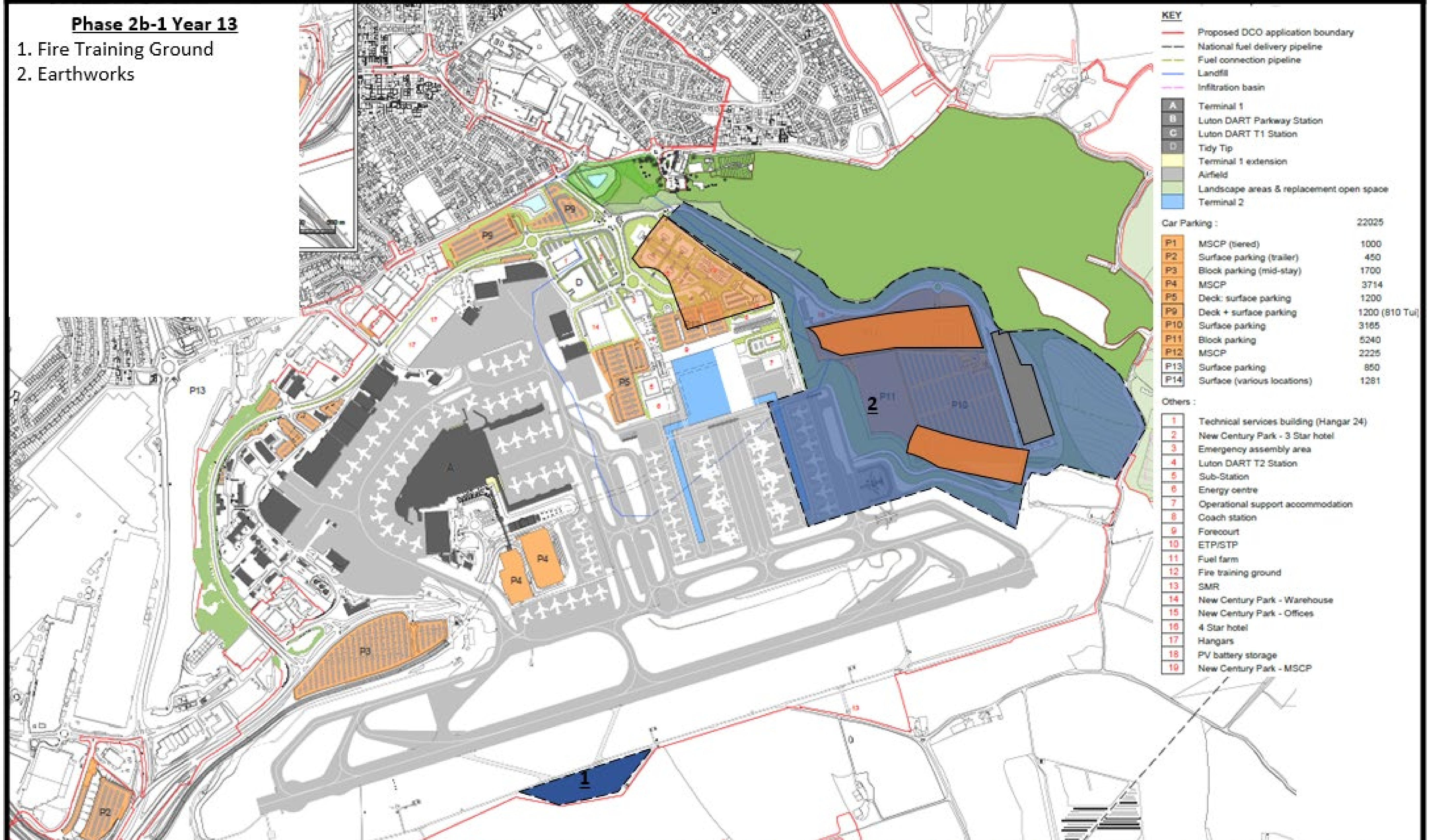
8. ETP/STP / Fuel Farm
9. Apron / Stands
10. Alpha Taxiway realignment
11. P6 & P7 reconfiguration



Construction Phasing (Phase 2b)

Phase 2b-1 Year 13

1. Fire Training Ground
2. Earthworks



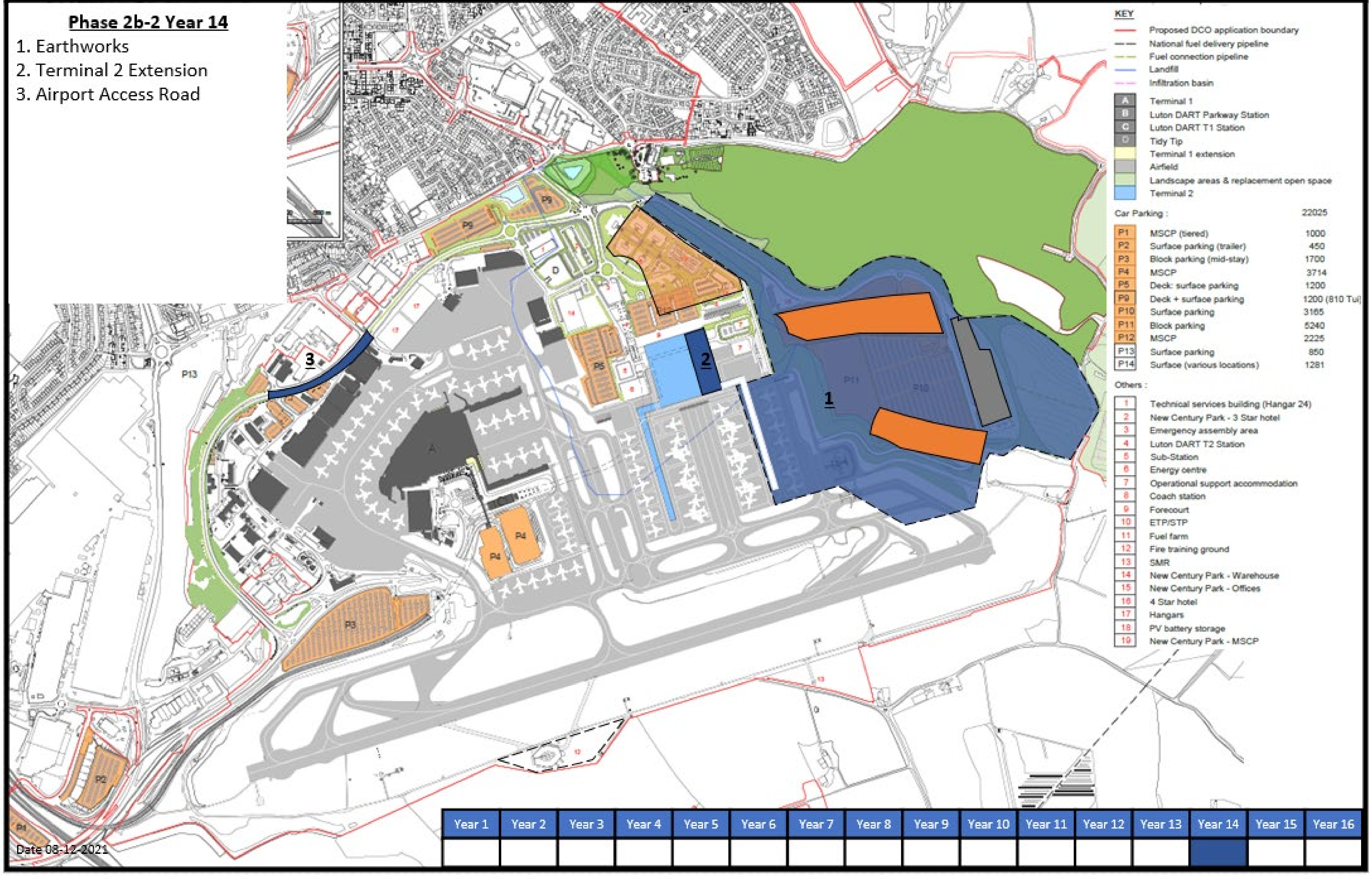
Date 03-12-2021

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16

Construction Phasing (Phase 2b)

Phase 2b-2 Year 14

1. Earthworks
2. Terminal 2 Extension
3. Airport Access Road



Construction Phasing (Phase 2b)

Phase 2b-3 Year 15

1. Airfield
2. Terminal 2 Extension
3. East Pier

5. Reconfigure car parks P10 and P11
6. NCP Buildings
7. MSCP P12

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16

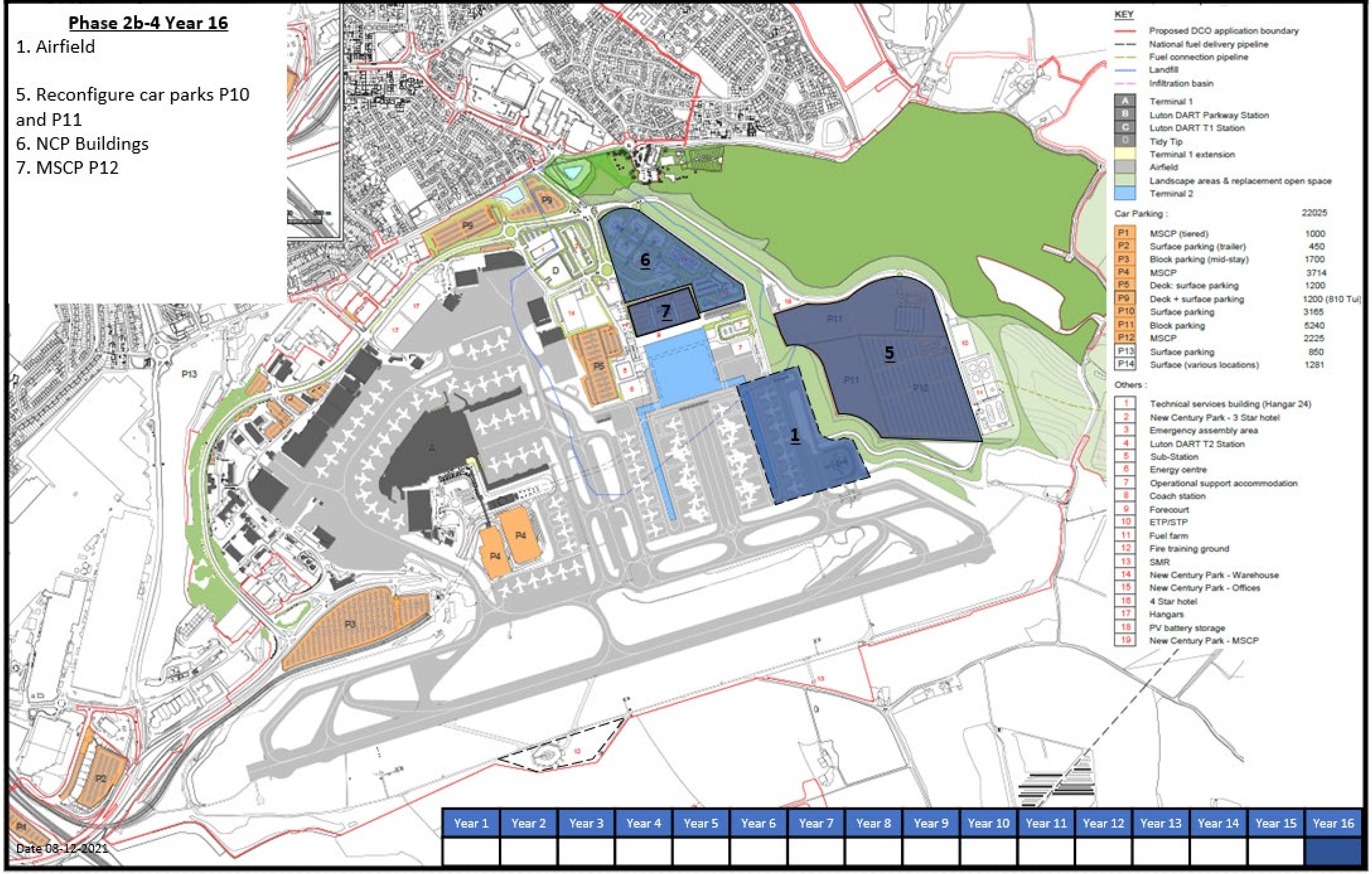
Date 08-12-2021

Construction Phasing (Phase 2b)

Phase 2b-4 Year 16

1. Airfield

5. Reconfigure car parks P10 and P11
6. NCP Buildings
7. MSCP P12



Appendix C– Vehicle Numbers

C1.1.1 Internal vehicle movement data

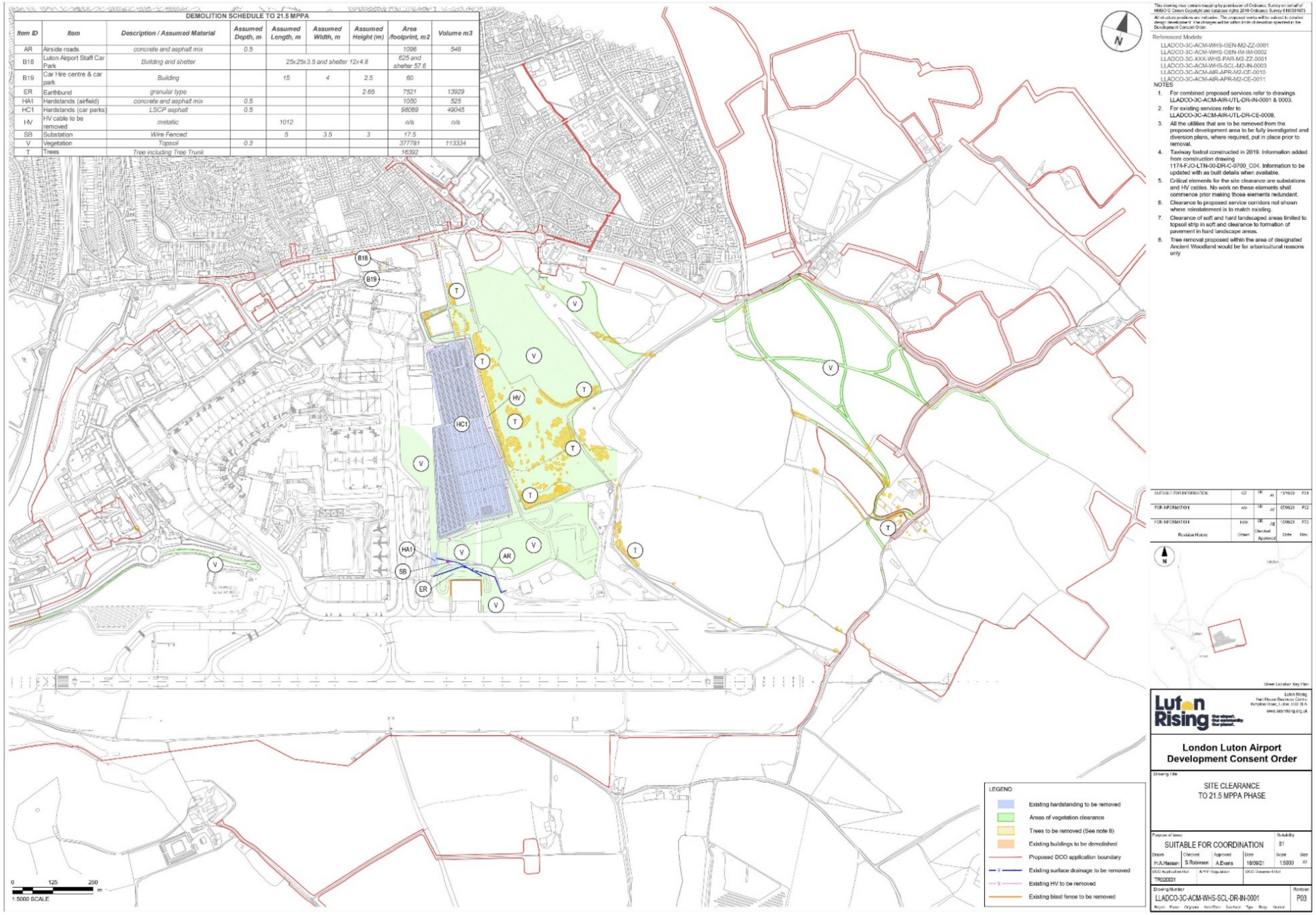
Annual Internal Vehicle Movements													
Year	**2025**	**2026**	**2027**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**		**Peak Quarter**
Total number of movements per year	59,752.00	17,359.67	1,885.00	59,225.00	63,089.08	47,869.92	22,980.71	55,050.00	55,585.00	27,046.00	20,414.00		26,007
Avg/day (based on 242 working days	230	67	7	228	243	184	88	212	214	104	79		400
Vehicle Type (%)													
Articulated Vehicle (HGV) (up to 44T)	10%	15%	15%	5%	5%	15%	20%	5%	5%	15%	20%		5%
Rigid Heavy Goods Vehicles (HGV) up to 30T	60%	30%	20%	60%	55%	40%	20%	60%	55%	40%	20%		55%
Specialised Low Loaders													0%
Vans (7.5t to 18t)	10%	25%	25%	15%	15%	15%	20%	15%	15%	15%	20%		15%
Vans (up to 3.5t)	10%	20%	30%	10%	15%	20%	30%	10%	15%	20%	30%		15%
Cars	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%	10%		10%
Breakdown by Vehicle Type													
Articulated Vehicle (HGV) (up to 44T)	23	10	1	11	12	28	18	11	11	16	16		20
Rigid Heavy Goods Vehicles (HGV) up to 30T	138	20	1	137	133	74	18	127	118	42	16		220
Specialised Low Loaders	0	0	0	0	0	0	0	0	0	0	0		0
Vans (7.5t to 18t)	23	17	2	34	36	28	18	32	32	16	16		60
Vans (up to 3.5t)	23	13	2	23	36	37	27	21	32	21	24		60
Cars	23	7	1	23	24	18	9	21	21	10	8		40

C1.1.2 External movement vehicle data

Annual External Vehicle Movements													
Year	**2025**	**2026**	**2027**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**	**2040**		**Peak Quarter**
Total number of movements per year	25,357	12,350	3,250	17,616	32,269	51,459	44,543	12,740	19,435	33,091	6,630		15,333
Avg/day (based on 242 working days per year)	105	51	13	73	133	213	184	53	80	137	27		236
Vehicle Type (%)													
Articulated Vehicle (HGV) (up to 44T)	10%	15%	15%	5%	5%	13%	20%	5%	5%	13%	20%		5%
Rigid Heavy Goods Vehicles (HGV) up to 30T	58%	30%	20%	58%	53%	40%	20%	58%	53%	40%	20%		58%
Specialised Low Loaders	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%		5%
Vans (7.5t to 18t)	10%	23%	23%	15%	15%	15%	20%	15%	15%	15%	20%		15%
Vans (up to 3.5t)	10%	20%	30%	10%	15%	20%	28%	10%	15%	20%	28%		10%
Cars	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%		5%
Motorbikes	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%		2%
Breakdown by Vehicle Type													
Articulated Vehicle (HGV) (up to 44T)	10	8	2	4	7	28	37	3	4	18	5		12
Rigid Heavy Goods Vehicles (HGV) up to 30T	61	15	3	42	71	85	37	31	43	55	5		137
Specialised Low Loaders	5	3	1	4	7	11	9	3	4	7	1		12
Vans (7.5t to 18t)	10	12	3	11	20	32	37	8	12	21	5		35
Vans (up to 3.5t)	10	10	4	7	20	43	52	5	12	27	8		24
Cars	5	3	1	4	7	11	9	3	4	7	1		12
Motorbikes	2	1	0	1	3	4	4	1	2	3	1		5
Number of Vehicles Per Day	105	51	13	73	133	213	184	53	80	137	27		

Appendix D – Site Clearance Drawings

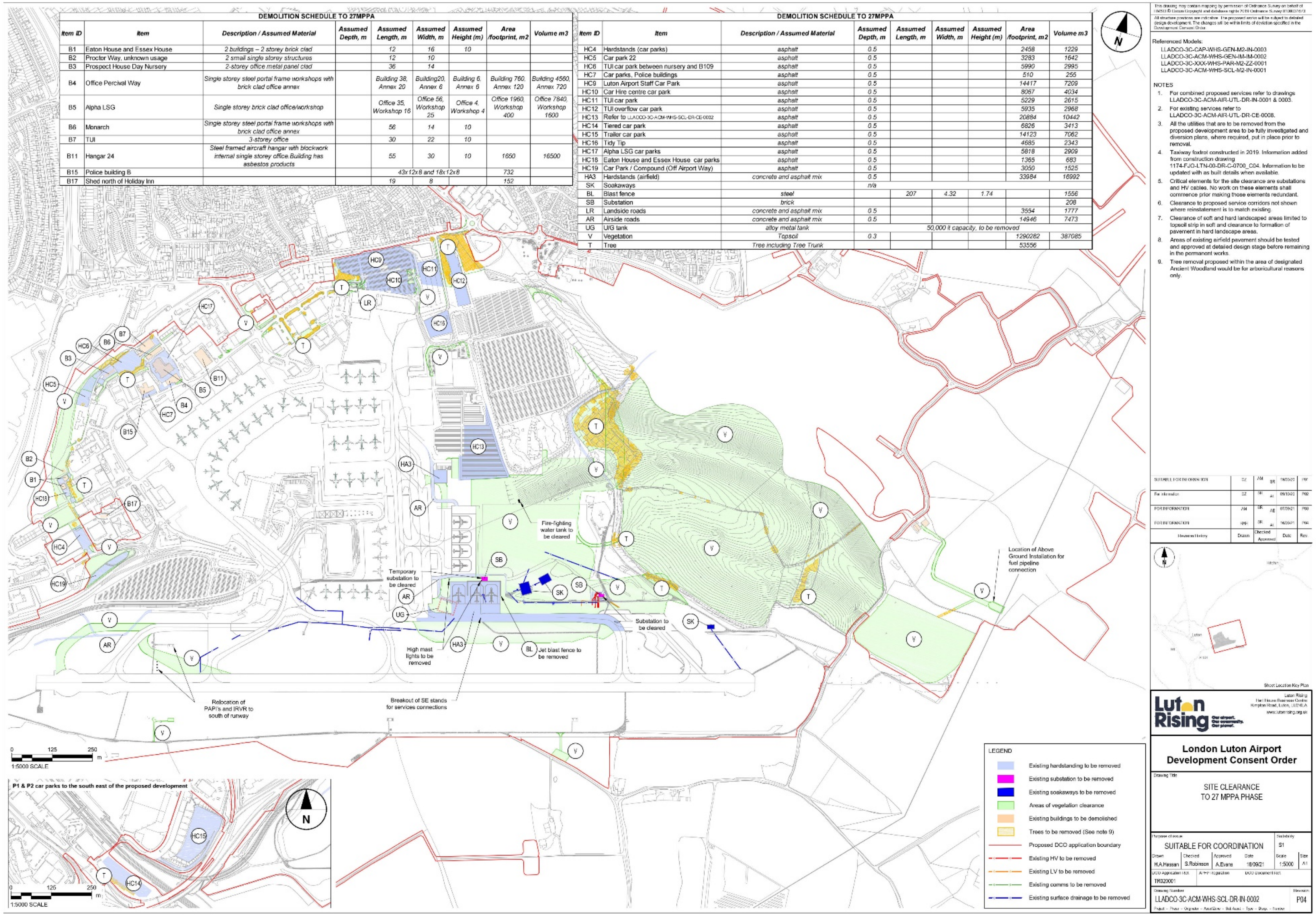
D1.1.1 Site Clearance for Phase 1 (LLADCO-3C-ACM-WHS-SCL-DR-IN-0001)



DEMOLITION SCHEDULE TO 21.5 MPPA

Item ID	Item	Description / Assumed Material	Assumed Depth, m	Assumed Length, m	Assumed Width, m	Assumed Height (m)	Area /footprint, m2	Volume m3
AR	Airside roads	concrete and asphalt mix	0.5				1096	548
B18	Luton Airport Staff Car Park	Building and shelter		25x25x3.5 and shelter 12x4.8			625 and shelter 57.6	
B19	Car Hire centre & car park	Building		15	4	2.5	60	
ER	Earthbund	granular type				2.65	7521	13929
HA1	Hardstands (airfield)	concrete and asphalt mix	0.5				1050	525
HC1	Hardstands (car parks)	LSCP asphalt	0.5				98089	49045
HV	HV cable to be removed	metallic		1012			n/a	n/a
SB	Substation	Wire Fenced		5	3.5	3	17.5	
V	Vegetation	Topsoil	0.3				377781	113334
T	Trees	Tree including Tree Trunk					16392	

D1.1.2 Site Clearance for Phase 2a (LLADCO-3C-ACM-WHS-SCL-DR-IN-0002)



DEMOLITION SCHEDULE TO 27MPPA

Item ID	Item	Description / Assumed Material	Assumed Depth, m	Assumed Length, m	Assumed Width, m	Assumed Height (m)	Area /footprint, m2	Volume m3
B1	Eaton House and Essex House	2 buildings – 2 storey brick clad		12	16	10		
B2	Proctor Way, unknown usage	2 small single storey structures		12	10			
B3	Prospect House Day Nursery	2-storey office metal panel clad		36	14			
B4	Office Percival Way	Single storey steel portal frame workshops with brick clad office annex		Building 38, Annex 20	Building20, Annex 6	Building 6, Annex 6	Building 760, Annex 120	Building 4560, Annex 720
B5	Alpha LSG	Single storey brick clad office/workshop		Office 35, Workshop 16	Office 56, Workshop 25	Office 4, Workshop 4	Office 1960, Workshop 400	Office 7840, Workshop 1600
B6	Monarch	Single storey steel portal frame workshops with brick clad office annex		56	14	10		
B7	TUI	3-storey office		30	22	10		
B11	Hangar 24	Steel framed aircraft hangar with blockwork internal single storey office.Building has asbestos products		55	30	10	1650	16500
B15	Police building B			43x12x8 and 18x12x8			732	
B17	Shed north of Holiday Inn			19	8		152	

DEMOLITION SCHEDULE TO 27MPPA

Item ID	Item	Description / Assumed Material	Assumed Depth, m	Assumed Length, m	Assumed Width, m	Assumed Height (m)	Area /footprint, m2	Volume m3
HC4	Hardstands (car parks)	asphalt	0.5				2458	1229
HC5	Car park 22	asphalt	0.5				3283	1642
HC6	TUI car park between nursery and B109	asphalt	0.5				5990	2995
HC7	Car parks, Police buildings	asphalt	0.5				510	255
HC9	Luton Airport Staff Car Park	asphalt	0.5				14417	7209
HC10	Car Hire centre car park	asphalt	0.5				8067	4034
HC11	TUI car park	asphalt	0.5				5229	2615
HC12	TUI overflow car park	asphalt	0.5				5935	2968
HC13	Refer to LLADCO-3C-ACM-WHS-SCL-DR-CE-0002	asphalt	0.5				20884	10442
HC14	Tiered car park	asphalt	0.5				6826	3413
HC15	Trailer car park	asphalt	0.5				14123	7062
HC16	Tidy Tip	asphalt	0.5				4685	2343
HC17	Alpha LSG car parks	asphalt	0.5				5818	2909
HC18	Eaton House and Essex House car parks	asphalt	0.5				1365	683
HC19	Car Park / Compound (Off Airport Way)	asphalt	0.5				3050	1525
HA3	Hardstands (airfield)	concrete and asphalt mix	0.5				33984	16992
SK	Soakaways		n/a					
BL	Blast fence	steel		207	4.32	1.74		1556
SB	Substation	brick						208
LR	Landside roads	concrete and asphalt mix	0.5				3554	1777
AR	Airside roads	concrete and asphalt mix	0.5				14946	7473
UG	U/G tank	alloy metal tank	50,000 lt capacity, to be removed					
V	Vegetation	Topsoil	0.3				1290282	387085
T	Tree	Tree including Tree Trunk					53556	

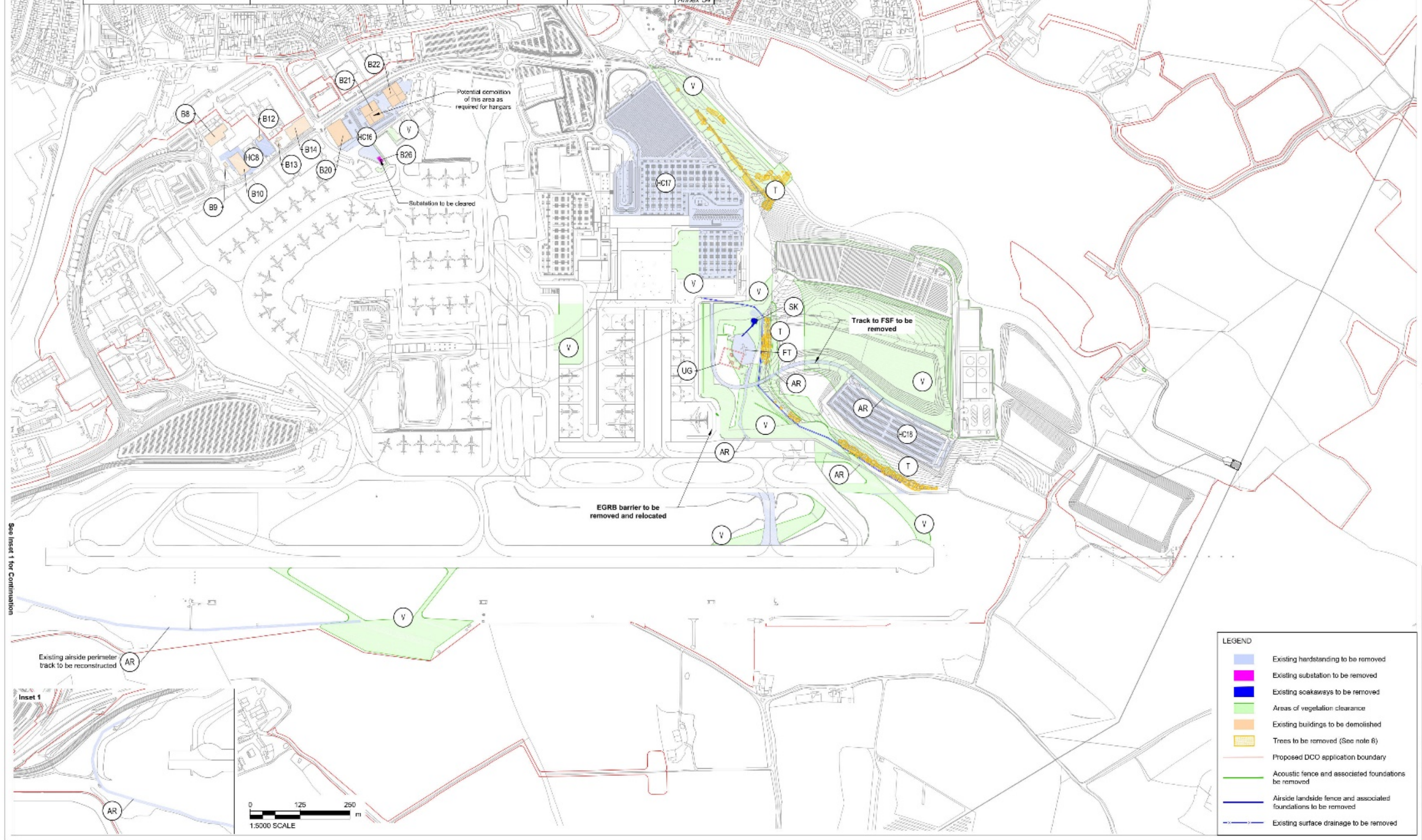
D1.1.3 Site Clearance for Phase 2b (LLADCO-3C-ACM-WHS-SCL-DR-IN-0003)

DEMOLITION SCHEDULE TO 32MPPA

Item ID	Item	Description / Assumed Material	Assumed Depth, m	Assumed Length, m	Assumed Width, m	Assumed Height (m)	Area /footprint, m2	Volume m3
B8	Former City Net Catering	*Single storey steel framed building with brick facades and annex*		*Building 47.5, Annex 22*	*Building 32, Annex 16*	*Building 4.6, Annex 4.6*	*Building 1472, Annex 352*	*Building 6773, Annex 1619*
B9	Shed adjacent to Hangar 23	*A steel framed light industrial building with elevations of corrugated bonded cement sheeting and asbestos products*		*13.5*	*10*	*4*	*135*	*540*
B10	Hangar 26	*Single storey steel portal framed with metal sheet cladding*		*55*	*30*	*10*	*1650*	*16500*
B12	Electrical substation	*One storey brick building, flat roof, adjacent to the GKN Reception*		*4.7*	*4.3*	*3*	*20*	*60*
B13	GKN Reception	*Various industrial sheds on this site, various heights (one storey) average height c.5m*		*12.4*	*7.5*	*3*	*93*	*279*
B14	GKN 787 building	*3-storey office*		*64*	*32*		*1890*	*9450*
B20	De Havilland House	*A two-storey building with brick /glaze facades*		*60*	*45*	*7.1*	*2700*	*19170*
B21	Unit 1, 2, 3 and 4 President Way	*Single-storey steel portal framed with metal sheet cladding*		*52*	*45*	*7.1*	*2340*	*16614*
B22	EasyJet Academy	*Two-storey steel framed building*		*52*	*45*	*7.1*	*2340*	*16614*
B26	Airside support building/substation	*Single storey pitched tile roof, brick walls, and Annex*		*Building 13, Annex 6*	*Building 6.5, Annex 2.4*	*Building 3.4, Annex 2.6*	*Building 85, Annex 15*	*Building 287, Annex 34*

DEMOLITION SCHEDULE TO 32MPPA

Item ID	Item	Description / Assumed Material	Assumed Depth, m	Assumed Length, m	Assumed Width, m	Assumed Height (m)	Area /footprint, m2	Volume m3
HC8	Car parks Hangars 24 and 26 and former city net catering	*asphalt*	*0.5*				*3072*	*1536*
HC16	Hardstands (car parks)	*asphalt*	*0.5*				*11830*	*5915*
HC17	Hardstands (car parks)	*asphalt*	*0.5*				*89196*	*44598*
HC18	Hardstands (car parks)	*asphalt*	*0.5*				*25896*	*12948*
AR	Airside roads	*concrete and asphalt mix*	*0.5*				*12021*	*6010.5*
FT	FTG Buildings including:							
FT	4 storage units	*Metal*	*3*				*16.5*	
FT	Bristol Britannia Fuselage	*Aluminium*	*11.5*				*195.3*	
FT	Dual Fuel Fire simulator	*Metal*	*3*				*944*	
FT	Drill Tower (3 storey)	*Metal*	*10*				*40*	
FT	Breathing apparatus chamber (2 storey)		*6*				*150*	
FT	CFBT simulator unit (2 no)		*5*				*54*	
FT	Classroom	*Pre-fabricated*	*3*				*16.5*	
FT	Simulator control hut	*Pre-fabricated*	*3*				*40*	
FT	Comfort facilities	*Pre-fabricated*	*3*				*40*	
FT	Bulk storage calor gas container	*steel*	*2.5*				*150*	
SK	Soakaways		*n/a*					
UG	U/G tanks	*alloy metal tank*	*25,000 lt capacity, to be relocated*					
V	Vegetation	*Topsoil*	*0.3*				*272415*	*81724.5*
T	Trees	*Tree including Tree Trunks*					*11870*	



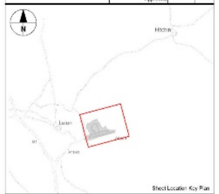
All structure positions are indicative. The proposed works will be subject to detailed design development. The changes will be within limits of deviation specified in the Development Consent Order.

Referenced Models:
LLADCO-3C-ACM-AIR-FFA-M2-CE-0001
LLADCO-3C-CAP-WHS-GEN-M2-IN-0002
LLADCO-3C-ACM-WHS-GEN-IM-IM-0002
LLADCO-3C-XXX-WHS-PAR-M2-ZZ-0001
LLADCO-3C-ACM-WHS-SCL-M2-IN-0002

NOTES

1. For combined proposed services refer to drawings LLADCO-3C-ACM-AIR-UTL-DR-IN-0001 & 0003.
2. For existing services refer to LLADCO-3C-ACM-AIR-UTL-DR-CE-0008.
3. All the utilities that are to be removed from the proposed development area to be fully investigated and diversion plans, where required, put in place prior to removal.
4. Taxiway foxtrot constructed in 2019. Information added from construction drawing 1174-FJO-LTN-00-DR-C-0700_C04. Information to be updated with as built details when available.
5. Critical elements for the site clearance are substations and HV cables. No work on these elements shall commence prior making those elements redundant.
6. Clearance to proposed service corridors not shown where reinstatement is to match existing.
7. Clearance of soft and hard landscaped areas limited to topsoil strip in soft and clearance to formation of pavement in hard landscape areas.
8. Tree removal proposed within the area of designated Ancient Woodland would be for arboricultural reasons only.

Revision History	Drawn	Checked	Approved	Date	Rev
SUITABLE FOR INFORMATION	OZ	SR	AE	05/10/20	P01
FOR INFORMATION	AM	SR	AI	07/09/21	P02
FOR INFORMATION	HAH	SR	AE	16/09/21	P03



Luton Rising
Hart House Business Centre
Kimpton Road, Luton, LU2 0LA
www.lutonrising.org.uk

London Luton Airport Development Consent Order

Drawing Title: SITE CLEARANCE TO 32 MPPA PHASE

Purpose of issue: SUITABLE FOR COORDINATION
Suitability: S1

Drawn	Checked	Approved	Date	Scale	Size
H.A.Hassan	S.Robinson	A.Evans	16/09/21	1:5000	A1

DCO Application Ref: TR020001
APFP Regulation:
DCO Document Ref:

Drawing Number: LLADCO-3C-ACM-WHS-SCL-DR-IN-0003
Project – Phase – Originator – Asset/Zone – Sub Asset – Type – Discp. – Number
Revision: P03

Appendix E – Water Demand

Phase 1										
	Potable Water								Foul Water Discharge	
	Unit / Rate	Litres	Quantity	Total Litres		working days per month	Total Litres per month	m3 of water per month	% discharged	m3 of water per month
Offices & Compounds										
Welfare Facilities (inc canteen) & compound	l/per person per day	40	400	16,000	per/d	22	352,000	352	100%	352
Wheel wash	l/per cycle	40	45	1,800	per/d	22	39,600	40	0%	0
Site Control posts	l/per cycle	40	10	400	per/d	30	12,000	12	100%	12
Logistics Centre	l/per cycle	40	45	1,800	per/d	22	39,600	40	100%	39.6
Concrete Batching										
Concrete batching plant	l/per m3	200	3,000	600,000				600	0%	0
Washdown	l/per cycle	50	45	2,250	per/d	22	49,500	50	80%	39.6
Dust Suppression	l/per tanker	1000	assume 1 per hour	8,000	per/d	22	176,000	176	0%	0
Bulk Earthworks										
Dust Suppression (earthworks)								250	0%	0
Stockpiling and Landscaping								100		0
Internal roads and Landscaping mitigation										
Dust Suppression	l/per tanker	2000	assume 1 per hour		per/d	22	0	0		0

Road Sweeping								100	20%	20
										0
Terminal building	average site consumption							50	25%	12.5
Airfield	average site consumption							100	25%	25
Commercial Development	average site consumption							50	25%	12.5
							Total	**1919**	**Total**	**513**

Phase 2a											
	Potable Water									**Foul Water Discharge**	
	Unit / Rate	**Litres**	**Quantity**	**Total Litres**		**working days per month**	**Total Litres per month**	**m3 of water per month**		**% discharged**	**m3 of water per month**
Offices & Compounds											
Welfare Facilities (inc canteen) & compound	l/per person per day	40	1,200	48,000	per/d	22	1,056,000	1056		100%	1056
Wheel wash	l/per cycle	40	90	3,600	per/d	22	79,200	79		0%	0
Site Control posts	l/per cycle	40	10	400	per/d	30	12,000	12		100%	12
Logistics Centre	l/per cycle	40	90	3,600	per/d	22	79,200	79		100%	79
Waste recovery centre	l/per cycle	40	10	400	per/d	30	12,000	12			
Concrete Batching											
Concrete batching plant	l/per m3	200	8,900	1,780,000				1780		0%	0
Washdown	l/per cycle	50	90	4,500	per/d	22	99,000	99		80%	79.2
Dust Suppression	l/per tanker	1000	assume 1 per hour	8,000	per/d	22	176,000	176		0%	0
Bulk Earthworks											
Dust Suppression (earthworks)								250		0%	0
Stockpiling and Landscaping								100			0

Internal roads and Landscaping mitigation										
Dust Suppression	l/per tanker	2000	assume 1 per hour	16,000	per/d	22	353,000	352		0
Road Sweeping								100	20%	20
										0
Terminal building	average site consumption							200	25%	50
Airfield	average site consumption							100	25%	25
Commercial Development	average site consumption							200	25%	50
							Total	**4,595**	**Total**	**1371**

Phase 2b

	Potable Water								Foul Water Discharge	
	Unit / Rate	**Litres**	**Quantity**	**Total Litres**		**working days per month**	**Total Litres per month**	**m3 of water per month**	**% discharged**	**m3 of water per month**
Offices & Compounds										
Welfare Facilities (inc canteen) & compound	l/per person per day	40	600	24,000	per/d	22	528,000	528	100%	528
Wheel wash	l/per cycle	40	65	2,600	per/d	22	57,200	57	0%	0
Site Control posts	l/per cycle	40	10	400	per/d	30	12,000	12	100%	12
Logistics Centre	l/per cycle	40	65	2,600	per/d	22	57,200	57	100%	57
Waste recovery centre	l/per cycle	40	10	400	per/d	30	12,000	12		
Concrete Batching										
Concrete batching plant	l/per m3	200	6,600	1,320,000				1320	0%	0
Washdown	l/per cycle	50	90	3,250	per/d	22	71,500	72	80%	57.2

Dust Suppression	l/per tanker	1000	assume 1 per hour	8,000	per/d	22	176,000	176	0%	0
Bulk Earthworks										
Dust Suppression (earthworks)								250	0%	0
Stockpiling and Landscaping								100		0
Internal roads and Landscaping mitigation										
Dust Suppression	l/per tanker	2000	assume 1 per hour	16,000	per/d	22	352,000	352		0
Road Sweeping								100	20%	20
										0
Terminal building	average site consumption							200	25%	50
Airfield	average site consumption							100	25%	25
Commercial Development	average site consumption							200	25%	50
							Total	**3,536**	**Total**	**799**

Appendix F – Primary Construction Plant

NRMM Vehicle Type	Works / Use	Phase 1	Phase 2a	Phase 2b	Number	Estimated Number of Plant per Location												Fuel Type	Power Output (kW)	Total Number of Machine Days on Site (per phase)			Operating Hrs
						Utilities	Earthworks	Airfield	Drainage	Demolition	CPAR 1	CPAR 2	Car Parks	Landfill	DART	Terminal 2	Landside						
							Mar - Oct							Mar - Oct						Ph.1	Ph.2a	Ph.2b	
360-hydraulic excavators (40T)	Bulk excavation, car park, airfield, landfill, DART, CPAR, landside buildings	✓	✓	✓	**8**		2							2	2	2		diesel	235	400	5356	2582	8
360-hydraulic excavators (20T)		✓	✓	✓	**26**	2	2	2	2		3	3	2	2	2	4	2	diesel	234	5038	13659	12429	8
360-hydraulic long reach excavators	Demolition	✓	✓		**4**	2				2								diesel	234	258	1162	516	8

Crusher	Demolition		✓		**1**					1								diesel	315	0	387	0	6
Rigid Heavy Goods Vehicles (HGV)	Excavated material removal, bulk aggregates, concrete deliveries.	✓	✓	✓	**60**	6	4	4	4	4	4	4	4		8	10	8	diesel	239	10338	35040	24860	8
All terrain articulated dumper (40T)	Bulk earth works	✓	✓	✓	**39**		10	4	4		5	5	5	2	4			diesel	350	9701	21555	20463	8
Dumper (9T)	General earthworks	✓	✓	✓	**26**	6					4	4	4	2	2	2	2	diesel	55	9701	21555	10576	6
GPS Bulldozer	Bulk earthworks		✓	✓	**10**	2	4				1	1	1	1				diesel	126	2075	5043	4901	8
Soil stabiliser	Bulk earthworks		✓	✓	**3**	1	1							1				diesel	126	329	968	903	8
Roller	Bulk earthworks	✓	✓	✓	**10**	2	2	1			1	1	1	1	1			diesel	95	2264	4871	4600	8

Compressors	Demolition, concrete works, road works	✓	✓	✓	**36**	4		2	4	2	4	4	2		4	6	4	diesel	95	6064	18758	15398	8
Concrete Paving Machine	Airfield – concrete pavement	✓	✓	✓	**1**			1										diesel	140	589	516	989	8
Asphalt paving machine	Roads and car parks	✓	✓	✓	**5**						1	1	2				1	diesel	140	1776	2860	2449	8
Roller	Roads and car parks	✓	✓	✓	**2**												2	diesel	95	520	774	516	8
Telehandler Forklift	Materials handling		✓	✓	**25**	2		2	2	2	2	2	4		3	4	2	diesel	129	5118	14928	10492	8
Tower Cranes	General lifting – foundation and superstructure		✓		**6**											4	2	electric		520	4950	1808	8
Mobile Truck Mounted concrete pump	Building superstructure, concrete works		✓	✓	**10**										2	4	4	diesel	129	1040	7444	3616	8

Concrete mixer truck	Electric concrete mixer truck	✓	✓	✓	**26**			4	2		4	2	2		4	4	4	diesel	125	5560	15378	13504	8
Mobile Cranes (100T)	Erection steel work, lifting plant and equipment (ETP/STP)	✓	✓	✓	**11**				1		1	1			2	4	2	diesel	370	1103	7444	4777	8
General waste skips	Removal of site waste	✓	✓	✓	**53**	2		2	2	2	5	5	5		10	10	10	diesel	238	9251	33157	21075	8
Vans	Site transport, plant service, materials, general deliveries, etc.	✓	✓	✓	**24**	2	2	2	2	2	2	2	2	2	2	2	2	diesel	142	4520	11700	9718	8
Cars	Couriers / site transport	✓	✓	✓	**38**	2	4	4	2	2	4	4	4	2	4	2	4	petrol	142	8652	19892	17112	8
Access equipment (cherry pickers / MEWPs)	Personnel access for works at height	✓	✓	✓	**42**					2					10	20	10	diesel	53	2600	34124	15500	8

Appendix G – Waste Quantities

Material Category	Material density	Quantity to be used in construction		Wastage rate	Wastage		Potential recycled content (% by weight)	Potential recycled content (tonnes)
	(tonnes/m3)	m3	tonnes	%	m3	tonnes		
Phase 1								
Concrete (m3)	2.4	46,067	110,560	5	2,303	5,528	16	17,690
Asphalt (m3)	2.4	57,505	138,013	2.5	1,438	3,450	25	34,503
Steel - Structural (tonnes)	7.85	-	-	0	-	-	60	-
Steel - Rebar (tonnes)	7.85	-	-	2	-	-	100	-
Aggregate (m3)	1.9	33,708	64,046	5	1,685	3,202	50	32,023
Earthworks material (granular) - imported (m3)	1.9	72,000	136,800	5	3,600	6,840	50	68,400
TOTAL		**209,280**	**449,419**				**Total aggregate potential recycled content (tonnes)**	**152,616**
							%	**34**

Phase 2a								
Concrete	2.4	393,509	944,421	5	19,675	47,221	16	151,107
Asphalt	2.4	104,866	251,678	2.5	2,622	6,292	25	62,919
Steel - Structural	7.85	-	8,941	0	-	-	60	5,365
Steel - Rebar	7.85	789	6,197	2	16	124	100	6,197
Aggregate	1.9	461,384	876,629	5	23,069	43,831	50	438,315
Earthworks material - imported	1.9	72,000	136,800	5	3,600	6,840	50	68,400
TOTAL		**1,032,548**	**2,224,666**				**Total aggregate potential recycled content (tonnes)**	**720,742**
							%	**33**

Phase 2b								
Concrete	2.4	85,882	206,117	5	4,294	10,306	16	32,979
Asphalt	2.4	63,126	151,503	2.5	1,578	3,788	25	37,876
Steel - Structural	7.85	-	4,585		-	-	60	2,751
Steel - Rebar	7.85	296	2,324	2	6	46	100	2,324
Aggregate	1.9	137,087	260,466	5	6,854	13,023	50	130,233
Earthworks material - imported	1.9	179,000	340,100	5	8,950	17,005	50	170,050
TOTAL		**465,391**	**965,094**				**Total aggregate potential recycled content (tonnes)**	**371,137**
							%	**39**

Appendix H – Primary Material Quantities

Primary Materials Quantities

Total	Construction Phase 1 - 21.5mppa	Construction Phase 2a - 27mppa	Construction Phase 2b - 32mppa	Total
Concrete (m3)	46,067	393,509	85,882	525,457
Asphalt (m3)	57,505	104,866	63,126	225,497
Steel - Structural (tonnes)	-	8,941	4,585	13,526
Steel - Rebar (tonnes)	-	6,197	2,324	8,521
Aggregate (m3)	33,708	461,384	137,087	632,179
Earthworks material - excavated (m3)	130,000	1,331,000	1,728,000	3,189,000
Earthworks material (granular) - imported (m3)	72,000	240,000	179,000	491,000
Earthworks material - exported (m3)	3,000	32,000	2,000	37,000
Airfield				**Total**
Asphalt	10,577	47,374	21,448	79,399
Concrete Pavement	7,562	28,720	26,402	62,684
Lean concrete	14,452	70,457	29,520	114,428
Granular	22,972	88,191	52,409	163,573

Bulk Earthwork Quantities:

	Phase 1 (21.5mppa)	Phase 2a (27mppa)	Phase 2b (32mppa)		Total required to achieve 32 mppa
Materials excavated					
Topsoil	0	39,000	93000		132,000
Clay	0	108,000	311,000		419,000
Chalk	0	238,000	923,000		1,161,000
Landfill	27,000	312,000	11,000		350,000
Other made ground	103,000	583,000	162,000		848,000
Excavation of suitable stockpile		30,000	146,000		176,000
Excavation of landscape stockpile		21,000	82,000		103,000
Materials imported					
Starter layer	12,000	60,000	41,000		113,000
Base drain	19,000	99,000	69,000		187,000
Gravel for gas collection layer	41,000	81,000	69,000		191,000
Total	**202,000**	**1,571,000**	**1,907,000**		**3,680,000**
How reused					
Construction of Airside platform	108,000	675,000	1,345,000		2,128,000
Construction of Landside platform	0	217,000	5,000		222,000
Construction of Landside Cap	7,000	111,000	32,000		150,000
Landscaping	20,000	150,000	273,000		443,000
Stockpiled material for future use	21,000	82,000			103,000
Taken off site for disposal or recycling	3,000	32,000	2,000		37,000
Lost into formation	12,000	60,000	41000		113,000
Lost on compaction chalk	0	22,000	83,000		105,000
Lost on compaction landfill	2,000	16,000	1,000		19,000
Fill base of valley for carpark		48,000			48,000
Topsoil		13,000	31,000		44,000
Contingency (suitable stockpile)	30,000	146,000	93,000		269,000
Total	**203,000**	**1,572,000**	**1,906,000**		**3,681,000**

Appendix I – Assumptions

6.21.4 Presently, the strategy is based on the following assumptions:

a. T1 Building work is limited and self-contained and undertaken by LLAOL.
b. TDOZ stand construction is carried out prior to Phase 1 by LLAOL.
c. Airport access road is constructed in two phases. East and western sections are constructed in Phase 2a and the central section in Phase 2b.
d. We have assumed the haul road to the new Fire Training ground is an upgrade of an existing road to take construction vehicles.
e. The existing fire training ground remain in their current location until the new training ground is available.
f. Up to 10% of the landfill will be removed from site and all the remaining material will be reused as fill.
g. The landfill treatment compound if required will only be in place during the landfill earthwork operations and not required thereafter.
h. The bulk earthworks programme is based upon 1,000,000m3 being the estimated maximum earth that can be moved in a single earthwork season.
i. Project will adopt a high use of modular construction (standardised design; beams, columns, walls, slabs, door sets, toilet cubicle, building envelope, and mechanical and electrical components).
j. There will be early supply chain engagement.
k. High use of off-site construction for building services, fixed links, curtain walling, primary cores, risers and walkways.
l. Construction sequence and temporary works integrated in to design to speed construction process. For instance, sheet piling sacrificed.
m. Assume materials and labour availability are not compromised by other major schemes locally or nationally
n. We have preconditions imposed on us whereby the window for earthworks is seasonal, March to October. Any change to this window will affect the programme.
o. Early creation of the replacement open space is required to create space for new surface car parks (P6 and P7).
p. Vacant possession of existing structures will be achieved to enable construction of the AAR.
q. Construction of the new Hanger 24 is required before the existing hanger is demolished.