Easterly Alternation Infrastructure Project Circular Economy Statement (CES)

October 2024

Heathrow

This document has been prepared on behalf of Heathrow Airport Ltd by;

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It is intended to be submitted to the London Borough of Hillingdon as a supporting document for the Easterly Alternation Infrastructure project

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Abbreviations

Abbreviation	Definition
ACoW	Arboricultural Clerk of Works
AGL	Airfield Ground Lighting
AMS	Arboricultural Method Statement
AQMA	Air Quality Management Area
CCTV	Closed-Circuit Television
CDM	Construction (Design and Management)
CE	Circular Economy
CEMP	Construction Environmental Management Plan
CES	Circular Economy Statement
CIEEM	Chartered Institute of Ecology and Environmental Management
CLO	Community Liaison Officer
CLP	Community Liaison Plan
CRoW	The Countryside and Rights of Way Act 2000
CTMP	Construction Traffic Management Plan
EA	Environment Agency
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMS	Environmental Management System
EPA	Environmental Protection Act 1990
FRA	Flood Risk Assessment
GCN	Great Crested Newt
GHG	Greenhouse Gas
GLA	Greater London Authority
GLAAS	Greater London Archaeology Advisory Service
HGV	Heavy Goods Vehicle
HRA	Habitats Regulations Assessment
HSE	Health and Safety Executive
HSMP	Health and Safety Management Plan
HWCN	Hazardous Waste Consignment Note
IEMA	Institute of Environmental Management and Assessment
KPI	Key Performance Indicator
LAeq	Equivalent Continuous Sound Pressure Level
LBH	London Borough of Hillingdon
LOAEL	Lowest Observed Adverse Effect Level
LSE	Likely Significant Effect

Abbreviation	Definition
MAGIC	Multi Agency Geographic Information for the Countryside
MEWP	Mobile Elevated Working Platform
MMP	Materials Management Plan
NERC	Natural Environment and Rural Communities Act 2006
NRM	New Rules of Measurement (developed by the RICS)
NRMM	Non-Road Mobile Machinery
OCEMP	Outline Construction Environmental Management Plan
PALS	Plan, Attitude, Lead, Share (Behavioural Based Safety Programme)
PEA	Preliminary Ecological Appraisal
PEP	Project Environmental Procedure
PM10	Particulate Matter with a diameter of 2.5 microns or less
PM2.5	Particulate Matter with a diameter of 10 microns or less
PPE	Personal Protective Equipment
PPG	Pollution Prevention Guidelines
PQC	Pavement Quality Concrete
PRoW	Public Right of Way
QMP	Quality Management Plan
RAMS	Risk Assessments and Method Statements
RCC	Roller Compacted Concrete
RICS	Royal Institute of Chartered Surveyors
RPA	Root Protection Area
SAC	Special Area of Conservation
SME	Small and Medium Sized Enterprises
SMP	Site Management Plan
SOAEL	Significant Observed Adverse Effect Level
SPA	Special Protection Area
SSSI	Site of Special Scientific Interest
SWMP	Site Waste Management Plan
TBT	Toolbox Talk
TCPA	Town and Country Planning Act
WCA	The Wildlife and Countryside Act 1981 (as amended)
WTN	Waste Transfer Note
ZoI	Zone of Influence

1. Executive Summary

1.1.1 This Circular Economy Statement (CES) has been prepared by VolkerFitzpatrick Ltd (VFL) on behalf of Heathrow Airport Limited ("Heathrow").

1.1.2 It will be used to support an application for planning consent for development of infrastructure that will facilitate full runway alternation when Heathrow Airport ("the Airport") is operating in an easterly direction ("the Proposed Development").

1.1.3 It provides a description of the works proposed in the construction phase and highlights the mitigation commitments and the required monitoring and management of specific environmental effects where required, including;

The potential for re-use and recycling materials derived from the demolition of existing infrastructure and re-use (either as recovered or through processing by crushing and screening);

- back into the new works
- into the local construction market
- minimising materials that would otherwise be regarded as waste

1.1.4 It reviews the opportunities for recycling during the course of construction.

1.1.5 The principal features of the works comprise;

- Re-configuring the airfield pavements and supporting infrastructure at the western end of Heathrow Airport Runway 09L
- Provision of an enhanced noise mitigation barrier for the nearby village of Longford

1.1.6 It will be the responsibility of Heathrow, the appointed Designer(s) and Contractor to develop the Circular Economy Statement to support the Planning Application for the proposed works prior to the commencement of construction and continue to develop and report on the outcomes during the construction phase.

1.1.7 The CES will be reviewed and updated on a regular basis throughout the pre-construction period as the detailed design is developed and any environmental or construction measures are identified for the project.

1.1.8 This CES sets out the overarching principles behind the design, construction and management of the Proposed Development in such a way that it supports the Mayor of London's London Plan and its Policy SI 7; Reducing waste and supporting the circular economy (see Appendix A).

2. Overview *

2.1 Circular Economy Statement

2.1.1 The London Plan Guidance document on Circular Economy Statements (CES) sets out the information that needs to be submitted in each of the tables in the CES statement template spreadsheet ("gla_circular_economy_statements_template v1.1 May 23").

2.1.2 The CES spreadsheet has been developed as for a “Pre-App” stage using the Standard template in a MS-Excel format and will be included in any submission of the CES. The CES template will be updated at each of the various stages as the project goes through the Planning process, these being

- Pre-App Stage
- Detailed Application Stage
- Post Construction Stage

2.1.3 The guidance goes on to indicate those elements that a CE statement is expected to include in order that it demonstrates the requirements of Policy SI 7(B). These include;

- Circular Economy targets
- Circular Economy design approaches
- Circular Economy design principles
- Circular Economy design principles by building layer
- Pre-redevelopment audit and pre-demolition audit
- Bill of Materials
- Operational waste management plan
- Recycling and waste reporting
- Lessons learned and key achievements

2.1.4 Each of these key CES elements is marked by an * in the Index of contents and in the following sections of this document wherein we have expanded on each element as necessary.

2.1.5 Other supporting documents include;

A Construction Environmental Management Plan

2.1.6 The Construction Environmental Management Plan (CEMP) has been prepared by VolkerFitzpatrick Ltd (VFL) on behalf of Heathrow Airport Limited (“Heathrow”).

2.1.7 It will be used to support an application for planning consent for development of infrastructure that will facilitate full runway alternation when Heathrow Airport ("the Airport") is operating in an easterly direction ("the Proposed Development").

A Site Management Plan (SMP)

2.1.8 This document will be produced by the Principal Contractor, VolkerFitzpatrick and will be consistent with the provisions of the CEMP to provide more detail for the contractor on the following, outlining the key policies, procedures and management controls through which the project will be managed;

- Construction Phase Health and Safety Plan
- Environmental Plan (a key reference for the CEMP)
- Quality Plan

2.1.9 It will also provide the key references for records and data capture to support the CES.

2.2 Site Location and Context

2.2.1 Heathrow Airport is located approximately 15 miles west of Central London and lies within the administrative boundary of London Borough of Hillingdon (LBH). The Airport also borders the London Borough of Hounslow and Borough of Spelthorne. The Airport is situated on approximately 1,227 hectares (ha) of land and operates two parallel runways (Northern Runway 09L/27R and Southern Runway 09R/27L) with four operational terminals (Terminal 2 Terminal 3, Terminal 4, and Terminal 5).

2.2.2 The Airport is broadly bounded to the north by the A4, to the west by the A3044, to the east by the A30 and to the south by the Duke of Northumberland's River, as well as smaller connecting roads. Approximately 600m from the western perimeter of Heathrow lies the M25, with a direct link to Terminal 5 (T5) and the perimeter road from Junction 14a. The M4 provides an additional direct link to the Airport's central terminal area and the perimeter road from Junction 4 via a 'spur'.

2.2.3 The Site location plans are shown on the drawings in Appendix B.

2.2.4 The land on the Airport is largely comprised of hardstanding in the form of runways, terminal buildings, taxiways, aprons, and auxiliary buildings, as well as 'airfield' grassland that is heavily managed to avoid attracting birds and other wildlife.

2.2.5 The proposed location of the noise barrier, primarily comprises of semi-improved neutral grassland, semi-natural woodland, scrub, and semi-mature tree-lines, with small areas of amenity grassland. The Duke of Northumberland River flows from east to west, transitioning through various stages of channelisation along its route.

2.3 Description of the Proposed Development

2.3.1 The Cranford Agreement, which restricted the use of the northern runway for departures in an easterly direction, ended in January 2009 after public consultation.

2.3.2 Heathrow has not yet implemented runway alternation during easterly operations, because ground-based infrastructure (such as new taxiways and hold areas) is required to allow regular and scheduled departures on the northern runway in an easterly direction.

2.3.3 Heathrow is seeking planning permission for development of such infrastructure.

2.3.4 The proposed scope or works provides for enabling works to allow implementation of full runway alternation during easterly operations at Heathrow Airport including the creation of a new 'hold area' at the western end of the northern runway, the construction of new access and exit taxiways, the construction of an acoustic noise barrier to the south of Longford Village and temporary construction compounds.

2.3.5 The Proposed Development includes a relatively small area for construction works and are restricted to areas within the operational airfield to facilitate changes to taxiways and a small area for the construction of a noise barrier at the north-western end of the northern runway as shown in Figure 2.2.

2.3.6 The works (referred to as “Easterly Alternation Infrastructure”) are proposed to comprise the construction of the following components:

- Taxiways and links to comprise hold areas at the western end of Runway 09L.
- New Runway Access Taxiways (RATs) on Runway 09L.
- Other associated airfield works, e.g. new connector taxiways or crossing points.
- Areas of additional pavement may also be developed to enable aircraft to access and exit the runways.
- Changes to layout of aircraft stands (501 – 505) to the north of Heathrow Terminal 5.

2.3.7 An acoustic barrier to the south of the village of Longford is deemed to be required and has arisen following the results of ground noise modelling, landscape and visual assessment and stakeholder engagement. The approximate extent of the potential acoustic barrier is illustrated in Figure 2.2.

2.3.8 Accordingly, the construction of the acoustic barrier has also been included within the scope for the Circular Economy Statement (CES).

2.3.9 In addition to the infrastructure proposed above, to mitigate certain environmental impacts of the works, the Applicant will need to break out existing areas of redundant pavement on the existing airfield.

2.3.10 This is to restrict, as far as possible, any significant net increase in the proportion of paved areas across the Airport which could lead to increased run-off and flood volumes and require upgrading the airfield stormwater drainage facility.

2.3.11 These operational changes would distribute noise more equitably around the Airport, providing greater predictability and extending the benefits of runway alternation to communities under the flight paths during easterly operations. Periods of relief would be provided for all affected communities but the communities living west of the northern runway and east of the southern runway would experience respite from what have for decades been continuous overflying on easterly operations.

2.4 Circular Economy Policy

2.4.1 The Mayor of London's "London Plan" Chapter 9; Sustainable Infrastructure sets out in "Policy SI 7 that sets out policy objectives for "Reducing waste and supporting the circular economy" as follows (See also Appendix A);

"A Resource conservation, waste reduction, increases in material re-use and recycling, and reductions in waste going for disposal will be achieved by the London Mayor, waste planning authorities and industry working in collaboration to:

1) promote a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible

2) encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products

3) ensure that there is zero biodegradable or recyclable waste to landfill by 2026

4) meet or exceed the municipal waste recycling target of 65 per cent by 2030 (Note 167)

5) meet or exceed the targets for each of the following waste and material streams:

a) construction and demolition – 95 per cent reuse/recycling/recovery

b) excavation – 95 per cent beneficial use (note 168)

6) design developments with adequate, flexible, and easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food.

B Referable applications should promote circular economy outcomes and aim to be net zero-waste.

A Circular Economy Statement should be submitted, to demonstrate:

1) how all materials arising from demolition and remediation works will be re-used and/or recycled
2) how the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life
3) opportunities for managing as much waste as possible on site
4) adequate and easily accessible storage space and collection systems to support recycling and re-use
5) how much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy
6) how performance will be monitored and reported.

C Development Plans that apply circular economy principles and set local lower thresholds for the application of Circular Economy Statements for development proposals are supported."

2.4.2 The policy narrative goes on to state;

"Waste is defined as anything that is discarded.

A circular economy is one where materials are retained in use at their highest value for as long as possible and are then re-used or recycled, leaving a minimum of residual waste.

London should move to a more circular economy as this will save resources, increase the resource efficiency of London's businesses, and help to reduce carbon emissions. The successful implementation of circular economy principles will help to reduce the volume of waste that London produces and has to manage.

A key way of achieving this will be through incorporating circular economy principles into the design of developments."

2.4.3 It is also supported by Policy D3; Optimising site capacity through the design-led approach

"The adoption of circular economy principles for referable applications means creating a built environment where buildings are designed for adaptation, reconstruction and deconstruction. This is to extend the useful life of buildings and allow for the salvage of components and materials for reuse or recycling. Un-used or discarded materials should be brought back to an equal or comparable level of quality and value and reprocessed for their original purpose (e.g. recycling glass back into glass, instead of into aggregate)."

2.4.4 It will meet the Policy Objectives through planned design and construction arrangements by including an adopted design for the Easterly Alternation Infrastructure that takes into account the aspirations of the London Plan Policy SI7 statement. It maximises opportunities to support the policy through:

- Building in resource efficiency through effective pavement design and supporting functions such as drainage / stormwater infiltration arrangements
- Innovation in the chosen specifications and use of materials with potentially high carbon footprint – such as cement
- Recognizing opportunities within the design to keep products and materials at their highest use
- Encourages waste minimisation and waste prevention through the reuse and recycling of materials from redundant or surplus pavement areas
- Reducing resources required in the production and distribution of products by planning to use on-site facilities for

a) batching plant(s) for production of new concrete and asphalts and

b) crushing and recycling materials recovered from the works

- Planning on zero biodegradable or recyclable waste arising from the works being sent to landfill and
- Ensuring all temporary construction facilities such as welfare etc fully support waste diversion from landfill through use of local authority waste collection and recycling facilities.
- Planning to exceed the targets for the following waste and material streams:

c) construction and demolition waste – it is anticipated that the project will achieve 83% reuse/recycling/recovery of granular materials as outlined in Table I in Appendix I

d) surplus excavated materials – it is anticipated that the project will achieve 26% beneficial use of excavated materials as outlined in Table I in Appendix I.

e) The design of the scheme, once in operation does not produce any waste during its operational life and will not give rise to waste streams involving dry recyclates or food waste (i.e. no municipal waste).

2.5 Method Statement

2.5.1 Following initial discussion within the project team, this Circular Economy Statement has been drafted to inform and outline the circular economy strategy for the Easterly Alternation Infrastructure works.

2.5.2 A workshop to review the proposals with the design team has been held to review and confirm the approach for the circular economy strategy and to identify further opportunities for the development.

2.5.3 The notes from further review meeting(s) will be included in Appendix J.

2.5.4 The project has adopted an holistic approach the design wherein we have identified opportunities to maximise retention, re-use and recycling and targets for the project.

2.5.5 The focus has been to create an infrastructure design which encourages the circular economy principles to be embedded in the initial or concept design, rather than an afterthought.

2.5.6 Having a clear understanding of the objective of the London Plan policy SI7, the concepts of circular economy were designed in to the project at the outset. The design approach follows the following framework:

- **Retain** – Retaining and repurposing areas of existing airfield pavement and associated infrastructure such as airfield ground lighting where possible.
- **Reuse** – Reusing existing areas of existing airfield pavement and associated infrastructure such as airfield ground lighting. Reusing existing materials, such as sub-base and sending the materials arising from demolished concrete areas for crushing to produce aggregate (also reducing embodied carbon).
- **Recycle** – to use materials recycled from the removal of existing airfield pavements etc and using other recyclable material for construction as far as possible - provided design construction quality and longevity is not compromised.
- This will include;
  - Re-using crushed concrete derived from PQ pavement areas for use as a proportion of aggregates in the production of Wet-Lean concrete (subject to suitable test results)
  - Re-using crushed concrete derived from all sources as a Granular Sub-Base (Type 1) in areas of new pavements
  - Re-use of excavated soils are to be considered for beneficial use;

    a) filling voids created by removal of redundant pavement areas under this project and

b) retained by Heathrow Airport to be used as inert filling on other projects across the wider airport estate

- Components and equipment from removed Airfield Ground Lighting (AGL) will be either re-used within this project (e.g. individual AGL components such as seating ring) or returned to the Heathrow Airport Engineering Store for future use as spares / replacement by the Airport's maintenance contractor.

2.5.7 Early-stage discussions and workshops were held with the key stakeholders in order to establish the most appropriate design layouts and construction features for the project.

2.5.8 Additional workshops may be undertaken at the detailed design stages with the Heathrow, the Design Team and Construction Team.

3. Circular Economy Targets *

3.1 Circular Economy Strategic Approach

3.1.1 This Circular Economy Statement has been prepared to reflect the design arrangements for the Easterly Alternation Infrastructure. This approach to design has been prepared in line with the principles outlined in the London Plan Guidance Document and the strategic approach outlined in this report shows how the proposed planned works follows the CE principles outlined therein;

1) Building in Layers (as applicable to this project)
2) Designing out waste
3) Designing for longevity
4) Designing for adaptability / flexibility
5) Designing for disassembly
6) Using elements or materials that can be re-used or recycled

3.1.2 These principles have been incorporated into the proposed design arrangements from the outset in order to support the CE aspirations of the London Plan.

3.1.3 The design and construction arrangements will allow appropriate targets for its CE to be met and in turn these will support the overall policy objectives of the London Plan.

3.1.4 The proposed project is a long-life development. It is not intended to be subject to regular change and as such its design has primarily been guided by its performance requirements and a need for longevity.

3.1.5 The design takes into account current and future projected aircraft loadings and movement geometry, thus carrying a large degree of future-proofing to meet the airport's needs during its design life.

3.1.6 As the development is designed to meet long term needs whilst also being durable and resilient to a changing climate, it can also can be incorporated into Heathrow Airport's normal maintenance activities without the need for adoption of special measures.

3.1.7 The design also pays due regard to an end-of-life strategy and will be suitable for re-purposing (if appropriate) or demolition and recovery / treatment / re-use of significant proportions of any materials arising.

3.2 Circular Economy Aspirations

3.2.1 A circular economy is one where materials are retained, reused and recycled at their highest value for as long as possible, with the ultimate goal of having no residual waste at all.

3.2.2 To make this possible requires the principle to lie at the heart of how projects are designed, built, operated and deconstructed.

3.2.3 Achieving a more circular economy will dramatically reduce the requirement for virgin materials and resources.

3.2.4 Any materials arising from the demolition phase that are surplus to this project can be considered initially for re-use on current and future projects within the Heathrow Airport estate and this will be Heathrow's initial aspiration.

3.2.5 For materials where there is no immediate or planned use, we have already identified nearby facilities whereby these surplus materials will still have significant value and can be fed back into the local economy on other construction projects outside the airport estate.

3.3 Circular Economy Goals

3.3.1 For this project, we have completed the 'CE targets and commitments' table in the CE statement template spreadsheet for the initial application stage tab. Subsequent stage tabs will be completed in accordance with subsequent planning stages.

3.3.2 In the table, we have outlined the targets that they are committing to, acknowledging that The London Plan Policy SI 7(A) targets should be set as a minimum level of compliance with that part of the policy.

3.3.3 We have provided an explanation for the target that we are committing to and how we intend to meet these targets and monitor performance, including the metrics to be used.

3.3.4 We have outlined how we will manage the excavation waste and this carries an initial focus on re-use within this project as far as is possible and thereafter on other projects within the wider Heathrow estate.

3.3.5 This project involves the partial demolition of a defined area of airfield pavement in the project area. The materials derived have been reviewed for their potential retention and inclusion into the proposed scheme (for which there is considerable potential) before other options are considered, including other projects within the Heathrow estate. These will be considered before off-site options are explored.

3.3.6 To maximise the potential for the re-use of materials on the project, we will identify a suitable area off-site for processing and storing of these materials before returning those that are to be re-used to the site for incorporation into the works.

3.3.7 With this in mind, we have already identified an established nearby recycling and processing facility where materials such as broken out concrete can be taken,

processed and stored. Once the materials have been processed, they will be brought back into site for incorporation within the works. This approach does have some logistical advantages in that it will allow initial buffering or supplies of, for example, granular sub-base type 1 across the project phasing.

3.3.8 After on-site opportunities for re-use of recovered materials (on this and future projects) have been exhausted, we will refer to the London Waste Map to consider other near-field opportunities for using local sites to manage surplus materials that have a secondary value and wastes.

3.3.9 Heathrow Airport will continue to keep under review a target to re-use as-yet unallocated surplus materials for use on other projects within the airport estate before exploring other off-site disposal opportunities. The potential for re-use in this way cannot be confirmed at this stage.

3.4 Circular Economy Numerical Targets and Commitments

3.4.1 The following outlines a high-level summary of the numerical targets this project has the potential to achieve.

Table 3.4; CES Targets

Approach for		Target
Existing site arrangements	Retain where appropriate	Maintain the overall area of impermeable paving as near to that of the existing aircraft movement areas to maximise continued use of existing storm water infiltration capacity and minimise any additional storm water run-off into drainage systems
Existing site arrangements	Demolition and recycle those parts not required	Section 3.10 and Table H in Appendix H of the CEMP outlines the re-use potential and quantities of significant materials derived from the project that are currently expected to be recycled back into the project as well as those that are surplus to the needs of the new design and construction. Further detail is outlined in the table below
Existing site arrangements	Excavated soils	The project has the capacity to re-use 26% of excavated soils back into the works.
		Heathrow Airport will target re-using the remaining 74% for filling on other projects within the airport estate before exploring other off-site opportunities. The potential for re-use cannot be confirmed at this stage
Existing site arrangements	Demolition of concrete airfield pavement areas and crushing for re-use	The project has the capacity to re-use 22% of crushed concrete materials back into the works as a partial replacement for primary aggregates in wet-lean concrete. This will be subject to testing and the accepted recycled % will be re-assessed as the detailed design and specification progresses.

Approach for		Target
		The project has the capacity to re-use 61% of other crushed and recovered sub-base materials back into the works as granular sub-base.
		The remaining 17% of recovered granular materials is expected to be recycled through a local construction materials recycling centre for use on other construction projects in the area.
Existing site arrangements	Airfield Ground Lighting (AGL); there is potential for re-use of some existing AGL units removed from redundant pavements	Undamaged seating rings from existing removed AGL units can be re-used in new AGL positions subject to compatibility and inspection following removal. Any re-use subject to specification and compatibility with the design arrangements This will remain a target only at this stage and the potential re-use % will be re-assessed as the detailed design and specification progresses.
		Undamaged components from existing removed AGL units are still expected to retain some useful operational life and can be taken into Heathrow Engineering Store stock to be made available for normal maintenance / emergency repair Target >80% retention into Heathrow Engineering Store
New construction	Use processed recycled or re-used materials where appropriate	Granular sub-base materials to be derived from recycled / re-used materials arising from the site (see above). Target >95% derived from materials recycled from the project
New construction	Primary Aggregates for Wet Lean Concrete	There is potential for partial replacement of primary aggregates in wet-lean concrete (subject to testing) This will remain a target only at this stage and the potential re-use % will be re-assessed as the detailed design and specification progresses.
New construction	Primary Aggregates for PQC and RCC Concretes	At this stage, specification and testing requirements preclude the use of recycled primary aggregates in PQC and RCC Concretes. Target 0%
New construction	Primary Aggregates for Asphalt	At this stage, specification and testing requirements preclude the use of recycled primary aggregates in Asphalt. Target 0%
New construction	Granular sub-base materials	Granular sub-base materials to be derived from recycled / re-used materials Target >95%
New construction	Temporary asphalt materials	Temporary asphalt materials to be recovered and recycled back into new asphalt. Target >95%

Approach for		Target
New construction	Cementitious materials	Cementitious materials required for new concrete will maximise allowable use of GGBS and / or PFA as permitted by quality standards and specification. Target >95% of concrete types will contain GGBS and / or PFA (these are recycled materials in themselves)
New construction	Fines for Asphalt	Fine or cementitious materials required for new asphalt will maximise allowable use of GGBS and / or PFA and / or Silica dust etc. as permitted by quality standards, specification and testing. Target >95% (these are recycled materials in themselves)
New construction	Steel used in acoustic barrier	Steel materials to use materials from recycled steel sources. Target >100%
New construction	Timber used in acoustic barrier	Timber to be from registered FSCS certified sources Target >100%

4. Circular Economy Design Approaches *

4.1.1 The design for this project enables a high proportion of materials derived during the demolition phase;

- to be re-used “as recovered” on this project, or
- to be re-used “as recovered” to enable their re-use on other projects, or
- to be processed and then re-used on this project, or
- to be processed and then re-used on this project in a lower value element within the works, or
- to be processed and then re-used on other projects.

4.1.2 This approach inter-alia, reduces the amount of waste generated by the development during its construction, operation and end of life decommissioning.

4.1.3 The Easterly Alternation Infrastructure design has been developed with this aspiration in mind from the outset, giving Heathrow the best possible chance of achieving these goals.

4.1.4 The design is straightforward, based on current technology, construction techniques and materials, some elements of which are able to be re-used, re-cycled and repurposed materials arising from the works are outlined in Section 3.4, Table 3.4 above.

4.1 GLA Circular Economy Statement Guidance Table -1

GLA Guidance indicates that the CES assessment should be based on Table 1 below, which references the Royal Institute of Chartered Surveyors (RICS) New Rules of Measurement building elements where relevant which then form the basis of CE statement reporting, particularly from outline application stage in the Bill of Materials.

Table 4.1; Building Layer Summary Table 1

Table 1	**Building layer summary and equivalent building element/RICS reference**	
Layer	Summary and Constituent Elements	**RICS References**
Site	The geographical location, context, external works, earthworks & landscaping	NRM 8 – External Works
	Airfield Pavements The principal part of the works comprises excavation, demolition and construction of areas of operational airfield pavement	NRM 8.1.1 – Roads / Paving NRM 8.1.3 External Fixtures (Airfield Ground Signage)

Table 1	Building layer summary and equivalent building element/RICS reference	
Layer	Summary and Constituent Elements	**RICS References**
Skin / Shell / Facade	The layer keeping out water, wind, heat, cold, direct sunlight and noise. Includes exterior surfaces such as the roof, siding, sheathing and windows. N/A	N/A
Super-structure	Above ground elements	NRM 2.1.1 Structural steel support for the Longford Acoustic Barrier
Sub-structure	Excavations and below ground elements, including;	NRM 1 Substructure airfield pavements NRM 1.1 Foundation / Piling for the Longford Acoustic Barrier
Services	M&E Installations to enable the infrastructure to function, including; Airfield Ground Lighting Airfield Drainage Systems	NRM 5 Services (MEP) NRM 5.5.5 Specialist installations (AGL) NRM 5.5.6 Builder' Work in connection with services (AGL)
Space / Space Plan / interior / interior space	This project does not result in "a building" with an internal space. The Layout of the works comprises only the reconfigured operational airfield in the vicinity of Runway 09L	N/A
Stuff / Contents	Nothing would be described here as possibly "falling out" if the development were turned upside down	N/A
Construction Materials	Any temporary installations / works / materials, packaging and equipment	NRM 0

The RICS NRM references are drawn from the RICS New Rules of Measurement, a standardised set of measurement and reference for different categories of works

4.2 GLA Circular Economy Statement Guidance Table -2

GLA Guidance notes relating to Circular Economy design approaches for existing buildings refers to the decision tree which should be followed to inform the design process for the development from the outset.

Ideally, it should be informed by any pre-redevelopment and pre-demolition audits where possible, however, these have not yet been carried out.

Graphic 4.2; Annotated - Decision Tree for Design Approach for the Project

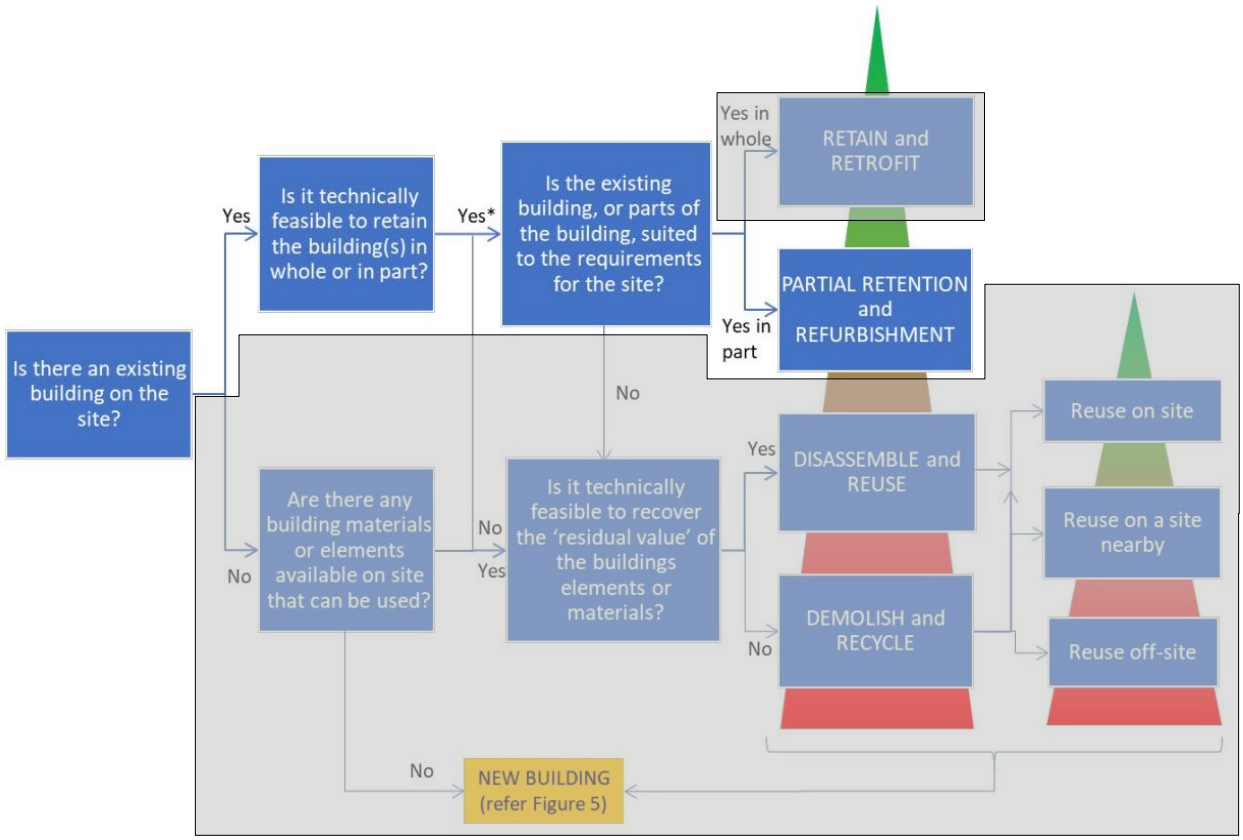


Table 2; CE Design Approaches for Existing Structures

The Table 2 below outlines the CE design approaches for existing structures and design choices made following the principles derived from decision tree

Table 2	CE Design Approaches for Existing Structures
Design Approach Choices for Existing Structures The decision Tree for Design Approaches for Existing Structures outlined in the London Plan guidance document is more compatible for considering the approaches to take for buildings as opposed to Airfield Infrastructure. However, there is merit to outlining the design decisions chosen for this project which are outlined below.	
Retain and Retrofit	The configuration of the Eastern Alternation Infrastructure at the west end of Runway 09L would not meet the requirements and future needs for the airfield.

Table 2	CE Design Approaches for Existing Structures
	A simple addition of extra areas of airfield taxiways would, inter-alia, have significantly increased the requirements for stormwater drainage for areas that would have become classified as redundant as far as the needs for future aircraft movement was concerned and would place an increased burden of the airport's stormwater management systems, maintenance etc. Removal of these areas was a decision to mitigate the extent to which stormwater management was required. Thus, the existing arrangements were not to be retained as a whole.
Partial Retention and Refurbishment	The design approach concluded that some, but not all of the existing airfield pavements should be retained, added to, where necessary to cater for the future needs of the operational airfield
Disassemble and Re-use	Not Applicable as there are existing structures on the site that are being re-used for future needs. Although there are areas of the airfield pavement structures that the design has planned to be removed, the constituent elements of these will be recovered to take advantage of the residual value by both disassembly and re-use and through demolishing and recycling
Demolish and Re-Cycle	

5. Circular Economy Design Principles *

5.1 Design Development

5.1.1 The circular economy principles listed in the paragraphs below have been embedded in the design of this project from the beginning and will be incorporated through to design completion.

5.1.2 Further detail is provided below about how the design principles have been applied to the scheme to date and / or how they will be incorporated in the detailed design. This aligns with the Circular Economy Design approach outlined in previous sections, and repeats some of the same points.

5.2 Building in Layers

5.2.1 The concept of 'building in layers' typically applies to the construction of new buildings, where different parts of a building should be constructed to be accessible so that they can be maintained and replaced where necessary.

5.2.2 The current scheme involves the construction of new airfield pavements and associated underground services and the construction of a new noise barrier. The principle of 'building in layers' will be applied to the different infrastructure components (instead of the parts of a building). For example a new area of airfield pavement or a new section of the drainage network could be an infrastructure component. This will allow, where possible, the different elements of infrastructure to be maintained or replaced whilst limiting the impact it has on the other parts of the infrastructure.

5.2.3 The design principles by building layer are discussed in further detail within Section 6 below.

5.3 Design out Waste

5.3.1 To minimise the volume of waste, the following waste hierarchy approach has been and will continue to be applied as part of the design:

- Where possible existing infrastructure will be retained in-situ and continue to be used for its current purpose without any alteration or changes. For example the stands North of T5a have been retained in the current design with no infrastructure changes (and no creation of waste).
- Where infrastructure needs to be removed to accommodate the new design, the waste generated will be limited as much as possible by:
  - Re-using infrastructure in its current form in a different location, for example elements of a pre-cast underground service pit or AGL fittings can be recovered and reinstalled in a new location.

- Processing waste material so that it can be reused on the project, for example concrete pavement can be crushed and re-used as sub-base materials within the new pavement construction.
- Any remaining waste generated that cannot be reused on the project (or other airfield projects), for example excess ground fill, should be responsibly disposed of to maximise its potential re-use elsewhere for other users.

5.3.2 The design has considered both tie-in to the existing infrastructure and construction phasing to maximise the waste reduction opportunities outlined in the waste hierarchy steps above.

5.4 Design for Longevity

5.4.1 New infrastructure assets will be designed taking the required lifespan of the asset into consideration, and not just designed to meet minimum performance criteria.

5.4.2 For example all the rigid pavements, in line with Heathrow design standards and industry best practice, will be designed with a 30 year design life. As a result, a larger volume of materials may be required to construct the pavement compared to one with a shorter design life, however the 30 year design life pavement will last longer and be more efficient with respect to the overall life cycle of the asset.

5.4.3 In addition to the initial design criteria, being able to efficiently and safely maintain an asset is key to ensuring its operation life span is optimised. Therefore the design criteria of new assets will also consider and accommodate maintenance requirements.

5.5 Design for Adaptability / Flexibility

5.5.1 The proposed scheme involves constructing new taxiway infrastructure within an existing airfield, and a new noise barrier adjacent. Due to the strict regulations and design criteria associated with airfield design there is limited opportunity to adapt the use or have flexibility in what the new infrastructure is used for, either now or in the future. The principle of designing for adaptability / flexibility is better suited to building assets.

5.5.2 However, the design for the proposed scheme has been developed so there is some flexibility in how the area can operate – for example there is no single point of failure on the proposed taxiway network, this provides operational resilience that provides opportunity for maintenance access. This helps support designing for longevity as discussed above.

5.5.3 The design approach considers the removal of areas of redundant pavement, thus contributing to improve the drainage and resilience to risk of flooding. This approach minimizes the additional areas of drained pavement contributing to the airfield's overall drainage system, allowing infiltration of the previously redundant paved areas.

5.6 Design for Disassembly

5.6.1 Where viable, new infrastructure will be designed so material re-use is optimised at the end of design life and elements with a shorter design life can be replaced without requiring the demolition of other elements with a longer design life.

5.6.2 For example ducting under areas of new pavement will allow AGL fittings or cabling to be removed and replaced without cutting into the pavement surface (which subsequently helps optimise the lifespan and maintenance requirements of the pavement). The noise barrier design will consider the disassembly of the panels whilst retaining the rest of the structure (posts and foundation) which may be reused with new panels.

5.7 Design using systems, elements of Materials that can be reused and recycled.

5.7.1 Where practicable, the design will optimise the use of materials and elements that can be re-used and recycled. This will include using standard sizing where possible and specifying standard pre-cast elements – for example underground service pits.

5.7.2 This approach maximises the re-use and recycling opportunity, but can also makes the maintenance of assets more efficient as spare parts are more readily available.

6. Circular Economy Design Principles By Building Layer *

6.1.1 The proposed scheme is principally airfield pavements and its design does not readily appear to lend itself to a description of construction "in layers" as envisaged by the London Plan Policy SI7, the same principles nevertheless still apply

6.1.2 The proposed scheme design has been broken down into elements, however, as outlined in the Strategic Summary table 1.0 below in which we have demonstrated the opportunities that exist using the "building layers" approach to designed out waste, optimize material use and aim to keep building elements / materials in use after the end of their life cycle.

6.1.3 Existing pavements are being retained in service, where appropriate and design loading regimes can be accommodated. Building Layers (apropos the London Plan Guidance include;

Table 6.1; Layer Summary & Constituent Elements - Approach Strategy

Layer	Summary & Constituent Elements	Strategy
Site	The geographical location, context, external works, earthworks & landscaping	Retain and re-use
Skin / Shell / Facade	N/A	
Super-structure	Above ground elements – N/A	N/A
Sub-structure	Excavations and below ground elements, including;	Base design solution on re-use of all materials where possible
Sub-structure	Excavated Material	Relocate to temp stockpile and re-use for filling and / or landscaping
Sub-structure	Sub-base layers - Existing	Relocate to temp stockpile and re-use for new sub-base layers
Sub-structure	Demolished PQ Concrete pavement	Relocate to temp stockpile, crush and screen and re-use in new sub-base layers
Sub-structure	Demolished Asphalt pavement	Remove by milling, relocate to temp stockpile, and re-use in new sub-base layers
Services	Surface water drainage	Re-use of existing system – the design envisages removal of redundant paved areas to limit additional impermeable paved areas

Layer	Summary & Constituent Elements	Strategy
Services	Airfield Ground Lighting	Re-use of existing lighting where appropriate and re-use of recovered components from AGL removed from redundant pavement areas. Linking in of new airfield ground lighting to existing power and controls network

6.1.4 The design objective for the elements with a long-life cycle (> 25 years) is to design for provision of future considerations including longevity, adaptability and flexibility.

6.1.5 Well-designed and constructed concrete pavements can operate satisfactorily for many years and provide excellent serviceable lifespan with minimal maintenance

6.1.6 Those elements of Building layers that have shorter life expectancy (< than 25 years) such as Airfield Ground Lighting bulbs are designed for maximum life possible by using LED technology but are also designed with ease of maintenance in mind to be simple to change as part of a normal routine maintenance regime.

6.1.7 In terms of services, these comprise;

- Ducted electrical services to the Airport Ground Lighting system.
- Piped gravity drainage feeding into the wider Heathrow Airport stormwater network.
- Opportunities for demountable / re-useable scaffolds and barriers will be used as opposed to one-off uses wherever possible.
- Our normal environmental practice is to hold discussions with suppliers with regards to opportunities to:
    - Reduce packaging where possible
    - Return packaging of delivered equipment to supplier for reuse by supplier.

6.1.8 The construction stage work will factor in re-use of temporary materials used for ramps and trimming edges of asphalt layers and re-introduce these back into newly batched product in order to further optimise material demands and ensuring waste minimisation

7. Pre-redevelopment Audit & Pre-Demolition Audit *

7.1.1 The London Plan Policy SI7 requires that projects should consider both a Pre-Development Audit and a Pre-Demolition Audit as being important tools to establish whether any elements of the existing construction can be reclaimed and how these materials should be managed in the reclamation process.

7.1.2 From the point of view of the proposed works – extension and reconstruction of areas of airfield paving, the key features are not complex and comprise limited numbers of elements. It is therefore considered suitable for these audits to be included within the scope of this document.

7.1.3 The “demolition” works per-se, within Heathrow Airport comprise simple removal of specific areas of existing airfield paving and associated excavation works. This will be undertaken by the Principal Contractor and managed as part of the normal airfield construction works, including during scheduled night-time possession.

7.1.4 The Pre-Redevelopment Audit & Pre-Demolition Audit document has been included at Appendix C.

7.1.5 Pre-Construction information, including a copy of entries in the Register of Asbestos for the area of the proposed works has already been provided to the Design and Construction teams by Heathrow Airport in accordance with the Construction (Design and Management) Regulations 2015.

8. Implementation

8.1 Implementation Plan

8.1.1 The circular economy strategy will be reviewed by the design team throughout the various stages of the project (RIBA Stages 1 to 6).

8.1.2 The CE commitments will be maintained during design development and implementation. Any divergence from the commitments should only made when reasonably necessary.

8.1.3 Any further decisions that could be taken to enhance the project's contributions to the circular economy aspirations should be considered at each stage.

8.1.4 A record of Design Development and Implementation will be tracked through the Circular Economy, Design Review and Construction Progress Meetings (See Appendices B1, B2 and B3 for Minutes of Meetings)

8.1 Implementation Strategy

8.1.1 The proposed strategy for the existing infrastructure is to deconstruct and recycle the materials to the fullest extent practicable.

8.1.2 The Site Management Plan will contain a developed Site Waste Management Plan (SWMP), prepared by VolkerFitzpatrick following contract award. It will outline the key commitments for recovery of materials arising from the works and include the procedures and protocols for recovery and re-use of materials arising from the works and for those materials that cannot be re-used within the works, measures for sorting and diverting waste from landfill disposal, through either:

- Reusing the material on site
- Processing materials arising from the site (for example by crushing and screening) so they can be re-used in the works
- Processing materials arising from the site (for example by crushing and screening) so they can be re-used on other sites
- Reusing the material on other sites without processing
- Salvaging or reclaiming the material for reuse (for example taking suitable components to Heathrow's Engineering Store)

8.1.3 Waste materials that cannot be re-used within the works will be sorted into separate key waste groups according to the waste streams generated by the scope of the works either onsite or offsite through a licensed contractor for recovery.

8.1.4 The SWMP will also cover the following:

- Procedures and commitments for minimising non-hazardous waste in line with the benchmark commitments
- Procedures for minimising hazardous waste
- Procedures for monitoring, measuring and reporting hazardous and non-hazardous site waste
- Procedures for sorting, reusing and recycling construction waste into defined waste groups either on site or through a licensed external contractor

8.1.5 The SWMP will be in line with guidance provided by DEFRA, Building Research Establishment (BRE) and Waste & Resources Action Programme (WRAP). Where materials cannot be reused or recycled on-site, or on other projects within the Heathrow estate the project team will identify opportunities for potential reuse off-site.

8.1.6 Recycling and Waste reports and records will be reviewed and audited periodically and recorded in

- Review Meetings / Notes
- Lessons Learned and / or Key Achievements reporting
- The Post Completion Circular Economy Report

8.2 Programme

8.2.1 The following table outlines the high-level programme & timing for the Easterly Alternation Infrastructure works, including the pre-construction phase, planning and permitting stages.

8.2.2 A copy of the detailed programme can be found at Appendix D

Table 8.2; High-level programme Dates for the EAI works

Programme Stage		From	To
RIBA Stage 2; Concept Design			
Confirm the project CE goals to support the London Plan		Mar 2024	Jun 2024
RIBA Stage 3; Spatial Coordination			
Planning Application Process with LB Hillingdon and consultation with LB Hounslow and Spelthorne BC		Oct 2024	Apr 2025
RIBA Stage 4; Technical Design			
Environmental Permit (Duke of Northumberland River) - Application Process.		Oct 2024	Jan 2025
Discharge Pre-Construction Conditions		TBA	Jan 2025
RIBA Stage 5; Manufacturing and Construction		Jul 2025	Jun 2027
Construction Programme Phasing		Jul 2025	Jun 2027
Longford Acoustic Mitigation Barrier		Jul 2025	Oct 2025
Airfield Phase 1 – New 500 Stand Taxi-Lane		Nov 2025	Mar 2026
Airfield Phase 2 – Realignment of Link 56		Mar 2026	Nov 2026
Airfield Phase 3 – Realignment of Link 57		Nov 2026	Jun 2027
Airfield Phase 4	– Rapid Access Taxi-Lane E	Nov 2025	Jun 2026
	– Rapid Access Taxi-Lane W	Jun 2026	Nov 2026
RIBA Stage 6; Handover (In Stages)		Jul 2025	Jun 2027
RIBA Stage 7; Use (In Stages)		Jul 2025	Jun 2027
Discharge Post-Construction Conditions		Jun 2027	May 2028

Assumption; 1 year allowance for Discharge of Post-Construction Conditions

9. Quantum of Works

9.1.1 The following outlines the quantum of works contained in the proposed design arrangements;

9.1 Summary of Works related to the Acoustic Barrier near Longford Village

Table 9.1; Acoustic Barrier Works - Principal Quantities

Description	Quantity	Units
Longford Village Acoustic Barrier		
Acoustic Barrier	593	m
Reptile Fencing	215	m
Removal Existing 2.5m Barrier Panels to Store	238	Nr
Removal Existing Barrier Posts to Store	240	Nr
New Foundations	198	Nr
Excavate soils & remove to stockpile for re-use	199	m3
Structural concrete foundations	199	m3
Structural Steel Posts	198	Nr
Reinstatement Filling with Recovered Soils	< 5	m3
New Barrier Panels	196	Nr

9.1.1 A breakdown of the works content for each phase of the Acoustic Barrier works has been included in Appendix E.

9.2 Summary of Works related to the reconfiguration of the Airfield Paving taxiways;

Table 9.2; Airfield Paving Works - Principal Quantities

Description	Quantity	Units
Airfield Paving taxiways		
Construct New PQC Area (m2)	32,969	(m2)
Construct New Composite Area (m2)	6,653	(m2)
Construct New PQA Area (m2)	3,754	(m2)
Excavate Soils	34,724	(m3)
Breakout of Hard Material	14,149	(m3)
Type 1 Sub-base	8,676	(m3)
Wet Lean Concrete	5,509	(m3)
H6 PQC	20,564	(m3)
RCC	3,659	(m3)
Asphalt – Base	1,745	(T)
Asphalt – Binder	793	(T)
Asphalt – Surface	793	(T)
Reinstatement Filling with Recovered Soils	9,073	(m3)
Airfield Ground Markings – Centreline	2,614	(m)
Airfield Ground Lighting	306	(Nr)

9.2.1 A breakdown of the works content for each phase of the airfield works has been included in Appendix F

9.3 Bill of Materials *

9.3.1 The following table outlines the principal materials quantities required for the project

Table 9.31; Principal materials quantities required for the Longford Noise Barrier Works

Materials	Quantity	Units
Longford Noise Barrier Works		
Excavate soils & remove to stockpile for re-use or disposal	199	(m3)
Reptile Fencing	215	(m)
Structural concrete foundations	199	(m3)
Structural Steel Posts	198	(Nr)
New Barrier Panels (timber / clear)	196	Nr

Table 9.32; Principal materials quantities required for AEI Works

Materials	Quantity	Units
Airfield Easterly Infrastructure Works		
Excavate soils & remove to stockpile for re-use or disposal	34,724	(m3)
Excavate & Crush Concrete	14,149	(m3)
Granular Sub-Base (Type 1)	8,676	(m3)
Wet Lean Concrete	5,509	(m3)
Roller Compacted Concrete (RCC)	3,659	(m3)
H6 Pavement Quality Concrete (PQC)	20,564	(m3)
Asphalt - Base	1,745	(T)
Asphalt - Binder	793	(T)
Asphalt - Surface	793	(T)
Reinstatement Filling with Recovered Soils	9,073	(m3)
Airfield Ground Markings - Centreline	2,614	(m)
Airfield Ground Lighting	307	(Nr)

10. Operational Waste Management Plan (OWMP) *

10.1.1 The Principal Contractor operates an inclusive Operational Site Management Plan (SMP) procedure that includes the;

- Operational Health and Safety Plan
- Operational Quality Plan
- Operational Environmental Plan

10.1.2 The Site Management Plan (SMP) is developed based on a standardised format for consistency that is then made project specific and develops as a live document throughout the project duration.

10.1.3 It is complementary to the Principal Contractor's own Health & Safety, Environment, Quality and Sustainability Management System.

10.1.4 The SMP specifically addresses the Health & Safety, Environmental and Quality Assurance requirements for the project and falls under part 4 of the Construction (Design and Management) Regulations 2015 (CDM 2015).

10.1.5 It fulfils the requirements for Construction Phase Plans as envisaged by CDM 2015 Schedule 3.

10.1.6 The preparation of this plan also involves the Client, who is required under CDM to provide pre-construction information to every designer and contractor appointed as well as the Principal Designer (PD) who is also required to assist the Principal Contractor (PC) in preparing the Construction Phase Plan, providing all information they hold that is relevant to the construction phase including:

- Pre-construction information obtained from the Client
- Any information relating to foreseeable risks obtained from Designers.

10.1.7 The SMP is prepared before the construction phase begins

10.1.8 The Environmental Plan section of the SMP includes the Operational Waste Management Plan as a part of their Environmental Plan.

10.1.9 This is used to define the protocols, planning and recording how all waste and non-waste movements derived from the construction operations are managed. This is maintained as a live record throughout the duration of the works.

10.1.10 This provides an effective way of ensuring all waste duty of care information and waste movements can be captured and recorded in a single location.

10.1.11 A partial draft Site Management Plan (SMP) has been included as a standalone document for reference – please see Appendix G.

10.1.12 The ongoing live recording of waste movements etc during the operational phase will be undertaken electronically via a spreadsheet type application. A Sample printed copy of a Blank OWMP has been included as an example at Appendix H

11. Recycling and Waste Reporting *

11.1.1 Reporting all information with respect to recycling and waste reporting will be carried out through the Principal Contractor's Recycling and Waste Reporting procedure which falls within the Environmental Plan part of their Site Management Plan.

11.1.2 A partial draft Site Management Plan (SMP) has been included as a standalone document for reference – please see Appendix G.

11.1.3 The ongoing live recording of waste movements etc during the operational phase will be undertaken electronically via a spreadsheet type application. A Sample printed copy of a Blank OWMP has been included as an example at Appendix H

12. End of Life Strategy

12.1.1 The end of the life of the infrastructure built through this project has been considered in the planned design from an early stage to ensure it can be simply deconstructed.

12.1.2 The first priority was to ensure the works will last to its design life of 25 years as a minimum and possibly beyond this.

12.1.3 The expected lifespan will be subject to a suitably design and implemented inspection and maintenance regime including attention to pavement joints, airfield ground lighting and airfield markings.

12.1.4 The majority of the proposed works on the airfield pavements are constructed from conventional pavement quality concrete and / or asphalt together with underlying granular and or concrete sub-layers. These materials, when properly maintained, are expected to outlast the proposed design life of the project.

12.1.5 As such, at the end of its design life, if they are not required to be retained in service, the key structural materials are all recyclable, re-useable and can be re-used on site as crushed aggregate for future developments on the Heathrow estate.

12.1.6 Concrete, Asphalt and granular sub-base materials are by far the most significant materials used within the project.

12.1.7 At the end of the airfield pavement life, these materials can be milled or demolished to be crushed and re-used as recycled aggregate. Evidence from typical construction sites typically show that almost all such concrete or asphalt materials can be recovered in this way for recycling into aggregate, with minimal amounts sent to landfill.

12.1.8 Certain other features, such as airfield ground lighting are component led and have been designed with component longevity in mind (LED luminaires etc) and ease of replacement during routine maintenance activities.

12.1.9 We recognize too that over the lifetime of the development it is possible that further techniques will be developed to extend the life of key materials as well.

12.1.10 A summary of the potential for materials used within this project to be recycled has been included in the chart in Appendix I

13. Post Completion Circular Economy Report

13.1.1 We confirm that the Heathrow team will compile a Post Completion Circular Economy Report and this will be provided to the local authority and GLA.

13.1.2 The report will be provided within three months from project completion and will include a summary of revised versions of the circular economy performance, comparing actual figures against the initially predicted targets.

14. Lessons Learned & Key Achievements *

14.1.1 The following section is to capture Lessons Learned and Key Achievements for the Heathrow – Easterly Alternation Infrastructure. Whilst this is ultimately required to be completed after the conclusion of the project, it should be populated during the course of the project to ensure relevant aspects are captured as the works progresses.

14.1.2 It is expected that the project review meetings should include an agenda item for logging any Lessons Learned and Key Achievements and these would be noted in the minutes of meetings (See Appendix J) and summarised below

Table 14.1; Lessons Learned & Key Achievements

Ref	Minuted at Appendix Ref	Summary of Lesson Learned and / or Key Achievement
14.01		
14.02		
14.03		
14.04		
14.05		
14.06		
14.07		
14.08		
14.09		
14.10		
14.11		

15. Conclusion

15.1.1 This report summarises the waste and circular economy strategy for the proposed development in order to meet the sustainability requirements of Policy SI 7, “Reducing waste and supporting the circular economy policy” from the London Plan.

15.1.2 The Circular Economy Statement, together with its referenced appendices and other documents provides a template for Heathrow Airport to demonstrate the circular economy aspirations for the Easterly Alternation Infrastructure project and compliance with the policy requirements of the London Plan.

15.1.3 This CES template together with its supporting information is intended to be a live document, that will be updated at each of the various stages as the project goes through the Planning process, these being;

- Pre-App Stage
- Outline Application Stage
- Detailed Application Stage
- Post Construction Stage

15.1.4 An overall strategic approach was identified through the proposed design to maximise the re-use of materials arising from the existing infrastructure on the site and to re-use these where possible in the proposed new development.

15.1.5 The end of life strategy for the proposed development and potential future modifications to Heathrow Airport’s infrastructure has been considered from an early stage and has been outlined within this document.

16. Appendices

A *London Plan Policy SI 7*

B *Site Location Plans*

C *Pre-Redevelopment Audit & Pre-Demolition Audit*

D *Programme*

E *Works Content For Each Phase Of The Acoustic Barrier Works*

F *Works Content For Each Phase Of The Airfield Works*

G *Site Management Plan (Including Environmental Plan)*

H *Operational Waste Management Plan (OWMP)*

I *Summary Of The Potential For Materials Derived Within This Project To Be Recycled*

J *Review Meetings / Notes*

Appendix A London Plan Policy SI 7;

16.1.1 The Mayor of London's "London Plan" Chapter 9; Sustainable Infrastructure sets out in Policy SI 7 its policy objectives for Reducing waste and supporting the circular economy and can be found at;

16.1.2 https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf (pages 380-381). The following are extracts from the London Plan Document;

Graphic A - extracts from the London Plan Document

Policy SI 7 Reducing waste and supporting the circular economy

A Resource conservation, waste reduction, increases in material re-use and recycling, and reductions in waste going for disposal will be achieved by the Mayor, waste planning authorities and industry working in collaboration to:

1) promote a more circular economy that improves resource efficiency and innovation to keep products and materials at their highest use for as long as possible
2) encourage waste minimisation and waste prevention through the reuse of materials and using fewer resources in the production and distribution of products
3) ensure that there is zero biodegradable or recyclable waste to landfill by 2026
4) meet or exceed the municipal waste recycling target of 65 per cent by 2030[163]
5) meet or exceed the targets for each of the following waste and material streams:
   a) construction and demolition – 95 per cent reuse/recycling/recovery
   b) excavation – 95 per cent beneficial use[164]
6) design developments with adequate, flexible, and easily accessible storage space and collection systems that support, as a minimum, the separate collection of dry recyclables (at least card, paper, mixed plastics, metals, glass) and food.

B Referable applications should promote circular economy outcomes and aim to be net zero-waste. A Circular Economy Statement should be submitted, to demonstrate:

1) how all materials arising from demolition and remediation works will be re-used and/or recycled
2) how the proposal's design and construction will reduce material demands and enable building materials, components and products to be disassembled and re-used at the end of their useful life
3) opportunities for managing as much waste as possible on site
4) adequate and easily accessible storage space and collection systems to support recycling and re-use
5) how much waste the proposal is expected to generate, and how and where the waste will be managed in accordance with the waste hierarchy
6) how performance will be monitored and reported.

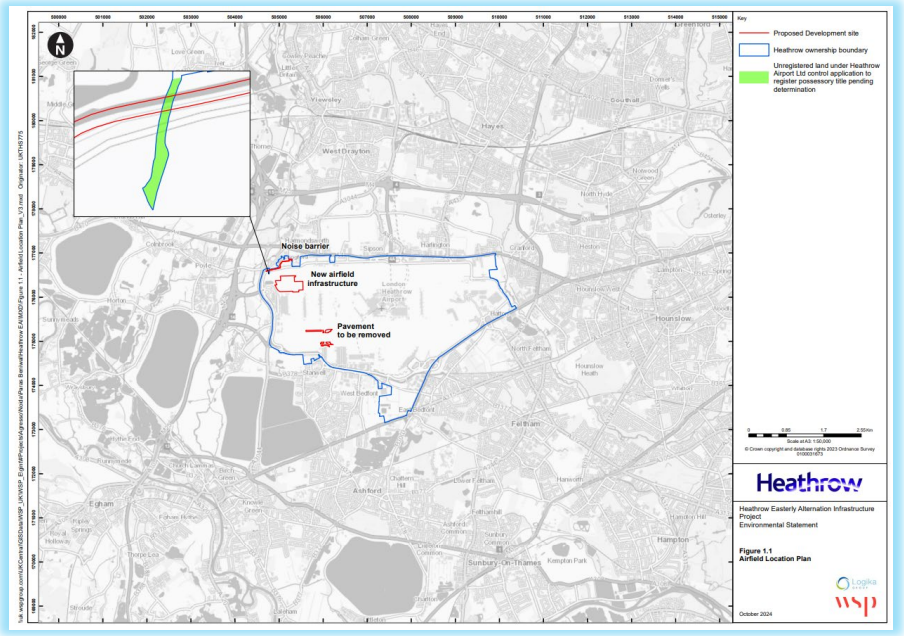
C Development Plans that apply circular economy principles and set local lower thresholds for the application of Circular Economy Statements for development proposals are supported.

Appendix B Site Location Plans

16.1.3 The Site Location Plans are given on the following drawings:

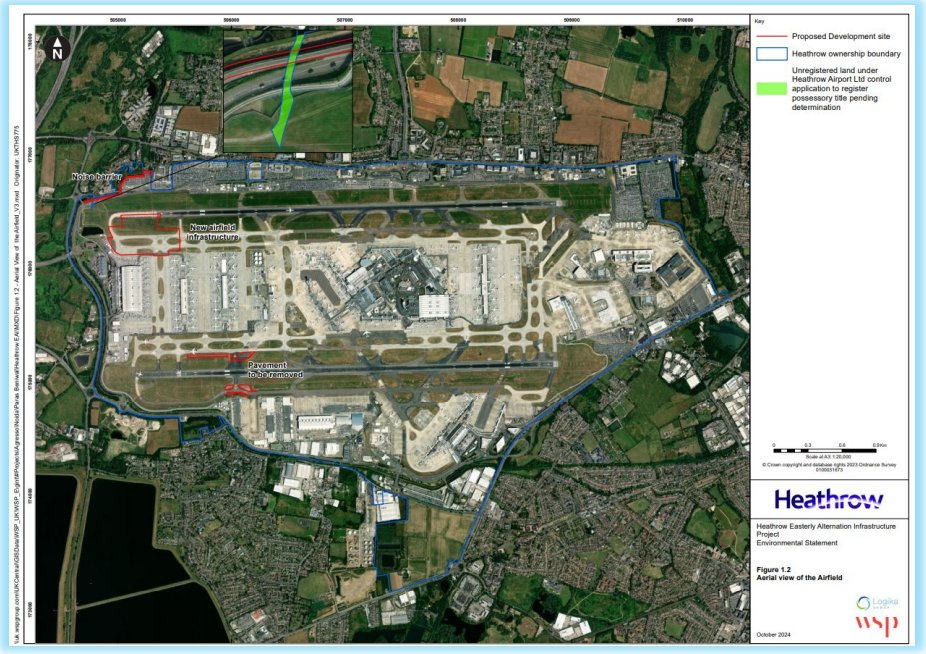
- WSP - Fig 2.1 (Airfield Location Plan)

Graphic B1 ; Site Location Plan



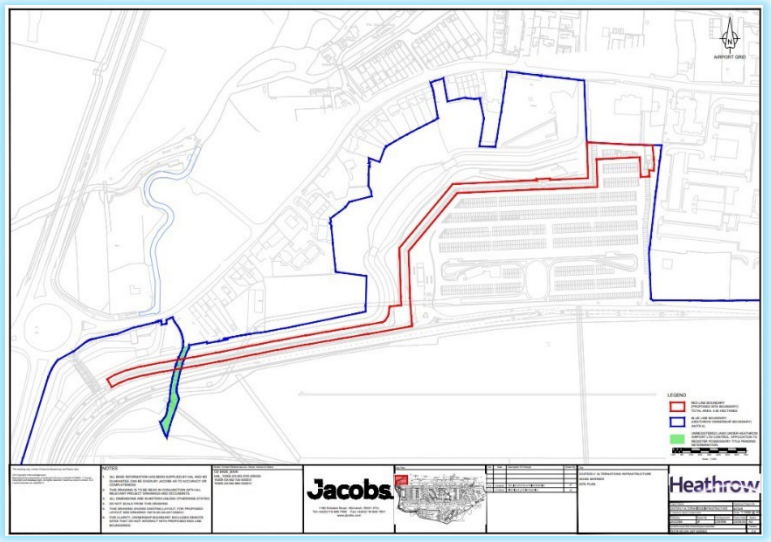
- WSP - Fig 1.2 (Location of the Proposed Development within Heathrow Airport's Boundary).

Graphic B2; Location within Heathrow Airport's Boundary



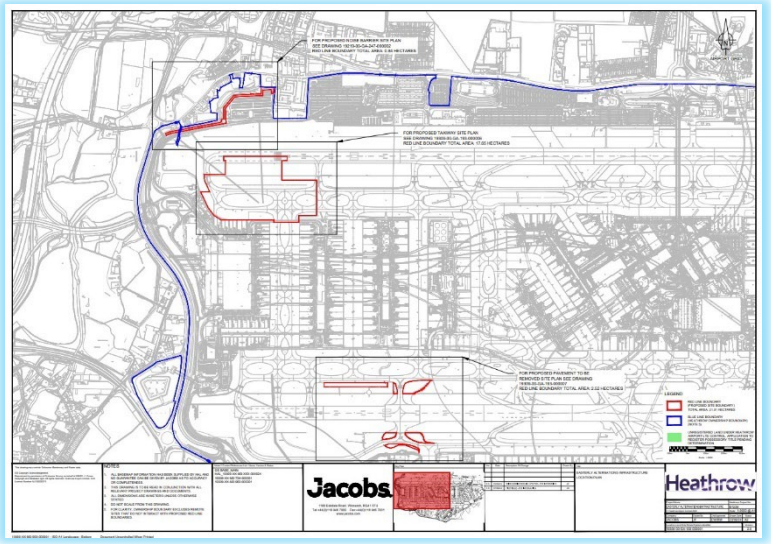
- Site Location Plan Longford Village Noise Barrier - Jacobs 19219-00-GA-247-000002_Longford Noise Barrier - Site Plan_v2.0

Graphic B3 ; Location of Longford Village Noise Barrier



- Site Location Plan Northern Runway Works - Jacobs 19309-00-GA-193-000001_Northern Runway - Location Plan_v2.0

Graphic B4; Location of Northern Runway Works



Appendix C Pre-Redevelopment Audit & Pre-Demolition Audit

16.1.4 The Pre-Redevelopment Audit & Pre-Demolition Audit documents will be provided by HAL through the Principal Designer in advance of contract award and issued as Pre-Construction Information. It will subsequently be included in the CES as supporting information

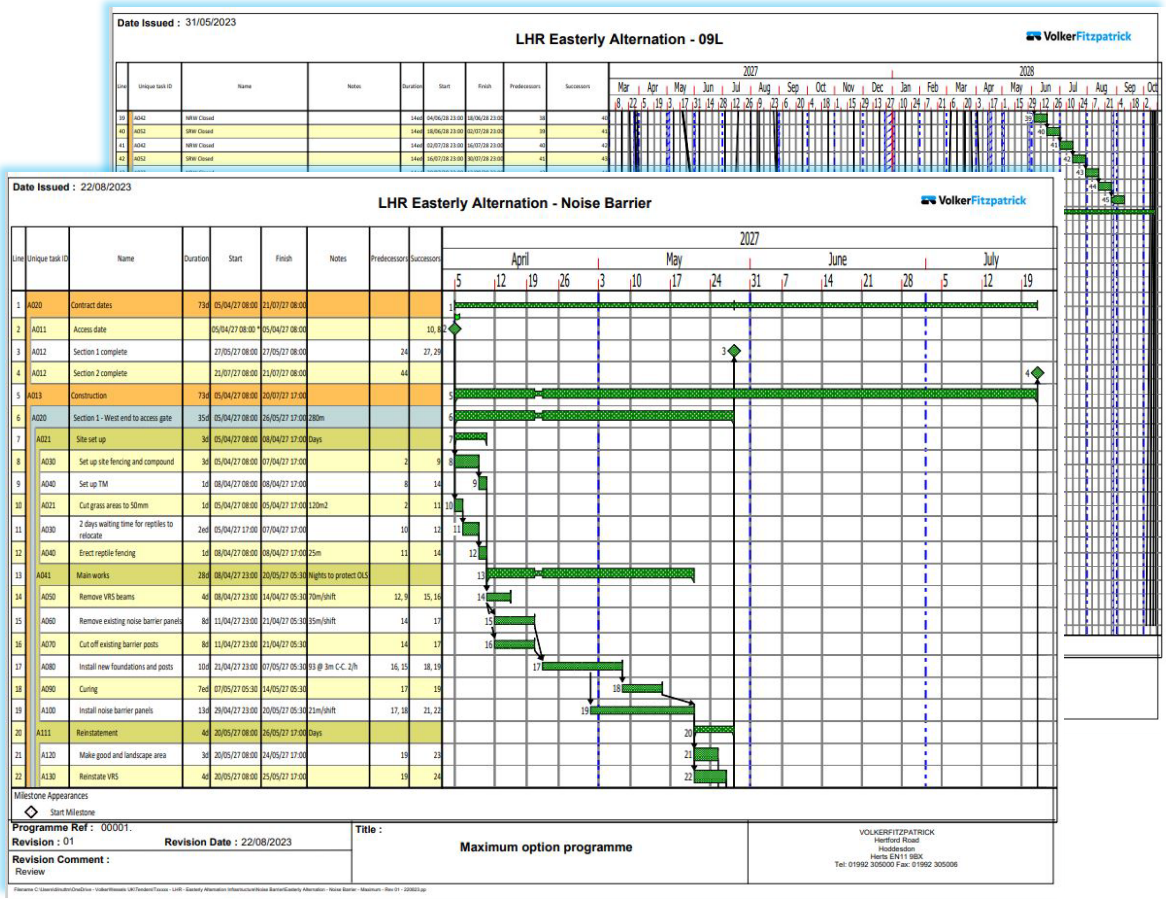
Appendix D Programme

16.1.5 Attached are copies (Separate Documents) of the Detailed Construction Programmes Ref;

- C15596 LHR Easterly Alternation – Noise Barrier - Programme Ref 00001 Rev 01
- C15596 LHR Easterly Alternation – 09L - Option 1 - Programme Ref 00001 Rev 04

Please note these are separate documents

Graphic D; Outline Programmes (attached as separate documents)



Appendix E Works Content For Each Phase Of The Longford Acoustic Barrier Works

Table E1; Acoustic Barrier Section 1

Description	Quantity	Units
Acoustic Barrier Section 1; West End to Access Gate	280	m
Reptile Fencing	25	m
Removal Existing Acoustic Barrier Panels to Store	112	Nr
Removal Existing Barrier Posts to Store	113	Nr
New Foundations	93	Nr
Excavate soils & remove to stockpile for re-use	93	m3
Structural concrete foundations	93	m3
Structural Steel Posts	93	Nr
Reinstatement Filling with Recovered Soils	0	m3
New Barrier Panels	92	Nr

Table E2; Acoustic Barrier Section 2

Description	Quantity	Units
Acoustic Barrier Section 2; Access Gate to East End	313	m
Reptile Fencing	190	m
Removal Existing 2.5m Barrier Panels to Store	126	Nr
Removal Existing Barrier Posts to Store	127	Nr
New Foundations	105	Nr
Excavate soils & remove to stockpile for re-use	106	m3
Structural concrete foundations	106	m3
Structural Steel Posts	105	Nr
Reinstatement Filling with Recovered Soils	0	m3
New Barrier Panels	104	Nr

16.1.1 Note circa 50% of the Noise Barrier will be constructed during daytime hours and 50% during night-time working to ensure that the works and Plant Equipment do not infringe the Airfield OLS

Appendix F Works Content For Each Phase Of The Airfield Works

Table F1; Airfield Works Phase 1

Description	Quantity	Units
Airfield Works Phase 1		
Construct New PQC Area (m2)	3,658	(m2)
Construct New PQA Area (m2)	2,281	(m2)
Excavate Soils	5,404	(m3)
Type 1 Sub-base	1,188	(m3)
Wet Lean Concrete	891	(m3)
H6 PQC	3,325	(m3)
Airfield Ground Markings - Centreline	537	(m)
Airfield Ground Lighting	63	(Nr)

Table F2; Airfield Works Phase 2

Description	Quantity	Units
Airfield Works Phase 2		
Construct New PQC Area (m2)	11,030	(m2)
Construct New PQA Area (m2)	1,468	(m2)
Excavate Soils	10,657	(m3)
Breakout of Hard Material	7,353	(m3)
Type 1 Sub-base	2,500	(m3)
Wet Lean Concrete	1,875	(m3)
H6 PQC	6,999	(m3)
Reinstatement Filling with Recovered Soils	6,636	(m3)
Airfield Ground Markings - Centreline	728	(m)
Airfield Ground Lighting	86	(Nr)

Table F3; Airfield Works Phase 3 (Days)

Description	Quantity	Units
Airfield Works Phase 3 (Days)		
Construct New PQC Area (m2)	13,320	(m2)
Excavate Soils	7,762	(m3)
Breakout of Hard Material	5,921	(m3)
Type 1 Sub-base	2,664	(m3)
Wet Lean Concrete	1,998	(m3)

Description	Quantity	Units
H6 PQC	7,459	(m3)
Reinstatement Filling with Recovered Soils	1,562	(m3)
Airfield Ground Markings - Centreline	829	(m)
Airfield Ground Lighting	98	(Nr)

Table F4; Airfield Works Phase 3 (Nights)

Description	Quantity	Units
Airfield Works Phase 3 (Nights)		
Construct New PQC Area (m2)	4,961	(m2)
Construct New PQA Area (m2)	5	(m2)
Excavate Soils	4,514	(m3)
Type 1 Sub-base	993	(m3)
Wet Lean Concrete	745	(m3)
H6 PQC	2,781	(m3)

Table F5; Airfield Works During Alternation Phase

Description	Quantity	Units
Airfield Works During Alternation Phase		
Construct New Composite Area (m2)	6,653	(m2)
Excavate Soils	6,387	(m3)
Breakout of Hard Material	875	(m3)
Type 1 Sub-base	1,331	(m3)
RCC	3,659	(m3)
Asphalt - Base	1,745	(T)
Asphalt - Binder	793	(T)
Asphalt - Surface	793	(T)
Reinstatement Filling with Recovered Soils	875	(m3)
Airfield Ground Markings - Centreline	520	(m)
Airfield Ground Lighting	60	(Nr)

Appendix G Draft Site Management Plan (Including Environmental Plan)

16.1.2 The Draft Site Management Plan has been prepared on behalf of Heathrow Airport Ltd by;

VolkerFitzpatrick Ltd
Hertford Road,
Hoddesdon,
Hertfordshire
EN11 9BX
United Kingdom

16.1.3 It is intended for use as a model framework system for the management of Health & Safety, Environment, Quality and Sustainability (HSEQS) on a working project. This document has been partially developed during the pre-construction stage as supporting information to a Construction Environment Management Plan developed for the proposed Easterly Alternation Infrastructure project. The document includes Pre-Construction drafts of the following;

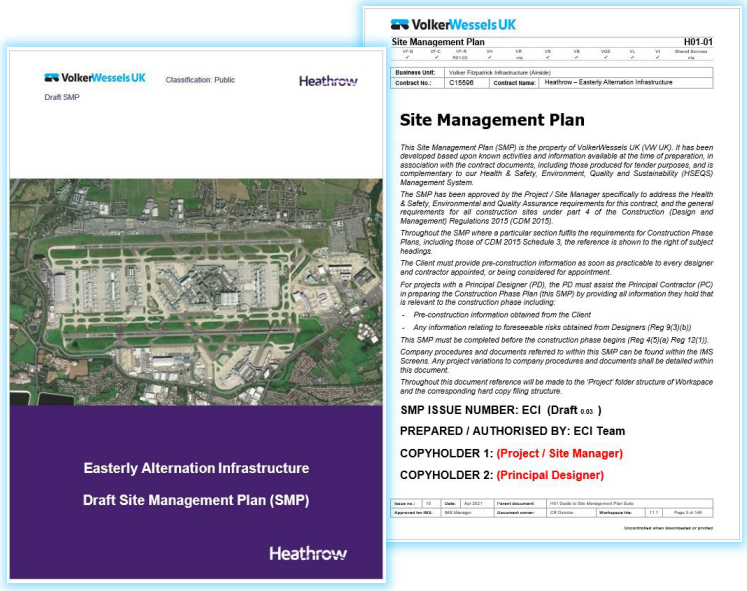
- The Environmental Section of the SMP and
- The Environmental Planning Meeting Agenda

16.1.4 It has been provided as supporting information to the CEMP for information only and a standalone appended document Ref;

"Easterly Alternation Infrastructure - DRAFT Site Management Plan (SMP)"

Graphic B; SMP

(See separate standalone document)



Appendix H Operational Waste Management Plan (OWMP)

This will be developed following contract award

Appendix I Summary Of The Potential For Materials Derived Within This Project To Be Recycled

16.1.5 The following table outlines the principal quantities of materials derived from / required for the project works and their potential for recycled uses or otherwise

Table I; Quantities of Primary Materials derived from the works and potential for recycling.

Materials	Quantity Arising From The Works	Quantity Recycled Through Re-Use On-Site	% Re-use On-Site	Surplus Quantity for Recycling Off-Site
Airfield Easterly Infrastructure Works				
Excavated soils removed to stockpile for re-use	34,923 m3	9,073 m3	26%	25,850 m3
Pavement Concrete Excavated & Crushed	14,149 m3		83%	2,434 m3
Granular Sub-Base (Type 1)		8,676 m3		
Crushed PQ Concrete Re-Used as Coarse and Fine Aggregate in Wet Lean Concrete *Note #1		3,039 m3		

*Note #1 - Subject to Permissible Specification

Appendix J Review Meetings / Notes

16.1.6 Notes of Review meetings with Design Team to confirm the approach for the circular economy strategy and to identify further opportunities for the development.

Table J; Summary of Review Meetings

Ref	Date	Meeting
J01		
J02		
J03		
J04		
J05		
J06		
J07		
J08		
J09		
J10		
J11		
J12		
J13		
J14		
J15		
J16		