

Gatwick Airport Limited

Response to Airports Commission Consultation

**Appendix**

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**Bechtel - Project Execution Plan**

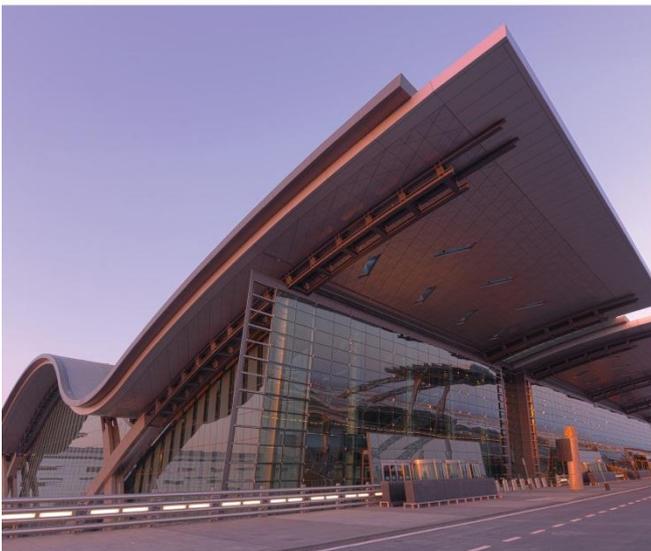


INFRASTRUCTURE  
MINING & METALS  
NUCLEAR, SECURITY & ENVIRONMENTAL  
OIL, GAS & CHEMICALS



## Gatwick Airport Project Execution Plan

30 January 2015



# Table of Contents

1	Executive Summary .....	1
	Phase 1 – 2025 R2 and Midfield Terminal Opening .....	1
	Phase 2 – 2030.....	1
	Phase 3 – 2035.....	2
	Phase 4 – 2040.....	2
	Risk Management.....	2
2	Environmental Impact Mitigation Approach.....	3
2.1	Land Vacation and Asbestos Removal .....	3
	Land Vacation and Asbestos Removal.....	3
	Asbestos Survey and Clearance .....	3
2.2	Habitat, Archaeology, and Demolition .....	4
	Habitat Management .....	4
	Archaeology and Heritage Management .....	4
	Demolition and Hard-Standing Removal .....	5
2.3	Site Preparation and Contamination Clearance.....	5
	Site Preparation .....	5
	Contaminated Land .....	5
2.4	Environmental Management – Plans and Physical Controls .....	6
	Physical Controls.....	6
3	Construction Approach.....	8
3.1	Phase 1 – 2025 : Runway 2 & Midfield Terminal Opening.....	8
	Enabling Works.....	8
	Runway and Taxiway Works .....	12
	Terminal Building and Contact Pier .....	17
	Landside APM .....	20
3.2	Highway Works .....	21
	M23 Interchange.....	21
	A23 Southern Diversion Works .....	22
	Balcombe Road Works.....	21
	Car Parks.....	23
3.3	Utilities and Airfield Equipment .....	25
	High Voltage .....	26
	Control Tower and Fire Facility.....	28
	Hangars .....	33
3.4	Phase 2 -2030.....	30
	Terminal Building and Contact Pier .....	30
	A23 Works .....	31
	Car Parks.....	32
	Cargo Building .....	32
3.5	Phase 3- 2035 .....	33
	Airfield, Terminal Building APM and Contact Pier Expansion.....	33
	Cargo Building .....	34
3.6	Phase 4 - 2040.....	35
	Terminal Building, Sattelite and Remote Pier.....	35

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- 4 Logistics Management Approach ..... 36
  - 4.1 Site Management ..... 36
    - Construction Sites..... 36
    - Utilities Plan ..... 38
    - Site Infrastructure (Batch Plant, Fabrication Shop, etc.)..... 38
  - 4.2 Materials and Workforce Management ..... 39
    - Materials and Equipment Logistics ..... 39
    - Material Delivery Access Routes ..... 39
    - Workforce and Access to Site..... 39
    - Site Access – Security ..... 40
    - Workforce Training and Recruitment ..... 40
    - Construction Waste ..... 40
- 5 Risk Management Approach ..... 42
  - 5.1 Programme Critical Path ..... 43
    - Phase 1 (2025) ..... 43
    - Phase 2 (2030) ..... 43
    - Phase 3 (2035) ..... 44
    - Phase 4 (2040) ..... 44
  - 5.2 Risk Assessment..... 45
  - 5.3 Programme ..... 45
- Appendix A: Risk Register ..... 1
- Appendix B: Programme..... 1

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# 1 Executive Summary

Gatwick Airport Limited (GAL) second runway (R2) project is still in the early planning phase. This document is intended to provide further guidance and definition to the construction delivery strategy, reflecting the updated phasing for R2. This has been prepared pursuant to our Task order as part of our secondment arrangement.

We believe that the four phases of the project execution phasing, established at five-year intervals between 2020 and 2040, allow the new runway, taxiways, aprons, and Midfield Terminal to be built with minimal impact on the operating airport during construction and incrementally, as demand requires. In developing this project execution strategy, the focus has been to further define the construction approach in terms of: sequences, work breakdown structure (WBS), package/work front interfaces, site set-up, demolition, environmental remediation, bulk earthworks, major civil works, surface access, utilities diversion and planning, logistics, labour, material, and traffic management activities.

## Phase 1 – 2025: Runway 2 and Midfield Terminal Opening

**The main activities of the Phase 1 work breakdown structure include:** the vacating of land; ecology, archaeology, and environment relocation; enabling works - demolition, asbestos removal, vegetation removal; utilities diversion, M23 interchange and airport access route over the Brighton railway lines facilitating access to the Midfield Terminal site, A23 southern section, Balcombe Road realignment, perimeter roads and security; runway, taxiways and aprons, airfield drainage, airfield ground lighting, navigational aids, air traffic control tower; rescue and firefighting services; Midfield Terminal and contact pier, including part of the airside APM shell and stand-alone baggage handling system, landside APM, car parks, south Terminal improvements, rail interchange and the initial Energy Centre module.

The Phase 1 critical path for the Terminal works commence with the vacation of land, in particular the British Airways Maintenance hangar and engineering stores, followed by environmental clearance and demolition, all of which will enable the diversion of the A23 to the south of the airport, clearing the Terminal site as only limited works can be done to this point. The critical path then runs through the building envelope to weather tightness, building systems and the testing and commissioning of these.

For the Airfield, the Phase 1 critical path starts with the vacating of land, ecology, archaeology, vegetation removal and diversion of existing utilities and diverting the river courses that cross the extended southern site. This facilitates the start of the bulk earthworks operation; runway, taxiway and apron pavements; installation and commissioning of airfield light and navigational systems and ultimately CAA aerodrome licensing.

## PHASE 2 – 2030 : Midfield Terminal, Contact Pier and Airfield extension

**The main activities of the Phase 2 work breakdown structure include:** the vacating of land at City Place; ecology, archaeology and environment relocation; enabling works – demolition, asbestos removal, vegetation removal; utilities diversions, completion of A23 road works; taxiways and aprons, airfield ground lighting, Midfield Terminal and contact pier expansion, Satellite building and pier, Airside APM shell extension, car parks, main cargo building, contact pier, and energy centre enlargement.

## Project Phasing & Scope

### Phase 1 – 2025: R2 and Midfield Terminal Opening

Vacating of land, environmental remediation, enabling works, utilities diversion, M23 interchange and airport access route, A23 southern section, Balcombe Road realignment, perimeter roads and security; runway, taxiways, and aprons, airfield ground lighting, navigational aids, air traffic control tower; rescue and firefighting station, Midfield Terminal and contact pier with access roads and car park, south terminal improvements, energy centre, landside APM and rail interchange.

### Phase 2 – 2030

Vacating of land, environmental remediation, enabling works, utilities diversion, A23 road completion; taxiways and aprons, airfield ground lighting, Midfield Terminal and contact pier expansion, Satellite building and remote pier commencement, energy centre expansion, car parks, main cargo building,

### Phase 3 – 2035

Enabling works, taxiways & aprons, airfield ground lighting, APM structure, Midfield Terminal and contact pier expansion, remote pier, cargo building north, energy centre expansion and car parks.

### Phase 4 – 2040

Enabling works; taxiways and aprons, airfield ground lighting, airside APM, Midfield Terminal and remote pier expansion, and cargo buildings.

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The Phase 2 critical path runs through the construction of the building elements for the extension northwards of the Midfield Terminal and the contact pier: foundations, building envelope, systems integration and commissioning. The critical path recognises the need for the buildings to be weather-tight by mid-2028 to allow baggage handling installation to complete; this drives the operational readiness and contingency ready for operations in 2030.

### **PHASE 3 - 2035 : Midfield Terminal expansion and Remote Pier**

*The main activities of the Phase 3 work breakdown structure include:* enabling works; taxiways and aprons, airfield ground lighting, Midfield Terminal expansion, Airside APM completion, Remote Pier extension, cargo building north, energy centre expansion, and car parks.

The Phase 3 critical path commences with the installation of diaphragm walls for the airside APM tunnel leading to the remote pier ground slab, superstructure, roofing, envelope and fit out and through to the APM systems integration and commissioning.

### **PHASE 4 – 2040: Midfield Terminal and Remote Pier completion**

*The main activities of the Phase 3 work breakdown structure include:* enabling works; taxiways and aprons, airfield ground lighting, Midfield Terminal and Remote Pier completion and cargo buildings.

The Phase 4 critical path runs through the construction element of the Western Remote Pier works: foundations, superstructure, roofing, envelope, fit out, testing and commissioning leading to operational readiness supporting the 2040 completion.

## **RISK MANAGEMENT**

The Gatwick risk management approach is designed such that that risks allowance are managed throughout all phases of the project works, at a level consistent with the budget. Moreover, the existing Gatwick R2 project risk register is both comprehensive and of 'industry best practice'. The risk register in Appendix A includes risks identified through the development of this document and are included within the updated Gatwick register as of December 2014.

The top two risks identified are:

#### **Bulk Earthworks (RW216)**

The assumption is that the cut and fills for earthworks balance with 97 per cent of the material able to be reused. It is viewed that this assumption is high and if, through geotechnical investigation, it proves the need to import or export large quantities of material, then the budget, schedule, and logistics planning would be impacted.

#### **Unexpected Contaminated Land (RW217)**

The rural nature of the land surrounding Gatwick and the presence of limited light industrial history, suggests that there is a generally low risk of encountering significant volumes or degrees of contaminated land. Areas and likely levels of contamination have been identified but it is not until further investigation and actual excavation of these areas that this risk may be realised.

## 2 Environmental Impact Mitigation Approach

### 2.1 Land Vacation and Asbestos Removal

#### LAND VACATION AND ASBESTOS REMOVAL

The programme of early works supporting the commencement of enabling works and construction includes vacation of land and property; survey and removal of asbestos; habitat and archaeology management; as well as the demolition and clearance of services and vegetation. These activities take place on thirteen separate parcels of land (A, B, C, D, E, F, G, H, J, K, L, M, and N) commencing July 2020 and continuing until November 2021 when all of the aforementioned preparation is complete for the land required for the construction of R2 Opening 2025 all as depicted in Figure 1. Areas B, C, D, E and G are priority areas either required for the A23 road diversion or Crawler's Brook and River Mole river diversions which clear the airfield and Terminal sites for major works to commence. Works are to be prioritised based on the required availability of specific areas.

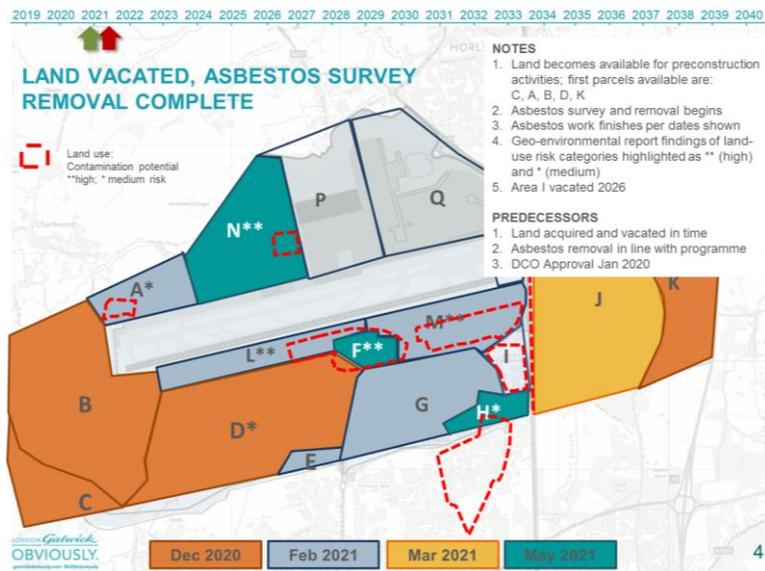


Figure 1. Land Vacated, Asbestos Survey Removal Complete (Dec 2020 – May 2021).

In order that the works can proceed as programmed, detailed assessments identifying key issues, as well as avoidance, mitigation, compensation, and relocation strategies need to be undertaken as part of the Environmental Impact Assessment during the years 2016 and 2017. Delay caused by late vacation of properties, asbestos survey, and removal and/or significant contamination risk may result in subsequent delay to concurrent habitat and archaeology programme and the subsequent programme of construction of work.

Asbestos removal (requiring between one to three months duration) archaeology and biodiversity activities (ranging from three to seven months) activities are to be undertaken concurrently in most areas. The programme duration for each of these works is consistent with the land uses of the area. For example, built-up areas are unlikely to require detailed archaeology or biodiversity works, while

agricultural land may not require asbestos removal.

#### ASBESTOS SURVEY AND CLEARANCE

Asbestos primarily in the form of insulation, fireproofing, ductwork, wall, floor, and ceiling materials in buildings and structures would be identified and removed in preparation for demolition, through the use of specialist contractors.

All relevant legislative requirements for both health and safety of the workforce and public as well the environmental management of hazardous substances and waste are to be identified and complied with.

It is recommended that early access be given for survey, especially to high-risk locations to facilitate the early identification of unexpected quantities or locations of asbestos.

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## 2.2 Habitat, Archaeology, and Demolition

### HABITAT MANAGEMENT

Habitat activities for areas located within the proposed site boundaries will involve a combination of clearance or removal, capture and extraction for translocation and on-site management as well as re-creation of the key habitat and biodiversity resources. These include:

- Sites of nature conservation importance and five areas of ancient woodland (some co-located.)
- 24 animal and plant species that are impacted as a direct result of the works including the following protected and priority species – great crested newt; grass snake; badger; bats; and 5 butterfly and 12 bird species.
- Invasive non-native plant and animal species, including Himalayan Balsam and Japanese Knotweed, are also identified as being present.

It is recommended that as much work as possible is planned and undertaken early in the schedule and in conjunction with relevant stakeholders, so that the maximum value can be achieved from biodiversity offsetting and so that constraints and delays to the development programme can be minimised.

Seasonal requirements for the removal and extraction of habitat and capture and relocation of species (as well as for the removal of vegetation during final site preparation and the removal of nesting birds from buildings and other structures) should be identified and planned, with a detailed programme developed for relevant areas. The present programme shows some areas (Habitat is combined with archaeology and heritage management) completing after the start of the bird nesting season so any vegetation must be cleared in advance of this. It is anticipated that clearance works would commence in Oct 2020 through to March 2021.

It is anticipated that appropriate receptor sites and aftercare plans for habitats will be identified and prepared in good time to coincide with the appropriate season. In addition, licences for working with protected species and their habitats should also be obtained in a timely manner.

### ARCHAEOLOGY AND HERITAGE MANAGEMENT

The construction activities required for R2 may result in removal of archaeological remains, scheduled monuments, and listed buildings. These include:

- 14 Grade II listed buildings
- Two scheduled monuments
- Eight areas with high potential to be of archaeological significance.

It is recommended that as much early work as possible takes place in conjunction with relevant stakeholders so that an appropriate strategy is developed for works to proceed in line with the programme. The archaeology programme assumes that upfront survey work to provide further details and analysis of baseline conditions is complete before the land is vacated. As such, it is recommended that survey access be sought to relevant land areas prior to land vacation to allow archaeological evaluations including LiDAR survey, detailed walkover (reconnaissance), survey, surface artefact collection (field walking), geophysical survey techniques, test-pitting, and trial trenching be undertaken.

Activities that are to be undertaken in preparation for construction involve removal of cover such as woodland, further surveys, trenching, fieldwork such as set-piece archaeological excavations of key 'sites', and of watching briefs on larger areas, dismantling, re-erection of identified assets, managed removal, and translocation (without dismantling). During all activities, the appropriate levels of archaeological recording should take place including descriptive and analytical records, dating, photographs, and inventories.

## DEMOLITION AND HARD-STANDING REMOVAL

Demolition works have the potential to cause a range of environmental impacts. It is therefore important that best practice management techniques are identified and implemented. It has been estimated that, of the demolition waste, 97% is expected to be reused or recycled. Refer to Figure 2.

Whilst the programme is unlikely to allow for a soft strip of buildings to maximise reuse, it is recommended that pre-demolition audits are undertaken as early as possible to identify high value reuse opportunities, and inform the future waste management strategy. Pre-demolition audits will also provide detailed estimates of waste quantities, so that the capacity of regional waste management facilities can be assessed so that recycling targets can be achieved.

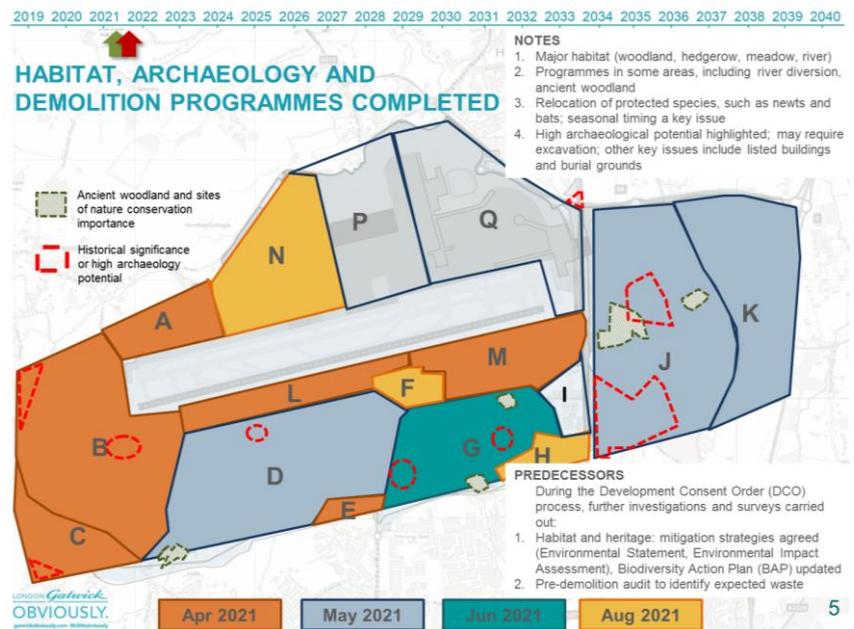


Figure 2. Habitat, Archaeology, and Demolition Programmes Completed (Apr-Aug 2021).

## 2.3 Site Preparation and Contamination Clearance

### SITE PREPARATION

The first parcels of land begin to become available for setting up site and pre-construction earthworks in July 2020, starting with areas C, A, B, D, and K. Subsequently areas E, L, M, J, and G become available followed finally by H, N, and F. Refer to Figure 3.

Considerations for removal of vegetation in accordance with seasonal requirements are to be incorporated into site preparation activities.

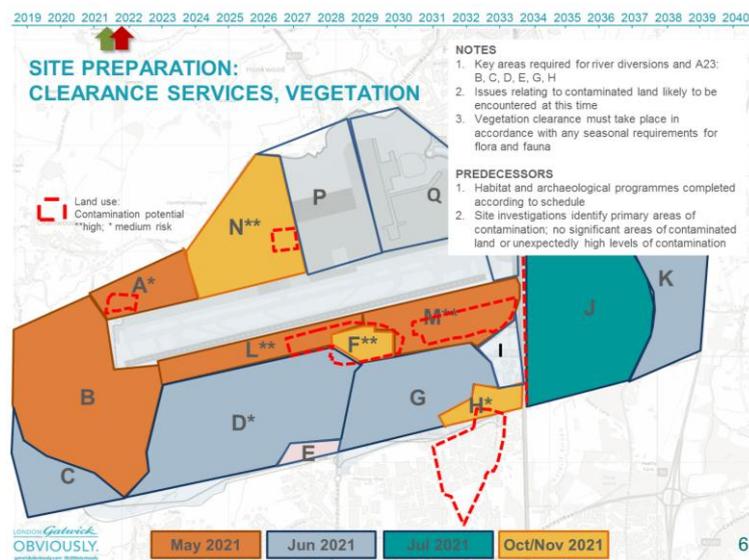


Figure 3. Site Preparation: Clearance Services and Vegetation (May 2021 – Oct/Nov 2021).

### CONTAMINATED LAND

On-site remediation of contaminated land occurs during the earthworks programme. One option is for a remediation centre to be set up on-site to enable in situ treatment of contaminated land. Controls for identification, excavation, removal, and storage of contaminated soils would be put in place for earthworks to facilitate the control of pollutants and the reuse of material. If land farming techniques are used to reduce contamination these areas should remain undisturbed for 12 months.

In advance of the main construction works, a detailed site investigation is required to establish levels of contamination. This reduces the risk of unexpected areas of contaminated land being identified late in the programme and causing delays. Currently any activity associated with land contamination is not

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detailed on the master schedule and has, as a result, been added to the risk register undertaken as a part of this exercise.

## 2.4 Environmental Management – Plans and Physical Controls

There are a number of key environment and sustainability impacts that result from the site clearance, earthworks, river and road diversions, and construction programmes for Gatwick Runway 2. Impacts will change as work progresses and vary in intensity depending on the location and the particular work activities taking place.

Environmental management is to be achieved through:

- Plans and procedures, such as the construction noise management plan and materials management plan, among others
- Physical controls, such as noise barriers and soil treatment facilities that may change or may be relocated as work progresses in order to reduce site impacts.

### Plans

A sustainable construction strategy is to be developed for the project that addresses environment and sustainability aspects including, as appropriate, social and economic issues. The strategy would identify challenging objectives and targets for the whole programme of works and project lifecycle, as well as define project roles and responsibilities.

A code of construction practice (COCP) will also be developed that contains measures and standards of work to be applied by Gatwick and all R2 contractors throughout the construction period. The COCP helps to provide a consistent approach to the management of construction activities across the project and has been used to good effect on recent major construction projects in the U.K.

Work plans for specific impact areas will also be developed that provide details of how best practice is to be implemented and objectives and targets are addressed. These work plans include a Construction Environmental Control Plan that includes:

- Pollution prevention plan (with pollution incident management plan)
- Pre-demolition audit
- Site waste management plan
- Remediation plan
- Materials management plan
- Construction noise management plan
- Vehicle and equipment operations plan (including Euro VI req. silencers, plant fuel, and emissions)
- Green travel plan - for construction workers
- Construction water and energy resource management plans
- Traffic management/logistics plans.

Project environment and sustainability requirements are to be flowed down in contract specifications and works using information that references commitments and assurances, including additional contract documentation such as COCP.

### PHYSICAL CONTROLS

The following physical controls should be implemented to promote a comprehensive approach to reducing impacts during construction. The required provisions should be incorporated as part of site up and logistics planning.

**Noise:** Well-maintained plant/machinery, silencers, and temporary noise barriers that move with work area (use stabilised soil heaps where possible); and noise insulation provision (as well as permanent noise wall and barrier).

**Air Quality:** Site set-up that includes location of machinery, fuel, and dust generation activities away from boundary. Use of dust barriers i.e., hoarding, damping down, covering of earthworks, stockpiles and vehicle loads, skips; haul

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road surfacing, road sweeping, vehicle wash; low emission plant/vehicles (Euro VI standard vehicles); ultra-low-sulphur diesel for plant and machinery; and a spoil storage – stabilised, consolidation centre.

**Carbon and Energy:** Connection to main power supply where possible early in the programme. Use high efficiency, low emission generators, plant/vehicles, and lighting. Use daytime and night-time generators; controls (e.g., timers, sensors) on-equipment and site lighting; energy and fuel meters; biogas boiler – water heating from food waste; access to rail head – materials deliveries; on-site bus transport; and on-site ready mix concrete batching plant - use of PFA (pulverised fuel ash) and GGBS (ground, granulated blastfurnace slag) as cement replacements.

**Water and Flood Risk:** Site tanker/dewatering facility; pollution control and attenuation ponds; runoff and sediment erosion control measures with slope drains, inlet/outlet protection traps, silt fences, barriers, filters; surface stabilisation e.g. seeding; water efficient equipment e.g. waterless wheel wash, fan misting systems, sensor taps with low water use techniques; and water meters on water monitoring stations.

**Waste:** Waste consolidation centre, materials consolidation centre and remediation centre storage areas for excavated and reusable materials.

**Materials:** Construction consolidation centre, concrete batching plant, remediation centre and a concrete crushing plant.

**Geo Environmental:** Remediation centre, storage areas for excavated materials, sediment and run-off controls, dust and noise monitoring station, and vapour monitoring.

# 3 Construction Approach

## 3.1 PHASE 1, 2025 – Runway 2 and Midfield Terminal Opening

### ENABLING WORKS

#### Site Preparation and Pre-Construction

Consideration of environmental impacts is imperative during site set up. The location of site facilities will take into consideration the impacts of noise, light, visual, and air quality pollution as well as impacts of traffic. Where possible facilities likely to generate nuisance can be located at a suitable distance from potential receptors or can incorporate appropriate mitigation features. This will include fuel storage areas, batching plant, and waste management facilities. It is recommended that the use of existing buildings as site facilities be considered before demolition of buildings takes place.

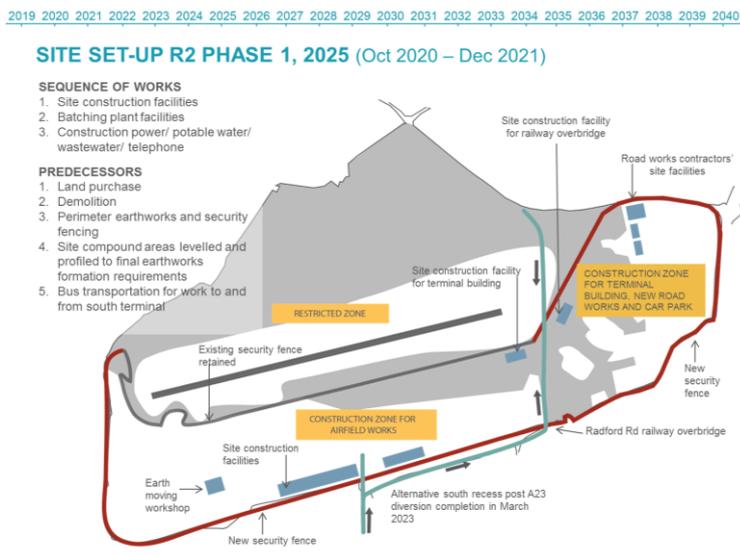


Figure 4. Site Set-up: Phase 1 - 2025.

Planned noise barriers for the new runway would ideally be constructed earlier in the programme to reduce the impacts of construction noise on local receptors.

Site locations are suggested in Figure 4 & 6. Spoil and cut to be stored in locations in line with the progress of earthworks are shown on Figure 5.

Waste segregation facilities and a consolidation centre are needed from the beginning of demolition phase to enable waste management targets to be achieved. Waste storage areas for reusable waste will enable the waste hierarchy to be effectively implemented.

consolidation areas for temporary waste storage for bulking and baling/compacting, hazardous waste storage, and empty skip storage.

The materials consolidation centre is addressed in the Logistics Section below.

After vacating properties and timely completion of habitat programme, archaeological works, asbestos surveys and demolition works by March 2021, the demolition can commence along with site preparation works starting in the area east of the existing River Mole that will enable an advanced diversion of this river. Refer to Figure 5. Works include: removal of redundant services and vegetation and site clearance including the areas not previously captured with the demolition programme.

Some recovered trees and bushes may be collected and kept in a temporary nursery for reuse and planting when the new landscaping earthworks are completed.

Prior to removal of the redundant services, final coordination would be held with utility providers

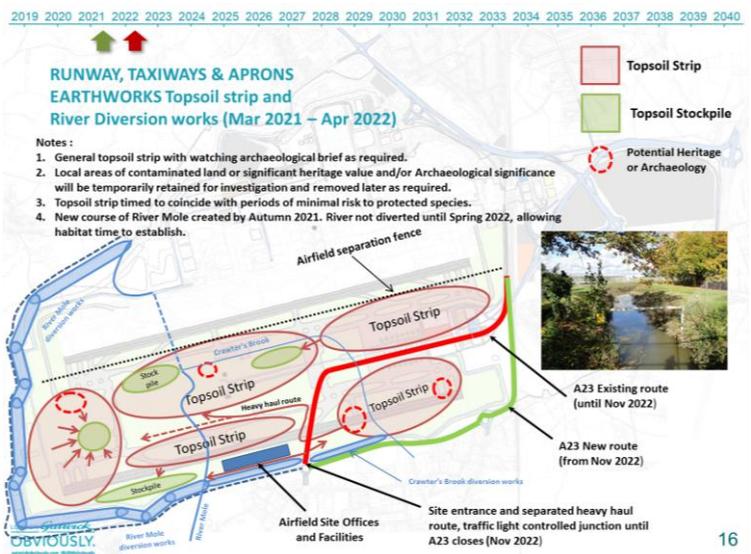


Figure 5. Site Preparation and Pre-construction Earthworks Including topsoil strip and stockpiling (Mar 2021 – Nov 2021).

and local authorities so that the 'permit to remove' process is implemented for safe removal. The road and sub-base granular material recovered from the old road would be recycled and would be used either for temporary haul routes in the construction phase or incorporated at a later stage as part of the permanent works.

The site preparation schedule is prioritised based on early required works such as the River Mole diversion and A23 diversion that impede bulk earth movement. During site preparation works, special precaution would be taken so that the current surface drainage arrangement is not changed.

Only the most contaminated or hazardous materials are to be removed from site consistent with the current assumption that at least 97 per cent of the material from demolition works would be reused or recycled on-site. It is estimated that around one million cubic metres of excavated suitable material is available for reuse for fill areas.

Prior to the mobilisation of major equipment, such as tracked back hoe machines, articulated dump trucks, and dozers, contractors would commence temporary fencing or hoarding to enclose and protect the work sites as necessary.

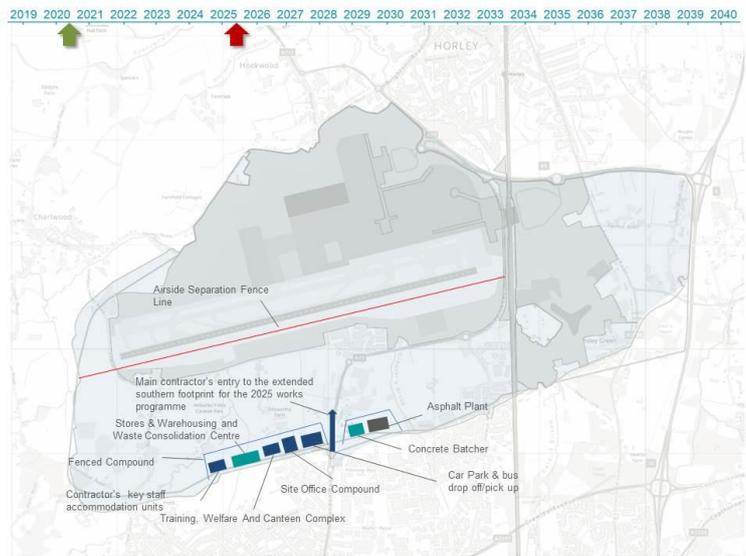
The main access is foreseen to be through A23 and the existing perimeter fence would be retained where possible to segregate airport operations and construction activities. Elsewhere, construction site fencing or hoarding as required would be erected. A new perimeter fence on the south side is to become the permanent fence, requiring earthwork bunds and river diversion works to be completed prior to installation.

The contractors' temporary facilities for the 2025 phase of the Airfield Works shall be located at the southern side of the airport periphery on either side of the A23 road that would be removed at the completion of the works. It may be possible to adopt a number of the existing properties to provide offices; stores and some workforce car parking that are outside of the R2 runway alignment footprint. Refer to Figure 6. Site compounds would be serviced from the local utility networks and would be secured with fencing, gate guard with lifting barrier access and flood lighting. Security would be provided through a permit system with CCTV camera surveillance.

The compound development would include a project wide training, welfare clinic, and dining hall facility providing the project 'best in class' facilities. The training centre would provide not only HS&E lessons but also apprentice skills training to young people, as part of the commitment to create a local skills force that can benefit from the 20 years of project development. If not located on site, a building identified in Crawley, with the support of the Job Seekers Employment, may be selected and converted for these purposes.

In summary, the list of contractor's facilities includes:

- Site office compound with perimeter fencing and mains utilities provision
- Security guard house with barrier and access control
- Staff and labour car park
- Warehouse and stores compound area with perimeter fence, mains services, and security access control – contractors
- Waste consolidation centre
- Noise and air quality monitoring stations
- Bus transport system to site locations on airfield site



**Figure 6. Phase 1 – 2025.**  
Airfield Contractors' Temporary Facilities  
(Jul 2020 – Jul 2025).

- 
- Training facility and induction centre and Apprentice skills training centre
  - Welfare and clinic for occupational health screening and first aid
  - Kitchen and dining facilities
  - Temporary accommodation block.

### **Construction Site Security**

When the compound fence, guard house, and security check are in place and operational, the contractors' incoming staff and labour would be screened before being permitted to access the site. This will be facilitated by a biometric identification process through turnstiles for access to the site bus collection point where the labour and site staff would then be transported to their various controlled and fenced field offices and set up points.

Temporary stone access roads will be provided across the site and where existing roads do not serve the locations. These temporary roads would be maintained by the respective contractors and coordinated under the master traffic management planner who would review and approve the various contractors' submissions prior to their construction.

As part of the early enabling works that form part of the site set up, the site boundary fence and airside separation fence to delineate the construction works from the existing airport operations would be installed and would provide security. Existing Emergency Accesses will be maintained and only amended by agreement with the relevant airport and emergency services authorities.

### **Asphalt and Concrete Batching Plants**

Significant quantities of concrete and asphalt are required for the 2025 runway opening phase and beyond. The concrete supply would be required for all structural foundation works and buildings, as well as supplying pavement quality (PQ) concrete for the pavement aprons.

Part of the compound set-up as detailed in Figure 6 would include the potential to install a 'project' dedicated concrete and asphalt batching plant that serves the project needs up to the 2025 opening. Such facilities would be specified to provide concrete and asphalt to the project and would be run by commercial operators who undertake the production and supply in the market place. Alternately, the existing Cemex and Aggregate Industries Asphalt Plants located at the existing Crawley Goods Yard rail head may be used and this possibility would be investigated at an early stage in the R2 planning.

### **River Diversions**

Following completion of all topographic surveys, ground investigation surveys and a full detailed design, construction would commence for the diversion of both the River Mole and Crawter's Brook. Both these features run through the proposed site and it is essential that they are diverted before formation works and filling of the airfield platform commences.

The existing River Mole culvert under the existing airfield would be re-used as part of the airfield drainage network once the River Mole is diverted. The new channels for both bodies of water would be excavated during the spring and summer of 2021. Excavated material would be stockpiled in a designated area on-site and used for construction works as required. Areas surrounding the diversion would be made good with vegetation and grass areas planted providing several months for habitat to develop before species relocation occurs in the spring of 2022.

Once the land is acquired for the new runway extension, it would be mapped and the fauna and flora would be catalogued. In order to mitigate programme risk, it is recommended this would be done in advance of the DCO approval. On completion of the survey, the flora and fauna species that require trans-location would be identified and the habitat sites identified. Ideally most would be trans-located to the existing perimeter water course and berm locations at the northern side of the airport. Commencement of the works would be outside the nesting and breeding season for birds and mammals.

In parallel to this environmental work, the survey and staking out of the southern and North West water course alignment that would be formed around the new periphery of the airport plot would be carried out.

The route of the new watercourse open channel alignment would be temporarily fenced. Refer to Figure 7. A berm with sandbag protection would be left in place at the future junction with the existing river alignment and the earthworks equipment and plant moved in to clear the site and form the new watercourse and associated berms. The trees and bushes would be removed along the surveyed alignment and the top soil then stripped off. The recovered top soil, some suitable trees and bushes would be collected and kept in a temporary nursery for reuse and planting when the new landscaping earthworks are completed. At the confluence of the River Mole and Crawter's Brook diversion is a requirement to build a weir structure.

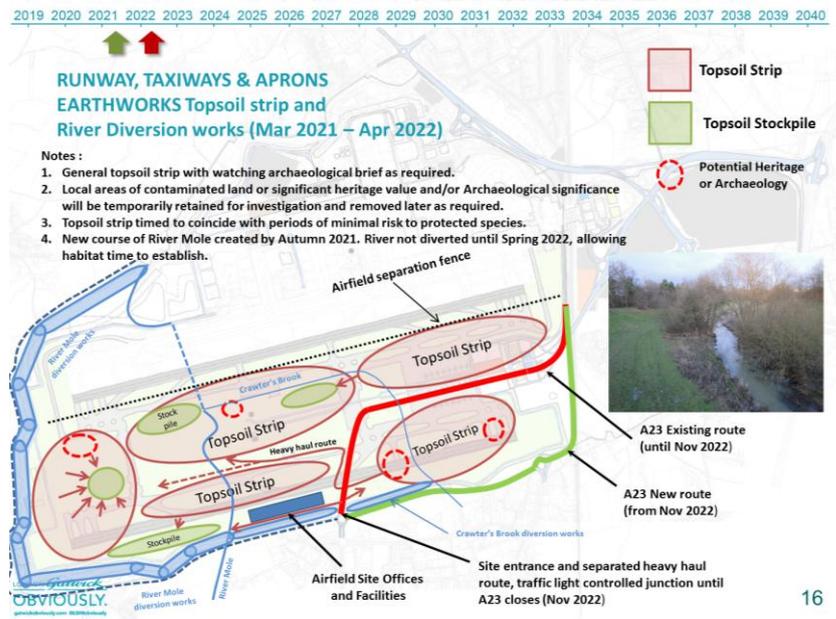


Figure 7. River Diversions R2 Opening 2025 (May 2021 – Aug 2022).

It is anticipated that new river channels will be completed in the 2021 earthworks season, allowing between six and twelve months for the new habitat to establish. In spring 2022, species would be relocated from existing to the new River Mole and Crawter's Brook corridors allowing the redundant water courses to be filled to and the earthworks to progress across the site. The piped culverts under the northern section of the airport would be inspected and relined for its changed use as flood attenuation for the airfield.

### Balancing Ponds and Temporary Drainage

Balancing pond earthworks for the contaminated and non-contaminated water in the North West ponds commence in Spring 2021. The ponds would be constructed before the site drainage installation to allow runoff during the construction phases to be adequately controlled. Due to the nature of runoff during the construction stage, the installed pond lining would need to be suitably protected so that silt and other site debris can be cleaned from the area without affecting the long-term operation of the facility. Constructing these ponds before the new runway, taxiways, and site drainage would mitigate against flooding and pollution events that could impact the downstream environment.

The new surface water drainage system would be constructed to collect and convey runoff from all proposed paved areas including runway, taxiways, and aprons and would incorporate cut-off drains to prevent runoff from adjacent grassed areas passing onto runways or taxiways. Refer to Figure 8. Clean flow would be conveyed to the River Mole and polluted flow would be pumped to the existing Crawley Sewage Treatment Works.

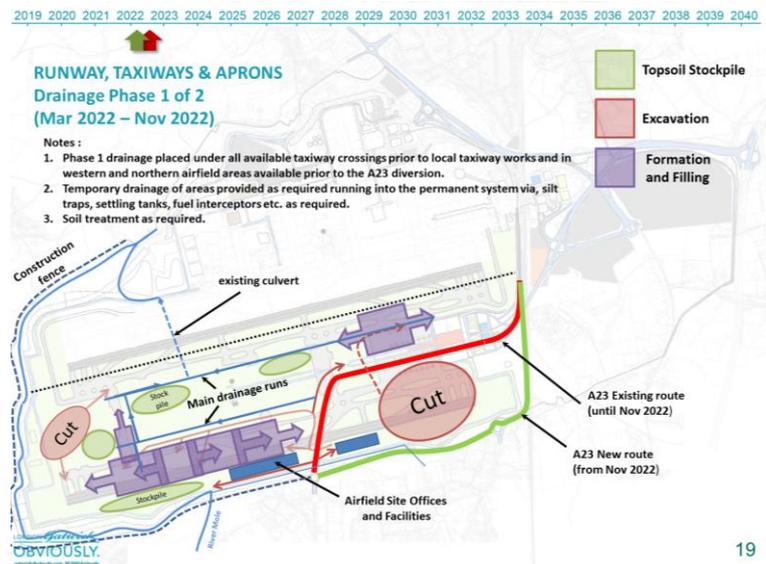


Figure 8. Drainage extent until removal of the A23.

## Earthworks Logistics

All stripped topsoil will be temporarily stockpiled in designated locations and later used for landscaping, noise bunds and river embankment works.

Earthworks logistics can be improved to follow the minimum cut and fill balance, using excavated materials from two major areas within the future airport boundary to reduce required treatment. Refer to Figure 9. Those areas are:

- South east corner between the existing A23 and the railway line occupied by Rowley Farm.
- Western airfield boundary adjacent to the route of the River Mole diversion.

Due to the significant distance from cut area and soft existing ground conditions, separate heavy traffic temporary site access routes would be constructed using suitable material from demolition and would be later reused for permanent fill. Where possible, temporary haul roads would follow the future runway shoulders to reduce the impact to ongoing works.

The A23 remains in place during this earthworks season so any earthmoving plant crossing the A23 will be done at either a traffic light controlled clean crossing or by suitable temporary bridge.

## Cut and Fill Material Characteristics

During the earthworks, controls would be applied to erosion and sedimentation mitigation for preventing transfer of air-blown particulate in order to reduce attraction to birds feeding, nesting, loafing, and roosting.

Only the most contaminated or hazardous material would be removed from site and at least 97 per cent of the material from demolition works would be reused or recycled on-site. It is anticipated that approximately one million cubic metres of excavated suitable material would be available that can be used for fill areas.

In order to increase reuse of existing material and reduce material transport on and off site, soil stabilisation with lime would likely be used to improve site-won soil workability, reduce water content and improve load-bearing characteristics. The phasing of the initial areas of this is shown in Figure 10.

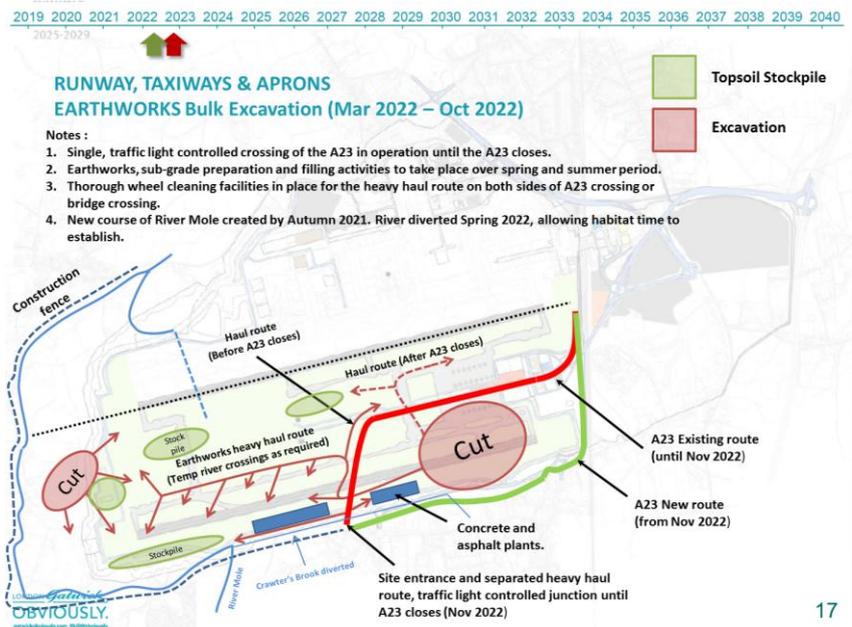


Figure 9. Main Earthworks cut areas and transport routes (Mar 2022 – Oct 2022).

17

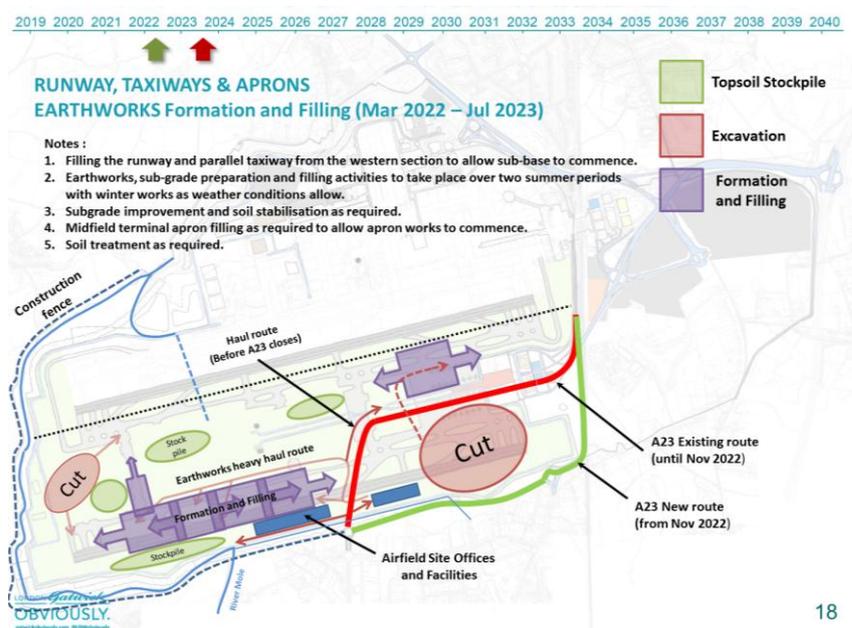


Figure 10. Main Earthworks formation and filling areas (Mar 2022 – Oct 2022).

18

## RUNWAY and TAXIWAY WORKS

### Runway Sub-grade Compaction

The technical specifications for all pavement materials would be airport specific and developed based on technical specifications that account for the unique loading and environmental conditions encountered at the Gatwick Airport.

It is anticipated that the existing clays in the area will be improved by the addition of lime to reduce the water content and improve the bearing performance of the soil formation and fill material.

### Runway and Taxiway Sub-Grade Phasing

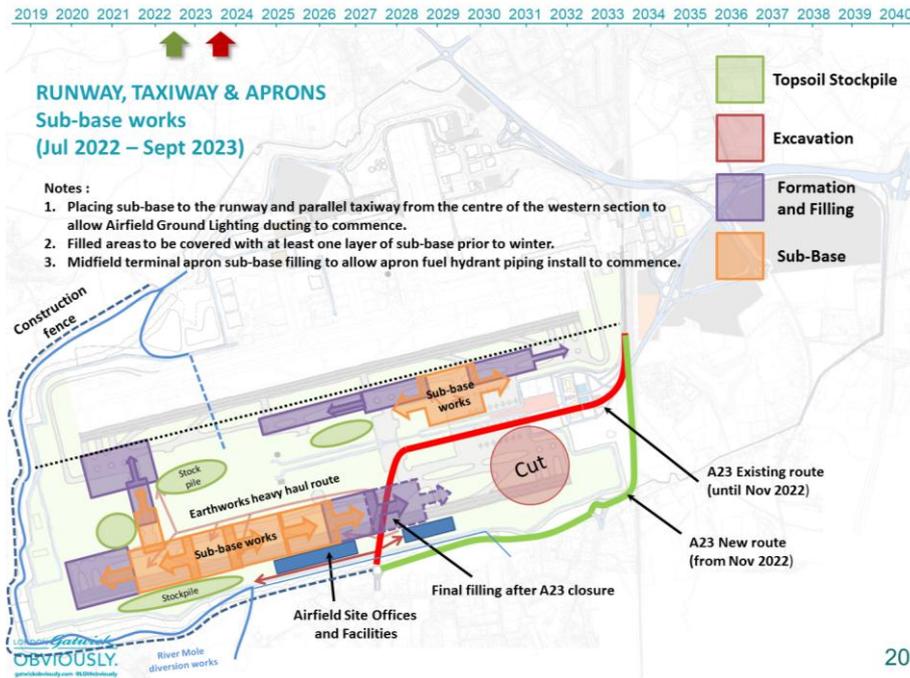


Figure 11. Staging of bulk filling and sub-base (Jul 2022 – Sep 2023).

Phasing of compaction and of the treated sub-grade is shown in Figure 10 with Figure 11 showing the following sub-base works.

Initially, the airfield works are driven by the larger areas available, principally those in the west from which the watercourses have been removed. Starting in the centre of this section and working both eastward and westward allows additional work fronts to be developed simultaneously. Once these work fronts are developed sufficiently, the smaller taxiways in the north and North Apron areas can be developed, similarly, creating additional work fronts. Once the Rowley Farm earthworks cut area is exhausted the eastern runway area can be developed. Finally, once the A23 is diverted, the centre runway and taxiway site can be opened up in addition to the South Apron.

20

Runway and taxiway earthworks comprising formation preparation and filling works commence simultaneously in the western areas. These are available at the start of the earthworks season March 2022 at the same time as the watercourses are diverted, opening up the site. The majority of the site fill will originate in the elevated area of Rowley Farm in the south east of the airfield footprint with smaller volumes arising from the western boundary.

A thorough, prior understanding of the existing soil conditions is required in order to define the sub-grade CBR and in situ density and to understand how the soil performs with changes in moisture conditions.

It is anticipated that there will be extensive soils sampling and testing facilities on site in order to assure both the quality and sustainable and economic use of site won fill materials.

## Runway and Taxiway Pavement Construction

Following sub-grade compaction, general filling and placement of 300mm of sub-base, the AGL ducts would be trenched within the upper layer of sub-base, AGL ducts placed and topped up with 10MPa lean concrete. It is critical that the locations of the airfield lights are accurately located in order that the duct ends are evident after coring through the asphalt pavement later. As the subsequent layers of lean-mix concrete and/or PQ concrete are placed, a long radius bend and duct raising piece are added. Refer to Figure 12.

Numerous quarry sources would be considered in order to source quality materials for use on this project, particularly for crushed aggregates for any macadam and stabilised pavements, concrete, and asphalt.

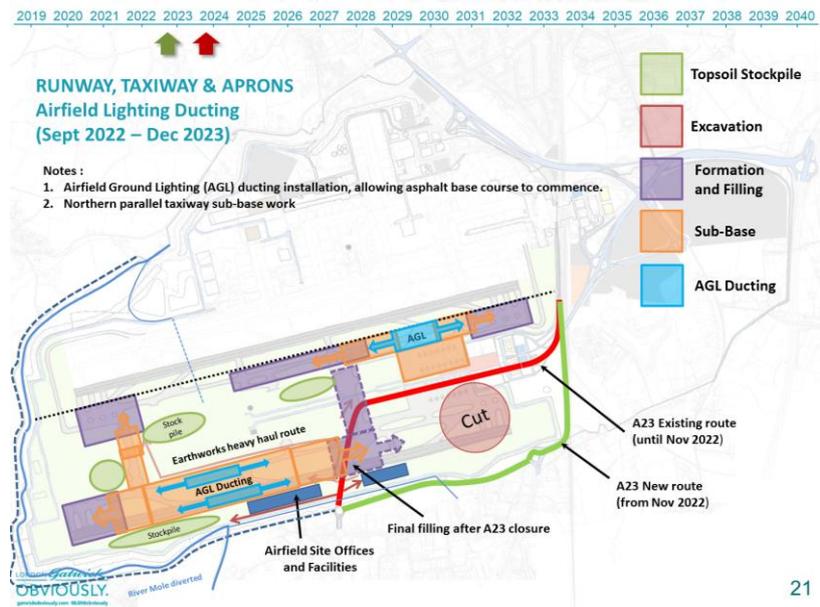


Figure 12. Airfield Ground Lighting ducting (Sep 2022 – Dec 2023).

Construction of runway sub-base would start in the western areas directly after formation and filling works and progress into eastern areas as they are made available. It is key to the programme of works, that sub-base placement follows closely behind filling works, in order to:

- Cover the filled areas which would be vulnerable and deteriorate in poor weather.
- Generate areas in which AGL ducting can be placed, which subsequently create areas in which the asphalt base course can be laid which has far less sensitivity to inclement weather and can be continued through the winter months.

## Risks

The main risks in the construction of runways and taxiways are:

- Inclement weather with the associated impact on works progress and control and discharge of ground water.
- Interface with live airfield operations on the northern edge of the construction area.
- Contractors' QA/QC performance.

**INCLEMENT WEATHER:** Where possible, works that are weather susceptible are phased to be carried out in the drier spring and summer months. For example, earthworks excavation and filling. Those works that are less susceptible such as AGL ducting, granular fill and asphalt is phased such that they can be done at any time.

**INTERFACE LIVE OPERATIONS:** In order to complete the taxiway connections to the existing live airfield, night possession of the existing runway will be required. This may necessitate the use of the northern emergency runway, although any low visibility conditions would impede its use given the emergency runway instrument landing capability.

In order not to impact current airport operations, works on taxiway tie-ins to the existing operational runway would be done during night possessions during the period April 2023 to July 2024.

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**QA/QC:** Contractors' QA/QC performance is especially important with respect to understanding and treatment of existing site conditions, utilising and modifying 'site-won' fill and achieving the required bearing capacity to allow subsequent works to progress.

Further, for example, in order to achieve good wearing course, skid-resistance and surface water drainage for good braking while avoiding aquaplaning extensive trials and testing will be carried out on a reasonable scale. Before commencement of wearing course activities, a test strip would be required to be performed at an early stage and asphalt grooving and skid trials carried out.

For all works, the contractors testing facilities will be in place prior to approval to commence with each element of the works to monitor the output of contractor's production.

### **Design Assumptions**

Recent works on existing runway on Gatwick Airport have been mostly refurbishing works and the cross-section of the existing runway is a mixture of old and new layers resulting in multiple layers such as granular fill, lean concrete, PQC, Flexural concrete, and recently placed Marshal Binder Course and Marshall Surface course.

New airfield pavement must be able to support loads imposed by aircraft without excessive distortion or failure and would be based on Gatwick projected fleet mix and design expectancy.

The analysis and selection of pavement materials and pavement types for this project is key. New Gatwick runway design would be fully flexible pavement structure with Marshall Asphalt for both binder and surface courses, as this is a highly controlled and consistent material, providing a high stability and most of the specialist performance requirements for most airfield applications. Design loadings would be evaluated by assessing the pavement sub-grade strength (CBR), and the frequency and type of trafficking, based on the loadings of the aircraft expected to use the airfield, and includes factors such as design life, tyre pressures, main wheel gear combinations, etc.

For review of construction methodology, following materials thicknesses has been assumed - and these will be considered more fully by the pavement designer in due course:

The region around Gatwick has a natural sub-grade that would vary between CBR 3 per cent to 6 per cent this soil condition must be taken into account as it would influence the structural make-up of the pavement. Lime stabilisation will improve the CBR value, allowing thinner construction but as a worst case scenario, for instance where lime stabilisation could not be carried out or was not suitable, a typical composite runway structure might be:

- 425mm of bituminous material on top of
- 350mm of F5 Pavement Quality Concrete on top of
- 150mm of Lean concrete (wet or dry as demanded by constructability)
- 300mm crushed granular sub-base material.
- Fill to thickness as required. (Lime stabilised as necessary)
- Natural foundation. (Lime stabilised as necessary)

For a fully Code F compliant runway, the above structure would apply for the central 60m.

The shoulders for a Code F runway would be 7.5m wide on either side of the runway and its construction would be in the region of:

- 250mm of bituminous material
- 150mm of lean concrete
- 300mm of crushed granular material.

The above mentioned bituminous material would be made up of high performing surface courses like 100mm of Marshall Asphalt (surface and base) or similar material like BBA that can accommodate stresses from high tyre pressures.

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### **Airfield Ground Lighting Installation**

At the location of each AGL, the pavement construction will be cored to reveal the underlying duct, the duct extended to its final level, the light can levelled, aligned and grouted in place. Once the levelling jig is removed, a blanking plate is fixed to prevent water and debris entering the duct.

During LV cable installation, the plate is removed, the LV cable pulled to the local pullbox/manhole and fitted with termination plugs to suit the length of duct run. Either the plate or the AGL fitting itself is fitted to prevent entry of debris.

### **Airfield Marking**

Taxiway and runway markings will be applied in phases throughout the works programme. Each phase will provide sufficient areas of works for the economic set-up of the painting operation.

It is imperative that during construction, the runway is clearly marked as non-operational and that taxiways are clearly marked as blocked as the markings work progress adjacent to existing operational areas.

## TERMINAL BUILDING AND CONTACT PIER

The Midfield Terminal and associated contact pier would be constructed to provide passenger accommodation and lounge capacity coinciding with the opening of Runway 2 in Phase 1, 2025. This initial build will provide 60,000m<sup>2</sup> on three levels, with part of the contact pier, providing 30,000m<sup>2</sup> and 16 contact stands. Refer to Figure 13.

**Set-up:** Construction site offices, stores, and welfare could be located west of the Phase 1 build, within the footprint of the future Phase 2 build. The site set up would deploy the existing concrete batching plant set up east of the rail line on the old Balcombe road. Alternatively supply could be arranged from the adjacent Airfield plants, or also from the Crawley Goods Yard operation.

**Plant:** Site tracked craneage would be mobilised for the foundation works followed by tower crane erection for the Terminal and pier buildings. It is likely that at least three tower cranes would be required for the site wide coverage to the Terminal Building footprint and one or two travelling tower cranes for the contact pier building. The tower crane mast heights would be suitable for aircraft clearance and fitted with appropriate warning lights to the tops of all cranes. See 'Crane Operations' below. In addition to the tower cranes would be the utilisation of mobile telescopic cranes and vertical hoists for the major material ingress to all levels of the building shell.

**Foundations:** The Terminal and contact pier foundations, including the airside APM basement and tunnel walls would be piled first, with the latter formed utilising either a diaphragm walling or secant pile technique. The interior of the APM tunnel and basement may be excavated at this stage allowing works above to progress unimpeded but may be left in place until the later phases of the works. The Contact Pier Building would be of a similar construction to the Terminal Building and would be constructed concurrently. On completion of the diaphragm wall and piled foundations, backfill would be progressed, together with the drainage and major utility duct layouts so that the ground slabs can then be cast and the superstructure build commenced.

**Building works:** The three-storey structural steel erection will commence after the sub-structure is substantially progressed. The precast floor soffit slabs, cast offsite, would be installed at the first and second floor levels. Floor reinforcement and concrete placement, as necessary, follows to complete the slab works. The roof would be added once the precast lifting works are completed to provide a degree of weather protection to subsequent works. Curtain walls would progressively enclose the sides working towards creating a weather tight environment with sufficient accesses left open to allow egress for the import of materials and plant. The design of the structural frame, roof and curtain walling would be such to allow the building to be expanded easily to north and south in subsequent phases.

Internal core walls would be built and the MEP plant installations progressed followed by lighter internal partitioning, MEP services, floor finishes, ceilings, fit-out and finishing work 2<sup>nd</sup> fix items, information systems etc. On completion of the building shell enclosure the external scaffolding and hoists would be removed and the peripheral access road and apron slabs completed,

## CRANE OPERATIONS DURING CONSTRUCTION

Cranes will be used in the midfield zone during each construction phase to support construction of the main buildings: midfield Terminal building; contact and remote piers; and, air traffic control tower. Both fixed and mobile cranes will be used, including fixed tower cranes at the midfield Terminal building and the air traffic control tower construction sites and fixed (rail-mounted) traveling cranes at the contact pier construction site. These fixed cranes will be supplemented by mobile cranes and vertical hoists, as required.

The operation of cranes on airports can present a serious hazard to air navigation because aircraft are at low altitudes during the approach and departure phases of flight. In addition to the potential creation of an air navigation obstacle,

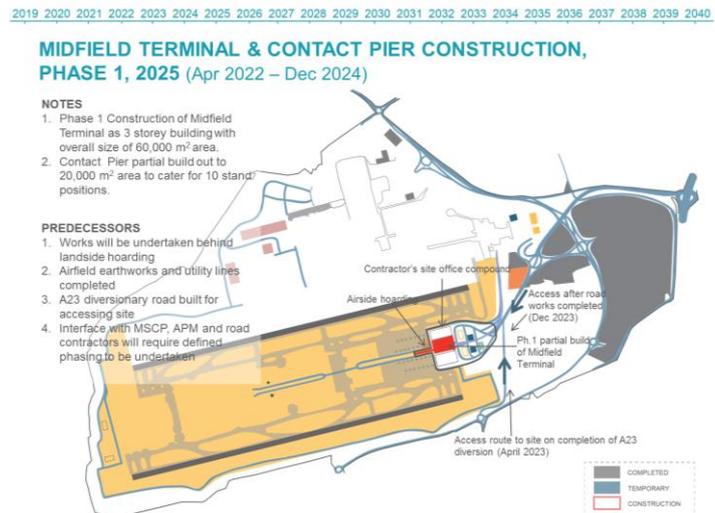


Figure 13. Midfield Terminal Building Phase 1 – 2025 (Apr 22-Dec24).

cranes could also interfere with navigation and/or communication equipment. Any flight safety implications of cranes in the midfield zone will be mitigated by coordinating crane and aircraft operations through the advance notification and coordination with the airport operator (and through them pilots and air traffic control) and in the cases of tower cranes, the fitting of aviation warning lighting.

Installation and use of construction cranes in the midfield zone will be subject to the requirements of Civil Aviation Publication 1096 (CAP 1096), issued by the UK Civil Aviation Authority (CAA), titled "Guidance to Crane Operators on Aviation Lighting and Notification." CAA places emphasis on identifying any instances in which crane height could exceed the airport's Obstacle Limitation Surfaces, imaginary surfaces that define maximum height of objects in the vicinity of runways.

### Obstacle Limitation Surfaces at Gatwick Airport Phase 1

CAA recognizes the Obstacle Limitation Surfaces (OLS) defined by the International Civil Aviation Organization (ICAO) in its Annex 14, Volume 1. The OLS governing the midfield zone during Phase 1 of construction, illustrated in Figure 14, is comprised of three main components:

- Runway Strip: extends horizontally 150m to each side of the runway centreline, at runway elevation.
- Transition Surface: rises from the outer edge of the runway strip at a slope of 7 horizontal to 1 vertical, until reaching an elevation of 45m above the runway strip's elevation.
- Inner Horizontal Surface: extends horizontally beyond the transition surface at an elevation of 45m above the runway strip's elevation.

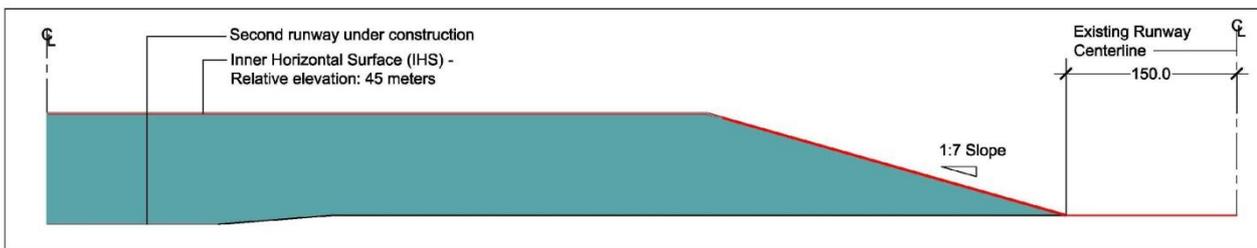


Figure 14. Obstacle Limitation Surfaces Affecting the Midfield Zone – Phase 1 Construction.

### Phases 2-4

- It is important to note that the OLS governing the midfield zone during construction Phases 2-4 is different than the Phase 1 OLS, because the second runway will be open for flight operations during Phases 2-4. Moreover, it is currently anticipated that the second runway's elevation will be approximately four metres lower the existing runway's elevation. The resulting OLS governing the midfield zone during Phases 2-4, illustrated in Figure 15, is comprised of the following components:
- Second Runway's Runway Strip: extends horizontally 150m to each side of the runway centreline, at the second runway's elevation.
- Second Runway's Transition Surface: rises from the outer edge of the runway strip at a slope of 7 horizontal to 1 vertical, until reaching an elevation of 45m above the runway strip's elevation.
- Inner Horizontal Surface: extends horizontally beyond the second runway's transition surface at an elevation 45m above the second runway strip's elevation, until intersecting with the existing runway's transition surface. (Note that the elevation of the Inner Horizontal Surface above the midfield zone is now 4m lower than its elevation during Phase 1.)
- Existing Runway's Runway Strip: unchanged from Phase 1.
- Existing Runway's Transition Surface: same as under Phase 1, except its upper edge now terminates at the elevation of the lower Inner Horizontal Surface, as defined by the elevation of the second runway.

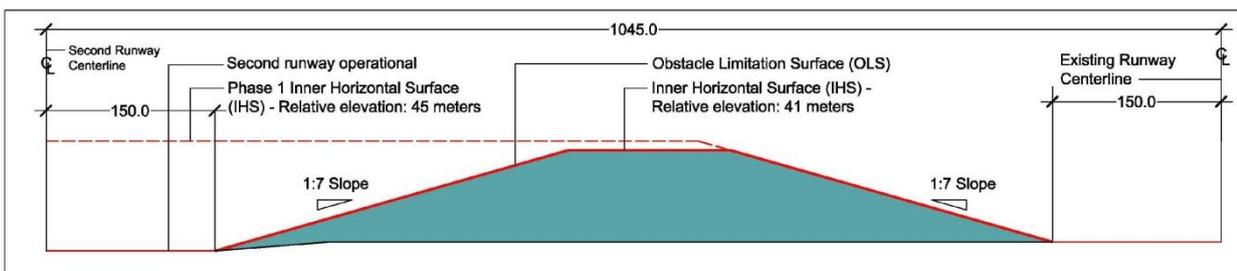


Figure 15. Obstacle Limitation Surfaces Affecting the Midfield Zone – Phases 2-4 Construction.

### Crane Configuration During Midfield Zone Construction

Main structures to be built in the midfield zone during Phase 1 will include the air traffic control tower and portions of the midfield Terminal building and the contact pier. Construction of each of these structures will require crane support.

The overall height of the air traffic control tower is likely to exceed 40m, in order to enable controllers to view all necessary portions of the airport's operational areas. Therefore, the height of the tower crane installed to support construction of the air traffic control tower will probably exceed the elevation of the Inner Horizontal Surface during some portions of the Phase 1 construction process. The crane plan for control tower construction will be optimized, in coordination with the airport operator and air traffic control authorities, to mitigate the extent and duration of the crane's penetration above the OLS.

Detailed plans for the three-storey contact pier building and three-storey midfield Terminal building are not yet designed, but both will be formatted such that the permanent structures remain below the OLS. Construction of the contact pier will be supported by fixed (rail-mounted) traveling cranes, and it is likely that three tower cranes will be installed to support construction of the midfield Terminal building. The resulting crane configuration is illustrated in Figure 16.

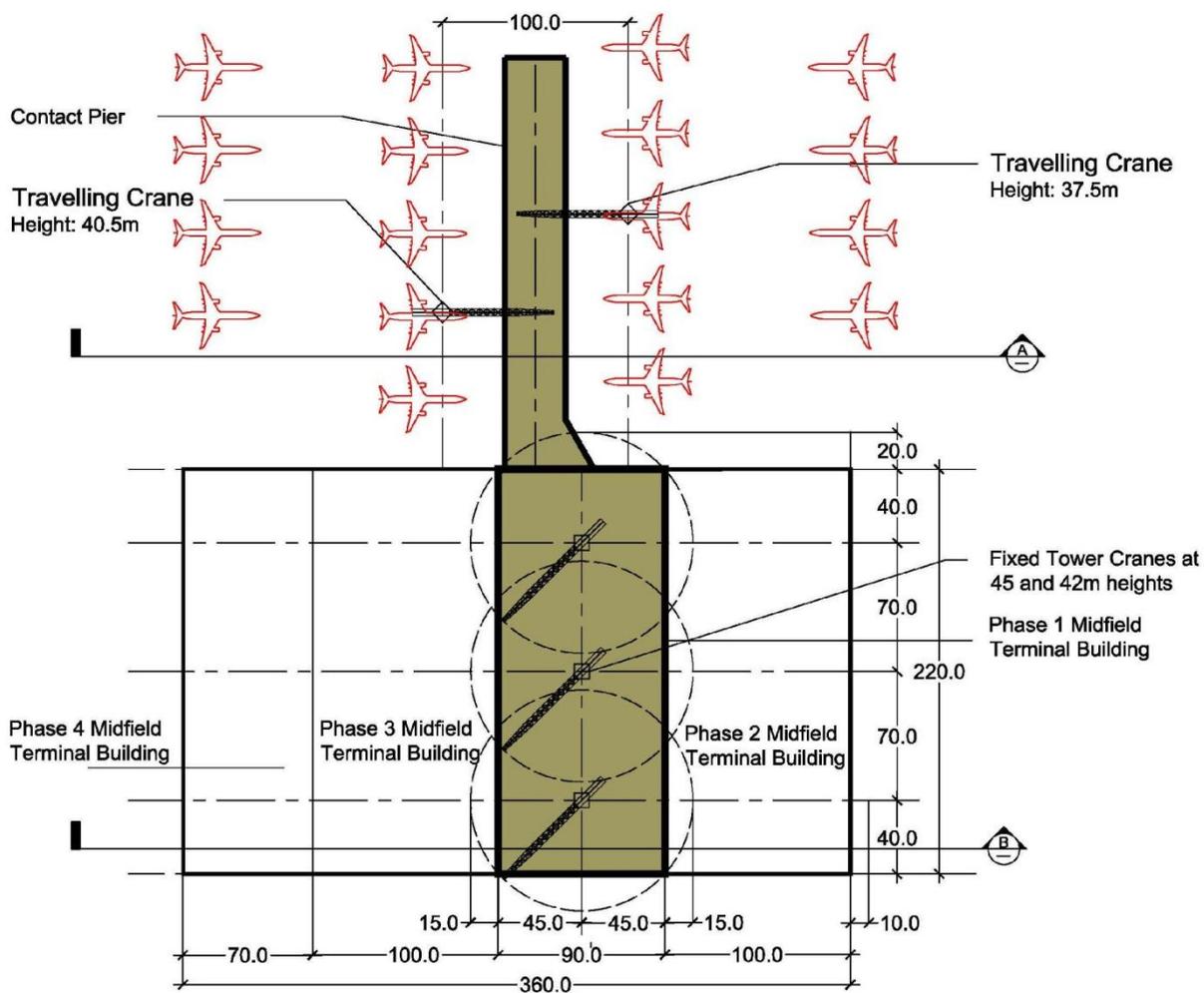


Figure 16. Potential Crane Configuration to Support Phase 1 Construction of Midfield Terminal Building and Contact Pier.

It is likely that the rail-mounted traveling cranes supporting Phase 1 contact pier construction can remain below the OLS, as illustrated in Figure 17.

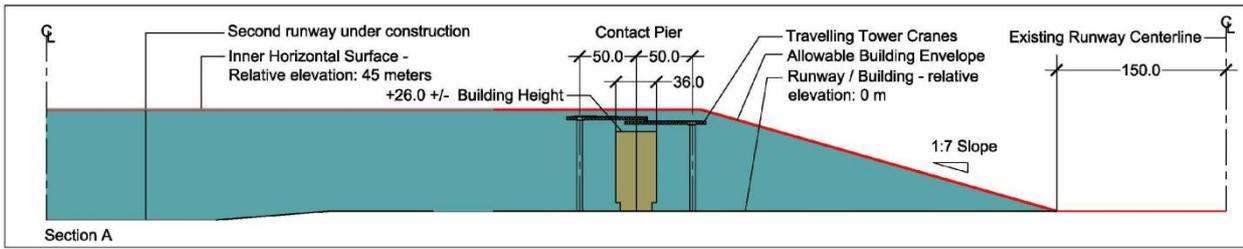


Figure 17. Obstacle Limitation Surfaces Affecting Contact Pier – Phase 1 Construction.

Depending on the design of the midfield Terminal building, the height of some portions of the tower cranes may need to exceed the Inner Horizontal Surface during Phase 1 construction, particularly since the heights of adjacent cranes must be offset so that they do not collide during operations. The potential tower crane heights are illustrated in Figure 18.

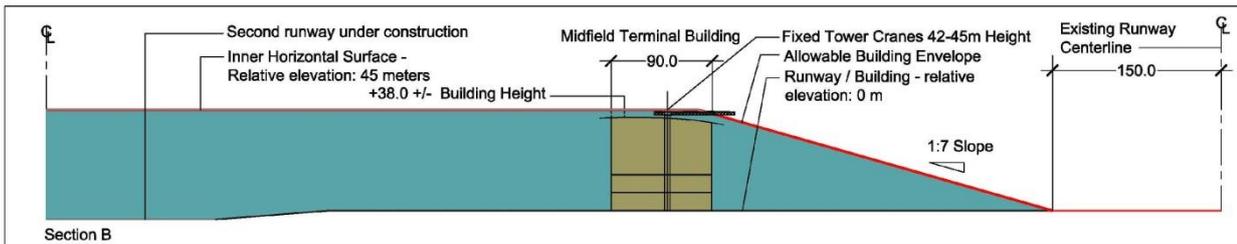


Figure 18. Obstacle Limitation Surfaces Affecting Midfield Terminal Building – Phase 1 Construction.

### Crane Configuration during Phases 2-4 Midfield Zone Construction

Main structures to be built in the midfield zone during Phases 2-4 will include expansion of the midfield Terminal building, extension of the contact pier, and construction of the remote pier. Crane plans similar to the Phase 1 plan will be developed for these later phases, with tower cranes supporting expansion of the midfield Terminal building and rail-mounted traveling cranes supporting construction of the contact pier and remote pier.

The OLS governing Phases 2-4 construction will be as illustrated in Figure 2, because the second runway will be in operation during these construction phases. As in the case of Phase 1 construction, it is likely that the rail-mounted traveling cranes supporting Phases 2-4 contact pier and remote pier construction can remain below the OLS. However, it is likely that the height of some portions of the tower cranes supporting midfield Terminal building expansion may need to exceed the Inner Horizontal Surface during Phases 2-4 construction.

### Landside APM (Automated People Mover)

Passengers will be transported to the new Midfield Terminal by a landside APM that connects the new Terminal directly to the South Terminal and Gatwick Railway Station and then onward to the North Terminal via a separate, existing APM. The APM will be operational at the point that the Terminal opens to passengers. Refer to Figure 19.

The APM will run from the South Terminal, starting at concourse level, running southward in the corridor between the existing A23 and the Brighton Mainline Railway. It is then reduced in height to almost ground level, pass under the runway inner surface, then rise to bridge over the

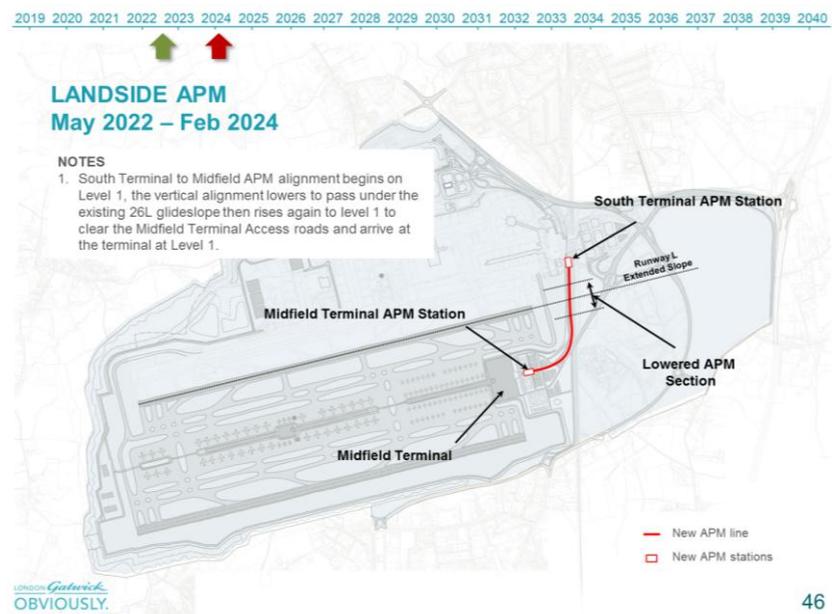


Figure 19. APM Landside.

A23 and access roads, terminating at concourse level in the new Midfield Terminal.

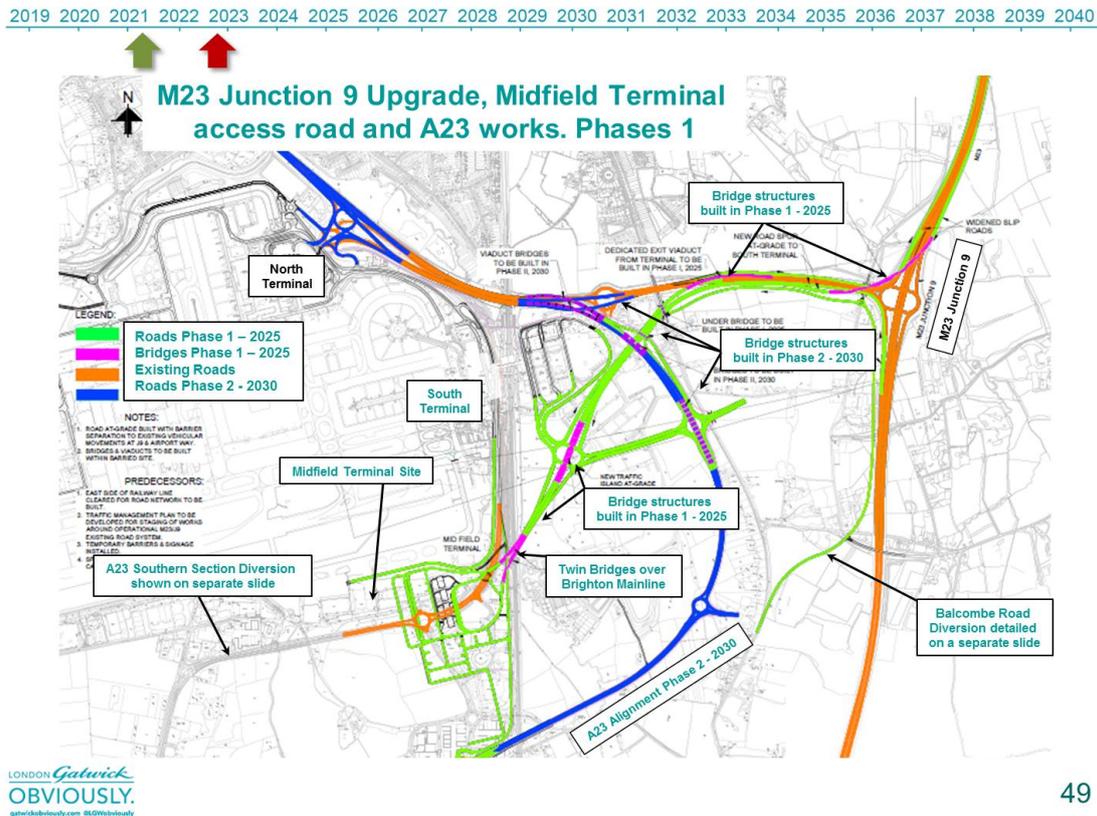
The conceptual design of the APM route is being further developed at this time and the construction methodology will be fully determined once this is received. Construction will inevitably involve piling in the corridor between the A23 and the railway which will possibly require the footpath/cycleway to be temporarily rerouted and relocated into a more compact alignment. It is anticipated that precasting many of the superstructure elements will be a preferred option as this gives both higher quality finish and more rapid construction.

Since a section of the APM is lowered to ground level so that the cars do not encroach on the glideslope, any crane works will have to be done during night-time working.

## Highway Works

### M23 Interchange

The increase in airport capacity for the new R2 and Midfield Terminal (MT) Opening necessitates improvements and enhancements at the M23 J9 interchange. See Figure 20. The new works at J9 require the construction of a new grade separated viaduct from the south bound carriageway to link with the westbound Airport Way, in addition to widening works to the existing sliproads on and off the northbound M23 carriageway. Airport Way would be increased from two lanes in each direction to four lanes in the east direction and five lanes in the west direction. In addition, the Highways Agency plan to increase the capacity of the M23 between Junctions 9 and 9a increasing the two lanes in each direction to four lanes in the eastbound and five lanes in the westbound respectively.



49

Figure 20. M23 J9 Major Road and Bridge Works Phase 1- 2025 (July 2021 – July 2023).

Whilst the A23 is not fully realigned until the 2030 phase, it is more efficient to build the bridge which carries it over the MT access road in this phase as the north abutment location becomes somewhat isolated and it removes the later need to work over the single main live carriageway to the new Terminal.

The proximity of the 66kV pylon tower on the north side of Airport Way is required to be checked for construction clearance on the road widening scheme, as well as all buried utility lines, before any works progress.

The road diversionary routes, vehicle separation from the construction works and temporary signage would be early enabling works requiring the Highways Agency and traffic police approval.

In advance of the physical road works, would be the surveying of the relevant sections, clearing and grubbing, followed by re-routing of utility services prior to the construction of major earthworks, bridges and roads or the bridge works over the live M23/J9 and present Airports Way.

In summary, the new junction and Terminal access road works necessitates; new multi-span bridges, widened slipways, a widened Airport Way, and a new road spur to the South Terminal. The works are complex and require pre-planning to develop the road traffic management plan and utility phasing prior to construction in order not to impact the present public use of J9 to the North and South Terminals.

### A23 Southern Diversion Works

In order to remove the existing A23 road that bisects the southern site plot, a new A23 alignment is to be constructed outside the new airport boundary linking the existing London Road roundabout at Fleming Way to a new roundabout at Gatwick Road. Refer to Figure 21. This new road section passes through Manor Royal Estate and consequently requires the demolition and clearance of the buildings and re-routing of the services, as a predecessor activity, along this proposed alignment.

The route to the South Terminal is then completed with a link paralleling the Brighton Mainline Railway, immediately to its west. Again, along this alignment the buildings in the path of the road require demolition and the utility services re-routed or removed as appropriate. With the new road and utility diversions complete, traffic would be switched over from the old A23 section to the new, requiring temporary diversions to be made across the junction ends - star points on Figure 22. The old section of the A23 would then be removed, allowing airfield construction activities to progress in its footprint.

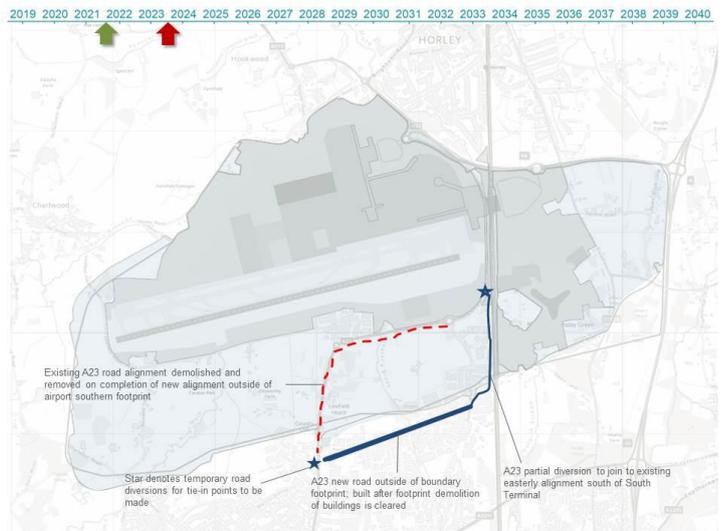


Figure 21. A23 Diversion, South Section  
Phase 1 2025 (Sep 2021 – Apr 2023).

### Balcombe Road Works

Balcombe Road is to be diverted around the eastern periphery of the extended R2 footprint. Refer to Figure 22. The existing alignment is shown (dashed red). The site will be cleared of vegetation and topsoil prior to the new alignment (blue) being constructed. Once the new alignment is complete and tied into the three junctions (blue stars), traffic is switched over onto the new alignment. The old road alignment and utility services through the airport site would be demolished and removed.

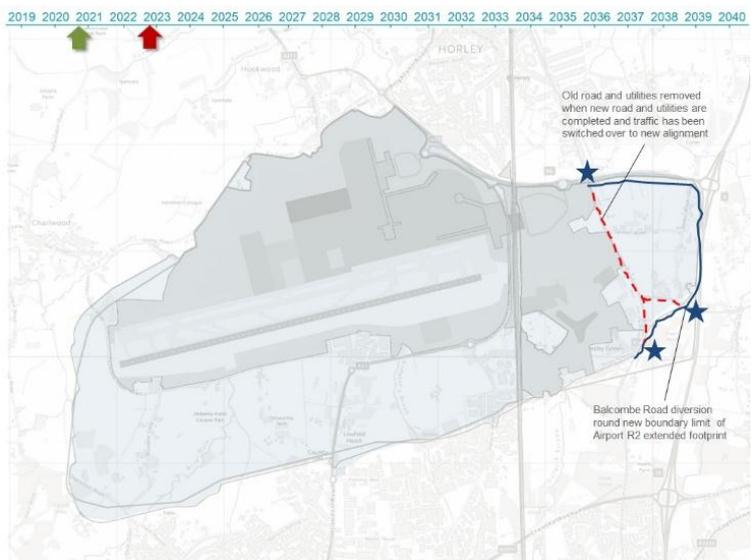
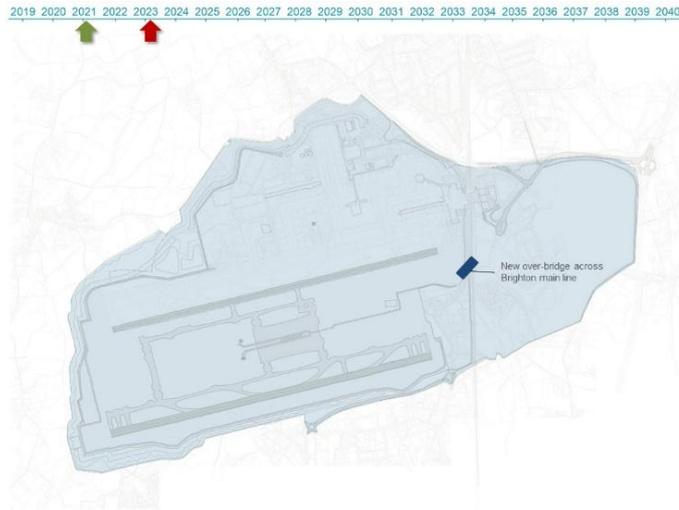


Figure 22. Balcombe Road Diversion  
Phase 1 2025 (Sep 2021 – Apr 2023).

## New Midfield Terminal Railway Crossing

The new access road between the Midfield Terminal and the M23 needs to cross the Brighton mainline railway to the south of Gatwick Station. Refer to Figure 23. It is anticipated that would be a push-launched steel prefabricated deck carried on concrete abutments built adjacent to the railway and this may require a temporary central support pier, (to be verified by the bridge designer). All stages of any centre pier support and push launch would be required to be undertaken in a number of pre-booked rail possessions.



**Figure 23.** New Terminal Road Bridge Phase 1 2025  
(Sep 2021 – Jun 2023).

The abutments would be built as reinforced concrete retaining walls founded on a piled foundation behind a robust fence protecting the live railway. After backfilling is completed a suitable platform would then be created for the bridge deck section to be assembled on the east side, within the newly acquired and cleared airport development site.

The bridge deck would be assembled from supplied prefabricated steel sections that would be delivered by low loader transport to the launch site. The prefabricated sections would then be lifted off by mobile heavy lift crane and assembled together to form the main deck and side chord members. Precast soffit slabs or permanent soffit formwork decking would be installed to form the road slab, with part cast at the rear end of the bridge to act as cantiledge when the deck is push-launched.

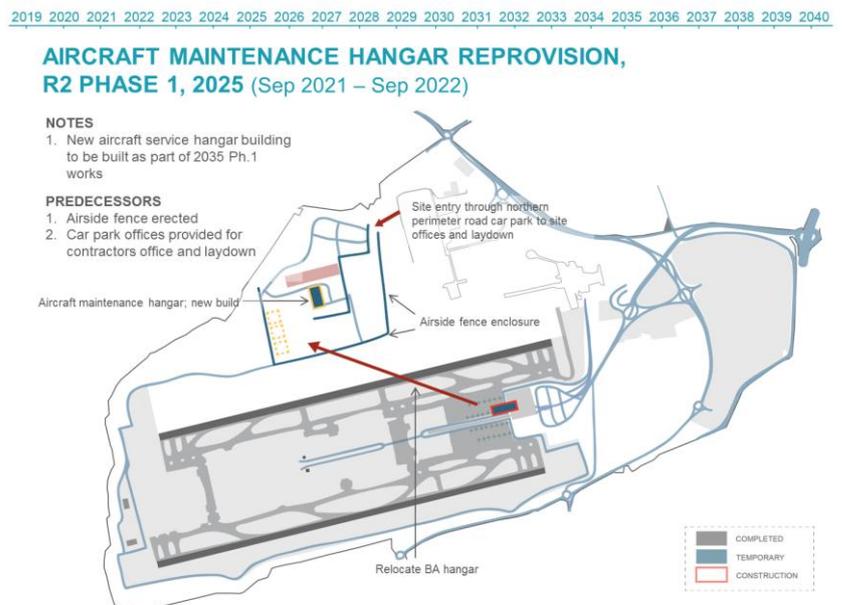
The bridge deck would be built off the ground to allow the skid plates and jacking rams to be installed that would move the bridge incrementally across the railway line. The bridge would be launched in a railway

possession of a minimum of 36 hours. After the bridge deck span has been installed and secured on its abutment bearing, the rest of the slab would be cast and the road furniture, markings, and street lighting would be installed ready for the new road access to be built.

## BA HANGAR

As shown in Figure 24, a replacement BA maintenance hangar will have to be built as a precursor to Phase 1 – 2025. The existing hangar and engineering store sit in the footprint of the new Mid Field Terminal and therefore need to move. The new hangar will be built and operational before the existing hangar is vacated and demolished.

Structure would likely be steel framed buildings founded on bored concrete piles that would be cast to competent stiffer clays. Cladding would be then installed as either aluminium or coated steel composite panels. Roofing would be double skin laid on rafters. Column frame members would be Once the hangar is completed and clad, then the internal fit out would take place, and the sliding hangar doors assembled and fitted.



**Figure 24.** Aircraft Maintenance Hangars  
Phase 1 – 2025 ().

## CAR PARKS

There is a requirement for new surface long stay and multi-storey car parking to be provided for the Runway and Midfield Terminal Opening phase. Car parking capacity will be provided as actual demand increases rather than aligning with any particular phases of Terminals opening.

Car park works for Phase 1 - 2025 include:

- Car park surface parking 5,946 spaces with 6,840 'block' parking spaces in addition.
- Car park, multi-storey (1 no.) to be erected at the Midfield Terminal (as shown in Figure 25).

Entry barriers would be provided where appropriate and the lighting, speaker, and fire hose reel installations would be surface mounted. Lifts would be provided in locations to suit the passenger flow to and from the Midfield Terminal access and egress points, together with secondary staircase routes. Car park management, as well as ticket access and egress control system, would be installed and would be tested and commissioned with all of the mechanical, electrical, and piping MEP installations (MEP) prior to operational use of the car park on opening.

Surface car parking would be asphalt pavement laid on sub-grade previously completed in a predecessor package. The works form a sub-set of the car parking works package and require road drainage, lighting, fencing, barriers, signage, and security control systems to be installed, together with the car park management system and ticket control. These systems need to be tested and commissioned as a stand-alone package and part of the overall integrated operational requirements of the new airport opening.

Surface car parking would be asphalt pavement laid on sub-grade previously completed in a predecessor package. The works form a sub-set of the car parking works package and require road drainage, lighting, fencing, barriers, signage, and security control systems to be installed, together with the car park management system and ticket control. These systems need to be tested and commissioned as a stand-alone package and part of the overall integrated operational requirements of the new airport opening.

### Car Park Relocation

Staff car parks (approximately 40,611 m<sup>2</sup> in area) and public car parks (approximately 77,000m<sup>2</sup> in area) are required to be demolished to enable for the construction of the major road works (A23 and M23). Figure 26 captures which car parks are to be demolished further to highlighting to what zones each car park belongs. The sequence of works would be as stated below.

Construction sequence for demolition of car parks is as follows:

- Zone J: May 2021 – Jul 2021
- Zones L and M: Apr 2021 – Jun 2021
- Zone N: Aug 2021 – Nov 2021
- Zones P and Q: Dec 2023 – Mar 2024.

Finalisation of car park site clearance is as follows:

- Zone J: May 2021 – Aug 2021
- Zones L and M: Apr 2021 – Jul 2021
- Zone N: Aug 2021 – Nov 2021
- Zones P and Q: Dec 2023 – Mar 2024.

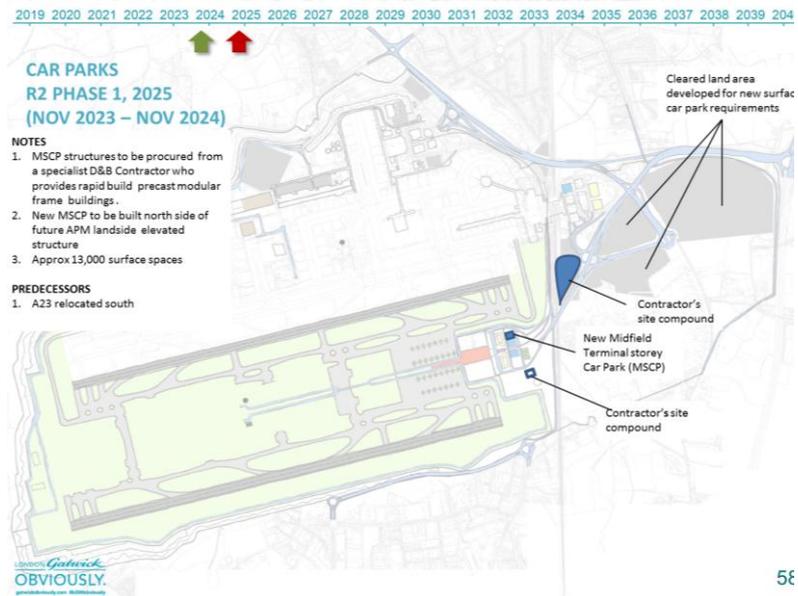


Figure 25. Car Parks –Phase 1 - 2025.

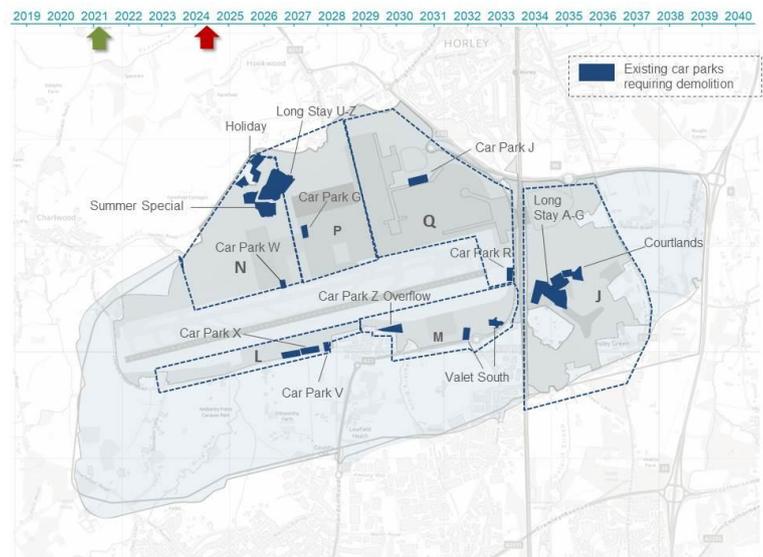


Figure 26. Car Parks Phase 1 - 2025.

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Following car park demolition, the materials would be processed and used on-site as bulk material - assuming that the materials are not found to be contaminated.

## 3.2 Utilities and Airfield Equipment

### Utilities and Airfield Equipment

#### Energy Centre

The UK Climate Change Act 2008 provisions a legally binding target of at least an 80 per cent cut in greenhouse gas emissions by 2050 as compared to the 1990 baseline.

By 2030 and beyond, the UK Carbon Plan foresees emissions from sectors such as aviation that will need to test technology by 2020 that includes: greater energy efficiency, switching from oil and gas to bio-energy or low-carbon electricity, and carbon capture and storage for industrial process.

Consistent with these regulatory commitments, by 2020 Gatwick will have reduced its energy use across R1 by 20 per cent and CO<sub>2</sub> emissions by 50 per cent from 1990 levels through its Decade of Change programme. As R2 is developed for 2025, Gatwick's energy strategy for the new Terminal and airside buildings will meet the expected building regulation minimum requirements for zero-carbon for 'regulated' energy (energy supplying building services that do not include major plug-in equipment such as: baggage handling, APM, etc.). All energy use in the new Midfield Terminal and airside buildings will be zero-carbon emissions.

As the airport develops beyond 2025, Gatwick will seek to build on the energy strategy and to extend the on-site generation of low or zero-carbon energy beyond that required to make the R2 Terminal and airside vehicles zero-carbon. This will cover the energy requirements of the other buildings on the site, the APMs, and the electric vehicle charging infrastructure for passenger vehicles. This will lead to a requirement for the generation of more zero-carbon electricity than heat and, owing to the ways much of this electricity might be generated, a wider market for low-carbon heat, including new customers off-site in local communities. The energy centre will have the flexibility and space to expand over time and include new systems to generate these additional demands

The energy strategy foresees a centralised energy centre with a combination of wood chip biomass and boilers fed by natural gas and biogas (derived from the site) in an energy centre, with appropriate access for biomass fuel delivery vehicles. This energy source is to be supplemented by a large photovoltaic array and a new main co-located primary sub-station (CF).

The intention is to co-locate the energy centre with the new primary sub-station (CF) and the anaerobic digestion plant for the airport's organic waste. A zone to the east of the railway line and adjacent to the existing wastewater treatment plant has been identified as the likely location, taking into account the airport's operational requirements. The floor area of the energy centre will be approximately 2,500m<sup>2</sup>. A vertical flue of approximately 25-35m height will be required (subject to detailed modelling) for the proper dispersal of combustion gases and compliance with the Clean Air act.

The Gatwick energy strategy also seeks to bring the following additional benefits:

- Improved 11kV linkages between the existing sub-stations and the new third sub-station, bringing the potential to improve the overall electrical resilience of the airport's operations
- Maintaining the current resilience of the incoming 33kV feeds to the existing sub-stations AF and BF, with the new CF sub-station to be fed from BF
- Potentially improving the overall level of resilience for the airport, if the work with UKPN shows that an independent 33kV supply needs to feed substation CF
- Increased resilience in terms of gas supplies, as the airport will generate biogas locally from digesting its waste and wastewater sludge for use in boilers and its vehicles potentially
- Low-carbon heat provided to buildings in R1, that further improves R1's carbon performance
- Reduced gas use for R1.

## High Voltage

Decommissioning of 11kV substations (S/S) supplying R2 work areas within the existing boundaries would be undertaken in sequence with the land vacating programme. Sufficient diversity of 11kV linkages between substations enables a flexible decommissioning programme and temporary connectivity to the new ATC tower, ARFF and passenger Terminal. Electrical supply to R2 work areas outside of the existing airport boundary is to be surveyed and a decommissioning plan is to be put in place. Refer to Figure 27.

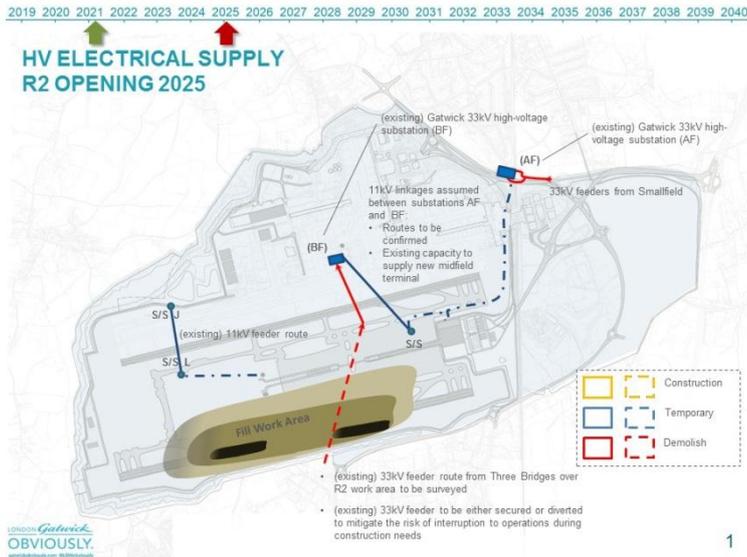


Figure 27. High Voltage (HV) Electrical Supply R2 Opening 2025.

R2 (only) 2030 maximum demand estimates are considered to be in the order of:

- Elect = 11.8 MW (current R1 = 23.9 MW)
- Heat = 8.6 MW (current R1 = 17.3 MW)
- Gas = 9.5 MW (current R1 = 21.7 MW).

Predecessors of this activity includes 33kV feeders over R2 area to be either secured or diverted (interruption to operations becomes a risk that needs to be mitigated). Further 11kV linkages between existing AF and BF substation are to be improved and extended to CF.

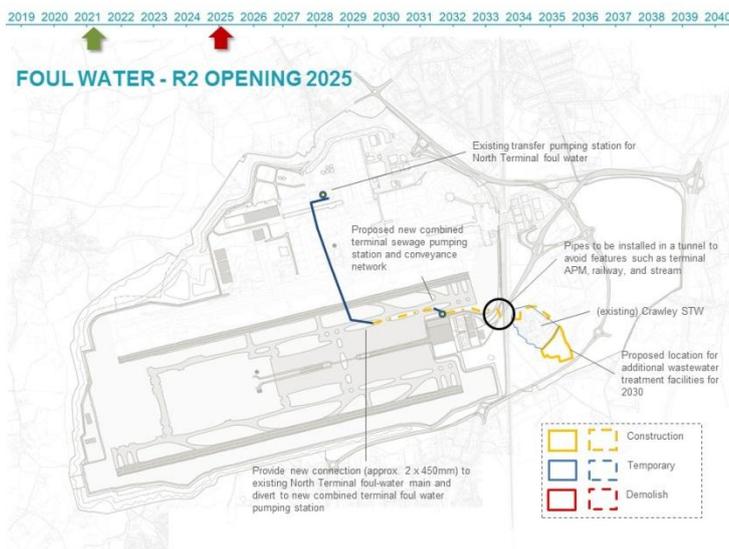


Figure 28. Foul Water R2 Opening 2025.

## Foul Water

Maintaining conveyance connectivity between the existing North Terminal foul water to the existing Crawley Sewage Treatment Works (STW) is the operational assumption. Also, diverting existing portions of the southern conveyance network segments through the new combined sewage pumping station at new passenger Terminal is foreseen. Foul water conveyance network outside existing airport boundary is to be surveyed and included within the decommissioning plan that is to be put in place. Refer to Figure 28.

## Fire and Water Mains

Potable water is currently supplied by the local water utility Sutton and East Surrey Water (SESW). Both the existing operation and the new R2 boundary fall within the East Surrey Water Resource Zone.

The water company business plans (PR14) were submitted to the Water Services Regulation Authority (OFWAT) before the publication of the Airport Commission's interim report. This means that SESW was unable to make any specific growth provision for the new runway and associated facilities at Gatwick Airport. Notwithstanding this, because SESW's previous and future business plans have included measures to improve resilience, they currently have capacity that accommodates the potential growth at Gatwick Airport.

It has been assumed that the future potable water requirements for Gatwick Airport would increase in proportion with the number of passengers passing through and staff working at the airport. The largest potable water would be in the use of toilet facilities by passengers and people working at or travelling via the airport. Other 'operational' potable water requirements such as water for aircraft site activities or for catering requirements would likely be relatively minor in comparison. Also, there would also be an increase in demand from associated commerce with an increase in hotel beds leading to the greatest non-Terminal increase in demand.

Preliminary potable water forecasts based upon typical usage:

- 2012/13 34.2mppa R1 Terminal buildings = 1,968 (average m<sup>3</sup>/day – actual)
- 2030/34 +60 mppa R1 + R2 Terminal buildings = 3,269 (average m<sup>3</sup>/day – worst case), with R1 + R2 Terminal buildings + assoc. commerce = 4415 (average m<sup>3</sup>/day – worst case).

During the R2 land vacating phase, sufficient diversity of fire and water ring mains have been assumed to exist, thereby enabling a flexible decommissioning programme of piping segments and maintaining a supply to tenants. Although, a detailed decommissioning plan is to be put in place for both fire and water mains supply in order to sequence demolition works with the land vacating programme schedule. Also, the water mains network outside the existing airport boundary may require further surveying.

The construction activity would create further water demand over and above that required for the routine operation of the existing airport. The exact amounts that would be required are difficult to assess at this stage and would depend greatly on the design and phasing of the work required. As part of the environment mitigation measures, low-water use techniques and facilities would be included in construction specifications.

Moreover, the water demand forecast model applied includes estimates of water needs for construction, using values from the Waste and Resources Action Programme (WRAP) report 'Audit of Water Use on Construction Sites'. This document studied water use on a U.K. airport construction site that operated between October 2010 and April 2013. For the purposes of estimating possible future water consumption during construction an amount of 120m<sup>3</sup>/£M has been used. Refer to Figure 29.

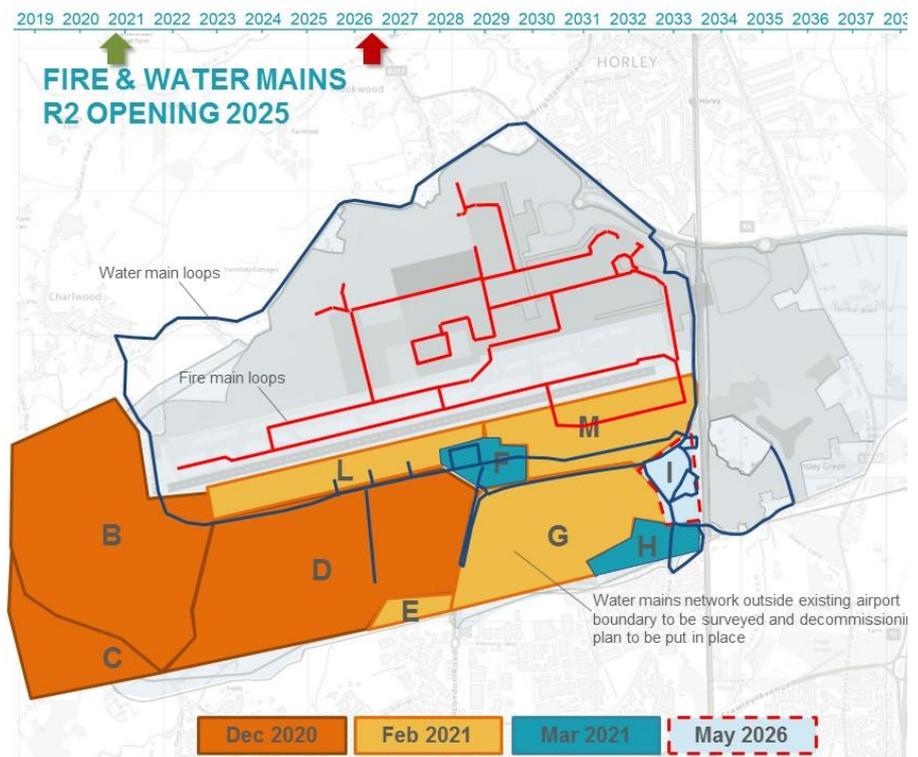


Figure 29. Fire and Water Mains Phase 1 - 2025.

## Fuel Systems

Although the fuel systems asset owner has current responsibility for funding all required infrastructure, it is important that they are engaged in early construction coordination. It is intended that all remote and contact stands in the new Midfield Terminal apron are serviced by the fuel hydrant system. These would be fed by extending the existing fuelling system from the southern end of the existing South Terminal apron, southward past the end of the existing runway the westward to the new Midfield Terminal aprons. Refer to Figure 30.

Works for the link between the existing South Terminal Aprons and the new Midfield Terminal aprons which may impinge upon the glideslope surfaces would be carried out at night in order not to interfere with the operational runway.

Fuel piping would be laid in the new apron footprint after treatment of the formation, filling and sub-base works. The apron PQ works would then be co-ordinated with hydrant riser, hydrant pit and any passive cathodic protection works. Fuel lines will be laid to fall with drains and air valves located at suitable locations as required.

It is anticipated that at some point in the future, when the aprons are extended westwards that for fuel volume and security of supply reasons, that a western fuel link will be created to form a loop back to the fuel farm. In order to facilitate this, sleeves will be included in the design in order to cross taxiways with a minimum of future disturbance. The fuel depot and existing fuel hydrant network are below capacity and are not due for upgrading before 2040. From 2040 to 2050 there would also be a need to upgrade the current fuel pumping system and in 2050 construct two remote fuel depots. Due to the phased approach, the fuel network design needs to accommodate provision of future shut off valve points on the apron ends.

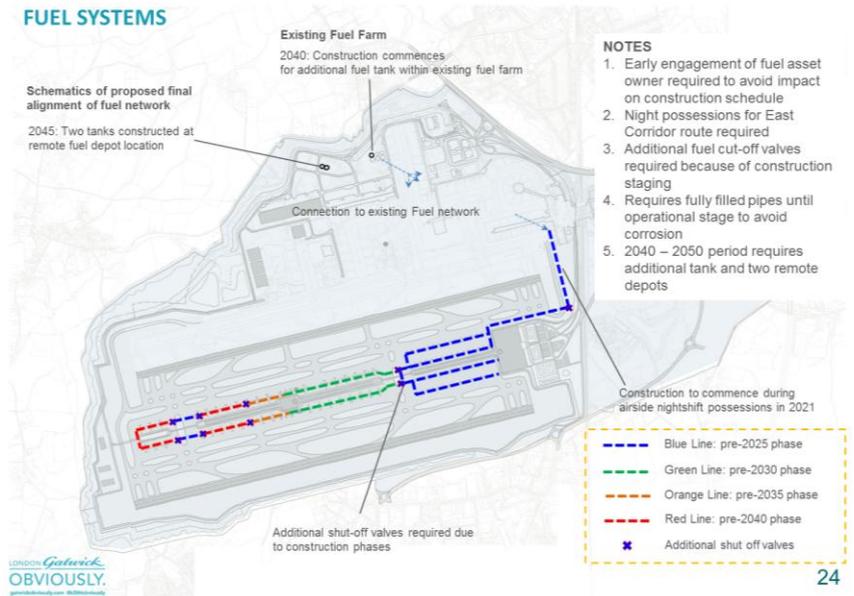


Figure 30. Fuel Systems All Phases.

## CONTROL TOWER AND FIRE FACILITY

Instrument Landing System (ILS) Category (CAT) III capability for the new runway has been assumed. Line-of-sight analysis identified that an Air Traffic Control Tower (ATCT) height of 39m would allow the controllers to see the ends of all operational runways. An additional 3m added to the tower height would allow controllers to see the extent of the eastern zone of the airfield that may enhance safety. Ground apron control could be incorporated into the new ATCT. Refer to Figure 31.

The location of a Rescue Fire Fighting Station (RFFS) is a primary factor for achievement of recommended response times. The fire station location would be such that access to the manoeuvring area and runway is direct and requires the minimum number of turns rescue and fire fighting vehicles have to negotiate. Based on CAP 168 Gatwick requiring a Category 10 service, this is the maximum level of protection and provides coverage for aircraft up to 90m in length and with a fuselage width of up to 8m. This is sufficient for all Code F aircraft for which the airfield has been designed to support.

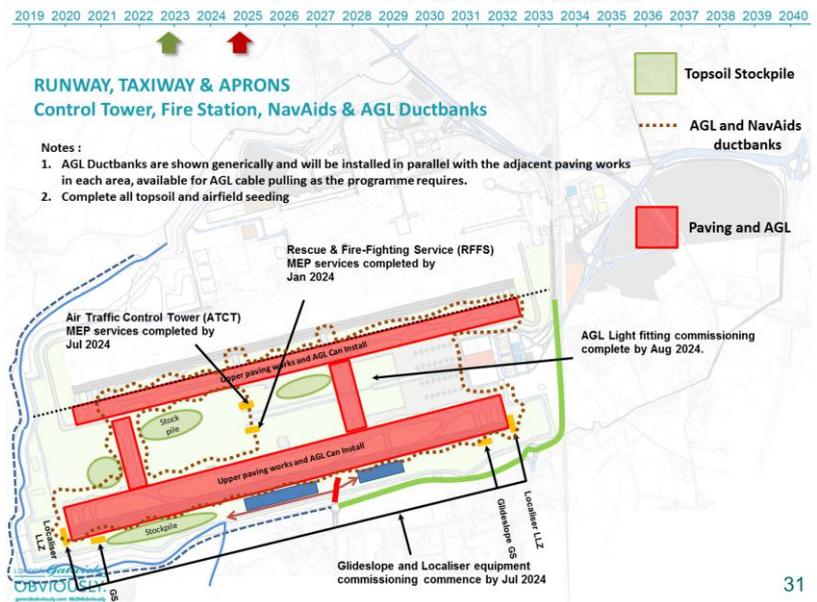


Figure 31. ATCT, ARFF, NAVAIDS, and AGL Phase 1 - 2025.

ATCT and RFFS foundations would commence December 2022, and earthworks would have to be sufficiently progressed to facilitate foundation piling, etc. Airfield Ground Landing (AGL) is to commence concurrently with the pavement construction in mid-2022, with duct bank installations to coincide with the finish of Runway (RWY) and Taxiway (TXY) stages.

For the licensing of the new aerodrome, the Gatwick AOR and Project Teams would address all regulatory requirements, including CAA's: CAP 168 – Licensing of Aerodrome, CAP 760 – Guidance on the Conduct of Hazard Identification, Risk Assessment and the Production of Safety Cases, CAP 670 – Air Traffic Services Safety Requirements. Aerodrome licensing inspections are to commence in November 2024, approximately six months prior to the May 2025 R2 Opening. Communication, Navigation and Surveillance for Air Traffic Management (CNS-ATM) equipment is to be managed by the Civil Aviation Authority and to coincide with ATCT and RWY/TXY Works.3.4 2030 – Phase 2

### 3.3 PHASE 2 2030

## AIRFIELD, MIDFIELD TERMINAL, CONTACT PIER AND SATELLITE PIER

2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

### MIDFIELD TERMINAL CONTACT & REMOTE PIER CONSTRUCTION, PHASE 2, 2030 (Oct 2026 – Jun 2029)

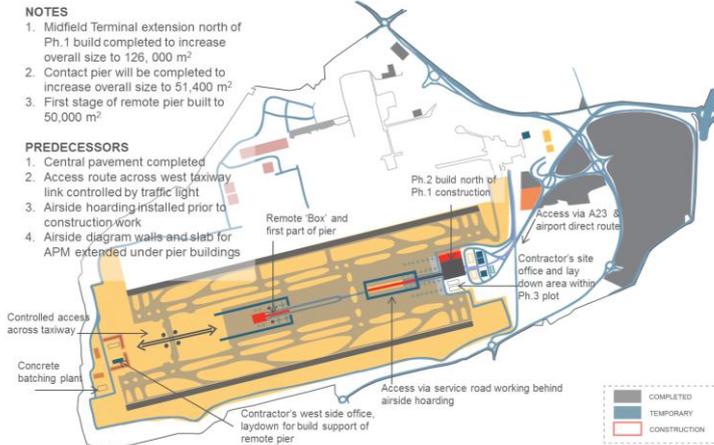


Figure 32. Midfield Terminal, Contact & Satellite Piers. Phase 2 – 2030

In Phase 2 – 2030, the following works are undertaken:

The northern half of the Midfield Terminal is completed, the Contact Pier is completed to the west and the central core of the new Satellite Pier is built.

New parking aprons and associated fuel systems are constructed to service the contact and new Satellite pier and a southern parallel taxiway added to connect the new apron to the second runway. Refer to Figure 32.

The surface car parks are enlarged in the east and two new multi storey car parks are constructed to accommodate additional demand, one at the South and one at the Midfield Terminal.

It is the intention that all working areas are designated as landside areas by secure fencing and hoarding with access points strictly controlled. Only minimal works would be carried out airside as operational requirements demand. The extended footprint of the Midfield Terminal construction site is surrounded on all sides by airport operational activities. It is likely that the apron contact stand and remote stand immediately to the west would be required for contractor laydown. Similarly, construction of the contact pier extension will be in very close proximity to the contact parking stands built in Phase 1. Aircraft may have to be moved down the apron to allow sufficient room to complete some work activities. If required, this is to be agreed with airport operations.

The Terminal contractor's office would be remote from the Terminal in the City Place area to the south-east, most likely continuing on from where they were located in Phase 1. Airfield contractors would have their site establishment, stores, batching plants etc. outside the airport western perimeter. The airfield and the Satellite pier works areas will be accessed from the western edge of the airport as shown in Figure 29. This access necessitates crossing the River Mole by bridge, entering the airport perimeter and crossing several taxiways. All such crossings will be securely controlled.

Similarly, as for the Phase 1 Terminal and contact pier works, the foundations of the contact and Satellite pier are formed in part from the APM tunnels walls and the construction method will be the same as Phase 1. The construction sequence of the buildings follow a traditional pattern of foundations, structural steel frame, precast upper floors, roof, and curtain walling to complete the building envelope. Weather tightness allows the baggage handling, MEP and fit-out works to commence, followed by building systems testing and integration with the systems installed during Phase 1.

## A23 WORKS

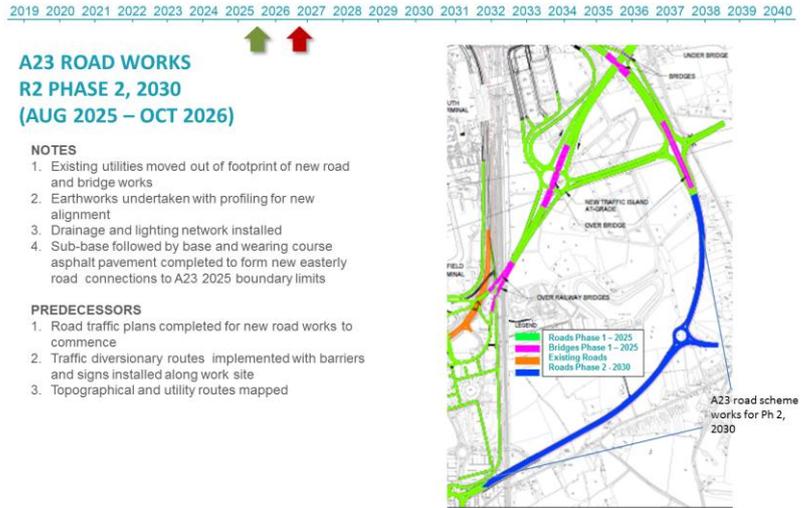
In Phase 2 the A23 road is extended from the southern diversion at the Gatwick Road traffic island extended round the easterly and north side of the airport site, providing full access links to the new Midfield Terminal Building and improved links to the South and North Terminal Buildings. Refer to Figure 33 (East and Figure 34 (North).

The works require the following stages to be undertaken:

- Full traffic plan staging for the road scheme development, showing barriers and signage for traffic and pedestrian diversionary routes during the construction phasing of the road and bridge works
- The barrier and signage implementations to allow full survey of the ground and utilities to be moved outside of the footprint of the earthworks and bridge foundations
- Commencement of the bridge works ahead of the road works
- Road at-grade requiring earthworks profiling for slipways and extended road installation. Earthworks fill would be imported from any remaining runway surplus material, or be brought from other borrow sites
- Sub-grade, asphalt, and concrete supplies transported to site by trucks from the established contractors batching plants set up on site, or transported from the Crawley Goods Yard Sidings if an agreement has been made with the present producers.

Once the asphalt pavement is completed and the road markings and signage have been installed then the tie-ins would be completed, the traffic barriers and temporary signage would be removed and the traffic switched to use the new road network.

There would be the requirement to construct the tie-ins to the existing road network prior to the traffic switch onto the new road system



51

Figure 33. A23 Road Works East Phase 1 – 2030 (Aug 2025 Apr 2028).



Figure 34. A23 Road Works North Phase 2 – 2030 (Aug 2025 Apr 2028).

## CAR PARKS

There is a requirement for new surface long stay and multi-storey car parking to be provided as demand increases, these may not necessarily coincide precisely with the period of Phase 2.

Car park works for Phase 2 - 2030 include (Figure 35):

- Two multi-storey car parks, one at the South and one at the Midfield Terminal
- Delivery of surface parking spaces to the east as shown.

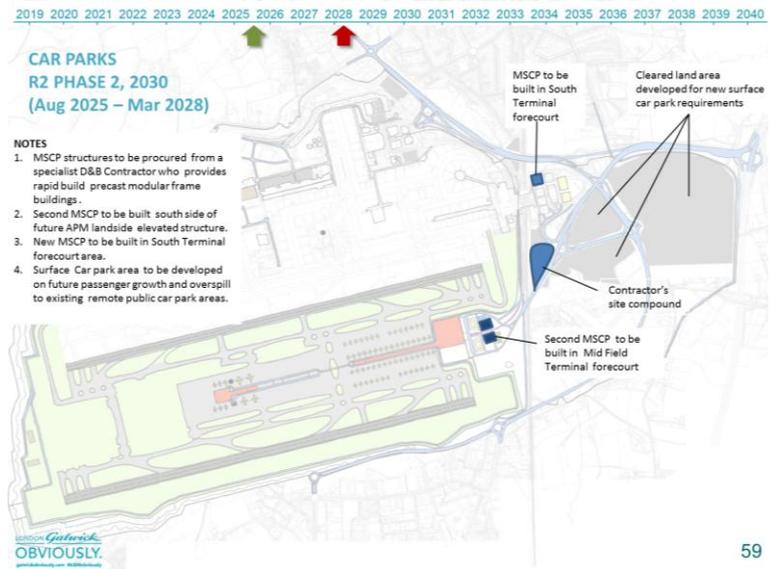


Figure 35. Car Parks Phase 2 – 2030

## CARGO BUILDING

As part of Phase 2 would be the requirement to have operational a new Cargo Building to cater for the increased cargo movement.

The primary access for the Cargo Building Contractor shall be from the northern car park control gate and the site offices and laydown would be positioned close to the Cargo Building. The works would be separated from the airside operations by an airside security fence installation that precedes construction taking place. Refer to Figure 36.

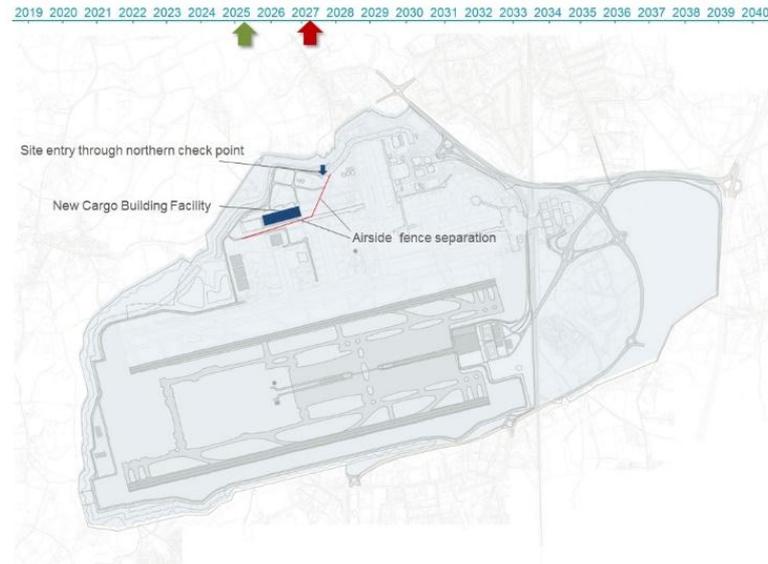


Figure 36. Cargo Building  
Phase 2 – 2030 (Aug 2025 – Feb 2027).

It is anticipated that the building would be a steel framed warehouse type structure with composite cladding and roofing system envelope. Foundations would be piled. Base slab would be in situ reinforced concrete bearing on ground beams supported off the pile caps.

The building frame would be pre-engineered steel members that would be brought to site ready-painted from a steel fabricator, lifted, and bolted into position. When the building structure is completed the intermediate floor grating would be installed and probably the base cargo handling steelwork transport trolley beam routing, and weigh and turning tables components. The building office framing system and floor slabs would be cast and the building envelope roofing and cladding then undertaken. Once enclosed the MEP installations would proceed and the cargo truck bays incoming and outgoing doors installed.

The building would likely have an office facility built in and would also contain mechanical cargo turn tables, weighing, palletisation operation, stacking, and retrieval system for the handling of the cargo items. The building would have an incoming landside platform and an outgoing airside docking gate system built in the structure. After testing and commissioning is completed and the road access and apron works up to the building are finished then the building would be turned over for operational use. The airside separation fence would then be removed.

## 3.5 Phase 3 - 2035

### AIRFIELD, TERMINAL BUILDING, AND SATELLITE PIER

For Phase 3 Works, the following facilities are completed:

- Construction of phase 3 Midfield Terminal expansion.
- Completion of the eastern half of the Satellite pier and a small portion of the western portion and completion of the APM shell below.
- Completion of the Satellite pier north and south aprons and associated fuel systems.
- Extension of the northern and southern parallel taxiways.

It is the intention that all working areas are designated as landside areas by secure fencing and hoarding with access points strictly controlled. Only minimal works will be carried out airside as operational requirements demand. The extended footprint of the Midfield Terminal construction site is surrounded on all sides by airport operational activities. It is likely that the apron contact stand and remote stand immediately to the west would be required for contractor laydown. Similarly, construction of the Satellite pier extension will be in very close proximity to the contact parking stands built in Phase 2. Aircraft have to vacate the innermost stands to allow sufficient room to complete some work activities and this is to be agreed with airport operations.

The Terminal contractor's site compound would be relocated in the City Place area to the south-east of the Midfield Terminal. The Airfield contractors will have their site establishment, stores, batching plants etc. outside the airport western perimeter, likely following on from Phase 2. The airfield and the Satellite pier works areas will be accessed from the western edge of the airport as shown in Figure 36. This access necessitates crossing the River Mole by the bridge provided in Phase 2, entering the airport perimeter and crossing several taxiways. All such crossings will be securely controlled.

The construction sequence of the buildings follow a traditional pattern of foundations, structural steel frame, precast upper floors, roof, and curtain walling to complete the building envelope. Weather tightness allows the MEP and fit-out works to commence, followed by building systems testing and integration with the systems installed during Phases 1 and 2.

During this phase, the Airside APM will be excavated from the western end, ground slabs constructed, MEP systems installed, followed by testing and commissioning.

The mucking away of the spoil from the APM tunnel would require careful logistical planning and an agreed haul transport route. Removal of the material from the work face is likely to be carried out by backhoe excavators discharging to either dump trucks or conveyor. A transfer station point would then be set up where road haulage trucks would cart the material away, ideally for re-use as fill in the eastern car park areas or potentially to the Crawley Goods Yard Siding, for disposal by train wagons to a licensed dump area.

2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040

#### MIDFIELD TERMINAL & REMOTE PIER CONSTRUCTION, PHASE 3, 2035 (Jan 2031 – Aug 2033)

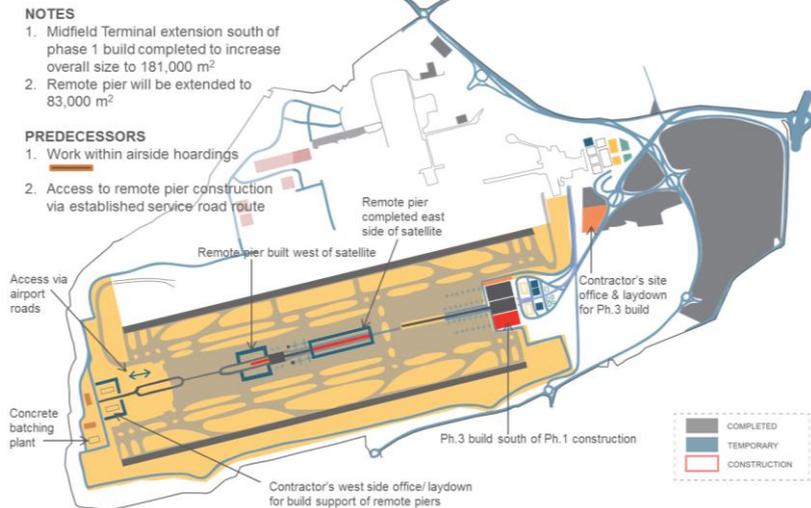


Figure 37. Midfield Terminal Expansion, Contact, and Remote Piers - Phase 3 – 2035.

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## CARGO BUILDING

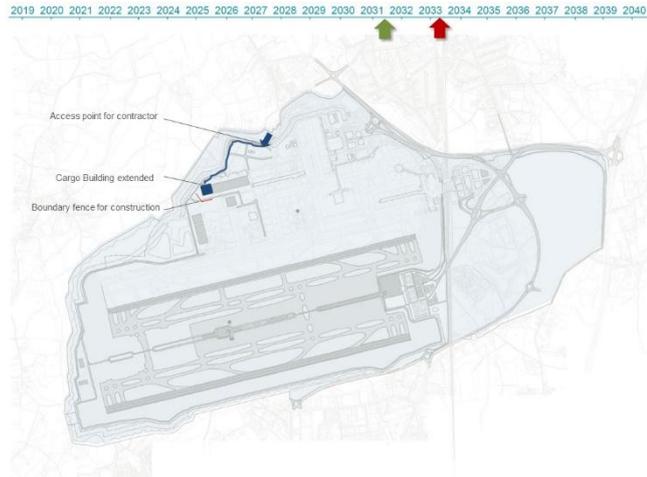


Figure 38. Cargo Building Extension Phase 3 – 2035.

The Cargo Building would be extended as part of the Phase 2 works. Refer to Figure 37. It would likely be let as a build only package to utilise and extend the installed cargo retrieval system from the Phase 1 Works stage.

Access for the contractor would be through the northern car park check point where a temporary site compound would be set up for him to undertake the new building works.

Programme has the Cargo Building commencing Jan 2031 and being completed in Feb 2033.

## Phase 4 - 2040

### TERMINAL BUILDING AND CONTACT PIER

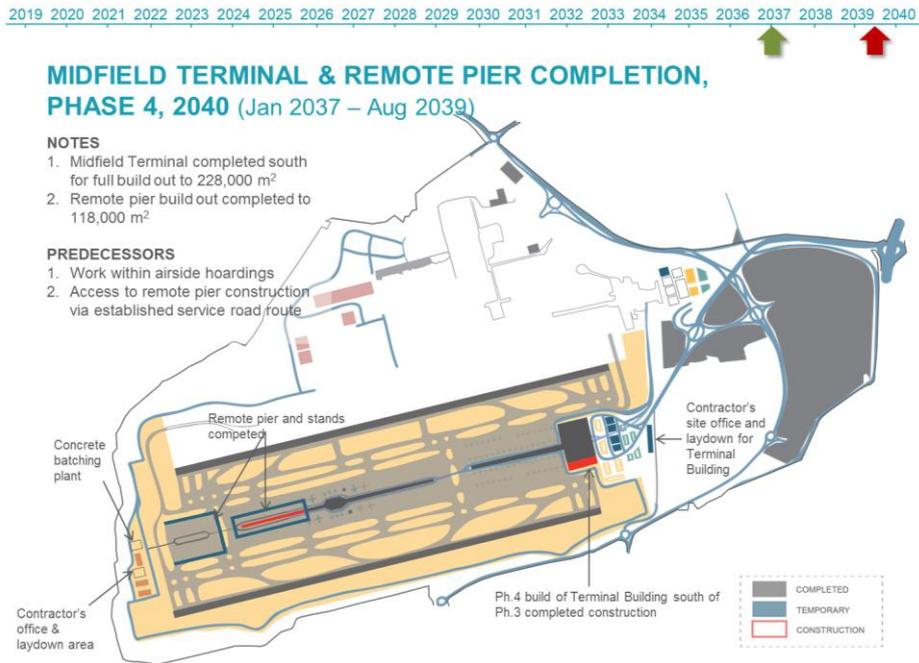


Figure 39. Completion of Airside APM and Satellite Pier with Terminal Building Completion. Phase 4 – 2040.

Phase 4 -2040 comprises the following works (Refer to Figure 39):

- Completion of the southern portion of the Midfield Terminal.
- Completion of the western half of the Satellite pier.
- Construction of a further remote stand to the west.
- Construction of the Remote Pier north and south aprons, associated fuel systems and taxiways.
- Fit out and bring into operation the airside APM

As for previous phases, it is the intention that all working areas are designated as landside areas by secure fencing and hoarding with access points strictly controlled. Only minimal works will be carried out airside as operational requirements demand. The remaining footprint of the Midfield Terminal construction site is surrounded on all sides by airport operational activities. It is likely that the apron contact stand and remote stand immediately to the west would be required for contractor laydown. Similarly, construction of the Satellite pier extension will be in very close proximity to the contact parking stands built in Phase 2. Aircraft have to vacate the innermost stands allow sufficient room to complete some work activities and this is to be agreed with airport operations.

The Terminal contractor's offices would be remote from the Terminal in the area formerly occupied by City Place to the south-east, most likely continuing on from where they were located in previous phases. Airfield contractors will have their site establishment, stores, batching plants etc. outside the airport western perimeter, likely following on from Phase 3. The airfield and the pier works areas will be accessed from the western edge of the airport as shown in Figure 37 crossing the crossing the River Mole by the bridge provided in Phase 2, entering the airport perimeter and crossing the western taxiways. All such crossings will be securely controlled.

The construction sequence of the buildings follow a traditional pattern of foundations, structural steel frame, precast upper floors, roof, and curtain walling to complete the building envelope. Weather tightness allows the MEP and fit-out works to commence, followed by building systems testing and integration with existing systems.

# 4 Logistics Management Approach

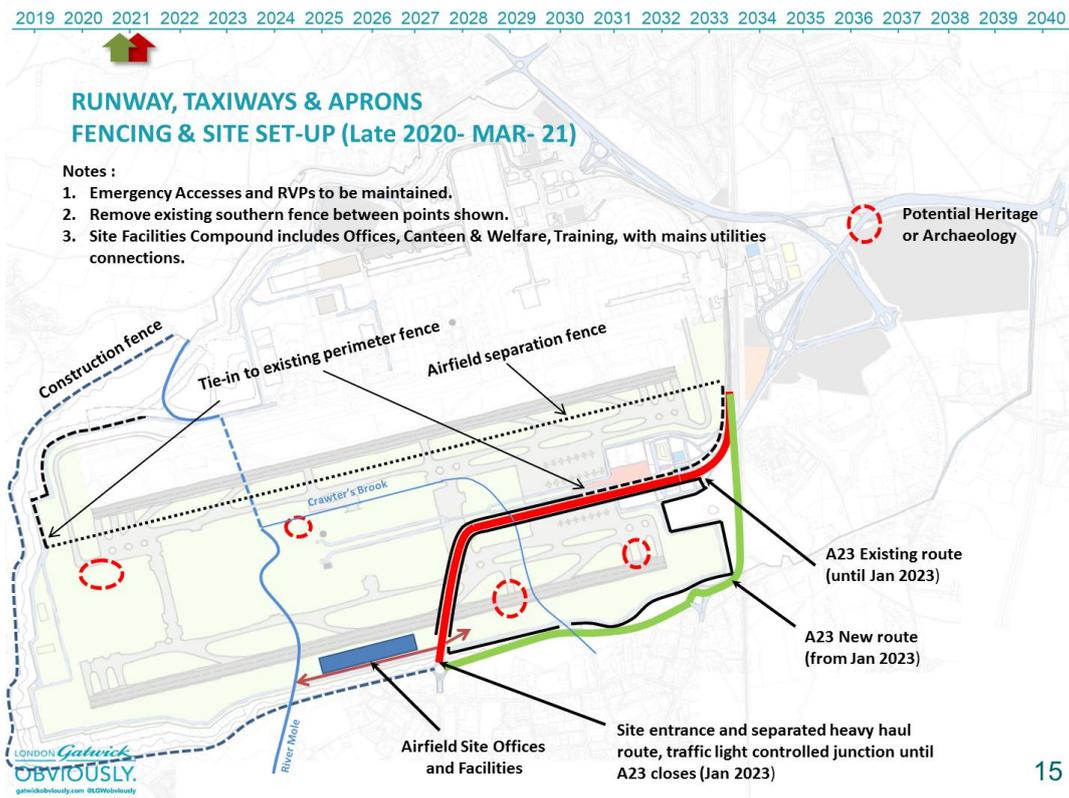
## 4.1 Site Management

### CONSTRUCTION SITES

The Gatwick R2 project can be split into three distinct works areas:

1. The area within the new airfield but including the southern A23 diversion and excluding the Terminal building and contact pier.
2. The Midfield Terminal location, including the landside APM and the multi-storey car park.
3. The area outside that includes the roadworks and car park work sites.

**Airfield Site** – Following the completion of the land purchase required for the construction works, the new airside construction fence would be erected to secure the site. The existing airfield fence is to be maintained to delineate the operational airfield from the construction site with access through the existing gates to the south east and south of the airfield. The main site access is from the existing A23/Fleming Way roundabout. As the construction of the project progresses through the phases to 2040, the worksite boundaries flex to suit the operational airfield and construction areas. Figures 40, 41, 42 & 43 show the main construction sites for the three phases following 2025, runway opening.



15

Figure 40. Site Set-up Phase 1 – 2025 Airfield.

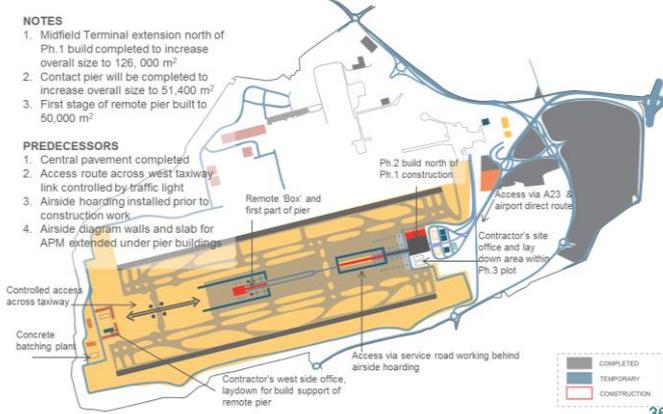
### MIDFIELD TERMINAL CONTACT & REMOTE PIER CONSTRUCTION, PHASE 2, 2030 (Oct 2026 – Jun 2029)

**NOTES**

1. Midfield Terminal extension north of Ph.1 build completed to increase overall size to 126,000 m<sup>2</sup>
2. Contact pier will be completed to increase overall size to 51,400 m<sup>2</sup>
3. First stage of remote pier built to 50,000 m<sup>2</sup>

**PREDECESSORS**

1. Central pavement completed
2. Access route across west taxiway link controlled by traffic light
3. Airside hoarding installed prior to construction work
4. Airside diaphragm walls and slab for APM extended under pier buildings



36

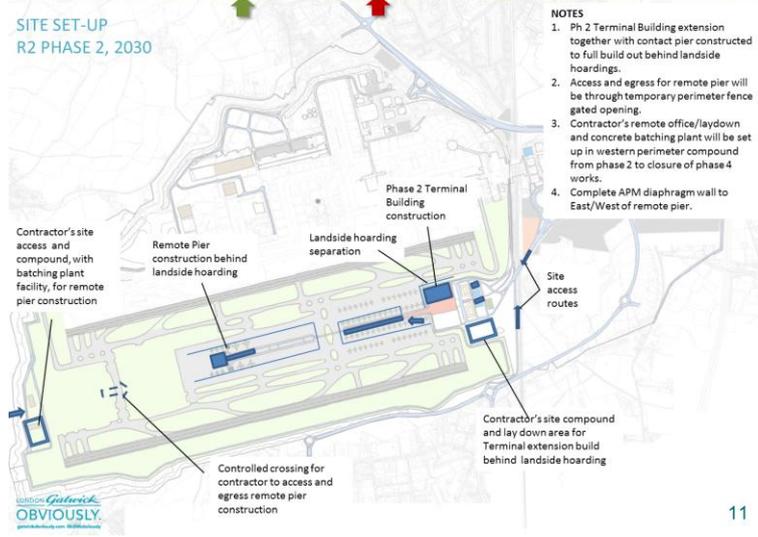
LEGEND:  
 - COMPLETED (grey)  
 - TEMPORARY (blue)  
 - CONSTRUCTION (red)

Figure 41. Site Set-up Phase 1 – 2025 Midfield Terminal.

### SITE SET-UP R2 PHASE 2, 2030

**NOTES**

1. Ph 2 Terminal Building extension together with contact pier constructed to full build out behind landside hoardings.
2. Access and egress for remote pier will be through temporary perimeter fence gated opening.
3. Contractor's remote office/laydown and concrete batching plant will be set up in western perimeter compound from phase 2 to closure of phase 4 works.
4. Complete APM diaphragm wall to East/West of remote pier.



11

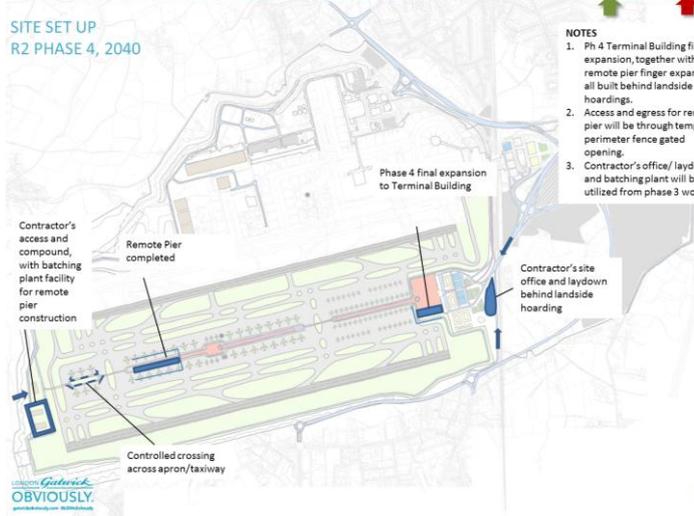
OBVIOUSLY

Figure 42. Site Set-up Phase 2 – 2030.

### SITE SET UP R2 PHASE 4, 2040

**NOTES**

1. Ph 4 Terminal Building final expansion, together with final remote pier finger expansion, all built behind landside hoardings.
2. Access and egress for remote pier will be through temporary perimeter fence gated opening.
3. Contractor's office/ laydown and batching plant will be utilized from phase 3 works.



13

OBVIOUSLY

Figure 43. Site Set-up Phase 4 – 2040.

## Roadworks Construction Site

The Satellite sites associated with the surface access road works and car park construction would be established as per the construction programme and be managed by the roads principal contractor.

## Terminal Construction site

The Terminal site would be established by the principal contractor for the new Midfield Terminal. Initially, this site will be curtailed by the existing A23 until it is removed in Jan 2023. After this date, the contractor's compound can be extended both south and eastwards. Once the north apron to the west is completed by the airfield contractor, parts of it may be utilised by the Terminal contractor as required.

## UTILITIES PLAN

The current airfield is well served with electrical supply points and it is proposed that the temporary construction power supply would be fed from substation G to the south of the current runway or as an alternate substation L to the SW of the existing airfield. Refer to Figure 44. The primary requirements for power during the construction activities are for the Midfield Terminal build 2025 – 2030 and a local supply to the construction facilities to the south of the site.

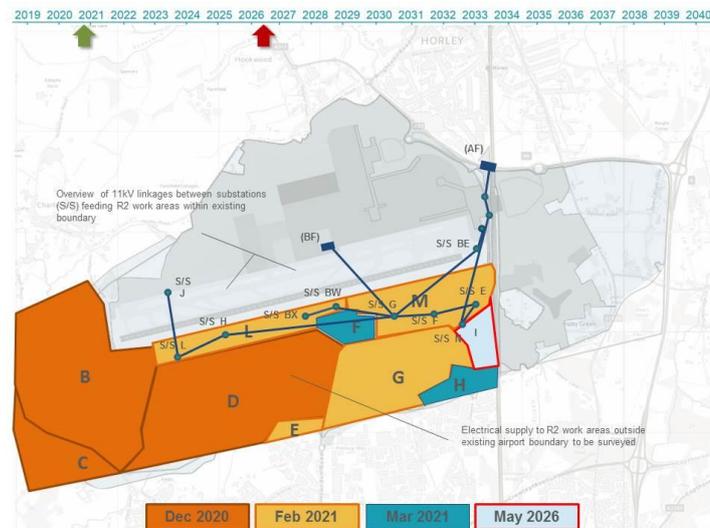


Figure 44. High Voltage (HV) Electrical Supply R2 Opening – 2025.

Within the Terminal construction site, a network of temporary power outlet points throughout the building site to serve the day-to-day needs of construction activities will be installed. The principal contractor would be responsible for the design, installation and maintenance of this to support the construction programme. It is proposed that Gatwick is responsible for providing access and continuity of supply to the switchboards.

With regards to potable water and sewage disposal, the proposal is that water supply would be available from the domestic supply that exists within the area (e.g. Fleming Way). Waste water disposal would be via mains sewerage where possible or tanker removal.

## SITE INFRASTRUCTURE (BATCH PLANT, FABRICATION SHOP, ETC.)

The proposed construction site layout and facilities locations are shown in Figure 45.

The airfield site has been set up to serve construction through to 2025 Runway opening and is primarily geared around the groundwork and airfield construction operations. A dedicated concrete batcher and asphalt plant may be established to service the runway construction and road works structure construction works. Alternatively, the existing plants located at Crawley Goods Yard off Gatwick Road may be used if a suitable agreement can be reached.

During the earthworks phase for the airfield, it is anticipated that the existing soil requires treatment to increase its structural bearing capacity. This process generally takes place in-situ as fill material is placed but a soil treatment plant would be located in the west of the site and remain in place until the completion of the bulk earthworks in late 2023.

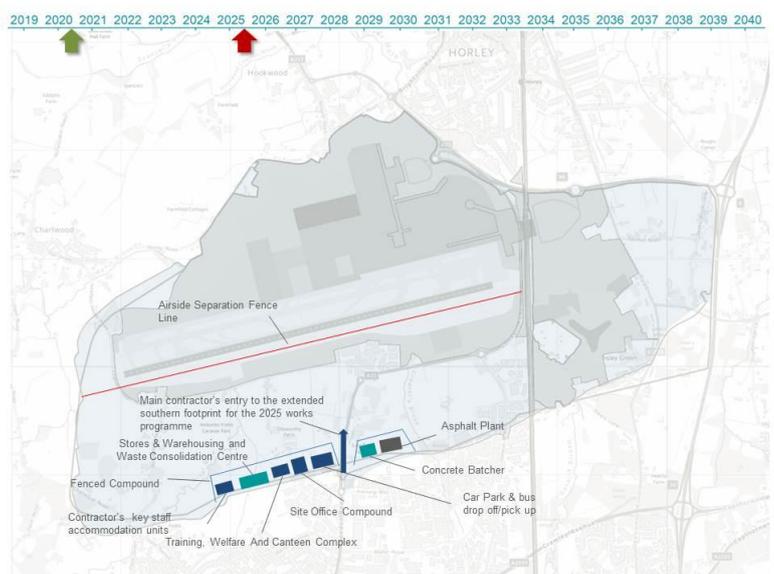


Figure 45. Contractors' Temporary Facilities R2 Opening 2025 (Jul 2020 – Jul 2025).

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## 4.2 Materials and Workforce Management

### MATERIALS AND EQUIPMENT LOGISTICS

The expansion of Gatwick requires a significant influx of labour, materials and equipment. Materials and Equipment may need to be pre-inspected and approved prior to entry to the airport site and installed in its respective locations. Facilities for the R2 programme, built adjacent to the existing operational airport facility, require minimised site footprints and just-in-time deliveries. These would be from a centralised and strategically located materials consolidation compound, close to the new development and within the airport boundary fence, close to the perimeter road for wide access distribution.

The early part of the Phase 1 - 2025 works, consist of bulk earthworks, asphalt and concrete supplies to build the runways, taxiways and associated apron slabs. The follow-on utility service piping, cabling, and instrumentation requirements form the bulk of the material and equipment supplies after the substantial earthworks phase has been accomplished. This drives the need for a secure airport side materials and equipment holding yard to be located in the western part of the site and under the control of the main/principal contractor.

Gatwick may appoint an equipment hire company who could provide a depot on the R2 site that supports the project and makes it more efficient for contractors to hire or buy small tools and equipment without leaving the site. These tools would target air quality emission and vibration H&S requirements. This service agreement has the capacity to include site establishment such as portable cabins, temporary power generation, and vehicle wash facilities.

### MATERIAL DELIVERY ACCESS ROUTES

In parallel with the principles of workforce transport to and from the project, material delivery would be routed to avoid the main access routes to the operational airport entry points. From 2020 to 2025, the main material deliveries are bulk materials (e.g. concrete and asphalt aggregates) for the roads, airfield and Terminal construction and structural steelwork, building materials and MEP plant for the Terminal. Predominantly, delivery would be from the M23, via the northbound A23 into the construction site access to the south of the existing airfield. This would be governed through the development and implementation of a traffic management plan. The rail sidings at Crawley provide an option for the bulk supply of material via the rail network dependent on material quantum and agreement with the current operator.

During Phase 1 to 2025, a material logistic centre would be fully established to service the airfield and Terminal construction. A similar approach may be adopted for the later phases. The aim is to manage the transportation of incoming materials in a controlled manner that supports the construction programme and minimises the waste associated with laydown and inventory on a potentially congested work site. As an alternative to the location east of the main railway line, the materials logistic centre may be located to the south of the airport and accessed from M23 Junction 9 and A23.

### WORKFORCE AND ACCESS TO SITE

The preliminary forecast for employment numbers have an overall peak of 6,000, occurring during the airfield and Terminal construction in 2023/2024. The total numbers are significant but are deemed to achievable when considering the labour catchment areas of south and southeast London plus the south coast towns all of which are within reasonable commuting distance.

In comparison, the labour peaks on the 2012 Olympic park and adjacent Westfield Stratford City development that were in the order of 10,000. It is proposed that the welfare facilities for the sites are provided as follows:

- Airfield site is established at the main compound to the south.
- Terminal site is established adjacent to the building development with further Satellite facilities required for the J9 spur road and rail crossing east of the Brighton main line
- Welfare facilities for the Terminal would ideally locate between it and City Place as this would also be a suitable location for Phase 2 of the Terminal expansion. Access to the Terminal site would require a temporary footbridge crossing over the A23, until it is removed in late 2022.
- Welfare for the road works are best located to the east of the railway in the large areas of the car parks.

In all phases of the works it is anticipated that the workforce would travel to the R2 site via private cars, company vans, and public transport. A principal aim is to maintain separation between the workforce and users of the airport in order to mitigate congestion at Gatwick Airport Station and the access roads in and out of the airport. Road access to the southern establishment would be via the Crawley Jn9a (M23/A2011) to A23 site access.

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## SITE ACCESS – SECURITY

Site security for the construction site would take into account the requirements for working on an adjacent to an operational airport. The requirement for airside passes is minimal as the majority of the worksites will be in a landside environment. Access to the construction site would be managed through unique biometric identification e.g. palm, fingerprint or retina scanning, maintaining verification of the workforce at all times. As technology advances the ability to track the workforce through the sites would be developed in order to analyse construction process and improve efficiency.

All vehicles accessing the site require unique bar code permits that facilitate barrier operation and access to particular work site zones. Vehicular access is limited to the supply of materials with controlled access to works vans and crew buses permitted on the construction site areas on a specific need-only basis managed by permit. The work force would be transported between site areas through dedicated bussing, requiring roads around the construction site to be built and maintained to a good standard.

Emergency vehicle access would be maintained and only changed as the works require with the explicit agreement of the airport and emergency services. An Emergency Access plan describing access routes throughout the durations of each phase would be developed and agreed.

## WORKFORCE TRAINING AND RECRUITMENT

With a 20-year construction period, the Gatwick R2 project provides a good opportunity to develop a sustainable workforce within the project catchment area. As part of the project development an apprentice and training facility would be established in the local area to develop the key construction skills required on the project such as electrical, mechanical, and services installation. Gatwick would work in partnership with the project contractors to implement a sustainable scheme for the duration of the project.

Workforce recruitment would focus on the local areas and south coast towns as a priority with further recruitments from the southeast London area and East Kent all of which are approximately one hour travel from the airport. The need for a broader national recruitment campaign is dependent on the status of the construction sector at the time of the main resourcing and the specialist nature of the works undertaken.

## CONSTRUCTION WASTE

The current predicted volumes of waste over the duration of the project are listed in the table in Figure 46 below:

Project Phase	Tonnes of Waste	Target % Recycled/Reused
Demolition	295,000	97
Earthworks	524,000	98
Construction	835,000	95

Figure 46. Predicted Volumes of Project Waste.

Materials will be managed so that waste volumes are reduced and that the waste hierarchy (eliminate, reduce, reuse, recycle, recover) is implemented. Waste management will include:

- Segregation and reuse on-site and reuse off-site (including remediation of contaminated land)
- Segregation and recycling on-site and off-site
- Shredding and composting
- Incineration with energy recovery
- Off-site landfill or disposal.

It is recommended that a waste management contractor (WMC) be appointed by GAL to manage waste for the whole R2 project. All contractors will be obliged to use this contractor for all waste management services. The WMC should be appointed in the earliest stages as time is needed to set up waste management facilities before waste is being generated on-site from demolition and clearance activities. WMC will set up a site Waste Consolidation Centre as part of site set up. The Waste Consolidation Centre shall be within the boundary fence of the Project site to remove any requirement for Waste Management Licensing or Permit. The Waste Consolidation Centre shall carry out the bulking of segregated loads, compacting, shredding, bagging, etc. of materials generated on-site and shall coordinate the disposal of the waste whether to internal or external recycling, for on or off site re-use, or removal to an off-site treatment facility via the road or rail networks.

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## On-Site

Each site area (airfield, roads, Terminal) will have waste areas as follows:

- A segregation area for the waste arising from the works (e.g. metal, plastic, hard core etc.) as well as office/site accommodation waste such as paper and packaging.
- A hazardous waste storage provision as well as facilities for the segregation of food waste from welfare facilities.
- An area for reusable materials must also be designated and any materials for re-use segregated. E.g. Packaging materials are to be returned to suppliers; this will be managed through the Materials Consolidation Centre.

Adequate training and awareness sessions would enable the workforce to manage materials and segregate arising waste materials.

Areas for segregation of excavated soils are allocated throughout the earthworks, along with a remediation centre for processing of contaminated soils for reuse.

All materials and waste will be collected by the appointed Waste Management Contractor (WMC) for processing. Collection of waste from will be arranged in direct liaison with the contractor for scheduling purposes through a dedicated call centre and online ordering.

## Transport of Waste

The WMC will liaise closely with the site logistics team so that procedures for controlling the transportation of loads, engine idling, emission standards, traffic routing, and scheduling and other procedures are met. Materials bulking on-site prior to removal reduces transportation movements.

The WMC must sheet all loads that may give rise to dust emissions during transit on or off the site. In exposed areas, water sprays must be used as necessary to prevent dust emissions from stored materials to prevent a dust nuisance to local amenities or the airport.

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## 5 Risk Management Approach

The risk reduction process and reporting structure is designed and implemented to support management and mitigation of risks in accordance with the risk reduction targets established by Gatwick Airport, utilising a framework and system employed at the programme-level. In addition, a process of regular project-level quantified risk assessments (QRAs), including Schedule QRAs, in accordance with agreed programme-level requirements, would be established. The purpose of this process is to implement a programme of continuous risk management, including assessment of threats and opportunities, analysis of risk/contingency budgets, mitigation planning and monitoring, drawdown, and data support/input to Gatwick's insurance brokers. The purpose of the contingency management programme is that cost contingency is managed throughout all phases of the project works execution at a level consistent with the contingency that has been developed and is best administered. It provides a uniform and consistent methodology and work process for the management, drawdown, and reporting of cost contingency.

As the project progresses, contingency is managed and controlled through trending and budget control modules of the cost control system. Contingency usage would be monitored against the budget at the level consistent with the contingency development. Additionally, contingency usage criteria can be established that allows flexibility and timeliness, but with necessary controls and approvals to properly balance progress against appropriate management input.

## 5.1 Programme Critical Path

This section describes the critical path for each phase of the project that supports the risk management plan in providing focus on areas essential for delivery of the project by the prescribed completion dates.

### Phase 1 - 2025 Runway 2 and Midfield Terminal Opening

The Phase 1 – 2025 airfield critical path commences with the vacating of land followed by ecology, archaeology, environmental relocation, demolition and diversion of existing utilities. Refer Figure 46 below. These enabling works then drive the bulk earthworks operation; runway, taxiway and apron pavements construction; installation and commissioning of airfield lighting and navigational systems, and CAA aerodrome licensing. A time contingency of three months has been included and forms the last part of the critical path to the 2025 runway opening.

Terminal construction activities, concurrent with the airfield construction described above, follow a critical path through substructure, superstructure and systems commissioning, also shown on Figure 47.

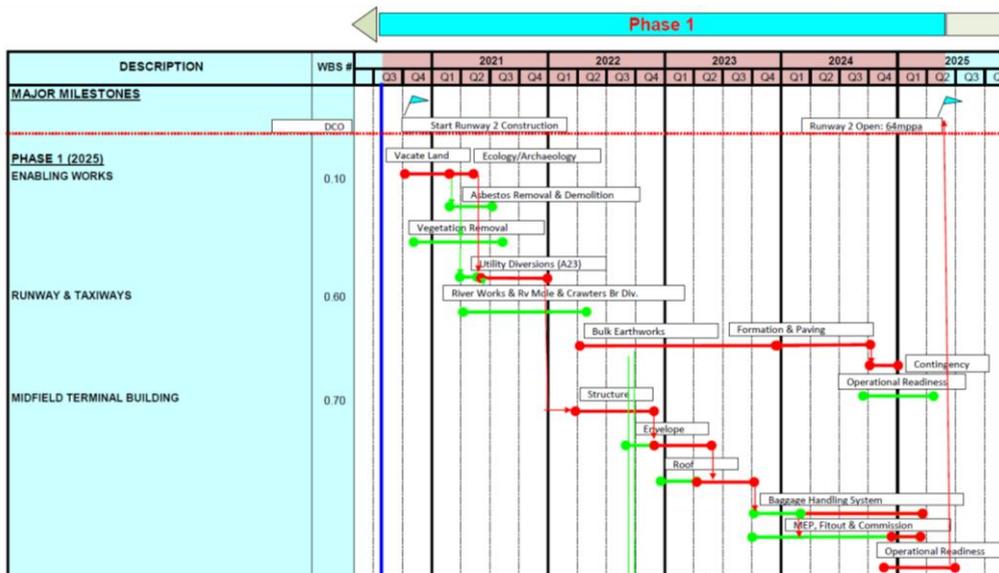


Figure 47. Phase 1 – 2025 Critical Path.

### PHASE 2 - 2030

Phase 2 – 2030. The critical path runs through the with the Midfield Terminal expansion works; Foundations, superstructure, fit-out and system install followed by integration testing and commissioning. This drives the operational readiness and contingency-ready for operations in 2030. Refer to Figure 48 below.

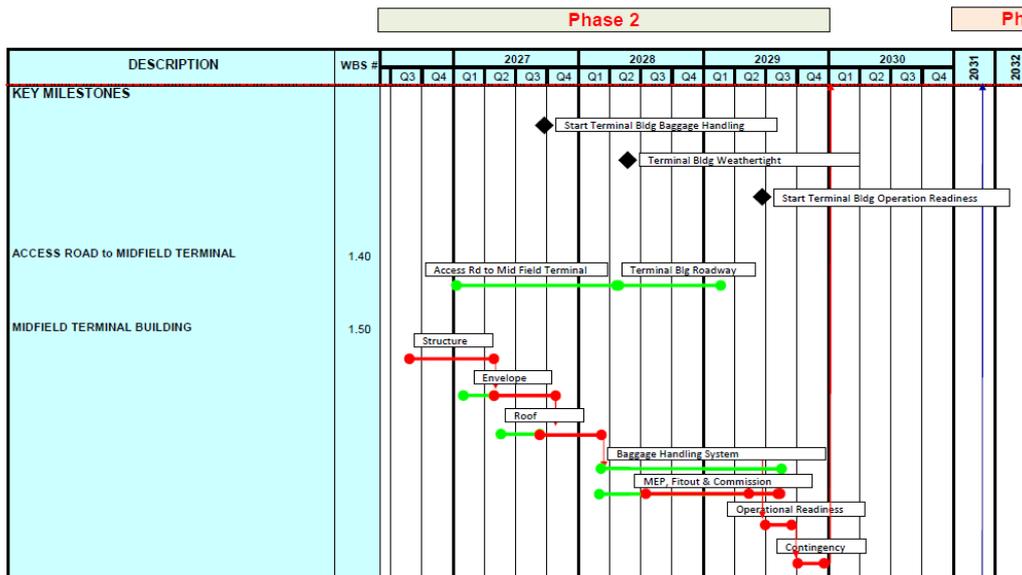


Figure 48. Phase 2 - 2030 Critical Path.

### PHASE 3 - 2035

Phase 3 – 2035. The critical path commences with the installation of diaphragm walls for the airside APM tunnel leading to the remote pier ground slab, superstructure, roofing, envelope, and fit out of the section required for Phase 3 as depicted in Figure 49 below. This drives the completion of apron works and schedule contingency-ready for operations in 2035.

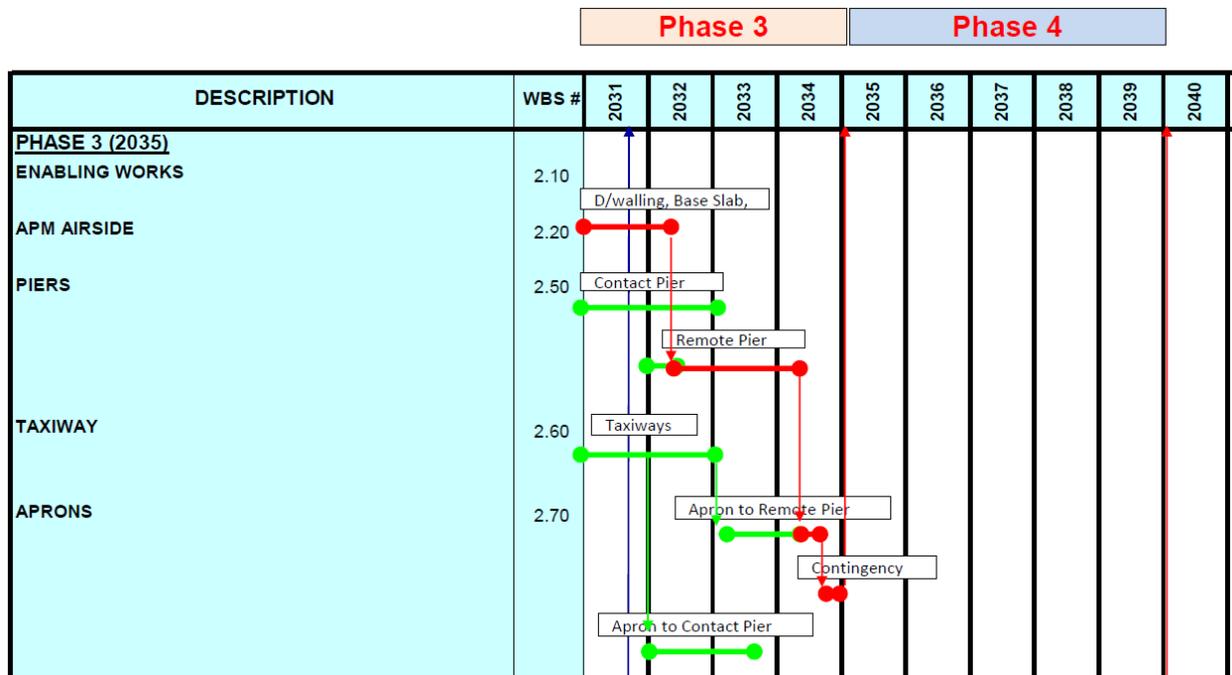


Figure 49. Phase 3 - 2035 Critical Path.

### PHASE 4 - 2040

Figure 50 shows that Phase 4 critical path runs through the construction of the remaining remote pier works. This includes the superstructure, roofing, envelope, and fit out of this section of remote pier leading to operational readiness and contingency.

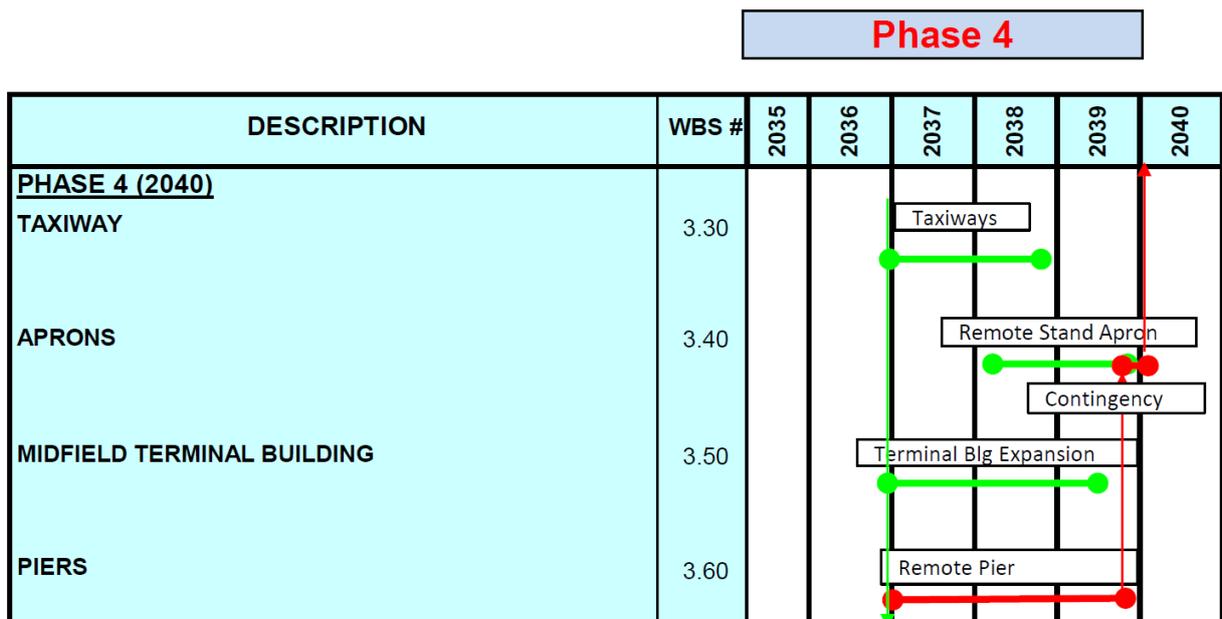


Figure 50. Phase 3 2040 Critical Path.

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## 5.2 Risk Assessment

Through this review effort, a total of 24 risks have been identified and recorded in a risk register. Cause and impacts have been described together with the mitigations. These mitigations form part the recommendations to Gatwick on the next actions to be taken for the success of the R2 Project.

The risk register showing all the risks is shown in Appendix A.

The top two risks are:

### **Bulk Earthworks (RW216)**

The assumption is that the cut and fills for earthworks balance with 97 per cent of the material able to be reused. It is viewed that this assumption is high and if, through geotechnical investigation, it proves the need to import or export large quantities of material, then the budget, schedule, and logistics planning would be impacted significantly.

### **Unexpected Contaminated Land (RW217)**

The rural nature of the land surrounding Gatwick and the presence of limited light industrial history, suggests that there is a generally low risk of encountering significant volumes or degrees of contaminated land. Areas and likely levels of contamination have been identified but it is not until further investigation and actual excavation of these areas that this risk may be realised.

## 5.3 Programme

A level 2 Primavera Programme is included in Appendix B.

The programme is not exhaustive in scope but contains sufficient detail to determine the relationship between principal activities, their durations and indicative dates

The programme does not detail activities before October 2020 e.g.

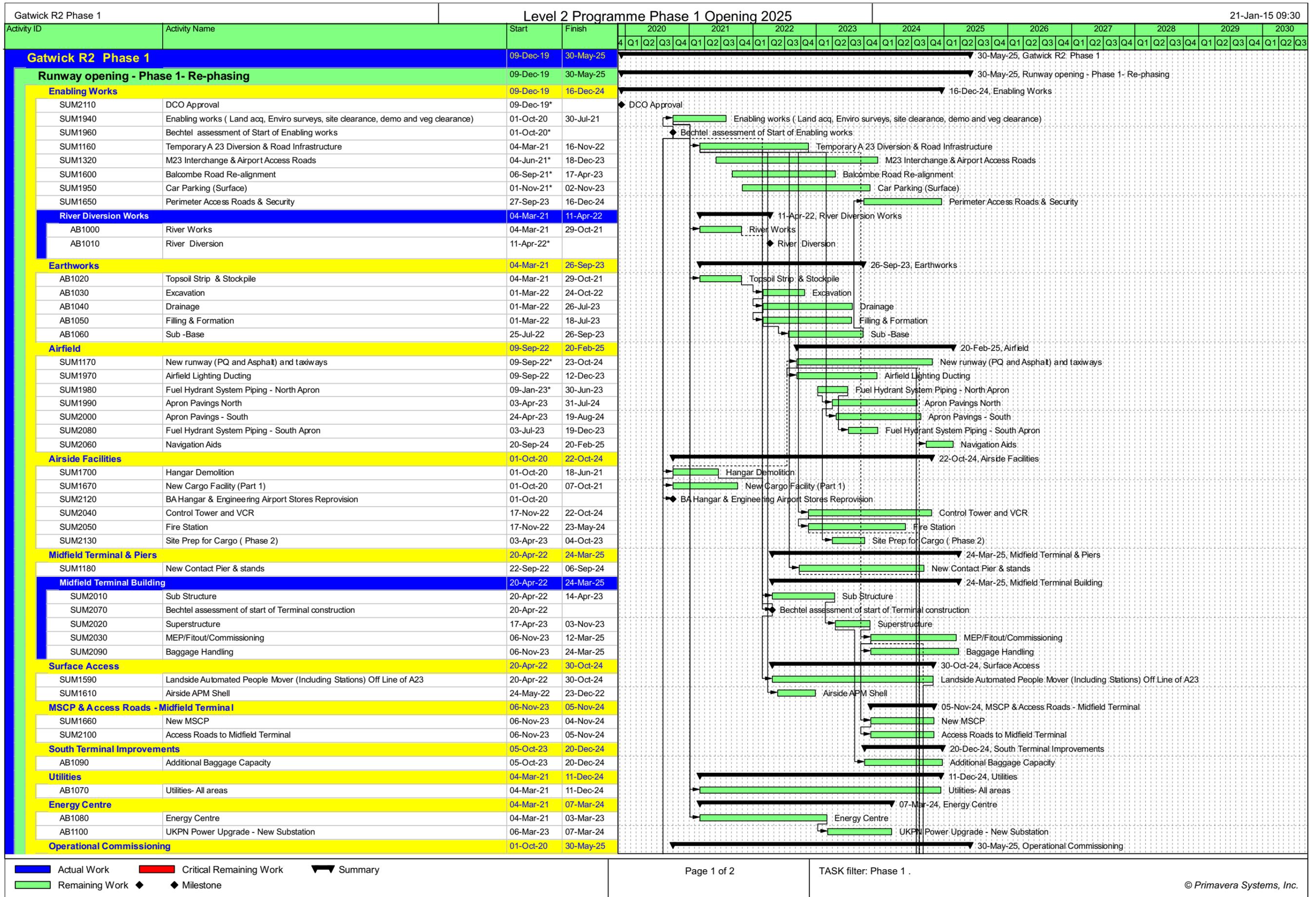
- The British Airways maintenance hangar and engineering stores re-provision.
- Individual land parcel vacation, individual surveys.

## Appendix A: Risk Register

Owner Organisation (Current) GAL	Risk ID	Risk Status	Programme Phase	Commission Appraisal Framework	Option 6	Risk Description	Risk Cause	Risk Impact	Score	Score
									0	0
YES	RW216	Open	Runway Opening	Implementation	✓	Bulk Earthworks: Suitability of Existing Ground Conditions	Assumption that 97% will be reused in cut and fill	If this is not the case then substantial quantities of cut and fill material will need to be transported off site impacting cost and schedule	16	16
YES	RW217	Open	Runway Opening	Implementation	✓	Unexpected contaminated land	No allowance for contaminated land on the basis of being processed on site and small quantities	Cost and Delay	6	6
NO	RW218	Open	Runway Opening	Implementation	✓	CNS ATM Equip: Contracting and contract management by CAA becomes disconnected from baseline programme schedule	Late contracting of supplier caused by requirements, design, procedures	Delay opening of R2	8	8
YES	RW219	Open	Runway Opening	Implementation	✓	All cost items relating to CNS ATM equipment not identified e.g. additional radars, A-SMGS	Requirements capture effort not sufficiently thorough	Delay opening of R2 and cost overrun	8	0
YES	RW220	Open	Phase 1	Implementation	✓	All cost items relating to new operational efficiency requirements not identified e.g. AOCC and apron control towers	Requirements capture effort not sufficiently thorough	Delay opening of R2 and cost overrun	8	0
YES	RW221	Open	Phase 1	Implementation	✓	Operational efficiency requiring the bringing forward of EAT construction	Requirements capture effort not sufficiently thorough	Cost overrun and reduced operational efficiency	4	0
YES	RW222	Open	Phase 1	Implementation	✓	VDGS cost not incorporated	Requirements capture effort not sufficiently thorough	Increased OPEX	6	0
YES	RW223	Open	Runway Opening	Implementation	✓	Cost not identified for the provision of high voltage electrical supply for 2025 where permanent supply not in place until 2030	Requirements capture effort not sufficiently thorough	Cost overrun and delayed opening	6	0
YES	RW224	Open	Runway Opening	Implementation	✓	Delay to clearance if buildings within the footprint of A23 in the south end of the runway	Vacating buildings, Demolition, Habitat, archaeology, Contamination, Asbestos	Delay to construction of A23 to allow earthworks to continue	9	0
YES	RW225	Open	Runway Opening	Implementation	✓	Asbestos within buildings A23 alignment	Asbestos insulation of pipework and roofing on the building	Delay to possession of the site	9	0
YES	RW226	Open	Runway Opening	Implementation	✓	Junction 9 M23 overhead 66KV tower and clearance to alignment	Overhead Cable route may require relocating as it is close to the widened alignment of slip roads	Overhead cables require relocating potentially impacting the carrying out of roadwork construction	12	0
YES	RW227	Open	Runway Opening	Implementation	✓	Additional A23 utilities over and above those already identified	No detailed study has been undertaken to show the location of utilities	Delay to A23 road realignment works	9	0

Owner Organisation (Current) GAL	Risk ID	Risk Status	Programme Phase	Commission Approval Framework	Option 6	Risk Description	Risk Cause	Risk Impact	Score	Score
NO	RW228	Open	Runway Opening	Implementation	✓	Interface between M23 and airports spur road interface is coordinated and current budget aligned	Has the business case adequately detailed the cost and scope of this work as detailed on the Arup scheme?	De-scoping of work to support business case funding and may cause traffic congestion in the future	16	0
NO	RW229	Open	Runway Opening	Implementation	✓	Possession works for overbridge for the overbridge works and separation of the trackwork for temporary pier support	Scope growth due to the congestion of the existing rail lines requiring additional possession time from NWR	Increase in schedule duration and additional cost of track and utility realignment	8	0
YES	RW230	Open	Runway Opening	Implementation	✓	Spur road and M23 Junction 9 coordination of traffic management while new alignment works take place may increase the traffic delays	Construction works and traffic management not fully integrated	Increase the traffic delays to an already over capacity road net work to Gatwick airport	9	0
YES	RW231	Open	Runway Opening	Implementation	✓	Duration of environmental relocation and mitigation are insufficient within the programme and estimate	The current schedule identifies a short period of time for this work that may not be sufficient	The environmental mitigation may delay the schedule by 1 year until the next season	16	0
YES	RW232	Open	Runway Opening	Implementation	✓	Existing 33KV electrical distribution through R2 footprint	33KV supply diversion through R2 work area not adequately sequenced with the earthworks	33KV diversion throughout the work area impacting the airport supply	9	0
YES	RW233	Open	Runway Opening	Implementation	✓	Existing 11KV electrical distribution through R2 footprint	Substation decommissioning is ahead of customer supply needs	Disruption to existing customers and tenants	9	0
YES	RW234	Open	Phase 1	Implementation	✓	Utilities corridor from the new energy centre under the railway becomes unfeasible	Requirements capture and surveys were inadequate	Locating of new energy centre becomes unfeasible for Phase 1	4	0
YES	RW235	Open	Runway Opening	Implementation	✓	Excessive wet weather during the 2020 that may impact enabling and bulk earthworks	Above normal rainfall	Impacts the runway scheduled opening	6	0
YES	RW236	Open	Phase 1	Implementation	✓	Resilience of existing for systems	Upgrade existing to connect into new where existing may be below standard	Additional system scope upgrading existing	9	0
YES	RW237	Open	Runway Opening	Implementation	✓	Uncertainty of drainage options most beneficial in whole life costs	Studies are not yet finalised	Cost and energy wasted	9	0
YES	RW238	Open	Runway Opening	Implementation	✓	Uncertainty of foul water conveyance diversion through the R2 footprint	Studies are not yet finalised	Cost and delays to runway opening	9	0
YES	RW239	Open	Phase 1	Implementation	✓	Unidentified utilities north of main terminal impacting APM construction	Studies are not yet finalised	Cost and delays to 2030	9	0
									0	0
									0	0

# Appendix B - Programme



█ Actual Work   
 █ Critical Remaining Work   
 ▶ Summary  
█ Remaining Work   
 ◆ Milestone

Activity ID	Activity Name	Start	Finish	2020				2021				2022				2023				2024				2025				2026				2027				2028				2029				2030		
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3				
SUM1680	Ancillary facilities in support of terminal, pier & airfield operations operations	01-Oct-20	16-Apr-24	[Gantt bar from Q1 2020 to Q4 2024]																																										
SUM1630	Runway Operational readiness	20-Sep-24	29-Apr-25	[Gantt bar from Q3 2024 to Q4 2025]																																										
SUM1620	New Terminal Operational readiness	07-Oct-24	30-May-25	[Gantt bar from Q4 2024 to Q1 2025]																																										
SUM1540	APM Operational readiness	31-Oct-24	05-Feb-25	[Gantt bar from Q4 2024 to Q1 2025]																																										
<b>Operational Handover</b>		30-Apr-25	30-May-25	[Gantt bar from Q4 2024 to Q1 2025]																																										
SUM1330	Runway operational	30-Apr-25		[Gantt bar from Q1 2025 to end of 2025]																																										
SUM1640	New Terminal Open		30-May-25	[Gantt bar from Q1 2025 to end of 2025]																																										