Requirement Summary Document for the Freight Handling Facility (FHF) at RAF Brize Norton

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1. Overview of the new Freight Handling Facility

Air Movements activity is an essential operational enabler within the military logistics chain. The RAF Air Transport Force (ATF) moves a significant volume of cargo through RAF Brize Norton, as it is the Authority's single military Airport of Embarkation (APOE). The proposed new build Freight Handling Facility (FHF) for RAF Brize Norton, as the sole Airport of Embarkation for UK Ministry of Defence (MOD), must be able to receive, outload, and process freight efficiently in accordance with demand signal.

To ensure this future Defence capability is maintained the Authority is embarking on a modernisation agenda, informed by industry, to ensure that it is resourced and configured to support the future needs of the Armed Forces. The new FHF has been identified as a particularly important part of this modernisation agenda, replacing the original facilities and to enable Brize Norton to meet the high demand signal set by Defence Strategic Direction (DSD).

The new FHF should be in full compliance with military and civilian regulations including CAA, NASP, IATA and HMRC (full list will be provided during the procurement stage) both information and physical security, within a secure and safe environment, through an integrated infrastructure and material handling equipment solution.

2. Indicative layout of the facility

The Materials Handling Solution within the new facility, and crucially its layout (Figure 1), are the foundation as to how the Freight Handling Facility will efficiently handle outbound (export) and inbound (import) and manage the receipt, storage, build, weighing, processing, and consignment of freight in compliance with all relevant civilian and military regulatory requirements. This layout should drive the requirements of the building footprint and design to optimise the infrastructure requirements around the Materials Handling Solution, working practices, and process flow to deliver best value.

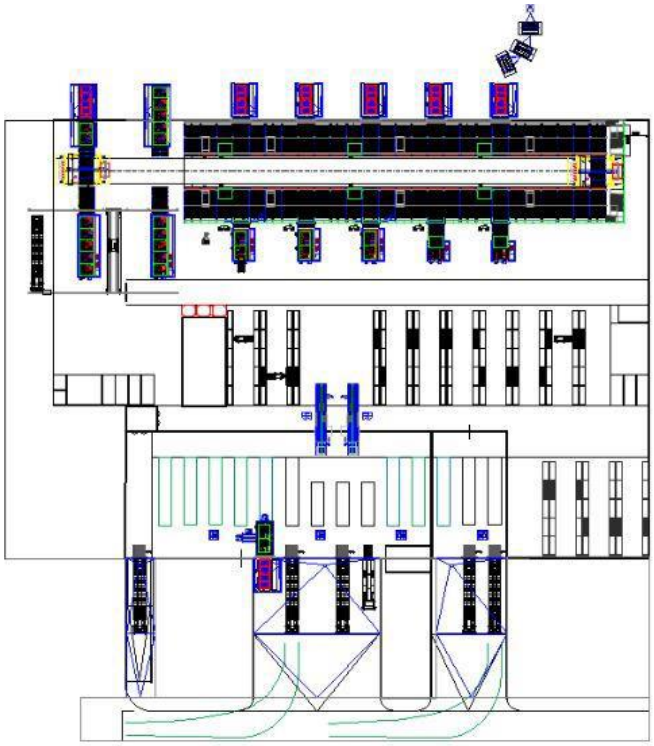

Figure 1: Indicative internal layout of the facility

Please note, all the layout diagrams and potential equipment lists are indicative for the proposed Freight Handling Facility at RAF Brize Norton. They are extracts from wider reports commissioned for

the project and is a concept for information only. Layouts could be subject to change and should be regarded as such.

All movements are expected to be fully automatic post pallet built, including the interface movement to and from the workstations. The building width is approximately 104m (landside), 120m (airside) and 87m deep with a total handling space of approx. 9,950 m^2 and a 4-layer (ground + 3) storage system is the expected internal storage facility resulting in a clear building height requirement of approximately 14m.

The new FHF will also incorporate suitable accommodation to provide technical, office and welfare facilities to allow the 1 Air Mobility Wing (AMW) (and contracted support) to operate both the FHF and manage 1 AMW operations. It should include both single and multi-occupancy offices, meeting rooms, crew rooms and other welfare facilities.

The Authority requires the workstations with the following characteristics:

- Build-up and breakdown activities on fixed (height adjustable) workstations for singles and doubles (2 single workstations and 3 double workstations);
- Workstations connected to the Aircraft Pallet (ACP)[1] storage;
- Weighing of ACPs on the scale on top of the workstations;
- Turntables for ACPs in the storage system to allow to turn (single) ACPs when required; and
- ACP movements to/from build/break position and to/from storage locations by means of an automated operated ETV (singles, doubles, triples and quadruples).

Please see Figure 2 which indicates process relations and their related spatial requirements.

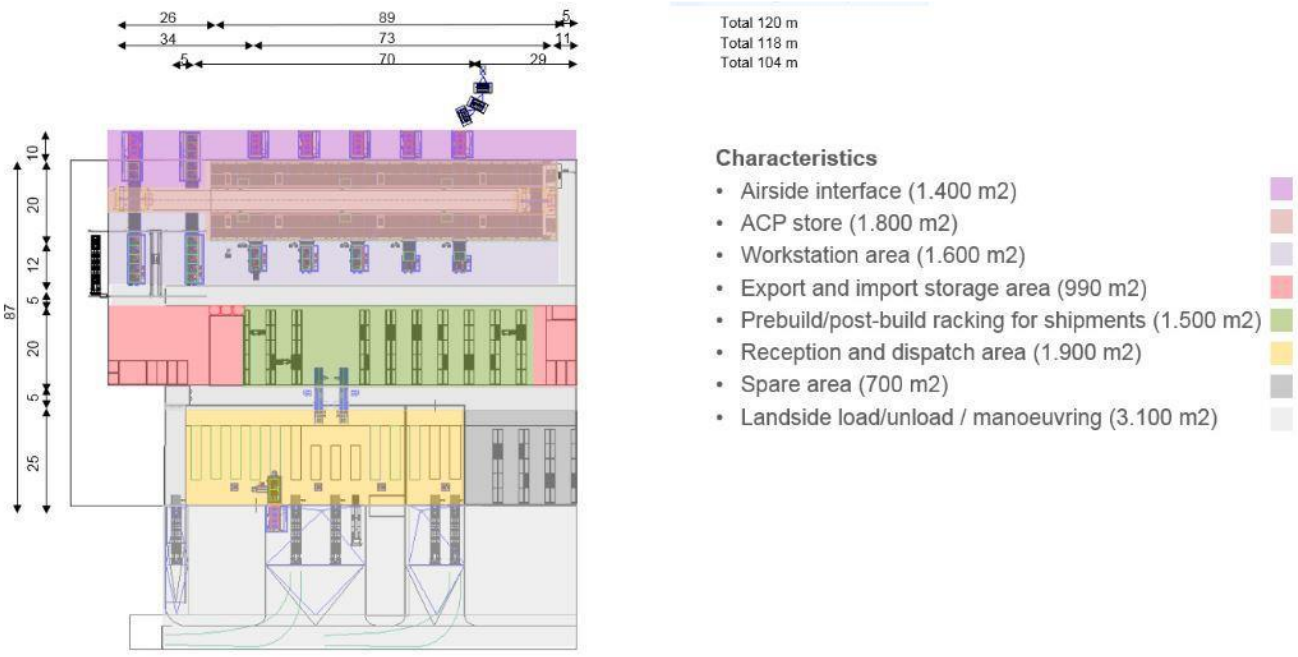

Figure 2: Indicative process relations layout of the facility

[1] ACP details – dimensions and cargo weights:

Type	Dimensions	Weight (normal)	Weight (surge)
Military Aircraft Pallet (ACP) 463L	108"W X 88"L X 96"H (2.74m x 2.24m x 2.44m)	Outbound - c. 1350 kg Inbound – c. 1000 kg	Outbound – c. 2500 kg Inbound – c. 2500 kg

3. External areas

The following areas must be provided around the facility (please see Figure 3):

- Airside storage and parking area (ACHE, Aircraft ramps, deployment kits, etc.) (2.000 m2);
- Vehicles and Mechanical Equipment (VAME) parking and washing area (2.500 m2);
- Vehicle ramp;
- Weigh Bridge (incl. X-Rays to screen cargo at acceptance); and
- Landside access corridor.

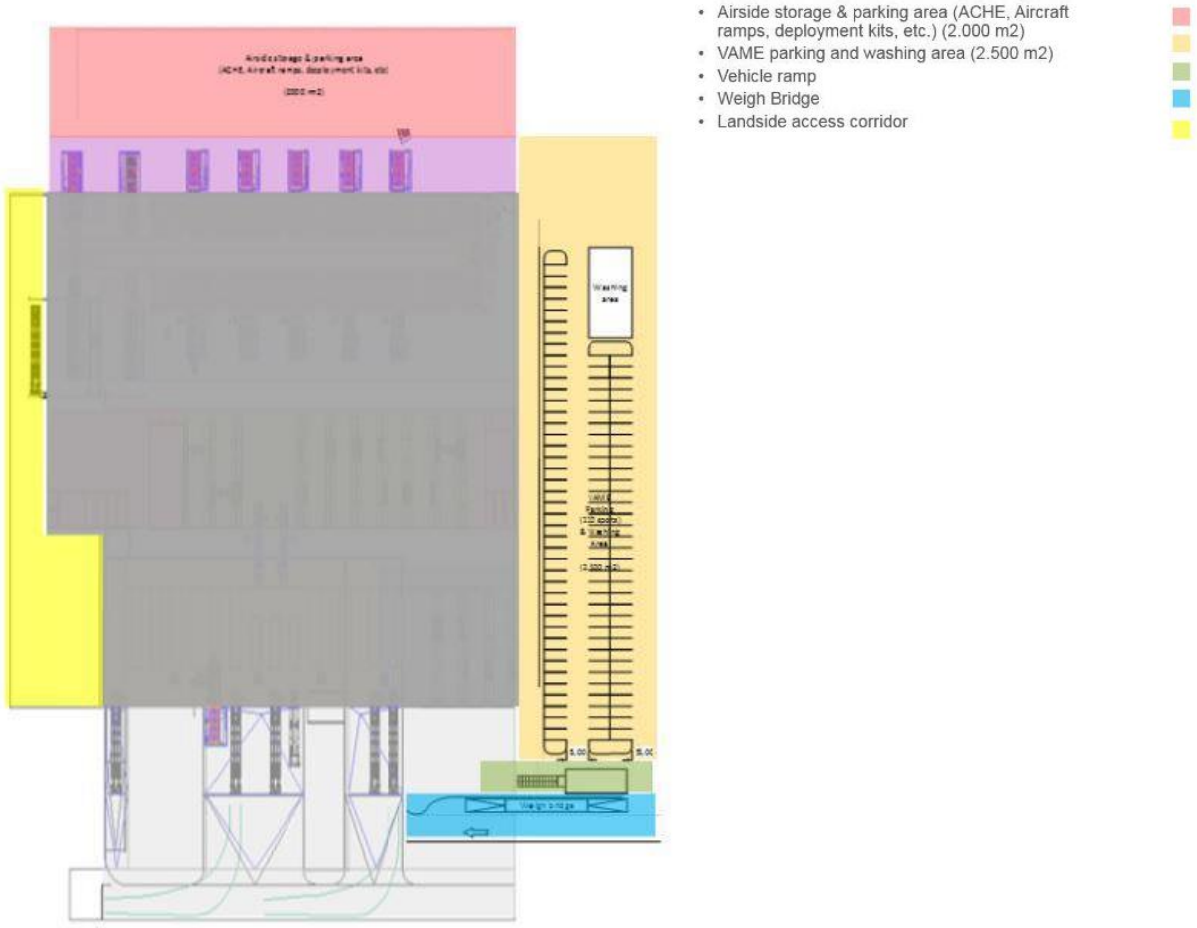

Figure 3: Indicative block plan of external areas

In addition to the areas identified above, a manoeuvring “corridor” needs to be provided around the facility. It is anticipated that this would amount approx. 35% of the facility footprint (please see Table 1).

External space components	SQM
Vehicle marshalling area (minimal required)	1.440
VAME	1.875
Washing	240
Weighing Bridge	180
Vehicle ramp	138
Vehicle Storage / MT Yard	180
Equipment storage barn	120
Deployment kit 1	60
Deployment kit 2	60
ACHE parking are	1.600
Subtotal	5.893
Maneuvring (35%) around individual external spaces	2.062
Total	7.955

Table 1: Indicative external space components

Depending on the option (manual or mechanised/automated) a different configuration of externals spaces would be required because of the different building shape and dimensions. However, the same principle and dimensions would apply to each area.

The recommended option segregates the ‘dirty’ areas and ‘clean’ areas making it easy to track what freight has gone through what processes. The VAME wash down facilities outside the building will enable all VAME to be prepared prior to departure without impacting on the throughput of freight inside the facility.

The facility is proposed at a ‘green field’ area within Brize Norton’s site with relatively proximity to the active airside (Figure 4). Please see Figure 5 in conjunction with Figure 4 showing the construction site boundaries.

Figure 4: Indicative illustration of the new FHF at Brize Norton Airport

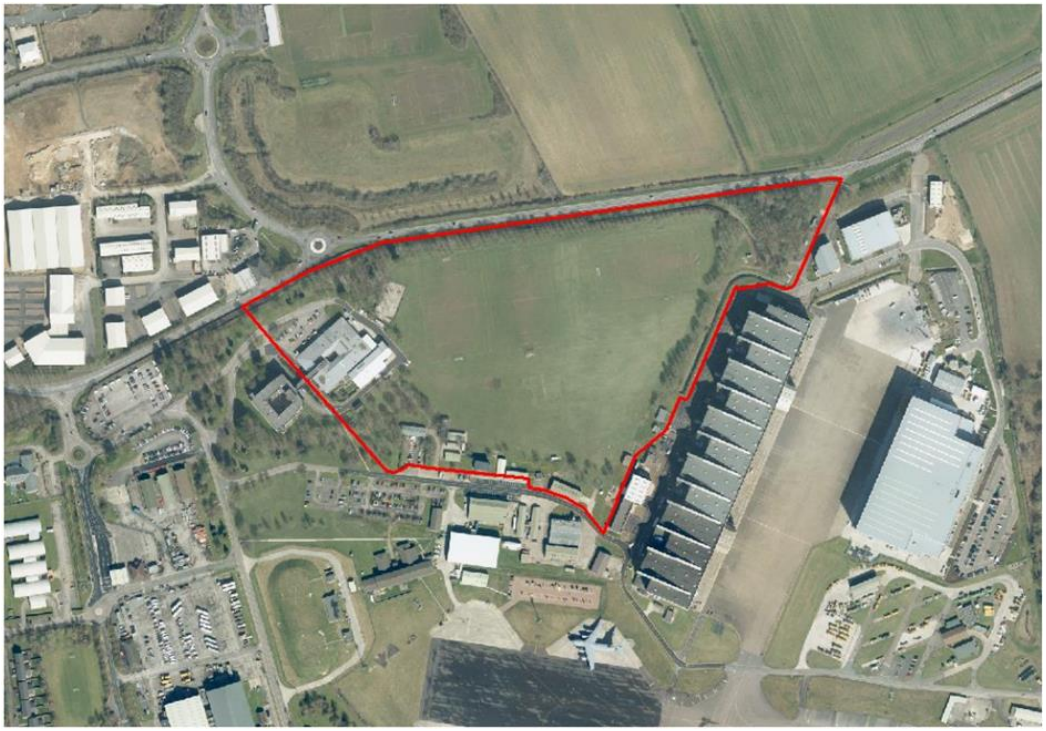

Figure 5: Indicative construction site boundaries at Brize Norton Airport

4. Materials handling equipment overview

The Defence Demand Signal determines the requirement for demand for the Freight Handling Facility for both Inbound and Outbound freight in three primary states:

- Business As Usual (BaU);
- BaU + Exercise and Movements; and
- Surge Demand during force deployment at scale.

The variation of flow between routine and peak (surge demands) will require an optimised solution which presents a best-in-class solution. There will need to be optimisation of the Material Handling Equipment controls in the predominantly low volume business as usual periods to ensure all equipment is in a state of readiness for surge requirements. A peak scenario is determined to be surge outbound and business as usual + exercise demand for inbound. Import and export peaks will not be concurrent.

The facility should be able to handle outbound Surge demand as well as the inbound BaU Exercise demand at the same time (peak demand). Peak demand must be sustained for a period of up to 120 days. Demand is a combination of Aircraft Pallets (ACP) and Vehicles and Mechanical Equipment (VAME) to be transported; built outbound cargo typically dwells for 48 hours (BaU) or 24 hours during Surge and inbound cargo typically dwells for less than 100 hours (awaiting customs clearance). For further information please see Table 2.

Requirement Per Day	Total Demand
Freight (no Aircraft Pallets)	Min. 90
VAME (ALEST*)	Min. 350
C-17 Equivalent Loads	Min. 10
*ALEST – Air Load Equivalent Short Ton	

Table 2: Indicative throughput details

Segregation will be required in the shipment storage. Intact Unit Load Device (ULD) containing dangerous and restricted goods will be stored in the Pallet and Container Handling System (PCHS). Sub categorization of built ULD storage is likely to be required.

As mentioned above, the facility should be able to process military Aircraft Pallets (463L) as Singles, Doubles, Triples and Quadruple chained/coupled combinations (i.e. slave pallet two way (WEL)). In addition, IATA[2] commercial ULDs should be able to be handled if they are within defined contours. Please see below a list of additional requirements with regards to ACP material handling:

- All ACPs should be able to be built on lowerable workstations (including pallet trains) with weighing scales;
- All permitted ACPs should be capable of being able to be stored in the Pallet Container Handling System (PCHS). NB Triple and Quadruple ACP pallet trains do not need to be stored in the PCHS;
- System should include 2 ETVs to facilitate the ACP movements and resilience;
- The infrastructure will incorporate an overhead gantry crane for large loads associated with break/build of triples and quads;
- Airside, facility should provide ACP interfaces to (off)load ACP (train)s onto/ from dolly trains , other commercial airside transport and existing equipment (e.g., Atlas Loader).

Please see an indicative list of equipment for the new FHF in Appendix 1.

Furthermore, in Appendix 2 the Authority listed several key interface considerations between Material Handling Equipment and the FHF building infrastructure for an optimum layout, operational safety and performance.

5. Information System requirement

Through universal APIs, the Material Handling Equipment operating software will interface with all the current LogIS platforms, such that the users' additional interfaces and touchpoints are minimised with respect to the Material Handling Equipment's operation. Future LogIS platform support requirements will be identified at a later stage of the procurement. Furthermore, a fall-back ability is required for the user to control the equipment directly through 'manual' or 'swivel-chair' input in the event of a LogIS system(s) outage, loss of connectivity etc. to ensure continual up-time.

6. Required resilience

Dependability and serviceability are key, with spares and availability also being high priorities for the Authority; failing to deliver against crucial national security objectives not an option. A commercial solution, using standard components, delivered intelligently and innovatively, is required to provide robustness and high availability.

Industry best practice is increasingly heading toward automation and autonomous operations; however, the Authority is not seeking bespoke solutions, or those on 'on the edge' of technology as this introduces too many potential variables to functionality, reliability, and delivery.

Therefore, the Authority is seeking market tried and tested technology components (reliability and consistency) configured in an innovative way (efficiency and delivery), ensuring that there is a logic and sequence to goods, receipt, storage, pallet build and despatch, and in-built segregation to ensure compliance. Innovation through optimized processes rather than unproven equipment.

[2] *International Air Transport Association*

7. Sustainability considerations

Embodied and emitted carbon is to be minimised in delivery and operation. The Authority is at the forefront of the UK government's drive to Net Zero and this project is an opportunity to push the bar higher.

Through optimizing flow, combined import/export storage and automation of storage/retrieval of the Material Handling Solution and the design of the building are to be optimized, lowering the embodied carbon (i.e., carbon released as a result of the materials used) associated with a new FHF build.

The equipment solution must meet the high standards of sustainability – from intelligent design and manufacture to optimising cargo movements, low energy equipment and intelligent load balancing.

Use of lower carbon materials, sustainable materials, and supply chains is desirable and will need to be evidenced. Preferential weighting will be given to providers and solutions who can evidence heighted environmental solutions and performance.

Appendix 1 – Indicative list of equipment

Indicative Equipment List –Top Level

- Cargo System;
- Racking;
- Gantry Crane 20T SWL –through life support only, crane will be provided separately;
- IT Software;
- IT Hardware.

Indicative Equipment List - Detailed

- Roller Deck LO 10 ft;
- Roller Deck NEL 10 ft. with Contour Control;
- Roller Deck_10ft_LO_driven_spacer;
- Ram protection;
- Storage Deck 10 ft. NEL, Rear;
- Height adjustable Dolly Dock 10 ft;
- 10 ft. Workstation LO with Scissor Lift and Scale (-1000 -510);
- 20 ft. Workstation LO with Scissor Lift and Scale (-1000 -510);
- Cargo Donkey 10ft;
- 15 ft Truck Dock with Scale;
- Floor Scale Small;
- Slave Pallet 10ft LO;
- Rails ETVs;
- ETV_20ft_LO_3D;
- Airside Dolly Dock Ram Protection;
- Work Station Ram Protection WEL;
- Work Station Ram Protection NEL;
- Rail End Stop ETV;
- Lift_Pit_Cover_long_3D_20ft;
- Pit 10 ft. workstation open LA;
- Standard X-Ray Consignment Cages;
- Fast action door (3000 mm) insulated;
- Empty Pallet Rack;
- Turntable_10ft_3D;
- Spacer at TT, WEP;
- Spacer at TT, NEP;
- Steel Structure ETV Systems.

Appendix 2 – Interface considerations between materials handling equipment and infrastructure

The following list is of key considerations when understanding the interface between optimum Material Handling Equipment layout, safety and performance and the infrastructure specification of the building.

1. Slab tolerances aligned with equipment tolerances (especially rails and racking);
2. Slab falls (internal and external) to align with equipment support design and adequate drainage;
3. Slab composition to minimise cracking, accommodate finishes and accommodate drilled fixings;
4. Slab loading;
5. Workstation, landside truck dock, airside interface pit size and location (indicative, final size/position dependent on details from selected Material Handling Equipment supplier);
6. Required areas and segregation for DG storage (internal/external);
7. Required areas and segregation for temperature-controlled storage (medical other temperature-controlled products);
8. Required areas for secure V&A and ACTO storage;
9. Landside interface (type and number of docks);
    9.1. Dock heights aligned to vehicle types
    9.2. Dock configuration aligned to vehicle types, FLT
    9.3. Intact ULD dock integrated with MHE solution and access control
    9.4. Landside interface to be protected from weather impact (e.g. canopy)
    9.5. Personnel door(s) (with security) to access landside loading area directly from the warehouse
10. Airside interface (type and number of interfaces);
    10.1. Airside ACP interface to be covered by a canopy to protect from weather impact
    10.2. Any support columns for canopy need to have impact protection and must not block airside roadways and ULD/vehicle flows
    10.3. Personnel door(s) (with security) to access airside directly from the warehouse
11. Side entrance (personnel) doors to interface with gantry crane;
12. Electrical (power) resilience and approach / electrical isolator positions;
13. Wi-Fi coverage and capacity;
14. Sprinklers (assumed PCHS sprinklered). Hazard classification and design code;
15. Automatic (fast) action door(s) interfacing with MHE equipment;
16. Columns and preventing pinch points (H&S) in automatic controlled areas;
17. Security doors according to CAA/NASP/HRMC compliancy.