

Asset Standard

Surface Car Parks

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2.3 Planning

2.3.1 Planning Strategy

Account shall be taken of the working pattern, demand and occupancy forecast levels associated with the airport the car park is serving. Planning shall consider airport operation functional needs related to:

- Traffic Safety Audit to include external road system including signage.
- Compliance with Airport Sustainable Development Plan
- Planning requirements – including noise; environment impact; archaeology impact; air quality; landscaping; lighting; visual impact and traffic impact.
- Aerodrome Safeguarding Requirements -Does not infringe with internationally agreed safety margins around flight paths nor interfere with visual and none-visual aids to navigation which safeguard aircraft on those flight paths. Position and height of development to be reviewed in relation to flight paths, external lighting and landscaping.
- Meeting DFT security requirements (e.g. perimeter edge safety/security screens), proximity of car park to airside/landside boundaries.
- Safeguarding Requirements on Glint & Glare - Effect on aircraft operations from vehicle headlights within the car park at night.
- Electronic surveillance, information services and communications.
- Provision for fire -fighting (hydrants etc) including fire strategy.
- Access for fire-fighting including routes to and from the area by fire appliances.
- Means of escape from car park operation building(s) & associated assembly point routes & locations.
- Access requirements for essential maintenance, emergency attendance vehicles and equipment.
- Effects from present and future development(s) close to the car park set against the requirement to meet any statutory compliance.
- The requirements of the parking product.
- Advertising and MAG marketing sites.
- Construction environment management plan.

A co-ordinated planning entry/access and egress strategy for traffic management and people shall be produced. It shall consider:

- Approach and exit points for the car park.
- Safeguard an alternative contingency break out (entrance / exit) barrier point.
- Bus stop areas.
- Payment points.
- Vehicle and pedestrian circulation routes within the car park
- Vehicle and pedestrian wayfinding circulation routes to and from bus stops
- Related facilities within the car park
- The provision for access to emergency service and essential maintenance vehicles.

2.3.2 Park Mark Standard

The surface car park is to be designed to Park Mark standard to ensure that measures have been put in place to deter criminal activity and anti-social behaviour, thereby doing everything possible to prevent crime and reduce the fear of crime in the car park. These measures include appropriate lighting, effective surveillance, clean environment and quality management.

3 Requirements

This section describes the critical performance criteria required by MAG to meet their business needs. The CONSULTANT OR CONTRACTOR shall demonstrate full compliance with the following criteria.

3.1 Development

This standard defines the performance criteria for the design of all new surface car parks and extensions/renewals to existing surface car parks. It has been produced to provide a consistent approach to car parking solutions across MAG. The document describes the requirements to focus on achieving a safe product, improved customer experience, ease of maintenance, optimum operational efficiency and whole life costs.

3.1.1 Entrance and exit area

3.1.1.1 Vehicle access and egress routes shall be positioned to aid the free flow of traffic and not cause congestion on adjacent road system. Road alignment geometry shall ensure such areas have good visibility requirements between drivers and other drivers, and between drivers and pedestrians.

3.1.1.2 The roadway system and entrance / exit barrier lanes to be able to accommodate buses, emergency appliances and essential maintenance vehicles.

3.1.1.3 Getting into the correct traffic zone:

- To aid efficient traffic flow into the desired traffic zone. Signs and road system shall give customers enough time to see exactly where to go and position themselves accordingly.
- At an appropriate point, types of facilities available should be identified i.e. long stay etc.
- As a further aid to wayfinding and improved customer service related to greater visibility including that of information signage and operational equipment all vehicle entrance and exit areas shall have lighting to a higher level of luminance to that of the car park and surrounding area.

3.1.1.4 Entrance areas are required to have:

- Sufficient number of entry lanes to handle 50 - 60% of car park peak busy hour rate for the car park it serves. A minimum of two lanes shall be provided.
- Provision for errant vehicles to turn around safely.
- Automatic barrier system.
- Full ANPR and recording CCTV on entry.
- Straight one-way entrance lanes.
- Signage and/or appropriate road markings to deter illegal parking in and around the entrance area.
- Beyond the entrance plaza, distributor and avenue style road systems, a 10 mph speed limit is to be reinforced by signage supported by road markings. A signage trail shall be implemented throughout the roadway system that will constantly remind drivers of the restriction. The use of traffic calming measures should also be considered.

3.1.1.5 Central Island, entrance and exit site requirements are:

- Island to be raised above road level to provide equipment protection from vehicles. To be of sufficient length and width to accommodate the equipment and any feeder pit and duct system for services.
- Roadway and island shall be on a straight alignment to approach lane with a flat level surface.
- Adequate clearance shall be given to all equipment to allow a driver to get out of his vehicle and due account be taken of overhanging wing mirrors.
- Barrier card reader to be sited within easy reach from the driver.
- Roadway surface shall accommodate buried loop detectors.

- All lanes beyond the island shall be maintained on a straight alignment for a minimum of 2 car lengths before any alignment and width adjustments are made to the roadway system to enable entry into the car park or exit roadway system.

3.1.1.6 Exit areas are required to have: -

- Exit routes that avoid confusion and congestion with entering traffic routes.
- Sufficient number of exit lanes to handle 50 - 60% of car park peak busy hour rate for the terminal it serves. A minimum of two lanes shall be provided.
- Provision for errant vehicles to turn around safely.
- Automatic barrier system.
- Full ANPR and recording CCTV on exit.
- Approach lanes to the exit barriers machines to be straight.
- All lanes beyond the exit barrier shall be maintained on a straight alignment for a minimum of 2 car lengths before any alignment and width adjustments are made to the roadway system before turns with safe visibility onto main airport road system.
- Entry onto the airport road system via a merger lane or dedicated junction. Speed restriction in force shall be clearly displayed to advise the driver in advance of joining the main carriageway system.

3.1.2 Car Park Pavement

3.1.2.1 General Requirements

- The main criteria governing the life of a car park are usage, structural capacity, frost susceptibility and drainage layer.
- Roadways and parking zones with an impervious surface shall be laid to falls with no areas of standing water.
- Road width for a two-way distributor road - 7.0m minimum
- Road for a one-way distributor road of width to allow safe overtaking of a stationary bus by a bus or emergency attendance appliance - 6.0m minimum. Road width shall ensure safe passage of cars, buses, emergency appliances and any essential maintenance vehicle or equipment specific to the area.
- For the construction of car parks and trafficked access road and bus routes this design guide follows the principals and standards to those published by Highways England. Designers may provide alternative materials and construction thicknesses with the approval of MAG, but such alternatives should deliver equivalent performance. All materials should have certifications under the Highway Authorities Product Approval Scheme.
- The design should comply with best current practice and encourage the need to promote sustainable construction materials and techniques, in particular recycling. The use of materials from sources that maximise the amount of recycled construction material is strongly encouraged.
- The CONSULTANT or CONTRACTOR is responsible for ensuring that designs and specifications for the design align with all other MAG Standards.
- Every project shall develop and continually update a Basis of Structural Design document (BoSD) that details the approach and parameters adopted. The CONSULTANT or CONTRACTOR shall obtain agreement of MAG Technical Leadership during the development stage of the project specific basis of design (BoSD) on their proposal.

3.1.2.2 Unbound Car Park Surface

- Unbound layers used for sub-base or capping, or the whole pavement structure will fulfil the functions of a working platform for construction and a structural layer (load spreading and resistance to rutting).
- It is expected that the unbound pavement life should have a life of 10 years with standard minor maintenance works being necessary annually.
- Foundation design shall be in accordance with IAN 73/06 Rev 1

3.1.2.3 Bound Car Park Surface

- It is intended that the pavement design be based on one foundation design, i.e. capping layer plus sub-base, or sub-base alone; and one flexible paving design for the structural layer. A different sub-base or structural layer option e.g. lime/cement stabilised formation or a hydraulic bound road base.
- The functional surface of the car park should have a life of 25 years provided regular maintenance to remove surface irregularities is carried out.

3.1.3 Independent zone parking area

3.1.3.1 The following will apply:

- The maximum number of spaces in a zone shall be dependent upon the car parking product and agreed with car park operations.
- Each zone shall be capable of being closed off independently by car park operations but still maintain the ability to allow vehicles to exit safely onto the main circulatory road system.
- Pedestrians should not have to walk more than 150m (150m radius) from their parked vehicle to a bus stop.
- One-way vehicle circulation search flow pattern shall be used to maximise capacity and minimise search patterns to reduce confusion and congestion in drive aisles. Two-way traffic flow is permissible but shall be limited to end of drive aisles and entrance/exit points.
- Circulatory one-way traffic within the zone to be a minimum of 6.0m inclusive of any drive aisle walkway zone.
- Circulatory two-way traffic within the zone to be a minimum of 7.0m inclusive of any drive aisle walkway zone. Also need to ensure that the width is sufficient for 2 buses to pass if required.
- Parking bays in a parallel configuration to a roadway serving the bus stop is the preferred arrangement for a zone.
- Standard parking bay to be minimum 4.8m deep by 2.4 m wide, white bay demarcation lines 100 mm in width, fully boxed bays closing off front of bay.
- Block parking to be minimum 2.2m wide with minimum 0.53m walkway. The length of the block parking should not extend 120m.

3.1.4 DDA Compliant

3.1.4.1 All self-parking surface car parks shall be fully compliant with the Disability Discrimination Act (DDA). Parking bays for use by blue badge holders shall be provided. Space allocation to comply with relevant British, European and ISO standards. Reserved blue badge spaces to be provided based on the provision of designated parking spaces for car parks 5% of the total parking capacity.

3.1.4.2 Blue badge parking space distribution, the following method is to be adopted:

- Parking within an independent zone shall be clustered round the bus stop serving the zone. A zone served by more than one official bus stop, it is permissible to distribute the required number of parking bays between the number of stops, but not mandatory.

- A zone without a dedicated bus stop but served by a bus stop in an adjacent zone or area, blue badge parking shall be located around the pedestrian walkway exit point for that zone.
- 3.1.4.3 The percentage requirement to be based only on the number of parking spaces within each independent zone. In this situation the sum of all independent zone blue badge parking shall equal the whole parking capacity provision. Each bay shall be clearly sign-posted at its head to identify the parking space.
- 3.1.4.4 Layout to be in compliance with relevant British, European and ISO standards. Space shall be made available to enable a disabled motorist or passenger to alight from a car and then to manoeuvre around parked vehicles. A zone of 1.2 shall be provided between designated parking spaces and between the designated spaces and a drive aisle roadway for boot access. Each vehicle parking bay should be minimum 4.8 m deep by 2.4 m wide with a 1.2m wide defined loading/unloading area each side of the parking space.
- 3.1.4.5 White bay demarcation lines to be 100 mm in width, fully boxed bays closing off front of bay. Wheelchair international symbol markings are to be displayed in both vehicle parking area and unloading zone.

3.1.5 Pedestrian walkways within an independent zone parking area

- 3.1.5.1 Dedicated walkway - Walkway shall be a minimum 1.2 m unobstructed width. The walkway shall be sufficient to accommodate simultaneous use in both directions by pedestrians with laden trolleys and people in wheelchairs. Such walkways are specific to pedestrian routes running transverse to vehicle drive aisles providing a defined route within a car parking area to a bus stop.
- 3.1.5.2 Where a walkway crosses a traffic lane to an adjoining walkway, an alternate striped pedestrian zebra crossing is to be used. Crossing to be 2.5 m wide regardless of walkway width.
- 3.1.5.3 Walkways exiting an independent zone into the path of a road system or crossing point shall safeguard pedestrians from walking directly into the path of vehicular traffic by provision of a guarding system located adjacent to the road edge. Direct alignment with a zebra crossing shall be avoided, walkway shall be offset to the limits of the crossing and guarding incorporated.
- 3.1.6.1 Bus stop areas shall be visible from all positions within the parking zone to afford intuitive wayfinding for the pedestrian, they shall be functional and uncluttered, landscaping shall not obscure sight lines to the area.
- 3.1.6.2 Each site shall have a weather proof enclosure. The enclosure and surrounding area shall be well lit within the car park in the night time hours.
- 3.1.6.3 The bus stop in addition provides the bus operator with aids to enable them to position themselves correctly to set-down / pick-up passengers.
- 3.1.6.4 All areas including enclosure shall have wheelchair accessibility
- 3.1.6.5 The prime requirements for the area are:
- Bus stop shall be sited on the exit side of the bus.
 - Provision of a weatherproof enclosure.
 - Be a raised hard standing laid to falls, to be no greater than 150 mm above the carriageway on the bus approach side, to meet access height bus entry requirements.
 - For pedestrian comfort surface water shall not collect or be channelled through the enclosure waiting area.
 - Raised hardstanding requiring steps to access (other than a kerb height) are to be avoided, such areas shall have ramped access, where appropriate dropped kerbs and cross falls, all to comply with relevant British, European and ISO standards

- When siting the enclosure, it is important the exit point from the waiting area is located as close as is practicable to the main desired line to the bus main pick-up entrance door, so pedestrians are not diverted unnecessarily.
- The enclosure shall be positioned at least 1.5 m clear from the edge of the carriageway, or any pedestrian guardrail to provide a footway zone.

3.1.7 Parking payment on return

- 3.1.7.1 The location of parking payment machines are to be either located in the terminal building or at agreed locations in and around the car park dependent upon car parking product and proximity the terminal building.
- 3.1.7.2 Where parking payment machines are provided in surface car parks then a canopy should be provided to protect the customer from the elements.

3.1.8 Pedestrian restraint and guarding

- 3.1.8.1 A pedestrian restraint and guarding system shall be used to protect pedestrians when walking near the edge of a raised area/retaining wall, prevent them from walking/running onto a carriageway at approaches to crossings and provide the means of guiding pedestrians to such areas to deter crossing elsewhere. A raised area is defined as a fall more than the height of two risers (or 380 mm if not part of a stair). The restraint system shall have regard to overall safety and avoid creating a visibility hazard for highway users.
- 3.1.8.2 Provisions for a pedestrian guarding at a zebra crossing adjacent a bus stop
- 3.1.8.3 Vehicle protection to be used in the following situations:
- In the interest of public safety where a safe area or zone needs to be created.
 - As a means of segregating or zoning permanent car park areas to ensure vehicles keep within intended traffic routes.
 - To protect a building and occupants, equipment critical to the operation of the car park facility including airport.

3.1.9 Pedestrian road crossings on main roadway circulation systems

- 3.1.9.1 Routes for pedestrians shall be segregated from vehicle routes, all pedestrian road crossings shall be accompanied with a zebra crossing to meet the requirements of this clause.
- 3.1.9.2 The number of pedestrian crossings across a carriageway shall be kept to a minimum and should normally be at right angles to the carriageway.
- 3.1.9.3 The approaches to a pedestrian crossing shall be clearly visible by approaching vehicles and provide easy access for wheelchair users.
- 3.1.9.4 Pedestrian crossing points at a bus stop shall be sited to the rear of the stationary bus on the exit (downstream) side to ensure stopped buses do not obscure the vision of pedestrians or drivers.
- 3.1.9.5 Crossing approach surfaces for footways and carriageways:
- Carriageway surface for the full extent of the crossing carpet (crossing plus the limits of zebra controlled area) shall be black to provide sufficient contrast to all line markings.
 - All markings to be coloured white illuminated.
 - All markings are deemed permanent and have skid resistance surface.
 - Crossing width to be a minimum 2.4m between the two rows of studs. Square in shape stud lines are to be used.
 - Dropped kerbs shall be provided, footway to be ramped with a slope having a desired gradient of 1 in 20 but not steeper than 1 in 12. Kerbs to be either flush with the carriageway or with a maximum upstand of 6 mm.
 - Drainage shall ensure surface water does not gather at crossing points.

Carriageway and footway areas shall be free of surface obstructions such as access covers or gullies.

- To aid approaching drivers all crossings shall have a belisha beacon placed at or near each end of the zebra crossing attached to a post coloured in alternate black and white bands. A shield or other device designed to prevent or reduce stray light may be introduced where light pollution to the surrounding area is an issue.
- All pedestrian approaches to a Zebra crossing shall be kept clear of trees and street furniture that may present a hazard for pedestrians especially those with disabilities.

3.1.10 Boundary fence

3.1.10.1 The type of boundary fence shall be dependent upon the car parking product and comply with the guidelines defined in Park Mark Accreditation.

3.1.10.2 Where the car park is located next to the critical part then a critical part boundary fence should be used.

3.1.11 Trolley Collection points

3.1.11.1 The provision of trolley collection points needs to be considered on surface car parks, dependent upon the type of car parking product.

3.1.12 Environment and materials

3.1.12.1 The car park environment is to be taken, as external, exposed and unheated, elements will be exposed to a variation of seasonal temperatures, frost, humidity and condensation. The form of construction will influence the level of water ingress. Water ingress and road contaminants (de-icing salts) will migrate off vehicles and people as they enter areas.

3.1.12.2 During the selection process for materials and components in addition to their operational performance for their design life account shall be taken of the environment, ease of maintenance, method of repair including replacement. A constraint of minimum disruption and closure downtime is of major importance.

3.1.12.3 A whole life cost analysis shall be carried out.

3.1.13 Litter rubbish management

3.1.13.1 Unless for reasons of security there should be arrangements for collection of rubbish by the placing of litterbins in most commonly used public areas, such as the bus stops.

3.2 Weatherproof Enclosures

3.2.1 Bus shelter enclosure

3.2.1.1 The enclosure shall be weather proof and either full or part enclosed dependent upon its location.

3.2.1.2 The enclosure shall: -

- Have a minimum design life of 10 years maintenance free. Finishes shall be easy to clean and maintain.
- Be weather proof and full height glazed to make full use of natural daylight.
- Have an appropriate sized waiting area to serve passengers with hand luggage and wheelchair access.
- Be well lit to create a bright oasis within the car park in the night time hours.
- Be wheelchair accessible.

3.2.1.3 A weatherproof enclosure should also be considered as shelter to the jockey drivers in remote block parking areas.

3.3 Wayfinding

3.3.1 Wayfinding and signage

- 3.3.1.1 Surface car parks shall have intuitive wayfinding for both pedestrian and motorist that makes full use of landscaping, lighting, signage and beacon signs at places of importance. Wayfinding, signs and lighting shall be provided to enable clear safe movement within and around the car park.

3.3.2 Roadway directional and line markings

- 3.3.2.1 Road markings including associated signage should wherever possible emulate normal Highway Statutory practise.
- 3.3.2.2 Roadway directional markings, parking bay demarcation lines, marking and lining systems associated with pedestrian walkways and general similar miscellaneous sites to floor areas are required to reduce confusion and congestion within the car park and provide, clear-cut, easy to follow directions to both traffic and pedestrians. All materials and their performance are to comply with relevant British, European and ISO standards.
- 3.3.2.3 Roadway direction markings because of their importance related to safety, colour is to be limited to white defined in the British Standard. Dimensions and international symbols unless otherwise defined are to be in accordance with the Traffic Signs Regulations.
- 3.3.2.4 Markings in general:
- Are to be applied proud of the surface.
 - To be of a contrasting colour to the substrate.
 - Shall adopt the same colour system throughout the car park.
 - All materials shall be compatible with the substrate being applied to.

3.4 Electrical services

3.4.1 Lighting

3.4.1.1 To comply with MAG lighting standard.

- Car parks are required to be designed to meet 'The Park Mark Standard' which will have a bearing on the standards to which the car park lighting should be designed.
- Good lighting quality is required at all road junctions, roundabouts and crossings to aid public safety. It is necessary to ensure pedestrian road crossings can be readily seen against the background of other lights and signs. Lighting levels recommended in the appropriate part of relevant British, European and ISO standards shall be applied as the minimum. As recommended by CIBSE
- A greater level of lighting should be concentrated along walkway routes including dedicated walkways within an independent zone parking area, to provide prominence, aiding wayfinding and a greater level of public safety.
- Lighting levels shall not compromise the operation of CCTV surveillance installations in use.
- Lighting columns to comply with relevant British, European and ISO standards
- All car park lighting, signage, traffic control, etc. shall utilise LED light sources.
- Car park luminaires must not direct any light upwards.
- Patterns of luminaires must be arranged so as not to be confused with aeronautical ground lighting when sited close to the Aerodrome.

3.4.2 Electrical distribution

3.4.2.1 Electrical distribution shall comply with the following MAG standards: -

- Electrical Distribution
- Switchboards Low Voltage Low voltage switchboards
- Cable Identification
- Testing of Life Safety Systems

3.4.3 Electronic surveillance

3.4.3.1 Electronic surveillance shall be installed to provide monitoring with the ability to examine all areas of the car park. MAG security surveillance cameras are required at all entrance and exit barrier points. Installation systems to comply with MAG CCTV standard.

3.4.3.2 The guidelines laid down in Park Mark standard under surveillance should be taken into consideration during any assessment of a car park. The CCTV system and level of illumination shall be compatible to meet the needs of security, safety of people and property.

3.4.3.3 CCTV shall be capable of obtaining high quality pictures at the illumination levels agreed for a given area.