

TD14-1041

Top Deck Parking Consultancy

Seven Oaks District Council

Bradbourne View, Buckhurst View, Suffolk Way View



Top Deck Parking – Consultancy



TopDeck Parking was formed by parent company Hill and Smith Ltd from a concept developed within Berry Systems - the UK's market leader in car park safety barriers and perimeter edge protection.

Between them, Top Deck Parking and Berry Systems have over 40year's experience within the car park construction sector. They have worked on over 3000 Car Park projects worldwide including new build, car park refurbishments, maintenance and appraisal projects. This extensive experience enables us to produce high quality solutions to clients' requirements from planning and layouts to full design and construction. Our engineers have recently won the British Parking Awards 'Best New Car Park'.



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1. General Survey Requirements

Site Survey & Investigation

In order to produce a balanced and appropriate approach to geotechnical investigative and interpretative work, a risk based approach is employed, in accordance with the guidelines in the UK ICE/DETR publication "Managing Geotechnical Risk" (2001). Ground related risks are assessed by desk study research which is carried out in advance of any intrusive ground investigation. This approach avoids wasteful abortive investigative works and reduces the likelihood of misinterpreting key aspects of the ground. Desk studies include a site inspection and a review of all available pertinent data, including historical maps, aerial photographs, geological publications and relevant publications.

To confirm that Top Deck can be effectively installed and operated on a site it is necessary to carry out survey and investigation into the site topography, services, ground conditions, etc. The extent of survey work varies depending on specific site conditions but will generally, as a minimum, include the following:

1. Initial walk-over and visual inspection.
2. Electronic topographical survey (if this is not already available).
3. Environmental desk top study (to include historical mapping).
4. Site services check (utility searches and local record review if available).
5. Site drainage survey (CCTV inspection and routing diagrams).
6. Trial hole investigation of near surface ground conditions.

We would recommend carrying out the above list to fully determine the site conditions and ensure there is no detrimental impact on the site through the incorrect installation of a structure.

Environmental Desk Top Study

Initially we undertake an environmental desk top study of the site to identify any issues which may affect a Top Deck installation. These may be related to previous uses, buried structures, nearby landfill, historical flooding, etc. Our study includes examination of historical maps and historical photographs (where available) for the site. We also make enquiries with the land owner to establish whether any previous reports, drawings or other information is available.

Our environmental investigation includes a visit and walk over the site to familiarise ourselves with the topography and surroundings and during which we particularly examine any significant issues raised by the environmental information. We also use this visit to plan the ground investigation work discussed below.

We report to the Client summarising any significant issues with the site and, if necessary, the likely remediation measures required.

Ground Investigation

The Top Deck structure is intended to be a demountable installation and has consequently been designed to stand directly onto the existing site surfacing. This is subject to the site being surfaced with material of sufficient quality.

We will carry out the following investigation procedures to assess the suitability of the surface layers. (It should be noted that as the structure is surface bearing the bearing pressure bulbs form in both the surfacing and near surface layers and, contrary to normal ground investigation work, it is these layers which require careful examination.)

Initially we will investigate with the Client and others whether any previous ground investigation information is available. Notwithstanding the availability of any previous information we will undertake our own investigation as follows:

1. Examine the build-up and condition of the surfacing layers. Assess their ability to support the bearing pressures exerted by the Top Deck columns.
2. Determine the type and condition of soils in the near-surface layers and assess their strength, stability, plasticity, etc., and general adequacy to support the Top Deck structure.
3. Determine contamination levels (where appropriate).

Our investigation procedures contain the below assessments where required:

Hand Excavated Trial Holes

In relation to item 1 above we hand excavate small trial pits through the surfacing layers to examine and record the built-up layers and the top of the formation. Where possible we will perform hand held Macintosh probe or shear vane tests at formation level. We may also carry out CBR testing of the sub-base.

Window Sampling and Dynamic Probing

In relation to item 2 above we undertake window sampling, usually to a depth of approximately 3.0m. Window samples are retained for laboratory analysis (which may include contamination testing) as necessary. Window sampling also identifies the presence of groundwater. We also undertake dynamic probe testing (using a small 'Terrier' type rig) to provide data on bearing capacities in the near-surface strata.

Machine Excavated Trial Holes

Subject to results from the above investigation it may become necessary to machine excavate trial holes to allow physical examination of the ground at depth. This method of investigation is only utilised when it becomes a necessity, in order to minimise disruption to existing site usage.

We subsequently produce a Site Investigation Report (incorporating the environmental investigation results) for the Client.

Remediation

Should the ground investigation identify inadequacies in the site we can provide advice on remediation works such as ground stabilisation, ground replacement or more traditional foundations.

It should be noted that Top Deck is designed and manufactured to the same specification as a permanent structure and where the Client wishes to install the system on a permanent or semi-permanent basis ground replacement or foundation

Examine the build-up and condition of the surfacing layers. Assess their ability to support the bearing pressures exerted by the Top Deck columns.

1. Determine the type and condition of soils in the near-surface layers and assess their strength, stability, plasticity, etc., and general adequacy to support the Top Deck structure.
2. Determine contamination levels (where appropriate).
3. Design Foundation Solutions for two storey construction
4. Review Drainage Strategy
5. Prepare Building Regulations application in conjunction with Top Deck Parking

Planning & Detailing

1. Production of Plans and elevations for the site based upon standard planning application criteria
2. Design & Materials report including specification information (NBS)
3. Vehicle access route and site access report

Structural Checking & Certification

Our appointed consultant engineers attend site during ground remediation works (if required) and during erection of the Top Deck structure to check construction procedures against design intent. On completion they undertake a full inspection of the structure and certify structural adequacy and suitability for use.

2. Stages & Summary

Stage 1 (Surveying)

Our fees include the investigation & surveys and scheme layouts. The scheme proposals are based upon an initial set and one revision to finalise the design your requirements and that of establishing planning conditions.

Further investigations would be made on the site through the progression of the bid, all pricing and allowance for the above list is outlined in the pricing document.

Stage 2 (Planning)

Top Deck Parking is a specialist parking consultant and have extensive expertise in the conceptual design of parking structures. We consistently achieve a user-friendly and structurally efficient parking layout for individual sites.

Our proposal for advancing beyond the first stage is to develop the design into a set of planning drawings and agreed specifications. In order to undertake this we will need to focus on the reviewed information gained on stage one of the project.

We will produce various elements of information and drawings in order that you are able to submit planning applications to your local authority, the submission could be carried out by Top Deck for a nominal fee however at present this has been omitted from the schedule below.

At this point we will also detail out our anticipated construction plans and programme for the delivery on each facility. The planning at this point will be developed over a period to suit Seven Oaks Council requirements.

We will also review the Health & Safety requirements of the project in order for us to fully detail out our offer to you from a

a 'management' capacity only and we have full access / direct communication to the end client or appointed client project manager to ensure we are controlling the release and transparency of information.



Stage 3 (Pre Contract)

Having completed the proposal and offer to our client we then require disclosure of the proposed contract in order for us to confirm our agreement and ensure we have covered all necessary cost in relation to the project and delivery.

Our contracts team will be brought online at this point to negotiate the conditions and guarantees required by yourselves, on completion of these negotiations we will be in a position to execute the contract upon your instruction and commence works on the structural design.

Beyond this point we will be engaged in all activities required under the contract to start works in an agreed programme.



4. Site Study

Bradbourne View

The Bradbourne site primarily consists of a traditional perpendicular layout on a 16m bin width, the driving aisles are approximately 6m wide allowing for a one way traffic flow to the site. The capacity of the ground floor within the identified boundary is 214 parking bays, on a visual assessment there appears to be no allowance for any disabled bays within this area.

The site contains a single point of access and egress to the main highway, there is an opportunity to extend the access to the proposed first floor from the adjacent deck seen in 'Photo 3' on the left hand side (Proposed Access Point # 2) or that of 'Photo 2' showing both a higher ground floor (Proposed Access Point # 1) and a higher first floor (Proposed Access Point # 2).

The advantage of combining the access route to the newly proposed first floor from the existing higher ground floor level or that of the existing first floor will maximise the net gain at the site due to the minimal impact of the steelwork on the existing ground floor.

Generally on a site this size you will lose approximately 15% of the current space count, the current 214 spaces within the boundary is expected to be reduced to 180 with the construction of ground floor access / egress ramps



We envisage the deck should be located adjacent to the South East elevation of the car park and fill the central section of the site. This is identified on Fig.1.

The circulation and flow around the site should be at the perimeter of the deck and follow the layout of the ground floor; this will maintain some consistency in the present site plan and drainage for primary support columns from the deck.

The area will required 2 egress points for pedestrians to escape in the event of a fire, these locations are identified in Fig.2, these are strategically located in order to comply with building regulations whilst minimising the impact on the ground floor.





With the use of the adjacent floor levels on the existing site we envisage that the net gain would be in the region of 155 spaces and a loss of 5 spaces.

We would also suggest a walkway access from the first floor to the existing higher level ground floor or that of the first floor level as indicated. This access would be used for DDA compliance and should therefore be at a max gradient of 1:20.

The proposed area of the elevated car deck would be in the region of 3396 Sqm, the average rate for an installed site would be based upon approximately £450 / sqm. The rate used is typical for this size site and is expected to be installed within two weeks from completion of any substructure works.

The proposal would then determine the site capacity to be:

Existing	214
Proposed expansion	155
Loss	-5
Total	364

Buckhurst View

The Buckhurst site consists of a herring bone layout on a 15.5m bin width, the driving aisles are approximately 5m wide allowing for a one way traffic flow to the site. The capacity of the ground floor within the identified boundary is 294 parking bays, on a visual assessment there appears to be no allowance for any disabled bays within this area.

The site contains a single point of access and egress to the main highway, the main access point is identified below. The construction of a deck on this site as previously mentioned reduce the capacity of the existing site by approximately 15%, due to the introduction of the access / egress ramps on the first floor. The ramps will be based upon a 1:10 gradient with transitions both top and bottom of the ramp at a gradient of 1:12.

Generally on a site this size you will lose approximately 15% of the current space count, the current 294 spaces within the boundary is expected to be reduced to 250 with the construction of ground floor.



We envisage the deck should be located adjacent to the three unoccupied boundaries of the site Fig.1, leaving the boundary adjacent to the residential properties 20m clear of the proposed car deck to the rear of the residential structure.

The circulation and flow around the site should be at the perimeter of the deck and follow the layout of the ground floor; this will maintain some consistency in the present site plan and drainage for primary support columns from the deck. The herring bone layouts are not always the most economic, however the loss of a complete row is deemed to be prohibitive to the optimised layout out and the net gain.



Ramp Location



The area will required 2 egress points for pedestrians to escape in the event of a fire, these locations are identified in Fig.2, these are strategically located in order to comply with building regulations whilst minimising the impact on the ground floor.

- Staircase # 1
- Staircase # 2
- Staircase # 3

The proposed area of the elevated car deck would be in the region of 5730 Sqm, the average rate for an installed site would be based upon approximately £450 / sqm. The rate used is typical for this size site and is expected to be installed within three weeks from completion of any substructure works.

The proposal would then determine the site capacity to be:

Existing	294
Proposed expansion	214
Loss	-24
Total	484

Suffolk Way View

The Suffolk site consists of a traditional perpendicular layout on a 15.6m bin width, the driving aisles are approximately 6m wide allowing for a one way traffic flow to the site. The capacity of the ground floor within the identified boundary is 81 parking bays, on a visual assessment there appears to be no allowance for any disabled bays within this area.

The site contains a two points of access and egress to an access road from the main highway. The location of a ramp access to the upper level on this site is a critical issue due to the net gain not being a justifiable increase with a more traditional 1:20 gradient from the location identified. Proposed ramp location number two will present an opportunity to demonstrate a reasonable gain at the site though use of the use of the existing change in levels providing they are of a significant difference. This should be in the region of at least 1.2m.

The advantage of combining the newly proposed first floor from the existing higher ground floor level will maximise the net gain at the site due to the minimal impact of the steelwork on the existing ground floor.

Generally on a site this size you will lose approximately 15% of the current space count, the current 81 spaces within the boundary is expected to be reduced to 70 with the construction of ground floor access / egress ramps and associated pedestrian routes.



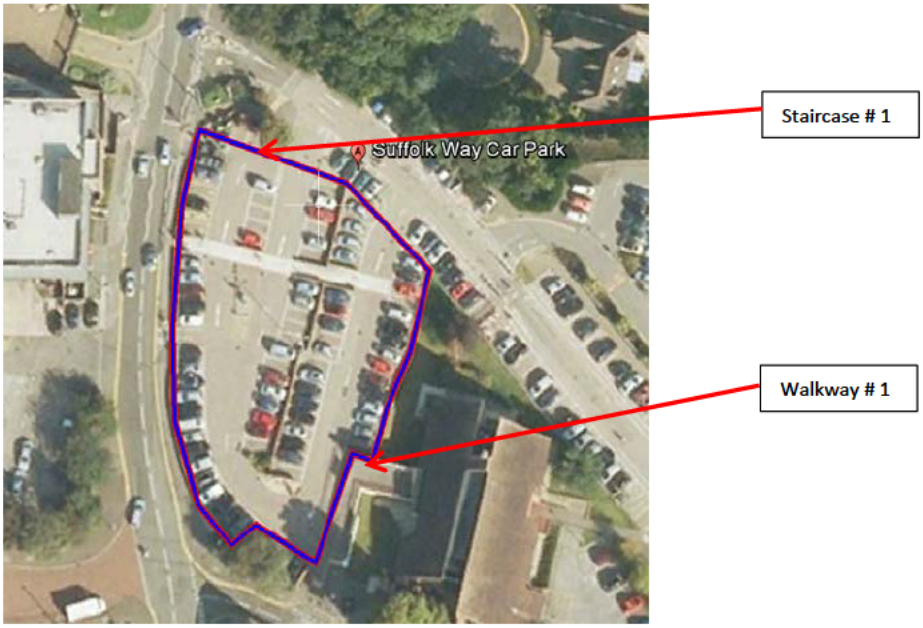
We envisage the deck should fill the central section of the site. This is identified on Fig.1.

The circulation and flow around the site should be at the perimeter of the deck and follow the layout of the ground floor; this will maintain some consistency in the present site plan and drainage for primary support columns from the deck.

The area will required 2 egress points for pedestrians to escape in the event of a fire, these locations are identified in Fig.2, these are strategically located in order to comply with building regulations whilst minimising the impact on the ground floor.

The deck perimeter is identified in blue, this is located directly over the site boundary in red.





With the use of the adjacent floor levels on the existing site we envisage that the net gain would be in the region of 70 spaces and a loss of 11 spaces.

We would also suggest a walkway access from the first floor to the existing pedestrian ramp level as indicated. This access would be used for DDA compliance and should therefore be at a max gradient of 1:20.

The proposed area of the elevated car deck would be in the region of 2338 Sqm, the average rate for an installed site would be based upon approximately £475 / sqm. The rate used is typical for this size site and is expected to be installed within two weeks from completion of any substructure works.

The proposal would then determine the site capacity to be:

Existing	81
Proposed expansion	70
Loss	-11
Total	140

5. Methodology of Approach

Construction planning is a fundamental activity in the management and execution of any construction project. We assess the choice of materials, the definition of work tasks, the estimation of the required resources and durations for individual tasks, and the identification of any interactions among the different work tasks. Our construction plan forms the basis for developing the budget and the schedule for work. In addition to these technical aspects of construction planning, we also make organisational decisions about the relationships between project participants and which organisations to include in a project.



Our Approach and Methodology in any project to achieve Quality in Construction consist as minimum of the following:

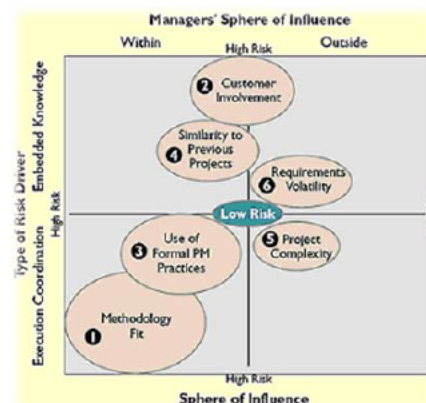
- Create a defined statement of work and owner's vision to align contractor's and owner's goals and acknowledge that the goals are mutually understood
- Assure accountability through commitment (sign-off)
- Include the Construction Manager professional in the design phase for better control of the construction process
- Adopt a proactive approach to issue resolution process
- Understand everyone's perceptions of the project well in advance of design and construction
- Collaborate with the Client up front
- Incorporate close-out items in the project schedule and schedule of values
- Include well-defined project close-out procedures in the project schedule
- Continually communicate expectations
- Changing expectations must be managed by the Construction Manager
- Compliance with original construction budget
- Support open communication amongst the design and construction team
- Timely response to inquiries
- Facility conforms to original goals and objectives (or building program)

We recommend a project kick off that concentrates on risk assessment that can be used to perform intuitive "what-if" analyses to guide managers in determining how they can proactively reduce project risk. This facilitated discussion would guide the team through an examination of the following:

- Commercial
- Design
- Project size and scope
- Organisation / Communication
- Planning issues / Health & Safety
- Pre-construction
- Onsite Construction
- Operations and support

Development Process and Measurements - Phased Project

Our basic approach taken to projects can be described as a phased, iterative approach. The first step in the process is to take all the system's requirements and strictly prioritise them. Then as the detailed design proceeds we will be able to understand exactly what can be achieved within monetary and timing constraints. This information, in turn, will be used to plan out the distinct phases of the project.



6. Design Specifications & Calculations

The Building – Description and Conceptual Design

Design rationale

Site clearance and preparation

Because of the restricted timescale for the delivery of an operational facility, the scope of the works is based upon a phased construction programme to minimise the disruption on the car parks. The site preparation works are required to be completed by others.

Ground works and ground level slab

The bearing capacity of the existing surface of the compound is unknown.

We feel there may be underground services either serving the existing site or passing through the site.

Because of the potential of underground services any substructure works should be confined to the shallowest practicable depth.

Integration with existing highways patterns

The entrance and exit vehicular routes form junctions in the proximity of each site shall be positioned and orientated to allow a free flow of traffic without causing congestion.

Regulatory and warning signage and road markings shall be provided in accordance with the Traffic Signs Regulations and General Directions 2002 and the Traffic Signs Manual Chapters 3, 4 and 5.

Provision of upper parking deck

Because of the nature of the requirement for additional car parking spaces, it is considered that a proprietary modular system will be the most appropriate and economic means of providing the upper deck of the car park. Unless otherwise stated, where the standards associated with the Top Deck structure do not meet the employers requirements the car park standards, upgrades to the proprietary standard can be provided and are identified with this proposal.

Provision of electrical, public health and ventilation services

The scope of MEP services should include:-

- The stripping out and diversion of existing infrastructure services in the area of the new car park.
- Provision of primary infrastructure services to the car park facility.
- Fit out of services within the car park.

The car park will be naturally ventilated in accordance with BS 7346 and there shall be no requirement for mechanical ventilation equipment.

Lighting systems at both ground and upper levels will form part of the proprietary car park system.

Barriers and other operational equipment can be provided and installed by us. Infrastructure and containment for power and data cabling should be provided as part of the main contract works.

Surface water drainage components can be integrated into the Top Deck structure.

9. Hill & Smith Group Profile

Hill & Smith Holdings PLC is an international group with leading positions in the design, manufacture and supply of infrastructure products and galvanizing services to global markets. Through a focus on strong positions in niche markets we aim to consistently deliver strong returns and shareholder value.

We operate from facilities in Australia, China, France, India, Sweden, Thailand, the UK and the USA.

The Group's operations are organised into three main business segments:

Infrastructure Products – Utilities, supplying products and services such as pipe supports for the power and liquid natural gas markets, energy grid components, "GRP" railway platforms, plastic drainage pipes, industrial flooring, handrails, access covers and security fencing.

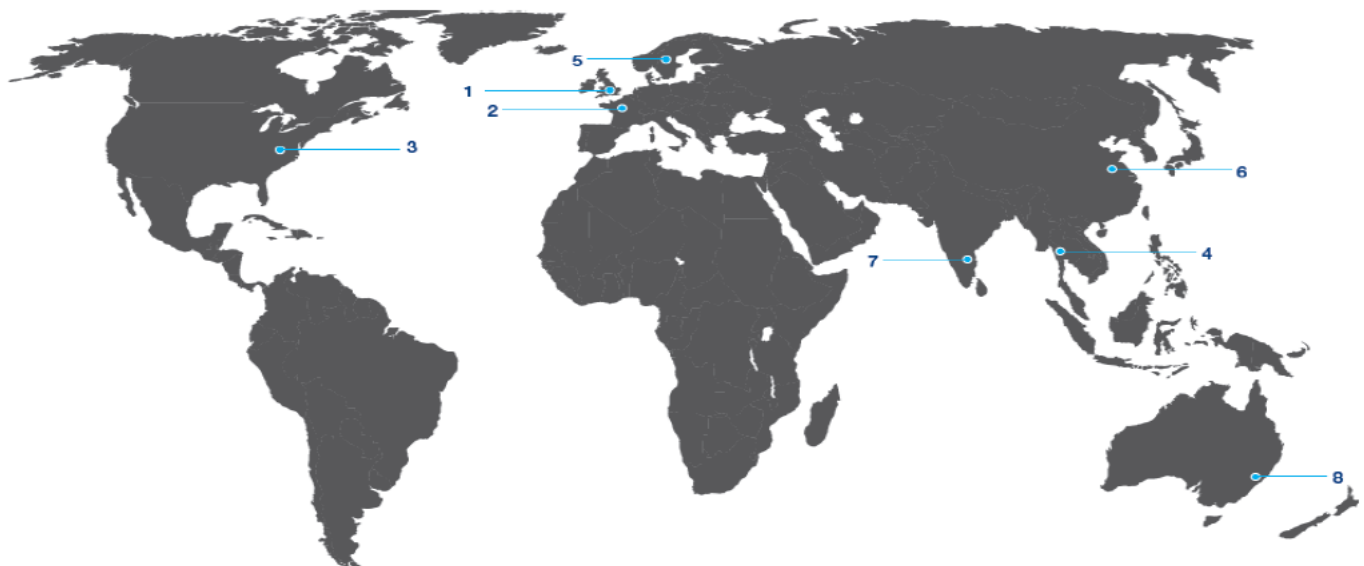
Infrastructure Products – Roads, supplying products and services such as permanent and temporary road safety barriers, street lighting columns, bridge parapets, gantries, modular car parks, variable road messaging solutions and traffic data collection systems.

Galvanizing Services which provides zinc and other coatings for a wide range of products including fencing, lighting columns, structural steel work, bridges, agricultural and other products for the infrastructure and construction markets.

In this area, the Group has been helped by strong demand, resulting from the increased focus on health and safety, the ageing road and rail networks and the need for airport expansion. Responding to the need for transport infrastructure improvements, the Group has invested heavily in this area of its business, including the acquisition of businesses with complementary product lines as well as new technology.

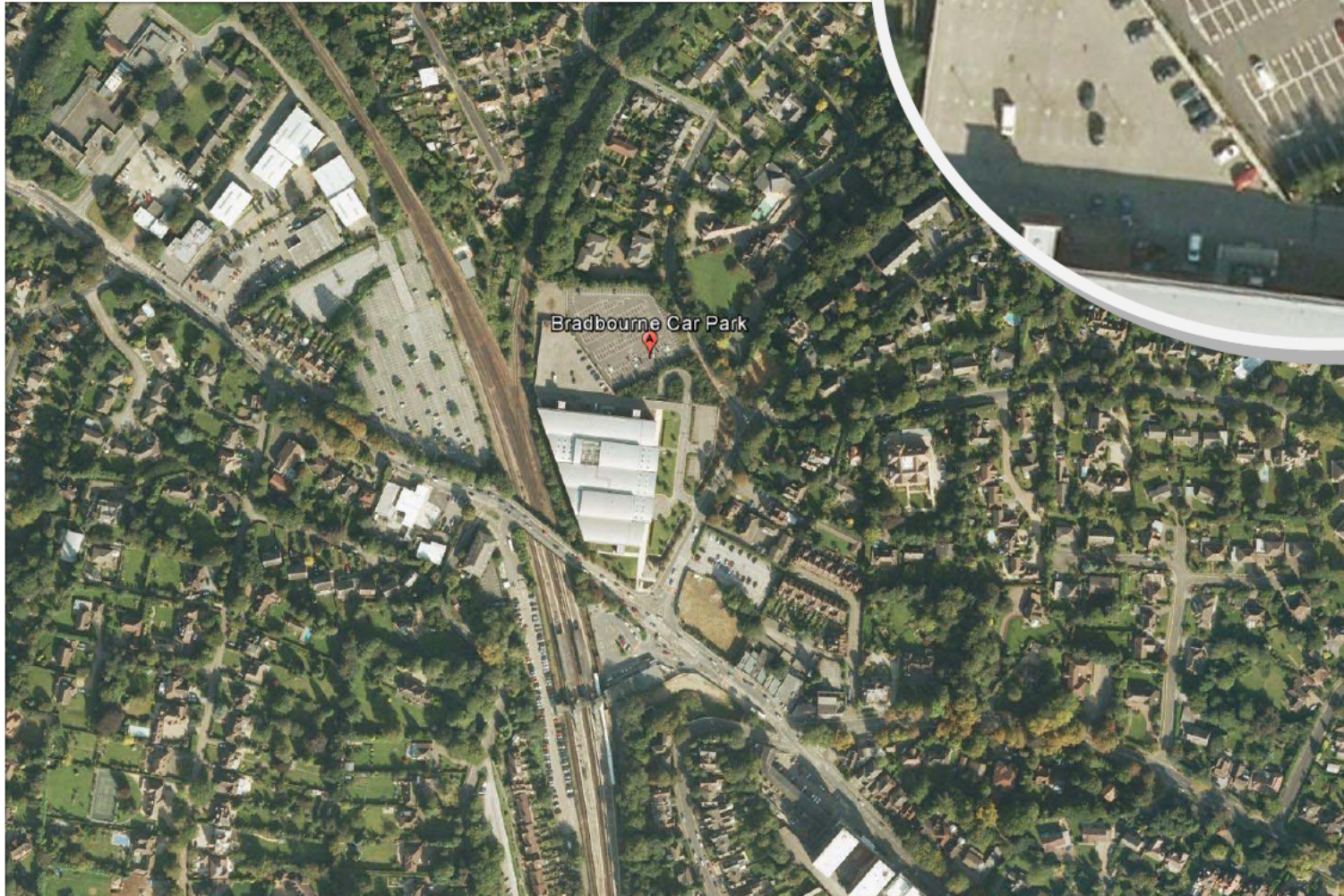
The Group's success in recent years has been driven by innovation and product improvement as well as a focused and highly effective management culture. The Group also owns leading European and US businesses, enabling it to access global markets.

Headquartered in the UK and quoted on the London Stock Exchange (LSE: HILS.L), Hill & Smith Holdings PLC employs some 3,600 staff across 51 sites, principally in 8 countries.



- ▶ **1.** UK – Head office and various Group site locations covering our main infrastructure products businesses and network of UK Galvanizing plants.
- ▶ **2.** France – the location of France Galva and Conimast where we have ten galvanizing plants and a lighting column business.
- ▶ **3.** USA – our V&S galvanizing and utilities plants are situated on the east coast along with the Bergen and Carpenter & Paterson pipe supports businesses and the fibre reinforced composite profiles business, Creative Pultrusions.
- ▶ **4.** Thailand – location of part of our pipes supports manufacturing capability, where we have plants near Bangkok.
- ▶ **5.** Sweden – location of ATA Bygg-och Markprodukter AB, the road safety barrier and signage business acquired in 2011.
- ▶ **6.** China – manufacturing and trading facilities located in the Jiangsu province for the further expansion of our pipes supports business.
- ▶ **7.** India – new manufacturing facility for pipes supports and also offices for development of our Hill & Smith infrastructure products business.
- ▶ **8.** Australia – new office in Queensland for the development of our wire rope and safety barrier products in Australia.

Bradbourne Site Location



Bradbourne Site Location

Site Statistics

Parking Bays	2.4m x 4.8m
Driving Aisles	5.5m Width
Area	4744 Sqm
Total Spaces	214



Photo 1



Photo 2



Photo 3

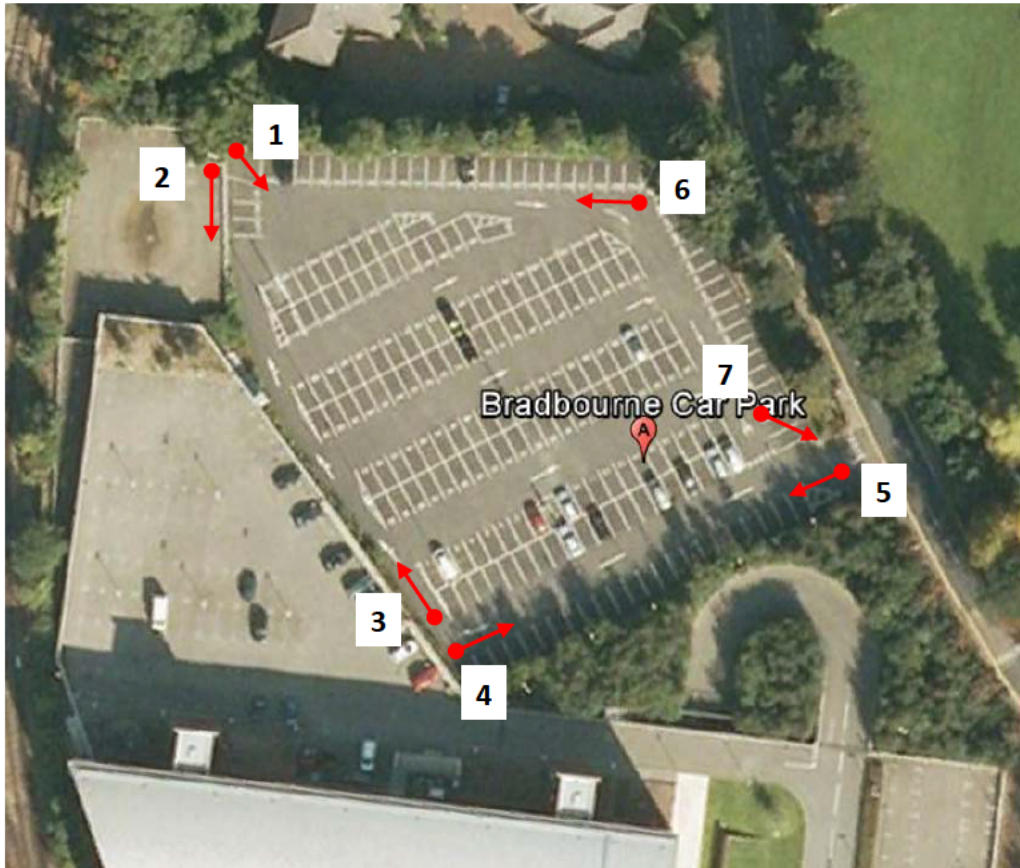


Photo 4



Photo 5

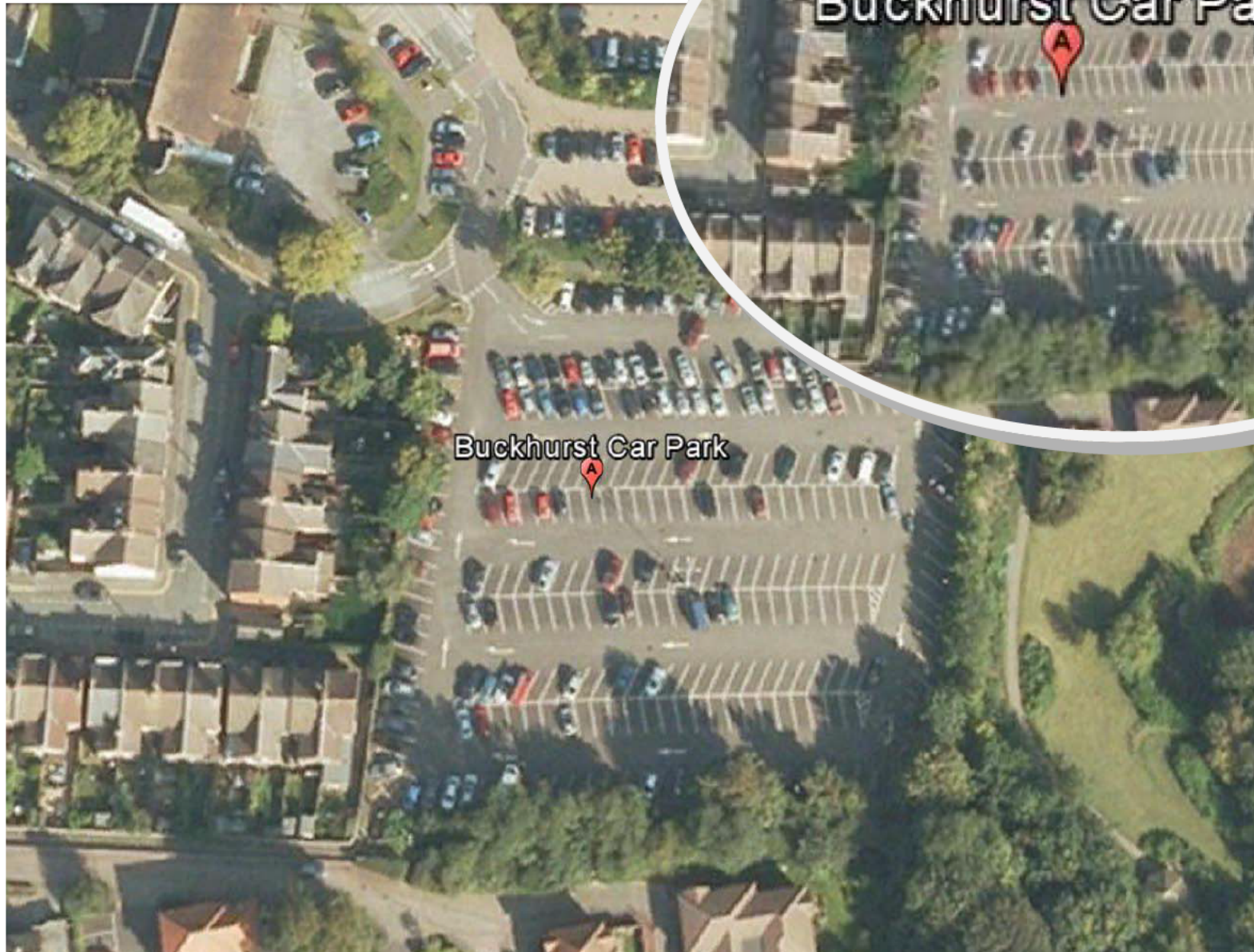


Photo 6



Photo 7

Buckhurst View Site Location



Buckhurst View Site Location

Site Statistics

Parking Bays	2.4m x 4.8m
Driving Aisles	5.0m Width
Area	6850 Sqm
Total Spaces	294

Herron Bone Parking



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7

Suffolk Way Site Location



Suffolk Way Site Location

Site Statistics

Parking Bays	2.4m x 4.8m
Driving Aisles	5.5m Width
Area	2338 Sqm
Total Spaces	81



Photo 1



Photo 2



Photo 3



Photo 4



Photo 5



Photo 6



Photo 7

For further information on any

Of our products please call:

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