

BAE SYSTEMS

HIP CAR PARK, BARROW-IN-FURNESS

Value: £3.96m

Completion: November 2020

Duration: 35 weeks

Contract: NEC 3 Option A Design and Build



Creation of a one story car park to create 840 car parking spaces. The site was surrounded by highway on 3 sides within the town centre conservation area. Section 278 agreements for the junction realignments were required.

SCOPE OF WORKS – STAGE 1 DESIGN MANAGEMENT

- In-house design manager appointed to control and manage all design consultants.
- Early contractor involvement allowed us to value engineer the whole project creating large savings for the client
- External Structural Engineering practice appointed for all structural design including foundations
- Drainage engineer was appointed to give further guidance on the design of the attenuation to meet Barrow Borough Councils (BBC) strict outfall discharge rates
- Liaison with BBC to obtain planning permission and building regulation approval for our design located within a
- conservation area.
- Discharge all planning conditions including the traffic management plan which, was of primary
- importance
- Lighting Engineer appointed to design an appropriate scheme for lighting levels to the ground and first floors
- Design of the ANPR & CCTV to the access points
- Liaison with the local highways network engineer for the new egress /access points to the car park. Michaelson Road had to be reconfigured so that the exiting traffic was to be left turn only
- Liaison with the piling/ground improvement sub-contractor to satisfy the structural requirements for the load bearing of the structure and to prevent differential settlement
- Steel stanchions layout was arranged to maximise car parking spaces
- Liaison with all sub-contractors to value engineer and to give guidance on buildability
- Due to the size of the structure, we recognised early in the design process that there would be an issue with the fire strategy. Consequently, we engaged a specialist fire consultant to develop a solution to satisfy building control.
- All consultants were given a programme for return of all design information. This enabling the design process to meet all time constraints and key milestones
- Design of the Vehicular Restraint System to the top deck
- Consideration had to be given to the galvanising thickness of the steel frame to achieve the design lifespan in a coastal region
- Landscape Architect was consulted in close liaison with the landscaping contractor to come up with a solution to soften the buildings outline. A living wall / screening was the eventual outcome.

SCOPE OF WORKS – STAGE 2 BUILD

- Vibro stone piles installed to improve the ground conditions and to prevent differential settlement
- Concrete pad foundations with holding down bolts
- Insitu concrete ground beams
- Attenuation crates
- Drainage including a petrol interceptor and a vortex control manhole
- Removal of old overhead crane foundations and underground obstructions
- Steel frame structure
- Tarmac ground floor finish
- Mezzanine floor consisting of metal decking with an insitu reinforced concrete floor
- Proprietary waterproofing system to the top deck
- Steel frame ramps
- Full landscaping scheme which included a living wall screen
- A specialist vehicle management system was installed with ANPR and CCTV systems to manage vehicle access and egress.
- Installation of all lighting
- External fencing and refurbishment of the 'Vickers Engineering' gates
- Removal of Japanese Knotweed
- White lines

KEY RISKS / CHALLENGES

- Existing obstructions / foundations below ground were unknown and extensive and had to be removed prior to ground improvement works. Resources had to be flexible as extra gangs had to be brought onto site to maintain the programme
- Minimising noise and disruption to residents and BAE's vibration sensitive buildings, particularly during piling operations.
- Due to the restricted headroom the tarmac Binder Course was laid before the structure was erected (thus also reducing the overall programme). Small specialist pavers were brought in to work below the steelwork for the final Surface Course
- Boundary retaining wall foundation was encroaching on the building envelope. A reconfiguration of the layout had to be implemented before steelwork design could commence thus avoiding abortive work



LESSONS IMPLEMENTED

Early and continued contractor involvement with the local authority ensured that they were fully consulted and informed throughout the schemes progression

COLLABORATION & VALUE ADDED

- Embedded knowledge from continued involvement with our client and understanding of their operating procedures
- Core team members for both ourselves and our client maintained building on previous relationships
- Working closely with the piling contractor during the design stage a solution was required to avoid excessive vibration. Ground stabilisation using vibrated stone columns reduced the amount of vibration compared to traditional concrete piles knocked into the ground

SUCCESSFUL OUTCOMES

- We were able to accommodate substantial additional works for the client within the contract period and post completion following building operating knowledge and feedback from users.
- Client was extremely happy with the overall design solution incorporating a Living Wall within the structure. This softened the appearance of the final product and was sympathetic to the surrounding conservation area
- As the car park was to be used for essential workers involved in the defence industry, it was imperative that there was no programme slippage. The contract was completed 6 weeks ahead of schedule despite Covid-19 restrictions and underground obstructions.

