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LEGEND:

ACCESSORY
ACCESSORY BUILDING
ACCESSORY FURNISHING
ACCESSORY STRUCTURE

PROGRAM TYPE:

- BACK OF HOUSE
- MEDIA
- KITCHEN
- RESTAURANT
- RETAIL
- STADIUM FACILITIES
- PLAYER AREA
- STADIUM
- STADIUM SECURITY
- STADIUM

SAFETY, HEALTH AND ENVIRONMENT INFORMATION

Read details on the identified hazard symbol representing the most relevant hazard. Symbols are listed below.

Symbol	Legend	Code	Notes
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9
10	10	10	10

Project Manager: GT GARDINER & THEOBALD

Planning Consultant: CBRE

Architect: LAINES & PEARSON

Design Consultant: PATTERN

Structural / MEP / Information: BURO HAPPOLD

Project Title: THE PEOPLE'S PROJECT

Planning Addendum: STADIUM PROPOSED PLANS

Proposed Floor Plan - Level 00

Checked: GT **Drawn:** AL **Designed:** PATTERN DESIGN

Contents of Book: FOR INFORMATION

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Appendix C – Detailed Construction Methodology

The logo consists of a black rectangle. Inside the rectangle, there is a yellow horizontal line at the top, followed by the text "LAING O'ROURKE" in white, and a red horizontal line at the bottom.

LAING O'ROURKE

The People's Project

BRAMLEY MOORE DOCK

CONSTRUCTION MANAGEMENT PLAN

DOC REF: BMD01-LOR-XX-XX-PL-W-100001

REV: P02

Revision	Date	Updated by	Notes
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Appendix A – Fish Rescue Plan

1. Introduction

The Construction Management (Delivery) Plan has been produced to support the Planning Application and will be developed in line with design development and ahead of the appropriate construction stages. This document will provide the fundamentals of how the proposed works will be managed; more detail will be provided in the proposed individual management plans, and as the specialist contractors are appointed.

2. Scope of works

The project consists of the construction of the 52,888-seat stadium (with associated facilities and infrastructure) to UEFA Category 4 and associated external works on the Bramley-Moore Dock site.

The listed hydraulic tower does not form part of the main contract and will be carried out by a specialist under a separate contract. In order to limit further deterioration of the building LOR are to undertake making safe works to enable safe internal access for further surveys and future subsequent listed building consent 'LBC' submissions for the restoration works.

The main activities include:

- 2 Protection of the listed structures and assets where retained on site, removal of heritage assets for repair and reuse in public realm works and making safe of the Hydraulic tower.
- 3 Construction of 3 new openings into the Grade II listed Regent Road wall (1 new opening required at start of construction programme)
- 4 Removal of non-listed buildings and in-ground obstructions
- 5 Repairs to Grade II Listed dock walls
- 6 Dock filling
- 7 Service diversions / disconnections, New primary sub station, new gas, water main and telecoms services
- 8 Substructure works, including piling
- 9 Substructure pile cap foundations and lift pits
- 10 Underground drainage and other services
- 11 Precast concrete work to columns, walls, slabs and stairs, as well as lower-tier rakers and terrace units
- 12 Structural steelwork including upper rakers
- 13 Precast terracing units, vomitories and step blocks
- 14 Steelwork roof trusses and purlins
- 15 Aluminium standing seam roof coverings and polycarbonate
- 16 Aluminium mesh cladding to roof barrel
- 17 Brickwork piers
- 18 Glazing, mesh and brickwork infills
- 19 Lifts and escalators
- 20 Handrails, balustrades and bowl barrier rails
- 21 Mechanical, electrical and public health installations
- 22 Fit-out activities, including bowl, concessions and concourses
- 23 Pitch works
- 24 Testing and commissioning
- 25 External hard and soft landscape works including western water channel, DNO compound, external stepped promenade and wind mitigation measures.

3. Indicative programme

The programme to complete all the works ready for operational use is anticipated to span approximately three years.

A typical stand construction requires:

- Site prep and substructure – approx. 26 weeks
- Superstructure concrete – approx. 26 weeks
- Steelwork and terracing – approx. 12 weeks
- Roof steelwork – approx. 20 weeks

- Roofing and cladding – approx. 26 weeks
- MEP and fit out – approx. 40 weeks
- Test and commission – 12 weeks

Several activities can overlap or run concurrently, as well as being carried out on two or more stands (subject to resource availability).

This will then achieve an overall three-year construction period.

4. Phasing and construction sequence

The works covered by this Construction Management Plan are anticipated to be carried out in a single phase.

The People's Project at Bramley-Moore Dock has a unique environment, which means that a traditional stadium construction focus on the more complex West and East stands will probably not provide a construction sequence that achieves an optimal outcome.

Our approach would be to initially focus construction activities on the North and South stands, which both have extremely restricted working zones, particularly behind them, with Nelson Dock behind the South Stand and the United Utilities (UU) wastewater treatment works (WwTW) behind the North Stand.

The construction sequence involves starting construction on the North and South stands ahead of the West and East (see construction sequence sketches for more details).

The construction programme activities (including making safe but excluding refurbishment of Hydraulic Tower)) can be divided into the following construction stages:

Stage 1 – Site preparation including dock filling

- Installation of floating raft bird pontoons to Nelson Dock
- Site establishment hoardings and welfare
- Making safe of existing grade II listed Hydraulic tower.
- Protection of listed structures and repairs to dock walls
- Creation of new opening in Grade II listed Regent Road wall to facilitate pedestrian access to the site compound (2 other openings to be created later in construction programme)
- Retention of heritage assets where possible and where not removal, storage and repair for reuse in the public realm works
- Strip-out and demolition of unlisted structures
- Grub up redundant foundations and remove in-ground obstructions
- Dock isolation structure formation
- Dock filling
- Piling platform from recycled demolition materials

Stage 2 – Substructure including piling

- CFA bore piles
- Pile caps, including lift pits
- Suspended ground floor slab

Stage 3 – Superstructure concrete works for East and West stands

- Precast columns
- Precast wall units (twinwall)
- Lattice slabs and in situ concrete, power floated
- Precast staircases and lift shafts

Stage 4 – Steelwork and precast terracing

- Steelwork rakers at 9.6m centres
- Precast concrete terrace units, vomitories and step blocks
- Steelwork structures – North and South stands
- Lattice concrete slabs – North and South stands

Stage 5 – Roof steelwork

- Assemble steelwork planar trusses to South and North stands
- Erect trusses onto trestles and complete site welding
- Cantilever trusses to East and West stands
- Purlins for roof coverings

Stage 6 – Roofing including mesh cladding to the barrel

- Aluminium standing seam roofing system
- Polycarbonate roofing
- Aluminium mesh to roof barrel
- Flat roofing to accommodation areas

Stage 7 – Facade

- Secondary steel
- Brickwork piers in Flemish bond
- Glazing, mesh and brick infills between brick piers
- Doors, gates turnstiles, etc

Stage 8 – MEP and fit-out

- Mechanical, electrical and plumbing installation
- Blockwork and other partitions
- Lift installation
- Escalator installation
- Handrails, barrier rails and other protection rails
- Fit-out accommodation and corporate spaces
- Fit-out concessions and concourses
- Fit-out bowl including seating

Stage 9 – Pitch works**Stage 10 – Western Water Channel and stepped promenade**

- Formation of permanent retaining piled walling
- Formation of capping beam / steps / terracing and substructure.

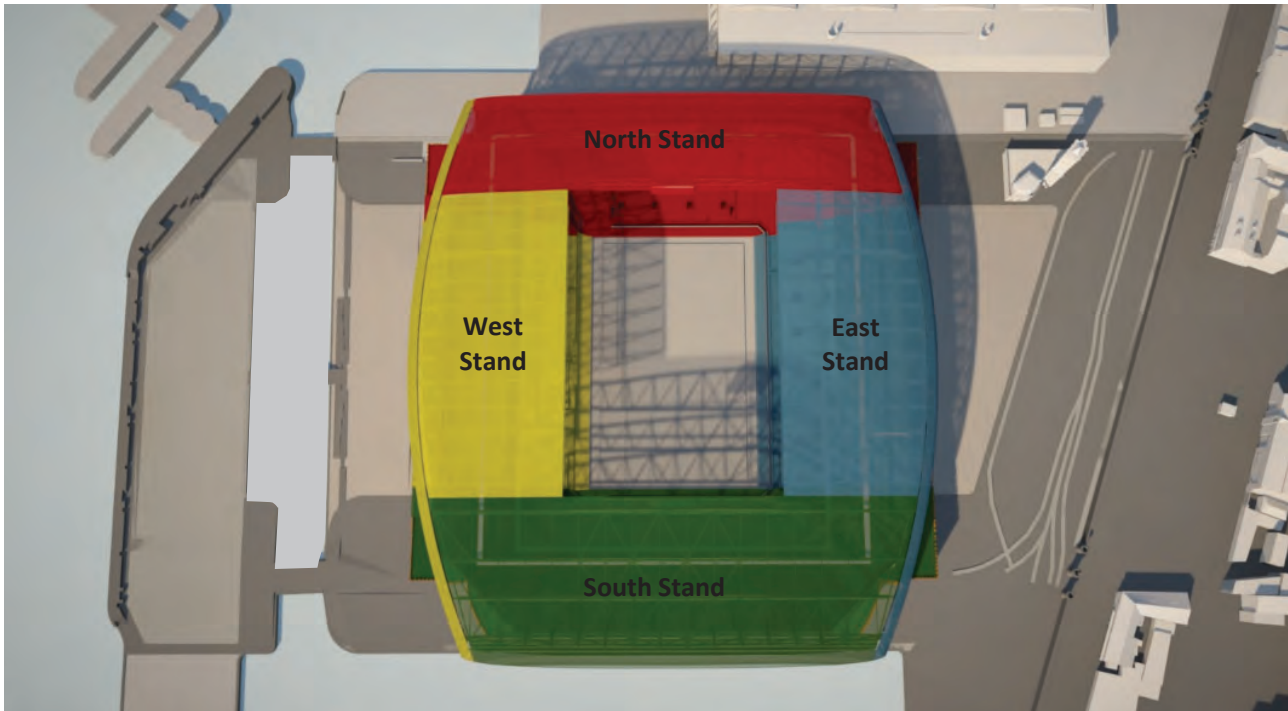
Stage 11 – External works

- Hard landscaping
- Soft landscaping
- Construction of Regent Road wall openings.
- Installation of site entrance security accommodation unit and vehicular control barrier

Stage 12 – Testing, commissioning and move to fully operational

4.1 Construction sequence visuals

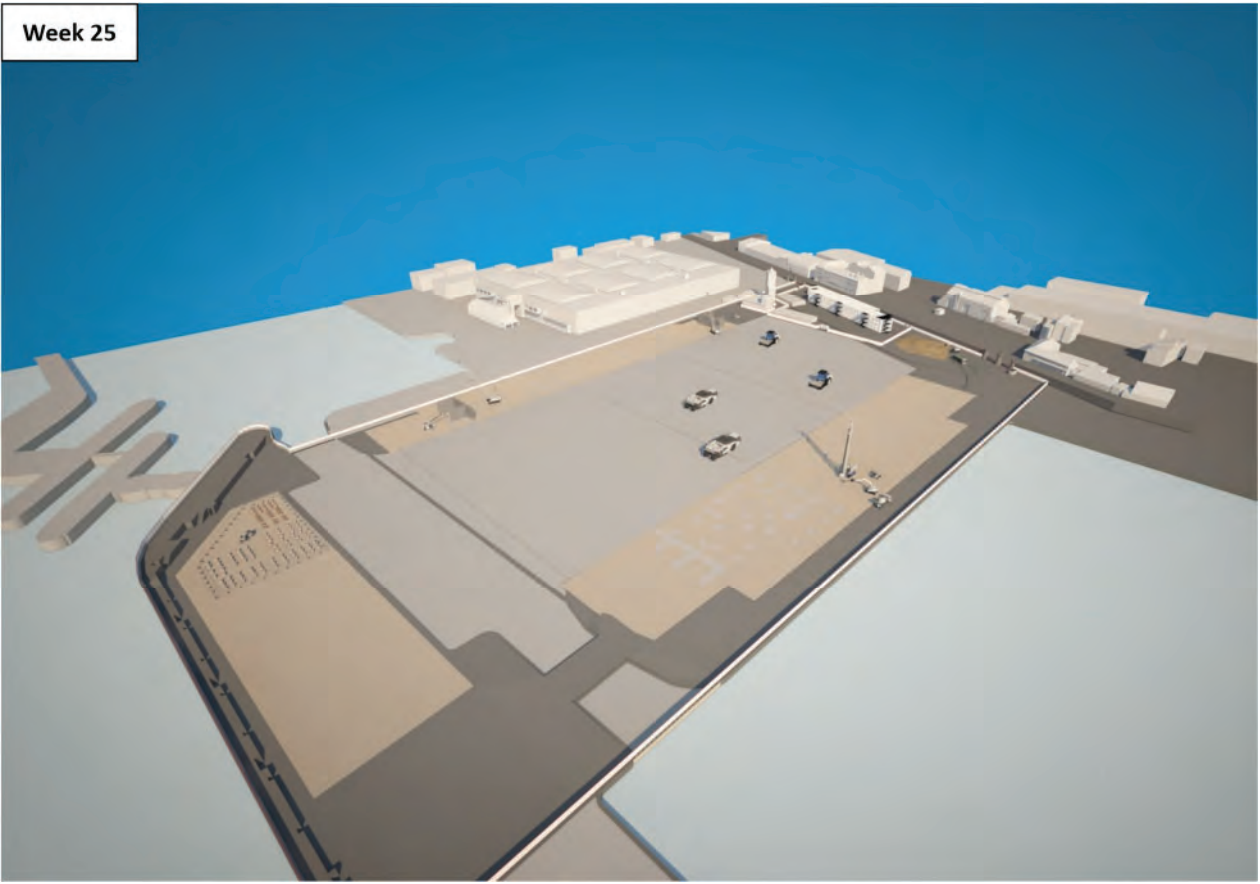
Stand overlay on site



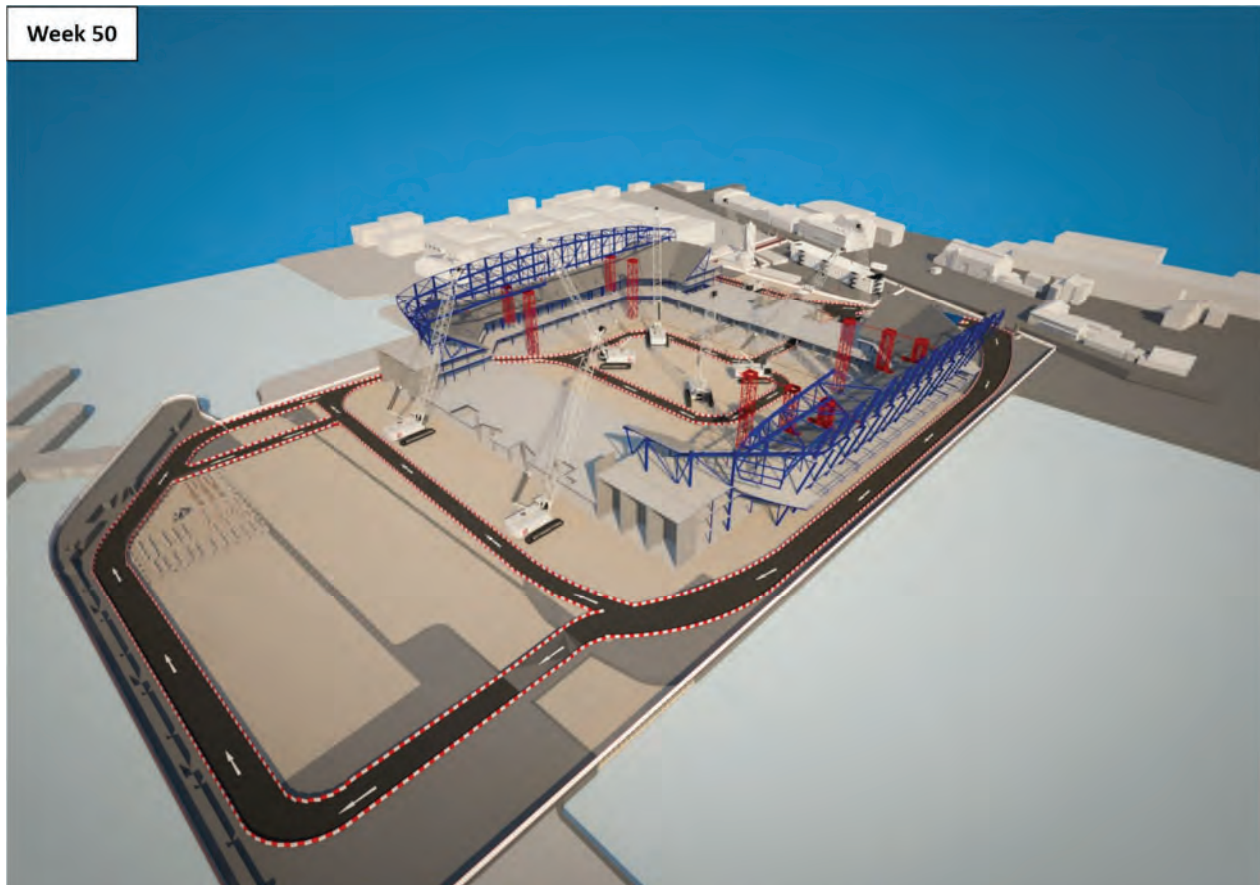
Indicative programme sequence with prefabricated facades

Weeks 1–25	Substructure to North and South stands, main dock filling works
Weeks 25–50	Steelwork and precast to North and South stands, substructure to East and West
Weeks 51–75	Roof steelwork North and South stands, concrete superstructure to East and West
Weeks 76–100	Roof coverings and facade as well as fit-out to North and South, steelwork and precast terrace units, immediately followed by steelwork roof trusses, as well as commencing lower facade and flat roof to East and West stands
Weeks 101–125	Roof coverings and fit-out to East and West, fit-out continuing to North and South
Weeks 126–150	Fit-out and complete roof coverings to East and West, pitch under construction

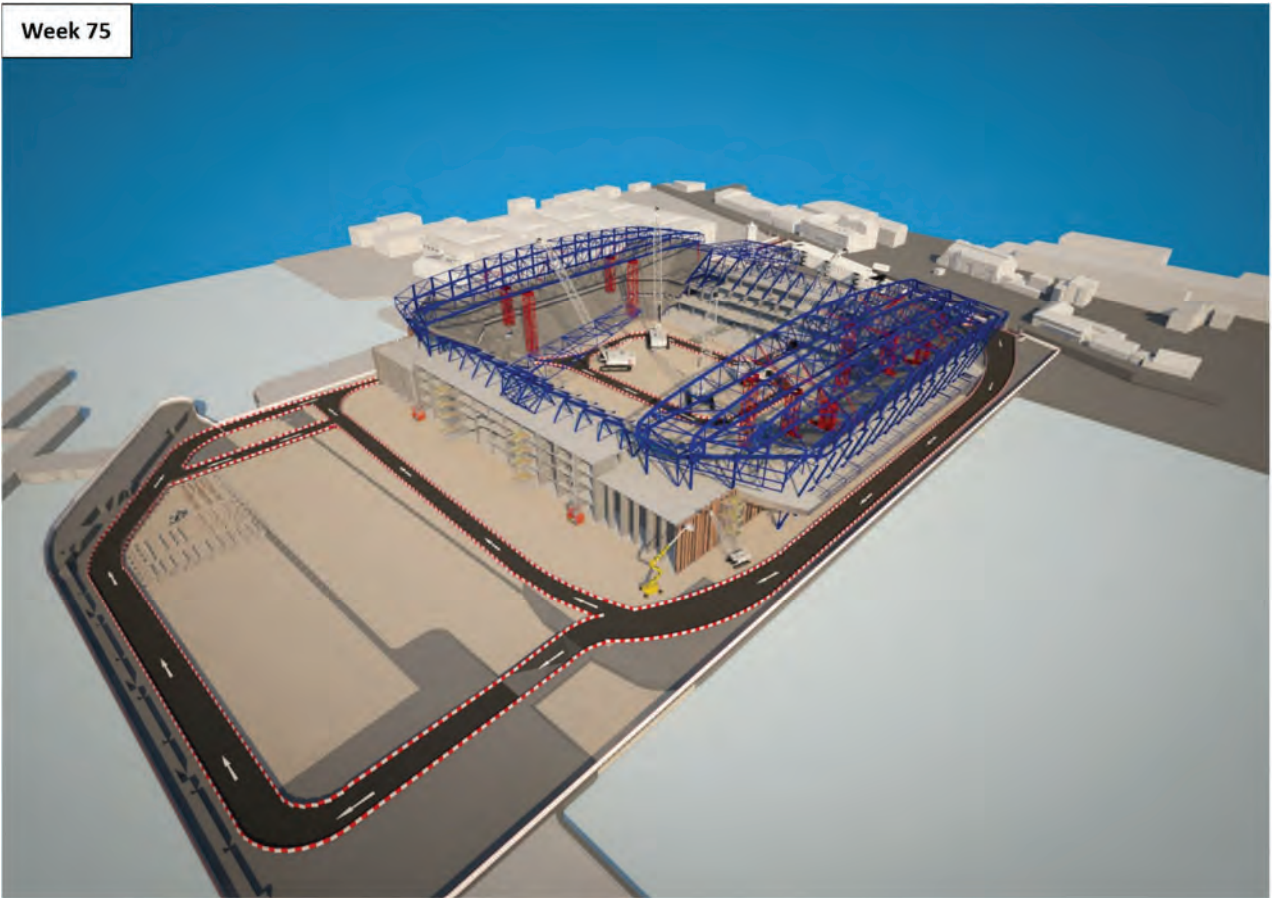
Week 25



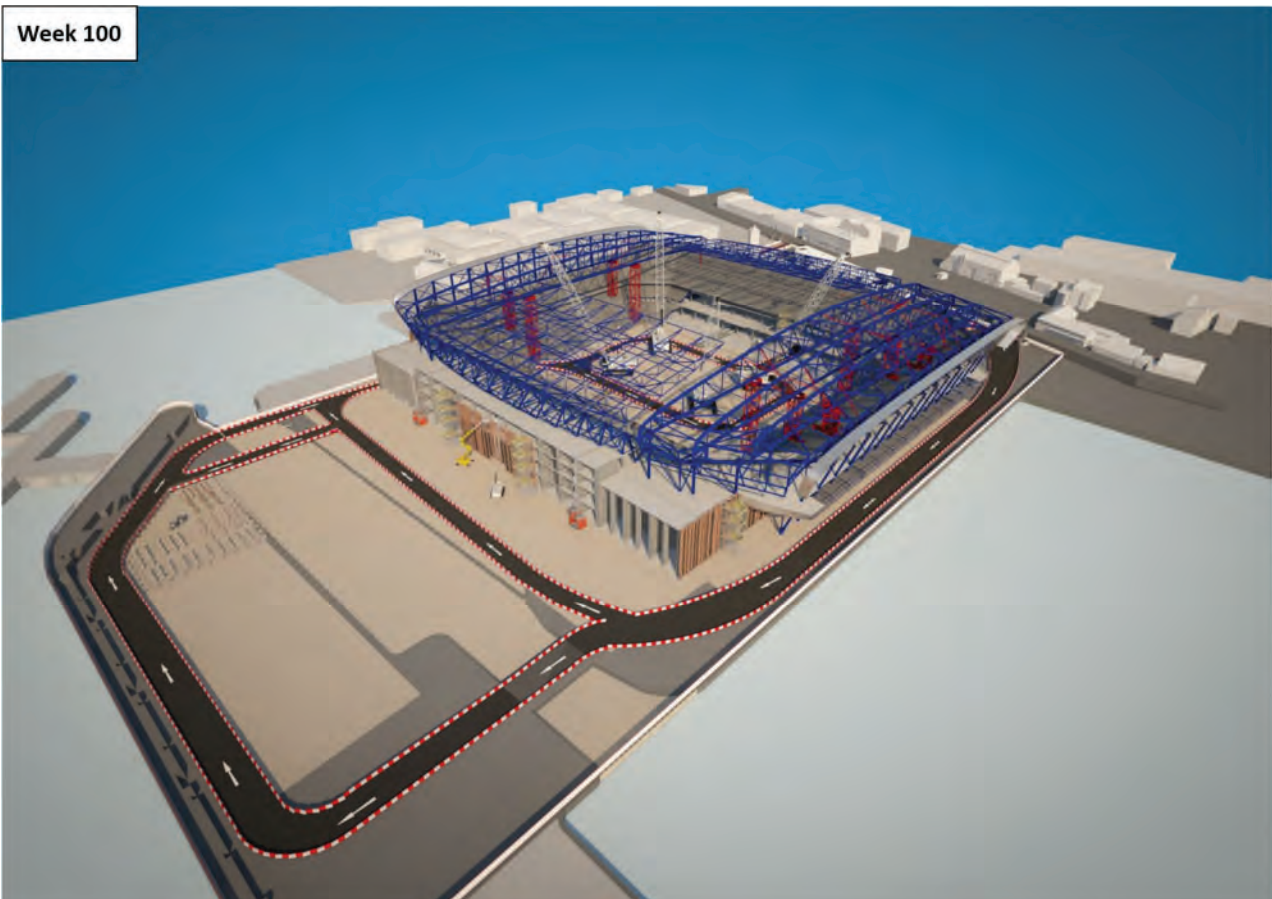
Week 50



Week 75



Week 100



Week 125



Week 150



- The construction sequence visuals above confirm how our proposed optimal construction strategy will be achieved
- South and North stands should commence in conjunction with filling of the dock to reclaim land for the West and East stands. Overlapping the programme activities will save valuable programme time and reduce significant congestion on the pitch area when compared to constructing all stands concurrently
- With this construction strategy, the in-ground obstructions will be identified and resolved early. Removing up to 3.5m depth of ground from North wharf and 2m depth from South wharf behind the dock wall coping areas' alongside demolition activities (with appropriate protection to the dock walls). We would survey what remains in the ground below the 2m zone and then decide on either removal of obstructions or redesign of piling and foundations
- Piling platform will be formed, all piling and substructure concrete outside the dock completed, as well as stair cores constructed complete with anchor plates and all holding-down bolts ready for the steelwork connections
- Steelwork to the North and South stands will commence from the west, constructed bay by bay and incorporating the precast slabs, rakers and terrace units. The lower tier will be left unconstructed at this stage, with priority given to commencing prefabrication of the roof trusses early
- In conjunction with the steelwork to the North and South stands, piling to the East and West stands and concrete works will be progressed
- The construction strategy currently envisages optimal efficiency of resources, with the North and South roof structures being completed and the steelwork resources transferred immediately to the East and West stands
- The envelope (roofing and facade) resources will have a similar benefit on resource numbers, with resources starting on the North and South roof and elevations and then moving on to East and West

5. Construction methodology

The indicative construction methodology is set out below. Best practice methods will be used at all times to minimise the impact on listed structures, local residents and adjacent properties. Our construction strategy will involve prefabrication of components off site where possible; this will reduce the programme period, minimise deliveries and reduce onsite activities, with associated environmental, health, safety and quality benefits.

This will include the use of precast concrete instead of in situ concrete where feasible, and offsite assembly where possible for mechanical and electrical installations.

The methodology will be developed in more detail when the specialist subcontractors are appointed.

5.1 Stage 1 – Site preparation including dock filling

- **Installation of bird rafts to Nelson dock** – To provide roosting habitat for non breeding bird species such as cormorants, Anchored floating rafts will be sited in Nelson dock. The design and construction of the rafts will be developed in consultation with the ecologist and in accordance with the RSPB design of management rafts guidance document.
- **Site accommodation/welfare** – For the initial activities during the site preparation works, accommodation will be self-contained starter units situated adjacent to the works. These will remain in place until the main accommodation is established.



Starter unit

- **Site establishment** – The site offices and welfare compounds will be positioned as indicated in the logistics plan. A compound will be constructed from Hardstaff concrete vehicle crash barriers (VCBs) with solid hoarding and gates to ensure any delivery vehicles are totally segregated from pedestrians in the non-PPE site compound. The pedestrian access from the compound to site will be controlled at this location by installing a series of Aurora secure login turnstile booths.
- **Site accommodation** will consist of energy-efficient multiple-stacked units placed with a mobile crane onto temporary concrete strip foundations (formed above the ground not to disturb tram rails, etc) all in line with the layout in the logistics section.
- **Protection of Listed Structures** – All listed structures, including the hydraulic tower and any dock walls, will be protected from damage during demolition and construction by Hardstaff VCBs, with hoardings attached where appropriate to prevent any damage. The removal of heritage assets will be undertaken for safe storage and later reuse. Details will be confirmed with future Listed Building Consent application.
- **Pre-demolition** – Asbestos surveys and soft strip:
 - A full asbestos survey will have been conducted in all structures to be demolished, and any asbestos removed under licence
 - Before soft strip, the necessary restricted access arrangements and fire points will be implemented with appropriate fire extinguishers and warning signage
 - Soft stripping of all non-structural elements. These will then be separated and placed into designated skips for recycling off site. The soft strip will be carried out using hand techniques
- **Demolition, grub up foundations, remove obstructions and form piling mat** – Ahead of demolition any heritage assets designated for reuse will carefully be removed and transported to the West Quay or a secure off site storage facility, where they will be stored ready for reuse later in the project (all to be formalised by appropriate listed building consent submission(s)). Anchor points in the existing dock walls required for the dock infill will remain in situ. Once infill is complete, the anchor points will be removed and stored alongside the other asset on the West Quay, or a secure offsite storage facility.

The existing (non-listed) buildings on the South Wharf consist of a concrete frame with large doors or brick infills. The lightweight steel roof trusses sit on the concrete beam and supports the metal roofing sheets. The roof will

be removed with a long-reach excavator. This will then allow the walls to be dismantled with care to ensure the walls collapse inwards, avoiding debris in the dock and impact on the dock walls

All the concrete and brickwork from all demolition and in-ground obstruction removal activities will be crushed on site to produce graded 6F2 suitable for the piling platform, with only metal and unsuitable material disposed off site.

It is understood that an archaeological watching brief will be required for all works related to the North and South Quay substructure as well as the demolition work to the existing buildings.

North and South Quay activities will commence concurrently, but the North, with fewer extant buildings, will progress quicker. The ground will be excavated to a minimum depth of 1.5m and any obstructions to piling removed and crushed to 6F2 for backfilling. Any existing piles not removed will be surveyed to ensure they do not interfere with the new piling layout.

Regent Road Wall Openings: Construction Methodology

A total of 3 new pedestrian openings are proposed to be created within the Grade II listed Regent Road wall to facilitate the approach access / egress during the operation of the stadium.

The Stage 1 site preparatory works will require a single new opening in the Grade II listed Regent Road wall to create the necessary pedestrian access into the works compound with the remaining 2 new access points would be created further into the construction programme. The existing turreted entrances at the north and south of the Regent Road boundary will be used for vehicles, and protected from vehicle damage during the stadium construction

The construction methodology of the new openings involves a phased approach, whereby the first new opening will be created at full height during early stages to allow for unfettered access for construction operatives. Once the site reaches a completed condition, the linings and final arrangement will be completed.

The physical works to the wall will be subject to the appropriate Listed Building Consent (LBC) submissions.

Forming the initial opening will involve temporary works scaffolding being designed and installed to ensure the wall stability during the cutting activities. A large diamond saw on a track will ensure a neat vertical cut is made to the full height and depth of the wall. The wall restraint to the section to be demolished will be removed (but remain in place to the retained sections) the granite stonework will be carefully dismantled with all stones put into safe storage.

Both cut lines of the wall will have a permanent steel cover plate fixed and grouted to retain and protect the stonework behind it in its current condition. The wall restraint temporary works scaffolding including kentledge to both sides of the opening, will stay in place until later in the project when the final infill arrangement will be constructed under a separate Listed Building Consent (LBC) (see section/stage 11 External Works for more detail)

Dock wall repairs

A comprehensive condition survey of the dock walls will be completed; the extent of repairs and salvage of heritage assets will then be agreed with Liverpool City Council and Historic England prior to the dock filling activities commencing. Installation of displacement monitoring equipment to the dock walls is proposed. A baseline survey (for the purpose of asset protection) will be undertaken a minimum of 2 days in advance of the dock infilling works and will continue for a minimum of 1 week after compaction of the dock infill is completed.

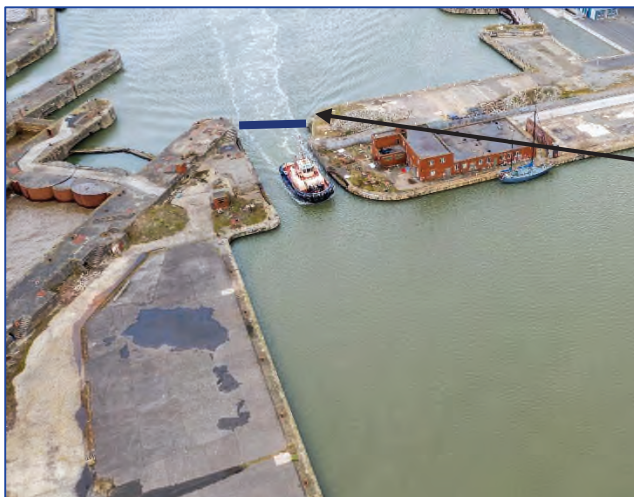
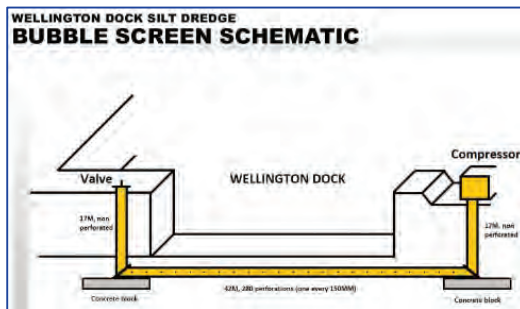
Dock filling activities – Boskalis Westminster Ltd

These activities will take place in the following order:

- 1 Install bubble screen.
- 2 Undertake 1st stage fish removal and relocation.
- 3 Rake dock bed & remove debris.
- 4 Install silt curtain.
- 5 Construct temporary isolation structure.
- 6 Undertake 2nd stage fish removal.
- 7 Undertake dock filling.
- 8 Undertake compaction operations.

1) Installation of bubble screen

Prior to the first stage fish removal and raking operation, a bubble screen will be installed across the northern mouth of the entrance channel between Sandon Half Tide Dock and Bramley Moore Dock. The bubble screen will prevent fish from re-entering the dock and prevent disturbed dock deposits from migrating into Sandon Half Tide Dock whilst also allowing the raking vessel (The 'Norma') to exit the dock under its own steam when the operation is complete. A typical schematic diagram of the bubble screen, produced for neighbouring Wellington Dock (previously filled by Boskalis as part of the now constructed and operational United Utilities Waste Treatment Works), is shown below. On the adjacent photograph you can clearly see the line of bubbles dispersing at the surface of the water across the mouth of the entrance channel between Sandon Half Tide Dock and Wellington Dock.



Bubble screen location to the north of the entrance channel.

2) Fish removal and relocation – stage 1

Fish removal and relocation will need to take place in advance of the raking process. This is required to minimise the potential for fish mortality during the infilling process from reduced dissolved oxygen levels, loss of habitat and exposure. Methods will target all known fish species known to inhabit the dock including pouting, European eel and coal fish. Every effort will be made to remove as many fish as possible, but no guarantee can be given that all fish will be caught and relocated during the rescue at this stage. A detailed plan will detail the method associated with rescue of any residual fish subject to agreement with the EA. All captured fish will be released back into the wider dock network.

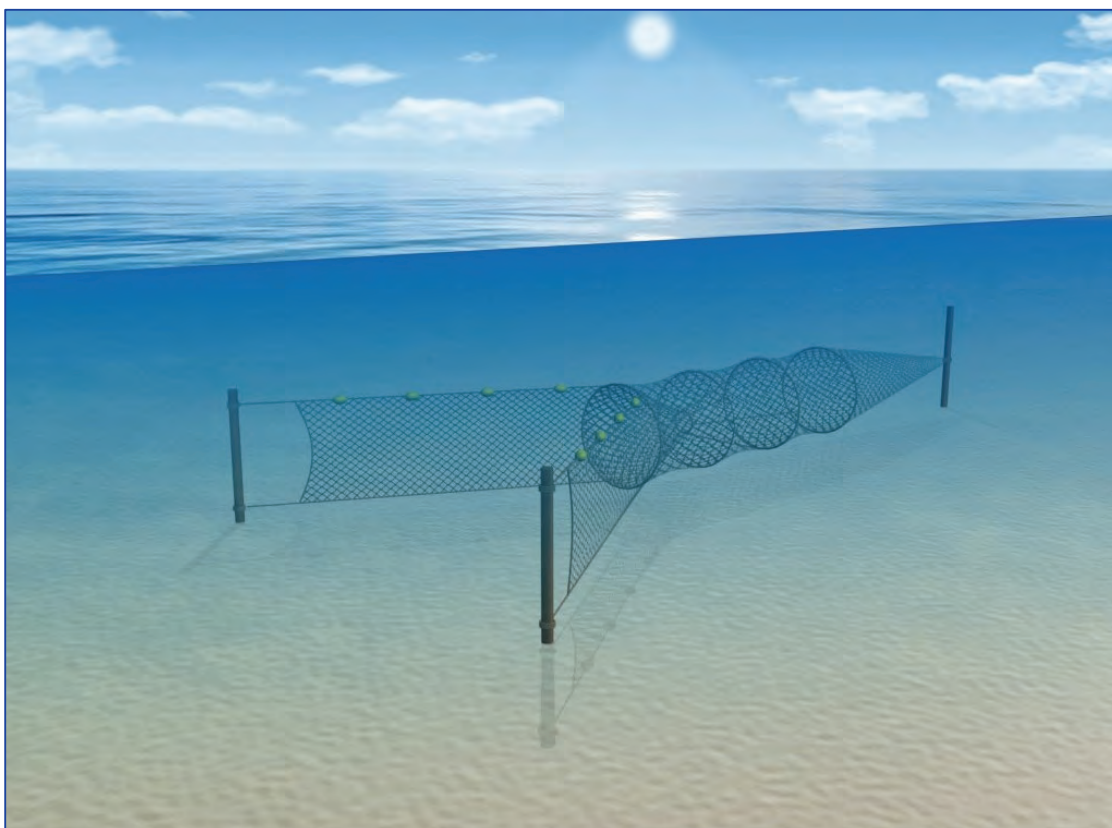
In order to prevent fish from re-colonising in Bramley-Moore Dock, a bubble screen (later to be replaced with a silt curtain) will be installed in order to deter fish away from the northern water channel adjacent to Sandon Half Tide Dock.

The anticipated methodology for removal and relocation of the fish will be as follows:

1. Preparation of fish capture equipment; work boat, sanitised fyke/hand nets, mooring buoys and ropes, PPE, water quality meter (temperature), sanitised aerators and sanitised fish holding/transportation equipment.
2. Deployment of 4 fyke nets at predetermined locations (Day 1).
3. Check fyke nets daily (morning and evening) using the work boat (Day 2-4), rotating the fyke nets location (corner to corner of the dock) on a daily basis.

4. Upon each visit, remove any captured fish from the fyke nets and transfer the fish into the adjacent waterbody.
5. During the transfer, the fish will be transported in large black containers, with a good supply of oxygen to minimise physiological stress.
6. Acclimatise fish before introduction to accommodate potential temperature differences and minimise physiological damage.
7. Sanitise all fish capture equipment at the end of the exercise.
8. Produce the fish removal and relocation exercise factual report. This will cover the number/species of fish captured, removed and relocated.

The full Fish Rescue Plan can be found in **Appendix A**.



A typical fyke net similar to those proposed for use during the fish removal exercise.

3) Rake dock bed & remove debris

Following 1st stage fish removal, the dock bed will be systematically raked by the purpose-built plough vessel, 'Norma', pulling debris to an agreed location where it will be lifted out of the water by a hydraulic excavator equipped with a grab attachment and placed into a skip ready to be taken by road to a licensed disposal area.

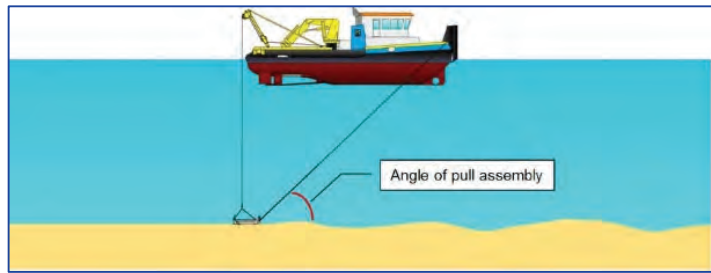
Removing debris prior to the reclamation and construction works will reduce the risk of obstructions impacting the piling operations and reduce the potential for differential settlement.

Raking vessel

The 'Norma' is a self-propelled vessel, equipped with fixed arms onto which a large rake (9m wide and weighing 9 tonnes) will be attached.

The rake is attached to a fixed-arm lifting assembly, linked to a winch which is used to control the rake in the vertical plane.

The pull assembly consists of fixed arms which pull the rake forwards and control its horizontal movement. The position where the pull assembly is connected to the rake can be adjusted as required.



By adjusting the connection, the rake will be pulled along at different angles, which can be adjusted to compensate for water depth and soil conditions.

Raking

The depth of the rake is monitored at all times by using a series of calibrated marks on the vessel, in conjunction with the dock water level information taken from a tide board which will be installed in the dock.

The 'Norma' is positioned using the Boskalis Dredge View 2.0 (DV2) plough control system. This shows the tracks of the vessel in real time, relative to the dock bed and other survey information, allowing the operator to rise and lower the rake to follow the depth of the dock bed. Through this system the 'Norma' will fully cover the area, ensuring no areas, other than immediately adjacent to the quay walls where the rake will not reach, are left untreated.

In order to achieve the maximum coverage of the area, no additional plant or third-party equipment will be allowed within Bramley-Moore Dock at the time of raking, allowing the 'Norma' full access to the whole of the dock.

The 'Norma' will operate 12 hours a day, 7 days a week (nominally 0700–1900) and will systematically track across Bramley-Moore Dock. Debris will be collected in the rake and pulled to an agreed dockside location, where it will be lifted out of the water by a hydraulic excavator equipped with a grab attachment. Once ashore, the recovered debris will be subject to a visual inspection to positively identify non-UXO or UXO objects before being appropriately disposed of.



Raking and debris removal programme

The size, volume and extent of the debris within Bramley-Moore is currently unclear and as such the duration of the raking programme is unquantifiable.

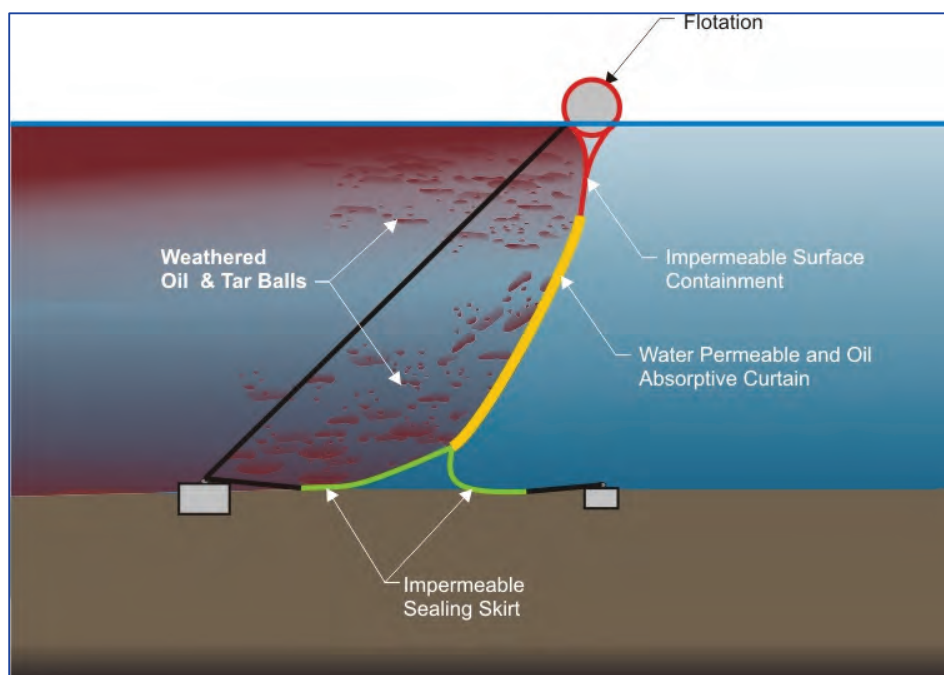
The raking exercise is expected to move through the upper layer of unconsolidated material within the dock bed. This process will cause agitation of the materials within this layer, and we have assumed there will be a minimum two to three-month period post raking to allow the material to settle prior to filling.

UXO risk

It is recognised that currently there is a medium risk of UXO based on CIRIA 681 guidelines: British AAA projectiles. The results of this Threat Assessment concluded the requirement for a UXO Risk Mitigation Survey to reduce the risk of unexploded ordnance to the substructure works of the proposed development within the wet dock. The UXO survey will be carried out after the raking operation in order to prevent the recording of erroneous readings from existing metallic objects amongst the debris.

4) Installation of silt curtain

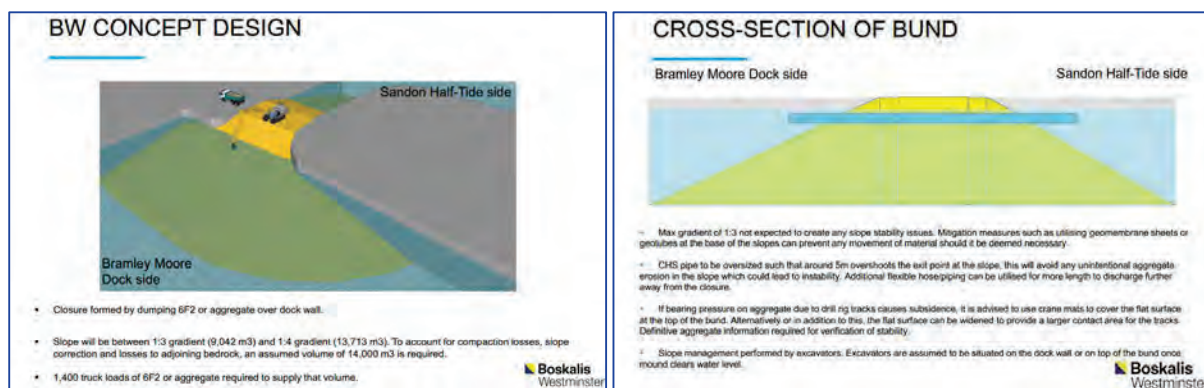
Following completion of the raking operation, a silt curtain will be installed slightly inboard of the bubble screen. Once installed, the bubble screen can be decommissioned and removed from site. The silt curtain will serve to prevent fish from re-entering the dock and will also prevent the migration of disturbed dock bed deposits into neighbouring Sandon Half Tide Dock. The indicative section below indicates how the silt curtain will provide an effective seal between the dock wall and dock bed.

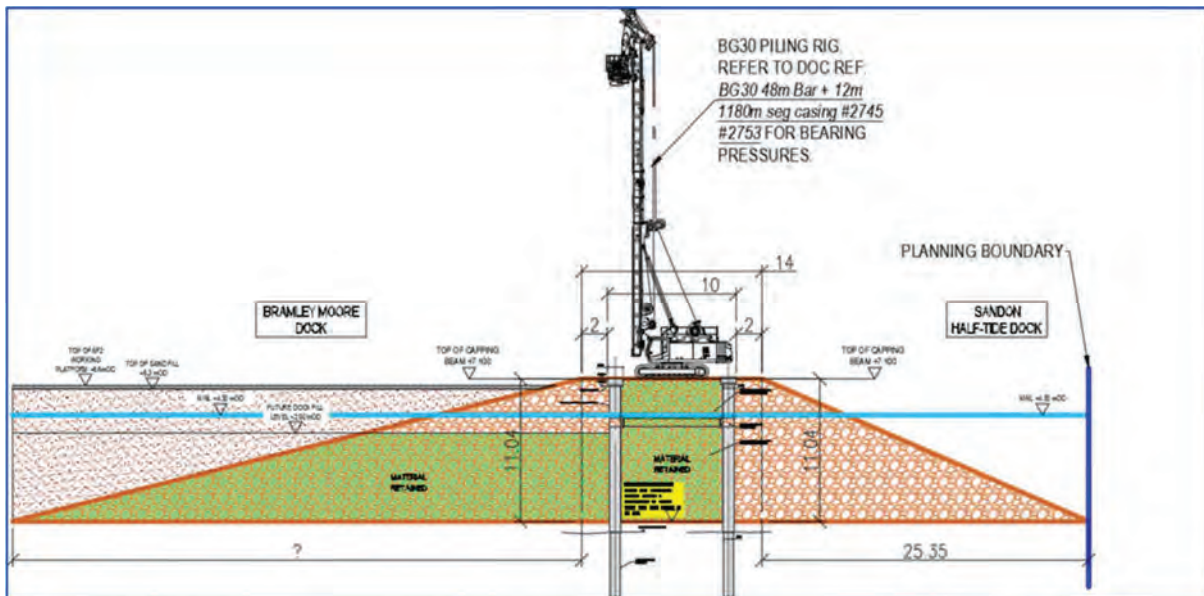


Typical section through silt curtain.

5) Construct temporary isolation structure

The dock must be fully enclosed prior to commencement of the filling operation. A temporary design solution has been developed, which involves the placement of 6F2 material and/or aggregate, within the entrance channel in order to form a temporary bund as depicted below.





The bund will need to be formed so that the edge of the slope is at least 2m beyond the line of the capping beam to enable the piling rig to travel and operate sufficiently to install the permanent twin secant pile wall cofferdam. It is the intention that the material within the cofferdam and the material remaining on the Bramley Moore Dock side of the structure beneath the water channel can be retained as part of the permanent works as indicated above. Material forming the slope on the north side of the structure and material to the south which will be within the water channel will need to be removed following completion of the permanent works.

Any repairs/modifications to the existing Southern isolation structure to ensure stability throughout construction will be implemented.

During construction, whilst the dock is infilled and the isolation structure in place, it is likely that salinity and dissolved oxygen levels may fluctuate over time to the southern water body (Nelson Dock). Baseline monitoring has established that there is an existing natural variation in salinity and dissolved oxygen levels to this water body, which is impacted to a large degree by activity in the southern dock system. Whilst monitoring will continue through the construction period, any effects on ecology associated with the suspension of the hydrological connection during the construction phase are anticipated to be minimal, given that Nelson Dock receives significant flow input from southern water bodies (including the Leeds/Liverpool Canal), and receives minimal input from BMD. Although there is likely to be a gradual trend toward freshwater conditions within Nelson Dock during construction, the existing species assemblage is likely to comprise a more freshwater dominated community given the current flow conditions and existing isolation structure.

6) Fish check

On completion of the dock closure works, a final fish removal exercise will be undertaken to remove any potential remaining fish from the dock waters.

7) Dock filling

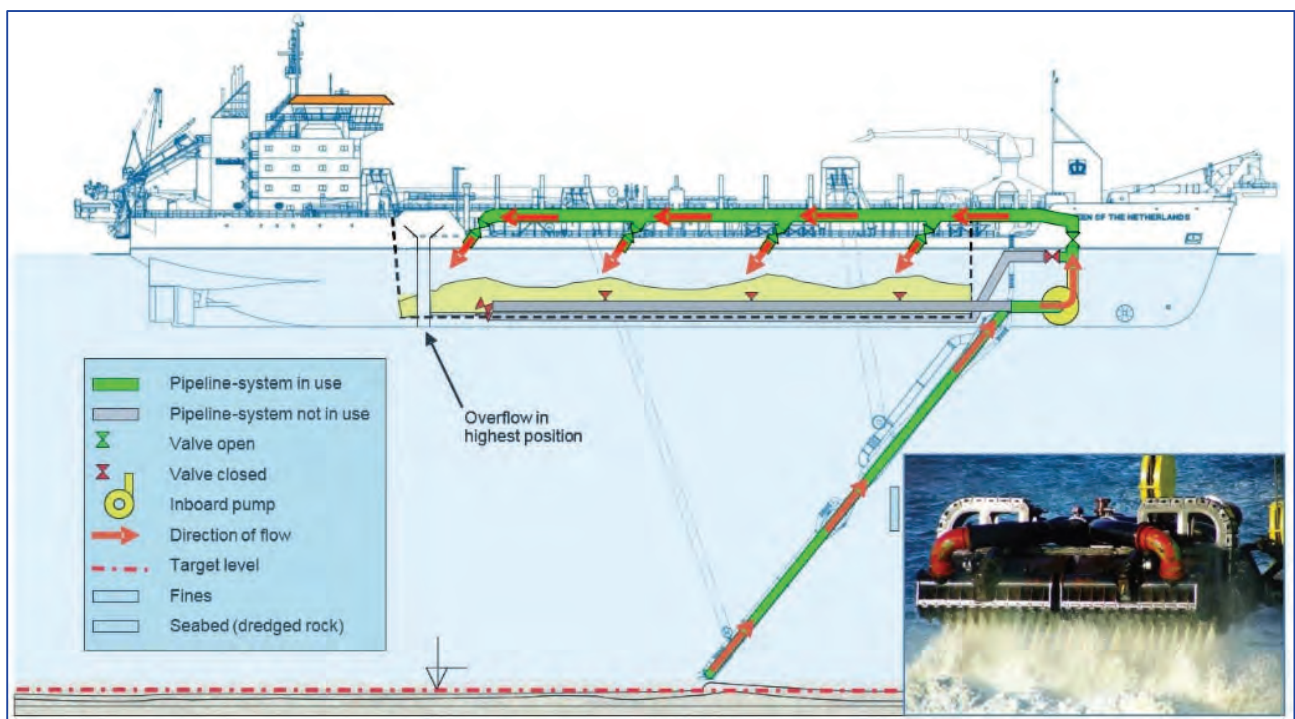
Infilling of Bramley-Moore Dock using approximately 480,000m³ of 'as dredged' sand sourced from BWL Licensed Winning Area 457 (Consent Number 34472/09/0/CON), hydraulically discharged within the dock footprint. The lower layers will be placed using a floating spreader pontoon, ensuring accurate placement of the material. The upper level will be placed directly using the discharge pipeline network.



Trailing Suction Hopper Dredger

Dredged material will be transported and hydraulically discharged into Bramley-Moore Dock using a 'Freeway' class Trailing Suction Hopper Dredger (TSHD). The TSHD's dredging process consists of a cycle of [1] sailing empty to area 457, [2] loading (dredging sand), [3] sailing full to Bramley Moore Dock and [4] discharging (pumping sand into dock).

A cross section of a typical trailer dredger is shown below:



Discharge pipeline installation

Prior to the arrival of the dredger, a discharge pipeline network and spreader pontoon will be mobilised to Bramley-Moore Dock.

A connection point, where the dredger will couple to the floating discharge pipeline, will be agreed with Peel Ports / Duchy of Lancaster at a suitable location within the River Mersey, close to Bramley-Moore Dock. The pipeline will be anchored and marked, ensuring it is not a hazard to navigation.

The 'Freeway class vessel's relatively shallow draft allows this point to be located outside the main shipping channel, while allowing a safe mooring over all states of the tide.



The discharge pipeline will follow a mutually agreed route from the dredger's connection point to Bramley-Moore Dock, using a 300m section of floating pipeline to the dock wall. From here it will be linked to steel shoreline, which will continue into the Bramley-Moore site.



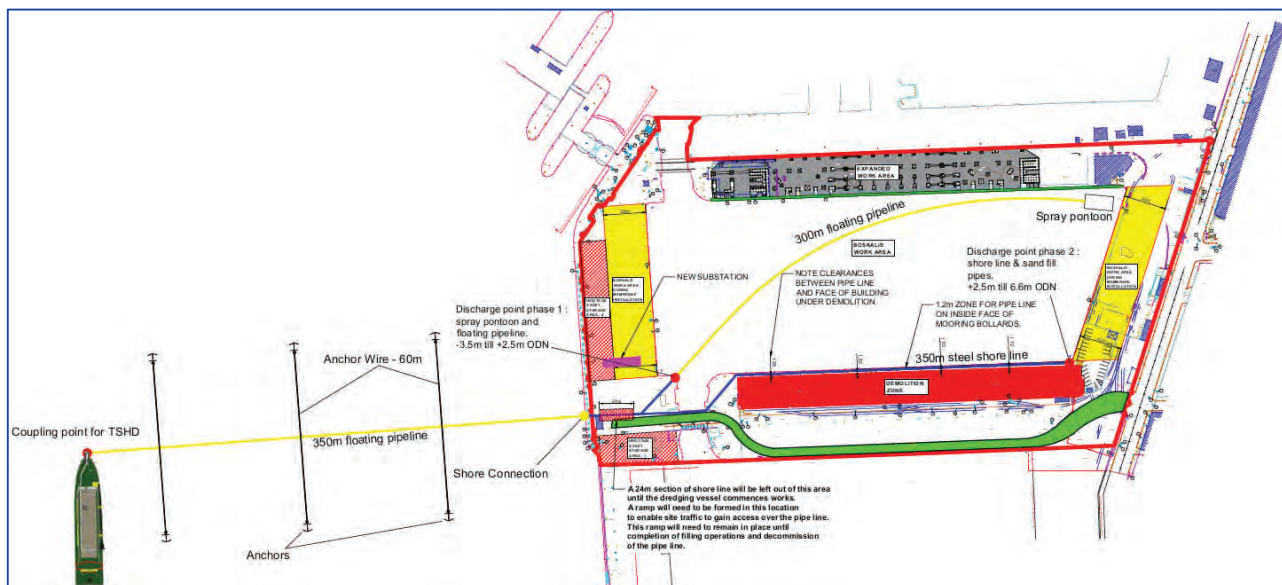
The steel shore pipeline, which is transported in 12m flanged sections, will be stockpiled in agreed locations during the installation process. This will be placed around the side of the existing dock and we will require a 10m access strip to allow installation and maintenance.

Once ready, the floating pipeline will be towed to a predetermined connection point position and connected to the shoreline.

Additional floating pipeline will be used within Bramley-Moore Dock during the initial stages of the reclamation process, linking the spreader pontoon to the pipeline network.



A wide area view showing the Trailing Suction Hopper Dredger in its temporary mooring location on the River Mersey, coupled up to the floating pipeline.



The above drawing extract shows the route of the floating pipeline from the TSHD coupling point to the river wall. From the river wall, the pipeline will transition to steel shoreline pipe running along the edge of the southern wharf. On the west wharf, the pipe will spur off to another section a floating pipeline within the dock which in turn will be connected to the spreader pontoon.

'As dredged' sand source area

The 'Freeway' class trailer dredger will dredge suitable material sourced from Crown Estate-licensed Area 457, which is located approximately 23 nautical miles from Bramley-Moore Dock.



The material from Area 457 has been used extensively for a variety of projects, including the 2012 Liverpool Wellington Dock infill, and to supply aggregate to the local construction market.

Programme

Allowing for 24/7 non-tidal working, we anticipate the 'Freeway' will deliver one load every 7 hours from Area 457, in the order of 46,500m³ per week.

Initial infilling using a spreader pontoon

'As dredged' sand will be fluidised within the hopper of the dredger and hydraulically pumped through the discharge pipeline network into Bramley-Moore Dock. Water to fluidise the dredged sand will be extracted from the River Mersey taking due consideration of the presence of elver.



The initial layers will be accurately placed using a spreader pontoon to ensure the capping of the underlying unconsolidated silts.

The spreader pontoon will move across the dock using winches and pulling wires from the existing mooring bollards.

Water used during the pumping process will be discharged back into the Liverpool Dock (Sandon Half Tide Dock) system by a weir system at the dock closure structure.

At the displacement location (adjacent to the isolation structure), a stilling pond will be created to slow down the water flow, which will in turn allow any fines to settle out before the water is displaced. This will be created by shaping the infilled sand once it is filled to the existing dock water level.

Reclamation of the upper Layers

Once the reclamation has progressed to a point where there is insufficient water depth for the spreader pontoon to operate further, the remainder of the material will be placed directly using steel shore pipeline, which will be extended as the 'as dredged' sand platform rises above the water level. The final level will be finished using dry plant operating to normal working tolerances to achieve the required level.

Overfilling may occur to allow for the later compaction of the material, ensuring the design level is met after the compaction works are achieved. Additional stockpiling of material will also be programmed, allowing suitable material for other elements of the works, where required.



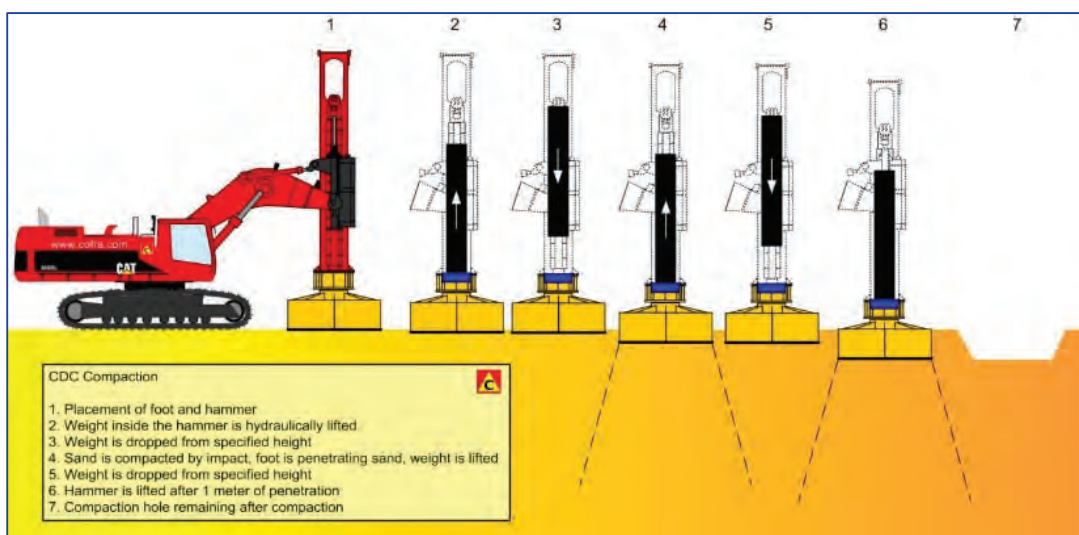
8) Material compaction:

The 'as dredged' sand will be compacted using Cofra Dynamic Compaction (CDC) and Cofra Rolling Compaction (CRC) methods. Production is based on operating a single shift working 12-hour days (0700–1900), six days a week.

The works are expected to take approximately six weeks to complete, including for the equipment assembly and testing. Additionally, a five-week lead-in time prior to mobilisation will be required. Post compaction cone penetration tests (CPT) will then be undertaken to confirm the suitability and performance of the compaction for material placed under the piling platform.



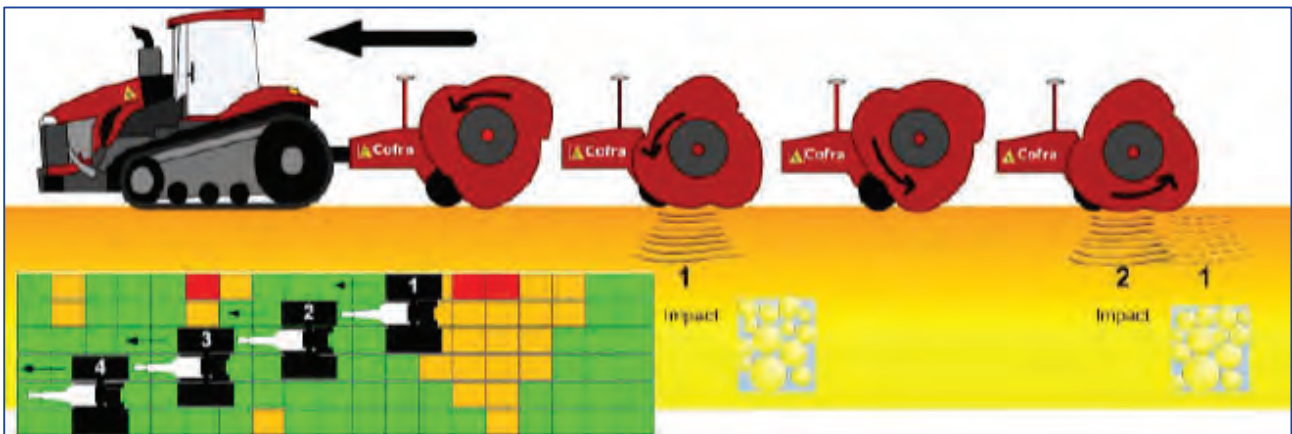
The CDC equipment consists of a heavy excavator equipped with a specially designed arm onto which a 9-ton hammer is attached. The weighted hammer is hydraulically lifted until it reaches a predetermined height, when the weight is then dropped using a hydraulic acceleration at a minimum rate of 40 times per minute, onto a foot with a 2m diameter.



Following completion of the fill to finished levels, a second round of compaction will be undertaken using the Cofra Rolling Compaction (CRC) technique.

The CRC technique is a fast and controllable roller compaction method which is suitable when compacting granular layers of 2 to 3 meters thick. The system consists of a tracked tractor that pulls an irregular shaped 16 tonne roller over the area to be compacted.

The technique compacts the underground fast, homogeneously and with a high accuracy due to the use of a GPS guided monitoring system. The monitoring system uses the deceleration of the impact of the roller which is related to the compaction level of the subsoil.



- **Piling platforms and crane working platforms**

An assessment of working platforms requirements has been made, and as a result it is deemed that hard obstructions and some voids are present in the North Wharf to a depth of circa 3m and the South Wharf to a depth of circa 2m. The strategy is to generally excavate to underside of these voids and obstructions and remove any unsuitable ground material (soft or hazardous), reusing the suitable Class 1 materials in the base of the excavation. Dewatering schemes will be in place as required to manage the ingress of ground water and working below the ground water table will be avoided where possible targeting locally any obstructions that penetrate into the Ground water table. A 600mm-thick layer of 6F2 and Type 1 stone will then be laid to cap off the class 1 materials to affect a final platform level to suit the piling platform requirements.

The dredged sand below the East and West stands will also be cement stabilised to raise its CBR to 15%. This would again allow it to be used as a 6F2/6F5 replacement material, once again with a capping of stone.

Marine-dredged sand would be placed and compacted (as described above) under the East and West stands to the required level. A 300mm-thick layer of stone will then be laid to cap off the cement-stabilised sand to affect a final platform level of 7.0m.

This stabilised sand, with a CBR value of 15%, will comfortably withstand the bearing pressures from the Casagrande B360XP CFA piling rigs, and in a later phase of construction the heavy lift crawler cranes.

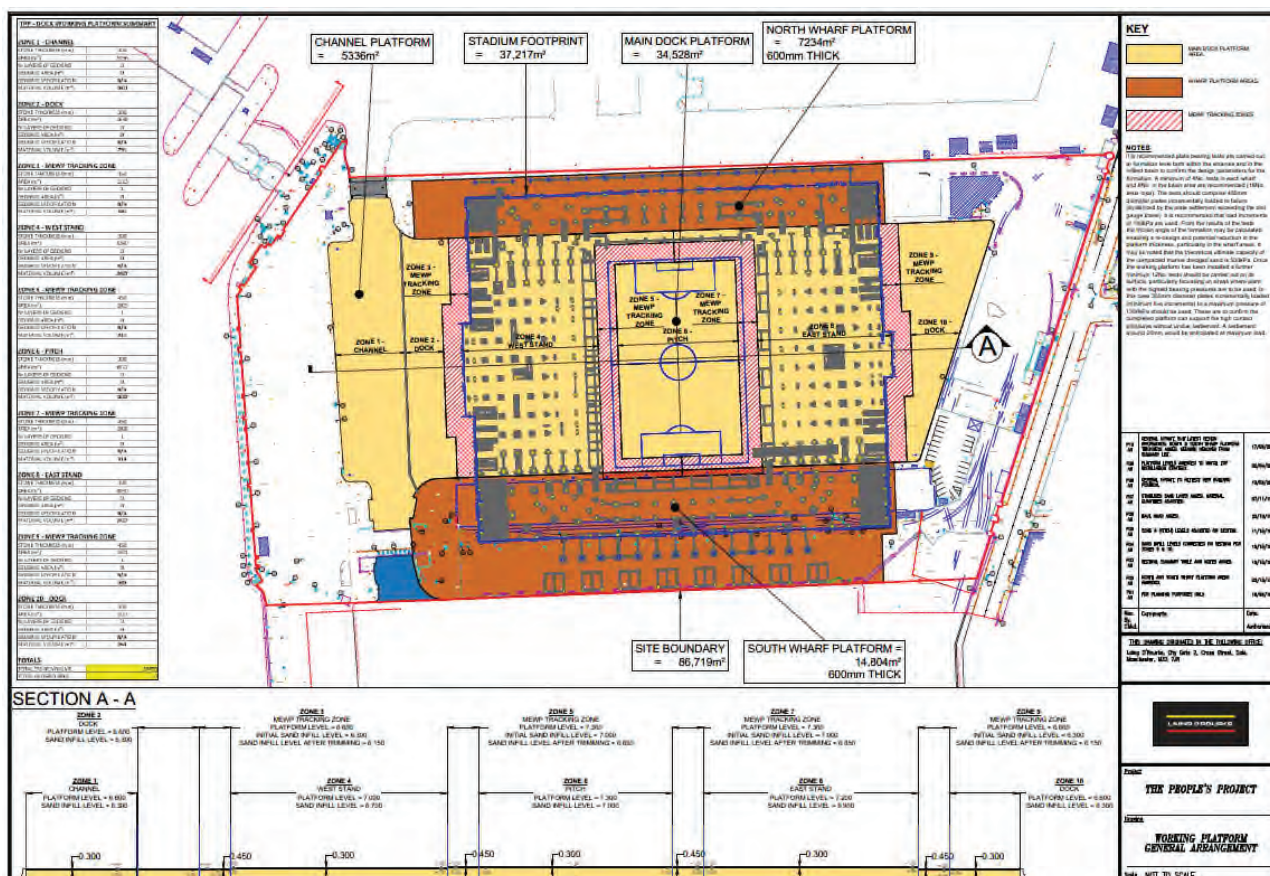
Around the perimeter of the pitch and adjacent to the rear of the East and West stands, the sand will be infilled to a level of 6.3 – 7.0m and capped with 450mm of stone reinforced with 1 layer of geogrid, affecting a platform level of 6.6m. These 10m-wide zones have a slightly thicker stone layer to support the imposed loads from large MEWPs required to gain access to the roof structure from pitch side and to provide access for roof and envelope works from outside the stands.

The imported sand will be infilled and compacted to a level of 6.3m in all remaining areas and capped off with a 300mm layer of stone.

The degree and rate of consolidation settlement of the dock silt layer to be covered by the marine sand has been assessed. The layer varies in thickness from 0.20m to 3.15m in the boreholes and CPTs with an average thickness of 1.10m. The average level is from -3.06m OD to -4.16m OD. We have assigned the dock silt consolidation parameters of $mv = 2.7m^2/MN$ and $cv = 15m^2/yr$. The mv values are obtained from the oedometer consolidation tests and the cv values from the CPT dissipation tests. The CPTs give field cv values around an order of magnitude higher than the oedometers, which is a common occurrence. Based on these parameters, the dock silt is calculated to settle at 370mm for its average thickness, 90% of which will occur within one week. For the maximum dock silt thickness, the calculated settlement is 910mm and the time for 90% consolidation is within eight weeks.

The working platform levels for piling and cranes will be monitored throughout to confirm the expected consolidation has occurred.

Whichever solution is adopted, this will need to be coordinated with the pitch construction contractor to minimise the disposal of material ahead of the pitch construction.



Installation of permanent northern isolation structure

A bored concrete solution is being proposed to permanently isolate Bramley-Moore Dock from the northern waterbodies. Two secant pile walls are being proposed which will be formed by constructing a series of reinforced concrete piles in the 'dry' water channel to the south of the temporary isolation structure, that interlock to form a water tight barrier. Pipes will be cast in between the two rows of piles at identical levels to the existing southern isolation structure to enable the exchange of dock water to the north and south.

(any connection to the Grade II listed dock walls to be subject to separate listed building consent submission).

5.2 Stage 2 – Substructure including piling

Ground conditions

The ground on site is typically composed of tarmac/concrete underlain by made ground and then sandstone (various degree of weathering). Several obstructions, voids, large cobbles, etc found in the Made Ground at various depths.

A range of samples and depths have been tested chemically. Typically, only made ground is found to be hazardous (for disposal considerations), predominantly in the north wharf area. Main issues are relating to hydrocarbon content in shallow Made Ground (down to 1m); however, there is also one area of very high pH down to 5mbgl (BH109), with a further area of contamination to the east of the site.

Earthworks

In order to deal with the existing ground conditions, a number of solutions will be adopted to transform the ground into a workable condition. These solutions are as follows:

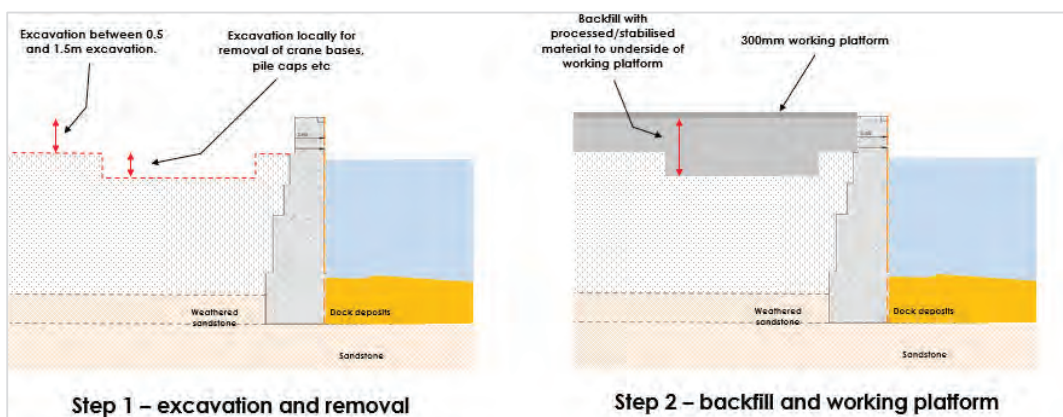
North and south wharf

The existing wharfs currently contain a number of cobble sets, existing dock infrastructure, mooring points, rail tracks and other dock-related items. These will be removed as part of enabling works to make the ground suitable. Refer to the Heritage asset retention and removal report (BMD01-PLA-S0-EX-RP-L-948002). The plan will

be to retain these materials and artefacts for future inclusion within the project or public realm works. Prior to any removals a Listed Building application will be submitted.



Once removed, generally 2m but up to 3.5m of existing ground will need to be excavated, taking due consideration of existing listed dock walls, transported to a processing area on site and crushed into a reusable material. The 6F2 type material which has been backfilled will be of a substantial bearing pressure required to sit piling rigs and other plant. The formation level for new pile caps will be 5.3m AOD (assuming 100mm blinding). There is a working area of 6,500m² within the existing wharf at approximately 6.7m AOD currently. General excavation will be to a level of 5.1m AOD with localised excavations (750m²) to 4.1m AOD. Backfilled with 300mm stabilised layers of recycled material (6.65m AOD), the working platform will be 6.95m AOD (300mm deep).



In the existing dock area, the dock will be filled to 5.8m AOD with marine-won sand. It is proposed to use the sand to 7.0m AOD. The working platform over the top will be installed to 7.3m AOD and a stone piling platform installed on top. Using this methodology will help to achieve the bearing pressures required for working plant, as well as achieving better excavation batters after piling completion. This optimises the volume of material being brought on and off site.

Groundwater

Levels vary across the site, with the shallowest point at c.1.8m. More typically, groundwater is found at 2–3m below ground level across the site.

There are issues with localised groundwater contamination, but this again seems to be confined to the North Wharf area and is likely to be related to contamination in the made ground. Visual evidence of contaminated water is observed within TSS1.2 and P101. Further chemical testing confirmed contamination within OH102 at 3m, relating to hydrocarbon content. It is likely that groundwater treatment may be required in these areas before discharge, unless an agreement can be reached with UU WWTW.

Piling methodology

The piles at Bramley-Moore Dock will be constructed using the continuous flight auger piling technique. This technique involves screwing hollow-stem augers into the ground until the target design depth is reached. The soil-laden augers remain in the ground on reaching the required depth. Concrete is pumped under pressure through the hollow stem as the augers are withdrawn at a controlled rate, ensuring that a positive concreting pressure is maintained to immediately fill the space in the ground left by the retreating auger. Concrete is placed to piling platform level. Pile reinforcement is inserted into the fluid concrete following removal of the augers from the pile position.

The issues with the sandstone experienced by the piling contractor who constructed the piles at the neighbouring site, Wellington Dock, has been addressed using the contiguous flight auger technique to be adopted at BMD..

Drainage

Drainage will be installed in accordance with drainage drawing BMD01-BHE-S0-XX-DR-C-524010, where penetrations are indicated to pass through the existing dock wall. Existing drainage penetration, sizes will be modified but maintaining the use of existing drainage insertions through the listed dock walls.

A drainage run will be installed during North Wharf enabling works while ground level is at 5.1m. Contaminated material will be removed, remove obstructions/voids, install pipework and associated manholes, process materials and backfill; the excavation level will be to 4.6m AOD.

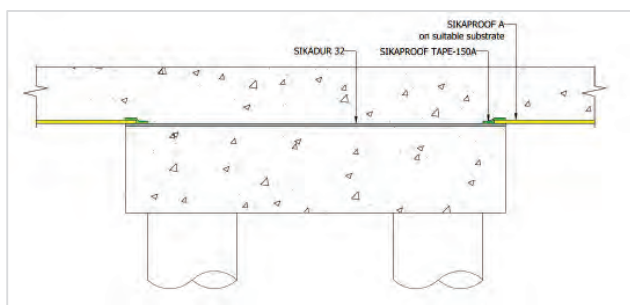
For surface water drainage a solution has been adopted which minimises the volume of drainage within the existing dock area, reducing the impact from ground settlement and minimising the works required to ensure the drainage does not move. Under-slab drainage will be suspended from the reinforced concrete slab using steel ties, while drainage external to the stadium but within the existing dock area will be installed on top of reinforced concrete piles. This will eliminate the risk to drainage from settlement of silts below the sand infill.

Foul water drainage will be installed with a similar strategy, but as a result of the layout of the drainage there will be no requirement to install in the existing dock area outside the footprint of the ground floor slab. This means piling techniques will not be required on the foul drainage in order to eliminate the risk of settlement.

Pile cap and ground floor slab methodology

Approximately 1,100no. CFA piles will be installed on the North and South wharfs and 1,200no. CFA piles installed in the existing dock area. Once complete, we will wrap the pile caps in formwork shutters before concreting.

For the ground floor slab, a gas proof membrane and vapour barrier are required. This is specified as SikaProof® A-08, providing water ingress protection, damp protection, preventing ground gasses and protecting the structure. We estimate the gas characteristic situation to require BS 8485:2015, which would mean that a combination of CS2 and the 400mm concrete slab and membrane would be sufficient.



5.3 Stage 3 – Superstructure concrete works for East and West stands

The superstructure concrete works include:

- Vertical elements (precast columns and twinwall)
- Horizontal elements (lattice slabs)
- Stair landings and lift shafts
- Lower tier east and west

Vertical elements

Precast columns and twinwall sections

Precast columns and twinwall will be proposed for the main vertical load-carrying members. Typically, a precast column is manufactured in grey concrete and is square, rectangular or circular in cross section. However, there are many instances where columns of other shapes are used as part of the external architecture.

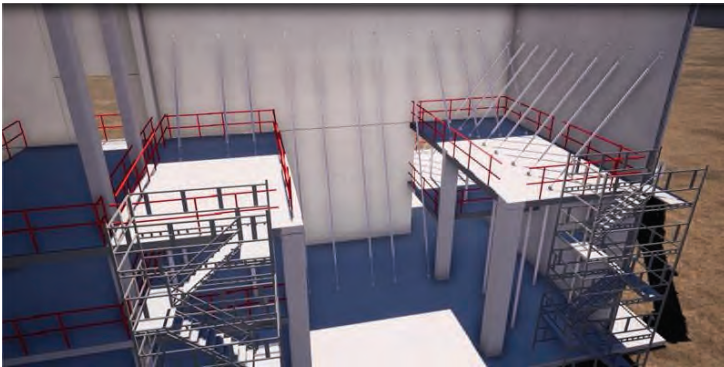
Precast concrete is most efficient and economical when identical members are to be cast repetitively, as the same forms can be used multiple times. The moulds are generally made from steel and have extremely accurate

faces; they require dimensional tolerances of less than $\pm 3\text{mm}$ and clean unblemished surfaces. Less expensive and versatile timber moulds allow ad hoc variations to profiles, eg channels or chases for M&E installations.

Precast columns can be produced as either multi-storey corbelled columns or single floor-to-floor elements. Columns can be connected using either a grouted dowel connection or a bolted column shoe.

Twinwall consists of two thin reinforced concrete panels joined by open web lattice. The wall panels are produced with a high-quality smooth finish on both sides because of the unique manufacturing process. Twinwall can be used to construct core walls (stairs and lifts) and shear walls up to 400mm thick.

Twinwall cores in all four corners will be installed in advance of the connecting steel frame. Landings at each floor are to be installed simultaneously for the panels to be propped against and for the overall stability of the core throughout the construction phase. Cast-in plates will be required at interfaces with structural steel so that connections can be made.



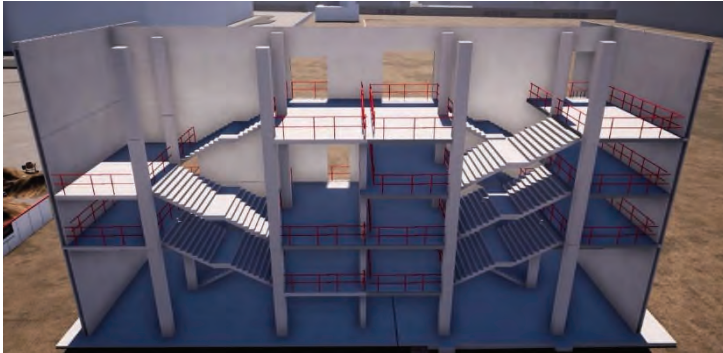
Core construction including panel installation and concreting will be facilitated by a 100t crawler crane, and all four cores will be constructed concurrently. The concrete infill will be poured using a 2m^3 skip, the specified rate of rise must be adhered to, as overfilling can cause structural failure to the twinwall panels. Self-compacting concrete will be used for the infill, as it is not feasible to pass a poker through the panel void.

Twinwall panels acting as shear walls will be installed floor by floor as the structure progresses. Panels will be offloaded from the transport (refer to logistics section) and pitched vertically from a designated lifting area. Temporary propping will be required to install the units. Vertical and horizontal joints will be sealed with Parex thixotropic grout in advance of pouring the in situ concrete infills, and access will be attained by MEWPs.



Precast concrete stairs and landings

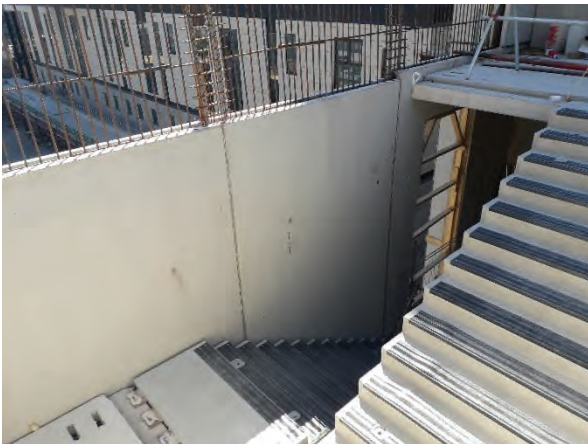
Stairs and landings will be manufactured in precast concrete, enabling a faster installation on site and a higher standard of finish. Reinforced concrete stairs will also generally offer a more robust solution to steel.



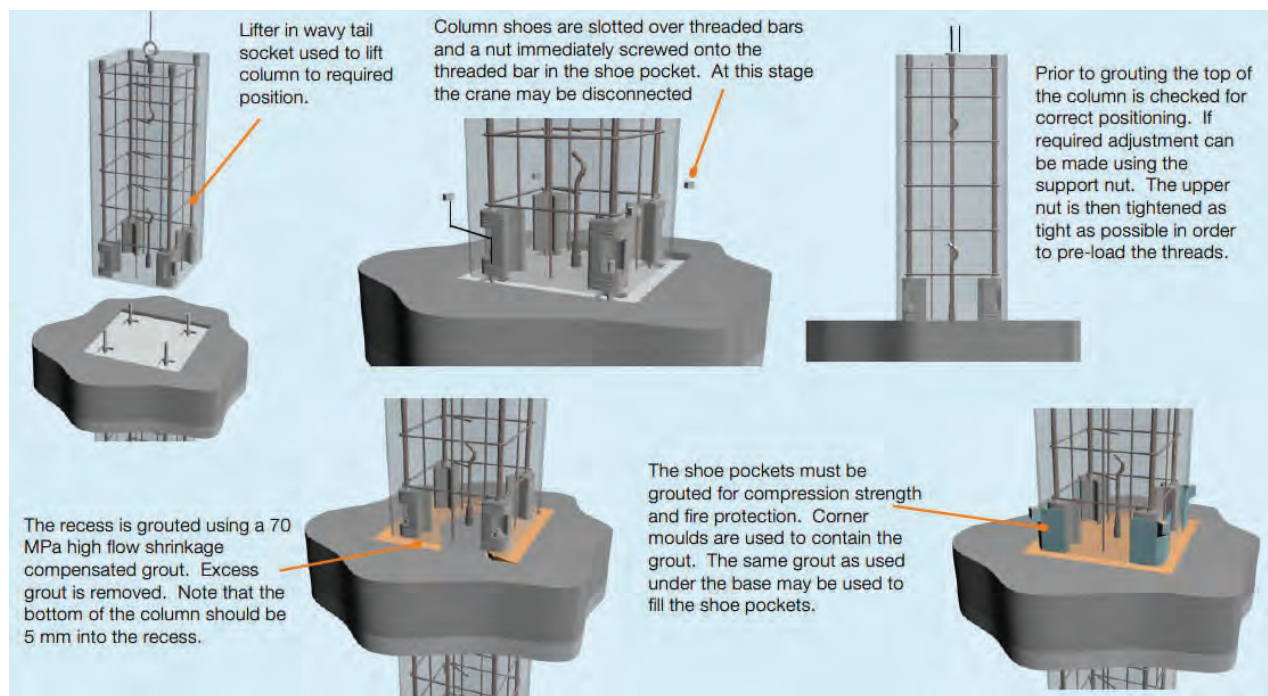
Precast concrete landings will be installed well in advance of the stairs. Not only are the landings required to support the stairs, they are also required to tie the core together throughout the build process and provide a structural slab for the core twinwall panels to be propped back to.

As mentioned previously in this document, landings will require a structural connection into the twinwall that works in tension as well as shear. Stairs installation will commence once the twinwall is fully erected and the landings are installed – not as the core progresses.

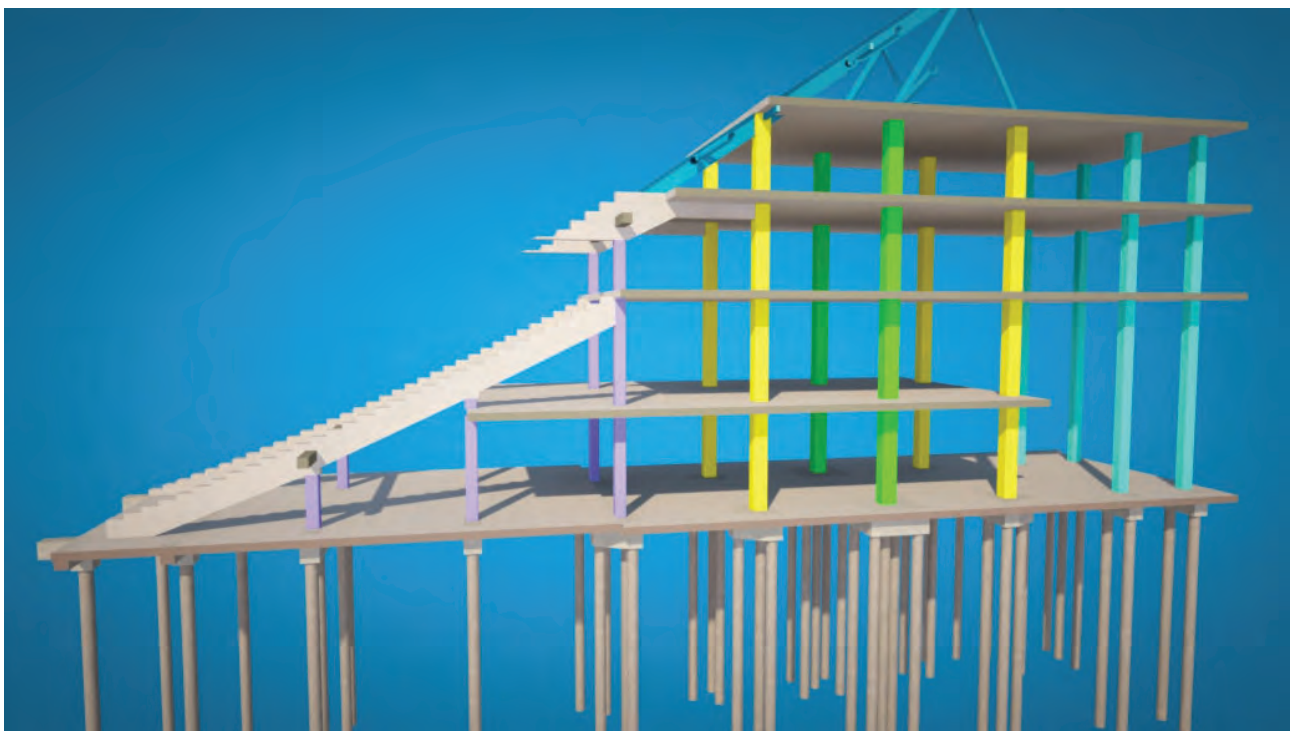
Handrails can be installed prior to installation to limit working in fall restraint, and protective covers can be pre-fixed to the stair tread. Timber is generally more robust than plastic, which can warp in warm weather.



Precast columns will be manufactured as single-height. All connections will be bolted using a Peikko shoe; this will eliminate the requirement for any propping and wet grouting operation at the time of installation.



It is anticipated that 19no. columns per day can be installed during standard construction hours. Installation will be facilitated by 4no.crawler cranes – two to feed the East Stand and two to feed the West.



All units will be offloaded from the transport in a designated area and positioned ready for installation. Columns will be pitched vertically using the crawlercrane, lifting points will be designed and integral to the units, RE lifting eyes will be used.

Single-height columns can be installed prior to casting the structural slab. This can sometimes offer programme benefits, but is not an option with the double-height columns, as there is generally not enough capacity in the threaded bars to withstand the additional load without the surrounding concrete cast and cured.

The column shoes are required to be filled with thixotropic grout once the connections have been tightened up and the structural slab cast.



Precast columns before and during installation at West Cumberland Hospital

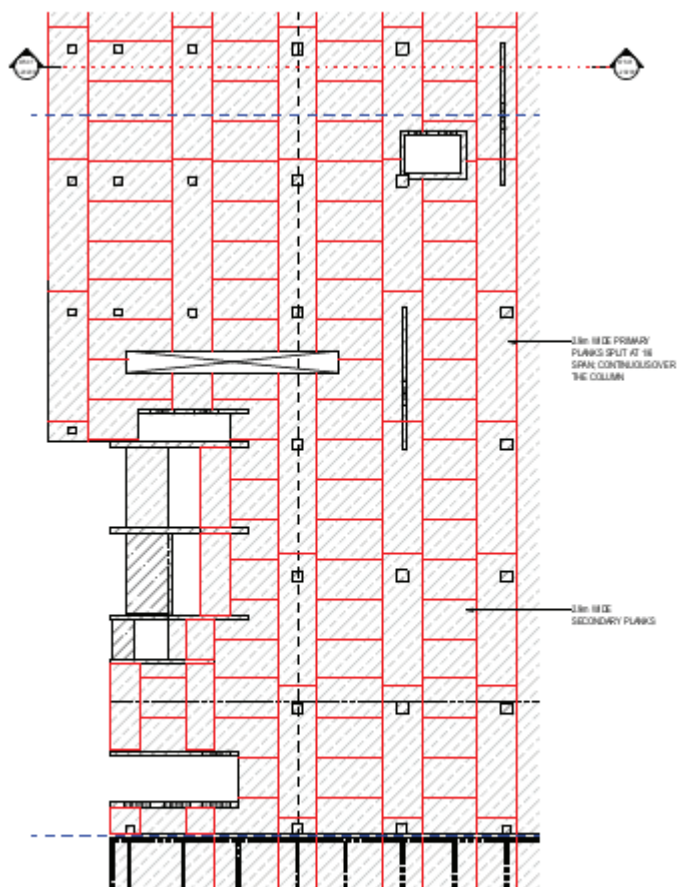
Horizontal elements

Lattice slabs

Lattice plank floor units are used as permanent structural precast concrete formwork to in situ concrete slabs.

This type of composite floor is equally suited for use in almost every building type. The floor slabs comprise an 85mm-thick precast concrete soffit slab, containing individually designed main and transverse reinforcement (B1 and B2) cast on steel moulds. This gives a good soffit finish, ready for direct decoration after normal preparatory treatments.

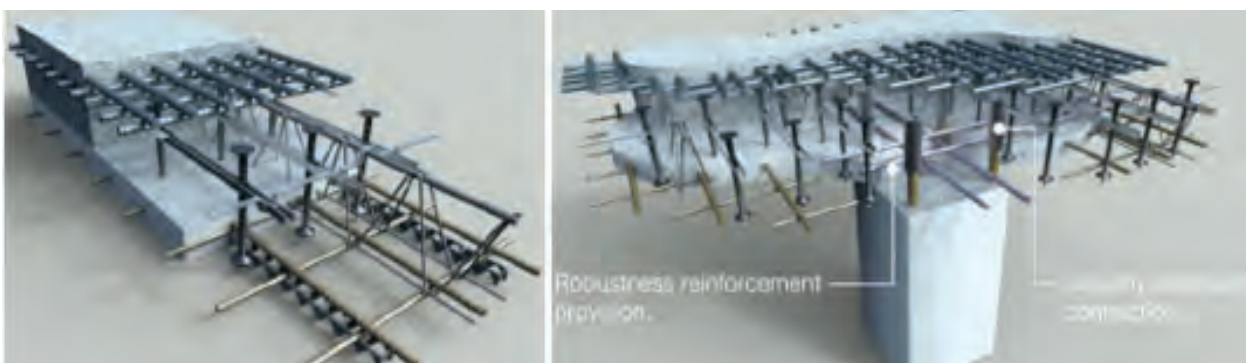
The lattice slab system is a hybrid system that uses thin preassembled concrete plate elements containing embedded reinforcement in orthogonal directions. Steel lattice girders embedded into the plate elements provide additional rigidity in the temporary condition and additional shear capacity. In the optimised arrangement, these plate elements take the form of principal plates and secondary plates.



TYPICAL ARRANGEMENT OF LATTICE SLABS

Typical hybrid floor plank layout

East and West Stand suspended slabs will comprise a 125mm-thick lattice plank with a 175mm-thick in situ topping. The slab make-up will differ in areas where the lattice is installed on the steel frame, which we will come to shortly. Concrete strength for the in situ topping will be C50/60.



GASS will be installed to support the lattice planks in their temporary condition to the concrete frame of the East and West stands. There are several areas where double-height falsework will be required, but generally the temporary works requirement to support the lattice is relatively simple. All temporary works designs will be completed by Laing O'Rourke's in-house temporary works department, Expanded Temporary Works.



Once the falsework is installed and signed off by the relevant temporary works supervisor, plank installation can commence. Lattice will be installed using the crawler crane, lifting points are cast integral to the planks in the form of the structural girders. Planks will be installed sequentially, and a 10mm gap will be left between each panel to allow for the manufacturing tolerance in the planks.

All lattice planks require fully grouted horizontal joints to accommodate for the 2.5% lateral load which is transferred into the planks during concrete placement. Once the joints are grouted the reinforcement can be installed. This will consist of a single bottom layer and two top layers.



Once the reinforcement and any other cast-in items for connections or services are installed, a final sign off as part of the progressive pre-pour inspection can be issued, after which the concrete can be poured.

Screed levels will be used as well as a rotating laser. This will ensure that the concrete is installed within level and flatness tolerance. All slabs will receive a power float finish, which will require 24/7 working however noise from these operations will be minimal and specific task lighting will be used.



Lift shafts

The lift shaft will be constructed from twinwall where appropriate. In locations where these are not required for the structural stability of the frame, precast lift sections will be used.

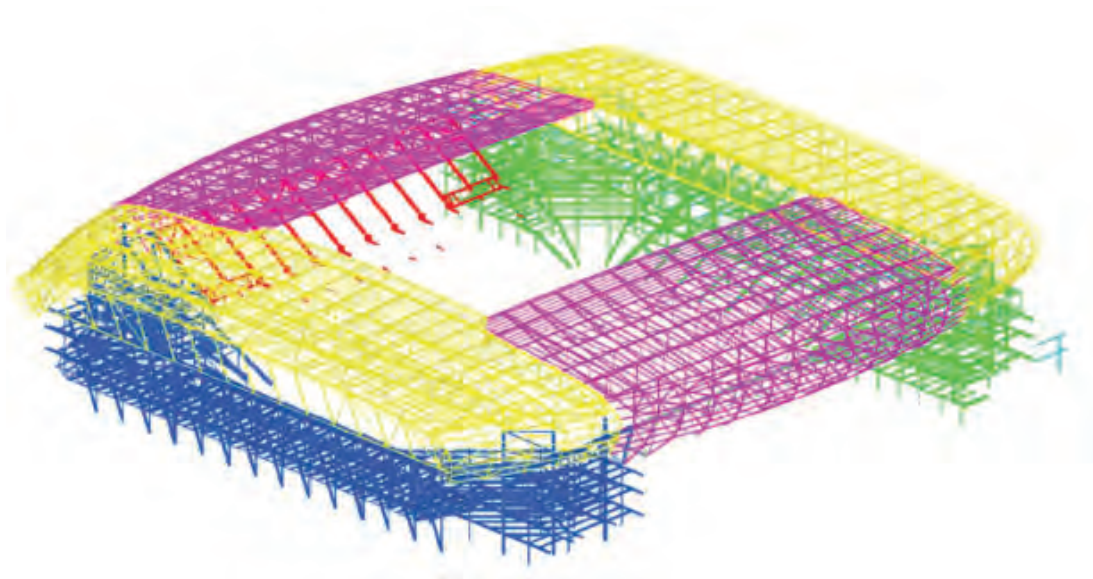


Typical precast concrete lift shafts, overview and built examples

5.4 Stage 4 – Steelwork and precast terracing

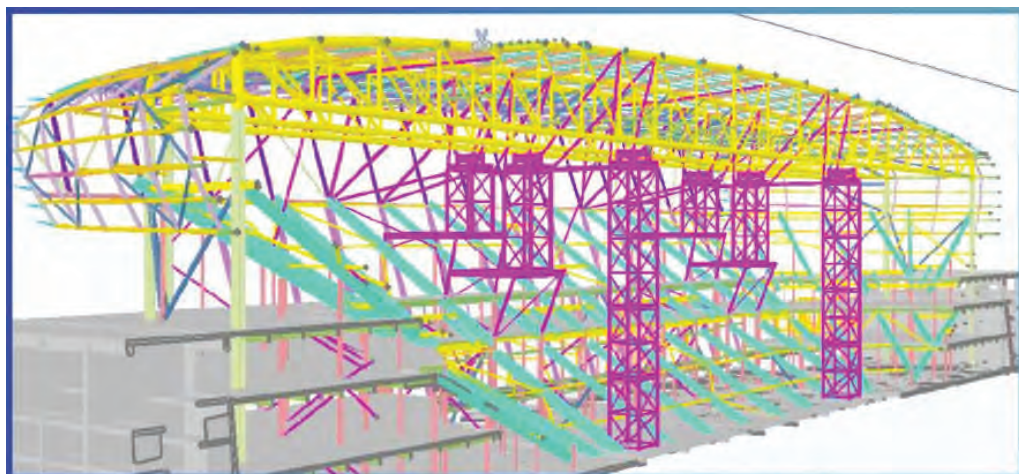
Steelwork including rakers

A structural steel frame forms the structural frame for the North and South stands which includes the corner quadrants with the concrete stair cores in each quadrant providing the lateral stability where the infill floor plate, being of precast lattice plank construction with an in-situ concrete topping. This ties lateral loads from the roof, façade and columns to these concrete cores, and down to the foundations. The east and west stand upper tiers will also be of a structural steel frame from level 3 and 4 of the previously constructed concrete frames on these 2 stands. All of the upper envelope and roof including its East and West barrel form, the North and South glazed gable elevation facades and roofing will be supported by the structural steel frame. The roofing structure and the upper tiers of the East and west stand will be supported by long span trusses. The north and south stand roof consist of 170m long, 12m deep long span bespoke trusses.



General overview of the steel frame inc roofing View from SE corner

The East and West stand roofs will be formed using large diameter steel tube cantilever trusses. In all cases the structural steel will all sit below the roof line and contained with the Seating Bowl. The roofing framework is explained more thoroughly in Section 5.5 and 5.6. The ground floor slab will be left out to permit crawler cranes within the footprint of the North and south stands and the extremes of the lower tier of the east and west stands to enable the erection of the stands bay by bay, working from west to east and north to south respectively. The steelwork will include the rakers to support the terrace seating areas to the north and south and quadrant only.



South Stand Roof and bowl with temporary steel

The lower steel frame will be constructed using a combination of 100T mobile cranes and 500T Crawler cranes. The construction sequence focuses on completing the north and south stands building from upon the existing Wharfs whilst the dock infilling works are progressing. Once the dock works are complete the Terracing and roof works commence utilising the footprint of the pitch area from the reclaimed dock infill.

The North and south stand will be built from the corner concrete cores and works from east to west simultaneously from outside to inside to complete the upper tier steelwork. Alongside the steel frame construction, the precast lattice flooring will be progressively installed on to the supporting steel frame to receive its structural concrete flooring later, the lattice flooring is described in more detail in the lattice flooring section. Until the concrete floor slabs are complete the temporary stability will be in the form of adequately sized removable temporary steel work bracing.

Sections of the lower tier are to be left out in the temporary condition to allow for the temporary works trestle towers which will support the roof whilst under construction. The foundations for these temporary towers will utilise the permanent foundations to minimise waste and optimise design. Upon completion of the roof structure the temporary trestles will be de-jacked and removed. Then the previously 'left out' infill steelwork and lower tier rakers and terracing can be installed to its completion.



Images showing phased install of terracing on south stand pre & post trestle removal

Due to the nature of structural steel being fabricated off site piece small steel beams and columns will be brought to site fully fabricated and painted and built up on site to the maximise possible utilisation of modularisation of elements will be to be erected in large sections. The elements for longer structural components, such as long trusses, will be brought to site in small lengths on multiple delivery vehicle and fabricated and welded on site. Where appropriate, the intumescent paint fire protection will be completed prior to the steelwork being delivered to site. Consequently, to deal with the environment in the temporary and permanent state, Firetex FX6002 by Sherman Williams will be used.

Lattice plank flooring

For a 9.6m x 7.6m primary grid, the nominal lattice plank dimensions will be 9.6m x 2.525m. The slab will be made up of an 85mm precast biscuit with an in situ concrete topping, to make up to a total required slab depth of 225mm. Concrete strength for the in-situ topping will be C40/50.

Shear studs will tie the structural steel frame into the lattice plank in situ topping. Lattice planks have been designed in conjunction with the steel frame to span at least 3.7m in the temporary case and the intermediate support beams have been located and designed to support this methodology to remove the need for temporary propping.

For a 9.6 m x 7.6 m primary grid, the nominal lattice plank dimensions will be 9600 mm x 2525 mm.

A typical column bay is modelled on SCIA Engineer to determine the permanent load case reinforcement requirements. This model has C40/50 nominal concrete strength class.

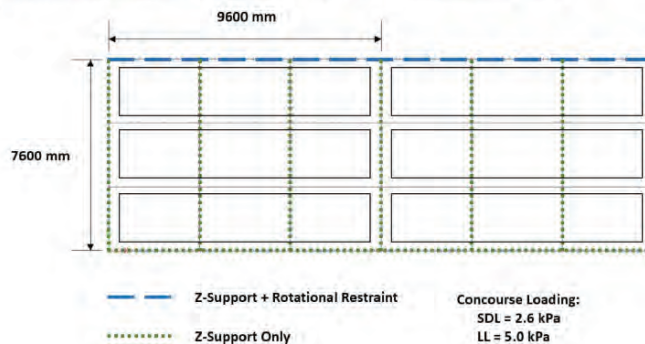
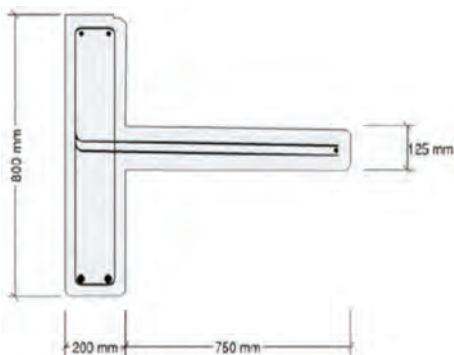


Figure 2: N-S Representative Area (Modelling Assumptions)

The East and West stands are generally concrete where the rakers are precast concrete on the lower tiers and steelwork rakers with precast terracing upon them on the seating stools.

Precast terracing and vomitories

Single precast terracing units spanning from steelwork raker to steelwork raker (a 9.6m span on this project) are the optimum solution. In Europe and the USA, manufacturers offer double terrace units, but these are not generally available in the UK, as most of the manufacturers do not have suitable moulds.



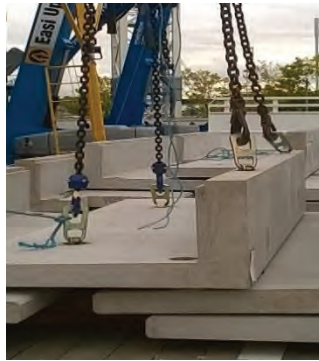
Typical 9.6m single precast terrace unit

Vomitores are formed from precast solid walls manufactured as an integral part of the terracing system and are usually installed by the steelwork contractor in conjunction with steelwork rakers and secondary beams and terracing units.

The completion of the precast terrace units, including all mastic pointing and temporary waterproof measures over the vomitories, provides the necessary environment below the terrace to commence fitting out the lounges and concourses. This often occurs ahead of roof completion and is therefore a critical path activity, so speed of installation and early completion is essential.



Example precast concrete terracing

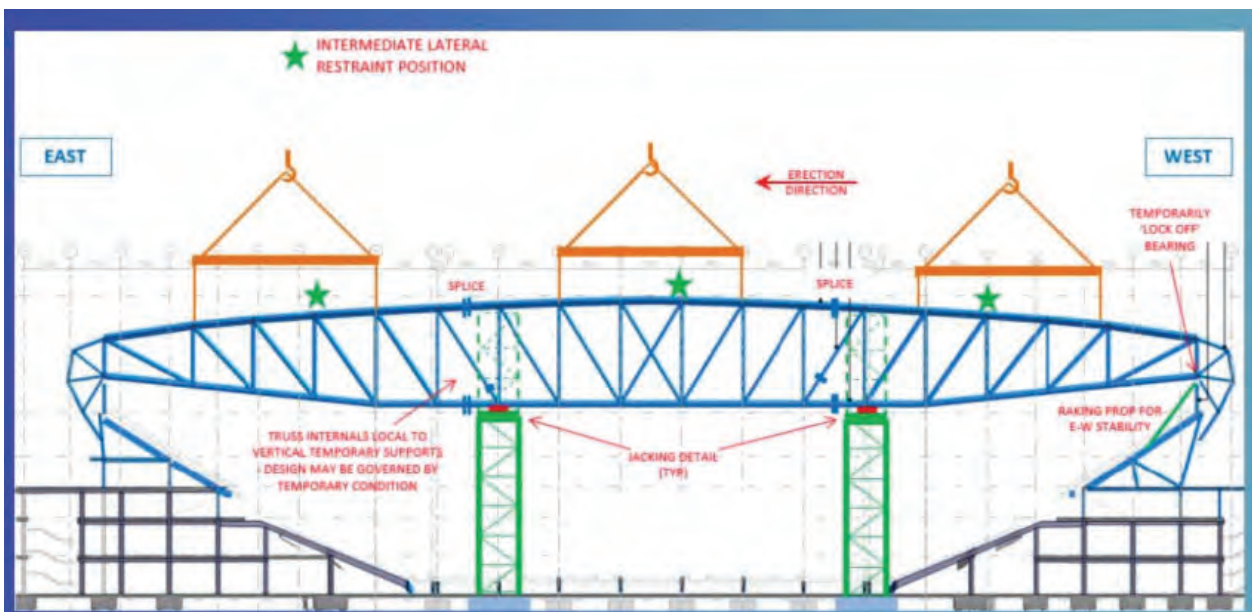


5.5 Stage 5 – Roof steelwork

North and South stand roofs

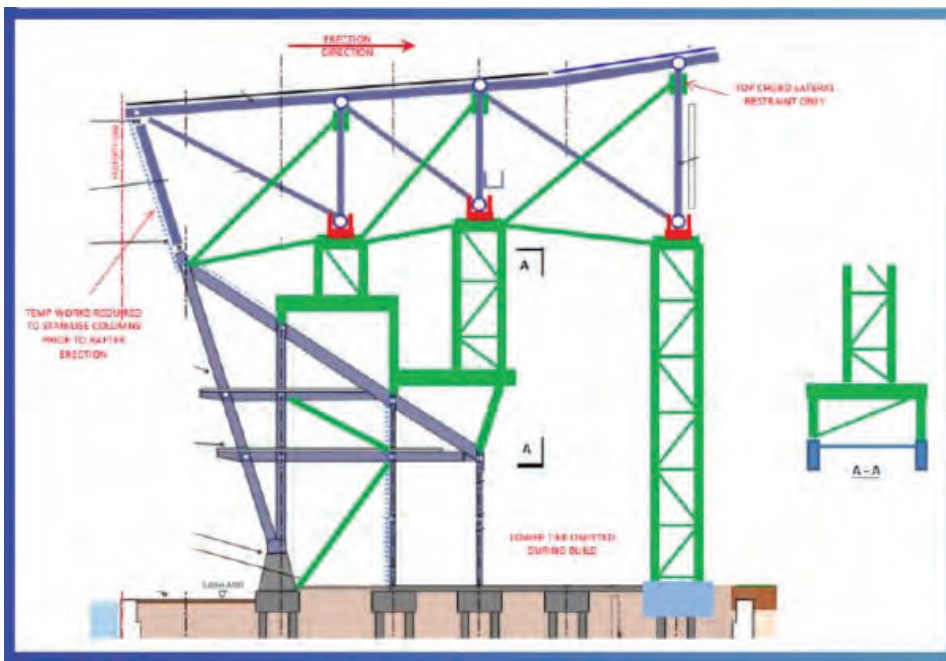
The current design includes two plane primary trusses to the North and three to the South. The proposed construction methodology to fabricate these on the ground in large 2 truss sections. To construct and install these large trusses 750 Tonne and 500T crawler cranes will be needed to install and stabilise the primary roof trusses onto the temporary trestle as mentioned earlier in section 4.6.1.

It is envisaged that at least 10 temporary support towers will be deployed in total. There will be 2 towers for each primary truss (one on each truss at 1/3 points span) to allow these 170m-long preassembled truss segments to be lifted from the ground in thirds, braced in pairs.



Typical construction sequence and lifting methodology for the roof trusses

An intermediate horizontal restraint to the truss top boom will be required for each part truss before any load is released from the craneage to provide global lateral stability to resist gravity and wind loads during the construction of the remaining roof elements. These restraints will take the form of a system of a number of large-diameter raking props from the stand structure below to adjacent trestles and permanent steelwork previously completed. These props will be equipped with a vertical sliding connection to the truss top chord to prevent transmission of vertical loads.



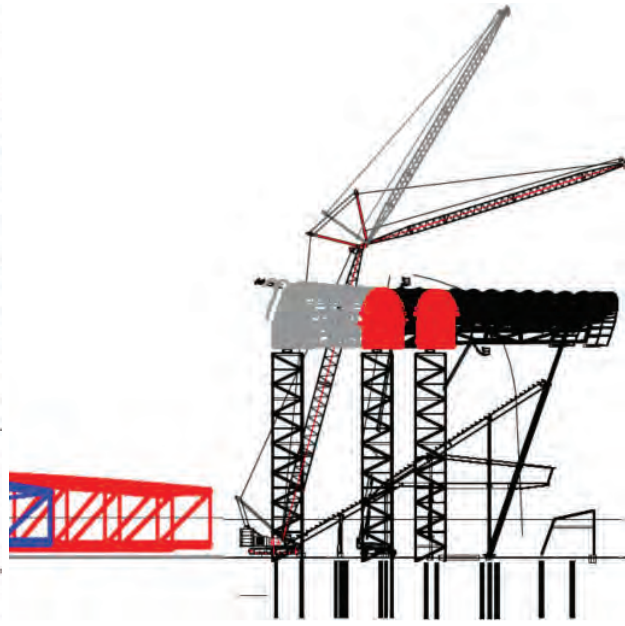
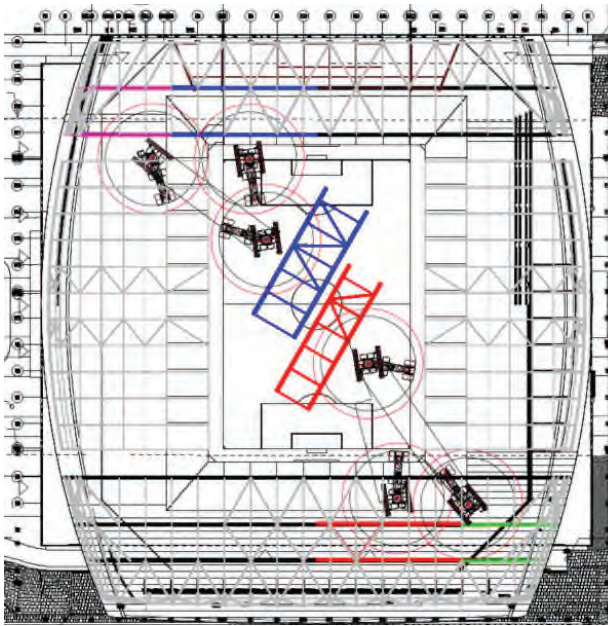
Typical section identifying temporary steel in green

All the temporary towers and framing elements need either to be braced together or to cantilever from the foundation and therefore, will interfere with the stand structure and thus will need to be removed after the roof is made stable. To mitigate the interaction of these temporary foundations and the permanent foundation for the stadium the temporary foundation will be designed to accommodate the permanent loads, so the foundations do not need to be removed. Consequently, the terraced and steel stand structure around the towers locally will need to be appropriately designed to make sure they can be provisionally left out and installed after the towers are removed.

Overall, the methodology detailed above is quite an extensive temporary works scheme for the North and South stand roofs. This must remain in place until the permanent stability system, including roof bracings, is completed.

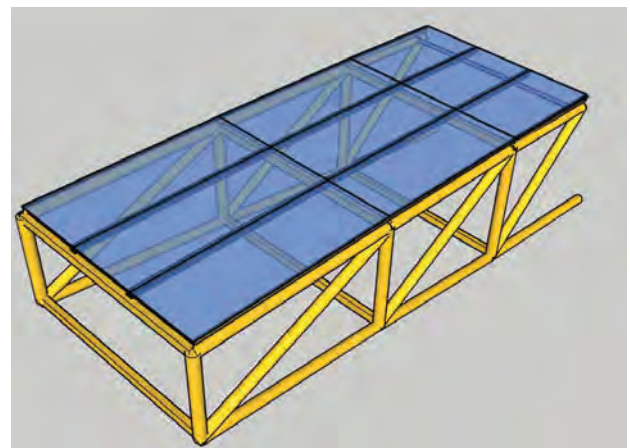
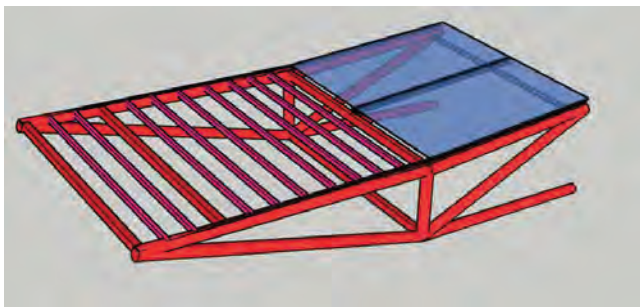
It is required that the bottom boom splices of the primary truss splices will have to be site welded.

The lifting of the truss segments, in particular those further away from the pitch, requires the use of large-capacity crawler cranes equipped with superlifts (Liebherr LR 1750 is currently proposed). Given the size and required movements of the cranes, they will require a large area of the pitch and must be coordinated with other construction activities.



Typical crane plan section for the north and south stand large crane truss install.

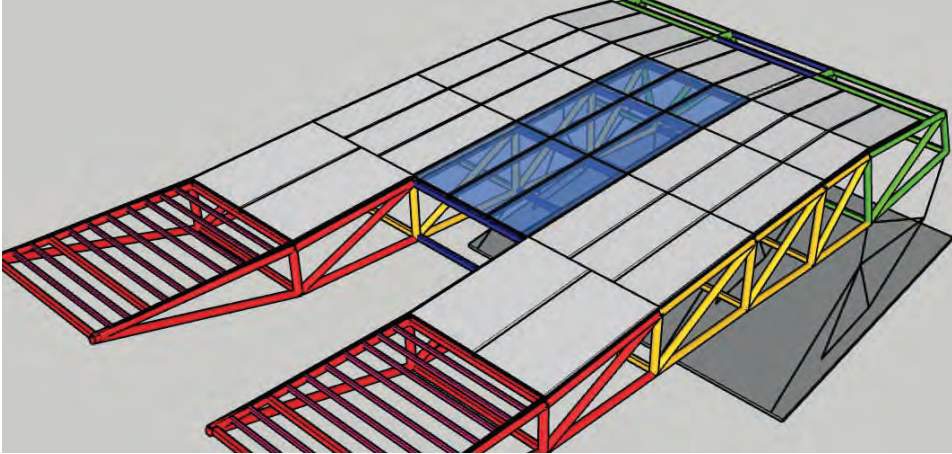
After the installation of the main trusses the rafters will be installed in frames at ground level with all the infill bracing, links and purlins, to form roof panels ready to be lifted into position using the large crawler crane with superlift. We will work to maximise the capacity of fitting out any roofing and MEP equipment on the ground to reduce the working at height risks and mitigate programme risk from lifting at height.



Typical roof module builds for east and west stand.

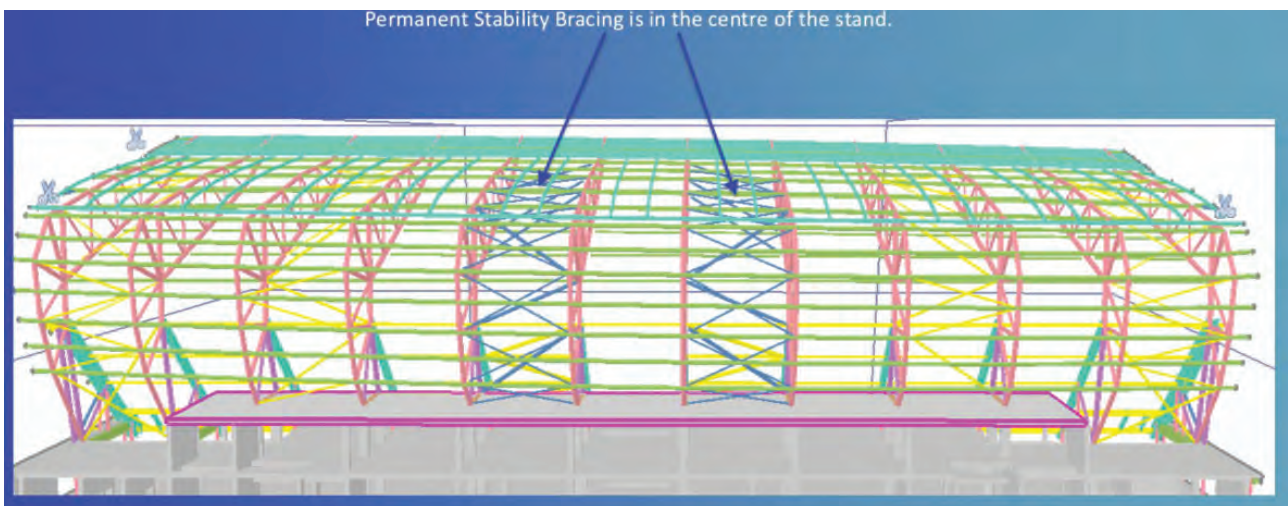
East and West stand roofs

The East and West cantilever truss construction is simpler in terms of buildability and temporary works than the North and South. The East and West stand roofs will be formed using large diameter steel tube cantilever trusses which will be prefabricated in 2 truss modules for stability purposes and spliced along their lengths from back of the bowl to mid model to raker tip. It is planned to assemble roof sections out of large sections of the cantilever trusses on the pitch as indicated below. The rafter tips will be connected to the rest of the truss and will then be lifted into position with a large crawler crane from the pitch. The infill between roof trusses will and be erected in module form with mobile cranes.



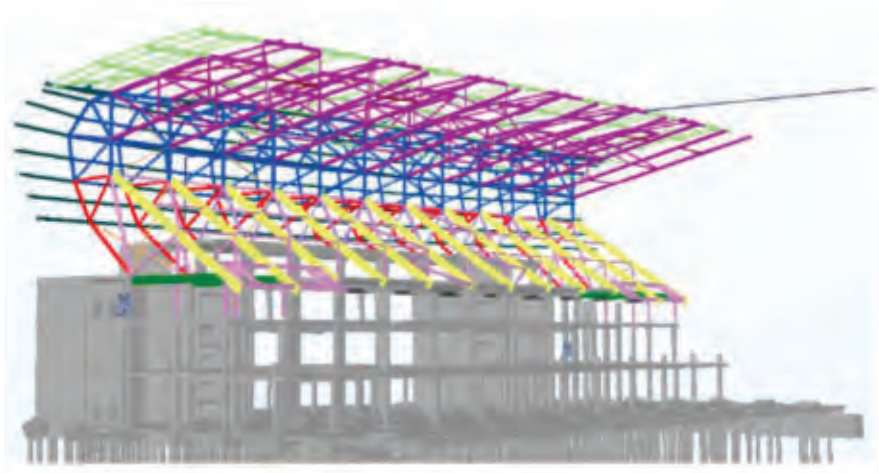
Typical East and west roof modules and infill bays partially prefabricated

The east and west stand lateral stability provided by plane and sway bracing frame in the middle of the stands and temporary bracing ties with provide lateral support until the cantilever trusses are fully fixed and grouted to the top of the concrete structure below on level 3 and 4.



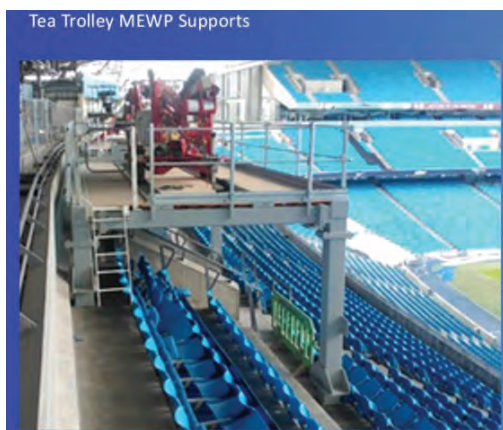
Purlins and secondary steel for East stand post main frame install

To minimise work at height, we are also considering lifting pairs of trusses together as a roof module, with all connecting steelwork assembled at ground level. This would clearly require a much larger mobile crane and would still involve infill bays being completed at height. Final proposals are subject to further detailed planning with the steelwork contractor.

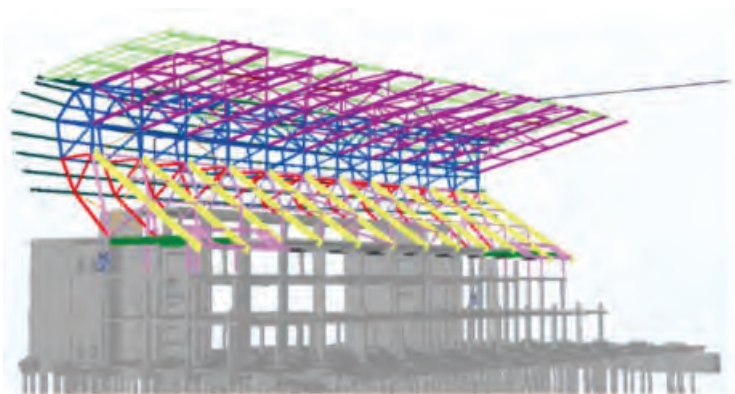


East Stand general structural overview

The front sections of the lower tier will be left unconstructed until the roof steelwork has been completed to give clear access for the cranes and MEWPs. Smaller MEWPs will operate off the upper terracing on temporary steel 'tea trolley' platforms.

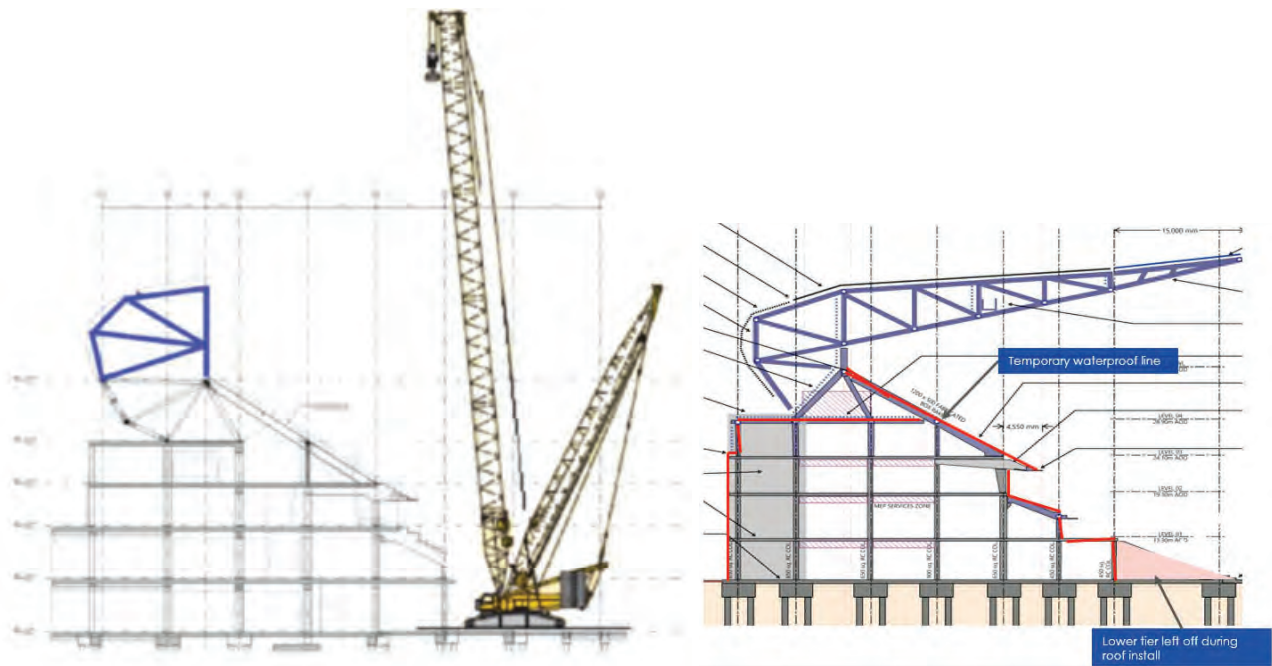


Terrace MEWP platform temporary support platforms



East Stand general structural overview

The East and West Stands commence after the North and South stand roof completion respectively. Due to size and nature of the methodology of the end stands and the components that are needed to be installed the majority of the pitch area will be a logistics, laydown and prefabrication areas for the roof trusses and cantilever frame modules. The logistics plan and access routes for plant, deliveries and people are designed around this major package of works as explained in section 6.

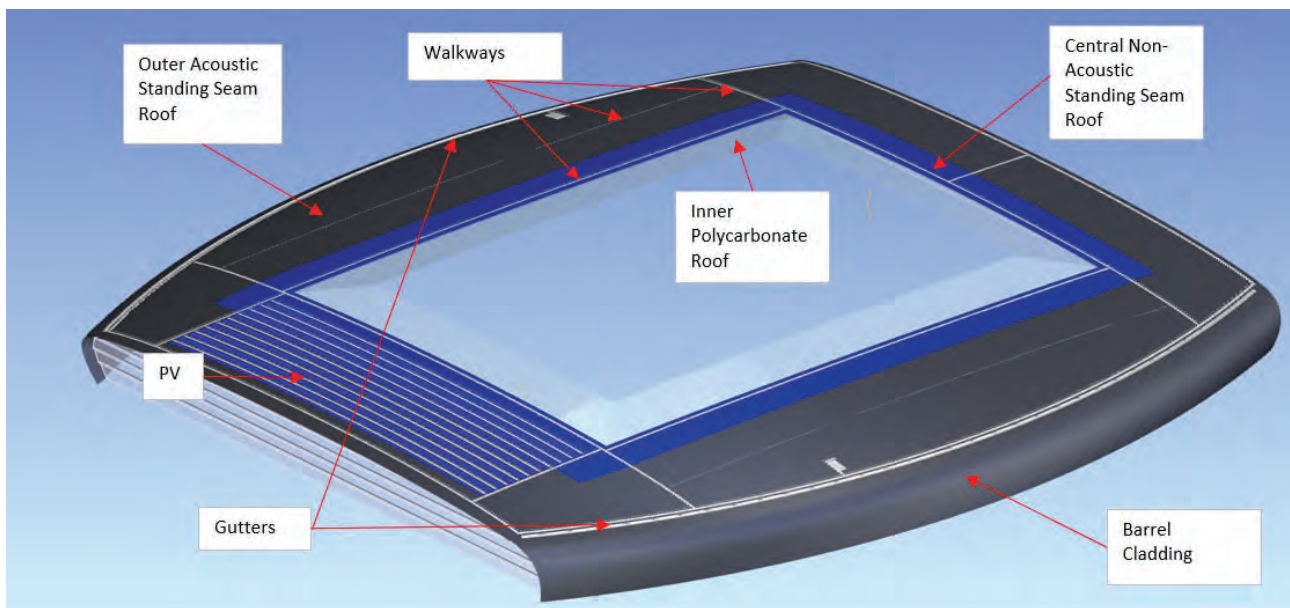


Typical crane plan section for the East stand large crane truss install with bottom tier left out for post steel install

Secondary steel

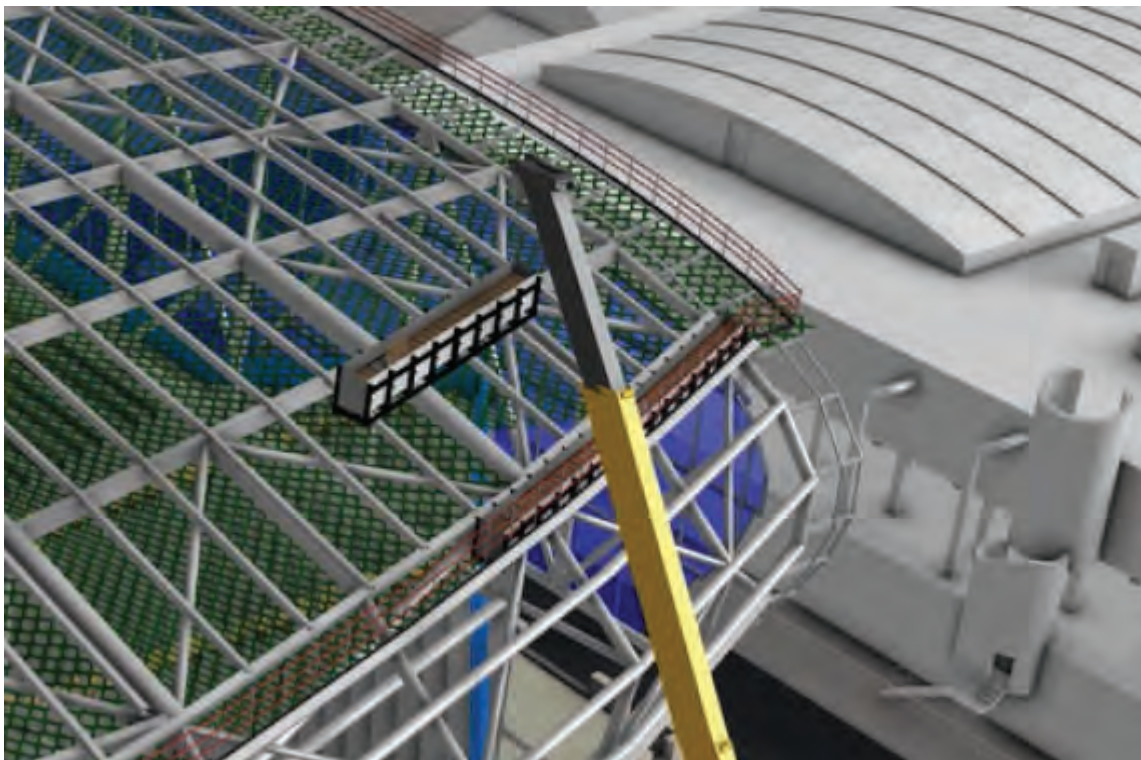
Once a substantial part of any of the stands primary steelwork is completed, infill purlins and secondary steelwork will be installed prior to the roof coverings and facade commencing. This secondary steelwork will be placed with the primary steelwork package due to the size of elements that are covered in these sections of work which include the access gantry and the mega screen in the North and south stand. These items of secondary steelwork will be allocated to reduce the health and safety working at height implications and adopt a collaborative approach to the design and manufacture to achieve certainty in delivery and efficiency.

5.6 Stage 6 – Stadium Roofing and Barrel Cladding



Gutters

The gutters to the East and West eaves of the standing seam roof are pre-fabricated self-supporting membrane lined gutter sections, these are craned into position and connected to 'fixing lugs' provided by the steelwork manufacturer. Operatives at roof level will then have to complete the fastening of the gutter sections and heat-weld the joints in the membrane lining.



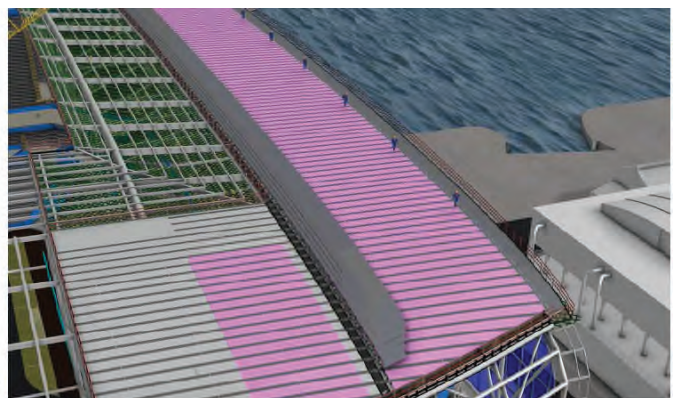
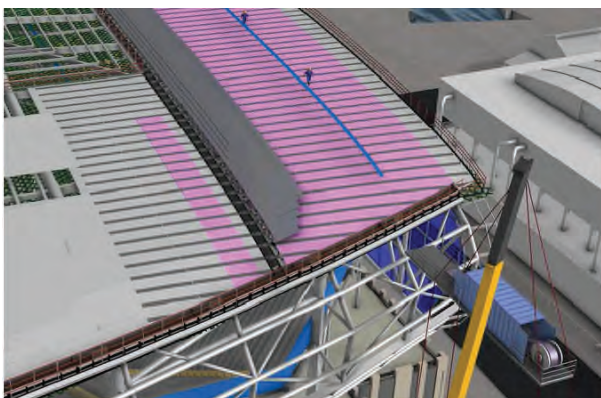
There is also an additional in situ formed gutter at the North and South interface between the inner polycarbonate roof and the central standing seam roof to aid with water run-off. This is a membrane lined aluminium composite gutter.



Outer roof and central standing seam roof surfaces

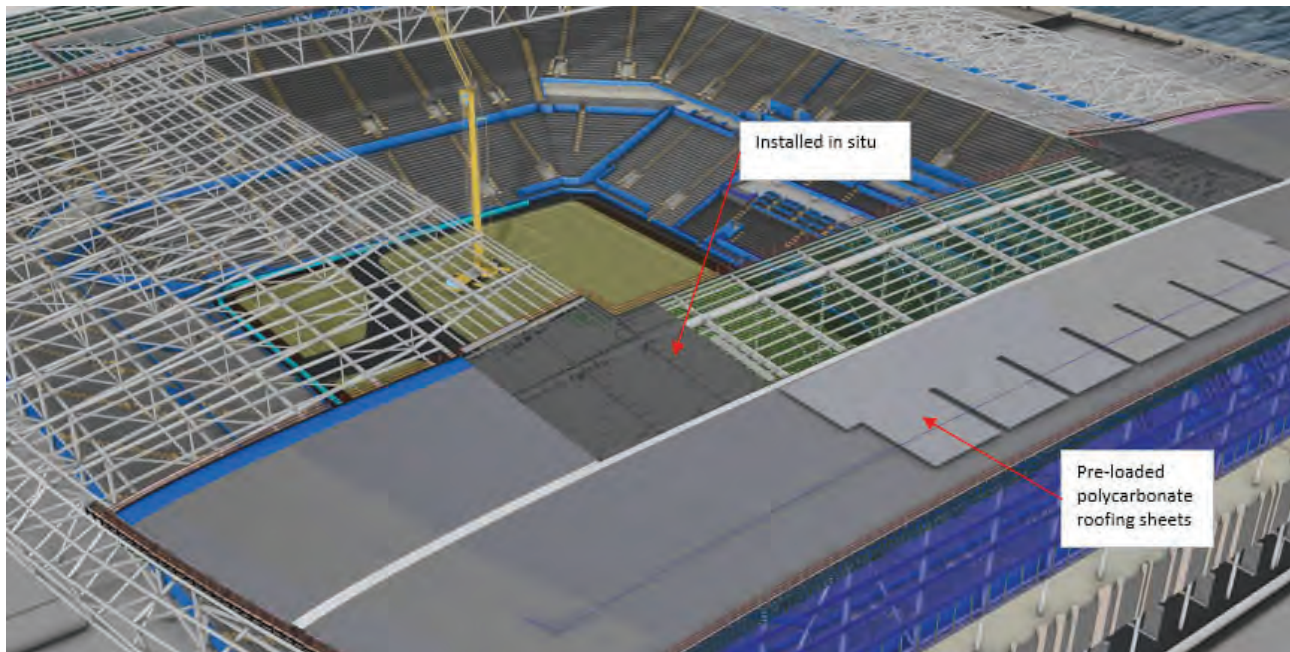
The outer and central surfaces of the upper roof are aluminium standing seam. The current solution requires this to be built up in situ as a metal structural decking sheet, with standing seam adjustable top hats and halter brackets fixed individually, insulation added (in acoustic areas) and then the coils of aluminium machined at eaves level to form trays.

Clearly with the exposure to weather and working at height issues for the roofers in this location, the potential to modularise the roof steelwork is to be explored so that decking can be installed at low level prior to installing at height, thus also removing or drastically reducing the amount of netting required for roofing install.



Roof inner polycarbonate surface

The inner surface of the roof on a football stand is usually transparent. This is a polycarbonate construction and although non-fragile it will be non-walkable. During installation, great care will need to be given to the safety of the roofing operatives, including the provision of nets and edge protection, until all permanent measures such as walkways are completed.



Polycarbonate roofing installation will require mobile crane to pre-load the polycarbonate to the roof and then they will installed in situ onto the secondary steel off staging. Again, we will be seeking to explore modularising the roof steelwork so that polycarbonate can be installed at low level prior to installing at height.

Barrel Cladding

The complex geometry of the barrel cladding has been simplified into a series of 3m wide vertical ladders, 75 in total. The ladders contain repetitive planar cladding panels to rationalise the amount of fabrication. The ladders consist of a fully anodised frame and panel arrangement that is fixed back to the structural steel provided by the steelwork contractor. Ideally the ladders will be a prefabricated assembly that is craned, as a single lift, using a specially designed jig onto the structural bracket connections. All final connections will be completed externally by operatives on MEWPs.



5.7 Stage 7 – Facade



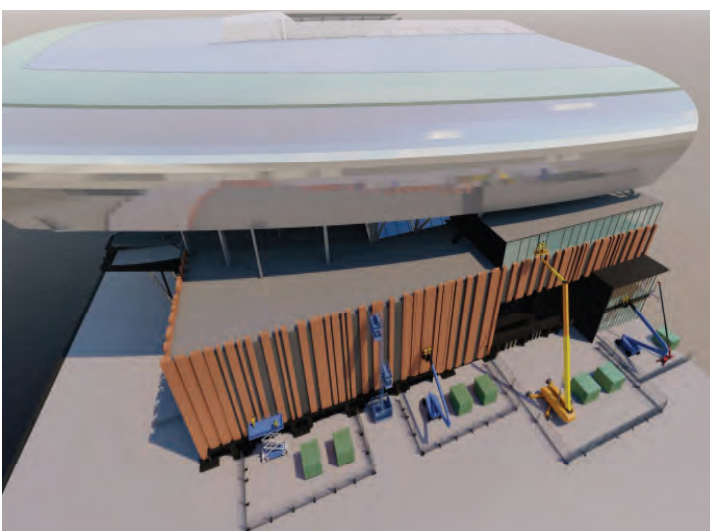
The lower facade works (L0 to L3) to the West, East, South and North stands consist of:

- Architectural brick clad precast piers, either stacked or hung from the structural frame.
- Spaces between brick piers will be infilled with perforated metal rainscreen panels to upper levels.
- East and West elevations contain a large rainscreen portal entrances with curtain wall glazing frontage.
- The L3 accommodation above brick clad envelope is a mix of storey height curtain wall glazing and rainscreen.

The brick clad precast piers to the East and West will be installed using a crawler crane. The precast cladding to the South is under a cantilevered soffit and so will be installed using either a Hiab or lifted through the slab above. The precast cladding to the North is in 2 sections, a L2 cantilevered balcony and L0 and L1 are under the cantilevered soffit; the balcony will be installed by L3 roof mounted crane due to the close proximity of the boundary, and the section under the cantilever will, similar to the South, be installed via a Hiab or lifted through the slab above.

It is anticipated that the perforated metal rainscreen panels will be installed via a mix of telehandler, MEWP and internal access tower.

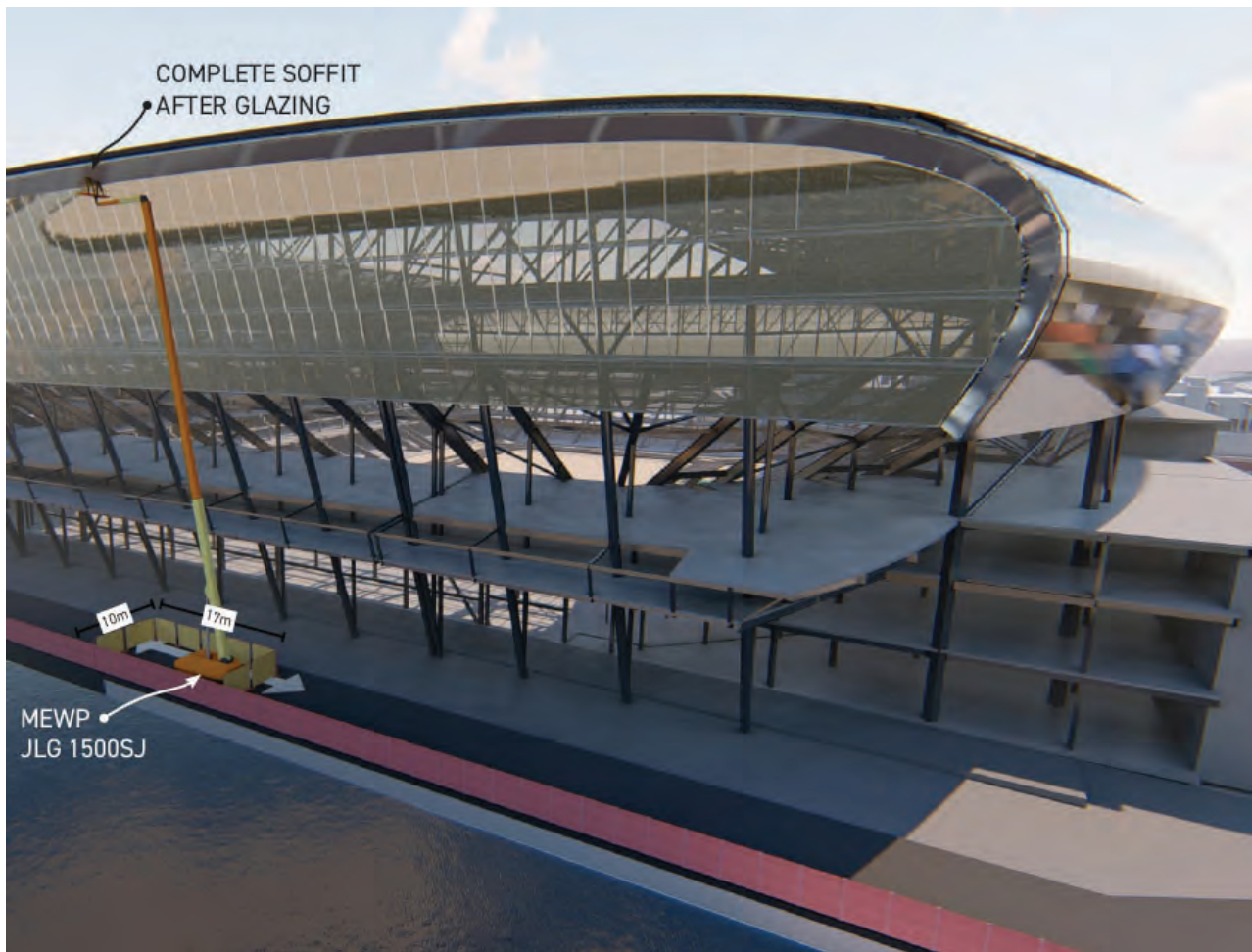
It is anticipated that the large rainscreen portal entrances and curtain wall glazing, and the L3 accommodation will be installed via a mix of telehandler and MEWP.



The North and South ends of the stadium L4 and above consist of;

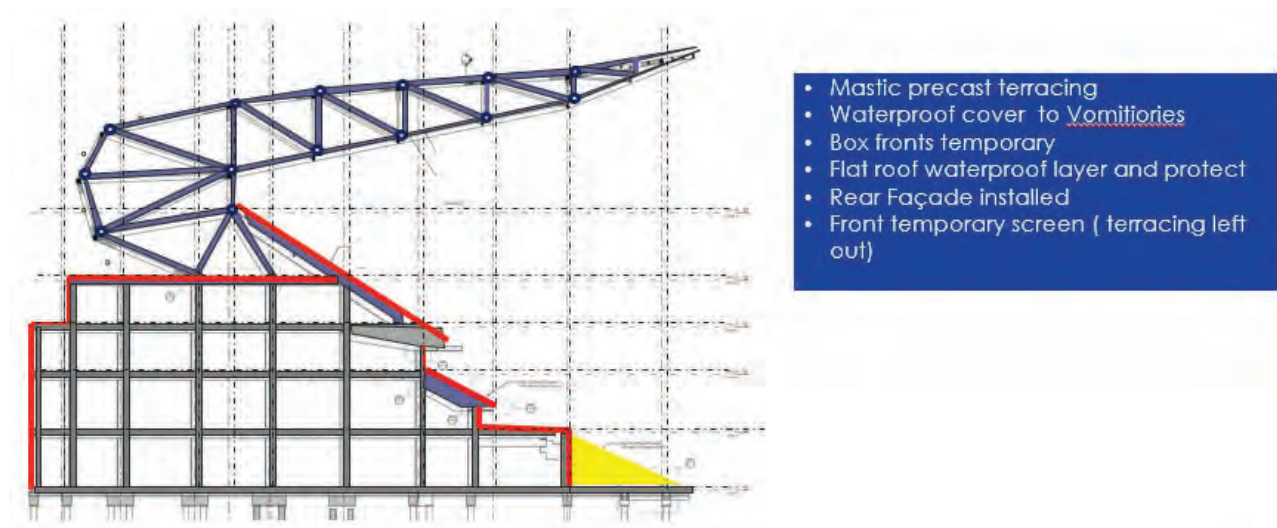
- Stepped single glazed curtain wall
- Soffit rainscreen cladding to the perimeter of the curtain wall

It is anticipated that these will be installed with a mix of mobile cranes, telehandlers and MEWPS. The use of unitised curtain wall and soffit cladding cassettes will be explored to reduce the time working at height, and the access constraints from the neighbouring dock (South) and water treatment works (North).

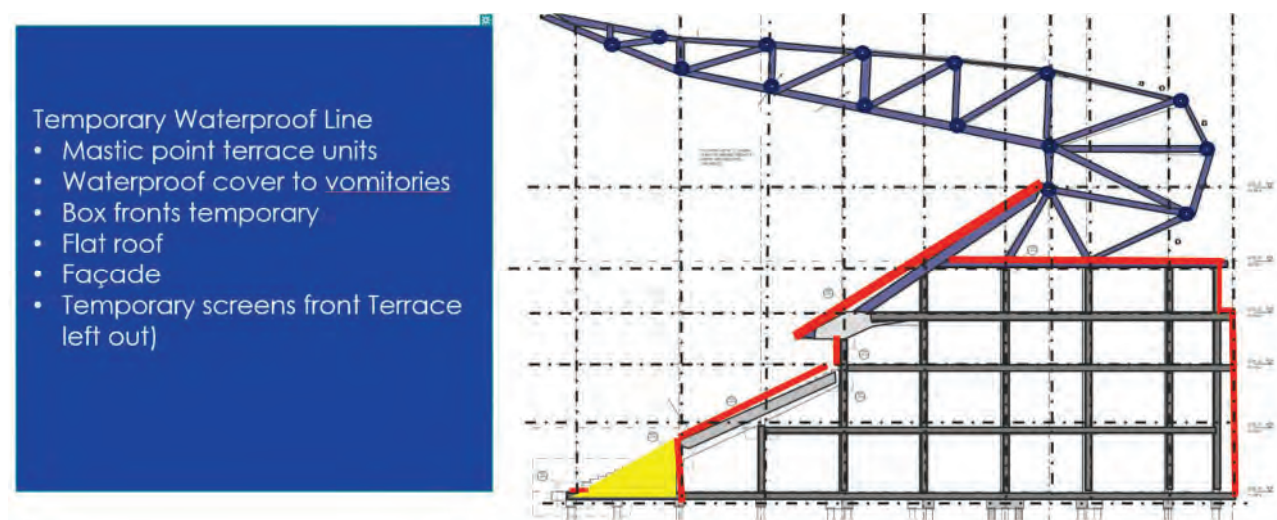


5.8 Stage 8 – MEP and fit-out

West Stand



East Stand



As soon as the temporary waterproof line has been established, as indicated above on the West and East stands, the fit-out can commence.

The MEP and internal fit-out will commence with offsite-manufactured distribution modules to both vertical and horizontal systems. These will consist of pipework ductwork, electrical trays and trucking. Each service will have the appropriate fire-rated components on the line of the fire compartments.

MEP offsite-manufactured packaged systems are delivered to site fully assembled and ready for immediate installation. Each system is designed to meet the individual needs of a building and its specific requirements, to maximise performance and efficiency.

Risers and plantrooms

Multi-service riser modules are designed to pass through up to four levels, and can be fitted internally in a riser shaft.

When fitted internally, the riser frames can be supported on a single floor, with the other floors using guide brackets. The advantage of this system is that work can commence to connect the services on the lower floors while the building structure progresses, shortening the service installation programme. The modules can also incorporate a firewall divide between services, if required.



Mechanical and domestic riser modules for Block F, Imperial College London

We can provide modules / plant items to be assembled on site into embedded/rooftop plantrooms. These fall into two sets: firstly, the modules manufactured off site that are traditionally assembled on site using traditional methods, eg pump assemblies and valve assemblies; secondly, the plant items procured from the MEP supply chain, eg AHUs, chillers and generators.

Our modular construction approach allows larger systems to be supplied in sections, for reconnection on site. Our engineering teams work to incorporate all mechanical, electrical, acoustic and load considerations, along with effective use of space and maintainability of individual components.

Working from the service model, our off site teams will produce 'Module logs' which identify each module vertical or horizontal. Each module has its own unique referencing number, which means that while the modules are being made an onsite team can prepare the area for the modules to arrive on site. The site team will set out from the working drawings where the modules are to be installed and where appropriate install the fixing devices, so they can be installed straight from arrival. A crane will be used to offload the modules and bring them to the point of entry into the stands. Using a plant skid system, the modules will then be moved into position, ready to be mechanically lifted into place. The protective wrappings will remain in place until the stadium is weathertight, to enable any weathering risks to be mitigated.



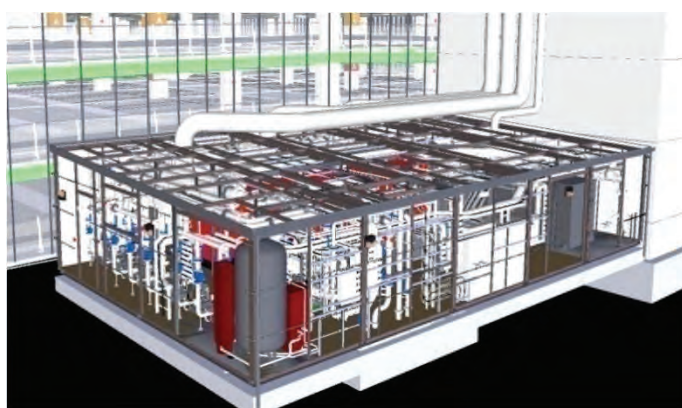
Example modularised MEP plant skids

Infrastructure and incoming service points will be an early activity, alongside building the substation for the 11kV network. The substation will be completed and made watertight to enable the 11kV transformers and switchgear to be installed as early as possible to maintain greater certainty and control over when a service can become live.

Modular wiring and preassembled distribution boards will be used for the power and lighting wiring as appropriate. The modular distribution boards will be made off site and arrive pre-attached to the service risers accordingly. Where they are located away from risers, they will come on a preassembled mounting frame ready to be fixed into place. All distribution boards and panels will be 'plug and play' up to 20A; all other wiring of three-phase supplies above 20A will be done more traditionally, due to the materials involved with 'Plug and Play'.

Working early with the design team will enable circuits to be confirmed early, which is a key element with modular wiring and preassembled distribution. Reliance is always factored in, as we know that design develops during construction but early engagement and design fix, along with the flexibility of modular wiring, will mean great absorption. The distribution board schedules will be given to our offsite team to enable production. The boards will be fully assembled and tested off site, along with the home-run cables and wiring which will come pretested. This enables the site testing teams to test 'first time'.

Like the MEP risers and modules, the offsite plantroom will be made using modelled information. As these are larger than the riser modules in most cases, these will be brought to site in unique sections. The plantroom sections will come pre-tested for onsite assurance. When they arrive to site, they will be lifted from the transportation using crawler cranes and installed in position using a specialist method such as plant skids. Once in place, the site teams will carry out the final connections ready for full sitewide commissioning.



Example of an offsite-modelled plantroom.

5.9 Stage 9 – Pitch works

The pitch works will be carried out by a specialist, who will be responsible for all aspects of the pitch construction, including drainage to an outfall provided at a suitable level by the general underground drainage contractor. The nature of the formation and level will be agreed prior to the pitch installer commencing; they will be given uninterrupted access to the pitch area from start to finish. The whole pitch construction process will take at least 26 weeks, to create the required playing surface for football.

5.10 Stage 10 – Western water channel and Western stepped Promenade

The western water channel and adjacent promenade will be formed once the area is no longer required logistically for construction of the West Stand. The new secant pile walls will be carried out immediately following other piling activities to get optimum use from the rigs, but capping beam and subsequent excavation of the proposed water channel to a nom. depth of 2m will follow much later. In conjunction with the Western water Channel works, the permanent dock isolation structure will be completed also using secant piled wall and capping beams including flow pipes.

The Western stepped promenade structure will follow constructed in a similar manner to the raker and terracing in the main stadium. Once sufficiently completed, the sand from the new water channel will be excavated to reveal the original dock wall. The hydraulic connection will be reinstated between Sandon Half Tide Dock and Nelson Dock.

5.11 Stage 11 – External works

The external works will involve incorporation the site's heritage assets in accordance with the Heritage asset retention and removal plan, including rail tracks and granite cobbles as well as exposing the existing dock walls (subject to separate LBC). The remainder of the hard landscaping will involve a range of new granite paving and exposed aggregate concrete "block" paving. The construction strategy will involve commencing the external works as soon as the areas are available following the stadium construction. The underground

services, including foul and surface water drainage and power for lighting requirements, will be the first activity. The external work construction will be progressed on several fronts with two delivery teams.

The completion of the forming of the openings in the listed Regent Road Wall will take place at this stage; the proposed structural sequence comprises:

- Full-height openings to be made in the wall during construction activity, with granite facing stones and rubble fill from removed wall portions to be stored safely on site, as required. The openings will be cut with a large diamond saw to the exact line ready to receive the steel plate lining. The first opening created during the early phase of the construction programme will be subject to the installation of appropriate security Hoarding and pedestrian access gates.
- Care will be taken to keep granite facing stones intact in removed portions of wall, and excavations and demolition works will proceed with techniques to minimise vibration, to manage the risk of damage to adjacent retained elements of granite wall and foundation. Vibration and verticality monitoring on the retained wall is recommended during the works.
- Once the site is ready, foundations will be installed at the new opening locations. New reinforced concrete pad foundations will be adopted. At the interface with the existing wall, similar foundations will be created and tied into the existing foundation to prevent differential settlement between old and new. If required, the end of the existing wall may be underpinned to provide additional robustness.
- New steel framing to be installed at vertical (i.e. 'goalpost') and horizontal (i.e. 'lintel') positions to provide vertical and lateral support at new openings. This frame to consist of vertical steel columns and a steel square hollow section (SHS) base rail to provide support to the lintel cladding.

The physical works to the wall will be subject to the appropriate Listed Building Consent (LBC) submission.

The soft landscape will follow the hard landscaping, but to suit the planting season.

5.12 Stage 12 – Testing, commissioning and move to fully operational

Our specialist Commissioning Manager will develop an integrated Project Commissioning and Soft Landings Plan during the PCSA stage to accommodate all activities – including fabric, HV/LV, gas, water, and life safety services, smoke extract, PAVA and emergency lighting – along with specific training for end users to enable the shift from construction to operation. Working closely with the construction team, our Commissioning Manager will map activities, constraints and risks systematically through pre-commissioning, integrated system commissioning and system operation, to ensure all assets are thoroughly tested and proven.

Early understanding and planning will be key to mapping the commissioning of sitewide services, which link to the main areas and back into the control rooms. An important activity for the Commissioning Manager will be to work closely with the MEP Coordinator and construction teams to make sure these areas and systems are aligned across each work area.

We will use a systematic approach for commissioning activities, including an online commissioning portal to ensure the integration of all systems and provide a fully operational and commissioned facility.

No process will begin until job-specific method statements and risk assessments have been submitted and signed off. Similarly, each activity will only be progressed to the next commissioning stage when it has been checked and signed off using Field View by the relevant individuals. Our established systems, which will be in place electronically on Field View throughout the testing and commissioning period, include:

- Risk assessment and method statements
- Mechanical and electrical rules and procedures
- Isolation and controls procedures
- Access to plantrooms and permits to work
- Requests for power

We will engage with key stakeholders, including FM teams and statutory authorities, throughout every phase of the project, with our Commissioning Manager and team holding regular planning and progress meetings.

We will prioritise commissioning of the MEP infrastructure, providing planning for power, data, water, air to ensure availability as required for sectional completions. Our commissioning process considers flushing, cleaning and disinfection at the appropriate times. Our commissioning teams will produce full training plans, containing details of how the FM team are to be trained and instructed on plant and equipment. This will form part of our Soft Landings Plan.

Once we have satisfied ourselves with the commissioning of the stadium, we will move the project to the operational readiness and test event phase, in conjunction with Everton Football Club.

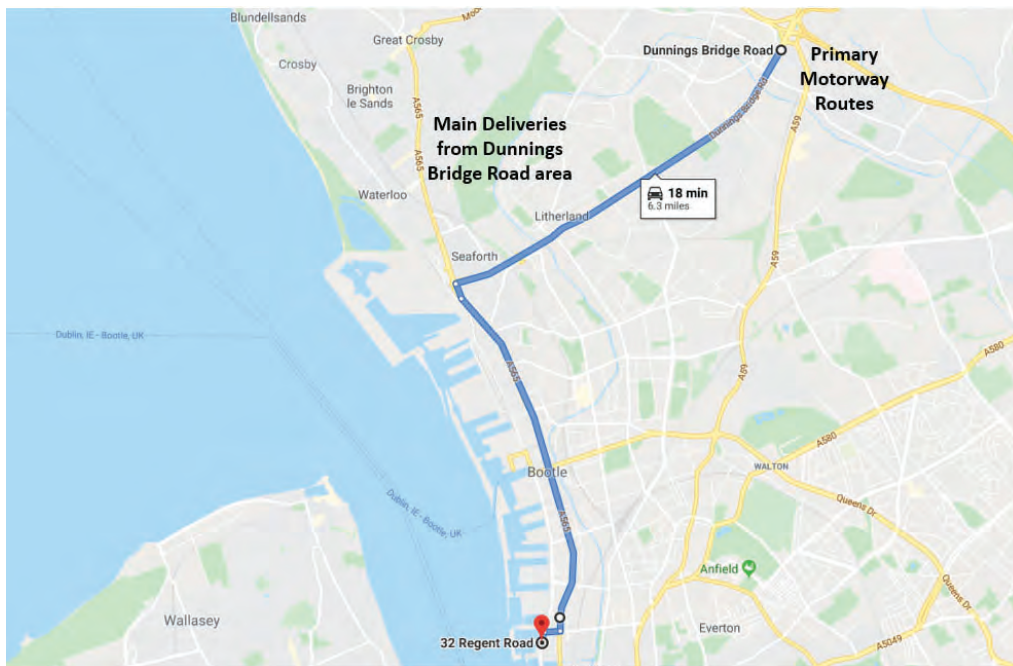
Building Control, the Safety Advisory Group and the Everton Football Club stadium operational team will be an integral part of the entire design and construction process, to ensure issues are addressed as they are identified. This will result in the smoothest possible transition into the operational phase.

6. Site establishment and logistics

The site establishment and logistics will be developed into a series of plans

6.1 Traffic management

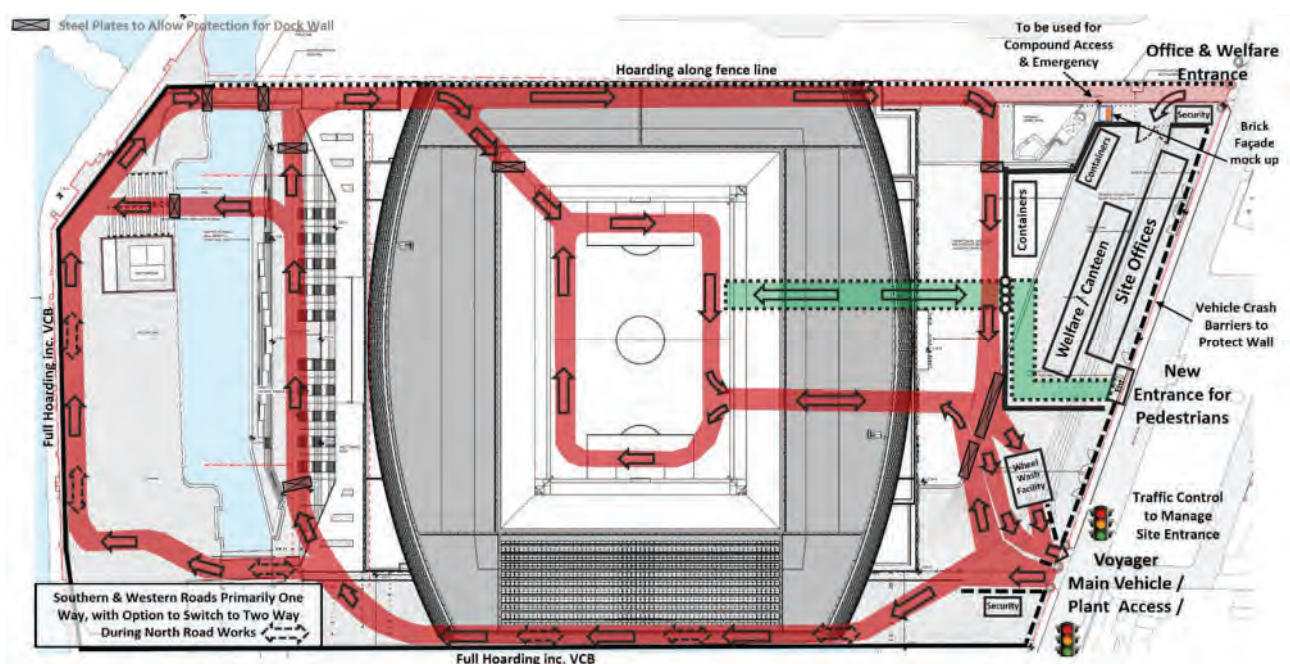
Site vehicle routing



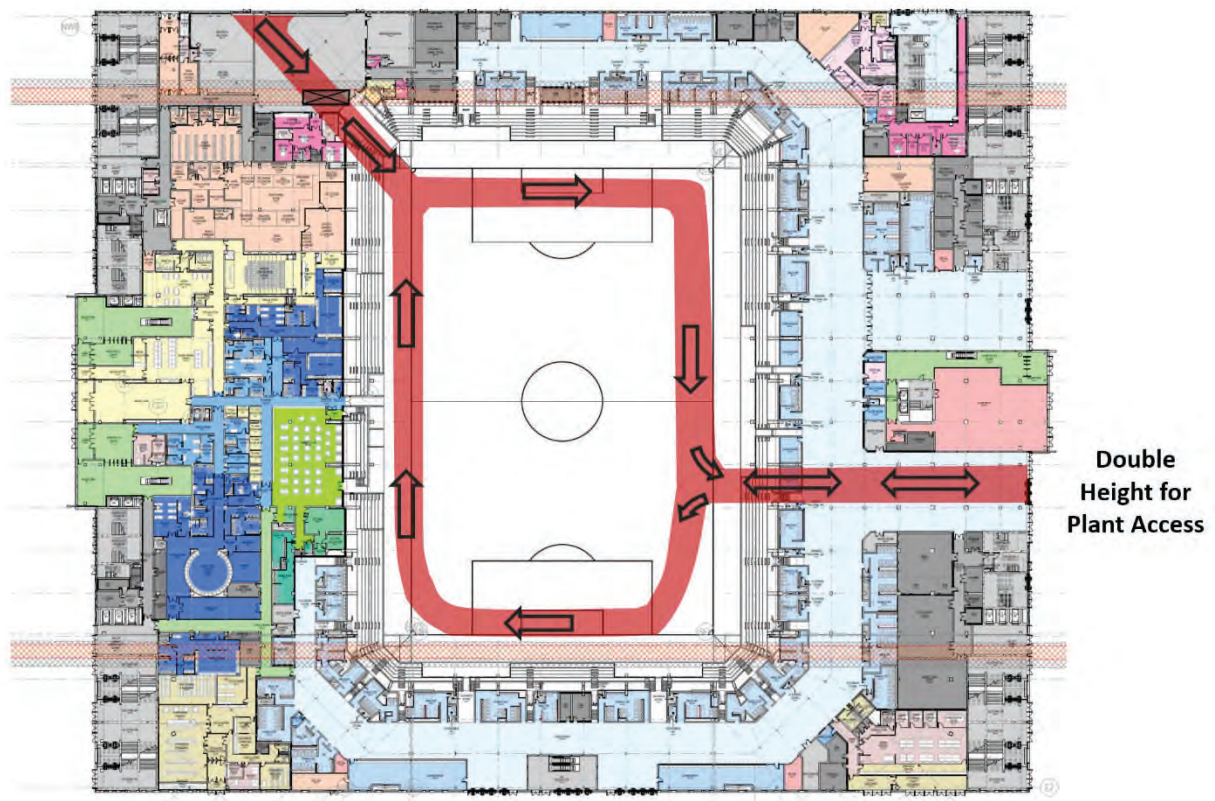
The main logistics route will be via A5035 Dunnings Bridge Road and A565 Derby Road. Local access to the site can be via Boundary Street, Sandhills Lane or Bankfield Street.

Overview of haulage roads around site, including access points.

Site Logistics plan



Internal route for plant and deliveries.



Below is an early forecast of the predicted phases and typical average daily delivery plan that will support the work required.

	Weeks	1–25	26–50	51–75	76–100	101–125	126–150
Enabling Works	Whole site	25					
Substructure	North	12	12	6			
	South	20	12	6			
	West		10	8			
	East		10	8			
Structure	North		6	4	3		
	South		6	4	3		
	West			5	6	4	
	East			5	6	4	
Envelope	North			5	8		
	South			5	6	5	
	West				6	8	
	East				5	8	
Roof	North				5	2	
	South			2	5		
	West					5	
	East					5	

	Weeks	1–25	26–50	51–75	76–100	101–125	126–150
Fit out	North				4	5	4
	South				4	5	4
	West				8	10	10
	East				8	10	10
Wind Struct			6			8	8
Externals					6	6	6
Pitch						4	4
General		7	7	7	7	7	7
Total		64	69	65	96	96	53

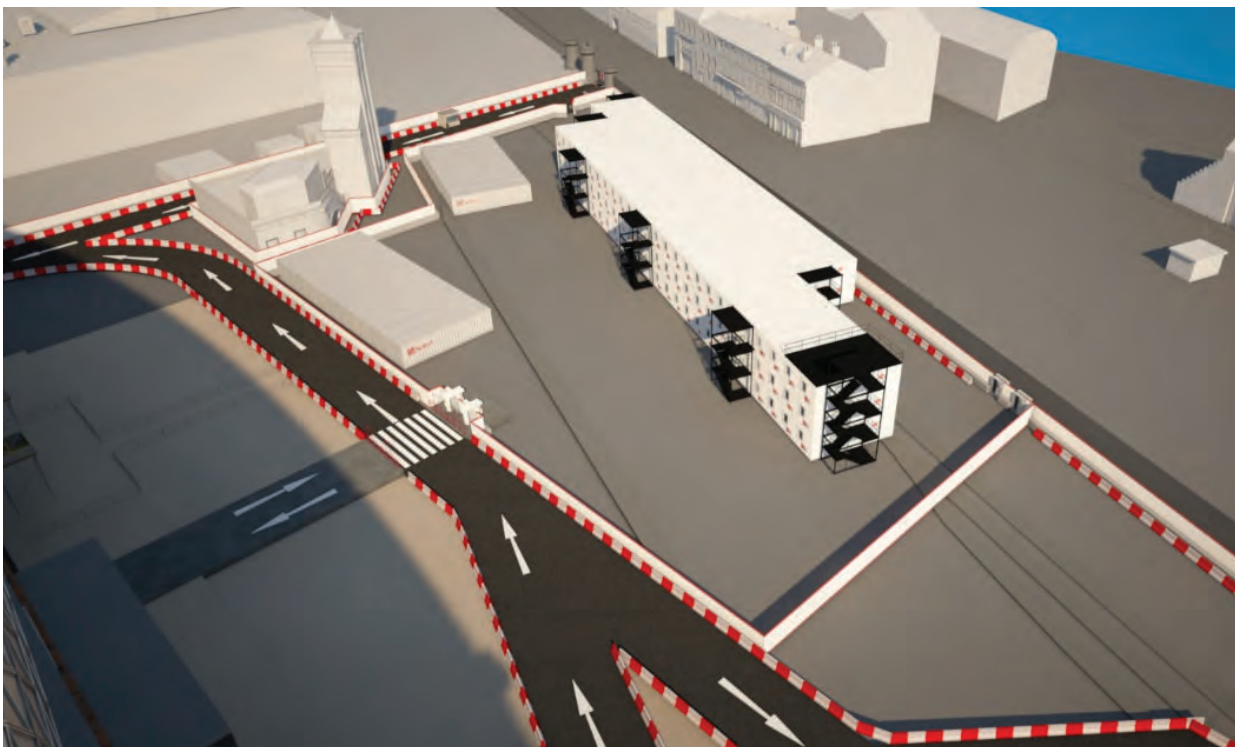
6.2 Site establishment

The site establishment will identify the following information:

- Site accommodation location
- Site access/egress
- Hoarding lines

Site temporary accommodation will consist of all welfare facilities. For the personnel on site, this will be designed for an average of between 800 and 900, with a peak of c.1,300 operatives (including subcontractors) during the internal phase. This will be supported by c.300 staff members that should be more a consistent count through the construction programme.

This will be positioned in a separate area away from the main construction works.



The site will be secured with a minimum 2.4m-high Hardstaff hoarding – which is essentially a concrete block (VCB) with a timber facade (Hoard-it system) on the outside. This will resist vehicle loading adjacent to the highway, as well as avoiding the need to excavate near live services. It is easy to install and alter as and when required, with all components being reusable. Hoardings will be inspected on a daily basis and maintained when required. Lighting on all hoardings in the highway will be provided.

Acoustic hoarding will be installed on the western site boundary to mitigate potential noise impacts on wintering birds associated with the surrounding European designated sites as far as practicable. There will also be an Ecological watching brief present throughout all noise generating construction activities during the winter months to ensure no unacceptable impacts arise.



Hardstaff hoardings external view



Hardstaff hoardings internal view

All pedestrian access will be via Aurora control booths (face recognition) from the site accommodation.

It is recognised that working in a dock site there will be precautionary actions taken to prevent falls into the water. This will be primarily addressed during the early stages of the project while the dock is being filled, while the plan is to start on the substructure to the North and South stands. VCB barriers will be positioned to steer transport and operatives away from dock edges to avoid accidents.

Later in the project, the South Stand erection and roof build will also present risks, due to the neighbouring dock (Nelson Dock) south of the structure. All preventative methods will be considered ahead of the build, though emergency procedures including a manned boat could offer a solution to support all related risk assessments.

6.3 Site logistics

- Contractor parking arrangements
- Working hours
- Site security and lighting

Contractor parking arrangements

Due to the scale of construction work in the area, Laing O'Rourke proposes a plan for reducing vehicle movement in the area and intends to promote its Green Travel Plan within the workforce.

The following forms the basis for our Contractor's Code of Conduct, relating to access and parking:

- No private vehicles are allowed on site. Contractors' employees (including management and subcontractors) arriving by car must park in one of the city-centre car parks and pay the applicable fee, or find alternative parking away from the city
- Managers / operatives / subcontractors are all actively encouraged to use public transport, cycling lanes and park-and-ride schemes in the area
- Contractors' works vans shall only be permitted onto site following prior agreement with the Logistics Manager and shall park in designated areas. Contractors' works vans parking is only allowed if the vehicle is required to complete the contractor's works. Additional arrangements can be made to allow for loading and unloading of equipment on site
- Deliveries will be allowed access to the site, but are to depart immediately after any unloading has been completed
- No vehicle, plant or materials shall block any access/egress route at any time
- Laing O'Rourke operates a zero-tolerance policy towards abuse and aggression. Any instances of abusive or threatening behaviour towards the Logistics Manager / gatemen / security will result in refusal of entry and an official report of the abusive conduct being sent to the works contractor's Head Office
- Operatives and staff will be actively discouraged from parking on the street near the site. We plan to arrange a remote car park away from the site, to discourage traffic from driving close to the site and parking in the local area. If needed, a shuttlebus arrangement will be included to transfer staff and operatives to and from both locations

Working hours

Site working hours will generally be 0700–1900 Monday to Friday and 0700–1300 on Saturdays.

No works are planned for Sundays or Bank Holidays.

Some work outside of normal working hours will be required at times; this will be agreed with Liverpool City Council (LCC) in advance in writing.

At the initial phase of the project, we are required to fill the dock with imported material. This will be managed through a dredging method that is required through sea transportation. This is typically done through a 24-hour / 7-day approach. These working hours will only be used through this phase upon agreement with all parties.

Power floating the floor slabs may need to continue late into the evenings and sometimes overnight, depending on environmental conditions and the concrete setting process. This activity will be subject to localised 'task' lighting.

Site security and lighting

Security arrangements will ensure unauthorised access is prevented at all times to the work areas. This will include facial recognition access turnstiles provided at the entrance to site. All staff/operatives will undertake a detailed, project-specific induction before being issued with access.

The site will be secured and monitored with two security guards and CCTV outside working hours.

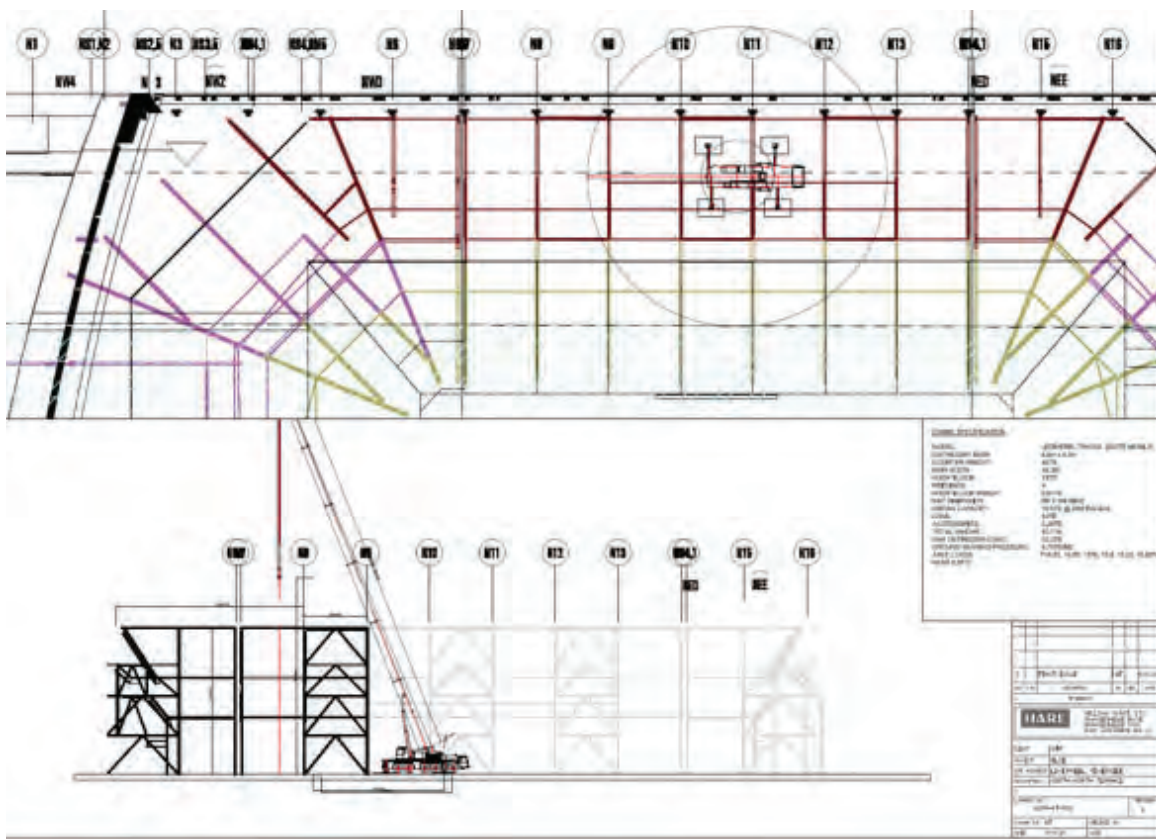
All site lighting will be LED energy efficient and kept low level and angled to point into the site. Lighting will be switched off outside of working hours.

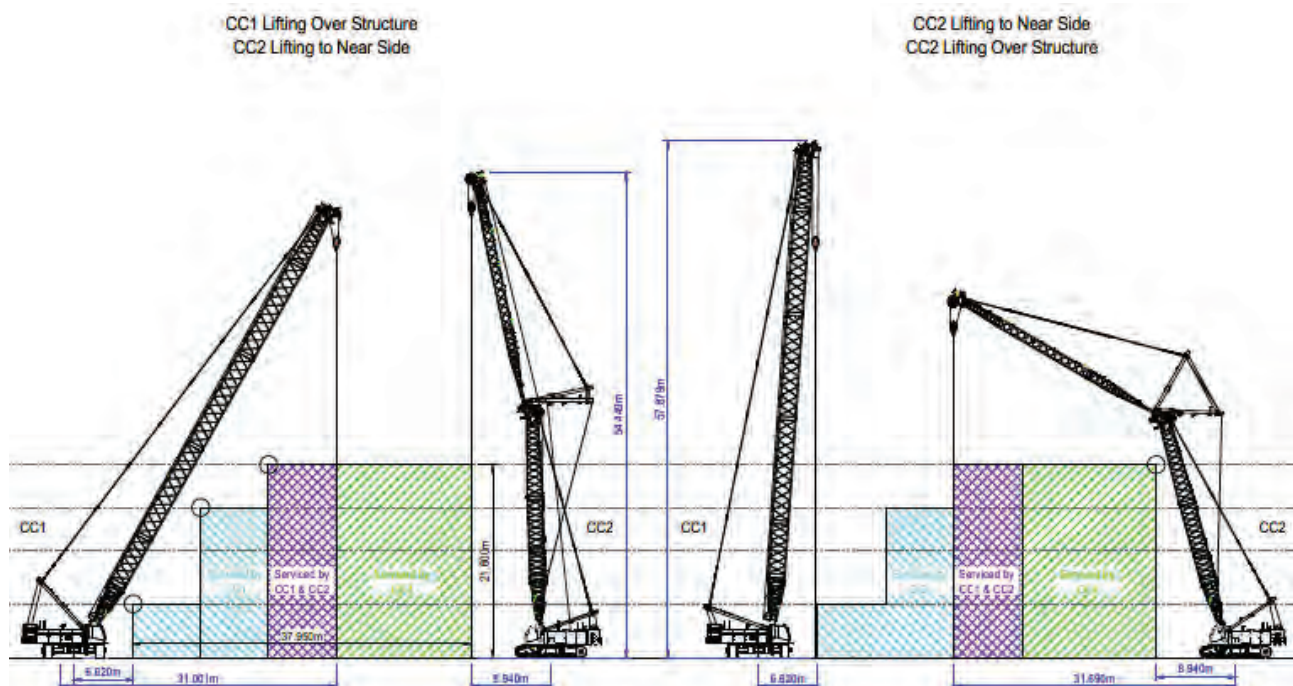
Site lifting strategy

In view of the exposed nature of the site and anticipated high winds, along with the likely weight of components required in the construction. Individual cranes will be sized to suit the component they are required to lift. These will range from a 200te mobile crane for the South Stand steelwork and precast, up to a 600t crawler with superlift for the North and South roof trusses.

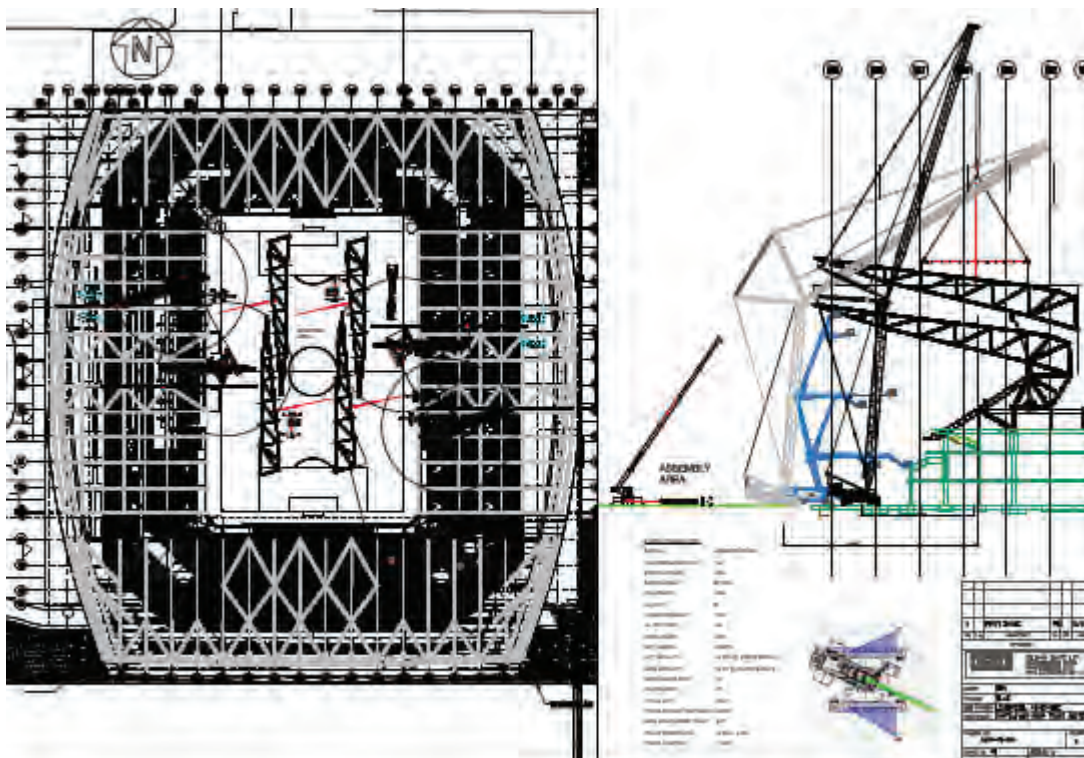
The craneage strategy once finalised will be notified to the CAA, obstacle warning lights are often installed on all cranes.

North and South Stand steelwork and precast





East and West Stand roofs



6.4 Fire and emergency

The Fire and Emergency Plan for the site will be set up ahead of commencement, with the agreed muster point to be positioned outside the stadium footprint, close to the accommodation compound.

7. Health and safety (H&S)

The project will be managed in accordance with Laing O'Rourke's Safety Management System (SMS), which complies with OHSAS 18001 and BSEN 14001.

The principal site document will be the Construction Phase Health, Safety and Environmental Plan. This will include:

- Details of all significant parties involved in the scheme
- Existing records of the building
- Management structure and appointments
- Communication strategy
- Arrangements for monitoring H&S performance
- Selection and control of subcontractors
- First aid arrangements
- Accident and incident reporting arrangements
- Arrangement for controlling significant site risks
- The H&S file

Management and planning

Other separate documents to this plan will include:

Health and safety is an integral part of the planning process for each project. Implementation of Laing O'Rourke's comprehensive H&S system and procedures will ensure every facet of the construction process is planned, managed, and monitored. This will also ensure compliance with statutory obligations.

Designers and contractors engaged on the project must be competent and adequately resourced. This will be achieved by:

- Completion of prequalification H&S questionnaires
- Interviews, to ascertain compliance with their legal duties
- Review of existing H&S policies and procedures
- Review of their H&S performance and site visits

Laing O'Rourke as principal contractor will produce a detailed construction programme based on the current information and pre-tender plan. The plan will set out the arrangements for managing and monitoring the project. Sub or trade contractors engaged by Laing O'Rourke to carry out works will be issued with this H&S Plan so they can integrate the project management philosophy into their H&S plans. The project team will implement the plan, assisted by the Laing O'Rourke's H&S advisers.

As part of our policy, all persons on the project will be encouraged to express their views and concerns about H&S. This will be achieved by various means, including:

- Project H&S committees
- Safety representatives from each contractor
- Toolbox talks including a feedback process
- Discussion and briefing on method statements and risk assessments
- General engagement with the workforce

An 'open door' policy will be employed, whereby all staff can discuss H&S issues with any member of the project team. Site noticeboards, toolbox talks and posters are used to convey environmental and H&S information to all site team members.

Where individual contracts are required (e.g. for waste removal) these will incorporate relevant requirements in respect of environmental controls, based largely on the standard of 'good working practice' as outlined in the Construction Phase H&S Plan, as well as statutory requirements.

Potential subcontractors will also be required to demonstrate how they would achieve the provisions of the Construction Phase H&S Plan, how targets will be met and how potential effects will be minimised.

Contractors will be required to comply with all provisions of relevant legislation, including:

- Control of Pollution Act, 1974, Part IV
- Health and Safety at Work Act, 1974

- The Clean Air Act, 1993
- Environmental Protection Act, 1990

All trade contractors' method statements and visual task sheets will be required to address the specific issues that may have a disruptive effect on the local community identified in the Construction Phase H&S Plan, including:

- Noise and vibration
- Local air quality and dust emissions
- Parking
- Deliveries
- Waste management
- Operatives' behaviour

8. Environmental

The environmental aspects of the project will be managed in accordance with the project Construction Environmental Management Plan (CEMP) and Laing O'Rourke's environmental management system (EMS). The environmental controls and mitigation measures to eliminate, reduce or offset likely significant adverse environmental effects during the demolition and construction phase are identified below. It is anticipated that these controls would be secured by appropriate planning condition or obligation:

- Preparation of a CEMP in line with ISO 14001, which clearly sets out the methods of managing environmental issues for all involved with the demolition and construction works, including supply chain management
- Requirement to comply with the CEMP included as part of the contract conditions for each element of the work. All contractors tendering for work will be required to demonstrate that their proposals can comply with the content of the CEMP and any conditions or obligations secured through the planning permission
- In respect of necessary departures from the above, procedures for prior notification to LCC and affected parties would be established
- Establishing a dedicated point of contact and assigning responsibility to deal with demolition- and construction-related issues if they arise. This would be a named representative from the construction team
- Production of a regular newsletter to be circulated to surrounding neighbours and authorities
- Regular dialogue with local stakeholders and regulators

Preparation of the EMP is an established method of managing environmental impacts resulting from demolition and construction works.

We will assess the potential impact of the proposed development on water resources in the Environmental Risk Assessment. Laing O'Rourke will ensure that any water that comes into contact with contaminated materials during construction is disposed of in accordance with the Water Resources Act (1991) and other legislation, and to the satisfaction of the Environment Agency (EA) and sewage undertakers. In addition, any risk will be reduced as far as practicable by adopting good management practices and relevant measures described in the EA's Pollution Prevention Guidelines (PPG6).

To ensure that suitable subcontractors are appointed, all potential subcontractors will have their environmental credentials vetted and asked to submit their company environmental policies and procedures.

The EMP would be submitted to all relevant bodies prior to commencement of the works. Compliance with the EMP is anticipated to be secured by appropriate planning conditions or obligations.

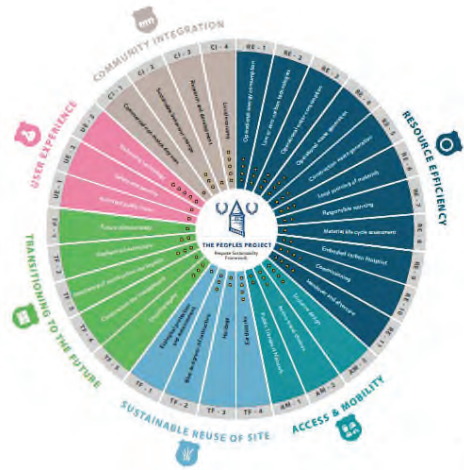
The EMS will also be developed to address and monitor the following issues:

- Everton Football Club sustainability framework and Sustainability Employer's Requirements (SER) document
- Applicable environmental legislation
- Pollution
- Nuisance (noise, vibration, dust, emissions, light)
- Public relations

Applicable environmental legislation will need to be identified in a register, to ensure that appropriate systems are put in place to comply with the legal requirements in question.

8.1 Everton Football Club sustainability framework

The client's team has developed a project-specific sustainability framework addressing a number of areas where principles of sustainable development could be implemented.



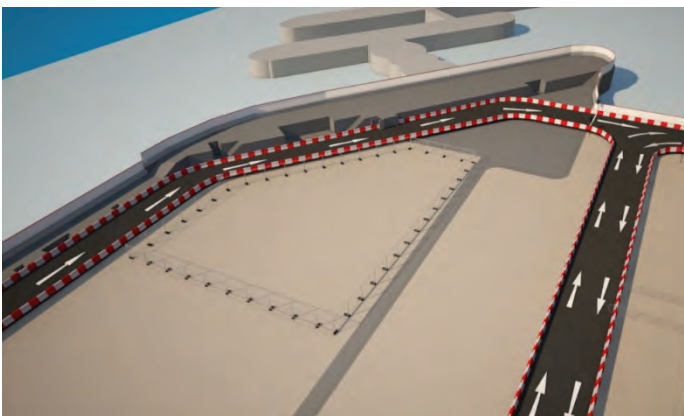
As a result of this, a detailed Sustainability Employer's Requirements document with project-specific targets and objectives have been developed. The document covers all phases of the development and sets out targets and objectives for all parties (client, wider design team and principal contractor). The document is due to be approved by the client's team; once finalised, it will be fully incorporated into the project's EMP and its deliverables. All are noted in the current version of the SER tracker.

8.2 Resource Management (Waste)

The project will develop an RMP to demonstrate selection of materials to minimise waste, types and quantities of waste that will be produced and targets established. It will identify how waste can be reused, recycled, or recovered.

There is an overarching aspiration to minimise waste generated during the project. Excavation waste is of particular interest, and the project's ambition is to be waste neutral. In order to achieve this, we will develop a site-specific Materials Management Plan (MMP) which will allow for reuse of all excavated materials that meet the engineering specification. The MMP will be pre-agreed with the local authority and EA.

Excavated materials will be stockpiled on site immediately after excavation, where they will be appropriately graded and separated. Dedicated testing (geotechnical and geo-environmental) will be agreed with LCC and the EA and put in place to ensure compliance with the pre-agreed MMP. Once materials are confirmed as suitable for reuse, they will be placed in dedicated locations. Engineering records will be kept for the purpose of verification. This approach will ensure that the amount of excavation waste is minimised.



Construction waste will be generated during all stages of the construction programme. However, this will be carefully managed and cleared to prevent nuisances such as litter, dust, odour and pests, and to maintain a 'clean' working and site environment, for the benefit of all parties. Major sources of waste within the construction process are anticipated to include:

- Surplus soils from construction

- Packaging – plastics, pallets, expanded foams, etc
- Waste materials generated from inaccurate ordering, poor usage, badly stored materials, poor handling, spillage
- Liquid wastes, other than surface water run-off and foul drainage, such as waste oils and chemicals

During the demolition and construction phases, requirements for the management of waste will be communicated to all subcontractors to ensure waste is managed in accordance with the waste hierarchy and relevant statutory controls. These measures will be controlled through the EMP and RMP, in consultation with the relevant authorities.

The RMP will also detail waste generation and landfill diversion targets once agreed (see also Sustainability Employer's Requirements). At this stage, we envisage the project's aims to be:

- Landfill diversion rate (non-hazardous construction waste) – 95%
- Waste generation (non-hazardous construction waste) – 6.5T/100m² GIFA with a stretch target of 3.2t/100m² GIFA (when an extensive offsite manufacturing solution is used)
- Use of closed loop recycling schemes such as community wood recycling

The Government removed the statutory requirement for site waste management plans (SWMPs) in England in October 2013. However, because SWMPs were considered good practice, an RMP will be produced to ensure that demolition and construction wastes are dealt with in an appropriate manner and in accordance with the waste hierarchy.

Procedures for the segregation and storage of waste will be detailed in the RMP. This will include the use of colour-coded skips to facilitate segregation for reuse and recycling; inspection of containers to ensure they are fit for purpose. There will not be any mixing of hazardous and non-hazardous wastes

For waste removed from the site, notification by the Contractor/Construction Manager for approval (via consultation with the authorities) will take place. Loads will only be deposited at authorised waste treatment and disposal sites. Deposition will be in accordance with the requirements of the EA and all relevant waste legislation.

Any person removing waste from the site will hold a current waste carrier licence, and all waste will be received at an authorised waste treatment or disposal facility. The nominated person(s) with responsibility for waste will ensure that all relevant authorisations are in place prior to removal from site. No burning of construction waste will be undertaken on the site.

In addition, removal of any non-hazardous waste from the site will be accompanied by a waste transfer note, signed by the producer and carrier of the waste, and correctly completed in accordance with the Environmental Protection (Duty of Care) Regulations 1991 (as amended). This will apply to the removal of solid and liquid wastes (other than surface water run-off and foul drainage).

To prove the correct depositing of waste material and prevent the occurrence of fly-tipping, removal of any hazardous waste from the site will be accompanied by a hazardous waste consignment note, signed by both the producer and the carrier of the waste, and correctly completed in accordance with the Hazardous Waste (England and Wales) Regulations 2005. This will apply to the removal of solid and liquid wastes (other than surface water run-off and foul drainage).

Waste generation and disposal data will be captured via Laing O'Rourke's internal 'IMPACT' system in order to provide accurate records and monitoring against project waste generation and landfill diversion targets.

8.3 Air Quality and Dust management

The principal concerns relating to air quality are emissions from construction activities in the form of dust and fumes. The degree of dust deposition is usually dependent on the nature of the works.

During periods of greater risk of dust creation, demolition, bulk dig, external works and through dry periods, we will carry out the following activities to minimise the dust and dirt emitted by the site:

- During demolition, water suppression will be used on the demolition machines to dampen down at the point of source (Internal soft stripping will also be undertaken). This will be enhanced with mist cannons, to dampen down areas where materials are stacked prior to being removed from site
- During the main works, a dampening water bowser will be used to keep dust on site to a minimum. This can also be towed behind various site vehicles
- Inside the building, we will use vacuums of different sizes to remove any dust that is generated by the construction works; brushes will not be used
- Skips will be emptied regularly and all skips that are removed from site will be sheeted over before leaving the site boundary

- Hardstanding and sealed internal haul roads will be provided where most vehicle movements occur
- Control measures and dust suppression techniques, including reuse of site-won water to minimise resource use on the project
- Vehicles leaving the site will be covered to reduce dust generation
- Orientation, shape and locations of stockpiles will be planned and controlled, to minimise the risk of dust rising through wind action
- Measures such as screening and covering will be used, as appropriate
- A jet wash pull-along bowser will be used to clean the wheels of vehicles as they exit site, this will minimise and reduce the risk of dust emissions and deposition of material on the public highway
- We will ensure appropriate selection and maintenance of construction vehicles, plant and equipment (eg using vehicle and plant which produce less emissions and are regularly serviced)
- Erect screens and barriers round dusty activities
- Plant and equipment will not be left running for long periods when not directly in use
- Electrically powered plant will be selected instead of petrol or diesel, where possible
- No waste or unwanted material will be burned on site
- Regular checks will be undertaken to monitor dust levels on and off-site.

8.4 Wash management strategy

During construction, and especially excavation, we envisage that an element of spoil will be picked up on the wheels, delivery wagons and muck away wagons (if any). It is our intention to put the following procedures in place:

- All roads and hardstandings on site to be stoned up as a minimum standard. The Eastern area of site will have temporary tarmac laid to encourage tidier access for vehicles to the main highways.
- The gateman will have full access to the wheel wash or a jet wash and wheel cleaning kit that he will use to clean the wheels of lorries that require it



- During muck away periods (if any – see waste minimisation strategy above) a road sweeper will be employed to clean Regent Road outside the site

8.5 Noise and vibration management strategy

A construction noise assessment has been undertaken in accordance with BS 5228:2009 which demonstrates that noise from daytime construction activity on the site is not considered to be significant. Despite the favourable assessment, a number of additional mitigation measures will be adopted to keep construction site noise to a minimum. These are detailed below and are derived from BS 5228-1:2009.

Working hours will be limited to those specified by LCC either in the planning permission or in general standing advice to building activities. Any necessary works outside these hours will be prearranged with LCC.

The main sources of noise on site will be associated with the use of plant and machinery demolition, dock filling and construction activities.

8.6 Noise and Vibration

Noise and vibration monitoring

Noise levels from potential construction activity have been assessed in accordance with BS 5228 criteria which indicates if a significant effect is likely to occur at noise sensitive properties. The results indicate that the noise

levels at the façades of the existing and proposed noise sensitive properties would be within the recommended criteria.

The assessment also demonstrates that external LAeq noise levels from construction noise is predicted to be within the TIDE Low Noise Level Effects criteria of 55 dB at sensitive receptor locations whilst moderate noise level effects may occur within this distance. Noise levels from construction are likely to be below the levels at which interference with bird calls / communication / hunting habits etc would be expected at distances of 50m from the site. At distances of less than 50m, effects of visual stimuli and the presence of machinery/operators are expected to be greater than the effects of noise alone.

However, it is envisaged that local noise monitoring will be carried out on site periodically during the demolition and other noisy activities. The locations chosen will be as close to the baseline monitoring locations as possible in order to provide like-for-like comparison.

Vibration monitoring will be undertaken during the construction phase; monitoring will record ppv, max displacement, VDV and acceleration. Measurement will generally be undertaken in accordance with the procedure described in BS ISO 4866:2010: Guidelines for the measurement of vibrations and evaluation of their effects on structures. Baseline monitoring to be undertaken on Grade II listed Dock Walls and Hydraulic Tower prior to works starting (minimum 2 days) on site to establish appropriate monitoring trigger levels for vibration and displacement.

Source noise control measures

- Unnecessary revving of engines and switch off equipment will be put in place
- Demolition will involve deconstruction rather than heavy breakers where possible
- Ground obstruction clearance will involve bored techniques rather than mechanical breakers where appropriate
- Drop heights will be minimised when loading vehicles with demolition waste
- 2.4m solid wood hoarding will be erected around the perimeter, within existing substantial boundary wall.
- Tools/plant to be fitted with silencers where possible
- Quietest plant selection will adopted
- Power supply to be established as soon as practicable to minimise reliance on generators

Construction-specific noise control measures

- Piling is typically one of the most intrusive noise sources associated with construction works; as a result, bored piles or CFA piles are proposed rather than driven
- The site will also maximise the use of off-site-manufactured precast units to minimise noisy *in-situ* concrete activities, including concrete deliveries
- Steel will be preassembled off site where possible
- Early construction of the roof and cladding, ahead of fit-out
- Use of acoustic screens for particularly noisy activities such as concrete cutting
- Control of deliveries (through Voyage Control software) including just-in-time deliveries with no waiting or queuing outside, engines switched off when not needed, speed reduction measures in place and reversing discouraged
- All vehicles and mechanical plant will be maintained in good order and operated in a manner which minimises noise emissions
- Plant to be turned off when not in use
- Regular and effective maintenance of plant and machinery will take place.
- Acoustic hoarding will be installed on the western site boundary to mitigate potential noise impacts on wintering birds associated with the surrounding European designated sites as far as practicable
- Ecological watching brief present throughout all noise generating construction activities during the winter months to ensure no unacceptable impacts arise

Record keeping and Community Relations

The following records will be kept on site and made available to interested parties for inspection upon request:

- Noise and vibration monitoring data

- Relationship building with people living and working in the vicinity of the site
- Monitoring equipment calibration certificates
- Details of complaints received and actions undertaken to resolve these

8.7 Water management

Due to the sensitive location of the project, it is imperative that good water management practices are observed on site. There are three main areas of concern: dewatering, concrete washout and pollution prevention measures.

Dewatering

It is envisaged that there may be a requirement to dewater excavations on site. Should that be the case (and depending on exact quantities and locations) Laing O'Rourke will liaise with the EA to obtain all required abstraction consents and ensure that the discharge element is also permitted. There are a number of potential methodologies and hence a number of regulators or companies to engage with (EA, UU, Peel Ports, Marine Management Organisation – MMO). Once details are confirmed, plans will be drawn up to clearly identify:

- Dewatering areas
- Volumes of water to be abstracted
- Details of water treatment required (e.g. silt removal)
- Monitoring and reporting regime
- Discharge location(s)

Concrete washout

The water used to clean concrete wagon discharge chutes carries two issues: high pH and high suspended solids content. Therefore, concrete washout waters will be treated using Siltbuster's roadside concrete washout (RCW) unit (or similar) with automatic dosing CO₂ gas to bring the pH to within neutral limits. The system also uses a geotextile bag to remove the suspended solids from the water. The unit is mobile and can be deployed to concrete pour areas, providing ease of use and access. The recovered solids will be sent off for recycling/reuse off site.

Site water quality monitoring will be established in line with set conditions (e.g. by the discharge consent). At this stage, we anticipate two parameters being of interest – pH and suspended solids content.



Real-time monitoring of the pH value is available within the RCW concrete washout unit. Laing O'Rourke will maintain records of pH readings in the concrete washout unit (inbuilt pH meter) and/or at the final treatment point, prior to discharge (depending on permit requirements).

Record keeping

Water usage will be monitored on site via local metering wherever possible. This is to ensure accurate usage data is available to measure progress against set project benchmarks and minimise excessive consumption.

Laing O'Rourke's internal IMPACT system will be used to record data and provide monthly reporting to the client's team.

Pollution prevention

General principles of pollution prevention will be implemented on site. This will include initiatives such as:

- Carrying out wheel washing activities in dedicated bunded areas
- Live draining will have silt traps or 'witches' hats' installed to prevent silt deposits
- Flood prevention measures such as storing fuel and chemicals away from drainage and water edge; sandbags available on site if needed to minimise water ingress
- Drainage plans to be well understood and communicated to all site staff

8.8 Ecology

- Nesting birds

Ecology surveys identified several nesting birds as present on site. It is therefore envisaged that birds may become a site constraint if the construction programme is not appropriately managed.

As a general rule, demolition and site preparation works will be undertaken outside of the nesting season. However, it is anticipated that this may not always be possible. In such cases, an Ecological Clerk of Works will be employed to ensure areas can be safely cleared if works need to be undertaken during the nesting season.

In accordance with the requirements of the Environmental Statement, the proposed mitigation for water birds comprises the placement of two floating pontoons in the adjacent Nelson Dock.

The size and detailed design of these bird rafts will be developed by specialist suppliers in conjunction with the ecologist and RSPB guidance to ensure they are appropriate to the target bird species, in this case Cormorants. The design will include methods for anchoring the pontoons to ensure they are secure, and their location within the dock will be agreed with the dock owner/operator to minimise impact on operational conditions.

Below are examples of similar pontoons/rafts installed on previous schemes

In accordance with the requirements of the Environmental Statement, the proposed mitigation for water birds comprises the placement of two floating pontoons in the adjacent Nelson Dock.

The size and detailed design of these pontoons will be developed by specialist suppliers in conjunction with the RSPB to ensure they are appropriate to the target bird species, in this case Cormorants. The design will include methods for anchoring the pontoons to ensure they are secure, and their location within the dock will be agreed with the dock owner/operator to minimise impact on operational conditions.

Below is an example of a similar pontoon/raft installed on a previous scheme.



- Bats

Following further survey and assessment, determination of provision of an alternative roost may be required where a licence application to Natural England will be needed.

- Aquatic Ecology

Due to the large number of non-native species within the site it is anticipated that a key requirement will be the preparation of a Biodiversity Security Plan (BSP) incorporating a Biosecurity Risk assessment. The pre-emptive preparation of a BSP will help flag up and address any key issues with the removal of species in this area which can support licence applications and be provided to consultees.

Fish rescue operation

Prior to the dock infill operation, fish will have to be removed from the dock area. As it is a bespoke package of work, a specialist marine ecology contractor will be employed to carry out the rescue operation ahead of the dock infill works commencing, as described above. The full Fish rescue plan can be found in Appendix A.

8.9 Wind Conditions

As the wind surveys for pedestrians suggest this is an exposed site and could be subject to high wind speeds on several days throughout the year, but site workers are less susceptible to uncomfortable winds than pedestrians.

For operatives working on site a specific risk assessment will be made to determine if it is safe for construction activities to proceed. Clearly this will depend on what the activity entails, i.e. if it is handling large sheets or materials that could attract wind load at height then the safe wind speed level would be lower than someone working with heavy small materials such as bricks or blocks at a low level.

As a guide if you are struggling to walk against the wind then it would not be safe to work in.

Major items of plant such as tower cranes, mobile cranes and platform hoists all have their own wind speed limits over which they cannot operate, many have automatic cut out mechanisms above the permitted wind speed.

8.10 Ground Contamination

Elevated localised contamination has been identified which required remediation, A site specific Remediation strategy will be developed to address these areas. A Materials Management Plan (MMP) will also be developed to efficiently re-use materials on site where possible.

8.11 Environmental Impact Assessment (EIA)

An EIA has been prepared to inform the planning application and MMO submission. The recommendations have been incorporated into the CEMP. It is, however, acknowledged that environmental mitigation measures may be amended through the planning application process. These will be incorporated into the project CEMP and environmental management procedures as details become available.

Energy and carbon management

In line with Laing O'Rourke's environment and energy management systems, we will aim to minimise energy usage on site, reducing carbon emissions. Some of the measures proposed for the project will include:

- Energy-efficient cabin set-up with a high level of insulation, PIRs, LED lighting and low-water sanitary fittings and white goods
- Generator use will be minimised as much as possible, with priority being given to mains power connection and electrical tools
- Priority will also be given to construction materials with a high percentage of recycled content or those from recycled and/or sustainable sources (e.g. FSC timber, BES 6001-certified products)
- Accurate energy consumption record keeping on Laing O'Rourke's internal IMPACT system to ensure fuel and energy data is monitored against set project targets and minimised where possible (including monthly reporting to the client's team)

9. Social sustainability

A sustainability strategy will be developed for the construction phase of the project. This Sustainable Construction Plan will include targets for:

- Inspiring the next generation (education)
- Inclusion (health and wellbeing)
- Creating a pipeline of future talent (apprentices) where we will review the requirements for onsite, offsite and heritage
- Supporting economic growth (employment and supply chain)
- Enhancing sense of place (community)
- Considerate Constructors Scheme (40 with minimum 7 in each category)

In association with Everton in the Community (EitC):

- Run programmes in partnership with EitC
Mirror their programmes using construction as a 'pull', as they do with sport
- Support young people to achieve their full potential
Offer an alternative to criminal behaviour
- Do things a bit differently and be innovative
Move away from traditional commitment to just numbers, ie work experience, school visits, combining these into meaningful and structured programmes where benefits can be seen
- Support adults on EitC programmes to the jobs market
- Continue engagement with the Boundary Street area
To link the new stadium with the existing EitC provision in Everton and the legacy project

Once the design is at Stage 4 and a final procurement strategy has been produced, the project will be in a position to allocate social sustainability targets to each work package based on their duration on site and the value of the works. Once at this stage, draft targets against the key areas outlined and agreed with Everton Football Club.

10. Communications and emergency contact

A Communications Plan will be developed for the project. This will include:

- 1 Complaints procedure – To ensure complaints are logged and dealt with promptly
- 2 Public relations – Regular liaisons with local residents and occupiers to mitigate the adverse effects of construction in the immediate area, by advising them of forthcoming construction activities and updating on progress. This may be in the form of newsletters, prearranged general meetings, or other visits

It is important to recognise the importance of the neighbourhood liaison role in ensuring the smooth running of site activities and their relation to local residents' and general public's welfare.

This represents a key function through which the coordination of site activities, the needs of the neighbours and the requirements of the statutory authorities are effectively communicated and resolved. In this way, all stakeholders are consulted and informed.

During the execution of the works, Laing O'Rourke will ensure all works are carried out safely and in such a way that it will not inconvenience pedestrians or other road users, and with a positive consideration to the needs of the local residents, site personnel and visitors, as well as the general public.

Laing O'Rourke will make regular progress updates, either as a leaflet drop to adjacent properties or via the management company and online facilities. Under the Considerate Contractors Scheme and in accordance with the target environmental standards, we will maintain regular dialogue with neighbours and provide regular updates on site progress and logistics.

Stakeholder engagement

In order to develop and maintain positive relationships with local residents and businesses, stakeholder engagement activities will be undertaken. This is a key process in construction noise management and it will comprise the following, all detailed in the communications section:

- Provision of site contact for any enquiries, issues or complaints
- Regular newsletter or similar to be distributed to all neighbours within the vicinity of the works
- Other forms of communication as appropriate (eg website, liaison meetings or similar)

Complaints procedures

Should a noise-related complaint be received from a local stakeholder, the following procedure will be implemented:

- 1 All received complaints will be recorded on the project Field View system
- 2 Initial response will be made where appropriate, eg immediate cessations of the noisy activity if applicable
- 3 Where appropriate, further investigation will be undertaken to establish the source/details of the noise, and corrective action will be undertaken
- 4 Details of the investigation outcome and actions taken will be relayed to the complainant
- 5 All actions will be recorded on the Field View system and the complaint will be closed on the system

Risks of noise, dust and air pollution will be considered for each proposed activity, and associated mitigation measures will be implemented.

In the event of an emergency, Laing O'Rourke has an emergency contact in place. This will be highlighted in the completed Construction Phase H&S Plan, as well as being displayed on the site noticeboards and hoarding.

Appendix D – Natural England DAS

Merseyside Environmental Advisory Service
1st Floor Merton House, Stanley Road
Bootle, Merseyside, L20 3DL
Director: Alan Jemmett, PhD, MBA

Enquiries: 0151 934 4951

Contact: Lucy Atkinson
Direct Dial: 0151 934 4953
Email: Lucy.atkinson@eas.sefton.gov.uk

DEVELOPMENT MANAGEMENT ADVICE

To: Peter Jones
Organisation: Development Management
Liverpool City Council

From: Lucy Atkinson

Your Ref: PreApp
File Ref: LI17-027
W/P Ref:
Date: 23rd June 2017

Proposed EFC Stadium, Bramley Moore Dock, Liverpool EIA Scoping Opinion

1. Thank you for consulting Merseyside Environmental Advisory Service in respect of this planning application. The proposals comprises involve infilling/partial infilling of BMD, demolition of non-listed structures, partial demolition of listed structures; construction of 60,000 seater stadium with retail, museum, ancillary offices, betting shop, associated facilities, concourse, 900 space car park, footways and public realm.
2. Having reviewed the application and supporting documentation, our advice is set out below in two parts.
 - Part One deals with issues of regulatory compliance, action required **prior to determination** and matters to be dealt with through planning conditions. Advice is only included here where action is required or where a positive statement of compliance is necessary for statutory purposes.
 - Part Two sets out guidance to facilitate the implementation of Part One advice and informative notes.

In this case Part One comprises paragraphs 3 to 42, while Part Two comprises paragraphs 43 and 44.

Part One

3. The applicant has submitted an EIA Scoping Report (*CBRE May 2017*) to inform the request and identify the EIA process and identify areas that will be scoped in and scoped out. The scoping opinion has been submitted under the 2011 Regulations

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but in the spirit of the 2017 Regulations will consider climate change, biodiversity, human health, major accidents and disasters. This is welcomed.

The EIA Scoping Report discusses the EIA methodology, phasing, the structure of the EIA, and the topics that will be scoped in and scoped out, as well as methods for assessing the impacts. The ES will also consider cumulative impacts with other significant developments and in-combination effects between different topics within the EIA. The report also refers to provision of qualifications and expertise of authors of the individual topic specialists.

4. The topic areas that will be scoped in are: transportation, air quality, noise, water environment, biodiversity, ground conditions, archaeology, heritage, townscape and visual amenity and socio-economics. In addition to this human health impacts will be considered under relevant chapters such as socioeconomic, air quality and noise and vibration. Climate change will also be considered under relevant chapters and will include vulnerability of baseline assessments to projected changes, vulnerability of proposed changes and the effect of proposed development within the context of climate change. The ES will also consider major accidents/disasters.
5. Also, the ES will consider the impacts on land particularly the change from a waterbody to an infilled site. I advise that consideration is also given to the impacts on the Port of Liverpool with respect to loss of this operational dock, and the displacement of existing businesses. For example, the dock is a minerals wharf for marine-won sand. NPPF paragraph 143 (bullet point 4) states that mineral wharves are safeguarded from development, and a recent aggregate assessment report for the NW (*North West Marine Aggregates Study, The Crown Estate November 2016*) identified the increasing importance of safeguarding wharfage for marine won aggregates in response to decreasing supply and minerals planning consents from land-won sources.
6. It is proposed that Solid Waste Management should be scoped down in the ES i.e. the scoping report indicates that scoped down technical topics are considered unlikely to exhibit significant environmental effects and does not merit detailed consideration in the main body of the ES document. I do not agree with this position as significant volumes of waste are likely to be generated during both the construction and operational phases of the development. This is discussed in more detail later in this memo.
7. I have not considered the proposed methodologies for each chapter as this will be role of individual specialists.
8. **In the main, I consider the submitted EIA Scoping Report satisfactorily addresses the issues that should be covered by the Environmental Statement and an appropriate basis for undertaking the EIA, subject to the following issues on specific topics/ES chapters being taken into account.**

Archaeology

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9. The proposed development lies within the World Heritage Site and its buffer zone. There are also a number of other heritage assets, both designated and non-designated, that lie within the proposed development and its redline boundary. Recent archaeological work at the adjacent Wellington Dock encountered the buried remains of a number of former Dock-related structures, and it would not be unreasonable to expect a similar state of affairs within the current proposals.
10. The proposal (section 6.10 & 6.11 of the CBRE Scoping Report), to include Chapters in the Environmental Statement on both Archaeology & Heritage, as well as the appointment of Oxford Archaeology North (OAN) to undertake the Archaeology desk-based assessment and walkover in accordance with ClfA standards and guidance, is welcomed, as is the statement on p.6.77 that:

“The study will identify and characterise the significance of the below ground archaeological assets identified. In accordance with the extent of that significance, it will identify strategies to record, preserve or manage those archaeological assets, and any necessity for further evaluation, where their character or value is not sufficiently defined. The assessment will be informed by WHS, national and local planning policy relating to the historic environment, and appropriate curatorial bodies will be consulted regarding mitigation strategy.”
11. MEAS can confirm that this approach is considered to be an appropriate means of quantifying the archaeological resource, assessing its significance and informing any mitigation required for the proposed development.

Ecology and Habitats Regulations

12. In support of the EIA Scoping Opinion request, the applicant has submitted an EIA Scoping Report (*CBRE, 15 May 2017, 150517_EFCStadium_Scoping_Final.docx, F1*) and a letter from the applicant's ecological consultant which sets out the proposed scope of the ecological surveys and assessments which will be undertaken to inform the Ecological Impact Assessment (*WYG, 10 May 2017, A100795*). I have reviewed these documents and make the following comments.

Desktop study

13. The proposed desktop study is to include consultation with the local biological record centre (Merseyside BioBank) which is welcome. The EIA Scoping Report refers to the use of aquatic ecology data from the NBN Gateway (now known as NBN Atlas). However, in accordance with the NBN Terms and Conditions, permission from the data provider will be required to use this information otherwise the data could not be relied upon during the determination of the planning application.

Extended Phase 1 Habitat Survey

14. I understand that the Extended Phase 1 Habitat Survey has already been undertaken and that no invasive plant species were recorded within the site.

Breeding birds

15. The breeding bird survey is proposed to comprise a single visit in April 2017, two visits in May 2017 and a single visit in June 2017. Considering the scale of the

proposals and potential impacts, weekly visits during the April to June period would have been preferable.

15. There was a common tern nesting site is present at the adjacent Sandon half-tide dock in 2015 which will need to be considered as part of a breeding bird survey. The Liverpool Bay proposed SPA extension, which lies directly adjacent to the application site, includes foraging areas important for common tern, from the Mersey Narrows and North Wirral Foreshore SPA, during their breeding season.
17. In addition to this, kittiwakes are known to breed on the outside of the Bramley Moore Dock wall and impacts upon this species as a result of the proposed development will need to be assessed. However, it will not be possible to view them for survey from the landward side. One option to enable a survey is to board the Mersey ferry, which runs adjacent to the breeding site, and take video footage of them, alternatively a small boat or drone could be used.

Bats

18. I understand that bat roost potential surveys of the structures on the site, including the boundary wall, have already been undertaken. Due to timescales, I advise that the applicant submits the bat roost potential survey report to the Council as soon as possible, to ensure that the recommendations made by the applicant's ecological consultant with regard to further survey requirements are acceptable. The survey report should include photographs and detailed descriptions of the buildings and structures which have been assessed.
19. The results of the aquatic surveys (see below) should be used to determine the requirement for bat activity surveys to be undertaken. If large aquatic invertebrate population, for example, flies or emerging larvae, are found to be present, bat activity surveys will be warranted.

Passage and wintering birds

20. Wintering bird surveys have been undertaken on the site from November 2016 to February 2017 inclusive, using two vantage points (VP1 and VP2). According to the applicant's ecological consultant, VP1 allowed for monthly bird counts of the site, whereas VP2 covered a wider area encompassing half way across the Mersey and adjacent docks.
21. The winter surveys have not included autumn passage and, from the vantage point locations which have been provided, it does not appear that the entire zone of influence of the proposed development has been included in the wintering bird surveys undertaken to date.
22. The applicant must ensure that further wintering bird surveys are undertaken to include autumn passage (commencing in September) and the entire zone of influence of the proposed development. A minimum of 36 hours vantage point survey will be required (in accordance with the current best practice for vantage point surveys (*currently Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms, Scottish Natural Heritage, 2014*)).



Aquatic Surveys

23. An integrated aquatic survey sampling methodology is needed to (i) characterize the aquatic communities / habitats present (ii) enable impact assessment to be completed and (iii) advise on any avoidance measures, mitigation and compensation needed. A key point will be to identify potential prey items, such as fish species, for any of the designation features of the Mersey Estuary and Liverpool Bay Natura 2000 sites e.g. cormorant / grebe, which form part of the overwintering water bird assemblage. The ROV survey will be undertaken of dock walls to provide information on the benthic communities present within the dock. The video must be of a good quality to ensure that benthic communities and any invasive species can be adequately identified and be recorded at different water depths. The applicant should also give consideration to undertaking scrapes of the dock wall to provide further information on the species present if the video quality is not sufficient as can occur within docks.
24. I advise that a biosecurity plan will be required in support of the application which describes how the spread of invasive non-native marine species will be prevented during the works. Grab samples of fauna within the dock sediment are also proposed. The grabs should be of a sufficient size and number to ensure that sampling effort is robust.
25. Sediment samples taken at the same time as the grab samples are also to be analysed for chemical contamination. This analysis must be undertaken at an accredited laboratory. The physical and chemical composition of the dock sediments to be removed and/or disturbed by the proposed development will need to be known to inform impact assessment and mitigation, re-use potential and disposal options e.g. environmental permit requirements.
26. The applicant's ecological consultant considers that sufficient data on water quality and fish will be available from existing sources. However, the sources and age of these data have not been specified and will be required within the Environmental Statement. They should be no older than 3 years.

Ecological Impact Assessment (EclA)

27. The proposed EclA should follow the CIEEM (2010 and 2016) guidelines. As part of the EclA, the applicant's ecological consultant proposes undertaking a cumulative impact assessment which is based upon details of schemes obtained from the Local Authority. However, in addition to the Local Planning Authority, details of schemes should also be obtained from other authorities, including Wirral and Sefton Councils and the Marine Maritime Organisation.

Habitats Regulations Assessment (HRA)

28. The applicant's ecological consultant proposes to undertake a shadow HRA Stage 1 Screening Report in order to determine whether the scheme is likely to impact upon features of the Mersey Estuary SPA.



29. Rather than screening, this should be referred to as an Assessment of Likely Significant Effects (ALSE) and it will be used by the Council to determine whether the scheme is likely to impact upon European sites. In addition to the Mersey Estuary SPA (and Ramsar sites), the ALSE will also need to include, but not be limited to, the following European sites:
- the Liverpool Bay proposed SPA extension (which lies immediately adjacent to the application site boundary);
 - Mersey Narrows and North Wirral Foreshore SPA and Ramsar sites;
 - Ribble and Alt Estuaries SPA and Ramsar sites; and
 - The Dee Estuary SPA and Ramsar sites.

Other issues

30. I advise that an integrated approach and liaison between the applicant's environmental specialists will be required to ensure that any archaeological or intrusive site investigation works do not have harmful ecological impacts.
31. Air quality, noise and lighting assessments are proposed to inform the EIA. These assessments should consider impacts upon statutory designated nature conservation sites.
32. The application site lies adjacent to the Mersey Estuary Nature Improvement Area (NIA), although the site only provides very limited opportunities for the creation of additional habitat. Any planting of trees on the site should form part of an integrated green infrastructure approach which includes other options for enhancing the site's ecological value, such as the creation of green walls / roof areas. There may be potential to use connections along the canal to improve accessibility (links into Ecological Network, emerging LCR SUD and The Mersey Forest GI Strategy and Nature Connected GI prospectus). Widespread planting of trees is however not appropriate for the site. This could be realized through a Green Infrastructure Plan for the proposal.

Waste

33. As raised in paragraph 8 above, I do not agree with the proposed position to scope down waste as significant volumes of waste are likely to be generated during both the construction and operational phases of the development. Generation of waste during both construction and operation may have impacts on air quality, noise, management of ground conditions, water environment and visual amenity. An assessment of waste impacts is proposed is intended to focus on the ability of the existing waste infrastructure capacity to cope with this development. Whilst it is appreciated that many of the waste impacts can be dealt with through other ES chapters, there are some issues which have not been considered and which do merit further consideration as part of the proposed development and its impact assessment. I advise that a Sustainable Resource Management Plan or similar approach, which considers sustainable resource matters, beyond WLP policy, such as minerals and energy, may be appropriate.



34. Given the location of the proposed stadium, and the windiness of the site, match day litter and litter from events is an issue which does need to be assessed. This has not been considered as part of the scoped down assessment. For example, generation of litter on-site and along the main access routes to the proposed stadium could have pollution and amenity impacts on the water environment including the River Mersey, docks and canal systems. Effects on the designated sites and biodiversity of the river, as well as a visual impact for local residents, businesses and visitors will need to be assessed within the ES and appropriate avoidance and mitigation measures proposed. Consideration should also be given to the provision of information to users of the stadium / venue (litter management policy / code) to help avoid litter generation.
35. In addition, consideration should be given to food waste generated during the operation of the new stadium (e.g. match days, and through day to day operation of the club) with a view to managing this as far up the waste hierarchy as possible, perhaps through an on-site, small-scale AD or CHP facility that could also make a positive contribution to meeting the energy needs of the proposed stadium and reduce carbon emissions.
36. Further, it is proposed that BMD will be infilled with marine-won sand, NPPF paragraph 143 bullet point 2 encourages the substitution of secondary and recycled aggregates over primary minerals. Construction, demolition and excavation waste (CDEW) is how many of the Liverpool docks have been infilled in the past, but would obviously be subject to an Environmental Permit and the necessary controls to avoid pollution. Therefore I will advise that infilling with CDEW and not just relying on virgin marine won sand would be appropriate subject to supply and engineering considerations.
37. The 'Relevant Planning Policy section' should also refer to the Merseyside and Halton Joint Waste Local Plan. Policies WM8 and WM9 apply.

Minerals

38. As referred to in paragraph 7 above, consideration needs to be given to the displacement of existing businesses, and the impacts the proposal will have on land, and in this case the Port of Liverpool operations in terms of loss of the dock. Specifically, the loss of a minerals wharf for marine-won sand which should be safeguarded under NPPF paragraph 143.
39. Merseyside has very limited minerals resources with only two active quarries and two active wharves for marine-won sand and gravel. Protecting these primary resources for the highest end uses would be preferable, and as referred to in paragraph 29 above, consideration should be given to using secondary or recycled aggregates for the infilling of the dock.

Low Carbon/Renewable Energy

40. The EIA Scoping report does not discuss inclusion of low carbon or renewable energy for the proposed stadium. This is a significant omission, given the scale of

the proposed development. Consideration should be given to this in ES and stadium design as a means of reducing the GHG emissions and climate change impacts arising from the proposed development. This could be linked to the sustainable resource management plan referred to in paragraph 33 above. There are many examples around the world of sports stadiums that are reducing their grid energy requirements and energy consumption through a range of measures including energy conservation and efficiency measures and; installation of renewable technologies e.g. sensitively located and designed on-building solar photovoltaics. Whilst all proposed renewable energy technologies would need to be assessed, installation of wind turbines in this location is likely to raise impact pathways with bird receptors and some designs may not be appropriate. The following links provide useful examples:

<http://www.power-technology.com/features/featuregreen-clean-mean---the-worlds-most-environmentally-friendly-sports-stadiums-4278520/>

<http://www.energysavingtrust.org.uk/blog/sports-stadiums-look-for-high-sustainability>

Construction Environment Management Plan

41. The applicant should also prepare a Construction Environmental Management Plan (CEMP) document to manage and mitigate the main environmental effects during the construction phases of the proposed development. The CEMP should address and propose measures to minimise the main construction effects of the development and, amongst other things, should include details of ecological mitigation, construction and demolition waste management, pollution prevention and soil resource management. The CEMP would normally be expected to include the agreed method statements to mitigate or avoid adverse environmental impacts.
42. The CEMP should be compiled in a coherent and integrated document and should be accessible to site managers, all contractors and sub-contractors working on site as a simple point of reference for site environmental management systems and procedures.

Part Two

43. MEAS can offer advice on the relevant archives and other sources that should be consulted.
44. Guidance on the Merseyside and Halton Joint Waste Local Plan can be found here: http://meas.org.uk/media/4981/ADP-001-WasteLocalPlan_Final_LoRes_opt.pdf

I would be pleased to discuss these issues further and to provide additional information in respect of any of the matters raised.

Lucy Atkinson
Waste Appraisal and Support Services Team Leader

Merseyside Environmental Advisory Service – delivering high quality environmental advice and sustainable solutions to the Districts of Halton, Knowsley, Liverpool, St.Helens, Sefton and Wirral



Date: 29 June 2017
Our ref: 12188_216388



Chris Argent
CBRE

chris.argent@cbre.com

BY EMAIL ONLY

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T 0300 060 3900

Dear Chris

This advice is being provided as part of Natural England's Discretionary Advice Service. Everton Football Club has asked Natural England to provide advice for 'Project Blue'.

This advice is provided in accordance with the undefined scope contract quotation and agreement no. DAS2809 dated 25th June 2017.

Further to our meeting on Tuesday 13th June, here is a summary of the advice Ella Howes (Lead Adviser - Marine) and I gave you.

Breeding Bird Surveys

We are satisfied with the approach taken to these surveys and are keen to see the full results of the surveys.

We also have local information that the wall between the dock and the estuary was being utilised by up to 200 pairs of breeding kittiwakes. We advise that surveys be carried out of this area (which cannot be seen from the dock itself) via the estuary/Mersey Ferry by videoing the area (during the breeding season) to confirm whether these birds are still using this area.

Bat Surveys

The number of surveys you are proposing is the minimum that should be undertaken and justification should be given if fewer than the minimum are undertaken. We would expect the number of surveys carried out, is enough to fully inform the ecologist of how the structures are being used by bats.

All potential roost entry/exit points must be visible to a surveyor during the emergence/dawn re-entry surveys. It is therefore not possible to confirm if the proposed number of surveys is appropriate at this stage. The building/structure inspections are generally used to determine how many surveyors are needed for each building/structure.

As the site is a flooded dock, we agree that there is little potential for any loss of commuting/foraging habitat.

Consideration needs to be given to the boundary wall adjacent to Regent Road as a potential hibernation site and investigations should be made to see if bats are hibernating in this structure.

Wintering Bird Surveys

The amount and length of the surveys undertaken are less than we would expect. We would normally expect you to undertake surveys from October to March inclusive with two visits per month.

We would also expect you to cover autumn and spring migration passages with weekly visits between September to November inclusive and March to Mid-May, inclusive.

You do have time to undertake autumn passage surveys this year but in the absence of full winter surveys and any spring passage surveys, through the desk stop study, you would need to demonstrate that you have enough information in order for the competent authority to determine whether or not there is likely to be likely significant effect to SPA birds.

Aquatic Surveys

We are happy with the proposed approach to the aquatic surveys. If the ROV survey is inconclusive, we would advise that wall scrapes are used to confirm the species present. If invasive species are found, we would advise that you produce a detailed disposal methodology for each species.

We would be happy to receive further details about the proposed grab sampling; however, we deem preliminary plans for 10 sampling points to be appropriate, subject to change depending on findings.

Sediment samples should be taken and assessed for contaminants, including: Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn), Organotins (TBT and DBT), Polychlorinated Biphenyls (PCBs) and Polycyclic aromatic hydrocarbons (PAHs).

Once we have received the details of these surveys, we will be happy to discuss proposed remediation options with you.

If wet piling is proposed, we would also advise the need for underwater noise assessments and suitable mitigation measures.

Dredging

If dredging is proposed, the impacts of this activity on the adjacent protected sites would need to be considered and appropriate disposal methods should be identified. In this event, we would be able to advise further on the appropriate way to dispose of the material.

Habitats Regulations Assessment

We look forward to seeing a draft structure of the HRA for comment.

You would need to include Liverpool Bay potential SPA within your assessment. This is being notified for foraging little tern and common tern and non-breeding little gulls. We would also advise that you consider the Liverpool Bay SPA and potential SPA as a whole rather than as separate SPAs.

The Liverpool Waters scheme includes proposed mitigation for cormorants in Nelson Dock comprising floating pontoons. You would need to ensure that your proposal does not undermine this proposed mitigation.

Your in-combination assessment will need to include all schemes which may impact on the interest features of the estuary. This could include plans or projects from neighbouring LPAs and the MMO.

You can also seek further advice from us regarding our conservation advice for the [designated sites](#).

Green Infrastructure

The proposed development is within an area that Natural England considers could benefit from enhanced green infrastructure (GI) provision. Multi-functional green infrastructure can perform a range of functions including improved flood risk management, provision of accessible green space, climate change adaptation and biodiversity enhancement. Natural England would encourage the incorporation of GI into this development.

Biodiversity

This development may provide opportunities to incorporate features into the design which are beneficial to wildlife such as the incorporation of roosting opportunities for bats the use of native

species in the landscape planting. This is in accordance with NPPF Paragraph 118 which states that 'opportunities to incorporate biodiversity in and around developments should be encouraged', Section 40(3) of the Natural Environment and Rural Communities Act (2006) which states that 'conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat'. Biodiversity 2020: A strategy for England's wildlife and ecosystem services and Making Space for Nature (2010) also provide strong drivers for the inclusion of biodiversity enhancements through the planning process

Strategic Approach

As noted when we met, we are in contact with Liverpool City Council planning department about options for a strategic approach to the development of the Liverpool dock area and this is something which you may wish to be a part of.

Yours sincerely

Miss Elizabeth Knowles
Lead Adviser
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team

Date: 07 June 2017
Our ref: 216630
Your ref: Bramley Moore Dock



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BY EMAIL ONLY

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Dear Peter

Environmental Impact Assessment Scoping consultation (Regulation 15 (3) (i) of the EIA Regulations 2011): Construction of new 600000 seat stadium
Location: Bramley Moore Dock, Regent Road, Liverpool

Thank you for seeking our advice on the scope of the Environmental Statement (ES) in your consultation dated and received on 25 May 2017.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Case law¹ and guidance² has stressed the need for a full set of environmental information to be available for consideration prior to a decision being taken on whether or not to grant planning permission. Annex A to this letter provides Natural England's advice on the scope of the Environmental Impact Assessment (EIA) for this development.

Should the proposal be amended in a way which significantly affects its impact on the natural environment then, in accordance with Section 4 of the Natural Environment and Rural Communities Act 2006, Natural England should be consulted again.

We would be happy to comment further should the need arise but if in the meantime you have any queries please do not hesitate to contact us. For any queries relating to the specific advice in this letter only please contact Elizabeth Knowles on 0208 225 7506. For any new consultations, or to provide further information on this consultation please send your correspondences to consultations@naturalengland.org.uk.

We really value your feedback to help us improve the service we offer. We have attached a feedback form to this letter and welcome any comments you might have about our service.

Yours sincerely

Elizabeth Knowles
Lead Adviser
Cheshire, Greater Manchester, Merseyside & Lancashire Area Team

¹ Harrison, J in *R. v. Cornwall County Council ex parte Hardy* (2001)

² *Note on Environmental Impact Assessment Directive for Local Planning Authorities* Office of the Deputy Prime Minister (April 2004) available from <http://webarchive.nationalarchives.gov.uk/+http://www.communities.gov.uk/planningandbuilding/planning/sustainability/environmental/environmentalimpactassessment/noteenvironmental/>

Annex A – Advice related to EIA Scoping Requirements

1. General Principles

Schedule 4 of the Town & Country Planning (Environmental Impact Assessment) Regulations 2011, sets out the necessary information to assess impacts on the natural environment to be included in an ES, specifically:

- A description of the development – including physical characteristics and the full land use requirements of the site during construction and operational phases.
- Expected residues and emissions (water, air and soil pollution, noise, vibration, light, heat, radiation, etc.) resulting from the operation of the proposed development.
- An assessment of alternatives and clear reasoning as to why the preferred option has been chosen.
- A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the interrelationship between the above factors.
- A description of the likely significant effects of the development on the environment – this should cover direct effects but also any indirect, secondary, cumulative, short, medium and long term, permanent and temporary, positive and negative effects. Effects should relate to the existence of the development, the use of natural resources and the emissions from pollutants. This should also include a description of the forecasting methods to predict the likely effects on the environment.
- A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment.
- A non-technical summary of the information.
- An indication of any difficulties (technical deficiencies or lack of know-how) encountered by the applicant in compiling the required information.

It will be important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals and a thorough assessment of the 'in combination' effects of the proposed development with any existing developments and current applications. A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.

2. Biodiversity and Geology

2.1 Ecological Aspects of an Environmental Statement

Natural England advises that the potential impact of the proposal upon features of nature conservation interest and opportunities for habitat creation/enhancement should be included within this assessment in accordance with appropriate guidance on such matters. Guidelines for Ecological Impact Assessment (EclA) have been developed by the Chartered Institute of Ecology and Environmental Management (CIEEM) and are available on their website.

EclA is the process of identifying, quantifying and evaluating the potential impacts of defined actions on ecosystems or their components. EclA may be carried out as part of the EIA process or to support other forms of environmental assessment or appraisal.

The National Planning Policy Framework sets out guidance in S.118 on how to take account of biodiversity interests in planning decisions and the framework that local authorities should provide to assist developers.

2.2 Internationally and Nationally Designated Sites

The ES should thoroughly assess the potential for the proposal to affect designated sites. European sites (eg designated Special Areas of Conservation and Special Protection Areas) fall within the scope of the Conservation of Habitats and Species Regulations 2010. In addition paragraph 118 of the National Planning Policy Framework requires that potential Special Protection

Areas, possible Special Areas of Conservation, listed or proposed Ramsar sites, and any site identified as being necessary to compensate for adverse impacts on classified, potential or possible SPAs, SACs and Ramsar sites be treated in the same way as classified sites.

Under Regulation 61 of the Conservation of Habitats and Species Regulations 2010 an appropriate assessment needs to be undertaken in respect of any plan or project which is (a) likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and (b) not directly connected with or necessary to the management of the site.

Should a Likely Significant Effect on a European/Internationally designated site be identified or be uncertain, the competent authority (in this case the Local Planning Authority) may need to prepare an Appropriate Assessment, in addition to consideration of impacts through the EIA process.

Sites of Special Scientific Interest (SSSIs) and sites of European or international importance (Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites)

The development site is adjacent to Liverpool Bay Extension potential SPA and could also have a potential impact on the following designated nature conservation sites:

- Mersey Narrows SSSI
- North Wirral Foreshore SSSI
- Mersey Narrows & North Wirral Foreshore SPA
- Mersey Estuary SPA
- Dee Estuary SPA
- Liverpool Bay SPA
- Ribble & Alt Estuaries SPA
- Dee Estuary SAC
- Sefton Coast SAC
- Mersey Narrows & North Wirral Foreshore Ramsar
- Ribble & Alt Estuaries Ramsar

Further information on the SSSIs and their special interest features can be found at www.magic.gov.uk. The Environmental Statement should include a full assessment of the direct and indirect effects of the development on the features of special interest within these sites and should identify such mitigation measures as may be required in order to avoid, minimise or reduce any adverse significant effects.

Natura 2000 network site conservation objectives are available on our internet site <http://publications.naturalengland.org.uk/category/6490068894089216>

2.3 Regionally and Locally Important Sites

The EIA will need to consider any impacts upon local wildlife and geological sites. Local Sites are identified by the local wildlife trust, geoconservation group or a local forum established for the purposes of identifying and selecting local sites. They are of county importance for wildlife or geodiversity. The Environmental Statement should therefore include an assessment of the likely impacts on the wildlife and geodiversity interests of such sites. The assessment should include proposals for mitigation of any impacts and if appropriate, compensation measures. Contact the local wildlife trust, geoconservation group or local sites body in this area for further information.

2.4 Protected Species - Species protected by the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2010

The ES should assess the impact of all phases of the proposal on protected species (including, for example, great crested newts, reptiles, birds, water voles, badgers and bats). Natural England does not hold comprehensive information regarding the locations of species protected by law, but advises on the procedures and legislation relevant to such species. Records of protected species should be sought from appropriate local biological record centres, nature conservation organisations, groups and individuals; and consideration should be given to the wider context of the site for example in

terms of habitat linkages and protected species populations in the wider area, to assist in the impact assessment.

The conservation of species protected by law is explained in Part IV and Annex A of Government Circular 06/2005 *Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System*. The area likely to be affected by the proposal should be thoroughly surveyed by competent ecologists at appropriate times of year for relevant species and the survey results, impact assessments and appropriate accompanying mitigation strategies included as part of the ES.

In order to provide this information there may be a requirement for a survey at a particular time of year. Surveys should always be carried out in optimal survey time periods and to current guidance by suitably qualified and where necessary, licensed, consultants. Natural England has adopted [standing advice](#) for protected species which includes links to guidance on survey and mitigation.

2.5 Habitats and Species of Principal Importance

The ES should thoroughly assess the impact of the proposals on habitats and/or species listed as 'Habitats and Species of Principal Importance' within the England Biodiversity List, published under the requirements of S41 of the Natural Environment and Rural Communities (NERC) Act 2006. Section 40 of the NERC Act 2006 places a general duty on all public authorities, including local planning authorities, to conserve and enhance biodiversity. Further information on this duty is available here <https://www.gov.uk/guidance/biodiversity-duty-public-authority-duty-to-have-regard-to-conserving-biodiversity>.

Government Circular 06/2005 states that Biodiversity Action Plan (BAP) species and habitats, 'are capable of being a material consideration...in the making of planning decisions'. Natural England therefore advises that survey, impact assessment and mitigation proposals for Habitats and Species of Principal Importance should be included in the ES. Consideration should also be given to those species and habitats included in the relevant Local BAP.

Natural England advises that a habitat survey (equivalent to Phase 2) is carried out on the site, in order to identify any important habitats present. In addition, ornithological, botanical and invertebrate surveys should be carried out at appropriate times in the year, to establish whether any scarce or priority species are present. The Environmental Statement should include details of:

- Any historical data for the site affected by the proposal (eg from previous surveys);
- Additional surveys carried out as part of this proposal;
- The habitats and species present;
- The status of these habitats and species (eg whether priority species or habitat);
- The direct and indirect effects of the development upon those habitats and species;
- Full details of any mitigation or compensation that might be required.

The development should seek if possible to avoid adverse impact on sensitive areas for wildlife within the site, and if possible provide opportunities for overall wildlife gain.

The record centre for the relevant Local Authorities should be able to provide the relevant information on the location and type of priority habitat for the area under consideration.

2.6 Contacts for Local Records

Natural England does not hold local information on local sites, local landscape character and local or national biodiversity priority habitats and species. We recommend that you seek further information from the appropriate bodies (which may include the local records centre, the local wildlife trust, local geoconservation group or other recording society and a local landscape characterisation document).

3. Landscape Character

Landscape and visual impacts

Natural England would wish to see details of local landscape character areas mapped at a scale appropriate to the development site as well as any relevant management plans or strategies pertaining to the area. The EIA should include assessments of visual effects on the surrounding area and landscape together with any physical effects of the development, such as changes in topography. The European Landscape Convention places a duty on Local Planning Authorities to consider the impacts of landscape when exercising their functions.

The EIA should include a full assessment of the potential impacts of the development on local landscape character using [landscape assessment methodologies](#). We encourage the use of Landscape Character Assessment (LCA), based on the good practice guidelines produced jointly by the Landscape Institute and Institute of Environmental Assessment in 2013. LCA provides a sound basis for guiding, informing and understanding the ability of any location to accommodate change and to make positive proposals for conserving, enhancing or regenerating character, as detailed proposals are developed.

Natural England supports the publication *Guidelines for Landscape and Visual Impact Assessment*, produced by the Landscape Institute and the Institute of Environmental Assessment and Management in 2013 (3rd edition). The methodology set out is almost universally used for landscape and visual impact assessment.

In order to foster high quality development that respects, maintains, or enhances, local landscape character and distinctiveness, Natural England encourages all new development to consider the character and distinctiveness of the area, with the siting and design of the proposed development reflecting local design characteristics and, wherever possible, using local materials. The Environmental Impact Assessment process should detail the measures to be taken to ensure the building design will be of a high standard, as well as detail of layout alternatives together with justification of the selected option in terms of landscape impact and benefit.

The assessment should also include the cumulative effect of the development with other relevant existing or proposed developments in the area. In this context Natural England advises that the cumulative impact assessment should include other proposals currently at Scoping stage. Due to the overlapping timescale of their progress through the planning system, cumulative impact of the proposed development with those proposals currently at Scoping stage would be likely to be a material consideration at the time of determination of the planning application.

The assessment should refer to the relevant [National Character Areas](#) which can be found on our website. Links for Landscape Character Assessment at a local level are also available on the same page.

4. Access and Recreation

Natural England encourages any proposal to incorporate measures to help encourage people to access the natural environment ~~countryside for quiet enjoyment~~. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways are to be encouraged. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure. Relevant aspects of local authority green infrastructure strategies should be incorporated where appropriate.

Rights of Way, Access land, Coastal access and National Trails

The EIA should consider potential impacts on access land, public open land, rights of way and coastal access routes in the vicinity of the development. Appropriate mitigation measures should be incorporated for any adverse impacts. We also recommend reference to the relevant Right of Way Improvement Plans (ROWIP) to identify public rights of way within or adjacent to the proposed site that should be maintained or enhanced.

5. Air Quality

Air quality in the UK has improved over recent decades but air pollution remains a significant issue;

for example over 97% of sensitive habitat area in England is predicted to exceed the critical loads for ecosystem protection from atmospheric nitrogen deposition ([England Biodiversity Strategy](#), Defra 2011). A priority action in the England Biodiversity Strategy is to reduce air pollution impacts on biodiversity. The planning system plays a key role in determining the location of developments which may give rise to pollution, either directly or from traffic generation, and hence planning decisions can have a significant impact on the quality of air, water and land. The assessment should take account of the risks of air pollution and how these can be managed or reduced. Further information on air pollution impacts and the sensitivity of different habitats/designated sites can be found on the Air Pollution Information System (www.apis.ac.uk). Further information on air pollution modelling and assessment can be found on the Environment Agency website.

6. Climate Change Adaptation

The [England Biodiversity Strategy](#) published by Defra establishes principles for the consideration of biodiversity and the effects of climate change. The ES should reflect these principles and identify how the development's effects on the natural environment will be influenced by climate change, and how ecological networks will be maintained. The NPPF requires that the planning system should contribute to the enhancement of the natural environment 'by establishing coherent ecological networks that are more resilient to current and future pressures' ([NPPF](#) Para 109), which should be demonstrated through the ES.

7. Cumulative and in-combination effects

A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.

The ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. The following types of projects should be included in such an assessment, (subject to available information):

- a. existing completed projects;
- b. approved but uncompleted projects;
- c. ongoing activities;
- d. plans or projects for which an application has been made and which are under consideration by the consenting authorities; and
- e. plans and projects which are reasonably foreseeable, ie projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.

Date: 02 September 2019
Our ref: DAS UDS 4959 / 216388



Rachel Kerr & Phil Preston (WYG)
On behalf of Colin Chung (Everton Stadium Development Limited)

Customer Services
Hornbeam House
Crewe Business Park
Electra Way
Crewe
Cheshire
CW1 6GJ

0300 060 3900

BY EMAIL ONLY

Dear Rachel and Phil,

Discretionary Advice Service (Charged Advice):
DAS Reference- UDS4959 / 216388 DAS meeting 19 August 2019
Development proposal and location: Bramley Moore and Goodison Park, Liverpool

This letter provides a summary of Natural England's advice following the meeting held on 19 August 2019. This advice is provided through Natural England's Discretionary Advice Service and in accordance with the Quotation and Agreement dated 16 August 2019.

Following the meeting, three detailed questions were provided via email from Phil Preston (dated 19 August 2019). Natural England has provided answers to these questions in a section detailed below.

Natural England role and engagement

Natural England is a non-departmental public body with a statutory purpose to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development. Natural England are a statutory consultee as part of the planning application process, providing advice to Local Planning Authorities and other regulators, including the Marine Management Organisation.

Natural England welcomes continued early engagement on this development as it provides us an opportunity to highlight important considerations required early on, therefore potentially reducing our time taken to respond during the statutory planning stages. As discussed at the meeting we are able to provide further advice on emerging environmental assessment documents and can provide further advice to support mitigation design.

Designated sites

Since Natural England provided previous advice on the proposed development at Bramley Moore Dock (EIA Scoping advice dated 7 June 2017 and DAS advice dated 29 June 2017) we can confirm that Liverpool Bay / Bae Lerpwl Special Protection Area (SPA) has become a fully classified site. This SPA is located adjacent to Bramley Moore Dock and approximately 2.7km from Goodison Park. As discussed with the extension to the site now fully classified, the SPA should be regarded as one whole designation and not treated separately.

We advise that the designated sites as listed within our EIA scoping advice are included within the HRA screening, however we advise that further consideration to impacts on the Dee Estuary SAC, Dee Estuary SPA can likely be excluded, provided that there are no potential impact pathways to these sites, this should be clearly evidenced and justified within the assessment.

All designated site citations and further information on the sites is available at Natural England's [designated sites view](#) system.

Natural England has published Conservation Advice packages which may provide useful information to aid the assessment for the Mersey Narrows and North Wirral Foreshore SPA. A full list of the available Liverpool City Region packages and supporting guidance is available here:

<https://www.gov.uk/government/collections/conservation-advice-packages-for-marine-protected-areas>.

We currently do not have an updated Conservation Advice package for Liverpool Bay SPA. You may find some useful background information available in the original Regulation 35 package. <http://publications.naturalengland.org.uk/publication/3236717?category=3212324>. However, please note this does not cover the additional features protected through the extension of the site and only provides advice on red throated diver and common scoter.

Habitats Regulations Advice and available evidence

We recommend that you ensure you consider all the relevant bird features (and supporting habitats) within a Habitats Regulations Assessment (HRA) and provide clear explanation with supporting evidence on the features screened in and out of any assessment coming forward. WeBS data is a useful source for evidence of bird numbers and trends <https://blx1.bto.org/webs-reporting/>.

Please note that breeding common tern is a feature of the Mersey Narrows and North Wirral Foreshore and foraging common terns are protected through Liverpool Bay SPA. Evidence of foraging common terns utilising the River Mersey is available and you should ensure that this feature is assessed within any assessment coming forward. You may find this reference useful information to aid your assessment;

<http://publications.naturalengland.org.uk/publication/6688364374786048>

An additional tool which you may find useful to aid your assessment of the proposed works and provide additional references and guidance (particularly for noise disturbance) is the [Bird Mitigation Toolkit](#). Further information on noise disturbance and useful references may be found within the Conservation Advice packages as mentioned above. We advise that noise impacts should be considered for designated bird features inside designated sites and for functionally linked supporting habitats outside designated sites.

We advise that there may be sufficient evidence available through recent development planning applications that are in the vicinity of the proposed works. Any gaps within the evidence should be identified and supplemented with additional survey work as required to ensure the HRA is supported by a robust evidence base.

Survey work

Natural England would welcome sight of the survey reports to clearly understand the evidence collected to date and we can offer further advice on the findings in terms of further considerations within the HRA(s).

Functionally Linked Land

Natural England advises that the docks and waterfront area are likely to provide supporting functional habitat (feeding and roosting) for birds from a number of internationally important sites including Liverpool Bay SPA and Mersey Narrows and North Wirral Foreshore SPA/Ramsar and therefore consideration of impact to the function of these areas is required within the HRA(s). Natural England would expect to see a thorough assessment of the potential impact of dock infilling on ecological receptors.

In combination assessment

We advise that as part of any in combination assessment you consider all schemes which may impact on the interest features of the designated sites. This could include plans or projects from neighbouring Local Planning Authorities (Liverpool City Council and Wirral Council) and the Marine Management Organisation.

Mitigation measures

Natural England cannot provide detailed advice on potential mitigation measures at this stage, however we would be happy to provide further advice once HRA(s) have been drafted.

People Over Wind ruling

Those undertaking HRAs should be aware of a recent ruling made by the Court of Justice of the European Union (the CJEU) on the interpretation of the Habitats Directive in the case of *People Over Wind and Sweetman vs Coillte Teoranta* (ref: C 323/17). The case relates to the treatment of mitigation measures at the screening stage of a HRA when deciding whether an appropriate assessment of a plan/project is required. The Court's Ruling goes against established practice in the UK that mitigation measures can, to a certain degree, be taken into account at the screening stage. As a result, Natural England advises that any "embedded" mitigation relating to protected sites under the Habitat Regulations 2017 Regulation 63 (1) should no longer be considered at the screening stage, but taken forward and considered at the appropriate assessment stage to inform a decision as to whether no adverse effect on site integrity can be ascertained. In light of the recent case law, any reliance on measures intended to avoid or reduce harmful effects at the likely significant stage is vulnerable to legal challenge.

Recreational pressure

Recreational disturbance to internationally protected coastal sites is an issue across the Liverpool City Region (LCR). This pressure is a particular issue through in-combination effects, for example additional housing may result in additional recreational visits, and therefore increased disturbance at the coastal designated sites. We advise that you consider the impact of recreational disturbance resulting from the additional residential dwellings proposed at Goodison Park within a HRA.

We are aware that the Local Planning Authorities (LPAs) around the LCR are currently considering the scope for a city wide strategic mitigation measure for recreational disturbance. This will help LPAs and developers address the issues arising from additional housing, thus helping deliver compliance with the Habitat Regulations and contribute to sustainable development. However, we understand that this strategy is being reconsidered as an evidence base rather than a mitigation strategy, therefore in the absence of any strategic mitigation across the LCR individual developments will need to provide mitigation (if required) on a case by case basis.

Strategic Mitigation

We are aware of a number of developments coming forward in the vicinity of the development at Bramley Moore Dock, as part of the Liverpool Waters Scheme, each development may have individual proposed mitigation measures, therefore you would need to ensure that this proposal does not undermine any other proposed mitigation in the vicinity of the development. With that in mind we strongly encourage the consideration of a strategic approach to mitigation across the wider Liverpool Waters Scheme.

There is an opportunity for future proposals to contribute to a strategic approach in which mitigation measures and biodiversity enhancements across the whole scheme can be considered together. This strategic approach will ensure that nature conservation is duly considered amongst all the developments, and potentially allows developers an opportunity to have more certainty in gaining permissions for their proposals.

Marine Environment / Dock Waters

We acknowledge that the final design and thus the remediation and construction methodologies have not yet been determined, however, we advise that you keep in mind the implications of any works for potential impact pathways to the River Mersey. Certain activities such as dredging/disposal of materials or any works along the river wall may require a marine licence. Any works that take place below mean high water (MHW) would be subject to a marine licence from the Marine Management Organisation (MMO), Please refer to the gov.uk website for more information:

<https://www.gov.uk/topic/planning-development/marine-licences>

NE would expect to see consideration of the impact of potential dock infill on the supporting function of the dock waters in relation to qualifying features of the SPAs as mentioned above within the HRA.

Potential impacts on the wider marine environment should also be considered within the Environmental Statement.

We would expect to see further details on the methods and materials to be used for dock infill and will provide additional comments and advice on this in due course. However, the material used should be inert and demonstrated that it is free from contamination.

As stated above, we are aware that survey work from adjacent developments could provide useful evidence to support an application. With the proposed loss of the dock waters we would expect to see thorough survey work to further understand the marine ecology of Bramley Moore Dock, therefore providing additional supporting information to inform the environmental assessment of the proposal.

Natural England is aware of records of *Nematostella vectensis* (starlet sea anemone) in the River Mersey close to the development site. We note that the records are specifically from within the river however, we bring this to your attention at this stage for your awareness. This species is protected under Schedule 5(9) of the Wildlife and Countryside Act (1981). Further advice on marine schedule 5 species can be found on:

<https://www.gov.uk/government/publications/protected-marine-species>

The UK has a target within the Marine Strategy Framework Directive to reduce the risk of introduction and spread of non-native species through improved management of high risk pathways and vectors. Invasive non-native species (INNS) do and can cause significant impacts to our native biodiversity through competition and disease and to our economy, as they are often costly to control or eradicate.

We acknowledge that survey work has been undertaken including assessment of marine invasive species and we would be happy to review and comment on any report either separately or as provided as part of the relevant environmental assessments (HRA/EIA).

We advise for completeness that you seek additional advice on potential impacts from the proposed works on migratory fish from the Environment Agency.

Biodiversity Enhancement and Net Gain

We would encourage you wherever possible to consider any opportunities for biodiversity enhancements and these should be incorporated into the project design. This is in accordance with NPPF Paragraph 175d which states that 'opportunities to incorporate biodiversity in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity', Section 40(3) of the Natural Environment and Rural Communities Act (2006) which states that 'conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat'. Biodiversity 2020: A strategy for England's wildlife and ecosystem services and Making Space for Nature (2010) also provide strong drivers for the inclusion of biodiversity enhancements through the planning process.

Guidance on [Net Gain](#) is provided in the biodiversity section of the natural environment Planning [Practice Guidance \(PPG\)](#) (July 2019). This explains how to implement the policies on net gain included in the NPPF. Additional guidance on Good Practice Principles for development to include Biodiversity Net Gain is available in the [CIEEM guidance](#) (2019).

NE response to questions provided via email (19/8/2019)

1) During a discussions re. cormorant it was highlighted that if 7 or more birds were recorded on site then this would trigger the requirement for HRA, would it be possible to clarify why 7 birds is significant and provide a reference to any relevant guidance document? We also note that cormorant form part of the bird assemblages for relevant SPA's, while cormorant are the most relevant (based on our discussion) do we need to consider thresholds for other species within the assemblage?

Cormorant are a 'named component' of the Liverpool Bay SPA assemblage as the species is present in numbers >1% of the GB population. Where features are a 'named component' they should be considered in their own right within the HRA, as well as with their contribution to the overall waterbird

assemblage. We advise that a worst case scenario is considered as it cannot be determined to which designated site cormorants are likely to be associated with, therefore a precautionary approach as prescribed by the Habitats Regulations should be undertaken. Liverpool Bay SPA has the lowest figure for cormorants (based on the information available to date) therefore we advise that the citation figure be used (or where more recent 5 year data is available this should be used) for assessment purposes. We do not have specific guidance that we can refer you to for using the 1% threshold, however this is Natural England's standard best practice in order to base an assessment of likely significant effect, to determine whether further Appropriate Assessment is required. This is a consistent approach to all other developments and also the outline permission of Liverpool Waters.

You may find it helpful to review the [Supplementary Advice on Conservation Objectives](#) (abundance and diversity attributes) for Mersey Narrows & North Wirral Foreshore SPA to understand further detail in respect to the conservation objectives for features (including assemblages).

2) You mentioned that we should aim for a 10% net gain as part of each development when considering biodiversity offsetting. Can you please clarify what metric you anticipate being used to calculate this?

More information and advice from the Government on Biodiversity Net Gain is available within the following document including advice the proposed future mandatory requirement for 10% net gain and advice on the metric (Defra Biodiversity Metric):

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/819823/net-gain-consult-sum-resp.pdf

3) When assessing recreational pressure for the Goodison site it was discussed that any development over 10 units would be assumed to result in Likely Significant effect and would need an appropriate assessment. You also mentioned (amongst mitigation measures likely to be required) that a commuted sum would be required per unit? Could you please provide a reference for this information so that it can be included within our HRA report?

We advise that you utilise the SSSI Impact Risk Zones available on the [Magic Mapping Tool](#) which will highlight the need to consider recreational disturbance for new residential development at the Goodison site. The threshold at which this Impact Risk Zone has been set is 10 residential units. We are unable to offer further comments on detailed mitigation measures (i.e. commuted sum) at this stage until proposals are clearly presented and a HRA has been drafted. A range of mitigation measures may need to be considered and we would encourage you to consider any further information as available within the Liverpool Local Plan.

If you have any further queries regarding this letter then please contact me at the details below.

Yours faithfully,

Amanda Yeomans

Senior Adviser/ Senior Specialist (Ports, Estuaries and Tidal Lagoons)

Coast and Marine (Cheshire, Greater Manchester, Merseyside & Lancashire Area Team)

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cc. commercialservices@naturalengland.org.uk

☒ The advice provided in this letter has been through Natural England's Quality Assurance process.

The advice provided within the Discretionary Advice Service is the professional advice of the Natural England adviser named above. It is the best advice that can be given based on the information provided so far. Its quality and detail is dependent upon the quality and depth of the information which has been provided. It does not constitute a statutory response or decision, which will be made by Natural England acting corporately in its role as statutory consultee to the competent authority after an application has been submitted. The advice given is therefore not binding in any way and is provided without prejudice to the consideration of any statutory consultation response or decision which may be made by Natural England in due course. The final judgement on any proposals by Natural England is reserved until an application is made and will be made on the information then available, including any modifications to the proposal made after receipt of discretionary advice. All pre-application advice is subject to review and revision in the light of changes in relevant considerations, including changes in relation to the facts, scientific knowledge/evidence, policy, guidance or law. Natural England will not accept any liability for the accuracy, adequacy or completeness of, nor will any express or implied warranty be given for, the advice. This exclusion does not extend to any fraudulent misrepresentation made by or on behalf of Natural England.

Merseyside Environmental Advisory Service
2nd Floor, Magdalen House
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Director: Alan Jemmett, PhD, MBA

Enquiries: 0151 934 4951

Contact: Peter McKeon
Email: measdconsultations@sefton.gov.uk

DISCRETIONARY ADVICE

To: Rachel Kerr / Phil Preston
Organisation: WYG

From: Peter McKeon
MEAS

Your Ref:
File Ref: DISC19-012
Date: 21 August 2019

Proposed football stadium at Bramley Moore Dock / Re-development of Goodison Park site

1. Thank you for seeking discretionary advice from Merseyside Environmental Advisory Service on your proposal for the above developments.

1. I have summarised the matters discussed in our meeting of 19 August 2019 below.

Bramley Moore Dock

2. The ecological surveys undertaken to date and the results of these were discussed. Copies of draft survey reports are to be provided to both MEAS and NE to enable confirmation that the level of survey undertaken is sufficient. However, for MEAS there will be an additional charge for this at a rate to be confirmed when the draft reports are provided.
3. With regard to non-breeding birds, it was mentioned that a population of seven (or more) cormorant would be considered significant in terms of the Liverpool Bay SPA population. Seven equates to 1% of the SPA cormorant population.
4. It was confirmed that a shadow HRA will be produced for submission with the planning application. Aside from loss and disturbance to habitats, other issues mentioned that will require consideration in the shadow HRA include bird strike, increased litter and recreational pressure. The shadow HRA will also need to take account of construction methodologies, such as piling methodology.
5. The need for the in-combination assessment to consider effects on Nelson Dock was discussed. Nelson Dock had previously been identified as the location for mitigation in relation to the Liverpool Waters developments. The assessment will therefore need to identify how the BMD development will affect this.

Merseyside Environmental Advisory Service – delivering high quality environmental advice and sustainable solutions to the Districts of Halton, Knowsley, Liverpool, St. Helens, Sefton and Wirral



6. It was mentioned that non-breeding bird mitigation could be located outside of the application site in adjacent dock areas. Liaison with consultants undertaking assessments and providing mitigation in relation to the Liverpool Waters developments was recommended.
7. During bat surveys, a single building on site was found to support a single common pipistrelle bat. Options for mitigation are to be explored, although it was recognised that opportunities for bats on the site post-development will be limited due to lighting and disturbance due to noise and vibration.

Goodison Park

8. Extended phase 1 habitat survey had been undertaken and habitats on the site were limited.
9. The development provides opportunities for net gains and enhancements, including green / brown roofs, green walls and erection of bat roosting and bird nesting boxes.
10. Recreational pressure effects were discussed and the need for these to be mitigated. The situation with the draft Visitor Management Strategy (VMS) was explained and the requirement for each application to be dealt with on an ad hoc basis in the absence of an agreed VMS. Potential mitigation measures were discussed including provision of a commuted sum, using figure taken from draft VMS, and provision of leaflet to occupiers of new dwellings informing them of SANGs and responsible usage of the coast.
11. Net biodiversity gains were discussed in relation to both Goodison Park and BMD. However, attempting to achieve a net gain of 10% mentioned, although it was added that this figure is not supported by any current planning policy.

Our advice is based on our understanding of your proposal. If there are any subsequent changes to your proposal, or to legislation, policy and/or statutory guidance, when your planning application is considered, our advice to Liverpool City Council Local Planning Authority may change or raise additional matters.

Our invoice will follow within 14 days as agreed.

Please let me know if you have any specific queries regarding the advice provided.

Peter McKeon
Ecologist

Date: 30 October 2020
Our ref: 329866
Your ref: 20F/0001



Peter Jones
Liverpool City Council
peter.jones2@liverpool.gov.uk

cc. Adrian Clarke
Marine Management Organisation
Adrian.Clarke@marinemanagement.org.uk
In reference to MLA/2020/00109

Customer Services
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BY EMAIL ONLY

Dear Peter

Planning consultation: Application for Full Planning Permission in accordance with submitted drawings for the demolition of existing buildings/structures on site (listed in the schedule); remediation works; foundation/piling works; infill of the Bramley-Moore Dock, alteration to dock walls and dock isolation works with vehicular and pedestrian links above; and other associated engineering works to accommodate the development of a stadium (Use Class D2) predominantly for football use, with the ability to host other events, with ancillary offices (Use Class B1a); Club Shop and retail concessions (internal and external to the stadium) (Use Class A1); exhibition and conference facilities (Use Class D1); food and drink concessions (internal and external to the stadium) (Use Classes A3 / A4 / A5); betting shop concessions (Sui Generis); and associated infrastructure including: electric substation, creation of a water channel, outside broadcast compound, photo-voltaic panels, storage areas/compound, security booth, external concourse / fan zone including performance stage, vehicular and pedestrian access and circulation areas, hard and soft landscaping (including stepped plaza, canopies, lighting, wind mitigation structures, public art, tree planting and boundary treatments), cycle parking structures and vehicle parking (external at grade) and change of use of the Hydraulic Tower structure to an exhibition / cultural centre (Use Class D1) with ancillary food and drink concession (Use Class A3) (revised description).

Location: Bramley Moore Dock Regent Road Liverpool

Thank you for your consultation on the above dated 24 September 2020 and received by Natural England on 06 October 2020.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

Further information required to determine impacts on designated sites

In summary, having reviewed the updated plans and information provided Natural England advises that further information is required to provide appropriate detail and justification within the Habitats Regulations Assessment.

The advice within this letter focuses on the following document:

- Shadow Habitats Regulations Assessment Stage 1 and Stage 2 Issue 5 by WTG, December 2019 Updated September 2020

Our advice follows below and is further to that provided in our previous response (ref. 309854, dated 20 April 2020). Detailed comments are provided in Annex A.

Internationally and nationally designated sites

This application is adjacent to Liverpool Bay Special Protection Area (SPA) and within 1.2km of the Mersey Narrows and North Wirral Foreshore SPA and Ramsar, and the Mersey Narrows Site of Special Scientific Interest (SSSI).

In considering the European site interest, Natural England advises that you, as a competent authority under the provisions of the Habitats Regulations, should have regard for any potential impacts that a plan or project may have¹. The [Conservation objectives](#) for each European site explain how the site should be restored and/or maintained and may be helpful in assessing what, if any, potential impacts a plan or project may have.

Please see the subsequent sections of this letter for our advice relating to SSSI features.

Habitats Regulations Assessment (HRA)

We have reviewed the updated Shadow HRA and acknowledge the additional information that has been provided in this version of the document and we provide the following advice on the assumption that your authority intends to adopt this document to fulfil your duty as competent authority. We remind you that as competent authority, it is your responsibility to produce the HRA and be accountable for its conclusions.

Natural England notes that an appropriate assessment of the proposal has been undertaken in accordance with Regulation 63 of the Conservation of Species and Habitats Regulations 2017 (as amended). Natural England is a statutory consultee on the appropriate assessment stage of the Habitats Regulations Assessment process, and a competent authority should have regard to Natural England's advice.

The appropriate assessment concludes that your authority is able to ascertain that the proposal will not result in adverse effects on the integrity of any of the sites in question. Having considered the assessment, and the measures proposed to mitigate for any adverse effects, it is the advice of Natural England that the assessment does not currently provide enough information and/or certainty to justify the assessment conclusions and that your authority should not grant planning permission at this stage. Further details and assessment is required to support the conclusions of the shadow HRA and our detailed advice on the additional assessment work required follows within Annex A.

Should the applicant wish to discuss the further information required and scope for mitigation with Natural England, we would be happy to provide advice through our [Discretionary Advice Service](#).

Environmental Statement (ES)

We note that within the Biodiversity Report (Appendix 12.1 of the ES) that tables 12.10, 12.11 and 12.13 within section 12.0 (Likely significant environmental effects of the scheme) include similar information to that presented within the HRA relating to impacts on designated sites, we refer you to our below detailed advice on the HRA and advise that our comments apply equally to the information provided within the above listed tables. It should be ensured that the tables and assessment within the ES are updated in line with the HRA.

Section 12.12.4 sets out good practice measures to minimise effects upon bird species which form qualifying features of the designated site, and that one of these measures includes 'Timing of works to ensure high levels of noise disturbance avoid sensitive periods (i.e. piling works

¹ Requirements are set out within Regulations 63 and 64 of the Habitats Regulations, where a series of steps and tests are followed for plans or projects that could potentially affect a European site. The steps and tests set out within Regulations 63 and 64 are commonly referred to as the 'Habitats Regulations Assessment' process.

The Government has produced core guidance for competent authorities and developers to assist with the Habitats Regulations Assessment process. This can be found on the Defra website. <http://www.defra.gov.uk/habitats-review/implementation/process-guidance/guidance/sites/>

avoid winter period (November – February) when wintering bird species/assemblage associated with the designated site are most likely to be affected by construction works.’ We note that this measure has not been outlined within the HRA or Construction Management Plan therefore we advise that the relevant documents are updated.

SSSI

Our concerns regarding the potential impacts upon the Mersey Narrows SSSI coincide with our concerns regarding the potential impacts upon the international designated sites.

Please note that if your authority is minded to grant planning permission contrary to the advice in this letter, you are required under Section 281 (6) of the Wildlife and Countryside Act 1981 (as amended) to notify Natural England of the permission, the terms on which it is proposed to grant it and how, if at all, your authority has taken account of Natural England's advice. You must also allow a further period of 21 days before the operation can commence.

If you have any queries relating to the advice in this letter please contact me at the details below, and to provide further information on this consultation please send your correspondences to consultations@naturalengland.org.uk.

Please consult us again once the information requested above, has been provided.

Yours sincerely

Angela Leigh
Planning & Development Lead Adviser
Cheshire to Lancashire Area Team
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Annex A: Detailed comments on shadow HRA

No.	Section No.	Document Page No.	Comment	Comment for LCC/MMO
1	4.1 Identification of potential pathways to LSE on European sites	23-24	The effects of shading have been discussed here ahead of the Assessment of Likely Significant Effects, we advise that this potential impact is included within Table 15. The assessment for shading focuses on fish and shellfish but should also consider impacts on functionally linked habitat, we advise further information is required here.	LLC & MMO
2	1.3 Development proposals- Creation of a new (non-navigable) water channel (western water channel)	5-6	As stated in our previous response we wish to request clarity from the MMO with regards to the extent of marine licensing requirements for this application and also with regards to the MMO's jurisdiction in the northern docks system.	MMO (LCC)
3	Table 15. Habitat degradation – air quality & dust deposition	29-30	There remains a lack of clarity here regarding dust deposition as impacts are ruled out, however under Habitat degradation -deposition of waste/litter impacts of dust are considered to be LSE. We advise the text here is amended accordingly.	LCC & MMO
4	Table 15. Habitat degradation – effects on water quality during dock infill preparation – raking of dock prior to infill (suspension of particulates and contaminants)	30	It is stated that none of the contaminants recorded within BMD exceed action level 1 threshold levels determined by CEFAS guidance, however within the Dock Deposit Disturbance assessment (Appendix 11.8) Action Level 1 was shown to be exceeded but with no exceedances for Level 2. We advise this text is updated in line with the findings of the assessment.	MMO (LCC)
5	Habitat degradation – effects on water quality during dock infill	30	Consideration should also be given here to the impacts on the adjacent Nelson Dock as a result of the severing the water connectivity. We note that measures are included within the CMP to reduce and mitigate impacts, therefore we advise that further consideration is required at AA, in line with the People over Wind judgement.	LCC & MMO
6	Displacement of prey species for qualifying bird species – noise and	32	We note that further assessment on noise and vibration impacts to prey species were considered and that mitigation in the form of construction planning was referenced in the Environmental Statement Chapter 13 Aquatic Ecology Chapter.	LCC & MMO

	vibration		We therefore advise that further consideration is required at AA, in line with the People over Wind judgement.	
7	Disturbance of qualifying features – lighting effects	33	As mentioned in our previous advice it is not clear if there are measures mentioned here that are being relied upon to avoid significant impact for SPA birds and so require further consideration within the AA. We advise clear distinction is made over measures which are in built to the proposals and those which represent specific measures to avoid impacts on designated site features.	LCC & MMO
8	Disturbance of qualifying features –auditory disturbance	34-35	The justification here needs to be made clearer and we advise that further detail from the Noise and Vibration Assessment is used to support the conclusions, including clear detail on the baseline noise levels (including LAeq and LMax noise levels) and the expected noise levels during operation.	LCC & MMO
9	Disturbance of qualifying features – lighting effects	35	We note the additional information has been provided here, however in order to support to conclusions we advise that further details on the amount of light spill from operational lighting are provided. It would be useful to have plans showing the positioning of light sources and the expected light levels to be emitted and the spread of light spill on adjacent areas in order to rule out any potential impacts.	LCC & MMO
10	5.0 Consideration of in-combination effects	39	We note that changes have been made to this chapter to include a number of projects as highlighted in our previous response, however we note that no marine licence applications appear to have been considered. Clarification is needed here to show if there are any relevant marine licences which need to be considered.	MMO (LCC)
11	Liverpool Cruise Terminal	46-47	We are aware of a more recent HRA for this development, and that MMO have produced their own HRA which provides different conclusion to that mentioned within the text. Mitigation has been required for Liverpool Cruise Terminal and consideration of impacts at AA was carried out. We advise this section is updated accordingly.	LCC & MMO
12	Wirral Waters	49-50	There are a number of standalone applications that sit with the Wirral Waters development, we advise these are also considered within the assessment.	LCC & MMO
13	6.6 Assessment of Effects which are carried through to AA	75	There is mention here regarding in-built mitigation measures. We advise that a summary is included here to make clearer which measures are in built and which are further required mitigation measures. We note that there is information within ES Appendix 12.1 Terrestrial Ecology, section 12.9 (mitigation within the submitted design) which could be incorporated within the HRA.	LCC & MMO
14	6.6.3 Habitat loss within functionally linked habitat beyond the boundary of the	76-77	There remains limited information regarding the proposed two floating rafts/pontoons and the suitability of their location in Nelson Dock. To support the conclusions here we advise information on the carrying capacity of these platforms is provided, how they will be installed and the timing of the installation in advance of	LCC & MMO

	designated sites		works commencing and how will success of the mitigation rafts be determined.	
15	6.6.7 Loss of qualifying features - potential bird strike	81-82	We advise that insufficient information is presented here to support the assessment conclusions and provide certainty regarding the proposed mitigation measures. There is no consideration of the appropriate distance from the stadium for the pontoons and if this can be achieved. Flight line data could be used to determine the use of the docks and wider area.	LCC & MMO
16	6.7 Conclusion	83	We advise that the overall conclusions of the assessment are brought together within this section (currently sit within 6.8 Discussion) and that a clear overall conclusion of the assessment is stated.	LCC & MMO

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Contact: Lucy Atkinson
Email: measdconsultations@sefton.gov.uk

DEVELOPMENT MANAGEMENT ADVICE

To: Peter Jones
Organisation: Development Management
Liverpool Council

From: Lucy Atkinson

Your Ref: 20F/0001
File Ref: LI20-014
W/P Ref:
Date: 21st October 2020

Development of stadium and associated works, including infilling of dock and demolition of existing structures Bramley Moore Dock, Regent Road, Liverpool ES Addendum September 2020

1. Thank you for consulting Merseyside Environmental Advisory Service in respect of this updated planning application. The proposals comprise the development of a new stadium and associated works, including the infilling of a dock and demolition of existing structures.
2. Having reviewed the application and supporting documentation, our advice is set out below in two parts.
 - Part One deals with issues of regulatory compliance, action required **prior to determination** and matters to be dealt with through planning conditions. Advice is only included here where action is required or where a positive statement of compliance is necessary for statutory purposes. Should the Council decide to adopt an alternative approach to MEAS Part 1 advice, I request that you let us know. MEAS may be able to provide further advice on options to manage risks in the determination of the application.
 - Part Two sets out guidance to facilitate the implementation of Part One advice and informative notes.
 - Appendix 1 provides the detailed reasoning in respect of the conclusions presented in respect of Habitats Regulations Three Tests Assessment.

In this case Part One comprises paragraphs 3 to 18, while Part Two comprises paragraph 19.



Part One

Habitats Regulations Assessment

3. A revised shadow HRA has been included as part of ES Appendix 12.1 (*Shadow Habitats Regulations Assessment Stage 1 and Stage 2 (WYG, December 2019 Updated September 2020, A100795, Issue 5)*). This has been amended following previous MEAS and Natural England advice.
4. However, before the shadow HRA can be accepted as the Council's own assessment, I advise that a further amendment to the document is required regarding construction phase effects on the water quality of Nelson Dock.
5. MEAS previously advised that the proposals could lead to a fundamental change in the ecology and water quality of Nelson Dock. Potential adverse effects on functionally linked habitat at Nelson Dock have been recognised in the submitted Construction Management Plan (CMP) (*Laing O'Rourke*) (ES Appendix 4.1 and shadow HRA Appendix C). However, they have not been considered within the shadow HRA.
6. Page 16 of the CMP states *"During construction, whilst the dock is infilled and the isolation structure in place, there is no quantifiable way of determining the impact of any hydrological disconnection with the southern Nelson dock. It is likely that salinity and dissolved oxygen levels may fluctuate over time. Baseline monitoring will therefore be undertaken of the southern water body prior to construction to indicate the natural variation in salinity and dissolved oxygen. Monitoring would then continue through the construction period. If the salinity and / or dissolved oxygen of the southern water body falls below a historic minimum, then over pumping from north to south may be undertaken to address the reductions."*
7. I therefore advise that the above potential effect on Nelson Dock, and the proposed mitigation set out in the CMP, is included within the shadow HRA. When this is done, I advise that the shadow HRA could be adopted by the Council as its own assessment. Further information is provided in Part Two.

Ecology

8. Bat mitigation measures have now been provided in paragraph 12.12.14 of ES Appendix 12.1 and this has enabled the three test assessment (Habitats Regulations) to be completed (Appendix 1). As the proposals involve the destruction of a bat roost, the applicant will require a Natural England European Protected Species licence prior to any works commencing on the hydraulic pump house (B1). To ensure this is in place the following planning condition is required:

CONDITION

Works will not commence unless the local planning authority has been provided with a copy of a licence issued by Natural England pursuant to Regulation 55 of the Conservation of Habitats and Species Regulations 2017 (as amended) authorising

the specified development to go ahead or evidence that the site has been registered under the bat mitigation class licence.

9. I advise that the undertaking of the bat mitigation measures, as described in paragraph 12.12.14 of ES Appendix 12.1, are secured by a suitably worded planning condition.
10. I advise that the applicant prepares a Construction Environmental Management Plan (CEMP) document to manage and mitigate the main environmental effects during the construction phases of the proposed development. The CEMP should expand upon the measures outlined in the submitted CMP for avoiding and minimising effects of noise and construction related pollutants during the works. The CEMP should also include, but not be limited to, the following:
 - The fish capture and translocation methodology (submitted as Appendix A of the CMP);
 - Details of the biosecurity measures which will be adopted during the dock infilling works in order to prevent the spread of invasive non-native species;
 - Details of the water quality monitoring of Nelson Dock, including the parameters which will be monitored and the frequency of monitoring. The water quality triggers / thresholds that will stop infilling works should be specified; and
 - Measures that will be undertaken to avoid harm to roosting bats and breeding birds.
11. The CEMP should be compiled in a coherent and integrated document and should be accessible to site managers, all contractors and sub-contractors working on site as a simple point of reference for site environmental management systems and procedures. I advise that the CEMP can be secured through a suitably worded planning condition.
12. A Biodiversity Net Gain (BNG) report has now been submitted as part of ES Appendix 12.1. BNG is not yet mandatory, although I welcome that it has been given consideration by the applicant. The results of the BNG assessment highlight the need for the landscaping scheme to maximise the opportunities for biodiversity. Previous MEAS advice regarding the proposed landscaping therefore still applies.

Sustainability and Low Carbon Energy

13. Section 10 of the Design and Access Statement Addendum (*The People's Project MEIS dated September 2020*), the Updated Sustainability Statement (*BuroHappold Engineering Ref: BMD01-BHE-ZZ-XX-RP-Y5-003 September 2020*) and the Energy Statement (*Buro Happold Engineering dated September 2020*) provide details of how sustainability has been addressed through the amended design process including amendments to the proposed solar photovoltaic array moving it from the surface car park canopy to an integrated array on the southern roof of the stadium. This has resulted in a slightly larger array and higher yield. It is also proposed to have back up battery storage and space, design and cost allowances to enable connection with the



proposed district heat network for Liverpool Waters alongside resource efficiency measures.

14. This is sufficient to demonstrate compliance with UDP policies GEN8 (Environmental Protection) and HD21 (Energy Conservation) and emerging Local Plan policies R7 (Renewable and Low Carbon Energy) and R9 (Solar Panels) subject to heritage and visual elements being satisfactorily addressed. The Updated Sustainability Statement and Energy Statement should be secured by a suitably worded condition as approved documents.

Archaeology

15. The Bramley-Moore Dock – Planning Addendum Design & Access Statement Addendum, Parts 1 to 9, September 2020 were reviewed for additional design information with potential to impact on archaeological heritage assets.
16. The content was reviewed against the Environmental Statement Addendum Volume III Appendix 9.1 Archaeological Desk-based Assessment (OAN October 2019 with an addendum August 2020) and the subsequent OAN Bramley-Moore Dock Archaeological Building Survey and Evaluation (September 2020).
17. There are no new archaeological issues to be considered as part of this amended application. Our previous comments in relation to archaeology still apply.

Waste

18. Previous comments (Memo from Lucy Atkinson (MEAS) to Peter Jones (Liverpool Council) dated 30th April 2020) on operational and construction waste still apply.

Part Two

Habitats Regulations Assessment

19. Due to the potential effects on water quality on Nelson Dock, I advise that the amended shadow HRA considers there to be a likely significant effect due to degradation in water quality of the dock during the construction phase. The Appropriate Assessment (Stage 2) should then conclude no adverse effects on site integrity with the adoption of the mitigation measures set out in the CMP. This approach will ensure compliance with the Sweetman (2018) ECJ ruling.

I would be pleased to discuss these issues further and to provide additional information in respect of any of the matters raised.

Lucy Atkinson
Environmental Appraisal and Support Services Team Leader

Merseyside Environmental Advisory Service – delivering high quality environmental advice and sustainable solutions to the Districts of Halton, Knowsley, Liverpool, St.Helens, Sefton and Wirral



Appendix 1: Application 20F/0001 Three test assessment

The three tests are set out in Regulation 55 of the Habitats Regulations 2017 (as amended). The three-test assessment of the proposals is set out below.

Test 1: Regulation 55(1)(e): *“preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment”*

The proposed new stadium will deliver a range of social and economic benefits which include the creation of jobs, during both the construction and operational phases of the project, and helping to bring about the acceleration of key regeneration projects including Ten Streets and the wider Atlantic Corridor. Social benefits that the project will provide include the creation of new public open space at Bramley Moore Dock. **This test has been met.**

Test 2: Regulation 55(9)(a): *“that there is no satisfactory alternative”*

The hydraulic pump house is currently in a disused and in a deteriorating state. Continued deterioration of the pump house will result in the eventual loss of the bat roosting features which are currently present. The proposed development will ensure that potential bat roosting habitat is retained upon the site in perpetuity. **This test has been met.**

Test 3: Regulation 55(9)(b): *“that the action authorised will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range”*

The bat surveys confirmed the presence of low numbers of common pipistrelle roosting bats within the pump house (B1) in the north-eastern corner of the site. The building is due to be refurbished as part of the proposed development. Paragraph 12.12.14 of the revised ES Appendix 12.1 includes details of bat mitigation measures. These include the provision of temporary alternative roosting provision prior to the commencement of works in the form of a Schwegler 1FF box (or similar), a tool box talk to be delivered by an ecologist on bats to construction operatives, pre-works inspection of roosting features on the pump house by a licensed ecologist, supervised soft-strip of potential roosting features and use of one-way exclusion devices to prevent bats from re-entering the pump house when they've left. Permanent replacement roosting provision will be provided in the form of 2no. Schwegler 1FF bat boxes that will be installed on site away from direct illumination. The proposed mitigation and compensatory measures described in ES Appendix 12.1 are acceptable and, provided that they are secured by a suitably worded planning condition, this test has been met.

Appendix E – Map Showing Statutory Designated Sites within 10 km