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Great Northern



Outline Construction Management Plan

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1.0 Introduction

This Outline Construction Management Plan (CMP) has been prepared by Real PM Limited on behalf of GNW Developments Limited ('the Applicant') in support of an Application for Full Planning Permission and Listed Building Consent Application for the comprehensive redevelopment of the existing buildings known as Great Northern Warehouse, Deansgate Terrace and Leisure Box Manchester. M3 4EN ('the Site') within the jurisdiction of Manchester City Council ('MCC').

The proposals form part of a wider regeneration priority area. On 27 July 2016, Manchester's Executive Committee endorsed the 'Great Northern Complex, Manchester Central and Castlefield Quay Strategic Regeneration Framework' ('SRF'), which sets out a clear ambition to guide the redevelopment, re-modelling and refurbishment of the site within SRF boundary.

The ambition for the Great Northern Warehouse, Deansgate Terrace and Leisure Box, as set out in the SRF, is to allow the site to reach its full potential and reflect its strategic and historic importance within Manchester City Centre.

Full Planning Permission and Listed Building Consent is proposed incorporating;

- Refurbishment and reuse of the Great Northern Warehouse to provide office space through removal of existing car parking and ground floor retail and leisure uses, including retention of the existing casino, restaurant and bowling alley.
- Conversion and alterations to the Deansgate Terrace to provide further office accommodation with ground floor retail and leisure spaces.
- A series of new and enhanced public spaces alongside a remodelled and reworked Great Northern Square to provide an enhanced amenities and experiences for all users.
- Creation of at -grade routes between Deansgate Terrace and the Warehouse (Dean Street) and between Deansgate and Watson Street (Alport Square).
- Rationalised car parking (Leisure Box only) and the removal of vehicular ramps to the warehouse.
- Demolition of the existing Odeon Cinema and the creation of new homes within three residential buildings on top of the retained car parking structures. The new homes will benefit from a significant amount of external private amenity space at roof top level.
- Rationalised and de-engineered junctions and access routes onto Watson Street, which combined with public realm enhancements and active frontages will create a street that encourages pedestrian movement into the wider city centre northwards from the Deansgate Castlefield transport interchange, and via the new vertical circulation from deck level onto Great Bridgewater Street, being provided as part of Viadux.
- Enhancements to Deansgate Mews as a destination for local independent retailers and local communities. This will be achieved by improving accessibility and providing weather protection to enhance user comfort in external amenity spaces.

This Outline CMP document sets out details of the proposed works required to carry out the demolition, infrastructure enabling, and construction activities involved in the delivery of the buildings to be completed over a number of phases whilst outlining their anticipated timescales and identifying the environmental impact of the works and where practicable, proposals for how these are to be mitigated.

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This application for planning permission and listed building consent related to only part of the current application site and comprised conversion of the Great Northern Warehouse, works to Great Northern Square, and remodelling of the northern end of Deansgate Terrace under the following description of development:

"Phased redevelopment of the Great Northern Warehouse (GNW), Deansgate Terrace and Leisure Box, including areas of public realm, comprising:

- *demolition of the central atrium, GNW car park ramps, and other modern elements, alongside removal of 519 car parking spaces from the GNW, retention of casino (Sui Generis), bowling alley and existing food and drink unit (Use Class E) alongside the refurbishment, restoration, and re-use of the Grade II* Listed Great Northern Warehouse to provide office, retail and / or food and drink use (Use Class E) and ancillary areas;*
- *the refurbishment, restoration, partial demolition and 3-storey extension of the Grade II Listed Deansgate Terrace (northern section) and Goods Yard Entrance to form office, retail and / or food and drink use (Use Class E) and drinking establishments / hot food takeaway (Sui Generis), with associated public realm works comprising the reconfiguration of Great Northern Square and the introduction of additional public realm with associated hard and soft landscaping, together with highways works, access and servicing facilities, rooftop plant and other associated works;*
- *partial demolition of the existing leisure box prior to conversion; reconfiguration and extension of existing car parking to provide 929 parking spaces and associated plant, followed by construction of three residential buildings to provide 746 no. apartments (Use Class C3) above the retained car park comprising ground floor plus 16, 27 and 34 storeys respectively including 753 cycle parking spaces, with office, retail and / or food and drink use (Use Class E), or Sui Generis (drinking establishments / hot food takeaway) at ground floor and level 3, hard and soft landscaping, together with highways works, access and servicing facilities, rooftop plant and other associated works; and,*
- *external alterations and restoration of Deansgate Terrace (southern section) to provide office, retail or food and drink use (Use Class E) or Sui Generis (drinking establishments / hot food takeaway / live music venue), along with delivery of associated public realm, highways works, plant, and associated works."*

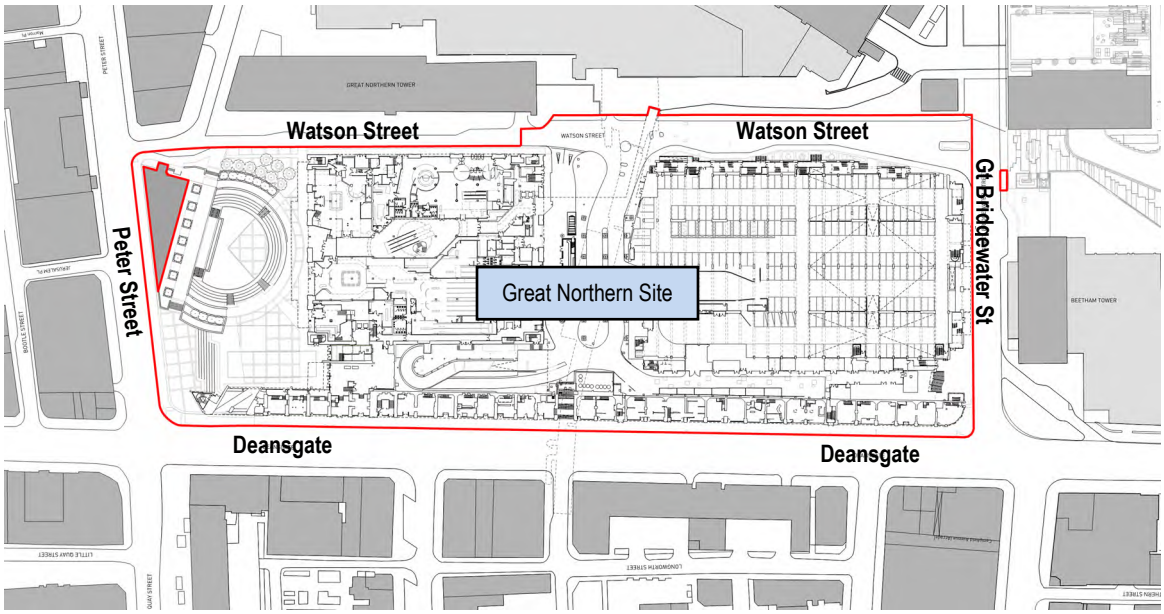


Figure 01 – Existing Buildings and Application Redline Boundary

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2.0 Site Location and Access

2.1 Existing Development Site

The development site is approximately 2.97 hectares and is located in Manchester City Centre, adjacent to the Castlefield and St John's Strategic Regeneration Areas.



Figure 02 – Wider Location Plan

The site is bounded by four carriageways; Peter Street to the north, Great Bridgewater Street to the south, Watson Street to the east and Deansgate to the west.

The Site is located adjacent to Deansgate and can be broadly divided into four components comprising:

- Great Northern Square – located to the north of the application boundary, the square is an area of public realm with a mix of soft and hard landscaping with an amphitheatre-style seating arrangement in its centre, which currently acts as barrier to movement across the space;
- Great Northern Warehouse and the modern atrium – a Graded II* Listed former railway goods warehouse built between 1896 and 1899, which was refurbished in 1999 to provide retail, commercial and car parking spaces (519 spaces);
- Leisure Box – a modern addition to the Warehouse following the 1999 refurbishments. The Leisure Box contains an Odeon cinema, the Gym and car parking (721 spaces); and
- Deansgate Terrace – covers the length of Deansgate from Peter Street to Great Bridgewater Street. The 3 to 4 storey length of terraces is Grade II Listed and currently comprises a mix of retail, food & drink and commercial

The development site is located within the Greater Manchester Combined Air Quality Management Area (AQMA) due to its proximity to major roads within the City Centre.

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The site is not within, nor does it contain, any ecological designations including sites of specific interest (SSSI), sites of biological importance (SB1) or special protection areas (SPA). The closet special area of conservation (SAC) and sites of special scientific interest (SSSI) Is the Rochdale Canal SSSI and SAC.

The site is partially in Flood Zone 1 and within the Manchester, Salford and Trafford Critical Drainage Area (CDA).

The development site is located adjacent to several Conservation Areas, including the Castlefield Conservation Area to the southwest, St John Street Conservation Area to the west, and St Peter's Square Conservation Area to the northeast. The northern edge of the Site falls within the Deansgate / Peter Street Conservation Area.

There are four listed assets within the development boundary:

- Great Northern Warehouse: The warehouse is Grade II* Listed, which reflects the outstanding national importance of the building, being considered, in its day, to be one of the most advanced railway goods exchanges in the country. The warehouse forms an important group with, and is an integral part of, the adjoining Grade II Listed Deansgate terrace;

- 223-233 Deansgate Terrace and 235-291 Deansgate Terrace (with Former Goods Yard Entrance): The terrace of 34 shop units is Grade II Listed in two separate parts: No's 223-233 and No's 235-291. The listed status of the terrace reflects its national importance architecturally and historically. The arched entrance into the former goods yard at the junction of Peter Street and Deansgate falls in part within the southern boundary of the Peter Street Conservation Area.

- Manchester & Salford Junction Canal Tunnel is located underneath the site and is Grade II Listed.

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2.2 Local Area

The Great Northern site occupies a strategic location at the south of the City Centre, at the important intersection of Deansgate and Peter Street. In addition to being within walking distance of the City's key services and facilities the site has excellent access to public transport including Piccadilly, Oxford Road and Deansgate Railway Stations, Metrolink, Metroshuttle services and a wide range of bus services to all destinations within Greater Manchester.

The site is surrounded by a mix of residential, commercial restaurants, cafes, nightclubs, workshops and offices.

The northern part of the site is within the boundary of the Deansgate/ Peter Street Conservation Area. The site is also adjacent to the boundaries of the St Johns, St Michael's and Castlefield Conservation Areas.

Within the site's immediate context, there are a number of emerging and consented developments, including the development of the Viadux site to the south of the Great Northern site adjacent to Deansgate/Castlefield Metrolink stop, which will establish new pedestrian linkages to Watson Street.

The site sits within a pivotal location at the southern edge of the city centre between a number of Manchester's key established and emerging economic growth and regeneration areas, including: the Central Business District, St Peter's Square, the Conference Quarter and Spinningfields; established regeneration initiatives around Corridor Manchester and First Street; and more recent regeneration areas, including Great Jackson Street and St John's. Each of these areas has been the subject of clearly articulated area-based regeneration strategies which have subsequently been implemented, or are in the process of being implemented, to deliver added value and complementary economic growth in the city centre.

The primary construction vehicle access routes have been prepared taking these into consideration where practicable.



Figure 03 – Local Site Location Plan (ref Simpson Haugh Architects)

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2.3 Existing Local Constraints

Within the local area there are a number of local constraints that need to be considered during the demolition and construction activities and although the primary approach to provide the best environment to deliver the project whilst minimising impact on the local environment, some constraints will require a more specific tailored response.

This section identifies key local physical constraints and where appropriate outlines the areas that the demolition and construction works should accommodate in terms of methodology and where appropriate sequence.

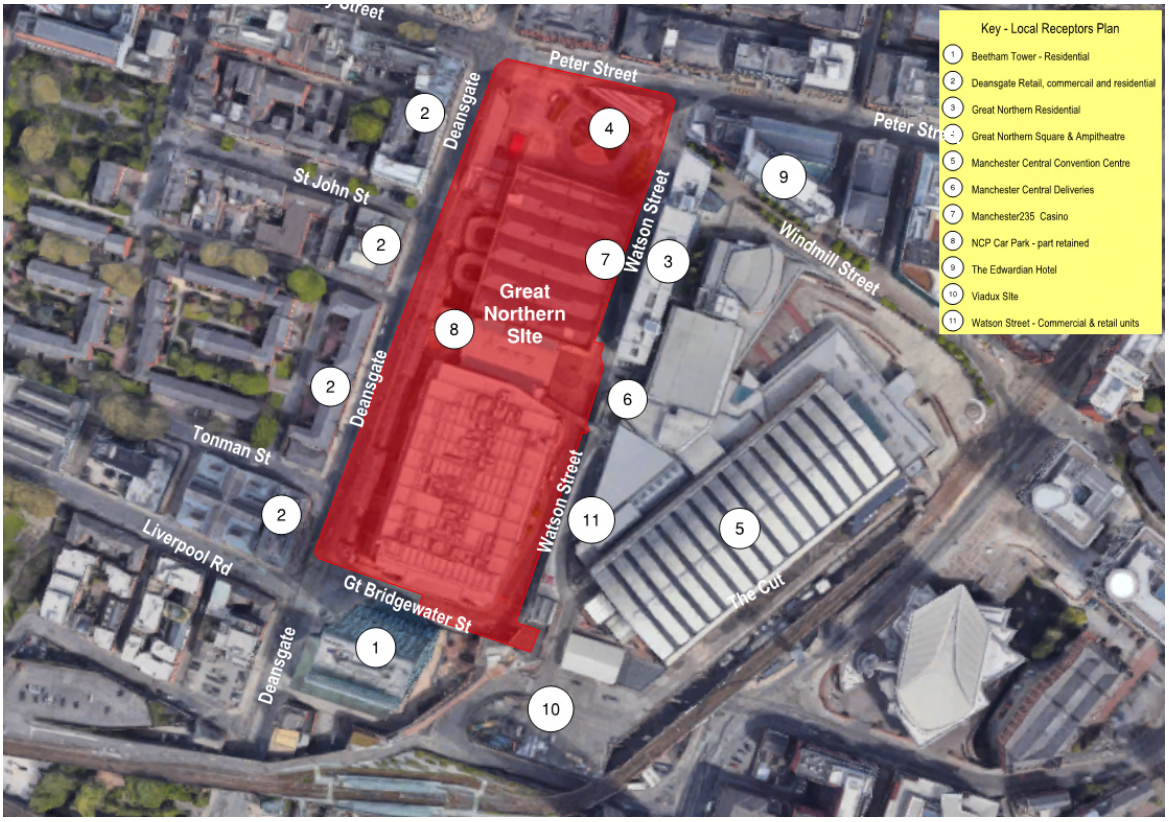


Figure 04 – Key Receptors Plan

2.3.1 Great Northern Warehouse - Existing Tenants

During the initial Phase A and B works a number of existing retail tenants will remain in occupation and access to their units for the public, deliveries and waste removal will need to be maintained and managed by the Contractor.

These include Manchester235 Casino, various food and beverage offerings and All Star Lanes Bowling and Almost Famous.

A managed approach to mitigate the potential impact of noisy and vibration generating activities during the enabling, demolition and construction activities will be employed by the Contractor, an outline of these can be found in section 6.0 of this document.

A detailed study that has been prepared in conjunction with the building management team, setting out access routes, areas of tenant occupation and proposed construction arrangements can be found in Appendix 3.

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2.3.2 NCP Car Park

The existing NCP Car Park accessed via Watson Street is to be maintained at a reduced capacity of 100 spaces during the Phase A works.

Specific sequencing and temporary works proposals have been prepared that detail the revised entrance and exit arrangements from Watson Street together with details of progressive relocation of parking spaces across the basement and ground floor car parking areas and can be found in Appendix 3.

2.3.3 Great Northern Tower

The Great Northern Tower is multi storey residential building located to the northeast/east side of the development site on the corner of Watson Street and Windmill Street running parallel with the Great North Warehouse building.

Vehicle access to and from the car park will be maintained from Watson Street at all times.

Throughout the works, in particular to the Phase A works that will take place on the adjacent Great Northern Warehouse Building, a managed approach to mitigate the potential impact of noise, dust and vibration generating activities during the enabling, demolition and construction activities will be employed by the Contractor, an outline of these can be found in section 6.0 of this document.

2.3.4 Other Local Receptors

In addition to the incumbent operators that require consideration during the works a number of local key receptors have been identified in Figure 04.

These range from retail, commercial, private residential and hotels, all of whom have been considered in the generation of the proposed vehicle routing, delivery and unloading areas and general logistics approach outlined within this document.

A managed approach to mitigate the potential impact of noisy and vibration generating activities during the enabling, demolition and construction activities will be employed by the Contractor, an outline of these can be found in section 6.0 of this document.

2.4 Site Access and Egress

The primary construction access and egress routes to the site for demolition and construction HGV's have been considered carefully to minimise the impact of vehicle movements on the local community and road network.

A review of the physical location of access nodes and transport links to the primary road network that would be suitable for demolition and construction traffic, potential routes to and from the site have been identified that where possible avoid Manchester City centre.

Due to the location of the development, the neighbouring properties, local road network layouts coupled with the need to retain the car park access routes that link directly to and from Peter Street and Deansgate, routes are provided for heavy goods vehicles at various stages through the works that allow the passage of vehicles broadly east-west through the site and exit back onto the site using Deansgate, Great Bridgewater Street and Watson Street.

Following this assessment and review of the local traffic movements, we have identified vehicle access and egress routes that provide safe and efficient links back to the primary road network whilst minimising the impact on the local highway.

Figure 05 below indicates the location of the development site in relation to the wider road network.



Figure 05 – Wider Site Location Plan

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2.4.1 General Vehicle Access

Construction access and egress onto the site will take place from the north of the site off Peter Street and south of the site from Deansgate as noted on Figure 06 with Watson Street and Great Bridgewater Street used at certain phases of the works, these are detailed further with this CMP.

The appointed Contractors will have a proven record for developments for this nature and operate an online booking in system for ALL deliveries and material removal from the site.

Contractors working on the development will be required to register with FORS (Freight Operator Recognition Scheme), CLOCS (Construction Logistics and Community Safety) schemes and ensure compliance with Euro 6/VI vehicle emission standards.

In addition to the requirements of FORS and CLOCS, construction vehicles should be fitted with cycle specific safety equipment, Fresnel lenses and side scan equipment which results in an audible beep in the driver's cab when a cyclist is on the left inside space. Under-run guards are also required to prevent cyclists from coming into contact with lorry wheels. Vehicles must also carry signs to warn cyclists and pedestrians to help reduce the risk of collisions.

To prevent mud, dust and waste being deposited on the highway, the contractor shall ensure that all vehicles leaving the site are suitably cleaned and watered down as necessary. A logistics team will be in place to wash down vehicles prior to re-entry to the highway. The logistics team will use jet-wash lances at a specific 'wash down area' to prepare the vehicles before they enter the highway together with regular road sweeper visits to sweep and wash the primary egress route local to the site.

The demolition and sub-structure logistics plans within this document indicate the overall location of the site, existing buildings together with construction vehicle access routes. Sections 3.0 and 5.0 develop these details further and provide an overview of the proposed approach to construction logistics.

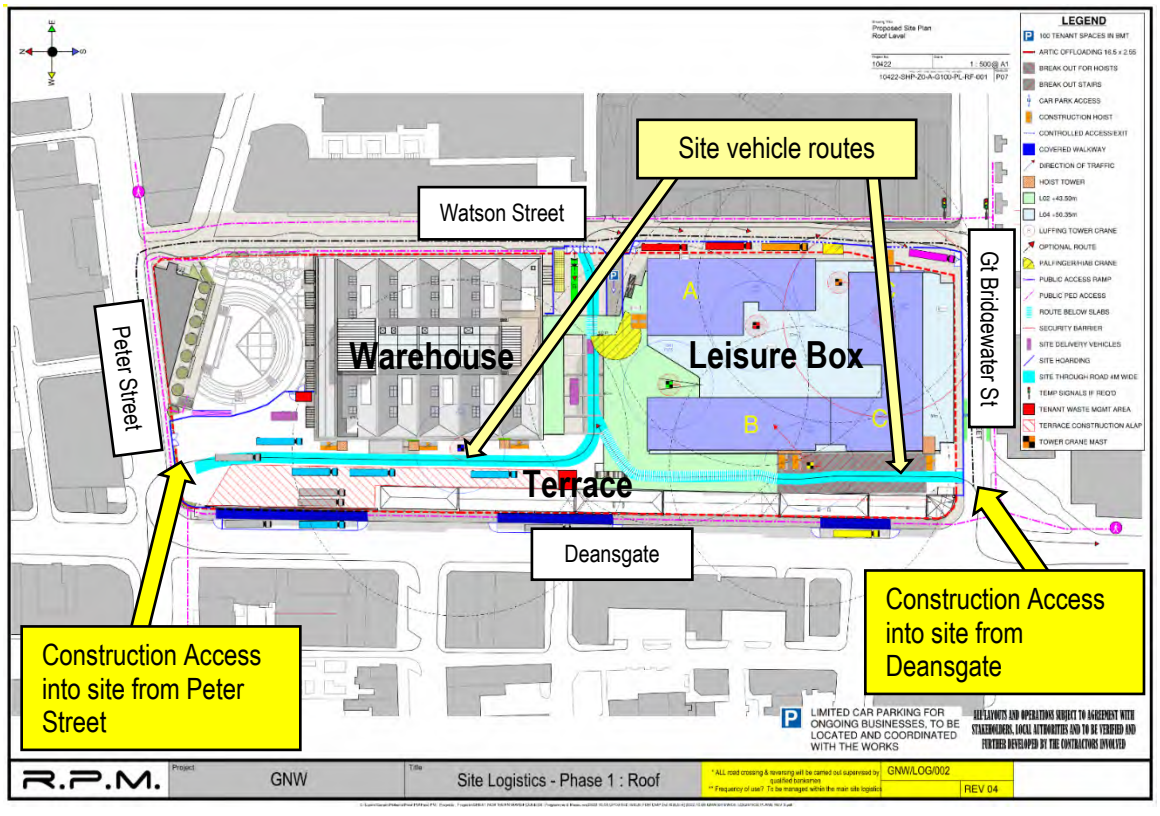


Figure 06 – Logistics Extract Plan indicating Site Construction Vehicle Access points and Site Routes

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2.4.2 Pedestrian and Cyclist Access

Peter Street, Deansgate and Great Bridgewater Street include cycle routes so careful marshalling of construction vehicles entering the site will be required to be implemented by the Contractor.

Hoardings along the west of the site will be positioned to maintain public access along the highway network. The pedestrian footpath to Deansgate and its adjacent cycle route will remain open for the duration of the works, with covered walkways provided to protect the public with the possible exception of local diversions that may be required to facilitate utility service diversions to enable the works.

With the proposed pit lanes located on Deansgate, temporary suspension of the car parking, loading bays and disabled parking will be required.

Pedestrian and cyclist movement will be managed at the site entrances through the use of concertina barriers deployed by trained and certified CLOCS SATM traffic marshals to prevent movement of pedestrians and cyclists during vehicle movements into and leaving the site.

To facilitate safe pedestrian and cyclist access during the phased delivery of the plots, it is proposed that a pedestrian/cyclist routing management plan would be prepared that involves the implementation of temporary signage and through consultation with MCC Highways the provision of any temporary illuminated zebra crossings to provide safe crossing points.

This plan will define in detail the number and position of trained vehicle traffic marshals who in broad terms will be deployed at each of the vehicle entry and exit locations and ensure that vehicles entering and exiting the site are managed and marshalled to ensure safe integration into the road network.

For details of specific pedestrian routing during the works refer to the phasing/logistics plans within Section 5.1 of this document.

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2.4.3 Demolition and Construction Vehicle Routing

As detailed in Section 2.1, the site is bounded by four carriageways, Deansgate to the west, Peter Street to the north, Great Bridgewater Street to the south and Watson Street to the east so good vehicle access is available to the site and therefore each of these roads have been identified as appropriate route that can be used for construction vehicles to access and egress the site during the various phases.

The primary access routes detailed in Figure 07 below identify the optimum routes from the primary road for not only HGV's, but all other vehicle types travelling to the site.

Swept path drawings have been prepared to test the proposed vehicle routes to and from the site via the key site entrances and can referenced in Section 5.0.

To ensure vehicles can arrive from and return to the primary road network as efficiently as possible, a route from the north has been identified that ensures all vehicles arriving from Quay Street make a right turn off Peter Street into Deansgate.

As the Phase A and B works progress, vehicle access to the site is available from Peter Street through a route created within the site to Watson Street and access via Great Bridgewater Street via through a further route created via Watson Street.

Details of the routing of vehicles within the development site across the phases can be found within the logistics plans in Section 5.0 of this document.

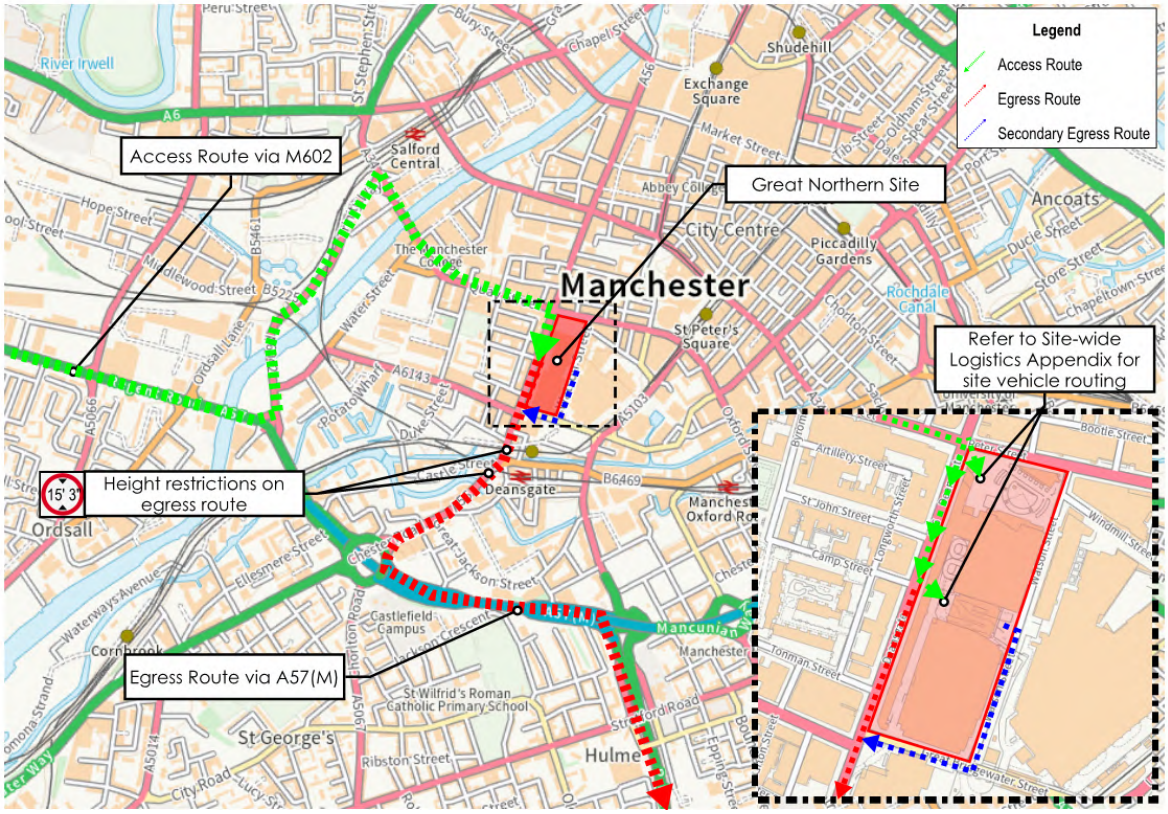


Figure 07 – HGV Construction Access (shown dotted green) and Egress Route (shown dotted red and blue)

The vehicle egress routes detailed in Figure 07 require vehicles leaving the site from Watson Street to make a right turn onto Great Bridgewater Street and left turn onto Deansgate (southbound) where they will continue their journey south to join the primary road network.

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3.0 Site Set Up and Logistics

3.1 Logistics Principles

The logistics plans within this document have been developed using the constraints as guiding principles and are intended to illustrate access to and from the site during the sub/super-structure and envelope and fit out phases of the Project.

The plans detail the vehicle access and egress locations during the various phases of the build and identify the tower crane locations and illustrate the pick-up locations necessary for the construction of the enabling, demolition and super-structure activities across each of the phase of the works.

3.2 Outline Logistics Proposals

Details of the logistics arrangements are illustrated within Section 5.0 and Appendix 3 of this document.

To facilitate the demolition and construction works, subject to prior approval with Manchester City Council the site perimeter will be enclosed by a solid 2.4m hoarding to protect the public during the works. Given the partial occupation of certain areas of the site by existing tenants access to the NCP car park will be maintained at a reduced capacity as noted elsewhere in this document.

Application for licence to install hoarding / scaffolding and any associated temporary traffic management arrangements will need discussion and agreement with MCC Highways Applications and Network Resilience teams via Contact Manchester (Tel. 0161 234 5004) Email - highwaylicences@manchester.gov.uk

The following sections cover the specifics around pedestrian access, demolition and construction vehicle access via Deansgate and Peter Street and egress via Watson Street and Great Bridgewater Street.

3.2.1 Deansgate

The pavement to Deansgate will remain open during the works with potential reductions during works to the northern terrace.

Deansgate will be one of the two major delivery points for the Development and provide 3 separate pick up locations for the proposed tower cranes with other pick-up locations provided within the confines of the site. Demolition and construction vehicles will arrive and depart Deansgate in a southerly direction via the prescribed construction traffic routes detailed within Section 2.0 of this document.

These routes are identified on the Sitewide Phase A and B logistics plans within Appendix 3.

At each pick up location an internally illuminated covered walkway will be provided to ensure safe pedestrian access is maintained.

The southern end of Watson Street will also provide tower crane pick up location.

Hoarding adaptions and relocation will take place sequentially as the public realm works are completed with access maintained where possible.

3.2.2 Peter Street

Following the completion of the works to the northern Deansgate Terrace, Peter Street will provide a vehicle access onto the site which will provide an internal arterial route that links with Watson Street vehicle unloading areas.

The North Square and amphitheatre will remain open for public access with the western section enclosed with a continuation of the perimeter site hoarding that will provide material processing and delivery areas. A temporary ramp will be provided to maintain the existing disabled access available from Peter Street into the square

3.2.3 Watson Street

Watson Street is the second of the two major delivery points for the Development and provide a pick up location for the proposed tower cranes with other pick-up locations provided within the confines of the site, vehicles will arrive via the east-west link between the Warehouse and Leisure Box accessed from either Peter Street entrance of the entrance off Great Bridgewater Street once sufficient demolition works have been completed to the rear of the Deansgate Terrace.

This will require the suspension of the existing vehicle loading bays.

The north section of Watson Street adjacent the Great Northern Warehouse will remain open to its junction with the NCP Car Park access/egress. A hoarding will be erected from the current car park exit running south with gates provided for vehicle exit and reversing bay provided for deliveries.

To the south of Watson Street adjacent to the Leisure Box a hoarding will be installed to provide a vehicle delivery area which will require the closure of the footway in this location and to its junction with Great Bridgewater Street (GBS). Vehicles will arrive from the east-west route within the site and exit via gates to the southern junction with GBS.

Hoarding adaptions and relocation will take place sequentially as the public realm works are completed with access maintained where possible.

These routes are identified on the Sitewide Phase A and B logistics plans within Appendix 3.

3.2.4 Great Bridgewater Street

The north pavement adjacent to site will be closed for the duration of the works with the hoarding running east west between the Watson Street vehicle exit and proposed vehicle entrance to the west end of Great Bridgewater Street. The existing staircase access to the rear of the Deansgate terrace will also be closed to facilitate the demolition and enabling works that take place to the rear of the terrace.

The southern footway between Deansgate and the junction with Watson Street will remain open during the works, with access to Beetham Tower maintained at all times.

The east west cycle routes will be maintained.

Hoarding adaptions and relocation will take place sequentially as the public realm works are completed with access maintained where possible.

3.3 Tree Removal and Protection

An initial tree survey carried out by Indigo Surveys Ltd resulted in the BS5837 quality/retention categories of 'B - moderate' and 'C - low' being attributed to the tree groups.

The site's trees are growing in a combination of raised planters and directly planted with hard surfaced surrounds in the site's amenity areas adjacent to the Great Northern Square. Some of these are growing fairly successfully whilst others are suffering due to the absence of suitable management and harsh and restricted growing environment i.e. limited suitable soil availability and associated nutrient and water deficiencies.

It will be necessary to provide protection to the trees prior to commencement of the works to the Warehouse building and external works to the north, it is envisaged this will comprise the following in accordance with BS583 Trees in relation to Design, Demolition and Construction;

- Agree any pruning works prior to works commencing by a suitably qualified Arboricultural contractor;
- Induction of construction personnel regarding the exclusion of works (including access and storage) from

the retained trees' RPAs;

- Secure temporary barrier fencing around the site to exclude the retained tree's crowns and RPAs from the working site; Store materials clear of all retained trees and conditions to ensure no contamination/run-off into soils in proximity to trees or on higher ground; and
- For the removal of existing structures and/or hard surfaces from RPAs the works to be undertaken separate to construction, manually and sensitively.

3.4 Logistics Management and Neighbourhood Liaison Manager

The contractor shall provide a nominated directly employed member of staff to act as Logistics and Neighbourhood Liaison Relationship Manager. This individual will be responsible for managing and co-ordinating the material access / egress to the site through the operation of a vehicle / material booking in system. It will be their responsibility to manage and update the contractors Construction Traffic Management Plan in conjunction with the Project Construction Phase Health and Safety Plan. Both documents will be reviewed, updated and distributed, as necessary.

As part of the role, early contact will be made with representatives from key neighbours and other adjoining residential properties in the vicinity to ensure regular contact is maintained throughout the demolition and construction process. This will allow the site team to log any complaints received by the neighbours or any other affected third parties. Responses to those complaints can then be managed. To facilitate this, a Freephone 24 hour emergency contact number will be displayed on the external hoarding.

The cleanliness of the site boundary will be maintained. The areas adjoining and used for access to cross the public highway will be kept clean and free from obstructions. Where there is a need to run cables, hoses or any other potential hazard for the users of the footway, suitable ramping together with appropriate signage must be employed.

These external areas will be the responsibility of the banksmen and outside of their role of policing deliveries to and from the site they will be on hand to offer help and assistance to vulnerable users of the footway.

3.5 Condition and Party Wall Surveys

As soon as the Contractor is appointed a series of photographic condition surveys will be carried out to the surrounding area during the lead in period before the start on site date.

To protect MCC and for the contractor to verify the condition of the carriageway prior to construction, dilapidation survey/s recoding the condition of carriageway / footways on the construction vehicles routes surrounding the site, namely Watson Street, Deansgate, Peter Street and Great Bridgewater Street are to be undertaken.

The scope of these surveys will encompass the immediate access route noted the immediate highway including adjoining properties and land where appropriate.

Due to the nature of the site, it is not envisaged that any party wall awards are required to be entered under the Act however, where deemed appropriate adjoining properties will be surveyed as part of any party wall process and regular inspections will be carried out as the works progress.

3.6 Site Security, Access & Traffic Management

External CCTV cameras will be sensitively located around the site perimeter. During working hours pedestrian and vehicle entrances and exits will be staffed by security personnel throughout the project period. Energy efficient and suitably located lighting will also be provided to the hoarding to enhance visibility and security.

All staff and visitors to the site will use an electronic system to access / exit from the site.

With the site well served by local public transport bus links and the following nearby rail connections are available;

- Deansgate-Castlefield Stop (Tram) a 2 minute walk
- Deansgate train station (northern Rail) a 5 minute walk.
- Manchester Piccadilly train station (Avanti West Coast, Northern and various regional lines) a 15-minute walk.
- Various bus routes available on Peter Street and Deansgate.

There will be **no parking** for staff or workforce construction vehicles on site.

3.7 Delivery / Vehicle Management

3.7.1 General Vehicle Movements

In order to minimise the impact which the increase of local construction traffic will have on the local area; all vehicle movements both in and out of the site will be managed and monitored by the Logistics Manager who will ensure vehicles do not, other than in the defined delivery points and pit lanes, wait on Peter Street, Watson Street, Great Bridgewater Street, Deansgate or other local highways; at any time.

All vehicle movements to and from the site will be subject to a delivery booking system managed by the Contractor's Logistics and Neighbour Liaison Manager and this system will incorporate any special events for the neighbours. The system will also ensure that material deliveries are rationalised to reduce vehicle movements to the site. To ensure bottle necks and waiting vehicles are avoided, a system will be implemented to ensure that each delivery is called into the site when required.

The deliveries outside of the site hoardings will be 'by exception'. All other deliveries will take place within the confines of the site and not off the highway. All deliveries crossing the footway and entering the site will be managed into the site using trained banksmen who will maintain the flow of the footway, particularly during peak times. Suitable well maintained 'Chapter 8' barriers will be used to segregate the public from construction traffic movements wherever necessary.

The appointed Contractor must have a proven record for developments for this nature and operate an online booking in system for ALL deliveries and material removal from the site.

It is envisaged that peak construction vehicle numbers during the works to reach approximately 100 for a limited period of time when demolition and Leisure Box piling, and structural works are in progress.

Of the numbers estimated above, one vehicle movement relates to a single vehicle (cars and HGV's) entering and existing the site via the previously noted primary HGV routes.

Details of the combined and standalone HGV and LGV estimated vehicle number based upon the summary programme can be found in Section 5.2.

To ensure that all vehicles leaving the site are suitably cleaned at the key demolition and sub-structure stages of the programme, a dedicated logistics team will be in place to wash down vehicles prior to re-entry to the highway. This team will use jet-wash lances at a specific 'wash down area' to prepare the vehicles before they enter the highway together with regular road sweeper visits to sweep and wash the primary egress route local to the site.

4.0 Details of the Works

The total construction programme is expected to span a period of approximately five years and will be undertaken in two main construction Phases. Refer to Appendix 3 for further details of the works, sequencing and logistics approach.

- **Phase A -** Warehouse conversion (including demolition of the glazed atrium link) and Deansgate Terrace North plus Great Northern Square
- **Phase B/C** - (potentially with some overlap of Phase A) Partial demolition of the Leisure Box, delivery of the proposed residential towers and conversion of the southern end of Deansgate Terrace.

In advance of the main construction works commencing on site there will be a pre-construction period of approximately one year which will allow for the delivery of a number of key utility service diversions and reinforcement works including provision of a temporary HV substation. Third party notifications and approvals will be discharged during this enabling works stage.

Alterations to the listed building elements, will be undertaken in accordance with the schedule of works set out in the Listed Building Consent drawings prepared by SimpsonHaugh. Detailed Conservation Method Statements will be developed prior to commencement of works to the Listed Building Consent.

A key programme constraint is the retention of existing tenants on the site including the Casino, Bowling Alley, Restaurant and Food & Beverage outlets located within the Great Northern Warehouse Building and the requirement to maintain 100 car parking spaces within the Ground and Basement levels of the existing Leisure Box Structure.

The retention of these existing tenants / live operations has dictated the detailed construction sequence, servicing and logistics that are reflected in the construction programme and is detailed in the technical Appendices.

Phase A Programme Overview

- Existing tenants: - Casino, Bowling Alley, Restaurant and Food & Beverage outlets remain in occupation throughout the entire construction works period including servicing provisions and public access.
- Enabling Works have an estimated duration of 6 Months with completion June 2024.
- Commence Main Construction works June 2024 with Vacant Possession of non-retained tenant areas.
- Great Northern Warehouse Commences August 2024, Construction estimated to take 21 Months with Completion March 2025.
- Northern Terraces Commence March 2025, Construction estimated to take 12 Months with Completion March 2025.
- External Works will run for the duration of the Phase A construction period and will include all works to the Northern Public realm area.
- At the completion of the Phase A works the Great Northern Warehouse, Northern Terraces and Northern Public realm Northern will be operational with full public access, Construction works to the Leisure Box will be ongoing with shared access to the central service area.

Phase B/C Programme Overview

- Existing car parking is proposed to be retained tenants at a reduced level of circa 100 parking spaces at Ground and Basement Levels and will remain in occupation throughout the entire construction works period.
- Enabling works have an estimated duration of 12 Months with completion June 24.
- Commence Strip Out April 2024, Demolition Works May 2024, Main Construction works June 2024 with Vacant Possession of non-retained car parking areas and public realm November 2024.
- Leisure Box Commences August 2024, Construction estimated to take 58 Months with Completion June 2029.

- External Works commence December 2027 with an estimated duration of 14 Months with completion Feb 2029.
- Phase B and C works will be ongoing following completion and handover of the Phase A works.

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4.1 Outline Demolition and Construction Sequence

This section builds on the outline phases laid out in the previous section and provides an indicative summary of the proposed enabling, demolition and construction works. Further details of which can be found within the programme in Section 5.0 of this document. A pre-demolition audit has been undertaken and can be found in Appendix 02 of this documents.

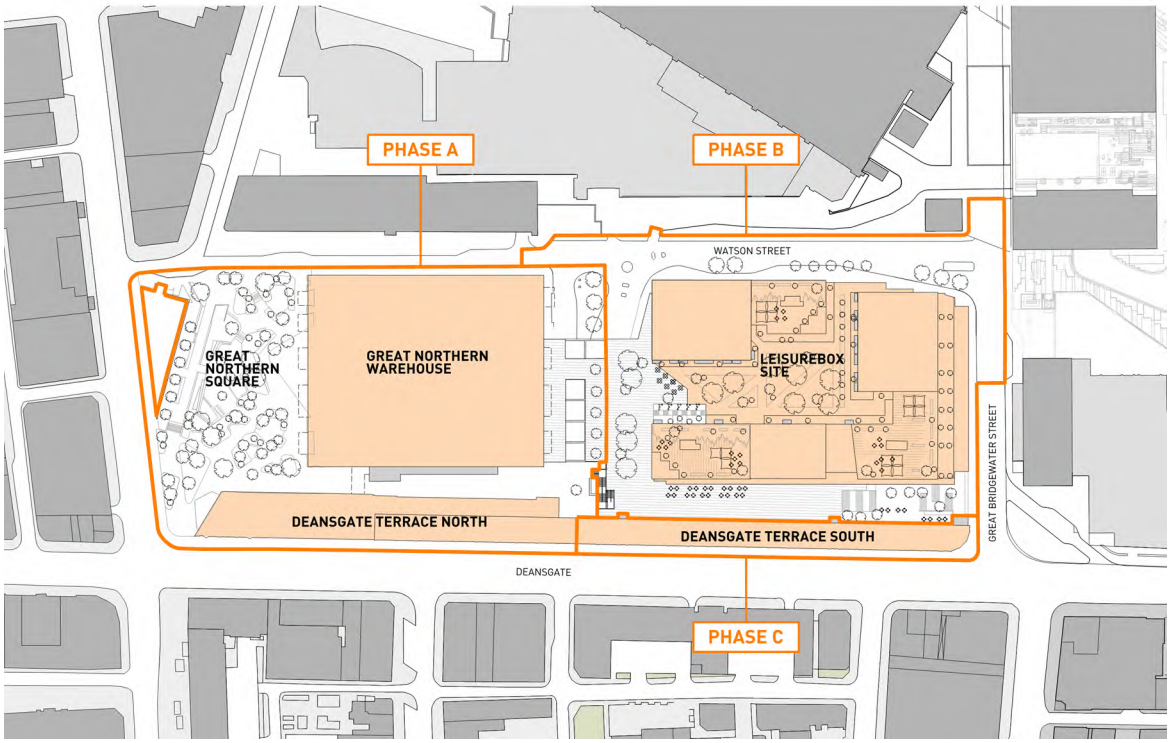


Figure 09 – Logistics Extract

Phase A Works

- Initial site access and egress to site will be via the existing vehicle entrance on Watson Street until sufficient enabling works have been completed to allow a one way system to be implemented.
- The one way site access and egress system will then come into operation in with access into site from temporary site crossovers & entrance gates on Peter Street & Great Bridgewater Street, these will merge in the central area of the site with egress from site through the remodelled existing entrance on Watson Street.
- Access and egress to the existing car park within the leisure box will be reconfigured on Watson Street to allow continued use based on a reduced number of 100 parking spaces at ground and basement level
- The configuration of the temporary car park provision will alter a number of times during the construction process in line with the construction sequence and programme.
- The live construction site will be fully secured with a full heigh close boarded hoarding to the site perimeter.
- Pedestrian and vehicular access to the site will be fully security controlled.
- The Majority of the Public realm to the North of the existing Great Northern Warehouse will remain in public use during the works, localised areas will require hoarding off to undertake specific works at various stages of the construction programme.
- Where possible vehicle off-loading points will be located within the site boundary, where this is not possible crane off load points will be located on the highway in approved loading bay positions on Watson Street and Deansgate.

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- Encapsulation scaffolds will be erected to areas of demolition and structural alteration works.
- Vertical material distribution will be provided through a combination of mobile craneage, tower cranes and goods hoists which will be located at key positions for both the enabling and new build works.

Phase B/C Works

- Towards the end of the Phase A construction works the site entrance off of Peters Street will be removed to allow for completion of hard landscaping works to the area.
- With Phase A completed the North are of the site will be fully handed over and will be in use with full public access.
- The one way site access and egress system will then operate with a single access into site from Great Bridgewater Street with egress from site through the remodelled existing entrance on Watson Street.
- Servicing to the newly completed Phase A area will be via the central area under banksmen control.
- Access and egress to the existing car park within the leisure box will be in continued use based on a reduced number of 100 parking spaces at ground and basement level.
- The configuration of the temporary car park provision will alter a number of times during the construction process in line with the construction sequence and programme.
- The live construction site will be fully secured with a full heigh close boarded hoarding to the site perimeter reconfigured to separate the North live area from the Southern Construction site area.
- Pedestrian and vehicular access to the site will be fully security controlled.
- Where possible vehicle off-loading points will be located within the site boundary, where this is not possible crane off load points will be located on the highway in approved loading bay positions on Watson Street and Deansgate.
- Vertical material distribution will be provided through a combination of mobile craneage, tower cranes and goods hoists which will be located at key positions for both the enabling and new build works.

This is an indicative construction programme and the Applicant highlights that there are multiple risks involved in the development process.

The Applicant notes that this programme may ultimately be extended in the event delays caused by sustained periods of poor weather, existing but hidden structure issues, unexpected ground conditions or other abnormals, volatility in economic and housing markets, political uncertainty, and the availability of funding.

The programme is based upon normal working hours in line with Manchester City Council Guidance of 7.30hrs to 1800hrs Monday to Friday and 0800hrs to 1400hrs on Saturdays.

On Sundays and Bank holidays noisy working will generally not be planned. On some occasions there are certain operations that maybe required to proceed during these periods, for example tower crane erection and dismantling.

These will be infrequent and will be agreed with the Environmental Health Officer (EHO) and local residents through a series of neighbourly engagements. The frequency of these will vary and respond to demand. Access to the Site will be permitted 30 minutes prior to working day commencing with noise being kept to a minimum for the first half hour of each day.

We acknowledge the close proximity of the neighbouring residents and existing tenants and as such will endeavour at all times to ensure the working hours are adhered to in order to protect this residential amenity.

Detailed method statements defining the proposed methods including any temporary works, including details of any proposed groundwater and movement monitoring will be provided as the design develops as part of the detailed CMP issue. These CMPs would be submitted to Manchester City Council for approval via condition prior to the relevant works commencing.

4.1.1 Site Set Up and Welfare Facilities

As the development will be released in phases with vacant possession of the existing buildings occurring at different stages there will be an appropriately phased approach to hoarding and welfare of the site.

As described above and shown in the logistics slides, to allow the initial works to commence, a fully decorated 2.4m hoarding will be provided to the site boundaries with access to the Great Northern public square maintained.

This would incorporate, where applicable appropriate tree protection measures to ensure the hoarding and any temporary accommodation do not impair the existing tree structure and growth as detailed with the Arboricultural report prepared by Indigo Surveys Limited.

Welfare and accommodation will initially be located within the existing buildings during enabling and demolition phases and progressively relocated as works progress; once the new construction works commence it is envisaged the welfare and accommodation will be located off the site, the specific details of final location will be identified.

The hoardings will be lit with energy efficient LED lighting and the access points illuminated so to minimise visual intrusion and light spillage/ pollution at the nearby properties but will comply with regulations to ensure safe passage around the perimeter. The hoarding is to include (where appropriate) public viewing panels that allow children as well and adults to observe operations and a Freephone contact number to the Neighbourhood Liaison Manager.

The site hoarding line will remain in place throughout the project, be regularly maintained and in the main will only be removed as the external finishing works require. As the façade and external works are completed at the interface with hoardings will be locally relocated.

Finite details of progressive hoarding moves will be provided within the contractors detailed logistics and phasing plans as part of the Plot specific Construction Management Plan and Construction Phase Health and Safety Plan that will be produced

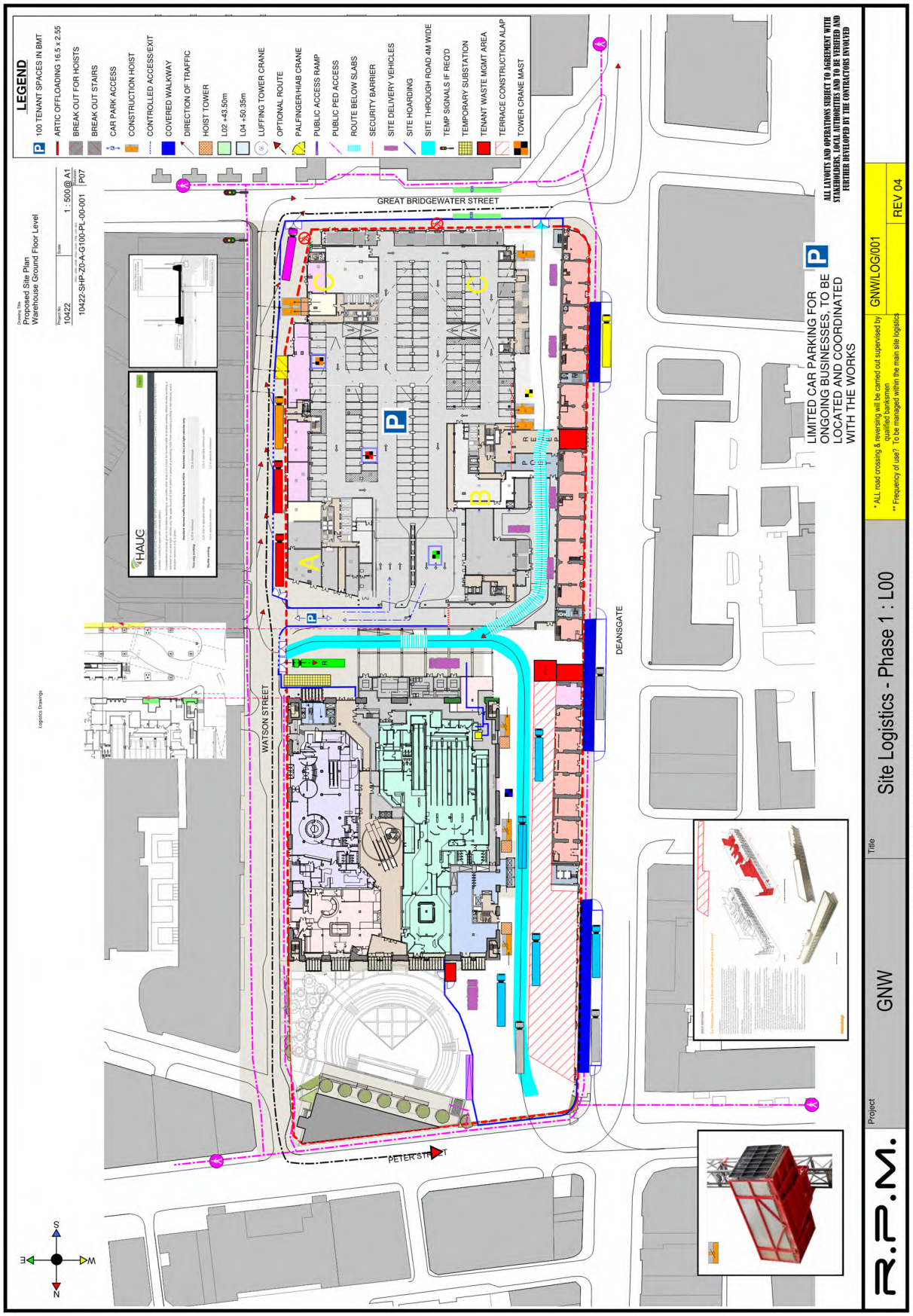
5.0 Indicative Site Logistics Plans and Programme

5.1 Logistics Plans

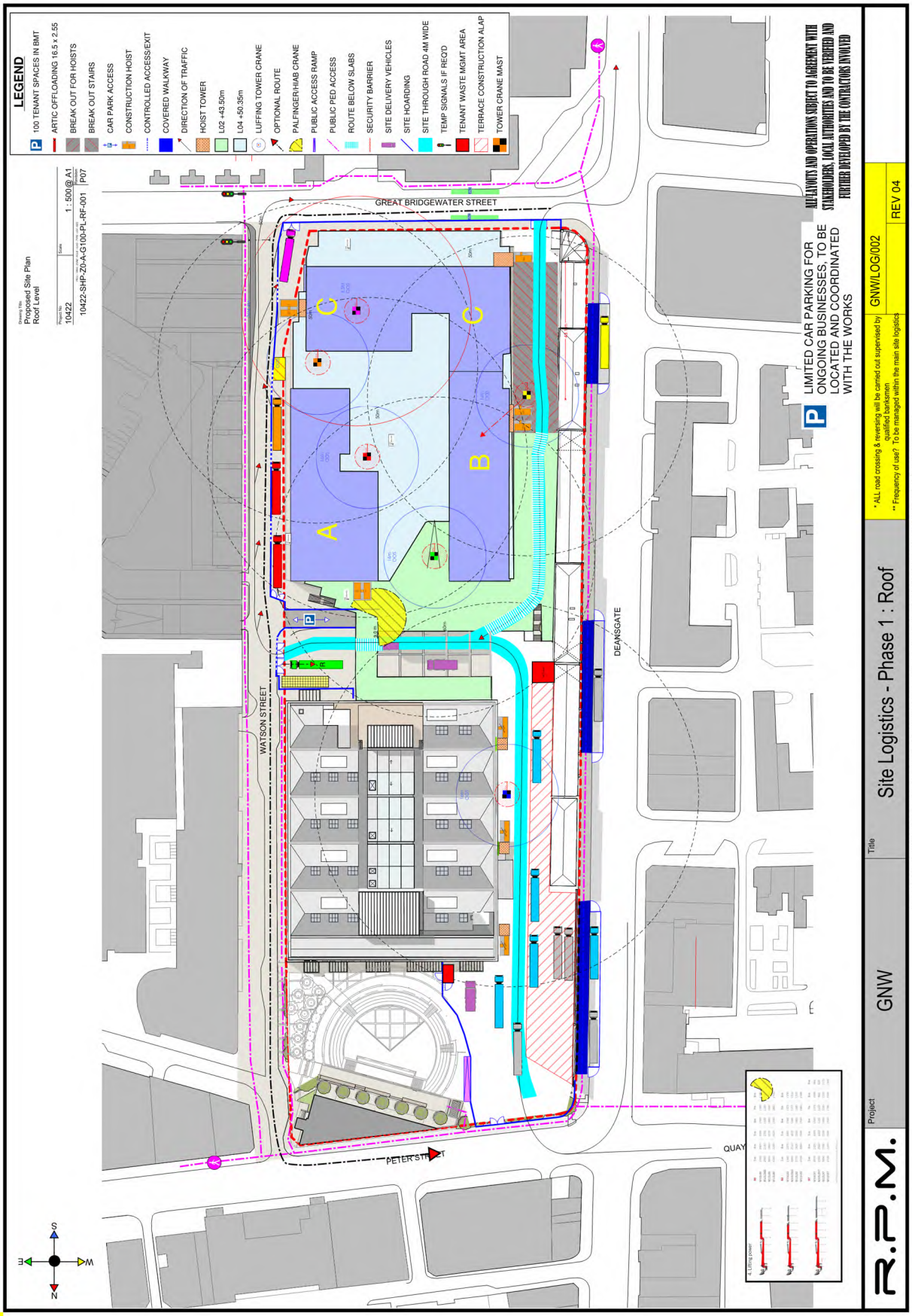
Sitewide Logistics Plans

(Also refer to Appendix 3 for further details of the proposed logistics arrangements)

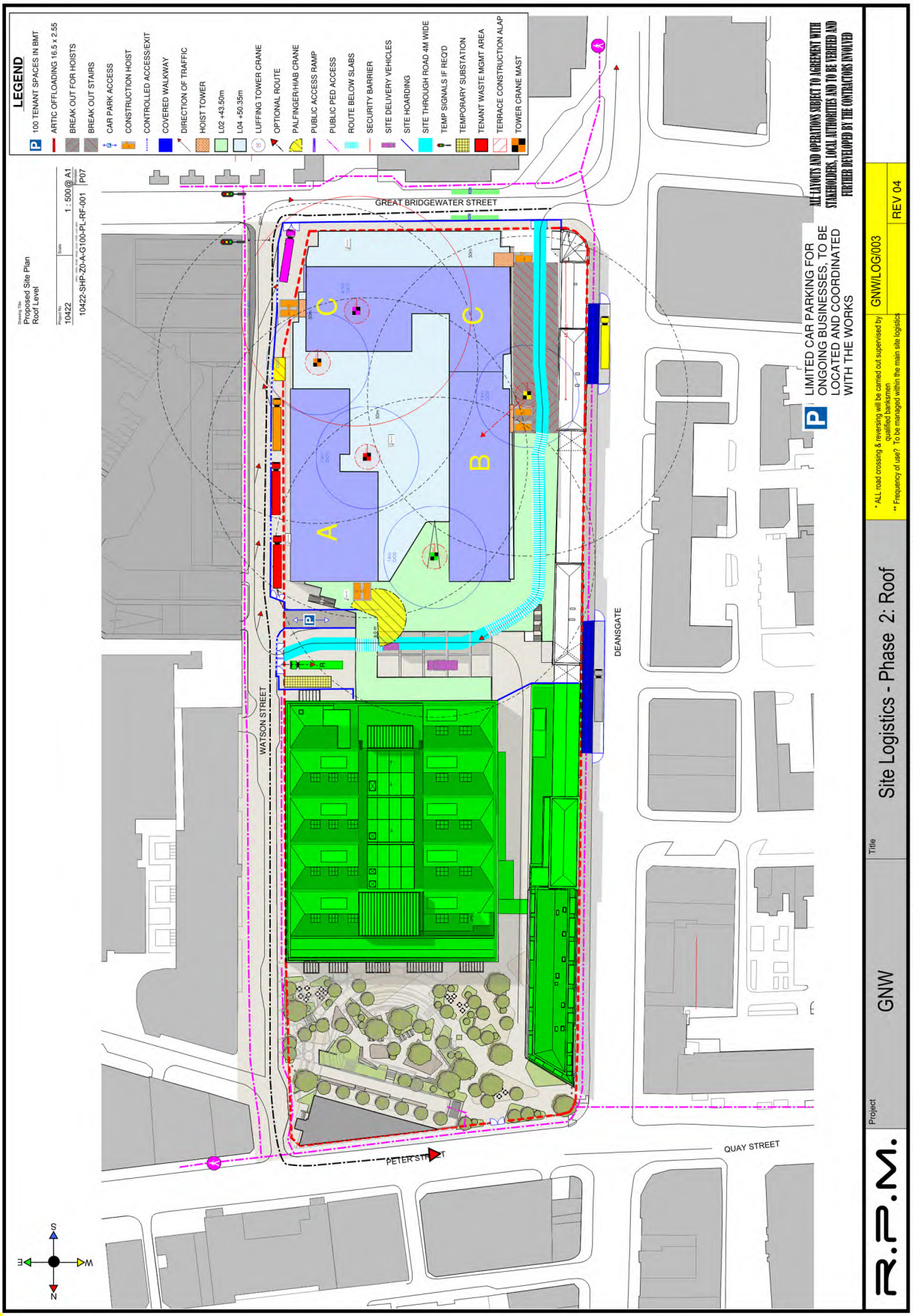
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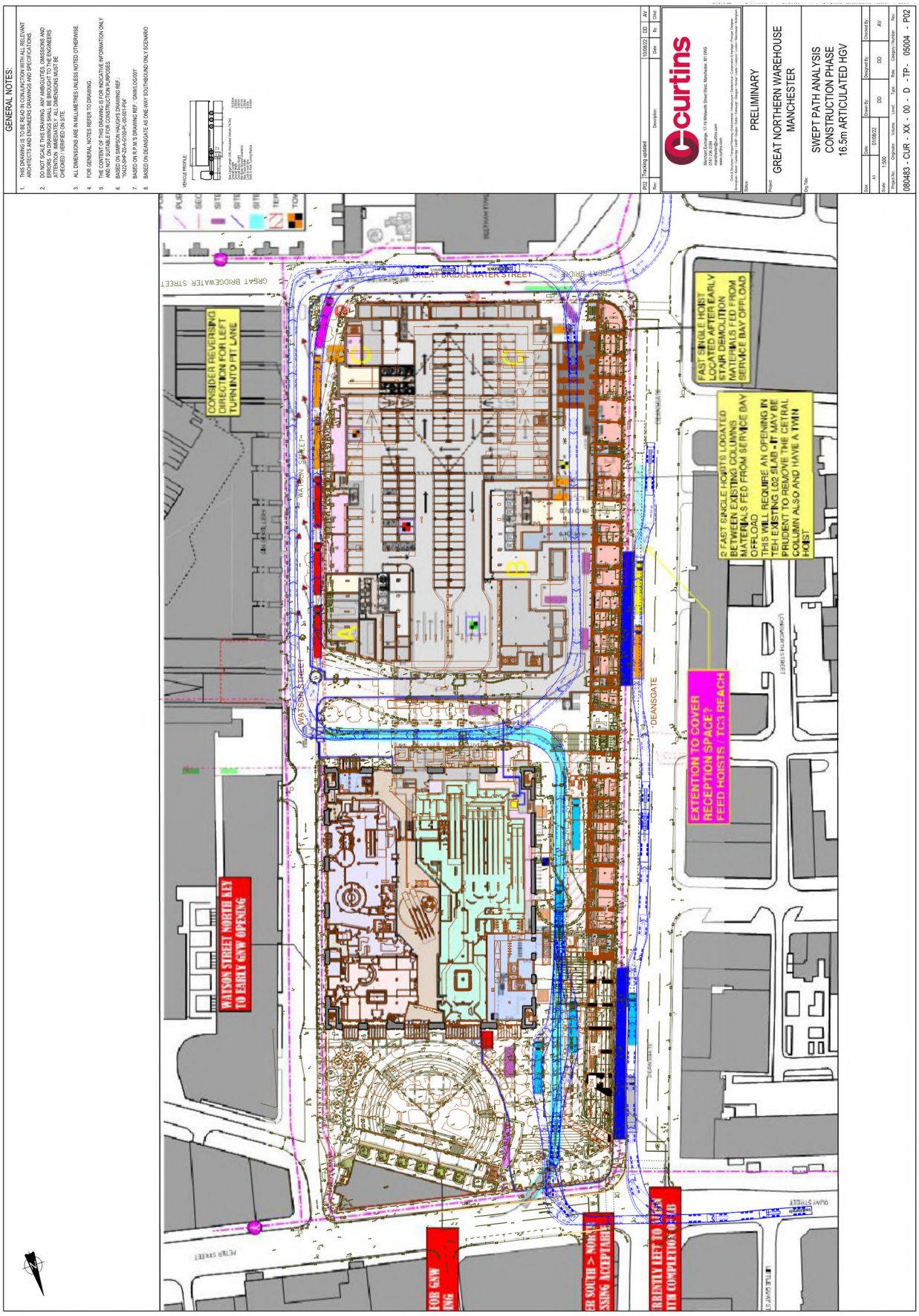
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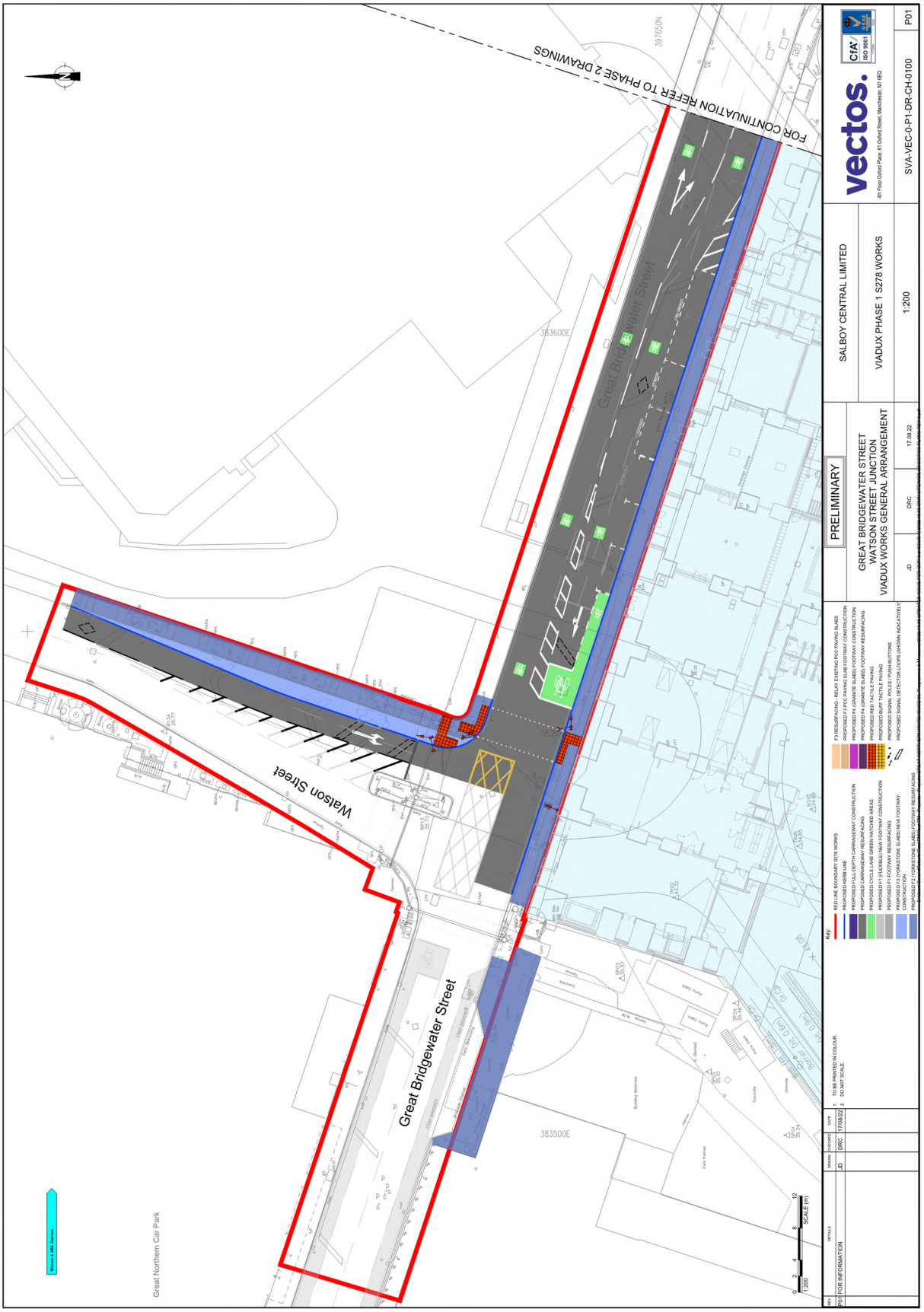
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5.2 Construction Phase Swept Path Plan and Completed Key Junctions

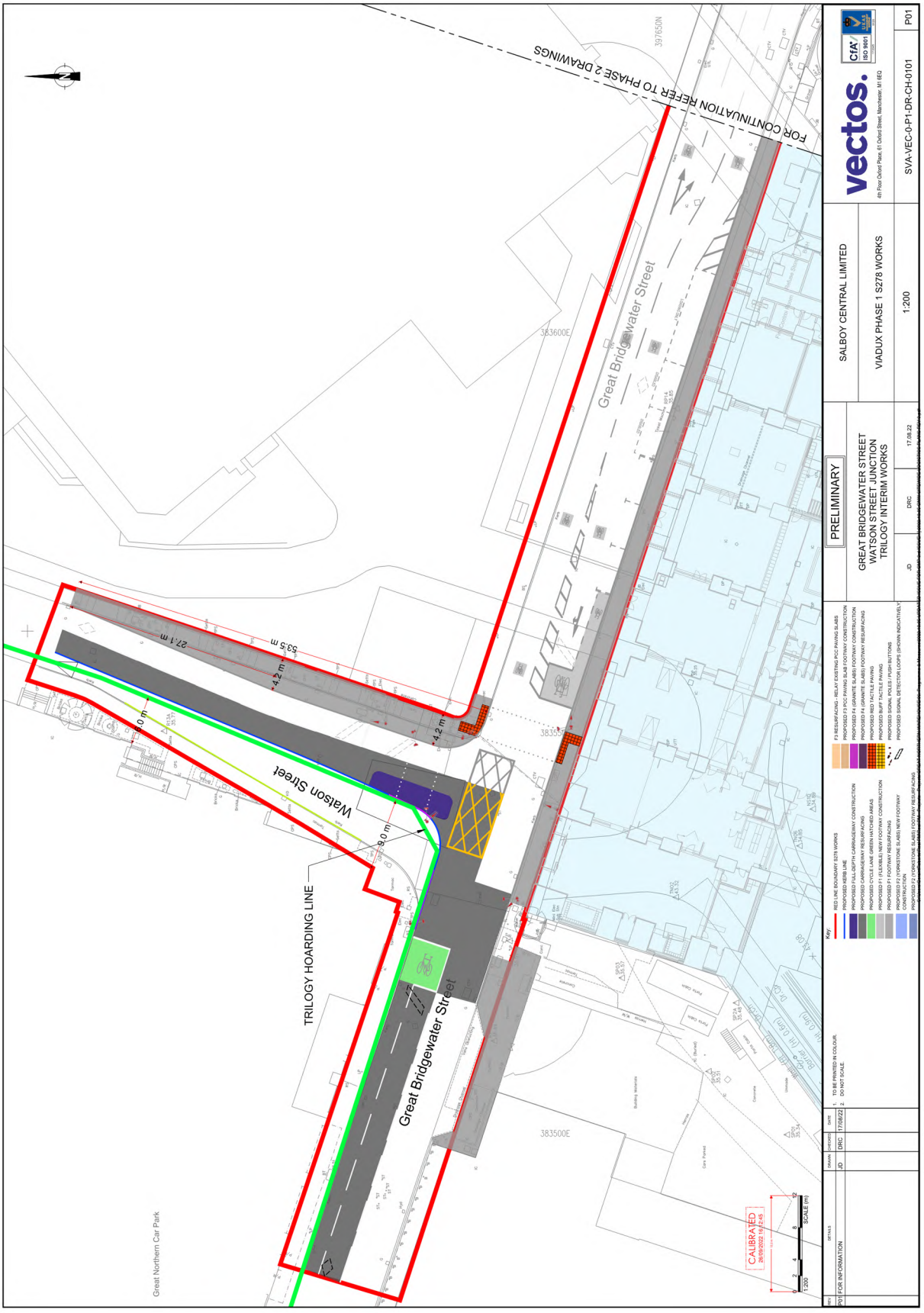
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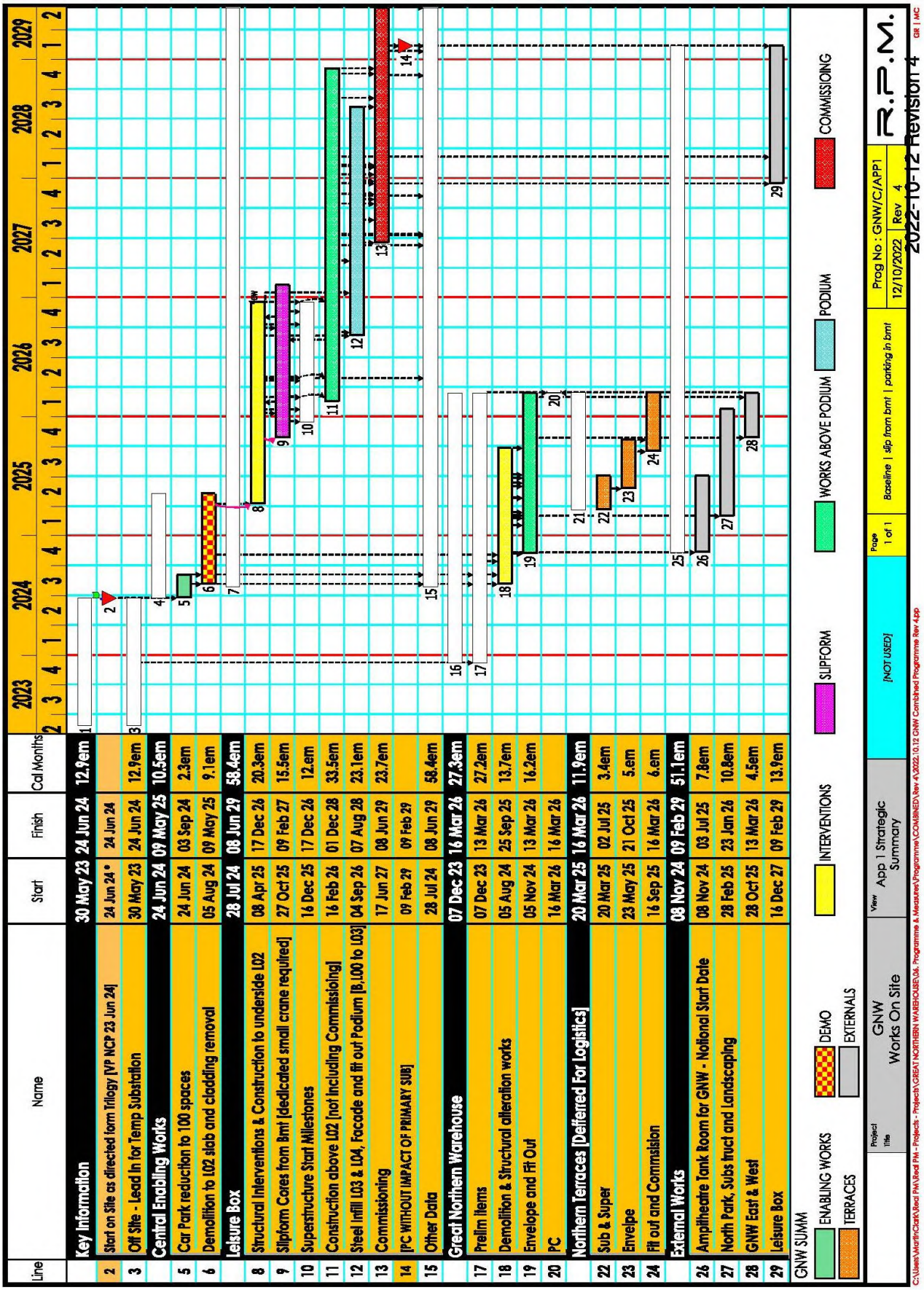
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5.3 Summary Programme

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6.1 Site Working Hours

The programme is based upon the following proposed working hours;

- Monday to Friday 0730hrs – 1800 hrs.*
- Saturday 0830hrs - 1400hrs.*
- No noisy works between 0800hrs and 0900hrs.
- No Sunday or Bank Holiday working planned unless by prior approval for specific works. i.e. Mobile crane for demolition plant lifting and removal, major plant deliveries, tower crane installation and removal activities.

Noisy operations will not take place outside these times.

* With the scope of demolition and piling planned, it is expected that the Principal Contractor will make an application to the MCC Environmental Protection Team for prior consent for works through Section 61 of the Control of Pollution Act 1974 at

https://www.manchester.gov.uk/forms/form/687/en/apply_for_prior_consent_noise_from_construction_sites

6.2 Considerate Constructors Scheme

The development will be undertaken in accordance Considerate Constructor Scheme (CCS) with targets set for minimum performance for the project, contractors, and suppliers.

The Contractor will be required to register the Project under the Considerate Constructor Scheme with a minimum target score of 7 in each section of the Schemes site code for Considerate Practice.

As part of the CCS scheme regular inspections will be carried out and subsequent reports will be distributed as part of the contractor's monthly report.

6.3 Noise, Vibration and Dust

In order to mitigate noise, vibration and dust during the demolition and construction works, the project will employ the 'Best Practicable Means.' Including application of methods recommended in BS 5228: Noise Control on Construction and Open sites, for example, undertaking works to ensure minimum disturbance, using muncher attachments to excavators in lieu of pneumatic breaker and utilising separation cut lines to minimise vibration transfer where applicable.

It is proposed that demolition and construction processes will be monitored using air quality monitors to record particulates and the results compared to with local monitoring station results. A site action level measured over 15 minutes will be agreed through consultation with Manchester City Council, once set appropriate mitigating action would be taken if this level is approached.

The following measures are to be undertaken for the control and monitoring of dust, fine particles and odours:

The contractor will develop a Code of Construction Practice (CoCP) in relation to construction noise and fugitive dust which must detail:

- The type of works to be undertaken.
- Construction techniques to be used.
- The site layout and access arrangements.
- Times and duration of site operations.
- An inventory and timetable of all dust-generating activities.
- Principle Contractor(s) Statutory Obligations and duties.
- How staff will be trained in the use of noisy machinery.
- How materials are to be handled to minimise the potential for noise nuisance.

- Times and durations of any abnormal noise and how the public will be kept informed.
- The appropriate range of dust suppression and control measures to be implemented in accordance with a 'high risk' site as defined under the Best Practice Guidance for 'The Control of Dust and Emissions from Construction and Demolition' (Greater London Authority and London Councils)
- The on-site storage of fuels or chemicals.
- Identify the Site Environmental Management Representative (SEMR).

The table below illustrates a summary of the overall predicted plant that will be deployed across Phases A and B of the works.

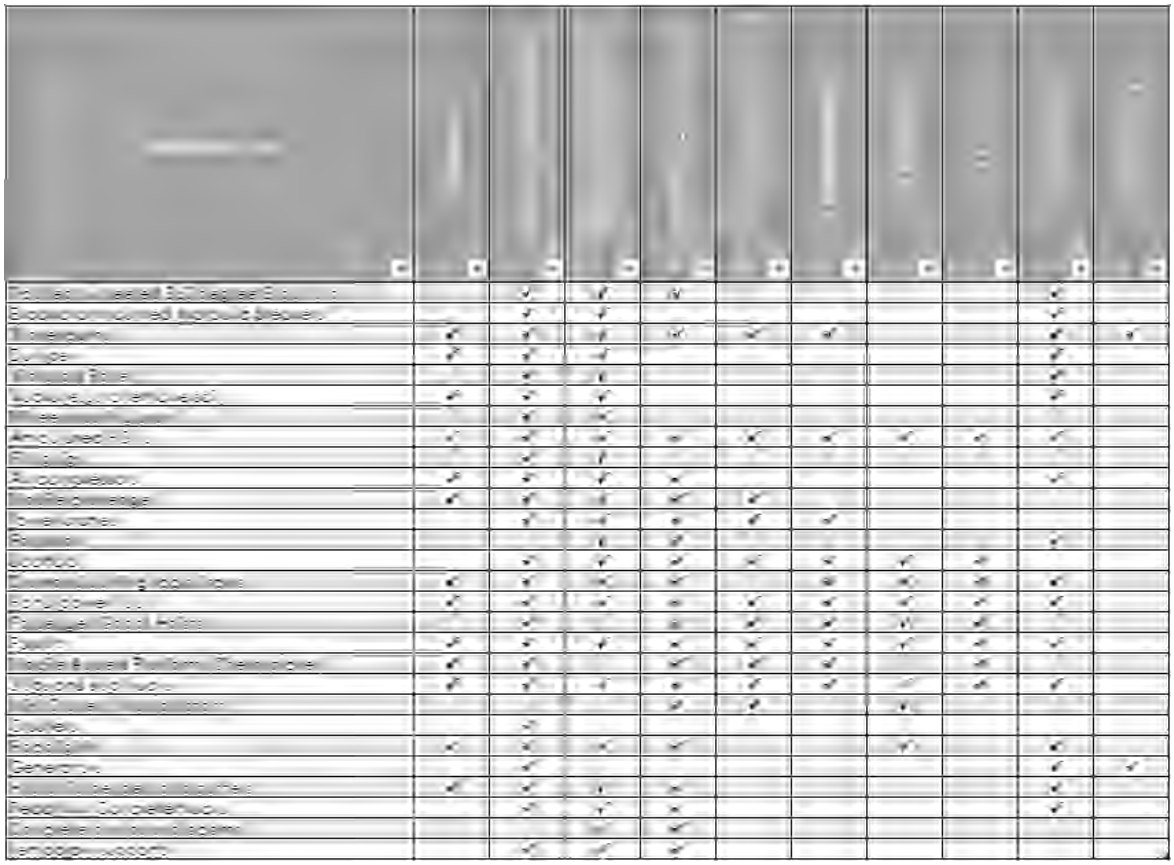


Table 01 – Sitewide Plant Schedule

All vehicle loads entering / departing the site are to be covered and material sprayed with water on all unsealed or exposed areas via watering carts at regular intervals during dry weather.

Erect temporary solid hoardings along all site boundaries to act as a windbreak and to limit lateral dust 'escape.'

Ensure that suitable training and awareness are provided to construction personnel so that they understand their responsibilities regarding environmental management, particularly the control of fugitive dust.

The appointed neighbourhood liaison/relationship manager will undertake regular liaison to ensure all residents and users of adjacent premises have been given advance notice to minimise dust concerns.

Where appropriate, the following measures to minimise noise and vibration levels will be adopted:

- Using modern, quiet and well-maintained equipment;
- Using low impact techniques, such as munchers where applicable;
- Using electrically powered equipment (mains or super silenced generators);
- Use of screws and drills rather than nails installing the hoarding;

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- Careful material handling such as lowering rather than dropping items;
- Isolating the deconstruction works from sensitive neighbours, to minimise the transfer of vibration and structure borne noise;
- Avoidance of unnecessary noise between operations, shouting, loud radios or excessive revving of engines by effective site management;
- The use of radios on site, shouting, swearing, singing; sitting outside the site is not to be permitted at any time.
- No idling engines to reduce noise and pollution.

The distance between noise and vibration sources and sensitive neighbours will be maximised and the sound path obstructed, where practical, by considerate siting of stationary plant and loading/unloading areas.
The suitability of specific noise limits is highly dependent upon the individual situation. The factors to be considered include the characteristics of the potentially affected neighbours, baseline ambient noise levels and the nature and duration of the works.

6.4 Neighbour and Community Liaison

The appointed Logistics and Neighbourhood Liaison Relationship Manager will liaise with the Manchester City Council, local residents, businesses and other interested parties to keep them informed of progress on site and forthcoming activities which may affect them.

As part of the demolition and construction processes, the Principal Contractor will meet with the Manchester City Council Environmental Health and Highway representatives and key members of from the local community to fine tune methods of working and the measures to minimise disruption. As part of this liaison, regular meetings will be held to ensure they are kept informed of the progress and any comments received logged and actioned as a result of the works.

To mitigate disturbance, the Principal Contractor will identify all residential properties and other sensitive occupiers in close proximity to the site prior to commencing work.

Prior to starting work, all occupiers in the vicinity of the site will be informed of the start date, the duration and nature of the project, the principal stages of the project and contact names and numbers of appropriate personnel via hand delivered mailed Project newsletter.

Further newsletters notifying neighbours of progress and forthcoming activities, particularly those which may cause disturbance, access difficulties and the like, are to be hand delivered to all adjoining occupiers and other neighbouring occupiers who may be affected by the works, on a monthly basis throughout the duration of the works.

A 'display board' will be erected outside the site, which will identify key personnel, contact addresses and telephone numbers as well as a full copy of the planning permissions and any forthcoming activities relating to the works

6.5 Waste Management

Unitary Development Plan (UDP) Part 1 Policy E1.6 requires the building materials used in new development and refurbishment schemes to be environmentally friendly wherever possible, and encourages the use of recycled building materials, which is also energy efficient.

Site waste management plans (SWMP) should, therefore, be implemented to reduce the quantity of waste generated, and to increase re-use and recycling. Opportunities for reuse of existing structures should be explored, and where this is not appropriate, materials should be reused on site and incorporated into the new design where practicable. Materials that are environmentally friendly, of low embodied energy, locally sourced, and can be recycled or reclaimed when the building comes to the end of its life should be prioritised. Materials that contain environmentally damaging chemicals should be avoided.

In addition, activities carried out during the construction of new developments have the potential to cause significant environmental impact. In order to avoid such impacts it is important that appropriate measures are put in place to manage and control the waste generated, the amount of water and energy used, and any potential releases to water, land and air.

The appointed Contractors will be responsible for implementing and updating Site Waste Management Plan (SWMP); a summary of which can be found below;

Introduction

- Background
- Project Overview
- Programme of Works

Outline Site Waste Management Plan

- Overview
- Public safety, emergencies & accidents
- Traffic flow, access routes & site access
- Control of noise, vibration, and dust
- Materials storage and handling
- General waste management & minimalisation
- Hazardous materials & contaminated land
- Protection of water resources & site drainage
- Ecological protection
- Energy & water usage
- Management of contractors & sub-contractors

Cumulative Impacts - Summary

In accordance with the Site Waste Management Plan (SWMP) Regulations, an SWMP would be developed by the Contractors detailing how waste would be disposed and managed during the construction works.

The disposal of all waste or other materials removed from the Site will be following the requirements of the Environment Agency, Control of Pollution Act (COPA), 1974, Environment Act 1995, Special Waste Regulations 1996, Duty of Care Regulations 1991 and the Hazardous Waste (England and Wales) Regulations 2005 and the Waste (England and Wales) Regulations 2011.

In general, and under the principles of the UK Government's 'Waste Strategy,' a principal aim during and construction will be to reduce the amount of waste generated and exported from the Proposed Development site. This approach complies with the waste hierarchy whereby the intention is first to minimise, then to treat at source or compact and, finally, to dispose of off-Site, as necessary. All relevant contractors will be required to investigate opportunities to minimise and reduce waste generation.

As part of this, and under the principles laid down in the UK Governments 'Waste Strategy 2000' a detailed SWMP will be produced (as part of the final CEMP) before on-site works commence.

This will consider the opportunities to minimise and reduce waste generation, such as:

- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme.
- Implementation of a 'just in time' material delivery system to avoid materials being stockpiled on site for long periods, which increases the risk of their damage and disposal as waste;
- Attention to material quantity requirements, over ordering, and generation of waste materials to be avoided;
- Reuse of materials on-site wherever feasible (e.g. reuse of crushed concrete from any demolition for fill, reuse of excavated soil for landscaping);
- Segregation of waste at the source where practical;
- Reuse and recycling of materials off-site where reuse on-site is not practical (e.g. through the use of an off-Site waste segregation facility and re-sale for direct reuse or reprocessing).

The contents of the Site Waste Management Plan (SWMP) noted above is set out following CoCP and will be agreed with MCC and other relevant bodies before the commencement of the works. This would detail the management, monitoring, auditing and training procedures in place to ensure compliance with the CoCP and relevant legislation. It would also set out the specific roles and responsibilities of the contractors' personnel.
The SWMP would include detailed information on the controls to be implemented for the following:

- Public Safety, Emergencies and Accidents;
- Traffic and Access Management;
- Control of Noise, Vibration and Dust;
- Materials Storage and Handling;
- General Waste Management and Minimisation;
- Hazardous Materials and Contaminated Land;
- Site Drainage;
- Protection of Ecological Resources;
- Protection of Archaeological Remains;
- Built Heritage.

Public Safety, Emergencies and Accidents

A clear and secure demarcation between operational activities and other areas would be maintained to ensure public safety. Particular attention would be paid to locations supporting high volumes of pedestrian movement, construction routes, access gates and security arrangements. A 'clean site' policy would be maintained. Hoardings would be used to prevent public access to areas of works and to provide information regarding the project and its progress

The Main Contractor will be required to maintain high safety standards throughout the works, and to be fully compliant with current health and safety legislation. An Emergency Incident Plan would be in place to deal with potential spillages and/or pollution incidents. Any pollution incidents would be reported immediately to MCC and the regulatory bodies such as the Environment Agency (EA).

Materials Storage and Handling

Environmental issues would be considered in the procurement of raw materials and all such materials would be appropriately stored to minimise damage by vehicles, vandals, weather, or theft. Contractors and their subcontractors would be expected to maintain a tidy site and where practical, to operate a 'just-in-time' policy for the delivery and supply of materials for the works. Excavated materials would primarily be removed from the site as there would be limited opportunity to store this material on spoil heaps. The excavated material would be loaded into vehicles for transportation to nearby construction or disposal sites.

Tanks and drums of liquid chemicals and fuels would be stored in bunded compounds and, where feasible, packaging would be returned. Where possible, prefabricated elements would be lifted directly into position from delivery vehicles. This would assist in reducing on-site storage and labour requirements and construction noise levels, reducing potential nuisances to the surrounding receptors.

General Waste Management and Minimisation

The Applicant has commissioned a Pre-Demolition Audit that can be referred to in Appendix 2 which has been prepared to establish the likely quantities and streams of waste material that will be generated during the demolition works and identifies targets for waste recycling.

Potential waste would be generated during all stages of the demolition and construction works, with major sources of potential waste within the construction process anticipated to include;

- Site clearance and spoil from excavations comprising concrete, brick rubble, steel, aluminium, plastics, wood, glass and glass cladding;
- Hazardous material, such as asbestos;
- Packaging comprising plastics, pallets, expanded foams;
- Materials delivered for use in new construction; and
- Dirty water, for example, surface water runoff containing silt.

The Applicant's contractor would endeavour to reduce waste generation during construction. In addition to the SWMP submitted with this application, a detailed SWMP would be developed by the contractors detailing how waste would be disposed and managed during the construction phase. This would be based on guidance within the Department of Trade and Industry (DTI) report 'Site Waste Management Plan - Guidance for Construction Contractors and Clients: Voluntary Code of Practice,' the production of the Resource Management Plan (RMP)

The Project has committed to the following, as part of the BREEAM Pre-Assessment for the site, with all relevant contractors having to comply with this commitment:

- ≤ 7.5 (m2) / ≤ 6.5 (tonnes) of waste generated per 100m2 (GIA); and

- 80% by volume / 90% by tonnage of the total (construction and) demolition waste to be diverted from landfill.

The appointed Contractors would be required to investigate opportunities to minimise waste arisings at the source. Where the existing buildings on the site will be demolished, a pre-demolition audit of any existing buildings, structures or hard surfaces is completed to determine if, in the case of demolition, refurbishment/reuse is feasible and, if not, to maximise the recovery of material for subsequent high-grade / value applications.

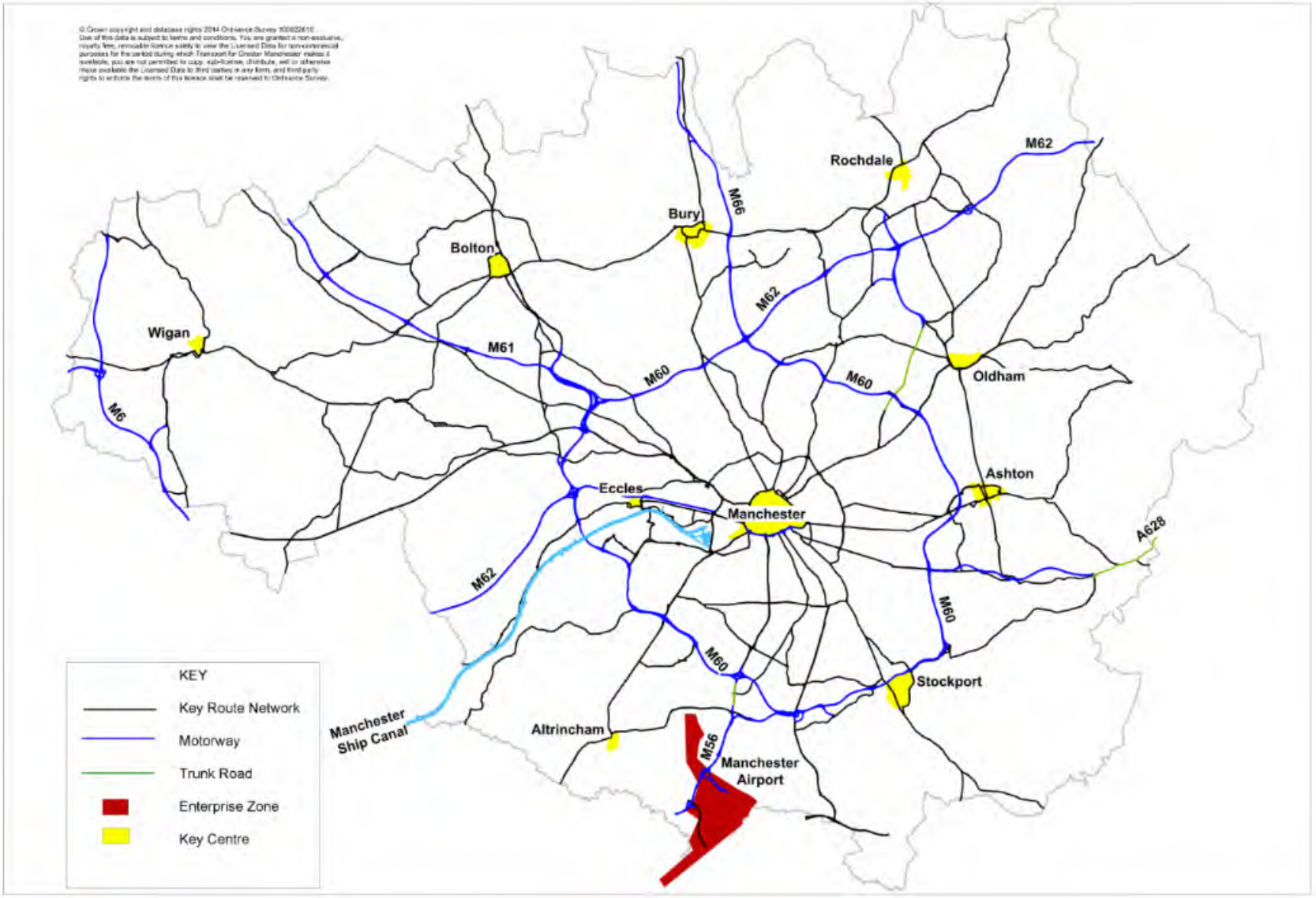
The following measures would be implemented to meet this target:

- Potential applications and any related issues for the reuse and recycling of the key material
- Concrete and brick from walls and foundations would be crushed and reused for temporary onsite roads and piling platforms:
- Waste materials will be sorted into separate key waste groups (according to the waste streams generated by the scope of works) either on-site or through a licensed contractor for recovery.

The Government has set broad targets for the use of reclaimed aggregates and in keeping with best practice construction contractors will be required to maximise the proportion of materials recycled. The disposal of all waste or other materials removed from the Site will be in accordance with the requirements of the Environment Agency, Control of Pollution Act, 1974 (COPA), Environmental Act, 1995, Special Waste Regulations, 1996 (Ref: 5-9) and the Duty of Care Regulations, 1991.

The detailed SWMP requires proof that all Site waste is deposited or transferred in the correct place by appropriately licensed contractors. A record of all waste transferred or disposed of must be kept through a system of signed Waste Transfer Notes. A docketing system will be used to prove the correct depositing of all site waste including any arisings and to prevent the occurrence of 'fly' tipping. Trade contractors will operate a sequentially numbered system to confirm that each load is received at the approved disposal Site. Copies of the dockets are to be provided to the nominated manager and be available for inspection on-site. Direct routes via main roads to designated tips will be agreed with the trade contractor.

Appendix 1 – Key Road Network Map


Rochdale
M62
Bury
M66
Bolton
M62
Wigan
M61
M60
M60
Oldham
M6
Ashton
Eccles
Manchester
A628
M62
M60
M60
Stockport
Manchester Ship Canal
Altrincham
M56
Manchester Airport
KEY
Key Route Network
Motorway
Trunk Road
Enterprise Zone
Key Centre

Appendix 2 – Pre-Demolition Audit

GREAT NORTHERN WAREHOUSE, MANCHESTER M3 4EN

PRE-DEMOLITION AUDIT REPORT

For

GNW DEVELOPMENTS LIMITED

adw DEVELOPMENTS

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Version Control

Issue	Document Name	Revision No.	Date of Issue	Description	Author	Reviewed By
1	Great Northern Warehouse – Pre-Demolition Audit Report – Skeleton Draft	1.0	3 October 2022	Pre-Demolition Audit in accordance with BREEAM WST 01 Guidance initial issue for guidance only	Toby Balson	ADW
2	Great Northern Warehouse – Pre-Demolition Audit Report – Oct 2022	2.0	28 October 2022	Full Pre-Demolition Audit report in accordance with BREEAM WST 01 Guidance	Toby Balson	ADW/GNW Developments Limited

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Pre-Demolition Audit

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Executive Summary

The aim of this report is to contribute to the sustainable management of materials arising from the demolition and refurbishment works at Great Northern Warehouse, located at Manchester M3 4EN.

The recommendations in the report are based on plans and associated documents provided to ADW Developments by GNW Developments Limited.

The report has been prepared by Toby Balson and Katherine Adams on behalf of ADW Developments. See Appendix A for details of the report authors.

A non-invasive visual survey of the site was carried out on 13th and 14th September 2022.

The estimated Key Demolition Products (KDP) by weight are Concrete (82%), Metals (10%), Brick (4%), Gypsum (1%), and Insulation (1%), with smaller amounts of Bitumen, Timber, Carpet, Stone, Glass, Ceramics and Plastics.

Miscellaneous items of WEEE are also present although these have not all been quantified.

It is recommended that a target of 95% diversion of waste from landfill (by weight) should be set, with a 2% target for material reuse.

A breakdown of waste figures by area is shown below, with summary figures for the entire site shown on the following page. Further detail is presented within the body of the report.

Waste arising by site area

Area	Tonnes	Volume
Deansgate Terrace	2,254	2,353
Great Northern Warehouse	4,991	1,912
Leisurebox	25,983	16,029
Total	**33,229**	**20,295**

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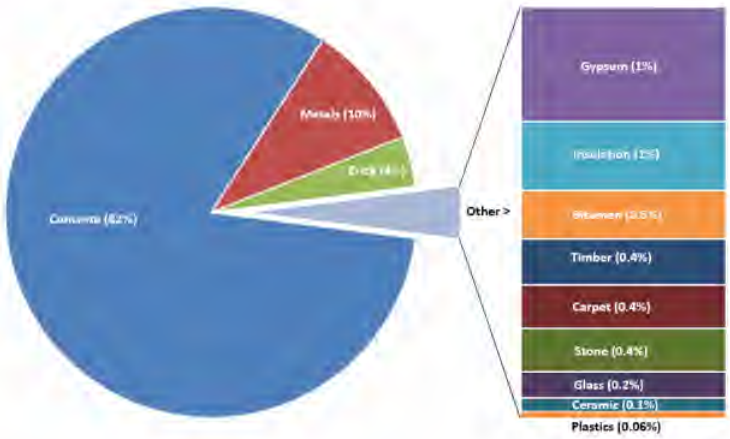
Pre-Demolition Audit

Key Demolition Products (KDP) – entire site

Key Demolition Products	Weight (tonnes)	Volume (m³)	European Waste Catalogue number
Concrete	27,289	13,746	17 01 01
Metals	3,288	440	17 04 05
Brick	1,319	763	17 01 02
Gypsum	374	496	17 08 02
Insulation	221	4,312	17 06 04
Bitumen	159	93	17 03 02
Timber	148	261	17 02 01
Carpet	142	48	20 01 11
Stone	141	55	01 04 08
Glass	83	34	17 02 02
Ceramic	47	20	17 01 03
Plastics	19	26	17 02 03
WEEE*	-	-	16 02 14
Grand Total	**33,229**	**20,295**	

* Not all quantified

Key Demolition Products (KDP) by percentage weight – entire site



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GREAT NORTHERN WAREHOUSE, MANCHESTER M3 4EN

Pre-Demolition Audit

1. Project Introduction

At the request of GNW Developments Limited, a Pre-Demolition Audit of Great Northern Warehouse has been undertaken. This audit addresses the potential for reusing and recycling components and materials from the building and aims to:

- provide an understanding of the materials likely to arise from the demolition and refurbishment works in order to help with the development of a site waste management plan
- maximise the management of material removed from the building in line with the waste hierarchy i.e. maximise reuse and recycling and minimise waste to landfill
- provide evidence for any external assessment such as BREEAM.

The audit covers the area of the site as described in Section 2 below.

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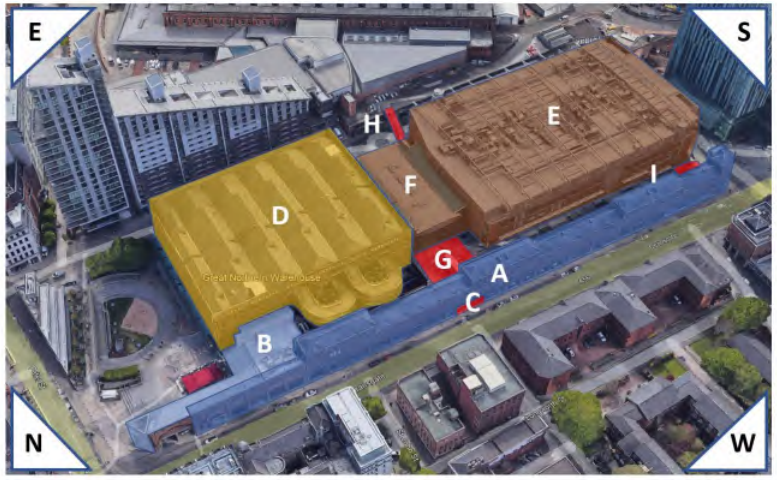
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Pre-Demolition Audit

2. Project scope

The GNW site is large and complex, with the image below providing a simplified guide to the various areas covered in this audit, as follows:

- **Area A: Deansgate Terrace.** Works include strip out and refurbishment of the existing units.
- **Area B: the Link Building** will be demolished, along with the existing rear extensions to the northern end of the terrace. The brick arches and façade to Deansgate Terrace will be preserved.
- **Area C:** the pedestrian steps to Deansgate Terrace will be demolished, along with one unit of the terrace to permit wider street level access.
- **Area D: the Great Northern Warehouse.** Works include conversion of the top three car park levels into office space, formation of sky lights, demolition of car park access ramps and refurbishment to communal access areas. The primary Victorian-era connecting level between the GNW and Leisurebox buildings will be preserved, but areas of brick jack arches and secondary steelwork will be removed to create architectural voids within the structure.
- **Area E: Leisurebox.** Works include complete demolition of the steel framed cinema building, as well as some demolition to the reinforced concrete car park structure below to form core areas for the new tower blocks.
- **Area F: Ticket Hall building.** Works include complete demolition of the building and associated internal structures – the ticket kiosk, timber structures and Whistlepunks enclosure.
- **Area G:** the concrete platform at Mews level will also be partially demolished.
- **Area H:** the connecting footbridge to the east of site will be demolished.
- **Area I:** the pedestrian access to the south of site will be demolished.



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3. Pre-Demolition Audit Methodology

A non-invasive visual survey of the site was carried out on 13th and 14th September 2022.

Access to most of the primary areas was provided although the scale of the site, and the active businesses within Deansgate Terrace in particular proved restrictive; in addition some ancillary areas were locked and therefore not surveyed.

Scaled building plans were provided.

The site was analysed in accordance with the gathered information, and the volume (m^3) figures calculated for each construction material have been converted into tonnages using standard density figures for each material assessed.

Please note that as the survey was non-invasive, certain aspects have been assumed based on typical practice, including but not limited to e.g. presence of insulation within wall partitions, the nature and dimensions of hidden structural elements, etc. MEP has been noted where visible, e.g. lighting.

Waste Electrical and Electronic Equipment (WEEE) falls outside the direct scope of this analysis and as such these items have not been quantified with weights and volumes; however their presence has been noted and reuse options have been suggested.

Note: The findings and values contained in this report represent the best estimate of the materials and components within the units by means of using drawings and photographs of the areas. We did not receive a complete inventory of the types of materials and construction used, and where necessary construction details have been inferred. Material conversion rates used to calculate volume (m^3) into tonnages have been undertaken using standard density factors.

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Pre-Demolition Audit

4. Audit Results

A breakdown of waste quantities per site area in tonnage and volume is shown below.

An estimate of the overall volume and tonnage of Key Demolition Products (KDP) likely to be generated during the demolition are shown below and on the following page.

The estimated Key Demolition Products (KDP) by weight are Concrete (82%), Metals (10%), Brick (4%), Gypsum (1%), and Insulation (1%), with smaller amounts of Bitumen, Timber, Carpet, Stone, Glass, Ceramics and Plastics.

The largest KDPs by volume are Concrete (68%), Insulation (21%), Brick (4%), Gypsum (2%), and Metals (2%), with smaller amounts of Timber, Bitumen, Stone, Carpet, Glass, Plastics and Ceramics.

Miscellaneous items of WEEE are also present although these have not all been quantified.

Summary of Key Demolition Products arising from the refurbishment

Key Demolition Products	Weight (tonnes)	Volume (m^3)	European Waste Catalogue number
Concrete	27,289	13,746	17 01 01
Metals	3,288	440	17 04 05
Brick	1,319	763	17 01 02
Gypsum	374	496	17 08 02
Insulation	221	4,312	17 06 04
Bitumen	159	93	17 03 02
Timber	148	261	17 02 01
Carpet	142	48	20 01 11
Stone	141	55	01 04 08
Glass	83	34	17 02 02
Ceramic	47	20	17 01 03
Plastics	19	26	17 02 03
WEEE*	-		16 02 14
Grand Total	**33,229**	**20,295**	

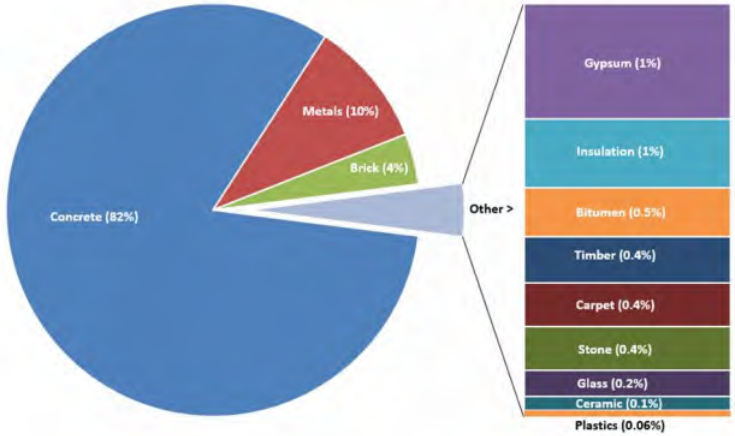
* Not all quantified

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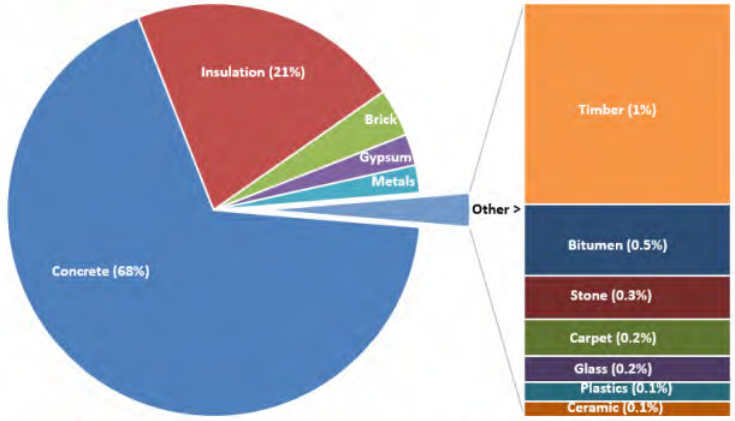
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Pre-Demolition Audit

Summary of Key Demolition Products (KDP) by percentage weight



Summary of Key Demolition Products (KDP) by percentage volume



Miscellaneous items and Waste Electrical and Electronic Equipment (WEEE) have been considered separately.

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Pre-Demolition Audit

Overall waste arising by site area

The following table sets out overall waste arising by site area.

As requested the site has been divided into three areas:

1. Deansgate Terrace, including:
   - Area A, the Terrace (refurbishment)
   - Area B, the Link Building (demolition)
   - Area C, the pedestrian steps and two of the terrace units (demolition)
2. Great Northern Warehouse (Area D), including:
   - Car park levels (refurbishment)
   - Access ramps (demolition)
   - Connecting level between the GNW and Leisurebox buildings (refurbishment)
3. Leisurebox, including:
   - Area E, the Leisurebox building (demolition of upper storeys and areas of concrete car park area)
   - Area F, the Ticket Hall building and associated internal structures (demolition)
   - Area G, part of the Mews adjacent to the Ticket Hall building.
   - Area H, the connecting footbridge
   - Area I, the pedestrian access steps to the south of site.

Waste arising by site area (tonnes)

Material	Deansgate	GNW	Leisurebox
Concrete	1,349	3,851	22,089
Brick	308	133	878
Gypsum	192	–	182
Metals	123	822	2,343
Stone	110	18	12
Timber	63	13	72
Insulation	60	-	161
Glass	22	–	61
Carpet	10	–	132
Plastics	10	-	9
Ceramic	9	–	38
Bitumen	–	155	4
Total	**2,254**	**4,991**	**25,983**

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Materials arising by site area

The following tables set out materials arising by site area in more detail.

Waste materials – Deansgate Terrace

Key Demolition Products	Weight (tonnes)	Volume (m³)	European Waste Catalogue number
Concrete	1,349	681	17 01 01
Brick	308	168	17 01 02
Gypsum	192	254	17 08 02
Metals	123	17	17 04 05
Stone	110	44	01 04 08
Timber	63	118	17 02 01
Insulation	60	1,038	17 06 04
Glass	22	9	17 02 02
Carpet	10	13	20 01 11
Plastics	10	7	17 02 03
Ceramic	9	4	17 01 03
Grand Total	**2,254**	**2,353**	

Waste materials – Great Northern Warehouse

Key Demolition Products	Weight (tonnes)	Volume (m³)	European Waste Catalogue number
Concrete	3,851	1,607	17 01 01
Metals	822	106	17 04 05
Bitumen	155	91	17 03 02
Brick	133	78	17 01 02
Stone	18	6	01 04 08
Timber	13	23	17 02 01
Grand Total	**4,991**	**1,912**	

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Pre-Demolition Audit

Waste materials – Leisurebox

Key Demolition Products	Weight (tonnes)	Volume (m³)	European Waste Catalogue number
Concrete	22,089	11,458	17 01 01
Metals	2,343	317	17 04 05
Brick	878	517	17 01 02
Gypsum	182	242	17 08 02
Insulation	161	3,274	17 06 04
Carpet	132	35	20 01 11
Timber	72	121	17 02 01
Glass	61	25	17 02 02
Ceramic	38	16	17 01 03
Stone	12	5	01 04 08
Plastics	9	19	17 02 03
Bitumen	4	2	17 03 02
Grand Total	**25,983**	**16,029**	

The Key Demolition Products (KDP) are now described.

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4.1 Key Demolition Products arising from the proposed works

4.1.1 Concrete

Concrete accounts for an estimated 27,289 tonnes or 82% of total waste arisings by weight; sources can be seen below.

Item	Tonnes	Volume
Floor and roof slabs	16,942	7,059
Blocks	6,475	4,625
Beams	1,294	539
Mortar	852	448
Screed	606	606
Stairs	507	211
Columns	505	211
Paving slabs	63	26
Grout	17	9
Render	15	6
Cast walls	13	6
Total	**27,289**	**13,746**

Material by area

The material arising is split across the three areas as follows:

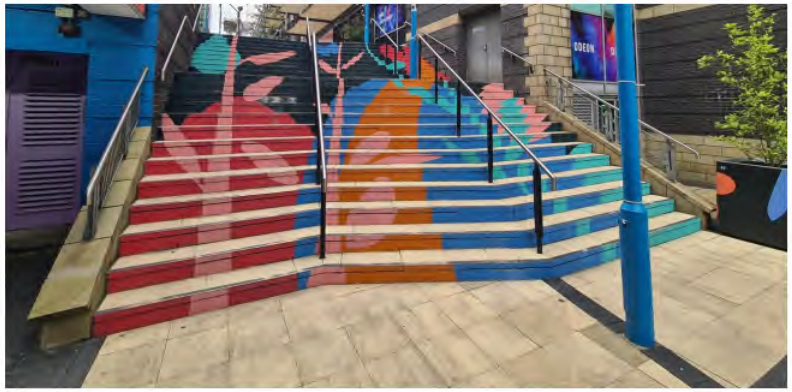
Waste arising by site area (tonnes)

Material	Deansgate	GNW	Leisurebox
Concrete	1,349	3,851	22,089
Main sources	**Link Building** • Floor slabs • Blockwork walls **Deansgate Steps** • Foundation slab	**Cark park** • Access ramps	**Odeon** • Floor/roof slabs • Blockwork walls **Car park** • Floor slab • Beams & columns • Concrete staircases **Bridgewater Steps** • Foundation slab
Key reuse opportunities	**Deansgate Steps** • Paving slabs	• N/a	**Bridgewater Steps** • Paving slabs **Mews** • Paving slabs

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Potential for material reuse

Key reuse opportunities are noted in the table above; these are quite limited with only paving slabs presenting the opportunity for direct reuse. Nevertheless 63 tonnes of material is potentially reusable.



Diversion from landfill

It is recommended that the concrete should be segregated either onsite or at a waste facility and crushed to produce recycled concrete aggregate (RCA)[1] in accordance with the WRAP Quality Protocol for aggregates[2] from inert waste.

There may an opportunity to use some of the RCA in the new construction or in nearby locations via a concrete supplier. Finished recycled aggregates should not contain more than 1% (by weight of clay, soil, metals, wood, plastic, rubber and gypsum plaster, in line with the limits set within the aggregates standard.

RCA can be used in:

1. Bitumen bound materials: e.g. base course or binder course mixtures.
2. Concrete: RCA can potentially be used to replace 20% of the coarse aggregate in concrete up to Grade 50.
3. Pipe bedding: suitably graded recycled concrete aggregate is used in pipe bedding.
4. Hydraulically bound mixtures (HBM) for sub-base and base: RCA can be used in the construction of car parks, estate/minor roads and hard standing.
5. Unbound mixtures for subbase: suitably graded recycled concrete aggregate is used as sub-base.
6. Capping: recycled concrete aggregate is suitable for capping applications.

[1] Recycled concrete aggregate is aggregate resulting from the processing of inorganic material previously used in construction and principally comprising crushed concrete [BS 8500-1: 2002].

[2] https://www.gov.uk/government/publications/quality-protocol-production-of-aggregates-from-inert-waste

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Waste management

Concrete waste should be segregated on site to maximise recycling.

Local waste management companies that could manage the waste arising include:

- Kennys Waste Management https://www.kennywastemanagement.co.uk/
- PPO Connor https://ppoconnor.co.uk/
- AR Recycling http://www.aggregatesupplieswigan.co.uk/services.php
- Jo Shea and Sons http://www.joshea.co.uk/

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Pre-Demolition Audit

4.1.2 Metals

Metals account for an estimated 3,288 tonnes or 10% of total waste arisings by weight; sources can be seen below.

Item	Tonnes	Volume
Rebar	1,450	186
Joists	634	82
Beams	558	72
Columns	265	34
Framing for walls/ceilings	86	12
Secondary steelwork	74	10
Other structural elements	56	8
Aluminium window/door frames	43	16
Staircases	34	4
Handrails and railings	24	3
Corrugated roofing sheets	18	3
Façade cladding panels	18	7
Ceiling tile grids	9	1
Rooftop plant enclosures	8	1
Metal grating walkways	7	1
Suspended ceiling panels	2	0.2
Roller shutters	2	0.2
Glazed doors	1	0.3
Sinks	0.1	0.01
Total	**3,288**	**440**

Material by area

The material arising is split across the three areas as follows:

Waste arising by site area (tonnes)

Material	Deansgate	GNW	Leisurebox
Metal	123	822	2,343
Main sources	**Link Building** • Steel frame • Floor slab rebar	**Cark park** • Floor slab reba • Ramp supporting framework **GNW** • Secondary steelwork	**Odeon** • Steel frame • Floor/roof slab rebar **Ticket Hall** • Steel frame

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Pre-Demolition Audit

Key reuse opportunities	**Link Building** • Steel frame **Deansgate Steps** • Handrails **Deansgate Terrace** • Metal ceiling tiles • Suspended ceiling frames	**Car park** • Ramp supporting framework	**Odeon** • Steel frame • Rooftop plant enclosures • Railings and handrails • Metal grating walkways • Aluminium cladding panels • Suspended ceiling grid **Ticket Hall** • Steel frame • Bridge

Potential for material reuse

Key reuse opportunities are noted in the table above. There are very large quantities of steel frame across all areas of the site, and particularly the Leisurebox building, where the frame weighs an estimated 1,350 tonnes; this should be prioritised for potential reuse.

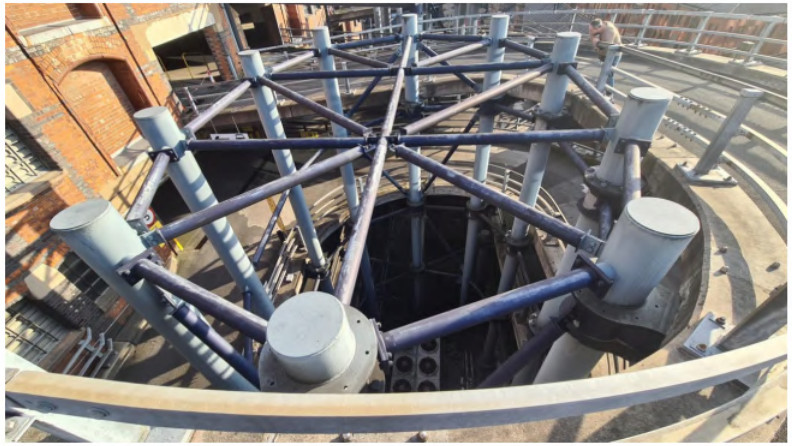


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There is also a large steel framework supporting the Great Northern Warehouse car park ramps. With an estimated 122 tonnes of material, potential to safely dissemble and reuse this should be investigated.



Smaller quantities of frame are also present in the Link Building and Ticket Hall building. Overall, at least 1,500 tonnes of framing is potentially recoverable across the entire site.

The bridge across Watson Street could potentially be dissembled for reuse.



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There are approximately 18 tonnes of facia cladding panels which may also be suitable for reuse.



With regard to the reuse of steel, the SCI has produced a protocol for its reuse including how to test for recertification (https://steel-sci.com/assets/downloads/steel-reuse-protocol-v06.pdf). This describes the following process:

- A building is offered for salvage of the steelwork for reuse. Considerations include the acceptability of the source material, the demountability of the structure, the increased cost of careful demolition, etc.
- A business case is established between the holder of stock and the company responsible for demolition.
- Important details of the anticipated salvaged steel are recorded as described in the document
- Salvaged steelwork is received by the stockholder, grouped and listed as described in the document. The necessary grouping has an important impact on the extent of testing required.
- Members are inspected and tested in accordance with the guidance with the information appended to the stock data. The testing regime involves a combination of non- destructive and optional destructive testing, with the opportunity to make conservative assumptions about certain material characteristics. Testing may be completed at any convenient time, but the seller of the stock is responsible for declaring the necessary characteristics as the material is sold.
- Material is sold, with an accompanying declaration of the material characteristics by the holder of salvaged stock.
- Structural design and member verification is completed with certain modifications, as described in the document.

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Pre-Demolition Audit

Diversion from landfill

Any metal items that are unsuitable for reuse can be recycled. Note, demolition contractors will price their contracts dependant on the value they obtain for scrap metal.

Waste management

Metal items should be segregated on site to maximise reuse and recycling.

Local waste management companies that could manage the waste arising include:

- EMR https://uk.emrlocal.com/yards/emr-manchester-scrap-metal
- S Norton https://www.s-norton.com/
- Sims Metals https://www.simsmm.co.uk/locations/manchester-greater-manchester/

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4.1.3 Brick

Brick accounts for an estimated 1,319 tonnes or 4% of total waste arisings by weight; sources can be seen below

Item	Tonnes	Volume
Brick walls	1,153	678
Rubble infill	166	85
Total	**1,319**	**763**

Material by area

The material arising is split across the three areas as follows:

Waste arising by site area (tonnes)

Material	Deansgate	GNW	Leisurebox
Brick	308	133	878
Main sources	**Deansgate Terrace** • Walls from two demolished units (including assumed rubble infill)	**GNW** • Brick jack arches	**Odeon** • External walls
Key reuse opportunities	**Deansgate Terrace** • Bricks may have architectural/historic value	**GNW** • Bricks may have architectural/historic value	**Odeon** • N/a

Potential for material reuse

There are two main types of brick present on site, the more traditional bricks used for Deansgate Terrace and the jack arches in the Great Northern Warehouse, and modern brickwork in the Leisurebox façade areas. It is estimated that around 275 tonnes of external bricks are traditional, with the remainder being more modern.

It is likely that the older brick areas may have been laid using lime mortar, making separation of the bricks easier. Where bricks are in good condition and/or historically significant, there may be some value in potentially reclaiming the bricks for reuse. A mortar investigation is recommended to better understand the potential to separate the bricks for reuse.

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Pre-Demolition Audit



Diversion from landfill

If the bricks cannot be separated, it is recommended that the brick waste is segregated either onsite or at a waste facility and crushed to produce recycled aggregate (RA). Waste management options are similar to concrete, depending on the level of contamination with other materials including pipe bedding, drainage, granular fill, general fill and capping and for sub-base.

Finished recycled aggregates should not contain more than 1% (by weight of clay, soil, metals, wood, plastic, rubber and gypsum plaster, in line with the limits set within the aggregates standard It is recommended that they are processed where possible into recycled aggregates (RA). The Quality Protocol for inert materials should be followed.

Local reclamation companies that can be contacted with regard to reclaiming the bricks and the value in doing so include:

- Ransfords, www.ransfords.com
- A1 Reclaimed Bricks, www.a1reclaimedbricks.co.uk/

Waste Management

Bricks should be segregated on site to maximise reuse and recycling.

Local waste management companies that could manage the waste (as per the concrete) include:

- Kennys Waste Management https://www.kennywastemanagement.co.uk/
- PPO Connor https://ppoconnor.co.uk/
- AR Recycling http://www.aggregatesupplieswigan.co.uk/services.php
- Jo Shea and Sons http://www.joshea.co.uk/

Alternatively, licensed waste management contractors should be able to reprocess the brick waste into aggregates.

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4.1.4 Gypsum

Gypsum accounts for an estimated 374 tonnes or 1% of total waste arisings by weight; sources can be seen below.

Item	Tonnes	Volume
Plasterboard	359	478
Wet plaster	15	18
Total	**374**	**496**

Material by area

The material arising is split across the three areas as follows:

Waste arising by site area (tonnes)

Material	Deansgate	GNW	Leisurebox
Gypsum	192	0	182
Main sources	**Deansgate Terrace** • Plasterboard ceilings • Plasterboard partitions	N/a	**Odeon** • Plasterboard ceilings • Plasterboard partitions
Key reuse opportunities	N/a	N/a	N/a

Potential for material reuse

There is no potential to reuse the gypsum waste arising.

Diversion from landfill

If the plasterboard is relatively free from contamination it may be suitable for recycling. Some of the recycling routes can include being used in the plasterboard manufacturing process (check with the waste/recycling company for their recycling routes).

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Waste Management

Gypsum waste should be segregated on site, if possible. If it is sent to disposal, then it should be landfilled in a monocell (i.e. landfilled separately from the other waste).

Local waste management options include:

- Roy Hatfield http://www.royhatfield.com/
- Burnley Plasterboard and Gypsum https://www.facebook.com/BPGRecyclingAndSkips/
- Hippo Waste https://www.hippowaste.co.uk/

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4.1.5 Insulation

Insulation accounts for an estimated 221 tonnes or 0.7% of total waste arisings by weight; sources can be seen below.

Item	Tonnes	Volume
Mineral wool insulation	128	2560
Foam insulation board	52	1611
Mineral fibre tiles	40	89
EPS insulation board	1	51
Total	**221**	**4,312**

Material by area

The material arising is split across the three areas as follows:

Waste arising by site area (tonnes)

Material	Deansgate	GNW	Leisurebox
Insulation	60	0	161
Main sources	**Deansgate Terrace** • Studwork partitions • Suspended ceiling tiles **Link Building** • Floor slab insulation • Roof insulation	N/a	**Odeon** • Studwork partitions • Acoustic partitions • Suspended ceiling tiles • Wall insulation • Roof insulation
Key reuse opportunities	**Deansgate Terrace** • Suspended ceiling tiles	N/a	**Odeon** • Suspended ceiling tiles

Potential for material reuse

In terms of volume, insulation is the second largest waste source at 21% of the total. The chief source is mineral wool (approximately 128 tonnes) assumed to be present in many of the various studwork partitions, as well as in cinema screen areas for acoustic purposes. This is not typically suitable for reuse.

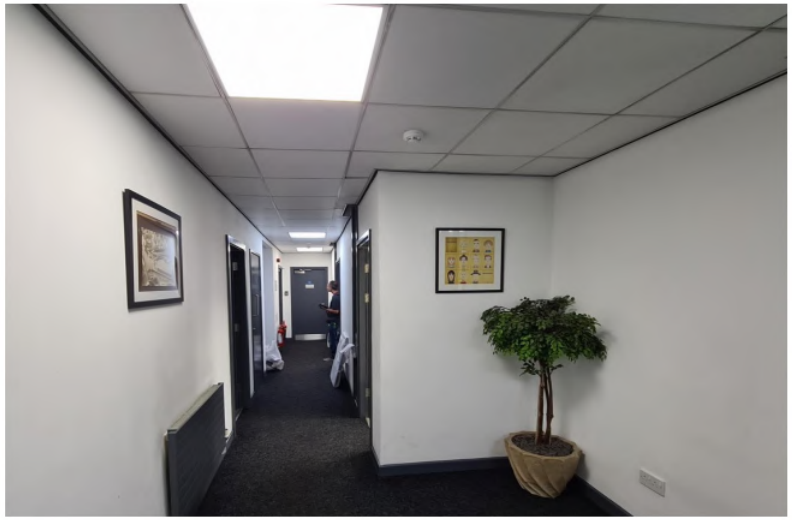
There are also extensive areas of suspended ceiling tiles in both Deansgate and the Odeon area – an estimated 6,700m² in total - of which approximately 75% should be reusable. Those present within the Odeon are believed to be specialist acoustic tiles which could potentially be offered for reuse in another cinema (see the first image on the following page).

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Diversion from landfill

Any insulation material not reused would usually be landfilled as recycling options are very limited.

Waste Management

Insulation batts/boards and mineral fibre ceiling tiles should be segregated on site prior to disposal.

Note that Rockwood offer a recycling scheme, though it has to be their own product and free from contamination: https://www.rockwool.co.uk/about/sustainability/recycling/.

It may be possible to recycle any unwanted mineral fibre tiles - see: www.armstrongceilings.com/commercial/en-gb/performance/sustainable-building-design/recycling-programmes.html (note these have to be manufactured after 2000 – the date will be stamped on the back)

Any remaining material should ideally be sent for energy recovery via incineration – local facilities include Bolton and Runcorn; the disposal route should be confirmed with your waste carrier.

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4.1.6 Additional Material Types

Additional materials likely to arise from the refurbishment are summarised below:

- **Bitumen**
  Bitumen accounts for an estimated 159 tonnes or 0.5% of total waste arisings by weight. The sources are shown below:

Item	Tonnes	Volume
Tarmac surface – GNW car park ramps	155	91
Asphalt surface – footbridge	4	2
Total	**159**	**93**

  There are no reuse opportunities for the materials arising.

  Bitumen should be segregated on site and tested to see if it is hazardous waste; if it is, it must be collected and disposed of by a licensed hazardous waste carrier.

- **Timber**
  Timber accounts for an estimated 148 tonnes or 0.4% of total waste arisings by weight. The sources are shown below:

Item	Tonnes	Volume
Studwork walls	29	59
Laminate/timber flooring	29	48
OSB sheets	25	40
Doors	23	47
Roof/floor frames	13	23
MDF sheets	9	12
Door frames	6	12
Timber skirting board	3	7
WC cubicles	3	4
Kitchen cabinets	3	4
Laminate worktops	2	2
Window frames	1	2
Miscellaneous	1	1
Total	**148**	**261**

  The largest reuse opportunity is around laminate/timber flooring, large quantities of which can be found in the Leisurebox Gym area, as well as across Deansgate Terrace. Depending on quality/wear, this could be reused or offered for community recycling. Approximately 4,020m² of flooring is believed to be present across the site.

  There are also a lot of OSB sheets in the Gym area, beneath the laminate flooring – whilst direct reuse is unlikely, the boards may have potential reuse value as construction shuttering/surface protection/security during the new build. Around 1,900m² is present in this area.

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There are approximately 670 timber doors across all areas of the site, of which it is estimated 10% could be reused.

There are also items such as kitchen cabinets (around 122) and WC cubicles (approximately 50 within the Odeon) arising, which could potentially be offered for community reuse – see http://wesleycommunityfurniture.co.uk/ or https://recycleforgreatermanchester.com/renew-hub/

Where reuse is not possible the timber should be segregated on site if space permits, or offsite and sent to a licensed waste management contractor for recycling.

Suitable recycling and reclamation organisations include:

- Touch Wood https://www.touchwood.org.uk/; part of Community Wood Recycling
- Enva Wood Recycling https://enva.com/resource-recovery/wood/wood-recycling-locations
- Wood Yard (reclamation) https://thewoodyardheywood.business.site/

- **Carpet**

Carpet accounts for an estimated 142 tonnes or 0.4% of total waste arisings by weight. Sources are shown below.

Item	Tonnes	Volume
Carpet	131	34
Carpet tiles	11	14
Total	**142**	**48**

The carpet is chiefly located within the Odeon area of the Leisurebox building, with around 6,700m² present. The carpet is in good condition but is highly patterned and unsuitable for many other contexts; nevertheless, the large quantities and spans present mean reuse should be considered.

The carpet tiles are mainly present across Deansgate Terrace, with smaller quantities in the Link Building and areas of the Odeon. Around 2,800m² are believed present overall. Based on the survey around 50% are estimated to be in good condition and suitable reuse. The remainder can be sent for recycling or disposed to landfill/waste to energy. Companies that offer this service include:

- Carpet Tile Recycling; http://www.carpettilerecycling.co.uk; 01115 940 4454 (these need to be stacked on a pallet)
- Envirocycle; http://envirocyclelondon.com/recycle-office-carpet-tiles/; 07549448123 (these will also offer a removal service)
- Used Carpet Tiles, offer a pick up service; https://www.usedcarpettiles.com/; T: 0800 014 8591

Some manufacturers also offer a reuse/recycling service:

- Interface works with ReEntry Partners (social enterprise) https://www.interface.com/EU/en-GB/campaign/reentry/reentry-en_GB
- Milliken; https://floors.milliken.com/floors/sustainability/end-of-life; t: 01942 612777
- Potential recycling routes can also be searched at: https://carpetrecyclinguk.com/find-a-recycler/

Carpet tiles should be stacked and segregated on site to maximise reuse and recycling.

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- **Stone**

Stone accounts for an estimated 141 tonnes or 0.4% of total waste arisings by weight. Sources are shown below.

Item	Tonnes	Volume
Reconstituted stone cladding	101	40
Slate tiles	18	6
Granite tiles - internal areas	13	5
Granite tiles - external areas	8	3
Total	**141**	**55**

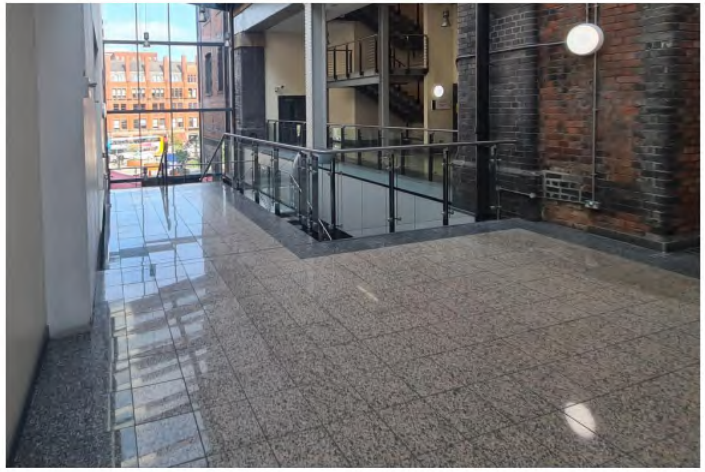
The stone cladding is mainly located in the Link Building (approximately 89 tonnes) with the remainder (likely in poorer condition) being located to the lower car park levels of the Leisurebox. It is estimated that 75% of this can be recovered for reuse.



The slate tiles (18 tonnes) located on the Great Northern Warehouse roof areas set for removal present a further reuse opportunity.

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There are around 13 tonnes of polished granite flooring within the Link Building stairwell area; this is in good condition and should also be considered for reuse.



Stone should be segregated on site to maximise reuse and recycling.

Local companies that might purchase the materials for reuse include:

- Willmow, https://willmow.co.uk/looking-to-sell/
- Lomax, https://www.reclaimedslateandpaving.co.uk/
- Roofslates.com, https://roofslates.com/

Any unwanted material can be disposed of via the same routes as concrete/brick waste, as outlined in the relevant sections above.

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- **Glass**

Glass accounts for an estimated 83 tonnes or 0.2% of total waste arisings by weight. Sources are shown below.

Item	Tonnes	Volume
Window glazing	64	26
Roof glazing	6	2
Glass canopies	3	1
Glazed wall panels	3	1
Glass railing	3	1
Door glazing	3	1
Glass blocks	1	0.5
Total	**83**	**34**

Despite the large quantities present, direct reuse of the glazing is unlikely to be feasible given modern thermal requirements. The chief reuse opportunities are for modular items such as the glazed wall panels (an estimated 51m are present, mainly on the first floor of the Link Building and within the Leisurebox Gym). Where practical, consideration should be given to reusing glass partitions within the new build, or in another project (onsite reuse is preferable as logistical challenges are likely to preclude reuse elsewhere).

Reuse opportunities also exist for the glass railings (90m within the Link Building and 50m in the Odeon) and the glass blocks (11m³ in the Link Building).

Glass should be segregated on site to maximise reuse and recycling.

Where reuse is not feasible, glass should be recycled.

Glass recyclers are:

- URM Group, https://www.urmgroup.co.uk/ E: info@urmgroup.co.uk
- May Glass Recycling, http://www.mayglassrecycling.co.uk/
- Viridor, https://www.viridor.co.uk/siteassets/document-repository/brochures/glass-recycling-ukviridor-low-res.pdf

- **Ceramics**

Ceramics account for an estimated 47 tonnes or 0.1% of total waste arisings by weight. Sources are shown below.

Item	Tonnes	Volume
Floor tiling	32	13
Wall tiling	9	3
WCs	5	2
Basins	2	1
Urinals	0.4	0.2
Shower trays	0.2	0.1
Total	**47**	**20**

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This occurs sitewide as sanitaryware and tiling across WC and kitchen areas. Due to difficulties removing items undamaged, and their likely general condition, reuse is not suggested. Ceramics should be separated on site, along with the concrete, if space permits, or offsite, crushed and used as Recycled Aggregates (RA), using the disposal routes outlined in the concrete/brick sections above.

- **Plastics**

Plastics account for an estimated 19 tonnes or 0.06% of total waste arisings by weight. Sources are shown below.

Item	Tonnes	Volume
Vinyl flooring	12	9
Polymeric roof covering	6	13
Vapour membrane	2	4
Total	**19**	**26**

The main source is vinyl flooring - around 1,700m² is estimated to be present, largely concentrated in the Deansgate Terrace area. Condition and fixing methods are likely to be variable, meaning direct reuse may not be feasible.

Schemes exist to recycle old vinyl flooring, depending on the quality and amount of screed attached. This can either be dropped off at specific locations or collected. See http://www.recofloor.org/about-us/#specifications for more details. If the product does not meet the specification for recycling, then it is likely to be sent for energy recovery.

Other major sources are the polymeric roof covering, and vapour membrane from the Leisurebox; these are unsuitable for reuse or recycling, and should be sent for energy recovery as discussed in the insulation section above.

Due to the scale of the site we have only logged these major items; please note it is likely that further concealed plastic items are present across the buildings, e.g. pipework, trunking and various miscellaneous items. The plastic is unlikely to be suitable for recycling and should also be sent for energy recovery.

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- **Waste Electrical and Electronic Equipment (WEEE)**

Various items of Waste Electrical and Electronic Equipment (WEEE) are present across the site. WEEE falls outside the direct scope of this analysis and as such these items have not been quantified with weights and volumes; however their presence has been noted and reuse options have been suggested.

Item	Quantity	Reusable
Recessed/spot lights (fluorescent)	541	n
Strip lights (LED)	234	y
Recessed/spot lights (LED)	142	y
Flood lights (LED)	48	y
Surface mounted lights (LED)	56	y
Pendant lights (LED)	32	y
Strip lights (fluorescent)	30	n
Air conditioning/VRF units	22	TBC
Air conditioning unit - internal	15	n
Pendant lights (fluorescent)	13	n
Lift motors	7	TBC
Hot water cylinders	6	TBC
Air handling units	5	TBC
Escalators	4	TBC
Boilers	4	n
The reusability column is provided for indicative guidance only; these items should be suitable for reuse, provided all required performance characteristics can be verified and no insurance/warranty clauses are breached.		

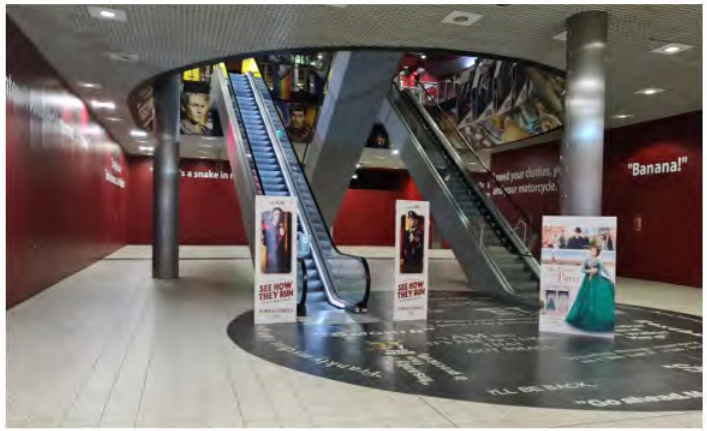
The main reuse opportunity is the LED lighting, with around 500 fittings present across the site. A further 600 fluorescent fixtures are also present – these are generally not suggested for reuse as they may be considered outdated; however those in good condition may be useful as spares elsewhere. The LED lighting should be strongly considered for reuse.



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A range of other equipment is also present, including 22 air conditioning/VRF units on the Leisurebox roof, several air handling units e.g. within the Gym plant area, various boilers and cylinders, etc. It may be possible to reuse these – and other items such as lift motors - depending on condition and remaining service life.

There are four escalators in the Odeon (one concealed behind a false wall) which may also be reusable if they can be dissembled without damage; alternatively they could be offered as spares.



For lighting, Recolight (www.recolight.co.uk) is as scheme which will send lights for recycling. There are also companies that will remanufacture lighting, including: Egg Lighting (www.egglighting.com/egg-circular) and Whitecroft Lighting – Vitality (www.whitecroftlighting.com/whitecroft-vitality).

Any waste electrical and electronic equipment should be separated on site and sent to a specialist recycling facility, such as the following: https://envirocraft.co.uk/branches/manchester/

Smaller white goods such as fridges, microwaves etc could be sent for community recycling: https://recycleforgreatermanchester.com/renew-hub/ or http://wesleycommunityfurniture.co.uk/

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5. Notes on reuse

Experts advise that a long lead-in time and maximum exposure are required to enable the reuse of products and components. The best chances for reuse, with the best environmental and economic benefits, are as near to site as possible:

- Used by the same client locally
- Sold or given away locally

The following recommendations may assist in maximising the reclamation potential of KDPs identified:

- Consult the client on the findings of this report and consider any options for closed-loop re-use in this project itself, or a similar project.
- Consider setting aside storage on site for segregation of salvage items.
- Advertise specific salvage items for free on www.salvo.co.uk or low value materials or use companies such as GloheChain (www.globechain.com); Reyooz (www.reyooz.com/about/clients) and Collecteco: https://www.collecteco.co.uk/. Salvo also operate a demolition/refurbishment alert service on their website which serves to bring forthcoming demolition products to the attention of potential buyers or users.
- For smaller items e.g. white goods, fans etc. use local organisations such as the Reuse Network: https://reuse-network.org.uk/donate-items/#/
- Contact local architectural salvage merchants about specific items. Salvo publish a directory on their website (https://www.salvoweb.com/). Ensure that salvaged items are removed and stored in such a way that all components remain together, e.g. hinges and fixings with doors, etc.
- Material exchange websites can be searched at https://www.supplychainschool.co.uk/log-in/?redirect_url=https%3A%2F%2Flearn.supplychainschool.co.uk%2Flocal%2Ftlactionplans%2Fresource_intro.php%3Fid%3D4291%26amp%3Bmodtype%3Durl (Note, you will need to create a log in but there is no charge to use the site).

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6. Targets

Reuse of materials

Reuse, rather than recycling, of items should always be prioritised.

It is believed that approximately 1,030 tonnes of material could potentially be reused, representing around 3.1% of total weight.

A reuse target of **2% by weight** is recommended.

Note that this does not include any brick reuse – should it be possible to reclaim 50% of the bricks from Deansgate and/or the jack arch areas, a further 0.4% reuse would be possible (giving 3.5% overall).

Recycling of materials - diversion from landfill

It is recommended that an overall recycling target is set prior to the project commencing based on the recommendations of this report in conjunction with the selected contractor(s). An estimate of the total percentage of waste materials that can be recycled is 33,060 tonnes, representing around 99.5% by weight.

A total diversion from landfill target of **95% by weight** is recommended.

Note that 90% by weight, or 80% by volume is required to achieve the relevant BREEAM credits; a more ambitious target representing an exemplary level would be 95% diverted from landfill.

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Appendix A

Report Authors

Toby Balson
Toby has over 16 years' experience in energy consultancy, building design and construction resource efficiency. His career began at BRE where he worked closely with the Energy Saving Trust and other clients developing sustainable construction training and guidance, including designing for material efficiency and reuse, as well as work on embodied carbon within buildings. He subsequently worked as Environmental Officer at the University of Cambridge, leading development of sustainable construction standards to be applied to their £0.5 billion build programme and leading implementation of ISO 14001 across the university, including minimisation of waste and options for reuse and recycling of different waste streams. He has extensive site survey experience having delivered multiple audits as part of ESOS, as well as energy performance contracting, post-occupancy-evaluation and pre-demolition audits across the UK.

Katherine Adams
Katherine has worked in the area of construction resource efficiency for 17 years, mostly at BRE, where she has been instrumental in shaping the construction industry to achieve high levels of diversion of waste from landfill and reducing waste. She has much experience of pre-demolition audits, having undertaken and reviewed many for various clients, which has involved the development of a robust methodology. She has been responsible for developing waste reporting, including the online system Smartwaste. She enjoys working closely with many elements of the industry, at both a sector and project level. She is currently undertaking a PhD at Loughborough University looking how circular economy can be embedded in the building sector and continues to assist BRE and other organisations such as ASBP.

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Appendix B

The Waste Hierarchy

The waste hierarchy is a framework which has been used in UK policy and legislation since the 1990s. The concept is simple, with waste prevention at the top of the waste hierarchy (the preferred option) and disposal at the bottom (the worst option). In between, in order of preference, is preparing for reuse, recycling and recovery. There are standard definitions within legislation on what constitutes each activity under the waste hierarchy.



Waste Prevention

- Waste prevention measures include reducing the quantity of waste generated, reducing the content of harmful substances, reducing the adverse impacts on environment and human health.
- Other terms may include waste reduction, elimination and minimisation.
- In the majority of cases, waste prevention is focused on materials, products and components before (somewhat confusingly) they become waste.
- Examples of waste prevention include good storage of materials to avoid damage; avoiding over ordering of materials, eliminating excess packaging, designing out waste and extending the lifetime of products.
- For a building/structure, waste prevention may include build nothing, build less, extending the life of a building (thereby not creating demolition waste); designing for adaptability, being more material efficient in the design, and using systems that may create less waste (such as modern methods of construction).

Reuse

- Reuse is any operation by which products or components that are not waste are used again for the same purpose.
- Preparing for reuse is checking, cleaning or repairing products or components of products that have become waste to enable them to be reused without any other pre-processing.

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- Other terms that encompass reuse are remanufacture, refurbishment, repair, and reclamation/salvage.
- Examples include reclaimed bricks, the reuse of steel beams and reusable packaging systems. Examples of remanufacture can be found for lighting. Reclamation/salvage is often used for reusing architectural items.
- At a building level, the refurbishment of a building is reuse.
- Often, reuse is conflated with recycling, but they are two different activities. Reuse may be seen as a waste prevention activity.

Recycling

- Recycling is any recovery operation where waste materials are reprocessed into products, materials or substances, whether for original or other purposes.
- There are two types of recycling:
  - Closed loop – where the waste materials are recycled back into the same or a similar product (e.g. waste plasterboard being recycled back into plasterboard).
  - Open loop recycling - where the waste material is recycled back into different products (e.g. container glass into fibre glass insulation and plastic bottles into plastic pipes). There tends to be more benefits from closed loop recycling – for example, studies have shown that it is better to use recovered glass to create new glass rather than use it as an aggregate in construction.
- Repurpose may also be a recycling activity, for example using scaffolding planks as furniture.
- Many construction product manufacturers will use recycled materials in their manufacturing processes.
- Terms that are being used more frequently include 'downcycling' and 'upcycling' due to the increasing prominence of the circular economy concept, which aims to keep products, components, and materials at their highest utility and value. As the names suggest, downcycling is where some value is lost e.g. crushed concrete used in fill applications, and upcycling is where value is enhanced e.g. cladding from recycled plastic bottles.

Other Recovery

- Recovery activities are incineration with energy recovery, gasification and pyrolysis (used for organic waste) which produce energy and anaerobic digestion and composting (also used for organic waste).
- Some waste from construction and demolition activities will be sent for energy recovery e.g. plastic and wood.
- 'Backfilling' is a recovery option, where inert materials (mostly from C&D waste) are used for the reclamation of excavated areas or engineering purposes in landscaping. The waste must be suitable for the intended purpose and must substitute non-waste products.
- Sometimes the terms 'recycling' and 'recovery' are used interchangeably.

Disposal

- The landfilling of waste and the incineration of waste where energy is not recovered are disposal activities.
- In some cases, it may be necessary to landfill waste e.g. hazardous waste such as asbestos.
- Inert waste may be disposed of e.g. to restore quarries where there are planning requirements.

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Requirements

Within the Waste Regulations, it is a requirement for all producers of waste to take reasonable measures to apply the waste hierarchy in priority order. However, it is acknowledged that the order does not necessarily have to be followed, the best environmental outcome should be obtained for each waste stream. When a regulator (the Environment Agency in England) provides a permit for waste facilities to enable them to operate within certain conditions, they should also ensure that the waste hierarchy is applied. This means that they have to decide whether certain activities are 'recovery' or 'disposal'. Guidance has been developed on how to apply the waste hierarchy in England, Wales, Scotland and Northern Ireland.

Waste Policy and Legislation

Waste policy and legislation in the past has been geared towards the bottom of the waste hierarchy; i.e. reducing the amount that is landfilled (e.g. the Landfill Tax) and increasing recovery and recycling. For construction and demolition waste (C&D), there is a target within legislation to recover at least 70% of non-hazardous C&D waste by 2020. In the UK we have been comfortably meeting this target since 2010 with a recovery rate of around 91%. The policy focus now is to move up the waste hierarchy.

In England, the Resources and Waste Strategy published in 2018, has targets of 'doubling resource productivity' and 'eliminating avoidable waste of all kinds by 2050'. A working interpretation of this target has been produced by the Green Construction Board (GCB), which is aligned to the waste hierarchy, and a Routemap of how to reach zero avoidable waste (ZAW) in the construction sector was published in 2021. This discusses the need to avoid unintended environmental consequences such as the inefficient use of material (e.g. over specification of structural materials) which produces no or little waste; or where recycling may be a more energy intensive option with greater environmental impact. For example, through the transportation of waste where there are no local recycling plants. Similarly, downcycling of materials may be a better option if it is replacing the use of primary materials.

Further reading

- Waste Regulations
- Defra Resources and Waste Strategy, 2018
- Defra Guidance on Applying the Waste Hierarchy
- Waste Prevention in England (2013)
- Waste Prevention Programme Consultation (England)
- Green Construction Board Zero Avoidable Waste Working Interpretation
- Green Construction Board Zero Avoidable Waste Routemap
- EU Waste Policy on Construction and Demolition Waste
- Zero Waste Scotland Best practice guide to improving waste management on construction sites

Text reproducted from the Construction Products Association Waste Hierarchy Briefing Paper, author Katherine Adams – see https://www.constructionproducts.org.uk/media/557063/waste-hierarchy.pdf

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Appendix 3 – Logistics

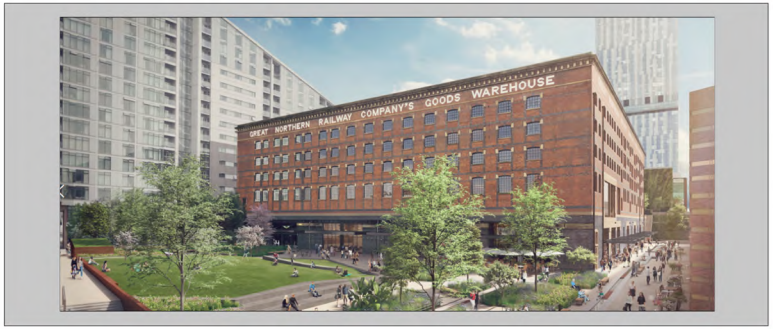
- Tenant Operations
- Leisure Box Car Parking
- Sitewide Demolition Phasing
- Leisure Box interventions
- Sitewide Logistics Plans

R.P.M.

Real PM Ltd.
Derbyshire House
St Chad's Street
London
WC1H 8AG

0207 036 0800

Great Northern Warehouse



Existing Tenant Operations

Internal Review / Issue Process			File details	
Stage	Initials	Date		
Originator	GR	12 Oct 22	Status	For Planning
Review	-	-	Revision	4
-	-	-		
-	-	-		

Distribution - to be further distributed	Distribution
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--	--

Description

Contents

Phasing drawings 1-5
Showing delivery, access and waste management of Bowling and Casino
L00 Existing Tenant demise and Access
L01 Existing Tenant demise and Access

Revisions

Rev 4
Stage 6 Deansgate pit lanes amended
Stage 6 Site road moved 1 bay south in central area

Key Assumptions

Assumptions as shown on phasing plans
"Almost Famous" to be accessed and managed from the north - not shown here, stand alone drawing may be required..
Fire escapes need to be validated and tested against legislation - proposed next level of detail,

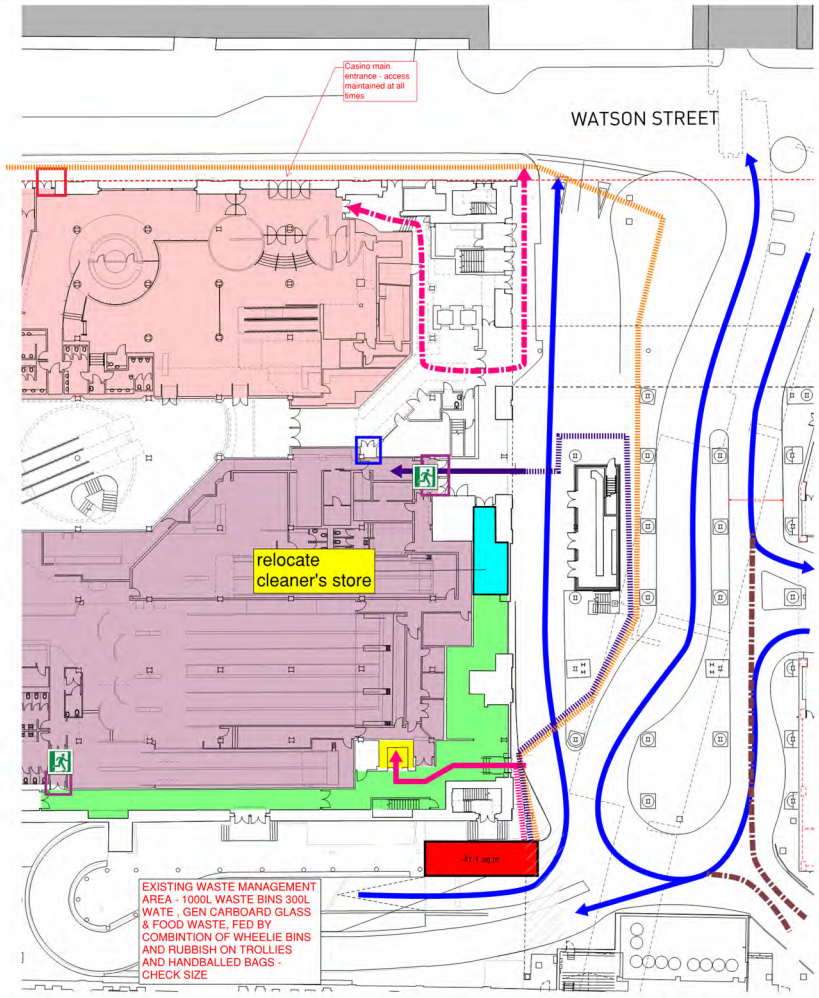
[Note: This document was issued as a draft following a review meeting on 22 Jul 22. The response is shown below - these comments still apply to the contents of this revision]



Legend 1

- Bowling servicing
- Bowling Waste
- Casino service lift
- Casino Servicing
- Casino VIP route
- Casino Waste
- Cinema Access
- Imposs & Alm Famous servicing
- relocate cleaner's store
- Tenants Waste Mgmt Area

Stage 1: Relocate cleaner's store to create delivery corridor



Job No 10422 | Scale 1:200 @ A1 | Drawing No 10422-SHP-Z2-A-G200-XP-00-001 | Revision P01

CALIBRATED 15/06/2022 11:40:21

ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED

R.P.M.

Project: GNW

Title: Central area existing Tenant management

All swept paths to be checked by specialist
All reversing will be supervised

GNW/CEN/01 Rev

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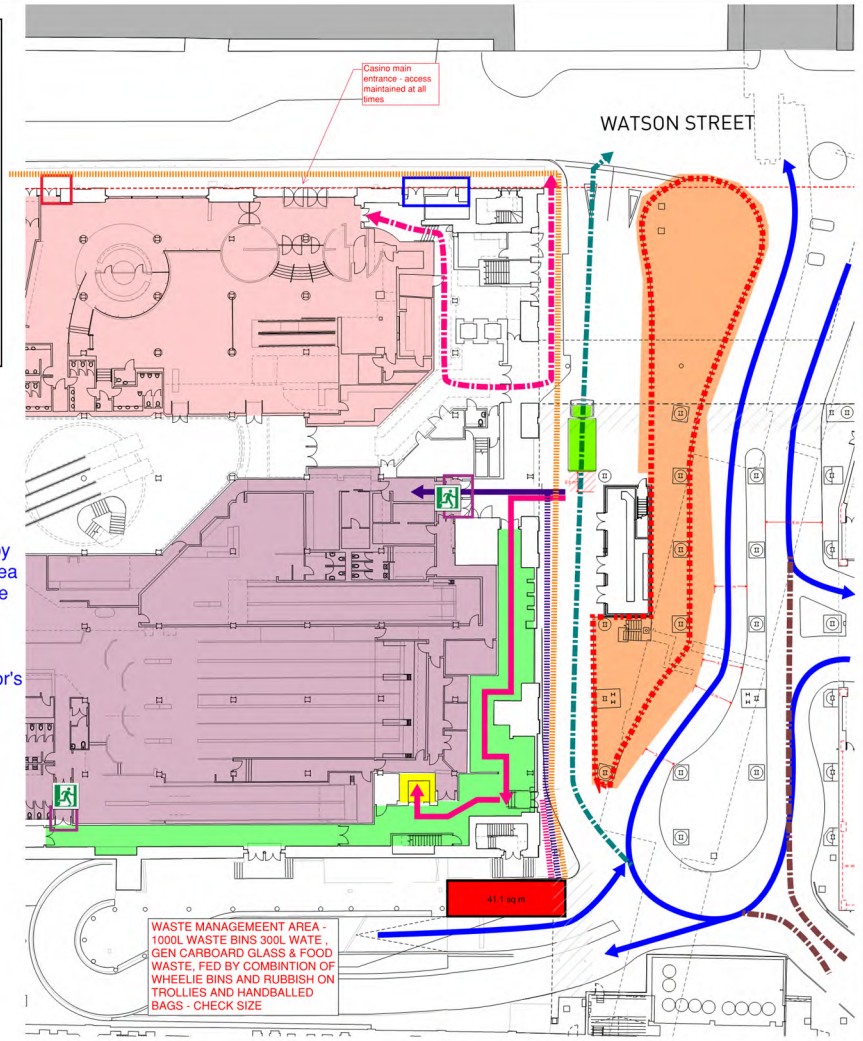
Stage 2: Remove kerbs to central section and level ground for maximum flexibility for logistics

Legend 2
Description
10.5te delivery truck
Bowling servicing
Car Park Access / Egress
Casino servicing
Casino VIP route
Remove kerbs & level area
Service Road Access
Tenant deliveries vehicle
Tenant Waste Management area

For discussion:

Tenant waste management to be managed by contractor within their waste management area - Tenant takes to to perimeter for their demise and Contractor removes from there.

All tenant deliveries use space indicated as 10.5 te truck. Tenants' to join with Contractor's online booking in delivery system.



How big is a 10 ton truck?

M123 and M125 10-ton 6x6 trucks

M123 and M125 10-ton 6x6 truck	
Mass	32,490 lb (14,740 kg) empty
Length	23 feet 4 inches (7.11 m)
Width	9 feet 6 inches (2.90 m)
Height	9 feet 3 inches (2.82 m)

Job No 10422 | Scale 1:200 @ A1 | Drawing No 10422-SHP-Z2-A-G200-XP-00-001 | Revision P01

CALIBRATED 15/06/2022 11:40:21

ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED

R.P.M.

Project: GNW

Title: Central area existing Tenant management

All swept paths to be checked by specialist
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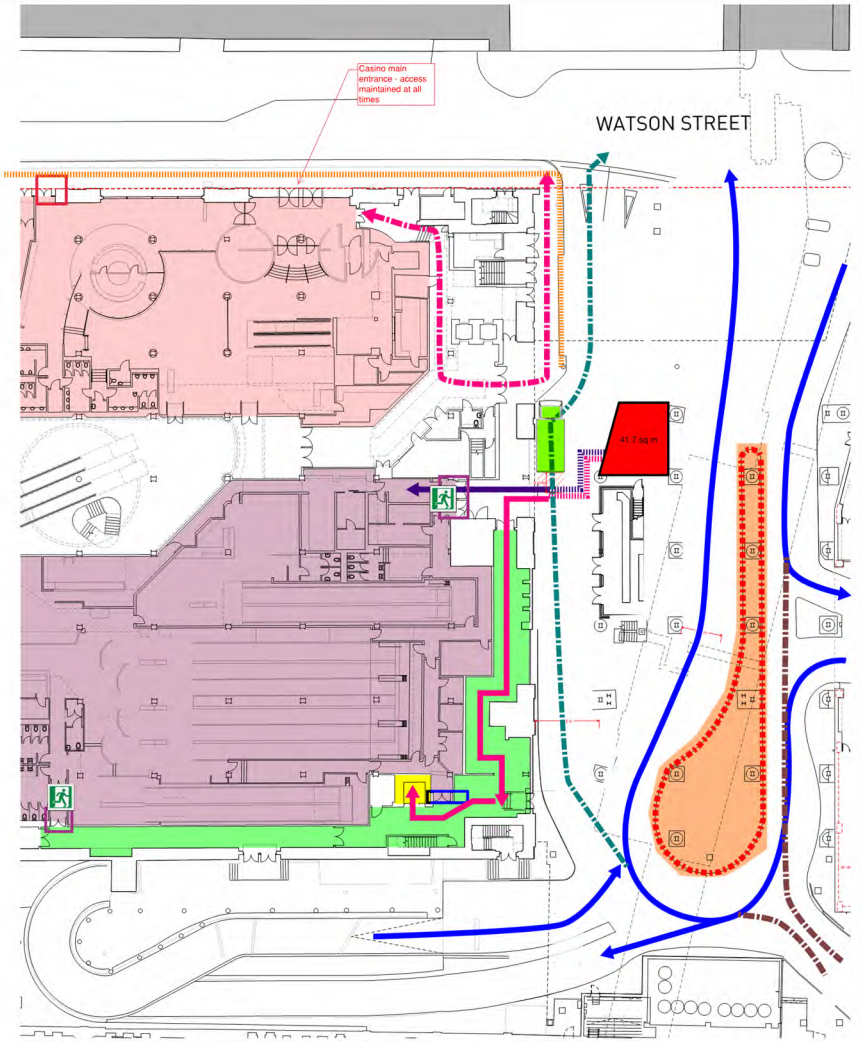
GNW/CEN/02

Rev

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Legend 3
Description
10.5te delivery truck
Bowling servicing
Bowling Waste
Car Park Access / Egress
Casino servicing
Casino VIP route
Casino Waste
Imposs & Alm Famous servicing
Remove kerbs & level area
Service Road Access
Tenant deliveries vehicle
Tenant Waste Management area

SWEPT PATHS TO BE CHECKED BY SPECIALIST



Stage 3:
Relocate waste management area.
Relocate delivery point for Casino and Bowling
Re-route servicing for casino through service corridor.
Remove kerbs to section next to Leisure Box car park entrance and level ground for maximum flexibility for logistics

Job No 10422 | Scale 1:200 @ A1 | Drawing No 10422-SHP-Z2-A-G200-XP-00-001 | Revision P01

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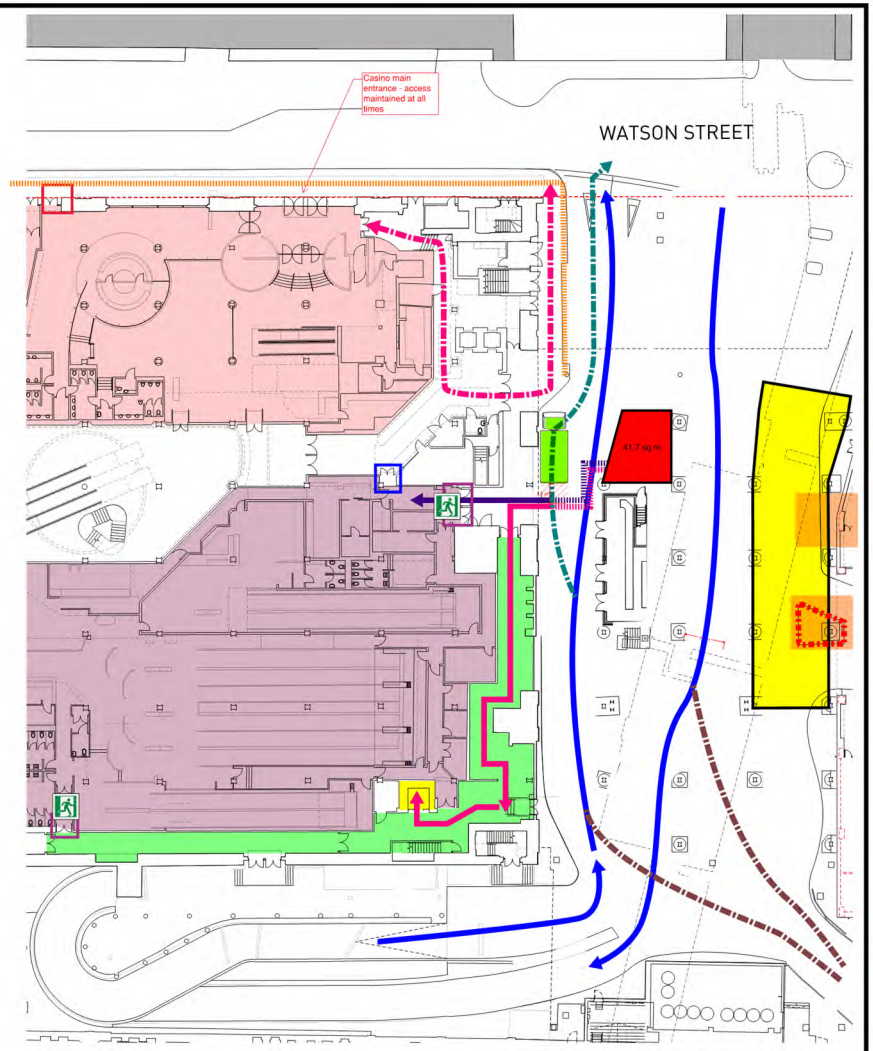
ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED

R.P.M. | Project: GNW | Title: Central area existing Tenant management | All swept paths to be checked by specialist. All reversing will be supervised | GNW/CEN/03 | Rev

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Legend 4
Description
10.5te delivery truck
Bowling servicing
Bowling Waste
Car Park Access / Egress
Casino VIP route
Casino Waste
Construct protection deck
Remove kerbs & level area
Service Road Access
Tenant deliveries vehicle
Tenant Waste Management area

Stage 4:
Close Leisure Box Car Park
100 no spaces made available in GNW upper levels
Open amended access route to GNW Car Park
Construct protection deck below overhead structure to allow safe working above
Remove kerbs to island outside of Leisure Box car park entrance and level ground for maximum flexibility for logistics
Set up internal hoardings to segregate demo area at LB ground floor.
Prepare circa 100 spaces on west side of Ground Floor LB car park.



Job No 10422 | Scale 1:200 @ A1
Drawing No 10422-SHP-Z2-A-G200-XP-00-001 | Revision P01
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ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED

R.P.M.

Project: GNW

Title: Central area existing Tenant management

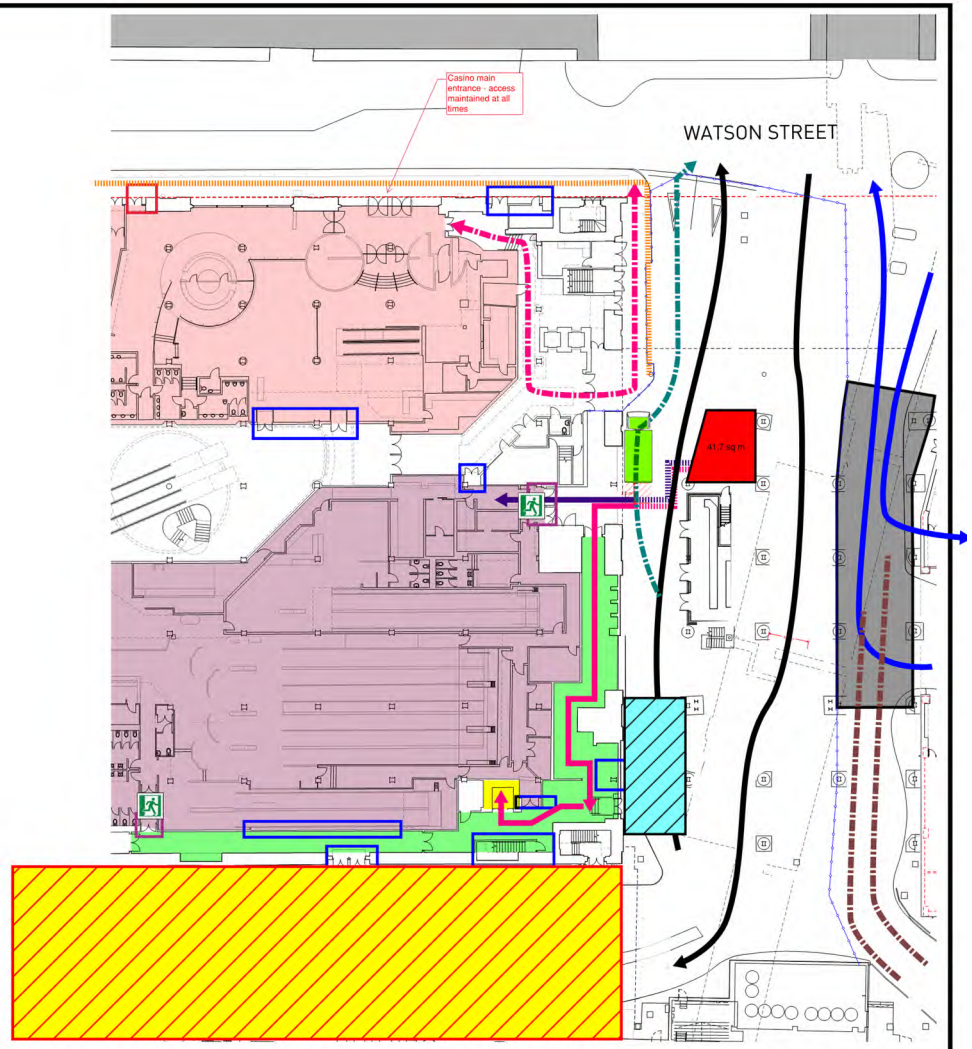
All swept paths to be checked by specialist
All reversing will be supervised

GNW/CEN/04

Rev

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Legend 5
Description
10.5te delivery truck
Bowling servicing
Bowling Waste
Build new F&B unit Shell
Casino servicing
Casino VIP route
Casino Waste
Contractor Vehicle route
Demolish to create Street
PolyLine
Protection deck
Service Road Access
Tenant deliveries vehicle
Tenant Waste Management area



Stage 5:
Re-open 100 spaces for existing tenants in Leisure Box car park.
Close GNW car park
Demolish all structures on the new "Street"
Set up secure perimeter hoarding to new work zone - shared with and managed by the works contractor

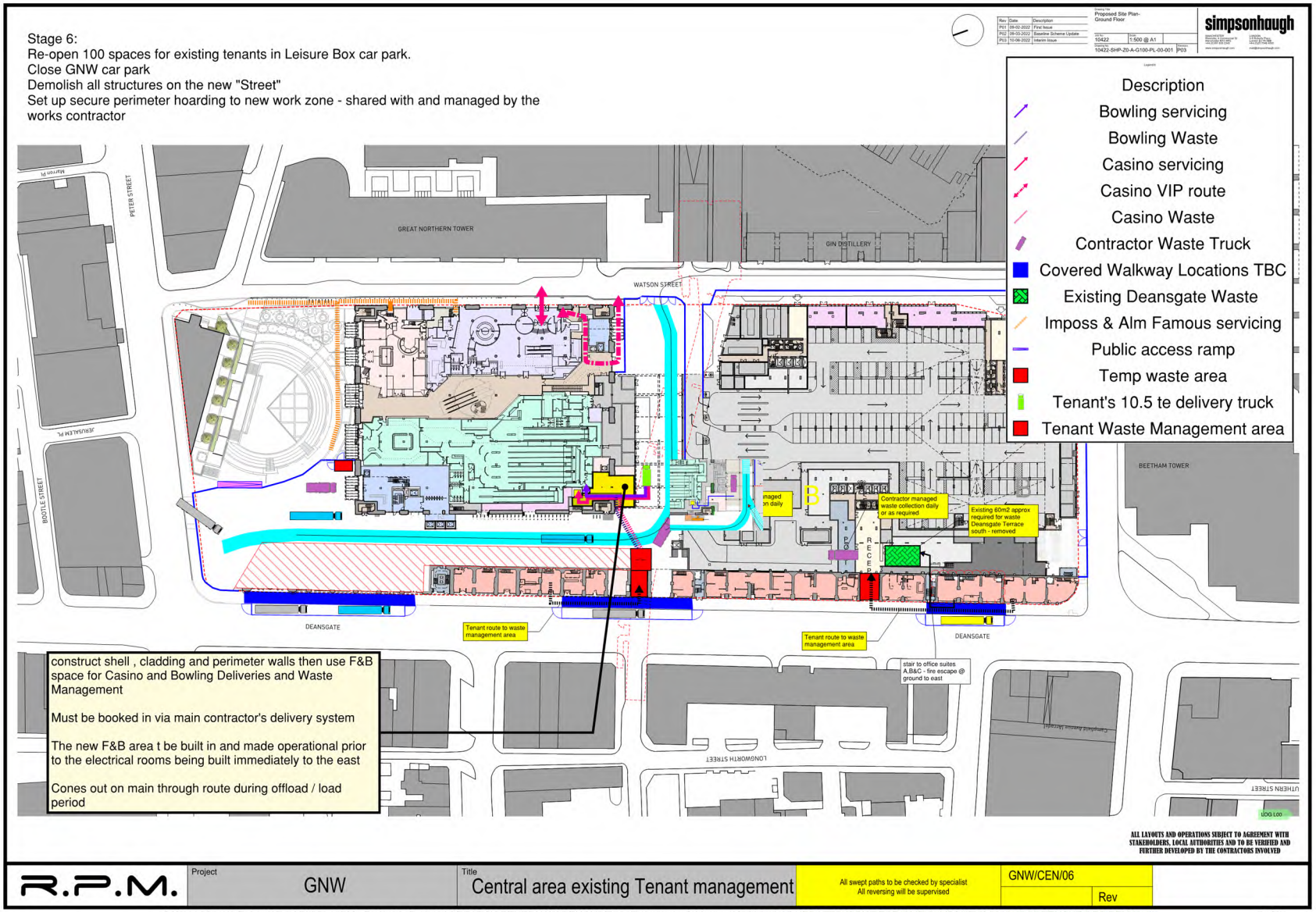
Job No 10422 | Scale 1:200 @ A1 | Drawing No 10422-SHP-Z2-A-G200-XP-00-001 | Revision P01

CALIBRATED 15/06/2022 11:40:21

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R.P.M. | Project: GNW | Title: Central area existing Tenant management | All swept paths to be checked by specialist All reversing will be supervised | GNW/CEN/05 | Rev

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Stage 6:
Re-open 100 spaces for existing tenants in Leisure Box car park.
Close GNW car park
Demolish all structures on the new "Street"
Set up secure perimeter hoarding to new work zone - shared with and managed by the works contractor
Description
Bowling servicing
Bowling Waste
Casino servicing
Casino VIP route
Casino Waste
Contractor Waste Truck
Covered Walkway Locations TBC
Existing Deansgate Waste
Imposs & Alm Famous servicing
Public access ramp
Temp waste area
Tenant's 10.5 te delivery truck
Tenant Waste Management area
GREAT NORTHERN TOWER
GIN DISTILLERY
WATSON STREET
BEETHAM TOWER
DEANSGATE
Tenant route to waste management area
Contractor managed waste collection daily or as required
Existing 60m2 approx required for waste Deansgate Terrace south - removed
stair to office suites A,B&C - fire escape @ ground to east
construct shell , cladding and perimeter walls then use F&B space for Casino and Bowling Deliveries and Waste Management
Must be booked in via main contractor's delivery system
The new F&B area t be built in and made operational prior to the electrical rooms being built immediately to the east
Cones out on main through route during offload / load period
ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED
simpsonhaugh
Proposed Site Plan- Ground Floor
10422-SHP-Z0-A-G100-PL-00-001 P03
R.P.M.
Project GNW
Title Central area existing Tenant management
All swept paths to be checked by specialist
All reversing will be supervised
GNW/CEN/06
Rev

R.P.M.

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Derbyshire House
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Great Northern Warehouse



Leisure Box Draft Car Parking Continuation

Internal Review / Issue Process			File details	
Stage	Initials	Date		
Originator	GR	12 Oct 22	Status	For Planning
Review	-	-	Revision	4
-	-	-		
-	-	-		

Distribution - to be further distributed	Distribution
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sam@trilogyproperty.com	--
james.heather@trilogyproperty.com	--
--	--
--	--

Description

Contents

Phasing drawings 1-3

Phase 1 :
Flatten central area,
Relocate 100 spaces into warehouse.
Erect crash deck.
Realign access road,
Construct temporary ramp L00 to BMT
Open car park entrance and exit to close to final layout

Phase 2 :

Open CIRCA 100 spaces in existing basement freeing up all of the interventions to Buildings A and C
Construct the individual pile caps and columns BMT to L00 and infill slabs around columns at L00 to all areas BETWEEN the areas required to reconstruct Cores A & C

Phase 3 :

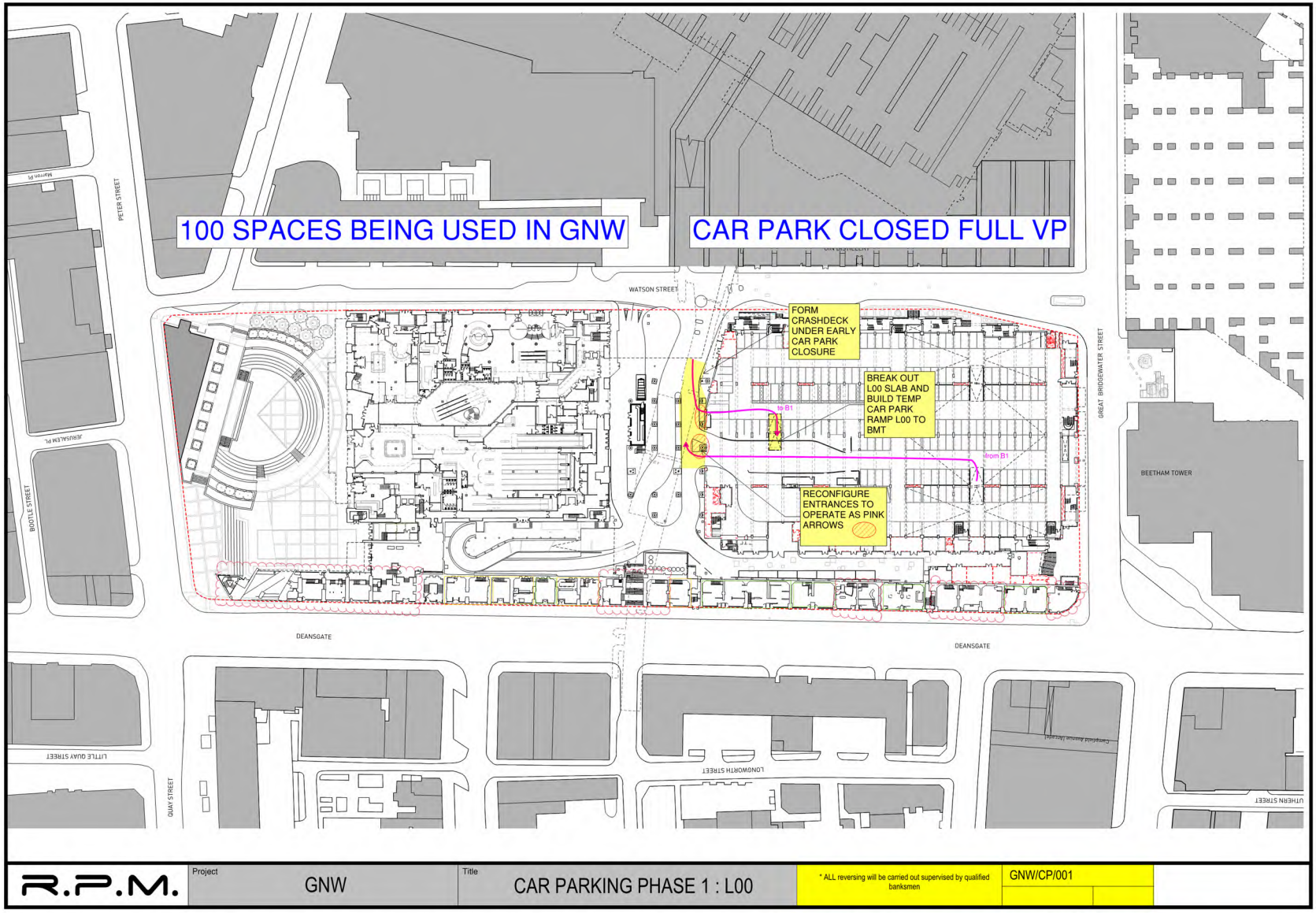
Reconfigure CIRCA 100 spaces to areas in the centre of the car park @ BMT level to also free up all of Building C core AND the new column interventions.
Eastern bays to be confirmed by Main Contractor - close vicinity to work faces.

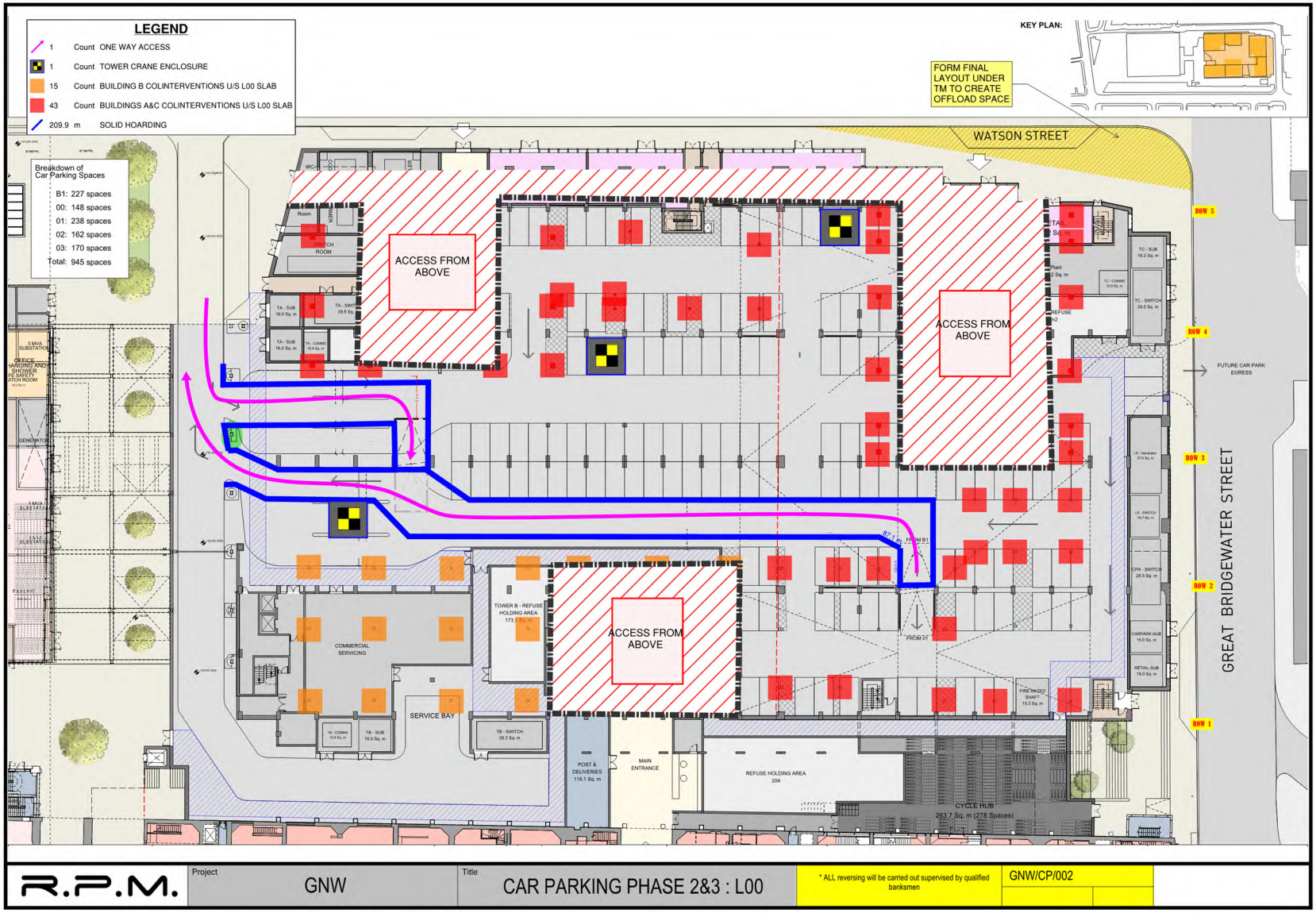
Phase 4:

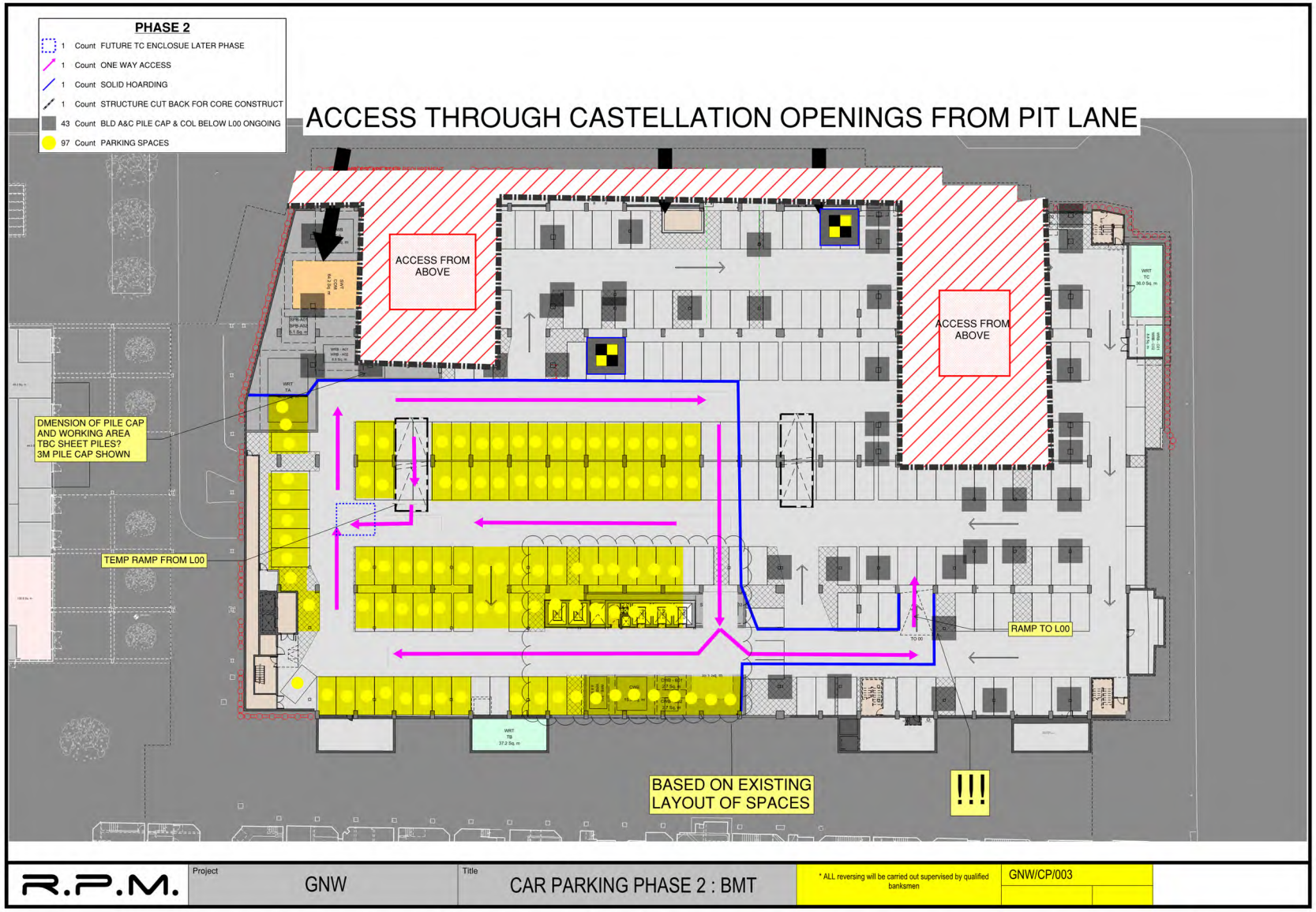
Relocate to L01 later to complete any residual works in BMT

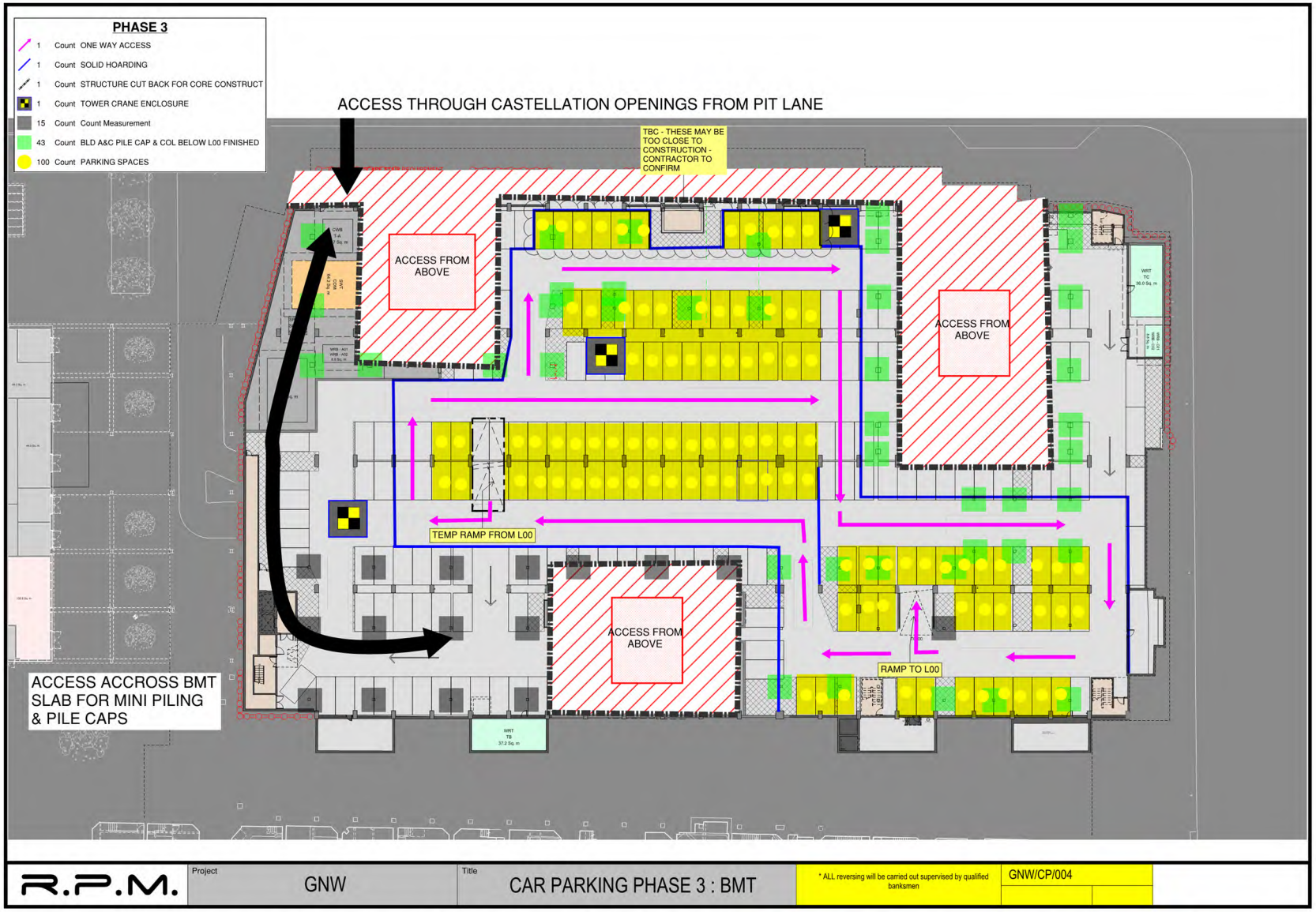
Key Assumptions

Assumptions as shown on phasing plans
Fire escapes/routes etc. can be managed / created as temporary through slabs to comply with all regs. TBC
Transport consultant to comment / AIP for future development
Some short closures may be needed for transformations between the key phases. TBC on further detailed development


100 SPACES BEING USED IN GNW
CAR PARK CLOSED FULL VP
FORM CRASHDECK UNDER EARLY CAR PARK CLOSURE
BREAK OUT L00 SLAB AND BUILD TEMP CAR PARK RAMP L00 TO BMT
to B1
from B1
RECONFIGURE ENTRANCES TO OPERATE AS PINK ARROWS
WATSON STREET
DEANSGATE
DEANSGATE
PETER STREET
BIOTTLE STREET
GREAT BRIDGEWATER STREET
BEETHAM TOWER
QUAY STREET
LONGWORTH STREET
R.P.M.
Project
GNW
Title
CAR PARKING PHASE 1 : L00
* ALL reversing will be carried out supervised by qualified banksmen
GNW/CP/001


LEGEND
1 Count ONE WAY ACCESS
1 Count TOWER CRANE ENCLOSURE
15 Count BUILDING B COLINTERVENTIONS U/S L00 SLAB
43 Count BUILDINGS A&C COLINTERVENTIONS U/S L00 SLAB
209.9 m SOLID HOARDING
Breakdown of Car Parking Spaces
B1: 227 spaces
00: 148 spaces
01: 238 spaces
02: 162 spaces
03: 170 spaces
Total: 945 spaces
KEY PLAN:
FORM FINAL LAYOUT UNDER TM TO CREATE OFFLOAD SPACE
WATSON STREET
ACCESS FROM ABOVE
ACCESS FROM ABOVE
ACCESS FROM ABOVE
ROW 5
ROW 4
ROW 3
ROW 2
ROW 1
FUTURE CAR PARK EGRESS
GREAT BRIDGEWATER STREET
TOWER B - REFUSE HOLDING AREA 173.0 Sq. m
COMMERCIAL SERVICING
SERVICE BAY
POST & DELIVERIES 118.1 Sq. m
MAIN ENTRANCE
REFUSE HOLDING AREA 204
CYCLE HUB 263.7 Sq. m (278 Spaces)
R.P.M.
Project GNW
Title CAR PARKING PHASE 2&3 : L00
* ALL reversing will be carried out supervised by qualified banksmen
GNW/CP/002


PHASE 2
1 Count FUTURE TC ENCLOSUE LATER PHASE
1 Count ONE WAY ACCESS
1 Count SOLID HOARDING
1 Count STRUCTURE CUT BACK FOR CORE CONSTRUCT
43 Count BLD A&C PILE CAP & COL BELOW L00 ONGOING
97 Count PARKING SPACES
ACCESS THROUGH CASTELLATION OPENINGS FROM PIT LANE
ACCESS FROM ABOVE
ACCESS FROM ABOVE
DMENSION OF PILE CAP AND WORKING AREA TBC SHEET PILES? 3M PILE CAP SHOWN
TEMP RAMP FROM L00
RAMP TO L00
BASED ON EXISTING LAYOUT OF SPACES
!!!
R.P.M.
Project
GNW
Title
CAR PARKING PHASE 2 : BMT
* ALL reversing will be carried out supervised by qualified banksmen
GNW/CP/003

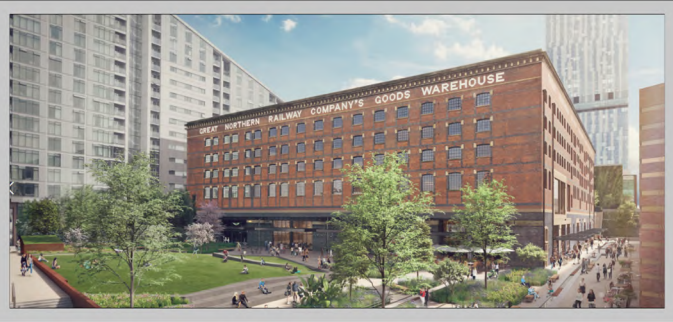

PHASE 3
1 Count ONE WAY ACCESS
1 Count SOLID HOARDING
1 Count STRUCTURE CUT BACK FOR CORE CONSTRUCT
1 Count TOWER CRANE ENCLOSURE
15 Count Count Measurement
43 Count BLD A&C PILE CAP & COL BELOW L00 FINISHED
100 Count PARKING SPACES
ACCESS THROUGH CASTELLATION OPENINGS FROM PIT LANE
TBC - THESE MAY BE TOO CLOSE TO CONSTRUCTION - CONTRACTOR TO CONFIRM
ACCESS FROM ABOVE
ACCESS FROM ABOVE
ACCESS FROM ABOVE
TEMP RAMP FROM L00
RAMP TO L00
ACCESS ACCROSS BMT SLAB FOR MINI PILING & PILE CAPS
R.P.M.
Project
GNW
Title
CAR PARKING PHASE 3 : BMT
* ALL reversing will be carried out supervised by qualified banksmen
GNW/CP/004

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Great Northern Warehouse



Site wide Demolition Phasing

Internal Review / Issue Process			File details	
Stage	Initials	Date		
Originator	MBC	12 Oct 22	Status	For Planning
Review	-	-	Revision	Rev 4
-	-	-		
-	-	-		

Distribution - to be further distributed	Distribution
adam.linard@2110consult.com	--
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james.heather@trilogyproperty.com	--
--	--
--	--

Description

Site wide demolition Phasing pack for Great Northern Warehouse :- Revised to Revision 03 to reflect Early access for Leisure Box Enabling Works

Content:-

Section 01 Existing Site images / Demolition scope

Section 02 Proposed De-Construction works to Leisure Box Structure - rev 04

Section 03 Proposed structural alteration works to Warehouse structure

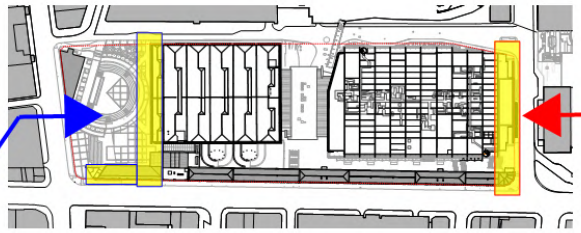
Notes:-

See individual slides for notes.

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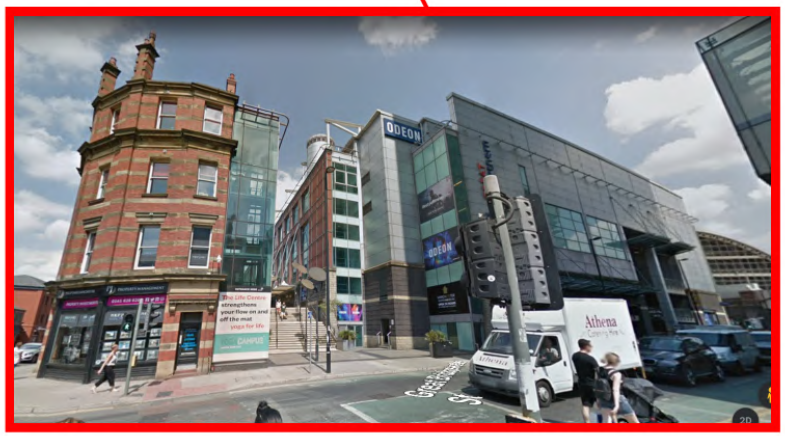

Great Northern Warehouse
- Site Plan
Peter St
Watson St
Deansgate
Deansgate
Great Bridgewater St
R.P.M.
Project
Great Northern Warehouse
Title
Existing site images / Demolitions scope
* Drawing not to scale
GNW ESI-DS-01

Great Northern Warehouse - Peter St & Great Bridgewater St Elevations





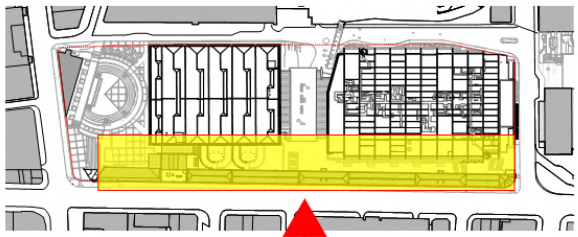
Peter St Elevation



Great Bridgewater St Elevation

R.P.M.	Project: Great Northern Warehouse	Title: Existing site images / Demolitions scope	* Drawing not to scale	GNW ESI-DS-02

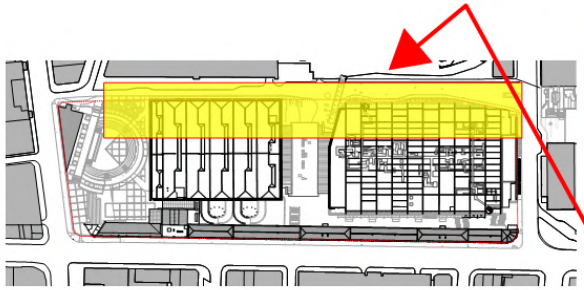
Great Northern Warehouse - Deansgate Elevation





Deansgate Elevation

R.P.M.	Project: Great Northern Warehouse	Title: Existing site images / Demolitions scope	* Drawing not to scale	GNW ESI-DS-03

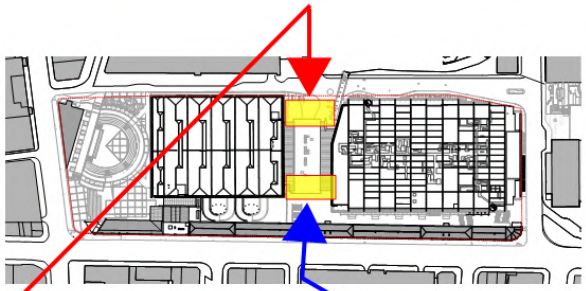


Great Northern Warehouse
- Watson Street



Watson Street Elevation

R.P.M.	Project: Great Northern Warehouse	Title: Existing site images / Demolitions scope	* Drawing not to scale	GNW ESI-DS-04



Great Northern Warehouse - Existing Link Structure Elevations



Existing Link Structure - Watson St Elevation

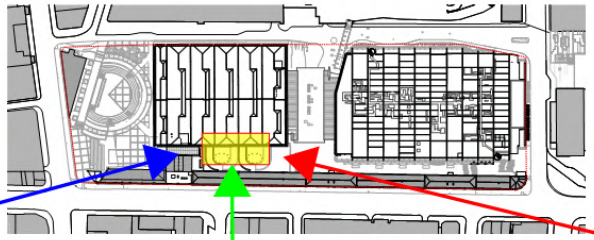


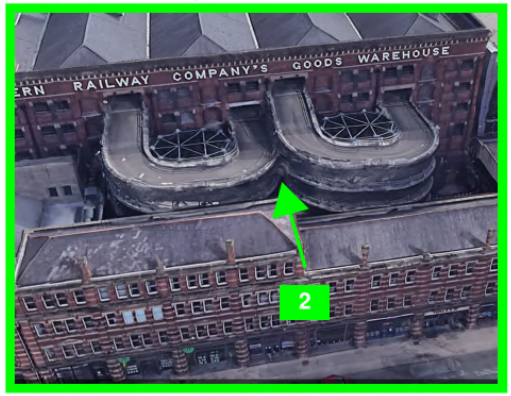
Existing Link Structure - Deansgate Elevation

R.P.M.	Project: Great Northern Warehouse	Title: Existing site images / Demolitions scope	* Drawing not to scale	GNW ESI-DS-05

Great Northern Warehouse - Existing Warehouse Car Park Ramp Structures



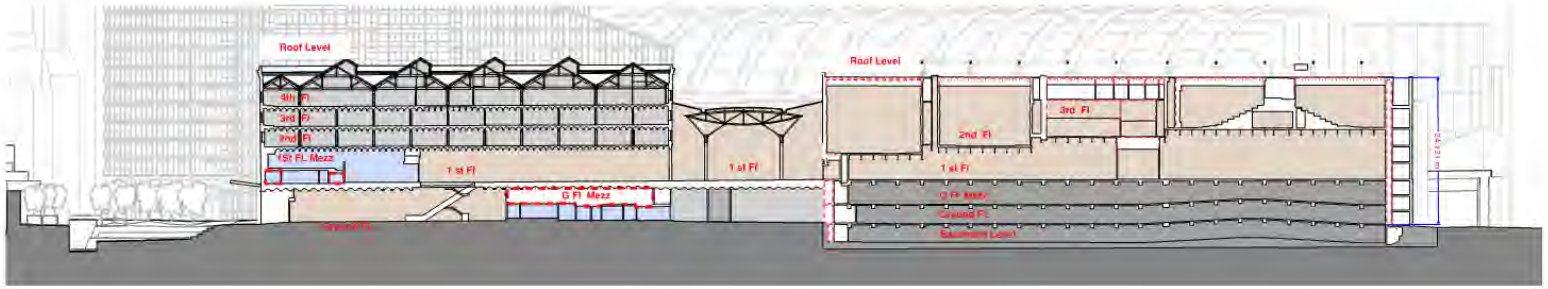






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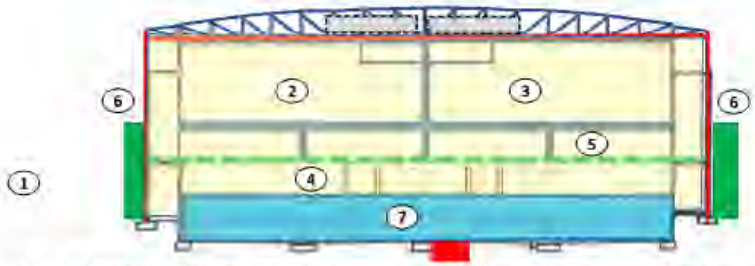
Great Northern Warehouse
- Existing Section with New floor levels identified



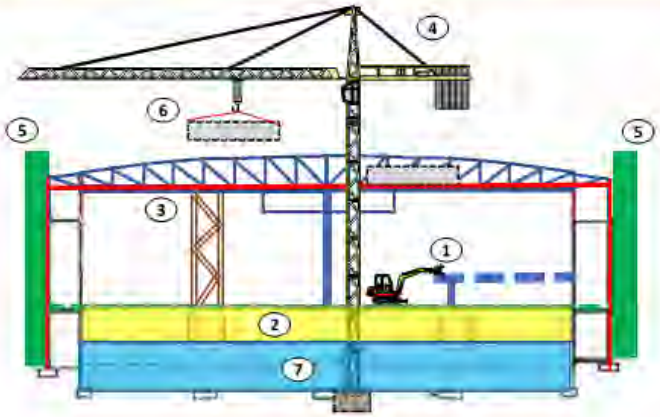
R.P.M.	Project: Great Northern Warehouse	Title: Existing site images / Demolitions scope	* Drawing not to scale	GNW ESI-DS-07

Great Northern Warehouse Deconstruction Sequence - Stages 1 & 2

Rev.04 12-10-2022



1. Advanced enabling works for establishment of a temporary substation between the Leisure Box & Warehouse Structures.
2. Following a full R&D Asbestos survey any asbestos based materials will be removed
3. Soft strip demolition will be carried out removing all internal finishes back to structure
4. Back propping / spreader beams to the temporary tower supports may be required to the Mezzanine floor below the level 2 working deck, this will need to be validated by the temporary works engineer.
   Enabling works for the two tower crane bases and openings will be undertaken following the soft strip operation, works areas locally hoarded off in live car park
5. Following on from the soft strip works the existing Level 2 retained structural slab will be protected to prevent any damage during the follow on de construction works and to make safe any existing penetrations / service openings
6. A fully Monarflex clad encapsulation scaffold will be erected to all external elevations of the existing structure
7. Public car parking in use at BM & Ground level, segregated from live site. To be sequenced with enabling works.

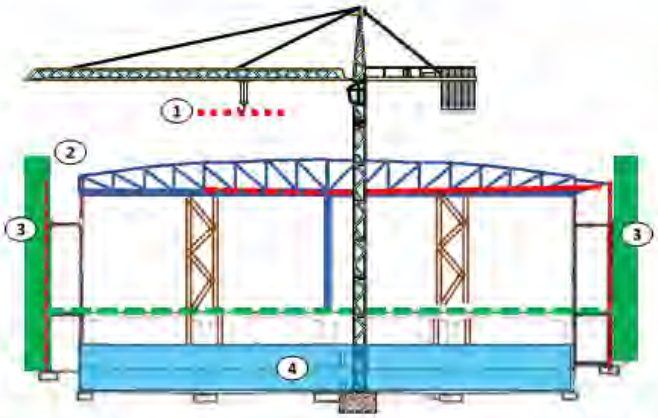


1. With sufficient soft strip demolition works completed and the Level 2 slab protected the existing Level 3 slab will be progressively broken out with the supporting structural frame being removed
2. Mezzanine Level will act as a buffer / protection zone above the existing operational car park at Ground and Basement level during the initial de-construction works (100 Spaces only)
3. Temporary works support towers will be installed to the underside of the existing primary trusses to enable the existing trusses to be sectionalised for lifting down, the towers will also add support to the trusses during removal of the secondary / purlin steelwork
4. Tower cranes TC1 & TC2 will be erected, saddle back cranes are currently shown, luffing jib cranes could be an alternative option
5. External encapsulation scaffold is completed to roof level
6. Roof plant & equipment is decommissioned and removed utilising the tower cranes
7. Public car parking in use at BM & Ground level, segregated from live site. To be sequenced with enabling works.

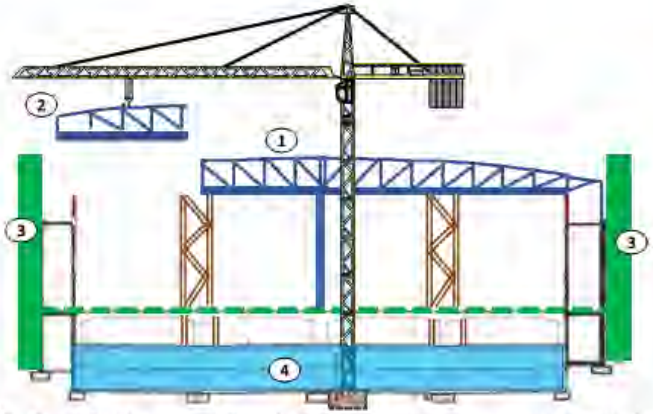
R.P.M.

Great Northern Warehouse
Deconstruction Sequence Stages 3 & 4

Rev 04 12-10-2022



1. With sufficient roof plant removal completed the existing roof cladding panels will be sequentially removed utilising the perimeter scaffold and MEWPS for access. This operation will be assisted by the tower cranes with two work faces running concurrently
2. The eaves interface at the end of the primary truss and perimeter structural steelwork / cladding will be progressively removed, this will then allow for the removal of the existing vertical cladding and primary truss removal
3. Removal of the existing vertical cladding will progress to all elevations working from the perimeter scaffolding this operation will be undertaken in two stages – Roof to Level 2 and Level 2 to Ground level
4. Public car parking in use at BM & Ground level, segregated from live site. To be sequenced with enabling works assumed max no of 100 spaces



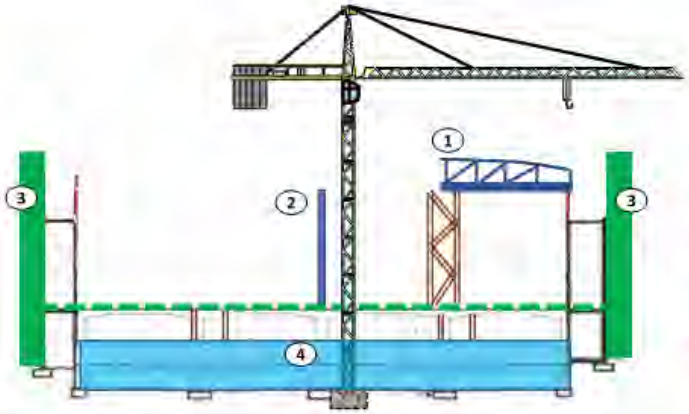
1. Roof cladding removal works will be ongoing, once removal works have progressed sufficiently to provide a safety zone of two truss bays works will commence on the primary truss removal
2. Due to the large span of the existing primary trusses the proposal will be to reduce the truss into four sections which will allow assist with ease f lifting and processing for removal from site. The earlier installation of two temporary works support towers per truss will allow the existing truss to be cut into four sections for removal with the tower crane whilst maintaining structural stability of the roof structure

   These works will follow progressively the removal of the by roof cladding
3. Works on the removal of the external vertical cladding will continue to progress to all elevations
4. Public car parking in use at BM & Ground level, segregated from live site. To be sequenced with enabling works assumed max no of 100 spaces

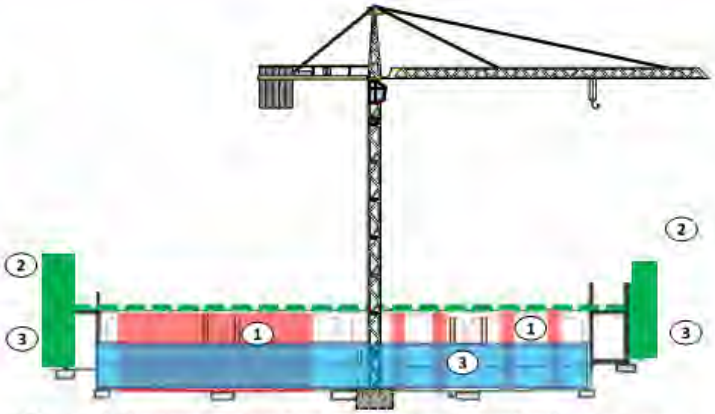
R.P.M.

Great Northern Warehouse
Deconstruction Sequence Stages 5 & 6

Rev 04 12-10-2022



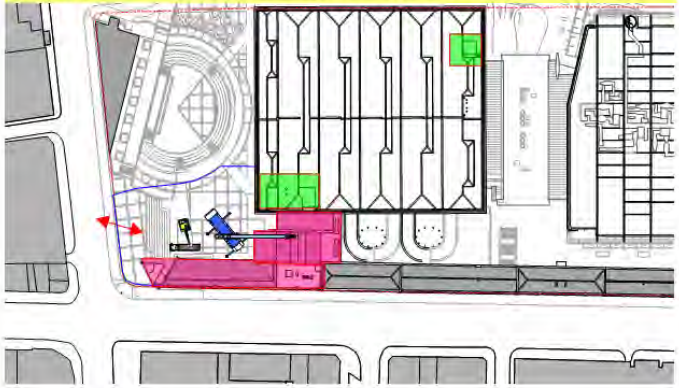
1. The sectionalised removal of the primary truss sections will continue working along the length of the existing truss, the temporary works support towers will be progressively removed following truss removal
2. The existing central steelwork support column will be the last section of the roof / truss section to be removed
3. Works on the removal of the external vertical cladding / structure will continue to progress to all elevations
4. Public car parking in use at BM & Ground level, segregated from live site. To be sequenced with enabling works assumed max no of 100 spaces



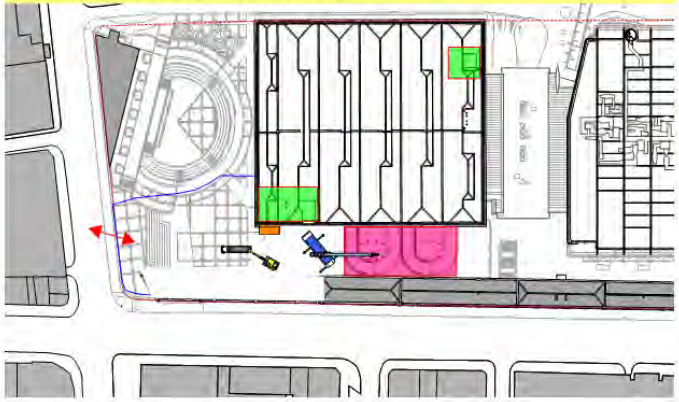
1. With the structural steelwork removal to the roof and central support columns nearing completion works will progress on structural demolition for new structure through the existing car park deck structure, this will be assisted by the two tower cranes. Localised opening up of the existing structure will be undertaken at new column locations
2. Works on the removal of the external vertical structure / cladding will progress down to level 2.
3. Cladding removal from level 2 to Ground level will follow on with encapsulation scaffold being progressively struck in sequence with the cladding removal works.
4. Public car parking in use at BM & Ground level, segregated from live site. At this stage parking will be reconfigured a number of times (possibly between levels) so as to allow for the interventions for new columns and the new main cores and their construction back to level 2. Assumed max no of 100 spaces

R.P.M.

Stage 01
De construction of existing link structure and rear section to the North of Deansgate structures progressed
Temporary roof erected at roof level over SW & NW existing Cores structure Link structure and

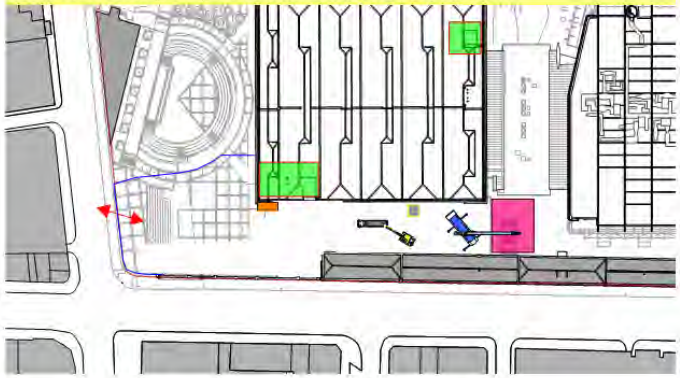


Stage 02
De construction of existing link structure will provide access for the removal of the existing car park ramp structure utilising a mobile crane
A good hoist to service the roof enabling works will be erected on the North end of the West elevation to service the early roof works



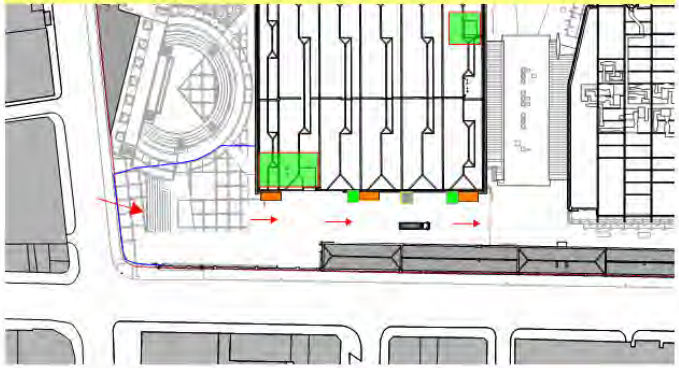
Stage 03
The Final element of de construction to the West elevation will be the removal of the terrace deck at the interface with the Atrium building / structure, it is proposed that specialist cut and lift operation will be carried out due to the requirement to retain the adjoining structures.

Tower crane base (TC06) will be formed along the west elevation

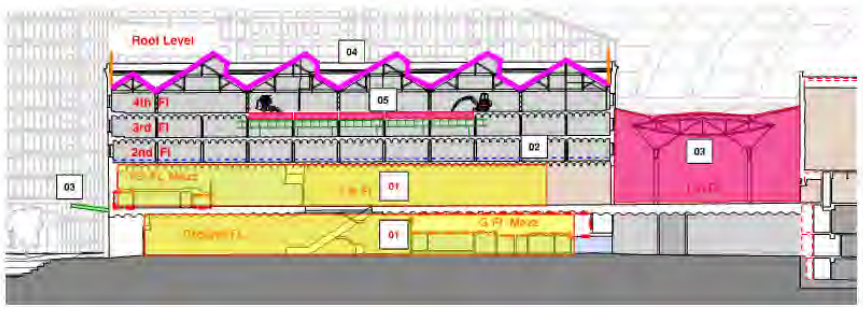


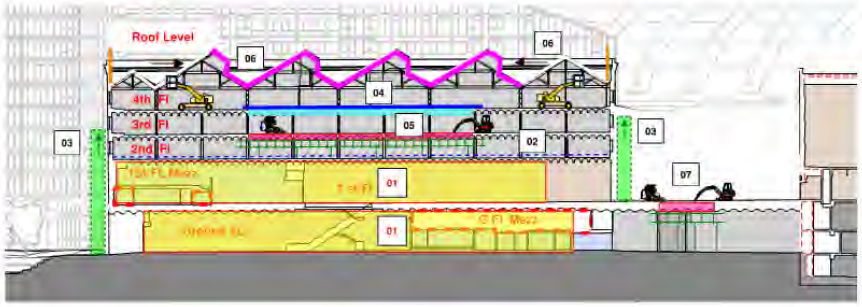
Stage 04
With the Removal of the terrace deck at the interface with the Atrium building / structure a one way traffic rout can now be opened up.

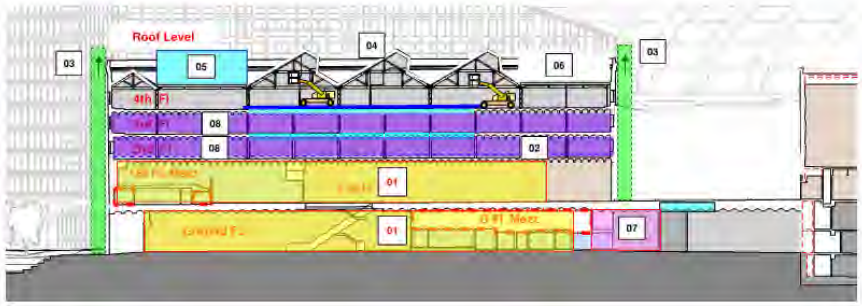
At this stage full logistics will be operational with two goods hoist operating on the West elevation along with a tower crane 06 and a further goods hoist to service the roof located on the North of the West elevation. *See logistics plans



R.P.M.	Project: Great Northern Warehouse	Title: Proposed structural alteration works to Warehouse structure - Plans	* Drawing not to scale	GNW -SIWH /01







Stage 1 Enabling & Demolition Works

1. Existing tenants remain in live occupation throughout the entire Project Period

2. Localised secondary level of Waterproofing protection installed above retained tenant areas

3. Advanced removal of existing perimeter structures - Atrium Building, car park ramps, canopies
4. Existing roof finishes retained as primary level of waterproofing to existing structure protection screens installed to inner parapet at roof level to allow advanced works to commence on the roof

5. Temporary works installed to underside of 4th floor new atrium area, slab progressively removed in engineered sequence

Stage 2 Enabling , Demolition and roof works

1. Existing tenants remain in live occupation throughout the entire Project Period

2. Localised secondary level of Waterproofing protection Maintained above retained tenant areas

3. Completion of the advanced removal of existing perimeter structures will allow the commencement of the scaffold erection to the external facades of the existing structure

4. Following completion of the new atrium opening at 4th floor level a fully weathered protection and access deck is installed above the new opening. This combined with localised weathering will form the primary level of waterproofing for the structure and allow removal of the existing main roof finishes

5. Formation of the new 3rd floor atrium opening progressing below the L4 protection deck

6. Removal of existing roof finishes commenced following installation of L4 Protection deck

7. With the Atrium building removed down to first floor slab level this will release formation of new full structural bay openings through the existing jack arches, this will be critical to release the area below for construction of the new Substation and switchgear / plant rooms

Stage 3 Roof works, internal Fit out and works to external elevations

1. Existing tenants remain in live occupation throughout the entire Project Period

2. Localised secondary level of Waterproofing protection Maintained above retained tenant areas

3. Scaffold erection to external facades of existing structure completed releasing remedial works to existing brickwork facade, roof parapets and window renovation

4. Protection deck above L4 New atrium void allows for full removal of existing roof finishes and strengthening, structural alteration to the existing roof trusses. this will be followed by installation of new roof lights, roof insulation panels and roof slating

5. Removal of existing roof trusses & construction of new North plant room structure & North stair core structure

6. Structural alterations to existing roof truss to form new terrace area and South plant room

7. Critical works can progress on the construction and fit out of the new Substation and switchgear / plant rooms

8. Internal fit out of new 2nd and 3rd floor office areas progressing, 4th floor fit out will commence once the main roof works are sufficiently progressed to provide a weatherproof environment

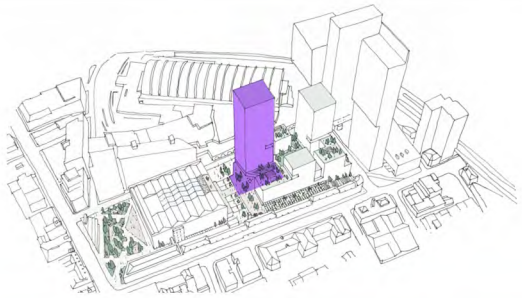
R.P.M.	Project: Great Northern Warehouse	Title: Proposed structural alteration renovation works works to Warehouse structure - Section stages 01 - 03	* Drawing not to scale	GNW -SA&R WH 01-03

R.P.M.

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Great Northern Warehouse



Leisure Box interventions : Core A

Internal Review / Issue Process			File details	
Stage	Initials	Date		
Originator	GR	12 Oct 22	Status	For Planning
Review	-	-	Revision	Rev 4
-	-	-		
-	-	-		

Distribution - to be further distributed	Distribution
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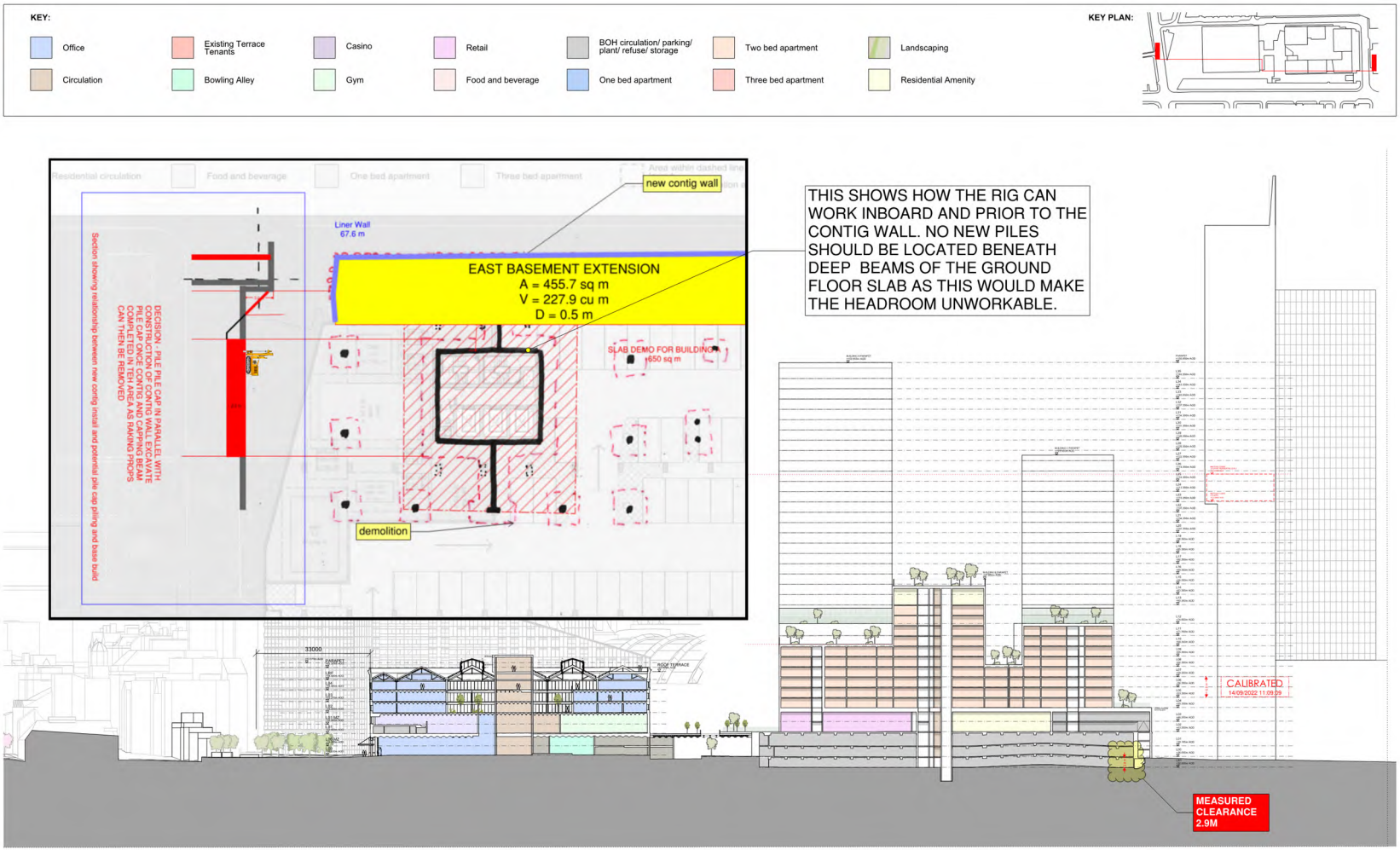
Description

Contents

1.Piling rig available headroom slide
2.Selection of Piling rigs available for use in restricted areas
3-13. Slides showing Steps 1 to 10 of the interventions process for Core A

Revisions

Slides 1 & 2 added
Comment on Step 3 relating to importance of cable diversions prior to demo starting



This drawing is copyright
Do not scale off dimensions.
All dimensions to be checked on site by contractor.
Contractor to report any dimensional discrepancies, errors or omissions prior to commencing on site.

NOTE:
This drawing has been created using the information stated below:
Highline: SEP survey received: 2017-07-06, Drawing name: S13920-HLA.DWG
GNW: SEP survey received: 2017-07-26, Drawing name: S13920-WH_GF_REV B.dwg
Deansgate Terraces: SEP survey received: 2017-07-26, Drawing name: S13920-DG_Level 1_REV B.dwg
Topographical: SEP survey received: 2017-07-21, Drawing name: S13920-T_Rev A.dwg

NORTH

Rev	Date	Description
P01	24-02-2022	First Issue
P02	09-03-2022	Baseline Scheme Update
P03	10-03-2022	Level Annotation Update
P04	16-04-2022	Tower massing updated
P05	19-06-2022	Interim Issue

Project Title: Great Northern
Drawing Title: Proposed Site Section - Section A-A
Job No: 10422
Scale: 1:500 @ A1
Status: Preliminary
Drawing No: 10422-SHP-Z0-A-G100-SE-AA-001
Revision: P05

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C:\Users\GeraintRoberts\Real PM\Real PM - Projects - Projects\GREAT NORTHERN WAREHOUSE\06. Programme & Measures\2022.10.05 UPDATED ISSUE FOR CMP 3rd ISSUE\6] 2022.08.03 LEISURE BOX INTERVENTIONS SEQUENCE REV 2.pdf

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KELLER

RESTRICTED ACCESS LOAD BEARING AND CONTIGUOUS/SECANT BORED PILING OPTIONS

				GENER			
Typical Pile diameter (mm)	220/190	280/235	340/300	340/300 or 408/350	508/450	508/450	750/850
Max Pile Diameter (mm)	280/285	340/300	400/300	508/450	600/600	600/600	900/1000
Rig Type	FF3 / TD308* both with Power pack	Fondedile FF4 / FF1	Fondedile FF5	Klemm 702 + Power pack	Hutte 203 + tracked powerpack	Klemm 709	Hutte HBR207
Rig weight (tonnes)	4.0 – 1.4/ 5.0 – 1.4	6.8 / 4.65	9.2	4.7 + 1.9	6.5	14	30
Approx Plan Area of rig (m)	3.4x 1.0/2.0 x 1.0	4.0 x 1.7/3.8 x 1.2)	4.6 x 1.9	4.0 x 1.9	5.2 x 2.0	5.5 x 2.4	7.5 x 2.5
Headroom Options (m) – No winch on mast	2.4* 2.7 or 3.2	2.7 or 3.2	3.7	3.2 to 3.9	5m to 2.7 or 3m	4.2 or 5.0 or 9.0	5.0 or 15.0
Mode	Rotary Percussive	Diesel Electric	Diesel Electric	Diesel Electric	Diesel Electric	Diesel Electric	Diesel Electric
Max Pile Depth at typical dia. (temporary casing) (m)	30 (12) / 23 (10)	30 (15)	30 (15)	25 (10)	20 (10)	30 (15)	40 (20)
Artificial Obstruction Drilling capability (at typical dia.)	Reinforced concrete steel timber etc	Reinforced concrete steel timber etc.	Reinforced concrete steel timber etc.	Limited mass concrete/ brickwork only	Limited mass concrete brickwork only	limited mass concrete brickwork only	limited mass concrete/ brickwork only
Distance to centre line of pile from vertical face (mm) – closed or winged auger guard	350	350	350	500	500	500	1000
Typical reinforcement / cage type	Central bar plus 114.3mm to 139.7mm OD CHS	Central bar plus 139.7mm to 219.1mm OD CHS	Central bar plus up to 6No B25 with 220mm diameter B12 links	Up to 6No B32 with 220mm diameter B12 links	Up to 6No B32 with 300mm dia B12 links	Up to 6No B32 with 300mm dia B12 links	6No B32 with 450mm diameter B12 links
	LOAD BEARING PILES						
Target spacing (mm)	600	750	900	900 or 1050	1350	1350	1800
Max unfactored isolated axial pile capacity (kN)	400	500	700	800	1000	1300	2200
	CONTIGUOUS BORED PILES						
Typical spacing (mm)	275	350	425	425 or 500	600	600	900
Typical service bending moment capacity per pile (KNm)	28	35	55	55	140	140	350
Comments	Pali Radice Applications	Pali Radice Applications	Pali Radice Applications – Largest dia. available for obstruction boring	For 450mm diameter depth limited to 18 (6)			Can be converted into short 5m mast mode

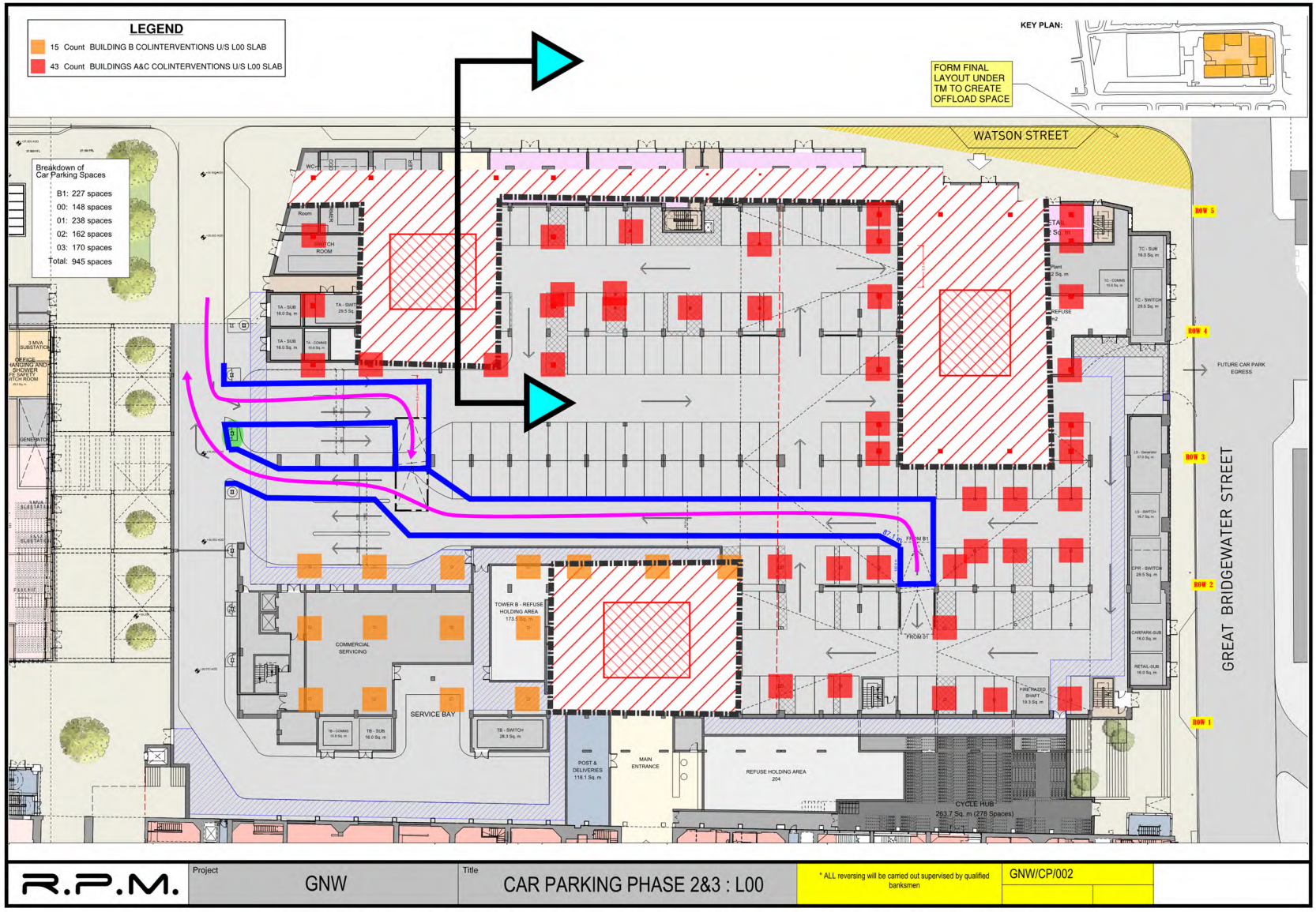
Table generally refers to stage drill cast in situ bored piles as follows: 340mm refers to temporary external casing diameter - 300mm refers to augered or otherwise formed socket diameter in base founding stratum (e.g. clay or bedrock).

Above data is typical and dependent on specific site constraints and ground conditions

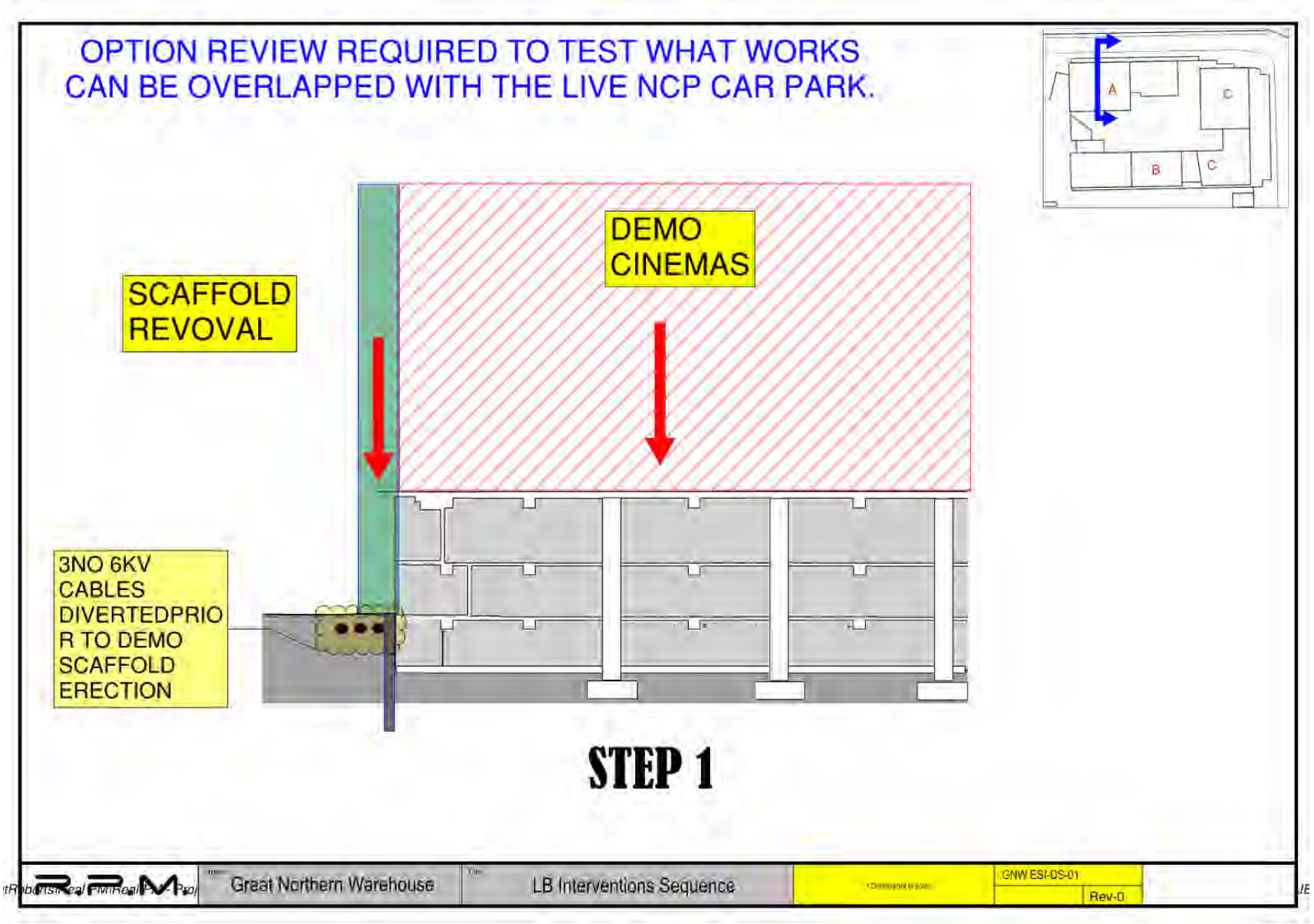
THIS IS THE ONLY RIG HERE THAT WILL WORK FOR A 600MM PILE IN A 2.9M SPACE

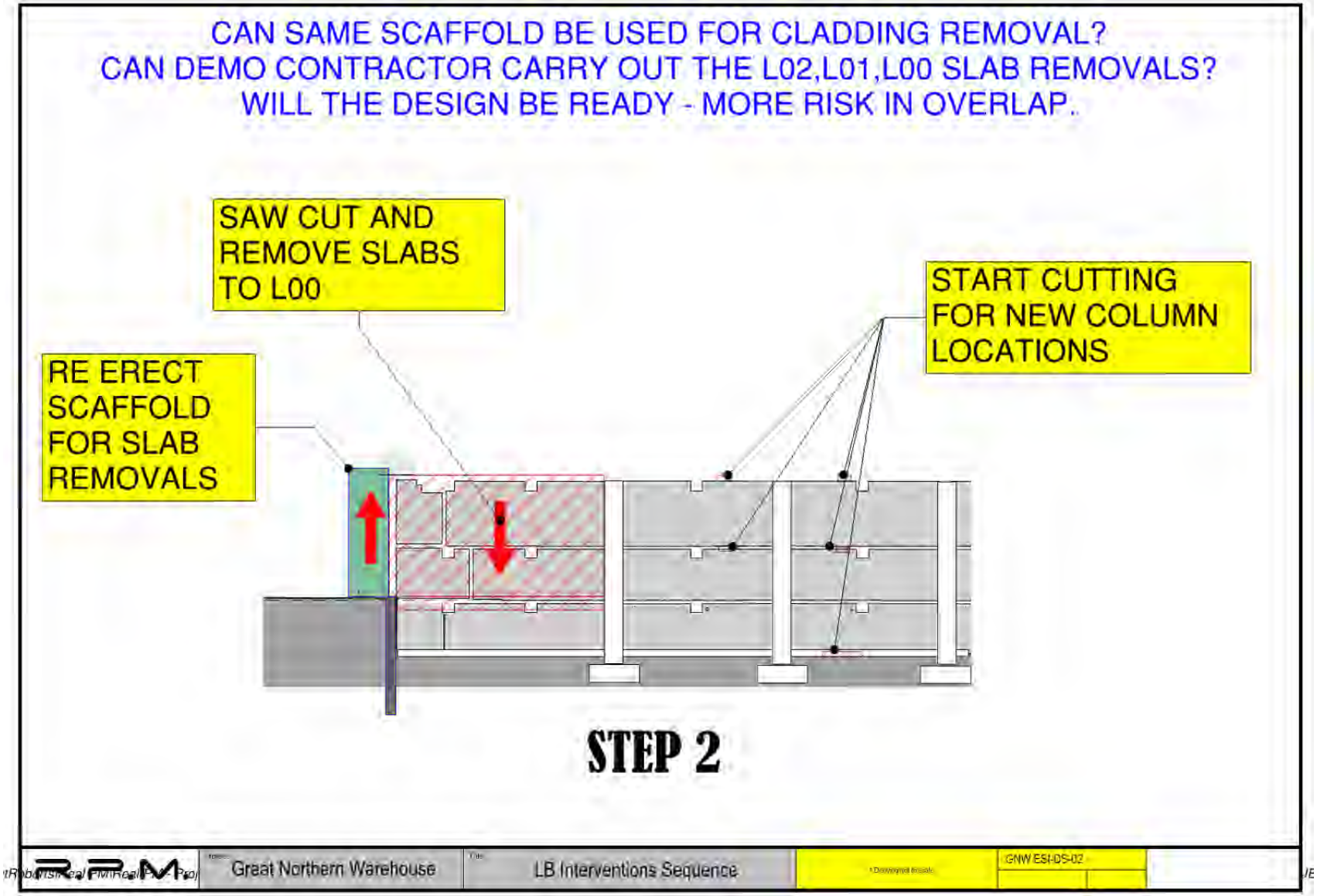
SA/RAP Options – Rev H

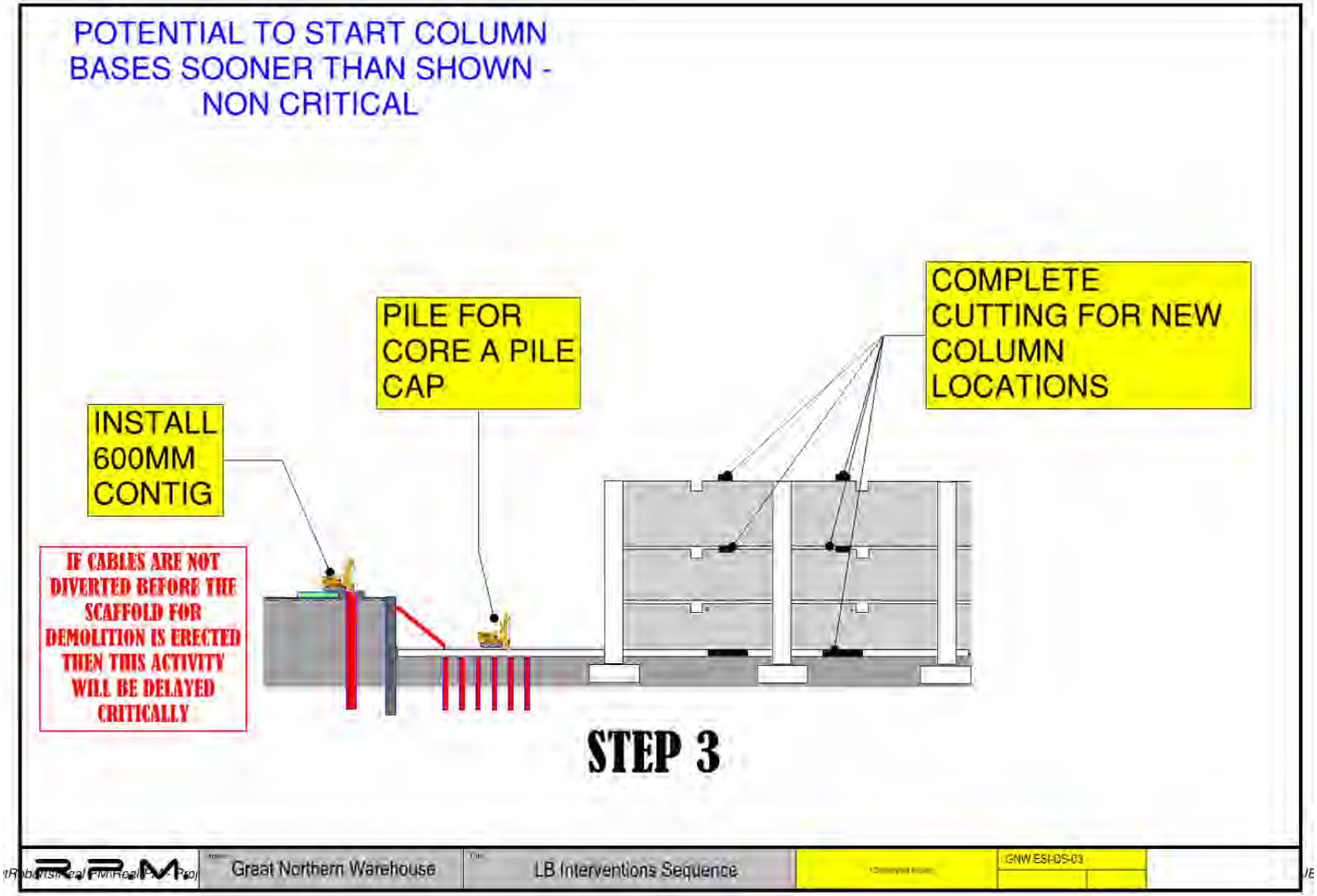
- Projects\GREAT NORTHERN WAREHOUSE\06. Programme & Measures\2022.10.05 L 8.03 LEIS

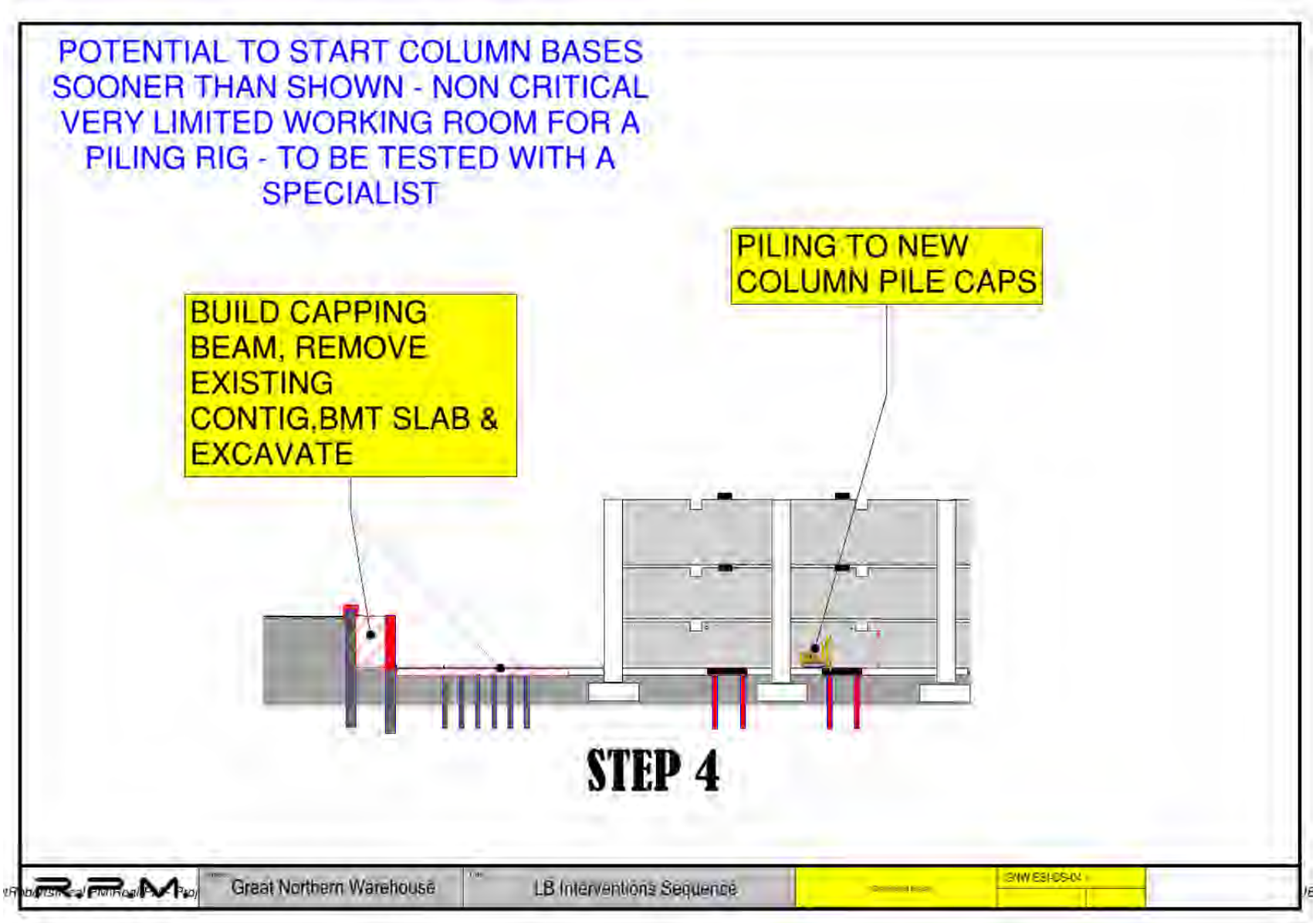


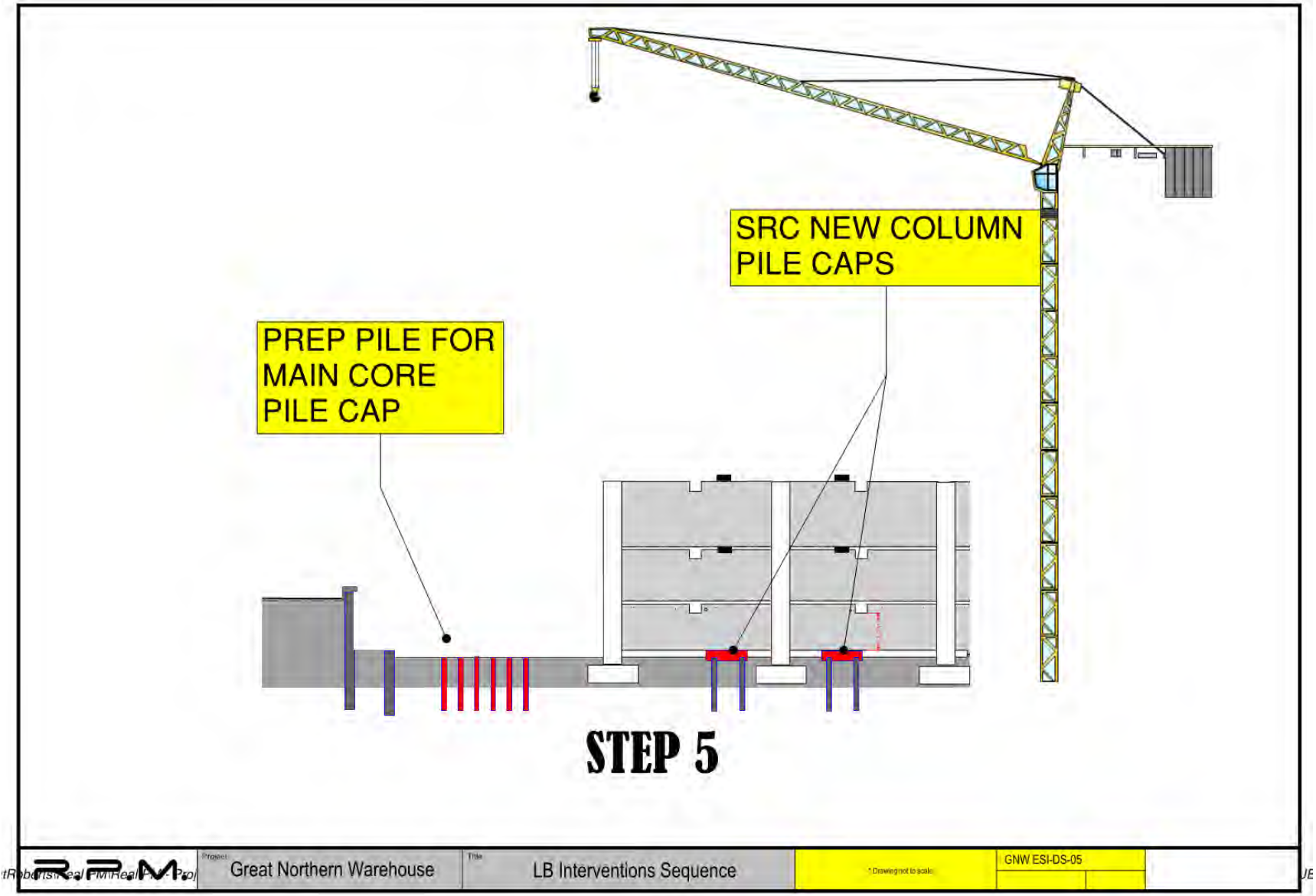
C:\Users\GeraintRoberts\Real PM\Real PM - Projects - Projects\GREAT NORTHERN WAREHOUSE\06. Programme & Measures\2022.10.05 UPDATED ISSUE FOR CMP 3rd ISSUE\6) 2022.08.03 LEISURE BOX INTERVENTIONS SEQUENCE REV 2.pdf

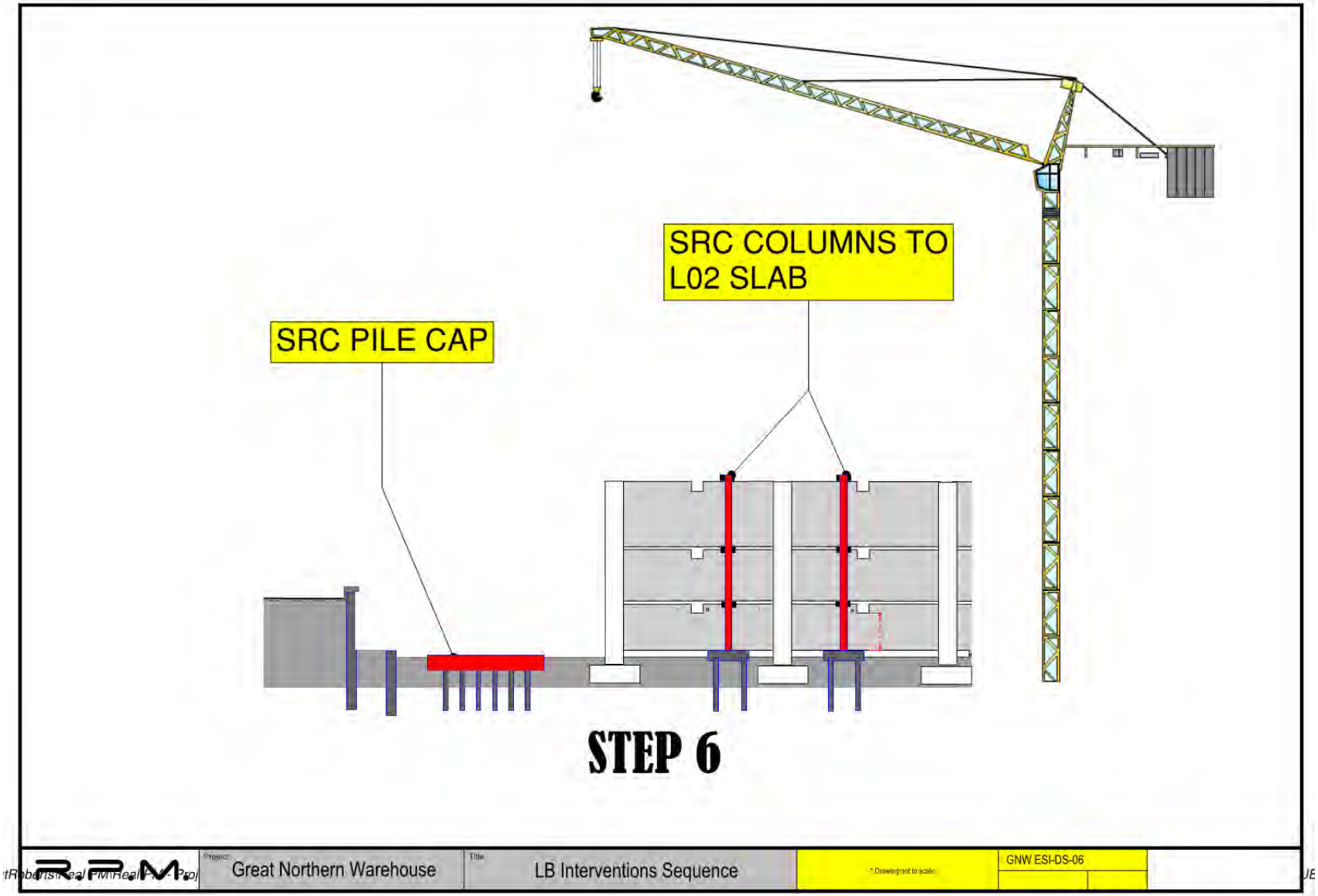

OPTION REVIEW REQUIRED TO TEST WHAT WORKS CAN BE OVERLAPPED WITH THE LIVE NCP CAR PARK.
A
B
C
C
DEMO CINEMAS
SCAFFOLD REVOVAL
3NO 6KV CABLES DIVERTEDPRIO R TO DEMO SCAFFOLD ERECTION
STEP 1
Great Northern Warehouse
LB Interventions Sequence
GNW ESI-DS-01
Rev-0

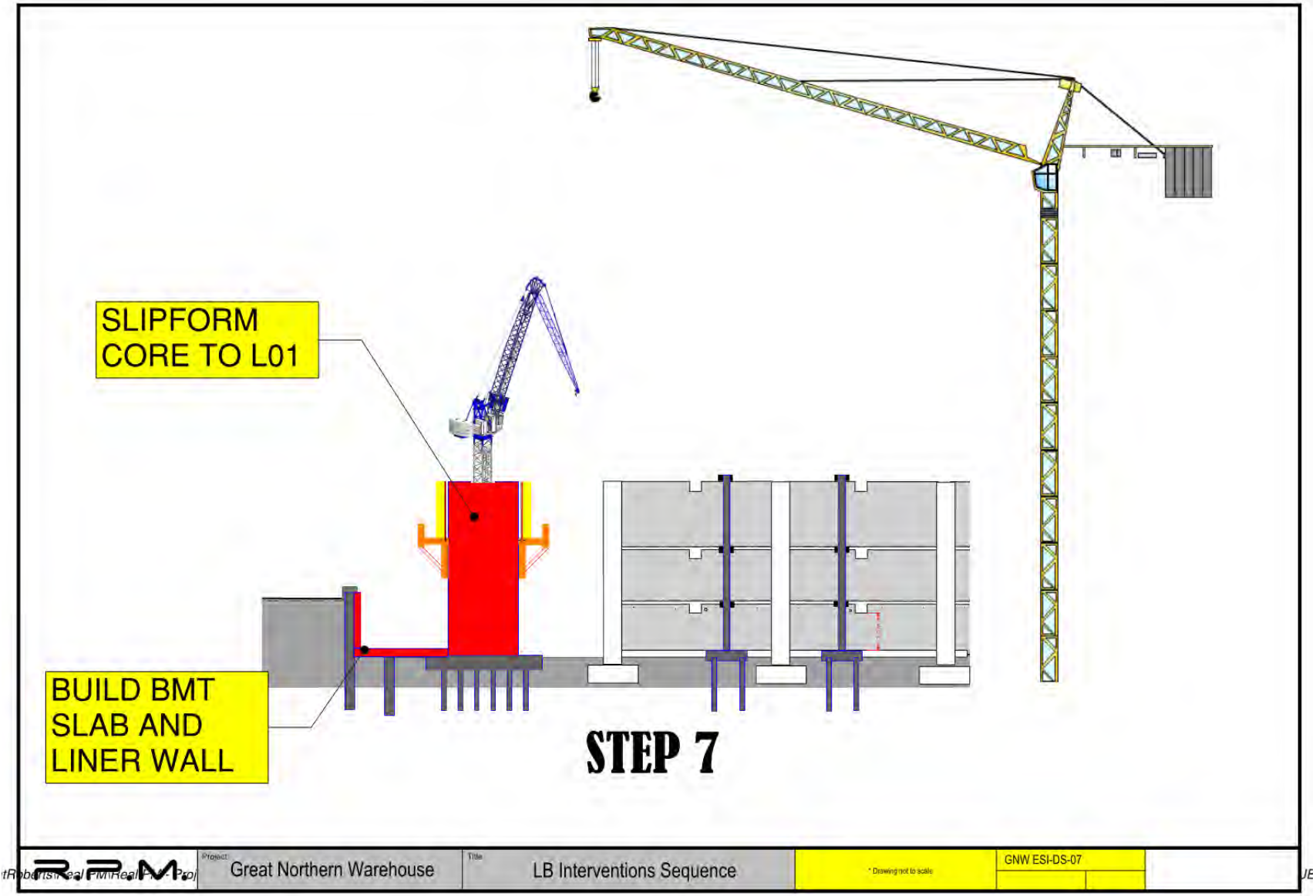

CAN SAME SCAFFOLD BE USED FOR CLADDING REMOVAL?
CAN DEMO CONTRACTOR CARRY OUT THE L02,L01,L00 SLAB REMOVALS?
WILL THE DESIGN BE READY - MORE RISK IN OVERLAP.
SAW CUT AND REMOVE SLABS TO L00
START CUTTING FOR NEW COLUMN LOCATIONS
RE ERECT SCAFFOLD FOR SLAB REMOVALS
STEP 2
Great Northern Warehouse
LB Interventions Sequence
GNW ESI-DS-02

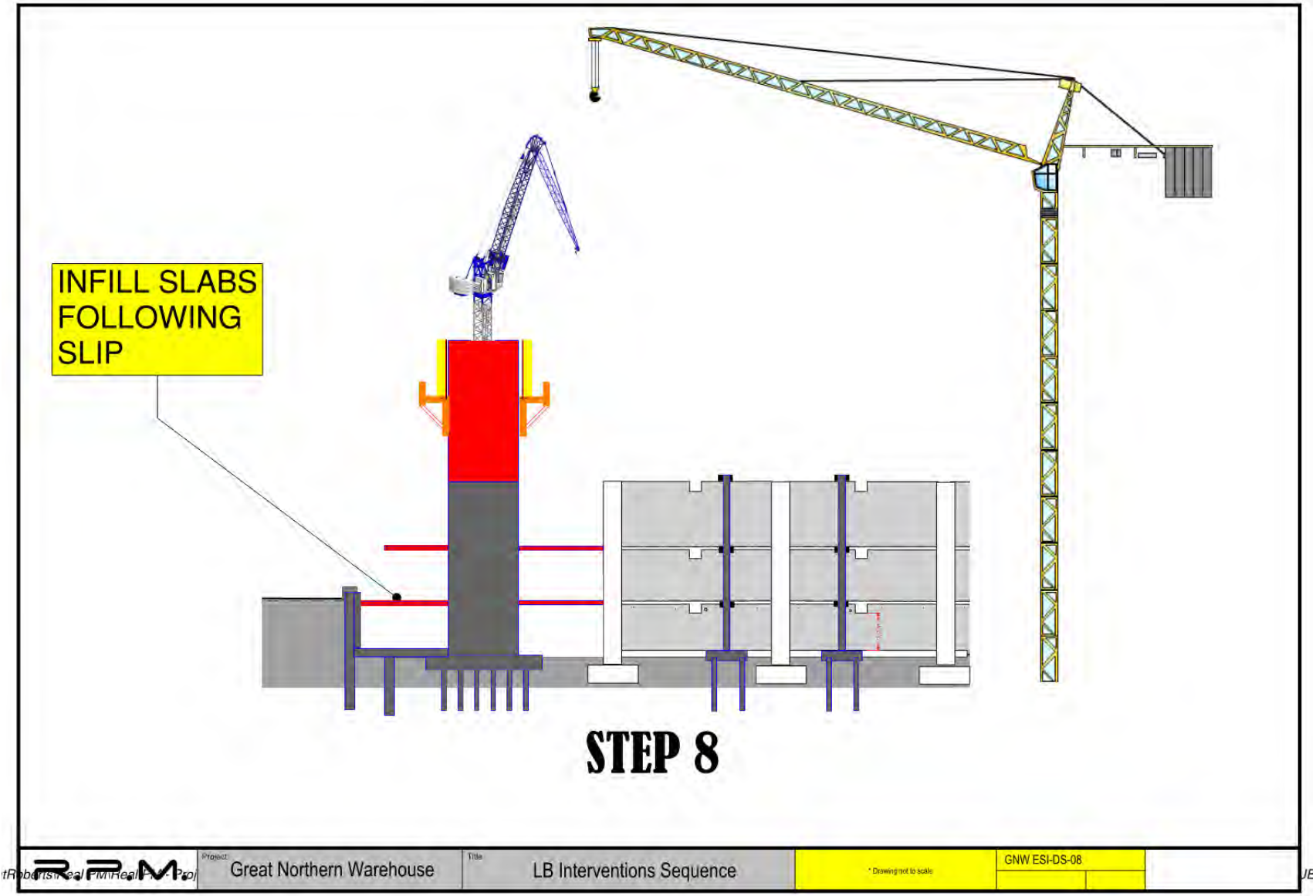

POTENTIAL TO START COLUMN BASES SOONER THAN SHOWN - NON CRITICAL
INSTALL 600MM CONTIG
PILE FOR CORE A PILE CAP
COMPLETE CUTTING FOR NEW COLUMN LOCATIONS
IF CABLES ARE NOT DIVERTED BEFORE THE SCAFFOLD FOR DEMOLITION IS ERECTED THEN THIS ACTIVITY WILL BE DELAYED CRITICALLY
STEP 3
Great Northern Warehouse
LB Interventions Sequence
GNW ESI-DS-03

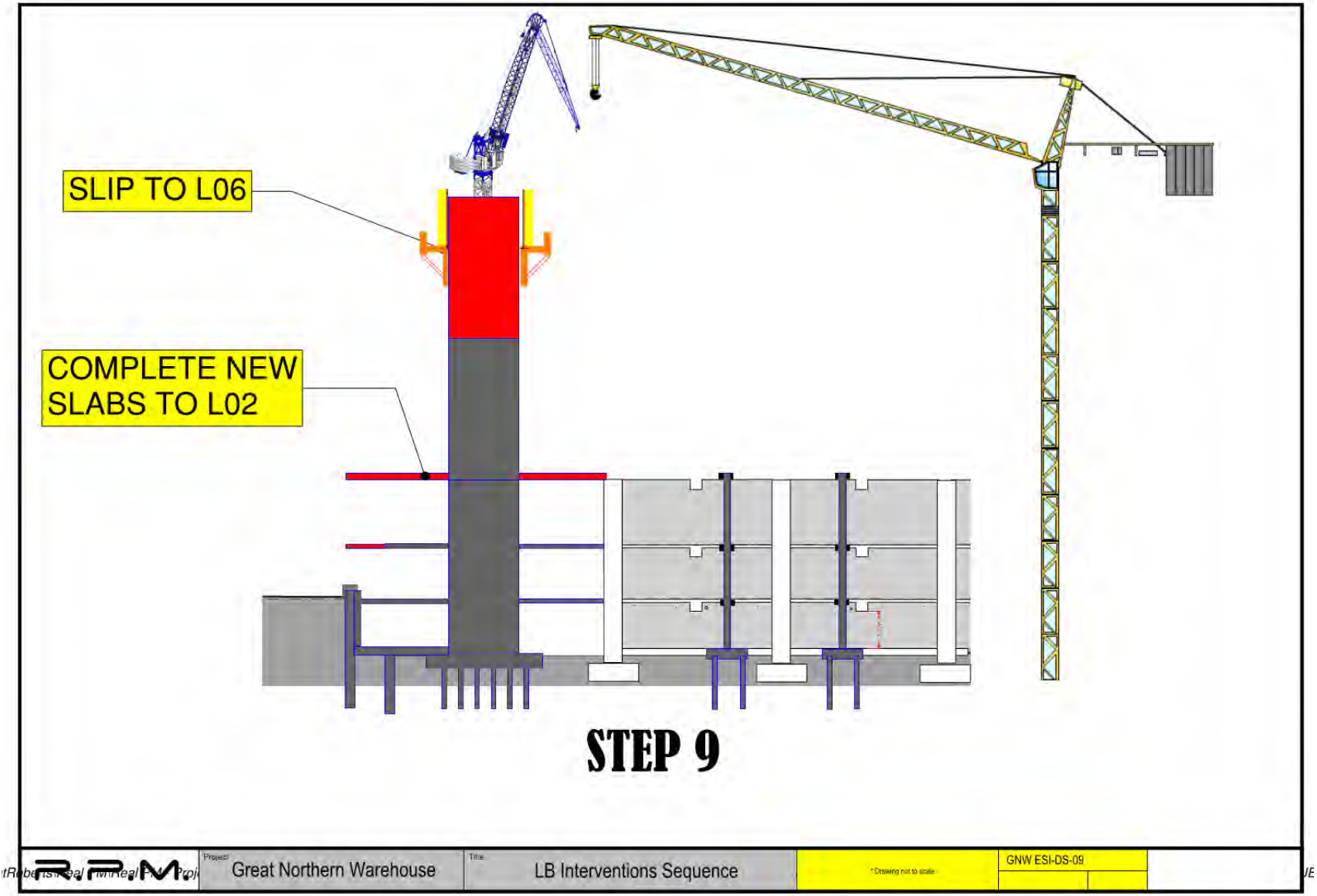

POTENTIAL TO START COLUMN BASES SOONER THAN SHOWN - NON CRITICAL VERY LIMITED WORKING ROOM FOR A PILING RIG - TO BE TESTED WITH A SPECIALIST
PILING TO NEW COLUMN PILE CAPS
BUILD CAPPING BEAM, REMOVE EXISTING CONTIG,BMT SLAB & EXCAVATE
STEP 4
Great Northern Warehouse
LB Interventions Sequence

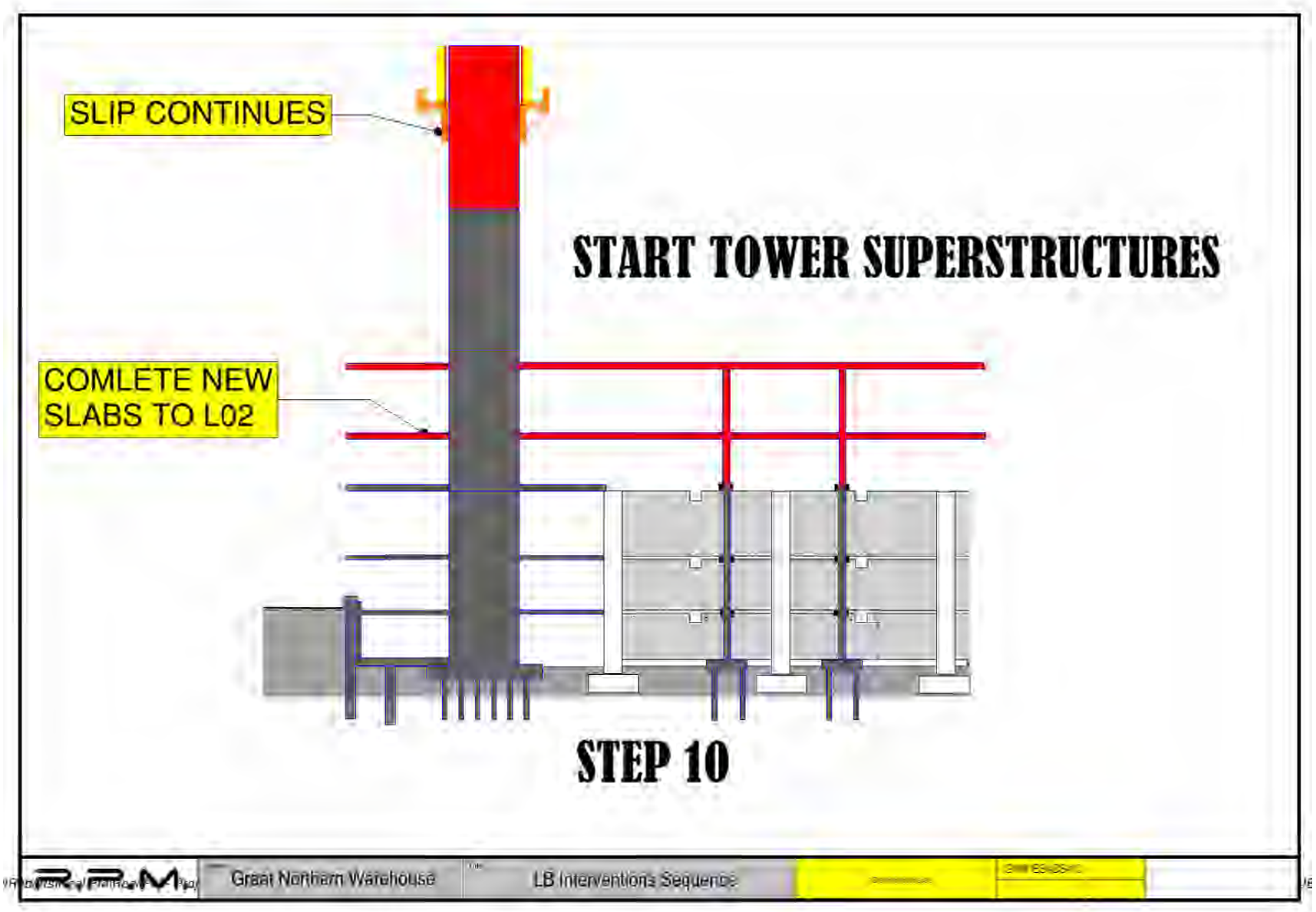

SRC NEW COLUMN
PILE CAPS
PREP PILE FOR
MAIN CORE
PILE CAP
STEP 5
RPM
Project:
Great Northern Warehouse
Title
LB Interventions Sequence
* Drawing not to scale
GNW ESI-DS-05


SRC COLUMNS TO L02 SLAB
SRC PILE CAP
STEP 6
RPM
Project:
Great Northern Warehouse
Title:
LB Interventions Sequence
* Drawing not to scale
GNW ESI-DS-06


SLIPFORM
CORE TO L01
BUILD BMT
SLAB AND
LINER WALL
STEP 7
RPM
Project:
Great Northern Warehouse
Title
LB Interventions Sequence
* Drawing not to scale
GNW ESI-DS-07


INFILL SLABS FOLLOWING SLIP
STEP 8
RPM
Project:
Great Northern Warehouse
Title
LB Interventions Sequence
* Drawing not to scale
GNW ESI-DS-08


SLIP TO L06
COMPLETE NEW SLABS TO L02
STEP 9
RPM
Project
Great Northern Warehouse
Title
LB Interventions Sequence
* Drawing not to scale
GNW ESI-DS-09

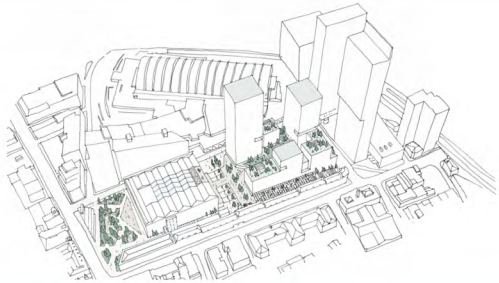

SLIP CONTINUES
START TOWER SUPERSTRUCTURES
COMLETE NEW SLABS TO L02
STEP 10
Great Northern Warehouse
LB Interventions Sequence

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Great Northern Warehouse



Sitewide Logistics

Internal Review / Issue Process			File details	
Stage	Initials	Date		
Originator	GR	10 Oct 22	Status	For Planning
Review	-	-	Revision	4
-	-	-		
-	-	-		

Distribution - to be further distributed	Distribution
adam.linard@2110consult.com	--
jamie@trilogyproperty.com	--
sam@trilogyproperty.com	--
james.heather@trilogyproperty.com	--
--	--
--	--

Description

Contents

1.L00 Phase 1 logistics GNW & LB
2.Roof Phase 1 logistics GNW & LB
3.Roof Main Phase 2 logistics GNW completed LB ongoing
4.Swept Path Analysis, [revised one bay to south]
5.Junction Phasing Watson & GBS
5.Preffered Offload Points Deansgate
6.Existing L00 for reference
7.Long section for reference

Key Assumptions

Assumptions as shown on phasing plans
"Almost Famous" to be accessed and managed from the north - not shown here, stand alone drawing may be required.

An offloading lane can be created in a location on Deansgate to allow offloading by the tower crane to construct Building B

Service Road 2 can be used solely by the Main Contractor [MC] - waste management in this area will also need to be the responsibility of the MC to avoid unnecessary coordination issues.

Also consider deliveries to Tenants also controlled by MC?

All islands removed from Watson St. / Gt. Bridgewater Street Junction utilising adaption of the current layout.

Deansgate operates as at the date of report and is not reduced / pedestrianised.

Vehicles travelling south of Watson St can cross to the pit lane under strict banked control by qualified supervision. Suitable TM will be developed to allow this to happen safely.

Offloading for Building C can be from the 'pink' offloading point to the west of the existing junction and can merge onto Great Bridgewater street

Notes

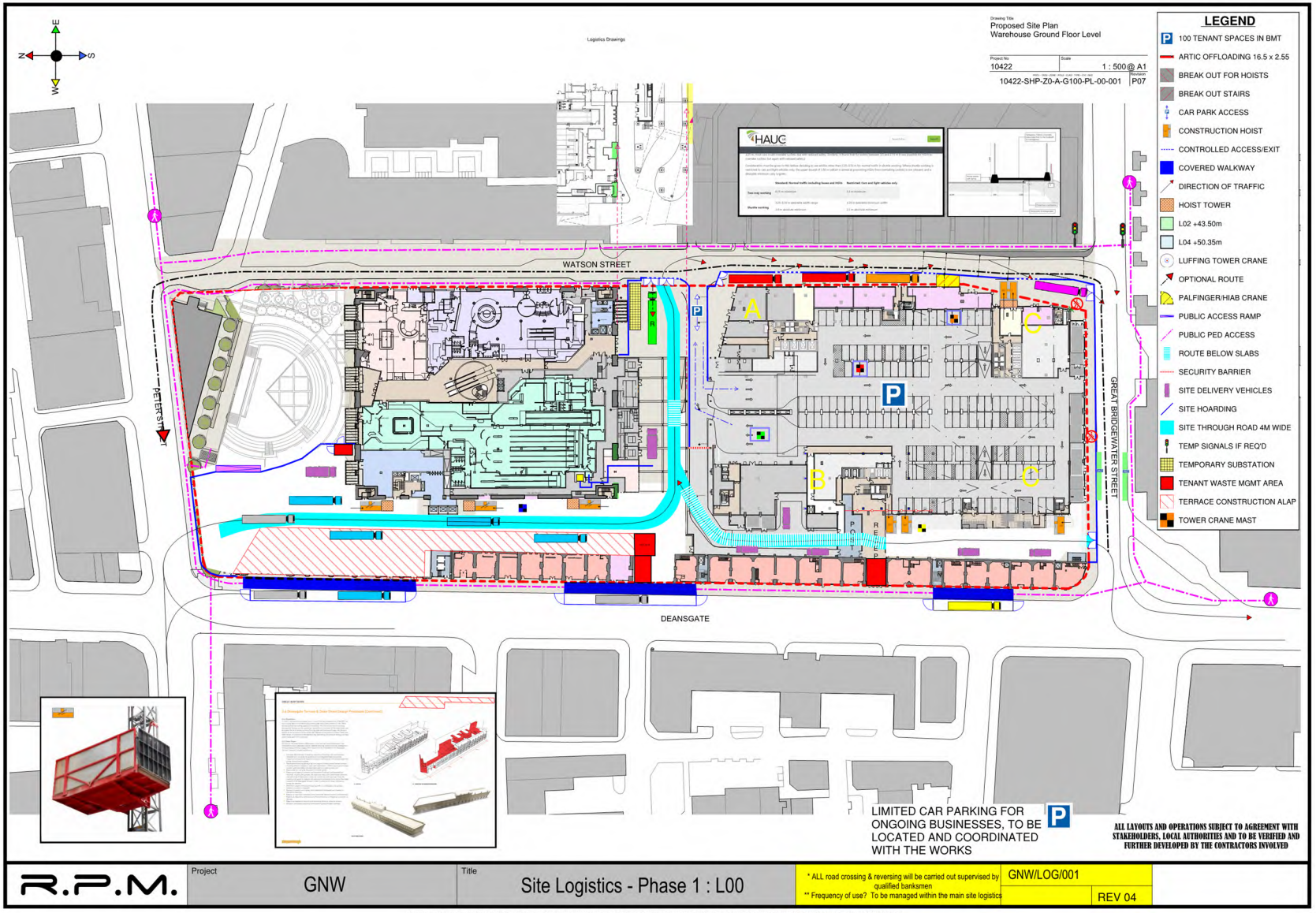
See swept path drawing for accurate vehicle movements

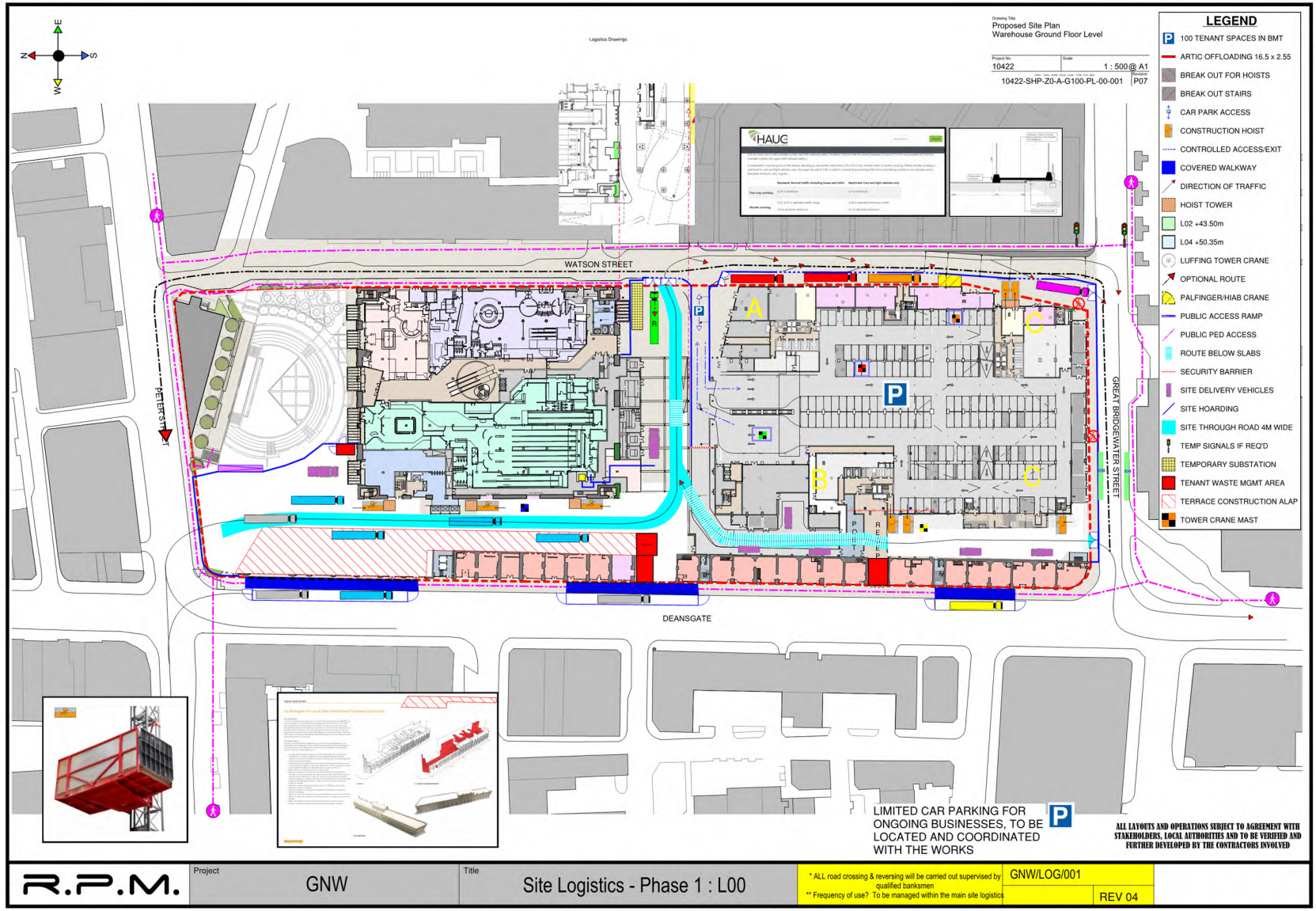
Revisions

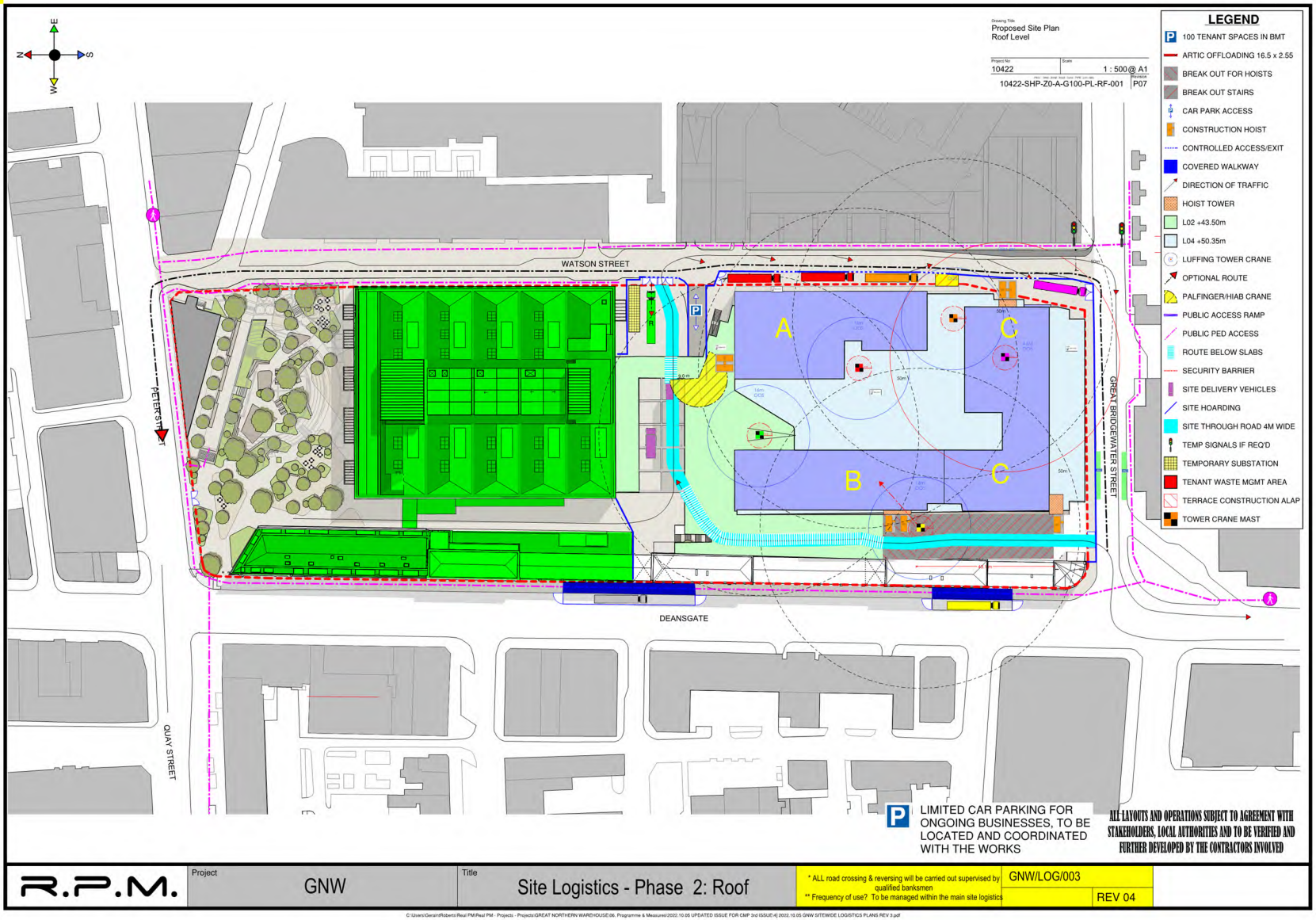
Rev 4

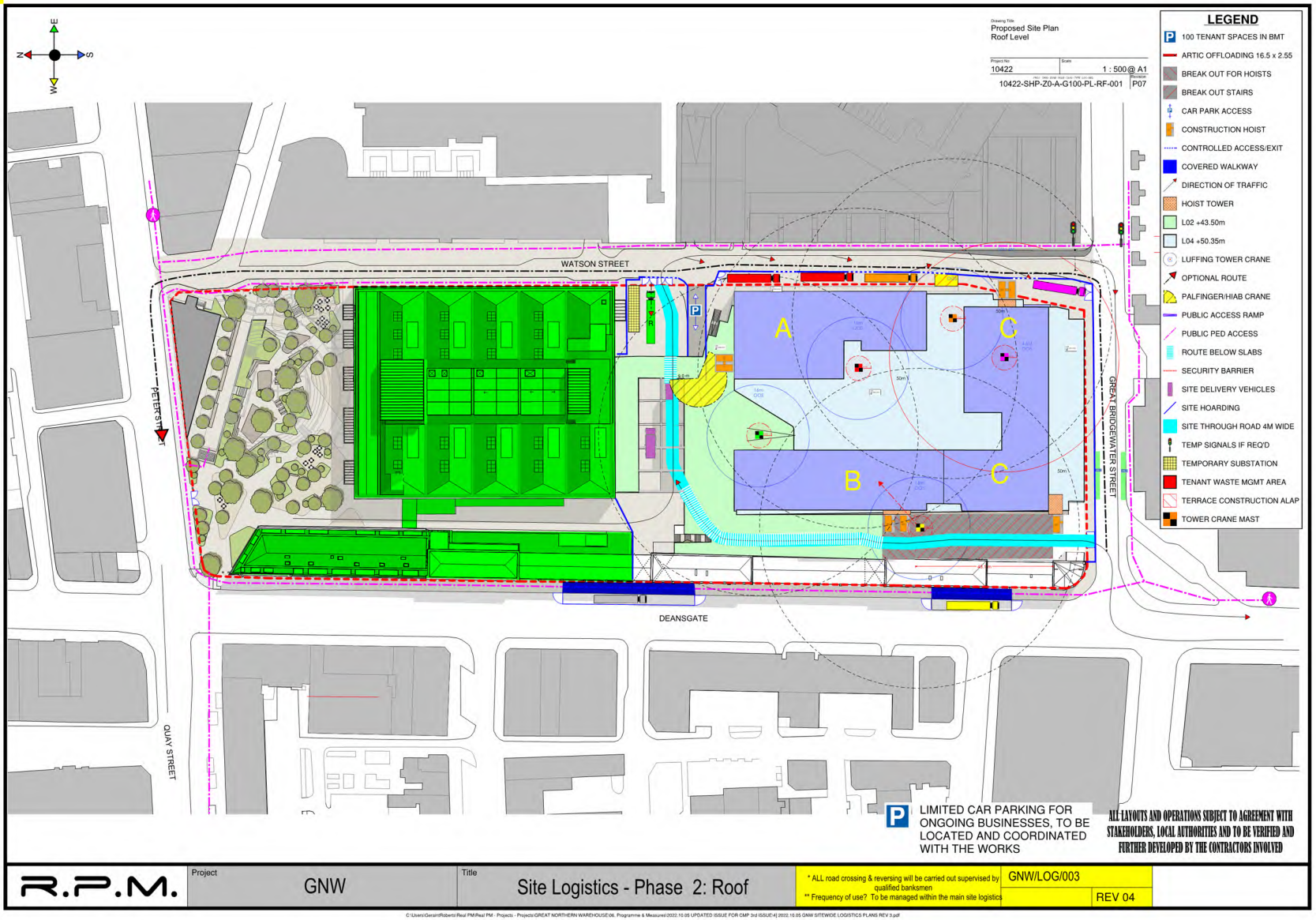
1. East footpath at junction Watson & Great Bridgewater St widened
2. Reduced pit lane as a result of the above
3. Building C east hoist relocated due to above.
4. Through route between GNW and LB has been moved a bay to the south to avoid the existing substation
5. Updated L00 and Roof Backgrounds
6. Offloading points on Deansgate amended all phases to match client direction.

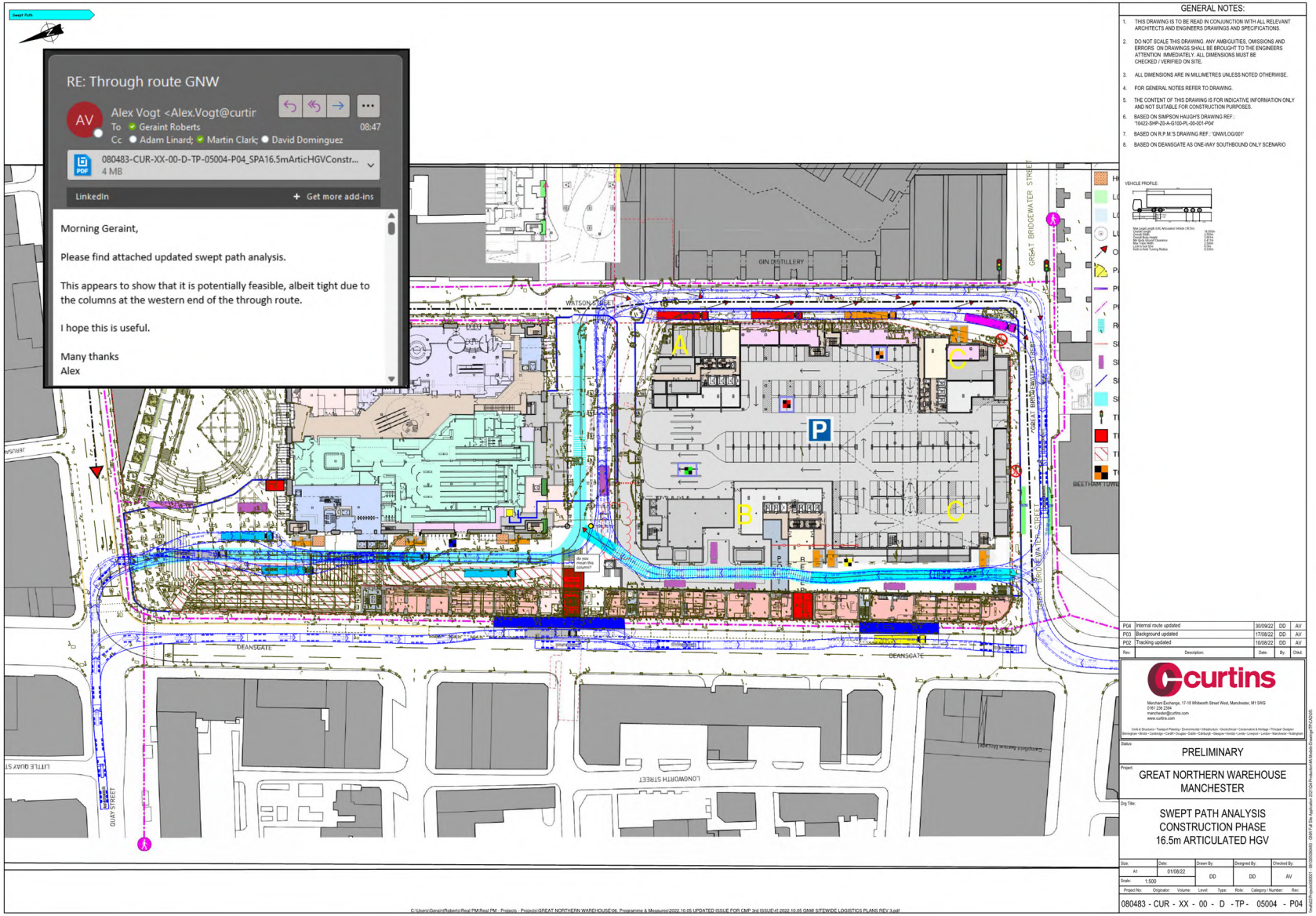
C:\Users\GeraintRoberts\Real PM\Real PM - Projects - Projects\GREAT NORTHERN WAREHOUSE\06. Programme & Measures\2022.10.05 UPDATED ISSUE FOR CMP 3rd ISSUE\4] 2022.10.05 GNW SITEWIDE LOGISTICS PLANS REV 5.pdf

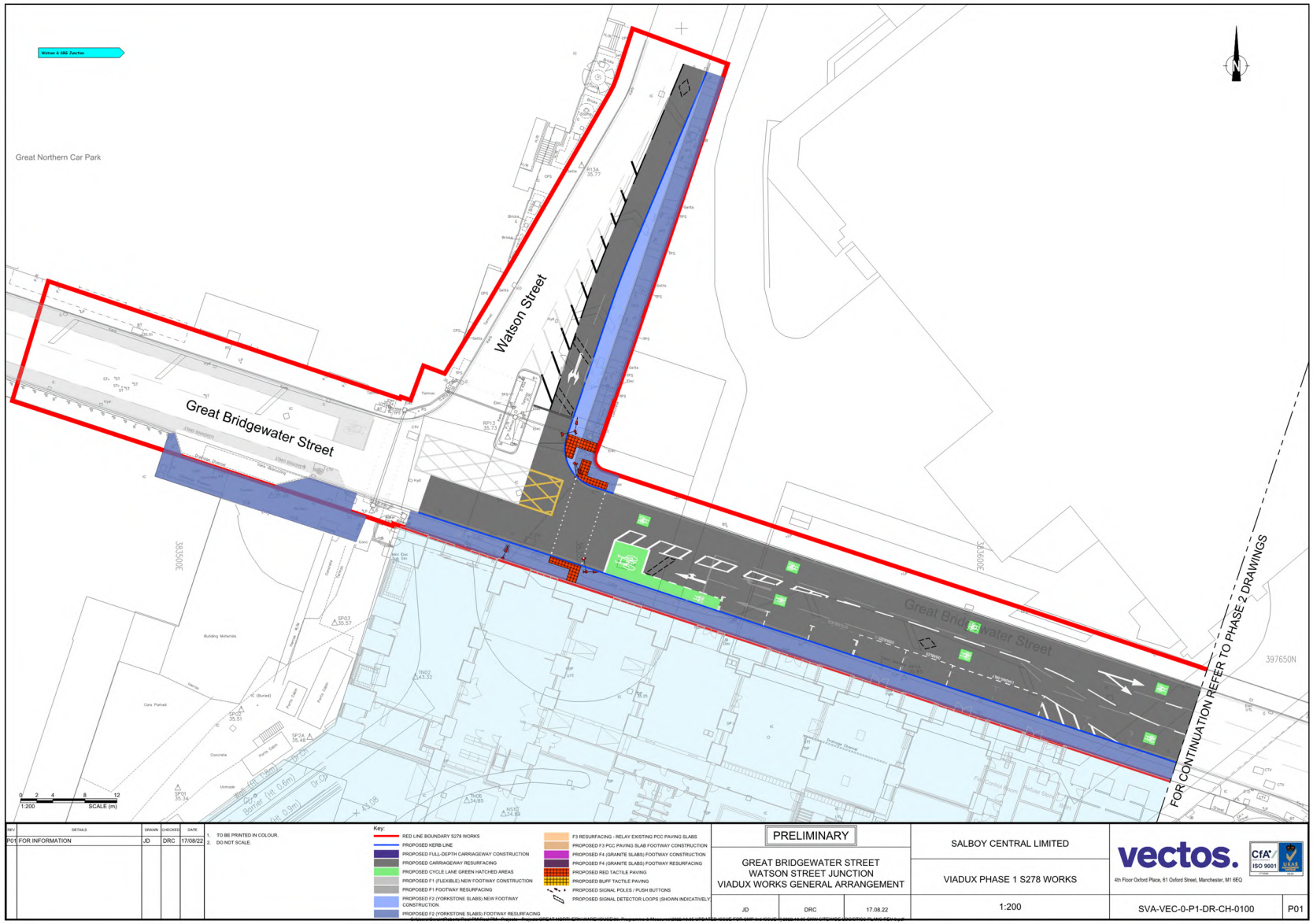

Logistics Drawings
Proposed Site Plan
Warehouse Ground Floor Level
Project No
10422
Scale
1 : 500@ A1
10422-SHP-Z0-A-G100-PL-00-001
Revision
P07
LEGEND
100 TENANT SPACES IN BMT
ARTIC OFFLOADING 16.5 x 2.55
BREAK OUT FOR HOISTS
BREAK OUT STAIRS
CAR PARK ACCESS
CONSTRUCTION HOIST
CONTROLLED ACCESS/EXIT
COVERED WALKWAY
DIRECTION OF TRAFFIC
HOIST TOWER
L02 +43.50m
L04 +50.35m
LUFFING TOWER CRANE
OPTIONAL ROUTE
PALFINGER/HIAB CRANE
PUBLIC ACCESS RAMP
PUBLIC PED ACCESS
ROUTE BELOW SLABS
SECURITY BARRIER
SITE DELIVERY VEHICLES
SITE HOARDING
SITE THROUGH ROAD 4M WIDE
TEMP SIGNALS IF REQ'D
TEMPORARY SUBSTATION
TENANT WASTE MGMT AREA
TERRACE CONSTRUCTION ALAP
TOWER CRANE MAST
HAUC
WATSON STREET
PETER'S ST
DEANSGATE
GREAT BRIDGEWATER STREET
A
B
C
LIMITED CAR PARKING FOR ONGOING BUSINESSES, TO BE LOCATED AND COORDINATED WITH THE WORKS
ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED
R.P.M.
Project
GNW
Title
Site Logistics - Phase 1 : L00
* ALL road crossing & reversing will be carried out supervised by qualified banksmen
** Frequency of use? To be managed within the main site logistics
GNW/LOG/001
REV 04
C:\Users\GerardRoberts\Real PM\Real PM - Projects - Projects\GREAT NORTHERN WAREHOUSE\06. Programme & Measures\2022.10.05 UPDATED ISSUE FOR CMP 3rd ISSUE\4] 2022.10.05 GNW SITEWIDE LOGISTICS PLANS REV 3.pdf

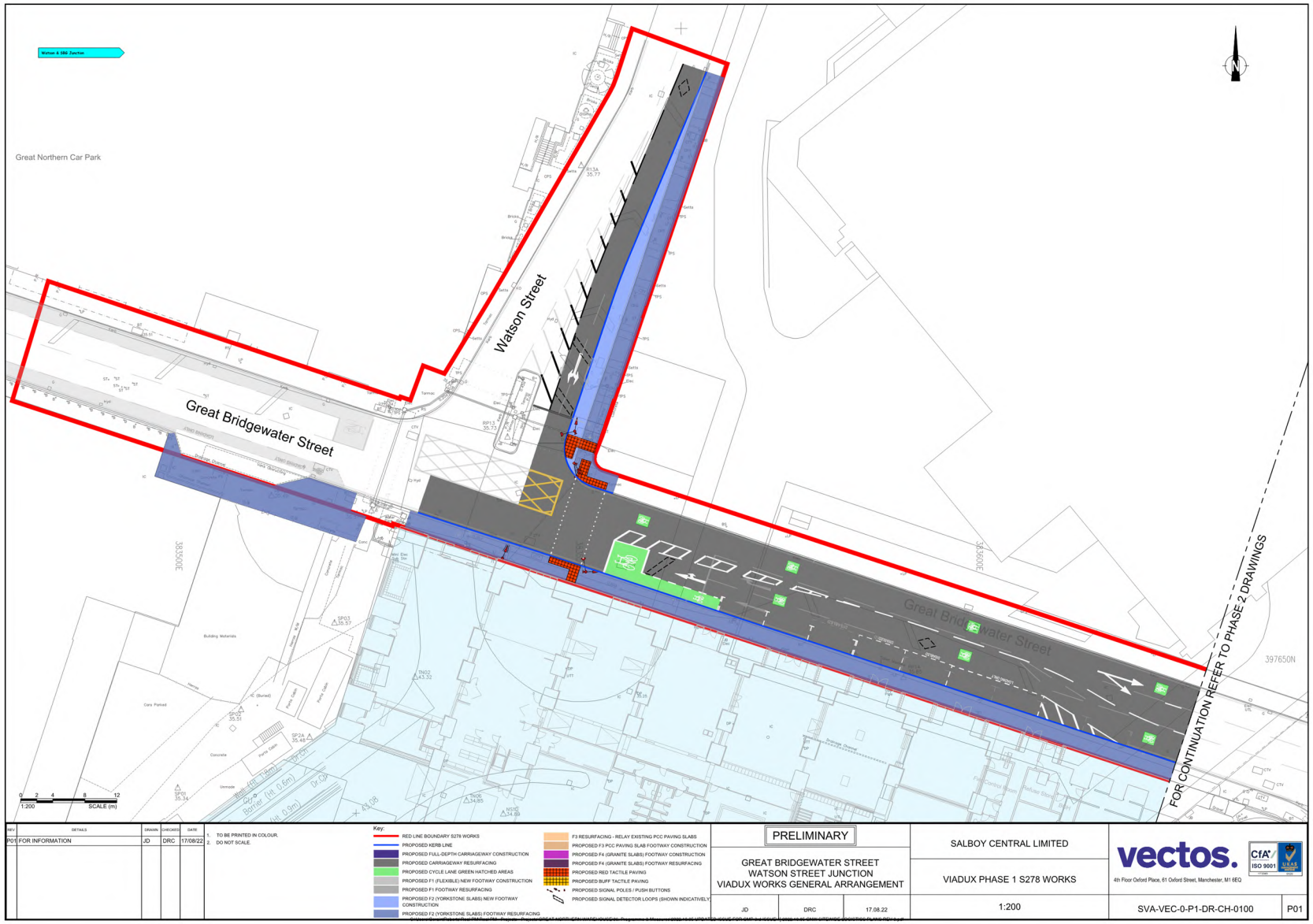

Logistics Drawings
Proposed Site Plan
Warehouse Ground Floor Level
Project No: 10422
Scale: 1 : 500 @ A1
10422-SHP-Z0-A-G100-PL-00-001
Revision: P07
LEGEND
100 TENANT SPACES IN BMT
ARTIC OFFLOADING 16.5 x 2.55
BREAK OUT FOR HOISTS
BREAK OUT STAIRS
CAR PARK ACCESS
CONSTRUCTION HOIST
CONTROLLED ACCESS/EXIT
COVERED WALKWAY
DIRECTION OF TRAFFIC
HOIST TOWER
L02 +43.50m
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SECURITY BARRIER
SITE DELIVERY VEHICLES
SITE HOARDING
SITE THROUGH ROAD 4M WIDE
TEMP SIGNALS IF REQ'D
TEMPORARY SUBSTATION
TENANT WASTE MGMT AREA
TERRACE CONSTRUCTION ALAP
TOWER CRANE MAST
WATSON STREET
PETER ST
DEANSGATE
GREAT BRIDGEWATER STREET
HAUC
LIMITED CAR PARKING FOR ONGOING BUSINESSES, TO BE LOCATED AND COORDINATED WITH THE WORKS
ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED
R.P.M.
Project
GNW
Title
Site Logistics - Phase 1 : L00
* ALL road crossing & reversing will be carried out supervised by qualified banksmen
** Frequency of use? To be managed within the main site logistics
GNW/LOG/001
REV 04


Proposed Site Plan
Roof Level
10422
1 : 500 @ A1
10422-SHP-Z0-A-G100-PL-RF-001
P07
LEGEND
100 TENANT SPACES IN BMT
ARTIC OFFLOADING 16.5 x 2.55
BREAK OUT FOR HOISTS
BREAK OUT STAIRS
CAR PARK ACCESS
CONSTRUCTION HOIST
CONTROLLED ACCESS/EXIT
COVERED WALKWAY
DIRECTION OF TRAFFIC
HOIST TOWER
L02 +43.50m
L04 +50.35m
LUFFING TOWER CRANE
OPTIONAL ROUTE
PALFINGER/HIAB CRANE
PUBLIC ACCESS RAMP
PUBLIC PED ACCESS
ROUTE BELOW SLABS
SECURITY BARRIER
SITE DELIVERY VEHICLES
SITE HOARDING
SITE THROUGH ROAD 4M WIDE
TEMP SIGNALS IF REQ'D
TEMPORARY SUBSTATION
TENANT WASTE MGMT AREA
TERRACE CONSTRUCTION ALAP
TOWER CRANE MAST
WATSON STREET
PETER'S ST
GREAT BRIDGEWATER STREET
DEANSGATE
QUAY STREET
A
B
C
C
LIMITED CAR PARKING FOR ONGOING BUSINESSES, TO BE LOCATED AND COORDINATED WITH THE WORKS
ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED
R.P.M.
Project
GNW
Title
Site Logistics - Phase 2: Roof
* ALL road crossing & reversing will be carried out supervised by qualified banksmen
** Frequency of use? To be managed within the main site logistics
GNW/LOG/003
REV 04

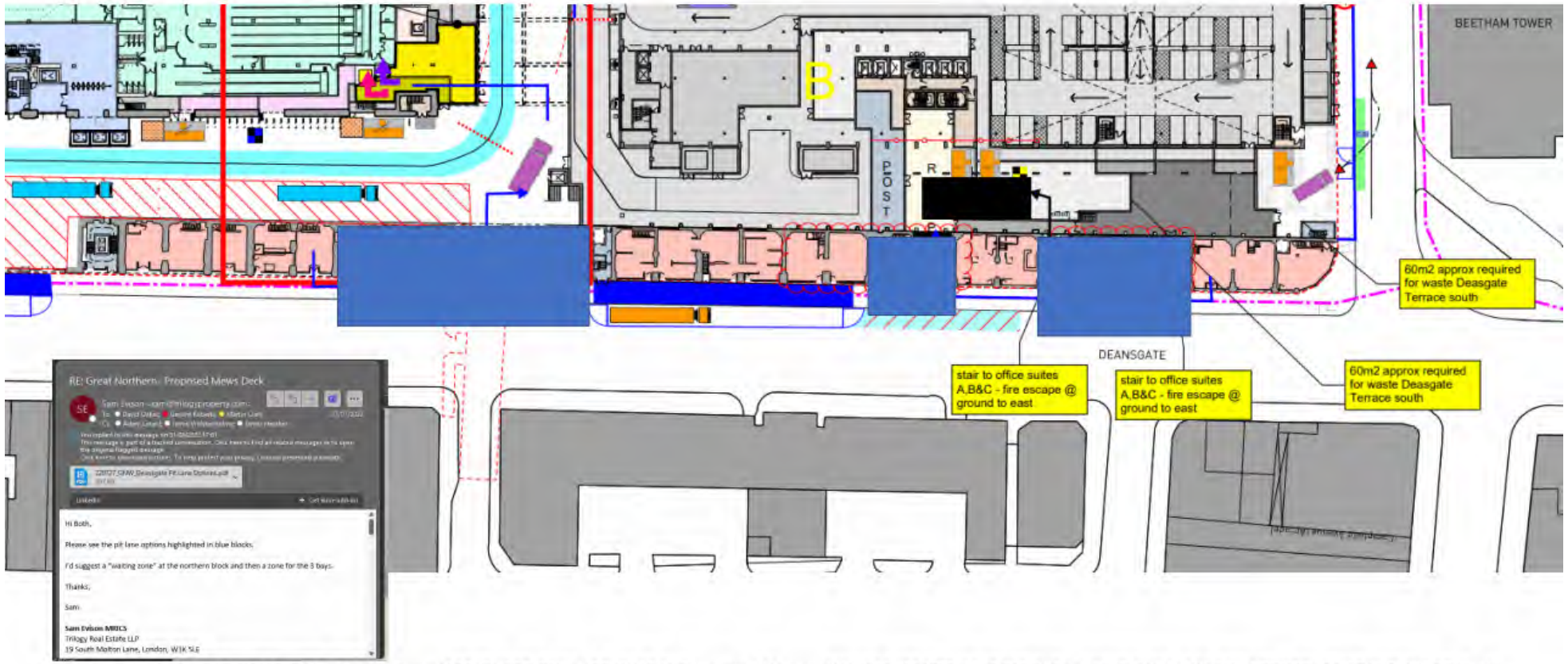

Proposed Site Plan
Roof Level
10422
1 : 500@ A1
10422-SHP-Z0-A-G100-PL-RF-001
P07
LEGEND
100 TENANT SPACES IN BMT
ARTIC OFFLOADING 16.5 x 2.55
BREAK OUT FOR HOISTS
BREAK OUT STAIRS
CAR PARK ACCESS
CONSTRUCTION HOIST
CONTROLLED ACCESS/EXIT
COVERED WALKWAY
DIRECTION OF TRAFFIC
HOIST TOWER
L02 +43.50m
L04 +50.35m
LUFFING TOWER CRANE
OPTIONAL ROUTE
PALFINGER/HIAB CRANE
PUBLIC ACCESS RAMP
PUBLIC PED ACCESS
ROUTE BELOW SLABS
SECURITY BARRIER
SITE DELIVERY VEHICLES
SITE HOARDING
SITE THROUGH ROAD 4M WIDE
TEMP SIGNALS IF REQ'D
TEMPORARY SUBSTATION
TENANT WASTE MGMT AREA
TERRACE CONSTRUCTION ALAP
TOWER CRANE MAST
WATSON STREET
PETER'S PLACE
DEANSGATE
GREAT BRIDGEWATER STREET
QUAY STREET
A
B
C
C
LIMITED CAR PARKING FOR ONGOING BUSINESSES, TO BE LOCATED AND COORDINATED WITH THE WORKS
ALL LAYOUTS AND OPERATIONS SUBJECT TO AGREEMENT WITH STAKEHOLDERS, LOCAL AUTHORITIES AND TO BE VERIFIED AND FURTHER DEVELOPED BY THE CONTRACTORS INVOLVED
R.P.M.
Project
GNW
Title
Site Logistics - Phase 2: Roof
* ALL road crossing & reversing will be carried out supervised by qualified banksmen
** Frequency of use? To be managed within the main site logistics
GNW/LOG/003
REV 04


RE: Through route GNW
Alex Vogt <Alex.Vogt@curtir
To Geraint Roberts
Cc Adam Linard; Martin Clark; David Dominguez
08:47
080483-CUR-XX-00-D-TP-05004-P04_SPA16.5mArticHGVConstr...
4 MB
LinkedIn
Get more add-ins
Morning Geraint,
Please find attached updated swept path analysis.
This appears to show that it is potentially feasible, albeit tight due to the columns at the western end of the through route.
I hope this is useful.
Many thanks
Alex
GENERAL NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE THIS DRAWING. ANY AMBIGUITIES, OMISSIONS AND ERRORS ON DRAWINGS SHALL BE BROUGHT TO THE ENGINEERS ATTENTION IMMEDIATELY. ALL DIMENSIONS MUST BE CHECKED / VERIFIED ON SITE.
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS NOTED OTHERWISE.
4. FOR GENERAL NOTES REFER TO DRAWING.
5. THE CONTENT OF THIS DRAWING IS FOR INDICATIVE INFORMATION ONLY AND NOT SUITABLE FOR CONSTRUCTION PURPOSES.
6. BASED ON SIMPSON HAUGH'S DRAWING REF.: '10422-SHP-ZZ-A-G100-PL-00-001-P04'
7. BASED ON R.P.M.'S DRAWING REF.: 'GNWLOG/001'
8. BASED ON DEANSGATE AS ONE-WAY SOUTHBOUND ONLY SCENARIO
VEHICLE PROFILE:
P04 Internal route updated 30/09/22 DD AV
P03 Background updated 17/08/22 DD AV
P02 Tracking updated 10/08/22 DD AV
Rev. Description: Date: By: Chkd:
curtins
Merchant Exchange, 17-19 Whitworth Street West, Manchester, M1 5WG
0161 236 2394
manchester@curtins.com
www.curtins.com
Status:
PRELIMINARY
Project:
GREAT NORTHERN WAREHOUSE
MANCHESTER
Drg Title:
SWEPT PATH ANALYSIS
CONSTRUCTION PHASE
16.5m ARTICULATED HGV
Size: A1
Date: 01/08/22
Drawn By: DD
Designed By: DD
Checked By: AV
Scale: 1:500
Project No: 080483
Originator: CUR
Volume: XX
Level: 00
Type: D
Role: TP
Category / Number: 05004
Rev: P04
080483 - CUR - XX - 00 - D - TP - 05004 - P04
DEANSGATE
LONGWORTH STREET
QUAY STREET
LITTLE QUAY ST
WATSON STREET
GREAT BRIDGEWATER STREET
GIN DISTILLERY
BEETHAM TOWER


Watson & GBG Junction
Great Northern Car Park
Watson Street
Great Bridgewater Street
FOR CONTINUATION REFER TO PHASE 2 DRAWINGS
397650N
385500E
0 2 4 8 12
1:200 SCALE (m)
Key:
RED LINE BOUNDARY S278 WORKS
PROPOSED KERB LINE
PROPOSED F1/LL-DEPTH CARRIAGEWAY CONSTRUCTION
PROPOSED CARRIAGEWAY RESURFACING
PROPOSED CYCLE LANE GREEN HATCHED AREAS
PROPOSED F1 (FLEXIBLE) NEW FOOTWAY CONSTRUCTION
PROPOSED F1 FOOTWAY RESURFACING
PROPOSED F2 (YORKSTONE SLABS) NEW FOOTWAY CONSTRUCTION
PROPOSED F2 (YORKSTONE SLABS) FOOTWAY RESURFACING
F3 RESURFACING - RELAY EXISTING PCC PAVING SLABS
PROPOSED F3 PCC PAVING SLAB FOOTWAY CONSTRUCTION
PROPOSED F4 (GRANITE SLABS) FOOTWAY CONSTRUCTION
PROPOSED F4 (GRANITE SLABS) FOOTWAY RESURFACING
PROPOSED RED TACTILE PAVING
PROPOSED BUFF TACTILE PAVING
PROPOSED SIGNAL POLES / PUSH BUTTONS
PROPOSED SIGNAL DETECTOR LOOPS (SHOWN INDICATIVELY)
REV DETAILS DRAWN CHECKED DATE
P01 FOR INFORMATION JD DRC 17/08/22
1. TO BE PRINTED IN COLOUR.
2. DO NOT SCALE.
PRELIMINARY
GREAT BRIDGEWATER STREET
WATSON STREET JUNCTION
VIADUX WORKS GENERAL ARRANGEMENT
JD DRC 17.08.22
SALBOY CENTRAL LIMITED
VIADUX PHASE 1 S278 WORKS
1:200
vectos.
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
SVA-VEC-0-P1-DR-CH-0100
P01


Watson & SBG Junction
Great Northern Car Park
Watson Street
Great Bridgewater Street
FOR CONTINUATION REFER TO PHASE 2 DRAWINGS
397650N
385500E
0 2 4 8 12
1:200
SCALE (m)
Key:
RED LINE BOUNDARY S278 WORKS
PROPOSED KERB LINE
PROPOSED FULL-DEPTH CARRIAGEWAY CONSTRUCTION
PROPOSED CARRIAGEWAY RESURFACING
PROPOSED CYCLE LANE GREEN HATCHED AREAS
PROPOSED F1 (FLEXIBLE) NEW FOOTWAY CONSTRUCTION
PROPOSED F1 FOOTWAY RESURFACING
PROPOSED F2 (YORKSTONE SLABS) NEW FOOTWAY CONSTRUCTION
PROPOSED F2 (YORKSTONE SLABS) FOOTWAY RESURFACING
F3 RESURFACING - RELAY EXISTING PCC PAVING SLABS
PROPOSED F3 PCC PAVING SLAB FOOTWAY CONSTRUCTION
PROPOSED F4 (GRANITE SLABS) FOOTWAY CONSTRUCTION
PROPOSED F4 (GRANITE SLABS) FOOTWAY RESURFACING
PROPOSED RED TACTILE PAVING
PROPOSED BUFF TACTILE PAVING
PROPOSED SIGNAL POLES / PUSH BUTTONS
PROPOSED SIGNAL DETECTOR LOOPS (SHOWN INDICATIVELY)
REV DETAILS DRAWN CHECKED DATE
P01 FOR INFORMATION JD DRC 17/08/22
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PRELIMINARY
GREAT BRIDGEWATER STREET
WATSON STREET JUNCTION
VIADUX WORKS GENERAL ARRANGEMENT
JD DRC 17.08.22
SALBOY CENTRAL LIMITED
VIADUX PHASE 1 S278 WORKS
1:200
vectos.
4th Floor Oxford Place, 61 Oxford Street, Manchester, M1 6EQ
SVA-VEC-0-P1-DR-CH-0100
P01

Deansgate Pit Lane Constraints



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Appendix 4 – Typical Major Plant

Low Headroom Piling Rig


HBR 203
Hydraulisches Bohrgerät
Hydraulic drill rig
HÜTTE
BOHRTECHNIK







HBR 203

Technical specifications / *Technische Daten*

Machine crawler base	*Raupenfahrwerk Maschine*		
Overall width of undercarriage	*Gesamtbreite*	*740/1200 mm*	**29.1/47.2 in**
Track shoes width	*Kettenbreite*	*220 mm*	**8.7 in**
Overall tracks length	*Länge der Fahrschiffe*	*1950 mm*	**76.8 in**
Travel speed	*Fahrgeschwindigkeit*	*2 km/h*	**1.2 mph**
Max. gradeability	*Max. Steigfähigkeit*	*20°*	**20°**
Ground pressure	*Bodendruck*	*94 kPa*	**13.6 psi**

Powerpack Engine	*Antriebsaggregat Motor*		
Cummins - Diesel	*Cummins - Dieselmotor*	**QSB4,5-TAA** - EU Stage IIIA - US EPA Tier III	
Rated power at 2200 rpm	*Leistung bei 2200 U/min*	*97 kW*	**130 HP**
Cummins - Diesel	*Cummins - Dieselmotor*	**QSB4,5-TAA** - EU Stage IV - US EPA Tier IVf	
Rated power at 2200 rpm	*Leistung bei 2200 U/min*	*119 kW*	**160 HP**
Fuel tank capacity	*Dieseltankinhalt*	*190 l*	**50 gal**
Hydraulic oil tank capacity	*Hydraulikölltankinhalt*	*350 l*	**92 gal**

Clamping and breaking devices*	*Klemm- und Brechvorrichtungen**	CB2-1	CB3-2	C7
Diameters	*Durchmesserbereich*	*67÷254 mm* | **2.6÷10 in**	*67÷324 mm* | **2.6÷12.7 in**	*152÷610 mm* | **2.6÷24 in**
Clamping force	*Klemmkraft*	*44,060 lbf* | **196 kN**	*44,060 lbf* | **196 kN**	*44,060 lbf* | **196 kN**

Hydraulic hammer	*Hydraulikhammer*	
Recommended	*Empfohlen*	**HH 1265**

Rotary heads	*Kraftdrehköpfe*	
Recommended	*Empfohlen*	**HG 13 - HG 20 - HG 28**

Options	*Optionen*		
Winch	*Seilwinde - max. Zugkraft*	*13 kN*	**3,000 lbf**
Electric motor	*Elektromotor*	*75 kW*	**100 HP**
Radio remote control	*mit Funkfernsteuerung*		

*** Other clamping and breaking devices available on request** / *Weitere Klemm- und Brechvorrichtungen auf Anfrage erhältlich*







HBR 203

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*** Other clamping and breaking devices available on request** / *Weitere Klemm- und Brechvorrichtungen auf Anfrage erhältlich*

Passenger/Goods Hoist



CONSTRUCTION HOISTS

PRODUCT GUIDE

ALIMAK SCANDO 450

Access anytime, anywhere

ALIMAK



Intelligent control

The microprocessor-based Alimak Lift Control system ALC-II reduces waiting times substantially and solves your site logistic problems.

Superior comfort

Frequency control provides very smooth starting and stopping with low starting current and less wear and tear.

Flexible modular design

The hoist car design is truly modular and offers several optional lengths and multiple door and ramp choices.

Economical

Reduced cost for fleet owners and rental companies due to flexibility, durability, and accessibility, leading to low cost of ownership. Fuse ratings from 25 A for low energy consumption.

ALIMAK SCANDO 450

Flexible, modular design, low power consumption and low cost of ownership

Alimak Scando 450 is a construction hoist for passengers and materials. It offers flexibility, efficiency, safety, low energy consumption and low cost of ownership making it the ultimate choice for both construction and rental companies. Fuse ratings from 25 A result in low energy consumption.

INTELLIGENT CONTROL

Accessibility is improved by a modern microprocessor based control system, ALC-II, which can solve many site logistic problems. For example, the system reduces waiting times by storing all calls from the landings and sending the hoist car that is logistically nearest to a landing to pick up cargo or passengers.

Alimak Scando 450 is equipped with a frequency control unit (FC), with closed-loop, which gives very smooth starting and stopping with low starting current and less wear and tear.

UNIQUE ADVANTAGE IMPROVES UTILIZATION

The Alimak Scando 450 can be used in single or dual car configurations. Alimak Scando 450 can also share the mast of an MC 450 mast climbing work platform or a TPM transport platform. This unique advantage improves utilization of accessories and increases the access capability in a cost-effective way. The hoist car design is truly modular and offers several optional car lengths between 2.0 – 3.2 m (6'-6 ¾" – 10'-6") and a multiple choice of doors or ramps.

When choosing an Alimak range hoist, you also choose access to a long, genuine experience of complex vertical access requirements from many different parts of the world. To Alimak, no applications are too difficult to solve. Adding the facts that our hoists have a very long lifetime, high quality and low cycle cost makes it easy to choose an Alimak hoist.



3

ALIMAK SCANDO 450

Technical specifications



MAIN CHARACTERISTICS

- Modular car design with extensions and multiple door and ramp options
- Single and dual car configurations
- Dual entrance possible at ground level and at any landing level
- A high-efficiency helical gearbox provides lower power consumption and reduced operational costs
- ALC-II collective control system with group control and internal fault diagnostics system
- Built-in electrical cabinet maximises internal hoist dimensions for increased lifting capacity
- Durable materials: Car walls and door cladding of perforated steel sheeting, with hot dip galvanized steel mast sections. All stainless steel electric cabinets and landing control boxes
- Wide range of optional equipment and functions
- Remote monitoring system
- Fully compliant with EN, ANSI, AS, TR and the majority of all national regulations.

ALIMAK SCANDO 450	
Motor control	Frequency control (FC)
Max. payload capacity	2,000 kg *(4,400 lb)*
Max. travelling speed	0–54 m/min. *(0–177 fpm)*
Max. lifting height	200 / 300 m *(492 / 984 ft)* *
Car width, internal	1.4 m *(4'-7")*
Car length, internal	2.0 – 3.2 m *(6'-6 ¾" – 10'-6")*
Car height, internal	2.13 m *(6'-11 ¾")*
Max. load space per car	9.5 m² *(335 ft²)*
No. of motors	1 or 2 x 11 kW
Safety device type	ALIMAK GF
Power supply range	380–500 V, 50 or 60 Hz, 3 phase
Fuse ratings	From 25 A
Type of mast	450, tubular steel with integrated rack
Length mast section	1.508 m *(4'-11 ¾")*
Weight mast section with 1 rack	70 kg *(155 lb)*
Rack module	5

* Up to 300 m (984 ft) lifting height on request. The maximum lifting height with 1-motor drive is 100 m (328 ft).
For other demands or specifications, please consult your Alimak representative.

www.alimak.com

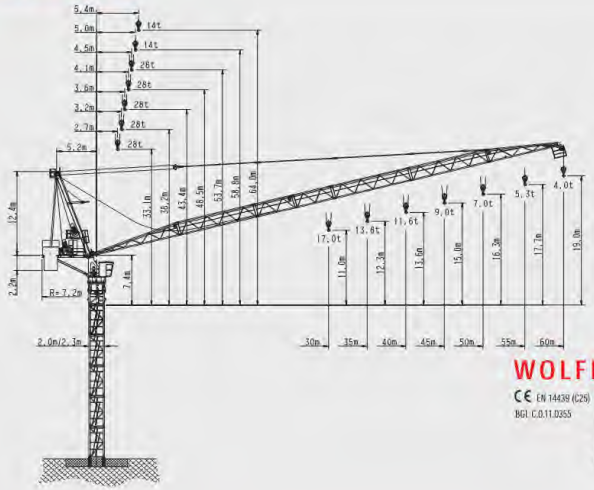
ALIMAK

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1239 EN/Aug 2022

Typical Tower Crane

WOLFFKRAN



WOLFF 355 B

CE EN 14439 (C25)
BGL C.0.11.0355

Nutzlastmoment/load moment/
Couple de charge: max. 5100 kNm
Traglast/lifting capacity/
Capacité de levage: max. 28,0 t
Ausladung/jib radius/
Portée: max. 60,0 m

WOLFF 355 B Kolli Liste · Colli List · Liste de colisage

Pos. Pos. Pos.	Stck. Pcs. Pcs.	Bezeichnung / Description / Description	Kolli / Colli / Colis	L (m) Length / Longueur	B (m) Width / Largeur	H (m) Height / Hauteur	Gewicht (kg) Weight / Poids	Volumen (m³) Volume / Volume
1	1	Turmspitzenoberteil / Tower top upper part / Partie supérieure flèche		13,36	2,30	2,52	9800	77,44
2	1	Turmspitzenunterteil kompl. / Tower top lower part complete / Partie inférieure flèche complète		7,96	2,30	2,53	15300	46,32
				8,12	2,32	2,80	16600	52,75
		Turmspitzenunterteil / Tower top lower part / Partie inférieure flèche		5,63	2,30	2,53	11700	32,76
				5,82	2,32	2,80	12995	37,81
3	1	Führerhaus auf Ausleger / Driver's cabin on jib / Cabine de conducteur sur flèche		2,80	2,07	0,51	400	2,96
	1	Führerhaus / Driver's cabin / Cabine de conducteur		2,26	1,45	2,30	940	7,54
4	1	Gegenausleger / Counterjib / Contre-flèche mit Podesten / with platforms / avec plateformes		6,58	2,30	0,93	5150	14,08
5	1	Montageplattform / Machinery platform / Plateforme avec dispositif de levage		2,31	2,19	2,41	8200	12,12
6	1			2,98	2,56	2,81	11196	21,44
7	1	Seilberuhigung / Rope swing-reduction device		2,71	1,39	0,52	215	1,96
8	1	Auslegerteil 1 / Jib part 1 / Elément de flèche 1		11,92	2,22	2,00	2250	52,93
9	1	Auslegerteil 2 / Jib part 2 / Elément de flèche 2		10,56	1,71	1,96	1710	35,40
10	1	Auslegerteil 3 / Jib part 3 / Elément de flèche 3		5,39	1,71	1,96	960	18,07
11	1	Auslegerteil 4 / Jib part 4 / Elément de flèche 4		5,39	1,71	1,96	930	18,07
12	2	Auslegerteil 5 / Jib part 5 / Elément de flèche 5		10,56	1,71	1,96	1630	35,40
13	1	Auslegerteil 6 / Jib part 6 / Elément de flèche 6		10,16	1,71	1,99	2020	34,58
14	5	Abspannlaschen / Bracing brackets / Tirants		10,51	0,24	0,61	1350	1,54
15	1	Unterflasche 28 t / Hook block 28 t / Crochet 28 t		0,68	0,26	1,63	540	0,29



Der Leitwolf
The leader of the pack

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WOLFF 355 B

Hauptkomponenten
Grundausleger 30 m. Vorlängerung bis 60 m. Ausladung in 5 m Schritten. Turmspitze mit Drehwerk. Drehrahmen mit Führerhaus, Drehwerk, Kugellaufverbindung mit Zentralschmierung und Schleifringsystem. Gegenausleger mit Hubwinde, Schaltschrank und Gegengewichten.

Main Components
30 m basic jib. 4 extensions up to 60 m radius in 5 m steps. Tower top with luffing winch. Slewing frame with driver's cabin, control cabinet, slewing gear, ball race bearing with central lubrication unit and slipring system. Counterjib with hoisting winch and counterweights.

Composants principaux
Flèche de base 30 m. Prolongements jusqu'à 60 m de portée, en tronçon de 5 m. Partie tournante avec mécanisme de relevage de la flèche. Partie tournante avec cabine, armoire de commande, couronne avec pompe à graissage centralisé et collecteur. Contre-flèche avec mécanisme de levage, armoire électrique et contrepoids.

Antriebstechnik
Alle Antriebe mit frequenzgesteuerten Kurzschlussläufermotoren und Motorschutz (Thermofühler). Hubwinde HW28110FU / HW28132FU. Drehwerk mit elektrisch lüftender Windfreistellung. Automatische Windzuschaltung. Einziehwinde EW 1575 FU.

Drive Technology
All drives frequency controlled squirrel cage motors, fully thermal protected. Hoisting winch HW28110FU / HW28132FU. Slewing gear with electrically operated weathervaning device. Automatic wind force compensation controls. Luffing winch EW 1575 FU.

Technique d'entraînement
Tous les mouvements sont équipés de moteurs à rotor en court-circuit réglé par des convertisseurs de fréquences, protections thermiques. Mécanisme de levage HW28110 FU / HW28132 FU. Entraînement rotation avec mise en position électrique. Compensation automatique en cas de vent. Mécanisme de relevage de la flèche EW 1575 FU.

Elektronik Antriebe
Mehrspannungsausführung für Netze 380 V – 480 V (50/60 Hz). Elektronische Sicherheits- Kransteuerung mit Busstechnik. Inkrementale Absolutwertgeber für alle Arbeitsbewegungen. Elektronische Lastmessung. Grafik-Terminal für Bedienerinformation mit mehrsprachiger Diagnoseanzeigen.

Electronic Equipment
Multivoltage equipment for supplies from 380 V to 480 V at 50/60 cycles. Electronic safety crane controls with bus technology. Incremental absolute encoders for all operating movements. Electronic load measuring device. Multilingual graphic display showing information to operator, both operational and diagnostics.

Équipement électrique
Équipement multi voltages pour des tensions de 380 V à 480 V (50 / 60 Hz). Réglage électronique de sécurité avec technique bus. Codeurs angulaires incrémentaux pour tous les mouvements de travail. Mesurage électronique de la charge. Display graphique multilangages avec des informations d'opération et diagnostique.

Sicherheitseinrichtungen
Elektronische Überlastsicherung. Trübung der Lastmomentgrenze durch automatische Reduzierung der Hubgeschwindigkeit. Meldegeführte Einstellungen der Maximalabschaltung und aller Endschalter vom Führerhaus aus. Dreh- und Ausladungsbegrenzung. Antikollisionsschnittstelle. Elektronisch geregelter horizontaler Lastweg.

Safety Devices
Electronic overload protection system. Increased load moment limitation by automatically hoisting speed reduction. Menu guided setting of overload protection system and of all limiters from operator's cabin. Working space limiter. Anti collision interface. Electronic controlled level luffing.

Dispositifs de sécurité
La centrale électronique de surcharge permet d'augmenter le charge maximale en réduisant la vitesse de levage. Réglage de la sécurité surcharge et des fins de courses depuis le display de la cabine. Limitation de rotation et de relevage. Jonction interface de anticollision. Parallélogramme électronique d'élevation.

Turmkonfiguration mit WOLFF Formelementen. WOLFF Schlagbolzen-Verbindung. Abnehmbares hydraulisches WOLFF Kletterwerk KWH 20.6.

Tower Elements, Climbing Device
Tower configuration of WOLFF system tower elements. WOLFF slug bolt connection. Detachable hydraulic WOLFF system climbing device KWH 20.6.

Éléments de tour, cage pour télescopage
Combinaison de mât avec des éléments de tour système WOLFF. Assemblage des éléments par axes. Cage pour télescopage hydraulique amovible WOLFF KWH 20.6.

Unterwagen UW
WOLFF Unterwagen UW mit Spurweiten von 6,0 – 8,0 m.

Undercarriage UW
WOLFF system undercarriage UW can be used with gauge from 6,0 up to 8,0 m.

Châssis translation
Châssis translation système WOLFF avec écartement de 6,0 à 8,0 m.

Kranstandkonsolen KRE, Kranstation KR
Zur Standardmontage. Kreuzrahmenelemente KRE sind umrüstbar zu Unterwagen UW.

Cross Frame Element KRE, Cross Frame KR
For standard installation. KRE elements can be modified to UW.

Éléments de base KRE, croix de base KR
Pour montage standard. Les éléments KRE sont modifiables en UW.

Anschlussleistungen und Hakenwege (Drehteil)
194 kVA (HW 28110 FU), Hakenweg 460 m bei 2-Strangbetrieb
205 kVA (HW 28132 FU), Hakenweg 460 m bei 2-Strangbetrieb

Power Requirements and Hook paths (Slewing part)
194 kVA with HW 28110 FU, hook path 460 m in 2-fall operation.
205 kVA with HW 28132 FU, hook path 460 m in 2-fall operation.

Puissance absorbée et course du crochet (mouvement pivot horizontal)
194 kVA (HW 28110 FU) avec une course maximale du crochet de 460 m
205 kVA (HW 28132 FU) avec une course maximale du crochet de 460 m

Antriebe WOLFF 355 B (HW 28110 FU)
Mechanisms
Mécanismes

Motor (kW) motor Moteur	110	110	7,5	3,5	0,4 / 5,5	
Geschwindigkeit speed Vitesse	0 – 7,51 0...195 m/min stufenlos / stepless / en continue 0 – 14,01 0...45 m/min	0 – 5,51 0...52 m/min stufenlos / stepless / en continue 0 – 28,01 0...25 m/min	1,80 min.	0,80 min.	25,0 m/min.	
Hakenweg (m) hook path course du crochet	920	460				

Antriebe WOLFF 355 B (HW 28132 FU)
Mechanisms
Mécanismes

Motor (kW) motor Moteur	132	132	7,5	3,5	0,4 / 5,5	
Geschwindigkeit speed Vitesse	0 – 1,71 0...290 m/min stufenlos / stepless / en continue 0 – 14,01 0...46 m/min	0 – 4,01 0...146 m/min stufenlos / stepless / en continue 0 – 28,01 0...25 m/min	1,80 min.	0,80 min.	25,0 m/min.	
Hakenweg (m) hook path course du crochet	920	460				

Traglasten (t) · WOLFF 355 B
Load Data
Charges

Ausladung (m) / Jib radius (m) / Portée (m)		20	25	30	35	40	45	50	55	60	
60	5,4 – 27,0			14,0	14,0	12,2	9,8	8,1	6,7	5,6	4,7	4,0
55	5,0 – 28,0			14,0	14,0	12,8	10,5	8,7	7,3	6,2	5,3	
50	4,5 – 29,5			14,0	14,0	13,7	11,3	9,5	8,1	7,0		
45	4,1 – 31,0			14,0	14,0	14,0	12,2	10,4	9,0			
40	5,6 – 33,5			14,0	14,0	14,0	13,4	11,6				
35	5,2 – 34,5			14,0	14,0	14,0	13,8					
30	2,7 – 38,0			14,0	14,0	14,0						
60												
55												
50	4,5 – 16,0			21,7	16,7	13,4	11,0	9,2	7,8	6,7		
45	4,1 – 16,5			22,7	17,6	14,2	11,9	10,1	8,7			
40	5,6 – 17,0			23,6	18,7	15,4	13,1	11,3				
35	5,2 – 17,5			24,4	19,3	15,9	13,5					
30	2,7 – 18,0			25,3	20,3	17,0						

Ausladung (m) / Jib length (m) / Longueur de flèche (m)

14,0 t

28,0 t

Traglast (t) / Load / Charge / Capacité de charge (t)

Typical Mobile Crane

Mobilkran-Mobile Crane LTM 1095-5.1

Grue mobile • Autogrù

Grúa móvil • Мобильный кран

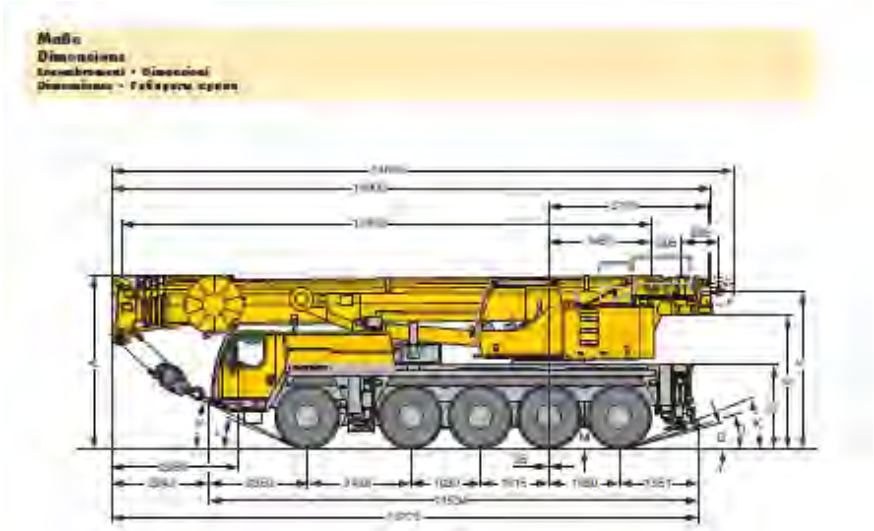
Technische Daten • Technical Data

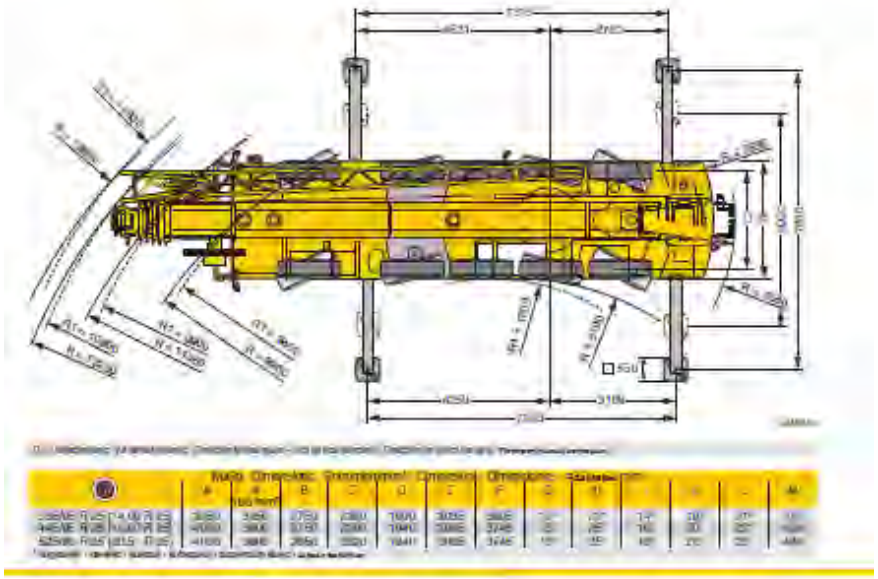
Caractéristiques techniques • Dati tecnici

Datos técnicos • Технические данные



LIEBHERR





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Gewichte
Weights
Poids • Pesi
Pesos • Вагрузка



Ausladung · Radius Sbalzo · Alcance Alcance · Вылет	1	2	3	4	5	Zusatzgegengewicht · Total weight Poids total · Peso totale Peso total · Общий вес, т
3	12	12	12	12	12	60 t



Tragkraft · Load I Portata · Carga Capacidad de carga · Грузоподъемность, т	Rollen · No. of sheaves Pulegge · Troncos Poleas · Количество блоков	Stränge · No. of lines Brins · Tratti portanti Ramales · Ветвей	Gewicht · Weight kg Peso · Tonnage Peso · Вес, кг
60	6	12	600 t
50,4	5	11	590 t
38,3	4	9	480 t
16	2	5	380 t
6,7	–	1	140 t

Geschwindigkeiten
Working speeds
Vitesses • Velocità
Velocidades • Скорости



		1	2	3	4	5	6	7	8	9	10	11	12	0,1	0,2	
1		1,7 t – 5,0	3,7	3,6	11,1	11	10,1	10,0	10,0	10,0	10,0	10,0	10,0	1,02 – 0,6	7,2	48 m
		0,7 t – 2,5	2,0	5,0	4,0	4,1	7,0	10,1	10,1	11,0	12	12	10,0	0,84 – 2,4	5,4	— 60 m
2		1 t – 5,1	1,4	3,4	6,1	10,2	10,1	10,0	10,2	10,2	10	10,0	10	2,28 – 0,7	7,4	48 m
		0,65 – 2,5	1,41	4,1	5,0	6,7	7,0	11,3	11,0	11,0	24	31,0	30	0,07 – 2,7	5,4	60 m

Hubwerk · Load Winde · Verricello Accionamiento · Тележка	Hubwerk · Hoisting speed Treuil · Verricello Velocidad de accionamiento · Лебедка грузовая	Hub- und Senkgeschwindigkeit · Hoisting and lowering speed Vitesse de levage et de descente · Velocità di sollevamento e di discesa Velocidad de elevación y descenso · Скорость подъема и опускания	Max. Drehzahl · Max. speed (rev./min) Tiro max. en 4. capa · Máx. tiro en 4ª capa Tiro máx. en 4ª capa · Макс. тяговое усилие
1	Hubwerk für Hubgut · Hoisting gear 1 – 24 Hubwerk auf dem Ausleger · per la gru sul braccio Cabestrante para carga · Лебедка грузовая	11 m/min / 100 m/min	57 kN
2	Hubwerk für Hubgut · Hoisting gear 1 – 24 Hubwerk auf dem Ausleger · per la gru sul braccio Cabestrante para carga · Лебедка грузовая	12 m/min / 200 m/min	57 kN
	1 – 1,7 min		
	bei 30 bis 60° Auslegerneigung · angle of 30 to max 60° boom angle aprox. 60 s para 60° · time 60 seconds and up at an angle of the boom to 60° aprox. 60 segundos desde 60° de inclinación de pluma · ca. 60 sec. por aproximadamente ángulo de 60°		
	ca. 380 s bei Auslegerlänge 12,5 m – 50 m · approx. 380 seconds for boom length from 12,5 m – 50 m aprox. 380 s para pasar de 12,5 m – 50 m · circa 380 secondi per passare dalla lunghezza del braccio di 12,5 m – 50 m aprox. 380 segundos para alcanzar la pluma de 12,5 m – 50 m · ca. 380 sec. для перемещения от 12,5 до 50 м		

Hubhöhen
Lifting heights
Hauteurs de levage • Altezze di sollevamento
Alturas de elevación • Высота подъема

T

