150 Holborn

London EC1

Construction management plan

August 2011

Arup

Laffly LLP

150 Holborn Camden London

Construction Management Plan

150Holborn/CMP 001

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Job number

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ARUP

Contents

1 Introduction

This initial Construction Management Plan seeks to address the points identified by LB Camden for the management of traffic during the construction period at and adjacent to the site at150 Holborn.

This is an initial plan and has been prepared in advance of the appointment of a principal contractor. This plan will be adopted by the principal contractor when appointed and any amendments made to plan at this stage will be made with the agreement of LB Camden.

2 Description of the Project

The project is located at 150 Holborn and comprises a number of structures set in an approximate 'u' shape around a central service yard. The building is currently occupied at Ground floor and First floor level by a number of business's (retail, restaurant and banking) with the upper floors comprising unoccupied office space.

The proposed scheme detailed within the planning application has a limited level of demolition activity (Existing roof levels to be demolished, internal walls and the creation of a double height entrance hall).

The current design intent is to 'overclad 'the existing brickwork with the new external facade, minimising demolition and associated disposal as well as providing an opportunity to make early progress with the internal fit out works..The façade system is an area that will be developed and confirmed with specialist contractor's advice during the detailed design phase of the project.

The structural works comprise new steel members with lightweight concrete floors on steel decking to extend the roof floor levels back up to their original levels plus roof extensions in addition a new level of slab will infill the existing blocks to the rear service yard area.

Internally the office areas will be fitted out to a 'category A' level of finish and the 6 residential units will be fully fitted out.

The site is constrained in terms of access; bounded to the West by Gray's Inn Road, to the South by Holborn, the East by Brooke Street and an existing building marks the Northern boundary of the rear service yard. There is a shared entrance to the rear service yard to the East of the site, accessed from Brooke Street.

The service yard currently incorporates an access ramp down to basement car parking for Fox Court, supports fire escapes, deliveries in / refuse out of the Operational business' at the Ground floor level.

It will be a primary, ongoing objective of the Project team to ensure that the impact of demolition and construction works on the day to day activities of adjacent business's, road users, residents and the general public is kept to a minimum for the duration of the works.

3 Programme & Construction Methodology

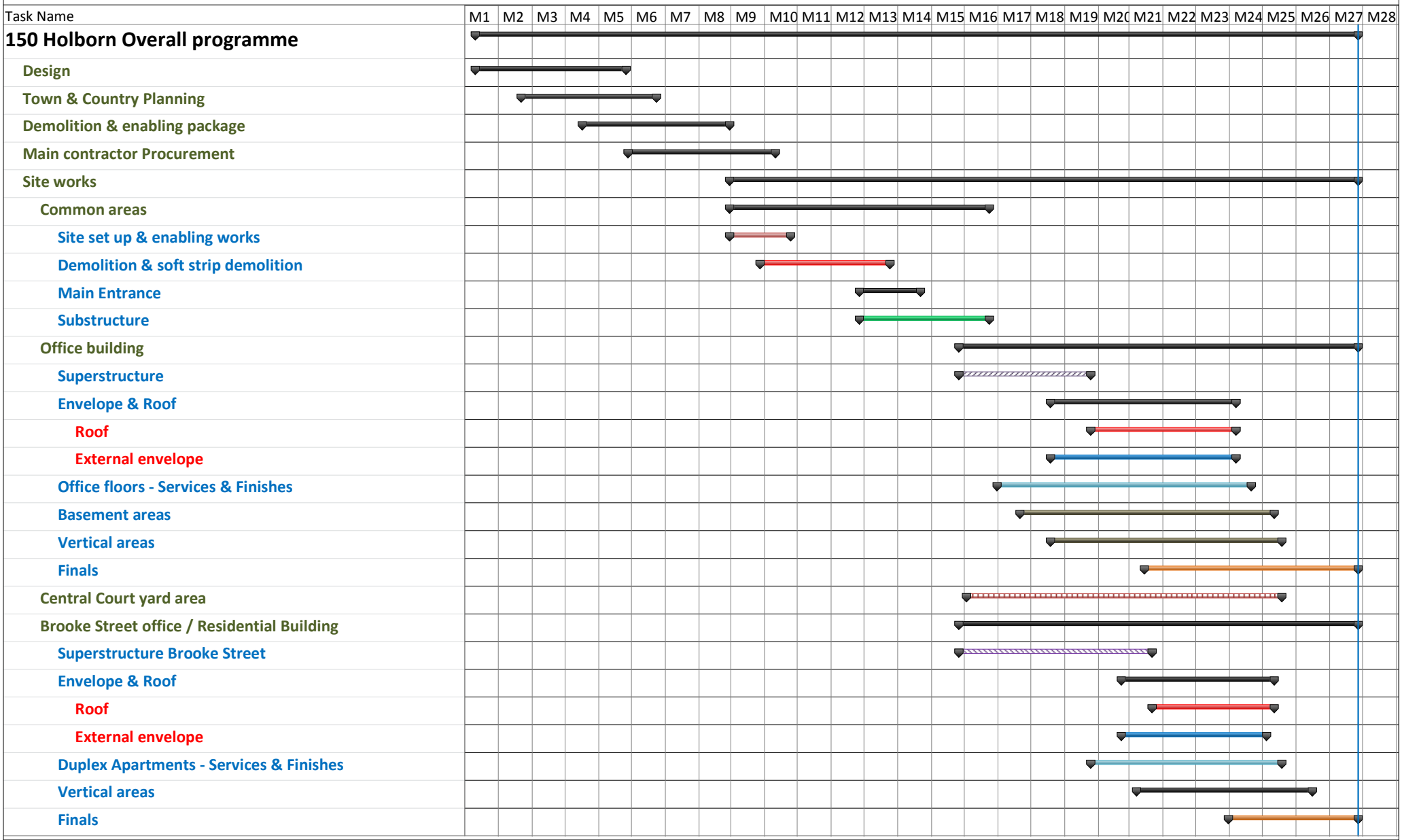
3.1 Programme

The overall build period is anticipated to be fifteen months which is preceded by a Four month demolition and enabling works phase.

We have carried out a detailed construction programming exercise to inform the level 1 summary programme attached overleaf.

150 Holborn, London
Summary Overall Programme

ARUP



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3.2 The construction sequence

The demolition and construction sequence is outlined below and illustrated in the attached sequence sketches.

Demolition

1. Erection of hoardings and security fencing
2. Isolation of existing services
3. Identification by surveys and controlled removal of asbestos (where still present)
4. Erect protective gantries and cantilevered protective fans over the adjacent footpaths and access routes
5. Installation of temporary support to ground and first floor level of stair core to provide temporary Barclays Bank fire escape route
6. Erect goods hoist to service yard
7. Soft strip demolition
8. Erection of demolition scaffolds to all elevations
9. Commence hard demolition by stripping out roof (works carried out with the assistance of either a mobile or tower crane, subject to later study)
10. Dismantle roof structures
11. Install temporary weather proofing at level 7
12. Prop and carefully remove the section of the 1st floor slab within the new entrance
13. Erect Tower crane

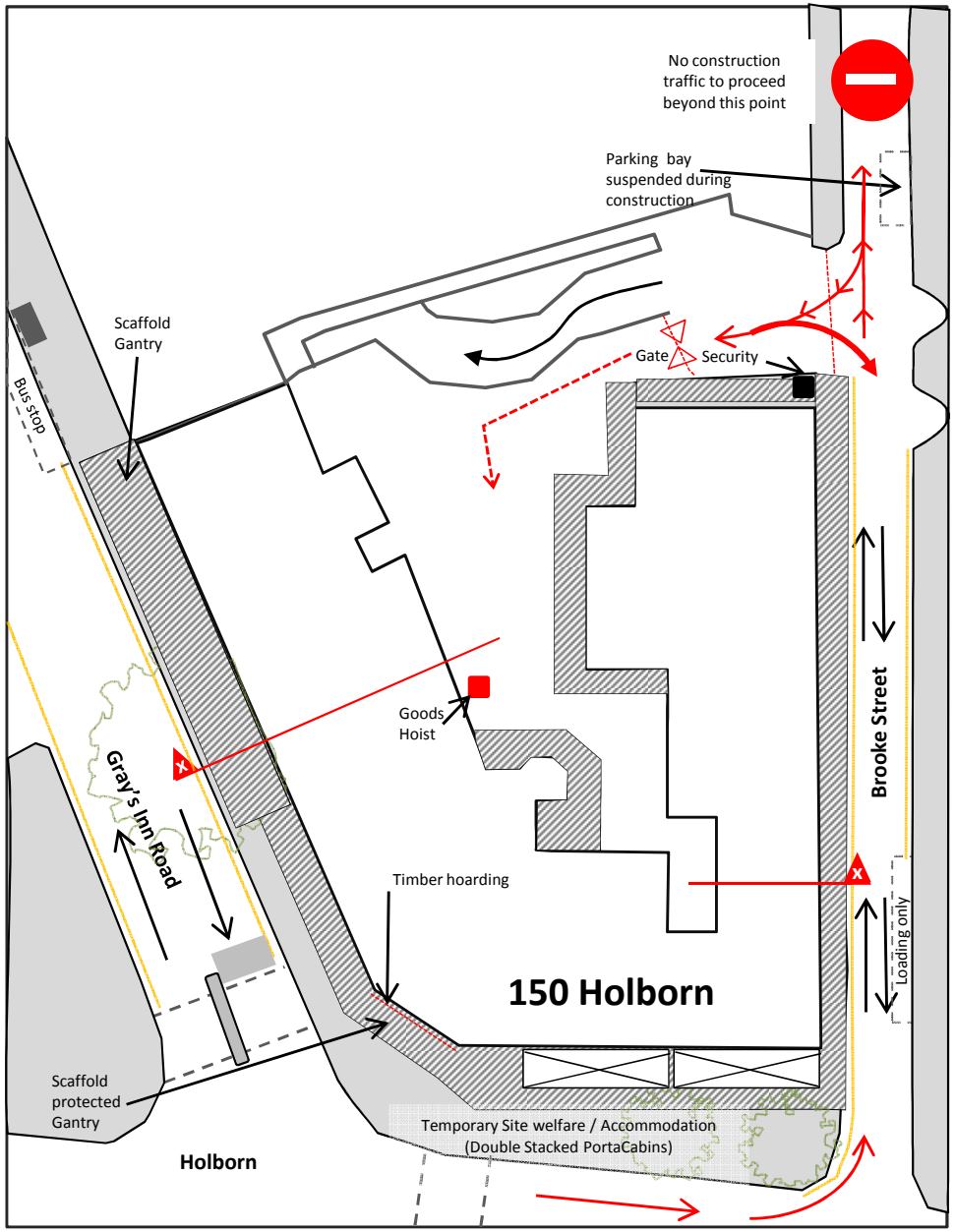
Construction

1. Bored pile foundations to new core areas
2. Insitu Reinforced Concrete walls and columns
3. New steel structures at roof levels
4. Steel decking and insitu concrete topping
5. Construction of new service yard structure
6. Installation of cladding support work
7. 1st fix Mechanical, Electrical and Plumbing services
8. Roof coverings and finishes
9. External envelope

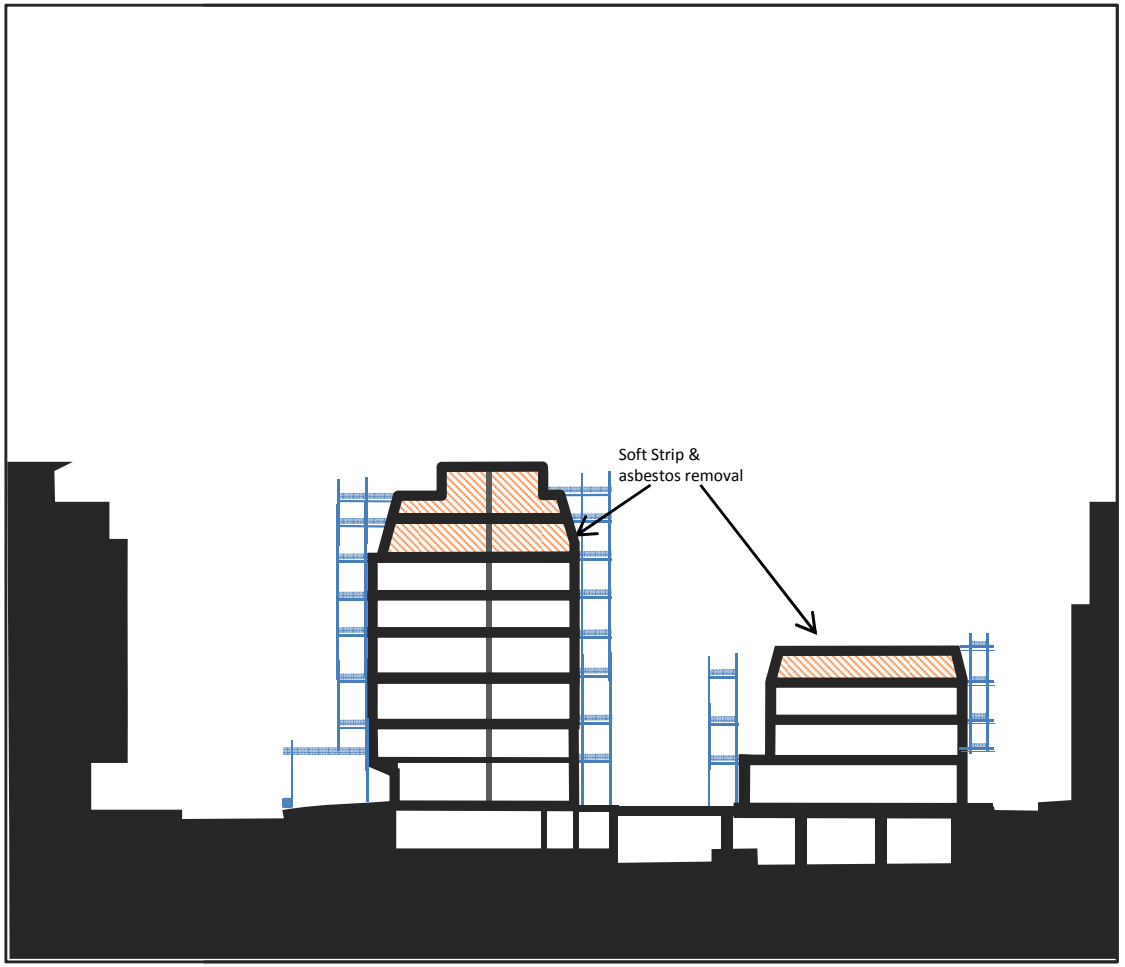
10. Internal fit out works to the Entrance hall, Basement floor plates and Core areas
11. Mechanical, Electrical and Plumbing services installation. Offsite prefabrication and modularisation to be utilised where practicable
12. Hard and soft landscaping will follow cladding completion and subsequent scaffold dismantling operations
13. Commissioning of the Mechanical, Electrical and Plumbing services will commence as soon as commissionable zones of the various systems become available. Commissioning will progressed through until Integrated systems tests .Demonstration of the various systems will be progressively carried out until successfully completed, commissioned, demonstrated, witnessed, proven and documented.

3.3 Construction sequence sketches

We enclose indicative construction sequence sketches ARUP/PL/SK002 to ARUP/PL/SK008 (inc.) overleaf.



01. Ground Floor Plan

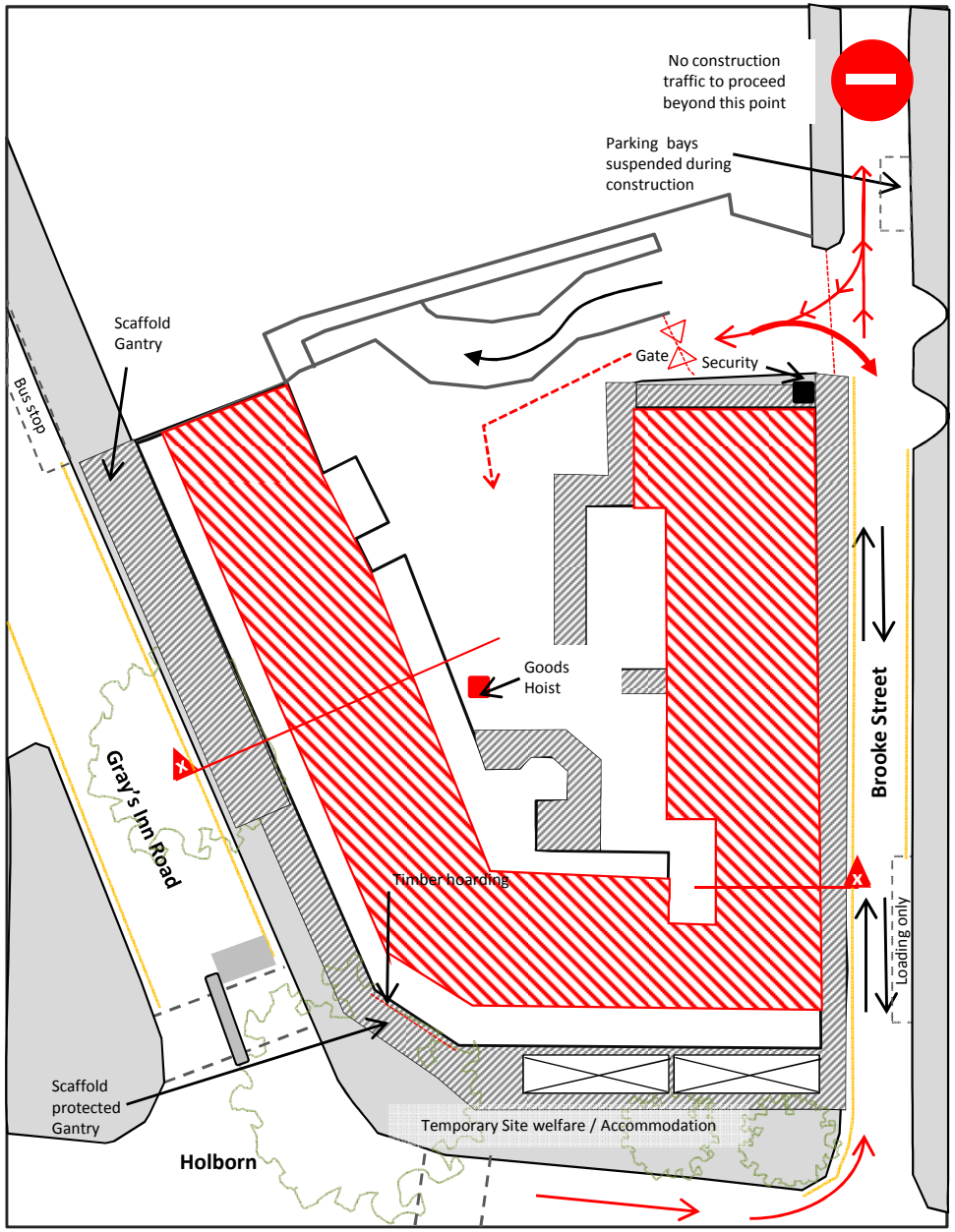


02. Section X-X

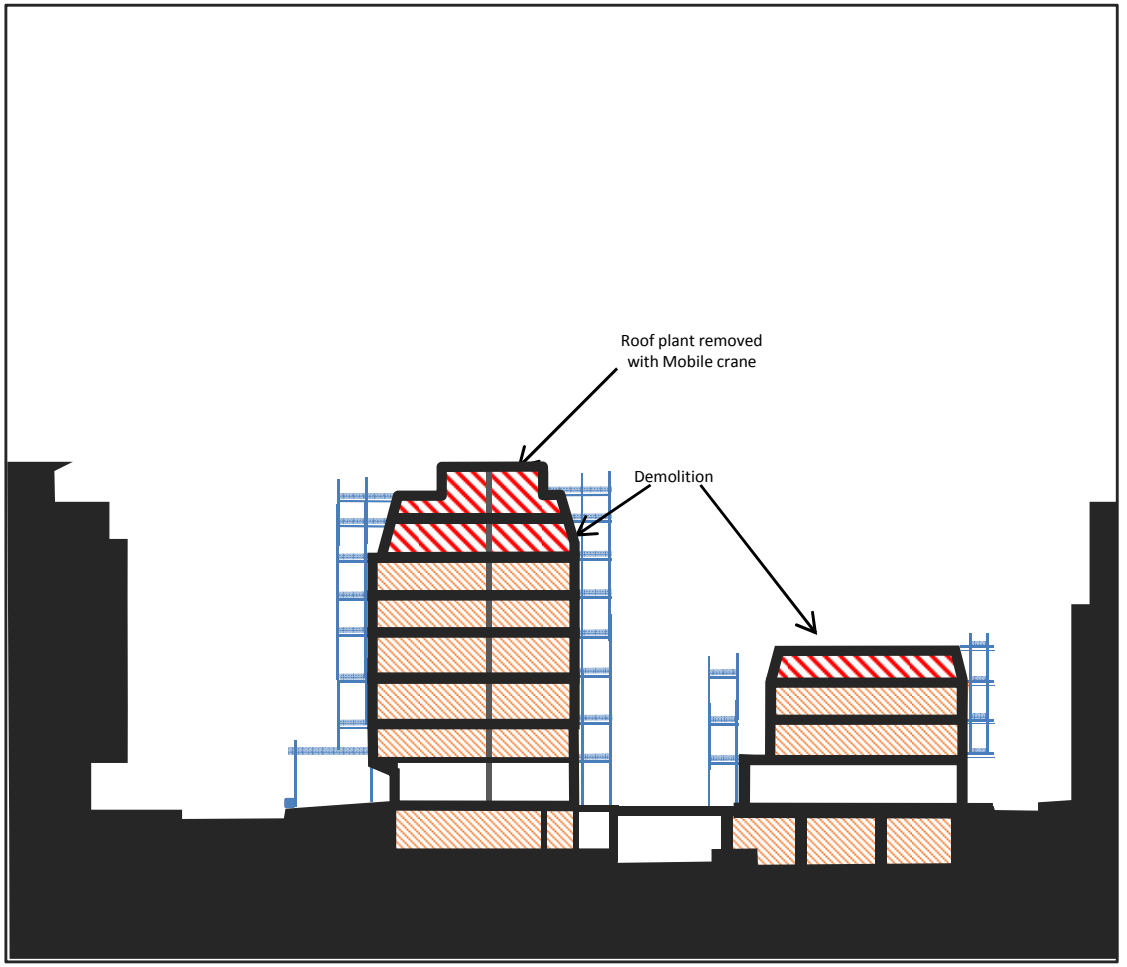
150 Holborn
Sequence Drawing 1- Site set up & Soft strip demolition

Drawing Title:	**Sequence 1**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/002**

ARUP



01. Ground Floor Plan



02. Section X-X

150 Holborn
Sequence Drawing 2 - Demolition

Drawing Title:	**Sequence 2**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/003**

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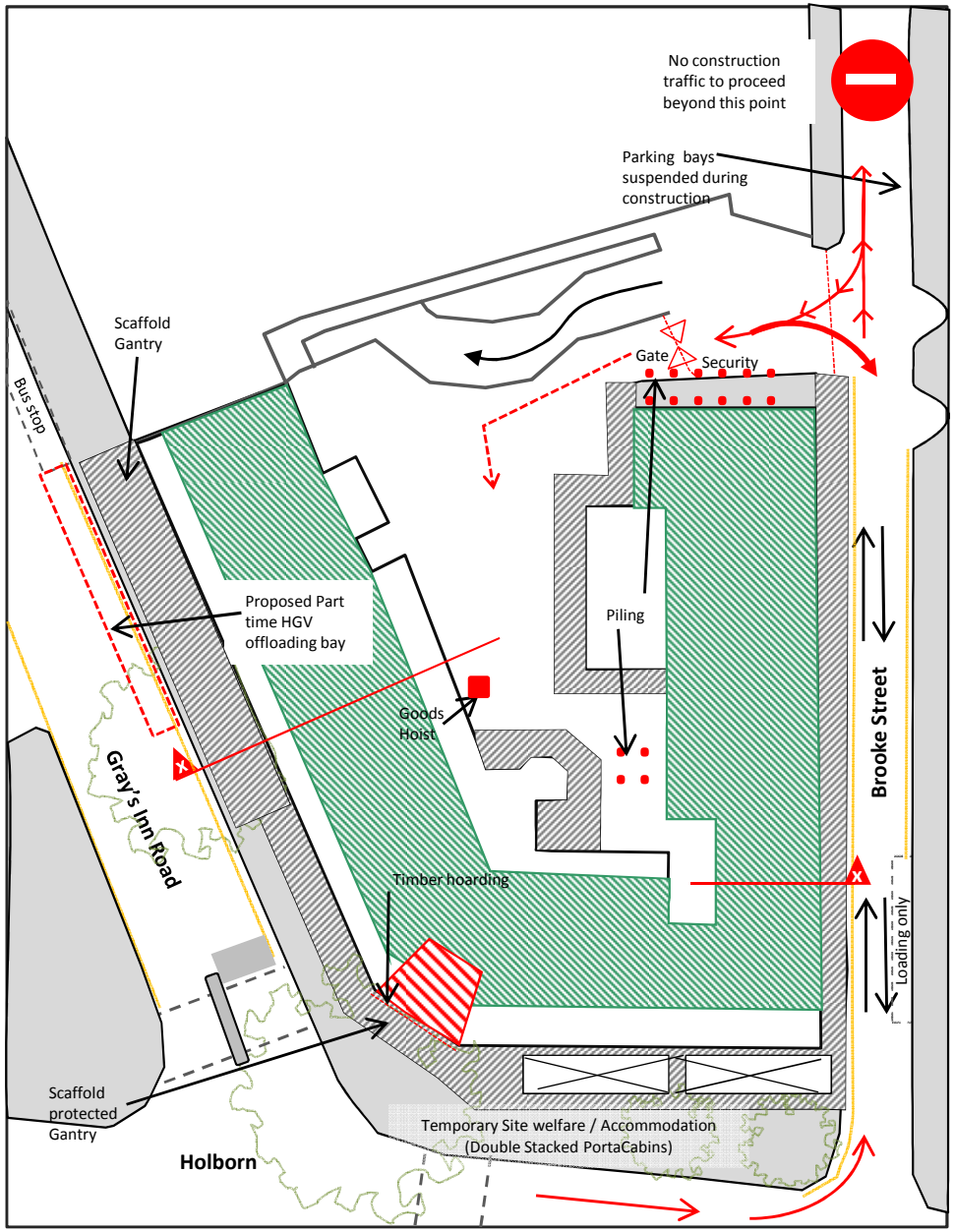

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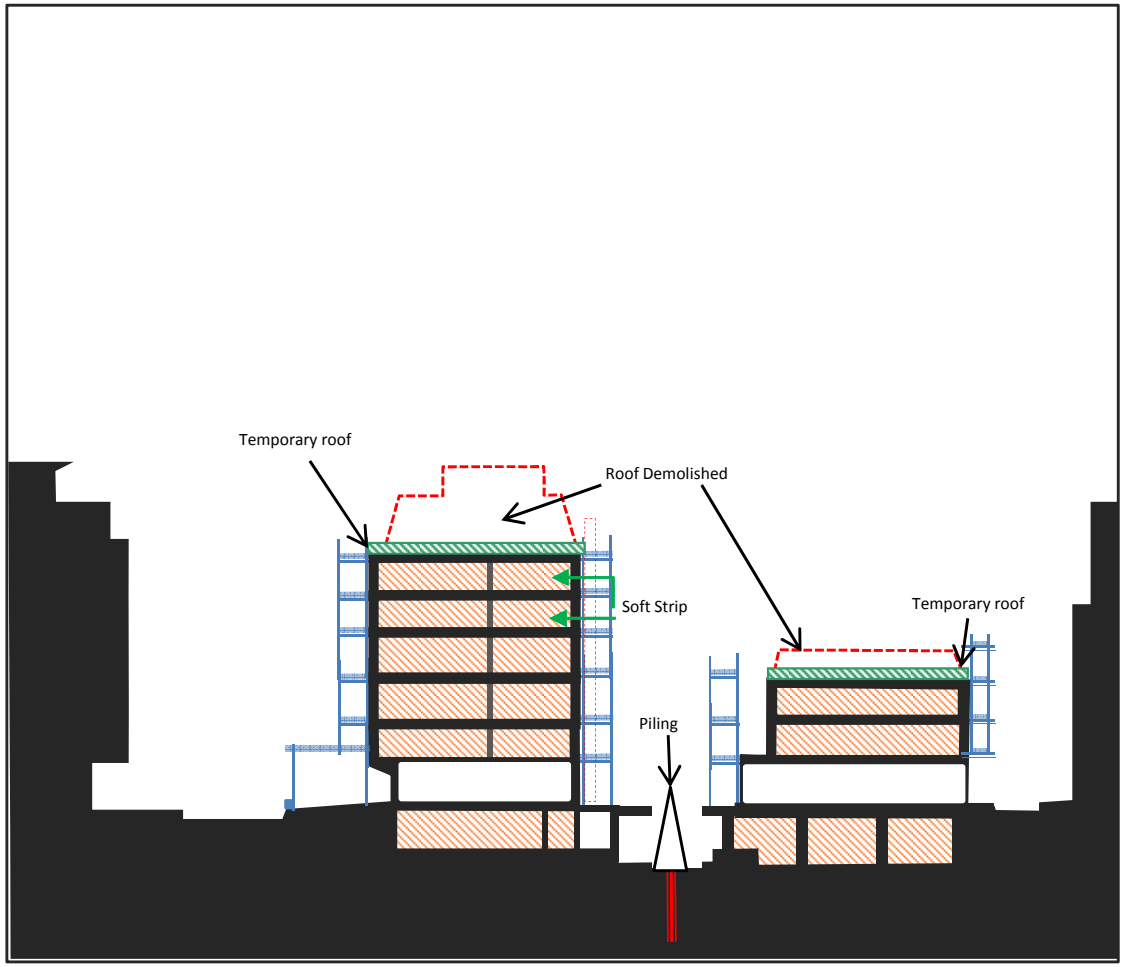


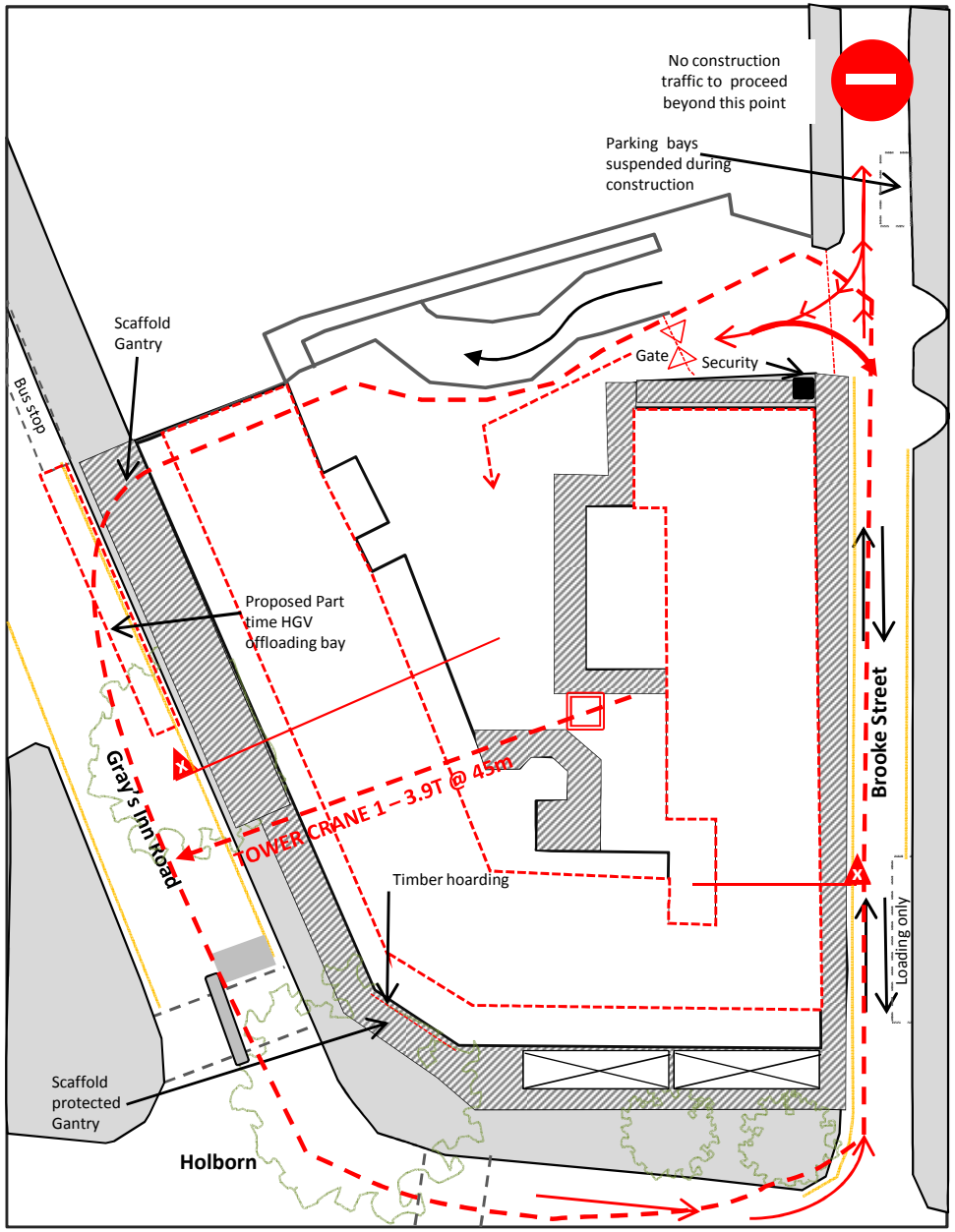
02. Section X-X

150 Holborn

Sequence Drawing 3- Demolition & sub-structure

Drawing Title:	**Sequence 3**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/004**

ARUP



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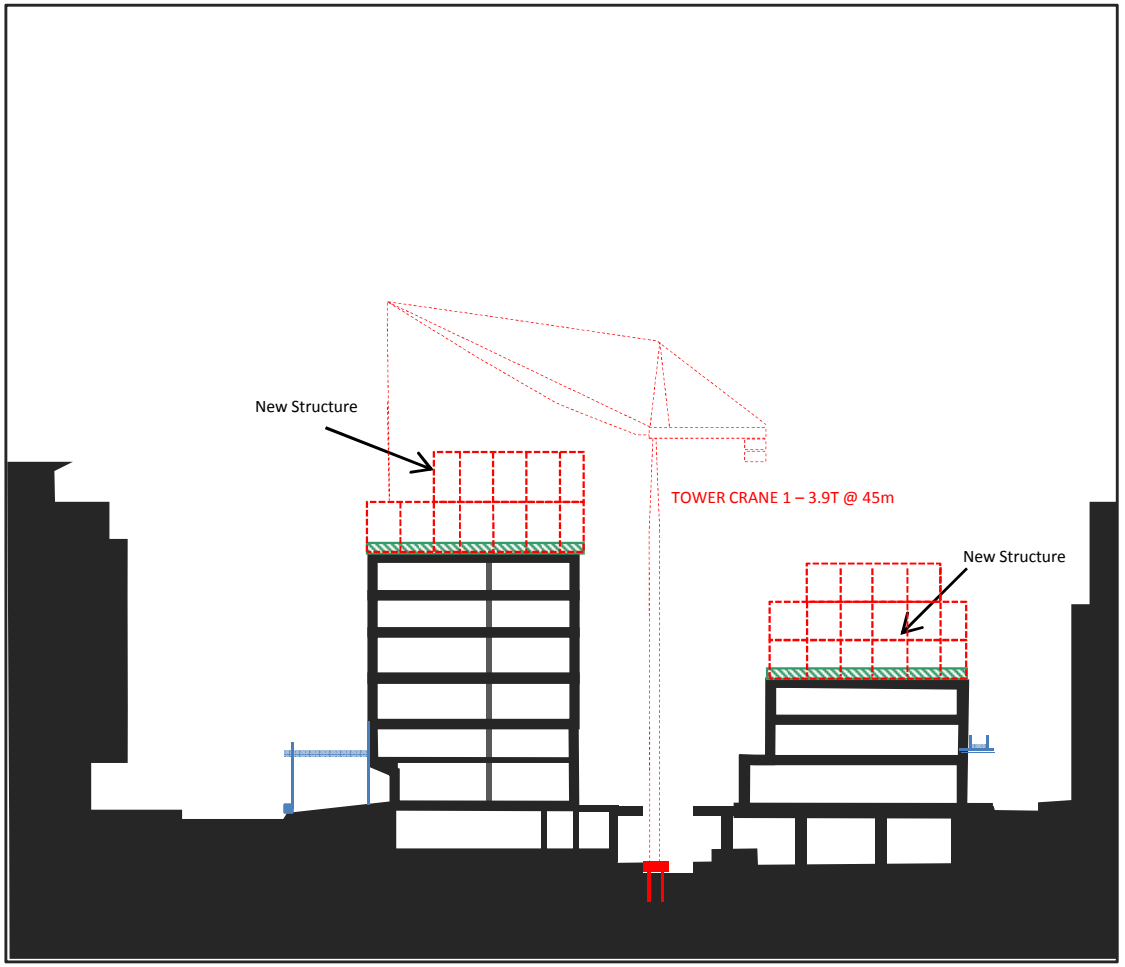

02. Section X-X

150 Holborn
Sequence Drawing 4 - Superstructure

Drawing Title:	**Sequence 4**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/005**

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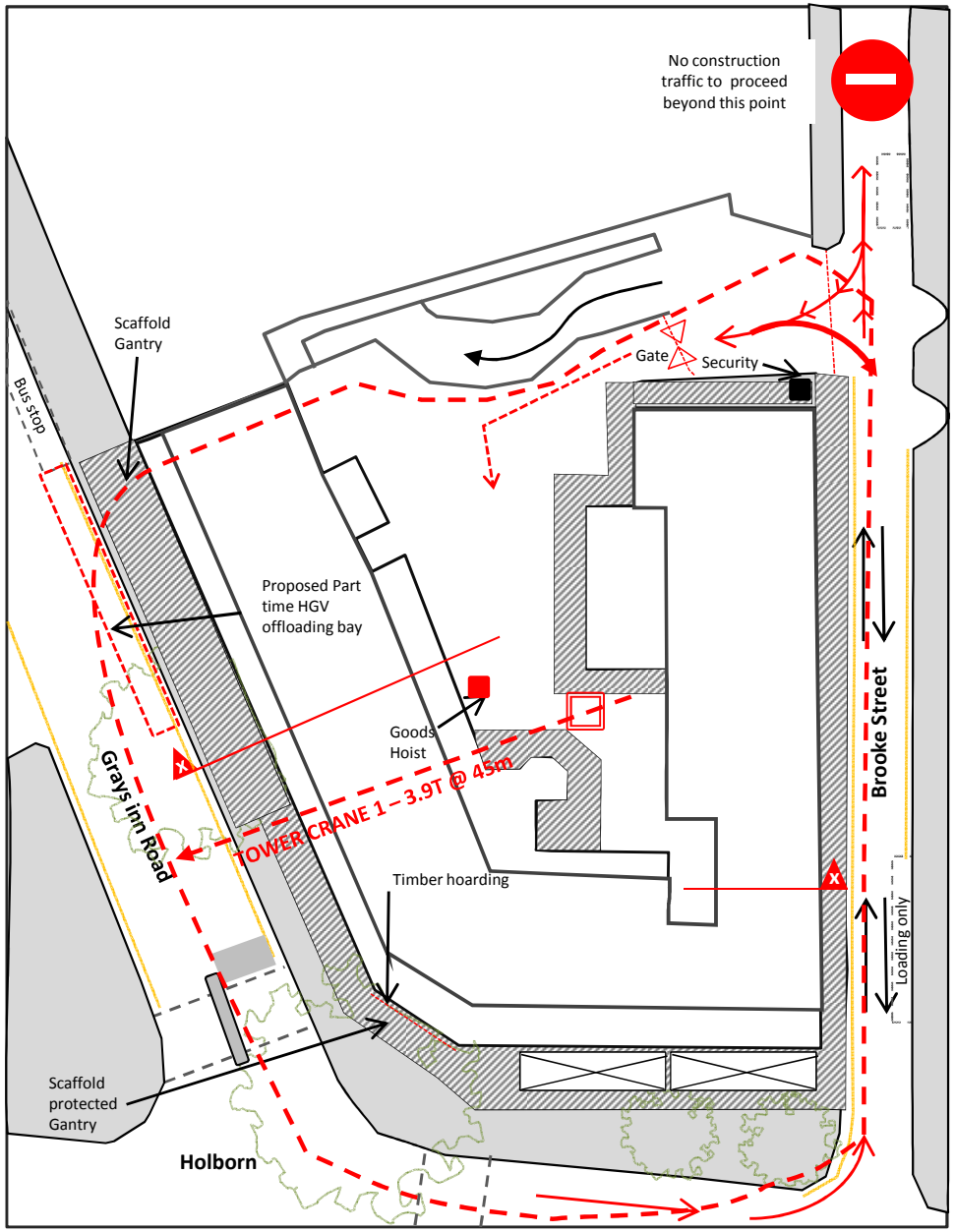

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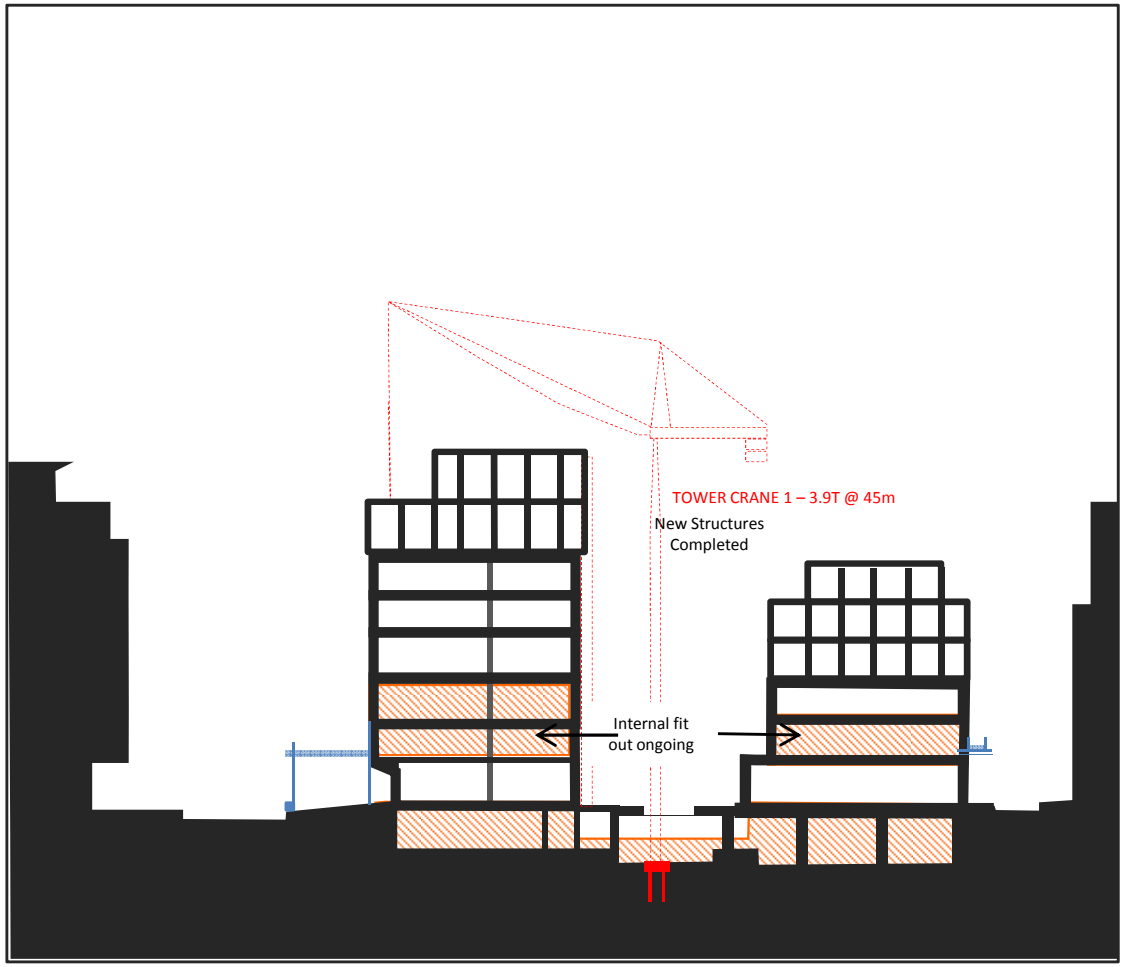
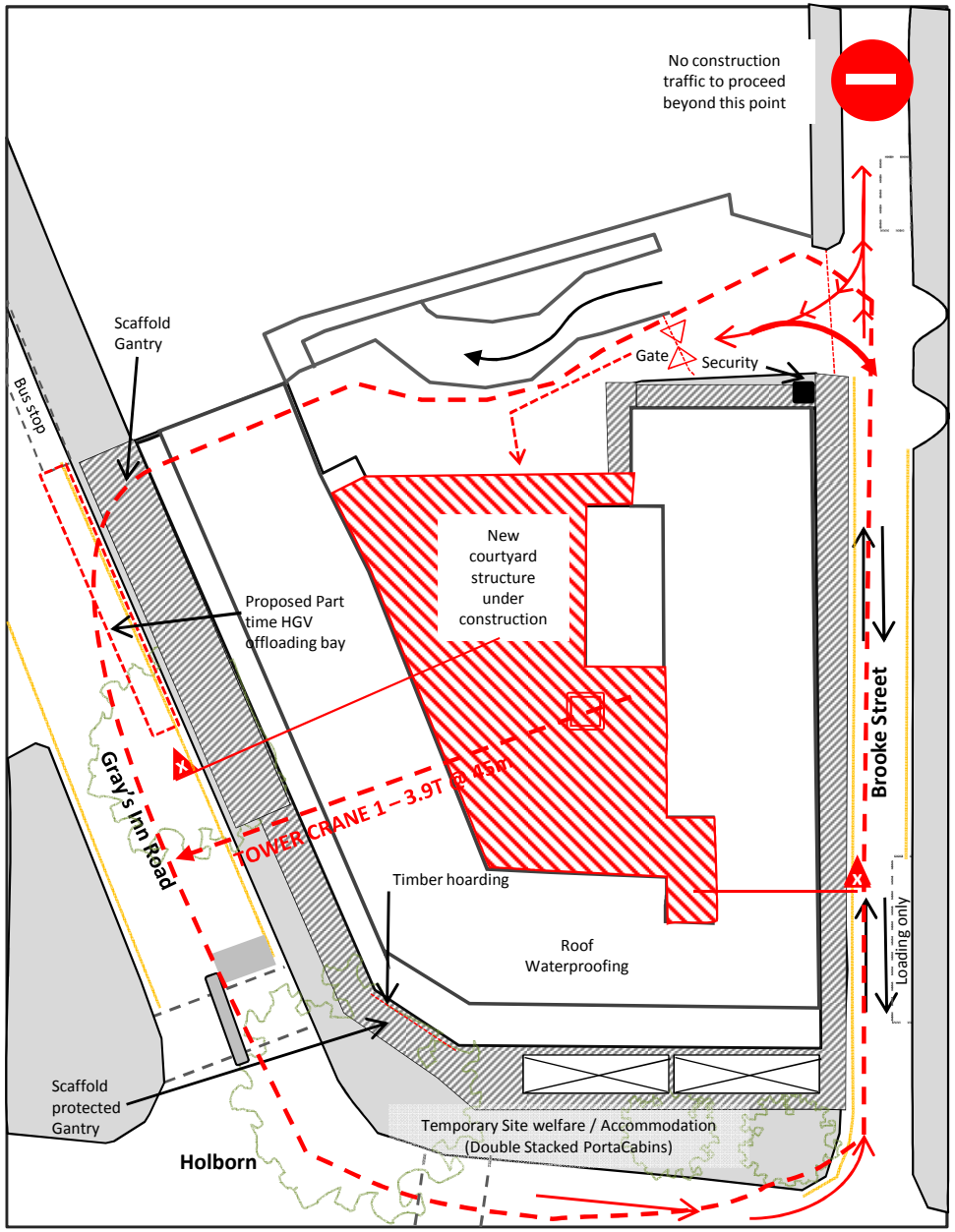


02. Section X-X

150 Holborn
Sequence Drawing 5- Initial fit out works

Drawing Title:	**Sequence 5**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/006**

ARUP



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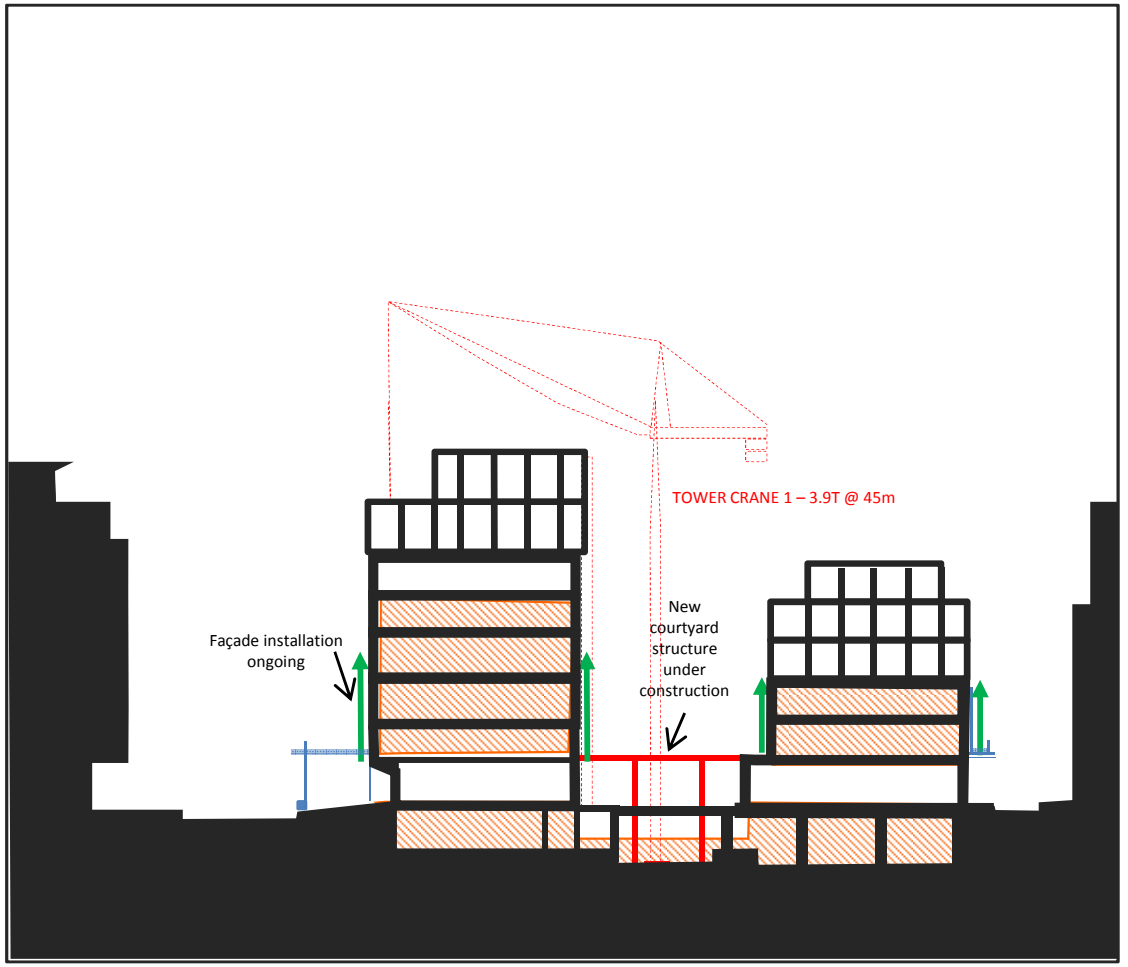
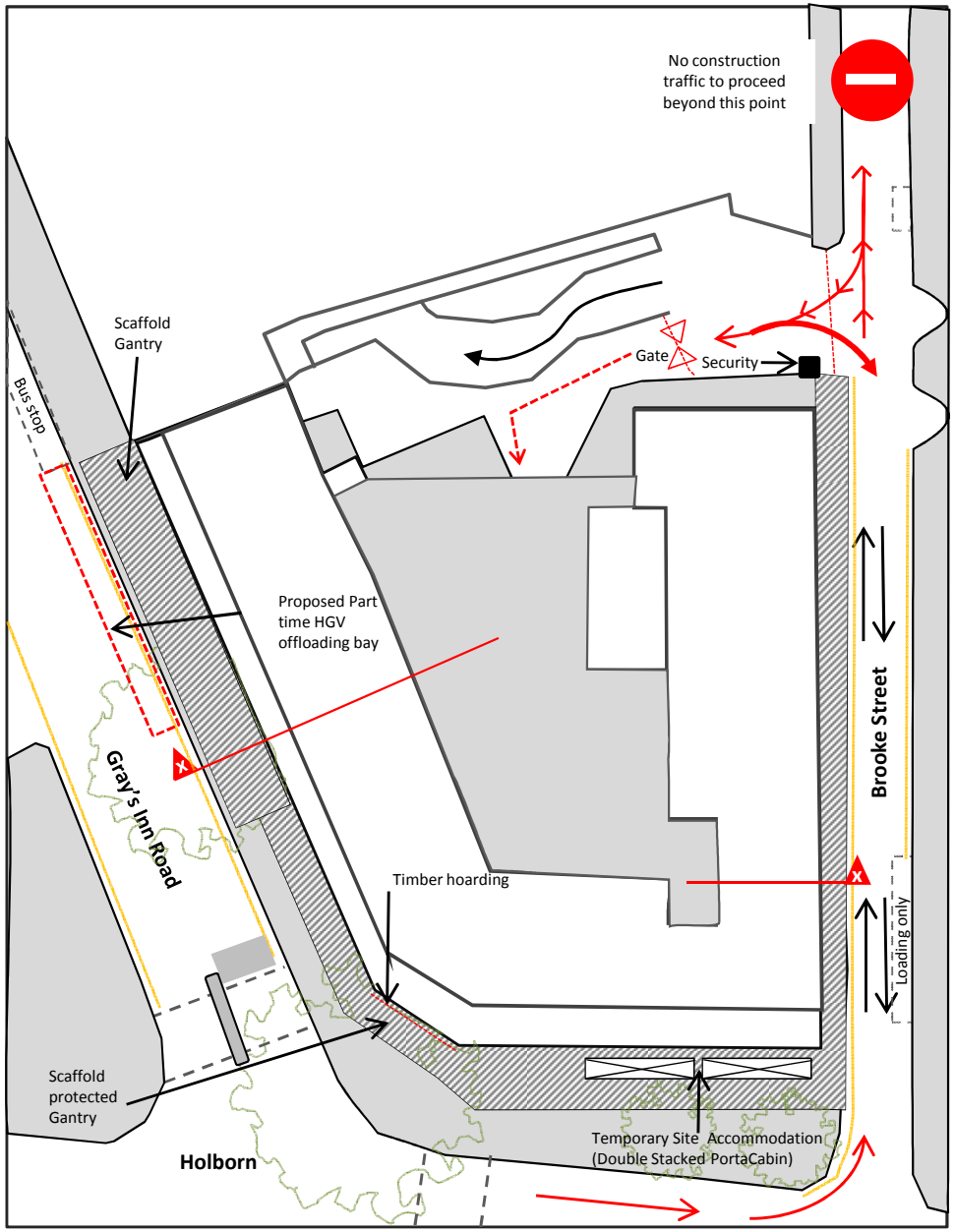


02. Section X-X

150 Holborn
Sequence Drawing 6 – External Cladding

Drawing Title:	**Sequence 6**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/007**

ARUP



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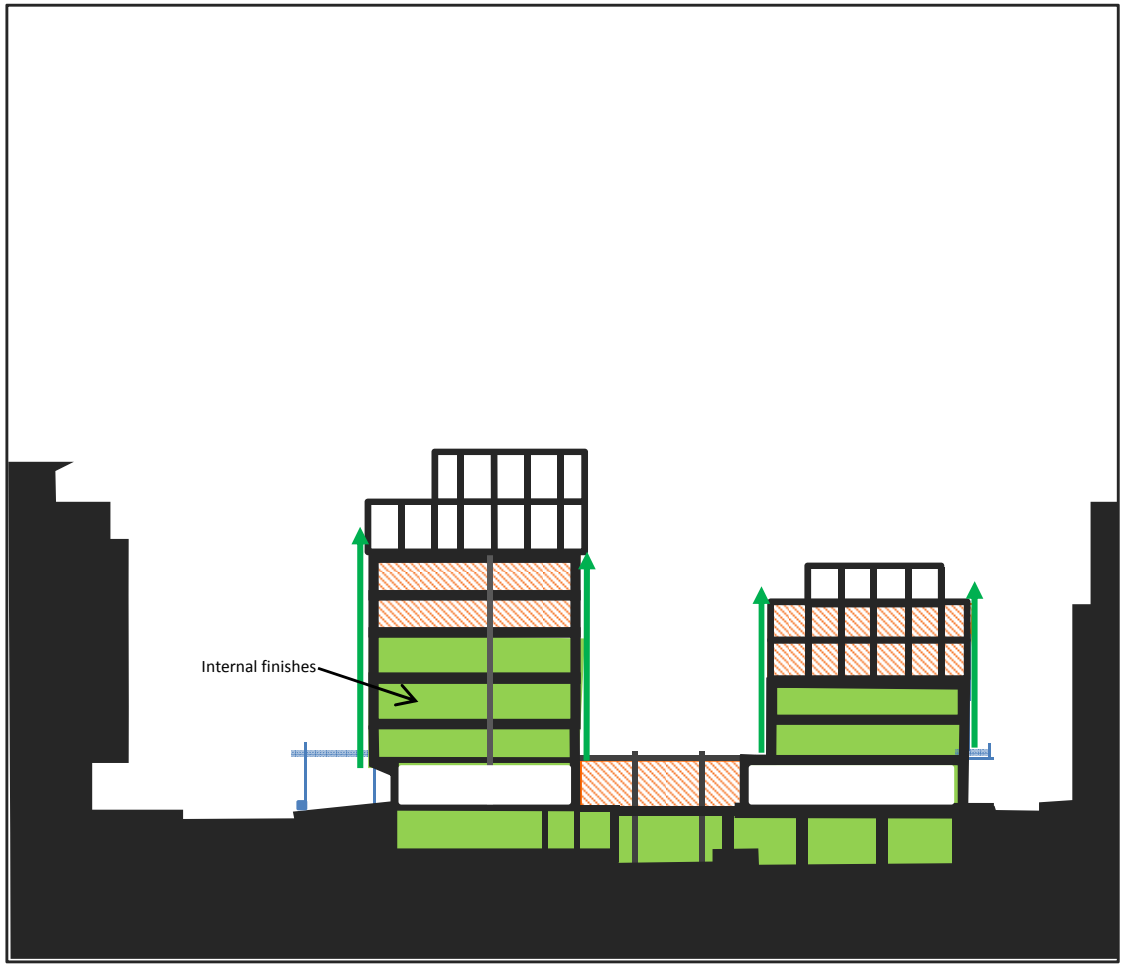


02. Section X-X

150 Holborn
Sequence Drawing 7 – External cladding to completion & internal fit out

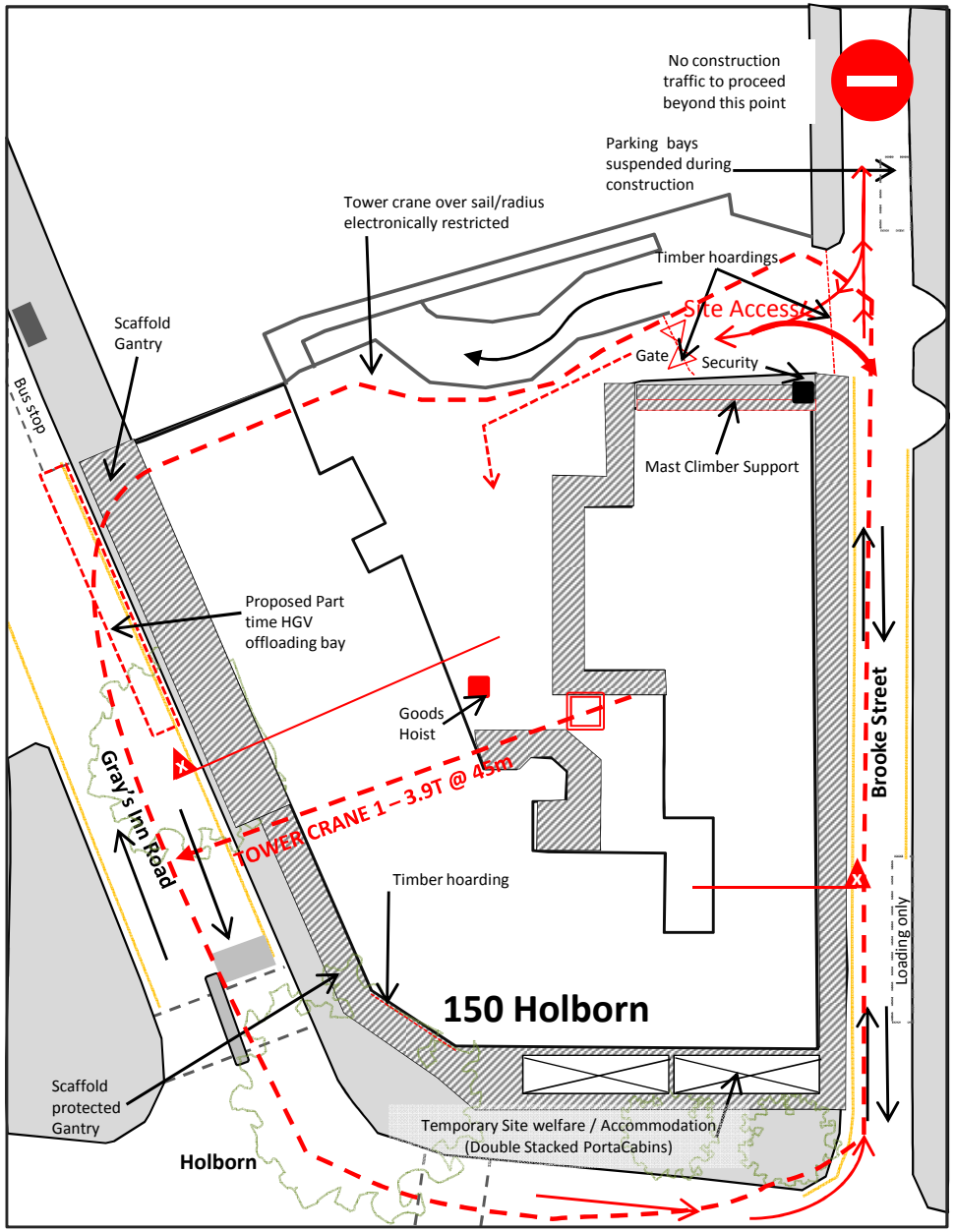
Drawing Title:	**Sequence 7**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/008**

ARUP

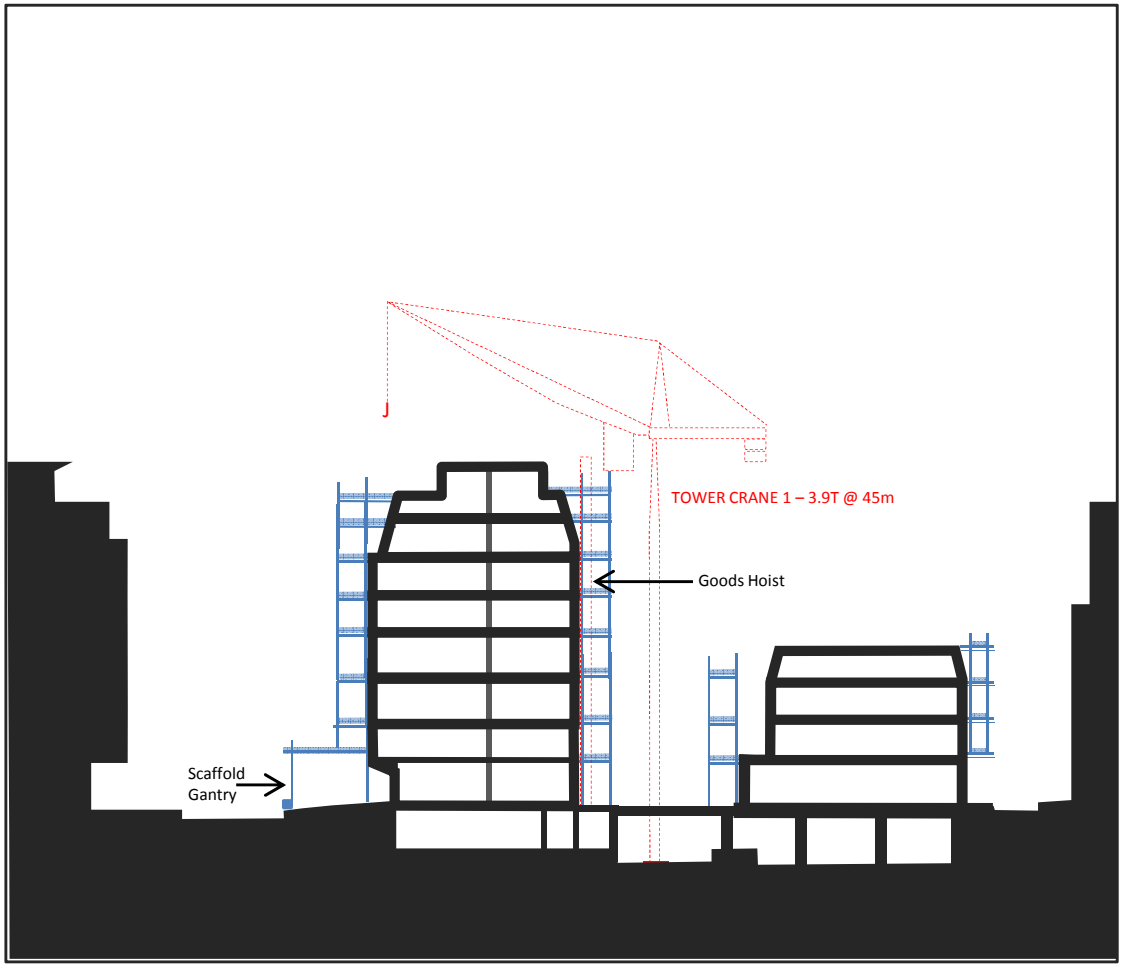
3.4 Site Layout

The following drawings set out the proposed site layout during the construction phase.

Drawing numbers; ARUP/PL/SK001 & SK011 are attached overleaf.



01. Ground Floor Plan



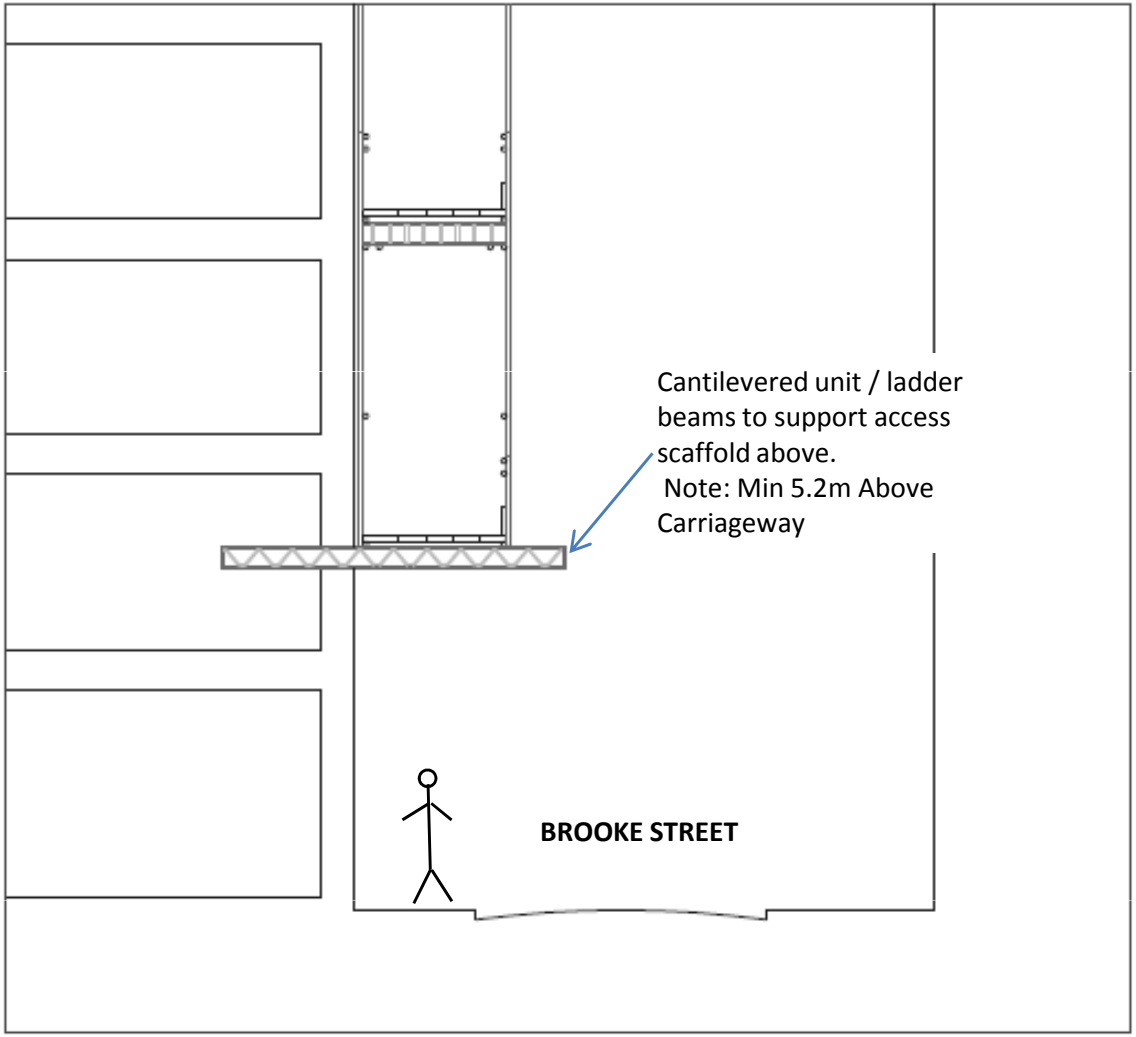
02. Section X-X

Overall site Layout

Drawing Title:	**Site Layout**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/001**

ARUP

SECTION Through Scaffold over hang along Brooke Street



150 Holborn **Pedestrian protection solution / indicative scaffold support along Brooke Street**	
Drawing Title:	**Pedestrian protection**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/011**

ARUP

3.5 Code of Construction Practice

The site will conform to LB Camden Code of Considerate Contractors Standards as noted within the document "Guide for contractors working in Camden" dated 2008, and be registered with the Considerate Constructors Scheme. These schemes encourage contractors to carry out their operations in safe and considerate manner, with due regard to residents, passing pedestrians and road users.

3.6 Neighbourhood liaison

A key aspect of the successful management of the project will be to establish and maintain good relationships with all site neighbours. Once a contractor has been appointed, a construction liaison group will be established with nearest neighbours and those who would be affected by the demolition and construction works.

Prior to commencement of works a single point of contact, (usually the contractors Construction or Logistics Manager) will be established for neighbouring residents. This person will be named at the site entrance, with a telephone number for queries/complaints. Outside normal working hours, site security will act as the main point of contact via a dedicated phone number. Security will alert the Construction or Logistics Manager if necessary (available 24 hours). The Construction or Logistic Manager will keep accurate records of complaints received, which will be made available to LB Camden for inspection.

The Construction or Logistics Manager will inform local residents likely to be affected by the impact of construction activities, such as erecting scaffolding/hoarding, operating mobile cranes, aerial platform operations, concrete pump lorry or any such equipment and shall advise of these planned events with suitable notice.

In the event of unusual activities or events that can be anticipated, these will be notified to LB Camden, and to relevant property owners or occupiers, wherever possible, in advance of the activity which will include:

- Commencement of construction in certain areas
- Road or footpath closures/diversions and movements of wide loads
- Actions requiring monitoring by LB Camden
- Work on or affecting land used by others; the contractor will inform LB Camden as soon as reasonably practicable, should any emergency works arise at short notice, confirmed as essential for reasons of safety, which could cause environmental disturbance.

3.7 Demolition and Enabling Works

All demolition and construction works will be carried in accordance with the LB Camden "Code of Construction Practice" and "Guide for contractors working in Camden" dated February 2008.

Additionally the contractor will be required to actively participate in the Considerate Constructors scheme.

Soft strip works to the internal floor plates will be the initial demolition activity. This will be carried out in parallel with a destructive asbestos survey to ensure that any remaining material is identified and correctly removed and disposed of in accordance with current H&SE guidelines and the specialist contractor's working method statements.

Prior to commencing demolition, the demolition contractor will ensure that all of the utilities have been disconnected in the locations to be demolished.

Protective scaffold gantries will be erected to the entire external perimeter of the site from the onset of demolition up until the completion of the external envelope works. The gantries will be constructed in line with LB Camden Highways department guidelines (i.e. timber hoardings, double boarded/ sheeted gantry roofs, adequately lit, etc).

Special attention will need to be paid to the operational incumbent businesses at Ground floor level, which will remain trading throughout the demolition and construction works.

3.8 Plant and Equipment

Consideration has been given to the type of plant that is likely to be used during the demolition and construction works. The anticipated vehicle type and use as well as the plant and equipment associated with the construction process are set out in the table below.

SUMMARY OF VEHICLE TYPE, USE AND DISTRIBUTION		
Vehicle Type	**Use**	**Distribution**
Rigid Heavy Goods Vehicle	Demolition arisings, Excavated material Removal	Strategic road network to motorway
Small Articulated Vehicle	Plant, steelwork, bricks and cladding panels	Strategic road network to motorway
Specialised Articulated HGV	Tower crane erection & dismantle, Mechanical & electrical Plant, Cladding panels. Roofing materials	Strategic road network to motorway
Specialised Equipment Low Loader	Occasional Delivery of Plant	Strategic road network to motorway
Vans	Plant service, materials, other Suppliers. Existing tenants deliveries	Distributed to local and strategic network
Cars	Occasional deliveries, couriers etc	Distributed to local and strategic road network

ESTIMATED TYPES OF PLANT AND EQUIPMENT FOR DEMOLITION AND CONSTRUCTION				
Plant	**Demolition**	**Substructure**	**Superstructure**	**Fit out**
Excavators / with hydraulic cutting shears	√	√		
Mini / Tripod piling rigs		√		
Excavators	√	√		
Compressors	√	√	√	√
Muck away lorries	√	√		
Hoist	√	√	√	√
Tower crane	√	√	√	
Mobile concrete pump		√	√	
General waste skips	√	√	√	√
Power tools	√	√	√	√
Delivery Vehicles	√	√	√	√
Forklifts	√	√	√	√
Scaffold access Platforms	√	√	√	
Mobile towers	√	√	√	√
√ **Indicates plant will be used during that stage of the works**				

3.9 Potential Impacts during construction and demolition

A review has been undertaken of the potential source of adverse impacts which can be associated with carrying out demolition and construction works. The results of this are presented in the table below;

POTENTIAL IMPACTS AND HEADLINE MITIGATION MEASURES DURING DEMOLITION AND CONSTRUCTION

Issue	Potential Impacts	Mitigation
Noise	Increased road noise levels from vehicles. Increased noise levels from plant during demolition, piling and general construction works (e.g. from the use of air compressors and diamond cutters).	Defined working hours, baffles to certain plant, local acoustic screening.
Vibration	Increased vibration levels from vehicles. Increased vibration levels from plant during demolition, piling and general construction works.	Phased deliveries to minimise numbers of vehicles attending site,
Dust / Air Quality	Windblown dust from ground surfaces, stockpiles, vehicles, work faces and cutting and grinding of materials. Exhaust emissions from lorries and plant delivering and removing materials including dust and particulates.	Cover all open backed vehicles, 'water down' demolition activities; switch off vehicle engines when parked.
Waste	Waste generation and its disposal.	Instigate Site Waste management Plan and re-cycling programme
Water	Increased sediment loadings to storm-water system. Potentially contaminated storm-water runoff.	Do not allow direct discharge of water into sewerage collection system.
Traffic	Traffic congestion caused by site traffic. Local traffic diversions will be required for tower crane erection and dismantle and mobile crane lift Increased vehicle movements mainly consisting of Heavy Goods Vehicles (HGVs). Nominal levels of transfer of mud and material from vehicles onto the public highway. Disruption from abnormal or hazardous loads. Exhaust emissions.	Phased deliveries to minimise numbers of vehicles attending site, switch off vehicle engines when parked, minimise abnormal loads.
Storage of fuels and construction materials	Accidental spills, discharges to drains/storm-water systems. Contamination to ground.	All fuel tanks etc to be bunded, no discharge allowed into the sewerage collection system.
Pedestrian access	Restrictions on pedestrian access to walkways, footpaths and roads.	Erect protective gantries / pedestrian tunnels over footways.
Hazardous and contaminated materials	Exposure of the workforce to deleterious / hazardous materials and contaminated land, mobilisation of any source contaminants and creation of pathway from source to groundwater receptor.	Site investigation reports indicate that no contaminated fill is present. COSHH assessments and careful implementation of associated working method statements to ensure that no hazardous materials find a path to groundwater source.
Ecology	Water / mud runoff into the drains.	Do not allow direct discharge of water into sewerage collection system, utilise interceptors where necessary.
Energy Usage	Indirect impacts associated with energy consumption such as CO2 emissions, depletion of natural	Site environmental plan to implement.

	resources, air pollution etc.	
Views	Views impacted and/ or impeded from construction equipment, particularly cranes.	Tower crane to be positioned within the service yard area and will have minimal impact upon adjacent views

3.9.1 Mitigation Measures

3.9.1.1 Demolition and Construction method statement

A contractor will be appointed to act as a Principle Contractor to develop and implement a Demolition and Construction Method Statement (DCMS).

The DCMS will be a contractual document outlining the different procedures to be undertaken to complete the various elements of the works. Individual subcontractors will incorporate requirements for environmental control, based on good working practice, careful programming, resource conservation, adhering to health and safety regulations and quality procedures.

In this way those involved with the demolition and construction phase, including subcontractors and site management will be committed to adopt the agreed best practice and environmentally sound methods.

Subcontractors will be required to demonstrate how they will meet the various targets of the DCMS and how the potential impacts will be offset, reduced or minimised.

The DCMS will include the following main items:

- The Demolition and Construction Programme
- A broad plan of the demolition and construction works highlighting the various stages and their context within the project
- Detailed site layout arrangements (including requirements for temporary works), plans for storage, accommodation, vehicular movements, and delivery access and egress routes
- Prohibited or restricted operations (locations, hours, etc)
- Details of operations that are likely to result in disturbance, with an indication of the expected duration of each phase with key dates, including a procedure for prior notification to LB Camden and relevant statutory and non- statutory (including neighbours) parties so that local arrangements can be agreed
- Responsibilities under the Council's document "Guide for Contractors working in Camden" dated February 2008. Or the Considerate Contractors Scheme and Neighbour and Public Relations Strategy
- A procedure to ensure communication is maintained via the contractor with LB Camden and local community to provide information on any operations likely to cause disturbance (through for example; meetings and newsletters)

3.9.1.2 Management of Noise, Vibration and Dust

Industry accepted good practical means of preventing; reducing and minimising noise will be adopted in agreement with LB Camden.

Appropriate procedures will be followed in order to mitigate noise, vibration and air pollution (e.g. through dust and fume generation) impacts.

Measures currently planned include:

- No works will be undertaken outside the specified working hours; except in cases of emergency, where safety is an issue, or where conditions of dispensation apply.
- The contractor will comply with the requirements of the COPA 1974, with particular reference to Part III of the Environmental Protection Act 1990, The Control of Noise at Work Regulations 2005 and the Health and Safety at Work Act 1974;
- All plant and equipment to be used for the works will be properly maintained, silenced where appropriate to prevent excessive noise and switched off when not in use and where practical;
- Hydraulic demolition and construction will be used in preference to percussive techniques where practical;
- The contractor will erect and maintain throughout the demolition and construction period, temporary hoarding around all working areas to assist in the screening of noise and dust generation from low-level sources
- Plant will be certified to meet relevant current legislation and Noise and Vibration Control on Construction and Open Sites (BS 5228)
- All subcontractors will be made familiar with current noise legislation and the guidance in BS 5228 (Parts 1 and 2) which will form a prerequisite of their appointment
- Loading and unloading of vehicles, dismantling of equipment such as scaffolding or moving equipment or materials around the site will be conducted in such a manner as to minimise noise generation
- Noise complaints, or exceeding of agreed levels will be reported to the contractor and immediately investigated

Vehicles transporting materials, capable of generating dust, to and from site will be suitably sheeted on each journey to prevent the release of materials and particular matter

3.10 Working hours

The hours of work will be in accordance with the code of Considerate Contractor Standards as noted within the document “Guide for contractors working in Camden” dated February 2008.

The working hours will be:

8.00am -6.30pm Monday to Friday and

8.00am -1.00pm Saturday.

It will not be usual to work on Sundays or bank holidays.

Exceptional operations (Such as tower crane erection / dismantle) will be carried out outside of these hours and will be notified by the contractor's construction or logistic manager.

Site floodlighting will be switched off at night to conserve energy and to minimise potential nuisance to neighbours. General internal site access route will however remain illuminated at the appropriate levels to ensure safe passage around site for security personnel.

3.11 Welfare

Welfare facilities will be provided in line with H&SE guidelines. All areas of the building will either be subject to demolition / construction works or occupied by others, so opportunity to situate adequately sized welfare facilities within the building footprint will be very limited.

The contractor will need to site welfare accommodation above the protective scaffold gantry that will be erected to Holborn as indicated on our sketches ARUP/PL/SK/001 -SK008 (inc.).

3.12 Workforce

From our experience of projects of a similar size, we would estimate that the workforce levels will peak at around 150 operatives on site.

3.13 Construction Personnel travel arrangements

In order to support efforts to minimise the effects of construction traffic on the surrounding highway network, there will be no car parking provision on site for construction workers. Construction personnel would therefore be encouraged to use other forms of transport to travel to the site. Given the site's proximity to excellent public transport services, it is envisaged that the majority of construction personnel would travel to the site by public transport.

Certain trades may require short-term parking for vehicles due to the transportation of specialist equipment/ plant requirements. Limited parking will be provided on site, but only for this purpose.

3.14 Site security

The ground floor perimeter of the building is generally secured by the operational businesses. The new entrance hall area and the site entrance to the service yard area will require a 2.4m high timber hoarding with lockable gates to secure the site boundary. When the site is closed, all doors and gates will be locked shut. A manned security check point will be positioned at the entrance to the service yard when the site is open to control deliveries. Vehicle and personnel will be verified at this point before they are allowed to access and egress the site / service yard

area. There will be distinct access routes with physical barriers to separate pedestrians and vehicles.

External scaffolds will be alarmed with intruder detection devices which when activated will sound an audible intruder alarm as well as automatically alert an offsite security response unit.

4 Traffic Management

4.1 General

Provisions will be made wherever possible, to ensure that unloading of vehicles can be carried out on site rather than on the adjacent roads. Later on in the build process, their will be a need to use articulated lorries for delivery of materials (e.g. Structural steelwork, curtain walling) and their will need to be a provision for a temporary vehicle offloading area in Gray's Inn Road. We have indicated this offloading bay on our sketches ARUP/PL/SK/001 to SK/07 (inc.) and SK/11.It is anticipated that materials will be offloading directly from the articulated lorry by tower crane and lifted over the protective scaffold gantries, into the site.

All construction traffic entering and leaving the site will be closely controlled. Vehicles making deliveries to site or removing spoil or demolition material etc. will access the site from Holborn into the Service yard located off of Brooke Street.

Under no circumstances will vehicles be allowed to traffic into the residential areas to the North of the site on Brooke Street.

Deliveries will be phased on a "just in time" basis. This will minimise travel time, congestion and stockpiling of materials on the site.

4.2 Swept path exercise

Access to the rear service yard is shared by a number of businesses and these will need to remain operational throughout the construction work period. The vehicular access into the service yard is constricted.

We enclose drawings ARUP/PL/SK009 & SK010 which are swept path site models that footprint the reversing manoeuvre necessary to enter the site through the existing service yard area and to park. We have modelled two scenarios; a 13.5m articulated vehicle and 10m rigid vehicle.

The results demonstrate that the vehicles will have to be carefully reversed into the service yard area and that this manoeuvre will need to be managed by attendant contractor's logistics management, control personnel or banks men. The vehicles will need to be parked in a position away from the access ramp.

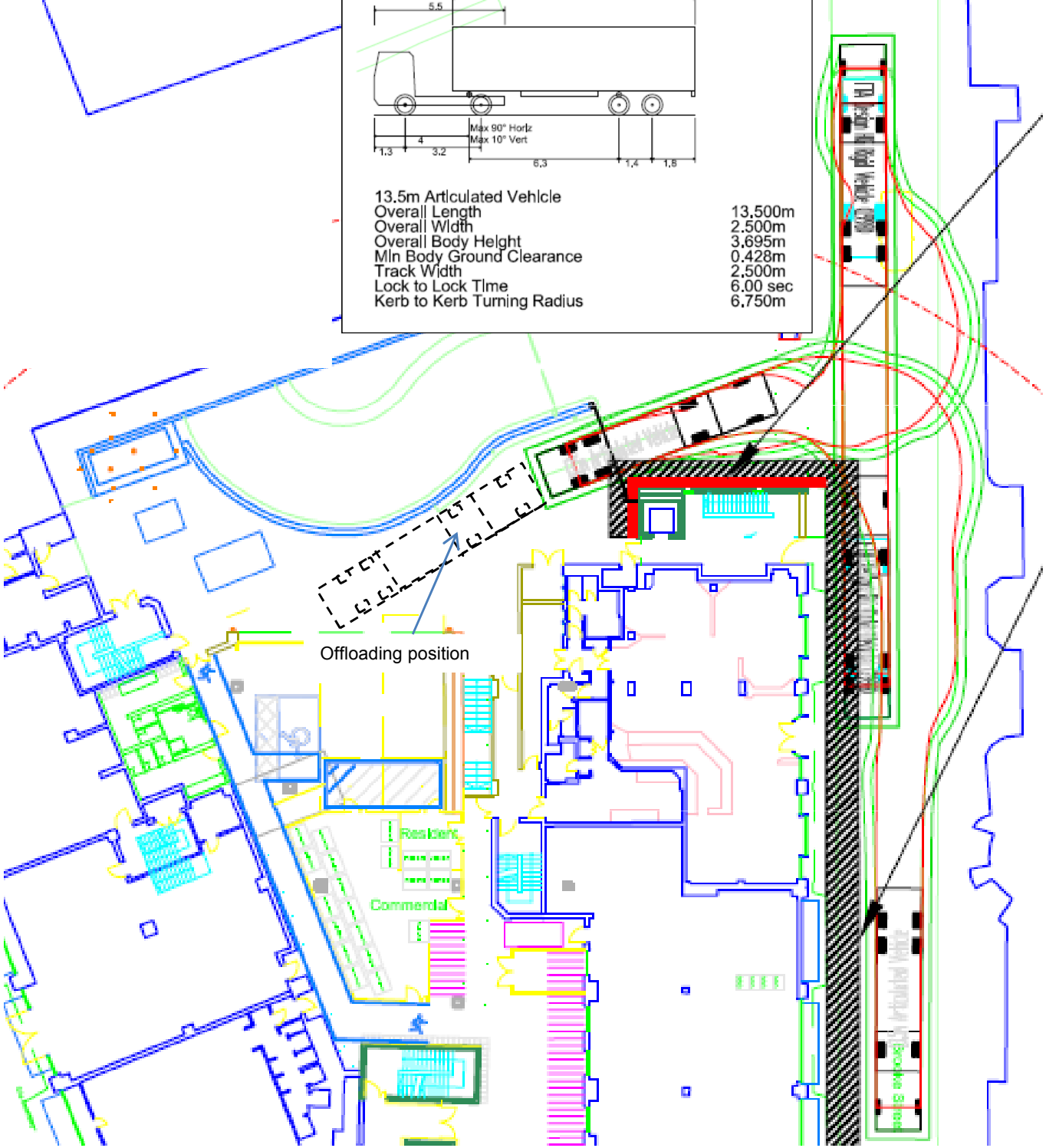
The swept path shows that access will necessitate that the articulated vehicle's cab may need to mount the footpath on both sides of Brooke Street to gain access.

These results would suggest a need to look at alternative arrangements for large deliveries to the site and to this end, we have proposed that a temporary vehicle offloading bay is created in Gray's Inn Road. This will be required for the period of the programme when reinforcement steelwork, structural steelwork and

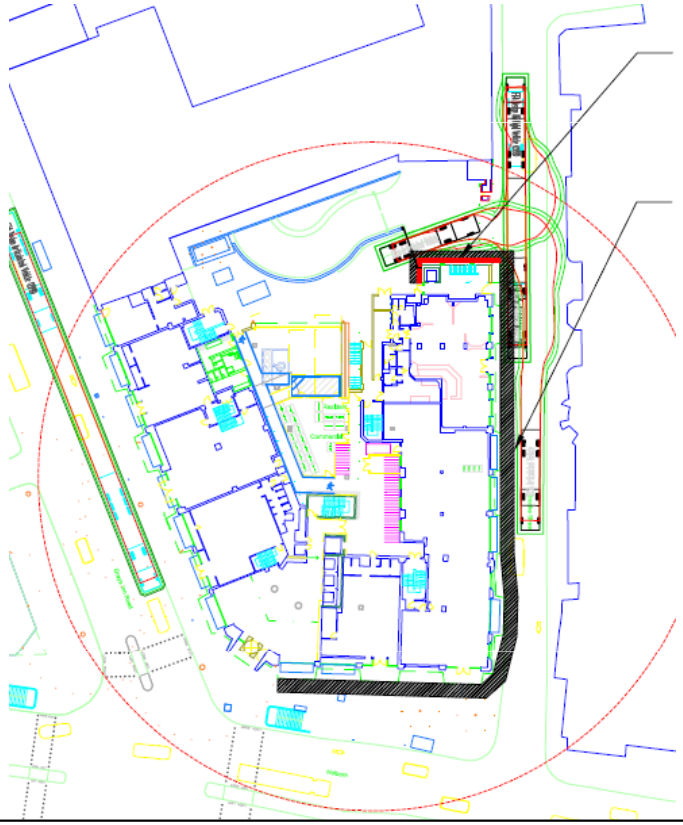
cladding panels are to be delivered to site and is indicated on sketches; ARUP/PL/SK002 to SK/008 (inc.).

Finalisation of the HGV delivery arrangement will be subject to further discussions with LB Camden Highways department.

Swept path drawing numbers; ARUP/PL/SK009 & SK010 are attached overleaf.



1.5m Wide gantry supported
By mast (0.5m zone for
recessed
mast support included).

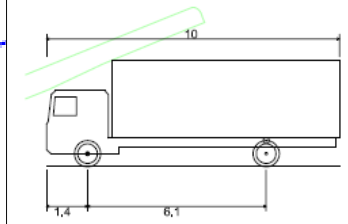


150 Holborn

13.5 Long Articulated vehicle – Swept path service yard Entry & egress

Drawing Title:	**Swept path 1**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/09**
Rev: A	

ARUP



FTA Design HG Rigid Vehicle (1998)

Overall Length	10.000m
Overall Width	2.500m
Overall Body Height	3.645m
Min Body Ground Clearance	0.440m
Track Width	2.470m
Lock to Lock Time	3.00 sec
Kerb to Kerb Turning Radius	11.000m

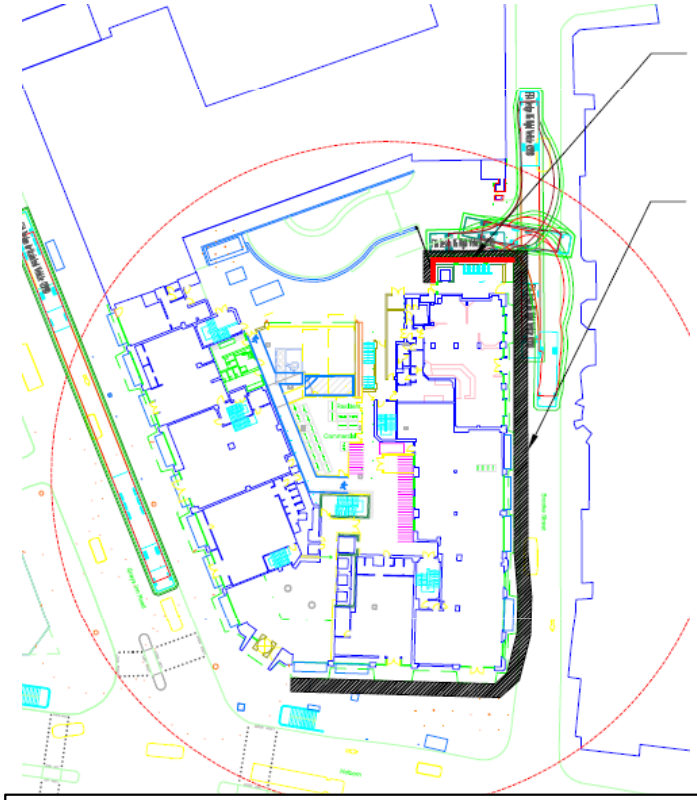
1.5m Wide gantry supported
By mast (0.5m zone for
recessed
mast support included).

Offloading position

Resident

Commercial

Brooke Street



150 Holborn

10m Long Rigid vehicle – Swept path service yard Entry & egress

Drawing Title:	**Swept path No2**
Drawn by :	YK
Date:	12/07/2011
Drawing Number:	**ARUP/ PL/SK/10**
Rev: A	

ARUP

4.3 On site servicing bays

The service yard is a shared use area. The current fire escapes from the businesses at ground and first floor will need to be maintained throughout the construction programme. We would anticipate that the fire escape routes that are currently defined by painted markings on the service yard would be defined and physically separated from the construction site by means of lightweight covered scaffold tunnels. The route of which will be adapted to suit demolition and detailed construction phasing

In addition provision will need to be made for servicing the day to day delivery needs to support their operation. Physical barriers will need to be put into place through the construction period when shared use of the service yard is required.

4.4 Average deliveries per day

The construction traffic prediction is based on the following empirical vehicle movements per day during the respective phases:

- Demolition 8 loads per day (16 vehicle movements)
- Concreting 6 loads per day (12 vehicle movements)
- Cladding 4 loads per day (8 vehicle movements)
- Fit-out 4 loads per day (8 vehicle movements).

4.5 Construction Traffic network

4.5.1 Overview

As explained earlier in this document, heavy goods vehicles and service vehicles will be required to transport goods and materials to and from the site throughout the duration of the works.

Staff and operatives working on the site will generate additional demand for travel. These trips will be monitored and managed through the adoption of the Construction Management Plan to minimise the impact on the environment and local transport network.

The programme of works and associated generation of vehicle movements by staff/operatives and construction vehicles has been based upon a detailed exercise carried out by Arup. The deliveries histogram profile shows average number of deliveries per day during a weekly period and is attached in appendix 1

It should be noted that the peak period for traffic generation during construction is expected to occur in the period of project Months 21-23 (inc.)

4.5.2 Routes for Construction Traffic

The construction traffic routes that will facilitate the delivery of goods and materials to and from the proposed development site will need to be agreed with LB Camden and other relevant authorities (e.g. Transport for London) prior to construction activity commencing.

At this stage it is not possible to exactly determine the origin of construction traffic. However, it is reasonable to assume that the majority of construction traffic will use the strategic road network to reach the site. The routes are likely to include:

- From the north: The A1, A10 and M1
- From the east: the A11, A12, A13 and M11
- From the south: the A2 and A3; and M2 and M20
- From the West: the A40 and M40

In the immediate vicinity of the site, the main access to the site for vehicles is the A40 Holborn via Brooke Street (refer to Photo 1). **Figure 1 overleaf** shows the likely routes for construction related traffic in the local area.

Figure 1: Suggested Construction Routes for 150 Holborn Site

Photo 1: Brooke Street (south-facing view)

4.5.3 Construction Traffic Flows

As mentioned previously, construction traffic estimates have been calculated by loading estimated vehicle numbers across a detailed construction programme. Based on our calculations, the large construction vehicle estimates peak at approximately 8 large deliveries per day (16 vehicle movements), recorded for Project Month 22.

It is anticipated that deliveries will generally take place out of peak hours when flows on the local road network are lower.

Given that at its peak, construction related traffic will generate some 16 vehicle movements per day, it is considered that this level of additional traffic will not have a significant adverse impact on the capacity of the local highway network.

It is considered that the effects associated with the temporary increase in traffic resulting from construction activity can be mitigated by means of managing vehicle arrival and departure times, to achieve an even spread of movements during the working day.

As such, construction traffic represents a minor adverse effect for a temporary duration.

4.5.4 Mitigation Measures

Mitigation measures will be required to minimise the environmental effects associated with vehicle use and the transportation of construction materials. These include the minimisation of dust and water pollution through the following:

- All vehicle loads must be covered and securely fastened

- All vehicles must be properly serviced and maintained to avoid any leaks of oil or petrol. All vehicle maintenance should be undertaken off-site
- Drip trays should be placed under standing machinery to avoid oil and petrol spill
- The level of works to the substructure is minimal and we anticipate that a low level of mud will be generated from excavation operations. If there is however an issue with site cleanliness then on-site vehicle wash facilities, manual road scrapers or mechanical sweepers will be used to keep mud off of the roads.
- Management of deliveries to avoid peak highway traffic periods

5 Tree protection & conservation

There are three mature trees adjacent to the site, which are located on Gray's Inn Road and Holborn.

As a rule; the contractor will plan and execute the works to avoid any interference to trees wherever possible.

However, some of the branches from the trees along Gray's Inn Road may encroach into the future working area needed to safely install the external cladding to the building. As a consequence it may be necessary to carefully trim the extremities of the trees adjacent to the façade in this area (subject to confirmation of cladding methodology and subsequent site survey confirmation). The contractor will take guidance from an approved arboriculturalist prior to undertaking any works to trees. Works will be undertaken in accordance with BS 5837 2005 'trees in relation to construction' and BS 3998 2010 'tree work recommendations'.

6 Waste Management

A Site Waste Management Plan for the project will be developed and implemented.

Generally, the disposal of all waste or other materials removed from the site will be in accordance with the Site Waste Management Plans Regulations 2008 and requirements of the Environment Agency (EA),COPA, 1974, Environment Act 1995, Special Waste Regulations1996 , the Duty of Care Regulations 1991; and Environmental Permit requirements.

In accordance with the principles of the United Kingdom (UK) Government's "Waste Strategy 2000" , the Greater London Authority's (GLA) "Municipal Waste Management Strategy Rethinking Rubbish in London" (23 September 2003) and the Site Waste Management Plans Regulations 2008, a principal aim during demolition and construction will be to reduce the amount of waste generated and exported from 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, 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, which increases the risk of their damage and disposal as waste

• Attention to material quantity requirements to avoid over-ordering and generation of waste materials

• Re-use of materials wherever feasible, e.g. re-use of crushed concrete and brick from the demolition process for fill

• Segregation of waste at source where practical

• Re-use and recycling of materials off-site where re-use on-site is not practical (e.g. through use of an off-site waste segregation facility and re-sale for direct re-use or re-processing)

• Skips will be covered to prevent dust and debris blowing around the Site, and will be cleared on a regular basis

• Burning of waste or unwanted materials will not be permitted on-site

• All hazardous materials including chemicals, cleaning agents, solvents and solvent containing products will be properly sealed in containers at the end of each day prior to storage in appropriately protected and bunded storage areas

• As external envelope is progressed, the site generated rubbish will be collected in lightweight floor-based wheeled skips that can manoeuvre around the floor plates. The skips will then be taken to ground floor level by a goods hoist and if not already, will be sorted into different waste types such as timber, copper, metal, paints, plasterboard etc and either disposed of into larger skips, or if suitable, placed into a compactor to reduce the volume of the waste before it is taken off-site

• Asbestos containing materials (ACMs), if encountered, will be removed and disposed to an appropriately licensed landfill by a licensed contractor prior to the commencement of works

Prior to the removal of any asbestos, the Health and Safety Executive will be notified and the ACMs will be removed by competent persons under controlled

conditions to an agreed method statement and risk assessment and disposed of in accordance with the Control of Asbestos Regulations 2006

The asbestos removal specialists will undertake air monitoring and issue an air clearance certificate once it is safe to re-enter areas from where asbestos has been removed

Areas, which were not accessible during the asbestos survey, will be surveyed prior construction work commencing.

Notwithstanding the advance surveys, should any unforeseen asbestos be subsequently exposed, disturbed or suspected to be present during the site work, the area will be immediately sealed and the specialists contacted to ensure its safe removal.

All work will be carried out in accordance with the Contractor's Construction Health and Safety Plan.

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7 Conclusion

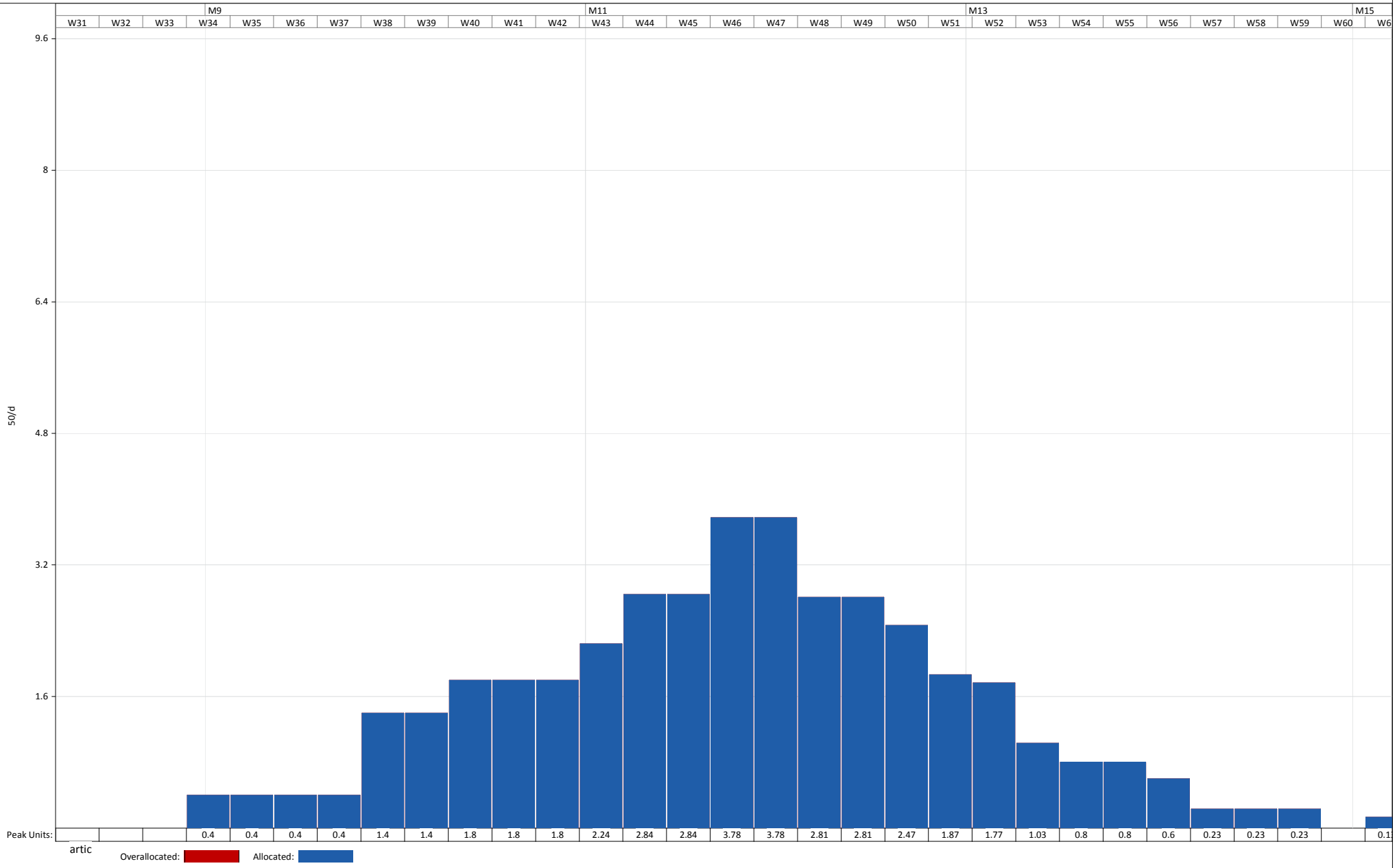
We have outlined an initial method of constructing the building and have endeavoured to identify and address the normal and understandable concerns with regards to the impact that the construction works will have on the immediate surroundings.
This document will be updated where appropriate throughout the duration of demolition and construction works by adopting a proactive approach to collaboration between the project owners and local residents, business's and the LB Camden and it is intended to be used as a working reference until Project completion.

Appendix 1 – Large vehicle deliveries histogram profile; average daily number of vehicles

150 Holborn , London

Average number of deliveries per day/ each week

ARUP

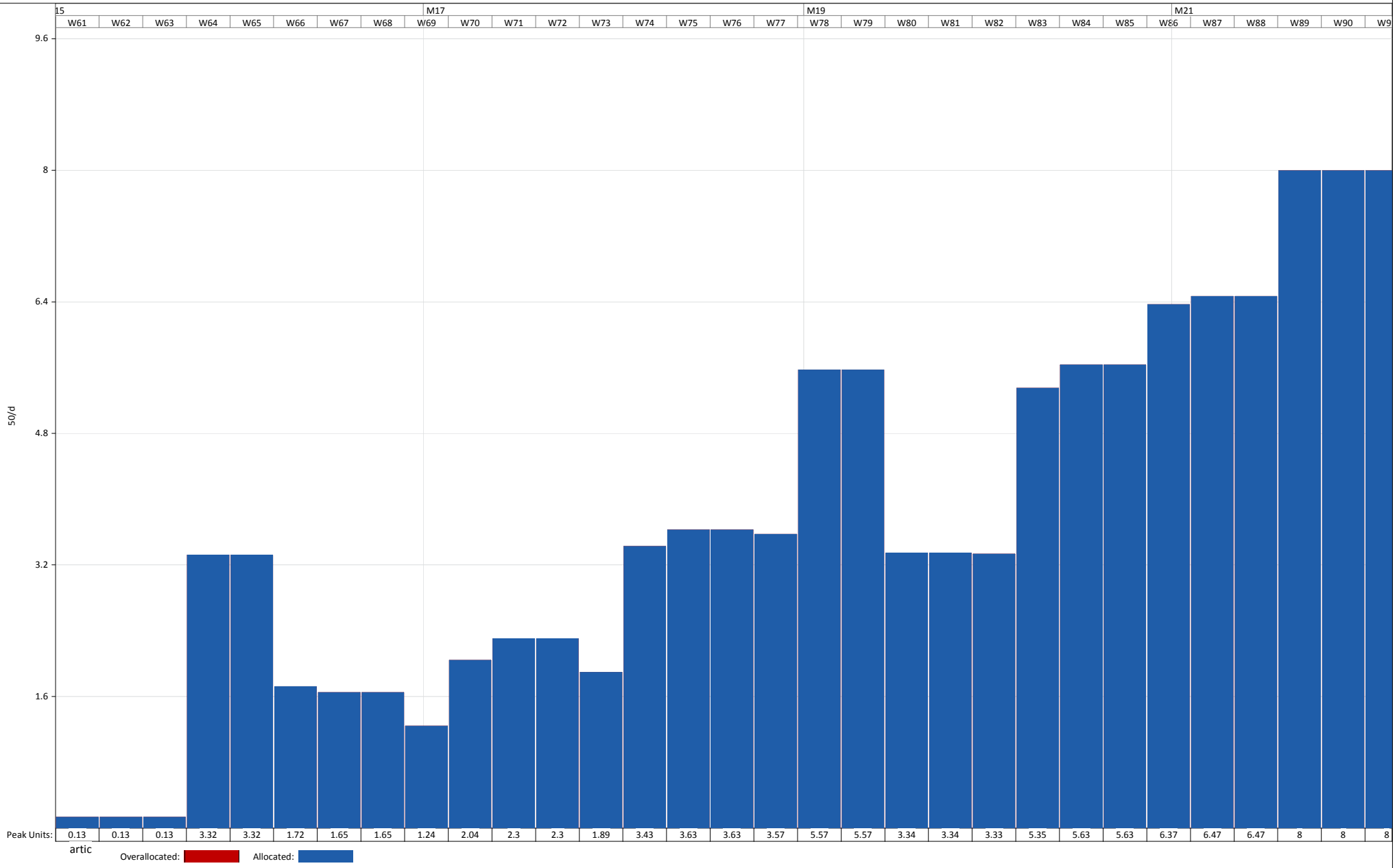


ARUP

150 Holborn , London

Average number of deliveries per day/ each week

ARUP

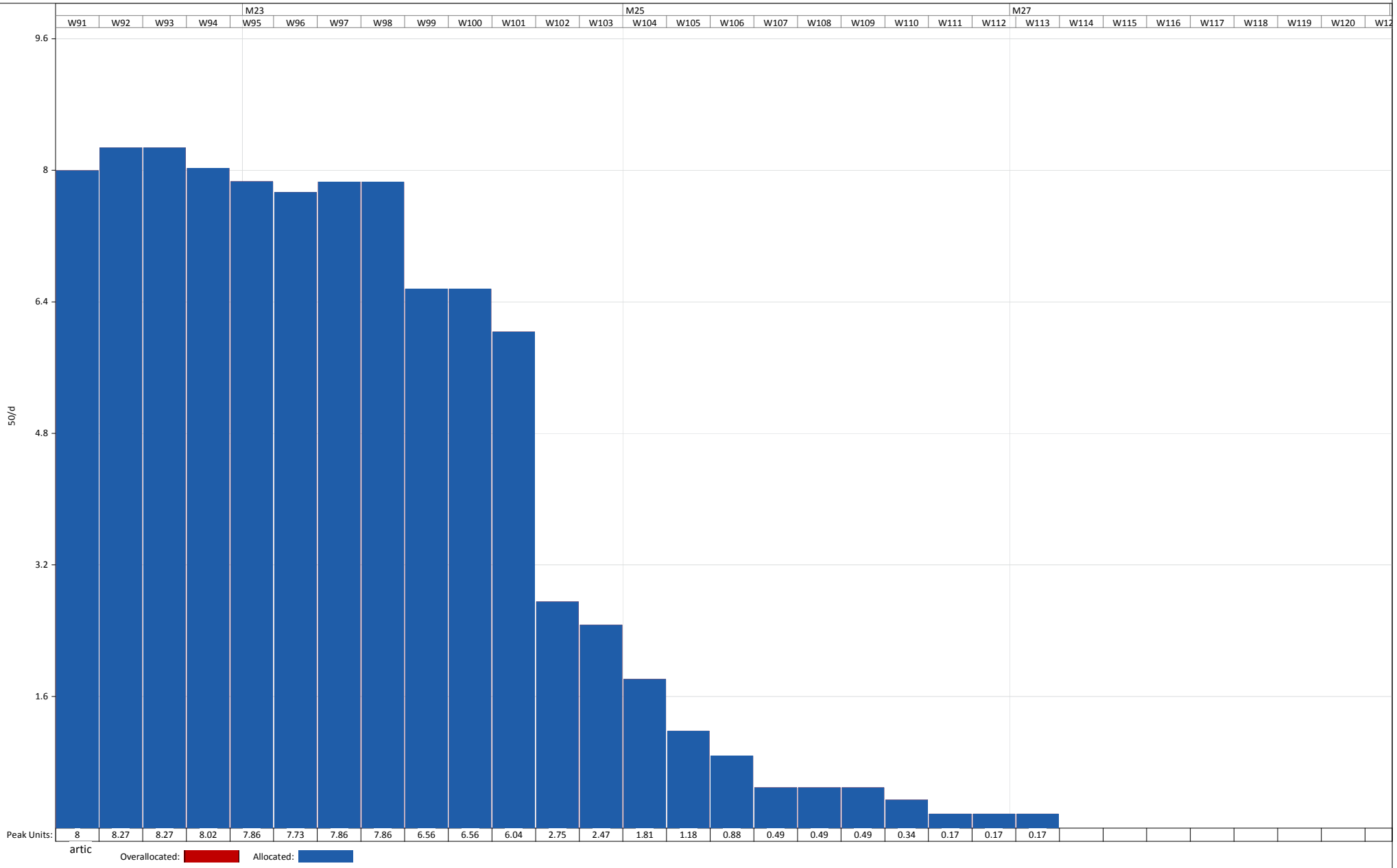


ARUP

150 Holborn , London

Average number of deliveries per day/ each week

ARUP



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