

IMPERIAL COLLEGE LONDON

St MARYS CAMPUS

**DELIVERY AND LOADING GUIDE
FOR SAFE APPLICATION OF MOBILE LIFTING
EQUIPMENT WITHIN THE COLLEGE CAMPUS**

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2	May 2017	General Revision	IACW
3	June 2020	General update in respect of the use of truck mounted cranes and the use of forklifts and teleporters.	IACW
4	May 2022	TBA	

1.0 Introduction

The purpose of this document is to protect the staff, students, visitors and general public at Imperial College London (College), their assets and its environs, during lifting operations involving mobile cranes and tower cranes, by Contractors within the confines of the College. This includes the use of truck mounted lifting equipment, hydraulic access platforms, fork lifts and teleporters.

This specification defines areas within the College where there are restrictions on the use of lifting equipment, and notifications of hazard areas where it is recommended that no equipment lifting takes place or is only allowed to proceed with additional protection.

The College shall ensure that alternative provisions for means of escape in case of fire are provided, where necessary.

The specification does not apply to the loads on to a public highway, except where over College vaults.

The normal contractual obligations of the Contractor and lifting equipment supplier shall not be reduced by this specification and all lifting operations shall comply fully with the relevant legislation.

The Director of Estates Operations is responsible, on behalf of the College, for agreeing that the lifting operations may take place. The College Appointed Structural Engineer is the person appointed by the College to ensure that the requirements of this document are carried out.

2.0 Imperial College Policy Requirements

2.1 Imperial College Requirements

Imperial College policy is to comply with all current legislation for all lifting operations throughout all campuses. Imperial College also requires all personnel connected with the delivery and lifting operation to be suitably qualified.

2.2 Legislation Governing Lifting Operations

- 2.2.1** The Health and Safety at Work Act (1974).
- 2.2.2** Lifting Operations and Lifting Equipment Regulations LOLER.
- 2.2.3** Construction (Design and Management) Regulations 2015.
- 2.2.4** The Provision and Use of Work Equipment Regulations (including all amendments and statutory implications). PUWER.

2.3 Imperial College Objectives

- 2.3.1** The principal objective of Imperial College is to ensure that all lifting operations are carried out in a safe and efficient manner, with minimum disruption to the College Students, Staff and the general public, without increasing the risk to the College Community.

2.4 Imperial College Liaising

2.4.1 The College Building Manager shall liaise with the Imperial College NHS Trust Operations Manager. The College Building Manager will obtain in writing the Trust's consent for the lifting operation, this consent will be forwarded to the Project Manager.

2.5 Imperial College Environmental considerations

2.5.1 All engines shall be switched off when not in use, for the purposes of bringing into service, lifting operations or de-rigging of the crane and its associated vehicles. This applies to all engine powered equipment.

2.5.2 No vehicle shall be left unattended with the engine running

2.5.3 No vehicle shall have its engine running when not in use.

3.0 Roles and Responsibilities

3.1 Imperial College staff

3.1.1 Director of Estates Operations, has the final responsibility for agreeing the lift operation and date.

3.1.2 Project manager
Responsible for ensuring that all the necessary notifications and consents have been obtained prior to the lifting operation. The College Project Manager will pass all the information on to the College Appointed Engineer, for their comments. The College Project Manager is responsible for ensuring that the Estates Operations Director is fully informed in respect of all aspects relating to the specified lifting operation. The College Project Manager shall ensure that all the products/equipment to be lifted have been checked and passed fit for purpose.

3.2 Imperial College Consultants.

3.2.1 The Consultants are responsible for ensuring the specified product is fit for purpose. This includes checking the products/ equipment to be lifted. Contact details will be provided to the College Appointed Engineer in case there are any queries to be raised.

3.2.2 The College Appointed Engineer for the Lifting operation has to ensure that the College parameters are fully complied with and reports directly to the College's Project Manager, the Director of Estates Operations and the Head of Health and Safety-Estates Projects.

3.3 Imperial College's Duty

The College Building Manager shall fully inform the Imperial College NHS Trust Operations Manager and agree lift dates for onward transmission to the College

Project Manager.

3.4 Imperial College Contractor's Duties

- 3.4.1** The Contractor's Site Manager shall ensure that all the necessary Documentation and consents have been obtained and sent to the College Project Manager in accordance with the table below. Note that this table is the minimum period time prior to notification of the use of any of the specified lifting equipment below:-

Crane lifting operations	Must be presented and agreed at the monthly Campus co-ordination meeting
All vehicles associated with Crane lifting operations, including the delivery vehicles.	Must be included in the Monthly Campus co-ordination meetings.
Truck mounted cranes delivering building materials.	Two days clear notice to the Building Manager.
Mobile Hydraulic access platforms for maintenance and repair	Must be presented and agreed at the monthly Campus co-ordination meeting
The use of fork lift and teleporters machines to move building materials either around the Campus or to deliver materials.	Two days clear notice to the Building Manager.
Delivery of plant and equipment to the Campus	Two days clear notice to the Building Manager.

The Contractor's site manager must ensure that the information presented is correct and includes all the vehicles have been correctly identified and the registration numbers provided to the Campus Car Park and Fleet administrator. Access to the Campus will be denied in the correct information is not provided in accordance with the above requirements.

- 3.4.2** The Contractor's Site Manager shall ensure that all the necessary Documentation and consents have been obtained and sent to the College Project Manager. The Contractors site manager is responsible for ensuring that the Contractor's Safety Officer has checked all the necessary documentation prior to the College submission.
- 3.4.3** The Contractor's Safety Officer is responsible for the safety of all site lifting operations.
- 3.4.4** The Contractor's Site Manager shall ensure that all the requirements for the lifting operation are in place prior to the commencement of the works.
- 3.4.** The maximum length of delivery vehicle shall not exceed 12.0m

3.5 Contractor's Staff

- 3.5.1** The Contractor's site manager shall ensure that all the necessary documentation and consents have been obtained and sent to the College Project Manager. The Contractors Site Manager is responsible for ensuring that the Contractor's Safety Officer has checked all the necessary documentation prior to the College submission.
- 3.5.2** The Contractor's safety officer is responsible for the safety of all site lifting operations.
- 3.5.3** The Contractor's site manager shall ensure that all the requirements for the lifting operation are in place prior to the commencement of the works.

4.0 Procedure for Approval of Contractors Lifting Operations

4.1 Notification

Crane lifts should be discussed at the monthly Campus Co-ordination meeting so that they can be coordinated with any other works on-going around the Campus. Any emergency crane lifts should be discussed and agreed with the Director of Estates Operations.

For the St Mary's Campus lift, request should be discussed 21 days in advance with Imperial College Building Manager. Imperial College Building Manager will discuss the proposed lifting arrangements with the appropriate IMPERIAL COLLEGE NHS Building Manager.

4.2 Information to be Provided by Imperial College

- a) Issue suitable campus plan showing service tunnels and services where necessary to ensure that Contractor has adequate base information prior to ordering the lifting equipment. This can take the form of a whole campus drawing or local sketch of the area.
- b) The College will provide any additional information in respect of College escape routes, lifting over roofs and traffic management as required.

4.3 Information to be provided by the Lifting Contractor

- a) Define the type of lift, i.e. "Basic, Standard or Complex" (*To BS 7121*) and locate possible operations area.
- b) Provide full details of the total works to be carried out, including the procedure to remove the load from the lifting equipment and safely transport it (if required) to the final location. For example, when an item of equipment has to be passed through an opening into the building, how is it transported to its final resting place?
- c) Provide a full and detailed Method Statement for the complete lifting and handling operations at least 14 days prior to the commencement of the lift. This Method Statement, from the Contractor, will contain the following information:-

- i. Delivery, Size and Type of equipment to be lifted from initial location to final location, including all secondary handling equipment required.
 - ii. The size and type of lifting equipment to be used.
 - iii. Full details of all the vehicles involved including all deliveries.
 - iv. Equipment size, location, outrigger reactions for all lifting equipment, service area required.
 - v. Test Certificates for all the lifting equipment to be used during the lifting operations, are to be provided by the lifting operations Contractor prior to the commencement of the erection and use of the lifting equipment on site.
 - vi. Safe working perimeters and distances around each lifting operation to form part of exclusion zones and materials handling zones for the Contractors delivering the goods. This will include all car parking spaces required. Full details, including protective fencing around the exclusion zone, to exclude all non-essential personnel.
 - vii. A list of competent people involved in the lift, together with their competencies, and the name and phone number of the person who will be in charge of the operation.
 - viii. Confirmation that all the necessary consents for the moving of abnormal loads have been applied for in good time.
- d) Define areas of St Mary's College to form exclusion and working zones for the lifting operations.

4.4 Information to be Provided by the Trust

The College shall send all relevant information to the Imperial College NHS Trust Operations Manager. The Imperial College NHS Trust shall inform the College Campus Manager of any site operational restrictions or equipment.

4.5 Duties Performed by the Main Contractor

- 1) Define and agree a route for all plant and equipment to enter the College with the Director of Estates Operations and Building Manager.
- 2) Ensure that no other lifting operations are proposed that may block other areas of Imperial College campus roads at the same time. There are circumstances where more than one lift can be accommodated on the same campus; this is at the discretion of the Director of Estates Operations.
- 3) Ensure that the Director of Estates Operations has full knowledge of the lifting equipment and any implications.

- 4) Ensure that all the components to be erected or placed in position are fit for purpose. This includes all structural steelwork, plant and all other equipment.
- 5) Ensure that the College has consented to the lift taking place.
- 6) Ensure that the lifting equipment test certificates and insurance documentation are provided to the College Appointed Engineer prior to commencement of works.
- 7) Ensure that all the lifting operation and the necessary ancillary works are conducted in a safe and efficient manner and in accordance with the method statement.
- 8) Ensure the lifting zone is enclosed with HERAS fencing, 1.8m high.
- 9) Ensure that all deliveries to the Campus are properly managed and have the necessary protection for the personnel about the Campus, this could include the use of low level barriers and, or a Banksman in addition to the plant operator.
- 10) Report back to College on completion as necessary.

5.0 General Requirements for All Campuses

5.1 General Paved Areas

5.1.1 Ground Bearing Pressure

The ground bearing pressure underneath the lifting equipment shall not exceed 100kN/m^2 (1 ton/f²) in all areas. The paved area in front of the St Mary's building shall not be used to support any outrigger loading.

5.1.2 Inspections

Where applicable, i.e. when lifting equipment outrigger is adjacent to walls, building basements and the service tunnels, an inspection shall be carried out by a College Appointed Engineer at least 3 days prior to the lifting equipment arriving on site and any structural defects noted. These notes should be passed to the College and a decision made by the Director of the Estates Operations as to whether the lift should proceed.

A recommendation for additional temporary propping and safety measures shall be made by the College Appointed Engineer, if necessary.

Upon successful completion of the lift and within three days of the lift taking place, the retaining walls, building basements and the service tunnels shall be re-inspected by the College Appointed Engineer and a report made to the College as required.

5.1.3 Lifting Procedures

On the day of the lift the position and size of spread of pad assemblies shall be checked by the College Appointed Engineer, and no lift shall take place until this check has been carried out. Should the lifting equipment supplier be unable to achieve the specified and agreed spreader plates, the lift shall not take place.

The lifting operations shall be observed by the College Appointed Engineer, to ensure that the lifting equipment positions and routing through the campus are strictly adhered to.

6.0 General Campus Guidance Notes

6.1 Saint Mary's Campus

6.1.1 Access Routes

The materials and lifting equipment shall gain access either from Norfolk Place or the front of the Medical School. The access to the rear of the Medical School is from South Wharf Road
All incoming deliveries of plant and equipment shall fully comply with the instructions issued by Security/Gatehouse on arrival.

Specific Restrictions for Use of Lifting equipment in Various Areas

6.1.2 Service Tunnels

The following requirements must be observed when planning and using heavy lifting equipment adjacent to and over existing service tunnels. No crane outriggers shall bear onto or adjacent to the existing service and walkway tunnels.

6.1.2.1 Inspections of Service Tunnels

When deemed necessary an inspection of the service tunnels shall be carried out by the College Appointed Engineer at least 3 days prior to the lifting equipment arriving on site and any structural defects noted and reported, with recommendations, to the Director of Estates Operations.

Within 3 days of the lift the College Appointed Engineer shall re-inspect the tunnels

6.1.3 Exclusion Zones

The area above the service and walkway tunnels. The pavement in front of the Medical School.

6.1.4 Basement Adjacent to Lifting Area

The existing retaining walls to basements may not have been

designed for full HGV loading and it is therefore required to reduce the ground bearing pressure to 100kNm^2 (1ton f^2)

6.1.5 Inspection of Basement Walls

When deemed necessary an inspection of the basement walls shall be carried out by the College Appointed Engineer at least 3 days prior to the lifting equipment arriving on site and any structural defects noted and reported, with recommendations, to the Director of the Estates Operations.

Within 3 days of the lift the College Appointed Engineer shall re-inspect the basement walls.

6.1.6 Unsuitable Areas

The Paved Area in front of the Medical School

6.1.7 Noise restrictions

DOES THE IMPERIAL COLLEGE NHS TRUST HAVE ANY RESTRICTIONS?

6.1.8 Hazard and Restricted Areas

In certain hazard areas it is recommended that no lifting equipment lift takes place or is allowed to proceed over these areas until such time as further additional protection is provided,
E.g. the gas bottle store adjacent and/or bulk nitrogen stores adjacent to the rear security office.

Access to the rear shall be from South Wharf Road. This road has a steep slope to basement level and, as such, any mobile lifting operations will have to be carefully considered, taking into account the adjacent terrain. The safe bearing pressure for this area is 100kN/m^2 (1 ton/ f^2).

There is a London Underground Tunnel below South Wharf Road. No cranes/ out-riggers can be placed on this road without prior permission from London Underground Limited, Abnormal Loads & Street Works Engineer. The contact address is lulcedip@tube.tfl.gov.uk.

Præd Street and South Wharf Road have weight restrictions of 100 tons. Permission has to be sought from London Underground Limited as above.

7.0 Procedure to be Adopted Prior to Lifting Operations Being Approved

7.1 Procurement Specification Amendments

Many items of plant have specified lifting or attachment points where the attachment is provided by the manufacturer. Test certificates for these attachments must be provided prior to the machine being delivered on site and the requirement for this information should be contained within the procurement documentation. Clause for procurement specification *“where attachment points are provide by the equipment manufacturer, test certification and, if necessary, test and design information should be provided prior to the*

order being placed". The equipment shall be delivered with the necessary certification if the lifting attachments are fixed in position and, if not, the specified lifting attachment shall be provided with current test certification."

7.2 Equipment to be Lifted – Information Required.

The maximum weight of the unit to be lifted shall be provided, together with any other lifting requirements, in a timely manner to ensure that the lifting operation on site can be carried out successfully. The required test certification for the lifting attachments shall be provided. Full details of the suspension points shall be provided.

7.3 Location of Lifting Operation

The proposed location for the lifting operation, together with any additional areas that may be required, shall be specified as soon as is practical to the College. This includes obtaining agreement from the Director of Estates Operations to ensure that the necessary precautions are put in place during the crane lift. These can include managing the College fire route, lifting over lightweight roofing, or any other requirements the College may add.

7.4 College Agreements

The final location for the crane and ancillary traffic will be agreed with the Director of Estates Operations as soon as is practical.
The minimum period of notice for a lifting operation using a mobile crane shall be three weeks

Information to be provided:-

- a) Size and type of crane to be used
- b) The maximum out rigger reaction
- c) The size of spreader to be provided
- d) The number of vehicles in attendance
- e) Are there any supporting operations
- f) The anticipated duration of the lifting operations
- g) Is there a requirement for a truck mounted crane for additional lifts.
- h) The location of the Heras temporary enclosure
- j) The route of the load from pickup to final position

The College will confirm that all the necessary safety procedures have been put in place. This includes the following:-

- a) The access and egress routes for the mobile crane is agreed
- b) The access and egress routes have been agreed for all plant deliveries

and removal of redundant equipment.

- c) The risk below the moving load is minimised.
For example, where lifting over glazed roofing, there is nobody underneath. No loads to be left suspended for greater than is necessary to ensure safe lifting and placing.

7.5 IMPERIAL COLLEGE NHS Trust Agreement

No lifting operations shall take place without the written consent of the IMPERIAL COLLEGE NHS trust site manager.

7.6 Information to be Provided

During the week before the lift, ensure that those directing the lifting operation are aware of College requirement to see all the normal safety certificates for the crane and its' lifting equipment. The check of the crane safety certificate will be directly related to the chassis number of the crane (This is the hardest element to change. Plant numbers and vehicle registration plates can be moved from machine to machine).

8.0 On the Day Procedures

8.1 College Requirements

The normal college time restrictions apply. The placing of spreader mats etc., may not rely on the main crane and this can proceed, usually using a truck mounted hydraulic arm with hook, subject to satisfactory test and operator's certificates being available. The outrigger reactions and the necessary load spreader mat defined. This requirement applies to the use of all lorry mounted cranes and all other plant with outriggers, including hydraulic access platforms.

8.2 IMPERIAL COLLEGE NHS Trust Requirements

The emergency Contact for the Imperial College is NHS trust is Jerry.O'Shea.
Email jerry.o'shea@nhs.net
Contact number to confirm when the lifting operation is complete St Mary's security 0203 312 1544

8.3 Crane, Lorry Mounted Crane and Hydraulic Access Platforms, Certification

Before the crane is allowed to proceed to its final location copies of the relevant test certificates shall be provided for verification by the College Appointed Engineer. The College Appointed Engineer shall check all certificates for lifting equipment and competency certification for all those involved in lifting operations.

8.4 Lifting Attachments

Prior to any equipment being lifted, copies of the necessary test certificates shall be provided where attachments or attachment points are provided. This requirement only applies to attachment points. Where the items to be lifted are supported in slings taking the entire load, there is no requirement for additional certification.

8.5 College Representative's Report

At the end of the lift, when the crane has been removed and no damaged to ground apparent, a simple text message shall be sent to the Director of Estates Operations. Should there be a requirement to report, this will be issued as soon as is practically possible after the event.

8.6 Other Recommendations

There is currently, in the crane procedures guide, a requirement for all lifting operations to be enclosed in Heras fencing. This requirement must be adhered to. College staff and students will enter any other barrier system and this is unacceptable.

9.0 Procedure to be Observed During Lifting Operations

9.1 Safety Barriers

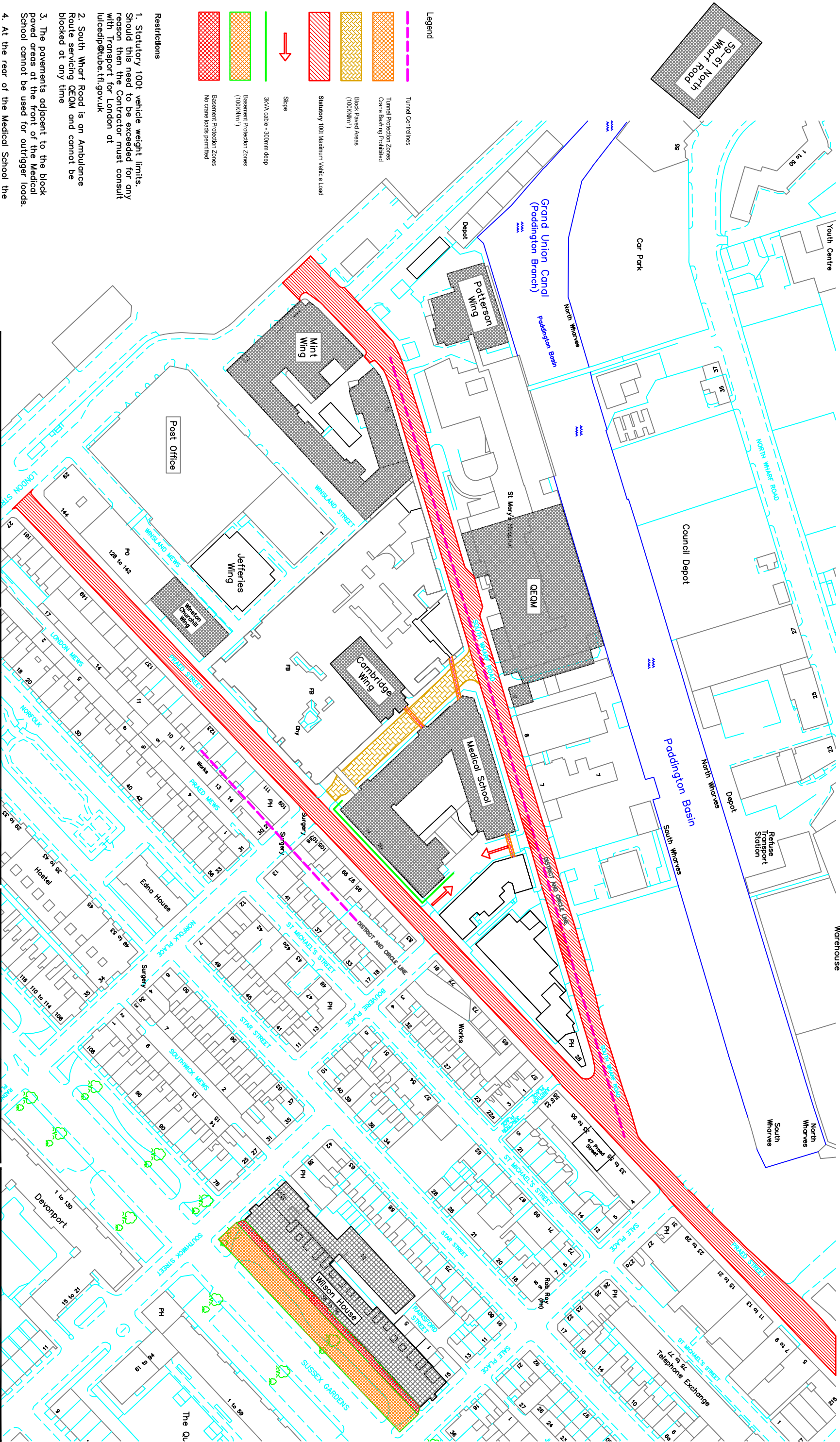
- 9.1.1** Erect and ensure that the non-essential personnel exclusion zone is satisfactory
- 9.1.2** Ensure that no previously agreed 'as necessary Means of Escape in case of fire' routes are blocked.
- 9.1.3** Do not exceed area agreed with the College for the lifting operations.
- 9.1.4** Ensure that all the escape routes and other exits that have an egress, within the lifting operations enclosure, have been locked off by Security.
- 9.1.5** The Security Office must be informed when all lifting operations are complete and the crane is removed.

9.2 Crane

- 9.2.1** Insurance and Rigging Detail
- 9.2.2** Provide details of insurance, safety certificates, etc. for the lifting equipment to be used.
- 9.2.3** Ensure that the position and size outrigger load spreaders are as per the agreed Method Statement and confirmed by the College Appointed Engineer. When this has been confirmed, the agreed lift(s) may take place.

9.3 Acceptance by College

No lifting operation shall take place within the St Mary's Campus until the necessary requirements above have been agreed by the College Appointed Engineer.



Revision		Description	Date

Project		Drawing Number	
ST MARY'S CAMPUS		1:2000	
CRANE LIFT ROUTES		@ A3	
AND RESTRICTIONS		Date	

Imperial College		Support Services	
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