

MAYOR OF LONDON

**INDUSTRIAL
INTENSIFICATION
PRIMER**



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Key references (weblinks)

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We Made That, AECOM, Nov 2015

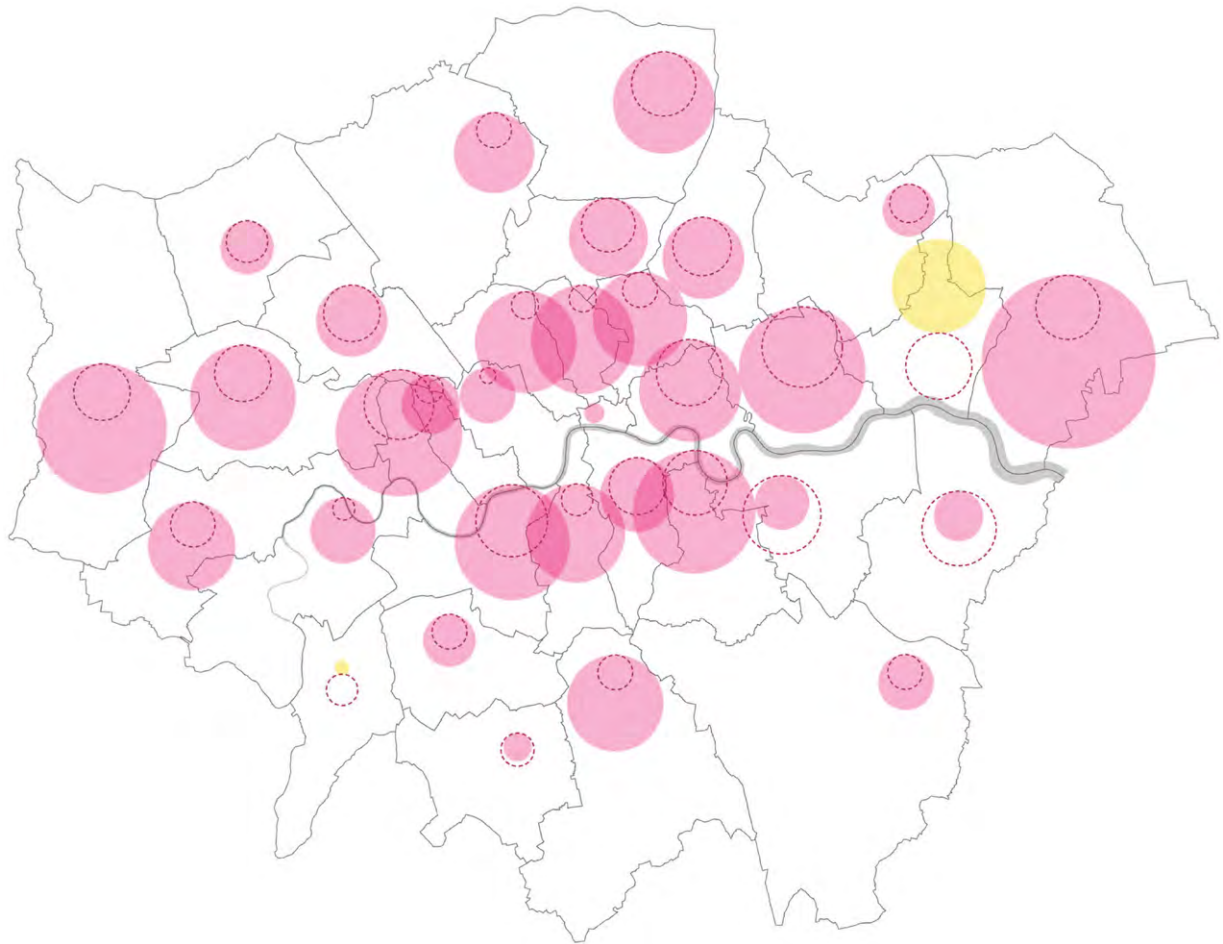
Industry in the City
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Industrial Land Supply & Economy 2015
AECOM, Cushman & Wakefield, We Made That

Industrial Demand Study (forthcomming)
CAG, Ramidus, Colliers

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- SPG benchmark release 5-year equivalent
- Industrial land released 2010-2015
- Industrial land gained 2010-2015

INTRODUCTION

There are growing pressures on London's industrial land, with faster than planned release and steady demand from businesses serving London's growing population and economy. Lack of available space and increased rents are pushing businesses further out with impacts on traffic congestion and carbon emissions. Smaller businesses may struggle to survive the upheaval of relocation, with an impact on jobs.

We must consider how industrial areas can be used more intensively, and how industry can be integrated in residential areas.

This document summarises the main forms this can take, with case study examples. While some of the options presented are fairly straight forward, and some are possible with greater attention to detail, others will be more challenging, in terms of economic viability and deliverability, as well as ensuring the quality of industrial and residential space. In

many cases intensification will have to be considered at the masterplan level as well as the level of individual developments.

The document also suggests some typical basic specifications for large and small industrial units to ensure that any intensified or mixed space is suitable for industrial occupiers.

The document draws heavily on the *LLDC Employment Space Study* by We Made That and AECOM, as well as past reports by Urhahn Urban Design. It should be read alongside the *Industrial Land Supply & Economy Study*, and the *Industrial Demand Study*.

There are number of other studies listed in the bibliography. Most of these are technical, design and typology studies. This primer document seeks to summarise these, as a starting point for further research into the viability and delivery of industrial intensification as well as planning tools.

SMALLER INDUSTRIAL UNITS



These spaces accommodate small scale and light industrial uses. These units are likely to require access to yard space appropriate for vans and occasional large goods vehicles. They are likely to have specific servicing requirements such as three-phase power and mechanical extract equipment.

Typical Characteristics

- 500m^2 (5,382 sq.ft)
- High ceilings (4.5 - 8m)
- 4m loading bay

Typical Use Class

B1c, B2, B8

Typical Uses

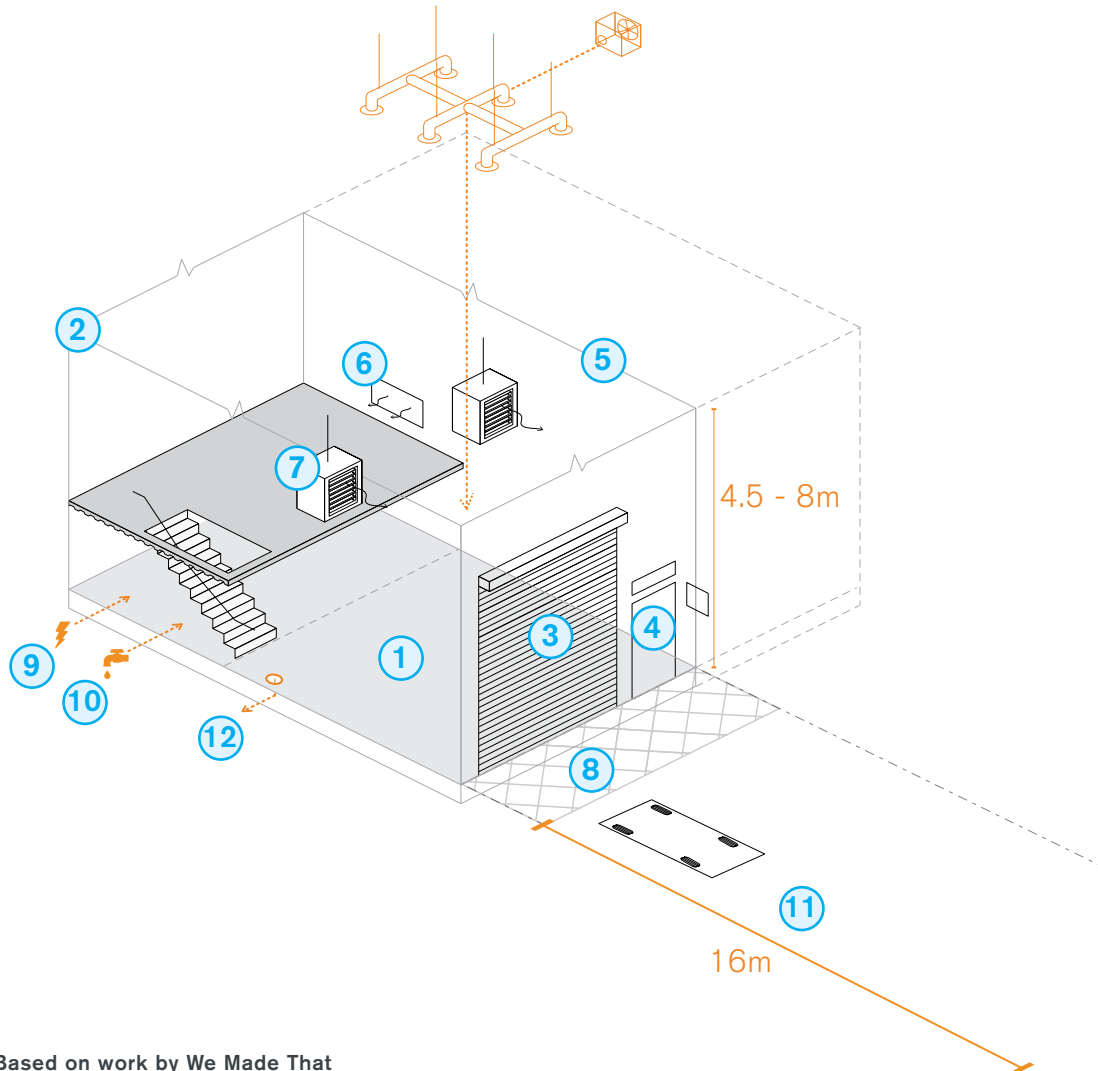
- Food & drink manufacturing, catering
- Small scale 'craft' manufacturing
- Advanced manufacturing
- Servicing and repair businesses
- Small scale storage and wholesale



This brewery occupies 460m^2 (5,000sq.ft), across two adjacent units, which allows the business to expand. Half the floorspace is used for brewing, 35% cold storage and the remainder for administration and dry storage. Ceiling heights range from 4.6m to 5.4m at the roof ridge. A yard of equal size to the internal spaces is used for cask washing, storing spent grain, parking and HGV access.

SMALLER INDUSTRIAL UNITS

TYPICAL REQUIREMENTS



Based on work by We Made That

1. Less than 500m² floor area
2. Double height ceiling allows for administration mezzanine. May also be provided adjacent to loading doors in wider units.
3. Roller-shuttered doors for deliveries (min. height 3.7m and width 2.4-3m)
4. Separate staff/ visitor access with signage
5. Spanning structure for flexible internal layout without columns interruptions
6. Heating to office areas
7. Blow air heating for work areas
8. External loading area
9. 3 phase power
10. Water supply
11. Access to a clear 16m deep yard space for van or small truck deliveries
12. Drainage from floors areas

Note: Typically rectangular plan form with ratio of long to short sides between 1:1 (where no particular traffic routes are dictated by process) and 3:1.

LARGER INDUSTRIAL UNITS



These units are characterised by large floorplates and ceiling heights, although these may be sub-divided. Uses can often be noisy and require articulated vehicles high levels of vehicle movements large delivery servicing. Small office-type space may be provided in addition to 'shop floors'. Specific uses may necessitate particular servicing requirements such as mechanical extraction.

Typical Characteristics

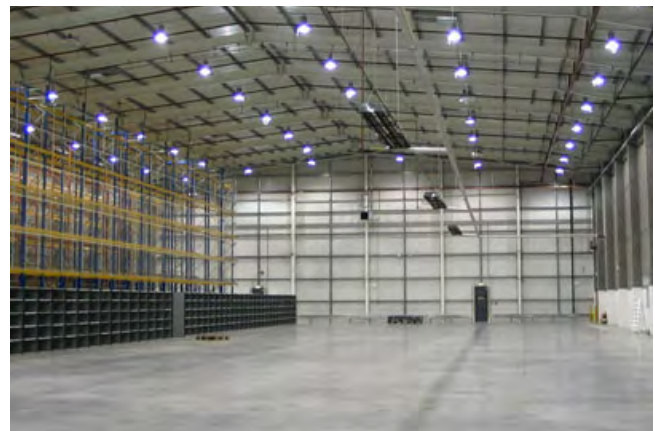
- >500m² (5,382 sq.ft)
- High ceilings (6 - 8m)
- Loading bays

Typical Use Class

B8, B2

Typical Uses

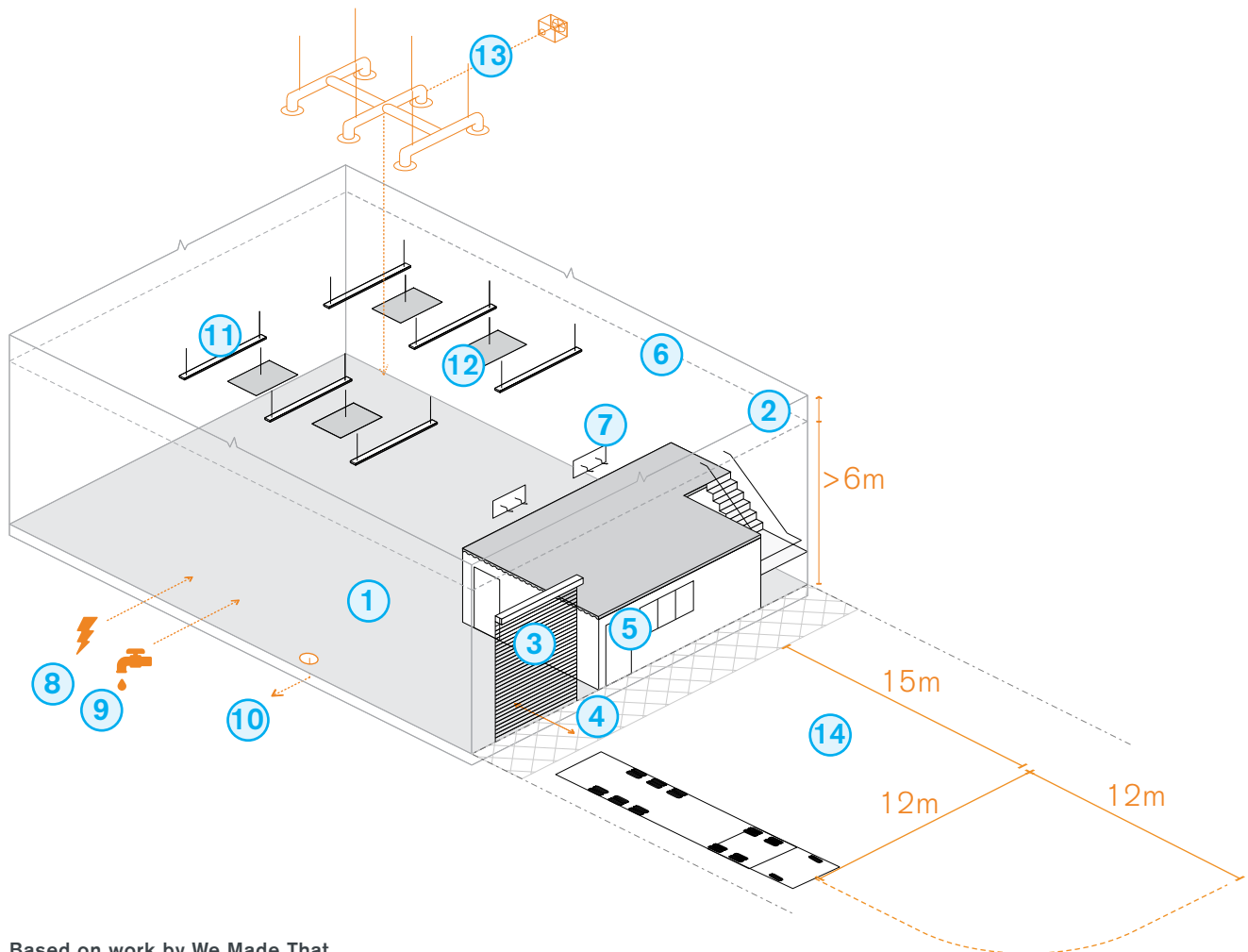
- Distribution and logistics
- Wholesale and trade counters
- Larger general manufacturing



These units have large clear spans, with regular column grids, structurally reinforced concrete floors, top-lit spaces and the potential for subdivision within.

A large yard space with HGV access and parking is also required for successful operation.

LARGER INDUSTRIAL UNITS TYPICAL REQUIREMENTS



Based on work by We Made That

1. Greater than 500m² floor area
2. Double height ceiling allows for administration mezzanine. May also be provided adjacent to loading doors in wider units
3. Roller-shuttered doors for deliveries (min. height 4m)
4. Smooth surface for internal to external movements, may require dock loading to meet height of HGVs
5. Separate staff/ visitor access with signage
6. Large clear spans for flexible internal layout
7. Heating to office areas
8. 3 phase power
9. Water supply
10. Drainage from floor areas
11. High bay lighting
12. Radiant heating panels
13. Extract system
14. Yard space should allow 12 clear metres for HGV turning, 15m for local bay and a clear min. height of 5.03m for approach routes.



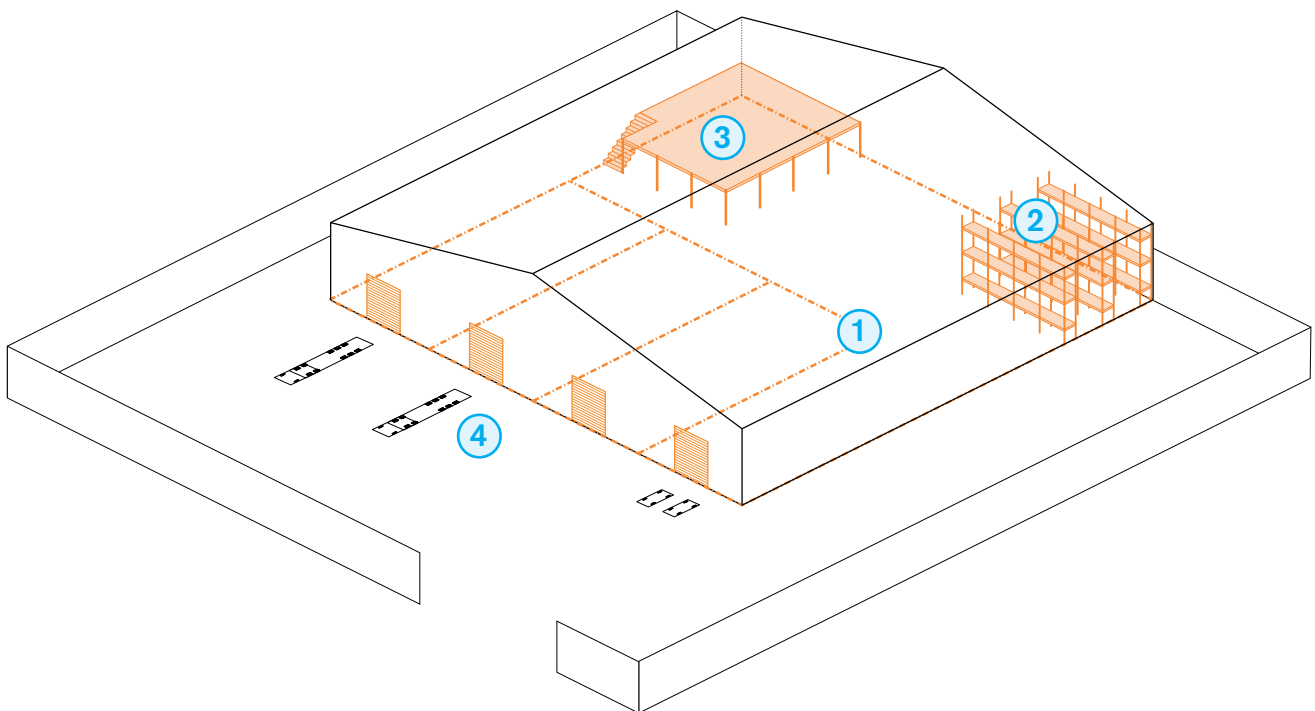
X2 warehouse, Hatton Cross - Multistorey warehousing with access ramp. Cornish Architects

INDUSTRIAL INTENSIFICATION

INDUSTRY + INDUSTRY

OPERATIONAL INTENSIFICATION

Both new and existing units should be managed to ensure that the use of space is as efficient as possible.

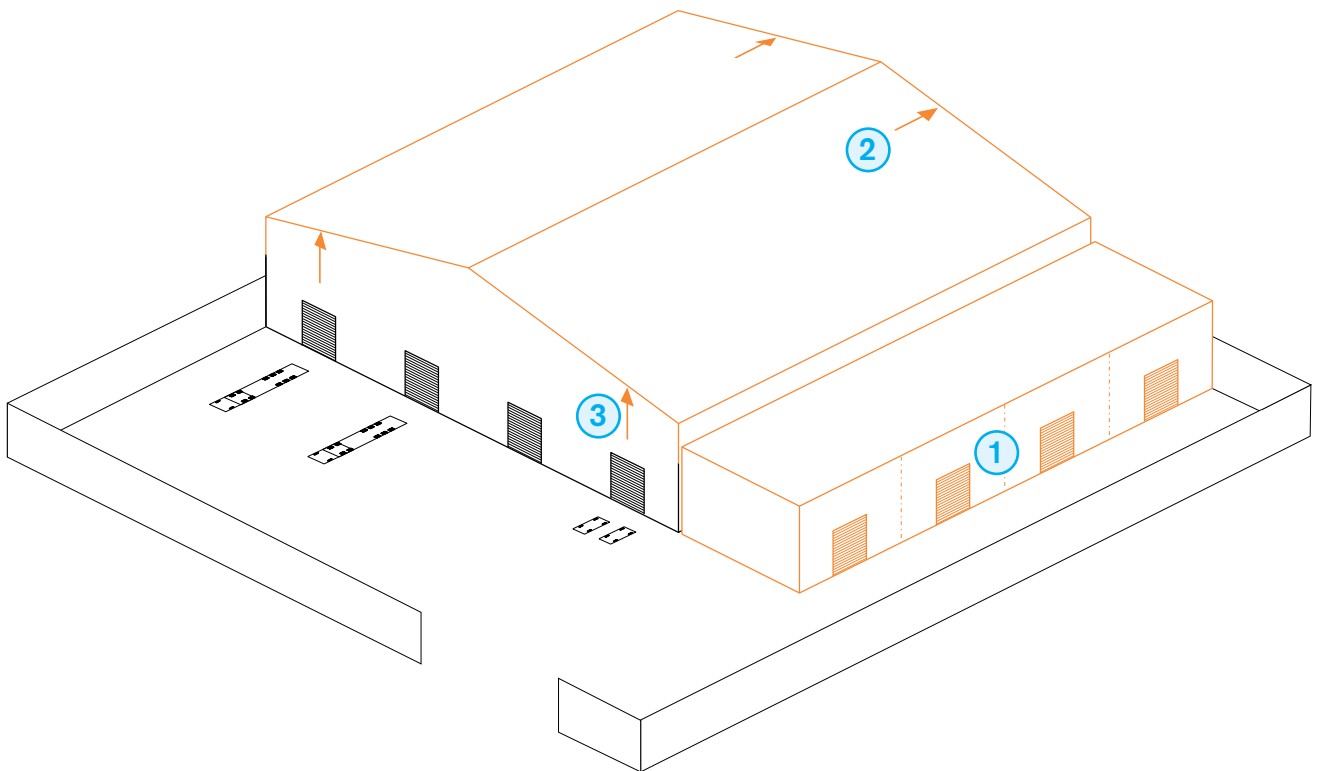


1. Existing spaces can be subdivided - either structurally or by fairly informal means such as the use of floor markings - to generate a variety of spaces suitable for a number of smaller businesses.
2. The installation of additional levels coupled with modern lifting equipment means that businesses can take advantage of the full building volume for storage.
3. Mezzanine levels may be added where required.
4. Yard space can be shared to offer smaller businesses maximum flexibility.

SITE AND BUILT INTENSIFICATION

Land should be used as efficiently as possible. Buildings should be built as close as possible to the boundaries and pavements to avoid wasted space.

Building smaller units alongside larger ones may be suitable, where there are blank façades with enough site area for a number of additional small units where regular servicing is not required.

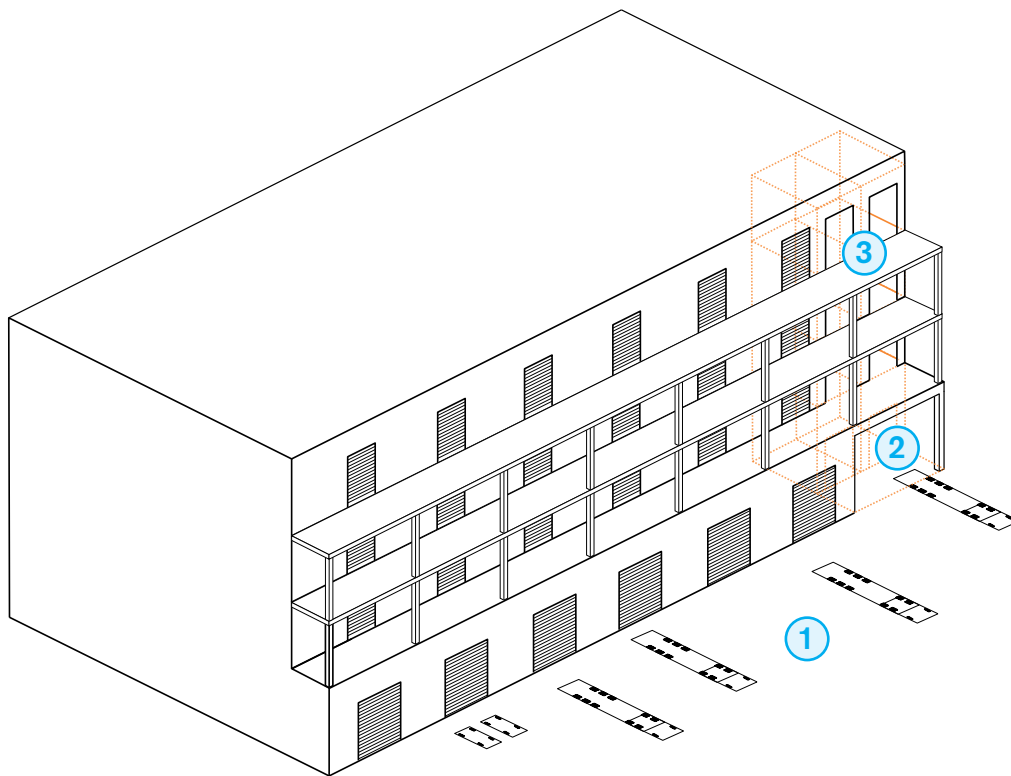


1. Large yard spaces should be organised and managed to ensure they are running efficiently. Where there is an excess of space, it could be possible to build a number of additional small units.
2. Plots should be used as efficiently as possible, utilising space right up to the boundary.
3. Generous ceiling heights offer a greater capacity which can be valuable for storage and adding mezzanine levels.

SMALLER INDUSTRIAL UNITS STACKED ON SMALL UNITS

Where new, small industrial units are being built, multi-storey options should be considered.

Smaller businesses may operate adequately on upper floors where there is access to a goods lift and shared yard.



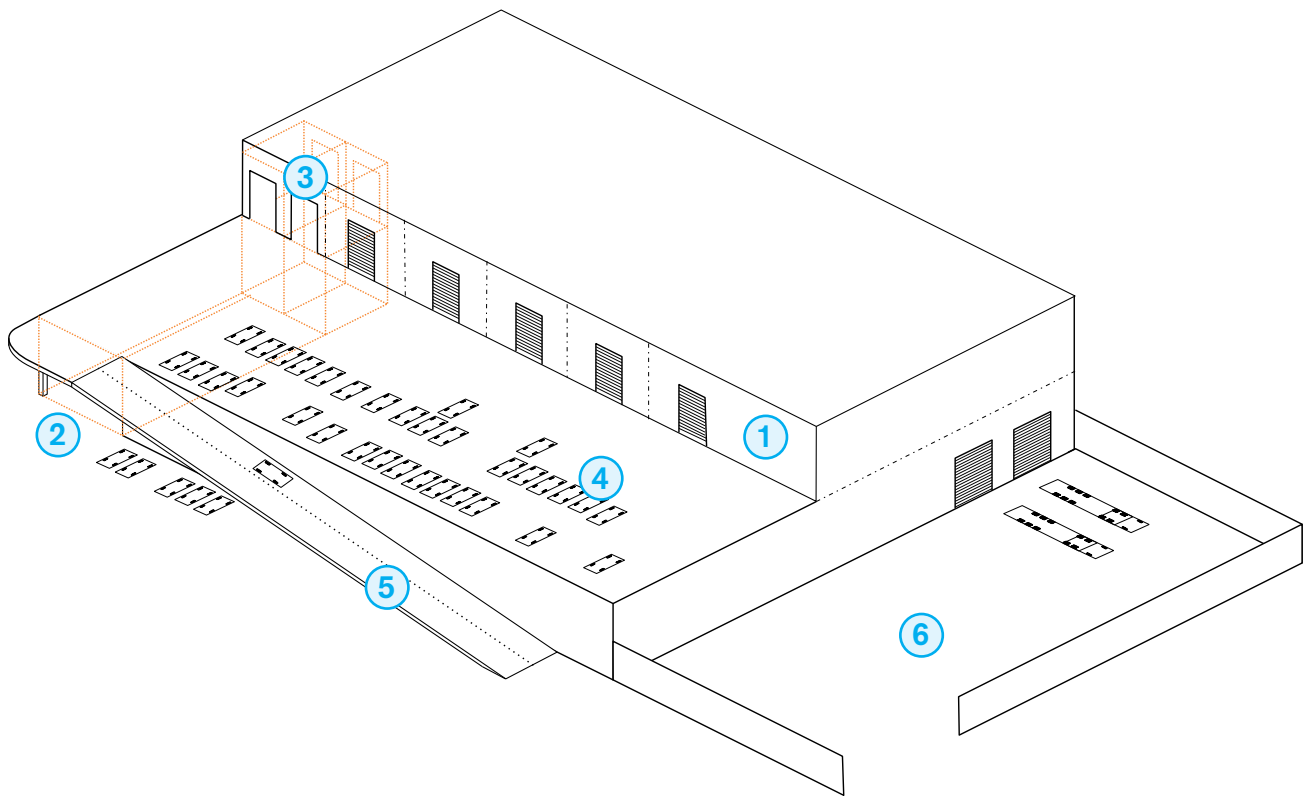
1. A shared yard space can give smaller businesses the flexibility of occasional HGV access.
2. A shared HGV loading bay may be sufficient for a number of smaller businesses.
3. Goods lifts may be adequate to enable some smaller businesses to operate on upper floors.

SMALLER INDUSTRIAL UNITS ABOVE LARGER UNITS

Where new, large industrial units are being built, multi-storey options should be considered.

Smaller businesses may operate adequately on upper levels where there is access to a goods lift or ramped vehicular access.

Rooftop parking spaces should also be considered.



1. Smaller industrial units can be stacked on top of larger warehouses. Structural spans should keep interruptions to the larger industrial unit to a minimum.
2. A shared loading bay may be sufficient for a number of smaller businesses to operate.
3. Goods lifts may be adequate to enable some smaller businesses to operate on upper floors.
4. Ramped access provides direct vehicular access to upper level units. Straight two-way ramps provide for efficient operation. It may be possible to take advantage of site level changes to accommodate ramps.
5. The remaining roof space could be used as yard space for the smaller units
6. Shared HGV access is provided at ground level.
7. It may be possible to provide larger units on top of each other with these principles.

CASE STUDY: REGENT STUDIOS

ADA STREET, HACKNEY



Function: Light industrial and hybrid office units with artists' studios

Architect: Sir Hubert Bennett (LCC) with Yorke, Rosenberg & Mardall

Date: 1966

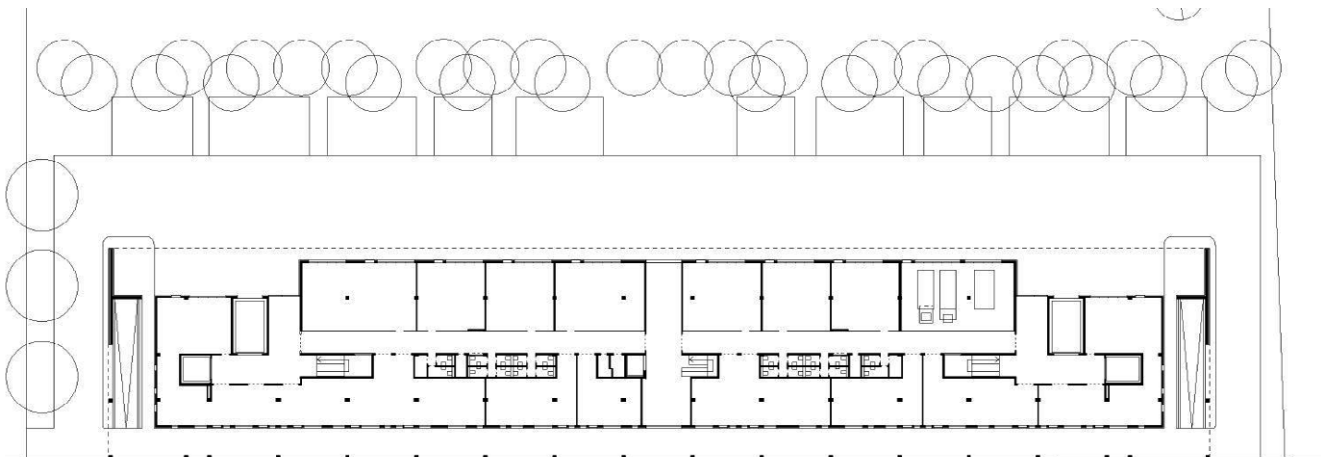
Regent Studios on Ada Street in Hackney is an example of multi-storey small industrial units in London.

The '*flatted factories*' of this era were designed so that a number of smaller businesses could operate at an increased density using shared goods lifts, accessed via heavy duty external gantries. Workshops were designed to be easily subdivided.

Many of the occupiers on upper levels today have lower servicing requirements, although tend to prefer larger floor area than typically found in higher specification office space.

GEWERBERHOF LAIM

MUNICH, GERMANY



Function: Small industrial units

Architect: Bogevischs Buero

Date: 2011

Münich is also experiencing growing pressures on its industrial land. This is one of ten Gewerbehöfe built by the City Council and jointly run with the regional chamber of commerce. They provide high density accommodation for uses such as joinery, leather workshops, garment manufacture and fine metalwork. Gewerbehof Laim has 11,000m² floorspace, with units from 40m². There are 4 goods lifts, shared yard space, 1,500m² loading and marshalling areas to internal access corridors, and 100 parking spaces in the basement. Floor loadings can take fork lift trucks.

HÔTEL INDUSTRIEL PANTIN PARIS, FRANCE



Function: Small industrial units, offices and multi-storey parking

Architect: Paul Chemetov, Borja Huidobro

Date: 1987-1989

The Pantin 3-storey building is part of an industrial area close to the Paris ring road.

The building offers a large degree of flexibility and choice - accommodating a diverse range of industrial scales - with approximately 1,000 workplaces over 75,000m².

Some smaller units on the upper floors have direct car and van access, via ramps. Parking is offered at basement, ground and first floor level.

KAAP NOORD
AMSTERDAM, NL



Function: Small industrial units, office space and roof level parking

Architect: BBVH

Date: 2005

Situated in Buiksloterham, as part of the six-mile waterfront in Amsterdam, Kaap Noord was realised in 2005. Combining small scale industrial units with office space, studios and roof level parking, the *business centre* aims to attract small businesses with mixed use and flexible spaces.

A shared yard space at ground floor level offers businesses HGV access.



Blyth Road, Hayes - Industrial buildings are part of the street

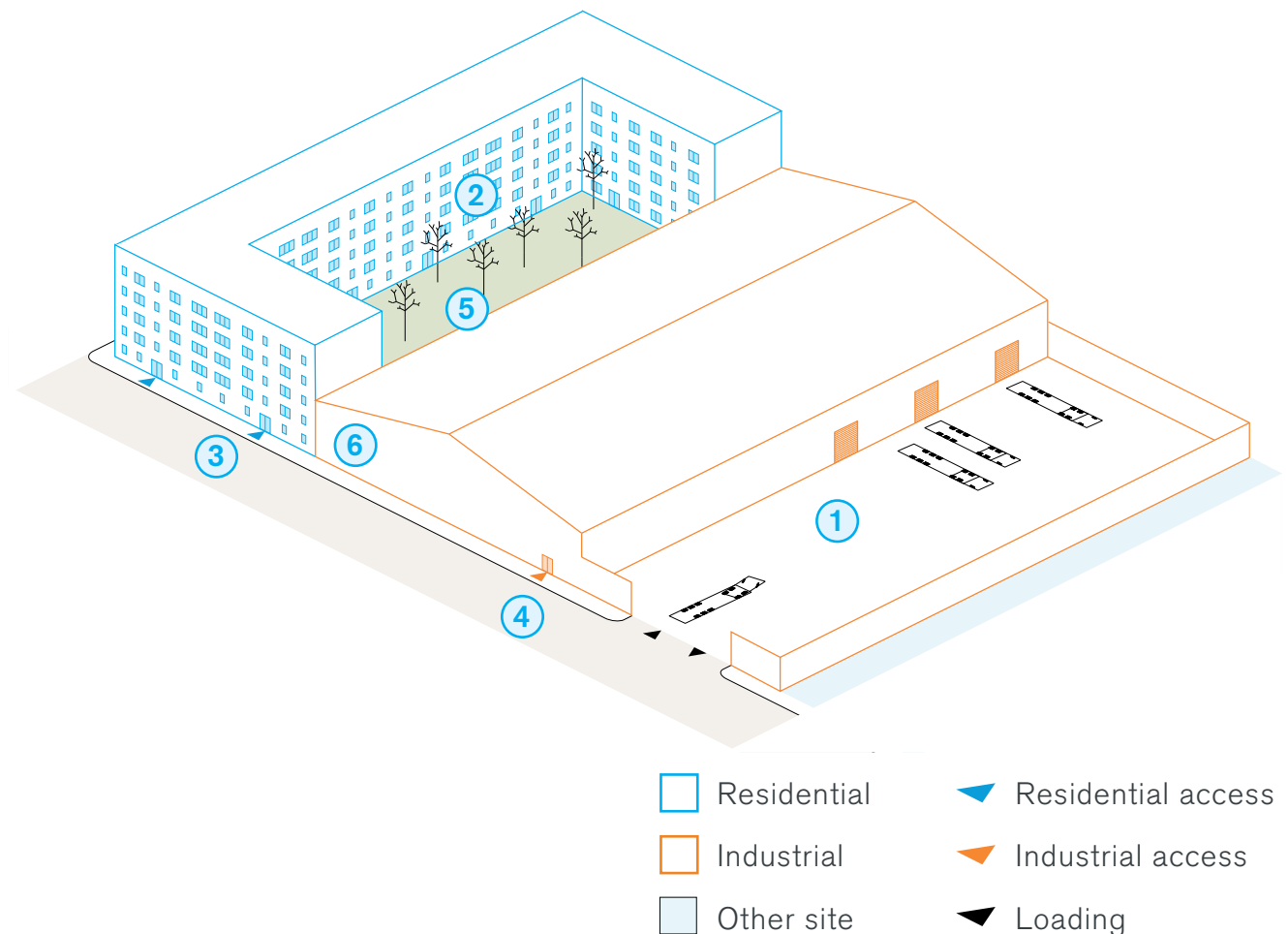
Image: Lara Kinneir

CO-LOCATION WITH RESIDENTIAL

RESIDENTIAL + INDUSTRY

INDUSTRIAL SPACE ALONGSIDE RESIDENTIAL

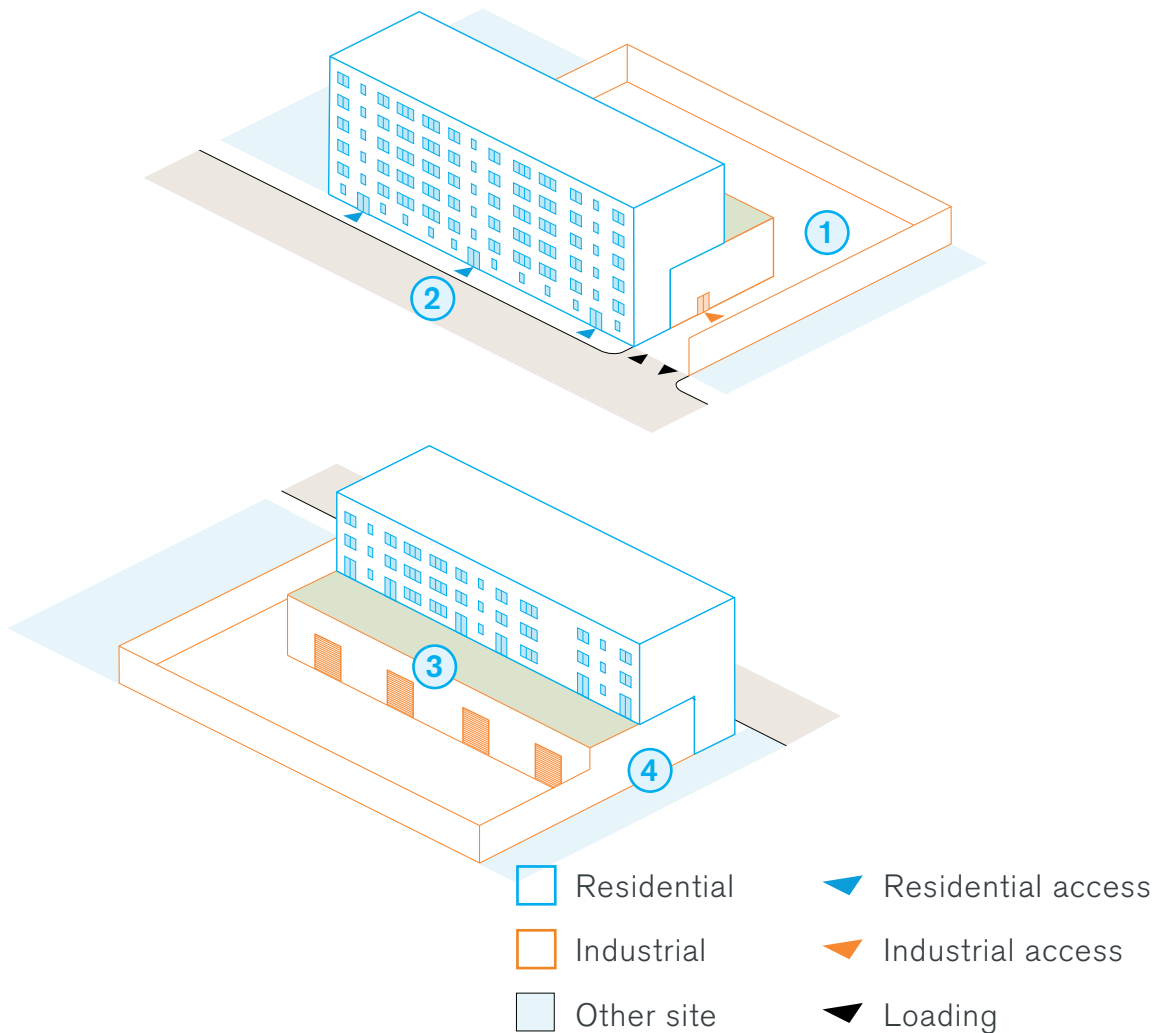
Industrial spaces can be located in close proximity to residential at block level, as long as adequate consideration is given to servicing requirements and environmental impacts, making use of blank façades. Residential should not be considered within designated industrial areas, although this approach may work on the edges to make a more efficient transition.



1. Vehicle access and yard space is situated away from residential units, with the industrial unit acting as a buffer.
2. Residential units can be built up to a blank facade without impacting industrial operations. A courtyard space has been created for residents.
3. Separate residential access is provided.
4. Associated office space may be accessed from the street.
5. Sites should be used efficiently and the boundary line between residential and industrial should be brought as close as possible.
6. The industrial unit is easily discernible from the residential units - Industrial buildings demand a different scale of design and should not be made to replicate residential units.

SMALLER INDUSTRIAL UNITS BELOW RESIDENTIAL

Small industrial units can be built in residential areas and schemes as long as access, servicing and potential environmental impacts are addressed. Industrial units should meet the requirements above.

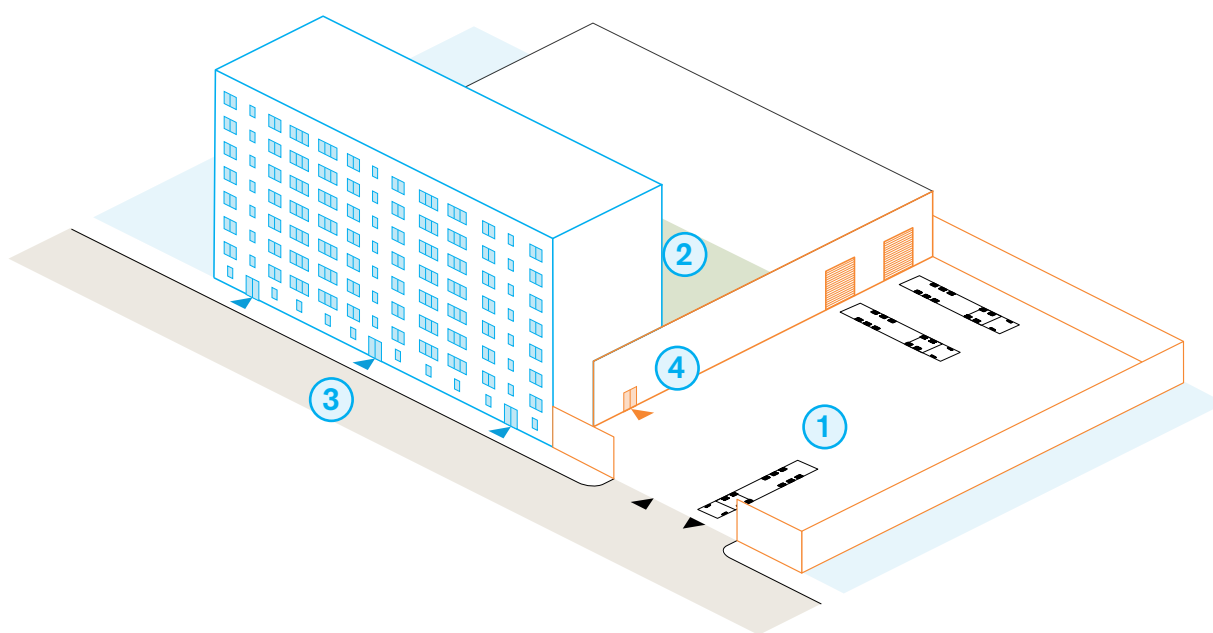


1. Yard space is accessed from the street and located behind the residential units. Special consideration should be given to address the environmental impacts on residents overlooking the yard space, however this should be easier to manage with smaller units.
2. Separate residential access is provided along the street, concealing the industrial units behind.
3. Residential units wrap the industrial units which can be used to dampen noise. The residential units could also be set back slightly, generating a garden space for residents on top of industrial unit and shield immediate views of the yard space.
4. The structure should allow clear spans for industrial units. Residential leases may need to allow flexibility for changing industrial requirements.

LARGER INDUSTRIAL UNIT INTEGRATED INTO RESIDENTIAL

Integrating larger industrial space with residential is more challenging but could be considered in appropriate circumstances. Specialist consultants will be required to mitigate against potential environmental impacts.

Co-location should not be considered within designated industrial areas as conflicts with surrounding sites may be created, and should only be considered where social infrastructure is sufficient.



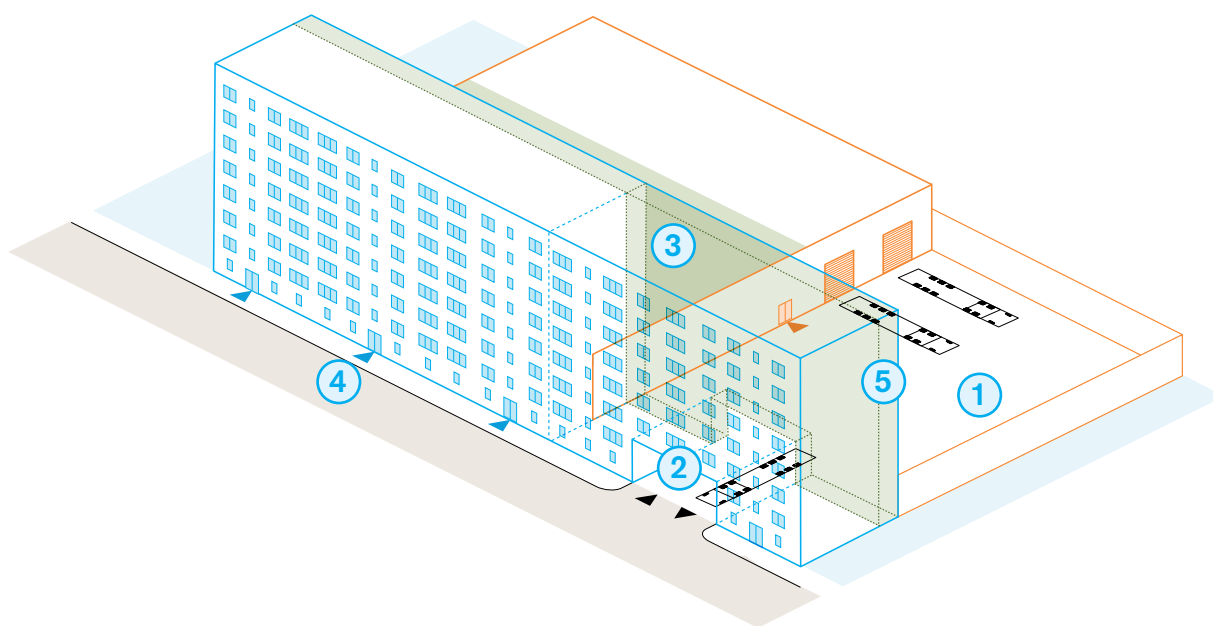
 Residential	▶ Residential access
 Industrial	▶ Industrial access
 Other site	▶ Loading

1. Yard space is accessed from the street. Where yard space is adjacent to residential units, special consideration should be given to address the environmental impacts on residents.
2. A garden space is created for residents on top of the industrial unit, with planting to help minimise the visual and acoustic impact of the adjacent yard space. Maintenance and service access to the roof should be maintained.
3. Separate residential access is provided along the street, wrapping the large industrial unit behind. Retail or office units could also be provided.
4. The structure should allow clear spans with minimal interruptions for industrial units. Residential leases may need to allow flexibility for changing industrial requirements.

LARGER INDUSTRIAL UNIT INTEGRATED INTO RESIDENTIAL

Integrating larger industrial space with residential is more challenging but could be considered in appropriate circumstances. Specialist consultants will be required to mitigate against potential environmental impacts.

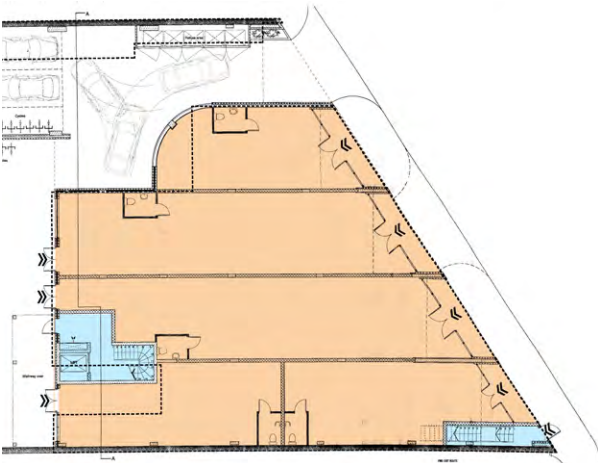
Co-location should not be considered within designated industrial areas as conflicts with surrounding sites may be created, and should only be considered where social infrastructure is sufficient.



 Residential	▶ Residential access
 Industrial	▶ Industrial access
 Other site	▶ Loading

- Yard space is concealed behind buildings to help preserve a sense of street scale. Where yard space is adjacent to residential units, special consideration should be given to address the environmental impacts on residents.
- Yard space is accessed underneath residential units, a two storey clear height may be required.
- A garden space is created for residents on top of the industrial unit, with planting to help minimise the visual and acoustic impact of the adjacent yard space.
- Separate residential access is provided along the street. Retail or office units could also be provided.
- Tripple glazing and additional acoustic / environmental screening such as a winter garden should be provided overlooking the yard space.

NORTHSIDE STUDIOS ANDREWS ROAD, LONDON



Function: B1 units with residential above

Architect: Gpad Ltd.

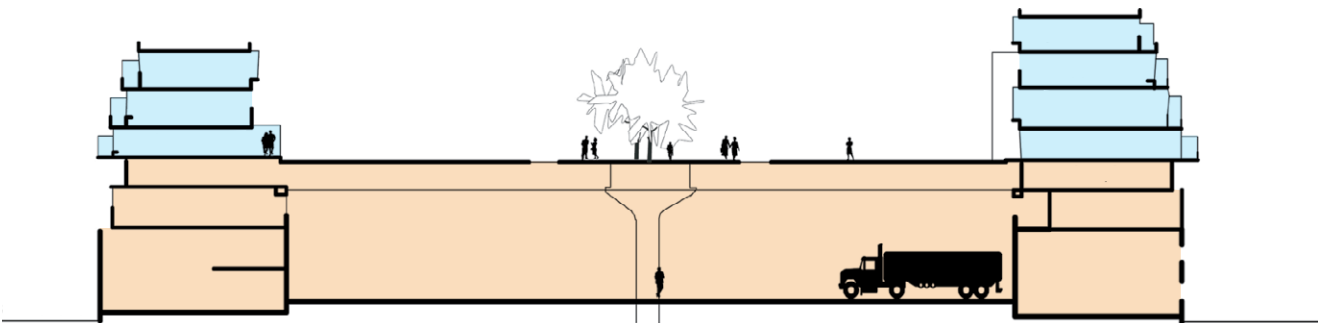
Date: 2005

This scheme accommodates five double storey B1 units totalling 800sqm, with on street lay-by access, and a tight rear vehicular access.

The 10 residential units above are set back from the road, minimising the visual impact of activity associated with the units below and creating a generous terrace. The residential units are accessed via a side staircase leading to the podium level on the rear., with a lift lobby to the rear.

The units are adequate for many businesses, although they will be of limited use for businesses noisy or noxious operations

KENSINGTON & CHELSEA DEPOT WARWICK ROAD, LONDON



Function: Council Depot with housing above

Architect: Arup

Date: 1980s

A podium structure accommodates a large council vehicle depot at street level, whilst supporting affordable housing above.

Although there is a blank frontage to the street, the development meets the back of pavement and is compatible with the surrounding Georgian terraces and streetscape.

The housing provision is of a high standard and is set back on terraces, and the industrial element functions well.

ALBERT WHARF + CEMEX AGGREGATES HAMMERSMITH & FULHAM



Function: Aggregates wharf with housing above

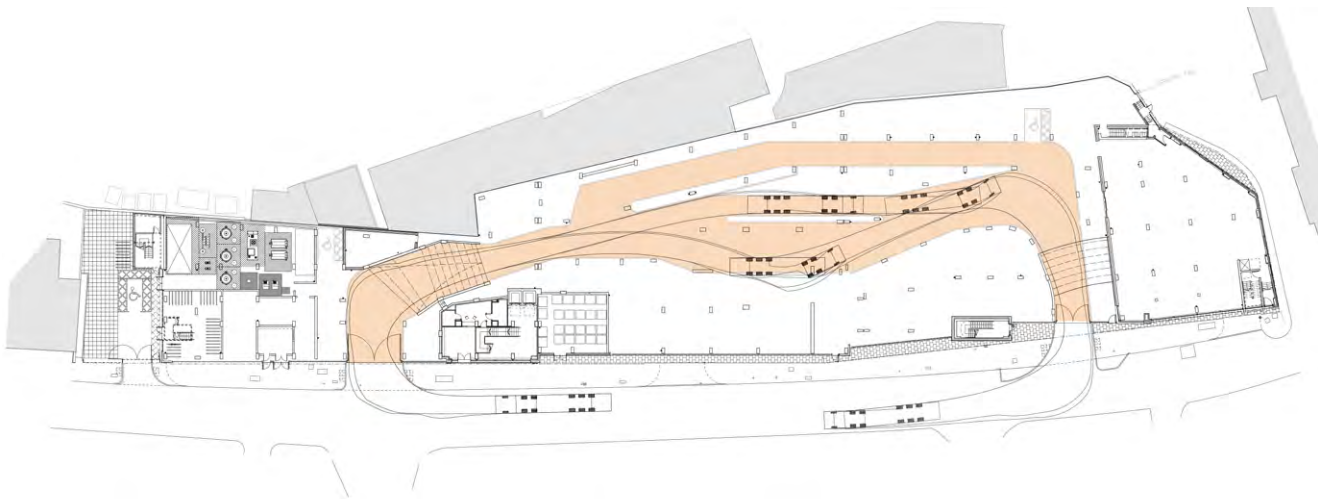
Architect: Allies and Morrison

Stage: Planning granted 2016

The construction of a concrete podium over the safeguarded Albert Wharf will facilitate 237 dwellings (use class C3), residents parking, an extension of the Thames Path and clerical space associated with the running of the Cemex plant.

Parking and services are used to form an acoustic a buffer, protecting the residential units from excessive noise.

TRAVIS PERKINS
ST. PANCRAS WAY, NW1



Function: Builders' merchants with student housing above

Architect: Cooley Architects

Date: 2014

Travis Perkins have worked with Unite to build 6-10 storeys of student accommodation above their yard space on St Pancras Way.

A concrete podium covers the yard space which supports the buildings and a communal terrace for students above.

The structure and services are designed to facilitate deliveries by articulated lorries.

WASTE & RECYCLING CENTRE ISLINGTON



Function: Housing adjacent to a Waste & Recycling Centre (WRC)

Architect: Sheppard Robson

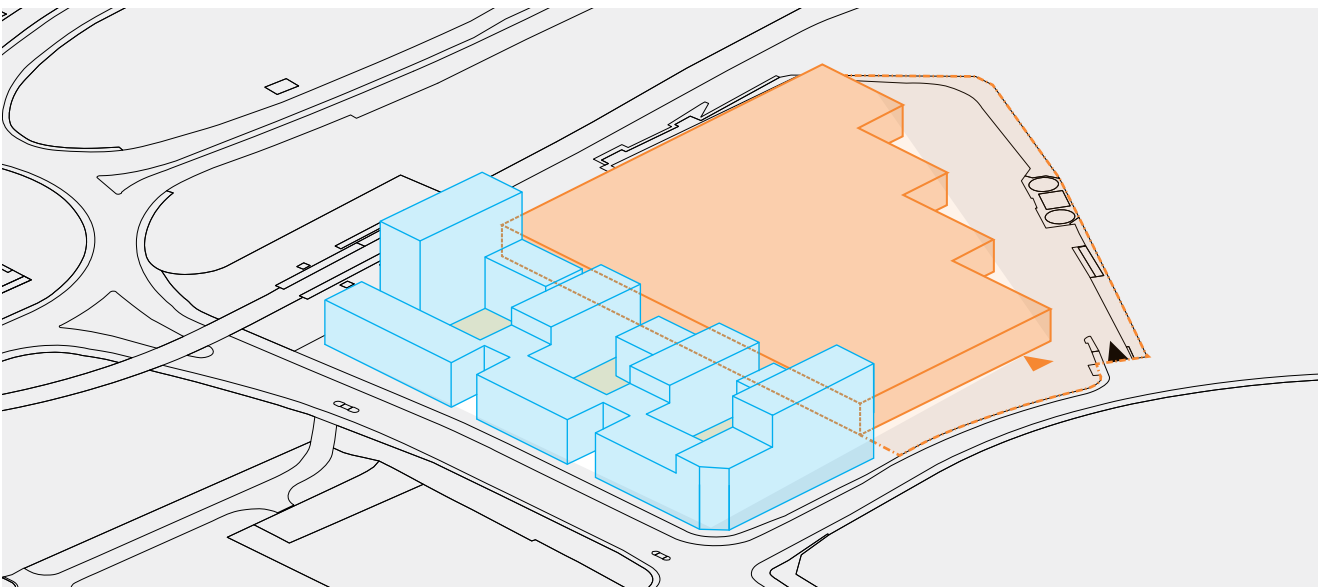
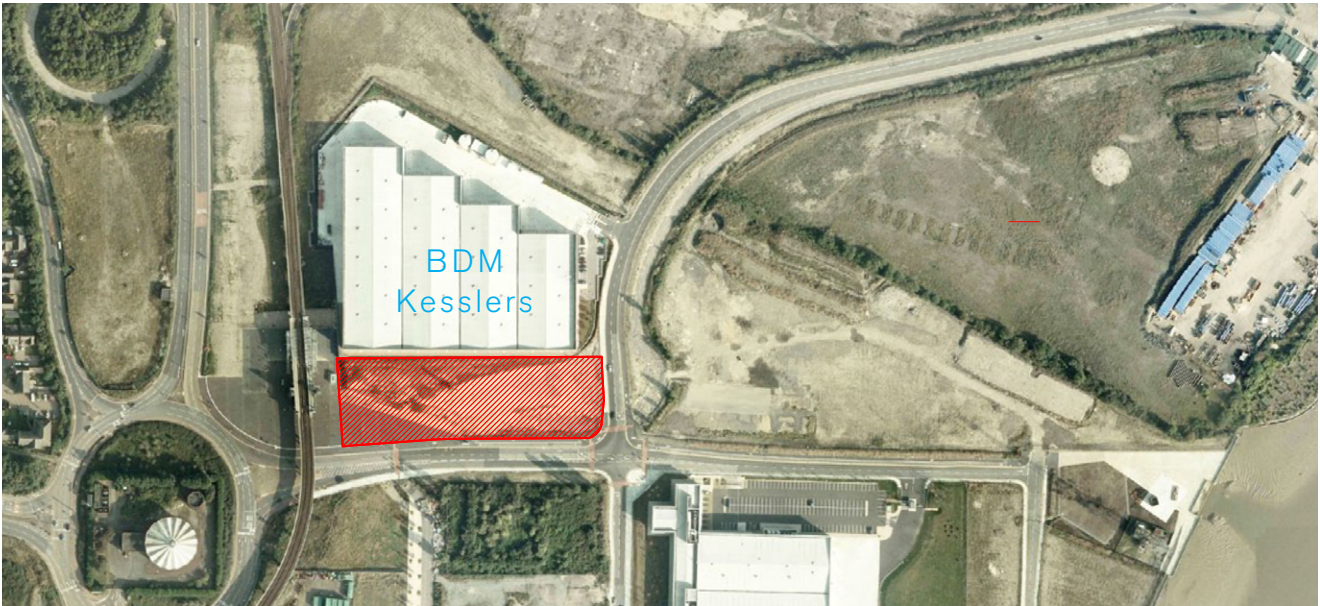
Stage: Completed 2006

The housing is orientated towards the street and consists of a blank wall on the side directly adjacent and overlooking the WRC.

Access to the housing is from Caledonian Road, with residential parking in the basement. Vans and other vehicles enter the WRC from Lotts Road on the other side.

The WRC is designed as a closed box providing sound and vibration insulation as well as efficient dust and odour control. Recycling activity is not carried out overnight.

BDM KESSLERS
ROYAL ALBERT BASIN



Function: Large warehouse

Architect: Robinson Kenning & Gallagher

Stage: Completed 2006

Function: Residential adjacent to large warehouse

Architect: Maccreanor Lavington

Stage: Planning granted 2016

The layout and organisation of BDM Kesslers warehouse left a plot hatched in red available for residential development along a blank facade. Separate access routes have been maintained with yard space on the opposite side to residential development, facing other planned industrial and noisy uses. The residential development can be built right up against the blank facade, as the warehouse itself shields noise from truck movements in the yard space. The administrative elements of the BDM building are placed to bring human scale activity along the street elevation.

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Industrial Demand Study (forthcomming 2017)

CAG, Ramidus, Colliers

