

Frasers Property Australia & Dexu  
Funds Management Limited

**Western Gateway Sub-Precinct  
Proposal: Block B  
14-30 Lee St, Haymarket NSW  
2000**

## Structural Statement

HDP-Arup-Structural-Struct Statement

Issue 04 | 9 October 2019

This report takes into account the particular  
instructions and requirements of our client.

It is not intended for and should not be relied  
upon by any third party and no responsibility  
is undertaken to any third party.

Job number 265869







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# Document verification

# ARUP

<b>Job title</b>		Western Gateway Sub-Precinct Proposal: Block B 14-30 Lee St, Haymarket NSW 2000		<b>Job number</b> 265869	
<b>Document title</b>		Structural Statement		<b>File reference</b>	
<b>Document ref</b>		HDP-Arup-Structural-Struct Statement			
<b>Revision</b>	<b>Date</b>	<b>Filename</b>	Structural Statement 14-30 Lee St, Haymarket.docx		
Draft 1	26 Jul 2019	<b>Description</b>	First draft		
			Prepared by	Checked by	Approved by
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		Signature			
Issue 1	31 July 2019	<b>Filename</b>	HDP-Arup-Structural-Struct Statement-Issue01		
		<b>Description</b>	Updated first draft in accordance to client comments.		
			Prepared by	Checked by	Approved by
		Name	Peter Bailey	Negin Sharifi	
		Signature			
Issue 2	16 August 2019	<b>Filename</b>	HDP-Arup-Structural-Struct Statement-Issue02		
		<b>Description</b>	Updated Issue 01 to address client's comments		
			Prepared by	Checked by	Approved by
		Name	Negin Sharifi	Peter Bailey	Peter Bailey
		Signature			
Issue 3	13 Sep 2019	<b>Filename</b>	HDP-Arup-Structural-Struct Statement-Issue03		
		<b>Description</b>	Updated Issue 02 with revised introduction		
			Prepared by	Checked by	Approved by
		Name	Negin Sharifi	Peter Bailey	Peter Bailey
		Signature			
<b>Issue Document verification with document</b> <input checked="" type="checkbox"/>					

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<b>Job title</b>		Western Gateway Sub-Precinct Proposal: Block B 14-30 Lee St, Haymarket NSW 2000		<b>Job number</b> 265869	
<b>Document title</b>		Structural Statement		<b>File reference</b>	
<b>Document ref</b>		HDP-Arup-Structural-Struct Statement			
<b>Revision</b>	<b>Date</b>	<b>Filename</b>	HDP-Arup-Structural-Struct Statement-Issue04.docx		
Issue 04	9 Oct 2019	<b>Description</b>	Updated based on recent comments received		
			Prepared by	Checked by	Approved by
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		<b>Filename</b>			
		<b>Description</b>			
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# 1 Introduction

Dexus CPA Pty Ltd (Dexus) and Fraser's Property Australia (Fraser's Property) (the Consortium) is seeking to build “a vibrant new business district and revitalise the face of Sydney’s busiest transport interchange” (Project Vision) at 14-30 Lee Street, Haymarket, otherwise known as the Site or Block B within the Western Gateway Sub-Precinct, as illustrated in .



Figure 1 - Central Station SSP Boundary

The Western Gateway sub-precinct is made up of three landholdings as illustrated in Figure 2:

- Block A – land predominately occupied by the YHA Hostel;
- Block B – the Dexus / Fraser's Property site subject of this report;
- Block C – land on which the Adina Hotel and Henry Deane Plaza are located.





Figure 2 - Western Gateway landholdings

To facilitate redevelopment of the Western Gateway sub-precinct, the existing planning controls are required to be amended. This report supports a submission to the Secretary of the Department of Planning, Industry and Environment ('the DPIE') which seeks to amend the height and density controls within the *Sydney Local Environmental Plan 2012* (Sydney LEP 2012).

The request to amend the planning controls follows the Minister for Planning and Public Spaces recent declaration identifying the Central Station Precinct as a State Significant Precinct (SSP). The Western Gateway, located within the Central Precinct SSP, is earmarked as a sub-precinct within the proposed SSP boundary for early consideration for rezoning.

Transport for New South Wales (TfNSW) is developing a vision for the growth and development of this precinct and is preparing a Strategic Framework to guide future detailed planning of the Central Precinct. The Strategic Framework will be placed on exhibition for public comment concurrently with the rezoning of the Western Gateway.

## 1.1 Project Objectives

The proposed rezoning forms part of a broader planning process being pursued by the Consortium to realise a shared vision and set of objectives for the Western Gateway and the Central Precinct more broadly. The overall Project objectives for Block B is to:

- High tech jobs – Deliver creative workspace that builds the Sydney Innovation and Technology Precinct and underpins Sydney's enduring global competitiveness.

- Transport connectivity – Redefine the experience of over 20 million pedestrians who walk through Henry Deane Plaza every year with world class public realm and connectivity.
- A revitalised precinct – Transform Central into an exciting place with lively retail and dining options, supporting Sydney's day and night time economy.
- Infrastructure for the future – Enable wider renewal of Central by delivering underground smart building services, waste and utility infrastructure necessary for an integrated and sustainable precinct.



Figure 3 - Block B within the Western Gateway Sub-Precinct (existing)

## 1.2 The Project

The Consortium intends to develop up to 155,000m<sup>2</sup> of commercial and retail GFA within a podium, two towers, lower and upper ground plane over a three level basement. The Project comprises:

- Two commercial towers comprising 46,000m<sup>2</sup> and 42,000m<sup>2</sup> located above the podium with floorplates of approx. 1,850 m<sup>2</sup> and 2,000m<sup>2</sup> GFA;
- 61,500m<sup>2</sup> of commercial office space located within the podium which provide flexibility and campus style / large floorplates approx. 6,200m<sup>2</sup> GFA,
- A retail offering of approx. 5,500m<sup>2</sup> accessible from lower and upper ground levels, including food and beverage catering to station, visitors and Western Gateway commercial occupants providing an activated frontage and interface to Henry Deane Plaza. This includes an activated Lee Street frontage and lobby located at upper ground level, providing access to the commercial office podium levels and towers above.
- Three levels of basement car parking to accommodate:
  - 48 service vehicle and loading dock parking and distribution area within an Integrated Distribution Facility (IDF)
  - Service vehicle, loading dock and distribution area for all stakeholders within the Western Gateway;

- Provision for emergency, maintenance and service vehicle parking and distribution area for future Central Over Station Development (OSD) within the IDF);
- 121 parking spaces for Block B occupants;
- Provision for Block A and C vehicle access via the Block B;
- Bicycle parking and end of trip facilities for staff;
- Bicycle parking spaces for customers/visitors;
- Podium and tower rooftops designed for passive activation and gatherings for occupants of the Project to utilise and appreciate the views of the city and harbour;
- Redeveloped public space and stairs from Block B to future Central Precinct Over Station Development (OSD) providing an east-west pedestrian connection to and from the Western Gateway Sub-Precinct;
- Integration with a redeveloped Henry Deane Plaza to accommodate the increased pedestrian movement from existing and future pedestrian connections to various modes of transport;

To prepare Block B for future development, an increase in building height and floor space controls is sought. These proposed amendments to the Sydney LEP 2012 align with State, regional and local strategic planning objectives and initiatives.

This report should be read in conjunction with the Planning Statement prepared by MG Planning, and the other appended technical reports.

## 2 Site Analysis

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### 2.1 Site Location

Located close to Central Station, Block B comprises land fronting Lee Street, Haymarket and is bounded by Henry Deane Plaza to the north, the railway corridor to the east, the Sydney Buses layover to the south and Lee Street and Railway Square to the west. Together it constitutes an area of approximately 9,632m<sup>2</sup> at ground level, with a dimension from north to south of approximately 103-143 metres and approximately 74-81 metres from east to west (Figure 4).



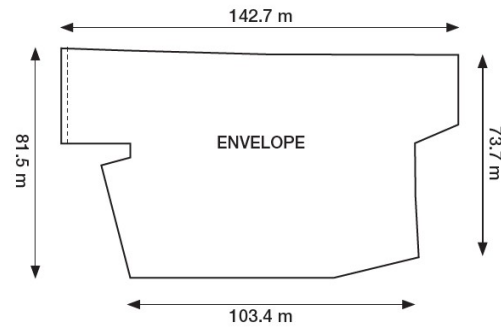


Figure 4 - Block B site boundary Source: Woods Bagot & SOM architects

Henry Deane Plaza (located on the lower datum) is centrally located within the Western Gateway and primarily funnels pedestrians between Devonshire Street tunnel, accessed from the Site's eastern boundary, and Lee Street tunnel, Railway Square, and tertiary institutions to the west.

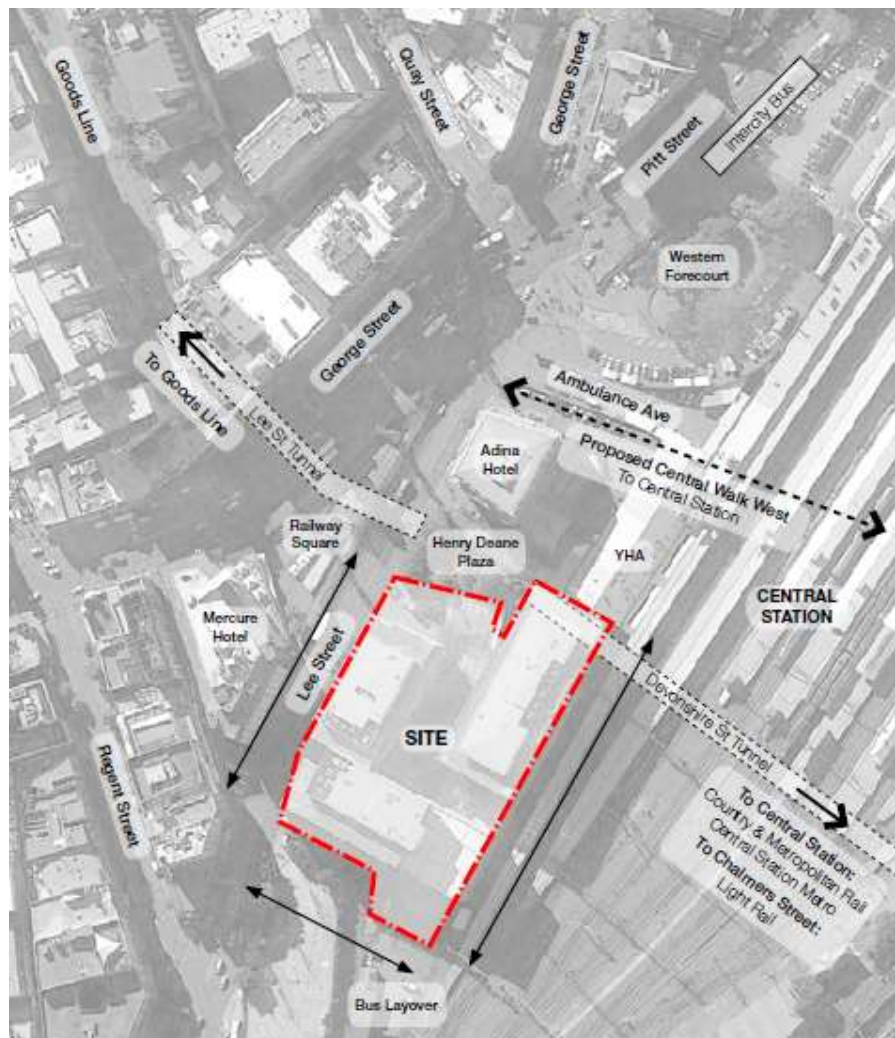


Figure 5 - Block B site boundary Source: Woods Bagot & SOM architects

The upper level of Block B flanks Henry Deane Plaza to the north and south (part of Block C).

A range of food and beverage outlets and service retail tenancies are located across both the lower and upper levels across the Western Gateway precinct

## 2.2 Site Ownership

The Consortium's Proposal relates to land located at 14-30 Lee Street, Haymarket. It is legally described as Lots 12, 14 and 15 in DP 1062447. Legal descriptions of each parcel within Block B are detailed below:

Table 1 - Site Ownership

Title Details	Legal Description
Lot 12 in DP 1062447	The proprietor of the fee simple is Rail Corporation of New South Wales. The proprietor of the leasehold estate of the land and the buildings on the land created by lease AA651830 expiring on 30 June 2099 is Dexu CPA Pty Ltd A.C.N. 160 685 156.
Lot 14 in DP 1062247	The proprietor of the fee simple is Rail Corporation of New South Wales. The proprietor of the leasehold estate of the land and the buildings on the land created by lease AA651832 expiring on 30 November 2100 is Henry Deane Building Nominees Pty Ltd A.C.N. 081 941 951
Lot 15 in DP 1062447	The proprietor of the fee simple is Rail Corporation of New South Wales. The proprietor of the leasehold estate of the land and the buildings on the land created by lease AA651833 expiring on 31 March 2101 is Gateway Building Nominees Pty Ltd A.C.N. 081 951 822.

## 2.3 Site Context

Block B sits on the southern fringe of the Sydney CBD at the western edge of the Central Station Precinct and is underpinned by Sydney's busiest train station. Whilst already benefitting from excellent public transport provision, the Western Gateway is also benefitting from significant State Government infrastructure investment including the construction of the new Metro, and the Sydney Light Rail extension.

## 2.4 Site Ground Conditions

Block B is currently occupied by a basement of variable levels built around 20 years ago. The current building is founded on a combination of pad footing and piles.

Residual soil remains underneath the basement in areas and is generally a mix of sand, clayey sand and clay.

Bedrock consists of Hawkesbury Sandstone at depth of around 10m is generally of medium to high strength, with some areas of Ashfield Shale.

Block B was formerly part of the rail yard so there could be some residual material from that period. Refer to the contamination report for a desk study of current contamination risks.

## 2.5 Central Rail Yard

The Central Station Rail yard is located immediately to the east of Block B. A 6 m wide easement zone, commonly referred to as platform zero, provides a buffer zone between Block B and the rail infrastructure of platform 1. This easement or buffer zone means that the impact of the development excavation on the rail infrastructure and operations will be minimal with good construction practices. Temporary retention anchors are likely to be needed to extend under the easement during excavation.

To the south of Block B is the rail substation which will continue to operate during construction of Block B. Retention systems will be designed to minimise any impact.

A detailed search for rail services in the easement is recommended during design development.

## 2.6 The Goods Line

The "Goods Line" is on a separate title cutting through the south-west corner of Block B. This was formerly a working rail line connecting the central yards to Darling Harbour. The goods line in this location has no construction of its own and is currently a disused rail line founded on ground in a cutting. The existing buildings and basement were simply built beside and over the line. It is envisaged that the goods line can be maintained, with permission, by simply incorporating it into the new construction. New structure will be provided under and around the goods line title zone with no underpinning or support required to any existing structure. A bridge structure supports Lee St and will need to be maintained at the junction with the new basement construction.

It is expected that there will be existing rail services in the goods line including live HV cables and communication and signalling cables (some possibly redundant) which will need to be diverted or suspended during construction, subject to TfNSW requirements and approval.

## 3 Potential Building Structure

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### 3.1 Overview of the Proposed Development

The proposed rezoning seeks to enable high rise development on Block B. An indicative scheme to show how Block B may be developed has been prepared. The indicative scheme comprises two high-rise towers, a podium and basement.

### 3.2 Foundations and Basement

The existing ground conditions on Block B are completely suitable for high-rise development and basement construction. Tower and podium buildings would be founded on reinforced concrete pad or raft foundations on medium to high

strength sandstone. Sandstone is at around 10m below street level. Some pile foundations may be required in areas of weak rock or at local depressions in the rock surface,

Basement excavation would require retention to the perimeter consistent with many other basements in Sydney. Retention systems would consist of a mix of

- New contiguous pile and shotcrete walls down to sandstone, with temporary anchors.
- Retention of existing basement walls, secured by temporary anchors.
- Temporary soldier pile walls with new basement walls constructed inside.
- Vertically cut sandstone in the lower basement levels from RL 10 down where inferred top of class III sandstone is expected. Temporary rock bolts with recessed bolt head and shotcrete may be required in areas of unstable rock subject to site inspections.

There are no existing buildings in close proximity apart from the substation to the south, so no underpinning of any existing structures is anticipated.

Basement floors will typically comprise conventional reinforced concrete construction. The basement floors will prop the permanent retaining walls. Vertical loads would be supported by a combination of reinforced concrete walls and reinforced concrete columns.

Blockwork lining will be provided to basement perimeter in moisture sensitive rooms and areas. Some drainage from excavated faces is expected.

### 3.3 Podium Structure

The podium is expected to be a large floor plate structure covering a high percentage of Block B. Construction is envisioned as a conventional Sydney solution constructed in in-situ concrete.

The floor plate structure would typically comprise one-way spanning reinforced or post-tensioned concrete slabs supported on primary post-tensioned concrete band beams. The beams will be designed to provide clearances for distribution of building services. Alternatively, flat slab construction with drop panels may be appropriate depending on planned usage and desirable column grids.

Vertical loads would be supported by a combination of reinforced concrete walls, reinforced concrete columns and concrete filled tubes (CFT). Concrete walls are typically arranged within the core structures.

### 3.4 Tower Structures

Commercial or residential uses for the towers are equally feasible on Block B and structural solutions for either can be pursued with confidence.

The tower structures are expected to be a conventional Sydney solution constructed in in-situ concrete.

Robustness, wind, and seismic loading will be applied in accordance with the relevant sections of AS/NZS1170 and AS1170 Parts 0, 2 and 4, with additional wind load data based on the results of wind tunnel testing.

Structural stability for the new overall structure will be provided by in-situ concrete walls forming the stair, riser and lift shafts. Reinforced concrete cores are a cost-effective and rapid form of construction for high-rise towers common in the Sydney market.

The floor plate structure is expected to comprise of one-way spanning reinforced or post-tensioned concrete slabs supported on primary post-tensioned concrete band beams. The beams will be designed to provide clearances for distribution of building services.

Straight and curved perimeters of the building would typically be framed by edge beams providing sufficient stiffness to the building perimeter to support the façade system

Variations to the depths of this basic floor configuration would be required in plant and storage levels and floors that support significant loads such as the BMUs and roof landscaping.

Vertical loads would be supported by a combination of reinforced concrete walls, reinforced concrete columns and concrete filled tubes (CFT). In locations where the façade profile changes up the height of the building raking columns are required.

## 4 Design Standards

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### 4.1 General

The design and documentation of the building and associated works shall comply with all relevant Australian Standards and the Building Code of Australia (BCA).

### 4.2 Codes of Practice

The tower, podium and basement structures will comply with:

- All current relevant Australian Standards;
- Building Code of Australia;
- Sydney Metro / TfNSW standards and requirements where applicable;
- Heritage requirements
- Development Near Rail Corridors and Busy Roads Interim Guidelines.

### 4.3 BCA Structural Provisions

The proposed buildings would be classified as follows in accordance with Part B1 of the BCA.



Table 2 - BCA Structural Provisions

BCA Table	Classification
Table B1.2a – Importance Level of Building	2
Table B1.2b – Design Events for Safety	Annual Probability of Exceedance Wind: 1:500 Earthquake: 1:500

## 4.4 Design Life

The structure is intended to be designed for a nominal 50-year design life. The BCA and Standards Australia material standards will be used as the basis for the durability specification for the structure.