Macquarie Capital

Sydney Metro
Martin Place Station

Stage 1 SSDA Report - Stormwater Management & Flooding Report

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Job number 247838

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Executive summary

This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

Macquarie Corporate Holdings Pty Limited (Macquarie) is seeking to create a World Class Transport and Employment Precinct at Martin Place, Sydney.

The application seeks Stage 1 approval for the establishment of building envelopes, maximum Gross Floor Areas and design parameters for two predominantly commercial office Over Station Development (OSD) towers, located above the site of the future Martin Place Metro Station (part of the NSW Government's Sydney Metro project).

In particular this report provides technical content to support the SSDA. It sets out the strategy for the proposed development in the context of the existing site specific conditions and relevant City of Sydney (CoS) Council planning requirements as described in the *Sydney Development Control Plan, 2012* (DCP) in addition to the System Requirements Specification (NWRLSRT-NSWR-SRT-SE-SPC-000004).

This report covers:

- Flood risk management
- Stormwater drainage from the development including on site detention

A summary of these issues and the proposed engineering responses are listed Table 1.

Table 1: Summary of stormwater and flooding issues and proposed outcomes

Item	**Summary**
Flood planning requirements & Flood risk management	Review of flooding indicates that it will be feasible to set flood levels in accordance with flood planning levels for the site are in accordance with the higher of *Interim Floodplain Management Policy* (City of Sydney, May 2014) and Metro 'System Requirements'. The development site is potentially affected by minor flooding in the 100yr storm and PMF (Probable Maximum Flood). Flood modelling will be undertaken to set minimum entry levels. Preliminary review of flooding suggests there are no significant impacts to overland flow, flooding or stormwater management. Further development and analysis will be undertaken to review and assess this in subsequent design stages.
Stormwater design	Stormwater from the development will be discharged into the existing Sydney Water infrastructure surrounding the site. Current investigations suggest existing infrastructure will not be altered by the development, with connections made to existing pits along the street. Sydney Water/City of Sydney may require on site detention for the site, and this can be accommodated within the development if required. Volumes will be confirmed during Stage 2 design.

1 Introduction

This report supports a State Significant Development (SSD) Development Application (DA) submitted to the Minister for Planning pursuant to Part 4 of *the Environmental Planning and Assessment Act 1979* (EP&A Act).

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1.1 Background

The New South Wales (NSW) Government is implementing Sydney's Rail Future (Transport for NSW, 2012), a plan to transform and modernise Sydney's rail network so that it can grow with the city's population and meet the needs of customers in the future.

Sydney Metro is a new standalone rail network identified in Sydney's Rail Future. The Sydney Metro network consists of Sydney Metro Northwest (Stage 1) and Sydney Metro City & Southwest (Stage 2).

Stage 2 of the Metro entails the construction and operation of a new Metro rail line from Chatswood, under Sydney Harbour through Sydney's CBD to Sydenham and eventually onto to Bankstown through the conversion of the existing line to Metro standards. The project also involves the delivery of seven (7) new Metro stations, including Martin Place.

This step-change piece of public transport infrastructure once complete will have the capacity for 30 trains an hour (one every two minutes) through the CBD in each direction catering for an extra 100,000 customers per hour across the Sydney CBD rail lines.

On 9 January 2017 the Minister for Planning approved the Stage 2 (Chatswood to Sydenham) Metro application lodged by Transport for NSW (TfNSW) as a Critical State Significant Infrastructure (CSSI) project (reference SSI 15_7400).

TfNSW is also making provision for future Over Station Development (OSD) on the land it has acquired for the Stage 2 Sydney Metro project, including land acquired for the purposes of delivering Martin Place Station. The OSD development is subject to separate applications to be lodged under the relevant provisions of the EP&A Act.

An Unsolicited Proposal submission has been lodged by Macquarie to the NSW Government for the delivery of a single fully integrated station/OSD solution for the new Sydney Metro Martin Place Station.

1.2 Site Description

The Sydney Metro Martin Place Station Precinct (the Precinct) project relates to the following properties (refer to Figure 1):

- 50 Martin Place, 9 – 19 Elizabeth Street, 8 – 12 Castlereagh Street, 5 Elizabeth Street, 7 Elizabeth Street, and 55 Hunter Street (North Site);
- 39 – 49 Martin Place (South Site); and
- Martin Place (that part bound by Elizabeth Street and Castlereagh Street).

The land the subject of this application relates only to the North and South Site (refer to Figure 2). Each site will accommodate one OSD tower above the future Sydney Metro Martin Place Station (representing the northern and southern entries/gateways to the Sydney Metro station). The land acquired for the Sydney Metro Martin Place Station is the same as for the Macquarie proposal, except that the Macquarie proposal includes the two properties north of Martin Place owned by Macquarie, namely 50 Martin Place and 9-19 Elizabeth Street.

Both the North and South Sites are regular in shape and have area of approximately 6,022m^2 and 1,897m^2 respectively, totalling 7,919m^2.

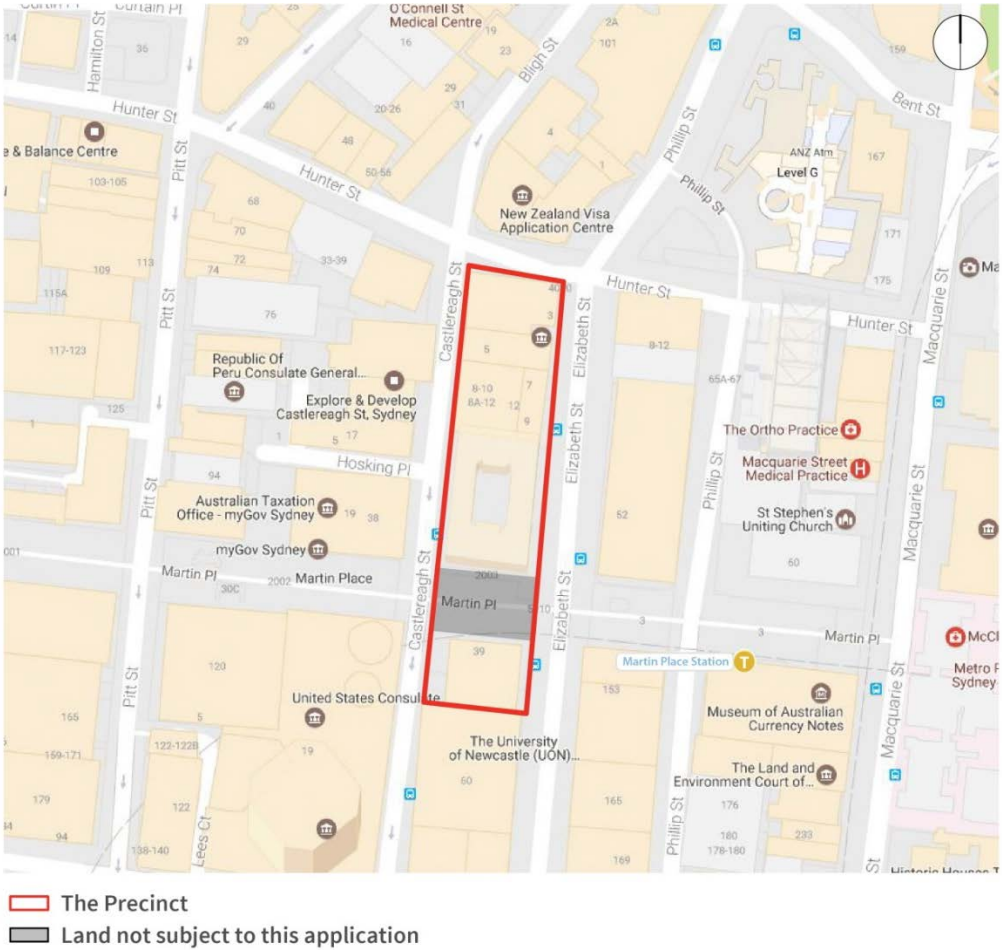


Figure 1. Location map of the precinct

Figure 2. Aerial photo of the North and South Site

Located close to the centre of the Sydney CBD, the Precinct comprises of the entire City block bounded by Hunter Street, Elizabeth Street, Martin Place and Castlereagh Street; that portion of Martin Place located between Elizabeth Street and Castlereagh Street and the northern most property in the block bounded by Martin Place, Elizabeth Street, Castlereagh Street, and King Street. Together it constitutes an above ground site area of approximately 9,400 square metres, with a dimension from north to south of approximately 210 metres and from east to west of approximately 45 metres. It incorporates a significant portion of one of Sydney's most revered public spaces – Martin Place.

Martin Place is recognised as one of Central Sydney's great public, civic and commemorative spaces, as well as being a historically valued commercial and finance location of Sydney's CBD. Martin Place and a large number of buildings on, or in close proximity to, Martin Place are identified as heritage items, either as items of National, State or Local significance. Number 50 Martin Place, which forms part of the Macquarie North Site, is one of these major heritage items.

There has been a number of redevelopment and refurbishment proposals in recent years along Martin Place to improve existing assets and recapture their premium commercial status (e.g. 5 Martin Place, 50 Martin Place, 20 Martin Place, upgrades of the MLC Centre, and 60 Martin Place). The City of Sydney Council has also identified a need to reinvigorate Martin Place and upgrade the public spaces.

The surrounding locality is characterised by a variety of built forms and architectural styles, with many of the buildings, including those of relatively recent years, not complying with the current planning controls with respect to building heights, setbacks and street wall heights.

In terms of land use the area is characterised by a predominance of office uses, with some ground floor retailing, cafés, or restaurants and hotels (most notably the Westin and the Wentworth) to support its primary business centre function.

1.3 Overview of Proposed Development

The proposal by Macquarie is unique and innovative in aligning the aspirations for public transport, civic amenity and the long-term sustainability of Sydney as a financial centre. This will be achieved through a development designed to maximise the opportunities for an improved Metro Station, integration of the existing and new public transport infrastructure, integration of that infrastructure with modern commercial office towers and world class retailing, along with rejuvenating and complimenting some of Sydney's most revered public spaces, and substantially improving station access and connectivity.

More specifically the development will comprise a concept proposal (under section 83B of the EP&A Act) for the OSD for the North and South Sites. It will be designed as a fully integrated Station and OSD project that, subject to approval, will be built and delivered as one integrated project for opening at the same time as the Sydney Metro is commissioned. The concept proposal establishes the vision and planning and development framework which will be the basis for the consent authority to assess future detailed development proposals (Stage 2 DAs).

The North Site

The Concept Proposal for the North Site is for a new 40+ storey, predominately commercial office building. The proposal seeks to integrate with the existing 50 Martin Place building, supporting large commercial floor plates. No connections to 50 Martin Place are proposed for the basement levels of that building, including the level of the significant heritage Safe Deposit Vault.

The South Site

The Concept Proposal for the South Site is for a new 28+ storey predominately commercial office building.

The detailed design of the OSD is still in its preliminary stages. Critically it requires an integrated design approach to be adopted between the commercial OSD components classified as SSD, and the Station components, which are classified as CSSI and have already been approved. This is to ensure:

- all the operational needs of the Metro Station are accommodated in accordance with TfNSW requirements and the structural and other requirements of the OSD are accommodated within the Station building beneath, in what is essentially one building; and
- a cohesive public domain and built form outcome is achieved for Sydney.

In this regard, OSD uses and structural elements are located within the below ground and lower podium levels, as conceptually approved under the CSSI consent for the Martin Place Station.

The Staged DA will seek consent for, amongst other things, land uses, gross floor area, building envelopes, and vehicle access arrangements.
A more detailed and comprehensive description of the proposal is contained in the Environmental Impact Statement (EIS) prepared by JBA.

1.4 Planning Approval Strategy

The *State Environmental Planning Policy (State and Regional Development) 2011* (SEPP SRD) identifies development which is declared to be State Significant. Under Schedule 1 and Clause 19(2) of SEPP SRD, development within a railway corridor or associated with railway infrastructure that has a capital investment value of more than $30 million and involves commercial premises is declared to be State Significant Development (SSD) for the purposes of the EP&A Act.

The proposed development (involving commercial development that is both located within a rail corridor and associated with rail infrastructure) is therefore SSD.

Pursuant to Section 83B of the EP&A Act a Staged DA may be made setting out concept proposals for the development of a site (including setting out detailed proposals for the first stage of development), and for which detailed proposals for separate parts of the site are to be the subject of subsequent DAs. This SSD DA is a staged development application made under Section 83B of the EP&A Act.

A detailed development application(s) (Stage 2 DAs) will accordingly follow, seeking approval for the detailed design and construction of all or specific aspects of the proposal in accordance with the approved staged development application.

Submitted separately to this SSD DA are applications to modify the CSSI approval together with a Planning Proposal relating to the North Site (FSR only) and South Site (height and FSR).

For clarity, Figure 3 is a diagrammatic representation of the suite of applications proposed by Macquarie, to show the relationship of the SSD DA (the subject of this report) to the Planning Proposal and the Martin Place Metro CSSI.

The Department of Planning and Environment have provided Secretary's Environmental Assessment Requirements (SEARs) to the applicant for the preparation of an Environmental Impact Statement for the proposed development. This report has been prepared having regard to the SEARs as relevant.

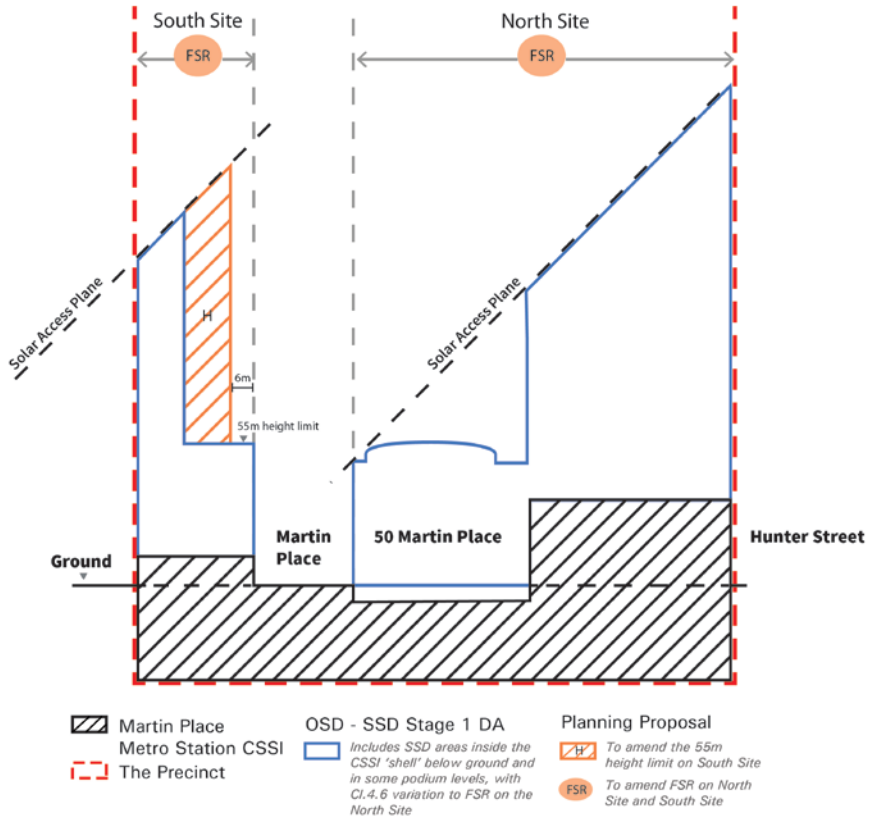


Figure 3: Relationship of planning applications

1.5 Purpose of this Report

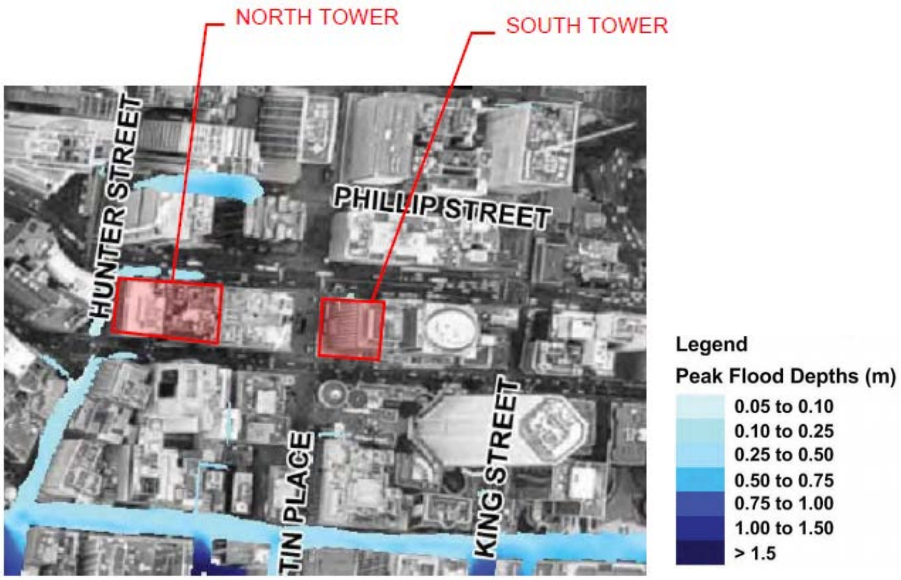
This report outlines the strategy for the proposed development in the context of the existing site specific conditions and relevant City of Sydney Council planning requirements, as described in the *Sydney Development Control Plan, 2012* (DCP) in addition to the System Requirements Specification (NWRLSRT-NSWR-SRT-SE-SPC-000004).

This report covers a number of different technical areas including:

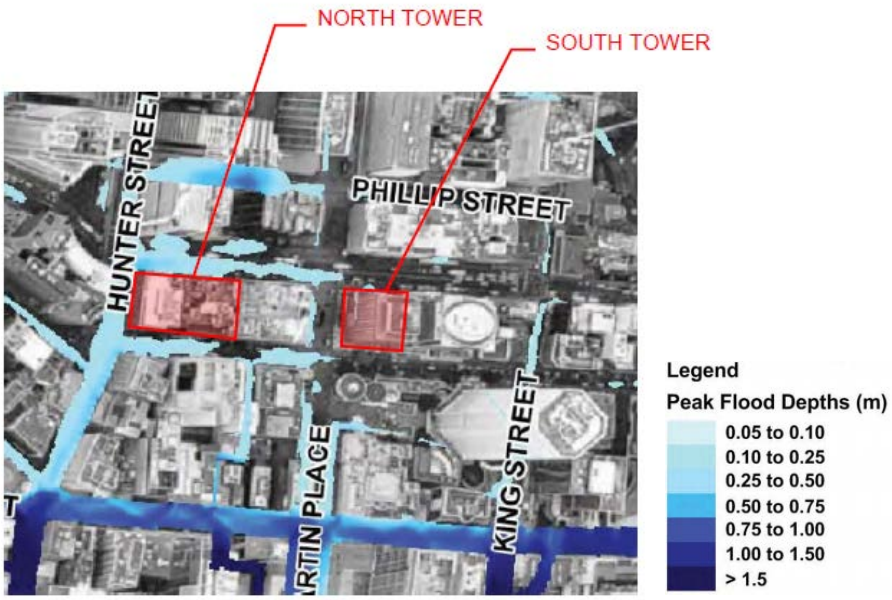
- Flood risk management
- Stormwater drainage from the development including on site detention Flood risk management

1.6 Existing Flooding

The City of Sydney Council *"City Area Catchment Floodplain Risk Management Study, Final Draft, May 2016"* provides information and flood maps which indicate that some areas of the proposed development site are potentially impacted by flooding. This is shown in Figure 4:



1 in 100yr flood



PMF flood

Figure 4. Existing flood extents and depths (greater depth indicated by deeper shades of blue) during both the 100yr and PMF flood (excerpt City Area Catchment Floodplain Risk Management Study, May 2016)

As shown on the excerpt, generally flooding is isolated to Hunter Street with some minor flooding (isolated to the road corridor) along both Elizabeth Street and Castlereagh Street surrounding the proposed 'North Tower'. The proposed 'South Tower' is exempt from flooding from adjoining streets.

1.7 Flood Planning Requirements

Flood planning levels for the site are understood to be dictated by the *Interim Floodplain Management Policy* (City of Sydney, May 2014) and the Sydney Metro 'System

Requirements Specification', with the more onerous requirements to be adhered to in the event of a discrepancy between the two standards.

As noted in the previous section, flooding is generally isolated to Hunter Street with overland flow within the road corridor along both Elizabeth and Castlereagh streets.

Applicable flood planning requirements from the *Interim Floodplain Management Policy* (City of Sydney, May 2014) are as follows:

- Commercial Development: Merits approach with a minimum of the 1% Annual Exceedance Probability (AEP) flood;
- Below ground car park entrances: 1% AEP flood level +0.5mor the PMF (whichever is higher), applicable to all possible ingress points to the carp park such as vehicle entrances and exits, ventilation ducts, windows light wells, lift shaft openings, risers and stairwells; and
- Critical facilities: 1% AEP flood level +0.5m or the PMF (whichever is higher).

The 1% AEP flood is approximately equal to the 100 year ARI flood referred to elsewhere within this report.

Flood planning levels identified in the Sydney Metro 'System Requirements Specification' are as follows:

"Flood immunity – underground (SM-CSW-SRS-3773):

Sydney Metro underground systems (including tunnel entries, station entries and below ground facilities) shall be designed, constructed, operated and maintained so as to prevent flooding from the 100 year ARI (Average Recurrence Interval) flood level plus 0.5m or the Probable Maximum Flood(PMF), whichever is the greater level.

The PMF is;

- *as defined in Australian Rainfall and Runoff,*
- *in accordance with the Department of Environment and Climate Change (DECC) Floodplain Risk Management Guideline – Practical Consideration of Climate Change, version 1 October 2007; and*
- *in accordance with DECC's Draft Seas Level Rise Policy Statement, February 2009."*

1.7.1 Climate Change

The potential impacts of climate change are discussed in the City of Sydney's 'City Area Catchment Flood Study, March 2014', with respect to both rainfall intensity increases and rising sea levels. In the worst case scenario for rainfall intensity (30% increase, no sea level rise), the increase of flood levels is at a maximum 0.1m along Hunter Street compared to the existing case. Refer to Figure 5 to observe predicted increases in flood levels for this scenario.

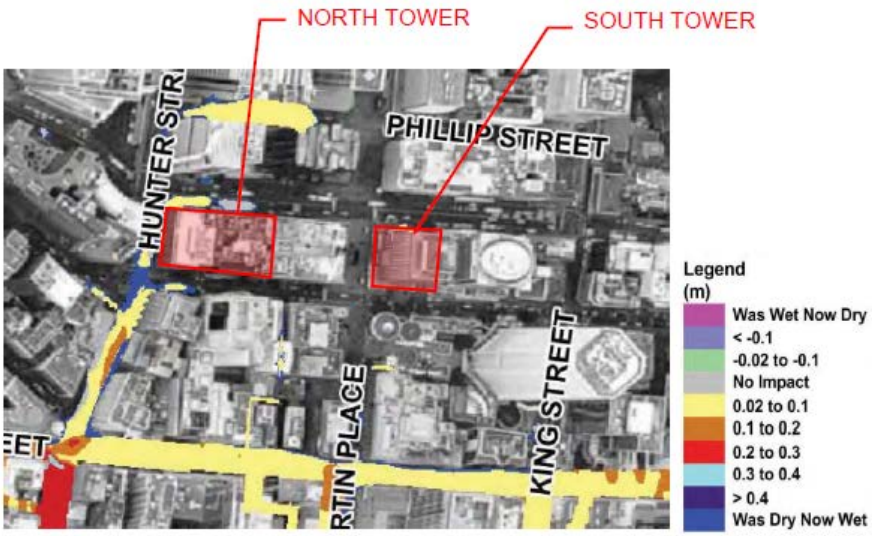


Figure 5. Climate Change Impacts, excerpt from City Area Catchment Flood Study

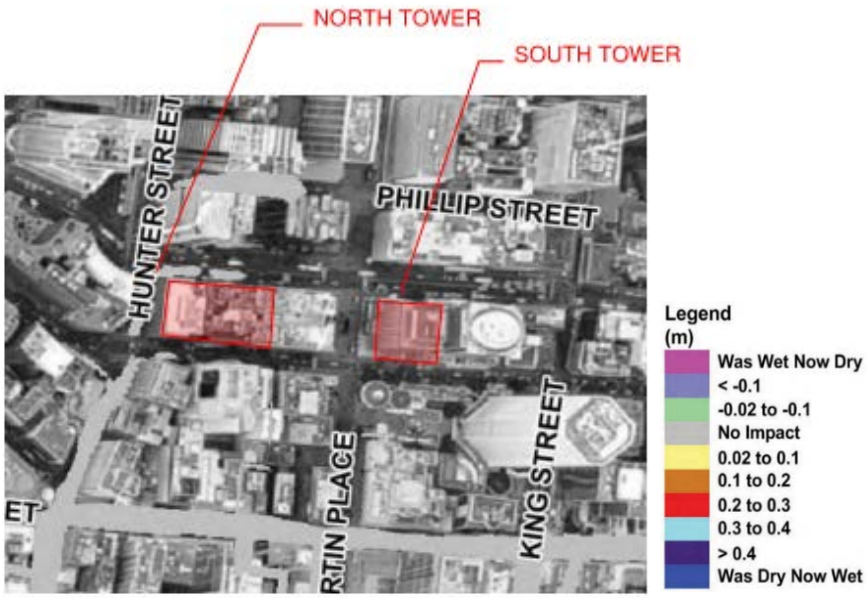


Figure 6 Sea Level Rise, excerpt from City Area Catchment Flood Study

The flood study also suggests that the proposed site will not be impacted by an increase in sea level rise, which is likely due to the elevation of this development relative to sea level. With reference to the excerpt from the Flood Study. An increase of sea level by 0.9m (2100 benchmark, DECCW, 2009) the results show that there is no potential impact to the site.

1.8 Flood Risk Management Strategy

In line with the most onerous of the City of Sydney Interim Floodplain Management Policy requirements and Sydney Metro 'System Requirements Specification':

- All openings and entrances to the Metro (lifts, basement entrances, pedestrian entrances, louvers, grates etc.) are proposed at the higher of the 100yr ARI + 0.5m and PMF.

- A merits based approach of minimum of 100yr ARI flood level will be adopted for commercial and retail entrances.
- Entrances to basement carparking will be set at the higher of the 100yr ARI + 0.5m and PMF.

All of the above requirements will include consideration of the effect of climate change.

1.9 Flood modelling

Flood modelling will be undertaken during further design development to support the Stage 2 DA, to advise on appropriate flood planning levels and to demonstrate that there is no significant impact on existing flooding from the proposed development. It is assumed that the 'City Area Catchment Flood Study' 1d/2d TUFLOW model will be provided by the City of Sydney for this analysis.

The three step process to be undertaken for the flood modelling under the Stage 2 Development Application will be as follows:

- **City of Sydney model results:** The TUFLOW model (supplied by City of Sydney) will be run to establish the initial flooding conditions as per the *City Area Catchment Flood Study* (City of Sydney, October 2014)
- **Surveyed existing case – 'base case':** The detailed survey of the existing site will be incorporated into the supplied TUFLOW model to provide a more detailed baseline to assess existing flood impacts on the site and inform flood planning levels.
- **Proposed case:** Any proposed grading modifications of the site within the current flood extent will be incorporated into the 'base case' TUFLOW model to determine any flood impacts from the proposed development.

2 Stormwater Drainage

2.1 Existing Drainage

The existing site is largely occupied by buildings of varying heights and basement car parks and Martin Place. Little information is available as to how the existing site discharges to the surrounding stormwater network, however from observation there are connections to the stormwater network along both Castlereagh Street and Elizabeth Street.

Figure 7 illustrates the stormwater infrastructure in the streets surrounding the development site from the DBYD request, which is owned by either Sydney Water or the City of Sydney. This figure shows that there are existing stormwater pits and pipes on Castlereagh, Elizabeth, Phillip and Bligh Streets, and within the public domain area of Martin Place.

Figure 7: Existing stormwater around the site (CoS, 2017)

Of particular significance is the Sydney Water trunk drainage infrastructure within Elizabeth and Castlereagh Street. It is noted that Sydney Water does not allow building structures to encroach laterally within 1m of their existing assets (unlimited depth and height). This requirement has and will continue to be adhered to throughout detailed design. Further design and investigation will occur through the development of this critical infrastructure to determine that there will be no negative impacts.

According to the information provided from Dial Before You Dig (DBYD) logs and survey, there are no known Sydney Water/ City of Sydney drainage pipes below the building footprint. It is likely however, that there are existing development drains serving the existing buildings and connecting into the surrounding streets. This will require further investigation which may only become possible once demolition of the site commences.

2.2 Proposed Development Drainage

The proposed development involves the construction of two multi-storey commercial and retail buildings which will occupy the majority of the two separate sites. The ‘North’ and ‘South’ towers will have roof and canopy drainage systems which will collect and convey water through the buildings and into rainwater harvesting tanks.

From the tanks, the approach will be to drain stormwater by gravity to the Sydney Water drainage network at existing connections along Castlereagh Street. This approach has been suggested because Castlereagh Street is the lowest of the streets surrounding both towers and provides the best opportunity for a gravity connection from the basement. No works are proposed to be undertaken on the Tank Stream heritage drain.

The design of the proposed off-site connections into the Sydney Water system shall be undertaken in the future stages of design development in conjunction with a Sydney Water Coordinator and in consultation with City of Sydney. This will be driven by the internal hydraulic design and reticulation, which will establish the proposed pipe invert levels within the basement.

2.3 On-Site detention

From Sydney Water's policy document on-site detention (June 2014) may be required for this development. Roof drainage for both buildings in excess of that stored by the rainwater harvesting tanks would be collected into a detention tank within the extents of the building, and discharged to the street drainage system. The requirement and size of the on-site detention tanks will be determined from Sydney Water.

As Martin Place is an existing public domain, no on-site detention is proposed for this area.