

To: [Department of Planning, Industry and Environment](#)

Produced: Michele Zornitta (Associate Water Resources Engineer -WSP)

Reviewed: John Pickering (Associate Engineer - WSP)

Subject: **Waterloo Metro Quarter OSD**
SSD-10438 Basement – Response to submission comments

Date: 15 February 2021

Introduction

This note has been prepared to respond to the comments raised by the Environment, Energy and Science Group (EES) to the Department of Planning, Industry and Environment (DPIE) public exhibition for Waterloo Metro Quarter Over Station Development (OSD).

Specifically, this note responds to the comments for the Basement SSD DA (SSD-10438) application. Figure 1 below represents a schematisation of Waterloo Metro Quarter OSD.

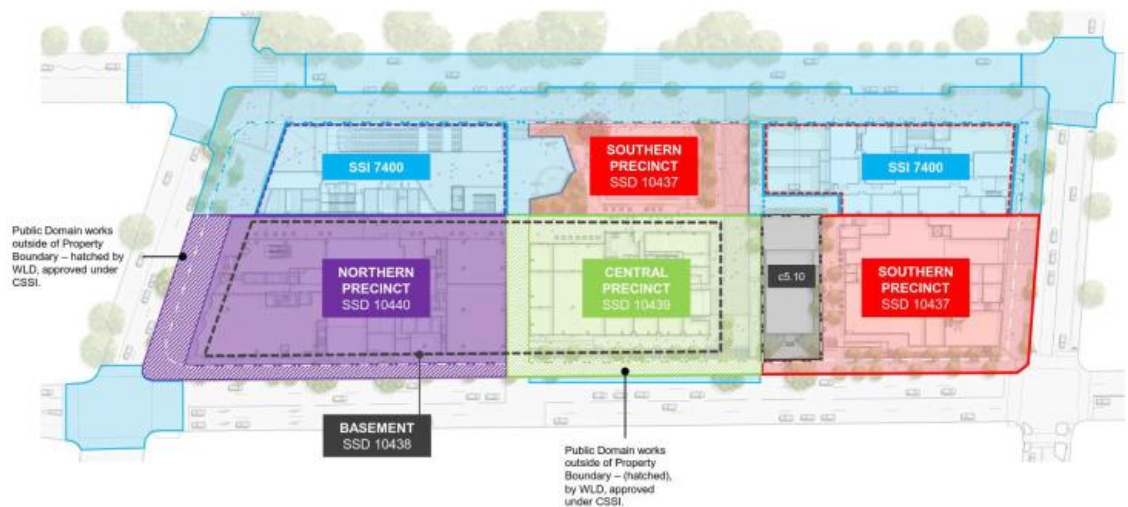


Figure 1: Waterloo Metro Quarter site, with sub-precincts identified

| Comment | | Response |
|--|--|--|
| Floodplain risk management | | |
| 1 | The reports have not included flood level mapping for any scenarios, except the 1% AEP flood event plus climate change. Mapping, including water level contours at appropriate intervals, must be provided as a minimum for the 5% and 1% AEP flood events and the PMF event. | Water level contour maps (with a 50mm contour interval) for the 5%AEP, 1% AEP and PMF flood events have been prepared and attached to this response as requested by the EES reviewer. |
| Flood impacts of the proposed development | | |
| 2 | <p>The individual buildings of the over station development are not expected to cause any flood impacts; however, the ancillary road works are predicted to cause unacceptable impacts.</p> <p>An acceptable tolerance for flood level increase would be 10mm. Appears road works were not included in concept stage modelling in Concept Water Quality, Flooding and Stormwater Report of 2018.</p> <p>Require mitigation measures to meliorate the flood impacts to be finalised and submitted for review by EES before a recommendation for approval can be made.</p> | <p>As agreed within this submission, we note the construction of the OSD buildings (and basement) are not expected to cause any flood impacts.</p> <p>Concern is raised in this submission regarding the acceptable tolerance for flood level increases within the surrounding road network and neighbouring properties resulting from road works.</p> <p>The scope of works proposed within this Basement SSD (SSD-10438) does not impact the extent of localised flooding surrounding the Waterloo Metro Quarter site.</p> |
| Flood risk for the development – Flood Planning Levels | | |
| 3 | <p>Generally, floor levels are above the 1% AEP flood level and generally above the PMF level. Where required at entries to basements, 500 mm freeboard to the 1% AEP flood level appears to have been provided. However, the report has not adequately documented all the proposed finished floor levels (FFLs) to enable their comparison to the proposed FPLs.</p> <p>As a minimum, the FFLs need to be provided in Table 4 alongside the FPLs.</p> | <p>All points of ingress to the basement are at or above the 1% AEP + 500 mm freeboard and PMF flood levels (whichever is higher).</p> <p>Please refer to Appendix B of this response for further details on finish floor levels.</p> |
| Flood risk for the development – Residual Risk and Emergency Management | | |
| 4 | Flood risk for the development – Residual Risk and Emergency Management. Need to demonstrate “Safe refuge can be provided within the proposed development.” Issues | As indicated in Response 3 above, the basement is protected from flooding; all points of ingress to the basement are at or above the PMF and 1%AEP+500 mm flood levels (whichever is higher). |

| | | |
|--|---|--|
| | <p>regarding residual risk that need to be addressed and require amendments to the design.</p> <p>A proper assessment of the flood behaviour as it relates to emergency management is required, together with the development of a strategy for flood emergency management.</p> <p>Shorter and longer durations should be considered for emergency planning, not only the duration that generates the peak flood level. No consideration has been given to the number of persons at risk and whether there is enough space for these individuals in the nominated shelter areas. Any persons in external licenced seating areas, must be accounted for in emergency planning.</p> <p>Lifts and escalators may not be operational during extreme floods. It is not considered acceptable for persons coming from the basement to exit onto the street in extreme floods. Direct stair access must be provided to refuge internal to the building. The proponent needs to confirm the suitability of the shelter in place provisions.</p> | <p>No evacuation is necessary from the basement as sufficient flood protection is proved within the basement.</p> <p>In a flood emergency occupant of the basement can remain safe in the basement until the flood emergency is finished.</p> <p>The site area is located at the top of the catchment and only events with short duration and high intensity rainfall are relevant in terms of flood protection. Different storm durations have been considered for the 1% AEP, 1%AEP+CC and PMF events to determine the critical storm durations that were used to define appropriate floor levels. This is as per accepted standard industry approach.</p> <p>As indicated within the flood study report storm durations tested are the same as what was considered in the Alexandra Canal Catchment flood model which is currently adopted by CoS; an additional storm duration of 90 minutes was also considered for the 1% AEP flood event.</p> <p>A flood emergency management plan will be provided at a later stage prior to occupation of the building.</p> |
|--|---|--|



APPENDIX A – FLOOD LEVEL MAPS

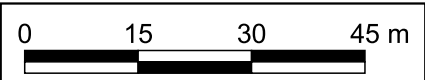


KEY:

- Station Building
- Northern Precinct
- Central Precinct
- Southern Precinct
- Waterloo Congregational Church
- Contour Level (m AHD)

Water Level (m AHD)

- <= 1
- 1 - 15.75
- 15.75 - 16
- 16 - 16.5
- 16.5 - 16.75
- 16.75 - 17
- 17 - 20



FOR INFORMATION ONLY

| Rev. | Date | ISSUE | Prepare | Approve |
|------|----------|--------------|---------|---------|
| B | 03/02/21 | SECOND ISSUE | MZ | AV |



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Waterloo - OSD

Proposed Scenario - 5% AEP

Water Level

Scale: 1:1000

03/02/21

Project Number: PS119449

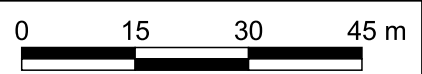


KEY:

- Station Building
- Northern Precinct
- Central Precinct
- Southern Precinct
- Waterloo Congregational Church
- Contour Level (m AHD)

Water Level (m AHD)

- <= 1
- 1 - 15.75
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- 16 - 16.5
- 16.5 - 16.75
- 16.75 - 17
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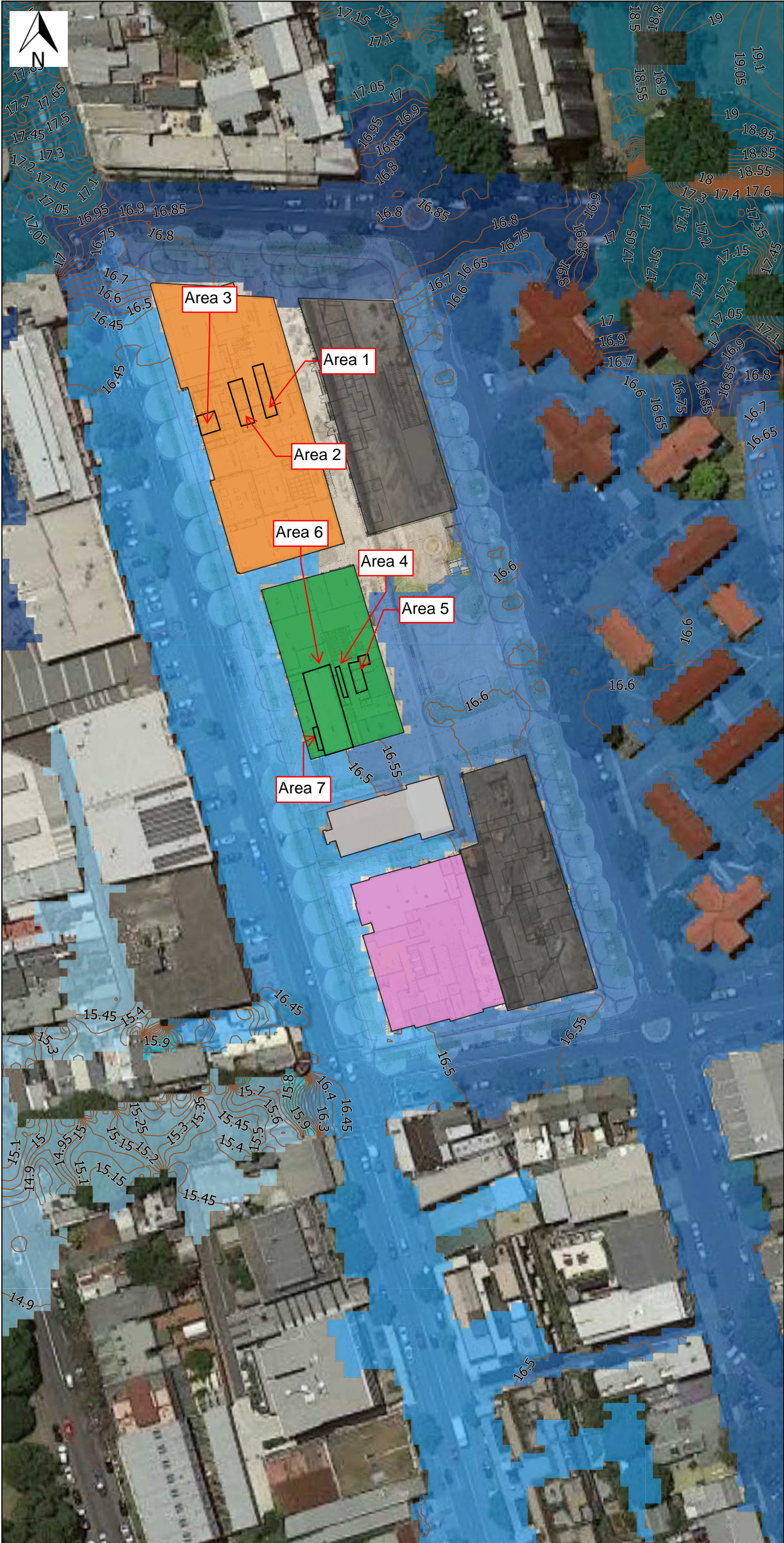
Proposed Scenario - 1% AEP

Water Level

Scale: 1:1000

03/02/21

Project Number: PS119449

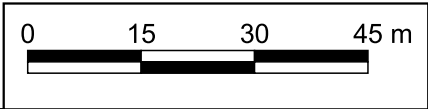


KEY:

- Station Building
- Northern Precinct
- Central Precinct
- Southern Precinct
- Waterloo Congregational Church
- Contour Level (m AHD)

Water Level (m AHD)

- <= 1
- 1 - 15.75
- 15.75 - 16
- 16 - 16.5
- 16.5 - 16.75
- 16.75 - 17
- 17 - 20



| FOR INFORMATION ONLY | | | | |
|----------------------|----------|--------------|---------|---------|
| Rev. | Date | ISSUE | Prepare | Approve |
| B | 04/02/21 | SECOND ISSUE | MZ | AV |

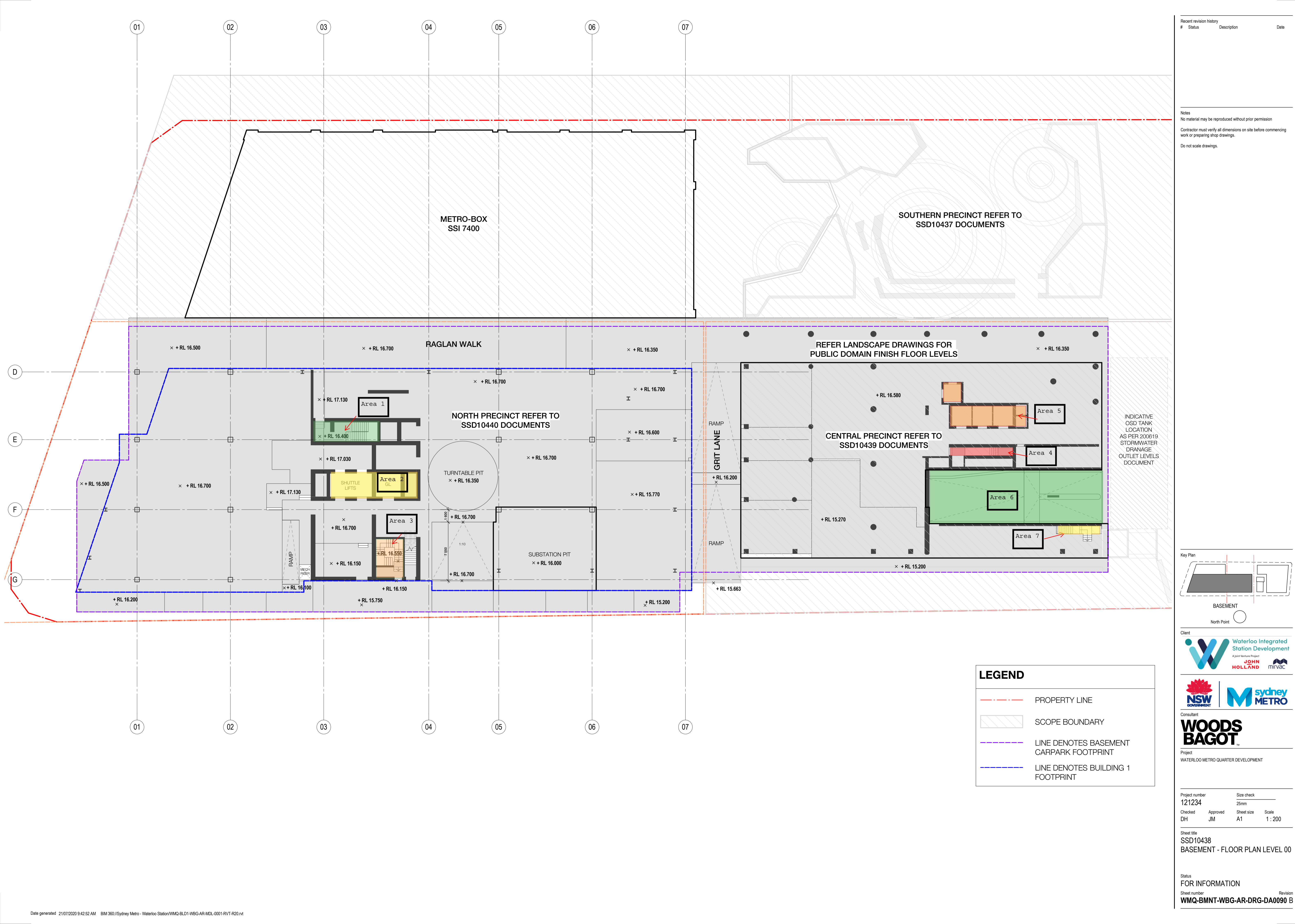


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| | |
|--------------------------|----------|
| Waterloo - OSD | |
| Proposed Scenario - PMF | |
| Water Level | |
| Scale: 1:1000 | 04/02/21 |
| Project Number: PS119449 | |



APPENDIX B – BASEMENT FINISH FLOOR LEVELS



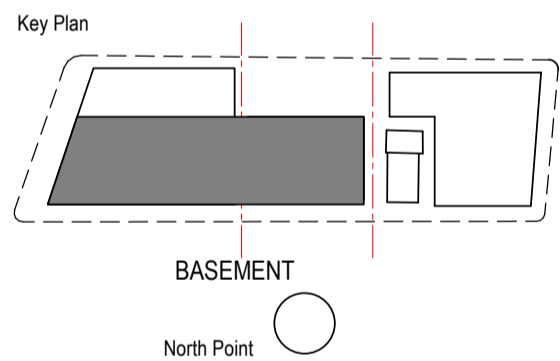
| Recent revision history | | |
|-------------------------|--------|-------------|
| # | Status | Description |
| | | Date |

Notes

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Contractor must verify all dimensions on site before commencing work or preparing shop drawings.

Do not scale drawings.



Consultant

WOODS BAGOT

Project

WATERLOO METRO QUARTER DEVELOPMENT

| | |
|----------------|------------|
| Project number | Size check |
| 121234 | 25mm |
| Checked | Approved |
| DH | JM |
| Sheet size | Scale |
| A1 | 1 : 200 |

Sheet title

SSD10438

BASEMENT - FLOOR PLAN LEVEL 00

Status

FOR INFORMATION

Sheet number

WMQ-BMNT-WBG-AR-DRG-DA0090 B

Revision

Table 1: Finish Floor Levels (access to the basement)

| Area | Classification | Flood Level as per hydraulic model results (m AHD) | Proposed Floor Level (m AHD) for relevant points of ingress to the basement | Compliant |
|------|---|--|---|--|
| 1 | Access to the underground car park from Northern Precinct | PMF = 16.80 1% AEP + 500mm= 17.115 | 17.13 | Yes. Finish floor level above PMF and 1% AEP+500mm flood level. |
| 2 | Access to the underground car park from Northern Precinct | From Raglan Street PMF = 16.80 1% AEP + 500mm= 17.115 From Botany Road PMF = 16.453 1% AEP + 500mm= 16.646 | 17.13 (protecting flooding from Raglan Street) 16.7 (protecting flooding from Botany Road) | Yes Finish floor level above PMF and 1% AEP+500mm flood level. |
| 3 | Access to the underground car park from Northern Precinct | PMF = 16.462 1% AEP + 500mm= 16.543 | 16.55 | Yes Finish floor level above PMF and 1% AEP+500mm flood level. |
| 4 | Access to the underground car park from Central Precinct | PMF = 16.598 1% AEP +500mm=16.249 | 16.72 | Yes Finish floor level above PMF and 1% AEP+500mm flood level. |
| 5 | Access to the underground car park from Central Precinct | PMF = 16.598 1% AEP +500mm=16.249 | 16.72 | Yes Finish floor level above PMF and 1% AEP+500mm flood level. |
| 6 | Access to the underground car park from Central Precinct | PMF = 16.56 1% AEP +500mm=16.249 | 16.58 | Yes Finish floor level above PMF and 1% AEP+500mm flood level. |

| Area | Classification | Flood Level as per hydraulic model results (m AHD) | Proposed Floor Level (m AHD) for relevant points of ingress to the basement | Compliant |
|------|--|--|---|---|
| 7 | Access to the underground car park from Central Precinct | PMF = 16.56 1% AEP +500mm=16.249 | 16.58 | Yes Finish floor level above PMF and 1% AEP+500mm flood level. |