CIVIL ENGINEERING

STATE SIGNIFICANT DEVELOPMENT APPLICATION

Randwick Campus Redevelopment

Integrated Acute Services Building (IASB) Addition

Prepared for: Lendlease

Document no: SSDA Report

Issue no: Rev 5

Confidential & Commercial in Confidence

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REVISIONS

Revision	Date	Purpose	Prepared By	Approved By
1	15/05/2019	Draft SSDA	NP	MG
2	04/07/2019	SSDA Issue	NP	MG
3	11/07/2019	SSDA Issue	NP	MG
4	16/07/2019	SSDA Issue	NP	MG
5	05/08/2019	SSDA Issue	NP	MG

Unless otherwise advised, the parties who have undertaken the Review and Endorsement confirm that the information contained in this document adequately describes the conditions of the site located at the Prince of Wales Hospital

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Appendices

1 Introduction

1.1 Site Location

The Randwick Hospital Campus comprises a single land parcel of approximately 13.26 hectares. Four hospitals currently share the campus: Sydney Children's Hospitals Network (SCHN), the Royal Hospital for Women (RHW), Prince of Wales Public Hospital (POWH), and the Prince of Wales Private Hospital (POWP). These institutions provide a mix of Acute, Ambulatory, Community, Cancer and Mental Health services, and are co-located with three leading research institutes: The Black Dog Institute, Neuroscience Research Australia, and The Bright Alliance.

A locality plan is shown in Figure 1.

The current extent of the campus is defined by High Street to the north, Barker Street to the south, Avoca Street to the east and Hospital Road to the west. The Kensington Campus of the University of New South Wales (UNSW) is located to the west of the Hospital Campus on Botany Street.

The focus of this report will be on the lowering of Hospital Road which provides connection between the approved Acute Service Building (ASB) site and the existing campus.

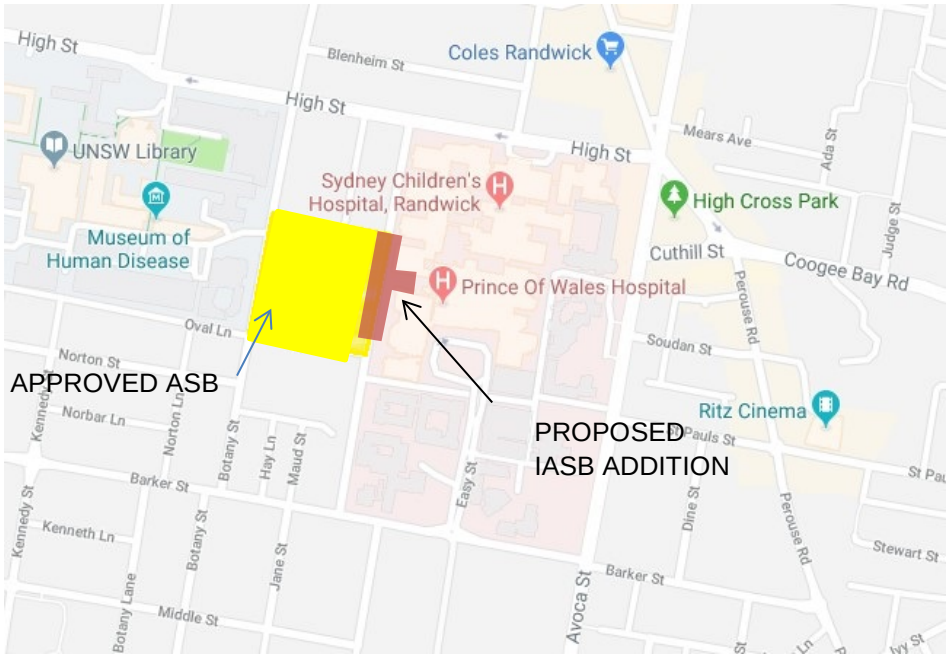


Figure 1 – Locality Plan (Source Google Maps)

1.2 Existing Hospital Road Site Area

Hospital Road provides a primary access to the hospital onsite car parking facilities for patients and visitors, whilst also providing access to the hospital loading dock for service delivery vehicles.

Hospital Road is aligned in a north-south direction and intersects High Street to the north and Barker Street to the south. Access to Hospital Road via Magill Street is currently blocked via bollards to prevent traffic movements entering Magill Street. Hospital Road is a privately owned Health asset.

The road grades from a high point at High Street and falls to the south towards Barker Street. It is predominately flat between Barker Street and Magill Street with an approximate 9m rise in level starting at Magill Street to a crest opposite the Ainsworth Building and north of the loading dock access, refer figure 2. The road then flattens out again between the Ainsworth building and High Street with a localised low point located in the middle.

The service delivery loading dock area is accessed via Delivery Drive is located between the Royal Hospital for Women and the Ainsworth Building. The loading dock level is lower than Hospital Road and vehicles must drive down to this lower area to access the dock and other internal hospital areas, refer figure 3.

Existing inground services located within Hospital Road include high voltage (HV) electrical, Sydney Water sewer and stormwater drainage as well as private hospital building services.

Figure 2 – Street view of Hospital Road facing north from Magill Street (Source Google Maps)

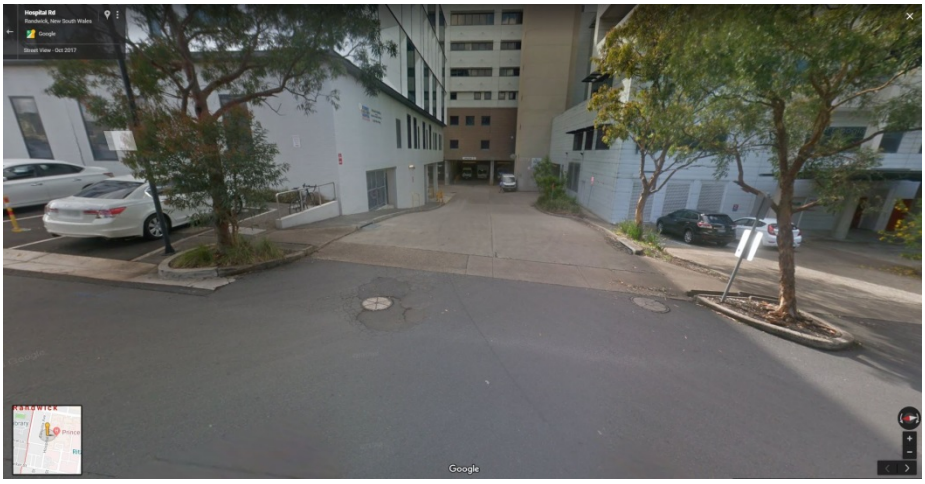


Figure 3 – Street view of Delivery Drive looking east from Hospital Road (Source Google Maps)

1.3 Project Scope

ACOR have been engaged by Lendlease (LLB) to complete the Civil design of the proposed Integrated Acute Services Building (IASB) Addition.

The scope of the SSDA for the IASB Addition includes the following elements:

- UNSW Eastern Extension (Base Building Only)
- Associated modifications within the ASB
- Lowering of Hospital Road
- Landscaping

The proposed scope involves expanding the approved ASB building to the east to allow for the integration of health, research and education facilities with the University of NSW (UNSW). The building will be elevated and span over a lowered Hospital Road allowing vehicle movement below. Structural columns will be constructed over Hospital Road to provide support for the building. These columns will need to be coordinated with existing and proposed inground services within the road.

The proposed Hospital Road lowering scope of work involves the lowering of 80m of the existing road by approximately 4.0m between the multi-story carpark and the Ainsworth building. The intent is to construct a suspended deck over Hospital Road that will improve pedestrian connectivity between the existing Randwick Hospitals Campus and the IASB addition. The road is proposed to be lowered to a level that maintains access to the loading dock for delivery vehicles and also provides provisions for basement carpark access for the future Sydney Childrens Hospital expansion.

Hospital Road is to remain operational during the construction of the works as Delivery Drive is the primary access for all maintenance and delivery vehicles. Therefore, the construction works will need to be staged to allow continual access throughout.

The Civil scope for the lowering of Hospital Road includes the pavement and level design for the lowered road surface as well as stormwater drainage works. The existing stormwater trunk drainage in Hospital Road will need to be diverted due to the extensive excavation required to lower the road.

1.4 SEARs Requirements

SEARs Civil requirements for the preparation of an Environmental Impact Statement (EIS) for the SSDA submission are summarised in Table 1 below.

Table 1 – SEAR's Requirements

SEARs Requirements	
Key Issues	**15. Drainage** ▪ Detail measures to minimise operational water quality impacts on surface waters and groundwater. ▪ Stormwater plans detailing the proposed methods of drainage without impacting on the downstream properties.
	16. Flooding ▪ Identify flood risk on-site (detailing the most recent flood studies for the project area) and consideration of any relevant provisions of the NSW Floodplain Development Manual (2005), including the potential effects of climate change, sea level rise and an increase in rainfall intensity. If there is a material flood risk, include design solutions for mitigation.
	17. Sediment, Erosion and Dust Controls ▪ Detail measures and procedures to minimise and manage the generation and off-site transmission of vapours, sediment, dust and fine particles.

2 Stormwater Drainage

2.1 Existing Stormwater Drainage Infrastructure – Hospital Road

Based on existing topography and survey completed by CMS, the drainage within Hospital Road generally drains from the higher northern end at High Street towards Magill Street to the south.

Hospital Road is drained by a 750mm diameter concrete pipe located on the eastern side of the road and is approximately 3.5m deep. This pipe drains both the road reserve as well as the surrounding buildings, namely the Sydney Children's Hospital (SCH), the Ainsworth Building and the Royal Hospital for Women (RHW). The stormwater drainage is a private asset and connects to the Council stormwater system south of Magill Street.

The loading dock is drained by a separate 450mm diameter pipe that runs parallel to the 750mm diameter pipe and connects into the system south of Magill Street.

2.2 Design Requirements

All stormwater drainage will be in accordance with the relevant requirements of the National Construction Code (NCC), the Australian Rainfall and Runoff, the Australian/New Zealand Standard AS/NZS 3500.3:2018 and in Randwick City Council's Private Stormwater Code (March 2013).

2.3 Stormwater Drainage Diversions

The lowering of Hospital Road by approximately 4.0m exposes the existing stormwater drainage near Delivery Drive and therefore the stormwater drainage must be diverted and lowered to allow for the proposed construction.

The extent of stormwater diversion is approximately 85m in length and intercepts the existing drainage near the Ainsworth Building and connects back into the drainage at the multi-story carpark entrance. The stormwater drainage will be relocated to the centre of the lowered Hospital Road to avoid other services which are also required to be diverted as part of these works as well as the structural piles and columns required for the UNSW Eastern Extension. Existing building downpipe connections from the Ainsworth building will need be reconnected to the new stormwater drainage line.

It has been advised that Hospital Road is required to be operational during the works and therefore staging on the service diversion works will need be reviewed and progressed as part of the detailed design.

2.4 Site Stormwater Drainage System

Gutters and downpipes for the extension will be designed by the hydraulics contractor and are proposed to be connected to the main ASB drainage system.

Stormwater and overland flows on the high level pedestrian deck above the lowered Hospital Road are proposed to be collected via rainwater outlets at surface level. The rainwater outlets will penetrate the deck and connect to the underground stormwater trunk network via downpipes. These works will be designed and documented by the hydraulic contractor.

Stormwater on the covered Hospital Road pavement and Delivery Drive access will be collected via a grated drain located along the structural perimeter wall. This drain will collect any surface spill or nuisance flows and direct them to the inground stormwater system.

Coordination of connection points between this internal stormwater drainage system and the underground piped system will be developed during Design Development.

2.5 Water Quality Management

The existing site area for the proposed Hospital Road lowering is currently 100% impervious and consists of fully paved roads and concrete footpaths. The proposed works do not worsen the existing conditions and

therefore we do not anticipate that Water Sensitive Urban Design will be required to improve the stormwater quality for this component of works.

3 Flooding

3.1 Flood Requirements

The requirements of Randwick City Council, including the guidelines from Councils Development Control Plan, are to ensure non-worsening of flooding of the surrounding areas as a result of the development up to the 1% Annual Exceedance Probability (AEP) event.

Lendlease (LLB) has commissioned BMT Pty to prepare a flood study and report for the lowering of Hospital Road. BMT previously completed the flood analysis for the main ASB works and have used this information to inform the impacts on the lowering of Hospital Road, the outcomes of which are described below. The BMT report details the flood modelling undertaken, pre and post development flows, and flood mitigation works required to ensure operation of the facility in extreme weather events. The full BMT flood report for Hospital Road can be found in Appendix B.

3.2 Existing Flooding Patterns

Predeveloped site flooding patterns have been determined by BMT through Tuflow modelling. The model shows that Hospital Road is not flood affected during storms up to and including the 1% AEP event. Localised ponding and flooding occurs within the loading dock which is at a trap low point of the site. Refer figure 4 below for 1% AEP flooding mapping.

Flooding does occur during the Probable Maximum Flood (PMF) as ponding water from the loading dock topples over the crest level at the Hospital road intersection and flows down the road towards Magill Street.

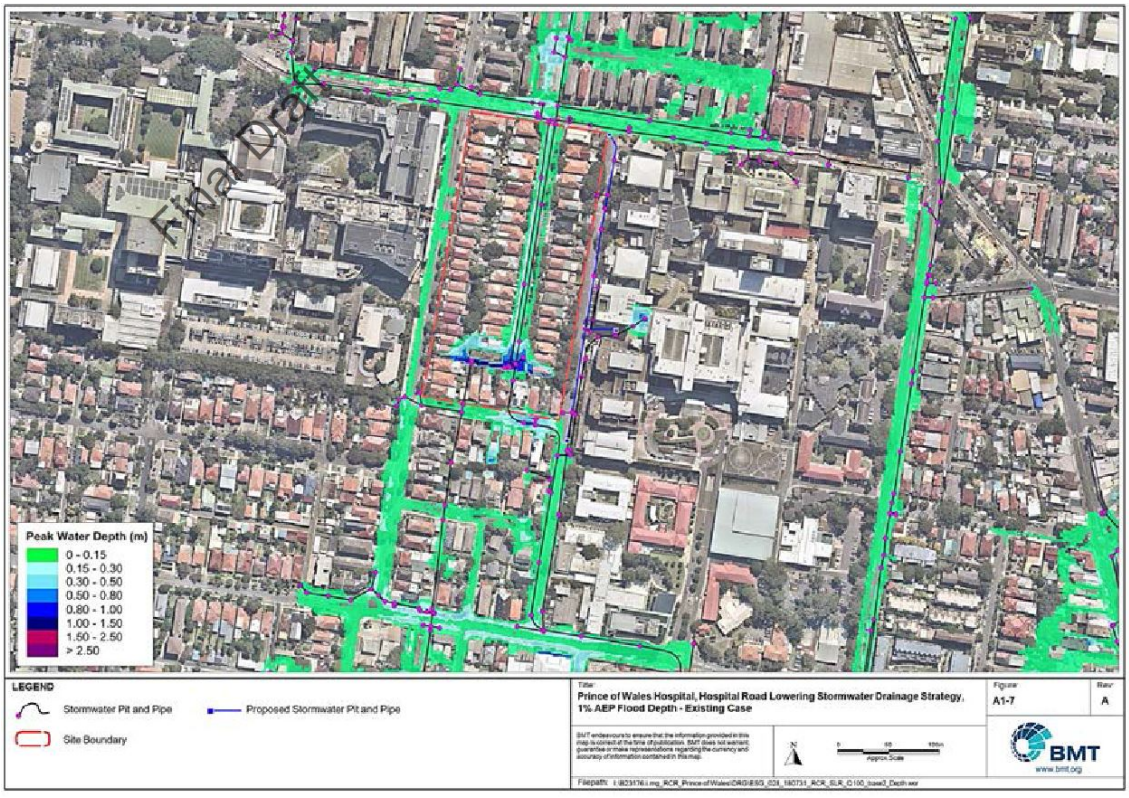


Figure 4 – Pre Development 1% AEP Flood Depth (Source BMT)

3.3 Post-Development Flooding Patterns

Post Development flooding scenarios as modelled by BMT show that there is a non-worsening of flooding in all rainfall events up to and including the 1% AEP event as shown in Figure 5 below. The flood map shows that flooding during the 1% AEP has been improved due to proposed works and that ponding depths within the loading dock are reduced.

This reduction in flooding is a result of the lowering of the surface level of both Hospital Road and Delivery Drive. The removal of the crest at the intersection of these roads now directs stormwater down Hospital Road away from the loading dock rather than ponding at the low point.

There is no Council requirement to consider flood impacts more severe than the 1% AEP, such as the PMF, other than setting building floor levels above the PMF.

It is therefore proposed that no further flood mitigation actions are required as part of the lowering of Hospital Road.

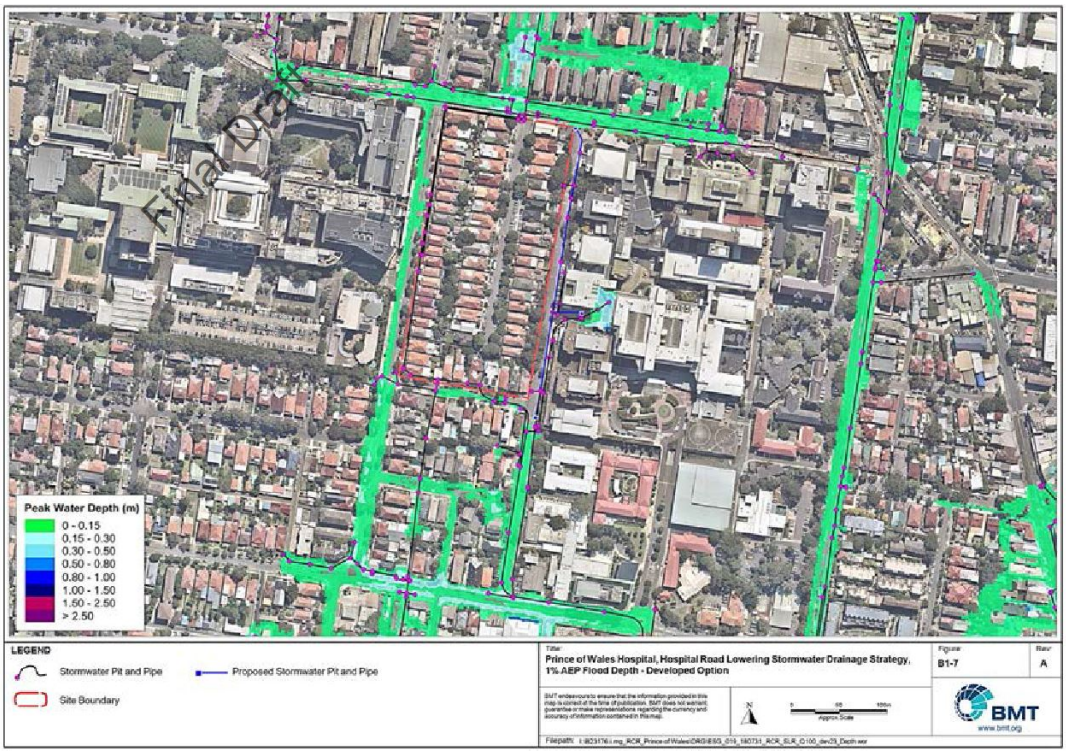


Figure 5 – Post Development 1% AEP Flood Depth (Source BMT)

4 Sediment, Erosion and Dust Control

The design will consider measures to control soil erosion and sediment transportation to mitigate the risk of sediment affecting the site or areas off-site during construction. Such measures will include sediment fences, settlement ponds and shaker grates in accordance with Landcom's Managing Urban Stormwater: Soils and Construction (Blue Book).

Prior to commencement of excavation works, a Soil and Water Management Plan (SWMP) must be prepared as part of the Contractor's Construction Environmental Management Plan (CEMP) for the works. The SWMP must include an Erosion and Sediment Control Plan (ESCP) prepared in accordance with the 'Blue Book'. Preliminary ESCP is included in the Civil Works Drawings Appendix A to this report.

A base case Soil and Water Management Plan has been prepared for the works by the contractor and is included in the SSDA design documentation. It should be noted that this is a preliminary design and will be required to be updated and modified during detailed design, and also by the Contractor during the course of the project, to suit construction staging and Contractors activities.

5 Summary

To accommodate the proposed Integrated ASB (IASB) Addition the following Civil design elements will need to be considered and reviewed as design progresses:

- Existing 750mm diameter stormwater drainage within Hospital Road will need to be diverted to suit the proposed finished surface levels. The stormwater will need to be coordinated with other inground services to be diverted, including sewer and HV, as well coordinating with structural piles and column locations.
- Flood mitigation is not required as the proposed works have nil effect and are not worsening the 1% AEP storm event.
- Sediment and soil erosion control measures will need to be implemented during construction to prevent the migration of sediment entering the stormwater system during construction.

Appendix A - Civil Works Drawings

RANDWICK CAMPUS REDEVELOPMENT - INTEGRATED ASB (IASB) ADDITION (HOSPITAL ROAD LOWERING) - RANDWICK NSW, AUSTRALIA

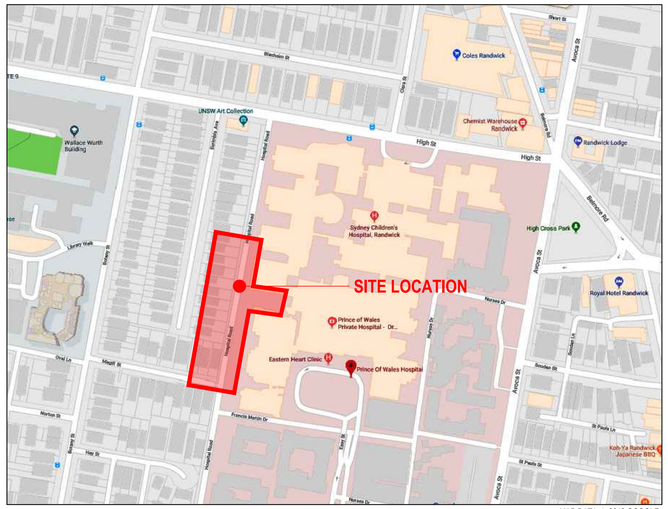
CIVIL

DRAWING NUMBER	DRAWING TITLE	REVISION
RCR-ACR-CV-00-DWG-00-001	COVER SHEET	D
RCR-ACR-CV-00-DWG-00-002	NOTES	D
RCR-ACR-CV-00-DWG-00-003	LEGENDS SHEET	D
RCR-ACR-CV-00-DWG-00-101	GENERAL ARRANGEMENT - SHEET 1	D
RCR-ACR-CV-00-DWG-00-201	PAVEMENT PLAN - SHEET 1	D
RCR-ACR-CV-00-DWG-00-401	SOIL AND EROSION	C
RCR-ACR-CV-00-DWG-00-601	STANDARD DETAILS - SHEET 1	C
RCR-ACR-CV-00-DWG-00-602	STANDARD DETAILS - SHEET 2	C
RCR-ACR-CV-00-DWG-00-603	STANDARD DETAILS - SHEET 3	C
RCR-ACR-CV-00-DWG-00-801	LONGITUDINAL SECTION - SHEET 1	D
RCR-ACR-CV-00-DWG-00-802	LONGITUDINAL SECTION - SHEET 2	C
RCR-ACR-CV-00-DWG-00-901	CROSS SECTIONS - SHEET 1	C
RCR-ACR-CV-00-DWG-00-902	CROSS SECTIONS - SHEET 2	A
RCR-ACR-CV-00-DWG-00-950	STORMWATER LONGSECTION - SHEET 1	C

DIAL BEFORE YOU DIG

DIAL BEFORE YOU DIG www.1100.com.au

IMPORTANT: THE CONTRACTOR IS TO MAINTAIN A CURRENT SET OF "DIAL BEFORE YOU DIG" DRAWINGS ON SITE AT ALL TIMES.



MAP DATA © 2018 GOOGLE

SERVICES SHOWN HAVE BEEN LOCATED FROM CLASS 'C' SURVEY ONLY. CONTRACTOR IS REQUIRED TO PHYSICALLY LOCATE ALL EXISTING SERVICES IN CLOSE PROXIMITY TO EXCAVATION PRIOR TO COMMENCEMENT OF WORK & APPROPRIATE PROCEDURES, PRECAUTIONS & CARE TO BE TAKEN WHEN WORKING WITHIN CLOSE PROXIMITY TO THESE SERVICES.

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NOTE
CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF WORK OR PREPARATION OF SHOP DRAWINGS. DO NOT SCALE THIS DRAWING

ISSUE	DATE	FOR
A	23.11.18	SCHEMATIC DESIGN
B	20.12.18	ISSUE FOR PRICING
C	15.05.19	DRAFT SSDA
D	04.07.19	ISSUE FOR SSDA
E	11.07.19	ISSUE FOR SSDA

PROJECT MANAGEMENT
PWC

STRUCTURAL ENGINEERING
ENSTRUCT GROUP

MECHANICAL ENGINEERING
FREDON AIR

ELECTRICAL ENGINEERING
FREDON

HYDRAULIC ENGINEERING
CP CONSULTANTS

CLIENT
NSW GOVERNMENT Health Infrastructure

PROJECT
HOSPITAL ROAD
LOWERING
RANDWICK NSW AUSTRALIA

ACOR PROJECT NUMBER
SY180053

DRAWING KEY

TRUE NORTH PROJECT NORTH

GRAPHIC SCALE
0 4 10

SCALE
@ B1 DO NOT SCALE

STATUS
DESIGN

DRAWING
COVER SHEET

DRAWING NUMBER	ISSUE
RCR-ACR-CV-00-DWG-00-001	E

GENERAL NOTES

1. CIVIL TRADE CONTRACTOR TO LOCATE BY PHYSICAL MEANS IN BOTH LINE AND LEVEL ALL EXISTING UNDERGROUND SERVICES BEFORE COMMENCEMENT OF ANY DEMOLITION AND ALL OTHER WORKS. ANY CONFLICTS WITH PROPOSED WORKS, DISCREPANCIES, AND ADDITIONAL SERVICES NOT SHOWN ON THE DRAWING ARE TO BE ADVISED TO THE MANAGING CIVIL TRADE CONTRACTOR IN WRITING IMMEDIATELY FROM THE TIME OF FINDING THE CONFLICT, DISCREPANCY, OR ADDITIONAL SERVICE, AND AWAIT THE MANAGING CIVIL TRADE CONTRACTOR'S DIRECTION. LOCATION IS TO BE UNDERTAKEN IN ACCORDANCE WITH SPECIFICATION.
2. ALL WORK SHALL BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS AND THE SPECIFICATION, AND DIRECTIONS OF THE MANAGING CIVIL TRADE CONTRACTOR.
3. THE CIVIL TRADE CONTRACTOR IS TO ENSURE THAT AT ALL TIMES, THE OPERATIONS OF THE PRINCIPAL ARE NOT DISRUPTED IN ANY WAY. THE MANAGING CIVIL TRADE CONTRACTOR SHALL BE ADVISED OF ALL TEMPORARY OR FINAL RELOCATION OF UNDERGROUND SERVICES. THE CIVIL TRADE CONTRACTOR SHALL OBTAIN THE APPROVAL OF THE MANAGING CIVIL TRADE CONTRACTOR PRIOR TO THE TEMPORARY OR FINAL RELOCATION OF ANY UNDERGROUND SERVICES.
4. THE CIVIL TRADE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
5. ON COMPLETION OF PROPOSED WORKS ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, SIGNAGE, CONCRETE AREAS, GRASS AND LANDSCAPED AREAS AND ROAD PAVEMENTS. (U.N.O.)
6. CIVIL TRADE CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS UNLESS ADVISED OTHERWISE.
7. WHERE NEW WORKS ABUT EXISTING THE CIVIL TRADE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.
8. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER THESE SERVICES. HAND EXCAVATE IN THESE AREAS, IN ACCORDANCE WITH SPECIFICATION.
9. THE CIVIL TRADE CONTRACTOR SHALL PROVIDE ALL TEMPORARY DIVERSION DRAINS AND MOUNDS TO ENSURE THAT AT ALL TIMES EXPOSED SURFACES ARE FREE DRAINING AND WHERE NECESSARY EXCAVATE SUMPS AND PROVIDE PUMPING EQUIPMENT AND OR TEMPORARY STORMWATER DRAINAGE TO DRAIN EXPOSED AREAS.
10. THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED SURVEY, HYDRAULIC, STRUCTURAL, ARCHITECTURAL, ELECTRICAL, & LANDSCAPE, DRAWINGS AND SPECIFICATIONS.
11. THE CIVIL TRADE CONTRACTOR SHALL CO-ORDINATE HIS WORKS CLOSELY AND CO-OPERATE WITH OTHER CIVIL TRADE CONTRACTORS ENGAGED BY MANAGING CIVIL TRADE CONTRACTOR.
12. FOR EARTHWORKS NOTES REFER TO ENSTRUCT SPECIFICATION.
13. THE CIVIL TRADE CONTRACTOR SHALL CO-ORDINATE AND LIAISE WITH THE MANAGING CIVIL TRADE CONTRACTOR TO STAGE AND UNDERTAKE THE WORKS SO AS NOT TO CAUSE INCONVENIENCE TO HEALTH INFRASTRUCTURE AND MINIMISE DISTURBANCE TO THE ACCESS AND OPERATION OF HOSPITAL FACILITIES.
14. FOR DETAILS OF THE REQUIREMENTS IN RELATION TO THE EXISTING ABOVE GROUND OR BELOW GROUND ELECTRICAL, TELECOMMUNICATION, AND SECURITY SERVICES TEMPORARY OR FINAL RELOCATION, REFER TO ELECTRICAL ENGINEER'S DRAWINGS.
15. ALL DEMOLITION WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE SPECIFICATION.
16. ANY ITEM REQUIRED TO BE REMOVED AND STORED FOR POSSIBLE REUSE AND REINSTALLATION SHALL BE KEPT MAINTAINED IN GOOD WORKING CONDITION DURING THE STORAGE PERIOD.
17. LOCALLY REGRADE ALL INTERFACE OF PROPOSED LEVELS TO EXISTING LEVELS USING BATTER AT MAX SLOPE OF 1 IN 4. UNLESS DIRECTED OR NOTED OTHERWISE.
18. THE CIVIL TRADE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EXCAVATIONS IN A SAFE, STABLE CONDITION, WITHOUT AFFECTING NEARBY BUILDINGS OR SERVICES. THIS INCLUDES OBTAINING APPROVALS FOR SHORING AND ANCHOR SYSTEMS.
19. SURVEY WAS CARRIED OUT BY REGISTERED SURVEYOR. REFER TO SURVEYING DRAWINGS FOR ORIGIN OF LEVELS. DETAILS SHOWN ON SURVEY DRAWINGS ARE THOSE AT DATE OF SURVEY.
20. PROVIDE PROTECTION OF EXISTING STRUCTURES AND TREES DURING CONSTRUCTION. REFER TO LANDSCAPE ARCHITECTS SPECIFICATION FOR TREE PROTECTION DETAIL.
21. THE CIVIL TRADE CONTRACTOR SHALL ALLOW FOR ALL ASSOCIATED COSTS AND EQUIPMENT FOR DEWATERING THE WORKS
22. THE CIVIL TRADE CONTRACTOR SHALL COORDINATE WITH ALL OTHERS TRADES TO ENSURE PIT LIDS AND FRAMES SUPPLIED ARE MINIMUM CLASS 'D' IN PAVEMENTS AND CLASS 'C' IN LANDSCAPE AREAS AND ARE INSTALLED FLUSH WITH THE FINISHED SURFACE

SITEWORKS NOTES

1. ORIGIN OF LEVELS :- AUSTRALIAN HEIGHT DATUM (A.H.D.)
2. CIVIL TRADE CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK.
3. ALL WORK IS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS, THE SPECIFICATIONS AND THE DIRECTIONS OF THE PRINCIPAL'S REPRESENTATIVE.
4. EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CIVIL TRADE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE PRINCIPAL'S REPRESENTATIVE. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
5. CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATIONS OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
6. ALL SERVICE TRENCHES UNDER VEHICULAR PAVEMENTS SHALL BE BACKFILLED WITH AN APPROVED NON-NATURAL GRANULAR MATERIAL AND COMPACTED TO 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS.1289.5.1.1.
7. ALL TRENCH BACKFILL MATERIAL SHALL BE COMPACTED TO THE SAME DENSITY AS THE ADJACENT MATERIAL.
8. ON COMPLETION OF PIPE INSTALLATION ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS.
9. PROVIDE 10mm THICK ABELFLEX JOINTS BETWEEN CONCRETE PAVEMENTS AND ALL BUILDINGS , WALLS, FOOTINGS, COLUMNS, KERBS, DISH DRAINS, GRATED DRAINS, BOLLARD FOOTINGS ETC
10. CIVIL TRADE CONTRACTOR TO OBTAIN ALL AUTHORITY APPROVALS.
11. ALL BATTERS TO BE GRASSED LINED WITH MINIMUM 300 TOPSOIL AND APPROVED COUCH LAID AS TURF.
12. MAKE SMOOTH TRANSITION TO EXISTING SERVICES AND MAKE GOOD.
13. TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MIN 50mm IN BITUMINOUS PAVING.
14. ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MIN OF 500mm PAST PAVING.
15. ON COMPLETION OF WORKS ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL INCLUDING, BUT NOT LIMITED TO, KERBS, FOOTPATHS, CONCRETE AREAS, GRASS AND LANDSCAPED AREAS.

STORMWATER NOTES

1. ALL 225 DIA. DRAINAGE PIPES AND LARGER SHALL BE CLASS "2" APPROVED SPIGOT AND SOCKET RCP PIPES WITH RUBBER RING JOINTS. (U.N.O.) ALL DOWNPIPE DRAINAGE LINES SHALL BE IN ACCORDANCE WITH HYDRAULIC DRAWINGS
2. ALL PIPE JUNCTIONS UP TO AND INCLUDING 450 DIA. AND TAPERS SHALL BE VIA PURPOSE MADE FITTINGS.
3. MINIMUM GRADE TO STORMWATER LINES TO BE 1%. (U.N.O.)
4. CIVIL TRADE CONTRACTOR TO SUPPLY AND INSTALL ALL FITTINGS AND SPECIALS INCLUDING VARIOUS PIPE ADAPTORS TO ENSURE PROPER CONNECTION BETWEEN DISSIMILAR PIPEWORK.
5. ALL CONNECTIONS TO EXISTING DRAINAGE PITS SHALL BE MADE IN A TRADESMAN-LIKE MANNER AND THE INTERNAL WALL OF THE PIT AT THE POINT OF ENTRY SHALL BE CEMENT RENDERED TO ENSURE A SMOOTH FINISH.
6. WHERE TRENCHES ARE IN ROCK, THE PIPE SHALL BE BEDDED ON A MIN. 50MM CONCRETE BED (OR 75MM THICK BED OF 12MM BLUE METAL) UNDER THE BARREL OF THE PIPE. THE PIPE COLLAR AT NO POINT SHALL BEAR ON THE ROCK. IN OTHER THAN ROCK, PIPES SHALL BE LAID ON A 75MM THICK SAND BED. IN ALL CASES BACKFILL THE TRENCH WITH SAND TO 200MM ABOVE THE PIPE. WHERE THE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH WITH SAND OR APPROVED GRANULAR BACKFILL COMPACTED IN 150MM LAYERS TO 98% STANDARD MAX. DRY DENSITY.
7. BEDDING SHALL BE (U.N.O.) TYPE HS2, IN ACCORDANCE WITH CURRENT RELEVANT AUSTRALIAN STANDARDS.
8. WHERE STORMWATER LINES PASS UNDER FLOOR SLABS SEWER GRADE RUBBER RING JOINTS ARE TO BE USED.
9. WHERE SUBSOIL DRAINAGE LINES PASS UNDER FLOOR SLABS AND VEHICULAR PAVEMENTS UNSLOTTED UPVC SEWER GRADE PIPE SHALL BE USED.
10. PROVIDE 3.0M LENGTH OF 100 DIA. SUBSOIL DRAINAGE PIPE WRAPPED IN FABRIC SOCK, AT UPSTREAM END OF EACH PIT.
11. ALL PROPRIETARY STORMWATER QUALITY IMPROVEMENT DEVICES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND SPECIFICATION. THE CIVIL TRADE CONTRACTOR SHALL ALLOW FOR ALL ANCILLARIES, SPECIALS AND FITTINGS (EG. RISERS, ANTI-FLOATATION ANCHORS, PEA GRAVEL BACKFILL ETC.) AS NECESSARY TO INSTALL THE DEVICES IN ACCORDANCE TO THE MANUFACTURERS REQUIREMENTS.

EXISTING SERVICES AND FEATURES

1. THE CIVIL TRADE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION, REMOVAL AND DISPOSAL IF REQUIRED OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA, AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE MANAGING CONTRACTOR.
2. THE CIVIL TRADE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
3. PRIOR TO COMMENCEMENT OF ANY WORKS THE CIVIL TRADE CONTRACTOR SHALL GAIN WRITTEN APPROVAL OF HIS PROGRAMME FOR THE RELOCATION/CONSTRUCTION OF TEMPORARY SERVICES.
4. EXISTING BUILDINGS, EXTERNAL STRUCTURES, AND TREES SHOWN ON THESE DRAWINGS ARE FEATURES EXISTING PRIOR TO ANY DEMOLITION WORKS.
5. CIVIL TRADE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS IS COMPLETE AND COMMISSIONED THE CIVIL TRADE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE MANAGING CONTRACTOR.
6. INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. CIVIL TRADE CONTRACTOR TO GAIN APPROVAL OF SUPERINTENDENT FOR TIME OF INTERRUPTION.
7. CIVIL TRADE CONTRACTOR TO MAKE GOOD ALL DISTURBED PAVEMENTS, FEATURES,SURFACES ETC. UPON COMPLETION OF ALL WORKS TO MATCH EXISTING OR AS DETAILED ON THESE DRAWINGS

EARTHWORKS AND COMPACTION NOTES

1. ALL EARTHWORKS UNDER BUILDING STRUCTURES SHALL BE UNDERTAKEN IN ACCORDANCE WITH REQUIREMENTS OF STRUCTURAL ENGINEER
2. STRIP TOPSOIL TO EXPOSE NATURALLY OCCURRING MATERIAL AND STOCKPILE ON SITE FOR SELECTIVE RE-USE OR DISPOSE OFF-SITE AS DIRECTED BY THE SUPERINTENDENT.
3. WHERE FILLING IS REQUIRED TO ACHIEVE DESIGN SUBGRADE PROOF ROLL EXPOSED NATURAL SURFACE WITH A MINIMUM OF TEN PASSES OF A VIBRATING ROLLER (MINIMUM STATIC WEIGHT OF 10 TONNES) IN THE PRESENCE OF THE SUPERINTENDENT. REFER TO SPECIFICATION FOR DETAILS.
4. ALL SOFT, WET OR UNSUITABLE MATERIAL TO BE REMOVED AS DIRECTED BY THE SUPERINTENDENT AND REPLACED WITH APPROVED MATERIAL SATISFYING THE REQUIREMENTS LISTED BELOW.
5. ALL FILL MATERIAL SHALL BE FROM A SOURCE APPROVED BY THE SUPERINTENDENT AND SHALL COMPLY WITH THE FOLLOWING :
   a. FREE FROM ORGANIC, PERISHABLE AND CONTAMINATED MATTER
   b. MAXIMUM PARTICLE SIZE 75MM
   c. PLASTICITY INDEX BETWEEN 2% AND 15%
5. ALL FILL MATERIAL SHALL BE PLACED IN MAXIMUM 200MM THICK LAYERS AND COMPACTED AT OPTIMUM MOISTURE CONTENT (+ OR - 2%) TO ACHIEVE A DRY DENSITY DETERMINED IN ACCORDANCE WITH AS 1289 E3.1 OF NOT LESS THAN THE FOLLOWING STANDARD MINIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 E1.1 :

LOCATION	STANDARD DRY DENSITY
UNDER BUILDING SLABS	TO STRUCTURAL ENGINEER
AREAS OF SERVICE TRENCHES	98%
EXTERNAL PAVED AREAS, ROADS AND CARPARKS	98%
LANDSCAPED AREAS	95%

6. THE CONTRACTOR SHALL PROGRAM THE EARTHWORKS OPERATION SO THAT THE WORKING AREAS ARE ADEQUATELY DRAINED DURING THE PERIOD OF CONSTRUCTION. THE SURFACE SHALL BE GRADED AND SEALED OFF TO REMOVE DEPRESSIONS, ROLLER MARKS AND SIMILAR WHICH WOULD ALLOW WATER TO POND AND PENETRATE THE UNDERLYING MATERIAL. ANY DAMAGE RESULTING FROM THE CONTRACTOR NOT OBSERVING THESE REQUIREMENTS SHALL BE RECTIFIED BY THE CONTRACTOR AT THEIR COST.
7. TESTING OF THE SUBGRADE SHALL BE CARRIED OUT BY AN APPROVED NATA REGISTERED LABORATORY AT THE CONTRACTORS EXPENSE. GITA CERTIFICATION SHALL BE PROVIDED TO THE MANAGING CONTRACTOR FOR EACH COMPLETED LOT.

ROADWORKS NOTES

1. ALL BASECOURSE AND SUB-BASECOURSE MATERIALS SHALL CONFORM WITH RMS QA SPECIFICATION 3051.
2. ALL BASECOURSE AND SUB-BASE MATERIALS SHALL BE COMPACTED TO ACHIEVE A MINIMUM OF 100% STANDARD MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT OF + OR - 2% IN ACCORDANCE WITH AS1289 E1.1.
3. ASPHALTIC CONCRETE SHALL BE LAID TO THE THICKNESS SPECIFIED AND IN ACCORDANCE WITH THE SPECIFICATION.
4. CONCRETE PAVEMENT SHALL BE LAID TO THE THICKNESS SPECIFIED AND IN ACCORDANCE WITH THE SPECIFICATION
5. CONCRETE FOR KERB SHALL HAVE A CONCRETE STRENGTH OF 20MPA AT 28 DAYS, MINIMUM SLUMP OF 60MM AND MAXIMUM AGGREGATE SIZE OF 40MM.

EROSION AND SEDIMENT CONTROL NOTES

IMPORTANT NOTES

1. THE EROSION AND SEDIMENT CONTROL DRAWINGS PROVIDED ARE FOR GUIDANCE PURPOSES ONLY - THE SOIL AND EROSION CONTROLS ARE INDICATIVE AND REMAIN SUBJECT TO CONSTRUCTION METHODOLOGY. THE CIVIL TRADE CONTRACTOR SHALL AT ALL TIMES REMAIN RESPONSIBLE FOR COMPLIANCE WITH ALL LAWS AND REGULATIONS PERTAINING TO SAFETY AND PROTECTION OF THE ENVIRONMENT.
2. CIVIL TRADE CONTRACTOR SHALL ENSURE THAT SEDIMENT IS NOT ALLOWED TO ENTER WATERCOURSES, ROADWAYS, PROPERTY OR DRAINAGE INFRASTRUCTURE. ANY DAMAGE WHATSOEVER CAUSED THROUGH BREACH OF THIS CONDITION BY THE CIVIL TRADE CONTRACTOR SHALL BE RECTIFIED SOLELY AT THE CIVIL TRADE CONTRACTORS COST.

GENERAL INSTRUCTIONS

1. THIS SOIL AND WATER MANAGEMENT PLAN IS TO BE READ IN CONJUNCTION WITH OTHER ENGINEERING PLANS RELATING TO THIS DEVELOPMENT.
2. CIVIL TRADE CONTRACTORS WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE UNDERTAKEN AS INSTRUCTED IN THIS SPECIFICATION AND CONSTRUCTED FOLLOWING THE GUIDELINES OF "MANAGING URBAN STORMWATER SOILS AND CONSTRUCTION", DEPT OF HOUSING, 1998 (BLUE BOOK).
3. ALL CIVIL TRADE CONTRACTORS WILL BE INFORMED OF THEIR RESPONSIBILITIES IN REDUCING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSLOPE AREAS.

LAND DISTURBANCE INSTRUCTIONS

1. DISTURBANCE TO BE NO FURTHER THAN 5 (PREFERABLY 2) METRES FROM THE EDGE OF ANY ESSENTIAL ENGINEERING ACTIVITY AS SHOWN ON APPROVED PLANS. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE ZONES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
2. ACCESS AREAS ARE TO BE LIMITED TO A MAXIMUM WIDTH OF 10 METRES THE SITE MANAGER WILL DETERMINE AND MARK THE LOCATION OF THESE ZONES ON-SITE. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE BOUNDARIES THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCING (DOWNSLOPE) OR SIMILAR MATERIALS.
3. ENTRY TO LANDS NOT REQUIRED FOR CONSTRUCTION OR ACCESS IS PROHIBITED EXCEPT FOR ESSENTIAL THINNING OF PLANT GROWTH.
4. WORKS ARE TO PROCEED IN THE FOLLOWING SEQUENCE:
   a. INSTALL ALL BARRIER AND SEDIMENT FENCING WHERE SHOWN ON THE PLAN.
   b. CONSTRUCT THE STABILISED SITE ACCESS.
   c. CONSTRUCT DIVERSION DRAINS AS REQUIRED.
   d. INSTALL MESH AND GRAVEL INLETS FOR ANY ADJACENT KERB INLETS.
   e. INSTALL GEOTEXTILE INLET FILTERS AROUND ANY ON-SITE DROP INLET PITS.
   f. CLEAR SITE AND STRIP AND STOCKPILE TOPSOIL IN LOCATIONS SHOWN ON THE PLAN.
   g. UNDERTAKE ALL ESSENTIAL CONSTRUCTION WORKS ENSURING THAT ROOF AND/OR PAVED AREA STORMWATER SYSTEMS ARE CONNECTED TO PERMANENT DRAINAGE AS SOON AS PRACTICABLE.
   h. GRADE LOT AREAS TO FINAL GRADES AND APPLY PERMANENT STABILISATION (LANDSCAPING) WITHIN 20 DAYS OF COMPLETION OF CONSTRUCTION WORKS.
   i. REMOVE TEMPORARY EROSION CONTROL MEASURES AFTER THE PERMANENT LANDSCAPING HAS BEEN COMPLETED.
5. ENSURE THAT SLOPE LENGTHS DO NOT EXCEED 80 METRES WHERE PRACTICABLE. SLOPE LENGTHS ARE DETERMINED BY SILTATION FENCING AND CATCH DRAIN SPACING.
6. ON COMPLETION OF MAJOR WORKS LEAVE DISTURBED LANDS WITH A SCARIFIED SURFACE TO ENCOURAGE WATER INFILTRATION AND ASSIST WITH KEYING TOPSOIL LATER.

SITE INSPECTION AND MAINTENANCE INSTRUCTIONS

1. THE SITE SUPERINTENDENT WILL INSPECT THE SITE AT LEAST WEEKLY AND AT THE CONCLUSION OF EVERY STORM EVENT TO:
   a. ENSURE THAT DRAINS OPERATE PROPERLY AND TO EFFECT ANY NECESSARY REPAIRS.
   b. REMOVE SPILLED SAND OR OTHER MATERIALS FROM HAZARD AREAS, INCLUDING LANDS CLOSER THAN 5 METRES FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS ESPECIALLY WATERWAYS AND PAVED AREAS.
   c. REMOVE TRAPPED SEDIMENT WHENEVER THE DESIGN CAPACITY OF THAT STRUCTURE HAS BEEN EXCEEDED.
   d. ENSURE REHABILITATED LANDS HAVE EFFECTIVELY REDUCED THE EROSION HAZARD AND TO INITIATE UPGRADING OR REPAIR AS NECESSARY.
   e. CONSTRUCT ADDITIONAL EROSION AND/OR SEDIMENT CONTROL WORKS AS IT MIGHT BECOME NECESSARY TO ENSURE THE DESIRED PROTECTION IS GIVEN TO DOWNSLOPE LANDS AND WATERWAYS. MAKE ONGOING CHANGES TO THE PLAN WHERE IT PROVES INADEQUATE IN PRACTICE OR IS SUBJECTED TO CHANGES IN CONDITIONS ON THE WORK-SITE OR ELSEWHERE IN THE CATCHMENT.
   f. MAINTAIN EROSION AND SEDIMENT CONTROL STRUCTURES IN A FULLY FUNCTIONING CONDITION UNTIL ALL EARTHWORK ACTIVITIES ARE COMPLETED AND THE SITE IS REHABILITATED.
2. THE SITE SUPERINTENDENT WILL KEEP A LOGBOOK MAKING ENTRIES AT LEAST WEEKLY, IMMEDIATELY BEFORE FORECAST RAIN AND AFTER RAINFALL. ENTRIES WILL INCLUDE:
   a. THE VOLUME AND INTENSITY OF ANY RAINFALL EVENTS.
   b. THE CONDITION OF ANY SOIL AND WATER MANAGEMENT WORKS.
   c. THE CONDITION OF VEGETATION AND ANY NEED TO IRRIGATE.
   d. THE NEED FOR DUST PREVENTION STRATEGIES.
   e. ANY REMEDIAL WORKS TO BE UNDERTAKEN. THE LOGBOOK WILL BE KEPT ON-SITE AND MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. IT WILL BE GIVEN TO THE PROJECT MANAGER AT THE CONCLUSION OF THE WORKS.

SEDIMENT CONTROL INSTRUCTIONS

1. SEDIMENT FENCES WILL BE INSTALLED AS SHOWN ON THE PLAN AND ELSEWHERE AT THE DISCRETION OF THE SITE SUPERINTENDENT TO CONTAIN SOIL AS NEAR AS POSSIBLE TO THEIR SOURCE.
2. SEDIMENT FENCES WILL NOT HAVE CATCHMENT AREAS EXCEEDING 900 SQUARE METRES AND HAVE A STORAGE DEPTH OF AT LEAST 0.6 METRES.
3. SEDIMENT REMOVED FROM ANY TRAPPING DEVICES WILL BE RELOCATED WHERE FURTHER POLLUTION TO DOWNSLOPE LANDS AND WATERWAYS CANNOT OCCUR.
4. STOCKPILES ARE NOT TO BE LOCATED WITHIN 5 METRES OF HAZARD AREAS INCLUDING AREAS OF HIGH VELOCITY FLOWS SUCH AS WATERWAYS, PAVED AREAS AND DRIVEWAYS.
5. WATER WILL BE PREVENTED FROM DIRECTLY ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR WATER HAS BEEN TREATED BY AN APPROVED DEVICE.
6. TEMPORARY SEDIMENT TRAPS WILL REMAIN IN PLACE UNTIL AFTER THE LANDS THEY ARE PROTECTING ARE COMPLETELY REHABILITATED.
7. ACCESS TO SITES SHOULD BE STABILISED TO REDUCE THE LIKELIHOOD OF VEHICLES TRACKING SOIL MATERIALS ONTO PUBLIC ROADS AND ENSURE ALL-WEATHER ENTRY/EXIT.

ASPHALTIC CONCRETE NOTES

1. GENERAL
   a) ALL MATERIALS SHALL COMPLY WITH RMS SPECIFICATION R116
2. MIX PROPORTIONS
   a) JOB MIX - 10mm NOMINAL SIZE AGGREGATE. MINIMUM BITUMEN CONTENT BY MASS OF TOTAL MASS - 5.1%
   b) MIX STABILITY - BETWEEN 16kN AND 36kN AS DETERMINED BY AS 2891
   c) AIR VOIDS IN COMPACTED MIX - BETWEEN 4% AND 7% OF THE VOLUME OF THE MIX.
   d) VOIDS FILLED IN BINDER - 65-80% OF AIR VOIDS IN THE TOTAL MINERAL AGGREGATE FILLED BY BINDER IN ACCORDANCE WITH AUSTRALIAN STANDARDS
3. PAVEMENT PREPARATION
   a) THE EXISTING SURFACE TO BE SEALED SHALL BE DRY AND BROOMED BEFORE COMMENCEMENT OF WORK TO ENSURE COMPLETE REMOVAL OF ALL SUPERFICIAL FOREIGN MATTER.
   b) ALL DEPRESSIONS OR UNEVEN AREAS ARE TO BE TACK-COATED AND BROUGHT UP TO GENERAL LEVEL OF PAVEMENT WITH ASPHALTIC CONCRETE BEFORE LAYING OF MAIN COURSE.
4. TACK COAT
   a) THE WHOLE OF THE AREA TO BE SHEETED WITH ASPHALTIC CONCRETE SHALL BE LIGHTLY AND EVENLY COATED WITH RAPID SETTING BITUMEN COMPLYING WITH AUSTRALIAN STANDARDS. APPLICATION RATE FOR RESIDUAL BITUMEN SHALL BE 0.15 TO 0.30 LITRES/SQUARE METRE. APPLICATION SHALL BE BY MEANS OF A MECHANICAL SPRAYER WITH SPRAY BAR.
5. SPREADING
   a) ALL ASPHALTIC CONCRETE SHALL BE SPREAD WITH A SELF PROPELLED PAVING MACHINE.
   b) THE ASPHALTIC CONCRETE SHALL BE LAID AT A MIX TEMPERATURE AS SHOWN BELOW;

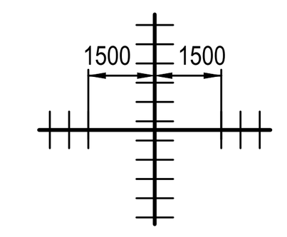
ROAD SURFACE TEMPERATURE IN SHADE (°C)	MIX TEMPERATURES (°C)
5 - 10	NOT PERMITTED
10 - 15	150
15 - 25	145
OVER 25	140

   c) ASPHALTIC CONCRETE SHALL NOT BE LAID WHEN THE ROAD SURFACE IS WET OR WHEN COLD WINDS CHILL THE MIX ADVERSELY AFFECT SPREADING AND COMPACTION.
   d) THE MINIMUM COMPACTED THICKNESS IS 30mm OVER EXISTING SEALED PAVEMENTS AND 50mm OVER NEW PAVEMENTS
6. JOINTS
   a) THE NUMBER OF JOINTS BOTH LONGITUDINAL AND TRANSVERSE SHALL BE KEPT TO A MINIMUM.
   b) THE DENSITY AND SURFACE FINISH AT JOINTS SHALL BE SIMILAR TO THOSE OF THE REMAINDER OF THE LAYER.
7. COMPACTION
   a) ALL COMPACTION SHALL BE UNDERTAKEN USING SELF PROPELLED ROLLERS.
   b) INITIAL ROLLING SHALL BE COMPLETE BEFORE THE MIX TEMPERATURE FALLS BELOW 105°C
   c) SECONDARY ROLLING SHALL BE COMPLETED BEFORE THE MIX TEMPERATURE FALLS BELOW 60°C
   d) MINIMUM CHARACTERISTICS VALUE OF RELATIVE COMPACTION OF A LOT WHEN TESTED IN ACCORDANCE WITH AS2150
8. FINISHED PAVEMENT PROPERTIES
   a) FINISHED SURFACES SHALL BE SMOOTH, DENSE AND TRUE TO SHAPE AND SHALL NOT VARY MORE THAN 10mm FROM THE SPECIFIED PLAN LEVEL AT ANY POINT AND SHALL NOT DEVIATE FROM THE BOTTOM OF A 3m STRAIGHT EDGE LAID IN ANY DIRECTION BY MORE THAN 5mm.

CONCRETE PAVEMENT AND JOINTING NOTES

VEHICULAR PAVEMENT JOINTING

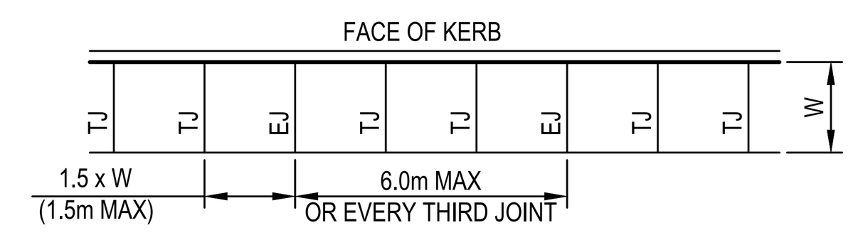
1. ALL VEHICULAR PAVEMENT TO BE JOINTED AS SHOWN ON DRAWINGS.
2. PROVIDE 10mm WIDE FULL DEPTH ISOLATION JOINTS BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVERS.
3. CONCRETE SUPPLY AND PLACEMENT SHALL COMPLY WITH SPECIFICATIONS FOR CONCRETE PAVEMENTS.
4. JOINT TO BE SAWN AS SOON AS CONCRETE HAS HARDENED SUFFICIENTLY THAT IT WILL NOT BE DAMAGED BY SAWING. IF AN UNPLANNED CRACK OCCURS THE CONTRACTOR SHALL REPLACE WHOLE SLABS EITHER SIDE OF THE UNPLANNED CRACK, UNLESS DIRECTED OTHERWISE.
5.
   a. CONSTRUCT JOINTS AS DETAILED
   b. CONSTRUCTION JOINTS WHERE REQUIRED BUT NOT SHOWN, SHALL BE LOCATED TO THE APPROVAL OF THE ENGINEER AND CONSTRUCTED AT THE CONTRACTORS EXPENSE.
   c. ALL LONGITUDINAL CONSTRUCTION JOINTS SHALL BE FORMED AND INCLUDE DOWEL BARS AS SPECIFIED. ALL TRANSVERSE CONSTRUCTION JOINTS SHALL BE FORMED AND INCLUDE DOWEL BARS AS SPECIFIED.
   d. BOND BREAKER TO BE TWO (2) UNIFORM COATS OF BITUMEN EMULSION ALL OVER THE EXPOSED SURFACE AND ON END.
4. DOWELS AND TIE BARS TO MEET STRENGTH REQUIREMENTS OF STRUCTURAL GRADE STEEL IN ACCORDANCE AS. 1302. DOWELS AND TIE BARS SHALL BE ;-
   - STRAIGHT
   - TO LENGTH SPECIFIED
   - CLEAN AND FREE FROM MILL SCALE, RUST AND OIL.
   - SAWN TO LENGTH NOT CROPPED.
5. WHERE DOWELLED JOINTS INTERSECT REMOVE DOWELS FROM LAST 1500mm FROM JOINT IN DIRECTION OF POUR.



6. DIMENSIONS OF SEALANT RESERVOIR DEPENDANT ON THE SEALANT TYPE ADOPTED. ENGINEERS APPROVAL TO BE OBTAINED FOR SEALANT AND RESERVOIR DIMENSIONS AND DETAIL PROPOSED BY THE CONTRACTOR. REFER DETAILS FOR TYPICAL ARRANGEMENT AND SEALANT.
7. PRIOR TO THE PLACEMENT OF CONCRETE IN THE ADJACENT SLAB, SELF EXPANDING FILLER SHALL BE ADHERED TO THE ALREADY CAST AND CLEANED CONCRETE FACE USING AN APPROVED WATERPROOF ADHESIVE. ADHESIVE SHALL BE LIBERALLY APPLIED TO THE FULL FACE OF THE CONCRETE SLAB TO BE COVERED BY THE FILLER, AND ON THE FULL FACE OF THE FILLER TO BE ADHERED.
8. REFER TO COMPACTION NOTES FOR PREPARATION OF SUB-BASE AND SUB-GRADE.
9. ALL WORK TO BE BROOM FINISH.

PEDESTRIAN FOOTPATH JOINTING

1. DOWELED JOINTS ARE TO BE LOCATED WHERE POSSIBLE AT TANGENT POINTS OF CURVES AND ELSEWHERE AT MAX 6.0m CENTRES.
2. TOOLED JOINTS ARE TO BE LOCATED AT A MAX 1.5 x WIDTH OF THE PAVEMENT
3. WHERE POSSIBLE JOINTS SHOULD BE LOCATED TO MATCH KERBING AND/OR ADJACENT PAVEMENT JOINTS.
4. ALL PEDESTRIAN FOOTPATH JOINTING LAYOUTS AS FOLLOWS (U.N.O.)



5. ALL RAMPED CROSSINGS SHALL BE DOWELED INTO ADJOINING PATH PAVEMENT

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PROJECT MANAGEMENT
PWC

STRUCTURAL ENGINEERING
ENSTRUCT GROUP

MECHANICAL ENGINEERING
FREDON AIR

ELECTRICAL ENGINEERING
FREDON

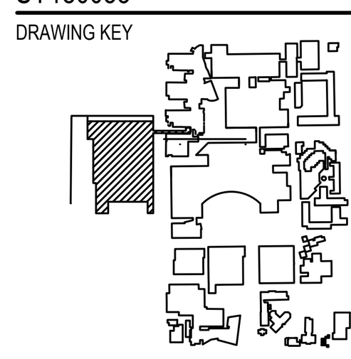
HYDRAULIC ENGINEERING
CP CONSULTANTS

CLIENT
NSW GOVERNMENT Health Infrastructure

PROJECT
HOSPITAL ROAD LOWERING
RANDWICK NSW AUSTRALIA

ACOR PROJECT NUMBER
SY180053

DRAWING KEY



TRUE NORTH
PROJECT NORTH

GRAPHIC SCALE
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SCALE
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STATUS
DESIGN

DRAWING
NOTES

DRAWING NUMBER
RCR-ACR-CV-00-DWG-00-002

ISSUE
D

CIVIL LEGEND

- K&G — KERB AND GUTTER
- DD — DISH DRAIN
- IK — INTEGRAL KERB
- 30.20 — FINISHED SURFACE CONTOUR
- SCJ — SAWN CONTRACTION JOINT
- DEJ — DOWEL EXPANSION JOINTS
- IJ — ISOLATION JOINT
- 750Ø SW — PROPOSED STORMWATER
- MH.02 — PROPOSED STORMWATER PIT
- GRATED DRAIN
- SSO SSO — SUBSOIL DRAINAGE LINE
- S S — PROPOSED SEWER
- PROPOSED HIGH VOLTAGE ELECTRICAL
- PROPOSED HYDRAULIC SERVICES
- COLUMN FOR DECK ABOVE
- XXXXXXXXXXXXXX — DEMOLITION LINE
- S S — EXISTING SEWER MAIN
- C C — EXISTING CONDUIT
- FO FO — EXISTING FIBRE OPTIC
- FI FI — EXISTING FIRE MAIN
- G G — EXISTING GAS MAIN
- W W — EXISTING WATER MAIN
- SC SC — EXISTING SECURITY
- RM RM — EXISTING RISING MAIN
- D D — EXISTING DRAINAGE
- E E — EXISTING ELECTRICITY
- E(LV) E(LV) — EXISTING LOW VOLTAGE ELECTRICITY
- E(HV) E(HV) — EXISTING HIGH VOLTAGE ELECTRICITY

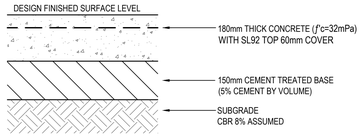
LONGITUDINAL SECTION LEGEND

- DESIGN SURFACE LEVELS
- EXISTING SURFACE LEVELS
- EXISTING PAVEMENT
- UTILITY (COMMS)
- UTILITY (ELECTRICAL)
- UTILITY (GAS)
- UTILITY (SEWER)
- UTILITY (STORMWATER INVERT)
- UTILITY (WATER)

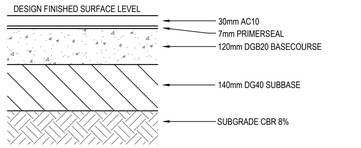
NOTE:
1. GREEN INDICATES PROPOSED UTILITY
2. GREY INDICATES EXISTING UTILITY
3. RED INDICATES UTILITY BEING ABANDONED
4. CIVIL CROSS SECTIONS DO NOT SHOW ABANDONED STORMWATER FOR CLARITY

PAVEMENT LEGEND

PAVEMENT TYPE 1
CONCRETE / LOADING ZONE



PAVEMENT TYPE 5
ASPHALT PAVEMENT RESURFACING (AC)



SOIL EROSION AND SEDIMENT CONTROL LEGEND

- SANDBAG SEDIMENT TRAP
- GEOTEXTILE FILTER FABRIC DROP INLET PIT
- STABILISED VEHICLE ENTRANCE

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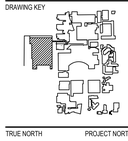

TRUE NORTH PROJECT NORTH

GRAPHIC SCALE
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SCALE
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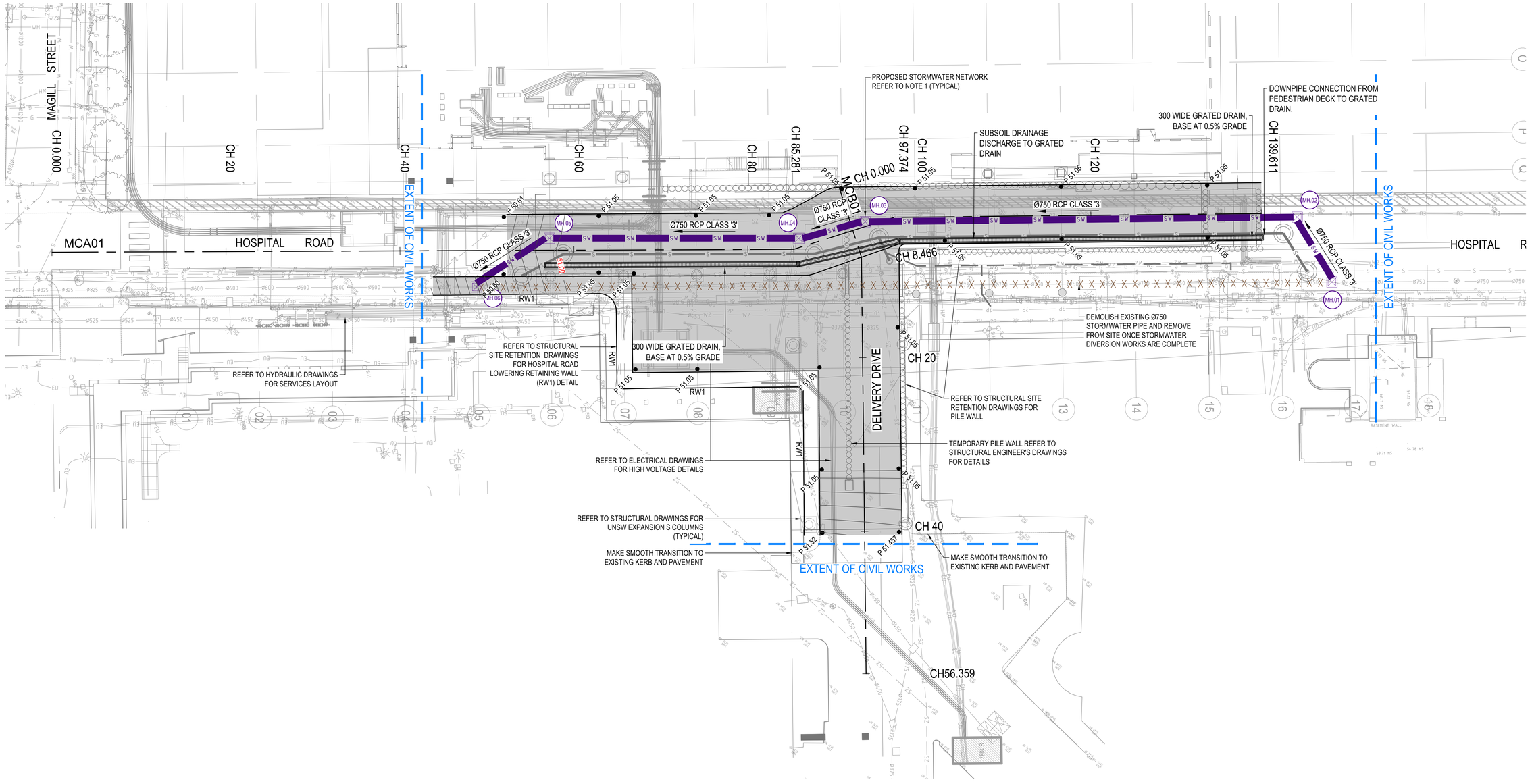
STATUS
DESIGN

DRAWING
LEGENDS SHEET

DRAWING NUMBER	ISSUE
RCR-ACR-CV-00-DWG-00-003	D

NOTE

1. REFER TO STORMWATER STANDARD DETAILS DRAWING RCR-ACR-CV-00-DWG-00-602 AND STORMWATER LONGSECTION AND PIT SCHEDULE DRAWING RCR-ACR-CV-00-DWG-00-950.



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ACOR PROJECT NUMBER
SY180053

DRAWING KEY

TRUE NORTH | PROJECT NORTH

GRAPHIC SCALE
0 4 10

SCALE
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STATUS
DESIGN

DRAWING
GENERAL ARRANGEMENT
SHEET 1

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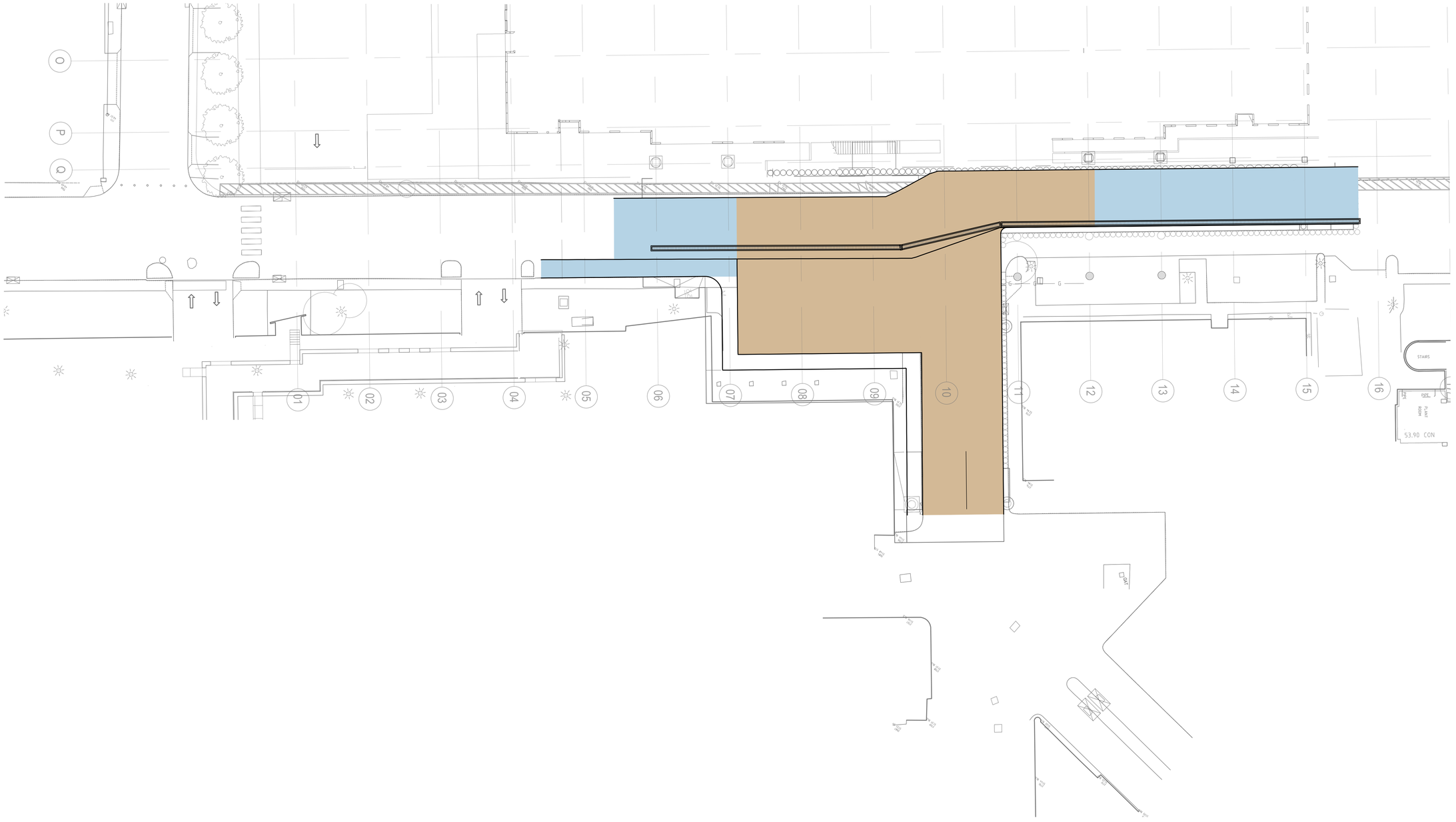

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DRAWING
PAVEMENT PLAN
SHEET 1

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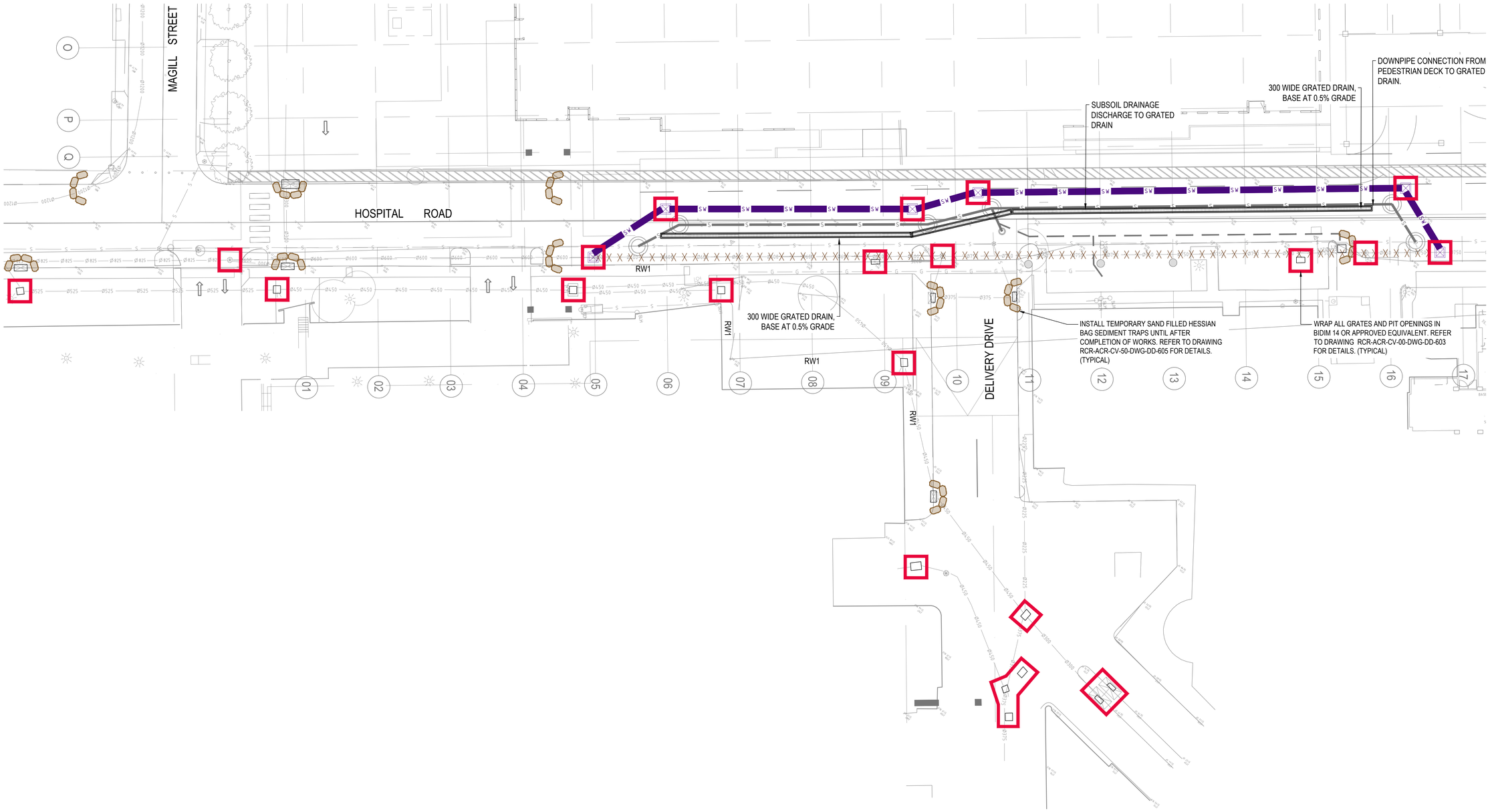

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DESIGN

DRAWING
SOIL AND EROSION
SHEET 1

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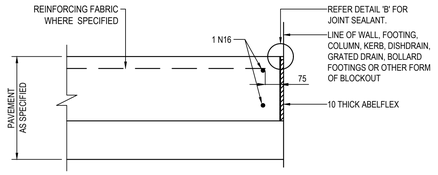

ISOLATION JOINT DETAIL (IJ)
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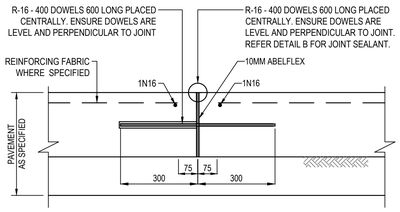
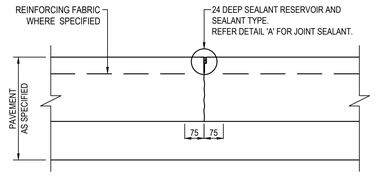
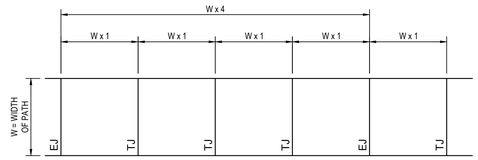


DOWEL EXPANSION JOINT (DEJ)
SCALE 1:10

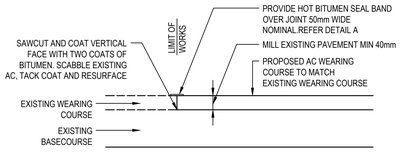


SAWN CONTRACTION JOINT (SCJ)
SCALE 1:10

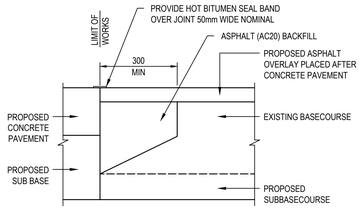


TYPICAL JOIT PLAN FOR FOOTPATHS AND MEDIANS
N.T.S.

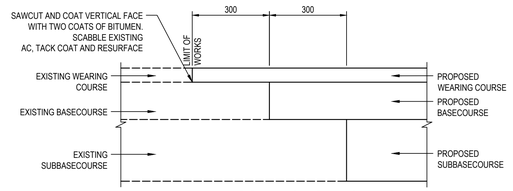
FOOTPATH NOTE
CONCRETE TO HAVE BROOM FINISH WITH SMOOTH TROWELLED EDGES.
TJ - FOOTPATH TOOLED JOINT. REFER DETAIL
EJ - FOOTPATH EXPANSION JOINT. REFER DETAIL



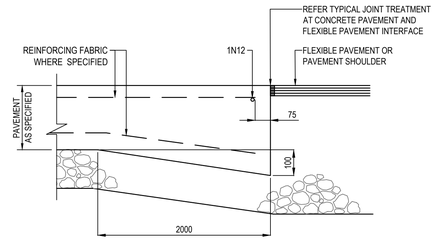
AC CONNECTION TO EXISTING PAVEMENT
SCALE 1:10



DETAIL A
SCALE 1:10

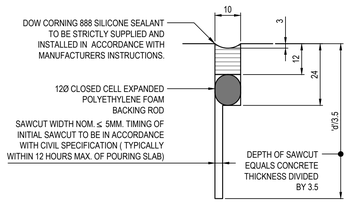


FULL DEPTH PAVEMENT CONNECTION TO EXISTING PAVEMENT
SCALE 1:10

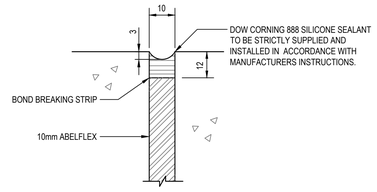


EDGE THICKENING FOR RIGID PAVEMENT (ET)
SCALE 1:10

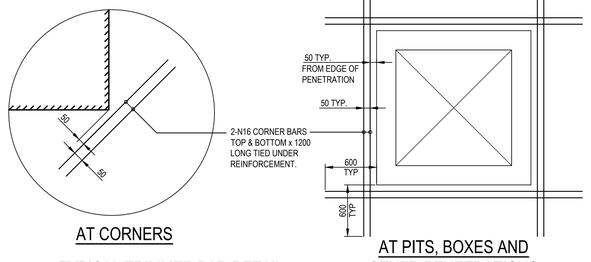
NOTES
1. JOINT THICKENING TO MATCH THE THICKER OF THE TWO ADJOINING PAVEMENTS
2. APPLICABLE TO AIRSIDE AND LANDSIDE RIGID CONCRETE PAVEMENTS



JOINT SEALANT DETAIL 'A'
SCALE 1:1



JOINT SEALANT DETAIL 'B'
SCALE 1:1



AT CORNERS

AT PITS, BOXES AND OTHER PENETRATIONS

TYPICAL TRIMMER BAR DETAIL
SCALE 1:20

1. TRIMMER BARS:
   1.1. TO BE CONSTRUCTED AT ALL PENETRATIONS IN AIRCRAFT/VEHICLE CONCRETE PAVEMENTS INCLUDING BUT NOT LIMITED TO:
   - ALL SERVICE PITS
   - ALL DRAINAGE STRUCTURES
   - ALL VALVE BOXES
   - ALL IN-GROUND FIRE HYDRANTS
   - ALL PROTRUDING CORNERS OF STRUCTURES OR SLABS
   - ALL COLUMNS PENETRATING CONCRETE PAVEMENT
2. CONSTRUCT 2-N16 TRIMMER BARS (1200LONG, TOP AND BOTTOM) AT ALL MISMATCHED OR DISCONTINUOUS JOINTS. TYPICAL

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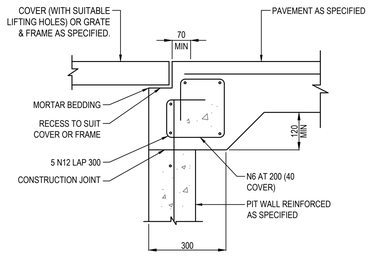
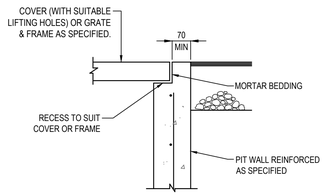


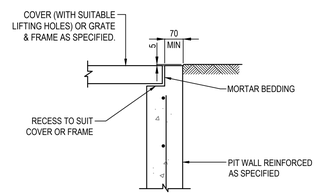
PIT EDGE DETAIL "A" IN CONCRETE PAVEMENT

SCALE 1:10



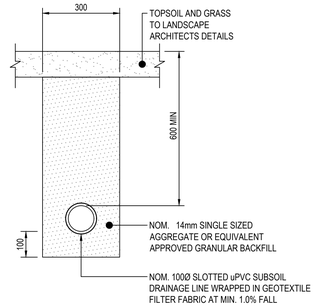
PIT EDGE DETAIL "B" IN FLEXIBLE PAVEMENT

SCALE 1:10



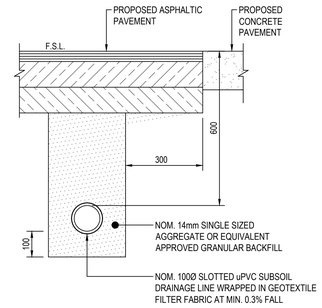
PIT EDGE DETAIL "C" IN LANDSCAPE AREAS

SCALE 1:10



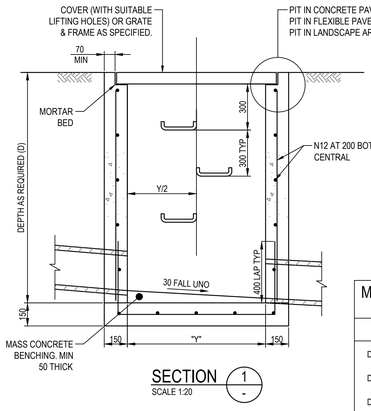
SUBSOIL DRAINAGE - TYPICAL

SCALE 1:10



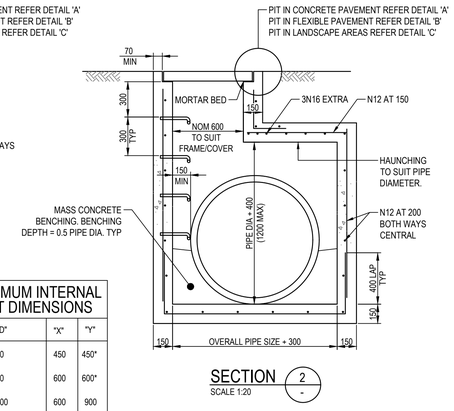
SUBSOIL DRAINAGE AT FLEXIBLE/RIGID PAVEMENT INTERFACE

SCALE 1:10



SECTION 1 / -

SCALE 1:20

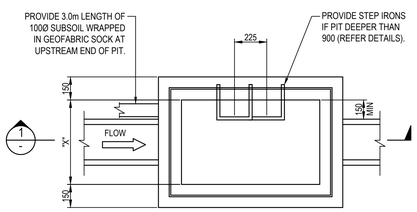


SECTION 2 / -

SCALE 1:20

MINIMUM INTERNAL PIT DIMENSIONS		
"D"	"X"	"Y"
D ⩽ 600	450	450*
D ⩽ 900	600	600*
D ⩽ 1200	600	900
D > 1200	900	900

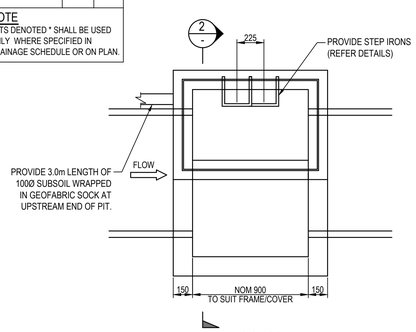
NOTE
PITS DENOTED * SHALL BE USED ONLY WHERE SPECIFIED IN DRAINAGE SCHEDULE OR ON PLAN.



PLAN

SURFACE INLET/JUNCTION PIT TYPE "A"

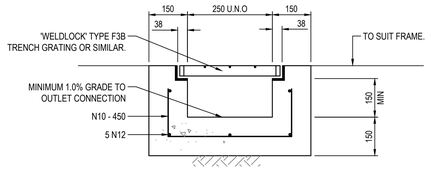
SCALE 1:20



PLAN

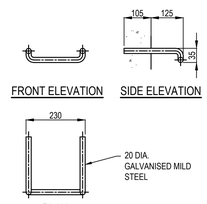
SURFACE INLET/JUNCTION PIT TYPE "B"

SCALE 1:20



GRATED DRAIN TYPE 'B'

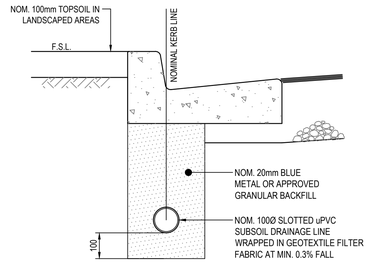
SCALE 1:10



PLAN

STEP IRON DETAIL

N.T.S.



SUBSOIL UNDER KERBS

SCALE 1:10

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SHEET 2

DRAWING NUMBER
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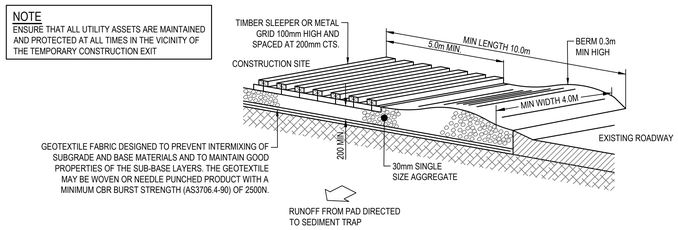
NOTE
ENSURE THAT ALL UTILITY ASSETS ARE MAINTAINED AND PROTECTED AT ALL TIMES IN THE VICINITY OF THE TEMPORARY CONSTRUCTION EXIT



CONSTRUCTION NOTES

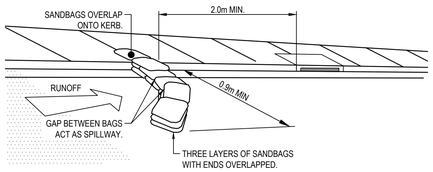
1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING 30mm SINGLE SIZE AGGREGATE.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE OR OTHER SEDIMENT TRAP WHERE THE SEDIMENT IS COLLECTED AND REMOVED.

MAINTENANCE NOTES

THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH PREVENTS TRACKING OR FLOWING OF SEDIMENT OFF THE CONSTRUCTION SITE. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED OFF THE CONSTRUCTION SITE MUST BE REMOVED IMMEDIATELY.

TEMPORARY STABILISED CONSTRUCTION EXIT

N.T.S.

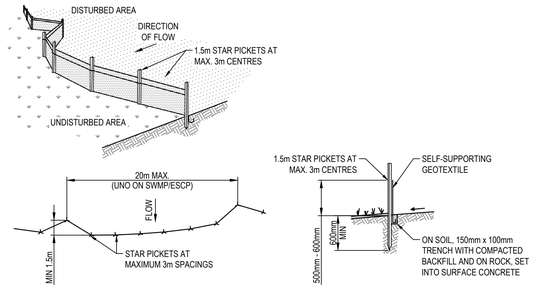


SANDBAG SEDIMENT TRAP - AT ON GRADE PIT

SANDBAG SEDIMENT TRAP - AT KERB SAG PIT

SANDBAG SEDIMENT TRAP.

N.T.S.



PLAN

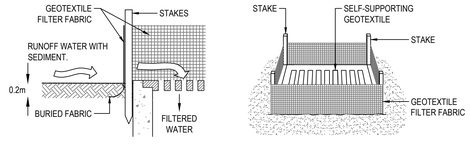
SECTION DETAIL

CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5m LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.

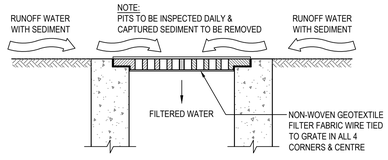
SEDIMENT CONTROL FENCE

N.T.S.



GEOTEXTILE FILTER FABRIC DROP INLET SEDIMENT TRAP.

N.T.S.



INLET TRAP

N.T.S.

NOTE
TO BE USED IN PAVED AREAS WHERE TRAFFIC ACCESS IS REQUIRED

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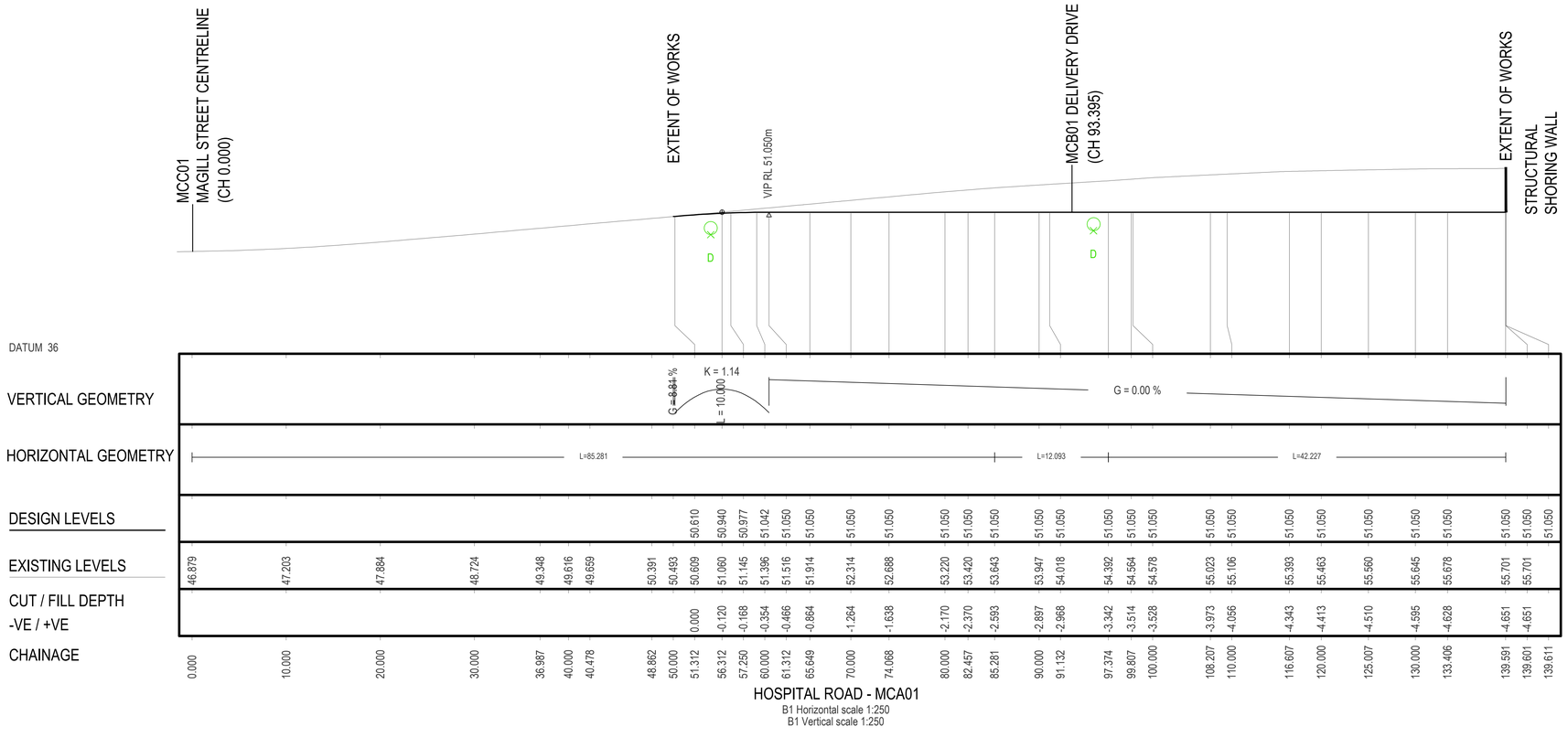

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B1 Horizontal scale 1:250
B1 Vertical scale 1:250

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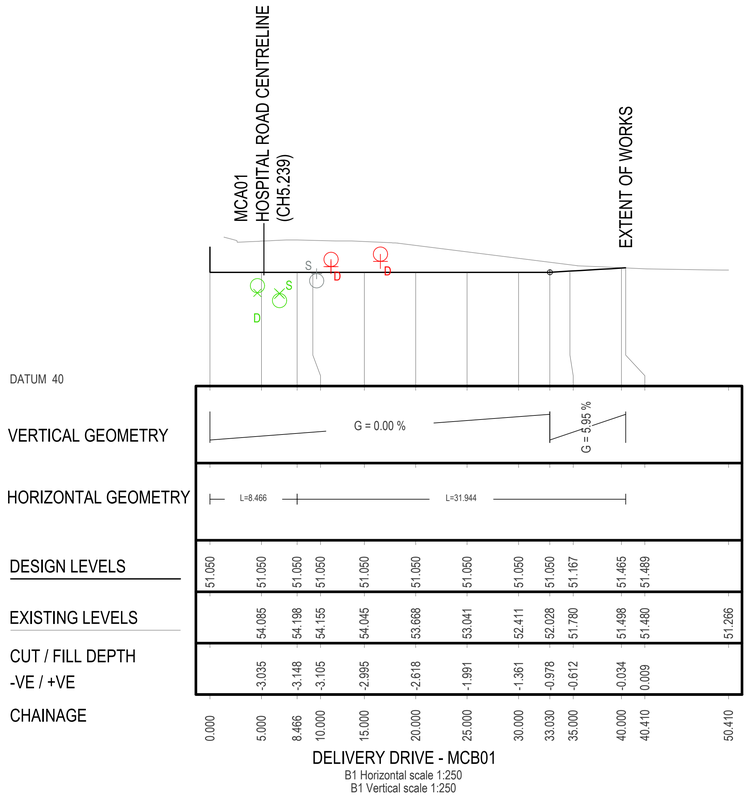

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B1 Vertical scale 1:250

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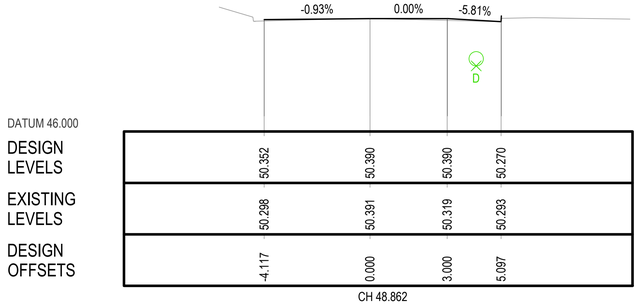

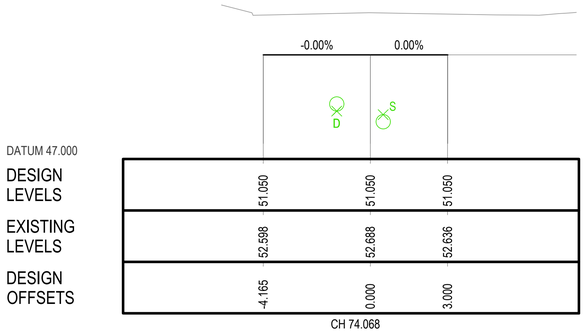

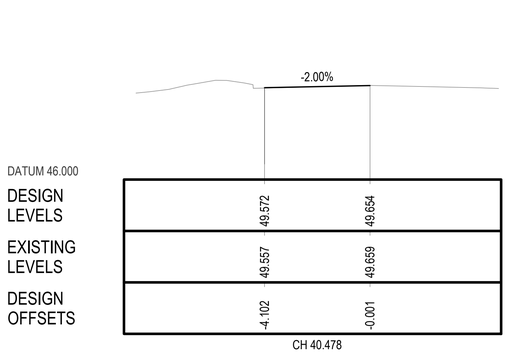

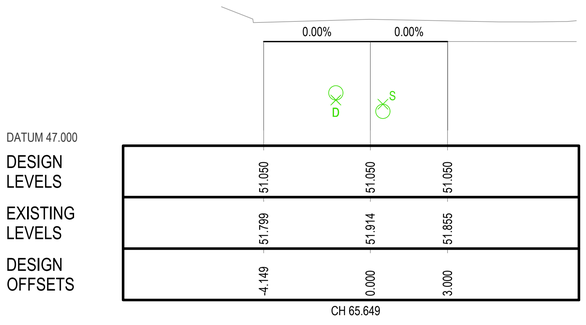

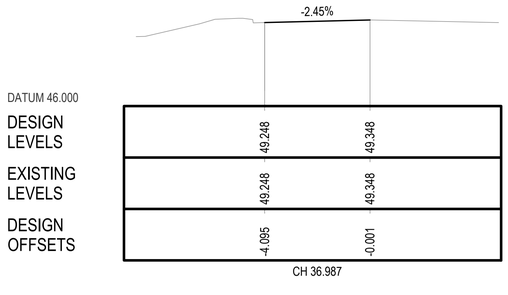

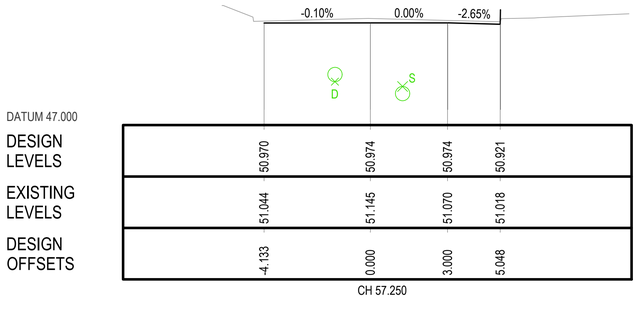

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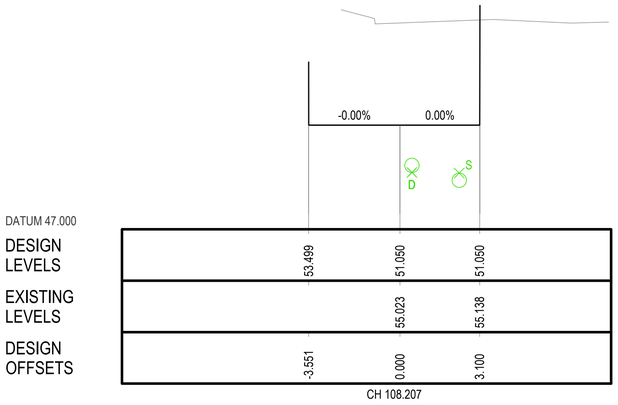

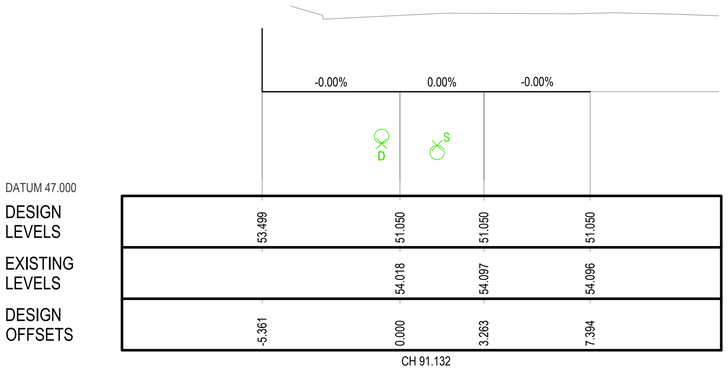

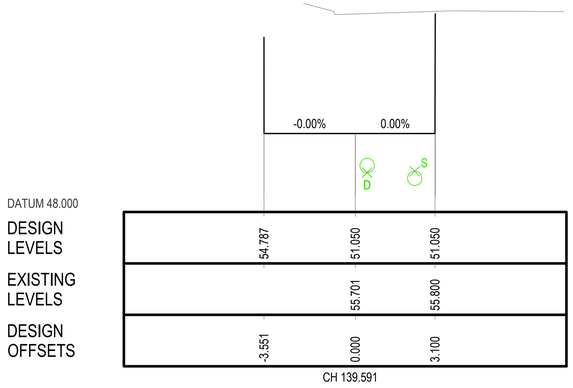

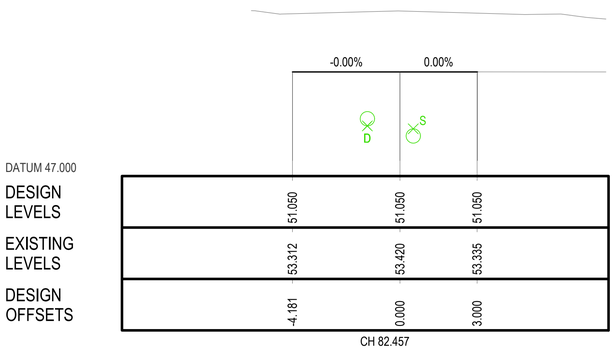

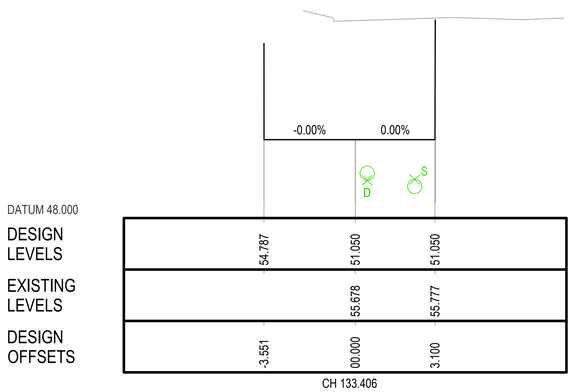

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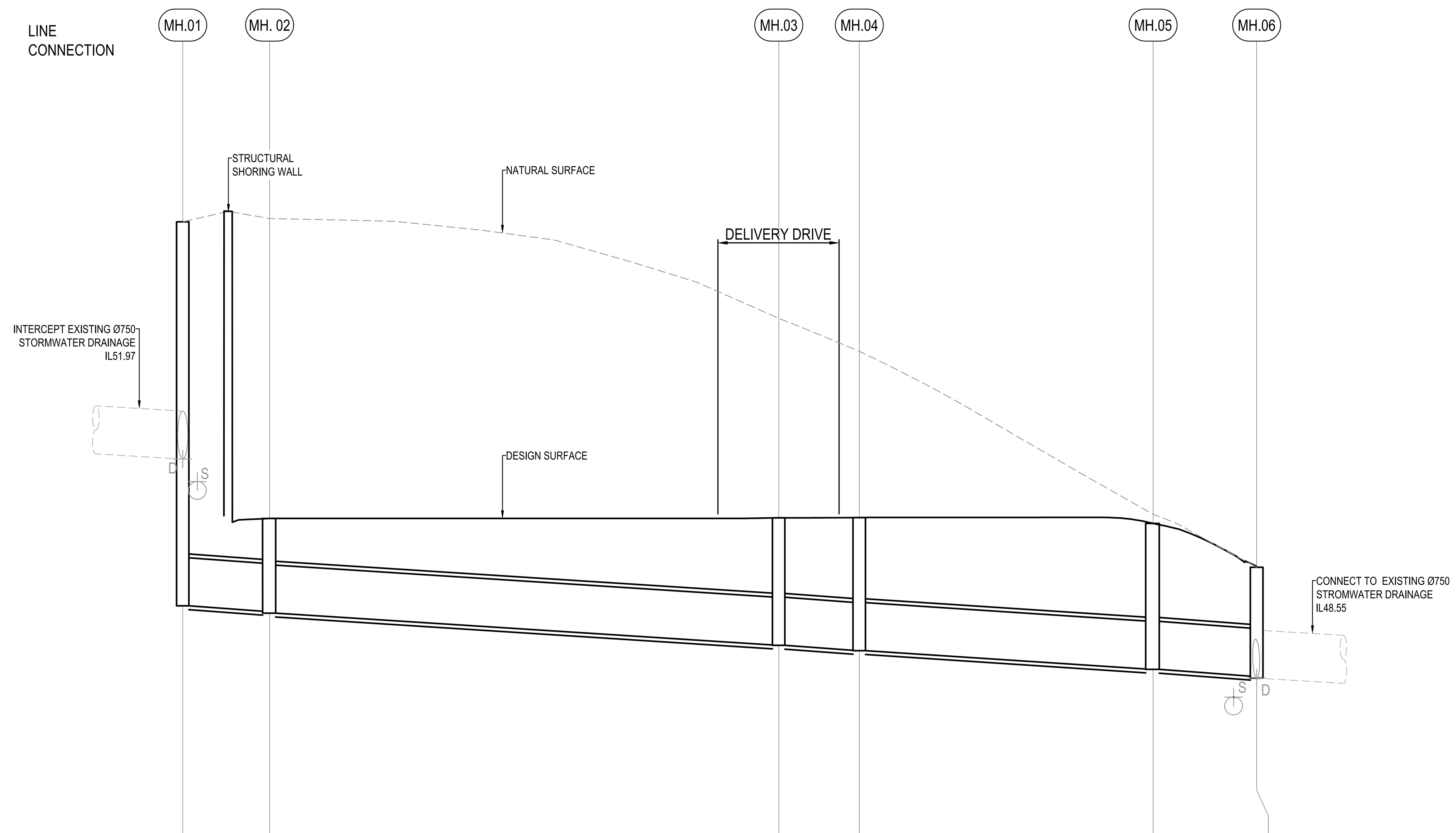

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PROPOSED STORMWATER LONGITUDINAL SECTION

HORIZONTAL SCALE 1:125
VERTICAL SCALE 1:50

SCHEDULE OF STORMWATER DRAINAGE STRUCTURES

STRUCTURE TYPE	INTERNAL SIZE OF ACCESS OPENING CHAMBER AND COVER/GRATE AND FRAME TYPE	STRUCTURE NUMBER	COVER LEVEL
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TYPE 'A' SURFACE INLET/ JUNCTION PIT	CLASS 'D' CAST IRON SOLID COVER AND FRAME. COVER TO BE BOLTED DOWN CONCRETE INFILLED	MH.02	51.05
TYPE 'A' SURFACE INLET/ JUNCTION PIT	CLASS 'D' CAST IRON SOLID COVER AND FRAME. COVER TO BE BOLTED DOWN CONCRETE INFILLED	MH.03	51.05
TYPE 'A' SURFACE INLET/ JUNCTION PIT	CLASS 'D' CAST IRON SOLID COVER AND FRAME. COVER TO BE BOLTED DOWN CONCRETE INFILLED	MH.04	51.05
TYPE 'A' SURFACE INLET/ JUNCTION PIT	CLASS 'D' CAST IRON SOLID COVER AND FRAME. COVER TO BE BOLTED DOWN CONCRETE INFILLED	MH.05	50.97
TYPE 'A' SURFACE INLET/ JUNCTION PIT	CLASS 'D' CAST IRON SOLID COVER AND FRAME. COVER TO BE BOLTED DOWN CONCRETE INFILLED	MH.06	50.28

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LOWERING
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ACOR PROJECT NUMBER
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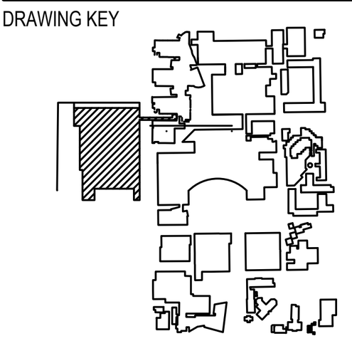

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RCR-ACR-CV-00-DWG-00-950

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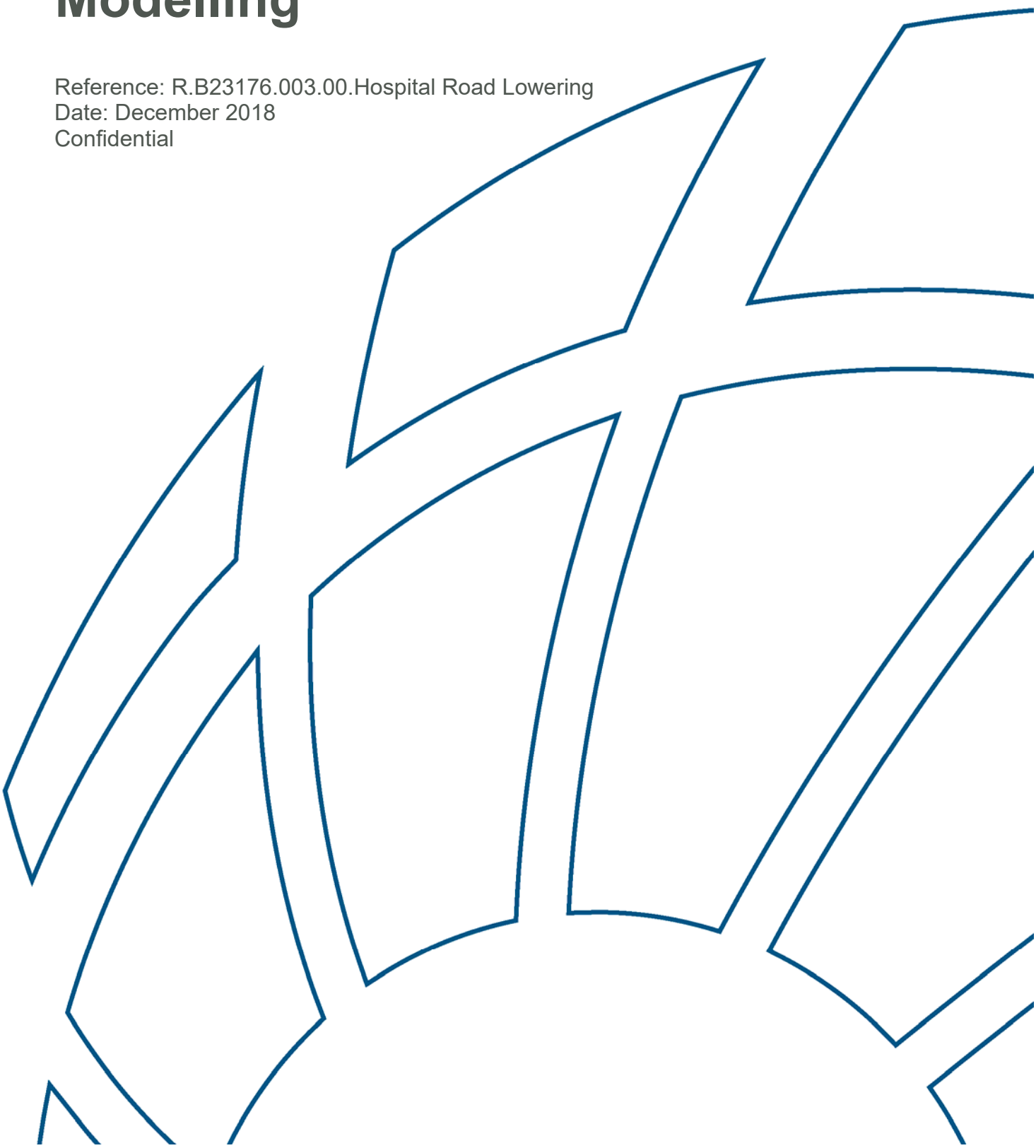
Appendix B - BMT Flood Report

Randwick Campus Redevelopment POW Hospital Road Lowering Flood Modelling

Reference: R.B23176.003.00.Hospital Road Lowering
Date: December 2018
Confidential



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Document:	R.B23176.003.00.Hospital Road Lowering
Title:	Randwick Campus Redevelopment POW Hospital Road Lowering Flood Modelling
Project Manager:	Martin Giles
Author:	Martin Giles
Client:	Lend Lease
Client Contact:	Miriam Salter
Client Reference:	

Synopsis: Flood modelling in support of RCR POW Hospital Road Lowering

REVISION/CHECKING HISTORY

Revision Number	Date	Checked by		Issued by	
0	14 December 2018	Martin Giles	MG	Martin Giles	M. Gil

DISTRIBUTION

Destination	Revision										
	0	1	2	3	4	5	6	7	8	9	10
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Contents

List of Figures

1 Introduction

1.1 Purpose

The Randwick Campus Redevelopment includes the redevelopment of the area bounded by High Street, Magill Street, Hospital Road, and Botany Street, at Randwick (the site).

The location of the site is shown on Figure 1-1.

Figure 1-1 Locality Plan

Consideration is being given to lowering Hospital Road as part of the works to improve the pedestrian connectivity between the existing and new hospitals and to facilitate access to the new buildings. The section of Hospital Road to be lowered is shown on Figure 1-1.

Preliminary plans developed with respect to the lowering of Hospital Road are presented in Appendix E.

As discussed in Section 1.2, the Randwick Campus Redevelopment is occurring in an area affected by flooding from an upstream catchment area. As part of the design completed to date, detailed flood modelling was completed to identify the trunk drainage works necessary to allow the redevelopment to proceed without causing an unacceptable impact on flood levels.

Given the sensitivity of the region to flooding, it is also necessary to ensure that lowering Hospital Road does not cause unacceptable flood level impacts and that adopted floor levels achieve the requisite immunity in relation to flooding.

Consequently, it is necessary to ensure that the lowering of Hospital Road achieves the following key objectives:

- No unacceptable increase in flood level external to the site up to the 1% AEP (100-year) flood event;
- Maintenance of the Probable Maximum Flood (PMF) level in Magill Street used to define the floor level of the Acute Services Building;
- Drainage of runoff from the existing hospital via Hospital Road is maintained; and
- Achievement of floor levels in the new hospital relative to PMF flood level to ensure acceptable immunity.

This report presents the results of detailed flood modelling completed using the flood model developed in support of the trunk drainage assessment to determine the feasibility of lowering Hospital Road together with the drainage works necessary to allow the lowering of the road to occur.

Overall, the modelling determined that the lowering of Hospital Road, combined with appropriate drainage works, can proceed.

1.2 Background

The first phase of the Randwick Campus Redevelopment consists of the construction of the Acute Services Building that occupies the lower part of the site from Magill Street (refer Figure 1-1).

The area between High Street and Magill Street receives runoff from an urban area to the north. The runoff ponds at a low point at the intersection of High Street and Eurimbla Avenue before being drained to Magill Street via a combination of underground drainage and overland flow in Eurimbla Avenue.

The drainage of the site is also affected by the construction of the Sydney Light Rail project, which includes drainage works which direct an increased flow to the intersection of High Street and Eurimbla Avenue.

To allow an appropriate drainage solution to be achieved, detailed flood modelling of the site and surrounding area was completed.

To conduct the flood assessment BMT utilised the TUFLOW hydraulic model developed for Randwick City Council by WMA Water and detailed in the draft report *'Birds Gully and Bunnerong Road Flood Study. Draft Report'*, March 2018. The report was completed based on the methodology detailed in the 2016 version of *Australian Rainfall and Runoff* and therefore reflects current best practice with respect to the modelling of urban catchments.

In general, the assumptions and methodology of the Council model were adopted and maintained for the model update and site assessments. As the model covers a wide area, it was necessary to refine the model in the vicinity of the site to provide sufficient detail in the key area of interest. The supplied model was modified to include:

- detailed survey;
- fences and other impediments to flow;
- blockages due to buildings;
- privately-owned stormwater drainage network of the existing hospital including on-site detention;
- Sydney Light Rail works; and
- adjusted catchment boundaries to better define runoff from areas close to the site.

Using the model, options for the drainage of the site were considered. To achieve a satisfactory outcome, the adopted trunk drainage solution comprises a combined conveyance and storage system between High Street and about half way down Botany Street, and a standard conveyance system between the end of the storage system and the existing drainage in Magill Street.

The system is located adjacent to High Street and Botany Street, allowing the removal of the existing drainage system between High Street and Magill Street and providing a single development footprint.

Details regarding the development of the model and the derived trunk drainage solution are presented in the BMT report *Randwick Campus Redevelopment, ASB Project Summary Flood Report* (October 2018).

To prevent duplication, this report discusses the changes made to the model in order to account for the lowering of Hospital Road.

2 Flood Model- Existing Situation

2.1 Drainage of Existing Hospital

As Hospital Road is a private road, the drainage system in Hospital Road associated with the existing hospital is not a Council asset. Council would only have provided details of its drainage assets to the consultant developing the flood model of the area. As a consequence, When the Council flood model of the area was being reviewed, it was determined that the model did not include the stormwater drainage in Hospital Road associated with the existing hospital.

As a result of the lack of knowledge regarding the drainage of the existing system, the model supplied by Council assumed that runoff from a significant proportion of the existing hospital would drain across Hospital Road towards Eurimbla Avenue.

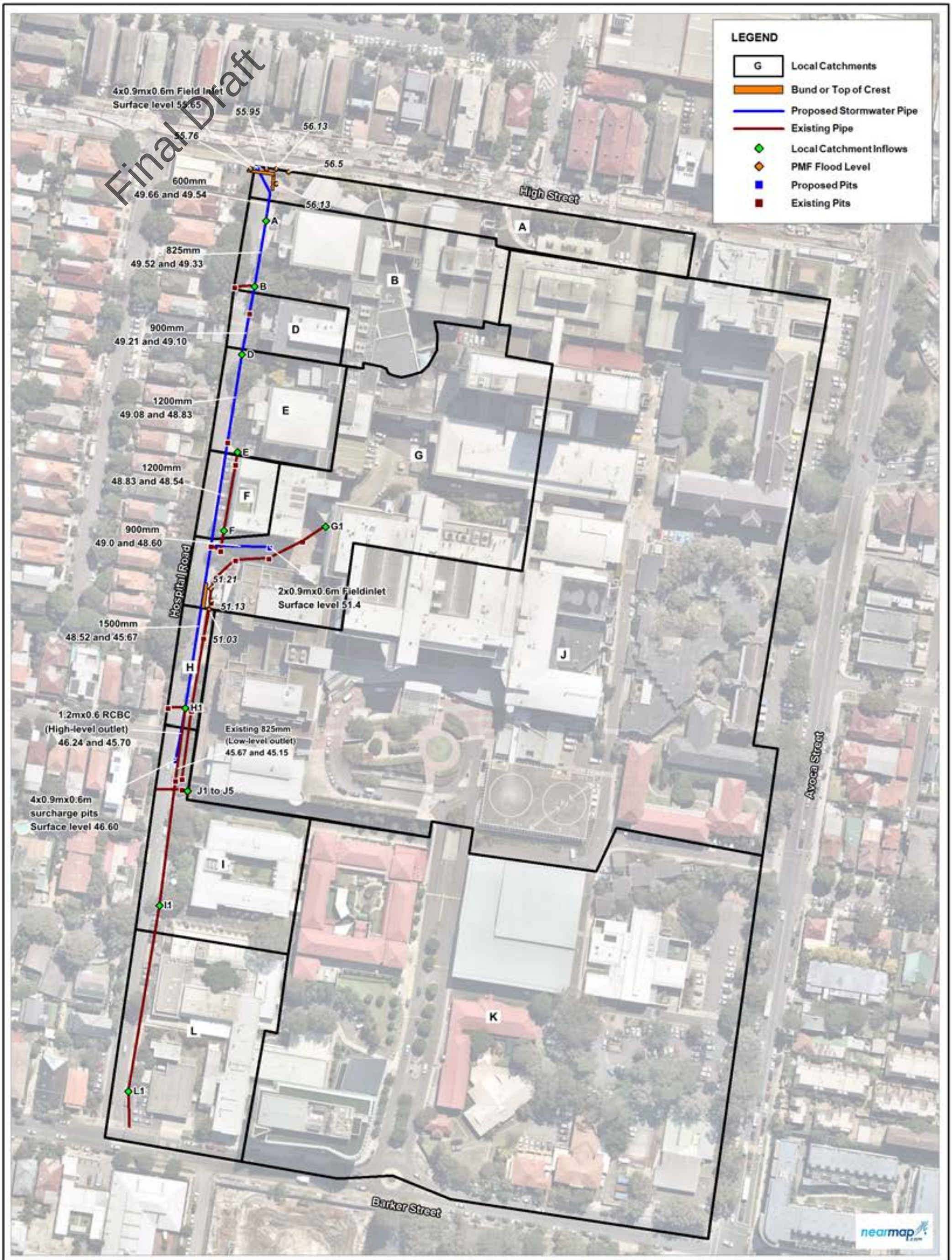
To more reliably reflect the runoff that occurs from the existing hospital, Lend Lease commissioned service location in Hospital Road and other parts of the Hospital to add to other available survey data. This survey assisted in the delineation of catchments within the existing hospital.

However, the collected information was not comprehensive, partly due to the fragmented nature of the system itself as a result of it being constructed in stages over many years in response to the expansion of the hospital.

For the flood modelling completed in support of the Acute Services Building, the existing hospital was divided into a number of subcatchments based on available information. While this level of detail was adequate for the trunk drainage assessment, it will be necessary to confirm the actual drainage of the existing hospital, particularly under extreme events, as detailed design progresses.

To assist in the modelling completed for this report, the civil consultants for the project (Acor) reviewed the available survey data and confirmed the catchment definition adopted by BMT for the modelling of the Acute Services Building. This catchment delineation is shown on Figure 2-1.

Due to the sensitivity of the drainage solution, it is recommended that the civil consultant revisit the drainage of the site as part of detailed design to ensure that the drainage design incorporates an appropriate number and configuration of inlet pipes to achieve the outcome presented in this report.



Title:

Prince of Wales - Flow Management Strategy Including Hospital Road Lowering

Figure: 2-1

Rev: A

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

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Approx. Scale

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2.2 Existing Situation

The peak flood depths associated with a range of events from the 1 EY to the Probable Maximum Flood (PMF) are presented in Appendix A, in order of increasing severity.

- Figure A1-1 1 EY Flood Depth- Existing Case;
- Figure A1-2 0.5 EY Flood Depth- Existing Case;
- Figure A1-3 20% AEP Flood Depth- Existing Case;
- Figure A1-4 10% AEP Flood Depth- Existing Case;
- Figure A1-5 5% AEP Flood Depth- Existing Case;
- Figure A1-6 2% AEP Flood Depth- Existing Case;
- Figure A1-7 1% AEP Flood Depth- Existing Case;
- Figure A1-8 0.5% AEP Flood Depth- Existing Case; and
- Figure A1-9 Probable Maximum Flood Depth- Existing Case.

Figure 2-2 presents an excerpt from Figure A1-8 of Appendix A, namely the depth of flooding for the PMF.

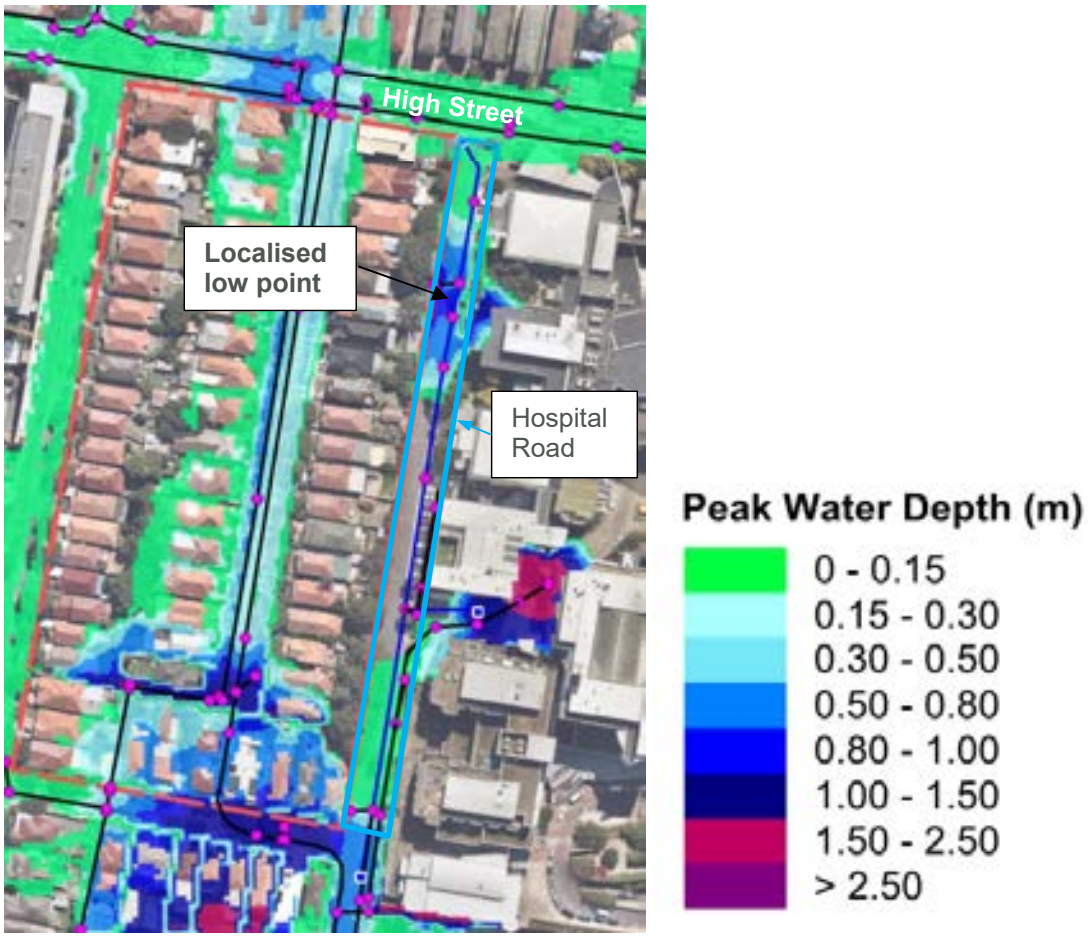


Figure 2-2 Existing Case Probable Maximum Flood Event Peak Flood Depths

For events up to and including the 1% AEP (100 year) event, flow in High Street drains to the low point in High Street to the west of Hospital Road rather than entering and flowing down Hospital Road. For the PMF event, some flow (of the order of 0.4 m^3/s) drains from High Street to Hospital Road.

Within Hospital Road, although Hospital Road generally falls in a southerly direction from High Street to Magill Street a localised low point exists about 60 metres from High Street. Provided the inlet to the drainage system in Hospital Road does not block (for example by leaves) beyond that normally assumed for drainage systems, then the depth of ponding is sufficiently low (less than one metre) for the low point to not overtop and flow to occur down Hospital Road.

Further to south, runoff from part of the hospital drains to a loading bay area. Ground levels within the loading bay, which is located about 175 metres from High Street, are significantly lower than the level of Hospital Road. As a consequence of this, when the capacity of the underground drainage system is exceeded, runoff ponds to a considerable depth (in excess of 1.5 metres for the Probable Maximum Flood) prior to overland flow commencing to the south.

Downstream of the loading bay, runoff drains to the intersection of Magill Street and Hospital Road, joining runoff from the remainder of the catchment.

3 Flood Model- Developed Case

3.1 Proposed Development

The development concept for Hospital Road is presented in Appendix E. The works include the lowering of Hospital Road. The civil consultants for the project, ACOR, provided a digital terrain model reflecting the proposed vertical alignment of the road.

3.2 Drainage Solution

The terrain model developed by ACOR was added to the flood model. The model was then used to iteratively determine the drainage work necessary to collect the runoff from the PMF event and drain it downstream of Magill Street to then allow the road and associated floor levels associated with the lowered Hospital Road to be achieved.

The resultant pipe network, which varies from a 600 mm diameter pipe to a 1,500 mm diameter pipe, is shown on Figure 2-1.

- ***High Street***

  At High Street, inlets are to be provided to capture the flow entering Hospital Road. The provision of inlets was considered to be necessary to ensure that the flow directed to the low point further to the west in High Street is not increased as a result of lowering Hospital Road.

  Although it is not necessary to limit flood level impacts for events greater than the 1% AEP (100-year) event, it was considered preferable for the Hospital Road solution to be a stand-alone system to ensure that the design of the trunk drainage system remains unaffected by any works at Hospital Road.

- ***Localised low point south of High Street***

  At the localised low point to the south of High Street, sufficient drainage to collect runoff that would otherwise pond at Hospital Road has been provided. As part of detailed design it will be necessary to ensure that the drainage system at this point receives and collects the runoff from the PMF event.

- ***Loading Bay in Existing Hospital***

  Particular attention was focussed on conditions in the loading bay further to the south. The digital terrain model supplied by Acor provides for a transition from the lowered Hospital Road to a high point on the existing access to the loading bay. From the high point, the existing access grading is retained.

  The level of the high point is, combined with the proposed inlets, sufficient to provide ample freeboard for the water that ponds in the loading bay. The design also includes a bank to ensure that any overland flow that occurs from water ponded in the loading bay is directed to Hospital Road at a point well downstream of the loading bay in order that the floor level adopted for the Sydney Children's Hospital to the west of Hospital Road (51.2 at B1) is readily achievable.

Finally, the development also provides for a reduction in the ponded water level in the loading bay. The extent of water level reduction provided as part of the lowering of Hospital Road will be explored as part of further design.

- ***Conditions at Magill Street and Downstream***

  The PMF flood level in Magill Street is of prime importance as the floor level of the ASB facing Magill Street has been set relative to the PMF flood level.

  To minimise flood level impacts within the underground drainage system and to avoid additional flow draining to Magill Street and increasing the flood level for the PMF in Magill Street, the solution includes a 1.2 m x 0.6 m RCBC connected to surcharge pits located in or next to the Hospital Road reserve downstream of Magill Street.

  It is expected that the configuration of the surcharge pits will be refined as part of detailed design.

3.3 Developed Case Results- Flood Depths

The flood depths calculated for the combined case of the trunk drainage works being completed as part of the Acute Services Building and the Hospital Road lowering are provided in Appendix B.

- Figure B1-1 1 EY Flood Depth- Developed Option;
- Figure B1-2 0.5 EY Flood Depth- Developed Option;
- Figure B1-3 20% AEP Flood Depth- Developed Option;
- Figure B1-4 10% AEP Flood Depth- Developed Option;
- Figure B1-5 5% AEP Flood Depth- Developed Option;
- Figure B1-6 2% AEP Flood Depth- Developed Option;
- Figure B1-7 1% AEP Flood Depth- Developed Option;
- Figure B1-8 0.5% AEP Flood Depth- Developed Option; and
- Figure B1-9 Probable Maximum Flood Depth- Developed Option.

3.4 Developed Case Results- Flood Impacts

The flood impacts (i.e. increase in flood level) for the combined case of the trunk drainage works being completed as part of the Acute Services Building and the Hospital Road lowering are provided in Appendix C.

- Figure C1-1 1 EY Flood Impact - Developed Option;
- Figure C1-2 0.5 EY Flood Impact - Developed Option;
- Figure C1-3 20% AEP Flood Impact- Developed Option;
- Figure C1-4 10% AEP Flood Impact - Developed Option;
- Figure C1-5 5% AEP Flood Impact - Developed Option;
- Figure C1-6 2% AEP Flood Impact - Developed Option;
- Figure C1-7 1% AEP Flood Impact - Developed Option;
- Figure C1-8 0.5% AEP Flood Impact - Developed Option;
- Figure C1-9 Probable Maximum Flood Impact - Developed Option; and
- Figure C1-10 Probable Maximum Flood Impact - Developed Option, Regional Impact

In terms of defining the acceptable impact of development, Section 5.2 of Chapter B8 (Water Management) of the Randwick Comprehensive Development Control Plan 2013 states that *'development shall not increase flood effects elsewhere, having regard to loss of flood storage, changes in flood levels and velocities and the cumulative impact of multiple potential developments, for floods up to and including the 1% AEP flood.'*

Based on the mapping presented in Appendix C, the development (Randwick Campus Development including Hospital Road Lowering) complies with the Council development control plan and is therefore acceptable.

The mapping presented in Appendix C does indicate an increase in flood level for events more severe than the 1% AEP event, such as the Probable Maximum Flood. However, there is no requirement to consider flood impacts for more severe events due to their rare frequency of occurrence and the economic cost associated with providing drainage to cater for the runoff associated with such events.

Despite this, it is necessary to set floor levels relative to the Probable Maximum Flood level due to the critical nature of the facility. To satisfy the requirements of Council, it is necessary to set flood levels at twice the depth of the PMF flood depth. It is recommended that the floor levels proposed for the development be reviewed at periodic intervals to capture any inadvertent changes in level as the design progresses and to ensure that floor levels set for the first time (for example stairwells giving entry to roads) are assigned an appropriate level.

The mapping presented in Appendix C reflects the combined impact of the Randwick Campus Redevelopment and the lowering of Hospital Road. Appendix D presents the impact of the lowering of Hospital Road relative to the trunk drainage works in place to highlight the incremental impact of the road lowering.

As the iterations minimised impacts for small events, the mapping only considers the 1% AEP (100-year) event and the PMF event.

- Figure D-1 1% AEP Flood Impact Relative to Developed Scenario;
- Figure D-2 PMF Flood Impact Relative to Developed Scenario;

For the 1% AEP event, a reduction in level in the loading bay is evident. Elsewhere, changes in level are less than 10 mm which is the nominal accuracy of models.

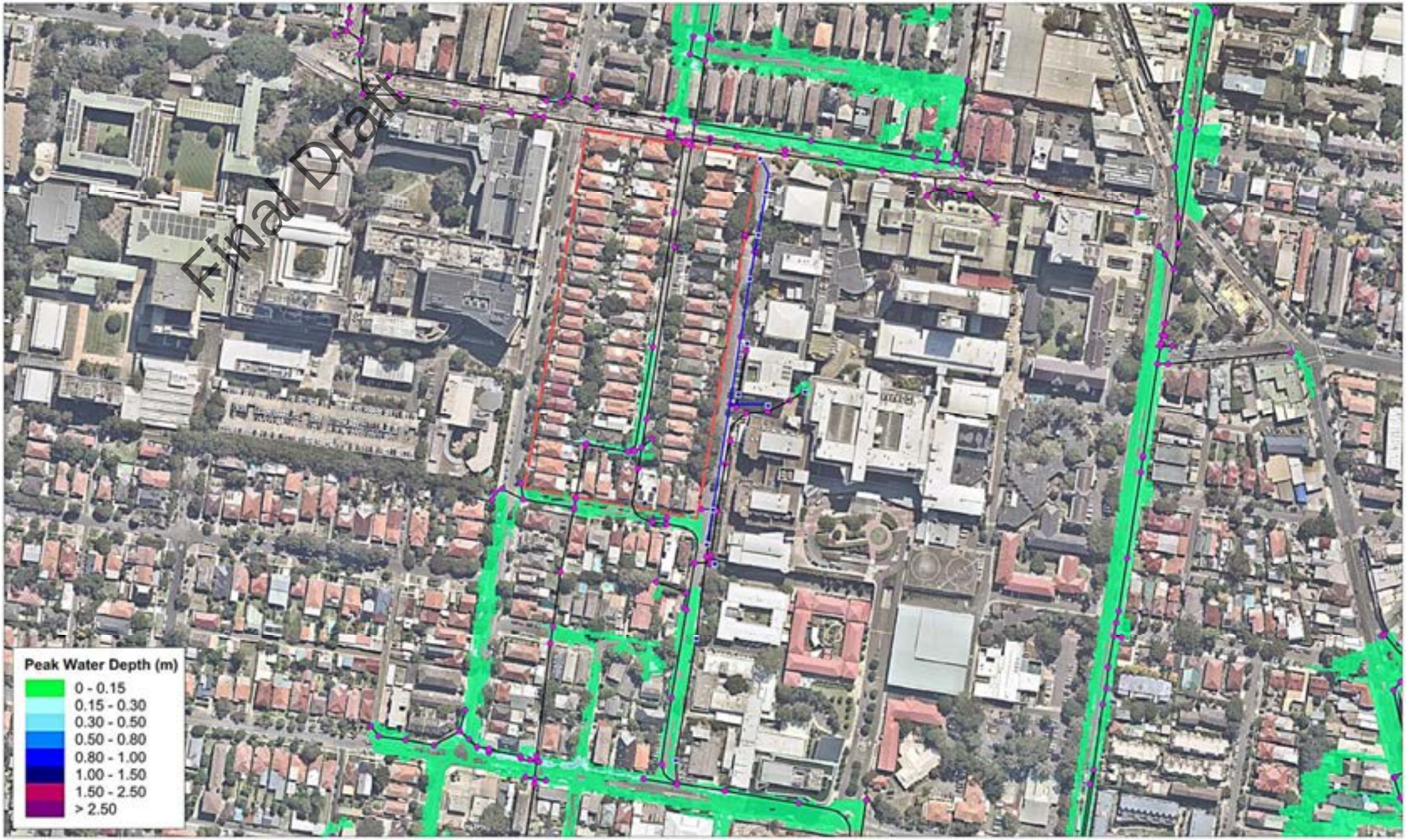
For the PMF event, there is an increase in level downstream of the site as a result of the reduction in storage in Hospital Road. However, the increase in level is less than the decrease in level in the same area for the trunk drainage solution. As a consequence, a net reduction in flood level is still achieved. Further, as noted above it is not necessary to eliminate impacts for the PMF event.

4 Conclusion

Detailed flood modelling has been completed with respect to the proposed lowering of Hospital Road.

Provided appropriate drainage works (refer Figure 2-1) are completed in conjunction with the lowering of the road, then Hospital Road can be lowered without causing an unacceptable impact on flood levels external to the site.

Appendix A Existing Case Peak Depths



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 1 EY Flood Depth - Existing Case

Figure: A1-1

Rev: A

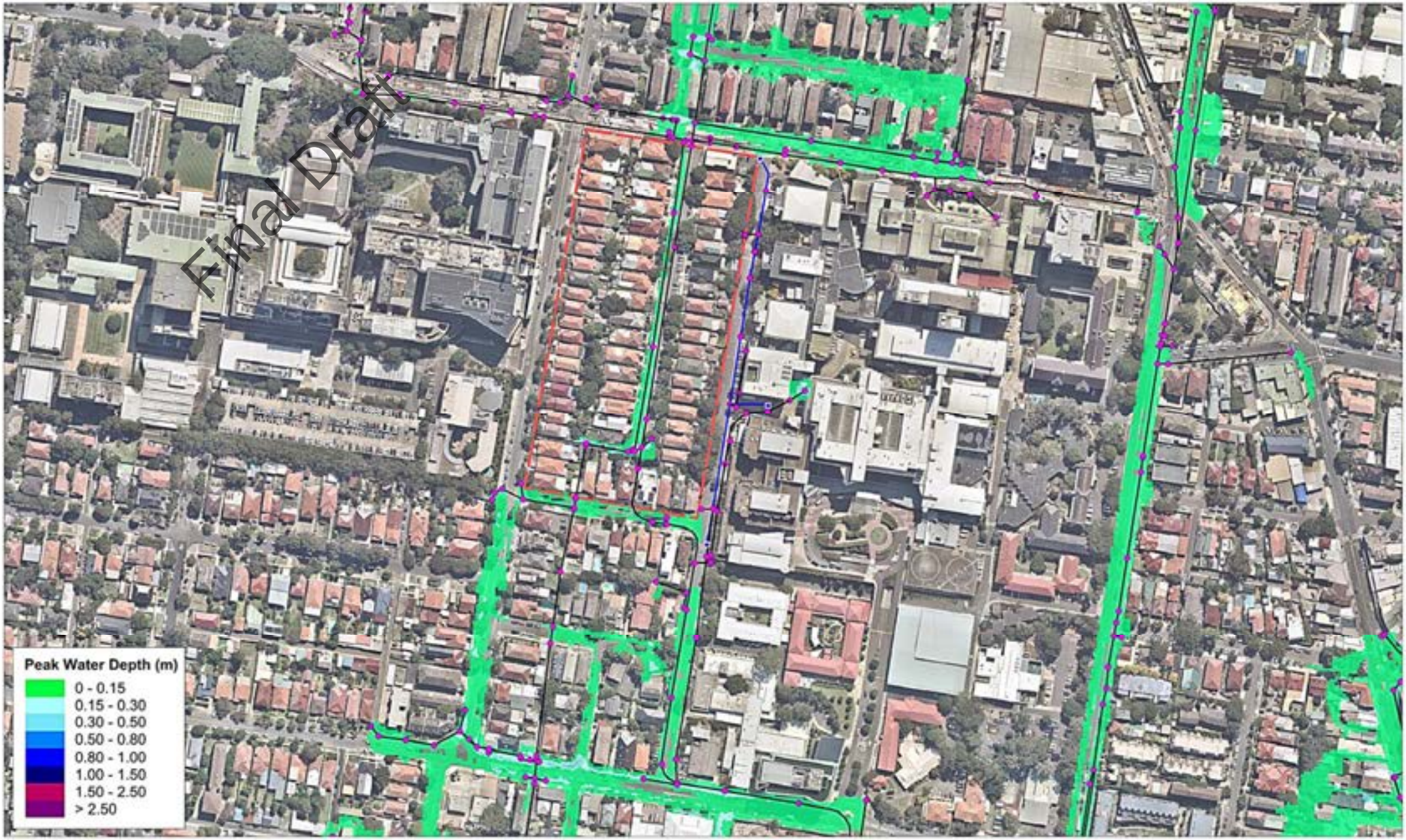
N

0 50 100m

Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_022_180731_RCR_SLR_Q001_base2_Depth.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 0.5 EY Flood Depth - Existing Case

Figure: A1-2

Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_023_180731_RCR_SLR_Q002_base2_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 20% AEP Flood Depth - Existing Case

Figure: A1-3

Rev: A

N

0 50 100m

Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_024_180731_RCR_SLR_Q005_base2_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 10% AEP Flood Depth - Existing Case

Figure: A1-4

Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_025_180731_RCR_SLR_C010_base2_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 5% AEP Flood Depth - Existing Case

Figure: A1-5

Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_026_180731_RCR_SLR_Q020_base2_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 2% AEP Flood Depth - Existing Case

Figure: A1-6

Rev: A

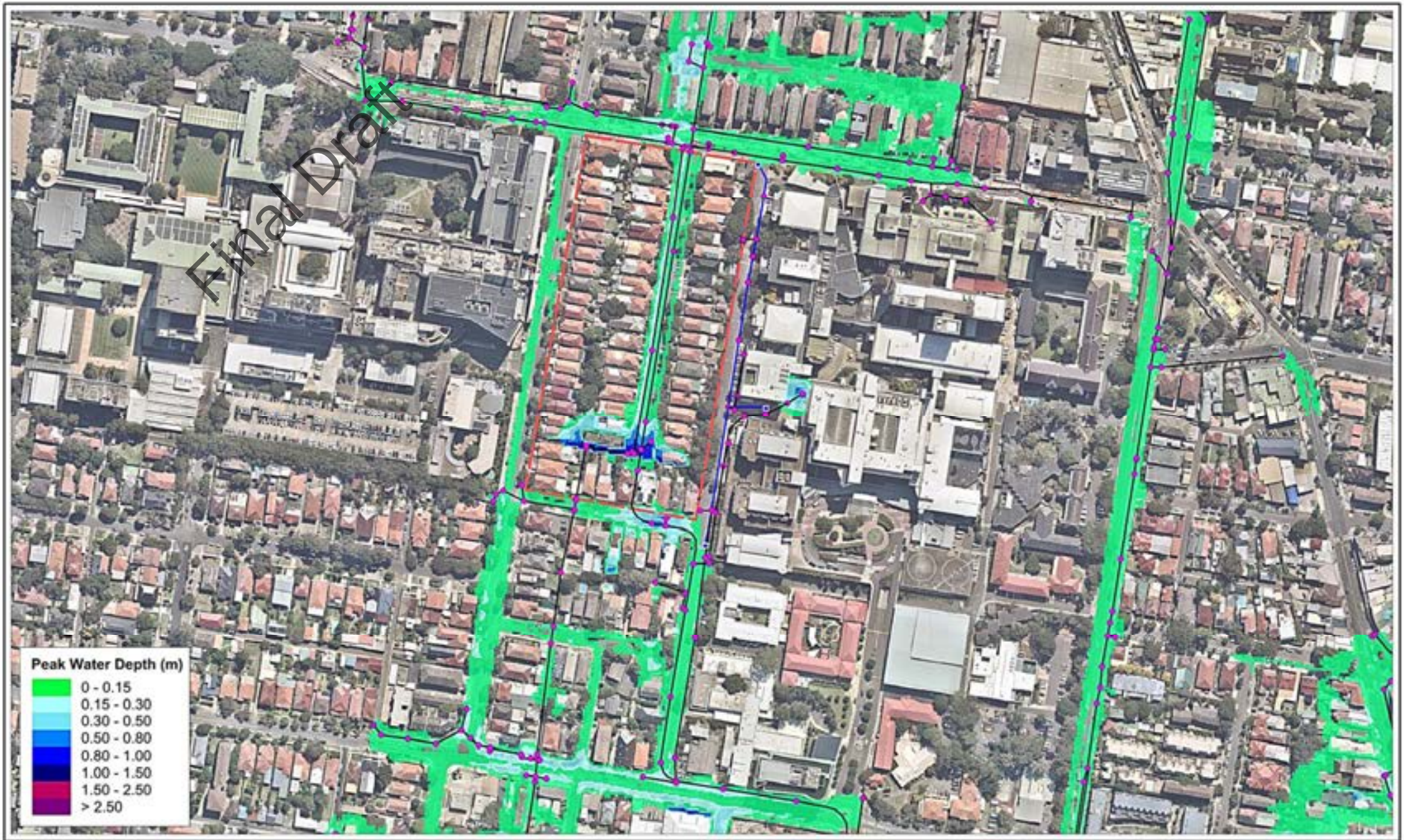
N

0 50 100m

Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_027_180731_RCR_SLR_C050_base2_Depth.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 1% AEP Flood Depth - Existing Case

Figure: A1-7

Rev: A

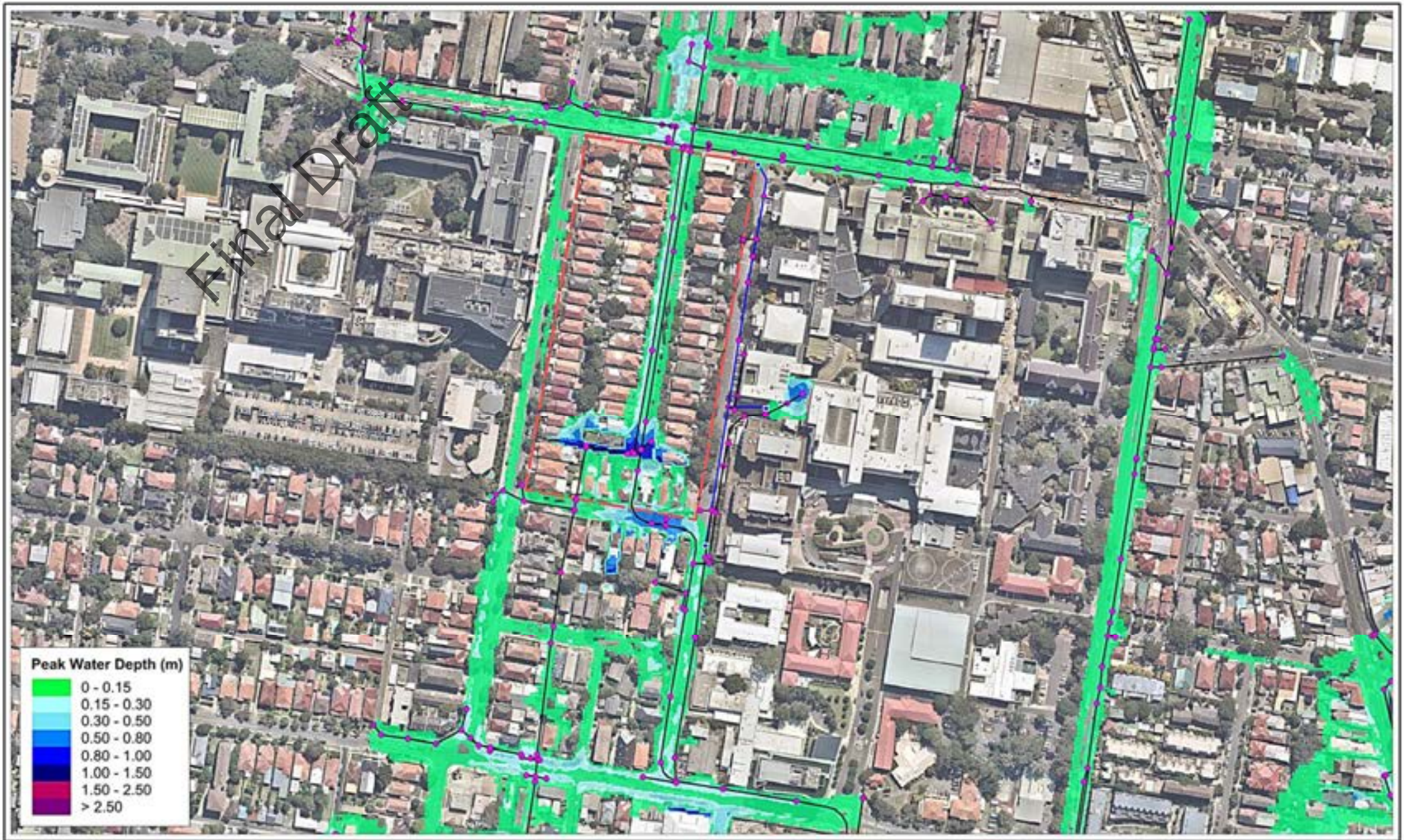
N

0 50 100m

Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_028_180731_RCR_SLR_Q100_base2_Depth.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 0.5% AEP Flood Depth - Existing Case

Figure: A1-8

Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_029_180731_RCR_SLR_Q200_base2_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, Probable Maximum Flood Depth - Existing Case

Figure: A1-9

Rev: A

N

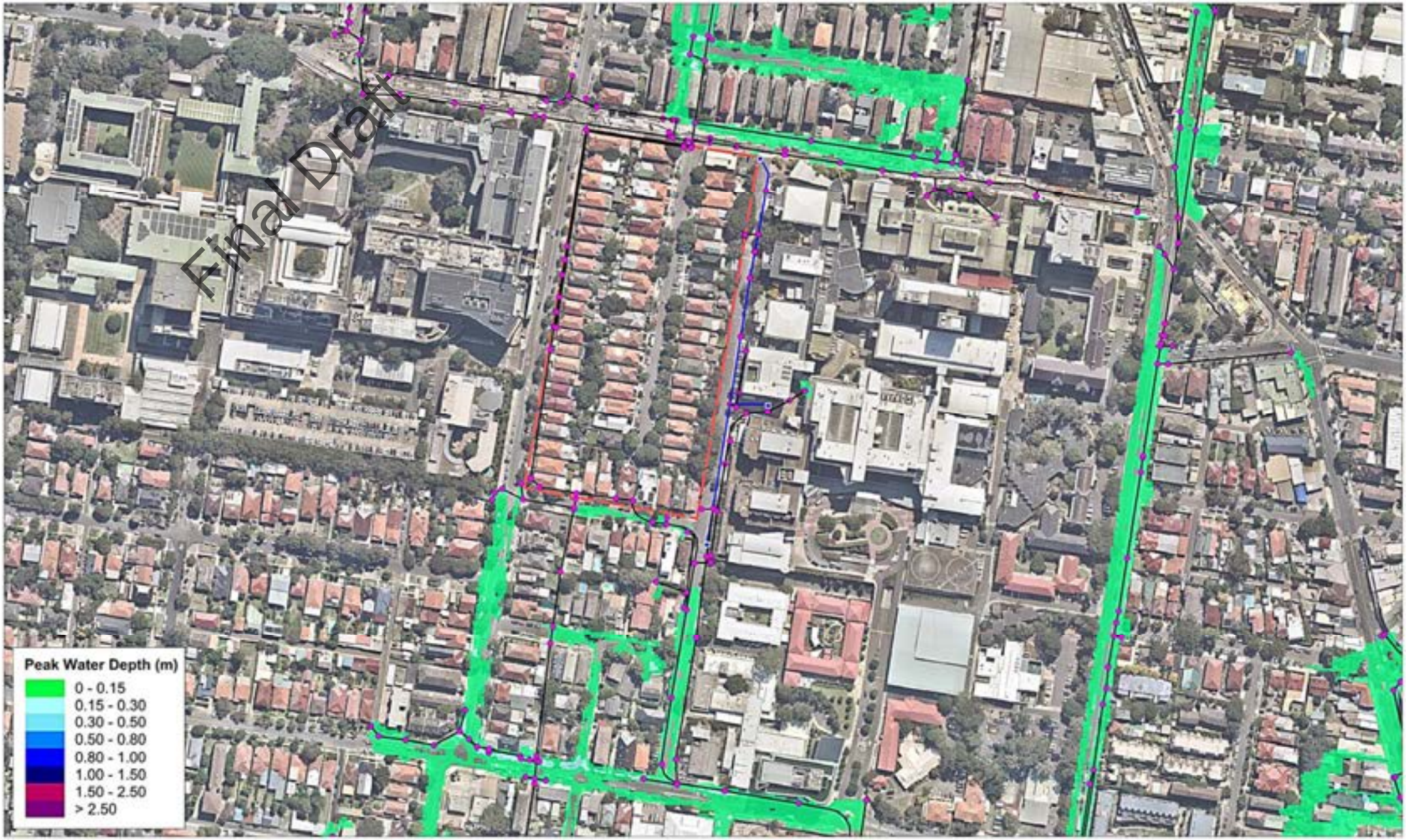
0 50 100m

Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_030_160731_RCR_SLR_OPMP_base2_Depth.wor

Appendix B Developed Case Peak Depths



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 1 EY Flood Depth - Developed Option

Figure: **B1-1**

Rev: **A**

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

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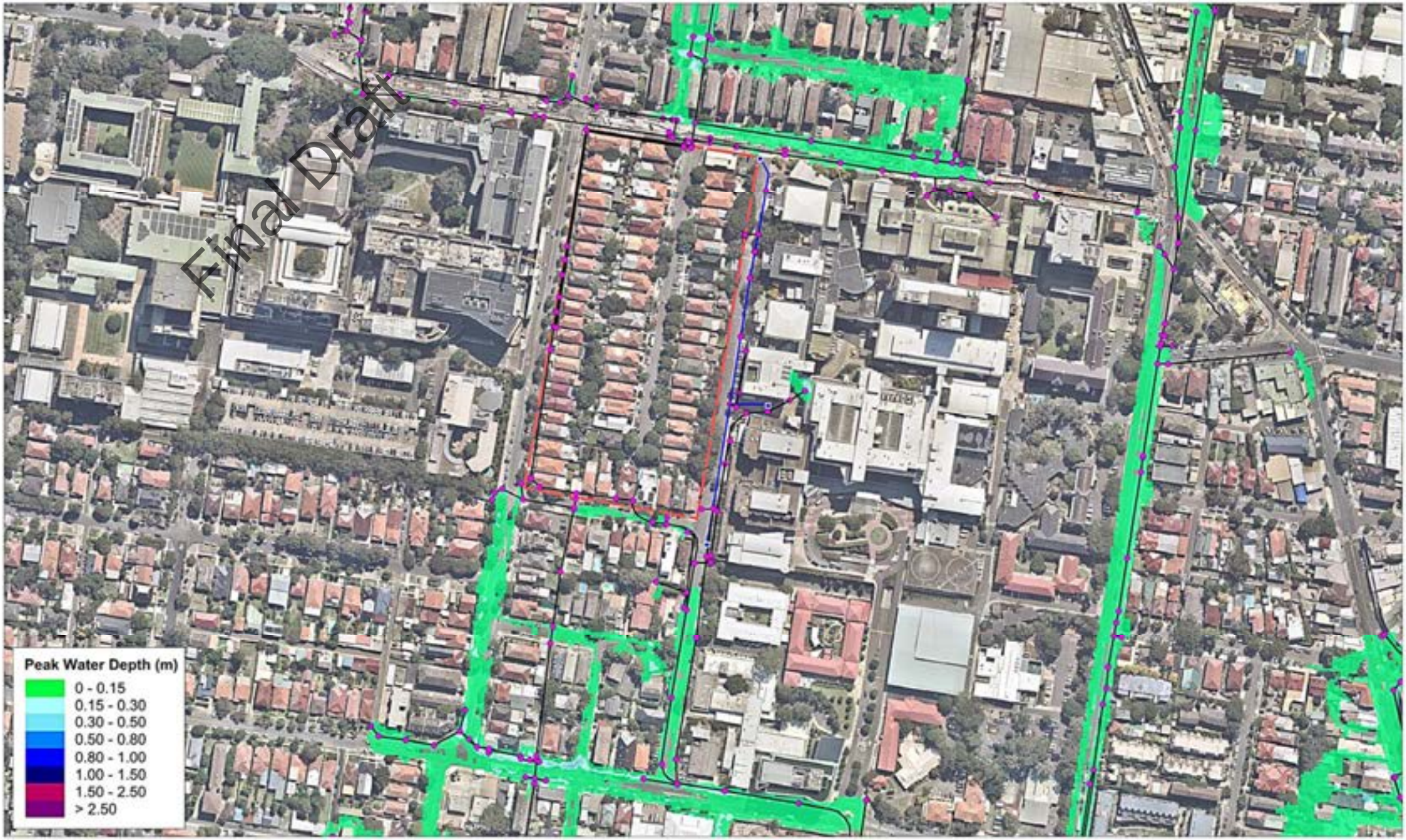

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 0.5 EY Flood Depth - Developed Option

Figure: **B1-2**

Rev: **A**

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_014_180731_RCR_SLR_C002_dev23_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 20% AEP Flood Depth - Developed Option

Figure: **B1-3**

Rev: **A**

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_015_180731_RCR_SLR_Q005_dev23_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 10% AEP Flood Depth - Developed Option

Figure: **B1-4**

Rev: **A**

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_016_180731_RCR_SLR_C010_dev23_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 5% AEP Flood Depth - Developed Option

Figure: B1-5

Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

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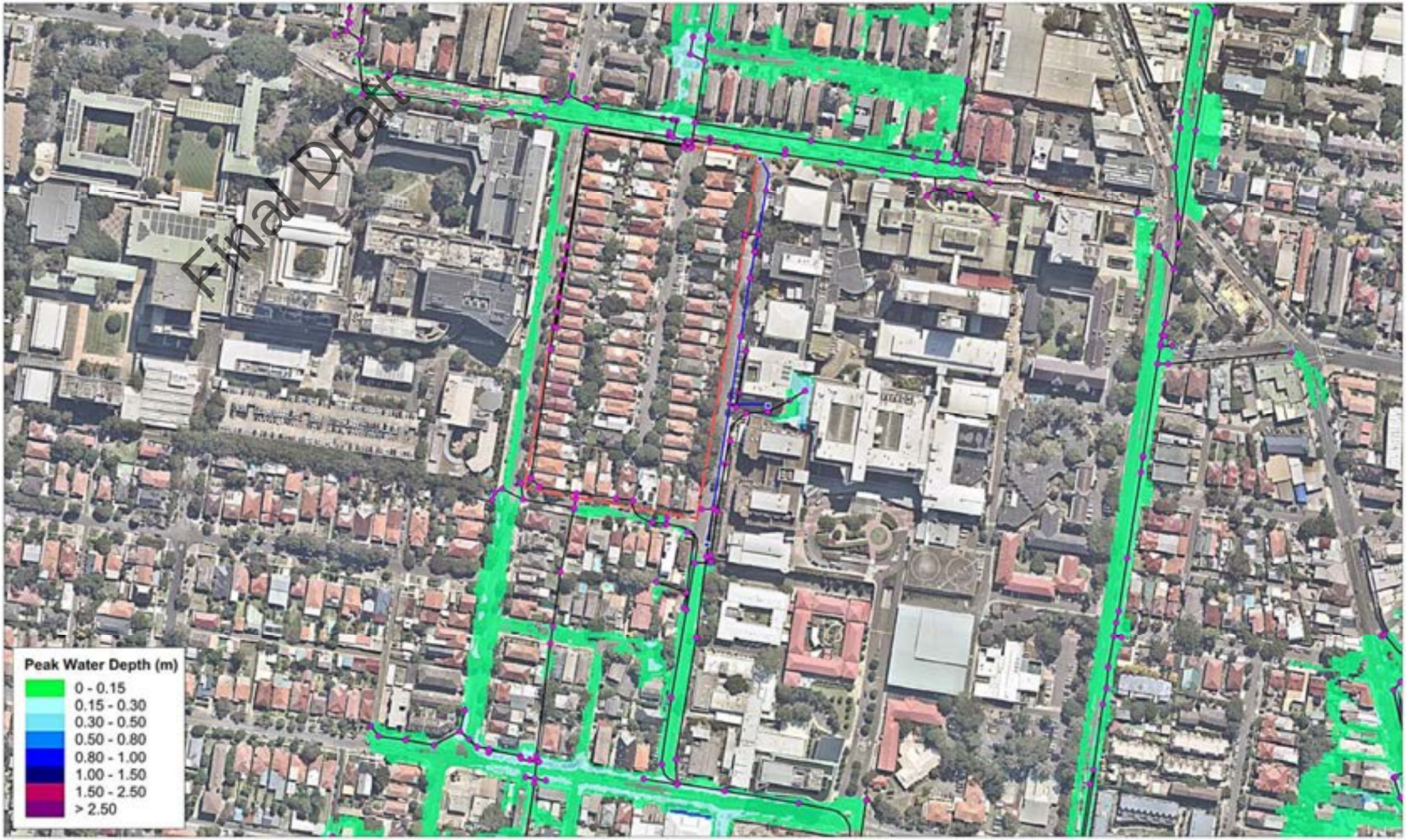


LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 2% AEP Flood Depth - Developed Option

Figure: **B1-6**

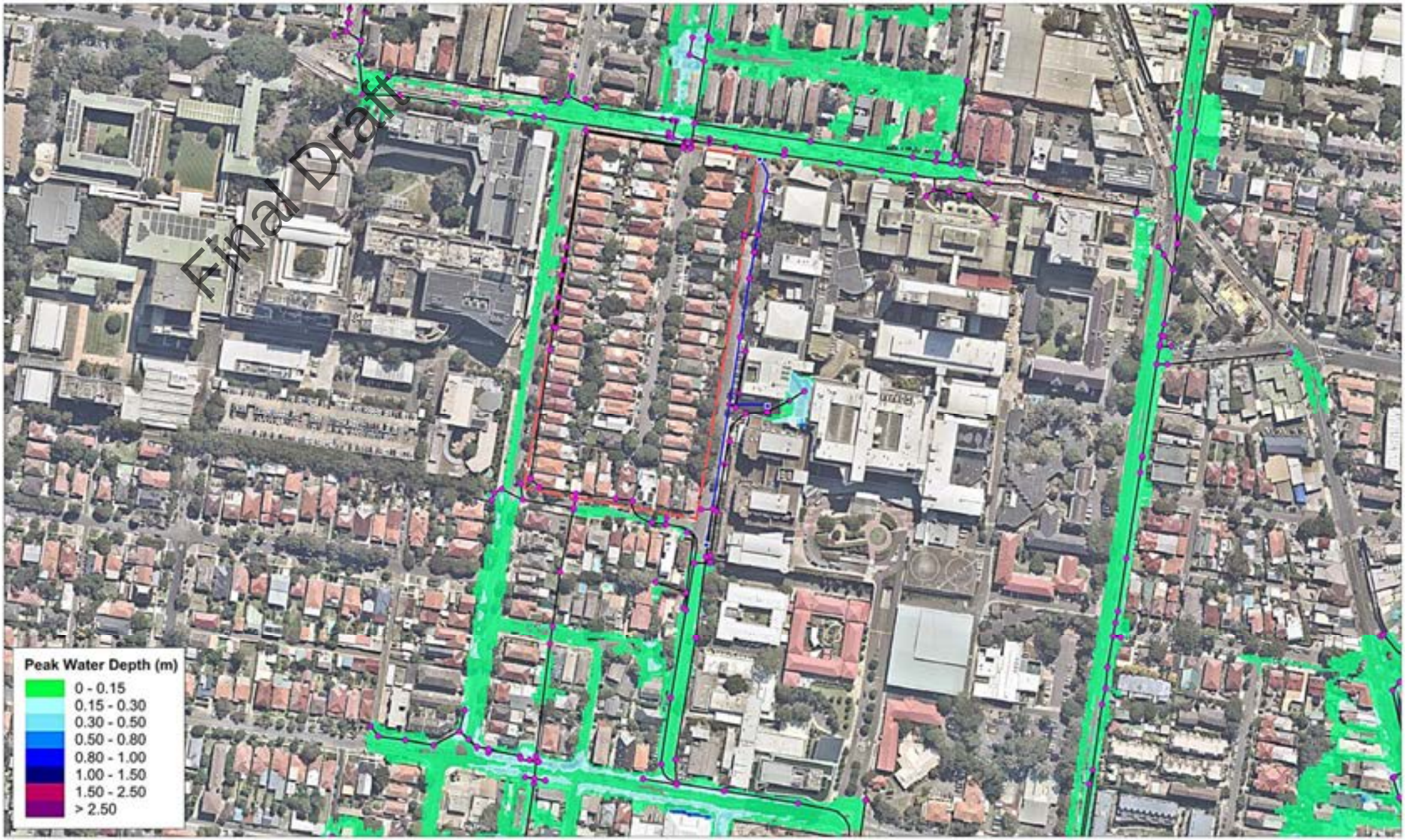
Rev: **A**

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_018_180731_RCR_SLR_C050_dev23_Depth.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 1% AEP Flood Depth - Developed Option

Figure: B1-7

Rev: A

N

0 50 100m

Approx. Scale

BMT
www.bmt.org

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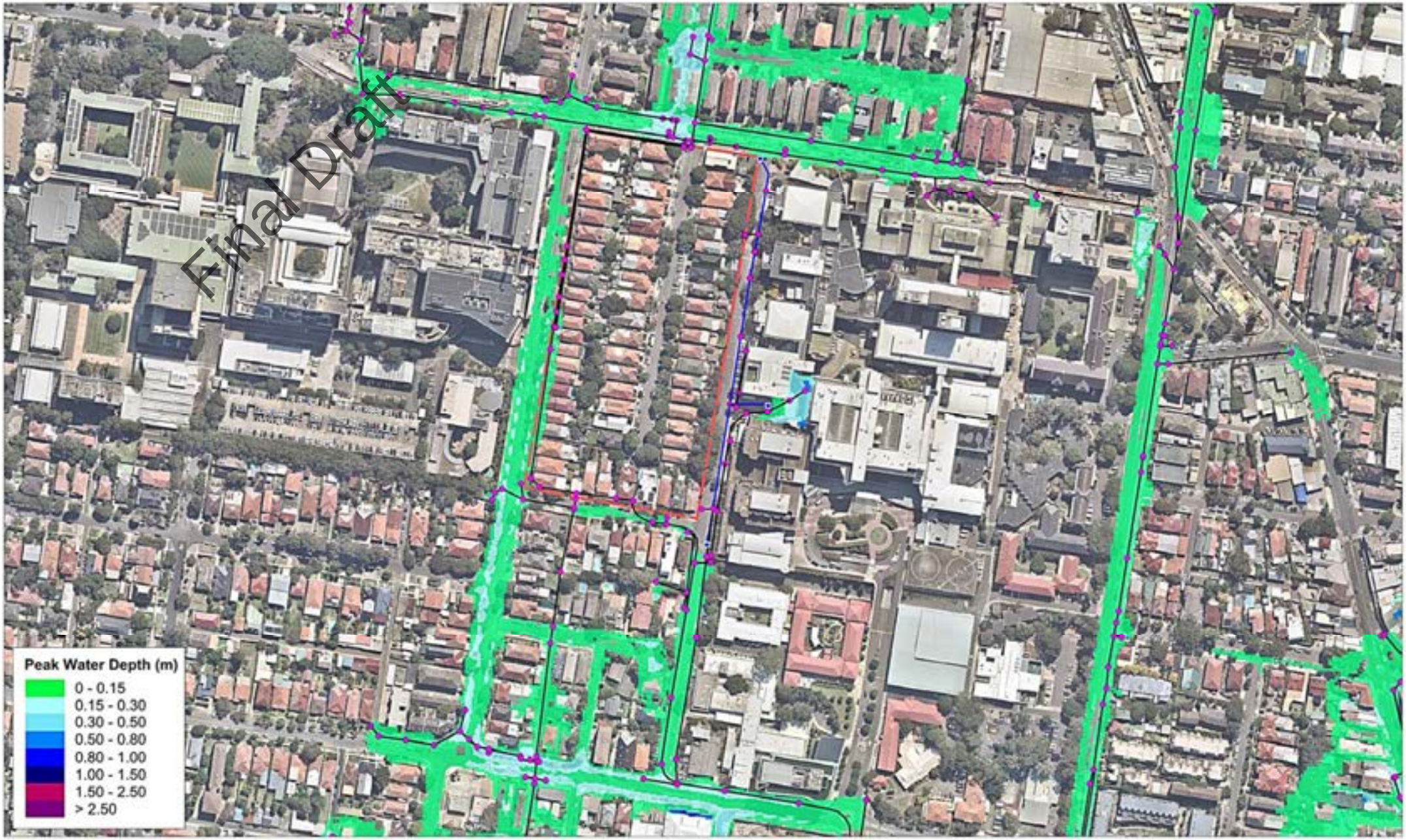


LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 0.5% AEP Flood Depth - Developed Option

Figure: B1-8

Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_020_180731_RCR_SLR_Q200_dev23_Depth.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, Probable Maximum Flood Depth - Developed Option

Figure: **B1-9**

Rev: **A**

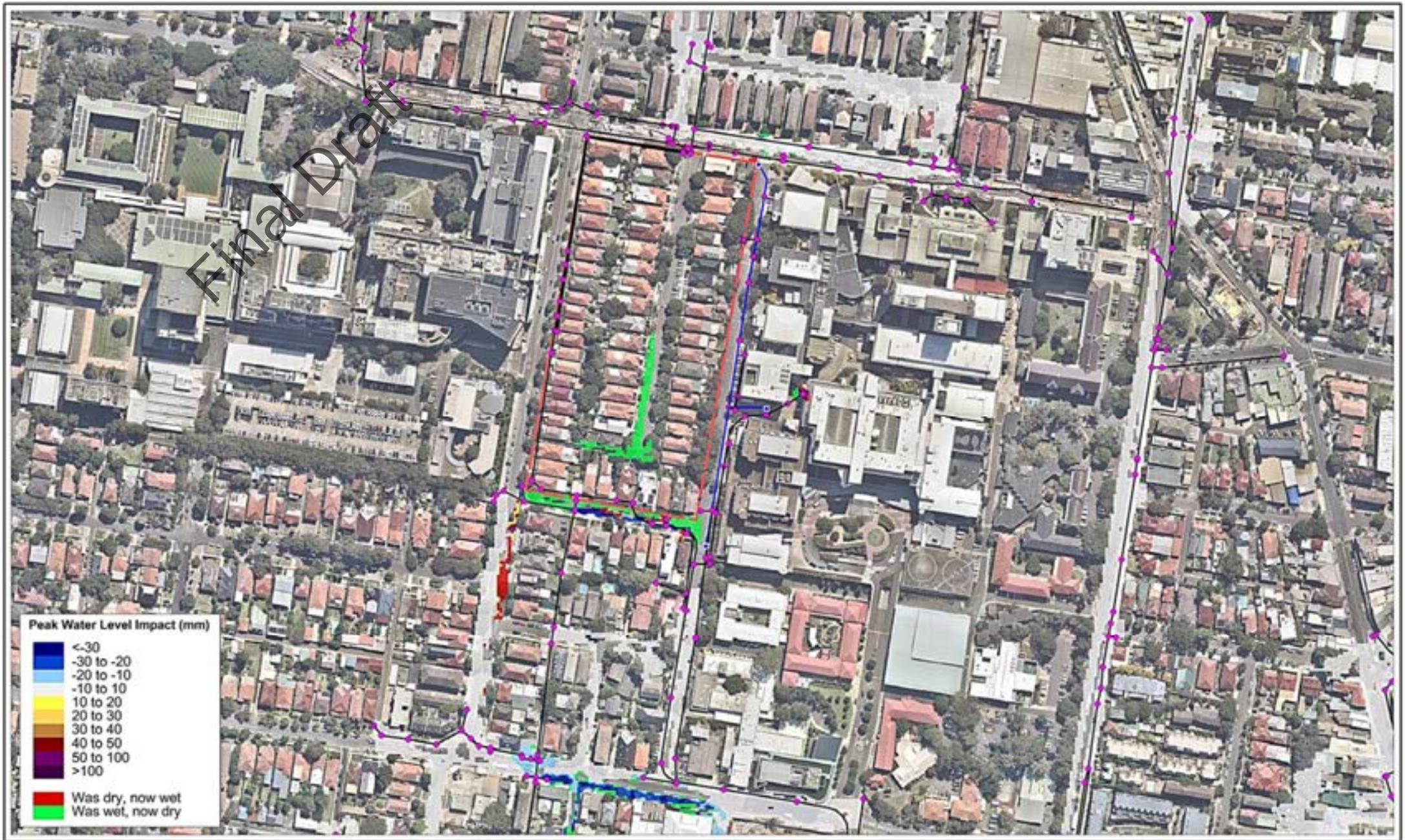
N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_021_180731_RCR_SLR_GPMP_dev23_Depth.wor

Appendix C Flood Impacts Relative to Existing Case



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 1 EY Flood Impact - Developed Option

Figure: C1-1

Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

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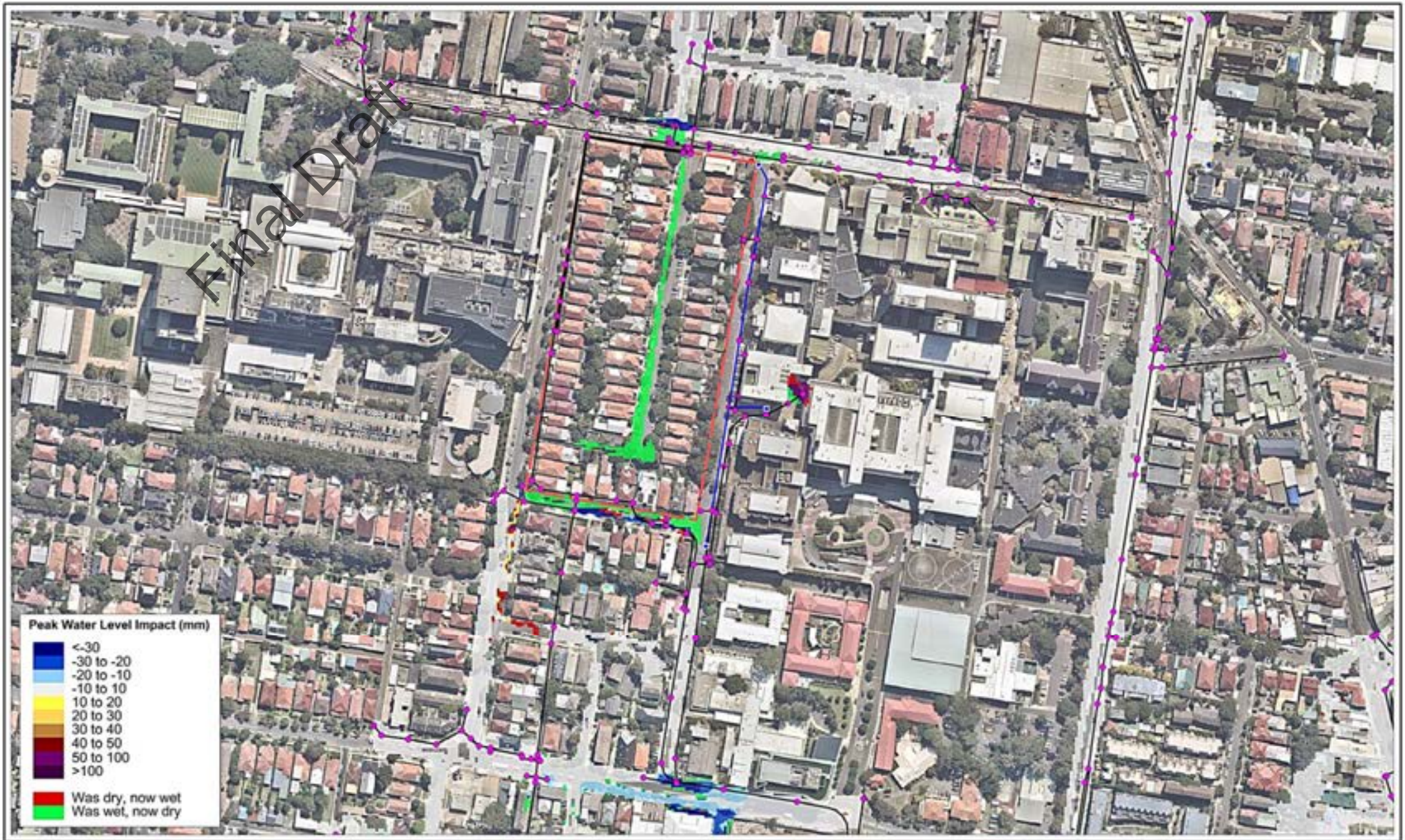


LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 0.5 EY Flood Impact - Developed Option

Figure: C1-2

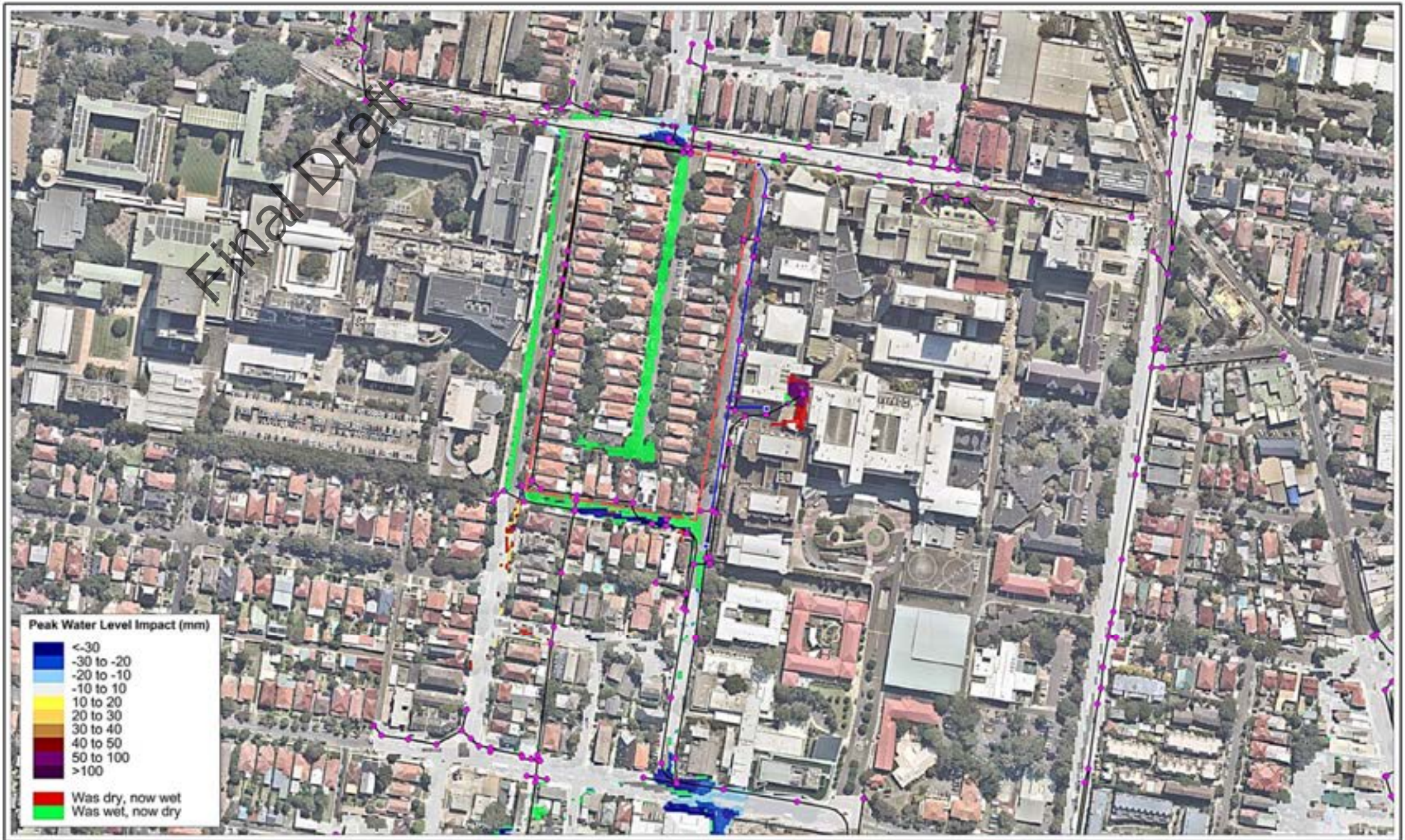
Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_005_180731_RCR_SLR_C002_dev23_Impact.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 20% AEP Flood Impact - Developed Option

Figure: C1-3

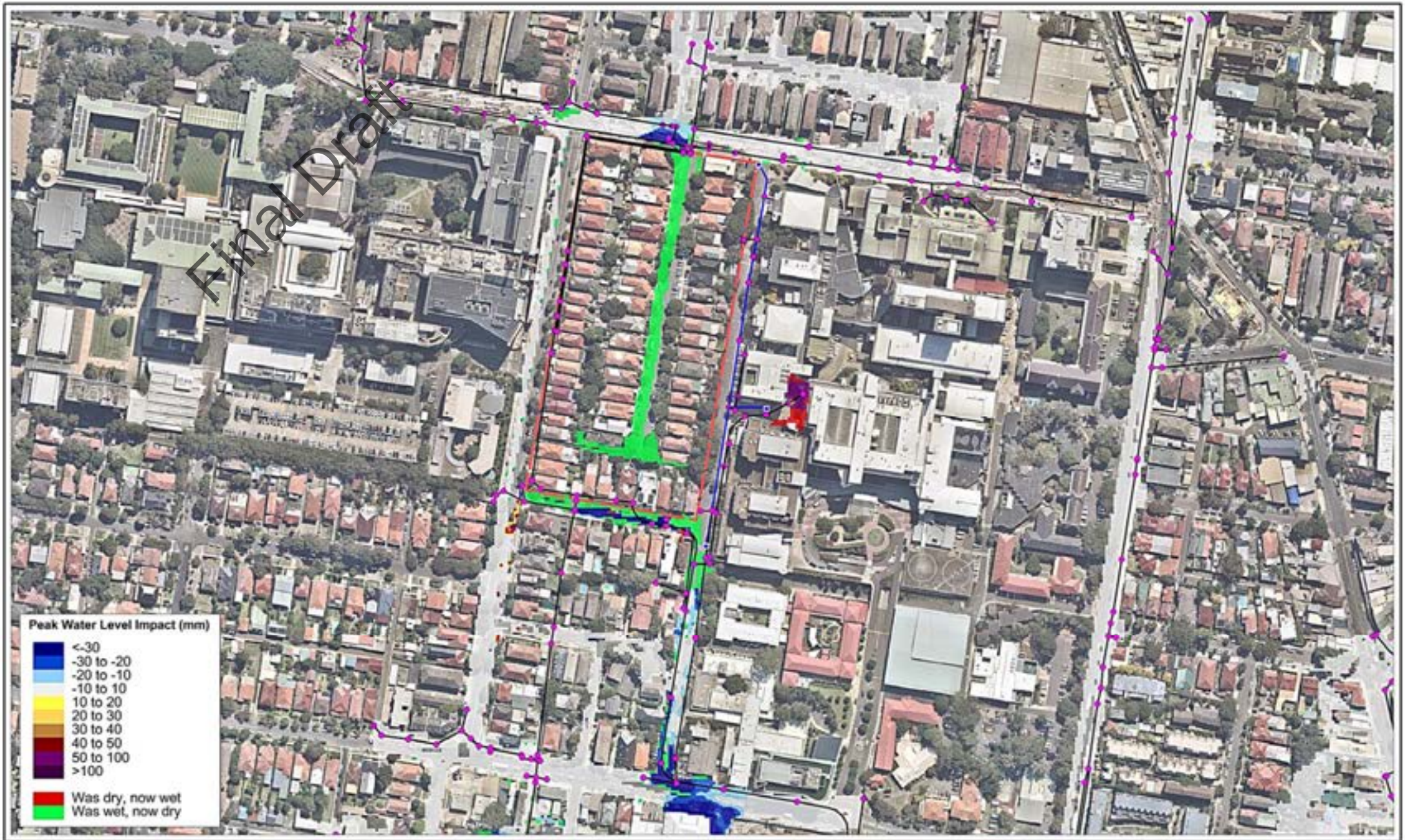
Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_006_180731_RCR_SLR_C005_dev23_Impact.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 10% AEP Flood Impact - Developed Option

Figure: C1-4

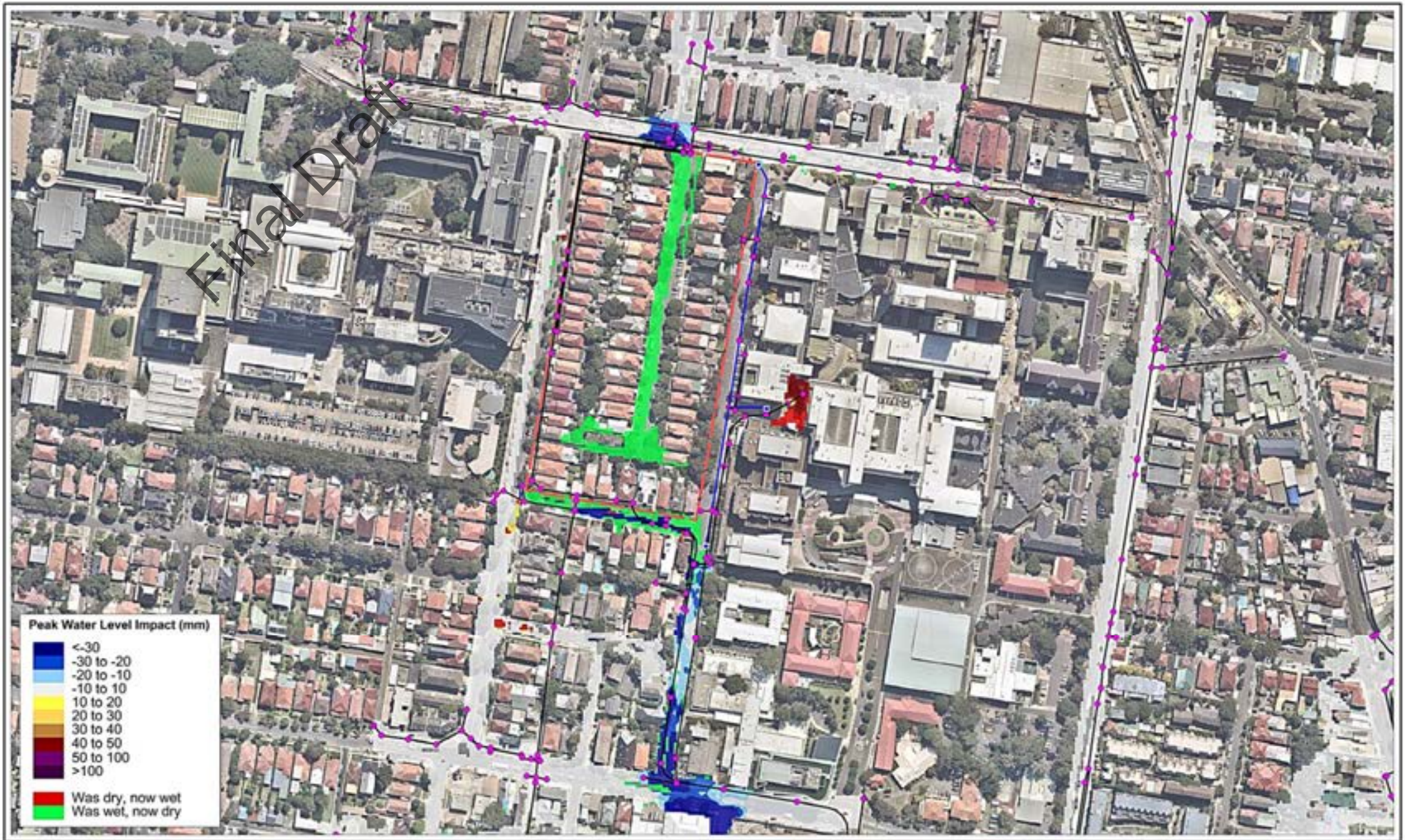
Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_007_180731_RCR_SLR_C010_dev23_Impact.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 5% AEP Flood Impact - Developed Option

Figure: C1-5

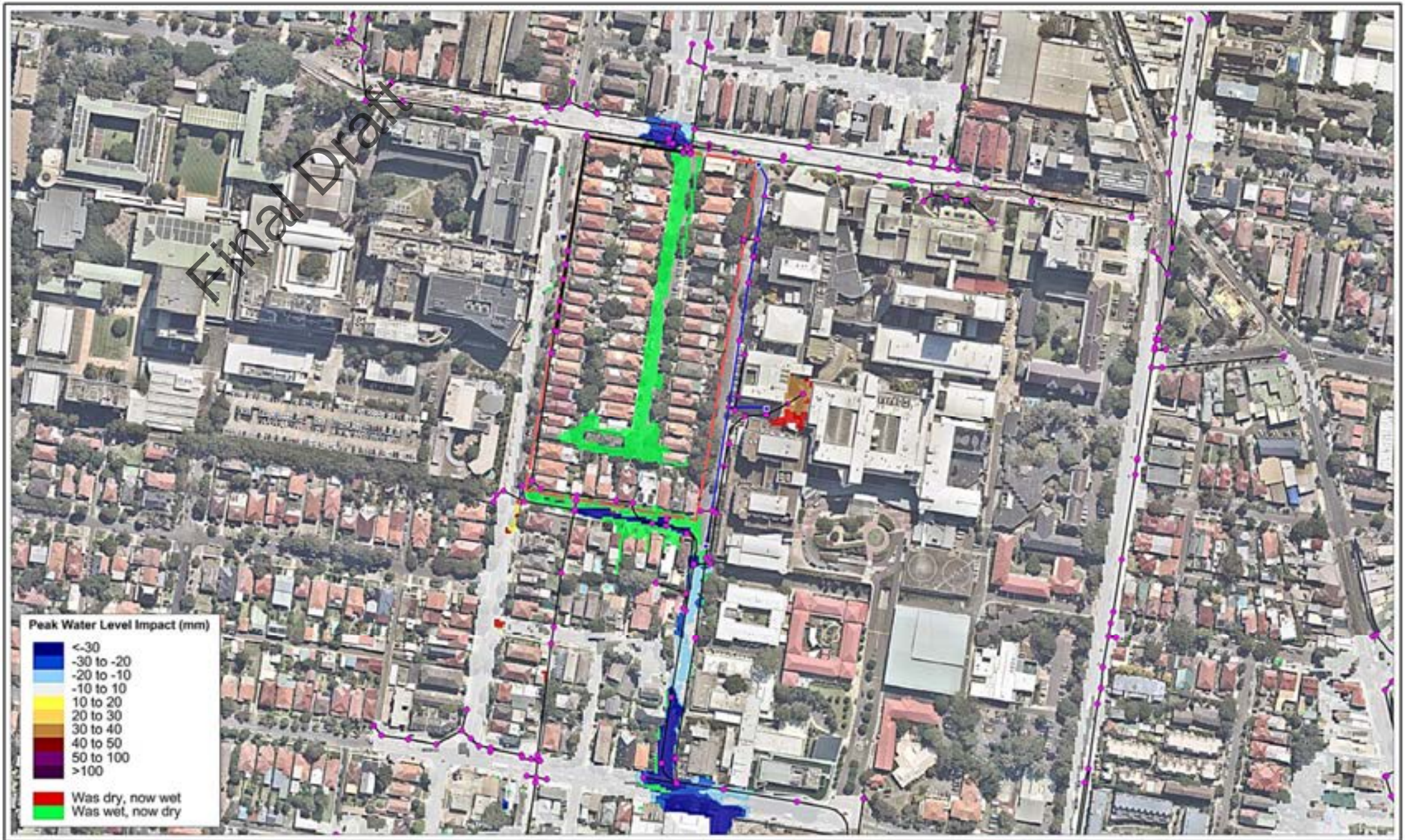
Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_008_180731_RCR_SLR_C020_dev23_Impact.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 2% AEP Flood Impact - Developed Option

Figure: C1-6

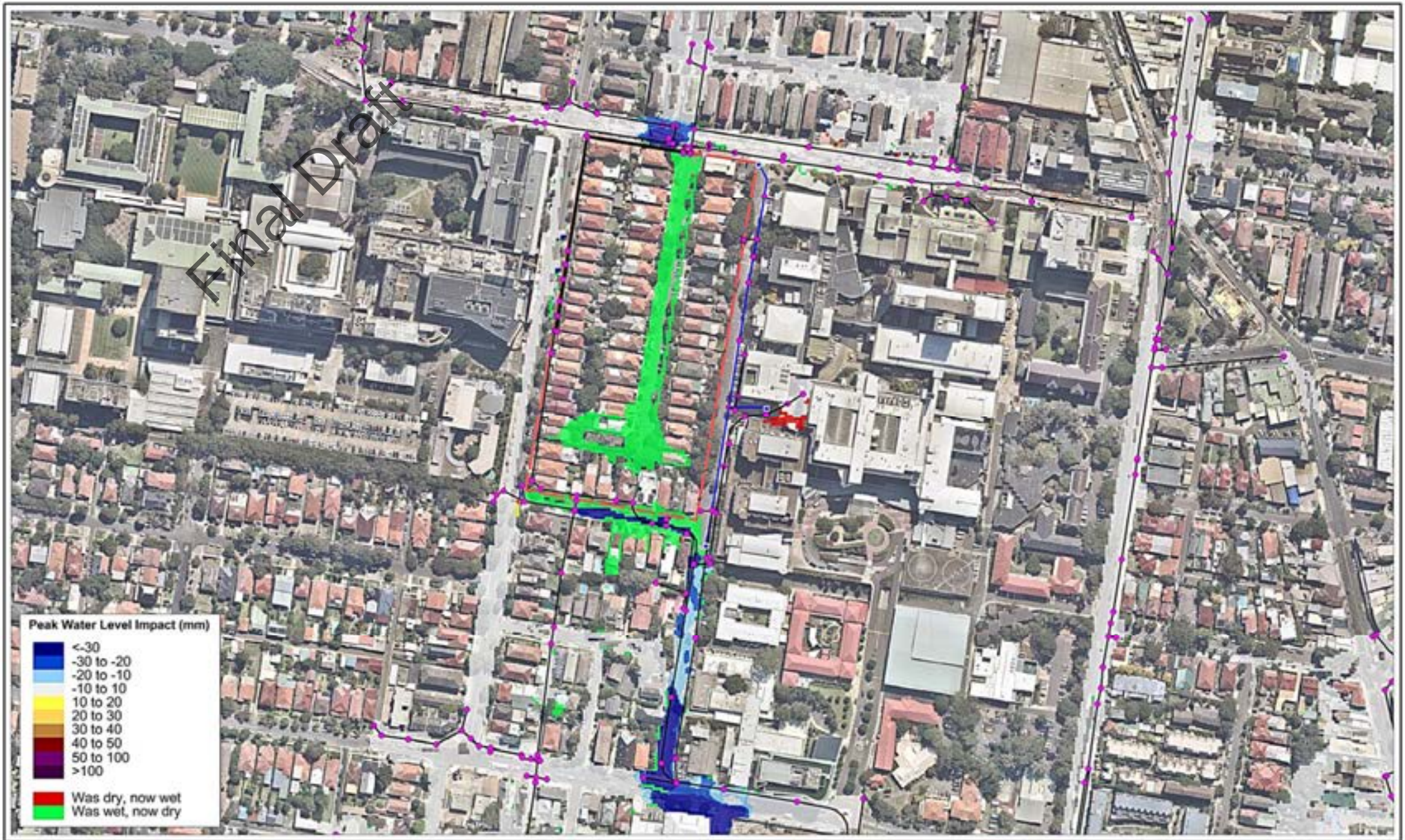
Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_009_180731_RCR_SLR_C050_dev23_Impact.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 1% AEP Flood Impact - Developed Option

Figure: C1-7

Rev: A

N

0 50 100m
Approx Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_010_180731_RCR_SLR_Q100_dev23_Impact.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 0.5% AEP Flood Impact - Developed Option

Figure: C1-8

Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_011_180731_RCR_SLR_Q200_dev23_Impact.wor

LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, Probable Maximum Flood Impact - Developed Option

Figure: C1-9

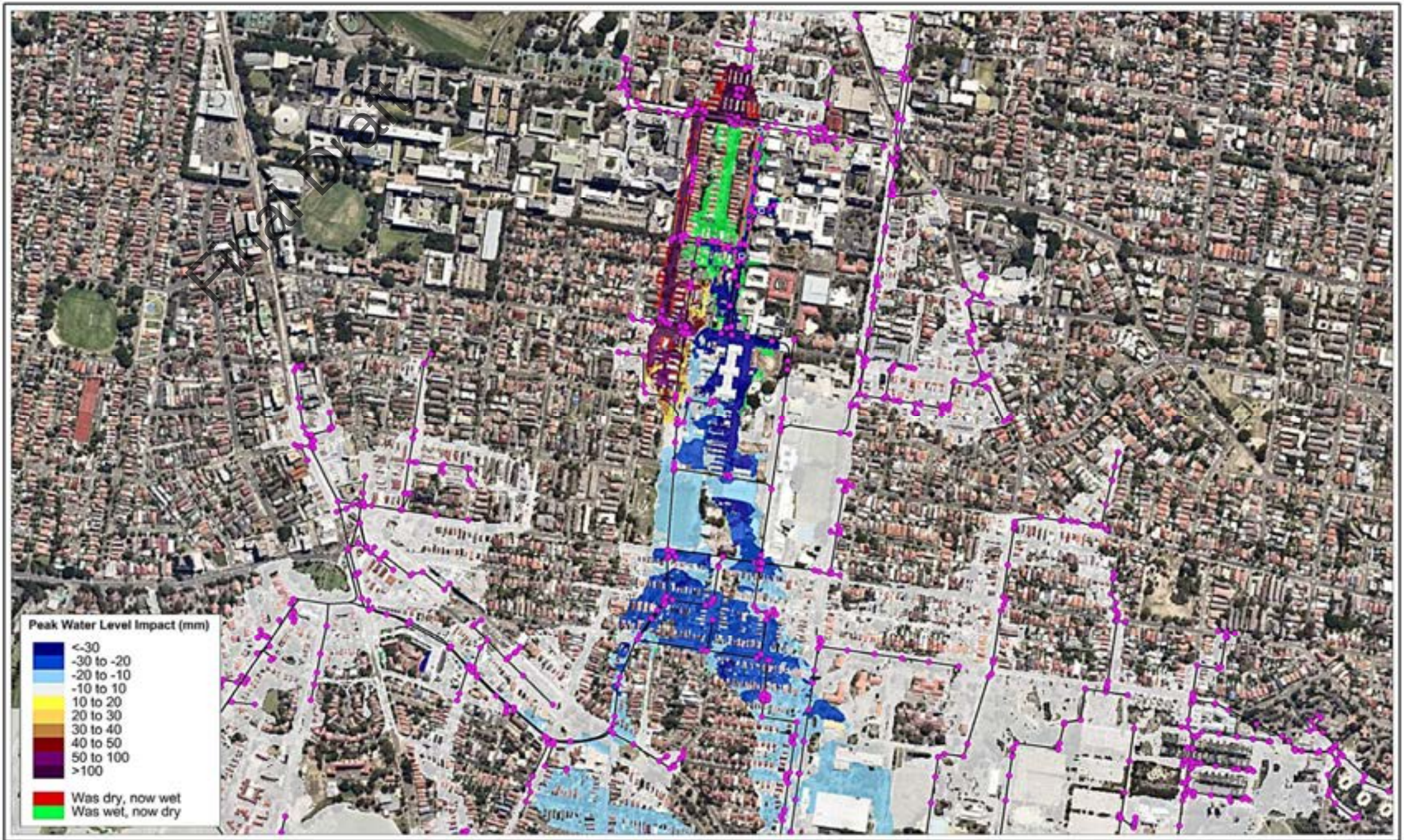
Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_012_180731_RCR_SLR_GPMP_dev23_Impact.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, Probable Maximum Flood Impact - Developed Option

Figure: C1-10

Rev: A

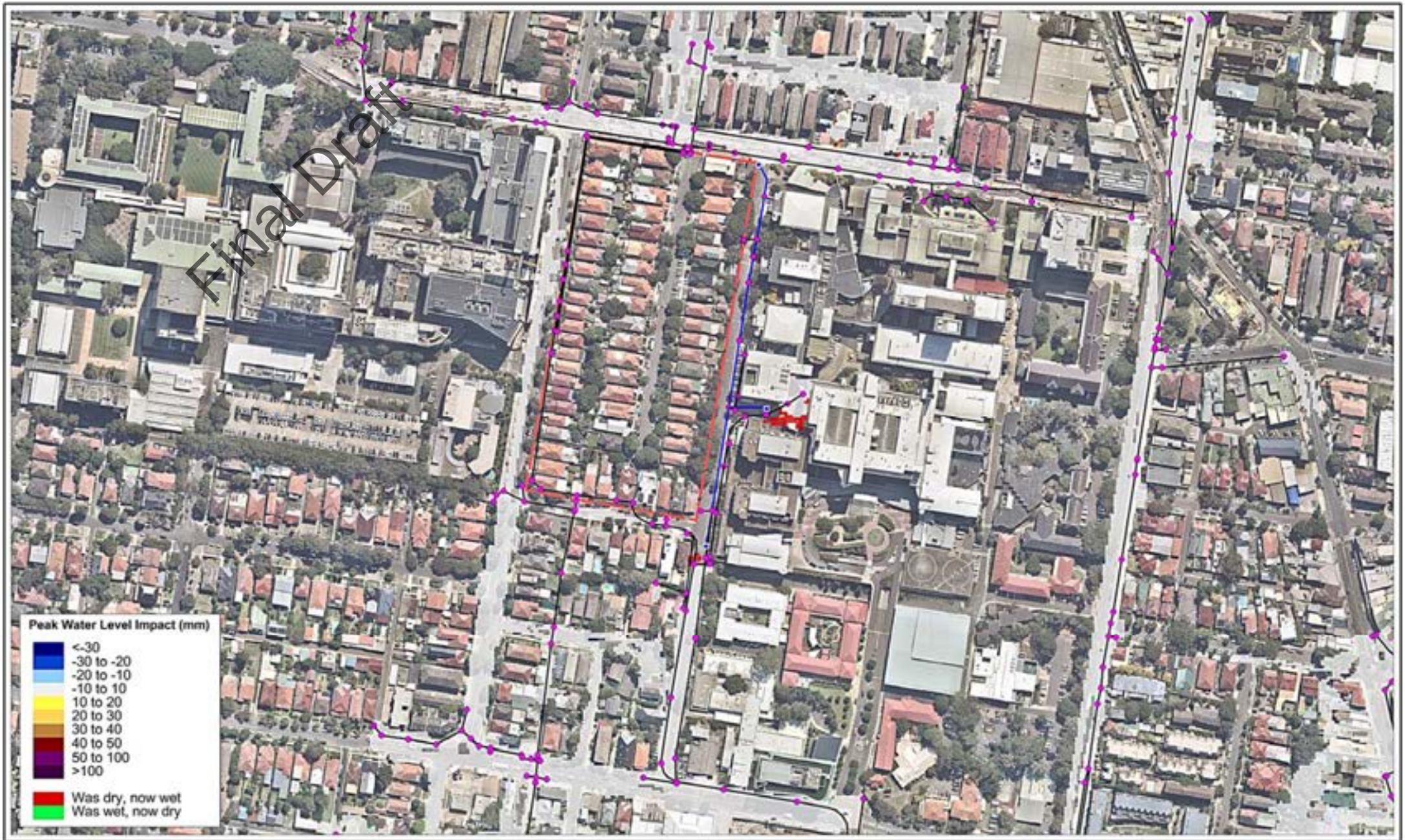
N

0 150 300
metres

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_012_180731_RCR_SLR_OPMP_dev23_regional_Impact.wor

Appendix D Flood Impacts Relative to ACS Developed Case



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, 1% AEP Flood Impact Relative to Developed Scenario without Hospital Road Lowering Option

Figure: D-1

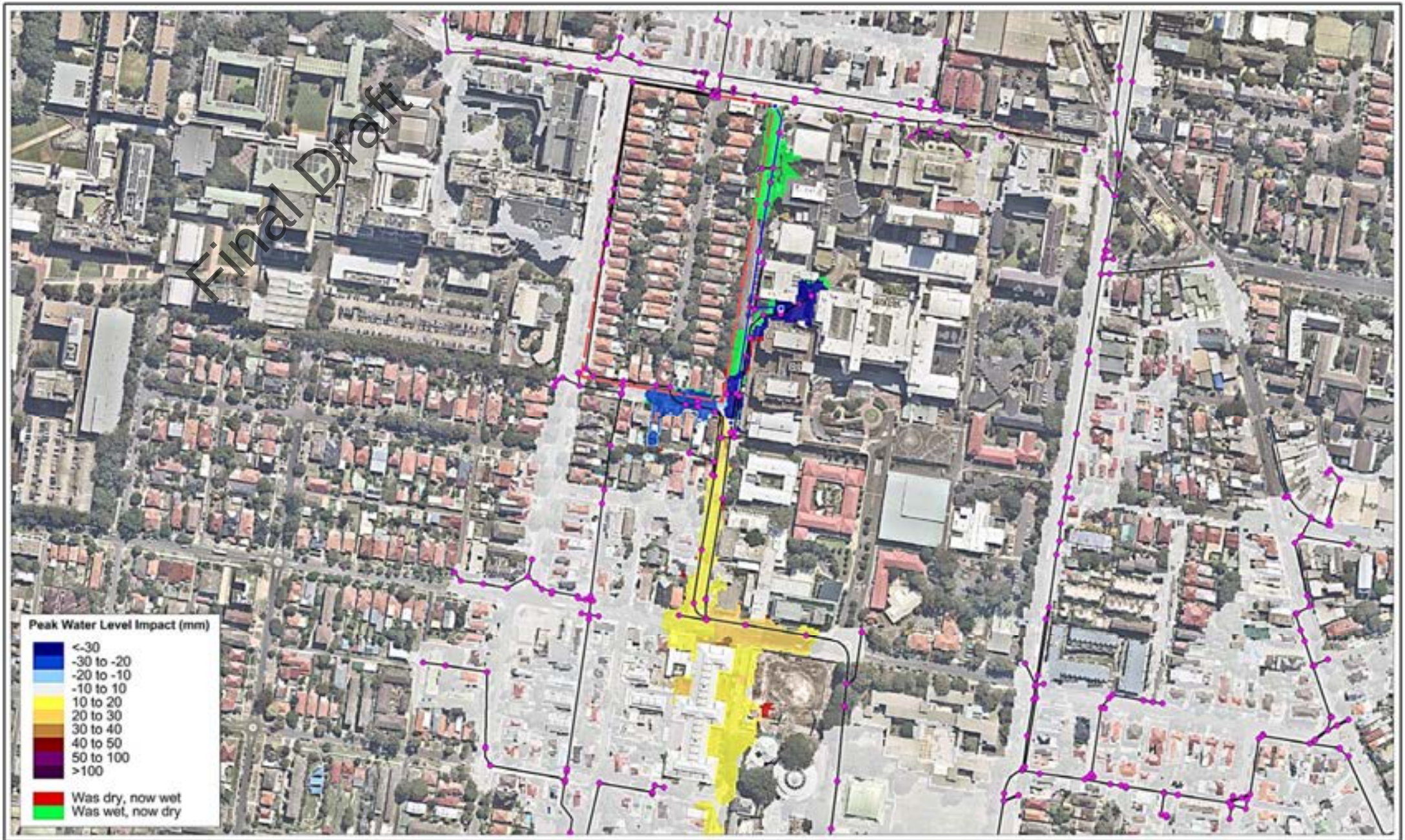
Rev: A

N

0 50 100m
Approx. Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_034_181213_PWH_C001_dev31_RL_Impact.wor



LEGEND

Stormwater Pit and Pipe

Proposed Stormwater Pit and Pipe

Site Boundary

Title:
Prince of Wales Hospital, Hospital Road Lowering Stormwater Drainage Strategy, PMF Flood Impact Relative to Developed Scenario without Hospital Road Lowering Option

Figure: D-2

Rev: A

N

0 60 120m

Approx Scale

BMT
www.bmt.org

Filepath: I:\B23176.i.mg_RCR_Prince of Wales\ORG\ESG_035_181213_PWH_PMF_dev31_RL_Impact.wor

Appendix E Proposed Road Lowering

01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17

LV 12
111.000m

LV 11
107.400m

LV 10
101.200m

LV 09
95.200m

LV 08
91.000m

56.857

57.149

700

4800

4200

950

RL. 51.050

EXTG ROAD
1 in 12.1

RL. 46.860

EXISTING
HOSPITAL ROAD
LEVEL

SECTION 11.0 - ASB EAST ELEVATION

12 13 14 15 16 17

56.857
57.149

61075 9000 13325 9000 18564

150

SCH - ED
FUTURE
AMBULANCE BAYS
RL. 51.050

LOWERED HOSPITAL ROAD

RL. 51.050
TRANSITION
1 in 9

RL. 50.050
TRUCK RAMP
1 in 6.5

RL. 48.000
TRANSITION
1 in 9

RL. 47.000
BASEMENT
B2

BMT has a proven record in addressing today's engineering and environmental issues.

Our dedication to developing innovative approaches and solutions enhances our ability to meet our client's most challenging needs.

BMT

BMT in Environment

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