



Suite 4, 257-259 Central Coast Highway  
Erina NSW 2250

T (02) 4365 1668 F (02) 4367 6555

E centralcoast@northrop.com.au ABN 81 094 433 100

# Stormwater Design Report for Review of Environmental Factors (REF)

*for*

**Moree Hospital Redevelopment**

*at*

**35 Alice St, Moree NSW 2400**

Job No: NL231211

Revision: C

Date: 08/09/2023

	BY	DATE
Prepared	KB	08/09/2023
Checked	DH	08/09/2023
Admin	AJ	08/09/2023

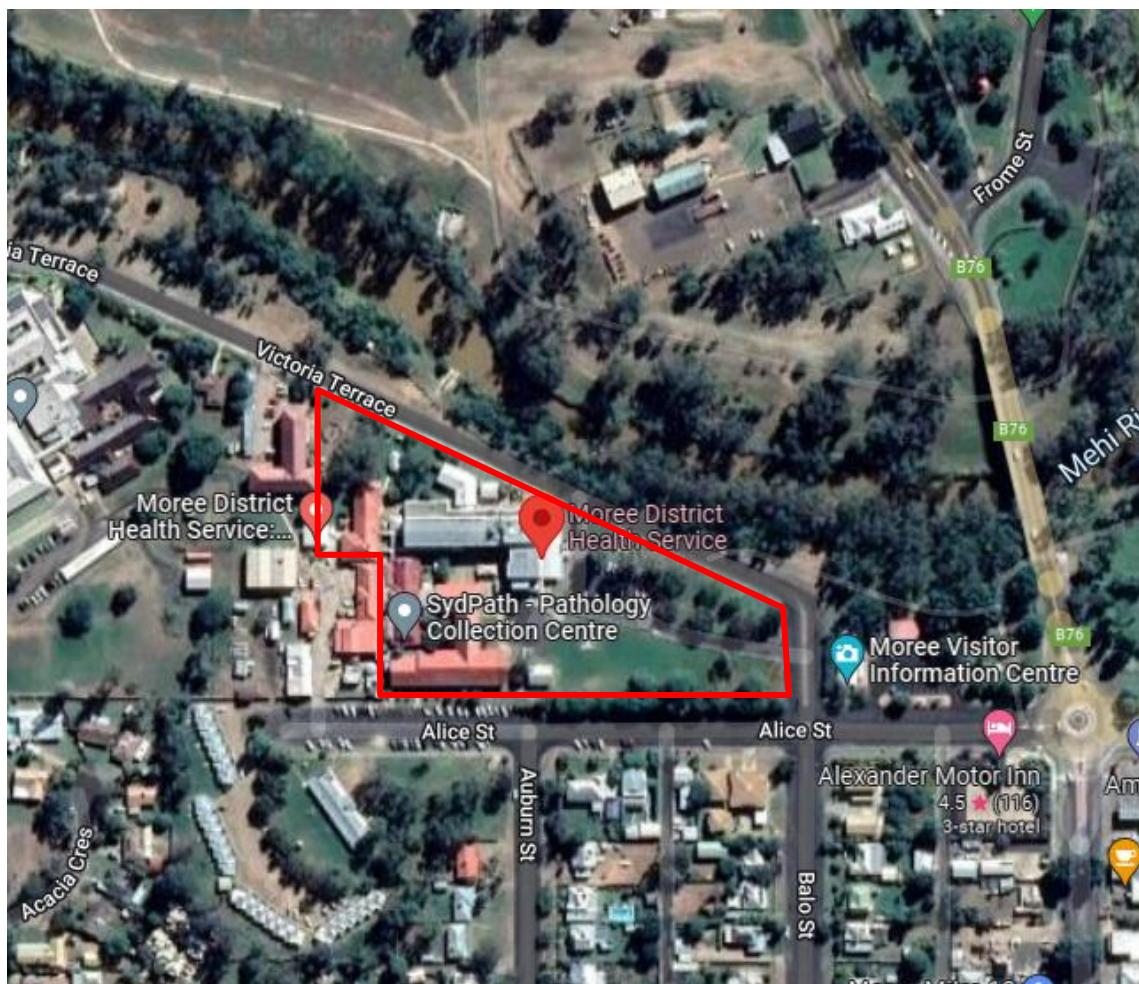
## 1. INTRODUCTION

Northrop Consulting Engineers Pty Ltd has been engaged to undertake the drainage and stormwater assessment and management plan for the proposed development located at Moree Hospital.

The purpose of this report is to summarise the proposed design solutions for the stormwater management for a REF submission. The proposed design has been considered with regard to the Moree Plains DCP 2013 as well as common industry practice.

## **2. SITE DESCRIPTION**

The subject site is located along the southern boundary of the existing Moree Hospital property, between Victoria Terrace and Alice Street, in the middle of Moree town centre. Moree Hospital is directly adjacent to the Mehi river, running along the northern edge of the property. The property has direct access gates to Victoria Terrace and Alice Street which connect the site to Balo street to the east. Balo street also serves as B76 highway access to the whole of Moree. Ultimately this connects the town to major populations hubs including Sydney and Brisbane. An aerial image of the property is shown below:



**Figure 1 Site Aerial Image**



### **3. PROPOSED DEVELOPMENT**

The objective of the Moree Hospital Redevelopment (MHR) Project is to align the recommendations of the endorsed CSP with new contemporary patient care facilities to support the adoption of new and improved models of care. The primary focus of this Project is to provide asset replacement through consolidation of services into a new two-story Acute Services Building (ASB). The ASB will be located on the south section of the existing site along Alice Street and provide a new main access to the campus.

The Project scope to redevelop Moree Hospital, in line with the CSP, include the master planning and delivery of the following:

- Emergency care services
  - Overnight inpatient beds
  - Operating theatre
  - Imaging services
  - Birthing suites
  - Pathology shell space
  - Clinical support services

In addition to the above clinical services, the redevelopment will also incorporate associated works such as:

- A new hospital main entry and Front of House
  - Back of House services
  - Modifications to existing carparking
  - Landscaping
  - decommissioning & demolition of redundant existing facilities
  - A new substation, and
  - A new loading dock & services yard area

## **4. PROPOSED STORMWATER MANAGEMENT STRATEGY**

The proposed stormwater management strategy is to utilise a pit and pipe system as well as maintaining overland flow paths. Through consultation with council, it has been determined that OSD would not be required as part of this development. Water quality measures have also been considered and are detailed in the following sections.

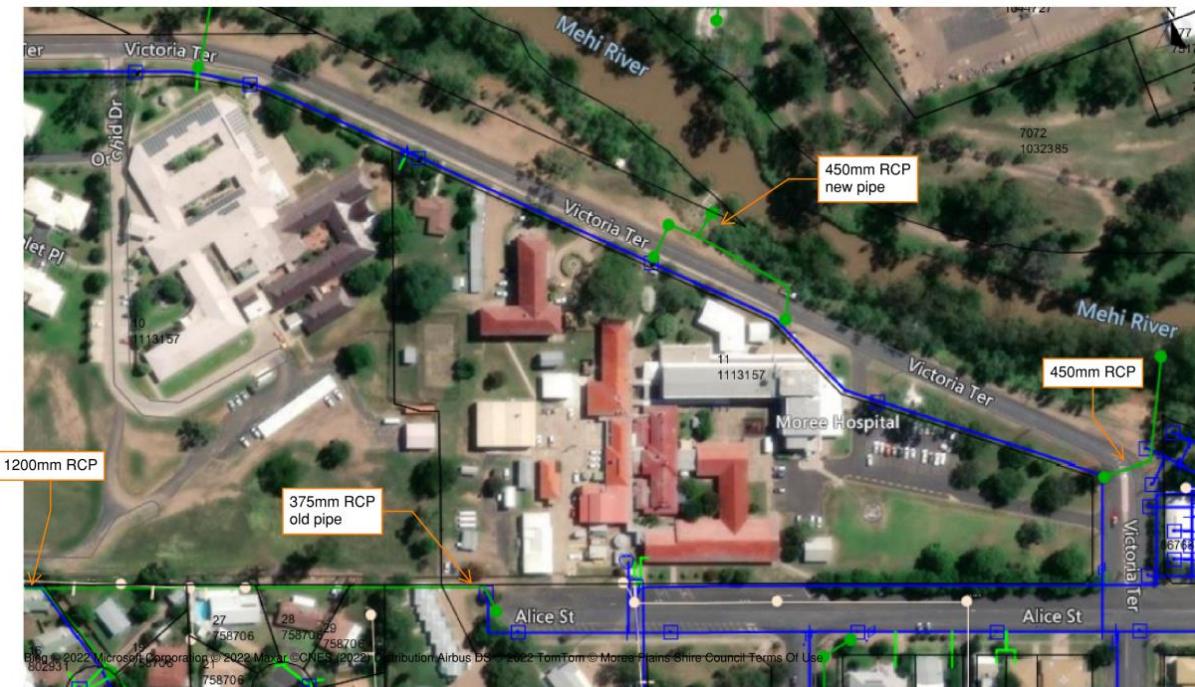
#### **4.1 MAJOR/MINOR DRAINAGE SYSTEM**

The major/minor approach to stormwater drainage is a recognised drainage concept for urban catchments.

The minor drainage system is comprised of below ground pit and pipe network and is designed to control nuisance flooding and enable effective stormwater management for the site. Typically, Council requires the minor drainage system to be designed for the critical 5% Annual Exceedance Probability (AEP) (1:20-year storm event) with overland flow safely catering for the 1% AEP (1:100-year storm event).

The major drainage system is designed to control and convey flows from the critical 1% AEP event (1:100-year). This is to incorporate suitably designed overland flow paths and drainage, to direct flows away from buildings towards Victoria Terrace and Alice Street, for flows which exceed the 5% Annual Exceedance Probability (AEP) (1:20-year storm event), up to the critical 1% AEP storm event (1:100-year).

Catchment and pipe network modelling with DRAINS software has been undertaken to suitably size the major/minor drainage network. Within the carpark, the drainage is connected to the existing pit to the north-east corner of the site. The existing carpark pavement that is being retained will also retain the existing stormwater system and not worsen the existing state. A pit and pipe system will also be utilised in the loading dock area and staff parking area so capture the minor storm event. These areas will have outlets to the back of kerb in Alice St. The proposed layout of this can be found in Appendix B.



**Figure 2 Existing Council Drainage Network**



## **4.1 ON-SITE DETENTION**

Due to the proximity of the site to the Mehi River, it is not recommended to provide On-site Stormwater Detention Facilities for the proposed development. Confirmation of this with Moree Plains Shire Council has been obtained.

## **4.1 STORMWATER QUALITY**

There are no specific requirements for water quality treatment of stormwater in the Local Government Area based on previous discussion with Moree Plains Shire Council – other than there being no negative water quality outcomes as noted in the Moree Plains Development Control Plan 2013.

Considering the restrictions on site being the existing stormwater infrastructure in Victoria Terrace and Alice St, as well as the relatively flat nature of the site and sparatic rainfall patterns in Moree, the approach taken to Stormwater Quality is to provide pit insterts within the carpark pits as well as a proprietary treatment device (Jellyfish) for the north-eastern discharge point.

## Jellyfish Treatment Device

A proprietary stormwater treatment device is proposed to be utilised to treat stormwater runoff prior to disposal to the north-east corner of the development. Below is a brief description of the operation of the device.

- Stormwater enters the Jellyfish through the inlet pipe, builds driving head, and traps floating pollutants behind the maintenance access wall and below the cartridge deck.
  - The upstream diversion pit produces driving head which pushes the stormwater below the cartridge deck where a separation skirt around the cartridges isolates oil, litter and debris outside the filtration zone, allowing sand-sized particles to settle in the sump.
  - The driving head causes the water to enter the filtration zone and up through the top of the cartridge into the backwash pool. Once the water has filled the backwash pool, clean water overflows where it exits via the outlet pipe
  - The membrane filters provide a very large surface area to effectively remove fine sand and silt-sized particles, and a high percentage of pollutants such as nitrogen, phosphorus, metals, and hydrocarbons while ensuring long-lasting treatment
  - As influent flow subsides, the filtered water in the backwash pool flows back through the high flow membrane cartridges into the lower chamber. This passive backwash extends cartridge life, keeping the membrane clean for future events
  - The drain down cartridge(s) located outside the backwash pool enables water levels to balance

## Ocean Guard Pit Inserts

Surface Inlet Pits within the proposed carpark development are to be fitted with Ocean Guard Pit Inserts (or equivalent). The pit inserts sit beneath the stormwater pit grates and collect gross pollutants and larger sediments prior to treatment by other devices. Similarly, the Ocean Guards can be provided proposed at each rainwater tank connection to treat runoff from the new roofed areas prior to discharge to the site trunk pit and pipe network.



Due to the site restrictions as discussed above, we consider the approach outlined above to be appropriate for the proposed development.

## **4.6 LOCAL OVERLAND DRAINAGE**

Local overland flow paths have been provided across the site with the proposed carpark having overland flow paths to the north and east towards Victoria Terrace. The proposed loading dock area and ambulance bay have overland flow paths directed towards Alice St. This arrangement can be seen on the concept engineering plans attached to the appendix of this report.

## **5. CONCLUSION**

The proposed stormwater management design presented above has been prepared to comply with Moree Plains Council's DCP as well as industry best practice. The design philosophy is based on the principle of at source treatment, to reduce conveyance infrastructure and manage water quantity and quality aspects.

At a concept level the system has been designed to cater for frequent and infrequent storm events.

Based on the above, our investigation and concept designs indicate the proposed development can adequately manage and address all items surrounding stormwater runoff. Should you have any queries, please feel free to contact the undersigned on (02) 4365 1668.

K. Barr

Karina Barrett

## Civil Engineer

D. Malleo

Daniel Holland

## Civil Engineer

## **REFERENCES:**

Moree Plans Development Control Plan 2013



## **LIMITATION STATEMENT:**

Northrop Consulting Engineers Pty Ltd (Northrop) has been retained to prepare this report based on specific instructions, scope of work and purpose pursuant to a contract with its client. It has been prepared in accordance with the usual care and thoroughness of the consulting profession for the use by Health Infrastructure (HI). The report is based on generally accepted practices and standards applicable to the scope of work at the time it was prepared. No other warranty, express or implied, is made as to the professional advice included in this report.

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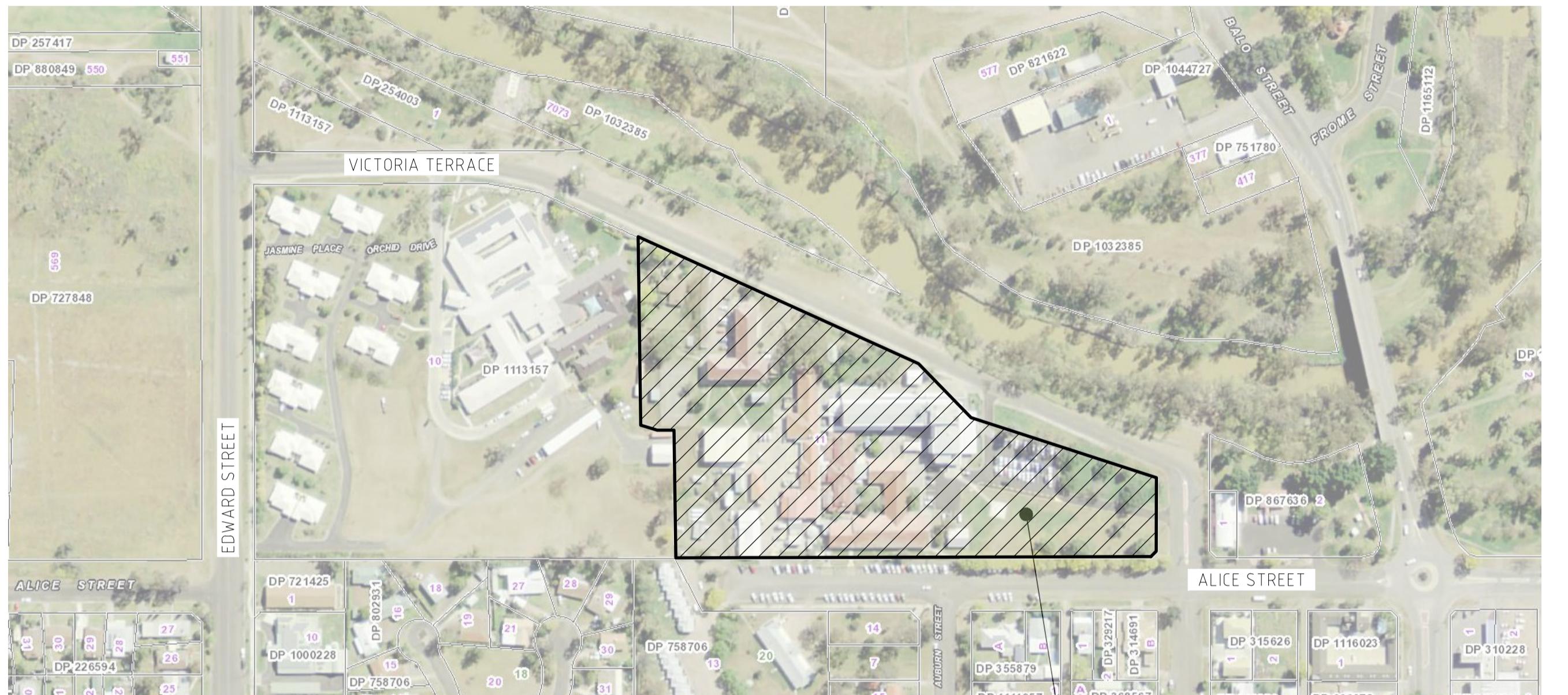


## APPENDIX A – SUPPLEMENTARY INFORMATION

- DRAINS model
  - Stormwater Management Plans

# MOREE HOSPITAL REDEVELOPMENT

35 ALICE STREET, MOREE  
CIVIL DETAILED DESIGN



## DRAWING SCHEDULE

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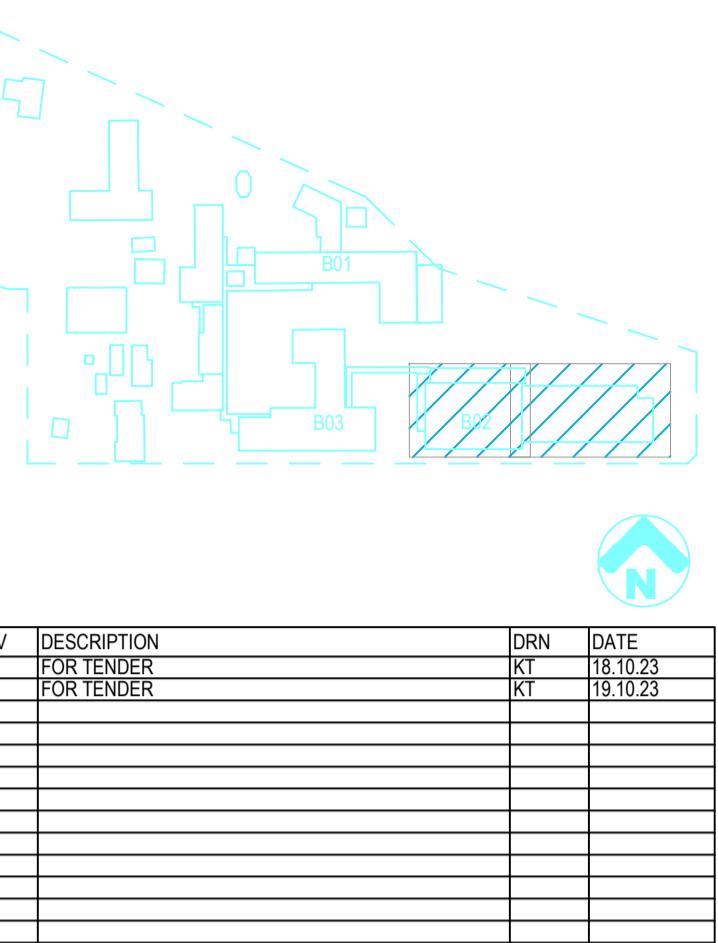
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COVER SHEET - REF  
SITE PLAN  
CONCEPT SEDIMENT & EROSION CONTROL PLAN  
SEDIMENT & EROSION CONTROL DETAILS  
BULK EARTHWORKS PLAN - SHEET 1  
BULK EARTHWORKS PLAN - SHEET 2  
STORMWATER AND LEVELS PLAN - SHEET 1 REF  
STORMWATER AND LEVELS PLAN - SHEET 2

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## GENERAL NOTES

## PROJECT TEAM

QUANTITY SURVEYOR mbm LEVEL 5, 1 CHURCHILL SQUARE, SYDNEY NSW 2000, AUSTRALIA PH (02) 8079 1000

LANDSCAPE ARCHITECTS TaylorBrammer 218 OXFORD ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8547 1000 | taylor@taylorbrammer.com.au

SERVICES ENGINEER JHA LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8431 1000 | inquiry@jhau.com.au

STRUCTURAL & CIVIL ENGINEER NORTHROP LEVEL 1, 215 PACIFIC HIGHWAY, CHARLESTOWN NSW 2290, AUSTRALIA PH (02) 4943 1777 | newsletter@northrop.com.au | ABN: 81 194 411 000

ARCHITECT STH LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8431 1000 | info@sthd.com.au | ABN: 21 134 476 995

CONTRACTOR BESIX Watpac LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000, PH (02) 8411 1400

PROJECT MANAGER savills LEVEL 25, 1 FARRER PLACE, SYDNEY NSW 2000, PH (02) 8215 9888

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## DESIGN DEVELOPMENT

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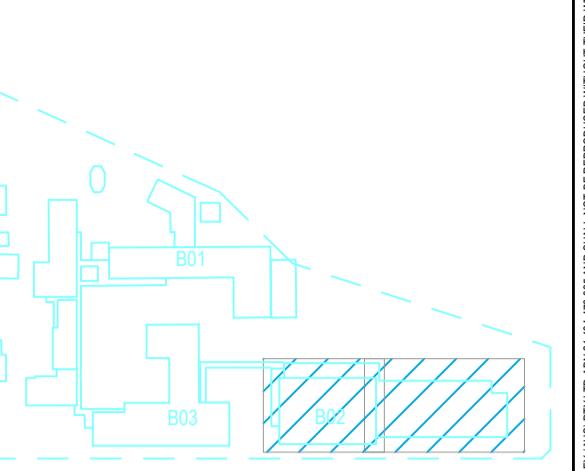
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PROJECT TEAM

QUANTITY SURVEYOR



LEVEL 5, 1 CHURCHILL SQUARE, SYDNEY NSW 2000, AUSTRALIA  
(02) 8079 1000

LANDSCAPE ARCHITECTS



218 OXFORD ST, SYDNEY NSW 2000, AUSTRALIA  
(02) 8511 1000 | taylor@taylorbrammer.com.au

SERVICES ENGINEER



LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA  
(02) 8537 1000 | inquiry@jha.com.au

STRUCTURAL & CIVIL ENGINEER



LEVEL 1, 215 PACIFIC HIGHWAY, CHARLESTOWN NSW 2290, AUSTRALIA  
(02) 4993 1777 | newcastle@northrop.com.au | ABN: 81 194 41 100

ARCHITECT



LEVEL 1, 81 YORK STREET, SYDNEY NSW 2000, AUSTRALIA  
(02) 2099 4600 | sony@sony.com.au | ABN: 21 134 476 995

CONTRACTOR



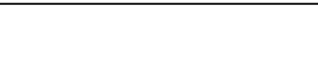
LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000, PH (02) 8114 1400

PROJECT MANAGER



LEVEL 25, 1 FARRER PLACE, SYDNEY NSW 2000, PH (02) 8215 9888

PRINCIPAL



LEVEL 1, 1 FARRER PLACE, SYDNEY NSW 2000, PH (02) 8215 9888

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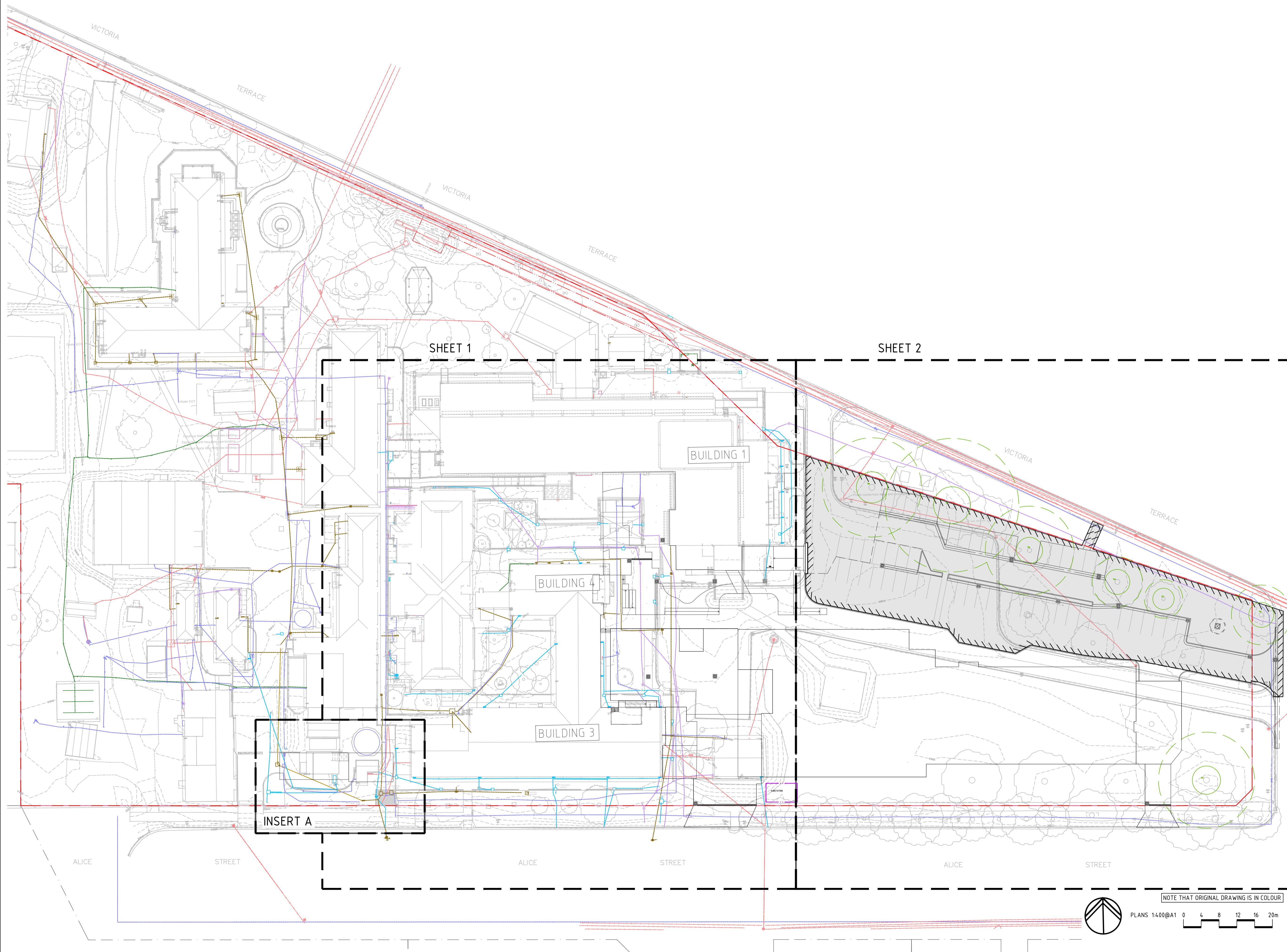
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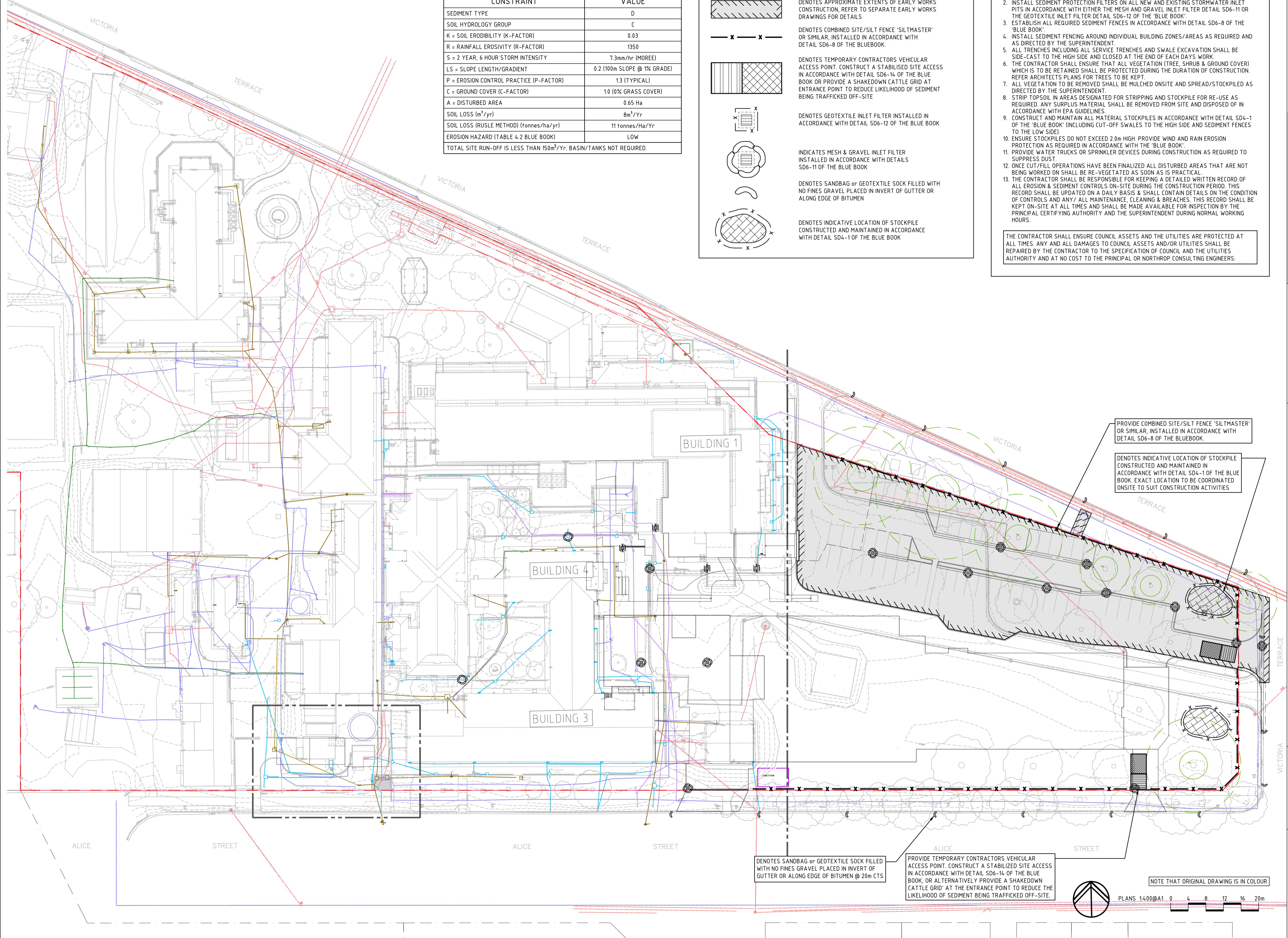
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mbm  
LEVEL 5, 1 CHIFLEY SQUARE, SYDNEY NSW 2000, AUSTRALIA  
(02) 8279 1000

TaylorBrammer  
218 OXFORD ST, SYDNEY NSW 2000, AUSTRALIA  
(02) 8547 1000 | taylor@taylorbrammer.com

JHA  
LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA  
(02) 8537 1000 | info@jhahydro.com.au

NORTHROP  
LEVEL 1, 215 PACIFIC HIGHWAY, CHARLESTOWN NSW 2290, AUSTRALIA  
(02) 4943 1777 | northrop@northrop.com.au | ABN: 81 194 41 100

STH  
LEVEL 1, 81 YORK STREET, SYDNEY NSW 2000, AUSTRALIA  
(02) 8594 4600 | sth@sthdirect.com.au | ABN: 21 134 476 995

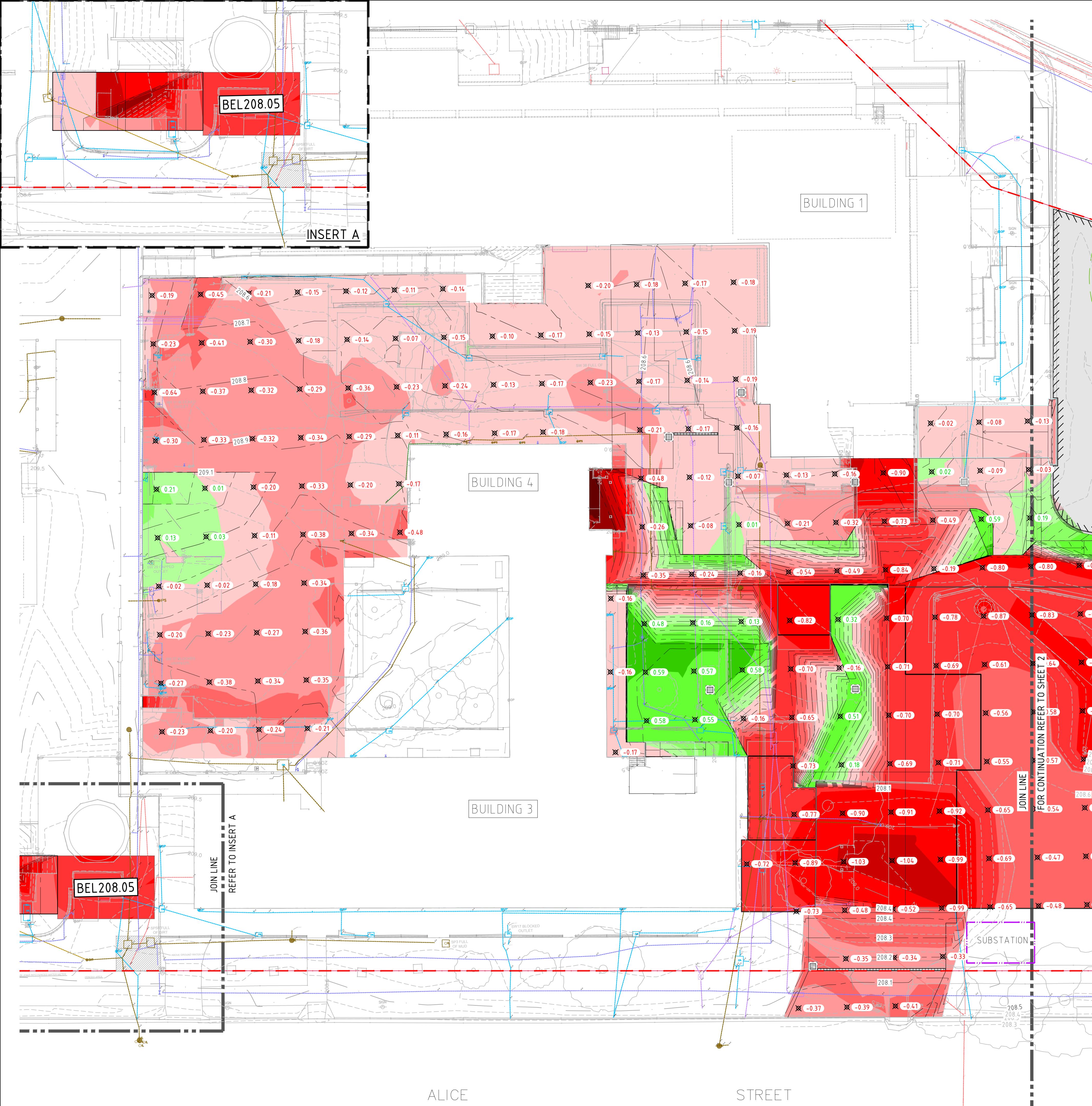
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LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000, AUSTRALIA  
(02) 8511 1400

savills  
LEVEL 25, 1 FARNER PLACE, SYDNEY NSW 2000, AUSTRALIA  
(02) 8215 9888

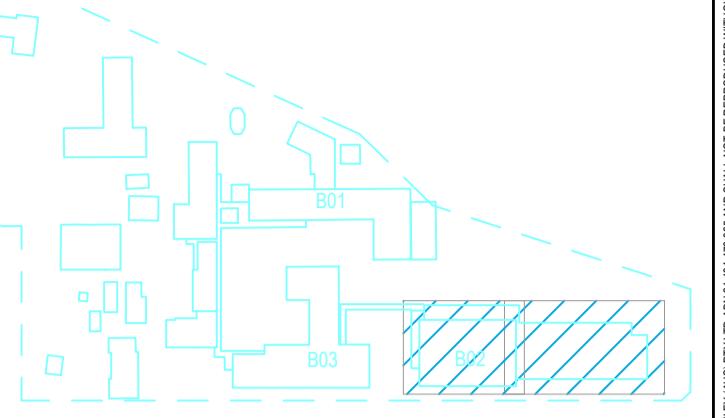
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TaylorBrammer 218 OXFORD ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8541 1000   taylor@taylorbrammer.com	
JHA LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8431 1777   info@jhau.com.au	
NORTHROP LEVEL 1, 215 PACIFIC HIGHWAY, CHARLESTON NSW 2290, AUSTRALIA PH (02) 4943 1777   nsw@northrop.com.au   ABN: 81 134 476 995	
STH LEVEL 8, 81 YORK STREET, SYDNEY NSW 2000, AUSTRALIA PH (02) 8299 4600   sony@sthd.com.au	
BESIX Watpac LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000, AUSTRALIA PH (02) 8215 1400	
savills LEVEL 25, 1 FARRER PLACE, SYDNEY NSW 2000, AUSTRALIA PH (02) 8215 9888	
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PROJECT TEAM
QUANTITY SURVEYOR <b>mbm</b> LEVEL 5, 1 CHURCHILL SQUARE, SYDNEY NSW 2000, AUSTRALIA PH (02) 8279 1000
LANDSCAPE ARCHITECTS <b>TaylorBrammer</b> 218 OXFORD ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8541 1000   taylor@taylorbrammer.com.au
SERVICES ENGINEER <b>JHA</b> LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8337 1000   info@jhau.com.au
STRUCTURAL & CIVIL ENGINEER <b>NORTHROP</b> LEVEL 1, 215 PACIFIC HIGHWAY, CHARLESTOWN NSW 2290, AUSTRALIA PH (02) 4943 1777   nsw@northrop.com.au
ARCHITECT <b>STH</b> LEVEL 8, 81 YORK STREET, SYDNEY NSW 2000, AUSTRALIA PH (02) 8599 4600   sony@sthw.com.au
CONTRACTOR <b>BESIX Watpac</b> LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000, PH (02) 8141 1400
PROJECT MANAGER <b>savills</b> LEVEL 25, 1 FARRER PLACE, SYDNEY NSW 2000, PH (02) 8215 9888
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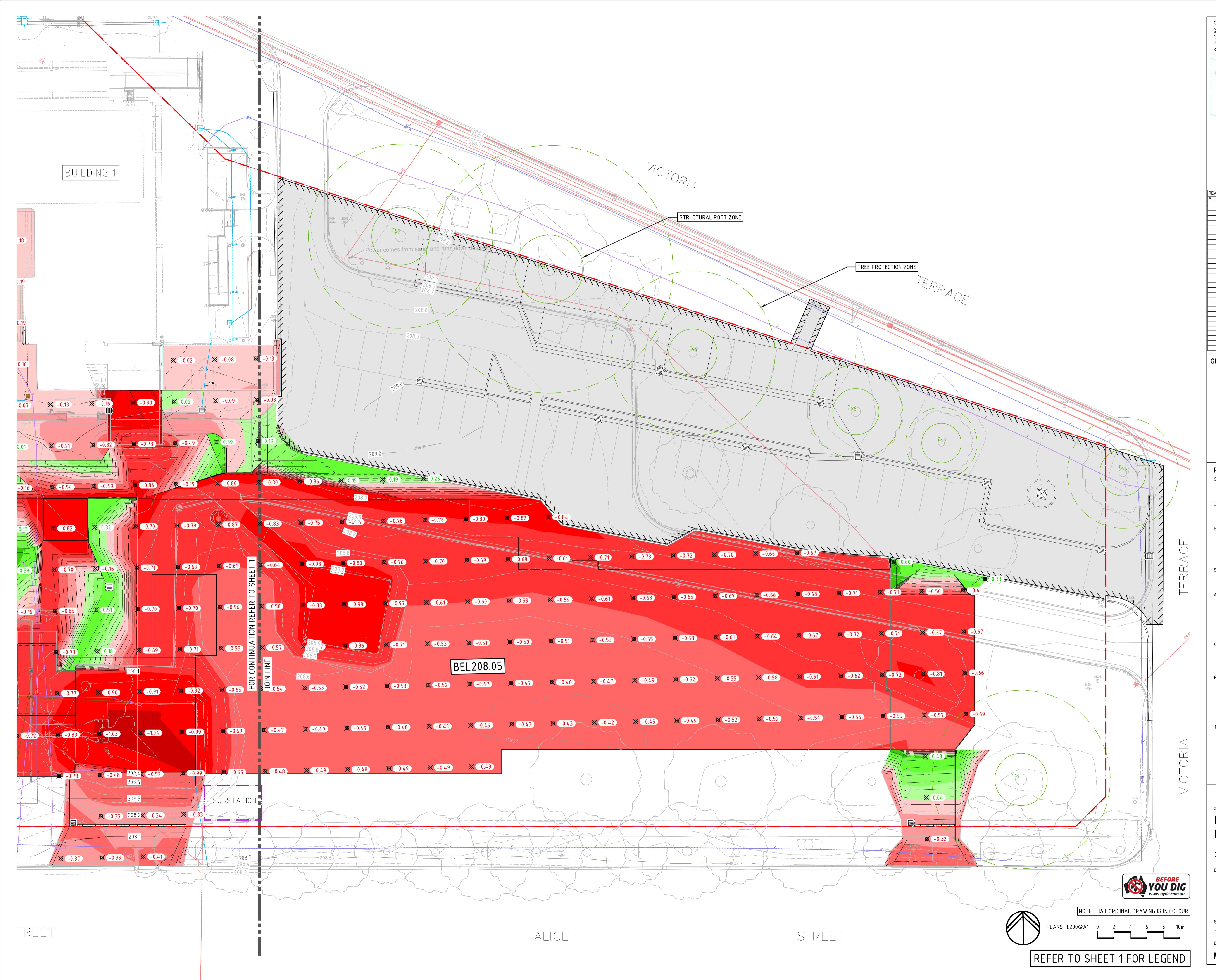
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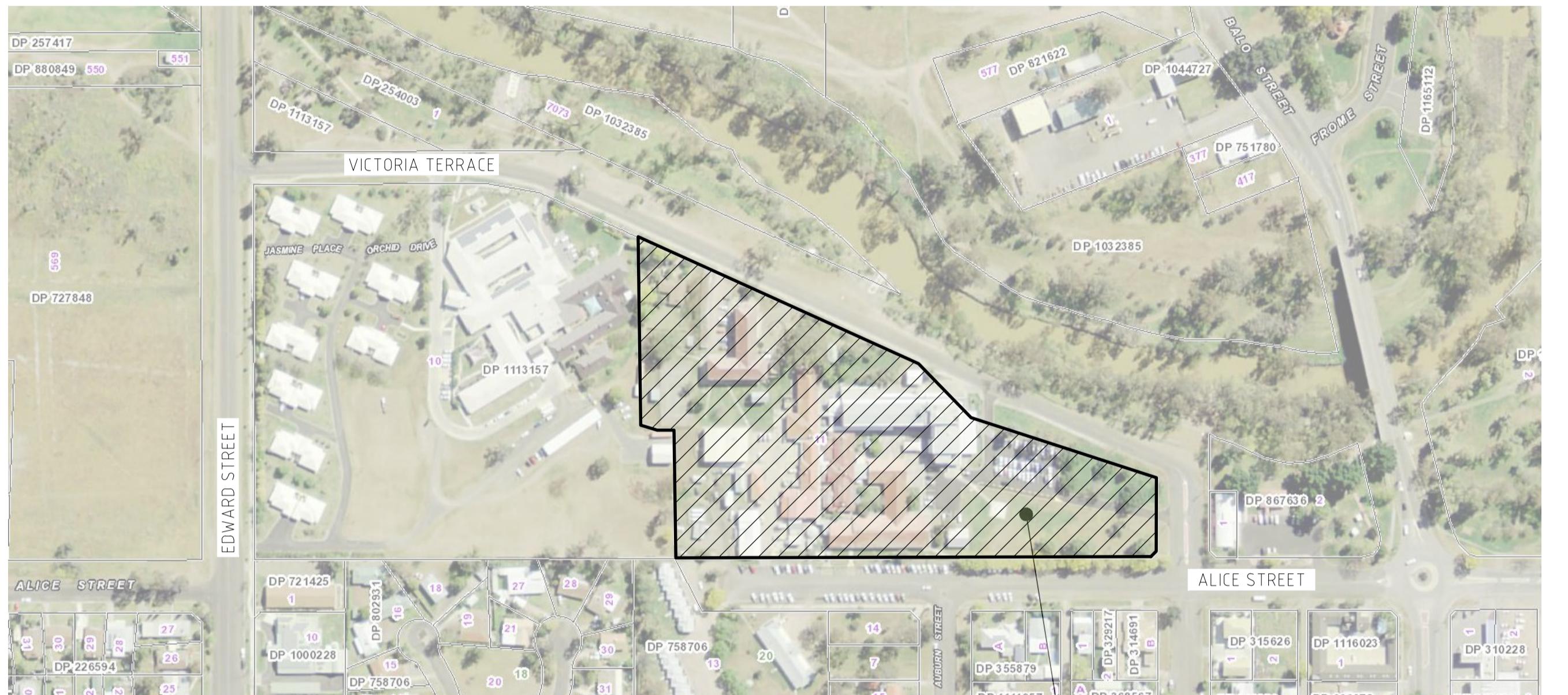






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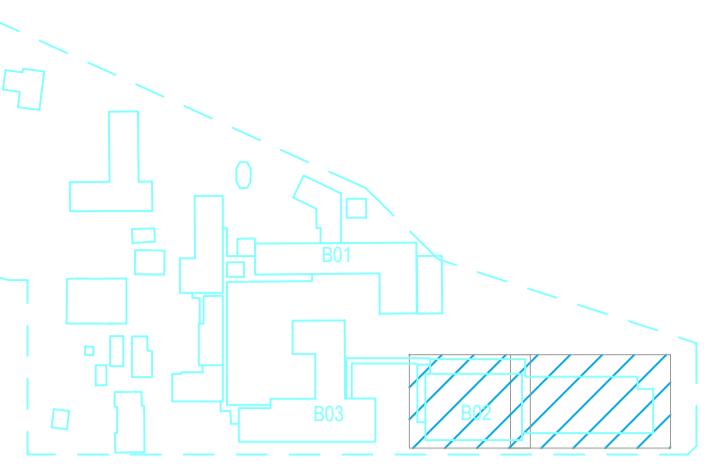
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	LEVEL 5, 1 CHURCHILL SQUARE, SYDNEY NSW 2000 AUSTRALIA PH (02) 8279 1000
LANDSCAPE ARCHITECTS	TaylorBrammer
SERVICES ENGINEER	JHA

STRUCTURAL & CIVIL ENGINEER	
ARCHITECT	STH
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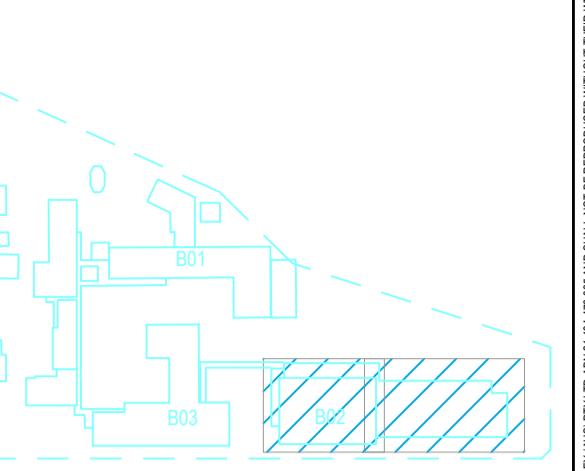
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PROJECT TEAM

QUANTITY SURVEYOR  
**mbm**  
LEVEL 5, 1 CHURCHILL SQUARE, SYDNEY NSW 2000, AUSTRALIA  
(02) 8079 1000

LANDSCAPE ARCHITECTS  
**TaylorBrammer**  
218 OXFORD ST, SYDNEY NSW 2000, AUSTRALIA  
(02) 8511 1000 | [info@taylorbrammer.com.au](mailto:info@taylorbrammer.com.au)

SERVICES ENGINEER

**JHA**  
LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA  
(02) 8537 1000 | [enquiry@jhengroup.com.au](mailto:enquiry@jhengroup.com.au)

STRUCTURAL & CIVIL ENGINEER  
**NORTHROP**  
LEVEL 2, 215 PACIFIC HIGHWAY, CHARLESTOWN NSW 2290, AUSTRALIA  
(02) 4943 1777 | [newcastle@northrop.com.au](mailto:newcastle@northrop.com.au) | ABN: 81 194 41 100

ARCHITECT

**STH**  
LEVEL 1, 215 YORK STREET, SYDNEY NSW 2000, AUSTRALIA  
(02) 2099 4600 | [sydney@sthgroup.com.au](mailto:sydney@sthgroup.com.au) | ABN: 21 134 476 995

CONTRACTOR  
**BESIX Watpac**  
LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000, PH (02) 8111 1400

PROJECT MANAGER  
**savills**  
LEVEL 25, 1 FARRER PLACE, SYDNEY NSW 2000, PH (02) 8215 9888

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**INTERNAL CIVIL WORKS  
SITE PLAN**

SCALE \_\_\_\_\_ DRAWN BY \_\_\_\_\_ CHECKED \_\_\_\_\_

DOCUMENT NUMBER KT KB

REVISION

MHR-NOR-CE-DR-SW-C01.10 B

SHEET 1

SHEET 2

INSERT A

ALICE

STREET

ALICE

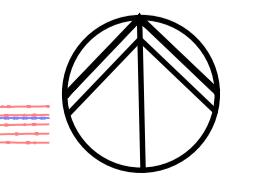
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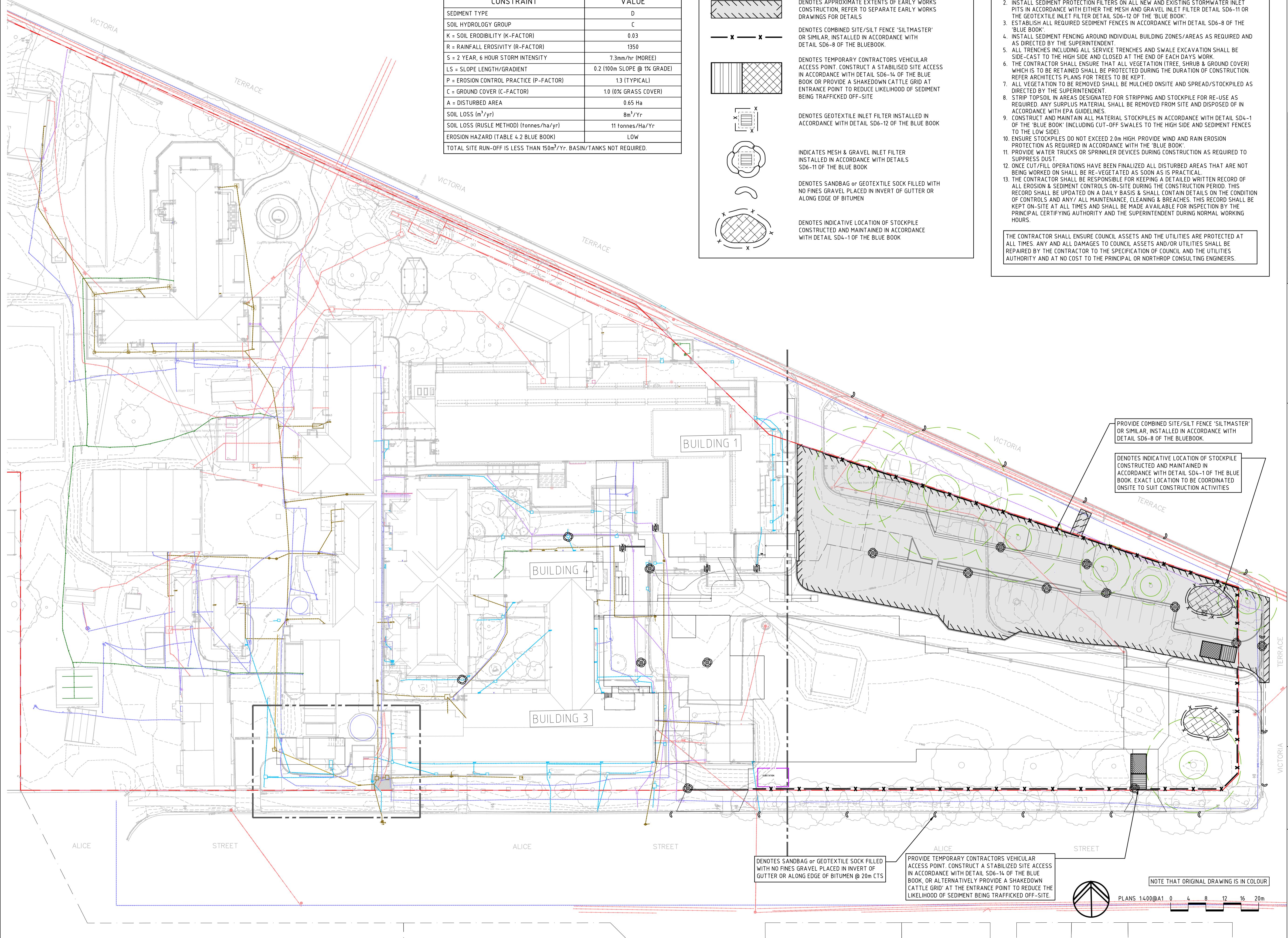
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STREET

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PLANS 1:400@A1 0 4 8 12 16 20m





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REV DESCRIPTION DRN DATE  
A FOR INFORMATION KT 08.09.23  
B FOR TENDER KT 18.10.23

REV	DESCRIPTION	DRN	DATE
A	FOR INFORMATION	KT	08.09.23
B	FOR TENDER	KT	18.10.23

mbm  
LEVEL 5, 1 CHIFLEY SQUARE, SYDNEY NSW 2000, AUSTRALIA  
(02) 8279 1000

TaylorBrammer  
218 OXFORD ST, SYDNEY NSW 2000, AUSTRALIA  
(02) 8547 1000 | taylor@taylorbrammer.com.au

JHA  
LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA  
(02) 8537 1000 | info@jhahydro.com.au

NORTHROP  
LEVEL 1, 215 PACIFIC HIGHWAY, CHARLESTOWN NSW 2290, AUSTRALIA  
(02) 4943 1777 | northrop@northrop.com.au | ABN: 81 194 41 100

STH  
LEVEL 1, 81 YORK STREET, SYDNEY NSW 2000, AUSTRALIA  
(02) 8594 4600 | sth@sthdirect.com.au | ABN: 21 134 476 995

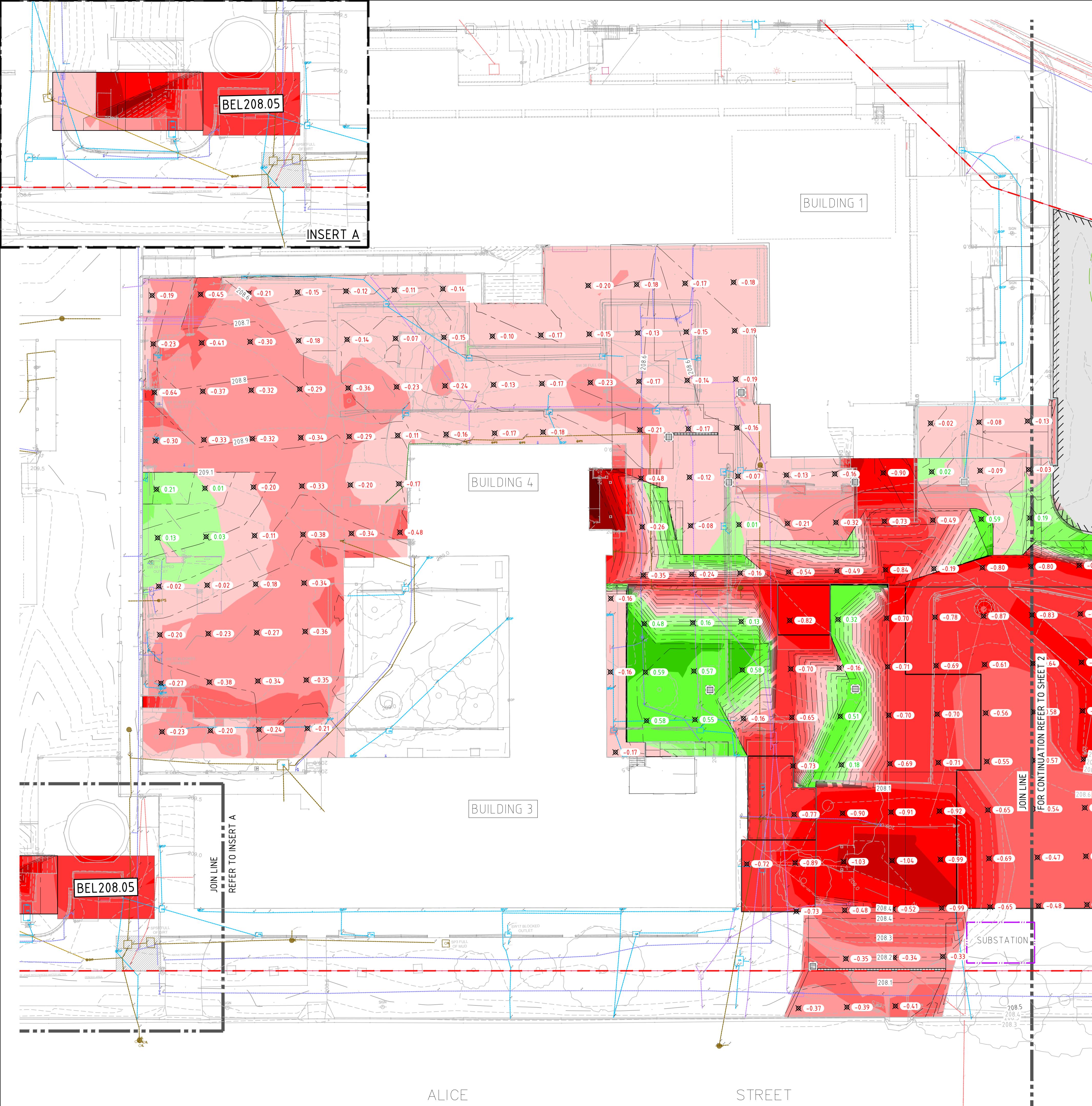
BESIX Watpac  
LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000, AUSTRALIA  
(02) 8511 1400

savills  
LEVEL 25, 1 FARNER PLACE, SYDNEY NSW 2000, AUSTRALIA  
(02) 8215 9888

NSW GOVERNMENT  
Health Infrastructure

Health Infrastructure

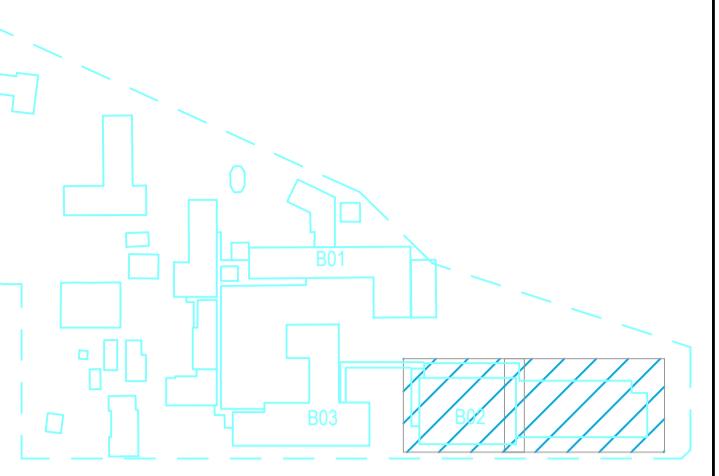




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KEY PLAN	
REV DESCRIPTION DRN DATE	
A FOR TENDER KT 18.10.23	
mbm LEVEL 5, 1 CHURCH SQUARE, SYDNEY NSW 2000, AUSTRALIA PH (02) 8279 1000	
TaylorBrammer 218 OXFORD ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8541 1000   taylor@taylorbrammer.com.au	
JHA LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000, AUSTRALIA PH (02) 8431 1777   jha@jha.com.au	
NORTHROP LEVEL 1, 215 PACIFIC HIGHWAY, CHARLESTON NSW 2290, AUSTRALIA PH (02) 4943 1777   northrop@northrop.com.au AHN 81194 436 000	
STH LEVEL 8, 81 YORK STREET, SYDNEY NSW 2000, AUSTRALIA PH (02) 8594 4000   sth@sth.com.au	
BESIX Watpac LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000, AUSTRALIA PH (02) 8299 4000   watpac@besix.com.au	
savills LEVEL 25, 1 FARRER PLACE, SYDNEY NSW 2000, AUSTRALIA PH (02) 8215 9888	
NSW GOVERNMENT Health Infrastructure	
<b>DESIGN DEVELOPMENT</b>	
PROJECT MOREE HOSPITAL REDEVELOPMENT	
35 Alice St, Moree NSW 2400	
DRAWING TITLE INTERNAL CIVIL WORKS BULK EARTHWORKS PLAN SHEET 1	
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PLANS 1:200 @ A1 0 2 4 6 8 10m	
SCALE 1:200 @ A1 DRAWN BY KT CHECKED KB	
DOCUMENT NUMBER MHR-NOR-CE-DR-SW-C03.01	
REVISION A	







REV	DESCRIPTION	DRN	DATE
A	FOR INFORMATION	KT	08/09/23
B	FOR TENDER	KT	18/09/23

GENERAL NOTES

PROJECT TEAM

QUANTITY SURVEYOR  
**mbm**  
LEVEL 5, 1 CHIFLEY SQUARE, SYDNEY NSW 2000 AUSTRALIA  
(02) 8279 1000

LANDSCAPE ARCHITECTS  
**TaylorBrammer**  
218 OXFORD ST, SYDNEY NSW 2000 AUSTRALIA  
(02) 8547 1000 | inquiry@taylorbrammer.com.au

SERVICES ENGINEER  
**JHA**  
LEVEL 20, 2 MARKET ST, SYDNEY NSW 2000 AUSTRALIA  
(02) 8537 1000 | info@jhassociates.com.au

STRUCTURAL & CIVIL ENGINEER  
**NORTHROP**  
LEVEL 1, 215 PACIFIC HIGHWAY, CHARLESTON NSW 2290 AUSTRALIA  
(02) 4943 1777 | newcastle@northrop.com.au

ARCHITECT  
**STH**  
LEVEL 8, 9 YORK STREET, SYDNEY NSW 2000 AUSTRALIA  
(02) 8594 4000 | sony@sthdirect.com.au

CONTRACTOR  
**BESIX Watpac**  
LEVEL 24, 44 MARKET STREET, SYDNEY NSW 2000 AUSTRALIA  
(02) 8215 1400

PROJECT MANAGER  
**savills**  
LEVEL 25, 1 FARRER PLACE, SYDNEY NSW 2000 AUSTRALIA  
(02) 8215 9888

PRINCIPAL  
**Health Infrastructure**  
NSW GOVERNMENT

DESIGN DEVELOPMENT

PROJECT  
**MOREE HOSPITAL REDEVELOPMENT**

35 Alice St, Moree NSW 2400

DRAWING TITLE

**INTERNAL CIVIL WORKS  
STORMWATER MANAGEMENT  
& LEVELS PLAN - SHEET 2**

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