Surface Water and Groundwater Impact Assessment

88 Newton Road, Wetherill Park, NSW

Prepared for: Centuria Capital Pty Ltd
EP3206.002 22 April 2024

APPROVED COMPANY ISO 9001 Quality Management Systems QMS Certification Services

APPROVED COMPANY ISO 45001 Occupational Health & Safety Management Systems QMS Certification Services

APPROVED COMPANY ISO 14001 Environmental Management Systems QMS Certification Services

EP RISK

Surface Water and Groundwater Impact Assessment

88 Newton Road, Wetherill Park, NSW

Centuria Capital Pty Ltd
Level 41, Chifley Tower
2 Chifley Square
Sydney NSW 2000

22 April 2024

Our Ref: EP3206.002

LIMITATIONS

This Surface Water and Groundwater Impact Assessment was conducted on the behalf of Centuria Capital Pty Ltd for the purpose/s stated in **Section 1**.

EP Risk has prepared this document in good faith, but is unable to provide certification outside of areas over which EP Risk had some control or were reasonably able to check. The report also relies upon information provided by third parties. EP Risk has undertaken all practical steps to confirm the reliability of the information provided by third parties and do not accept any liability for false or misleading information provided by these parties.

It is not possible in a Surface Water and Groundwater Impact Assessment to present all data, which could be of interest to all readers of this report. Readers are referred to any referenced investigation reports for further data.

Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect to, their situation.

All work conducted and reports produced by EP Risk are based on a specific scope and have been prepared for Centuria Capital Pty Ltd and therefore cannot be relied upon by any other third parties unless agreed in writing by EP Risk.

The report(s) and/or information produced by EP Risk should not be reproduced and/or presented/reviewed except in full.

QUALITY CONTROL

Version	Author	Date	Reviewer	Date	Quality Review	Date
v1	L. Rose N. McGuire	10.11.2023	P. Simpson	10.11.2023	O. Godfrey	10.11.2023
v2	G. White	8.04.2024	L. Munnichs	8.04.2024	S. Kennedy	8.04.2024
v3	G. White	15.04.2024	L. Munnichs	15.04.2024	L. Munnichs	15.04.2024
v4	G. White	22.04.2024	L. Munnichs	22.04.2024	L. Munnichs	22.04.2024

DOCUMENT CONTROL

Version	Date	Reference	Submitted to
v1	10.11.2023	EP3206.002_Centuria_Wetherill Park_GWIA	Centuria Capital Pty Ltd
v2	8.04.2024	EP3206.002_Centuria_Wetherill Park_GWIA	Centuria Capital Pty Ltd
v3	15.04.2024	EP3206.002_Centuria_Wetherill Park_GWIA	Centuria Capital Pty Ltd
v4	22.04.2024	EP3206.002_Centuria_Wetherill Park_GWIA	Centuria Capital Pty Ltd

Executive Summary

EP Risk Management Pty Ltd (EP Risk) was engaged by Centuria Capital Limited (Centuria, the Client) to undertake a Surface Water and Groundwater Impact Assessment (the Assessment) for the property located at 88 Newton Road, Wetherill Park, New South Wales (NSW), 2164 (the Site).

It is understood that the Assessment is required to accompany a local Development Application (DA) to Fairfield City Council. The proposed development will involve the demolition of existing buildings and structures, followed by the construction and operational use of a single-storey warehouse and distribution centre with ancillary office space and amenities, on-site parking, landscaping and access, and other associated works including bulk earthworks, site preparation works and site clearance, as well as augmentation and construction of servicing utilities.

The scope of works to achieve the objectives include:

- A desktop hydrogeological study including a review of previous reports prepared for the Site and publicly available hydrogeological information.
- Development of a Groundwater Conceptual Model and an analysis of the proposed dewatering required for the development.
- An assessment of the construction and operational impacts associated with the Proposed Development on the surrounding groundwater and surface water nearby the Site.
- Development of appropriate mitigation and monitoring measures to be implemented throughout the construction and/or operation and an assessment of their effectiveness with respect to surface and groundwater impacts.
- Preparation of this report summarising the findings of the assessment.

The proposed development includes demolition of the existing structures on the Site and construction of a large warehouse and ground level parking. In addition to the structures, underground services will be required to be constructed and/or relocated including stormwater and sewer assets.

Based on the information contained in the concept plans provided, it's considered that minimal dewatering will be required and would mostly be limited to perched water rather than groundwater during construction including:

- Some minor dewatering of the perched water aquifer in the southwestern portion during bulk earthworks may be required.
- Some minor dewatering in some proposed stormwater and sewer excavations (likely only perched water) may be required.

A further review of the proposed dewatering estimate should be undertaken following the design finalisation.

Potential construction stage impacts include contamination from chemical or hydrocarbon spills and increased sediment loads being discharged to downstream systems as a result of runoff from exposed areas. Construction impacts would be managed through implementation of Surface Water Management Plans (SWMPs) in accordance with the Blue Book and detailed planning and management of construction sites to avoid impacting overland flow paths without appropriate mitigation.

Water quality impacts would be managed through implementation of water sensitive urban design measures.

Construction stage impacts on groundwater may occur due to minor interception of perched water by excavations associated with construction. Impacts on perched water level due to dewatering would occur during the construction phase only.

A summary of the key impacts and proposed mitigation and monitoring measures are presented in **Table 1 .**

Table 1 – Potential Construction and Operation Impacts and Mitigation Measures

Activity	Potential Impacts	Risk Rating	Mitigation Measures	Residual Risk Rating
Interception of groundwater aquifer	Significant drawdown due to dewatering operations	Moderate	The proposed excavations are not expected to intercept the groundwater table, however, perched water may be encountered in the south western corner. Minimise duration of time that excavations encountering perched water are open.	Low
Chemical or hydrocarbon spill	Contamination of groundwater	Moderate	Storage of hazardous materials and refuelling to be undertaken in bunded areas. Spill kits to be kept onsite and staff informed of how to use them in an incident.	Low
Discharge of excess groundwater	Contamination of stormwater networks by discharging contaminated groundwater.	Moderate	The groundwater table is not expected to be intercepted during the proposed excavation works. However, where perched water is encountered it is proposed to be utilised, where possible, as dust suppression. Approval to treat and dispose to sewer should be obtained if large volumes of perched water are required to be dewatered.	Low

Table of Contents

List of Tables in Body of Report

List of Attached Figures

List of Appendices

1 Introduction

EP Risk Management Pty Ltd (EP Risk) was engaged by Centuria Capital Limited (Centuria, the Client) to undertake a Surface Water and Groundwater Impact Assessment (the Assessment) for the property located at 88 Newton Road, Wetherill Park, New South Wales (NSW), 2164 (the Site). The location and boundary of the Site is shown in **Figure 1**. The Site is approximately 5.17 hectares (ha) and is currently occupied by a warehouse building and an office building to the East. The Site is currently defined as Lot 1 in Deposited Plan (DP) 1017259 and is currently zoned as E4 – General Industrial, under the Fairfield Local Environment Plan (LEP) (2013).

1.1 Background

It is understood that the Assessment is required in support of a local Development Application (DA) to Fairfield City Council, relating to the proposed redevelopment of the site as a single-storey warehouse and distribution centre with office space and amenities, on-site parking, and related landscaping and utilities

1.2 Scope of Works

The scope of works to achieve the objectives include:

- A desktop hydrogeological study including a review of previous reports prepared for the Site and publicly available hydrogeological information.
- Development of a Groundwater Conceptual Model and an analysis of the proposed dewatering required for the development.
- An assessment of the construction and operational impacts associated with the Proposed Development on the surrounding groundwater and surface water nearby the Site.
- Development of appropriate mitigation and monitoring measures to be implemented throughout the construction and/or operation and an assessment of their effectiveness with respect to surface and groundwater impacts.
- Preparation of this report summarising the findings of the assessment.

2 Site Condition and Surrounding Environment

2.1 Land Use and Layout

The Site comprises a large trapezium-shaped portion of land, approximately 5.17 ha. An EP Risk Environmental Consultant attended the Site on 13th July 2023 to undertake a site walkover and visual inspection. General site features observed are summarised below:

- Two buildings were present on-site, one large warehouse within the western portion of the Site and an office building with a surrounding carpark located within the eastern section of the Site.
- Loading docks were located on the north and eastern sides of the warehouse.
- A concrete lined stormwater drainage channel located adjacent the northern boundary of the Site.
- No evidence of above ground storage tanks (ASTs) or Underground Storage Tanks (USTs) were observed on-site.
- A fire sprinkler system was observed within the warehouse.
- The warehouse was being used as a storage / distribution centre for various commercial parts.

2.2 Surrounding Land Use

The Site is located within the Greater Western Sydney suburb of Wetherill Park and was predominately surrounded by industrial properties. Surrounding land use within a 1 km radius comprised of the following:

To the North

- A Drainage Creek running northeast – southwest (E4 – General Industrial).
- Industrial Properties (E4 – General Industrial).
- Caltex Service Station (E4 – General Industrial).
- Victoria Street running east – west (E4 – General Industrial).
- Industrial Properties (E4 – General Industrial).
- Surrounding area of Prospect Reservoir beyond (SP2 – Infrastructure).

To the South

- Newton Road (E4 – General Industrial).
- Commercial Properties (E4 – General Industrial).
- The Horsley Drive (SP2 – Classified Road).
- Residential Properties beyond (R2 -Low Density Residential).
- Benghazi Park beyond (C2 – Environmental Conservation).
- Wewak Park beyond (RE1 – Public Recreation).

To the East

- Newton Road (E4 – General Industrial).
- Industrial Properties beyond (E4 – General Industrial).

To the West

- Vacant land (E4 – General Industrial).
- A Drainage Creek running northeast – southwest (E4 – General Industrial).
- Industrial Properties (E4 – General Industrial).

2.3 Topography and Drainage

The topography of the Site was observed to decline towards the northeast of the Site from the southwest. The approximate elevation of the Site was between 46 – 52 m Australian Heigh Datum (AHD). There were no significant topographic features within the Site boundary.

Drainage is considered to flow to the north towards the concrete lined drainage channel.

2.4 Geology

Based on the geological information sourced from the NSW Department of Industry, Resources and Energy (2023) the northern portion of the Site is underlain by Cenozoic to more recent aged alluvium comprising unconsolidated alluvial clay, silt, sand and gravel deposits; and the southern portion of the Site is underlain by Middle Triassic – aged Bringelly Shale comprising shale, carbonaceous claystone, laminate, lithic sandstone and rare coal.

2.5 Soil Landscapes

Based on information sourced from the NSW Department of Planning and Environment (DPE, 2022), the Site is located within the Kurosol soil order.

The South Creek Soil Landscape occupies the northern portion of the Site, and the landscape is described as having floodplains, valley flats and drainage depressions of the channels on the Cumberland Plain; and usually flat with mainly cleared incised channels. Soil are often very deep layered sediments over bedrock or relict soils. The main soils of the South Creek Soil Landscape where pedogenesis has occurred consist of Structured Plastic Clays or Structure Loams in and immediately adjacent to drainage lines; while Red and Yellow Podzolic Soils are most common terraces with small areas of Structure Grey Clay, leached clays and Yellow Solodic Soils.

In addition, the Blacktown Soil Landscape occupies the central and southern portions of the Site, and the landscape is described as gently undulating rises on Wianamatta Group shales. Slopes are usually greater than five (5) percent, and local relief is 30 m. The landscape also includes broad rounded crests and ridges with gently inclined slopes, cleared Eucalypt woodland, and tall open – forest (dry schlerophyll forest). The main soils of the Blacktown Soil Landscape are shallow to moderately deep hard setting mottled texture contrast soils, Red and Brown Podzolic Soils on crests grading to Yellow Podzolic Soils on lower slopes and in drainage lines.

2.6 Acid Sulfate Soils

According to the Blacktown Council Local Environment Plan (LEP) the Site is not mapped within an area of acid sulfate soils. The Commonwealth Scientific and Industrial Research Organisation (CSIRO) Atlas of Australian Acid Sulfate Soils (2013) indicates the Site is within an area of Class C for acid sulfate soils. The Class C category is considered to have an extremely low probability of acid sulfate soil occurrence (1 – 5% chance).

2.7 Hydrology

No Surface water bodies were located at the Site; however, a stormwater drainage channel is located adjacent to the north and runs southwest to northeast. In addition, Prospect Reservoir, an approximate 50.2 megalitre (ML) potable water supply and storage reservoir, is located approximately 1.5 km to the north.

Due to the coverage of buildings and hardstand at the Site, the majority of the surface runoff is expected to be directed to the municipal stormwater system or the adjacent stormwater channel to the north that runs southwest to northeast.

2.8 Meteorology

Average monthly and annual rainfall data from the closest meteorological station at the Prospect Reservoir weather station (Station ID 67019) is presented in Table 1.

Table 1 – Rainfall data (mm)

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	95.1	99.2	103.1	75.5	68.5	75.5	57.8	50.2	46.3	60.2	72.8	75.5	878.6

A graph showing cumulative residual rainfall (or rainfall departure) over the period from 1887 to 2023 is presented as **Figure 2.8.1** below.

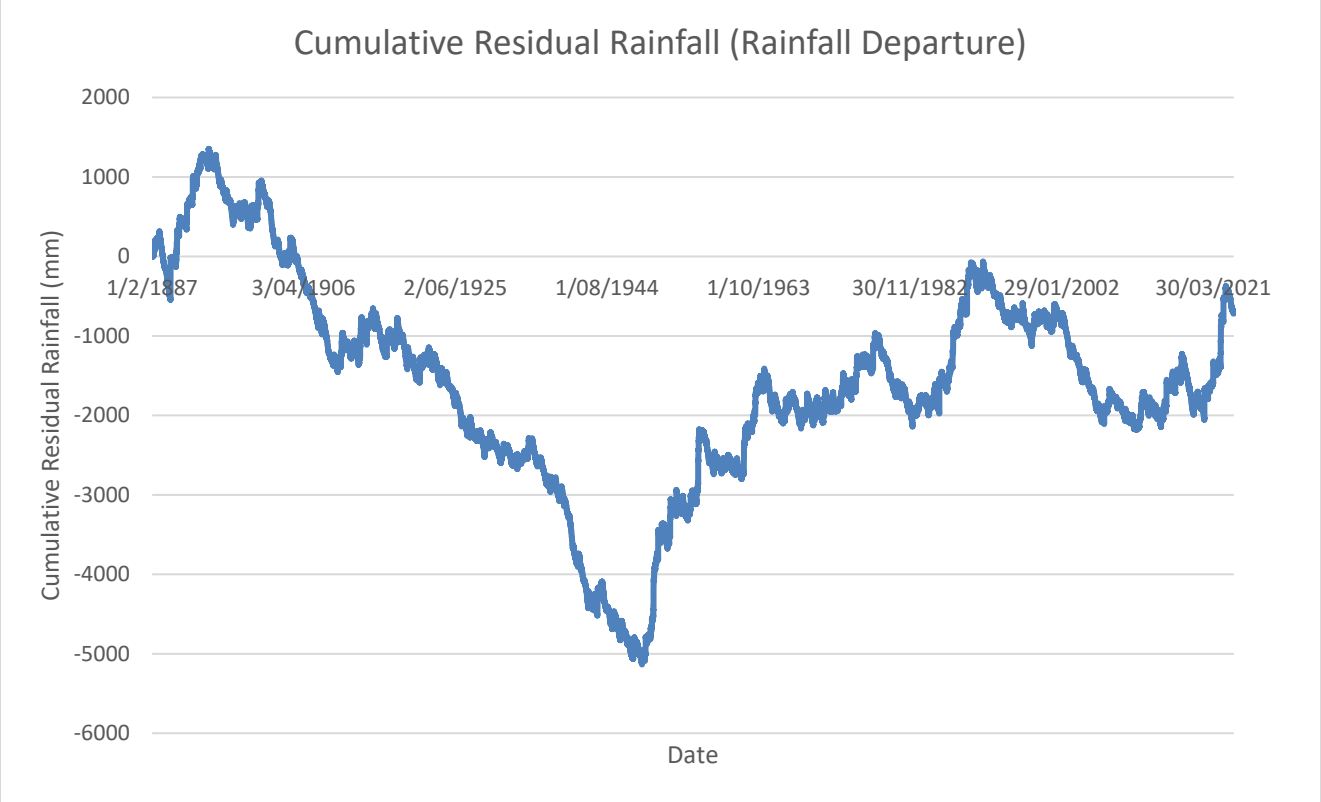


Figure 2.8.1 – Cumulative Residual Rainfall Graph for Prospect Reservoir Weather Station

The cumulative rainfall departure is calculated as the difference in actual rainfall and average rainfall. The sum of the difference in actual and in average rainfall is calculated daily and presented over time to show areas of relatively high and low rainfall periods. Negative values represent dry periods while positive values represent wet periods. As shown above periods with above average rainfall include 1887 to 1904, 1949 to 1956, and 1986 to 1992. Periods of below average rainfall include from 1905 to 1948, 1979 to 1983 and 1992 to 2007. More recently from February 2020 to October 2022, the area has seen a significant increase in rainfall in a relatively short period of time (as show by the steep line from 2020 to 2022) and it's considered that recent infiltration and groundwater levels are relatively higher compared to the average.

2.9 Hydrogeology

Aquifer Units

The Site is located within the Wianamatta Group which consists of three units: the Ashfield Shale, the Minchinbury Sandstone and the Bringelly Shale, with the Minchinbury Sandstone of negligible thickness (McNally, 2004). In Western Sydney, the Wianamatta Group has a maximum thickness of up to 300 m; however, a more typical thickness ranges from 100 to 150 m.

Two (2) aquifer systems are associated with the shale formations of the Wianamatta Group. The upper aquifer typically has a depth of 3 to 10 m and comprises of residual soils and colluvium derived from the shales, floodplain alluvium and the weathered saprolite. Hydraulic conductivities reportedly range between 0.01 and 10^{-5} m/day with the higher end conductivities suggesting open fractures in weathered shales or ferricrete bands. The lower aquifer system occurs comprises of fine – grained mudrocks and occurs below the base of the weathering. Hydraulic conductivities reportedly range between 0.001 and 10^{-8} m/day, with the lower end

reflecting the intrinsic impermeability of the unfractured shale. Both aquifers are reported to have limited storage and low bore yields, typically less than 0.1 ML/day (McNally, 2004; Parson Brinckerhoff, 2013).

Aquifers in the Wianamatta Group are not generally targets for water supply due to generally very low yields, in places highly saline groundwater (5,000 to >15,000 mg/L in the Western Sydney area) and the lack of water – bearing zones (Russell et al., 2009).

Water Allocations

A summary of the water allocations for the aquifer is presented in **Table 2**.

Table 2 – Recharge, Water Requirements and Extraction Limits of the Southern Sydney Rivers Source ML/year)

Average Annual Recharge	Environmental Water from Recharge	Basic Landholder Rights	Native Title Rights	Water Utility Share Components	Other Utility Share Components	Extraction Limit
15,500	3,294	47.5	0	32,000[1]	0	13,000

The location of the Prospect Creek Aquifer in relation to the wider sharing plan and the Sydney Basin is presented in **Figure 2.9.1**, **Figure 2.9.2.** and **Figure 2.9.3.**

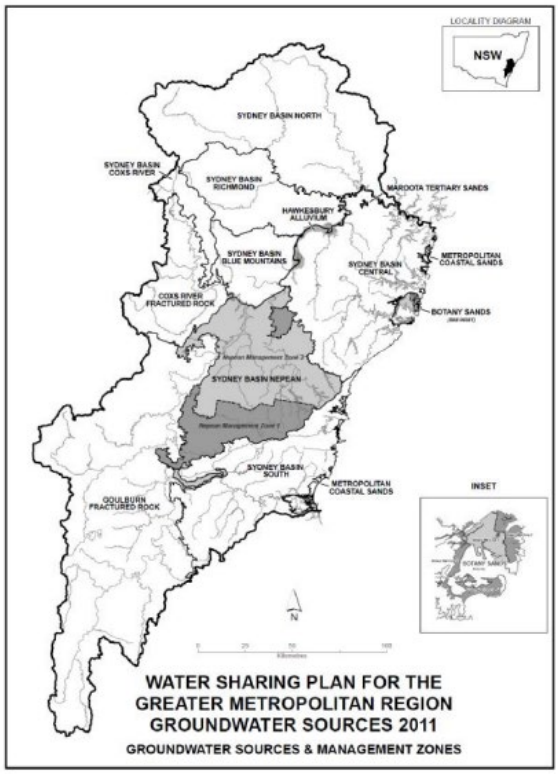


Figure 2.9.1 – Location of the Greater Metropolitan Region Groundwater Sources

[1] 32,000 ML/year is for the Sydney Catchment Authority.

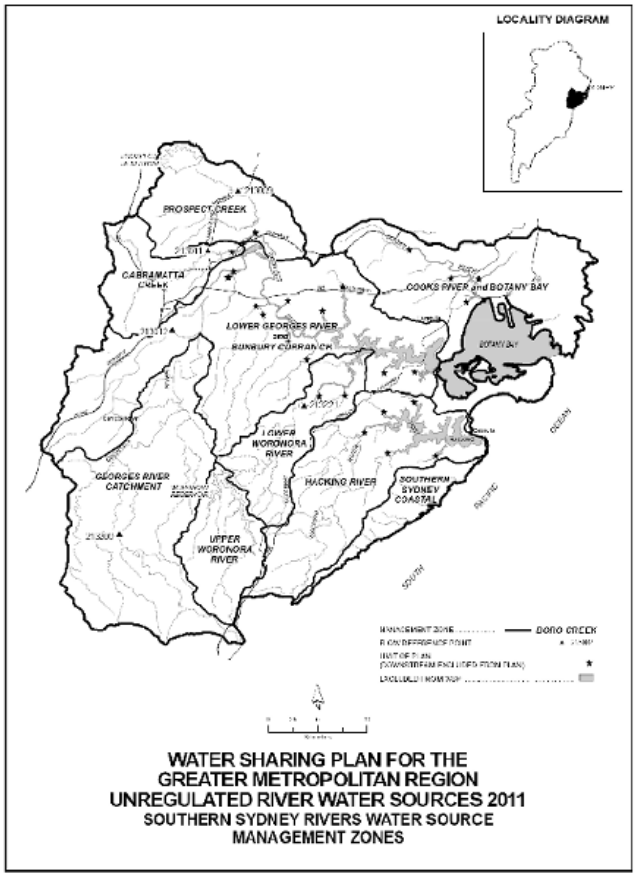


Figure 2.9.2 – Location of the Prospect Creek Groundwater Source

A cross section of the Sydney Basin adopted from Herron et al. (2019) is presented in **Figure 2.9.3**

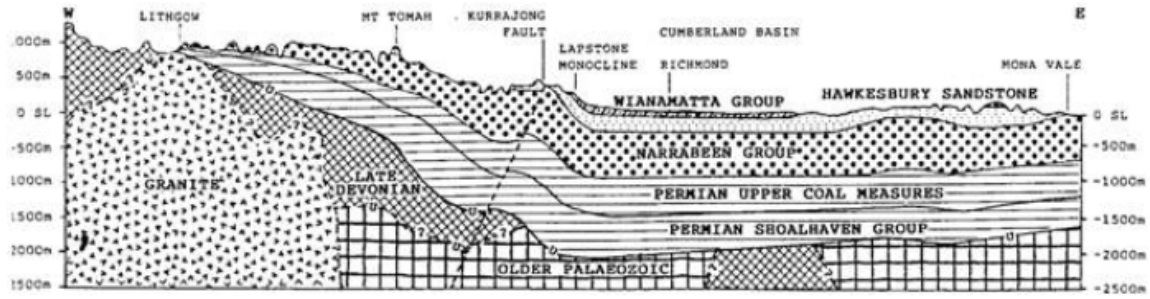


Figure 2.9.3 – Cross-section of the Sydney Basin (Herron et al, 2019).

Licensed Groundwater Information

No registered groundwater bores were identified at the Site; however, approximately 36 boreholes were identified within 2 km of the Site. Of the approximately 36 boreholes, 10 of the bores are within 500 m of the Site. A map showing the location of the licensed bores surrounding the Site is presented in **Figure 2.9.4**.

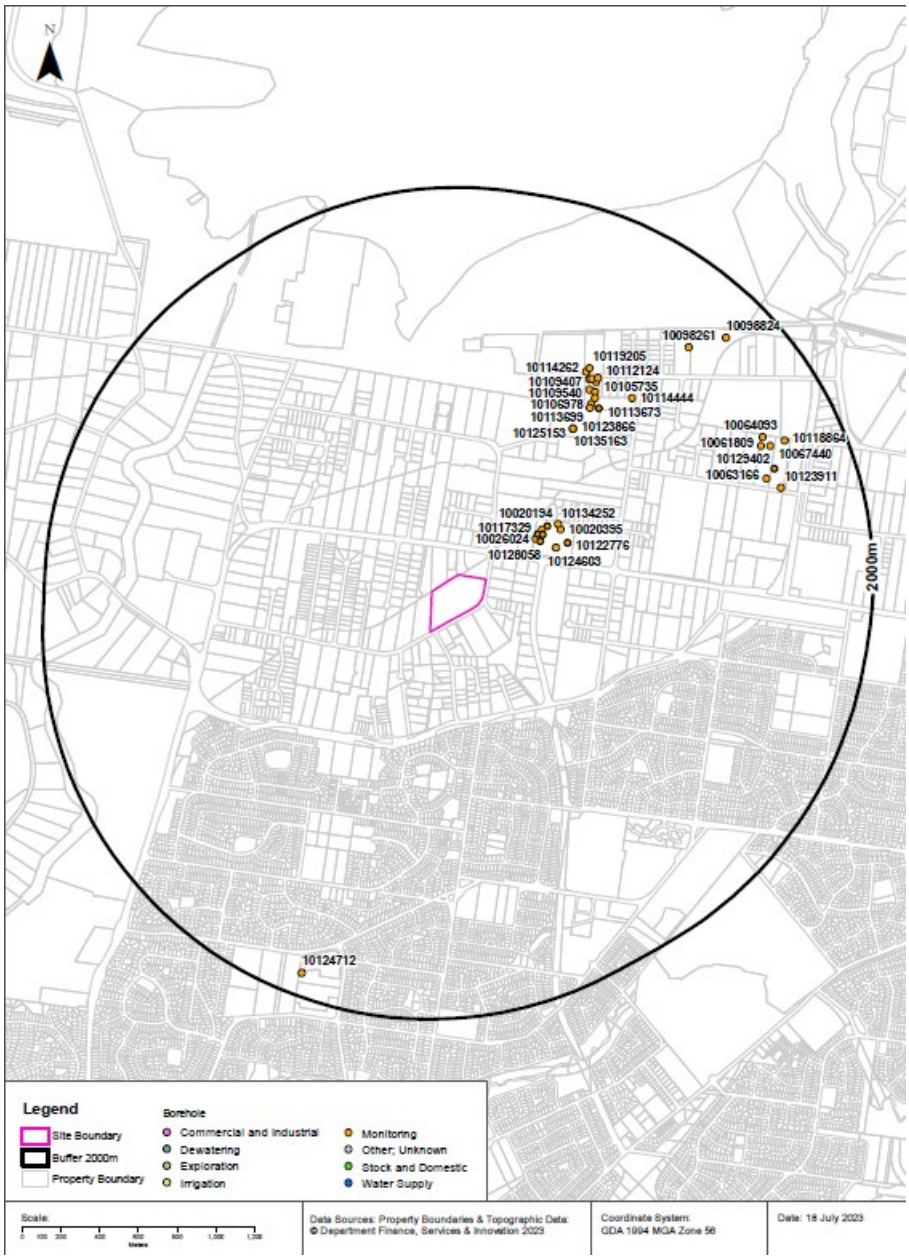


Figure 2.9.4 – Licensed Groundwater Bores Nearby the Site.

A summary of the 10 bores within 500 m of the Site is presented below:

- The bores are used for monitoring and were installed between 2006 and 2009.
- The closest monitoring bore is 332 m from the Site.
- The total depth of the bores ranged from 1.10 and 5.10 metres below ground level (m BGL).
- No standing water levels or salinity concentrations were reported.

Site Specific Hydrogeological Information

Four (4) groundwater monitoring wells were installed at the site to a maximum depth of 8.50 m BGL. The stabilised groundwater details are provided in **Table 3**.

Table 3 – Onsite Monitoring well details

Well ID	Latitude	Longitude	Well depth (m BGL)	TOC RL[2] (m AHD)	Observed Groundwater Level (m BTOC[3])	Groundwater RL (m AHD)
MW01	304811.9	6252719	8.5	51.538	4.9	46.638
			7.3		5.13	46.408
MW02	304912	6252903	6.5	46.32	5.52	40.8
			6.81		5.715	40.605
MW03	304782.8	6252874	7	45.343	3.76	41.583
			7.75		3.853	41.49
MW04	3050041	6252924	6.55	45.22	4.153	41.067
			6.66		4.375	40.845

MW01 was located on a small hill in the south western portion of the Site and it's considered groundwater was mounded in this area.

The maximum groundwater elevation across the Site in the most recent monitoring round was 46.408 m AHD and regional groundwater was calculated to flow north/northeast towards the drainage channel.

2.10 Hydrochemistry

Groundwater sampling was undertaken in the EP Risk DSI (2023) at four (4) on-site monitoring wells. Groundwater was generally colourless to pale brown in colour and had low to moderate turbidity. No odour was observed in any of the monitoring well. A review of the stabilised groundwater field quality parameters prior to sampling indicated the following ranges:

- Temperature = 20.0 to 23.2°C.
- Total Dissolved Solids (TDS) = 2,497 to 14,387 mg/L.
- Oxidation – Reduction reaction (Redox) = 93.9 to 121.0 mV.
- Electrical conductivity (EC) = 3.8 to 22.1 mS/cm.
- Dissolved Oxygen (DO) = 0.25 – 1.55 mg/L.
- pH = 5.99 to 7.00.

The groundwater parameters indicated the groundwater across the Site was fresh to saline. pH was reported to be acidic to neutral throughout the Site. Dissolved oxygen at the Site was reported to be low.

A number of additional physiochemical parameters were also recorded for the groundwater sample including analysis for major cations and major anions, with the results from the 1st November 2023 presented the piper diagram as **Figure 2.10.1.**

[2] Top of casing, as surveyed by an appropriately licensed land surveyor (Affinity Survey) on 19/10/2023.
[3] M BTOC – metres below top of casing.

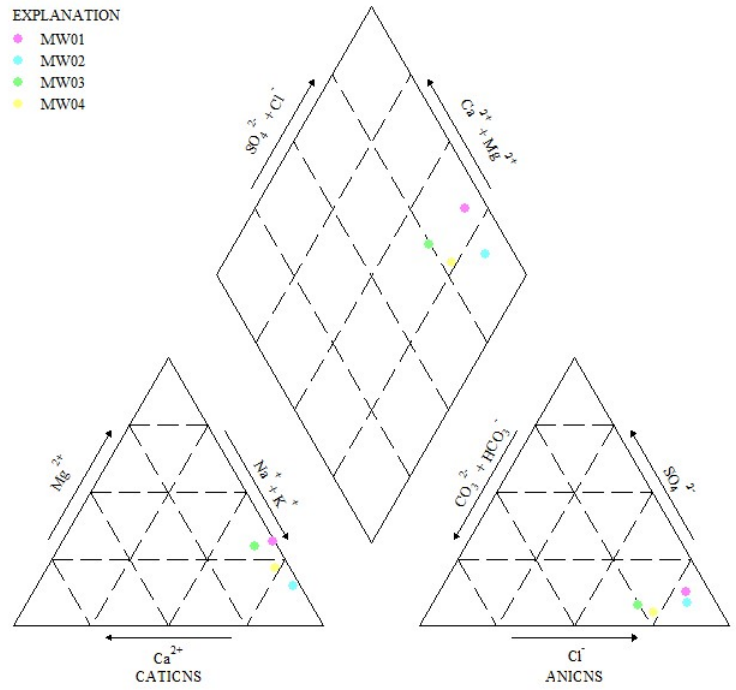


Figure 2.10.1 – Piper Diagram

The groundwater sample from all four of the monitoring wells (MW01-MW04) can be classified as sodium chloride (Na-Cl) type waters.

2.11 Groundwater Dependent Ecosystems

No groundwater – dependent ecosystems (GDE) were identified at the Site; however, one moderate potential GDE was identified within 1 km of the Site:

- Moderate potential GDE – from national assessment – Vegetation – Terrestrial (937 m southwest).

3 Groundwater Conceptual Model

3.1 Hydrostratigraphy

Based on the Detailed Site Investigation (EP Risk, 2023), the Site is underlain by:

- FILL – Silty SAND: fine to medium sand, dry, loose, angular gravels. Encountered from the surface to approximately 0.2 m below ground level.
- Sandy CLAY: Dark brown – pale grey, moist to wet, low to medium plasticity clay. Encountered below the sand to approximately 5 m BGL - 7.5 m BGL.
- SHALE: extremely weathered (XW) at the bedrock surface, quickly becoming slightly weathered (SW) and high strength fresh (FR), medium to coarse grained, grey-pale grey-red, wet. Encountered from approximately 5 m BGL to 7.5 m BGL.

3.2 Aquifer Properties

A summary of the aquifer properties based on literature values is presented in **Table 4.**

Table 4 – Aquifer Properties

Aquifer Property	Unit 1 – Residual (perched aquifer) and Alluvial	Unit 2 - SHALE
Thickness (m)[4]	**South West Portion:** >7.5 m (51 m AHD to <43.5 m AHD) **Rest of the Site:** 5 – 6 m (46 m AHD to 41 m AHD)	> 4 m (encountered at 41 m AHD to <37 m AHD)
Hydraulic Conductivity[5] (m/s)	1 x 10^{-3} to 1 x 10^{-5} m/s	1 x 10^{-4} to 1 x 10^{-8} m/s
Porosity[6]	0.3	0.2

3.3 Proposed Development

The proposed development includes demolition of existing buildings and structures on the Site and construction and operational use of a single-storey warehouse and distribution centre with ancillary office space and amenities, on-site parking, landscaping and access, and other associated works including bulk earthworks, site preparation works and site clearance, as well as augmentation and construction/relocation of servicing utilities including stormwater and sewer assets.

An overview showing the proposed development (concept plans) is attached as **Appendix A**.

3.4 Conceptual Model Summary

The conceptual model was created using the above information and a summary of the model is presented in **Figure 3.6.1**.

[4] EP Risk Detailed Site Investigation (2021)
[5] McNally (2004)
[6] Hatley (2004)

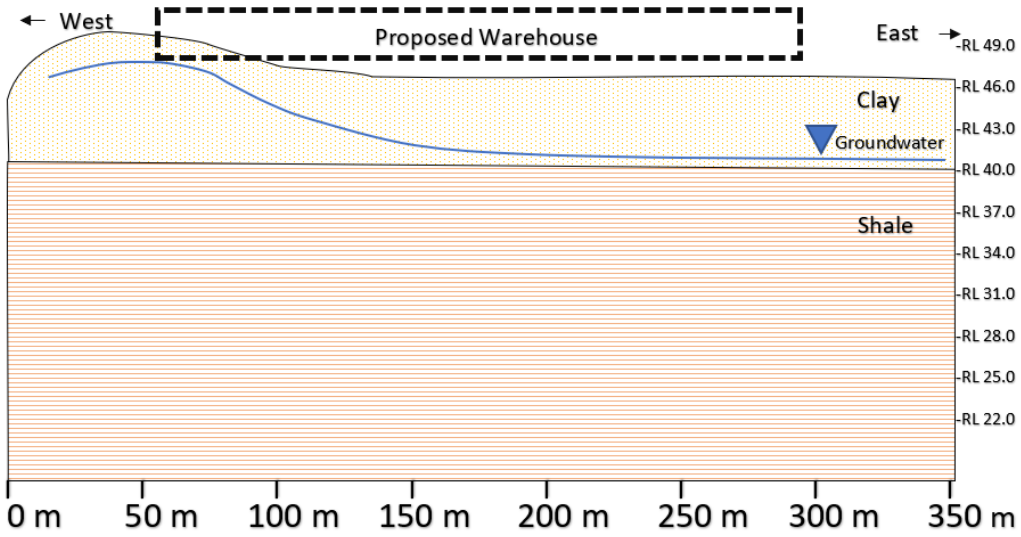


Figure 3.6.1 – Groundwater Conceptual Model Developed for the Site

The conceptual model is used to inform the groundwater dewatering analysis and subsequent impact assessments.

4 Legislative Context

4.1 NSW Legislation

4.1.1 Protection of the Environment Operations Act 1997

The Protection of the Environmental Operations Act 1997 (POEO) is NSW legislation administered by the NSW Environment Protection Authority (NSW EPA). The POEO Act regulates air and water pollution, noise control and waste management and outlines the provision of environmental protection licences that owners or occupiers of premises engaged in scheduled activities are required to hold and comply with. The proposal is not considered a scheduled activity under the POEO Act.

Under the POEO Act, there is a legal responsibility to ensure that runoff leaving a site meets an agreed minimum water quality standard, including water being discharged from the Site following storm events.

4.1.2 Protection of the Environment Administration Act 1991

The Protection of the Environment Administration Act 1991 is NSW legislation that establishes the EPA, Board of the EPA and community consultation forums. The objectives of the Act are to protect, restore and enhance the quality of the environment and to reduce risks to human health. It sets out obligations and responsibilities for managing activities that may cause environmental harm and allows the Board to determine whether the EPA should institute proceedings for serious environmental protection offences. Under the Act, any discharges into water of substances likely to cause harm to the environment as a consequence of the proposal activities must be reduced to harmless levels.

4.1.3 Water Act 1912 and Water Management Act 2000

The Water Act 1912 and the Water Management Act 2000 (WM Act) are the two major pieces of legislation for the management of water in NSW and contain provisions for the licencing of water access and use. The Water Act 1912 has historically been the main legislation for managing water resources in NSW, however, is currently being progressively phased out and replaced by water sharing plans (WSPs) under the WM Act.

The aim of the WM Act is to ensure that water resources are conserved and properly managed for sustainable use benefiting both present and future generations. It is also intended to provide formal means for the protection and enhancement of the environmental qualities of waterways and in-stream uses as well as to provide for protection of catchment conditions.

Water sharing plans

Water sources in NSW are managed via WSPs under the WM Act. Provisions within WSPs provide water to support the ecological processes and environmental needs of groundwater dependent ecosystems and waterways. WSPs also regulate how the water available for extraction is shared between the environment, basic landholder rights, town water supplies and commercial uses. Key rules within the WSPs specify when licence holders can access water and how water can be traded.

Water access licences (WAL) entitle licence holders to specified share components in the available water that may be sustainably extracted from a particular water source. The actual volume of water available to be extracted may vary, dependent on available water determinations made under the WM Act. Available water determinations are made for each WAL category in each water source and are generally made at the start of a water year, although may be altered at any time.

The Proposed Development is within the Water Sharing Plan for the Greater Metropolitan Region Unregulated River Sources 2011 and the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011.

Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011

The proposal development is within the Water Sharing Plan for the Greater Metropolitan Region Unregulated River Sources 2011 (NSW Government 2018) and is located in the Prospect Creek Groundwater Source. This plan applies to groundwater sources and includes rules for environmental water provisions, long term average extraction limits and access, trading and works approvals.

Water Access Licences

Under Schedule 4, Part 1, clause 7 of the Water Management (General) Regulation 2018, extraction of < 3 ML of water from any aquifer for the purposes of excavation dewatering is exempt from requiring a WAL.

Water Supply Work Approval

Under the Water Management Regulations (2018), to construct a bore or 'work' to facilitate the dewatering, A water supply work approval must be granted. There are currently no exemptions to this requirement that apply to the Site.

4.2 Policies and Guidelines

The following policies and guidelines are relevant to this impact assessment.

4.2.1 General Policies and Guidelines

National Water Quality Management Strategy

Since 1992, the National Water Quality Management Strategy (NWQMS) (ARMCANZ & ANZECC 1994) has been developed by the Australian and New Zealand Governments in cooperation with state and territory governments. The NWQMS aims to protect the nation's water resources, by improving water quality while supporting the businesses, industry, environment and communities that depend on water for their continued development.

The NWQMS consists of three major elements: policy, process and guidelines. The main policy objective of the NWQMS is to achieve sustainable use of water resources, by protecting and enhancing their quality, while maintaining economic and social development. The process strives to form a nationally consistent approach to water quality management through the development of high-status national guidelines. The guidelines provide the point of reference when issues are being determined on a case-by-case basis. These include guidance on regulatory and market-based approaches to managing water quality as well as regional water quality criteria.

The Australian and New Zealand Environment and Conservation Council (ANZECC) guidelines are relevant to this assessment.

Australian and New Zealand Guidelines for Fresh and Marine Water Quality

The Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018) (hereforth referred to as the ANZG guidelines) are based on the policies and principles of the NWQMS. The main objective of the guidelines is to provide an authoritative guide for setting water quality objectives required to sustain

current or likely future environmental values for natural and semi-natural water resources in Australia and New Zealand. The guidelines provide a set of tools to enable the assessment and management of ambient water quality in a wide range of water resource types and define the recommended limits to acceptable changes in water quality.

It should be noted that these guidelines have not been designed specifically for direct application in activities such as discharge consents, recycled water quality or stormwater quality. They have been derived to apply to ambient waters that receive effluent or stormwater discharges and protect the environmental values they support. However, the ANZG guidelines have been used as the basis for the groundwater quality assessment presented in this report.

Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales

The Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales (DEC 2004) document lists the sampling and analysis methods to be used when complying with a requirement to test for the presence or concentration of matter in water and the volume, depth and flow of water or wastewater.

4.2.2 Groundwater Policies and Guidelines

NSW Aquifer Interference Policy

The NSW Aquifer Interference Policy requires that potential impacts on groundwater sources, including their users and groundwater dependant ecosystems, be assessed against the minimal impact considerations outlined in the policy. If the predicted impacts of the proposal are less than the minimal impact considerations, then the potential groundwater impacts of the proposal are acceptable.

The NSW Aquifer Interference Policy (NOW, 2012) was finalised in September 2012 and clarifies the water licencing and approval requirements for aquifer interference activities in NSW. Many aspects of this policy will be given legal effect in the future through an Aquifer Interference Regulation. Stage 1 of the Aquifer Interference Regulation started on 30 June 2011.

This policy outlines the water licensing requirements under the Water Act 1912 and WM Act. A water access licence is required whether water is taken for consumptive use or whether it is taken incidentally by the aquifer interference activity (such as groundwater filling a void) even where that water is not being used consumptively as part of the activity's operation.

Sufficient access licences must be held to account for all water taken from a groundwater or surface water source as a result of an aquifer interference activity, both for the life of the activity and after the activity has ceased. This take of water continues until an aquifer system reaches equilibrium and must be licensed.

The NSW Aquifer Interference Policy requires that potential impacts on groundwater sources, including their users and groundwater dependant ecosystems, be assessed against the minimal impact considerations outlined in the policy. If the predicted impacts of the proposal are less than the minimal impact considerations, then the potential groundwater impacts of the proposal are acceptable.

NSW State Groundwater Policy Framework Document

The objective of the NSW State Groundwater Policy Framework Document (DLWC 1997) is to manage the State's groundwater resources so that they can sustain environmental, social and economic uses for the people of NSW. The policy has three component parts:

- NSW Groundwater Quantity Management Policy (DLWC 1998a)

- NSW Groundwater Quality Protection Policy (DLWC 1998b)
- The NSW State Groundwater Dependent Ecosystem Policy (DLWC 2002).

NSW Groundwater Quality Protection Policy

The NSW Groundwater Quality Protection Policy (DLWC 1998b) is a component of the NSW State Groundwater Policy. The focus of this policy is to protect from pollution water below the ground surface in aquifers, and ecosystems from which these waters are recharged or into which they discharge. It provides a framework for the sustainable management of groundwater quality.

The NSW State Groundwater Dependent Ecosystems Policy

The NSW State Groundwater Dependent Ecosystems Policy (DLWC 2002) is a component of the NSW State Groundwater Policy. It is designed to protect valuable ecosystems which rely on groundwater for survival and provides guidance on how to protect and manage these natural systems in a practical sense.

Guidelines for groundwater quality protection in Australia

The Guidelines for groundwater quality and protection in Australia (DAWR 2013) are designed to support the objectives of the NWQMS as they relate to groundwater. They provide currently known principles and key methods for maximising groundwater quality protection under the three following frameworks:

- Groundwater management – which deals with groundwater entitlements and allocations.
- Land-use planning – which controls decisions on land development.
- Environmental protection – which deals with environmental maintenance and hazardous activities.

Risk Assessment Guidelines for Groundwater Dependent Ecosystems

The Risk Assessment Guidelines for Groundwater Dependent Ecosystems (OEH 2012) document assists in support of the requirements of the Water Management Act 2000 in relation to groundwater dependent ecosystems (GDEs). It provides guidance on the methods to identify and value GDEs and risk assessment framework.

Minimum Requirements for Building Site Groundwater Investigations and Reporting

The minimum requirements for building site groundwater investigations and reporting (NSW DPIE 2021) assists in support of the requirements of the Water Management Act 2000 in relation to groundwater dewatering and the assessment framework.

5 Dewatering Assessment

The proposed development includes demolition of the existing structures on the Site and construction of a large warehouse and ground level parking. In addition to the structures, underground services will be required to be constructed and/or relocated including stormwater and sewer assets.

For the purposes of this assessment, the lowest predicted depth of disturbance was estimated by reviewing the existing services and proposed development plans and the following was observed:

- The deepest invert level for the proposed stormwater was 41.77 m AHD and the highest measured groundwater level was recorded at 46.408 m AHD.
- The largest proposed cut is located in the south western portion where the perched water aquifer exists and extends up to a maximum of 4.591 m below existing ground level at an elevation of 46.64 m AHD. The maximum perched water level measured in MW01 in this area was 46.64 m AHD.
- The Proposed warehouse floor is 47.10 m AHD +/- 500 mm and is above the maximum groundwater level.
- The proposed development includes construction of a new 225 mm sewer line and connection to the existing sewer via a new manhole in the southern and northern portions of the Site. No cross sections showing the proposed depth of sewer relocation were provided however review of the existing services plan indicated the proposed sewer invert levels would range between 45.8 in the south to 42.0 m AHD in the north to connect to the existing sewer infrastructure.

Based on the information contained in the concept plans provided, it's considered that dewatering mostly be limited to the following:

- Some minor dewatering of the perched water aquifer in the south western portion during bulk earthworks may be required.
- Some minor dewatering in some proposed stormwater and sewer excavations will be required.

A further review of the proposed dewatering estimate should be undertaken following the design finalisation.

5.1 Summary of Proposed Dewatering Methodology

Vertical dewatering would likely be the preferred dewatering method given the low volumes of dewatering required. The groundwater would likely need to be treated given the high salinity at the Site. The treatment method would likely comprise pH adjustment and settlement to remove solids to meet the water quality objectives.

Opportunities for reuse of water at the Site that meet the water quality objectives should be prioritised for all dewatering activities however reuse applications are limited due the limited footprint of the Site. Where large volumes of water are produced, treatment and disposal to sewer under a trade waste agreement (TWA) would likely be the preferred disposal option. A detailed water treatment design should be prepared once the dewatering method has been decided and disposal / reuse options determined.

5.2 Calculation of Groundwater Take

To estimate the total groundwater take during the proposed construction works, calculations were undertaken in accordance with the theory presented by Powers (2007) *Construction Dewatering: New Methods and Applications* as presented below.

Dewatering via a vertical dewatering bore can be approximated using plane flow and partially penetrating slots in an unconfined aquifer. The radius of the cone of depression of the water table of a large diameter bore is approximated by the following equations (**Equation 1, 2 and 3**) as follows:

$$R_0 = 3000(H - h)\sqrt{K}$$ - Equation 1

Where:

R_o = radius of influence (m)

H = Saturated thickness of aquifer prior to dewatering (m)

h = Saturated thickness of aquifer at maximum drawdown (m)

K = Hydraulic conductivity (m/sec)

$$r_s = \sqrt{\frac{ab}{\pi}}$$ - Equation 2

Where:

r_s = radius of the equivalent well system (m)

a = Length of the excavation (m)

b = Width of the excavation (m)

The calculation of pumping rate can be calculated from **Equation 3** below.

$$Q = \frac{\pi K(H^2 - h^2)}{Ln(\frac{R_0}{r_s})}$$ - Equation 3

Where:

H = Saturated thickness of the aquifer prior to pumping (m)

h = Saturated thickness of the aquifer at maximum drawdown (m)

K = Hydraulic conductivity (m/sec)

R_o = radius of influence (m)

R_s = equivalent radius of the well system (m)

Q = pumping rate from the dewatering system (m^3/sec)

Based on the calculations attached as **Appendix B**, the estimates of groundwater take over the proposed construction period is approximately **6.99 ML.** The maximum radius of influence was calculated to be 46 m from the edge of the excavation.

6 Construction Impact Assessment

6.1 Groundwater Level Impacts

Due to being underlain by Winnamatta Group Shales, the proposal area is classed as a "less productive groundwater source" under the NSW Aquifer Interference Policy (AIP). A less productive groundwater source is defined by the AIP as a groundwater source having total dissolved solids greater than 1,500 milligrams per litre or does not contain water supply works that can yield water at a rate greater than five litres per second.

The NSW Aquifer Interference Policy requires that potential impacts on groundwater sources, including their users and groundwater dependant ecosystems, be assessed against the minimal impact considerations outlined in the policy. If the predicted impacts are less than the Level 1 minimal impact considerations for less productive fractured rock groundwater sources, then the potential groundwater impacts of the proposal are acceptable. The Level 1 minimal impact considerations for less productive porous and fractured rock water sources are:

- Less than or equal to 10 per cent cumulative variation in the water table, allowing for typical climatic 'post-water sharing plan' variations, at a distance of 40 metres from any high priority GDEs or high priority culturally significant site listed in the schedule of the relevant water sharing plan.
- A maximum of a two metre water table decline cumulatively at any water supply work.
- Any change in the groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 metres of the activity.

The proposal has been assessed against the adopted Level 1 minimal impact considerations below.

6.1.1 Water supply works

The maximum radius of influence for the proposed dewatering was calculated as 46 and the closest water supply works is at least 300 m away from the Site and therefore the proposal would not result in any impacts to a water supply work.

6.1.2 High priority culturally significant sites

There are no high priority culturally significant sites listed in the Water Sharing Plan for the Southern Sydney Rivers Groundwater Sources. Therefore, the proposal would not result in any impacts to a culturally significant site.

6.1.3 Groundwater dependent ecosystems

No high priority GDE's were identified within 1 km of the Site and based on the limited dewatering, the proposal would not result in any impacts to any high priority GDE's.

6.1.4 Summary

The proposal is not predicted to result in any decline in groundwater pressure or groundwater head at any water supply works or high priority GDE and is not predicted to alter the beneficial use of the groundwater.

6.2 Water Quality Impacts

The following potential impacts of the construction phase of the proposal on surface water and groundwater quality have been identified:

- Increased erosion from a range of construction activities resulting in an increase in sedimentation in downstream waterways.
- Contamination of waterways or groundwater from chemical or hydrocarbon spills.
- Discharge of excess groundwater resulting in pollution of receiving drainage networks and watercourses.

To manage these potential impacts a Soil and Water Management Plan (SWMP) would be prepared and implemented and include measures to manage and reduce the risk of water quality impacts associated with the works. Mitigating any potential impacts will need to consider best practice in managing the Site, in accordance with the Blue Book (Landcom 2004 / DECC 2008).

Assessment of the water quality outcomes against the ANZECC (2000b) and ANZG (2018) guidelines will be undertaken during detailed design once a water quality monitoring program has been implemented and sufficient water quality data are available. The detailed design would then take into consideration the findings of the assessment and any recommendations for water quality treatment measures, which may include gross pollution traps to remove litter and debris.

6.2.1 Initial Construction Works

During the initial stages of construction, various preparatory works would be undertaken such as site establishment works and construction access provision. These works would also include:

- Installation of environmental controls, including sediment and erosion controls following best practice guidelines such as the Blue Book (Landcom 2004 / DECC 2008).
- Any necessary flood mitigation measures to manage overland flows and minimise adverse impacts on surrounding environment where possible.

6.2.2 6.2.2 Erosion and Sedimentation

Soil is the most likely potential contaminant that could impact surface water quality during the construction phase if runoff is allowed to mobilise soils from exposed areas. Increased erosion and sedimentation would be influenced by the severity of a storm event and the slope and footprint of the disturbed area.

Where possible, construction and drainage activities would be planned considering the upcoming weather forecast to minimise the risks of potential heavy rainfall and major surface runoff events.

Although planning of activities in this manner would not prevent construction during periods of potentially heavy rainfall, the risk of having disturbed construction areas or unpreparedness during heavy rainfall periods would be reduced.

6.2.3 6.2.3 Spills and leaks

Chemical spills and leaks have the potential to contaminate both surface water via rainfall runoff processes or groundwater through infiltration. Prior to construction the need for spill kits should be assessed along with the best location for such equipment. Storage of hazardous goods, maintenance activities and refuelling activities would be undertaken in bunded areas and away from waterways and stormwater drains. These locations would be identified in the SWMP.

6.2.4 Dewatering Discharges

Where excavation activities are deep enough to intercept groundwater, dewatering may be required. Discharge of groundwater without assessment or treatment to receiving environments can introduce pollutants. Where possible the dewatered groundwater should be used on-site for irrigation or dust suppression activities. If on-site use is not possible then offsite discharge or disposal options should be considered in consultation with Council and WaterNSW.

7 Operational Impact Assessment

7.1 Groundwater Level Impacts

A large portion of the Site is covered by existing impermeable concrete hardstand and warehouse footprint. The slight increase in hard stand areas compared to the existing layout may result in some local changes to the rates of rainfall infiltration. The main groundwater receptor is baseflow to waterways. Runoff from hard stand areas will continue to flow towards the drainage channel to the north. Therefore, reduction in rainfall infiltration is likely to have a negligible effect in flows available to groundwater receptors in the area.

Due to the lack of long-term interaction of the proposed development with groundwater, the proposed development is not predicted to result in any long-term impact on groundwater level. Therefore, it is predicted that the groundwater impacts would be less than the Level 1 minimal impact considerations specified in the NSW Aquifer Interference Policy and are therefore considered acceptable.

7.2 Water Quality Impacts

As mentioned above, due to the lack of long-term interaction of the proposed development with groundwater, and only a slight change in hard stand areas compared to the existing development, the proposed development is not predicted to result in any long-term impact on groundwater quality. Therefore, it is predicted that the groundwater impacts would be less than the Level 1 minimal impact considerations specified in the NSW Aquifer Interference Policy and are therefore considered acceptable.

8 Mitigation and Management Measures

8.1 Construction Phase

8.1.1 Surface water and groundwater management and mitigation

A Soil and Water Management Plan (SWMP) would be prepared as part of the Construction Environment Management Plan (CEMP). The SWMP would define the control and mitigation of potential surface water and groundwater quality impacts during construction. The SWMP would be developed to incorporate the most appropriate or 'best practice' controls and measures in accordance with the Blue Book (Landcom 2004/DECC 2008). The SWMP would be staged to suit the changing needs as the works progress. Due consideration would also be given to the extent of works and situation relative to the sensitivity of the environment surrounding the construction activity.

Both the CEMP and SWMP would typically include strategies such as:

- Bunding of storage areas containing hazardous goods and undertaking of refuelling activities in bunded areas.
- The staging of construction to minimise potential impacts.
- Separating clean and dirty water and preventing infiltration of impacted surface water into the underlying groundwater system.
- Preventing groundwater seepage from contacting potentially contaminating site activities by minimising ponding of water in active areas and making storage facilities impermeable.
- Preventing impacted groundwater from entering the surface water management system unless it represents a credible treatment option.
- Adequately storing and handling site chemicals.
- Identifying and responding to chemical spills and managing their clean-up.
- Monitoring for the emergence of diffuse water quality impacts and implementing response procedures to remediate any impact.

With appropriate strategies in place, the risk of increased sedimentation in the receiving watercourses would be substantially reduced.

Further, existing open swale drains and any other open drainage channels provided through construction areas will help provide an opportunity to cut off, via emergency bunding where required, any spills and leaks that may begin running off-site or into underground stormwater drainage networks. This would be in the unlikely event of chemical spills or leaks occurring within the proposal area.

Construction-related risks, such as earthworks, spills, and stockpile and equipment locations, are fairly common for projects of this size and type and would be managed in accordance with the Blue Book (Landcom 2004 / DECC, 2008).

Impacts on groundwater due to excavations below the groundwater table and associated dewatering should be mitigated by minimising time that excavations are left open, minimising size of excavations and siting excavations away from groundwater receptors where possible. Any dewatered groundwater may be used on-

site for dust suppression or irrigation, with excess water potentially discharged to stormwater. If excess water is to be discharged then testing is recommended prior to discharge.

Bunding of storage areas containing hazardous goods and undertaking of refuelling activities in bunded areas would reduce the risk of the proposal impacting on groundwater quality. All hazardous goods and re-fuelling activities would be undertaken in these bunded areas. These practices would be outlined in the SWMP.

8.1.2 Surface water flow monitoring

Monitoring of surface water flows is not required as impacts from the proposal are considered to be negligible.

8.1.3 Residual impact

Residual impacts of the construction phase of the proposal may include slightly increased surface runoff and transport of litter and other pollutants to receiving watercourses. Water quality impacts would be managed through implementation of runoff and erosion control measures and the water quality monitoring program.

8.2 Operational phase

8.2.1 Surface water and groundwater management and mitigation

The intent of the proposal design with regard to surface water quality would be to minimise impacts on the receiving systems and implement the design criteria. In general, Water Sensitive Urban Design (WSUD) principles should be incorporated including erosion control measures such as soil stabilisation, landscaping, planting native vegetation and mulching.

The intent of the proposal design with regard to groundwater quality would be to balance reduced infiltration as a consequence on increased impervious area with the need to minimise infiltration of compromised surface water into the groundwater system. In general, the measures outlined for the management of surface water above should adequately achieve this balance.

8.2.2 Material re-use

To minimise the potential for dispersive erosion following completion of the construction phase, gypsum stabilisation of site won material reused as general fill should be considered.

8.2.3 Surface water flow monitoring

Monitoring of surface water flows is not required as impacts are considered negligible.

8.2.4 Groundwater elevations and drawdowns

There is no requirement to monitor groundwater elevations and drawdowns as impacts are considered negligible during the operational phase.

8.2.5 Surface water and groundwater quality monitoring

It is not proposed that surface water or groundwater monitoring is required during the operational phase of the Project.

8.2.6 Residual impact

Residual impacts of the operational phase of the proposal may include slightly increased surface runoff and transport of litter and other pollutants to receiving watercourses. Water quality impacts would be managed through implementation of water sensitive urban design measures.

9 Conclusion

A summary of the findings of the impact assessment are presented below. Some impacts have been identified however with the implementation of appropriate mitigation and monitoring controls; it is expected that the impacts identified will be acceptable.

Potential construction stage impacts include contamination from chemical or hydrocarbon spills and increased sediment loads being discharged to downstream systems as a result of runoff from exposed areas. Construction impacts would be managed through implementation of SWMPs in accordance with the Blue Book and detailed planning and management of construction sites to avoid impacting overland flow paths without appropriate mitigation.

Water quality impacts would be managed through implementation of water sensitive urban design measures.

Construction stage impacts on groundwater may occur due to minor interception of groundwater by excavations associated with construction. Impacts on groundwater level due to dewatering would occur during the construction phase only.

A summary of the key impacts and proposed mitigation and monitoring measures are presented in **Table 5.**

Table 5 – Potential Construction and Operation Impacts and Mitigation Measures

Activity	Potential Impacts	Risk Rating	Mitigation Measures	Residual Risk Rating
Interception of groundwater aquifer	Significant drawdown due to dewatering operations	Moderate	Minimising the duration of time that excavations below the water table are open.	Low
Chemical or hydrocarbon spill	Contamination of groundwater	Moderate	Storage of hazardous materials and refuelling to be undertaken in bunded areas. Spill kits to be kept onsite and staff informed of how to use them in an incident.	Low
Discharge of excess groundwater	Contamination of stormwater networks by discharging contaminated groundwater.	Moderate	Where possible, use the extracted water as dust suppression onsite. Approval to treat and dispose to sewer should be obtained if large volumes are required to be dewatered.	Low

10 References

ANZECC & ARMCANZ 2000a *Australian Guidelines for Urban Stormwater Management*. Canberra: Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ).

ANZECC & ARMCANZ 2000b *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Canberra: Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ).

ANZG 2018 *Australian and New Zealand Guidelines for Fresh and Marine Quality: Default Guideline Values,* retrieved 9 January 2020 from https://www.waterquality.gov.au/anz- guidelines/guideline-values/default.

ARMCANZ & ANZECC 1994 *National water Quality Management Strategy: Water Quality Management – an outline of the policies*: Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ).

DEC 2004 Approved Methods for the Sampling and Analysis of Water Pollutants in New South Wales. NSW Department of Environment and Conservation.

DEC 2006 *Using the ANZECC Guidelines and Water Quality Objectives in NSW*. NSW Department of Environment and Conservation (DEC).

DEE 2019 *Context statement for the Sydney Basin bioregion*. Department of Environment and Energy. Accessed 20 December 2019 from https://www.bioregionalassessments.gov.au/assessments/11-context-statement-sydney-basin- bioregion/1141-groundwater-systems.

DWLC 1997 *The NSW State Groundwater Policy Framework Document*. NSW Department of Land and Water Conservation.

DLWC 1998 The NSW Groundwater Quality Protection Policy - A Component Policy of the NSW State Groundwater Policy. NSW Department of Land and Water Conservation.

DLWC 2002. *The NSW State Groundwater Dependent Ecosystems Policy*. NSW Department of Land and Water Conservation.

EP Risk (2023), Detailed Site Investigation, 94 Newton Road, Wetherill Park, NSW (Ref: EP3206.001 v1).

Hatley RK (2004) Hydrogeology of the Botany Basin. Australian Geomechanics 39(3), 73–90.

Herron NF, McVicar TR, Rohead-O'Brien H, Rojas R, Rachakonda PK, Zhang YQ, Dawes WR, Macfarlane C, Pritchard J, Doody T, Marvanek SP and Li LT (2018) Context statement for the Sydney Basin bioregion. Geoscience Australia.
Landcom 2004 Managing Urban Stormwater: Soils and Construction Volume 1.

NHMRC, NRMMC 2011 *Australian Drinking Water Guidelines Paper 6 National Water Quality management Strategy*. National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra.

NOW 2011a Water Sharing Plan, Greater Metropolitan Region Groundwater Sources Background Document. Sydney: NSW Office of Water.

NOW 2012 *NSW Aquifer Interference Policy*. State of NSW, Department of Trade and Investment, Regional Infrastructure Services - NSW Office of Water.

NSW Department of Planning, Industry and Environment 2021, Minimum requirements for building site groundwater investigations and reporting.

NSW Government 2015 Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011, Current version for 1 January 2015.

NSW Government 2018 Water Sharing Plan for the Greater Metropolitan Region Unregulated River Water Sources 2011, Current version for 14 January 2018.

NWQMS 2013 Guidelines for Groundwater Quality protection in Australia. National Water Quality Management Strategy.

Serov P, Kuginis L, Williams J.P., 2012 *Risk assessment guidelines for groundwater dependent ecosystems, Volume 1 – The conceptual framework*, NSW Department of Primary Industries, Office of Water, Sydney.

Powers J. P., Corwin A. B., Paul C., Schmall P.C. and Kaeck W. E. (2007). *Construction Dewatering and Groundwater Control: New Methods and Applications*, Third Edition.

Figures

EP RISK
www.eprisk.com.au

Groundwater Impact Assessment
74/94 Newton Road, Wetherill Park NSW, Australia

Job No: EP3206
Date: 09-11-2023
Version: v1

0 25 m 50 m
Approximate Scale Only

Coordinate System: WGS 84
Drawn By: OG Checked By: OG
Scale of regional map not shown
Source: Nearmaps/OpenStreetMap

Figure 1 - Site Layout and Monitoring Well Locations

Appendix A
PROPOSED DEVELOPMENT PLANS

PROPOSED MULTI-LEVEL WAREHOUSE

74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

STATE SIGNIFICANT DEVELOPMENT APPLICATION PACKAGE

DRAWING LIST

GENERAL NOTES:

1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
2. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AND CURRENT STANDARDS AUSTRALIA CODES AND WITH THE BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATION.
3. ALL DIMENSIONS SHOWN SHALL BE VERIFIED BY THE BUILDER ON SITE. ENGINEER'S DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS. ENGINEER'S DRAWINGS ISSUED IN ANY ELECTRONIC FORMAT MUST NOT BE USED FOR DIMENSIONAL SETOUT. REFER TO THE ARCHITECT'S DRAWINGS FOR ALL DIMENSIONAL SETOUT INFORMATION.
4. DURING CONSTRUCTION THE STRUCTURE SHALL BE MAINTAINED IN A STABLE CONDITION AND NO PART SHALL BE OVERSTRESSED. TEMPORARY BRACING SHALL BE PROVIDED BY THE BUILDER TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.
5. UNLESS NOTED OTHERWISE ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN MILLIMETRES.
6. ALL WORKS SHALL BE UNDERTAKEN IN ACCORDANCE WITH ACCEPTABLE SAFETY STANDARDS & APPROPRIATE SAFETY SIGNS SHALL BE INSTALLED AT ALL TIMES DURING THE PROGRESS OF THE JOB.

ELECTRONIC INFORMATION NOTES:

1. THE ISSUED DRAWINGS IN HARD COPY OR PDF FORMAT TAKE PRECEDENCE OVER ANY ELECTRONICALLY ISSUED INFORMATION, LAYOUTS OR DESIGN MODELS.
2. THE CONTRACTOR'S DIRECT AMENDMENT OR MANIPULATION OF THE DATA OR INFORMATION THAT MIGHT BE CONTAINED WITHIN AN ENGINEER-SUPPLIED DIGITAL TERRAIN MODEL AND ITS SUBSEQUENT USE TO UNDERTAKE THE WORKS WILL BE SOLELY AT THE DISCRETION OF AND THE RISK OF THE CONTRACTOR.
3. THE CONTRACTOR IS REQUIRED TO HIGHLIGHT ANY DISCREPANCIES BETWEEN THE DIGITAL TERRAIN MODEL AND INFORMATION PROVIDED IN THE CONTRACT AND/OR DRAWINGS AND IS REQUIRED TO SEEK CLARIFICATION FROM THE SUPERINTENDENT.
4. THE ENGINEER WILL NOT BE LIABLE OR RESPONSIBLE FOR THE POSSIBLE ON-GOING NEED TO UPDATE THE DIGITAL TERRAIN MODEL, SHOULD THERE BE ANY AMENDMENTS OR CHANGES TO THE DRAWINGS OR CONTRACT INITIATED BY THE CONTRACTOR.

LOCALITY PLAN
NTS

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 10

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: DRAWING LIST & GENERAL NOTES

DRAWING No: C015039.01-SSDA 10 ISSUE: A

SITE PREPARATION NOTES:

1. ALL EARTHWORKS SHALL BE COMPLETED GENERALLY IN ACCORDANCE WITH THE GUIDELINES SPECIFIED BY THE GEOTECHNICAL ______________ PROVIDED BY ___________ DATED _________.
2. EXISTING LEVELS ARE BASED ON INFORMATION PROVIDED BY LTS SURVEYORS TITLED 51145 001DT DATED12.10.20.
3. STRIP ANY TOP SOIL OR DELETERIOUS MATERIAL AND DISPOSE OF FROM SITE OR STORE AS DIRECTED.
4. COMPLETE CUT TO FILL EARTHWORKS TO ACHIEVE THE REQUIRED LEVELS AS INDICATED ON THE DRAWINGS WITHIN A TOLERANCE OF +0mm/-10mm THROUGH BUILDING PADS/PAVEMENTS AND +0mm/-20mm ELSEWHERE.
5. PREPARE STEEP BATTERS TO RECEIVE FILL BY CONSTRUCTING BENCHING TO FACILITATE FILL PLACEMENT AND COMPACTION.
6. AREAS TO RECEIVE FILL (THAT ARE NOT ON BENCHED BATTERS) AND AREAS IN CUT SHALL BE PROOF ROLLED TO IDENTIFY ANY SOFT HEAVING MATERIAL. SOFT MATERIAL SHALL BE BOXED OUT AND REMOVED PRIOR TO FILL PLACEMENT. PROOF ROLLING TO BE INSPECTED BY A GEOTECHNICAL ENGINEER OR THE EARTHWORKS DESIGNER.
7. SITE WON FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
8. IMPORTED FILL SHALL BE COMPACTED IN MAXIMUM 300mm LAYERS AND TO DRY OR HILF DENSITY RATIOS (STANDARD COMPACTION) OF BETWEEN 98% AND 103%. THE PLACEMENT MOISTURE VARIATION OR HILF MOISTURE VARIATION SHALL BE CONTROLLED TO BE BETWEEN 2% DRY AND 2% WET.
9. ALL ENGINEERED FILL PARTICLES SHALL BE ABLE TO BE INCORPORATED WITHIN A SINGLE LAYER. FURTHER, LESS THAN 30% OF PARTICLES SHALL BE RETAINED ON THE 37.5 mm SIEVE. ENGINEERED FILL SHALL BE ABLE TO BE TESTED IN ACCORDANCE WITH THE STANDARD COMPACTION METHOD (AS1289.5.4.1) OR HILF TEST METHOD (AS1289.5.7.1). THESE METHODS REQUIRE LESS THAN 20% RETAINED ON THE 37.5 mm SIEVE. WHERE BETWEEN 20% AND 30% OF PARTICLES ARE RETAINED ON THE 37.5 mm SIEVE THE ABOVE TEST METHODS SHALL STILL BE ADOPTED AND TEST REPORTS ANNOTATED APPROPRIATELY. THESE REQUIREMENTS SHOULD BE MET BY THE MATERIAL AFTER PLACEMENT AND COMPACTION
10. ALL THE EARTHWORKS UNDERTAKEN AND THE SUBGRADE CONDITION IN THE CUT AREAS [IN THE STATED PERIOD] ARE DOCUMENTED IN THE REPORTS AND HAVE BEEN UNDERTAKEN IN ACCORDANCE WITH THE SPECIFICATION (EG. COSTIN ROE SITE PREPARATION NOTES IN DWG C013003.01-EWC10)
11. PRIOR TO ANY EARTHWORKS, EROSION CONTROL AS OUTLINED IN THE EROSION AND SEDIMENTATION CONTROL PLAN SHALL BE COMPLETED.
12. EXISTING ROCK, IF ANY, SHALL BE REMOVED BY HEAVY ROCK BREAKING OR RIPPING.
13. MATCH EXISTING LEVELS AT BATTER INTERFACE.
14. CONTRACTOR TO MATCH EXISTING LEVELS AT THE INTERFACE OF EARTHWORKS AND EXISTING SURFACE AT BATTER LOCATIONS OR WHERE NO RETAINING WALLS ARE PRESENT. ANY DISCREPANCY BETWEEN DESIGN AND EXISTING LEVELS TO BE REFERRED TO THE ENGINEER FOR DIRECTION OR ADJUSTMENTS TO DESIGN LEVELS.
15. DURING EARTHWORKS THE CONTRACTOR IS TO ENSURE ALL AREAS ARE FREE DRAINING & WILL NOT RETAIN WATER DURING RAINFALL. PROVIDE TEMPORARY MEASURES AS REQUIRED TO ENSURE FREE FLOWING RUNOFF THROUGH MANAGED DRAINAGE PATHS, DIVERSION DRAINS OR OTHER SUITABLE DISPOSAL METHOD AS AGREED DURING THE WORKS. REFER ANY CONCERNS TO THE ENGINEER. REFER TO EROSION AND SEDIMENT CONTROL DRAWINGS AND NOTES.

SURVEY NOTE:

1. EXISTING SITE LEVELS AND DETAILS BASED ON A PLAN OF SURVEY '51145 001DT' BY 'LTS SURVEYORS' DATED 12.10.2020.

CONTAMINATION NOTE:

CONTAMINATED MATERIAL ENCOUNTERED DURING THE WORKS SHALL BE MANAGED IN ACCORDANCE WITH THE CONTAMINATION MANAGEMENT PLAN, WHICH FORMS PART OF THE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN. A CAPPING LAYER CONSISTING OF CLEAN COMPACTED CLAY FILL (VENM ONLY) TO A MINIMUM DEPTH OF 100mm IS TO BE PROVIDED OVER THE SITE. CONTAMINATED MATERIAL CAN NOT BE REMOVED FOR OFF-SITE DISPOSAL.

DUST CONTROL NOTES:

1. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE DUST CONTROL MEASURES ARE APPLIED AND MAINTAINED IN ACCORDANCE WITH THE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN.
2. THE APPLICATION OF LIQUID BASED DUST SUPPRESSION MEASURES MUST BE SUCH THAT SEDIMENT LADEN RUNOFF RESULTING FROM SUCH MEASURES DOES NOT CREATE A TRAFFIC OR ENVIRONMENTAL HAZARD. (EG USING HAY BALES)
3. DUST GENERATION ASSOCIATED WITH WIND EROSION TO BE CONTROLLED USING WATER TRUCKS, DUST SUPPRESSING FOG, MIST GENERATORS, SEALANT PLACED OVER THE SOIL, SURFACE ROUGHENING OR RE-VEGETATION.
4. THE FOLLOWING ACTIVITIES SHALL BE ADOPTED, IF NECESSARY, TO MANAGE DUST CONTROL ON SITE:
   - LIMITING THE AREA OF SOIL DISTURBANCE AT ANY GIVEN TIME
   - REPLACING TOPSOIL AFTER COMPLETION OF EARTHWORKS.
   - PROGRAMMING WORK TO MINIMISE THE LIFE OF STOCKPILES.
   - TEMPORARILY STABILISING LONG-TERM STOCKPILES.
   - GRAVELLING UNSEALED ACCESS AND HAUL ROADS.
   - MINIMISING TRAFFIC MOVEMENT ON EXPOSED SURFACES.
   - LIMITING VEHICULAR TRAFFIC TO 15km/h.
   - RETAINING EXISTING VEGETATION AS WIND BREAKS.
5. OIL, LANDFILL GAS CONDENSATE OR ANY CONTAMINATED LEACHATE OR STORMWATER IS NOT TO BE USED FOR DUST SUPPRESSION.

EROSION CONTROL NOTES:

ALL CONTROL WORK INCLUDING DIVERSION BANKS AND CATCH DRAINS, V-DRAINS AND SILT FENCES SHALL BE COMPLETED DIRECTLY FOLLOWING THE COMPLETION OF THE EARTHWORKS.

1. SILT FENCES AND SILT FENCE RETURNS SHALL BE ERECTED CONVEX TO THE CONTOUR TO POND WATER.
2. HAY BALE BARRIERS AND GEOFABRIC FENCES ARE TO BE CONSTRUCTED TO TOE OF BATTER, PRIOR TO COMMENCEMENT OF EARTHWORKS, IMMEDIATELY AFTER CLEARING OF VEGETATION AND BEFORE REMOVAL OF TOP SOIL.
3. ALL TEMPORARY EARTH BERMS, DIVERSION AND SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED AND MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
4. CLEAR WATER IS TO BE DIVERTED AWAY FROM DISTURBED GROUND AND INTO THE DRAINAGE SYSTEM.
5. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND PROVIDING ON GOING ADJUSTMENT TO EROSION CONTROL MEASURES AS REQUIRED DURING CONSTRUCTION.
6. ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING, TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE, APPROVED LOCATION.
7. ALL FINAL EROSION PREVENTION MEASURES INCLUDING THE ESTABLISHMENT OF GRASSING ARE TO BE MAINTAINED UNTIL THE END OF THE DEFECTS LIABILITY PERIOD.
8. ALL EARTHWORKS AREAS SHALL BE ROLLED ON A REGULAR BASIS TO SEAL THE EARTHWORKS.
9. ALL FILL AREAS ARE TO BE LEFT WITH A BUND AT THE TOP OF THE SLOPE AT THE END OF EACH DAYS EARTHWORKS. THE HEIGHT OF THE BUND SHALL BE A MINIMUM OF 200mm.
10. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND HYDROMULCHED WITHIN 10 DAYS OF COMPLETION OF FORMATION.
11. AFTER REVEGETATION OF THE SITE IS COMPLETE AND THE SITE IS STABLE IN THE OPINION OF A SUITABLY QUALIFIED PERSON ALL TEMPORARY WORK SUCH AS SILT FENCE, DIVERSION DRAINS ETC SHALL BE REMOVED.
12. ALL TOPSOIL STOCKPILES ARE TO BE SUITABLY COVERED TO THE SATISFACTION OF THE SITE MANAGER TO PREVENT WIND AND WATER EROSION.
13. ANY AREA THAT IS NOT APPROVED BY THE CONTRACT ADMINISTRATOR FOR CLEARING OR DISTURBANCE BY THE CONTRACTOR'S ACTIVITIES SHALL BE CLEARLY MARKED AND SIGN POSTED, FENCED OFF OR OTHERWISE APPROPRIATELY PROTECTED AGAINST ANY SUCH DISTURBANCE.
14. ALL STOCKPILE SITES SHALL BE SITUATED IN AREAS APPROVED FOR SUCH USE BY THE SITE MANAGER. A 6m BUFFER ZONE SHALL EXIST BETWEEN STOCKPILE SITES AND ANY STREAM OR FLOW PATH. ALL STOCKPILES SHALL BE ADEQUATELY PROTECTED FROM EROSION AND CONTAMINATION OF THE SURROUNDING AREA BY USE OF THE MEASURES APPROVED IN THE EROSION AND SEDIMENTATION CONTROL PLAN.
15. ACCESS AND EXIT AREAS SHALL INCLUDE SHAKE-DOWN OR OTHER METHODS APPROVED BY THE SITE MANAGER FOR THE REMOVAL OF SOIL MATERIALS FORM MOTOR VEHICLES.
16. THE CONTRACTOR IS TO ENSURE RUNOFF FROM ALL AREAS WHERE THE NATURAL SURFACE IS DISTURBED BY CONSTRUCTION, INCLUDING ACCESS ROADS, DEPOT AND STOCKPILE SITES, SHALL BE FREE OF POLLUTANTS BEFORE IT IS EITHER DISPERSED TO STABLE AREAS OR DIRECTED TO NATURAL WATERCOURSES.
17. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN SLOPES, CROWNS AND DRAINS ON ALL EXCAVATIONS AND EMBANKMENTS TO ENSURE SATISFACTORY DRAINAGE AT ALL TIMES WATER SHALL NOT BE ALLOWED TO POND ON THE WORKS UNLESS SUCH PONDING IS PART OF AN APPROVED ESCP / SWMP.

SEDIMENT CONTROL BASIN NOTES:

1. TYPE D BASIN IS REQUIRED.
2. VOLUME OF THE BASINS SHALL BE AS NOMINATED ON DRAWING. NOMINAL POND LOCATIONS AND NOMINAL DIMENSIONS.
3. SEDIMENT BUILD UP TO NOT EXCEED 33% TOTAL CAPACITY OF BASIN.
4. DEWATERING OF BASIN TO BE PERFORMED TO THE BOTTOM OF THE SEDIMENT SETTLING ZONE FOLLOWING ACHIEVEMENT OF WQO's. MANAGEMENT OF DOSAGE AND DISCHARGE TO BE ACHIEVED WITHIN 5 DAYS OF THE INITIAL RAINFALL EVENT.
5. FOLLOWING DEWATERING PER NOTE 4, WATER LEVEL TO BE MAINTAINED AT 20% CAPACITY AFTER A FOUR DAY SETTLING PERIOD FOLLOWING A STORM EVENT.
6. WATER TO BE DOSED WITH GYPSUM TO ACCELERATE SETTLEMENT OF SUSPENDED SOLIDS AS REQUIRED.
7. GYPSUM DOSAGE RATE TO BE APPLIED AT APPROX. 32kg PER 100 CUBIC METRE OF COLLECTED RUNOFF.
8. THE USE OF ALUM (OR ANY OTHER ALTERNATIVE) AS A FLOCCULANT IS NOT RECOMMENDED. ALUM OR ANY OTHER FLOCCULANT IS TO BE USED ONLY FOLLOWING CONSULTATION WITH AND ACCEPTANCE FROM COUNCIL ESC OFFICERS.
9. DISCHARGE FROM POND IS PERMISSIBLE WHEN THE WATER PH IS 6.5-8.5 AND IS CLARIFIED TO AT OR BELOW A TSS OF 50mg/L. CLARIFICATION WOULD GENERALLY BE ACHIEVED IN 36-72 HOURS WITH THE USE OF GYPSUM. CORRELATION TESTS MUST BE UNDERTAKEN ON SITE TO ENSURE THIS IS ACHIEVED.
10. DEWATERING SHALL BE DONE IN SUCH A MANNER AS TO REMOVE THE CLEAN WATER (BEING WATER WITHIN THE ADOPTED CRITERIA) WITHOUT REMOVING OR DISTURBING THE SEDIMENT THAT HAS SETTLED. THE PUMP INTAKE PIPE IS NOT TO REST ON THE SETTLED SEDIMENT LAYER.
11. IF WATER EXCEEDS TSS OF 50mg/L DURING DEWATERING, PUMPING IS TO CEASE. RECORDS ARE TO BE KEPT (ON-SITE AT ALL TIMES) OF ALL MEASUREMENT PRIOR TO, DURING AND AFTER DISCHARGE. RECORDS TO BE MADE AVAILABLE TO COUNCIL OFFICERS UPON REQUEST.
12. PROVIDE SECURITY FENCE TO BASIN FOR SAFETY.

SEDIMENTATION BASIN NOTES:

1. REFER TO SEDIMENT & EROSION CONTROL NOTES.
2. FOR SEDIMENT AND EROSION CONTROL DETAILS, REFER TO THE LANDCOM 'BLUE BOOK' AND EXTRACTS ON DRAWING SSDA20.
3. SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND CONSTRUCTION, MANAGING URBAN STORMWAER-THE BLUE BOOK'. CAPACITY BASED ON 5-DAY RAINFALL DEPTHS AT 85th PERCENTILE INTENSITY (32.2mm) IN THE LIVERPOOL CATCHMENT AREA.

NOTES:

1. ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
2. ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES)
3. REFER TO DRAWING SSDA20 FOR SEDIMENTATION BASIN CALCULATIONS

TABLE 1 - STABILISATION REQUIREMENTS AND TREATMENT METHODS

DURING CONSTRUCTION - TEMPORARY STABILISATION (DURING PERIODS OF INACTIVITY OR WHEN WORKS ARE ON HOLD)

LANDS	STABILISATION REQUIREMENT	TIMEFRAMES	TREATMENT METHODS - PRODUCTS	REMARKS
ALL LANDS	C-FACTOR = 0.15 (50% EQUIVALENT GROUND COVER[1]	APPLIES AFTER 20 WORKING DAYS OF INACTIVITY (EVEN THOUGH WORKS MIGHT CONTINUE LATER)	SOIL BINDER (I.E VITAL P47/STONEWALL OR EQUIVALENT[1])	- SPRAY ALL SURFACES WITH VITAL P47/STONEWALL OR EQUIVALENT[1]. - VITAL DILUTION RATE = 1:10(VITAL:WATER). -RE-APPLY/MAINTAIN AS NECESSARY (APPROX. EVERY 3-6 MONTHS WITHOUT SUITABLE VEGETATION COVER) TO ENSURE THE REQUIRED COVER IS PROVIDED.
			GEOTEXTILE, JUTE MATTING, BLACK PLASTIC OR EQUIVALENT[1]	- COVER ALL EXPOSED SOILS. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PROVIDED.
WATERWAYS, DRAINAGE LINES AND CONCENTRATED FLOW AREAS	C-FACTOR = 0.05 (70% GRASS COVER OR EQUIVALENT GROUND COVER[1]	APPLIES AFTER 10 WORKING DAYS FROM COMPLETION OF FORMATION AND BEFORE THEY ARE ALLOWED TO CARRY CONCENTRATED FLOWS.	REFER TO THE DRAIN SPECIFICATIONS DETAILED ON THE PLAN FOR SPECIFIC LINING/STABILISATION REQUIREMENTS. EXAMPLE TREATMENT METHODS ARE SHOWN BELOW.	
			TEMPORARY LINING - GEOTEXTILE (I.E. BIDIM A24 OR EQUIVALENT[1])	- COMPLETE ANY SUBSOIL TREATMENT BEFORE LAYING THE MATTING. - INSTALL MATTING IN ACCORDANCE WITH SD 5-7. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PROVIDED.
			JUTE MESH, SEEDING AND SOIL BINDER (I.E. VITAL P47/STONEWALL OR EQUIVALENT[1]) - LOW FLOWS TO MODERATE	- COMPLETE SUBSOIL TREATMENT (I.E. GYPSUM LIGHTLY RIPPED INTO SUBGRADE AT A RATE OF 5 TONNES/Ha). - PLACE TOPSOIL TO A DEPTH OF AT LEAST 75mm. - COMPLETE ANY FERTILISATION AND SEEDING BEFORE LAYING THE MATTING. - INSTALL MATTING IN ACCORDANCE WITH SD 5-7. - SPRAY ALL SURFACES WITH VITAL P47/STONEWALL OR EQUIVALENT[1]. - VITAL DILUTION RATE = 1L / m^2 OF DILUTED VITAL MIXTURE. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PERMANENTLY MAINTAINED.
			JUTE MATTING (~350gsm) AND SEEDING OR EQUIVALENT[1]) - LOW FLOWS TO MODERATE	- COMPLETE SUBSOIL TREATMENT (I.E. GYPSUM LIGHTLY RIPPED INTO SUBGRADE AT A RATE OF 5TONNES/Ha). - PLACE TOPSOIL TO A DEPTH OF AT LEAST 75mm. - COMPLETE ANY FERTILISATION AND SEEDING BEFORE LAYING THE MATTING. - INSTALL MATTING IN ACCORDANCE WITH SD 5-7. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PERMANENTLY MAINTAINED.
			TURF REINFORCEMENT MATTING (TRM) (E.G. TERRAMAT OR EQUIVALENT[1]) - MODERATE FLOWS	- COMPLETE SUBSOIL TREATMENT (I.E. GYPSUM LIGHTLY RIPPED INTO SUBGRADE AT A RATE OF 5TONNES/Ha). - PLACE TOPSOIL TO A DEPTH OF AT LEAST 75mm. - COMPLETE ANY FERTILISATION AND SEEDING BEFORE LAYING THE MATTING. - INSTALL MATTING IN ACCORDANCE WITH SD 5-7. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PERMANENTLY MAINTAINED.
			ROCK LINING - HIGH FLOWS	- COMPLETE SUBSOIL TREATMENT (I.E. GYPSUM LIGHTLY RIPPED INTO SUBGRADE AT A RATE OF 5TONNES/Ha). - INSTALL GEOTEXTILE UNDERLAY (IF SPECIFIED) IN ACCORDANCE WITH SD 5-7. - INSTALL ROCK ARMOURING (TO THE DEPTH AND SIZE AS SPECIFIED ON THE PLAN). - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PROVIDED.
STOCKPILES	C-FACTOR = 0.10 (60% GRASS COVER OR EQUIVALENT GROUND COVER[1]	APPLIES AFTER 10 WORKING DAYS FROM COMPLETION OF FORMATION	SEEDING AND SOIL BINDER (I.E. VITAL P47/STONEWALL OR EQUIVALENT[1])	- APPLY SEED TO ALL STOCKPILE SURFACES (NOTE: SEEDING MAY NOT BE REQUIRED IF EXISTING SEEDBED IS PRESENT). -SPRAY ALL STOCKPILE SURFACES WITH VITAL P47/STONEWALL OR EQUIVALENT[1]. - VITAL DILUTION RATE = 1:10 (VITAL:WATER). - APPLICATION RATE = 1L / m2 OF DILUTED VITAL MIXTURE. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PERMANENTLY MAINTAINED.
			GEOTEXTILE, JUTE MATTING, BLACK PLASTIC OR EQUIVALENT[1]	- COVER ALL EXPOSED SOILS. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PROVIDED.
GENERAL SURFACES	C-FACTOR = 0.10 / 0.05 (60% / 70% GRASS COVER OR EQUIVALENT GROUND COVER[1]	C-FACTOR = 0.1 APPLIES AFTER 10 WORKING DAYS FROM COMPLETION OF FORMATION AND C-FACTOR = 0.05 APPLIES WITHIN A FURTHER 60 DAYS	TOPSOIL, SEEDING AND SOIL BINDER (I.E. VITAL P47/STONEWALL OR EQUIVALENT[1])	- REFER TO SD 7-1 - COMPLETE SUBSOIL TREATMENT (I.E. GYPSUM LIGHTLY RIPPED INTO SUBGRADE AT A RATE OF 5TONNES/Ha). - PLACE GYPSUM TREATED TOPSOIL TO A DEPTH OF AT LEAST 75mm. - APPLY ANY FERTILISERS REQUIRED. - APPLY SEED TO ALL SURFACES. - SPRAY ALL SURFACES WITH VITAL P47/STONEWALL OR EQUIVALENT[1]. - VITAL DILUTION RATE = 1:10 (VITAL:WATER). - APPLICATION RATE = 1L / m2 OF DILUTED VITAL MIXTURE. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PERMANENTLY MAINTAINED.
			HYDROMULCH OR EQUIVALENT[1]	- REFER TO SD 7-1 - COMPLETE SUBSOIL TREATMENT (I.E. GYPSUM LIGHTLY RIPPED INTO SUBGRADE AT A RATE OF 5TONNES/Ha). - PLACE GYPSUM TREATED TOPSOIL TO A DEPTH OF AT LEAST 75mm. - APPLY HYDROMULCH WITH APPROVED SEED MIX TO SOIL SURFACE. - RE-APPLY/MAINTAIN AS NECESSARY TO ENSURE THE REQUIRED COVER IS PERMANENTLY MAINTAINED.

[1] - EQUIVALENT COVER/PRODUCT MUST ACHIEVE THE EQUIVALENT C-FACTOR WITH PROVEN RESEARCH/DOCUMENTATION TO VERIFY THIS.
STANDARD DRAWINGS REFERENCED CAN BE LOCATED IN THE 'SOILS & CONSTRUCTION, MANAGING URBAN STORMWATER - VOLUME 1' BOOK BY LANDCOM. ALTERNATIVE DETAILS MAY BE SOUGHT IN CONSULTATION WITH THE ENGINEER

TABLE 2 - LIMITATIONS TO ACCESS DURING CONSTRUCTION

LAND USE	LIMITATION	REMARKS
CONSTRUCTION AREAS	LIMITED TO 5 (PREFERABLE 2) METRES FROM THE EDGE OF ANY ESSENTIAL CONSTRUCTION ACTIVITY AS SHOWN ON ENGINEERING PLANS.	ALL SITE WORKERS SHOULD CLEARLY RECOGNISE THESE AREAS THAT, WHERE APPROPRIATE, ARE IDENTIFIED WITH BARRIER FENCING (UPSLOPE) AND SEDIMENT FENCE (DOWNSLOPE) OR SIMILAR MATERIALS.
ACCESS CORRIDORS	LIMITED TO A MAXIMUM WIDTH OF 7 METERS	THE SITE MANAGER WILL DETERMINE AND MARK THE LOCATION OF THESE ZONES ON SITE, THEY CAN VARY IN POSITION SO AS TO BEST CONSERVE EXISTING VEGETATION AND PROTECT DOWNSTREAM AREAS WHILE BEING CONSIDERATE OF THE NEEDS EFFICIENT WORKS ACTIVITIES. ALL SITE WORKERS WILL CLEARLY RECOGNISE THESE BOUNDARIES.
REMAINING LANDS, INCLUDING REVEGETATION AREA	ENTRY PROHIBITED EXCEPT FOR ESSENTIAL MANAGEMENT WORKS	THINNING OF GROWTH MIGHT BE NECESSARY, FOR EXAMPLE, FOR FIRE REDUCTION OR WEED REMOVAL.

REINFORCED EARTH RETAINING WALL NOTES:

1. ALL COMPONENTS AND INSTALLATION SHALL COMPLY WITH AS4678 AND THE STANDARDS REFERRED TO THEREIN.
2. MINIMUM HEIGHT (H) TO GEOGRID REINFORCEMENT LENGTH (L) TO BE 1.0.
3. MINIMUM BEARING CAPACITY OF FOUNDATION (BASED ON MINIMUM H/L RATIO OF 1.0) TO BE AS FOLLOWS :
   a. H MAX. 2.0m = 100 kPa
   b. H MAX. 3.5m = 150 kPa
   c. H MAX. 5.0m = 200 kPa

   BEFORE COMMENCEMENT OF CONSTRUCTION THE FOUNDATION SHALL BE INSPECTED AND VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.
4. WHERE MINIMUM BEARING IS NOT ACHIEVABLE OR NOT MEETING DESIGN REQUIREMENT, THE FOUNDATION MATERIAL IS TO BE EXCAVATED AND REPLACED WITH APPROVED MATERIAL PLACED IN ACCORDANCE WITH THE FILLING SPECIFICATION TO A MINIMUM COMPACTION OF 100% SMDD AND PLACED WITHIN 2% OF OMC.
5. MINIMUM SURCHARGE LOADS TO BE APPLIED AS FOLLOWS U.N.O. ON PLAN:
   a. LIVE LOAD = 20 kPa
   b. DEAD LOAD = 5 kPa
   c. CONSTRUCTION TRAFFIC LIVE LOAD = 10 kPa
6. THE GEOGRIDS SHALL BE OF THE TYPE AND INDEX STRENGTH NOMINATED ON THE DRAWINGS. THE MINIMUM GEOGRIDS SHALL BE A SINGLE LENGTH IN THE DIRECTION OF DESIGN TENSION, NOT LAPPED, MAKING PROVISION FOR CONNECTION TO THE FACING ACROSS THE WHOLE WIDTH OF THE FACING AND PROVIDING FOR THE SPECIFIED ANCHORAGE WITHIN THE DESIGNATED ANCHORAGE ZONE. GEOGRIDS SHALL COVER THE WHOLE OF THE PLAN AREA BEHIND THE WALL FOR THE SPECIFIED ANCHORAGE LENGTH AND SHALL BE LAPPED WITH ADJACENT SECTIONS IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
7. MINIMUM WALL EMBEDMENT AT THE TOE OF THE WALL TO BE 300mm.
8. DESIGN LIFE OF STRUCTURE IS TO BE 100 YEARS.
9. SELECT BACKFILL MATERIAL WITHIN THE REINFORCED SOIL BLOCK SHALL BE SOUND GRANULAR MATERIAL OF NATURAL OR INDUSTRIAL ORIGIN, NON-EXPANSIVE, FREE FROM ORGANIC OR OTHER DELETERIOUS MATERIAL CONFORMING TO THE PHYSICAL, CHEMICAL AND ELECTROCHEMICAL LIMITS AS SPECIFIED AND SHALL NOT BE SUBJECT TO BREAKDOWN UNDER COMPACTION. THE SELECT BACKFILL MATERIAL IS TO HAVE THE FOLLOWING PARAMETERS:
   a. MINIMUM INTERNAL FRICTION, Ø = 34°
   b. EFFECTIVE COHESION, C'= 0 kPa
   c. UNIT WEIGHT = 21 kN/m^3
   d. PH BETWEEN 4 AND 9.
10. SELECT BACKFILL IS TO BE PLACED AND COMPACTED IN LAYERS NOT MORE THAN 300mm (LOOSE). COMPACTION TO NOT LESS THAN 100% SMDD WILL BE ACHIEVED AND MATERIAL PLACED WITHIN 2% OF OMC. DENSITY TESTING SHALL BE PERFORMED IN EACH COMPACTED LIFT IN ACCORDANCE WITH AS3798.
11. PROVIDE A DRAINAGE LAYER DIRECTLY BEHIND THE FACING UNITS IN A MINIMUM 300mm WIDE 12-20mm AGGREGATE LAYER. FACING UNIT VOIDS TO BE FILLED WITH AGGREGATE. PROVIDE 100mm MINIMUM AG. DRAIN IN GEOTEXTILE SOCK AT TOE OF WALL FACING AND CONNECT TO DRAINAGE SYSTEM AT 30m MAX. SPACING.
12. THE NEED FOR A CHIMNEY DRAIN OR DRAINAGE AT THE REAR OF THE MASS SOIL BLOCK IS TO BE CONFIRMED ON SITE BY THE GEOTECHNICAL ENGINEER AND DESIGNER FOLLOWING PREPARATION OF THE FOUNDATION AND PRIOR TO CONSTRUCTION OF THE MASS SOIL BLOCK.
13. CONSTRUCTION EQUIPMENT WEIGHING MORE THAN 500kG STATIC WEIGHT IS TO BE KEPT BACK 1.5m FROM THE REAR FACE OF THE WALL FACING UNITS. COMPACTION OF THE SELECT FILL MATERIAL WITHIN THE 1.5m STRIP ADJACENT TO THE WALL SHALL BE ACHIEVED BY LIGHT MECHANICAL TAMPERS (VIBRATING PLATE, TRENCH COMPACTOR OR SIMILAR) TO GIVE THE SAME DENSITY AS IN THE REMAINDER OF THE SELECT FILL.
14. ALL DESIGN AND CONSTRUCT WALL SYSTEM TO BE COMPLETED IN ACCORDANCE WITH THESE NOTES.
15. TOP OF WALL HEIGHTS ARE NOTED TO ALIGN WITH FINISHED PAVEMENT HEIGHTS. THE CONTRACTOR AND THEIR DESIGN AND CONSTRUCT WALLING CONTRACTORS ARE TO ENSURE THAT ALL WALL STRAPS ARE INSTALLED BELOW THE DESIGN EARTHWORKS SUBGRADE. CONTRACTOR TO ALLOW FOR WALL STRAPS TO BE GRADED AWAY FROM THE FACE OF THE WALL OR OTHERWISE INSTALLED TO SUIT EARTHWORKS DESIGN LEVELS AND GRADES.
16. DIFFERENTIAL SETTLEMENT NOTE:
    FUTURE BUILDING AND SERVICE DESIGNERS TO CONSIDER DIFFERENTIAL SETTLEMENT OF REINFORCED EARTH WALL BLOCK AND GENERAL FILL AREAS. PARTICULAR ATTENTION TO BE DRAWN TO HEAVILY LOADED AREAS, OR DIFFERING LOADED AREAS (INCLUDING SPRINKLER TANK AND TRUCK PAVEMENT AREAS) AND WHERE SIGNIFICANT CHANGES IN OVERALL WALL HEIGHT OR FILL AMOUNTS ARE EXPERIENCED. IT IS THE RESPONSIBILITY OF THE FUTURE DESIGNERS TO ENSURE APPROPRIATE DESIGN CONSIDERATION TO DIFFERENTIAL SETTLEMENT ARE MADE DEPENDING ON THE DESIGN ELEMENT AND INTERACTION WITH RETAINED ELEMENTS AND GENERAL FILL MATERIAL.

RETAINING WALL NOTES:

1. ALL COMPONENTS AND INSTALLATION SHALL COMPLY WITH AS4678 AND THE STANDARDS REFERRED TO THEREIN.
2. MINIMUM BEARING CAPACITY OF FOUNDATION TO BE AS FOLLOWS :
   a. H MAX. 2.0m = 100 kPa
   b. H MAX. 3.5m = 150 kPa
   c. H MAX. 5.0m = 200 kPa

   BEFORE COMMENCEMENT OF CONSTRUCTION THE FOUNDATION SHALL BE INSPECTED AND VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.
3. WHERE MINIMUM BEARING IS NOT ACHIEVABLE OR NOT MEETING DESIGN REQUIREMENT, THE FOUNDATION MATERIAL IS TO BE EXCAVATED AND REPLACED WITH APPROVED MATERIAL PLACED IN ACCORDANCE WITH THE FILLING SPECIFICATION TO A MINIMUM COMPACTION OF 100% SMDD AND PLACED WITHIN 2% OF OMC.
4. MINIMUM SURCHARGE LOADS TO BE APPLIED AS FOLLOWS U.N.O.
5. ON PLAN :
   a. LIVE LOAD = 20 kPa
   b. DEAD LOAD = 5 kPa
   c. CONSTRUCTION TRAFFIC LIVE LOAD = 10 kPa
6. MINIMUM WALL EMBEDMENT AT THE TOE OF THE WALL TO BE 300mm MINIMUM UNLESS NOTED OTHERWISE.
7. DESIGN LIFE OF STRUCTURE IS TO BE 100 YEARS.
8. TIED WALLS ARE TO BE TEMPORARILY PROPPED AT TOP UNTIL SUCH TIME THE TOP OF WALL IS TIED TO THE SLAB AND 28-DAY CONCRETE STRENGTH HAS BEEN ACHIEVED.
9. CONSTRUCTION EQUIPMENT WEIGHING MORE THAN 500KG STATIC WEIGHT IS TO BE KEPT BACK 1.5m FROM THE REAR FACE OF THE WALL FACING UNITS. COMPACTION OF THE SELECT FILL MATERIAL WITHIN THE 1.5m STRIP ADJACENT TO THE WALL SHALL BE ACHIEVED BY LIGHT MECHANICAL TAMPERS (VIBRATING PLATE, TRENCH COMPACTOR OR SIMILAR) TO GIVE THE SAME DENSITY AS IN THE REMAINDER OF THE SELECT FILL.
10. ALL DESIGN AND CONSTRUCT WALL SYSTEM TO BE COMPLETED IN ACCORDANCE WITH THESE NOTES.
11. WALL ELEVATIONS ALLOW FOR NOMINAL EMBEDMENT DEPTHS. WHERE DESIGN AND CONSTRUCT (D+C) WALL SYSTEMS ARE PROPOSED IT IS THE CONTACTORS RESPONSIBILITY TO ALLOW FOR THE FINAL EMBEDMENT DEPTHS AS PER THE D+C DESIGN. ALLOWANCE FOR OVERALL WALL AREAS TO CONSIDER THE FINAL EMBEDMENT DEPTH.
12. WALL ELEVATIONS AND AREAS ARE BASED ON THE VERTICAL PLAN AREA. CONTRACTOR TO ALLOW ADDITIONAL SURFACE AREA WHERE WALLS ARE NOT VERTICAL OR HAVE BACKSLOPES.

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 11

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: GENERAL NOTES - SHEET 2

DRAWING No: C015039.01-SSDA 11 | ISSUE: A

EXISTING SERVICES NOTES:

1. DURING THE EXECUTION OF WORKS, THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF EXISTING SERVICES. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED TO THE EXISTING SERVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE RELEVANT SERVICE AUTHORITY, AT NO COST TO THE PRINCIPAL.
2. WHERE IT IS NECESSARY TO REMOVE, DIVERT OR CUT INTO ANY EXISTING SERVICE, THE CONTRACTOR SHALL GIVE AT LEAST THREE (3) DAYS NOTICE OF ITS REQUIREMENTS TO THE SUPERINTENDENT, WHO WILL ADVISE WHAT ARRANGEMENTS SHOULD BE MADE FOR THE ALTERATION OF SUCH EXISTING WORKS.
3. EXISTING SERVICES HAVE BEEN PLOTTED FROM SUPPLIED DATA. THE ACCURACY IS NOT GUARANTEED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO COMMENCING WORK. ALL CLEARANCES AND APPROVALS SHALL ALSO BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL NEW AND EXHUMED SERVICES THAT CROSS EXISTING AND FUTURE ROADS/PAVEMENTS WITHIN THE SITE SHALL BE BACKFILLED WITH DGB20 MATERIAL TO SUBGRADE LEVEL AND COMPACTED TO 98% STANDARD DENSITY RATIO. SUBJECT TO PRIOR APPROVAL FROM RELEVANT AUTHORITY.
5. ON COMPLETION OF SERVICES INSTALLATION. ALL DISTURBED AREAS SHALL BE RESTORED TO ORIGINAL, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AREAS, GRASSED AREAS AND ROAD PAVEMENTS.
6. CARE TO BE TAKEN WHEN EXCAVATING NEAR UTILITY SERVICES. NO MECHANICAL EXCAVATION TO BE UNDERTAKEN OVER SERVICES. LIAISE WITH RELEVANT AUTHORITY.
7. THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION AND REMOVAL IF REQUIRED OF ALL EXISTING SERVICES IN AREAS AFFECTED BY THE WORKS WITHIN THE CONTRACT AREA AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT. ALL TO REGULATORY AUTHORITY STANDARDS AND APPROVAL.
8. THE CONTRACTOR IS TO MAINTAIN EXISTING STORMWATER DRAINAGE FLOWS THROUGH THE ROADS AT ALL TIMES. MAKE DUE ALLOWANCE FOR ALL SUCH FLOWS AT ALL TIMES.
9. PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL OBTAIN THE SUPERINTENDENT'S APPROVAL OF THE PROGRAM FOR THE RELOCATION/CONSTRUCTION OF TEMPORARY SERVICES.
10. CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES AS REQUIRED TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
11. INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE OR DAMAGE TO THE ADJACENT RESIDENCES. CONTRACTOR TO GAIN APPROVAL OF THE SUPERINTENDENT FOR TIME OF INTERRUPTION.
12. THE CONTRACTOR SHALL UNDERTAKE A DIAL BEFORE YOU DIG (DBYD 1100) SERVICES SEARCH BEFORE THE COMMENCEMENT OF ANY WORKS.

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON ESTATE DEISGN INFORMATION PROVIDED BY LTS SURVEYORS DATED 12.10.20 REF 51145001DT

- W – EXISTING SYDNEY WATER MAIN
- S – EXISTING SEWER MAIN
- E – EXISTING UNDERGROUND ELECTRICAL
- T – EXISTING UNDERGROUND TELECOM
- G – EXISTING GAS
- SW – EXISTING STORMWATER

EXISTING SERVICES PLAN

SCALE 1:400

4m 0 10 20 30 40m

SCALE 1:400 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT/CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 15

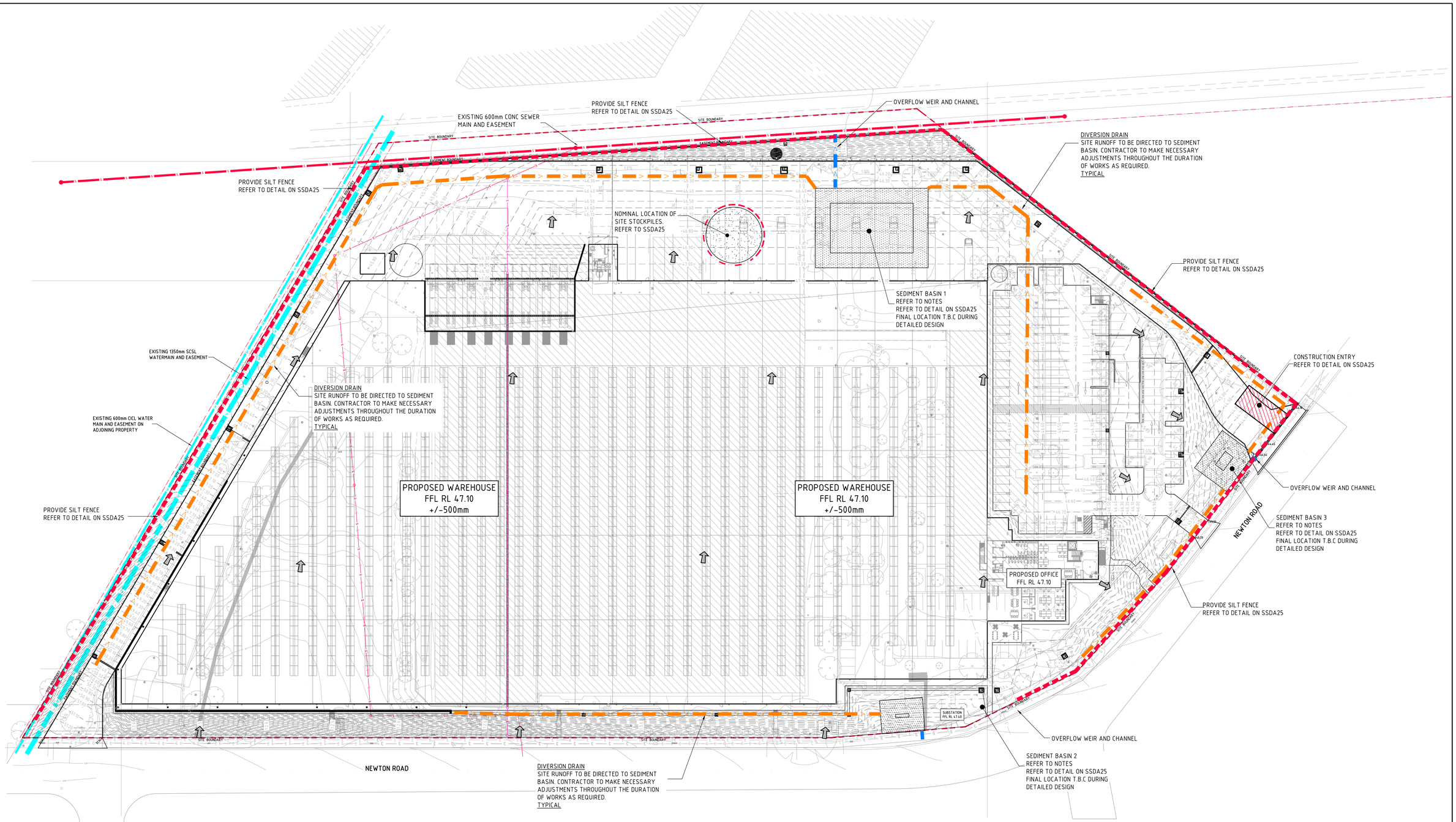
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: EXISTING SERVICES PLAN

DRAWING NO: C015039.01-SSDA 15 | ISSUE: A



LEGEND:

PROVIDE 1m RETURNS TO SILT FENCE AT 30m MAX. INTERVALS.
TYPICAL (N.S.O.P.)

- DENOTES DIVERSION DRAIN
- DENOTES SILT FENCE WITH CATCH DRAIN
- DENOTES SILT FENCE ONLY
- CATCHMENT BOUNDARY
- DENOTES CONSTRUCTION ENTRY
- OVERLAND FLOW DIRECTION
- SEDIMENT BASIN (REFER TO PLAN)

SEDIMENTATION BASIN NOTE:

FOR SEDIMENT & EROSION CONTROL DETAILS REFER TO DRAWING C015039.01-SSDA25.

SEDIMENTATION BASIN SIZING BASED ON RECOMMENDATIONS OF 'SOILS AND CONSTRUCTION, MANAGING URBAN STORMWATER-THE BLUE BOOK'.
CAPACITY BASED UPON 5 DAY RAINFALL DEPTH AT 85th PERCENTILE INTENSITY (32.2mm).

APPROXIMATE AREA OF DISTURBED SITE = 5.07Ha

SEDIMENTATION BASINS TO COLLECT RUN-OFF IN EXTREME RAINFALL EVENTS. COLLECTED RUN-OFF TO BE ASSESSED BY A QUALIFIED LABORATORY FOR DOUSING RATES OF ALUM OR GYPSUM TO ENSURE COAGULATION OF SEDIMENTS PRIOR TO WATER BEING DISCHARGED TO COUNCIL STORMWATER SYSTEM.

EACH BASIN IS TO HAVE A MARKER PLACED AS PER THE DETAIL TO INDICATE WHEN SEDIMENT IS TO BE REMOVED. REMOVED SEDIMENT IS TO BE CLASSED AND DEWATERED PRIOR TO REMOVAL FROM SITE.

ALLOWANCE TO BE MADE DURING BENCHING OF SITE TO ENSURE RUN-OFF IS DIRECTED TO SEDIMENTATION BASINS.

NOTES:
1. ASSUME TYPE D SOIL (CLAY/SILTY CLAY)
2. ASSUME GROUP D SOIL (HIGH PLASTICITY AND SHRINK/SWELL PROPERTIES)

SOIL TYPE ASSESSED FROM GEOTECHNICAL REPORT PROVIDED BY XXXX TITLED XXXX DATED XXXX.

EROSION AND SEDIMENT CONTROL PLAN
SCALE 1:400

SEDIMENT BASIN 1 DIMENSIONS:

CATCHMENT AREA	= 4.20 ha
DISTURBED AREA	= 4.20 ha
REQUIRED BASIN VOLUME	= 867m^3
BASE DIMENSIONS (L X B)	= 25m x 15m
TOP DIMENSIONS (L X B)	= 34m x 24m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 872m^3
Q10 WEIR PEAK FLOW	= 1.052m^3/s
SPILLWAY WIDTH	= 4.0m
SPILLWAY DEPTH	= 0.3m

SEDIMENT BASIN 2 DIMENSIONS:

CATCHMENT AREA	= 0.30 ha
DISTURBED AREA	= 0.30 ha
REQUIRED BASIN VOLUME	= 75m^3
BASE DIMENSIONS (L X B)	= 4m x 1m
TOP DIMENSIONS (L X B)	= 13m x 10m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 78m^3
Q10 WEIR PEAK FLOW	= 0.091m^3/s
SPILLWAY WIDTH	= 1.0m
SPILLWAY DEPTH	= 0.3m

SEDIMENT BASIN 3 DIMENSIONS:

CATCHMENT AREA	= 0.57 ha
DISTURBED AREA	= 0.57 ha
REQUIRED BASIN VOLUME	= 119m^3
BASE DIMENSIONS (L X B)	= 5m x 3m
TOP DIMENSIONS (L X B)	= 14m x 12m
MAX SIDE SLOPE	= 1V:3H
DEPTH	= 1.5m
PROVIDED BASIN VOLUME	= 119m^3
Q10 WEIR PEAK FLOW	= 0.145m^3/s
SPILLWAY WIDTH	= 1.0m
SPILLWAY DEPTH	= 0.3m

EROSION CONTROL NOTES:

REFER TO DRAWING SSDA11 FOR EROSION AND SEDIMENT CONTROL NOTES

FOR DEVELOPMENT APPLICATION

4m 0 10 20 30 40m
SCALE 1:400 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

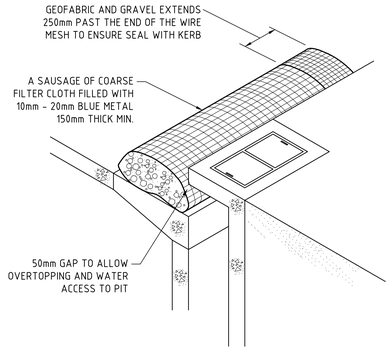
ARCHITECT: SBA ARCHITECTS
CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 20

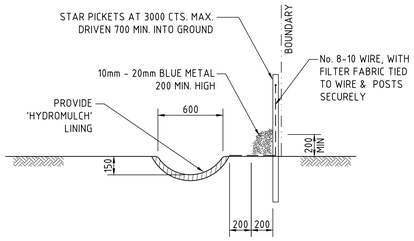
CONSULT AUSTRALIA
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN
DRAWING No: C015039.01-SSDA 20
ISSUE: B



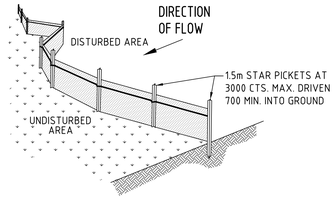
KERB INLET CONTROL

N.T.S



TYPICAL OPEN DRAIN & SILT FENCE

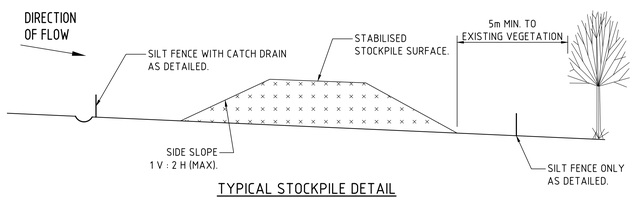
SCALE 1:20



TYPICAL SILT FENCE DETAIL

N.T.S

NOTE: PROVIDE 1m RETURNS AT 30m INTERVALS. TYPICAL

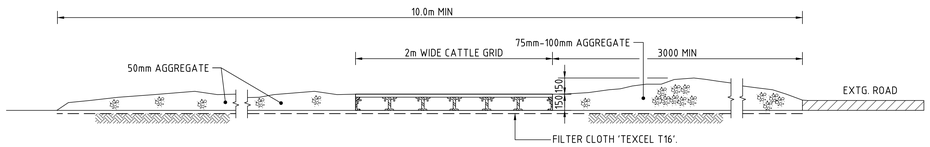


TYPICAL STOCKPILE DETAIL

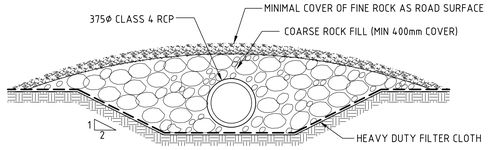
N.T.S

STOCKPILE NOTES

1. PLACE ALL STOCKPILES IN LOCATIONS MORE THAN 5m FROM EXISTING VEGETATION, ROADS & HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT ELONGATED MOUNDS. SIDE SLOPE TO BE 1 V: 2 H MAX.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2m IN HEIGHT.
4. WHERE STOCKPILES ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE USING WOOD CHIP MULCH - 16 TONNE/Ha.
5. CONSTRUCT SILT FENCE WITH CATCH DRAIN ON UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES & SILT FENCE ONLY 1 TO 2m DOWNSLOPE AS SHOWN.

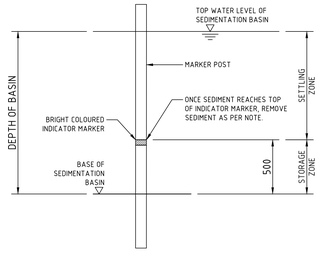


SECTION 1:20 (1) : STABILISED CONSTRUCTION ENTRANCE 'TRUCK SHAKER'



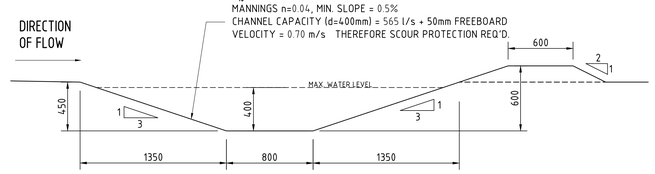
SECTION 1:20 (1)

TYPICAL CROSSING OVER DIVERSION CHANNEL



SEDIMENT STORAGE MARKER

SCALE 1:20



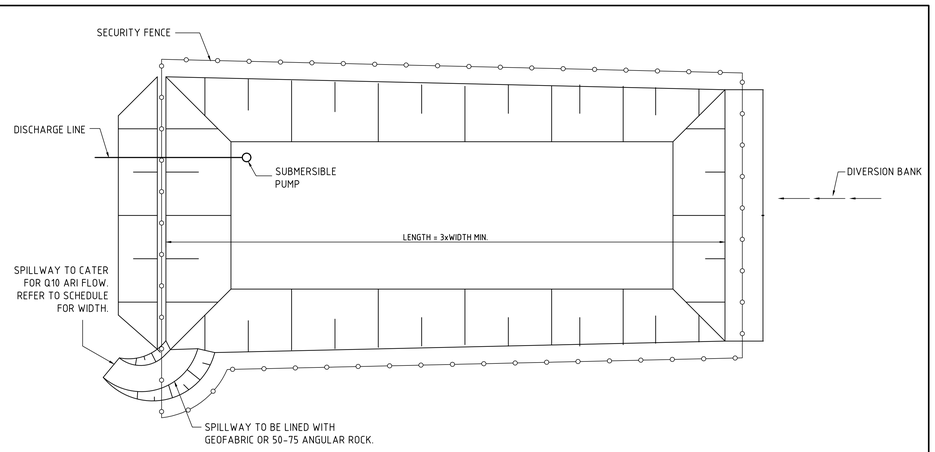
DIVERSION DRAIN SECTION -3500 WIDE

SCALE 1:20

TEMPORARILY PROTECT THE SWALE FROM EROSION DURING CONSTRUCTION.

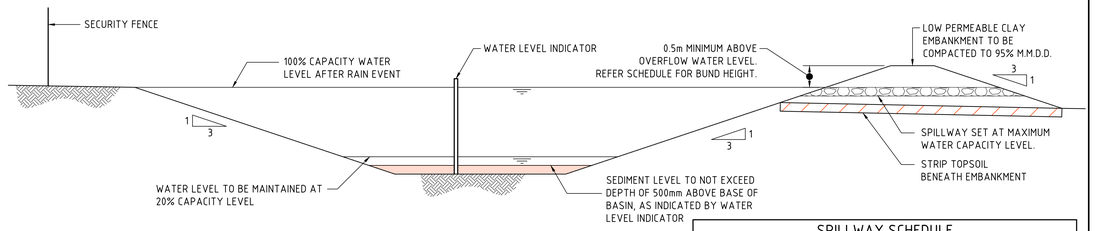
TEMPORARY DIVERSION DRAINS & EARTHEN CLEAN WATER DIVERSION DRAINS SHALL BE STABILISED BY:

a. TURF REINFORCEMENT; OR
b. GEOFABRIC LINER; OR
c. POLYMER HYDRAULIC SOIL STABILISER. DOSAGE TO BE TO MANUFACTURER'S SPECIFICATION FOR FLOW RATES NOMINATED. DOSAGE SHALL BE SUCH THAT C=0.05.



TYPICAL SEDIMENT CONTROL POND PLAN

SCALE 1:250



TYPICAL SEDIMENT CONTROL BASIN SECTION

SCALE 1:50

SPILLWAY SCHEDULE

CATCHMENT (Ha)	FLOW (m^3/s)	WIDTH (m)	FLOW DEPTH (m)	ROCK SIZE (mm)	BUND HEIGHT ABOVE SPILLWAY (m)
1	0.3	2	0.20	200	0.70
2	0.6	4	0.20	200	0.70
5	1.4	5	0.30	200	0.80
10	2.8	8	0.35	200	0.85
20	5.5	14	0.40	250	0.90
40	11.0	20	0.50	250	1.00

1. Erosion Hazard and Sediment Basins

Site Name: 74-94 Newton road

Site Location: Whetherill Park

Precinct/Stage: EROSION AND SEDIMENT CONTROLS

Other Details:

Site area	Sub-catchment or Name of Structure 1	2	3				Notes
Total catchment area (ha)	4.14	0.36	0.57				
Disturbed catchment area (ha)	4.14	0.36	0.57				
Soil analysis (enter sediment type if known, or laboratory particle size data)							
Sediment Type (C, F or D) if known:	D	D	D				From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)							Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)							
% clay (fraction finer than 0.002 mm)							
Dispersion percentage							E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(a). Auto-calculated
Soil Texture Group	D	D	D				Automatic calculation from above
Rainfall data							
Design rainfall depth (no of days)	5	5	5				See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	85	85	85				
x-day, y percentile rainfall event (mm)	32.2	32.2	32.2				
Rainfall R-factor (if known)							Only need to enter one or the other here
IFD, 2-year, 6-hour storm (if known)	10	10	10				
RUSLE Factors							
Rainfall erosivity (*R*-factor)	2210	2210	2210				Auto-filled from above
Soil erodibility (*K*-factor)	0.075	0.075	0.075				
Slope length (m)	200	100	100				
Slope gradient (%)	0.5	0.5	0.5				RUSLE LS factor calculated for a high rill/interrill ratio.
Length/gradient (*LS*-factor)	0.12	0.11	0.11				
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	
Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)							
Storage (soil) zone design (no of months)	2	2	2				Minimum is generally 2 months
C_V (Volumetric runoff coefficient)	0.64	0.64	0.64				See Table F2, page F-4 in Appendix F
Calculations and Type D/F Sediment Basin Volumes							
Soil loss (tha/yr)	26	23	23				
Soil Loss Class	1	1	1				See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	20	18	18				Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	14	1	2				See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	853	74	117				See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	867	75	119				

NB for sizing of Type C (coarse) sediment basins, see Worksheet 3 (if required).

2. Flow Calculations

Peak flow is given by the Rational Formula: $Q_Y = 0.00278 \times C_{10} \times F_Y \times I_{Y,\,tc} \times A$

where: Q_Y is peak flow rate (m^3/sec) of average recurrence interval (ARI) of "Y" years
C_{10} is the runoff coefficient (dimensionless) for ARI of 10 years.
F_Y is a frequency factor for "Y" years.
A is the catchment area in hectares (ha)
$I_{Y,\,tc}$ is the average rainfall intensity (mm/hr) for an ARI of "Y" years and a design duration of "tc" (minutes or hours)

Time of concentration (t_c) = $0.76 \times (A/100)^{0.38}$ hrs

Note: For urban catchments the time of concentration should be determined by more precise calculations or reduced by a factor of 50 per cent. Place an x in the appropriate row below to automatically halve the time of concentration for that sub-catchment.

Structure Details	1	2	3					Notes
Name								
Catchment Area (ha)	4.14	0.36	0.57					
Place an x here to halve tc	x	x	x					Place an x if disturbed catchment
Time of concentration (tc)	7	3	3					minutes
Rainfall Intensities								
1-year, tc	69.6	69.6	69.6					Enter the relevant rainfall intensities (in mm/hr) for each of the nominated rainfall events. The time of concentration (tc) determines the duration of the event to be used
2-year, tc	90.1	90.1	90.1					
5-year, tc	118	118	118					
10-year, tc	134	134	134					
20-year, tc	155	155	155					
50-year, tc	184	184	184					
100-year, tc	205	205	205					
C10 runoff coefficient	0.9	0.9	0.9					Use AR&R or Table F3, pg F-6
Frequency Factors								
FF, 1-year	0.8	0.8	0.8					Can use 0.8 for a construction site
FF, 2-year	0.85	0.85	0.85					Can use 0.85 for a construction
FF, 5-year	0.95	0.95	0.95					Can use 0.95 for a construction
FF, 10-year	1	1	1					Generally always 1
FF, 20-year	1.05	1.05	1.05					Can use 1.05 for a construction
FF, 50-year	1.15	1.15	1.15					Can use 1.15 for a construction
FF, 100-year	1.2	1.2	1.2					Can use 1.2 for a construction site
Flow Calculations								Notes
1-year, tc (m^3/s)	0.577	0.05	0.079					
2-year, tc (m^3/s)	0.793	0.069	0.109					
5-year, tc (m^3/s)	1.161	0.101	0.16					
10-year, tc (m^3/s)	1.388	0.121	0.191					
20-year, tc (m^3/s)	1.686	0.147	0.232					
50-year, tc (m^3/s)	2.102	0.191	0.302					
100-year, tc (m^3/s)	2.548	0.222	0.351					

NB for flow calculations on sediment basin spillway, see Worksheet 3 (if required).

3. Sediment Basin Spillway Design

Structure Details	1	2	3				
Structure Name	1	2	3				Auto-filled from Worksheet 1
Catchment Area (ha)	4.14	0.36	0.57				Auto-filled from Worksheet 1
Time of concentration (tc)	7	3	3				Auto-calculated assuming tc is halved
Rainfall Intensities (IFD Values)							
1 year, Ic	52.51	52.51	52.51				Enter the relevant rainfall intensities (in mm/hr) for each of the nominated rainfall events. The time of concentration (tc) determines the duration of the event to be used
2 year, Ic	68.08	68.08	68.08				
5 year, Ic	89.03	89.03	89.03				
10 year, Ic	101.56	101.56	101.56				
20 year, Ic	117.91	117.91	117.91				
50 year, Ic	139.5	139.5	139.5				
100 year, Ic	156.1	156.1	156.1				
C_{10} runoff coefficient	0.9	0.9	0.9				Use AR&R or Table F3, pg F-6
Design ARI event (select):	10	10	10				Select design ARI (years) from dropdown
Frequency Factor	1	1	1	#N/A	#N/A	#N/A	Auto-filled based on selected ARI
Flow Calculation	1.052	0.091	0.145	#N/A	#N/A	#N/A	Auto-calculated based on selected ARI

2m 0 5 10 15 20 25m

SCALE 1:250 AT A0 SIZE SHEET

500mm 0 1 2 3 4 5m

SCALE 1:50 AT A0 SIZE SHEET

200mm 0 500 1000 1500 2000mm

SCALE 1:20 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

ISSUED FOR INFORMATION	15.02.24	A
AMENDMENTS	DATE	ISSUE

ARCHITECT: SBA ARCHITECTS

CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 25

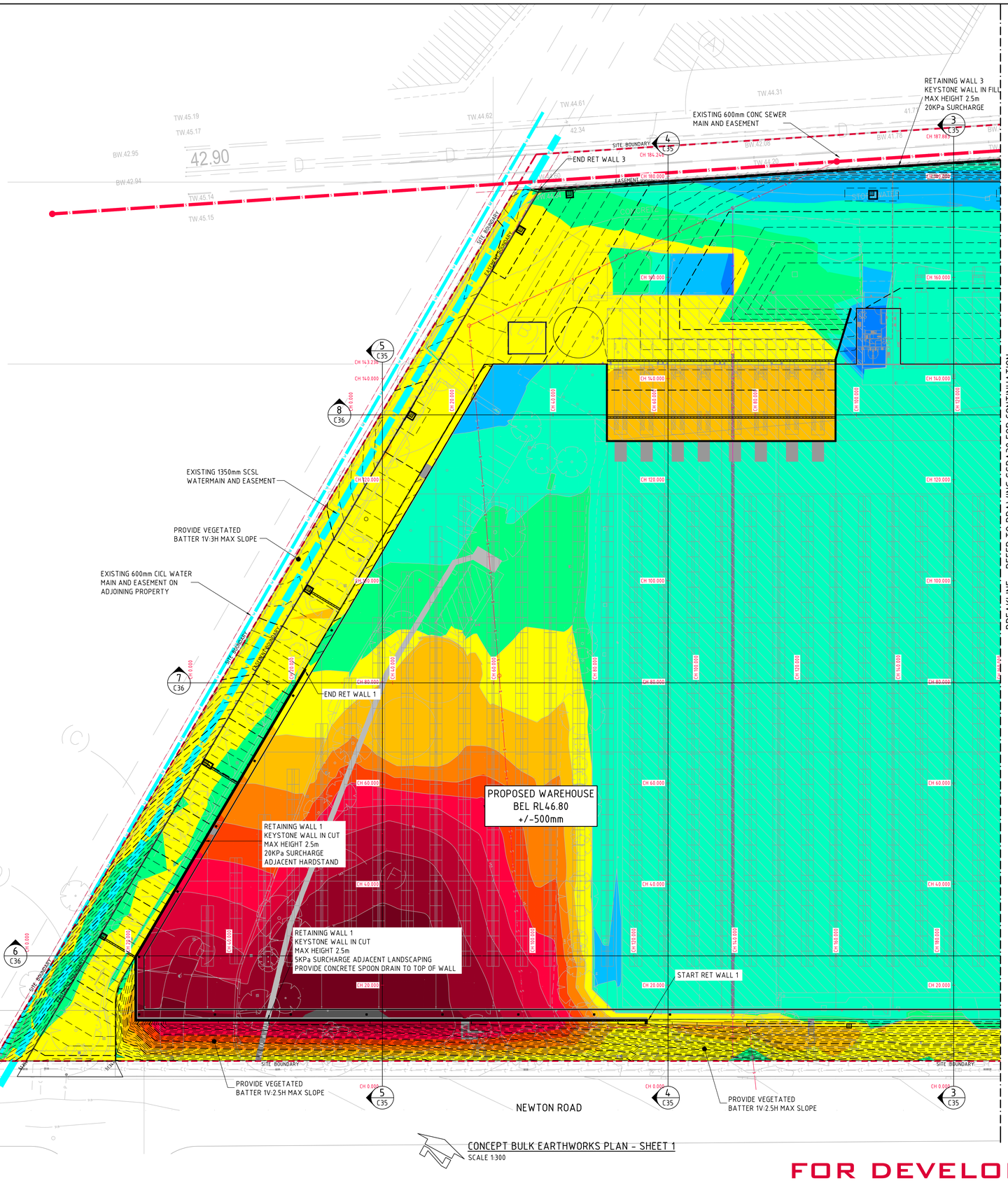
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: EROSION & SEDIMENT CONTROL DETAILS

DRAWING No: C015039.01-SSDA 25

ISSUE: A

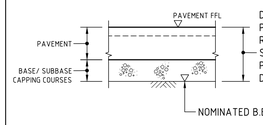


LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS SURVEYORS DATED 12.10.20.

- 50.00 – EXISTING CONTOUR (0.2m INTERVAL)
- 50.00 – B.E.L. CONTOUR (MAJOR 1.0m)
- 50.10 – B.E.L. CONTOUR (MINOR 0.25m)
- 50.00 – B.E.L. SPOT LEVEL
- SGGP, SINGLE GRATED GULLY PIT
- W – EXISTING SYDNEY WATER MAIN
- S – EXISTING SEWER MAIN



NOMINATED B.E.L. DETAIL
NTS

CONCEPT EARTHWORK ESTIMATES

SITE AREA	= 5.07 Ha
DELETERIOUS MATERIAL STRIP	=(-10,100m³) (TO BE EXPORTED/REUSED) (200mm OVER 5.07 Ha)
CUT	= -16,200m³
FILL	= +25,700m³
ALLOWANCES	
DETAILED EXCAVATION (1,500m³/Ha)	= 7,600m³
DIFFERENCE	= +1,900m³ (i.e. IMPORT REQUIRED)

NOTE:
VOLUMES BASED ON 200mm DELETERIOUS MATERIAL STRIP OVER THE NOMINATED AREA. EARTHWORKS VOLUMES ARE APPROXIMATE ONLY. NO ALLOWANCE HAS BEEN MADE FOR DELETERIOUS MATERIAL, EROSION AND SEDIMENT CONTROL, BULKING OR COMPACTION OF FILLED SOILS, THE REMOVAL OF UNCONTROLLED OR CONTAMINATED MATERIAL OR ANY OTHER UNSPECIFIED EXCAVATION RELATED TO CONSTRUCTION ACTIVITIES. DETAILED EXCAVATION ALLOWANCE IS APPROXIMATE ONLY AND ACCOUNTS FOR STORMWATER/SERVICES TRENCHING AND FOUNDATIONS. THE DETAILED EXCAVATION VOLUMES ARE TO BE CONFIRMED BY THE CONTRACTOR. REFER ANY CONCERNS TO ENGINEER.

SITE PREPARATION NOTES:

REFER TO DRAWING SSDA11 FOR SITE PREPARATION NOTES

DEPTH RANGE

No.	FROM DEPTH	TO DEPTH	COLOUR
1	-5.000	-4.500	
2	-4.500	-4.000	
3	-4.000	-3.500	
4	-3.500	-3.000	
5	-3.000	-2.500	
6	-2.500	-2.000	
7	-2.000	-1.500	
8	-1.500	-1.000	
9	-1.000	-0.500	
10	-0.500	0.000	
11	0.000	0.500	
12	0.500	1.000	
13	1.000	1.500	
14	1.500	2.000	
15	2.000	2.500	

ALLOWANCES FOR STRUCTURE

	DEPTH OF PAVEMENT
INTERNAL	
WAREHOUSE	300mm
OFFICE	300mm
EXTERNAL	
HARDSTAND	300mm
CAR PARK	300mm
LANDSCAPING	300mm
PEDESTRIAN	300mm

CONCEPT BULK EARTHWORKS PLAN - SHEET 1
SCALE 1:300

FOR DEVELOPMENT APPLICATION

3m 0 5 10 15 20 25 30m
SCALE 1:300 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	26.03.24	A

ARCHITECT: SBA ARCHITECTS
CLIENT: Centuria
PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 31

CONSULT AUSTRALIA
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

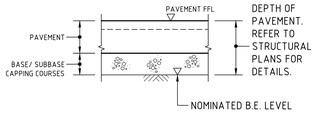
DRAWING TITLE: CONCEPT BULK EARTHWORKS PLAN SHEET 1
DRAWING NO: C015039.01-SSDA 31
ISSUE: B

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON SURVEY INFORMATION PROVIDED BY LTS SURVEYORS DATED 12.10.20.

- 50.00 – EXISTING CONTOUR (0.2m INTERVAL)
- 50.00 – B.E.L. CONTOUR (MAJOR 1.0m)
- 50.10 – B.E.L. CONTOUR (MINOR 0.25m)
- 50.00 – B.E.L. SPOT LEVEL
- SGGP – SGGP, SINGLE GRATED GULLY PIT
- W – EXISTING SYDNEY WATER MAIN
- S – EXISTING SEWER MAIN



NOMINATED B.E.L. DETAIL
NTS

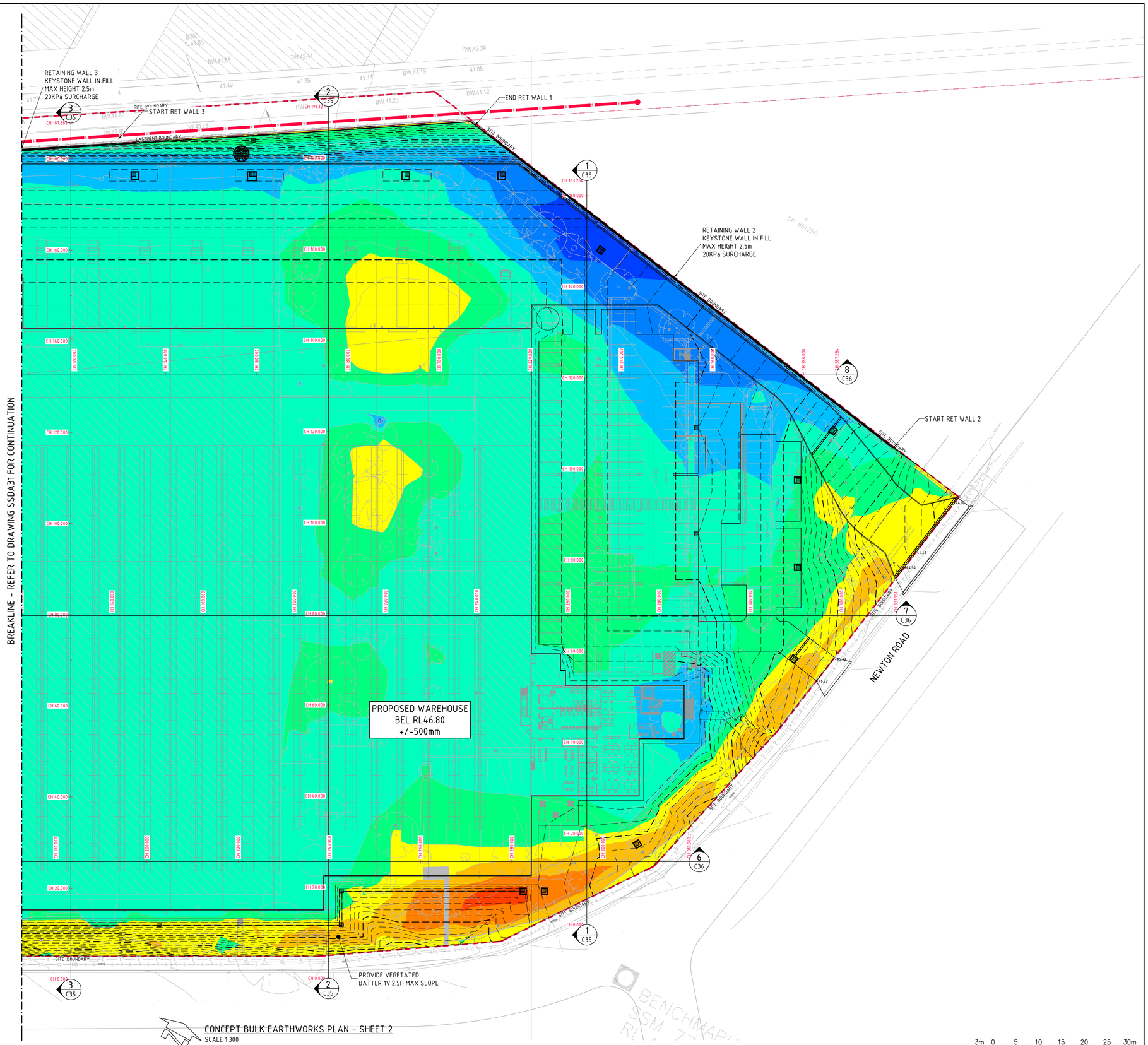
SITE PREPARATION NOTES:

REFER TO DRAWING SSDA11 FOR SITE PREPARATION NOTES

DEPTH RANGE			
No.	FROM DEPTH	TO DEPTH	COLOUR
1	-5.000	-4.500	
2	-4.500	-4.000	
3	-4.000	-3.500	
4	-3.500	-3.000	
5	-3.000	-2.500	
6	-2.500	-2.000	
7	-2.000	-1.500	
8	-1.500	-1.000	
9	-1.000	-0.500	
10	-0.500	0.000	
11	0.000	0.500	
12	0.500	1.000	
13	1.000	1.500	
14	1.500	2.000	
15	2.000	2.500	

ALLOWANCES FOR STRUCTURE

	DEPTH OF PAVEMENT
INTERNAL	
WAREHOUSE	300mm
OFFICE	300mm
EXTERNAL	
HARDSTAND	300mm
CAR PARK	300mm
LANDSCAPING	300mm
PEDESTRIAN	300mm



CONCEPT BULK EARTHWORKS PLAN – SHEET 2
SCALE 1:300

FOR DEVELOPMENT APPLICATION

3m 0 5 10 15 20 25 30m
SCALE 1:300 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	26.03.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

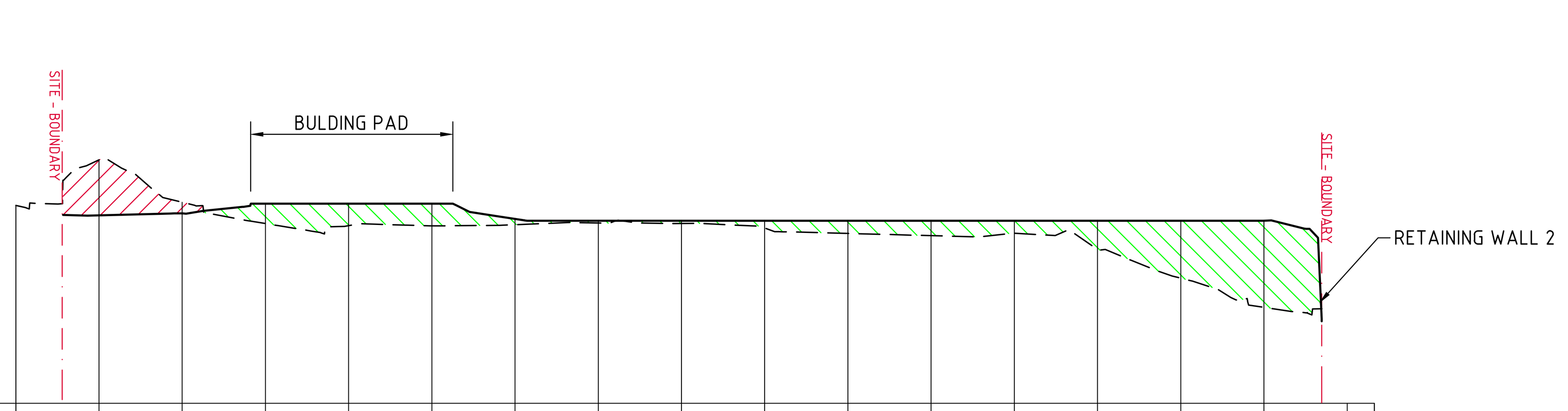
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 32

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 e: +61 2 9241 3751
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

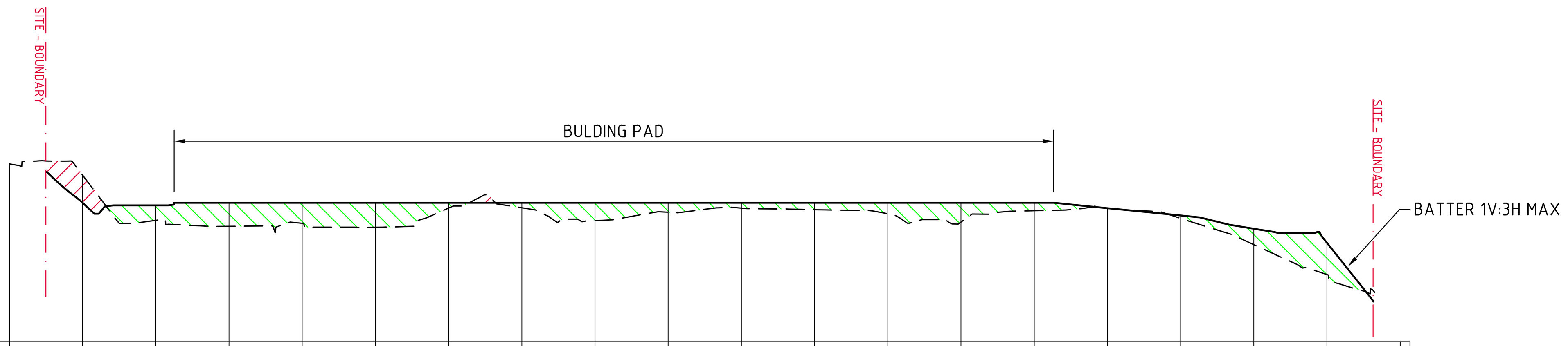
DRAWING TITLE: CONCEPT BULK EARTHWORKS PLAN SHEET 2

DRAWING No: C015039.01-SSDA 32 ISSUE: B



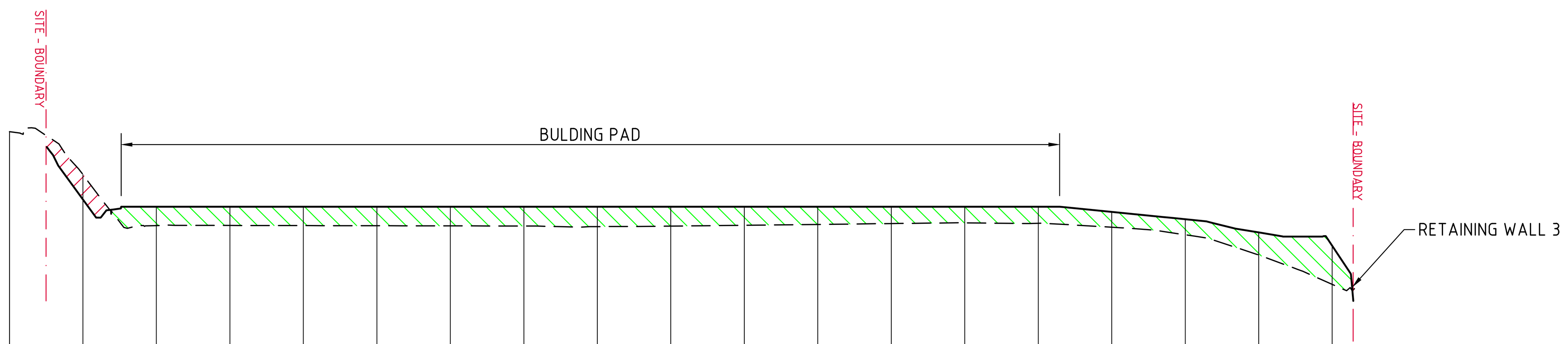
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	163.264
CUT/FILL DEPTH		-1.335	-0.270	0.478	0.528	0.534	0.140	0.054	0.066	0.176	0.304	0.359	0.299	0.693	1.381	2.084		
BULK EARTHWORKS LEVEL		46.518	46.566	46.800	46.800	46.800	46.434	46.390	46.390	46.390	46.390	46.390	46.390	46.390	46.390	46.391		
EXISTING SURFACE LEVEL	46.76	47.853	46.836	46.322	46.272	46.266	46.294	46.335	46.324	46.214	46.086	46.031	46.090	45.697	45.009	44.307		

SECTION BULK EARTHWORKS 1
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



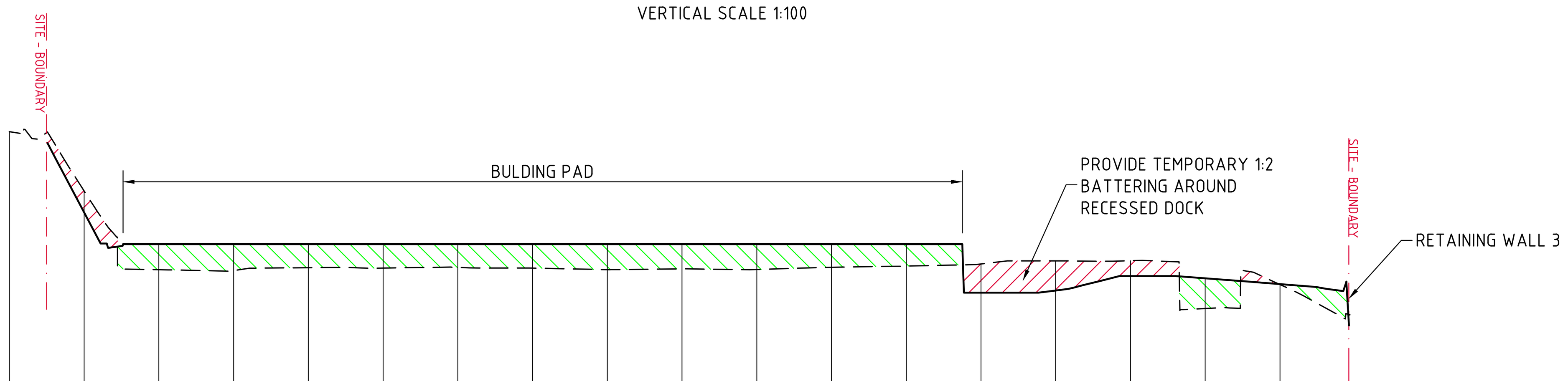
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	190.000	191.327
CUT/FILL DEPTH		-0.759	0.410	0.643	0.559	0.669	0.143	0.135	0.489	0.257	0.144	0.190	0.298	0.527	0.215	0.009	0.080	0.436	0.871		
BULK EARTHWORKS LEVEL		46.800	46.731	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.654	46.453	46.091	45.707		
EXISTING SURFACE LEVEL	47.87	47.560	46.321	46.157	46.241	46.131	46.657	46.665	46.311	46.543	46.656	46.610	46.502	46.273	46.585	46.645	46.373	45.655	44.837		

SECTION BULK EARTHWORKS 2
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



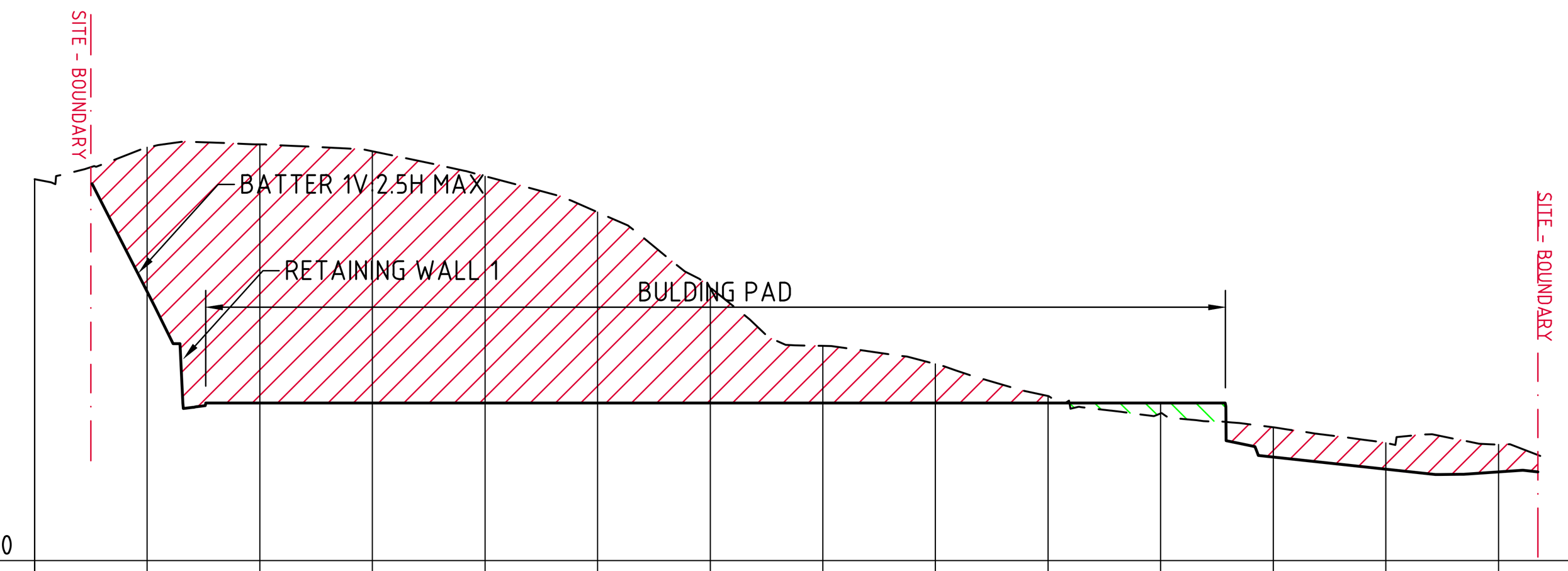
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	187.883
CUT/FILL DEPTH		-0.677	0.515	0.512	0.515	0.519	0.523	0.527	0.542	0.529	0.506	0.483	0.460	0.442	0.453	0.417	0.422	0.613	1.051	
BULK EARTHWORKS LEVEL		46.996	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.658	46.457	46.098	45.737	
EXISTING SURFACE LEVEL	48.84	47.674	46.285	46.288	46.285	46.281	46.277	46.273	46.258	46.271	46.294	46.317	46.340	46.358	46.347	46.241	46.035	45.484	44.685	

SECTION BULK EARTHWORKS 3
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	184.246
CUT/FILL DEPTH		-0.575	0.687	0.708	0.632	0.643	0.625	0.645	0.686	0.665	0.681	0.622	0.590	-0.767	-0.791	-0.413	0.807	0.014		
BULK EARTHWORKS LEVEL		47.650	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	45.500	45.557	45.941	45.882	45.729		
EXISTING SURFACE LEVEL	49.81	48.225	46.113	46.092	46.168	46.157	46.175	46.155	46.114	46.135	46.119	46.178	46.210	46.267	46.348	46.354	45.075	45.714		

SECTION BULK EARTHWORKS 4
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	143.236
CUT/FILL DEPTH		-2.566	-4.591	-4.470	-4.025	-3.388	-2.048	-1.013	-0.691	-0.124	0.186	-0.528	-0.468	-0.488		
BULK EARTHWORKS LEVEL		48.772	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	45.839	45.624	45.574		
EXISTING SURFACE LEVEL	50.77	51.339	51.391	51.270	50.825	50.188	48.848	47.813	47.491	46.924	46.614	46.367	46.092	46.062		

SECTION BULK EARTHWORKS 5
HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

LEGEND:

- DENOTES BULK EARTHWORKS PROFILE
- DENOTES EXISTING PROFILE
- DENOTES AREA IN CUT
- DENOTES AREA IN FILL

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT A0 SIZE SHEET

5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR INFORMATION ONLY	26.03.24	A

ARCHITECT: SBA ARCHITECTS

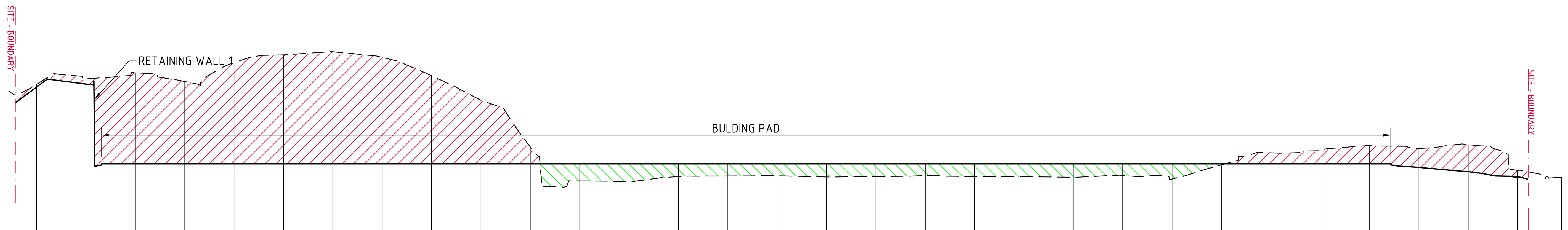
CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 35

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: CONCEPT BULK EARTHWORKS SECTIONS SHEET 1
DRAWING No: C015039.01-SSDA 35
ISSUE: B



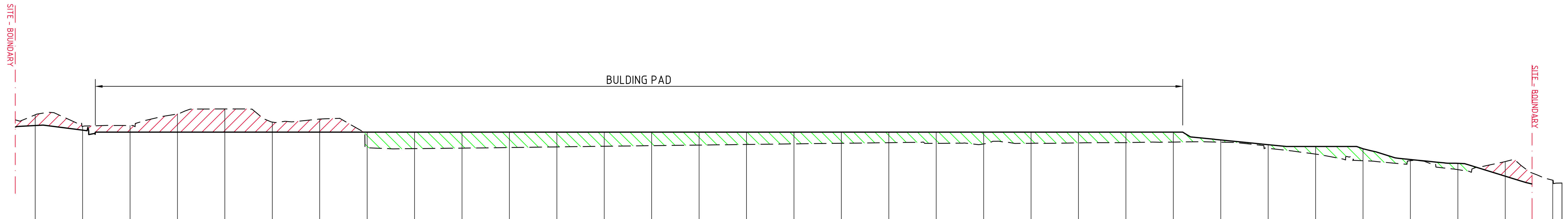
DATUM 44.00

CUT/FILL DEPTH		-0.110	-0.208	-3.694	-3.337	-4.101	-4.415	-4.543	-4.316	-3.571	-2.578	-0.684	0.695	0.720	0.521	0.496	0.487
BULK EARTHWORKS LEVEL		49.913	50.032	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800
EXISTING SURFACE LEVEL		50.023	50.241	50.494	50.137	50.901	51.215	51.343	51.116	50.371	49.378	47.484	46.105	46.080	46.279	46.304	46.313
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000

CUT/FILL DEPTH	0.535	0.517	0.477	0.512	0.527	0.544	0.477	0.615	0.042	-0.445	-0.551	-0.737	-0.766	-1.096	-0.274	
BULK EARTHWORKS LEVEL	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.652	46.483	46.261	
EXISTING SURFACE LEVEL	46.265	46.283	46.323	46.288	46.273	46.256	46.323	46.185	46.758	47.245	47.351	47.537	47.418	47.579	46.535	46.25
CHAINAGE	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	318.908

SECTION BULK EARTHWORKS 6

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



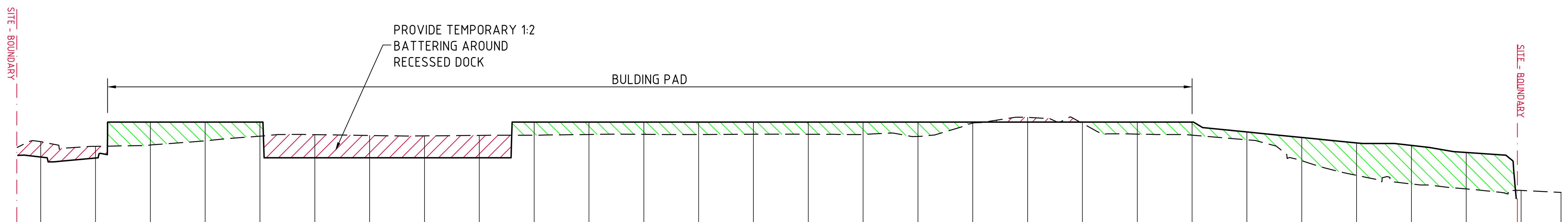
DATUM 43.00

CUT/FILL DEPTH		-0.450	-0.158	-0.280	-0.768	-0.981	-0.426	-0.553	0.661	0.694	0.673	0.649	0.621	0.595	0.570	0.544	0.519
BULK EARTHWORKS LEVEL		47.081	46.885	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800
EXISTING SURFACE LEVEL		47.531	47.042	47.080	47.568	47.781	47.226	47.353	46.139	46.106	46.127	46.151	46.179	46.205	46.230	46.256	46.281
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000

CUT/FILL DEPTH	0.494	0.468	0.443	0.471	0.497	0.468	0.450	0.442	0.417	0.094	0.154	0.322	0.506	0.051	0.266	-0.617		
BULK EARTHWORKS LEVEL	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.800	46.473	46.273	46.197	46.102	45.647	45.484	44.945		
EXISTING SURFACE LEVEL	46.306	46.332	46.357	46.329	46.303	46.332	46.350	46.358	46.383	46.379	46.119	45.875	45.596	45.596	45.218	45.562	44.774	44.66
CHAINAGE	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	320.000	330.000	331.951

SECTION BULK EARTHWORKS 7

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



DATUM 43.00

CUT/FILL DEPTH		-0.558	-0.425	0.835	0.684	0.513	-0.841	-0.811	-0.796	-0.814	0.482	0.453	0.448	0.454	0.444	0.445	0.450
BULK EARTHWORKS LEVEL		45.527	45.491	46.800	46.800	46.800	45.500	45.500	45.500	45.500	46.800	46.800	46.800	46.800	46.800	46.800	46.800
EXISTING SURFACE LEVEL		46.084	45.916	45.965	46.116	46.287	46.341	46.311	46.296	46.314	46.318	46.347	46.352	46.346	46.356	46.355	46.350
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000

CUT/FILL DEPTH	0.523	0.037	-0.170	0.050	0.441	0.479	0.285	0.847	1.178	1.403	1.325		
BULK EARTHWORKS LEVEL	46.800	46.800	46.800	46.800	46.800	46.800	46.438	46.238	46.038	45.949	45.691		
EXISTING SURFACE LEVEL	46.277	46.763	46.970	46.750	46.359	46.321	46.154	45.391	44.860	44.546	44.366	44.309	44.24
CHAINAGE	170.000	180.000	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	287.284

SECTION BULK EARTHWORKS 8

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

LEGEND:

- DENOTES BULK EARTHWORKS PROFILE
- DENOTES EXISTING PROFILE
- DENOTES AREA IN CUT
- DENOTES AREA IN FILL

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT A0 SIZE SHEET

5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR INFORMATION ONLY	26.03.24	A

AMENDMENTS	DATE	ISSUE

AMENDMENTS	DATE	ISSUE

ARCHITECT
SBA ARCHITECTS

CLIENTCLIENT
Centuria

PROJECT
PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 36

CONSULT AUSTRALIA

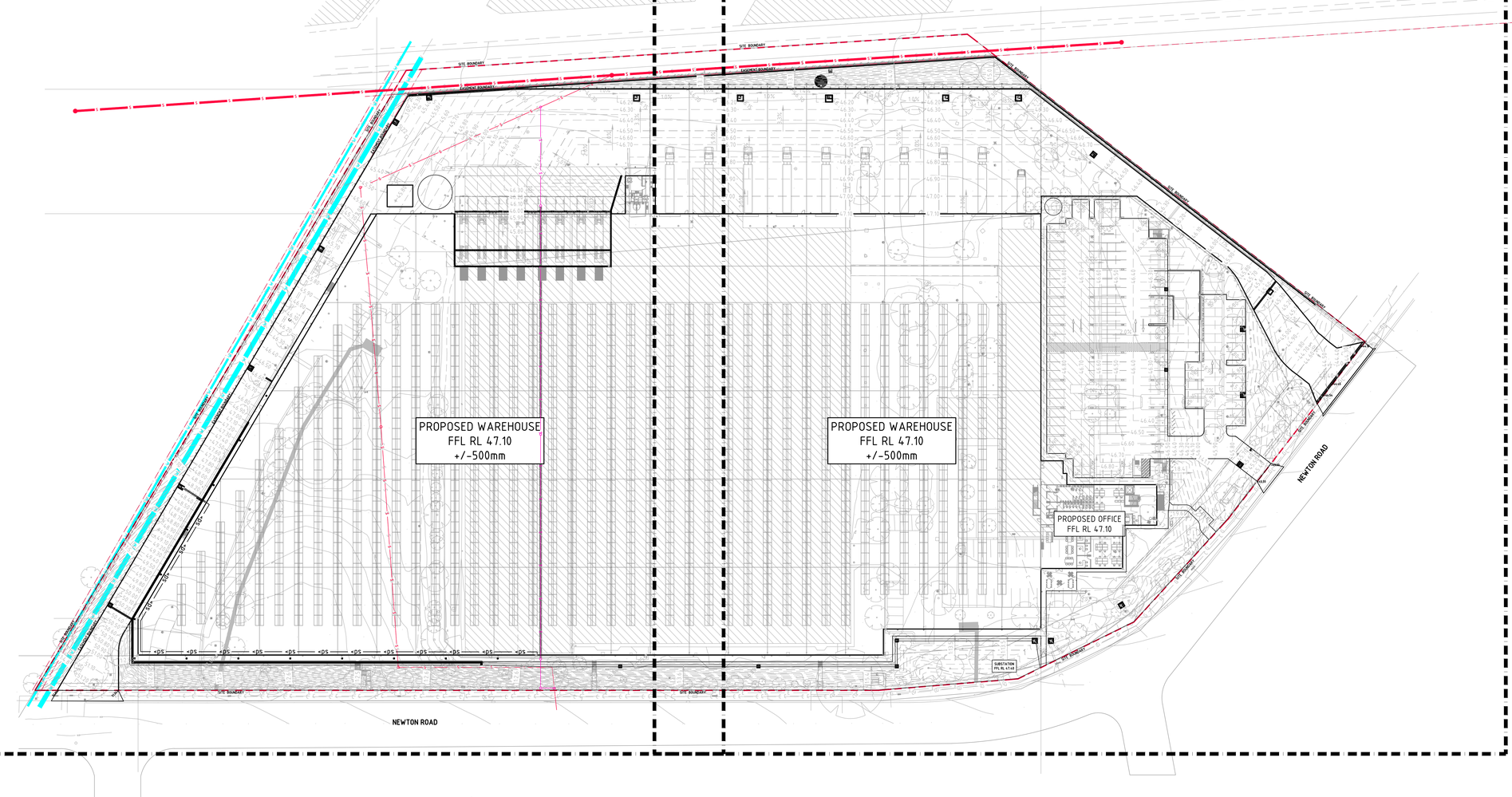
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CRC COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
CONCEPT BULK EARTHWORKS SECTIONS SHEET 2

DRAWING No C015039.01-SSDA 36
ISSUE B

SHEET 1 – REFER TO DRAWING SSDA41 & SSDA51

SHEET 2 – REFER TO DRAWING SSDA42 & SSDA52



DRAWING KEY PLAN
SCALE 1:500

STORMWATER DRAINAGE NOTES:

1. ALL STORMWATER WORKS TO BE COMPLETED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS3500.3 PLUMBING AND DRAINAGE, PART 3: STORMWATER DRAINAGE.
2. THE MINOR (PIPED) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 20 YEAR ARI STORM EVENT AND THE MAJOR (OVERLAND) SYSTEM HAS BEEN DESIGNED FOR THE 1 IN 100 YEAR ARI STORM EVENT.
3. ALL FINISHED PAVEMENT LEVELS SHALL BE AS INDICATED ON FINISHED LEVELS PLANS SSDA51 & SSDA52.
4. PIT SIZES SHALL BE AS INDICATED IN THE SCHEDULE WHILE PIPE SIZES AND DETAILS ARE PROVIDED ON PLAN.
5. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED BY SURVEY PRIOR TO COMMENCING WORKS ON SITE.
6. ALL STORMWATER PIPES Ø375 OR GREATER SHALL BE CLASS 2 (WITH HS2 SUPPORT) REINFORCED CONCRETE WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.
7. ALL PIPES UP TO AND INCLUDING Ø300 TO BE uPVC GRADE SN8 UNO.
8. PIPE CLASS NOMINATED ARE FOR IN-SERVICE LOADING CONDITIONS ONLY. CONTRACTOR IS TO MAKE ANY NECESSARY ADJUSTMENTS REQUIRED FOR CONSTRUCTION CONDITIONS.
9. ALL CONCRETE PITS GREATER THAN 1000mm DEEP SHALL BE REINFORCED USING N12–200 EACH WAY CENTERED IN WALL AND BASE. LAP MINIMUM 300mm WHERE REQUIRED. ALL CONCRETE FOR PITS SHALL BE F'c=25 MPa. PRECAST PITS MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
10. IN ADDITION TO ITEM 9 ABOVE, ALL CONCRETE PITS GREATER THAN 3000mm DEEP SHALL HAVE WALLS AND BASE THICKNESS INCREASED TO 200mm.
11. PIPES SHALL BE LAID AS PER PIPE LAYING DETAILS. PARTICULAR CARE SHALL BE TAKEN TO ENSURE THAT THE PIPE IS FULLY AND EVENLY SUPPORTED. RAM AND PACK FILLING AROUND AND UNDER BACK OF PIPES AND PIPE FAUCETS, WITH NARROW EDGED RAMMERS OR OTHER SUITABLE TAMPING DETAILS.
12. CONCRETE PIPES UNDER, OR WITHIN THE ZONE OF INFLUENCE OF PAVED AREAS SHALL BE LAID USING HS2 TYPE SUPPORT, AS A MINIMUM, IN ACCORDANCE WITH AS 3725. AGGREGATE BACKFILL SHALL NOT BE USED FOR PIPE BEDDING AND OR HAUNCH/SIDE SUPPORT.
13. WHERE PIPE LINES ENTER PITS, PROVIDE 2m LENGTH OF STOCKING WRAPPED SLOTTED Ø100 uPVC TO EACH SIDE OF PIPE.
14. ALL SUBSOIL DRAINAGE LINES SHALL BE Ø100 SLOTTED uPVC WITH APPROVED FILTER WRAP LAID IN 300mm WIDE GRANULAR FILTER UNLESS NOTED OTHERWISE. LAY SUBSOIL LINES TO MATCH FALLS OF LAND AND/OR 1 IN 200 MINIMUM. PROVIDE CAPPED CLEANING EYE (RODDING POINT) AT UPSTREAM END OF LINE AND AT 30m MAX. CTS. PROVIDE SUBSOIL LINES TO ALL PAVEMENT/ LANDSCAPED INTERFACES, TO REAR OF RETAINING WALLS (AS NOMINATED BY STRUCTURAL ENGINEER) AND AS SHOWN ON PLAN.
15. WHERE SUBSOIL DRAINAGE PASSES UNDER A PAVEMENT OR A SLAB, UNSLOTTED UPVC ARE TO BE PROVIDED UNLESS NOTED OTHERWISE.
16. ALL PIPE GRADES 1 IN 200 MINIMUM UNO.
17. PROVIDE STEP IRONS IN PITS DEEPER THAN 1000mm.
18. MIN. 600 COVER TO PIPE OBVERT BENEATH ROADS & MIN. 400 COVER BENEATH LANDSCAPED AND PEDESTRIAN AREAS.
19. PIT COVERS IN TRAFFICABLE PAVEMENT SHALL BE CLASS D 'HEAVY DUTY', THOSE LOCATED IN NON-TRAFFICABLE AREAS SHALL BE CLASS B 'MEDIUM DUTY' U.N.O.
20. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
21. DOWN PIPES (DP) TO BE AS PER HYDRAULIC ENGINEERS DETAILS WITH CONNECTOR TO MATCH DP SIZE U.N.O. ON PLAN. PROVIDE CLEANING EYE AT GROUND LEVEL.
22. PIPE LENGTHS NOMINATED ON PLAN OR LONGSECTIONS ARE MEASURED FROM CENTER OF PITS TO THE NEAREST 0.5m AND DO NOT REPRESENT ACTUAL LENGTH. THE CONTRACTOR IS TO ALLOW FOR THIS.
23. WHERE CONNECTION TO EXISTING INGROUND DRAINAGE SYSTEMS, OPEN SWALES, CHANNELS OR ANY OTHER EXISTING SYSTEM, IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION AND INVERT ON SITE AT THE BEGINNING OF THE CONSTRUCTION PERIOD. REFER ANY VARIANCE FROM DOCUMENTATION OR SURVEYS TO THE ENGINEER FOR CLARIFICATION.

FINISHED LEVELS PLAN NOTES:

1. LEVELS DATUM IS AUSTRALIAN HEIGHT DATUM (A.H.D.).
2. GRADING REQUIREMENTS TO BE COMPLETED IN ACCORDANCE WITH AUSTRALIAN STANDARD AS2890.1, AS2890.2 AND AS2890.6.
3. ALL CONTOUR LINES & SPOT LEVELS INDICATE FINISHED PAVEMENT LEVELS U.N.O. ON PLAN.
4. CONTOUR INTERVALS
   - THE MINOR CONTOUR INTERVAL IS 0.1m.
   - THE MAJOR CONTOUR INTERVAL IS 0.5m.
5. HARDSTAND GRADING
   - MINIMUM PAVEMENT GRADE IS TO BE 1:100 (1%).
   - GRADING OF ON-GRADE DOCKS TO BE 1:100 (1%) FALL AWAY FROM THE DOCK FACE FOR A LENGTH OF 15m U.N.O.
   - GRADING OF TRUCK CIRCULATION ZONES TO BE MINIMUM AS NOTED ABOVE, 3-4% NOMINAL AND MAX. 5%.
6. CAR PARKING AREA GRADES
   - MINIMUM PAVEMENT GRADE IS TO BE 1:100 (1%), DESIRABLE MINIMUM GRADE 1:50 (2%).
   - MAXIMUM PAVEMENT GRADE IS TO BE 1:20 (5%) N CARPARKING AREAS AND 1:25 (4%) ELSEWHERE.
   - DISABLED ACCESS PARKING ZONES AND SHARED SPACE TO BE MAXIMUM OF 1:33 (3%) IN ASPHALT PAVEMENT AND MAXIMUM OF 1:40 (2.5%) IN CONCRETE PAVEMENT.
   - CARPARK RAMP GRADES TO BE MAX 1:5 WITH 2.5m SMOOTH TRANSITION AT TOP AND BOTTOM U.N.O.
7. TRUCK RAMP GRADES
   - MAXIMUM B-DOUBLE OR 19.0m AV RAMP GRADES ARE TO BE 1:8.3 (12%) U.N.O. ON PLAN
   - PROVIDE MINIMUM 4.0m LONG TRANSITION WHERE CHANGES OF GRADE EXCEED 1:20 (5%) AT A CREST U.N.O.
   - PROVIDE MINIMUM 3.0m LONG TRANSITION WHERE CHANGE OF GRADE EXCEED 1:20 (5%) AT A SAG U.N.O.
   - TRANSITIONS ARE TO PROVIDE A SMOOTH CONTINOUS CIRCULAR AND TANGENTIAL CHANGE IN GRADE TO ENSURE NO SHARP OR ACUTE CHANGES IN GRADE ARE PRESENT.
8. WHERE FIRE BRIGADE ACCESS IS REQUIRED, MAXIMUM RAMP GRADIENTS ARE TO BE 1:6 (16.6%), DESIRABLE RAMP GRADIENTS ARE TO BE 1:8 (12.5%) WITH 7m TRANSITION TOP AND BOTTOM U.N.O. ON PLAN.
9. PERMANENT BATTER SLOPES ARE TO HAVE A MAXIMUM GRADE OF 1V:3H U.N.O. BASED ON GEOTECHNICAL ASSESSMENT. PROVIDE MINIMUM 0.5m BERM BETWEEN THE BACK OF KERB OR PAVEMENT EDGES AND THE TOP OR TOE OF A BATTER.
10. ALL BATTER SLOPE WITH GRADES AT OR EXCEEDING 1V:6H ARE TO BE TURFED IMMEDIATELY OR APPROPRIATE EROSION CONTROL IS TO BE PROVIDED TO THE SATISFACTION OF THE ENGINEER.
11. ALL FOOTPATHS ARE TO FALL AWAY FROM THE BUILDING AT 2.5% NOMINAL. GRADE.
12. ALL PAVEMENTS ARE TO BE SET AT 30mm BELOW THE FINISHED FLOOR LEVEL OF THE WAREHOUSE AND OFFICE AREAS. PROVIDE LOCAL FEATHERING AT DOORWAYS OR ROLLER SHUTTERS TO PROVIDE FLUSH FINISH AS REQUIRED.
13. WHERE NEW AND EXISTING INTERFACING IS REQUIRED, MATCH EXISTING LEVELS AND PROVIDE SMOOTH INTERFACE BETWEEN NEW AND EXISTING GRADIENTS. REFER ANY CONCERNS TO THE ENGINEER.

FOR DEVELOPMENT APPLICATION

5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 40

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: DRAWING KEY PLAN

DRAWING No: C015039.01-SSDA 40 ISSUE: B

EXISTING 600mm CONC SEWER MAIN AND EASEMENT

SITE BOUNDARY

EASEMENT BOUNDARY

CONCRETE

PIT 6

PIT 7

Φ750

Φ825

PIT 5

CONNECT NEW 225 SEWER TO EXISTING VIA NEW MANHOLE

EXISTING 225mm VC SEWER MAIN

Φ225

PIT 4

GD

DIVERT EXISTING 225mm SEWER LINE UNDER WAREHOUSE. OFFSET 3m FROM GRID LINE 9. PIPE TO BE CONCRETE ENCASES UNDER WAREHOUSE. MAX 120m BETWEEN MANHOLES

EXISTING 1350mm SCSL WATERMAIN AND EASEMENT

Φ675

EXISTING 600mm CICL WATER MAIN AND EASEMENT ON ADJOINING PROPERTY

PIT 3

PROVIDE 200x200 HAVESTOCK FLOOR DRAIN (OR SIMILAR) AT 15m SPACING TYPICAL

PROPOSED WAREHOUSE
FFL RL 47.10
+/-500mm

PIT 2

SYPHONIC ROOF DRAINAGE TO CONNECT TO PIT 2. SUBJECT TO FUTURE DESIGN DURING DETAILED DESIGN STAGE

EXISTING 225mm VC SEWER MAIN

150Φ uPVC. PIPE SYSTEM TO BE FULLY SEALED SOLVENT WELDED JOINT uPVC LAID AT 1:300 FALL. CONTRACTOR TO LOCATE AND CONNECT ALL SUBSOIL TAILOUTS FROM ADJACENT RETAINING WALL AND CONNECT TO SEALED PIPE SYSTEM. PIPE TO BE INSTALLED PRIOR TO OR IN CONJUNCTION WITH ADJACENT RETAINING WALL

DIVERT EXISTING 225mm SEWER LINE UNDER WAREHOUSE. OFFSET 3m FROM GRID LINE 9. PIPE TO BE CONCRETE ENCASES UNDER WAREHOUSE. MAX 120m BETWEEN MANHOLES

PIT 1

PROVIDE 200x200 HAVESTOCK FLOOR DRAIN (OR SIMILAR) AT 15m SPACING TYPICAL

150Φ uPVC. PIPE SYSTEM TO BE FULLY SEALED SOLVENT WELDED JOINT uPVC LAID AT 1:300 FALL. CONTRACTOR TO LOCATE AND CONNECT ALL SUBSOIL TAILOUTS FROM ADJACENT RETAINING WALL AND CONNECT TO SEALED PIPE SYSTEM. PIPE TO BE INSTALLED PRIOR TO OR IN CONJUNCTION WITH ADJACENT RETAINING WALL

PROVIDE SYPHONIC ROOF DRAINAGE TO EXTENT SHOWN. FINAL DESIGN DURING DETAILED DESIGN STAGE

PROVIDE GRASSED SWALE
0.5% MIN LONGITUDINAL FALL
0.5m WIDE BASE WIDTH
MAX BATTER SLOPE 1V:3H

PIT 11

Φ450

EXISTING 225mm VC SEWER MAIN

CONNECT NEW 225 SEWER TO EXISTING VIA NEW MANHOLE

PROVIDE 600 WIDE SPOON DRAIN WITH 300x300 DRAIN CAST INTO CONCRETE SPOON DRAIN . PROVIDE 150Φ uPVC OUTLET PIPE & CONNECT TO ADJACENT STORMWATER PITS 15

NEWTON ROAD

BREAKLINE - REFER TO DRAWING SSDA42 FOR CONTINUATION

CONCEPT STORMWATER DRAINAGE PLAN - SHEET 1

SCALE 1:300

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON ESTATE DEISGN INFORMATION PROVIDED BY LTS SURVEYORS DATED 12.10.20 REF 51145001DT

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED DRAINAGE LINE
- EXISTING DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- ROOFWATER LINE
- EXISTING SYDNEY WATER MAIN
- EXISTING SEWER MAIN
- SUBSOIL LINE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS

STORMWATER DRAINAGE NOTES:

REFER TO DRAWING SSDA40 FOR STORMWATER NOTES
ALL INLET PITS TO BE FITTED WITHC OCEAN PROTECT OCEANGUARD PIT BASKET

PIT SCHEDULE

PIT No.	GRATE RL	TYPE	SIZE	COMMENT
PIT 1	50.30	SGGP	900x900	○
PIT 2	48.30	SGGP	1800x900	○ 900SQ RISER
PIT 3	46.60	SGGP	1200x1200	○ 900SQ RISER
PIT 4	45.65	SGGP	1200x1200	○ 900SQ RISER
PIT 5	45.20	SGGP	1200x1200	○ 900SQ RISER
PIT 6	45.36	SGGP	1200x1200	○ 900SQ RISER
PIT 7	45.95	SGGP	1500x1500	○ 900SQ RISER
PIT 8	45.95	SGGP	1500x1500	○ 900SQ RISER
PIT 9	45.95	SGGP	1800x1800	○ 900SQ RISER
PIT 10	46.25	SGGP	1500x1500	○ 900SQ RISER
PIT 11	46.80	SGGP	900x900	○
PIT 12	46.80	SGGP	900x900	○
PIT 13	46.80	SGGP	900x900	○
PIT 14	46.80	SGGP	900x900	○
PIT 15	46.80	SGGP	1200x1200	○ 900SQ RISER
PIT 16	46.80	SGGP	1200x1200	○ 900SQ RISER
PIT 17	46.80	SGGP	1200x1200	○ 900SQ RISER
PIT 18				
PIT 19				
PIT 20				
PIT 21				
PIT 22	45.60	SGGP	1200x1200	○ 900SQ RISER
PIT 23	45.70	SGGP	1200x1200	○ 900SQ RISER
PIT 24	45.70	SGGP	1200x1200	○ 900SQ RISER
PIT 25	45.45	SGGP	1200x1200	○ 900SQ RISER
PIT 26	46.67	SGGP	1500x1500	○ 900SQ RISER
PIT 27	46.20	SGGP	1500x1500	○ 900SQ RISER
PIT 28	46.20	SGGP	1500x1500	○ 900SQ RISER
PIT 29				
PIT 30	46.20	SGGP	900x900	○
PIT 31	46.20	SGGP	900x900	○

○ -DENOTES PIT TO THE FITTED WITH OCEAN PROTECT OCEANGUARD PIT INSERT

FOR DEVELOPMENT APPLICATION

3m 0 5 10 15 20 25 30m
SCALE 1:300 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT/CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 41

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
CONSULT AUSTRALIA
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: CONCEPT STORMWATER DRAINAGE PLAN SHEET 1

DRAWING No: C015039.01-SSDA 41 ISSUE: B

LEGEND:

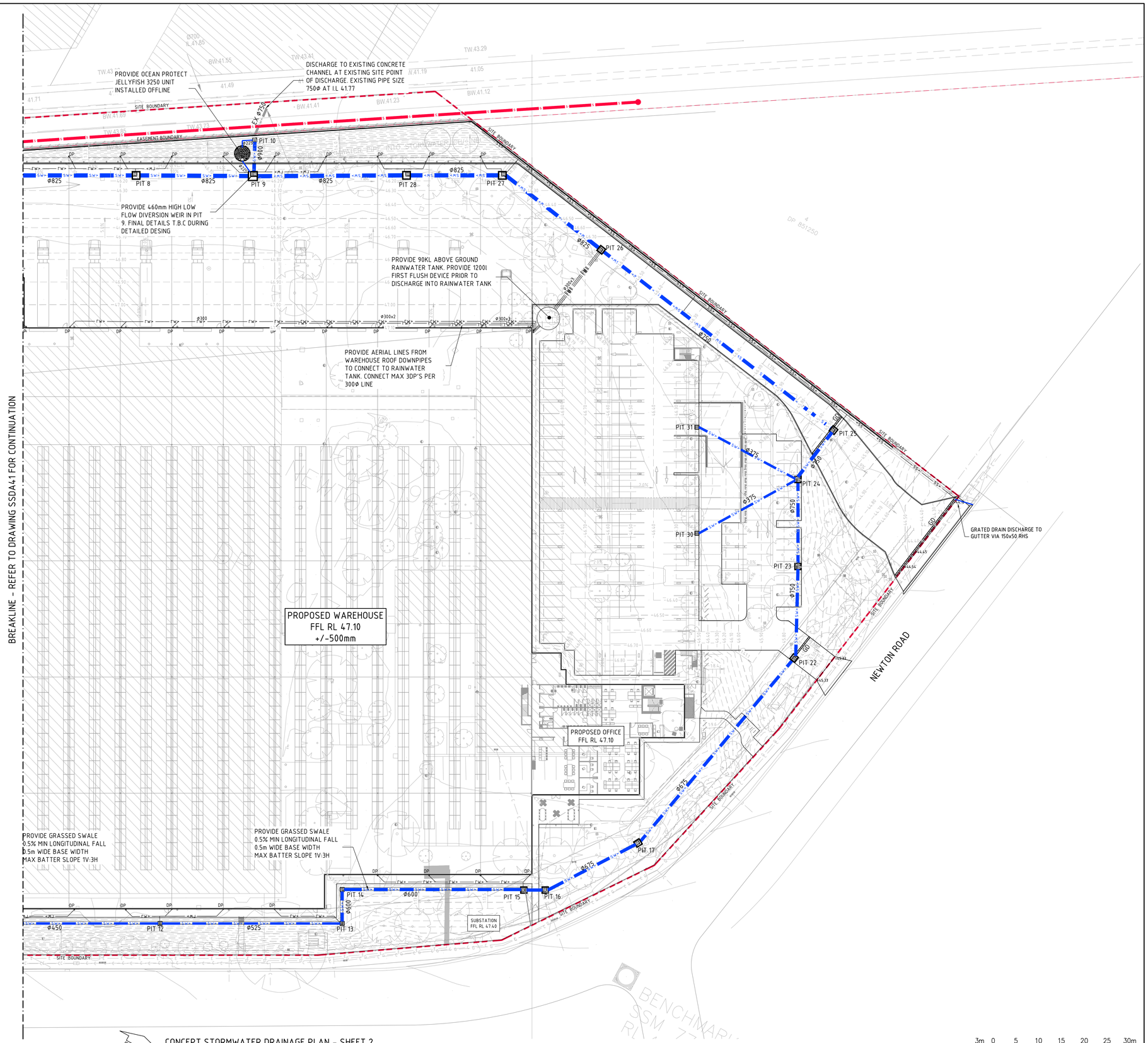
LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON ESTATE DEISGN INFORMATION PROVIDED BY LTS SURVEYORS DATED 12.10.20 REF 51145001DT

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- PROPOSED DRAINAGE LINE
- EXISTING DRAINAGE LINE
- ROOFWATER DOWNPIPE (INDICATIVE)
- ROOFWATER LINE
- EXISTING SYDNEY WATER MAIN
- EXISTING SEWER MAIN
- SUBSOIL LINE
- OVERLAND FLOW DIRECTION
- FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS

STORMWATER DRAINAGE NOTES:

REFER TO DRAWING SSDA40 FOR STORMWATER NOTES
ALL INLET PITS TO BE FITTED WITHC OCEAN PROTECT OCEANGUARD PIT BASKET



CONCEPT STORMWATER DRAINAGE PLAN – SHEET 2
SCALE 1:300

FOR DEVELOPMENT APPLICATION

3m 0 5 10 15 20 25 30m
SCALE 1:300 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT: Centuria

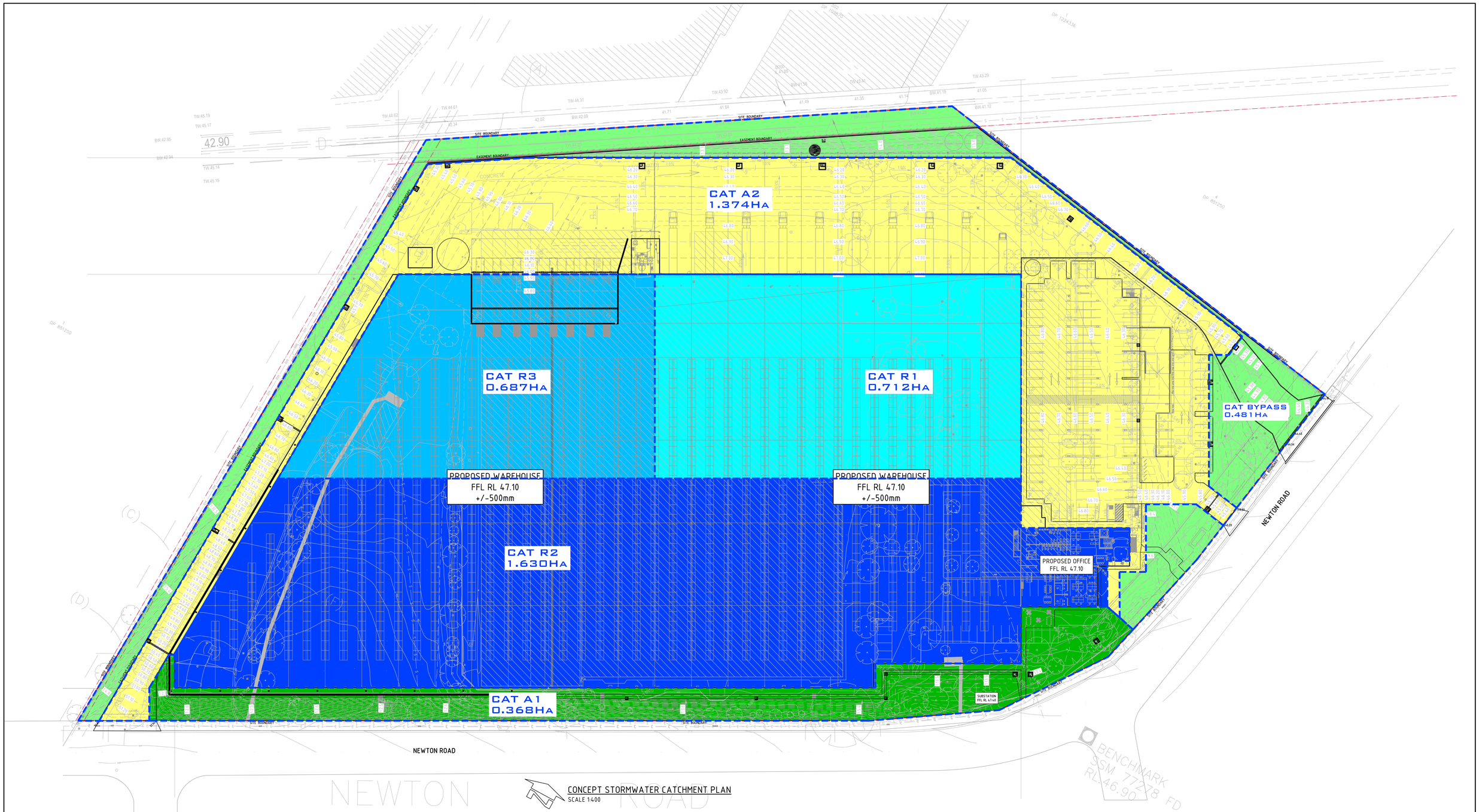
PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	ME	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 42

CONSULT AUSTRALIA
Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 e: mail@costinroe.com.au
f: +61 2 9241 3731 w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: CONCEPT STORMWATER DRAINAGE PLAN SHEET 2

DRAWING No: C015039.01-SSDA 42 ISSUE: B



CONCEPT STORMWATER CATCHMENT PLAN
SCALE 1:400

SUB-CATCHMENT AREAS - MUSIC

No.	CATCHMENT AREA (Ha)	% IMPERVIOUS	TREATMENT SYSTEM
ROOF R1	0.712	100	OCEANGUARD + RAINWATER TANK
ROOF R2	1.630	100	OCEANGUARD + JELLYFISH
ROOF R3	0.687	100	OCEANGUARD + RAINWATER TANK
LANDSCAPE A1	0.368	10	OCEANGUARD + JELLYFISH
HARDSTAND A2	1.374	90	OCEANGUARD + JELLYFISH
BYPASS	0.481	70	NONE
TOTAL	5.252		

LEGEND:

- DENOTES CATCHMENT ROOF R1
- DENOTES CATCHMENT ROOF R2
- DENOTES CATCHMENT ROOF R3
- DENOTES CATCHMENT LANDSCAPE A1
- DENOTES CATCHMENT HARDSTAND A2
- DENOTES BYPASS AREA

NOTE:
ALL INLET PITS TO BE FITTED WITH OCEAN PROTECT OCEAN GUARD INSERTS.

FOR DEVELOPMENT APPLICATION

4m 0 10 20 30 40m
SCALE 1:400 AT A0 SIZE SHEET

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

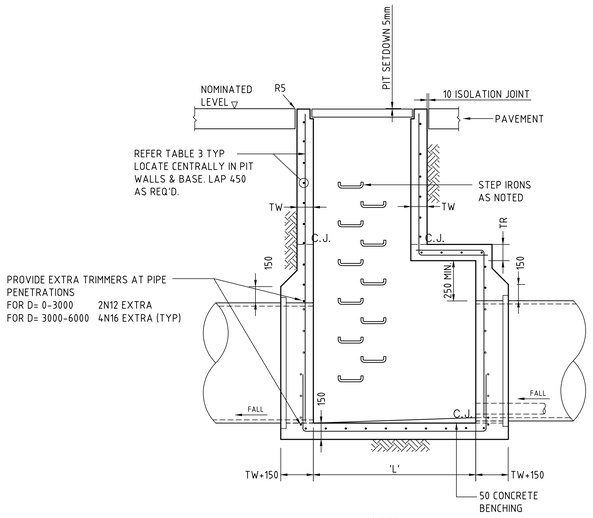
ARCHITECT: SBA ARCHITECTS
CLIENT: Centuria
PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	ME	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 44

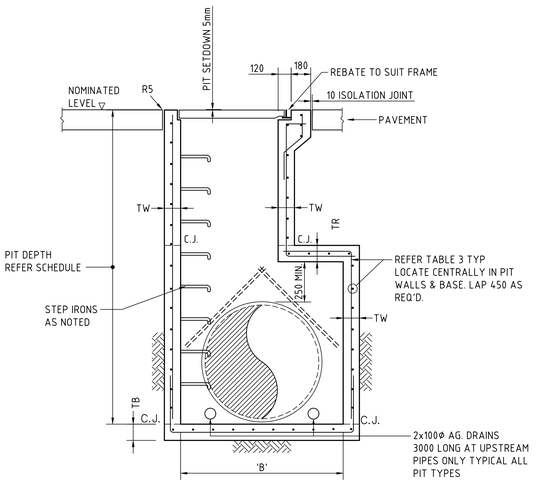
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: CONCEPT STORMWATER CATCHMENT PLAN MUSIC MODEL
DRAWING No: C015039.01-SSDA 44
ISSUE: B



SECTION
SCALE 1:20

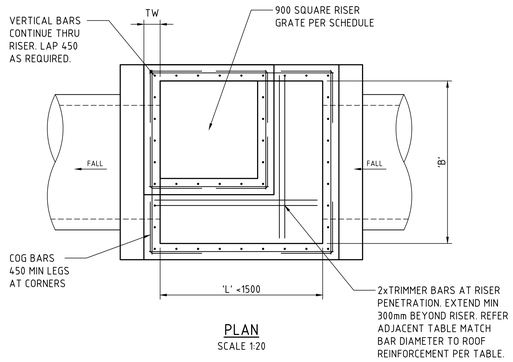


SECTION
SCALE 1:20

CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
PIT	80	20	GP	NIL	32

NOTES:

1. WHERE GULLY PIT IS LOCATED ON KERB RETURNS OR BULB OF CUL-DE-SACS PROVIDE CURVED PRECAST CONCRETE LINTELS.
2. SAG PITS SHALL HAVE LINTEL PLACED CENTRALLY ABOUT THE GRATE.
3. ALL REINFORCING TO HAVE 30 MIN. CLEAR CONCRETE COVER.
4. FOR PITS DEEPER THAN 1200mm STEP IRONS SHALL BE PROVIDED.

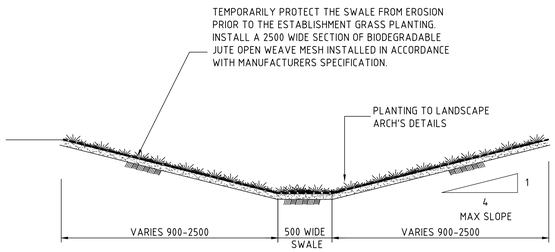


PLAN
SCALE 1:20

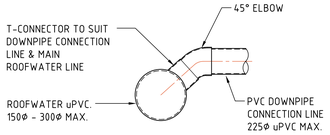
TABLE 1 - TAPERED CLASS D PIT REINFORCEMENT & WALL THICKNESS - MAXIMUM SHORT SPAN 1500mm						
DEPTH 'H'	WALL THICKNESS 'TW'	WALL REINFORCEMENT	ROOF THICKNESS 'TR'	ROOF REINFORCEMENT	BASE THICKNESS 'TB'	BASE REINFORCEMENT
<1.5m	150mm	N12-200 EACH WAY	150mm	N12-200 EACH WAY	150mm	N12-200 EACH WAY
1.5m-3.0m	200mm	N12-200 EACH WAY	200mm	N12-200 EACH WAY	200mm	N12-200 EACH WAY
3.0m-4.5m	200mm	N16-200 EACH WAY	200mm	N16-200 EACH WAY	200mm	N12-200 EACH WAY
4.5-6.0	250mm	N16-200 EACH WAY	250mm	N16-200 EACH WAY	250mm	N16-200 EACH WAY

TAPERED SINGLE GRATED GULLY PIT - SGGP

SUBSOIL NOT SHOWN FOR CLARITY.



TYPICAL SWALE DETAIL
1:20
ADOPT AS REQUIRED

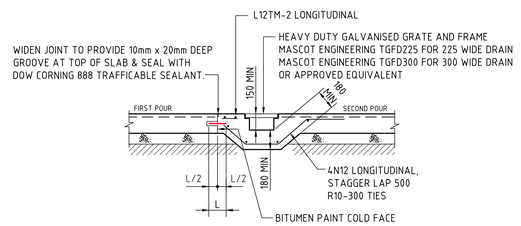


DOWN PIPE CONNECTION TO uPVC PIPE

1. PROPRIETARY T-PIECE CONNECTORS SHALL BE USED TO WHERE DIRECT CONNECTIONS ARE REQUIRED TO uPVC PIPES .
2. ALL JOINTS TO BE SEALED WITH SOLVENT WELDED JOINTS.
3. THE PVC PIPE SHALL NOT PROTUDE BEYOND THE INNER SURFACE OF THE STORMWATER PIPE.

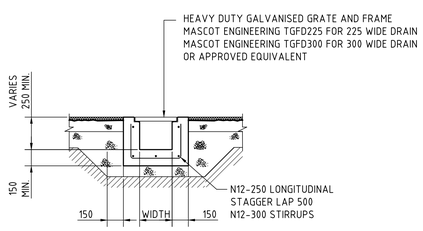
DOWNPIPE CONNECTION DETAILS

SCALE 1:20



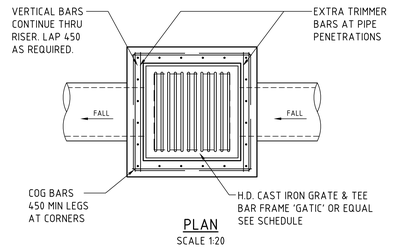
FALL 1:100 TO PITS

DOWEL JOINT AND GRATED DRAIN DETAIL-HARDSTAND
SCALE 1:20

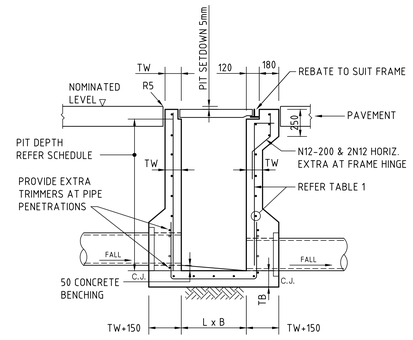


FALL 1:100 TO PITS

GRATED DRAIN DETAIL IN ASPHALT
SCALE 1:20



PLAN
SCALE 1:20



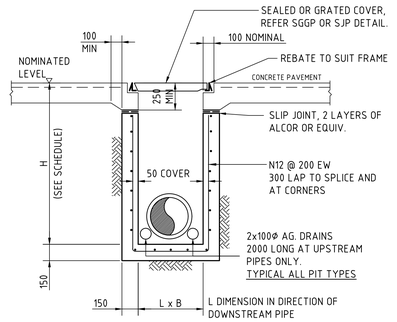
SECTION
SCALE 1:20

SINGLE GRATED GULLY PIT - SGGP

CONCRETE QUALITY					
ELEMENT	SLUMP	AGGREGATE (MAX. SIZE)	CEMENT TYPE	ADMIXTURE	F'c (MPa)
PIT	80	20	GP	NIL	32

NOTES:

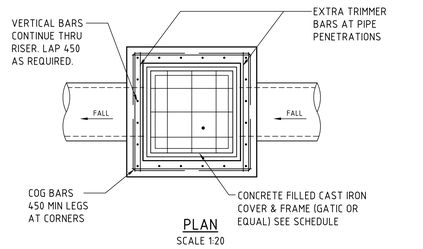
1. WHERE GULLY PIT IS LOCATED ON KERB RETURNS OR BULB OF CUL-DE-SACS PROVIDE CURVED PRECAST CONCRETE LINTELS.
2. SAG PITS SHALL HAVE LINTEL PLACED CENTRALLY ABOUT THE GRATE.
3. ALL REINFORCING TO HAVE 30 MIN. CLAER CONCRETE COVER.
4. FOR PITS DEEPER THAN 1200mm CLIMB RAILS SHALL BE PROVIDED.



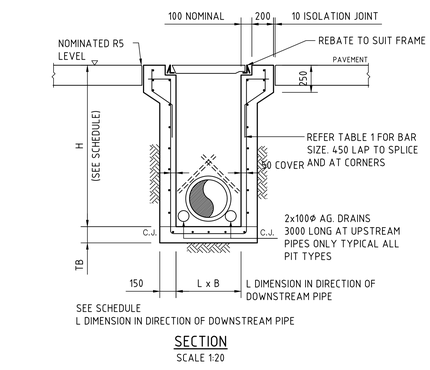
SECTION
SCALE 1:20

SJP/CIS & SGGP/CIS (CAST IN SLAB) PIT DETAIL GRATE/COVER SUPPORT CAST-INTO PAVEMENT SLAB

(ADOPT IN CONCRETE PAVEMENTS FOR SGGP's & SJP's, WHERE JOINTS ARE NOT LOCATED WITHIN PROXIMITY OF THE GRATE)



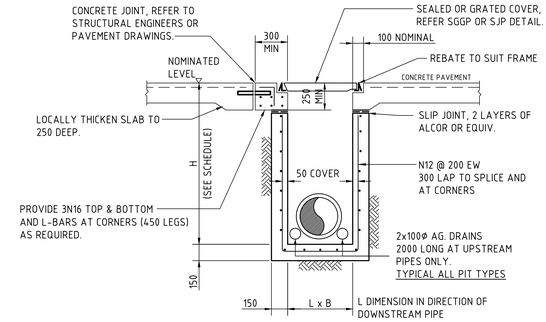
PLAN
SCALE 1:20



SECTION
SCALE 1:20

SEALED PIT - SP

TABLE 2 - CLASS D <1200mm SQUARE PIT REINFORCEMENT & WALL THICKNESS				
DEPTH 'H'	WALL THICKNESS 'TW'	WALL REINFORCEMENT	BASE THICKNESS 'TB'	BASE REINFORCEMENT
< 1.0m	150mm	-	150mm	-
1.0m-3.0m	150mm	N12-200 EACH WAY	150mm	N12-200 EACH WAY
3.0m-4.5m	200mm	N12-200 EACH WAY	200mm	N12-200 EACH WAY
4.5-6.0	200mm	N16-200 EACH WAY	200mm	N16-200 EACH WAY



SECTION
SCALE 1:20

SJP/CIS & SGGP/CIS (CAST IN SLAB) PIT DETAIL GRATE/COVER SUPPORT CAST-INTO PAVEMENT SLAB

(ADOPT IN CONCRETE PAVEMENT FOR SGGP's & SJP's, WHERE PITS ARE LOCATED IN THE CORNER OF SLAB PANELS OR ADJACENT TO SLAB PANEL JOINTS)

100mm 0 200 400 600 800 1000mm
SCALE 1:10 AT A0 SIZE SHEET

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

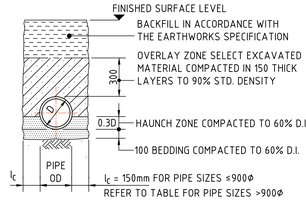
ARCHITECT: SBA ARCHITECTS
CLIENT: Centuria
PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 45

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING
CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: CONCEPT STORMWATER DETAILS - SHEET 1
DRAWING No: C015039.01-SSDA 45
ISSUE: A



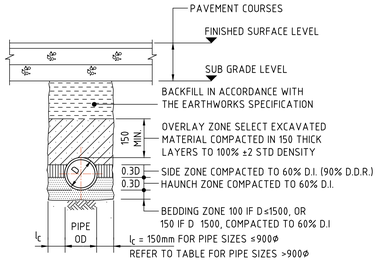
TYPE H1 SUPPORT TO CONCRETE PIPES AT LANDSCAPED AREAS

SCALE 1:20

BEDDING & HAUNCH MATERIAL GRADING	
SIEVE SIZE (mm)	WEIGHT PASSING (%)
19.0	100
2.36	100 TO 50
0.60	90 TO 50
0.30	60 TO 10
0.15	25 TO 0
0.075	10 TO 0

SIDE ZONE WIDTH	
PIPE SIZE (mm)	l_c (mm)
≤ 900Φ	150
1050Φ	175
1200Φ	200
1350Φ	225
1500Φ	250
1650Φ	275
1800Φ	300

ENGINEER TO SPECIFY TRENCH WIDTHS FOR PIPE SIZES GREATER THAN 1800Φ



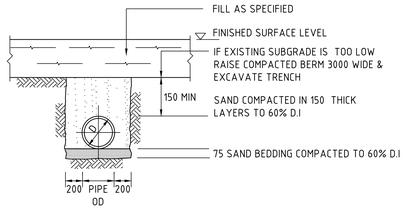
TYPE HS2 SUPPORT TO CONCRETE PIPES UNDER PAVEMENT

SCALE 1:20
D ≤1350, MAX FILL = 4.0m
D >1350, MAX FILL = 3.0m

BEDDING & HAUNCH MATERIAL GRADING	
SIEVE SIZE (mm)	WEIGHT PASSING (%)
19.0	100
2.36	100 TO 50
0.60	90 TO 50
0.30	60 TO 10
0.15	25 TO 0
0.075	10 TO 0

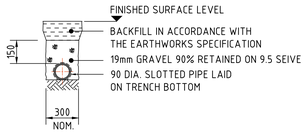
SIDE ZONE WIDTH	
PIPE SIZE (mm)	l_c (mm)
≤ 900Φ	150
1050Φ	175
1200Φ	200
1350Φ	225
1500Φ	250
1650Φ	275
1800Φ	300

ENGINEER TO SPECIFY TRENCH WIDTHS FOR PIPE SIZES GREATER THAN 1800Φ



SUPPORT TO uPVC PIPES

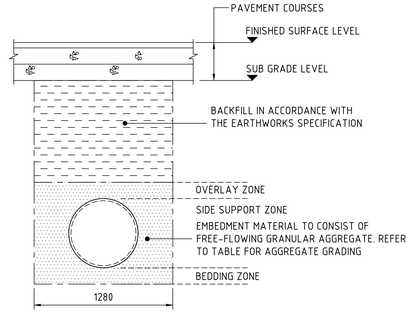
SCALE 1:20



SUPPORT TO AGRICULTURAL DRAIN

FOR USE UNDER CAR PARK PAVEMENTS/LANDSCAPED AREAS
SCALE 1:20

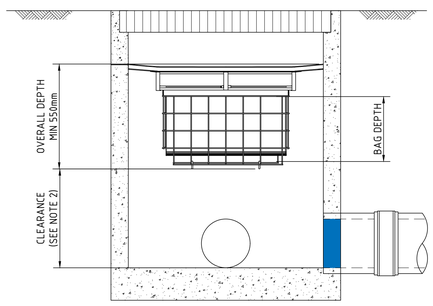
TYPICAL AGGREGATE GRADING			
	% PASSING BY MASS		
SIEVE SIZE (mm)	NOMINAL SIZE OF SINGLE-SIZE AGGREGATE 10mm	7mm	5mm
26.5	–	–	–
19	–	–	–
13.2	100	–	–
9.5	85–100	100	–
6.7	–	85–100	100
4.75	0–20	–	85–100
2.36	0–5	0–20	0–40
0.075	0–2	0–2	0–2



SUPPORT TO STORMPRO HDPE PIPES UNDER PAVEMENT

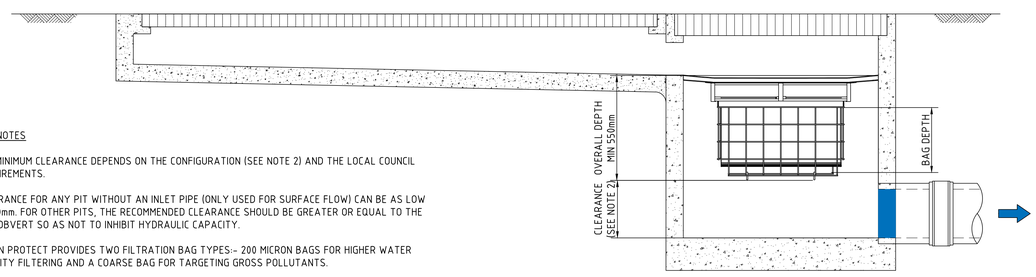
SCALE 1:20
PIPES TO BE INSTALLED AS PER REQUIREMENTS OF STORMPRO NSTALLATION GUIDE

MINIMUM TRENCH DIMENSIONS									
NOMINAL DIAMETER (mm)	150mm	225mm	300mm	375mm	450mm	525mm	600mm	750mm	900mm
MINIMAL TRENCH WIDTH (mm)	470mm	560mm	745mm	830mm	1115mm	1200mm	1280mm	1435mm	1700mm
MINIMAL DEPTH OF BEDDING ZONE (mm)	100mm	100mm	100mm	100mm	150mm	150mm	150mm	150mm	150mm
MINIMAL DEPTH OF OVERLAY ZONE (mm)	150mm	150mm	150mm	150mm	150mm	150mm	150mm	150mm	200mm



SURFACE FLOW CONFIGURATION

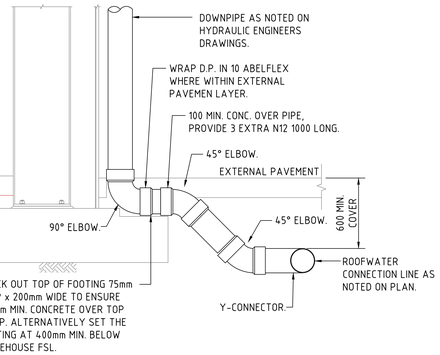
PIPE FLOW CONFIGURATION



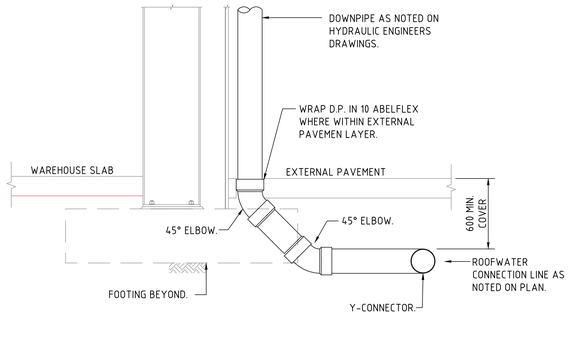
GRATED STRIP DRAIN CONFIGURATION

GENERAL NOTES

1. THE MINIMUM CLEARANCE DEPENDS ON THE CONFIGURATION (SEE NOTE 2) AND THE LOCAL COUNCIL REQUIREMENTS.
2. CLEARANCE FOR ANY PIT WITHOUT AN INLET PIPE (ONLY USED FOR SURFACE FLOW) CAN BE AS LOW AS 50mm. FOR OTHER PITS, THE RECOMMENDED CLEARANCE SHOULD BE GREATER OR EQUAL TO THE PIPE OBVERT SO AS NOT TO INHIBIT HYDRAULIC CAPACITY.
3. OCEAN PROTECT PROVIDES TWO FILTRATION BAG TYPES:- 200 MICRON BAGS FOR HIGHER WATER QUALITY FILTERING AND A COARSE BAG FOR TARGETING GROSS POLLUTANTS.
4. DRAWINGS NOT TO SCALE.



DOWNPIPE TURN-UP DETAIL A
(AT FOOTING LOCATION)
SCALE 1:20



DOWNPIPE TURN-UP DETAIL B
(CLEAR OF FOOTING)
SCALE 1:20

OCEAN PROTECT OCEANGUARD DETAILS

100mm 0 200 400 600 800 1000mm
SCALE 1:10 AT A0 SIZE SHEET

200mm 0 500 1000 1500 2000mm
SCALE 1:20 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS
CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 46

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: CONCEPT STROMWATER DETAILS - SHEET 2
DRAWING No: C015039.01-SSDA 46
ISSUE: A

EXISTING 600mm CONC SEWER MAIN AND EASEMENT

END RET WALL 2

CONNECT NEW 225 SEWER TO EXISTING VIA NEW MANHOLE

EXISTING 225mm VC SEWER MAIN

RECESSED DOCK 1300 DEEP

DIVERT EXISTING 225mm SEWER LINE UNDER WAREHOUSE. OFFSET 3m FROM GRID LINE 9. PIPE TO BE CONCRETE ENCASES UNDER WAREHOUSE. MAX 120m BETWEEN MANHOLES

EXISTING 1350mm SCSL WATERMAIN AND EASEMENT

PROVIDE VEGETATED BATTER 1V:3H MAX SLOPE

EXISTING 600mm CICL WATER MAIN AND EASEMENT ON ADJOINING PROPERTY

END RET WALL 1

PROPOSED WAREHOUSE
FFL RL 47.10
+/-500mm

EXISTING 225mm VC SEWER MAIN

RETAINING WALL 1
KEYSTONE WALL IN CUT
MAX HEIGHT 2.5m
20KPa SURCHARGE
ADJACENT HARDSTAND

DIVERT EXISTING 225mm SEWER LINE UNDER WAREHOUSE. OFFSET 3m FROM GRID LINE 9. PIPE TO BE CONCRETE ENCASES UNDER WAREHOUSE. MAX 120m BETWEEN MANHOLES

RETAINING WALL 1
KEYSTONE WALL IN CUT
MAX HEIGHT 2.5m
5KPa SURCHARGE ADJACENT LANDSCAPING
PROVIDE CONCRETE SPOON DRAIN TO TOP OF WALL

START RET WALL 1

CONNECT NEW 225 SEWER TO EXISTING VIA NEW MANHOLE

EXISTING 225mm VC SEWER MAIN

PROVIDE SUSPENDED RAMP WALKWAY MAX GRADE 1:20

EXISTING STREET SIGN TO BE RELOCATED OUT OF NEW DRIVEWAY

EXISTING TELECOMMUNICATIONS PITS TO BE RELOCATED OUT OF NEW DRIVEWAY

PROVIDE INDUSTRIAL DRIVE CROSSING IN ACCORDANCE WITH FAIRFIELD CITY COUNCIL REQUIREMENTS

PROVIDE VEGETATED BATTER IN CUT 1V:2.5H MAX SLOPE

NEWTON ROAD

BREAKLINE - REFER TO DRAWING SSDA52 FOR CONTINUATION

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON ESTATE DEISGN INFORMATION PROVIDED BY LTS SURVEYORS DATED 12.10.20 REF 51145001DT

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- W – EXISTING SYDNEY WATER MAIN
- S – EXISTING SEWER MAIN
- S – PROPOSED 225mm SEWER MAIN
- 50.00 – FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 – FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- 50.10+ – FINISHED PAVEMENT SPOT HEIGHT

FINISHED LEVELS NOTES:

REFER TO DRAWING SSDA40 FOR FINISHED LEVELS NOTES

FINISHED LEVELS PLAN - SHEET 1

SCALE 1:300

3m 0 5 10 15 20 25 30m

SCALE 1:300 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 51

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: FINISHED LEVELS PLAN SHEET 1

DRAWING No: C015039.01-SSDA 51

ISSUE: B

LEGEND:

LEVELS DATUM IS AHD.

EXISTING SITE LEVELS AND DETAILS BASED ON ESTATE DEISGN INFORMATION PROVIDED BY LTS SURVEYORS DATED 12.10.20 REF 51145001DT

- SGGP, SINGLE GRATED GULLY PIT
- SJP, SEALED JUNCTION PIT
- KIP, KERB INLET PIT
- GD, GRATED DRAIN (300W x 225D UNO)
- W — EXISTING SYDNEY WATER MAIN
- S — EXISTING SEWER MAIN
- 50.00 — FINISHED PAVEMENT CONTOUR (MAJOR) 0.5m INTERVALS
- 50.10 — FINISHED PAVEMENT CONTOUR (MINOR) 0.1m INTERVALS
- 50.10+ — FINISHED PAVEMENT SPOT HEIGHT

FINISHED LEVELS NOTES:

REFER TO DRAWING SSDA40 FOR FINISHED LEVELS NOTES

BREAKLINE - REFER TO DRAWING SSDA51 FOR CONTINUATION

RETAINING WALL 2
KEYSTONE WALL IN FILL
MAX HEIGHT 2.5m
20KPa SURCHARGE

SITE BOUNDARY

EASEMENT BOUNDARY

PROPOSED WAREHOUSE
FFL RL 47.10
+/-500mm

PROPOSED OFFICE
FFL RL 47.10

SUBSTATION
FFL RL 47.40

START RET WALL 2

PROVIDE INDUSTRIAL DRIVE CROSSING IN ACCORDANCE WITH FAIRFIELD CITY COUNCIL REQUIREMENTS

PROVIDE VEGETATED BATTER IN CUT 1V:2.5H MAX SLOPE

NEWTON ROAD

DP 4 851250

BENCHMARK SSM 7...

FINISHED LEVELS PLAN - SHEET 2
SCALE 1:300

3m 0 5 10 15 20 25 30m
SCALE 1:300 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	10.04.24	B
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT/CLIENT: Centuria

PROJECT
PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

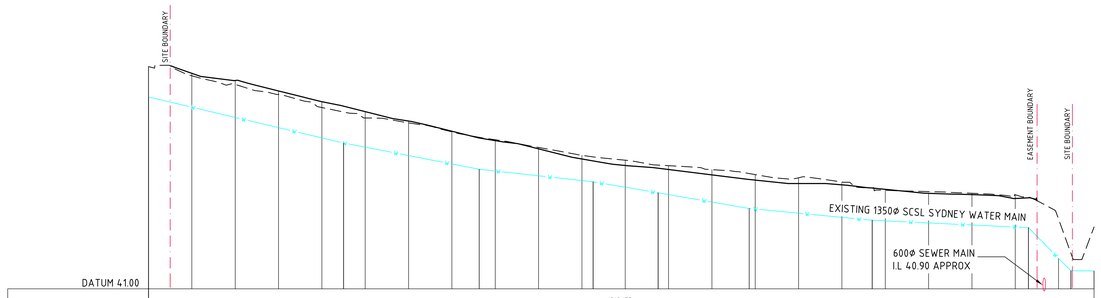
DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 52

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3751
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE
FINISHED LEVELS PLAN
SHEET 2

DRAWING No: C015039.01-SSDA 52
ISSUE: B



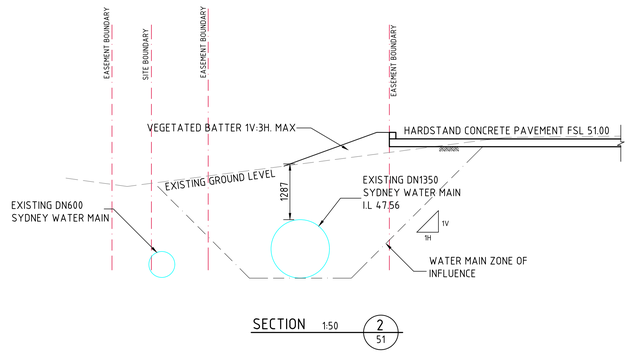
SECTION CL 1350mm WATER MAIN (1/51)
HORIZONTAL SCALE 1:250
VERTICAL SCALE 1:50
WATER MAIN LEVELS ARE BASED ON POTHOLE SURVEY AND ARE SHOWN APPROXIMATE ONLY

NOTE:

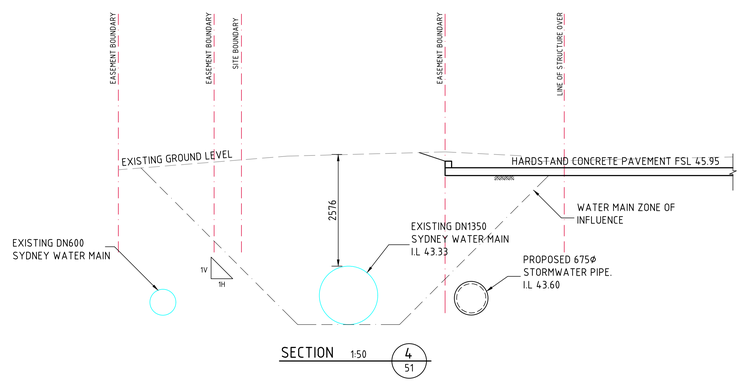
- SECTIONS OF SYDNEY WATER ASSETS ARE PROVIDED FOR INFORMATION ONLY.
- DRAWINGS SHOW THE GENERAL ARRANGEMENT OF THE PROPOSED WORKS & GEOMETRICAL RELATIONSHIP TO THE EXISTING SYDNEY WATER ASSETS.
- DRAWINGS DO NOT SHOW ANY PROPOSED PROTECTION DETAILS OR CONCEPT PROTECTION DETAILS ASSOCIATED WITH THE WORKS.
- THESE DRAWINGS ARE INTENDED TO BE USED TO INFORM THE ASSESSMENT OF THE REQUIREMENTS ASSOCIATED WITH THE SYDNEY WATER ASSETS AND CONSULTATION WITH SYDNEY WATER.

LEGEND:

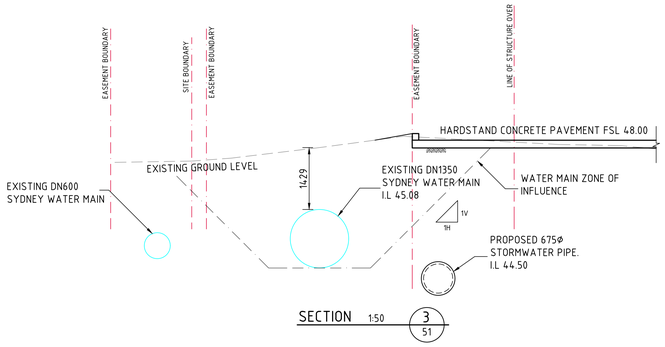
———— – DENOTES BULK EARTHWORKS PROFILE
– – – – – – DENOTES EXISTING PROFILE
———— DENOTES WATER MAIN OBVERT PROFILE



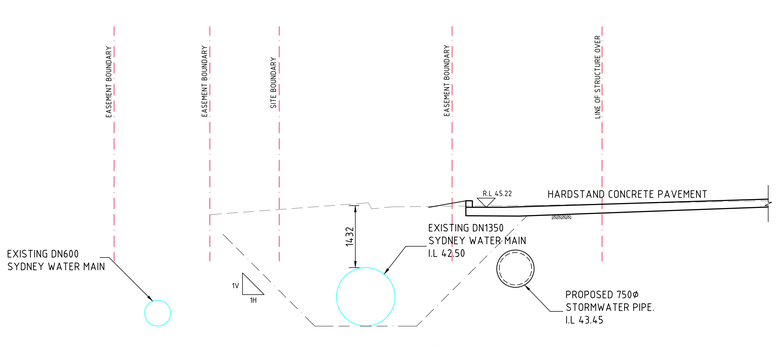
SECTION 1:50 (2/51)



SECTION 1:50 (4/51)



SECTION 1:50 (3/51)



SECTION 1:50 (5/51)

1m 0 1 2 3 4 5 6 7 8 9 10m
SCALE 1:100 AT A0 SIZE SHEET

5m 0 10 20 30 40 50m
SCALE 1:500 AT A0 SIZE SHEET

500mm 0 1 2 3 4 5m
SCALE 1:50 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A
AMENDMENTS	DATE	ISSUE

AMENDMENTS DATE ISSUE
AMENDMENTS DATE ISSUE

ARCHITECT: SBA ARCHITECTS
CLIENT/CLIENT: Centuria

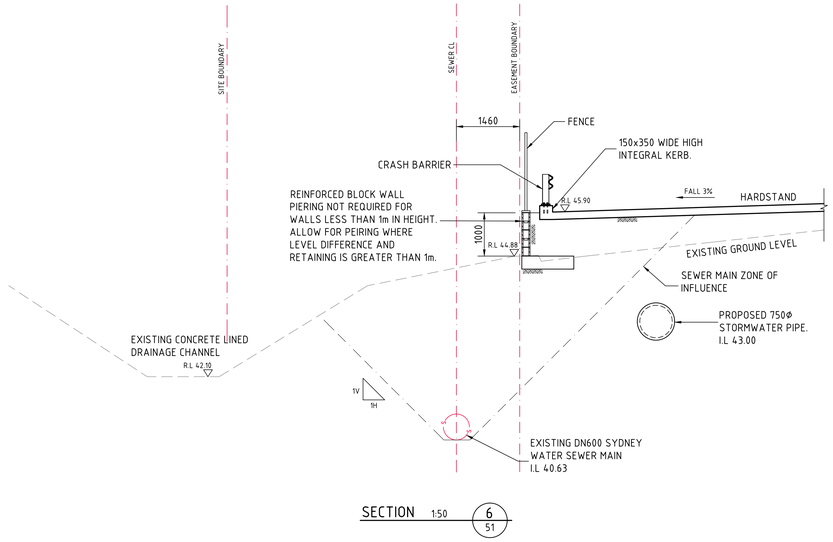
PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 55

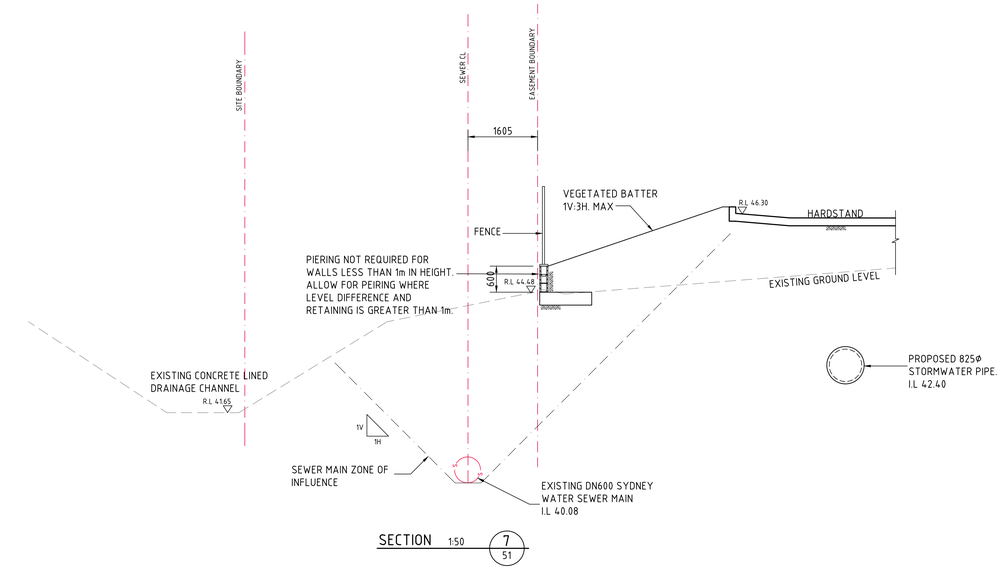
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

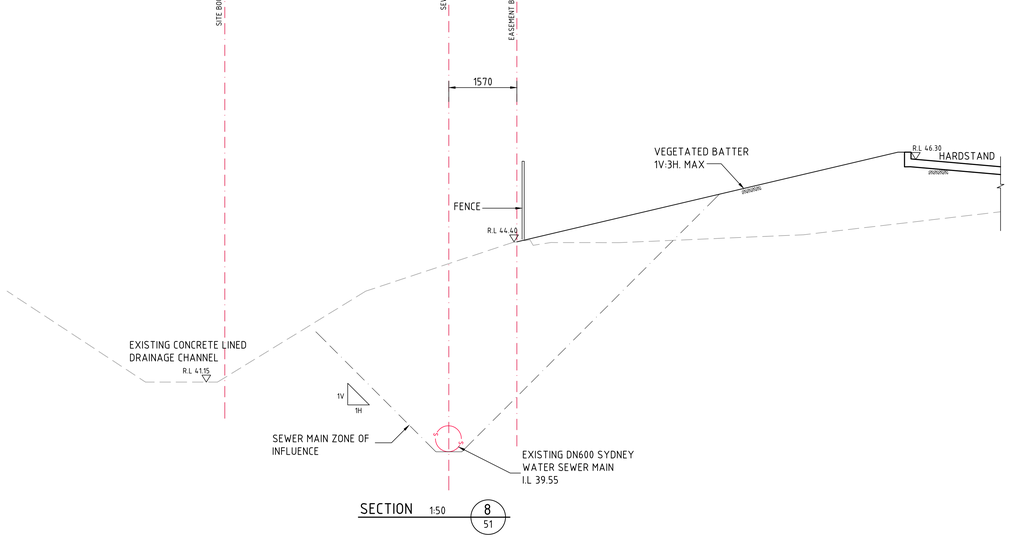
DRAWING TITLE: TYPICAL SECTIONS-SHEET 1
DRAWING No: C015039.01-SSDA 55 ISSUE: A



SECTION 1:50 6/51



SECTION 1:50 7/51



SECTION 1:50 8/51

500mm 0 1 2 3 4 5m

SCALE 1:50 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 56

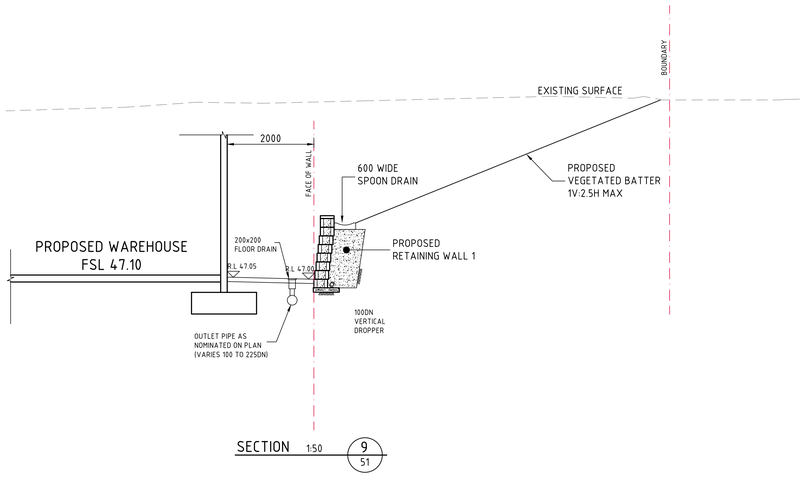
CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

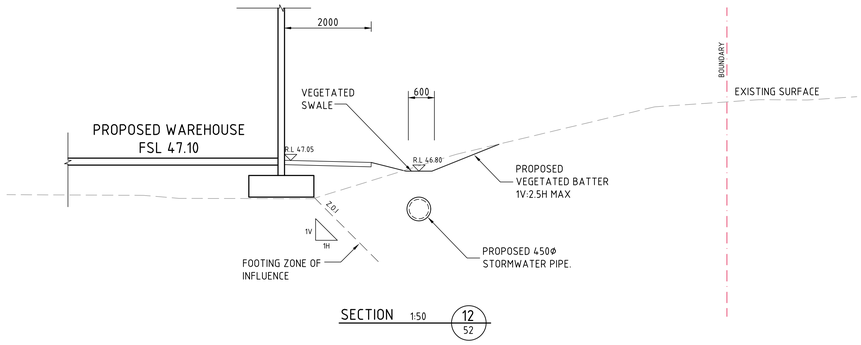
COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: TYPICAL SECTIONS-SHEET 2

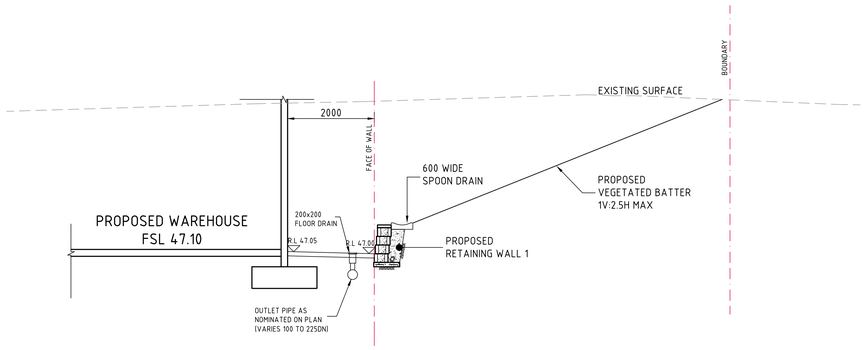
DRAWING No: C015039.01-SSDA 56 ISSUE: A



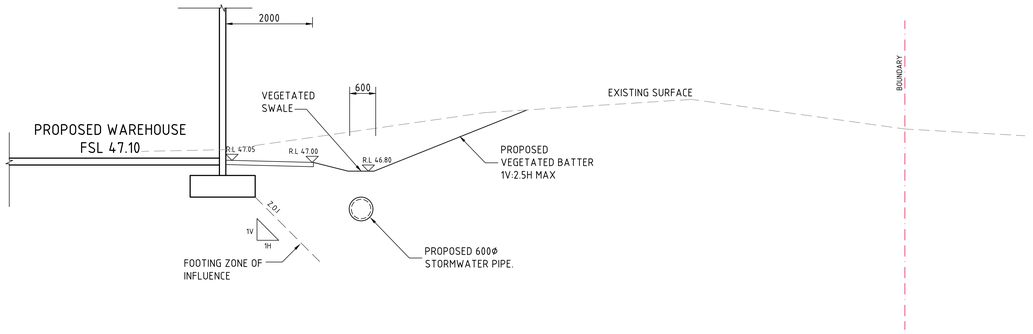
SECTION 1:50 9/51



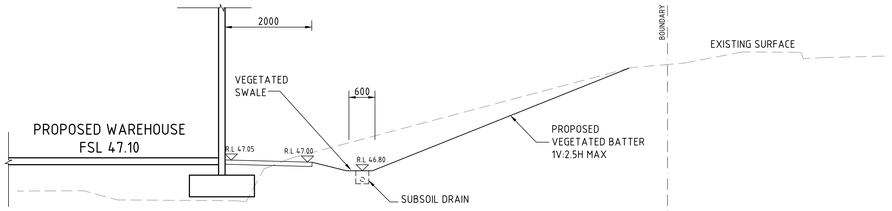
SECTION 1:50 12/52



SECTION 1:50 10/51



SECTION 1:50 13/52



SECTION 1:50 11/51

500mm 0 1 2 3 4 5m

SCALE 1:50 AT A0 SIZE SHEET

FOR DEVELOPMENT APPLICATION

AMENDMENTS	DATE	ISSUE
ISSUED FOR DEVELOPMENT APPLICATION	15.02.24	A

ARCHITECT: SBA ARCHITECTS

CLIENT/CLIENT: Centuria

PROJECT: PROPOSED WAREHOUSE
74-94 NEWTON ROAD, WETHERILL PARK NSW 2164

DESIGNED	DRAWN	DATE	CHECKED	SIZE	SCALE	CAD REF:
MC	MC	FEB 24	MW	A0	AS SHOWN	C015039.01-SSDA 57

CONSULT AUSTRALIA

Costin Roe Consulting Pty Ltd.
ABN 50 003 696 446
PO Box N419 Sydney NSW 1220
Level 4, 8 Windmill Street, Millers Point NSW 2000
p: +61 2 9251 7699 f: +61 2 9241 3731
e: mail@costinroe.com.au w: costinroe.com.au

COSTIN ROE CONSULTING | CIVIL & STRUCTURAL ENGINEERS

DRAWING TITLE: TYPICAL SECTIONS-SHEET 3

DRAWING No: C015039.01-SSDA 57 | ISSUE: A

Appendix B
DEWATERING CALCULATIONS

Wetherill Park Dewatering Assessment

EP3206.002

Preliminary Dewatering Calculations

Formula assuming plane flow and partially penetrating slots in an unconfined aquifer to estimate vertical extraction

$$Ro = 3000(H - h)\sqrt{K}$$

Equation 1 - Sichardt's formula

$$rs = \sqrt{\frac{ab}{\pi}}$$

Equation 2 - equivalent radius

$$Q = \frac{\pi K(H^2 - h^2)}{LN(\frac{R0}{rs})}$$

Equation 3 - Dewatering

Where
Ro = radius of influence
rs = radius of the well sytem
H = saturated thickness of aquifer
h = saturated thickness after drawdown
K = hydraulic conductivity
Q = flowrate
a = length of excavation
b = width of excavation

Option A - No Sheet Piling

Parameter	Description	Amount	Unit
Depth of aquifer		40.8	[m AHD]
K =	Hydraulic conductivity	1.00E-05	[m/sec]
	RL of groundwater	46.41	[mAHD]
	Depth to groundwater		[mBGL]
FOS	factor of safety	1.5	-
	% re-infiltration	100	[%]

Source
EP Risk DSI (residual clay to 5-6 m, average depth of 5.5 m)
Based upon McNally (2004)

Stage	Area	Average depth of base (mAHD)	Additional depth of excavation below base (m)	Depth of excavation (mAHD)	RL of Groundwater	Groundwater encountered?	Depth of dewatering below base (mAHD)	Dewatering target depth (mAHD)	a (m)	b	a/b	Method	Average natural surface level (mAHD)	H (m)	Saturated thickness at maximum drawdown (hw) (m)	k (m/sec)	Ro (m)	rs (m)	Q (m3/sec)	Q (m3/day)	Q (L/day)	Q (ML/day)	No. days	Dewatered Volume (ML)
Stage 1	Sewer Excavation (RL 42 - RL 45.8)	43.900	-0.100	43.800	46.408	yes	-0.100	43.700	185	8	23.125	Rectangular	46.32	5.61	2.900	1.00E-05	26	22	0.0042935	371	370962	0.371	8	4.4515
Stage 1	Stormwater Excavation (RL 41.77)	41.770	-0.100	41.670	46.408	yes	-0.100	41.570	3	3	1	Rectangular	46.32	5.61	0.770	1.00E-05	46	2	0.0002937	25	25379	0.025	1	2.5379
																							TOTAL	6.99
																								[ML]
																							Sum Total	6.99 (ML)

Assumptions:

1 The aquifer is unconfined
2 The aquifer has an unlimited aerial extent
3 The aquifer is homogenous, isotropic and uniform thickness
4 The water table is horizontal prior to pumping
5 The aquifer is pumped at a constant pumping rate
6 The well only partially penetrates an estimated thickness of the aquifer
7 Assume r, is calculated assuming a rectangular system
8 Assumes horizontal flow and no vertical component to flow
9 These calculations do not factor in the effects of shoring or sheet piling
10 Assumes that the base of the aquifer is level
12 Assumes steady state conditions
13 Assumes a 24 hour day of pumping
14 Proposed depth of excavation of 0.1 m below the sewer invert level to allow for bedding gravel.