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Waterway Impact Assessment

255 Condamine St., Manly Vale, NSW

Prepared for Upstate Group

Report P1605609JR08

December 2021

Final Report

Project Details

Project Item	Detail
Report Title	Waterway Impact Assessment, 255 Condamine Street, Manly Vale, NSW
Client	Upstate Group
Project Number	P1605609
Document ID	P1605609JR08V03
Director	A. Norris
Manager	A. Norris
Principal Author	D. Martens

Document History

Issue	Issue Date	Status	Description / Comment	Author	Reviewer	Approved
1	26/3/2021	Final	Development Application	DMM	MD	ASN
2	7/12/2021	Final	Development Application - update	DMM	MD	ASN

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Executive Summary

This report has assessed the impact of a proposed boarding house development at 255 Condamine St., Manly Vale (the Site) on a waterway known as Burnt Bridge Creek within the Site. The assessment has been conducted in accordance with Warringah Council's Guidelines for Preparing a Waterways Impact Statement. The following findings and conclusions are made.

1. **Proposed Development:** The proposed structure consists of boarding house and ancillary car parking supported on piers suspended over flood affected land.

2. **Existing Creek Conditions:** The existing Creek within the Site is highly modified and degraded, having been historically relocated to its current position, and being largely channelised with a near vertical sandstone retaining wall on its northern bank and a structural fill embankment on its southern bank. The Creek bed is bedrock controlled with a limited bed sediments including sands and various refuse from the urban catchment. The western part of the northern bank is formed from a historical rock and soil cutting which is presently unstable. The southern bank is also presently unstable, receiving slumped material from failing sections of the existing fill embankment. For several hundred metres downstream of the Site the Creek is completely channelised by a series of culverts and concrete channel sections.

3. **Riparian Corridor Rehabilitation Works:** The Proposal seeks to rehabilitate the existing riparian corridor by: stabilising and remediating the existing western portion of the northern bank; stabilising the existing southern bank; and managing riparian vegetation through weed removal and replanting. These works will ensure long-term retention and enhancement of riparian land, by improving habitat and ecological processes, delivering bank stability, and providing riparian vegetation and improved water quality by managing and treating stormwater prior to release.

4. **Construction Requirements:** A riparian vegetation management plan and a sediment erosion control plan will be prepared as part of the construction certificate process. These documents will guide the works and ensure that the desired riparian management outcomes are achieved.

5. **Impact on Waterway:** The Proposal will deliver a material benefit to the existing riparian corridor by providing Creek bank stability, improved riparian vegetation and improved water quality. The Proposal is consistent with the objectives of the NRAR Waterway Guidelines, the objectives of the NBLEP and relevant design objectives provided in the NBDCP.

Contents

Tables

Figures

1 Introduction

1.1 Overview and Scope

This waterway impact assessment has been prepared to support a boarding house development application (the **Proposal**) at 255 Condomine Street, Manly Vale, NSW known as Lot 8 in DP 604034 (the **Site**). This report updates an earlier version of the report due to slight amendments to the Proposal.

The Site maintains a total area of approximately 863 m^2 and contains a waterway known as Burnt Bridge Creek. We understand that the Proposal includes the following:

1. Demolition of existing structures.
2. Increase of available flood storage to mitigate potential flood impacts.
3. Construction of multi-level boarding house.
4. Rehabilitation of the riparian corridor within the Site.

The scope of work covered by this report includes:

1. Description of existing riparian conditions.
2. Review of riparian management objectives.
3. Assessment of waterway impact.

1.2 Development Controls and Guidelines

The following development controls and design principles have been considered in this assessment:

1. Northern Beaches (Warringah) Council (2014) Waterways Impact Statement Guidelines (the **NB Waterway Guidelines**).
2. Northern Beaches (Warringah) Council Development Control Plan 2011 (the **NBDCP**).
3. Northern Beaches (Warringah) Council Local Environment Plan 2011 (the **NBLEP**).
4. Northern Beaches (Warringah) Council (2004) Creek Management Study.

5. Natural Resources Access Regulator (2012) Guidelines for Riparian Corridors on Waterfront Land (the **NRAR Guidelines**).

1.3 About the Author

This report has been prepared by Dr Daniel Martens who has both environmental and engineering qualifications. Dr Martens has worked with a range of surface water systems such as creeks, rivers, wetlands, lakes and estuaries for more than 30 years including: the identification and description of surface water systems; modelling of hydrological regimes including flood assessments; assessment of the environmental impacts of development on watercourses; and the development of watercourse management plans. Dr Martens holds an Honours (First Class) degree in fluvial geomorphology, a Masters degree in environmental engineering, and a PhD in Environmental Engineering.

2 Existing Riparian Conditions

2.1 Existing Development

At the time of preparing this report, much of the Site was clear of vegetation and development. A derelict brick building with ancillary driveway and concrete access stairs was present in the eastern portion of the Site. The balance of the Site consisted of grassed fill materials, with fill batters currently unstable as evidenced by various batter slumps. The waterway was located near the northern Site boundary, this being partially built over by development to the north at 257-259 Condamine St. An overview of Site conditions is provided in Figure 1.

2.2 Council Assessment

The Warringah Council Creek Management Study (2004) provides the following description in respect of Burnt Bridge Creek with the Site:

1. The Creek is classified as a Group C waterway.
2. The Creek maintains little ecological value.
3. The Creek catchment is highly developed.
4. The Creek is of low recreational value.

2.3 Channel Modifications

Significant modifications have been made to Burnt Bridge Creek upstream and downstream of the Site, with an overview of channel treatments provided at Figure 2. The following is noted:

1. Burnt Bridge Creek within the site is not a natural channel because the creek has previously been diverted through the site and built as a constructed channel. Downstream of the Site, the channel is bedrock controlled on the bed and concrete lined on the banks under the Condamine Street bridge (refer to Figure 3) and then completely concrete enclosed and piped under 206 Condamine Street and 31 and 28-34 Roseberry Street downslope of the bridge (refer to Figure 2 and Figure 4).
2. Upstream of the Site the channel has been historically realigned (refer to Figure 5 for position of historical alignment), with the northern bank

being cut into rock and soil to form near vertical embankments (refer to Figure 6).

2.4 Water Quality

Present water quality within the Creek is relatively poor with nutrient and suspended sediments likely to be elevated at times in association with historical catchment clearing and urbanisation taking place without appropriate stormwater quality control systems. Our inspection on 28 September 2020 and 17 November 2021 of the Site revealed:

1. Bed sediments contain a mixture of organics, gross pollutants, sands and materials sourced from areas such as road pavements and other wastes.

2. No flow was observed during the Site inspection, indicating an intermittent flow regime which may at times experience elevated pollutant concentrations and low oxygen conditions.

2.5 Bank Conditions

2.5.1 Bank Location and Floodplain

Creek banks are poorly defined within the Site. Inspection of the sandstone block wall forming the northern Creek bank on 257 – 259 Condamine Street showed that flows generally reach depths of up to 0.5 – 0.6 m (refer to Figure 7). Similarly, on the southern bank there is an area below the fill embankment which maintains a level of around 0.5 – 0.7 m above the permanent Creek water level (refer again to Figure 7).

During the 17 November inspection this level was observed as an active floodplain at the western end of the Site and within the adjoining property to the west. The floodplain and creek bank levels are shown in Figure 8, Figure 9 and Figure 10, confirming the following:

1. **Creek bank**: The creek bank is approximately 0.5 - 0.7 m above the permanent water line. The bank is expressed as a clear break in slope between the near vertical slope to the water's edge and the flat grade of the adjoining floodplain. The creek bank was comprised of largely sandy materials held together with plant roots and some clay content.

2. **Floodplain**: There is a distinctly developed floodplain behind the creek bank upslope of the Site. This is variably expressed depending on location, being widest upslope of the site (where it reaches > 5 m width). The floodplain is characterised by sandy sediment which has been

deposited by floods (refer to Figure 11). Floodplain vegetation to the west of the site is well established and consists largely of non-endemic species including trees, understorey and ground cover.

By contrast, the fill embankment within the site is entirely anthropogenic, containing a range of fill and waste materials (refer to Figure 12 and Figure 13), likely having been placed near to the time that the existing derelict building was constructed.

On this basis we conclude that the present active Creek banks are located at a level of between 0.5 – 0.7 m above the permanent Creek water level. The balance of material above this level within the Site is historical fill.

2.5.2 General Condition

An overview of existing Site conditions is shown in Figure 14, which indicates the location of the current creek, types of retaining structures used along the creek and the extent to which the building to the north overhangs the creek. The following is observed:

1. Vegetation along the southern Creek bank was dominated by a range of non-endemic grasses and weed species. Heights were generally low at < 0.5 m. Width of the riparian zone was generally narrow at < 5 m.

2. Vegetation along the northern Creek bank was largely confined to the western 20 m portion of the Site where a range of ferns had colonised the rock cutting and residue sandstone boulders (refer to Figure 6).

2.5.3 Southern Bank Stability

During the 28/9/2020 site inspection the southern fill embankment within the Site was observed to be over steepened and unstable and had been subject to various slippages, both historic and active. In summary:

1. The fill embankment located within the Site adjacent to the southern Creek bank is over-steepened and unstable at a number of locations.

2. In places the fill embankment has failed, and material has been transported downslope to the Creek bank and into the Creek (refer to Figure 15).

During the 17/11/2021 inspection it was observed that the fill embankment had continued to fail, with evidence of several recent slope failures. These have led to portions of the anthropogenic fill being transported to the creek bank below and into the creek (refer to Figure 16 and Figure 17).

Bank stabilisation and reconstruction is required and recommended.

2.5.4 Northern Bank Stability

During the 17/11/2021 inspection a more detailed examination of the northern creek bank and embankment was undertaken. The following was observed during the inspection:

1. The bank is not a natural bank but rather has been constructed by soil and rock excavation.

2. The bank is impacted by anthropogenic filling and waste deposition including concrete over pours (refer to Figure 18).

3. The bank is unstable with evidence of recent bank instability (refer to Figure 19 and Figure 20). In particular there has been a boulder slide with movement of two large boulders into the creek, likely caused by erosion of unconsolidated material below and around the boulders. These materials are likely to continue to move into the creek and obstruct flow in coming high flow / flood events, this leading to further bank erosion.

Bank stabilisation and reconstruction is required and recommended.

2.6 Aquatic Ecology

Based on our inspection of the Creek, we concur with Council's assessment that the Creek within the Site has been heavily impacted by past catchment activities and presently maintains low aquatic ecological value. The western 20 m reach of the northern Creek bank has some ecological habitat. However, this bank is nevertheless degraded and unstable and requires remediation.

We note that the Site Creek is largely transitional in form, being located between unchannelised reaches upstream and completely channelised reaches downstream. Within the Site, the channel is already largely channelised with the northern bank confined by sandstone block retaining structures and a rock cutting, and the southern bank constrained by a large fill embankment (refer to Figure 14). Given the Creek's position and the level of existing channel confinement, there is little opportunity at the Site to materially improve or enhance the aquatic habitat and ecological values.

3 Riparian Management

3.1 Design Principles and Outcomes

We recommend that the following overarching principles be applied to managing the riparian corridor within the Site. These have been derived based on the outcome measures contained within section 3 of the NB Waterway Guidelines

1. **Maintain Natural Features:** Natural features should be retained and improved where possible so that existing habitat areas and ecological processes are preserved and enhanced. This will ensure existing fauna movement routes are not disturbed. We note that there are virtually no natural features within the Site riparian corridor.

2. **Do Not Obstruct Creek Flow:** Ensure that no structures are built within the Creek that would cause an alternation in hydrologic regime or detrimental impact on water quality. We note that the bank failures, particularly the northern bank boulder movements, have obstructed flow within the Creek and need to be removed and remediated.

3. **Revegetate Riparian Zone:** Areas to be dedicated to the riparian corridor should be revegetated with suitable riparian species to promote ecological values. This will encourage natural diversity and will minimise the future risk of introduced plants and animals displacing natural species.

4. **Maintain and Improve Bank Stability:** Areas of existing bank instability should be remediated to preserve the integrity of channel bed and banks and enable establishment of riparian vegetation. Provision of increased flood storage through removal of some of the existing fill will assist in delivering bank stability. These actions will lead to long-term security of waterway processes.

5. **Incorporate WSUD:** Water Sensitive Urban Design (**WSUD**) principles should be incorporated into the Site development, including the use of rainwater tanks, treatment of stormwater prior to release to the Creek and release of stormwater into the Creek so that erosion is prevented. These measures will protect the Creek from nutrient and sediment pollution.

6. **Construction Management:** Prevent sediment movement into the Creek during construction by implementing construction practices such

as sediment and erosion control measures and appropriate construction oversight. These measures will protect natural areas from being exposed to Site based contamination.

3.2 Mitigation Measures

The following specific waterway impact mitigation measures are recommended to be incorporated into the Proposal so that the nominated riparian design principles and outcomes can be achieved:

1. **Remediate Northern Bank:** The northern bank should be stabilised, remediated and revegetated. This will include removing any existing flow obstructions within the channel. Existing larger endemic vegetation should be retained where possible, and where not, replanting should be with similar species.

2. **Undertake Bank Protection Works:** Bank protection works should be undertaken to stabilise the existing banks and provide a suitable substrate for riparian vegetation. This will need to include some bank protection with sandstone blocks and embankment retention and regrading in places.

3. **Implement Riparian Vegetation Management:** A riparian vegetation management plan should be prepared as part of the construction certificate documentation. This should include riparian vegetation establishment and maintenance phases. The establishment phase should detail the process and timing for weed removal, a species planting schedule and any temporary bank protection works (e.g. jute matting). The maintenance phase should describe any requirements and responsible persons for providing sufficient water and weed management to ensure establishment of the riparian vegetation.

4. **Implement Sediment and Erosion Control Plan:** A sediment and erosion control plan should be prepared as part of the construction certificate documentation. The plan should consider impact management of earthworks associated with the flood mitigation strategy, construction of footings [including piers] to support the superstructure, and earthworks required to stabilise the existing southern embankment.

5. **Control Stormwater Quality:** All stormwater generated by the Proposal should be treated using an appropriate stormwater management system so that nutrient and sediment loads released to the Creek are in accordance with Council's requirements.

6. **Mitigate Flood Impacts:** The building footprint, together with any ancillary earthworks and bank stabilisation works, will be designed so that there are no adverse flood impacts on the channel and adjoining properties arising out of the Proposal. [Flood modelling has already been undertaken demonstrating that no significant impacts arise out of the Proposal.]

4 Assessment

4.1 Proposed Works

The proposed works within and near to the riparian area are shown in Figure 21 with detailed creek protection works plans provided at Attachment B. In summary, the following works are to be undertaken:

1. **Building on Piers:** The bulk of the building is proposed to be suspended over flood liable land on piers. Only a small portion of the eastern part of the building will be in direct contact with the ground. No piers are proposed within the watercourse although a small number of piers will be positioned near the southern bank.

2. **Sandstone Block Walls:** Two low height mass sandstone block walls are proposed along the southern bank. The lower approximately 600 mm high wall is positioned to formalise the Creek bank to provide for long-term bank stability. The upper wall will be constructed to create the rear of the local floodplain. The region between the walls will be constructed from natural materials to enable colonisation with riparian flora. The northern bank will be stabilised with a variable height stacked sandstone block wall or revetment.

3. **Stormwater Treatment:** Stormwater will be treated prior to release into the watercourse by a Stormfilter stormwater filtration system.

4. **Stormwater Outlets:** Surplus stormwater generated by the Proposal will be directed to the creek and will be discharged through a headwall with suitable erosion control material placed at the outlet to prevent scour.

5. **Increase Flood Storage:** Some removal of the existing Site fill materials will be undertaken to increase local flood storage and mitigate any potential on or off-site flood related impacts arising out of the development.

6. **Riparian Corridor:** The existing narrow riparian zone will be retained and enhanced through bank stabilisation works, conservation of the northern bank and weed removal as well as revegetation of the southern and northern bank. The proposed rehabilitated riparian corridor extents are shown on Figure 21 with detailed creek protection works plans provided at Attachment B.

7. **Permanent Erosion Control:** Sub-ground floor areas that form part of the expanded floodway but are in areas where light levels may become minimal, will be protected from erosion during high flows by the placement of grouted cobbles over the finished ground surface.

4.2 Environmental Impacts

Our assessment of environmental impacts on the waterway arising out of the Proposal is provided in Table 1. The assessment finds that there will be no significant impacts on the waterway, but rather, existing riparian conditions will be substantially improved through bank stabilisation and revegetation works which will in turn provide improved ecological habitat and long-term waterway security.

Table 1: Assessment of environmental impact on the waterway.

Issue	Impact Assessment
Water quality impacts	No impacts on Creek water quality are anticipated because: • All stormwater generated by the Site will be treated by a stormwater treatment system prior to release to the Creek. • Existing Creek bank instabilities will be rectified through placement of sandstone block retention systems and regrading the bank where necessary. • Sediment and erosion control measures will be implemented during construction works. • The existing riparian corridor will be retained and enhanced through a program of riparian revegetation.
Channel form, erosion and bank stability impacts	No impacts on channel form, erosion or bank stability are anticipated because: • Constrictions in the existing channel form arising form bank instabilities and historical waste placement in the channel will be remediated. • Existing creek bank instabilities will be rectified through placement of sandstone block retention systems and regrading the bank where necessary. • Existing flood storage capacity within the Site will be increased through lowering some of the existing Site fill levels. • All stormwater generated by the Site will be released in a control manner to the Creek so as not to cause bank erosion.

Issue	Impact Assessment
	• The existing riparian corridor will be retained and enhanced through a program of riparian revegetation ensuring long-term stability.
Stormwater systems impacts	No impacts on any existing stormwater infrastructure are anticipated because: • The Proposal does not disturb or interfere with any existing stormwater infrastructure. • All stormwater is managed within the Site prior to release to the Creek.
Ecological impacts	No detrimental ecological impacts are anticipated because: • No significant ecological communities will be disturbed by the Proposal. • All stormwater generated by the Site will be treated prior to release to the Creek. • Existing Creek bank instabilities will be rectified through placement of sandstone block retention systems and regrading the bank where necessary. This will improve the viability of existing riparian habitat areas and improve ecological processes within the Site. • The existing riparian corridor will be retained and enhanced through a program of riparian revegetation. This will improve the viability of existing riparian habitat areas and improve ecological processes within the Site.
Landscape impacts	No landscape related impacts are anticipated because: • The Proposal does not disturb or interfere with any existing landscaping. • The Proposal does not involve the removal of any significant trees.
Flood impacts	No flood related impacts are anticipated because: • Existing flood storage capacity within the Site will be increased through by lowering some of the existing Site fill levels. • The proposed building will be constructed on piers and suspended over the flood liable land. • Flood modelling has demonstrated that no significant flood impacts arise from the Proposal.

Issue	Impact Assessment
Impacts on proposed development	The waterway and riparian works will not impact on the proposed development because: • All habitable floors have been located above the relevant flood planning level. • The building will be supported on piers taken to an appropriate level to ensure that any potential future bank erosion would not detrimentally affect building stability. • Existing Creek bank instabilities will be rectified through placement of sandstone block retention systems and regrading the bank where necessary.
Native vegetation impacts	No impacts on native vegetation are anticipated because: • No significant trees are proposed to be removed as part of the Proposal. • The existing riparian corridor is presently over-run with weeds and a range of exotic species. The proposed weeding and rehabilitation / native revegetation works will significantly improve the existing vegetation conditions.
Creek line and overland flow impacts	No impacts on Creek alignment or overland flow paths are anticipated because: • The existing Creek alignment is proposed to be improved by removing existing obstructions arising from current bank instabilities and historical waste placement in the channel. • No overland flows paths will be impacted or significantly modified by the Proposal.

4.3 NRAR Guidelines

We have reviewed the NRAR Guidelines and are of the view that the overarching objective of the guideline, which is to *establish and preserve the integrity of riparian corridors*, is met by the Proposal. Specifically, the following is noted:

1. The Proposal maintains and rehabilitates the existing riparian corridor with native riparian vegetation.
2. The Proposal minimises harm to the riparian corridor and ensures long-term protection of the corridor so that riparian habitats can be preserved and ecological processes be enhanced.

3. The Proposal provides comprehensive treatment of stormwater prior to release to the Creek as well as a controlled release of stormwater to the Creek to ensure that bank erosion risks are mitigated.

4. Whilst the recommended NRAR riparian corridor widths cannot be achieved at the Site due to Site space constraints, a reduction is considered acceptable because: the existing riparian zone widths are very narrow (< 5 m) and will be retained or widened where possible; and the Creek is already largely channelised with near vertical sandstone walls forming much of the northern bank, and over steepened fill embankments adjacent to the southern bank.

4.4 Northern Beaches LEP

We have assessed the waterway works against the relevant NBLEP clauses with a summary of that assessment provided in Table 2. Based on this assessment, we consider that the waterway works are consistent with the objectives of clauses 6.1, 6.2 and 6.3.

Table 2: Assessment of waterway works against the NBLEP.

Clause	Assessment
cl 6.1 Acid sulfate soils	The objectives of this clause are considered satisfied because: • The proposed earthworks and riparian works have been assessed and found to be acceptable in the Martens Preliminary Geotechnical and Acid Sulfate Soils report P1605609JR06 dated January 2021. • All Site works will be undertaken in accordance with the Acid Sulphate Soils Management Plan which has been included in Martens report P1605609JR06.
cl 6.2 Earthworks	The objectives of this clause are considered satisfied because: • Existing drainage patterns will not be disrupted by the Proposal. • The proposed earthworks will not detrimentally affect the future use or redevelopment of the land. • Any fill excavated from the Site will be subject of a waste classification before being removed off-site to an appropriately licensed facility. • The earthworks will not detrimentally affect adjoining property.

Clause	Assessment
	• No material quantities of fill are required for the riparian works except the possible importation of clean soil to rehabilitate the riparian corridor. • No relics are likely to be disturbed. • The Proposal will not adversely affect the Site watercourse because the Creek will be retained and stabilised, with riparian vegetation rehabilitated and stormwater treated and controlled prior to release. • The Site is not located within a drinking water catchment or an environmentally sensitive area.
cl 6.3 Flood planning	The objectives of this clause are considered satisfied because: • The building will be suspended over the flood hazard on piers structurally designed to accommodate flood forces. • The Proposal will not significantly adversely affect flood behaviour, as demonstrated by flood modelling documented in Martens report P1605609JR05.

4.5 Northern Beaches DCP

We have assessed the waterway works against the relevant NBDCP controls with a summary of that assessment provided in Table 3. Based on this assessment, we consider that the waterway works are consistent with the objectives of controls C4-C6, E4-E6, E8 and E11.

Table 3: Assessment of waterway works against the NBDCP controls.

Control	Impact Assessment
C4 - Stormwater	The objectives of this control are considered satisfied because: • Stormwater from the Proposal will be captured, re-used and treated prior to release to the Creek. • The inclusion of OSD and rainwater capture will result in the minimisation of stormwater quantity released to the riparian environment. • The Proposal includes the incorporation of water sensitive urban design elements such as: rainwater capture and re-use; stormwater treatment at source; rehabilitation of riparian corridors; and controlled release of stormwater to the environment. • Councils' stormwater drainage system will not be impacted by the Proposal, which incorporates increases in flood

Control	Impact Assessment
	storage to ensure that potential flood related impact are appropriately mitigated. • The Proposal manages all stormwater generated within the Site boundary and does not rely on any off-site Council infrastructure.
C5 – Erosion and sedimentation	The objectives of this control are considered satisfied because: • A detailed sediment and erosion control plan will be prepared as part of the construction certificate documentation to cover all construction related matters such as earthworks, footings and riparian corridor works. • In the long-term, sediment delivered to the Creek from the Site will be managed by the proposed stormwater treatment system and Site vegetation.
C6 – Building over drainage easements	The objectives of this control are considered satisfied because: • The Proposal will not interfere with the drainage of water through the Creek. • The proposed building will be suspended on concrete piers to ensure that there is ready access to the watercourse for maintenance.
E4 – Wildlife corridors	The objectives of this control are considered satisfied because: • The proposed riparian works will ensure that the existing corridor will be retained and enhanced. • The proposed riparian rehabilitation works will mitigate current soil erosion problems and assist in improving water quality within the Creek. • The proposed riparian rehabilitation works will preserve and enhance existing habitats and provide sufficient shade for aquatic species. • The proposed riparian rehabilitation works will enhance native vegetation and ecological functions of the corridor.
E5 – Native vegetation	The objectives of this control are considered satisfied because: • The proposed riparian rehabilitation works will include weed removal and management, and replanting the corridor with native riparian species.
E6 – Retaining unique environmental features	The objectives of this control are considered satisfied because: • There are no unique environmental features on the Site.

Control	Impact Assessment
E8 – Waterways and riparian lands	The objectives of this control are considered satisfied because: • The proposed riparian works will protect, maintain and enhance the ecology and biodiversity of the Creek and existing riparian corridor. • The building is located such that impacts on the Creek and riparian corridor are substantially mitigated. • The Proposal generally retains the existing watercourse position, mitigates existing bank erosion risks and provides long-term bank and floodway stability protection measures. • The Proposal includes adequate access to the riparian corridor to enable on-going maintenance. • The Proposal seeks to improve the Creeks current Class C status.
E11 – Flood prone land	The objectives of this control are considered satisfied because: • The building will be suspended over the flood hazard on piers structurally designed to accommodate flood forces. • The Proposal includes the provision of additional flood storage to mitigate any on or off-site flood related impacts. • The Proposal will not significantly adversely affect flood behaviour, as demonstrated by flood modelling documented in Martens report P1605609JR05.

5 Conclusions

The following conclusions are provided in respect of the waterway impact assessment:

1. The existing Burnt Bridge Creek within the Site is highly modified and degraded, having been historically relocated to its current position, and being largely channelised with a near vertical sandstone retaining wall on its northern bank and a structural fill embankment on its southern bank.

2. The existing Creek bed is bedrock controlled and contains a limited range of bed sediments including sands and various refuse sourced from the predominantly urban catchment. The western part of the northern bank is formed from a near vertical historical rock cutting and is unstable due to various boulder movements. The southern bank is presently unstable and receives slumped material sourced from various failing sections of the existing fill embankment. For several hundred metres downstream of the Site the Creek is completely channelised by a series of culverts and concrete channel sections.

3. The waterway component of the Proposal seeks to rehabilitate the existing riparian corridor by: stabilising the creek banks and southern fill embankment; and managing riparian vegetation through a program of weed removal and replanting of native vegetation. This work will ensure long-term retention and improvement of current riparian conditions, including improvements to habitat and ecological processes, by ensuring bank stability, adequate vegetation and improved water quality [through improved bank and vegetation rehabilitation and stormwater treatment].

4. As part of the construction certificate documentation process, a riparian vegetation management plan and a sediment erosion control plan will be prepared. These documents will guide the works and ensure that the desired riparian management outcomes are achieved.

5. We conclude that the Proposal will deliver a material benefit to the existing riparian corridor by providing for improved Creek bank stability, riparian vegetation rehabilitation and improved water quality. The Proposal is consistent with the objectives of the NRAR Waterway Guidelines, the objectives of the NBLEP and relevant design objectives provided in the NBDCP.

Attachment A – Figures

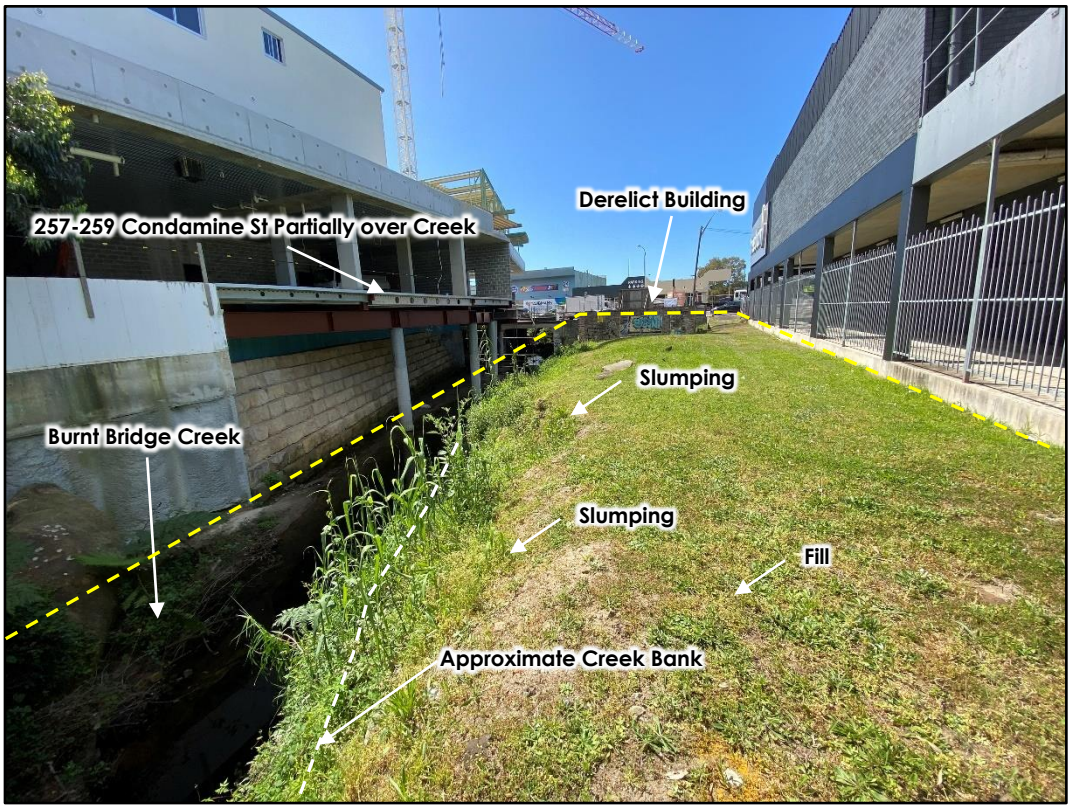


Figure 1: Overview of Site condition.

Figure 2: Burnt Bridge Creek channel treatment.

Figure 3: Burnt Bridge Creek below Condamine Street bridge.

Figure 4: Burnt Bridge Creek culvert below 206 Condamine St.

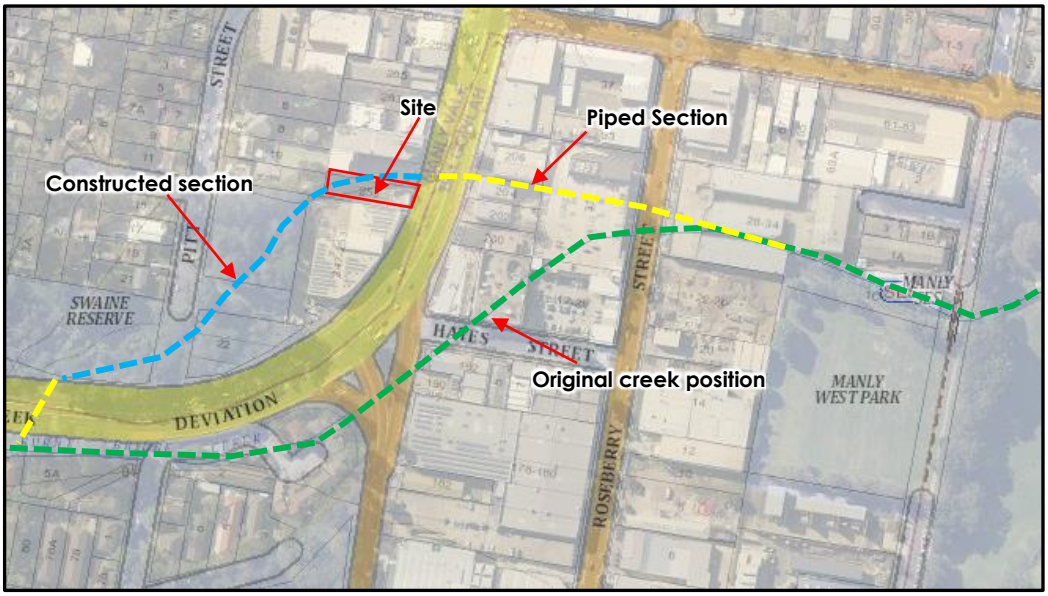


Figure 5: Diversion and piping of Burnt Bridge Creek.

Figure 6: Burnt Bridge Creek immediately upstream of Site.

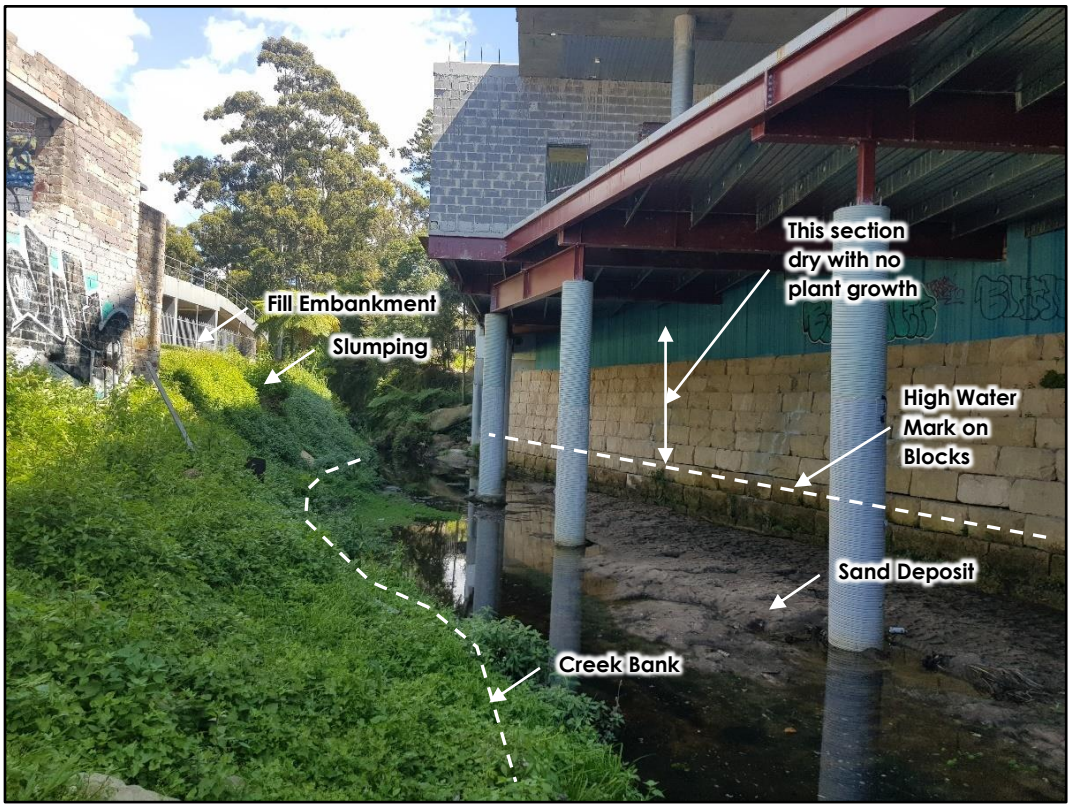


Figure 7: Existing bank conditions with the Site.

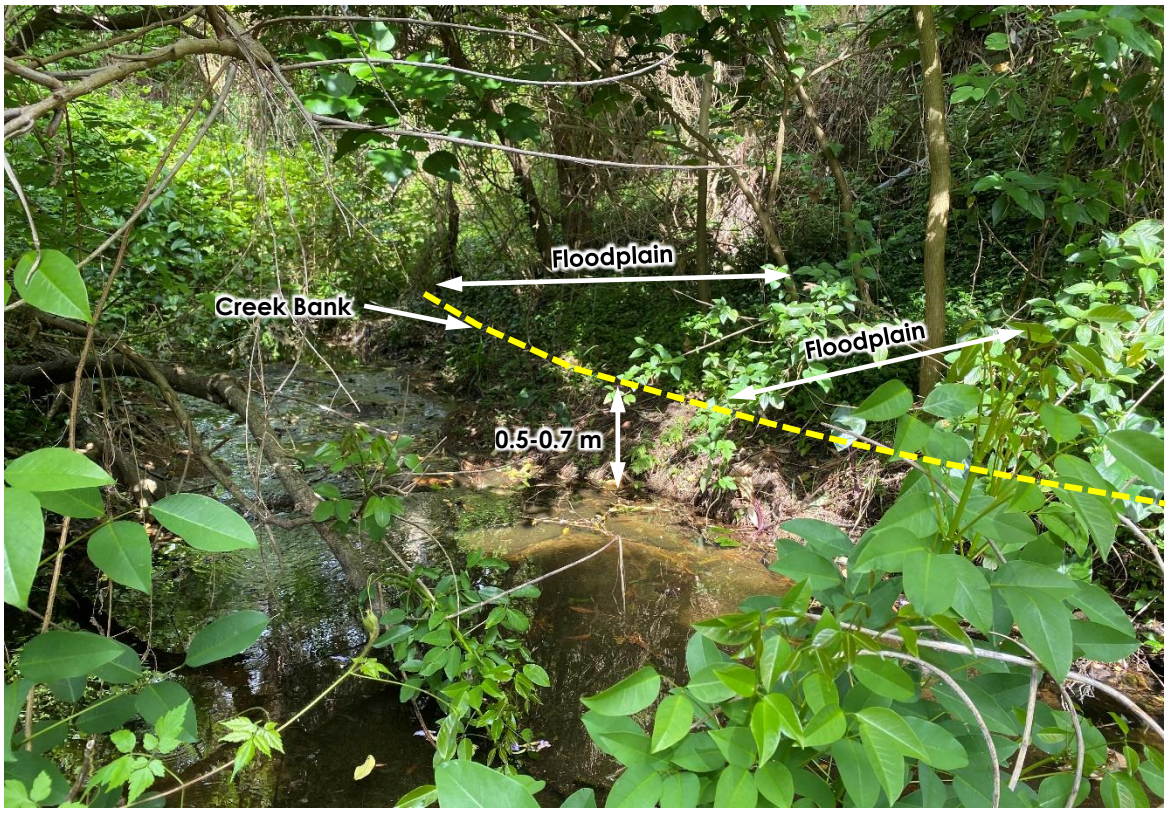


Figure 8: Northern creek bank and floodplain upstream of site looking west.

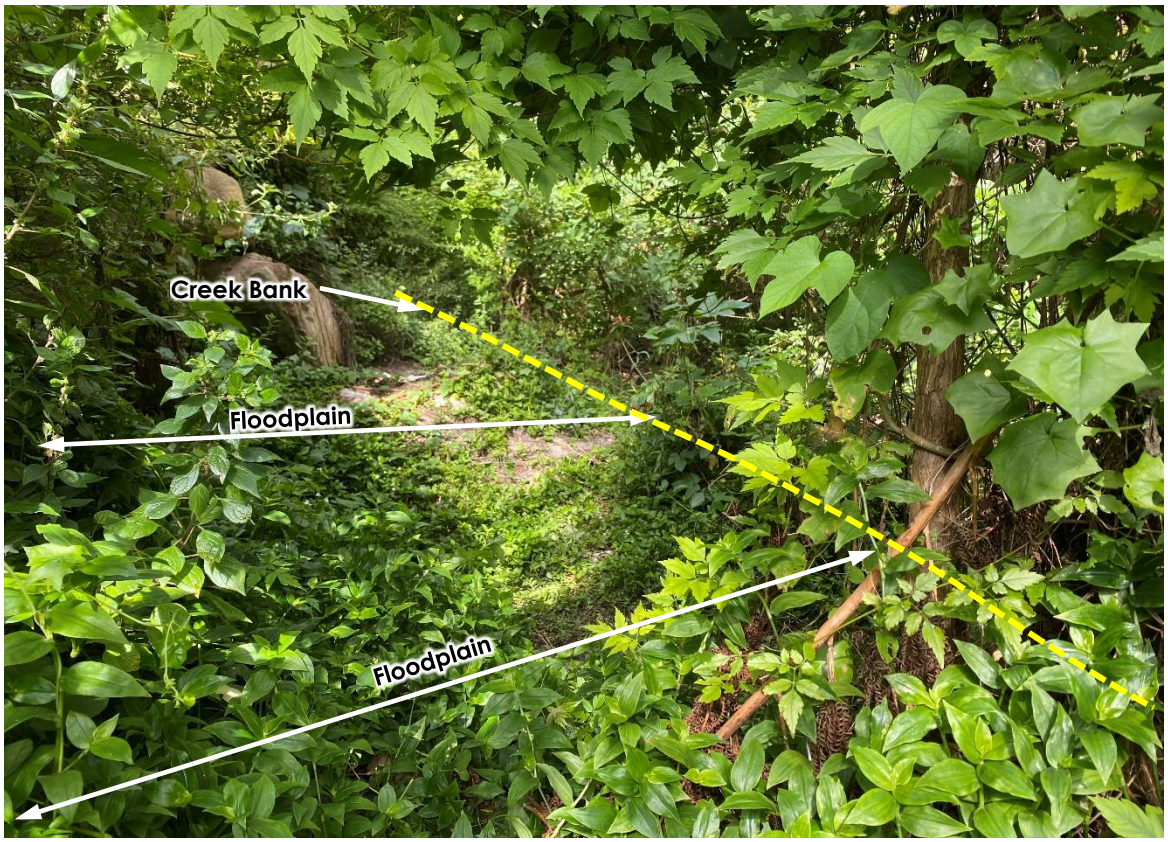


Figure 9: Southern creek bank and floodplain upstream of site looking west.

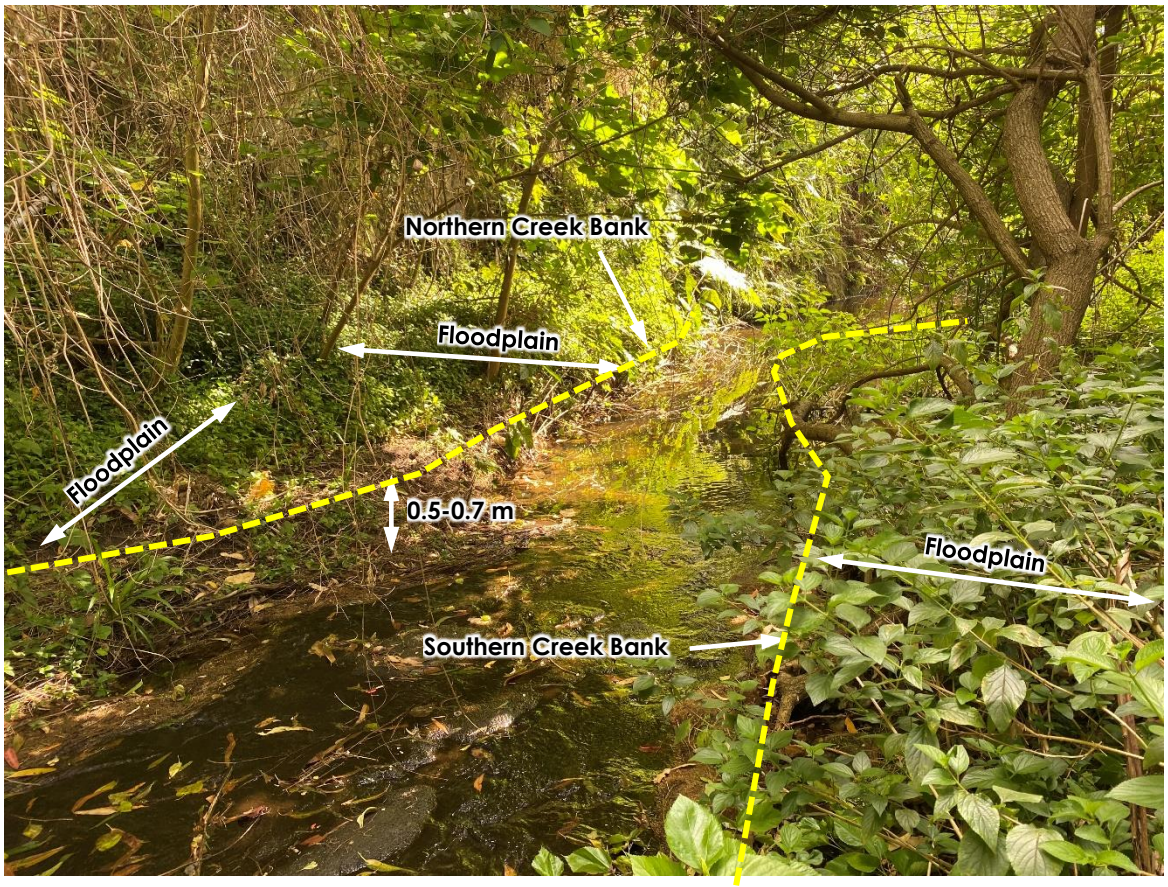


Figure 10: Creek banks and floodplain upstream of site looking east.

Figure 11: Sandy floodplain sediment on southern bank.

Figure 12: Fill embankment behind creek bank within site looking east.

Figure 13: Fill embankment adjacent to derelict building within site.

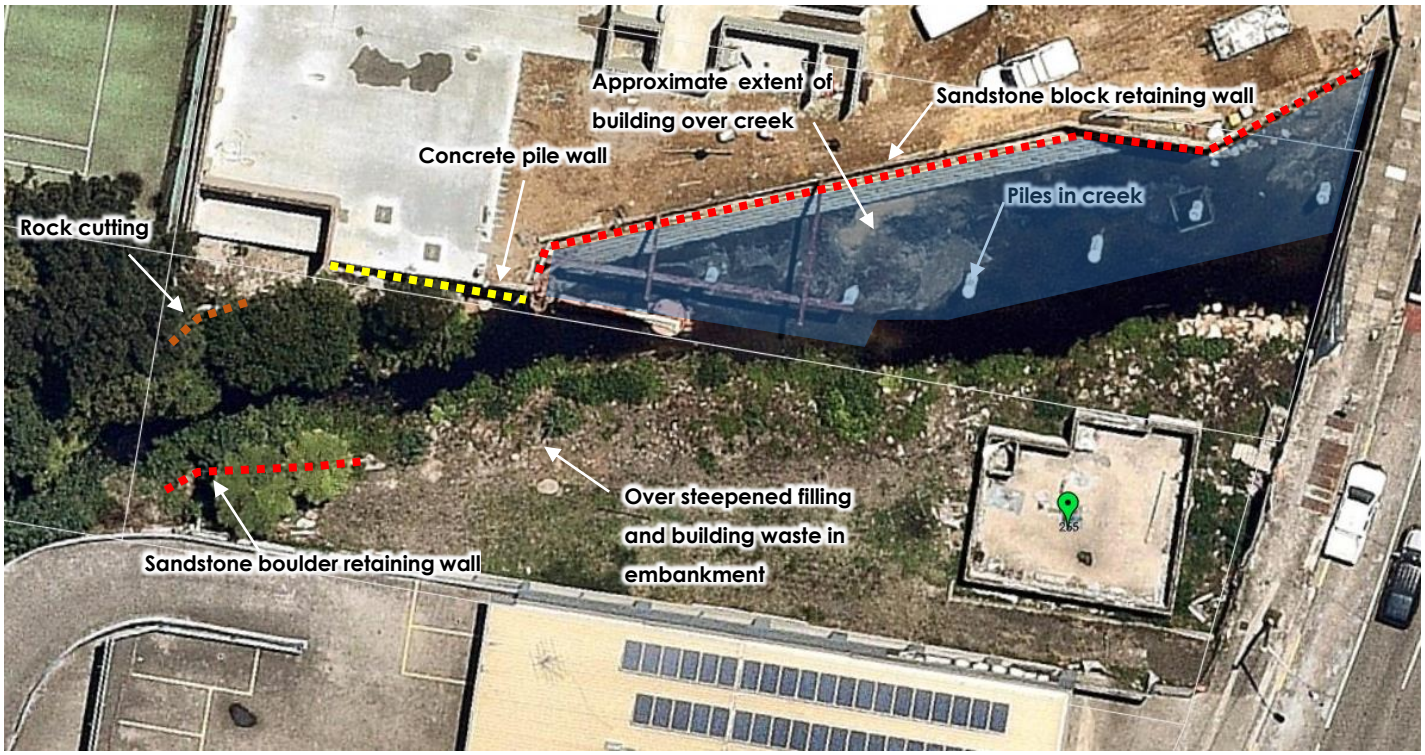


Figure 14: Creek condition overview (21/1/2020).

Figure 15: Fill embankment failure with the Site (28/9/2020).

Figure 16: Fill embankment adjacent to derelict building within site (17/11/2021).

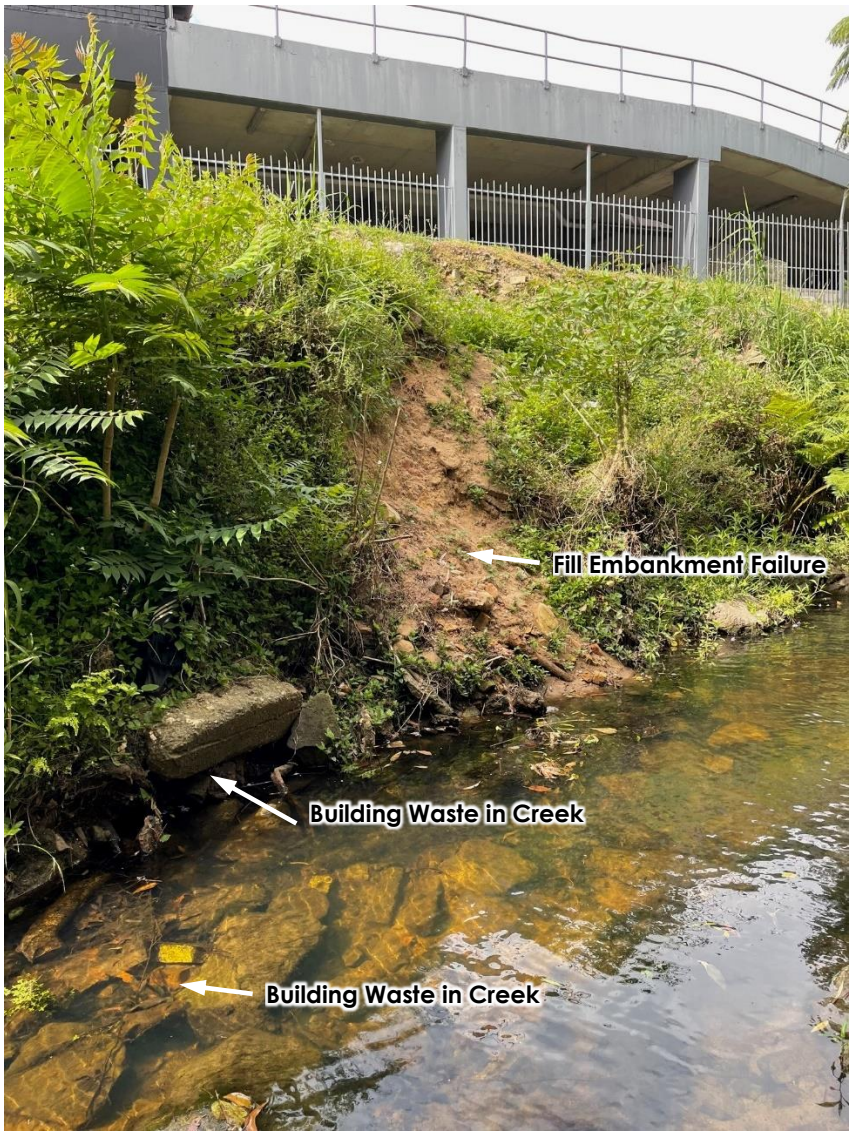


Figure 17: Fill embankment failure and waste in creek within site (17/11/2021).

Figure 18: Northern Creek bank and embankment within site (17/11/2021).

Figure 19: Northern Creek bank and embankment within site (17/11/2021).

Figure 20: Northern Creek bank and embankment showing failure (17/11/2021).

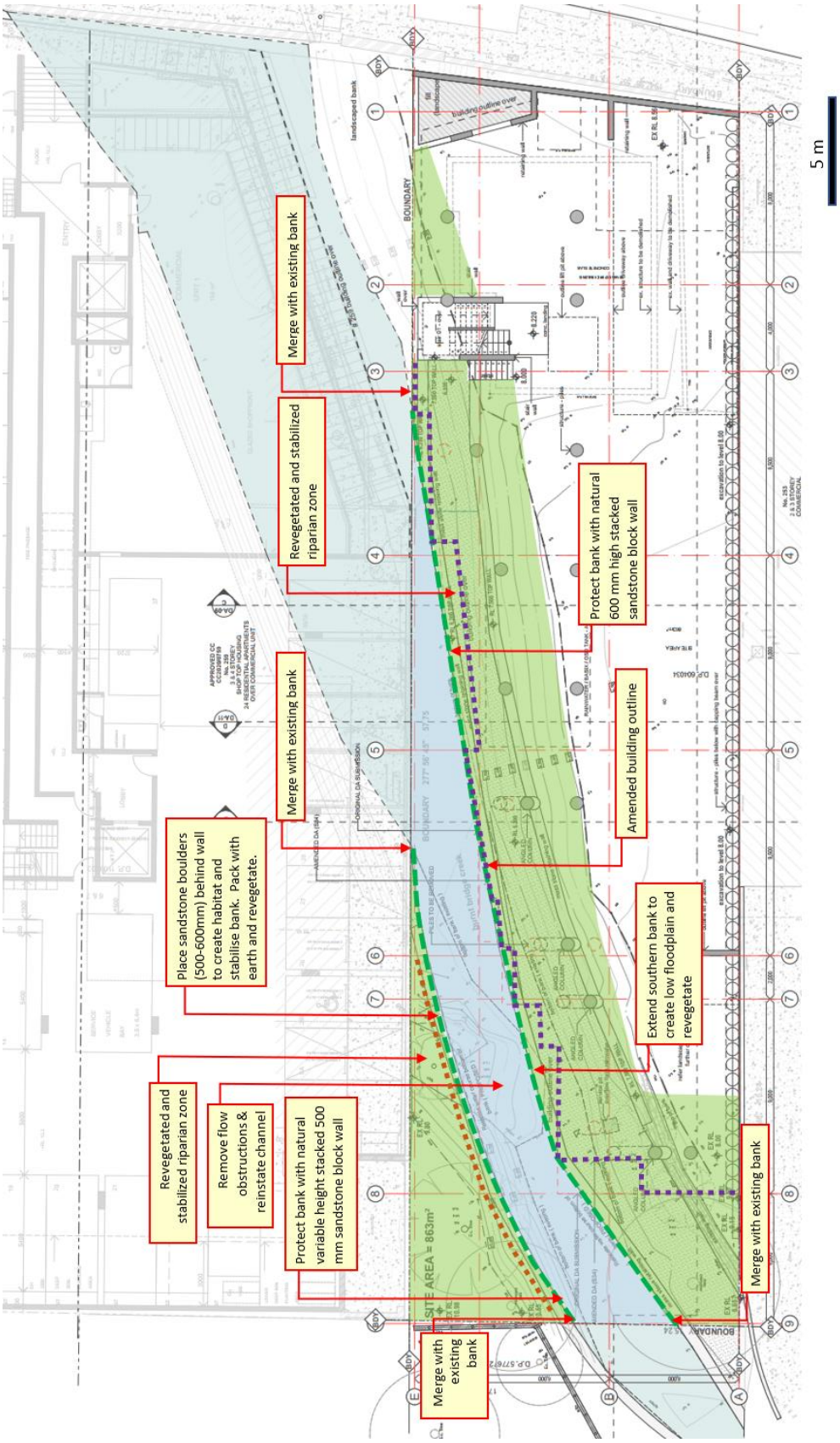


Figure 21: Concept creek works plan.

Attachment B - Creek Protection Works Plans

PROJECT: PROPOSED BOARDING HOUSE

PLANSET: CHANNEL DESIGN PLAN

CLIENT: MY MANLY VALE PTY LTD

LOCALITY PLAN
NOT TO SCALE

LGA: NORTHERN BEACHES COUNCIL

255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

DRAWING LIST		
DWG NO.	REV	DWG TITLE
GENERAL		
PS07-A000	B	COVER SHEET
CONSTRUCTION MANAGEMENT WORKS		
PS07-B300	B	SEDIMENT AND EROSION CONTROL AND DEMOLITION PLAN
PS07-B350	A	SEDIMENT AND EROSION DETAILS
EARTHWORKS		
PS07-C100	B	EARTHWORKS PLAN
PS07-C500	B	EARTHWORKS CUT-FILL ANALYSIS PLAN
PS07-C600	B	EARTHWORKS SECTIONS SHEET 1
PS07-C601	B	EARTHWORKS SECTIONS SHEET 2
PS07-C602	B	EARTHWORKS SECTIONS SHEET 3

GENERAL NOTES:
1. THIS PLAN IS FOR DEVELOPMENT APPLICATION PURPOSE AND NOT FOR CONSTRUCTION. DESIGN TO BE REVIEWED AND UPDATED FOR CONSTRUCTION CERTIFICATE.
2. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH, AND THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT AUSTRALIAN STANDARDS, COUNCIL SPECIFICATIONS, AND ALL PROJECT CONSULTANT'S PLANS AND REPORTS.
3. INTERNAL SURVEY INFORMATION AND EXTERNAL SITE BOUNDARY SHOWN BASED ON SURVEY INFORMATION PROVIDED BY BEE & LETHBRIDGE 15/09/2020.
4. ARCHITECTURAL INFORMATION SHOWN BASED ON DESIGN BY GARTNER TROVATO ARCHITECTS 21/09/2021.
5. LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
6. FINAL SURFACE CONTOURS ARE BASED ON DESIGN AND EXISTING SURVEY AND LIDAR SURFACES.

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	REVISED FOLLOWING S34	20/10/2021	NN	CG	DD	GT
A	WITHOUT PREJUDICE DRAFT FOR S34	28/09/2021	NN	CG	DD	GT

SCALE

GRID | DATUM | PROJECT MANAGER: GT

CLIENT: MY MANLY VALE PTY LTD

PROJECT NAME/PLANSET TITLE
PROPOSED BOARDING HOUSE
CHANNEL DESIGN PLAN
255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

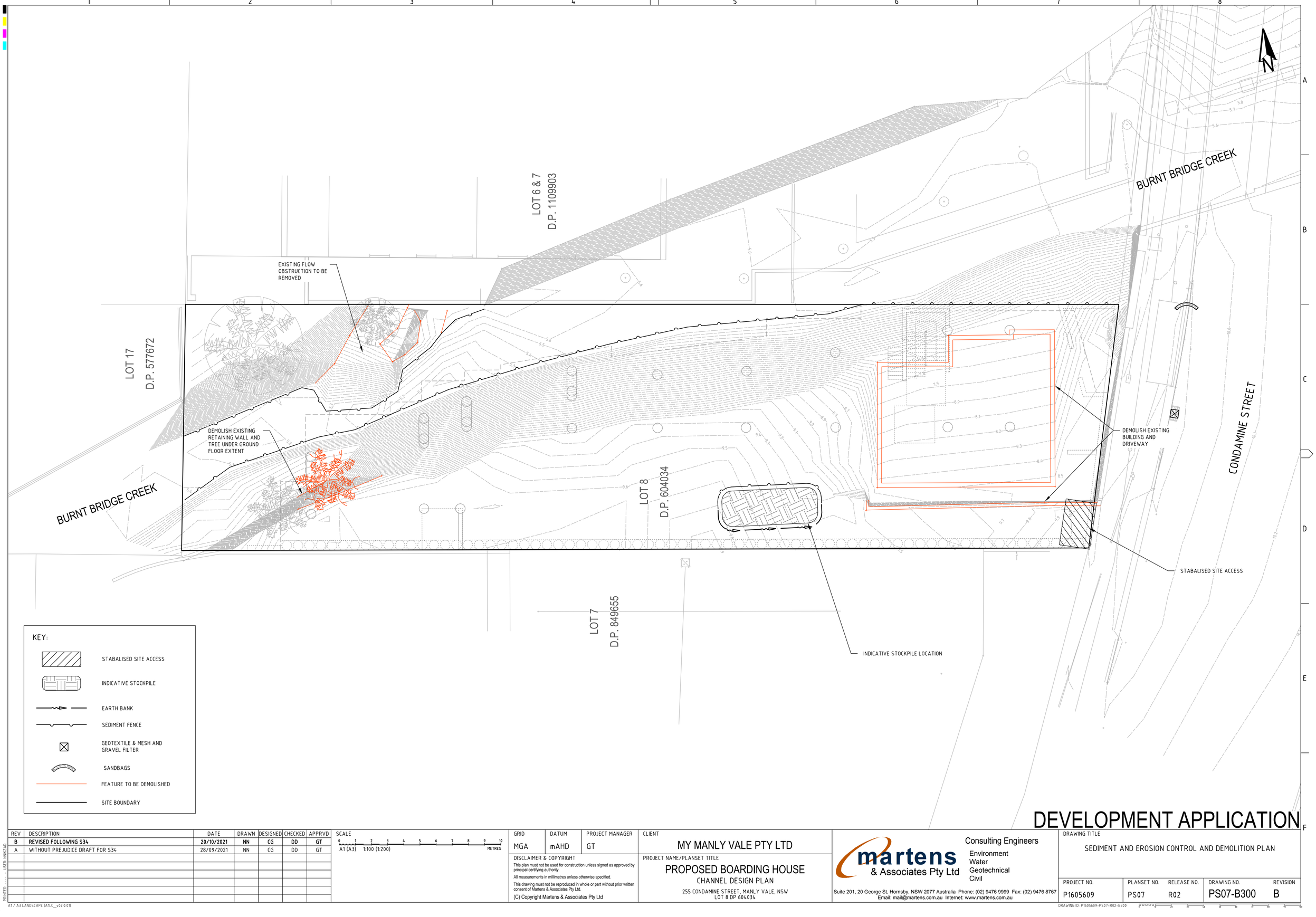
martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE: COVER SHEET

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1605609	PS07	R02	PS07-A000	B

DRAWING ID: P1605609-PS07-R02-A000

PRINTED: --- USER: NNYZAD
A1 / A3 LANDSCAPE (A1LC_v02.0.01)



DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	**REVISED FOLLOWING S34**	**20/10/2021**	**NN**	**CG**	**DD**	**GT**
A	WITHOUT PREJUDICE DRAFT FOR S34	28/09/2021	NN	CG	DD	GT

SCALE
0 1 2 3 4 5 6 7 8 9 10 METRES
A1 (A3) 1:100 (1:200)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	GT

CLIENT
MY MANLY VALE PTY LTD

PROJECT NAME/PLANSET TITLE
PROPOSED BOARDING HOUSE
CHANNEL DESIGN PLAN
255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

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Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SEDIMENT AND EROSION CONTROL AND DEMOLITION PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1605609	PS07	R02	PS07-B300	B

DRAWING ID: P1605609-PS07-R02-B300

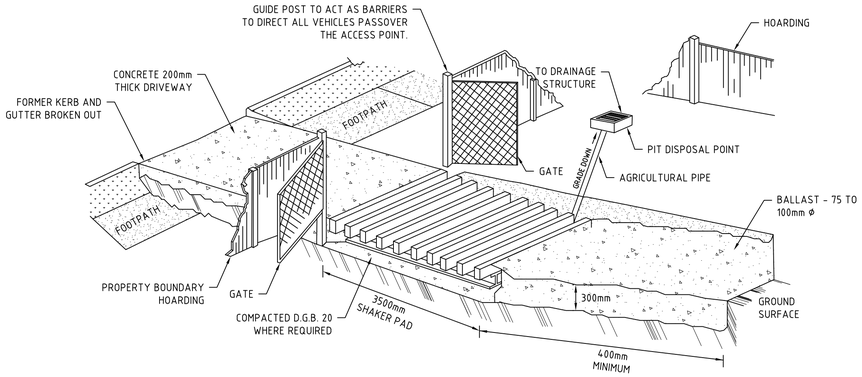
PRINTED: --- USER: NNYZAD
A1 / A3 LANDSCAPE (A1LC_v02.0.01)

STABILISED ACCESS POINT

TYPE II SAP

THE TYPE II SAP DESIGN IS MORE DEFINED IN THAT IT REQUIRES AN AREA OF BALLAST WITHIN THE SITE COMBINED WITH A SHAKER PAD; ADJACENT THE SHAKER PAD AND IN THE PUBLIC WAY IS A TEMPORARY (CONCRETE) VEHICULAR CROSSING. (SEE DIAGRAM)

STABILISED ACCESS POINT - TYPE 2



IN BOTH TYPE I AND TYPE II SAP'S, THE TEMPORARY VEHICULAR CROSSING MUST:

- CONNECT TO AN EXISTING GUTTER LAYBACK (WHERE THE KERB AND GUTTER EXIST) . IF A GUTTER LAYBACK DOES NOT EXIST THEN THE CONNECTION MUST BE MADE TO THE GUTTER BY REMOVING THE ADJCENT KERB SECTION ONLY.
- CONNECT TO A DISH CROSSING (WHERE KERB AND GUTTER DOES NOT EXIST). IF A DISH CROSSING DOES NOT EXIST, THEN IT MUST BE CONSTRUCTED IN ACCORDANCE WITH DETAILS CONTAINED IN COUNCIL'S ISSUED FOOTPATH CROSSING LEVELS.

IT SHOULD BE NOTED THAT THESE TYPES OF SAPS ARE CONSIDERED TO BE APPLICABLE FOR THE MAJORITY OF ACTIVITIES HOWEVER SOME SITES MAY REQUIRE SPECIAL CONSIDERATION.

SHAKER PAD (CATTLE GRID)

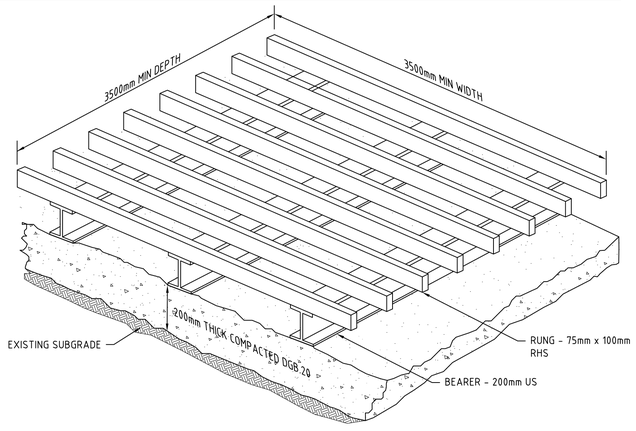
A CORRECTLY DESIGNED AND INSTALLED SHAKER PAD WILL ASSIST IN PREVENTING SEDIMENT TRANSFERE FROM A SITE. ANY STABILISED ACCESS POINT (SAP) CAN BE DESIGNED WITH A SHAKER PAD (COMPULSOPRY IN TYPE II SAP'S)

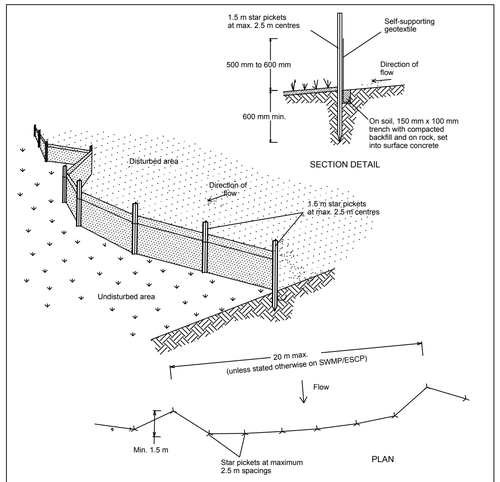
SHAKER PADS CAN BE DESIGNED AND CONSTRUCTED TO ENABLE RE-USE ON FUTURE PROJECTS.

THE SHAKER PAD:

- MUST BE DESIGNED AND CERTIFIED BY A PRACTICING STRUCTURAL ENGINEER. THE CERTIFIED DESIGN SHOULD BE SUBMITTED WITH THE RELEVENT APPLICATION.
- CAN BE CONSTRUCTED FROM ANY SUITABLE MATERIAL.
- MUST BE LOCATED ON A SUITABLY PREPARED AND COMPACTED SUB-GRADE/BASE MATERIAL.
- MUST BE SITUATED SUCH THAT THE RUNGS OF THE SHAKER PAD ARE LEVEL WITH THE ADJOINING NATURAL SURFACE.
- MUST BE A MINIMUM OF 3.5m IN LENGTH.
- MUST BE A MINIMUN OF 3.5m IN WIDTH.
- MUST HAVE CLEAR SPACING BETWEEN RUNGS OF 200 - 250mm.
- RUNGS MUST HAVE A MAXIMUM WIDTH (BEARING AREA) OF 75mm.
- MUST HAVE A MINIMUM CLEAR DEPTH OF 300mm IE FORM THE ROP OF THE RUNG TO THE FINISHED SUB-GRADE/BASE LEVEL.

THE SHAKER PAD MUST BE PROVIDED WITH SUITABLE BARRIERS AT THE SIDES TO ENSURE THAT ALL TYERS OF VEHICLES LEAVING THE SITE TRAVERSE THE DEVICE.

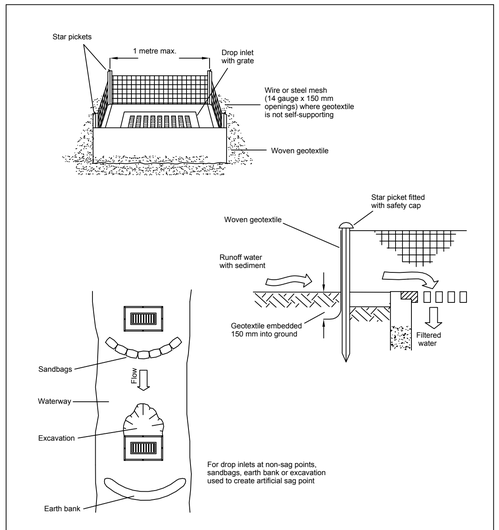




Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

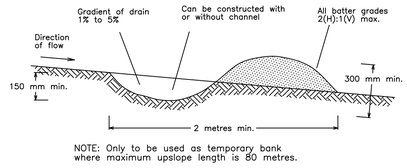
SEDIMENT FENCE — SD 6-8



Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

GEOTEXTILE INLET FILTER — SD 6-12

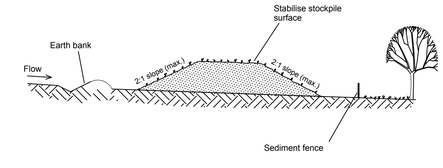


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

EARTH BANK (LOW FLOW) — SD 5-5



Construction Notes

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

STOCKPILES — SD 4-1

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	WITHOUT PREJUDICE DRAFT FOR S34	28/09/2021	NN	CG	DD	GT

SCALE

GRID | DATUM | PROJECT MANAGER: GT

CLIENT: MY MANLY VALE PTY LTD

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PROJECT NAME/PLANSET TITLE

PROPOSED BOARDING HOUSE

CHANNEL DESIGN PLAN

255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

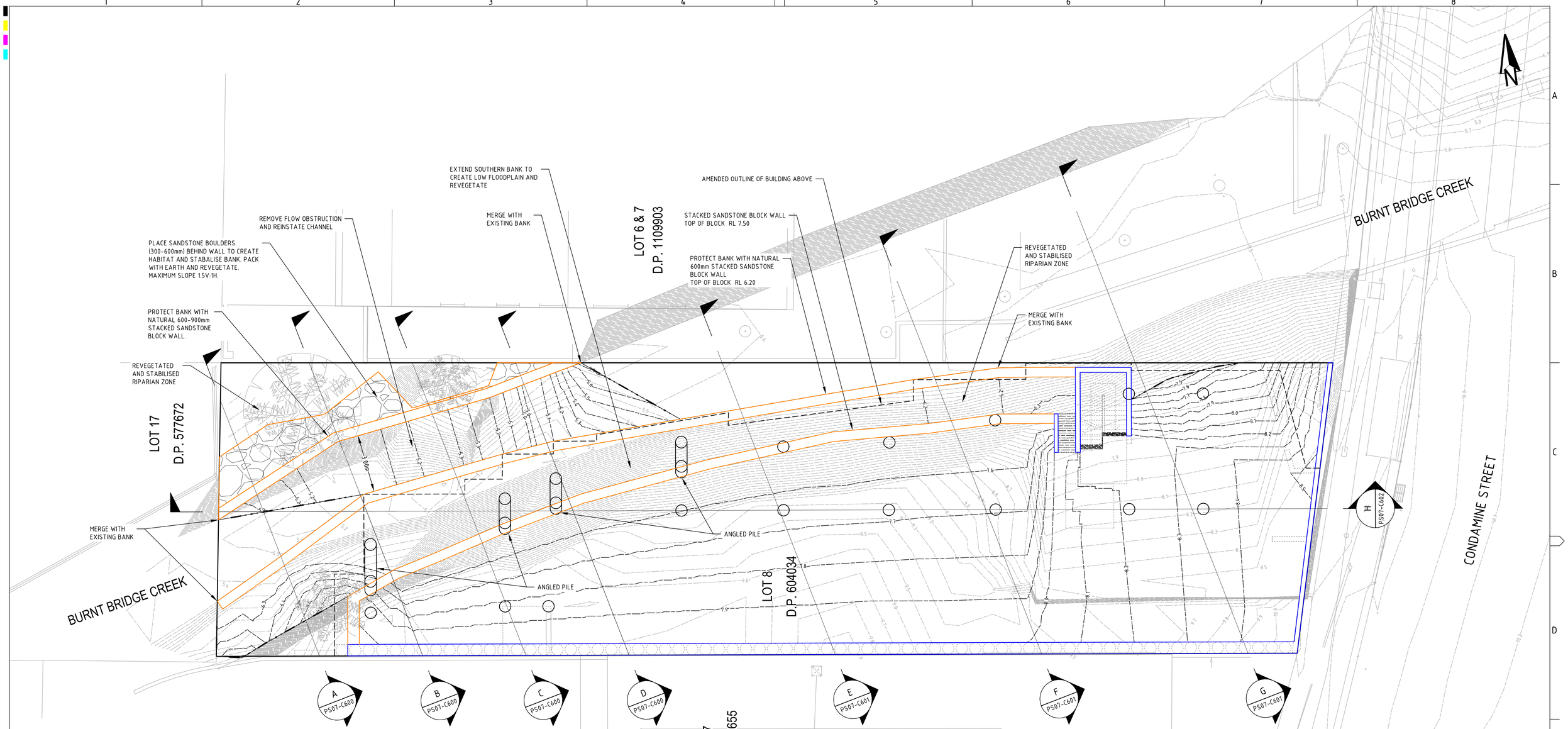
DRAWING TITLE: SEDIMENT AND EROSION DETAILS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1605609	PS07	R02	PS07-B350	A

DRAWING ID: P1605609-PS07-R02-B350

PRINTED: ---- - USER: NWKZAD

A1 / A3 LANDSCAPE (A1LC_v02.0.01)



KEY

- EXISTING CONTOURS
- PROPOSED CONTOURS
- EARTHWORKS INTERFACE LINE
- SANDSTONE BLOCK BANK STABILISATION WORKS
- EDGE OF RETAINING WALL
- SITE BOUNDARY
- OUTLINE OF BUILDING ABOVE
- STRUCTURAL PILE
- SANDSTONE BOULDER REVETMENT

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	**REVISED FOLLOWING S34**	**20/10/2021**	**NN**	**CG**	**DD**	**GT**
A	WITHOUT PREJUDICE DRAFT FOR S34	28/09/2021	NN	CG	DD	GT

SCALE
A1 (A3) 1:100 (1:200)
0 1 2 3 4 5 6 7 8 9 10 METRES

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	GT

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CLIENT
MY MANLY VALE PTY LTD

PROJECT NAME/PLANSET TITLE
PROPOSED BOARDING HOUSE
CHANNEL DESIGN PLAN
255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

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Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
EARTHWORKS PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1605609	PS07	R02	PS07-C100	B

DRAWING ID: P1605609-PS07-R02-C100

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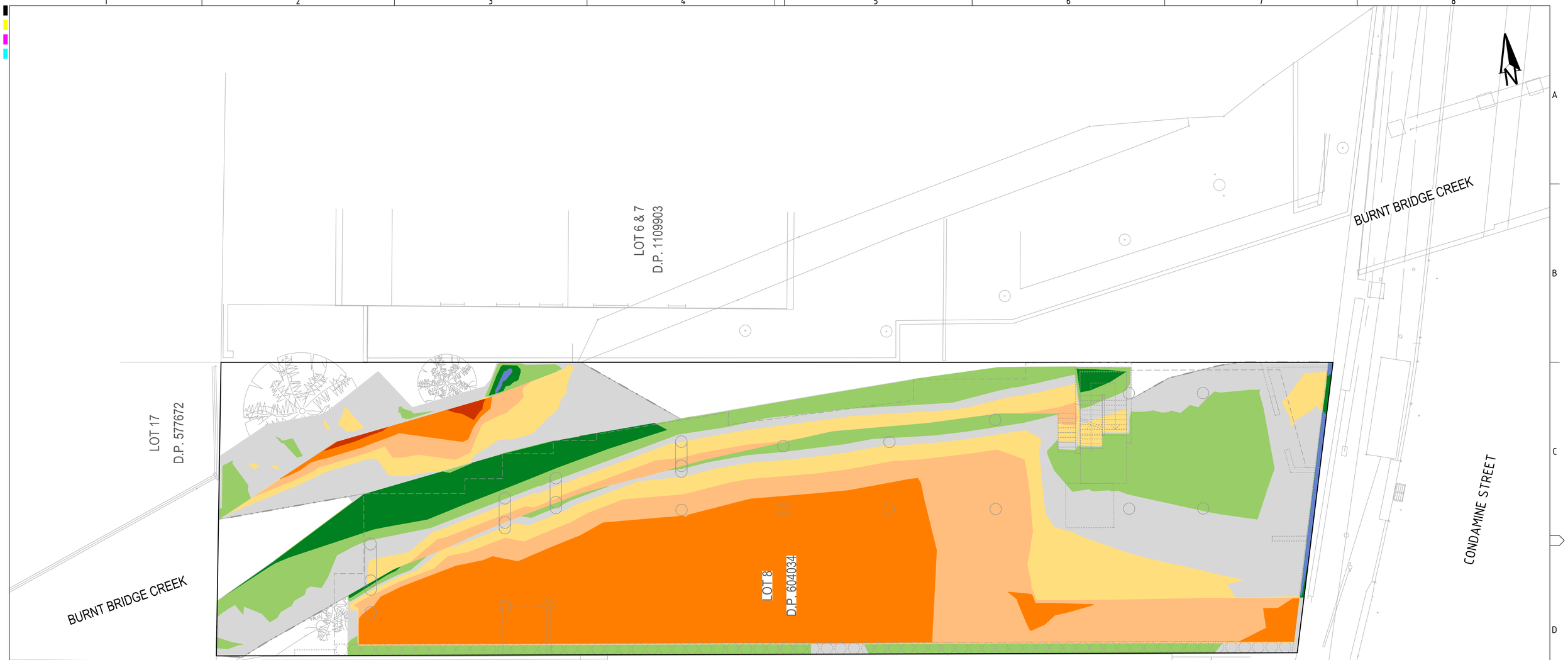

CUT-FILL DEPTH DESIGN TO EXISTING

LESS THAN		-3.000	m	
-3.000	to	-2.250	m	
-2.250	to	-1.500	m	
-1.500	to	-0.750	m	
-0.750	to	-0.150	m	
-0.150	to	0.150	m	
0.150	to	0.750	m	
0.750	to	1.500	m	
1.500	to	2.250	m	
2.250	to	3.000	m	
GREATER THAN		99999	m	

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	**REVISED FOLLOWING S34**	**20/10/2021**	**NN**	**CG**	**DD**	**GT**
A	WITHOUT PREJUDICE DRAFT FOR S34	28/09/2021	NN	CG	DD	GT

SCALE
0 1 2 3 4 5 6 7 8 9 10 METRES
A1 (A3) 1:100 (1:200)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	GT

CLIENT
MY MANLY VALE PTY LTD

PROJECT NAME/PLANSET TITLE
PROPOSED BOARDING HOUSE
CHANNEL DESIGN PLAN
255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

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Consulting Engineers
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Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
EARTHWORKS CUT-FILL ANALYSIS PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1605609	PS07	R02	PS07-C500	B

DRAWING ID: P1605609-PS07-R02-C500

PRINTED: ---- - USER: NWK2AD
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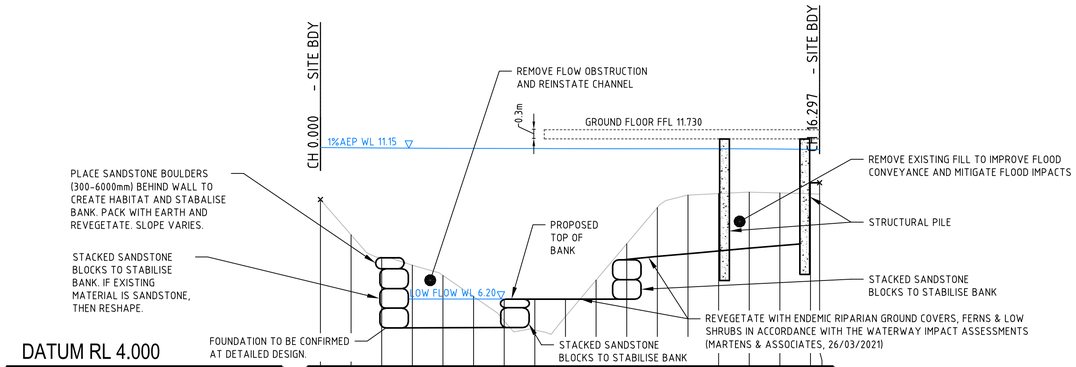
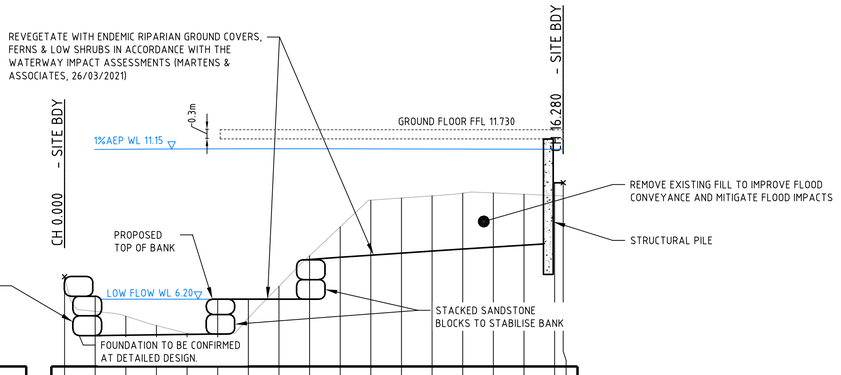


DATUM RL 4.000

DESIGN SURFACE LEVELS				5.261	5.265	5.269	6.200	6.200	6.200	6.200	7.500	7.594	7.682	7.772	7.863	7.946	10.000	10.000
EXISTING SURFACE LEVELS	9.452	8.299	7.562	7.308	6.971	6.283	5.490	5.190	5.631	6.820	8.005	9.190	9.595	9.645	9.691	9.667	9.638	9.628
CUT / FILL DEPTH	0.000	0.000	0.000	-2.047	-1.706	-1.014	0.710	1.010	0.569	-0.620	-0.505	-1.595	-1.913	-1.873	-1.828	-1.721	0.362	0.372
CHAINAGE	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	16.297

SECTION C

SCALE: HORIZONTAL - 1:100
VERTICAL - 1:100

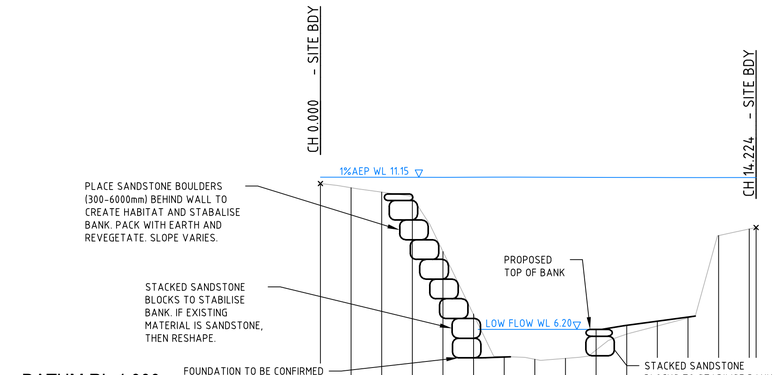


DATUM RL 4.000

DESIGN SURFACE LEVELS	6.931	6.299	5.022	5.036	5.051	6.200	6.200	6.200	7.500	7.567	7.632	7.701	7.769	7.835	7.897	7.960	10.000	10.000
EXISTING SURFACE LEVELS	6.931	5.800	5.646	5.338	5.083	5.039	5.579	6.618	7.615	8.557	9.431	9.501	9.572	9.659	9.667	9.624	9.580	9.569
CUT / FILL DEPTH	0.000	0.500	-0.624	-0.302	-0.032	1.161	0.621	-0.418	-0.115	-0.991	-1.798	-1.800	-1.803	-1.824	-1.770	-1.664	0.420	0.431
CHAINAGE	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	16.280

SECTION D

SCALE: HORIZONTAL - 1:100
VERTICAL - 1:100

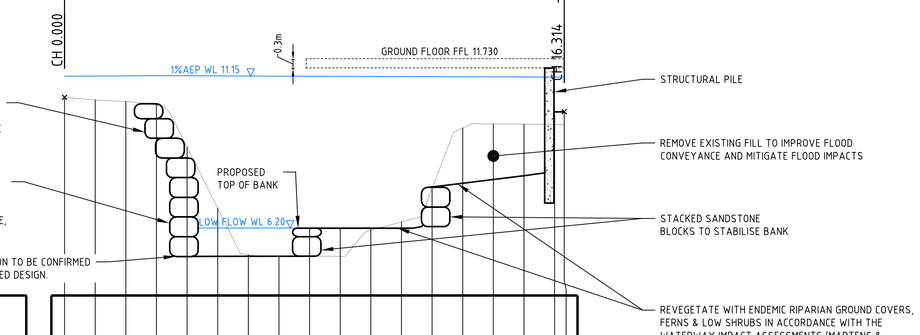


DATUM RL 4.000

DESIGN SURFACE LEVELS				10.572	8.690	6.702	5.297		6.200	6.332	6.467	6.601						
EXISTING SURFACE LEVELS	10.960	10.823	10.680	10.509	8.741	6.679	5.312	5.274	5.253	5.524	6.047	6.310	6.571	9.261	9.476	9.524		
CUT / FILL DEPTH	0.000	0.000	0.000	0.062	-0.051	-0.002	-0.015	0.000	0.000	0.676	0.286	0.157	0.030	0.000	0.000	0.000		
CHAINAGE	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000	13.000	14.000	14.224		

SECTION A

SCALE: HORIZONTAL - 1:100
VERTICAL - 1:100



DATUM RL 4.000

DESIGN SURFACE LEVELS				10.228	8.797	5.278	5.280	5.281	6.200	6.200	6.200	6.200	7.552	7.664	7.786	7.909	10.000	10.000
EXISTING SURFACE LEVELS	10.468	10.384	10.328	10.218	8.846	6.850	5.328	5.281	5.280	5.276	6.134	6.399	7.492	9.468	9.596	9.592	9.586	9.580
CUT / FILL DEPTH	0.000	0.000	0.000	0.010	-0.049	-1.572	-0.048	-0.000	0.920	0.924	0.066	-0.199	0.061	-1.804	-1.810	-1.683	0.414	0.420
CHAINAGE	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	16.314

SECTION B

SCALE: HORIZONTAL - 1:100
VERTICAL - 1:100

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	**REVISED FOLLOWING S34**	**20/10/2021**	**NN**	**CG**	**DD**	**GT**
A	WITHOUT PREJUDICE DRAFT FOR S34	28/09/2021	NN	CG	DD	GT

SCALE
0 1 2 3 4 5 6 7 8 9 10 METRES
A1 (A3) 1:100 (1:200)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	GT

CLIENT
MY MANLY VALE PTY LTD

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PROJECT NAME/PLANSET TITLE
PROPOSED BOARDING HOUSE
CHANNEL DESIGN PLAN
255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

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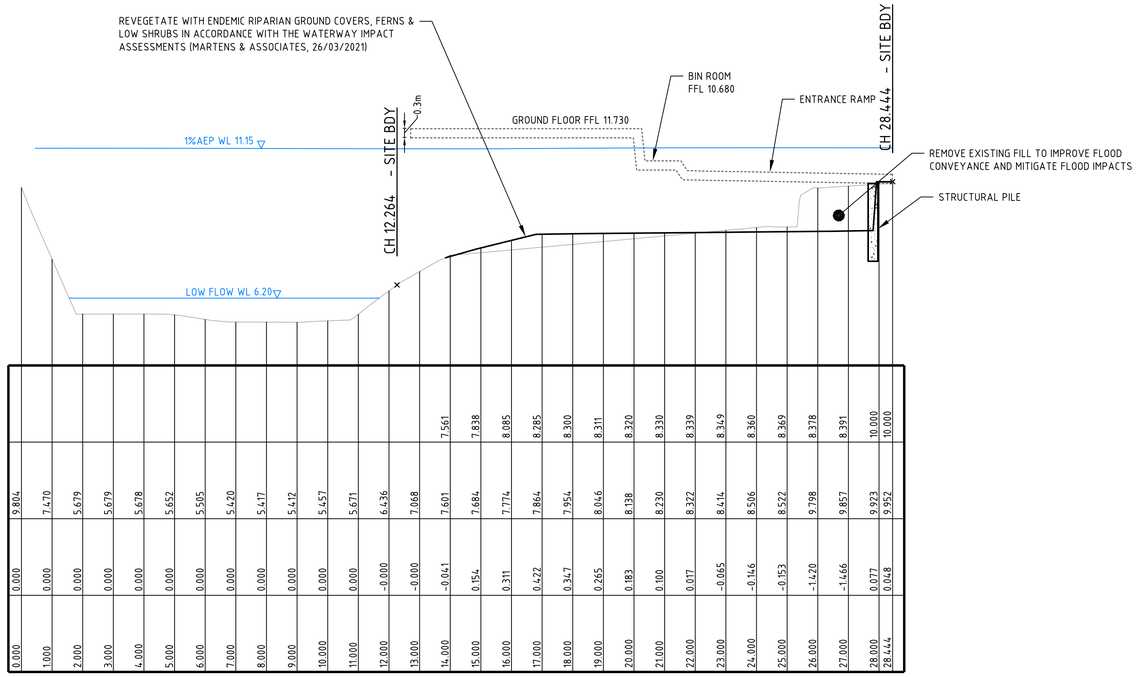
DRAWING TITLE
EARTHWORKS SECTIONS
SHEET 1

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1605609	PS07	R02	PS07-C600	B

DRAWING ID: P1605609-PS07-R02-C600

PRINTED: ---- - USER: NNAZAD
A1 / A3 LANDSCAPE (A1LC_v02.0.01)

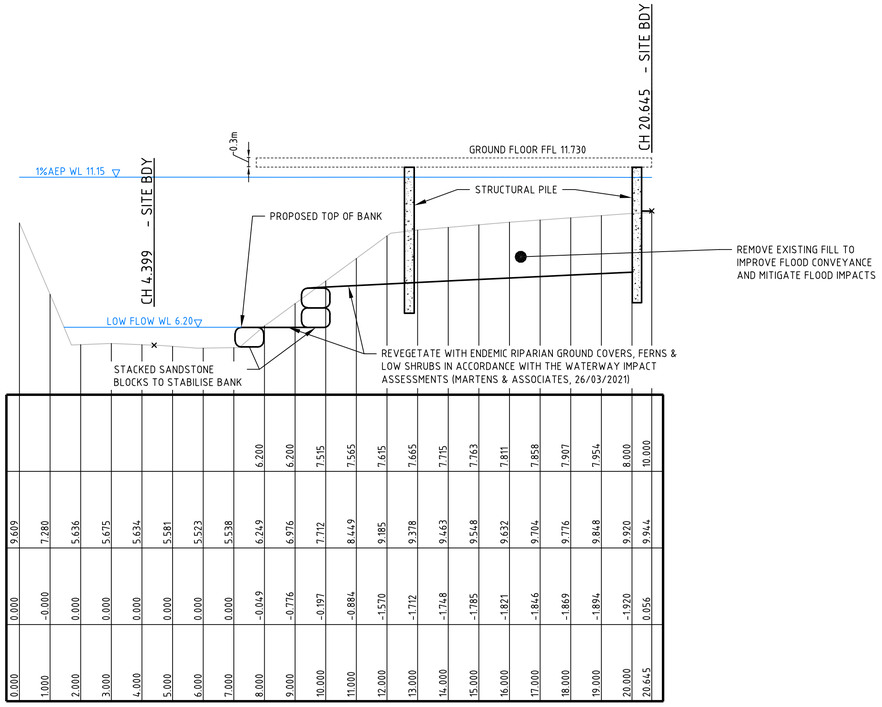


DATUM RL 4.000

DESIGN SURFACE LEVELS													7.561	7.838	8.085	8.285	8.300	8.311	8.320	8.330	8.339	8.349	8.360	8.369	8.378	8.391	10.000	10.000
EXISTING SURFACE LEVELS	9.804	7.470	5.679	5.679	5.678	5.652	5.505	5.420	5.417	5.412	5.457	5.671	6.436	7.068	7.601	7.684	7.774	7.864	7.954	8.046	8.138	8.230	8.322	8.414	8.506	8.522	9.798	9.857	9.923	9.952
CUT / FILL DEPTH	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.000	-0.000	-0.041	0.154	0.311	0.422	0.347	0.265	0.183	0.100	0.017	-0.065	-0.146	-0.153	-1.420	-1.466	0.077	0.048
CHAINAGE	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	17.000	18.000	19.000	20.000	21.000	22.000	23.000	24.000	25.000	26.000	27.000	28.000	28.444

SECTION G

SCALE: HORIZONTAL - 1:100
VERTICAL - 1:100

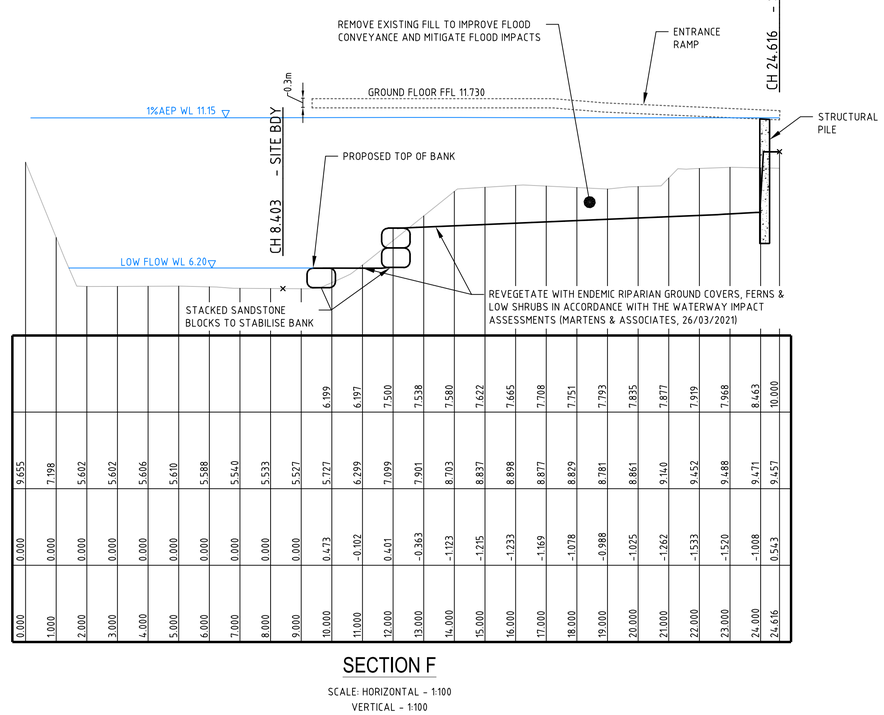


DATUM RL 4.000

DESIGN SURFACE LEVELS								6.200	6.200	7.515	7.565	7.615	7.665	7.715	7.763	7.811	7.858	7.907	7.954	8.000	10.000							
EXISTING SURFACE LEVELS	9.609	7.280	5.636	5.675	5.634	5.581	5.523	5.538	6.249	6.976	7.712	8.449	9.185	9.378	9.463	9.548	9.632	9.704	9.776	9.848	9.920	9.944						
CUT / FILL DEPTH	0.000	-0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.049	-0.776	-0.197	-0.884	-1.570	-1.712	-1.748	-1.785	-1.821	-1.846	-1.869	-1.894	-1.920	0.056						
CHAINAGE	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	17.000	18.000	19.000	20.000	20.645						

SECTION E

SCALE: HORIZONTAL - 1:100
VERTICAL - 1:100



DATUM RL 4.000

DESIGN SURFACE LEVELS													6.199	6.197	7.500	7.538	7.580	7.622	7.665	7.708	7.751	7.793	7.835	7.877	7.919	7.968	8.463	10.000
EXISTING SURFACE LEVELS	9.655	7.198	5.602	5.602	5.606	5.610	5.588	5.540	5.533	5.527	5.727	6.299	7.099	7.901	8.703	8.837	8.898	8.877	8.829	8.781	8.861	9.140	9.452	9.488	9.471	9.457		
CUT / FILL DEPTH	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.473	-0.102	0.401	-0.363	-1.123	-1.215	-1.233	-1.169	-1.078	-0.988	-1.025	-1.262	-1.533	-1.520	-1.008	0.543		
CHAINAGE	0.000	1.000	2.000	3.000	4.000	5.000	6.000	7.000	8.000	9.000	10.000	11.000	12.000	13.000	14.000	15.000	16.000	17.000	18.000	19.000	20.000	21.000	22.000	23.000	24.000	24.616		

SECTION F

SCALE: HORIZONTAL - 1:100
VERTICAL - 1:100

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	REVISED FOLLOWING S34	20/10/2021	NN	CG	DD	GT
A	WITHOUT PREJUDICE DRAFT FOR S34	28/09/2021	NN	CG	DD	GT

SCALE
0 1 2 3 4 5 6 7 8 9 10 METRES
A1 (A3) 1:100 (1:200)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	GT

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CLIENT
MY MANLY VALE PTY LTD

PROJECT NAME/PLANSET TITLE
PROPOSED BOARDING HOUSE
CHANNEL DESIGN PLAN
255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

martens & Associates Pty Ltd
Consulting Engineers
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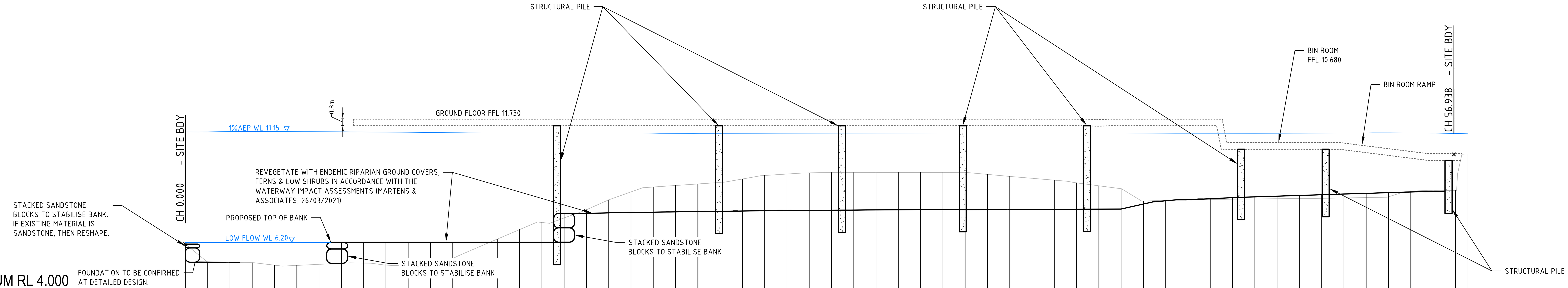
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
EARTHWORKS SECTIONS
SHEET 2

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1605609	PS07	R02	PS07-C601	B

DRAWING ID: P1605609-PS07-R02-C601

PRINTED: --- - USER (NNY7AD)
A1 / A3 LANDSCAPE (A1LC_v02.0.01)



CHAINAGE	DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS	CUT / FILL DEPTH
0.000	6.127	6.127	0.000
1.000	5.316	5.332	-0.016
2.000	5.306	5.312	-0.005
3.000		5.291	0.000
4.000		5.181	0.000
5.000		5.170	0.000
6.000		5.219	0.000
7.000	6.200	5.267	0.933
8.000	6.200	5.275	0.925
9.000	6.200	5.184	1.016
10.000	6.200	5.136	1.064
11.000	6.200	5.115	1.085
12.000	6.200	5.479	0.721
13.000	6.200	5.924	0.276
14.000	6.200	6.350	-0.150
15.000	6.200	6.776	-0.576
16.000	6.200	7.095	-0.895
17.000	7.500	7.300	0.200
18.000	7.502	7.665	-0.163
19.000	7.526	8.110	-0.584
20.000	7.542	8.466	-0.923
21.000	7.557	8.685	-1.128
22.000	7.571	8.754	-1.182
23.000	7.585	8.822	-1.237
24.000	7.597	8.890	-1.293
25.000	7.609	9.045	-1.436
26.000	7.620	9.202	-1.582
27.000	7.628	9.267	-1.639
28.000	7.636	9.319	-1.683
29.000	7.644	9.330	-1.686
30.000	7.652	9.333	-1.681
31.000	7.659	9.335	-1.676
32.000	7.662	9.337	-1.675
33.000	7.665	9.339	-1.674
34.000	7.668	9.341	-1.674
35.000	7.674	9.342	-1.668
36.000	7.679	9.251	-1.572
37.000	7.683	9.160	-1.477
38.000	7.686	9.076	-1.390
39.000	7.688	8.992	-1.304
40.000	7.691	8.871	-1.180
41.000	7.694	8.740	-1.046
42.000	7.698	8.609	-0.911
43.000	7.922	8.054	-0.132
44.000	8.068	8.091	-0.023
45.000	8.116	8.119	-0.004
46.000	8.161	8.129	0.032
47.000	8.207	8.139	0.068
48.000	8.243	8.150	0.094
49.000	8.275	8.160	0.116
50.000	8.307	8.170	0.137
51.000	8.338	8.180	0.159
52.000	8.371	8.195	0.177
53.000	8.402	8.212	0.190
54.000	8.432	8.246	0.186
55.000	8.463	8.496	-0.033
56.000	8.488	8.535	-0.047
57.000		8.528	0.000
57.567		10.170	0.000

SECTION H

SCALE: HORIZONTAL - 1:100
VERTICAL - 1:100

DEVELOPMENT APPLICATION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	**REVISED FOLLOWING S34**	**20/10/2021**	**NN**	**CG**	**DD**	**GT**
A	WITHOUT PREJUDICE DRAFT FOR S34	28/09/2021	NN	CG	DD	GT

SCALE 0 1 2 3 4 5 6 7 8 9 10 METRES
A1 (A3) 1:100 (1:200)

GRID: MGA | DATUM: mAHD | PROJECT MANAGER: GT

CLIENT: MY MANLY VALE PTY LTD

PROJECT NAME/PLANSET TITLE
PROPOSED BOARDING HOUSE
CHANNEL DESIGN PLAN
255 CONDAMINE STREET, MANLY VALE, NSW
LOT 8 DP 604034

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Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
EARTHWORKS SECTIONS
SHEET 3

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1605609	PS07	R02	PS07-C602	B