Vickery Rail Spur (100% design)

Flood Assessment

Whitehaven Coal Limited
0800-12-L5, 18 July 2024

Report Title	Vickery Rail Spur (100% design)- Flood Assessment
Client	Whitehaven Coal Limited PO Box 638 Newcastle NSW 2300
Report Number	0800-12-L5

Revision Number	Report Date	Report Author	Reviewer
0	8 September 2023	JF	GR
1	3 October 2023	JF	GR
2	14 March 2024	JF	GR
3	13 June 2024	RS	GR
4	17 July 2024	JF	GR
5	18 July 2024	JF	GR

For and on behalf of
WRM Water & Environment Pty Ltd

Greg Roads
Director

Executive Summary

The Vickery Extension Project (the Project) is located approximately 25 kilometres (km) north of Gunnedah in New South Wales (NSW) and involves the construction of an open-cut coal mine, associated on-site infrastructure, and rail spur. The Project was granted a development consent under the *Environmental Planning and Assessment Act 1979* (EPAct) in August 2020.

This report presents the findings of the flood impact assessment for the Project rail spur, which crosses the Namoi River floodplain. The rail spur, which is approximately 14 km long, includes a 2.195 km long bridge over the Namoi River, a 476 m long bridge over Stratford Creek and a continuous set of culvert structures some 9.5 km long to the west of the Namoi River all of which have soffits above the 1% annual exceedance probability (AEP) design flood including an allowance for climate change. The Project Development Consent (SSD 7480) conditions relating to the rail spur are as follows:

B48 - *The Applicant shall ensure that the design and construction of the project, including the Project Rail Spur and Kamilaroi Highway overpass, is consistent with the objectives of the Floodplain Management Plan for the Upper Namoi Valley Floodplain 2019* (FMP) *to the satisfaction of the Planning Secretary.*

B49 - *The Project Rail Spur, Project Rail Spur bridges and any upgrade to the haul road must be designed and constructed to minimise flooding and scour impacts, in consultation with BCD and consistent with the recommendations of the Department's flood peer review. The design and construction of the Project Rail Spur must provide for its complete elevation above the 1% Average Exceedance Probability flood level west of the Namoi River, generally in accordance with the EIS. Prior to construction of the Project Rail Spur or any upgrades to the haul road, the Proponent shall undertake a flood assessment of the detailed design to confirm there would be minimal impacts as predicted in the documents listed in condition A2(c).*

The FMP, which is made under section 50 of the *Water Management Act 2000* (WMAct), establishes management zones, rules and assessment criteria for granting or amending approvals for flood works that meet the objectives of the plan. The proposed rail spur is exempt from requiring a flood work approval under the WMAct due to Section 4.41 of the EPAct.

The rules within the FMP relate to specific flood work types other than major infrastructure projects, such as the Project rail spur. As a result, the assessment criteria in the FMP have been used to satisfy the objectives of the FMP in accordance with the above development consent conditions.

The FMP assessment criteria relate to the flooding characteristics of a 20% AEP (small) design flood as well as the 5% AEP (large) design flood event. To satisfy the above conditions, the Project rail spur has also been assessed against the 1% AEP design flood with and without climate change. Hydrological and hydraulic models were developed to define the flooding characteristics for these floods across the Namoi River floodplain. The results of the existing conditions modelling are as follows:

- For the 20% AEP event, the Namoi River does not overflow between Gunnedah and the Project rail spur. Flooding along the western and eastern floodplains in the vicinity of the Project rail spur is due to local catchment flows only.
- For the 5% AEP event, the Namoi River overflows onto the eastern floodplain to Stratford Creek as well as to the western floodplain. The floodplain flows are generally shallow except for defined floodways where flows exceed 1 m deep. Existing floodplain infrastructure has a significant impact on flood behaviour.
- For the 1% AEP event, floodwater covers much of the floodplain to depths exceeding 1 m, overtopping most of the existing flood works.

The Project rail spur crosses the AD (defined floodway), AID (ill-defined floodway), BL (flood storage), C (flood fringe) and D (special protection) management zones defined within the FMP. An assessment of the project rail spur against the assessment criteria given for each zone is given in the following table.

Criterion	Comply	Description
Ecological and cultural impacts (all zones) A flood work approval must not be granted or amended to authorise the construction or modification of a flood work unless, in the minister's opinion, the flood work can be constructed to maintain adequate flood connectivity to: (a) ecological assets, and (b) facilitate fish passage	Yes	No blockage is proposed other than bridge piers and culvert legs to obstruct the connectivity to any ecological assets or obstruct fish passage.
Ecological and cultural impacts (all zones) A flood work approval must not be granted or amended to authorise the construction or modification of a flood work unless, in the minister's opinion, the flood work can be constructed to maintain adequate flood connectivity to: (a) Aboriginal values, and (b) heritage sites	Yes	No blockage is proposed other than bridge piers and culvert legs to obstruct the connectivity to any aboriginal values or heritage sites
Ecological and cultural impacts continued (all zones) A flood work approval must not be granted or amended to authorise the construction or modification of a flood work if, in the minister's opinion, the construction of the flood work is likely to disturb the ground surface of a heritage site or cause more than minimal erosion to a heritage site.	Yes	Given that the proposed alignment is generally consistent with the Project EIS alignment, the adopted mitigation, management and monitoring measures detailed in the EIS will be adopted for the proposed Project rail spur.
Drainage impacts (all zones) A flood work approval must not be granted or amended to authorise the construction or modification of a flood work unless, in the minister's opinion, the flood work can be constructed to maintain drainage on adjacent landholdings and other landholdings that may be affected by the proposed flood work within 12 hours of existing drainage time when compared to drainage times under pre-development and existing development conditions for a range of flood scenarios.	Yes	The assessment found no change to drainage times as a result of the proposed rail spur because culvert inverts are proposed to be constructed at grade.
Cumulative impacts (all zones) A flood work approval must not be granted or amended to authorise the construction or modification of a flood work unless the minister has considered the cumulative impact that the proposed flood work and other existing works on the landholding may have on adjacent landholdings, and on other landholdings that may be affected by the proposed flood work and the floodplain environment.	Yes	The assessment comparing the Project rail spur against existing conditions with all floodplain infrastructure in place showed negligible impact across the western floodplain and only minor impacts on the eastern floodplain. On this basis, it is expected that similar impacts would occur for Project conditions minus pre-development conditions compared to existing conditions minus pre-development conditions.

Hydraulic local impacts (relevant for Zone BL, Zone AID, Zone C) A flood work approval must not be granted or amended to authorise the construction or modification of a flood work if, in the minister's opinion, construction or modification of the flood work is likely to:		
Redistribution		
a) redistribute the peak flood flow by more than 5% on adjacent landholdings and other landholdings that may be affected by the proposed flood work when compared to the peak flood flow under pre-development and existing development conditions for a range of flood scenarios including, at a minimum, scenarios for the relevant small and large design floods, or	Yes	Flows are not predicted to increase by more than 5% at any flow reporting location either along each flood corridor or on adjacent landholdings. The distribution of flow across the floodplain is not significantly altered by the proposed Project rail spur for the two design events identified in the FMP or for the larger 1% AEP event.
Flood levels		
a) increase flood levels by more than 20 cm on adjacent landholdings and other landholdings that may be affected by the proposed flood work when compared to flood levels under predevelopment and existing development conditions for a range of flood scenarios including, at a minimum, scenarios for the relevant small and large design floods, or	Yes	Peak flood levels on adjacent landholdings or other landholdings would not change or would be within 0.05 m of existing conditions as a result of the rail spur for the relevant small and large design floods and for the 1% AEP design flood.
Flood flow velocities		
b) increase flow velocity by more than 50% on the landholding under application, adjacent landholdings and other landholdings that may be affected by the proposed flood work when compared to flow velocity under pre-development conditions for a range of flood scenarios including, at a minimum, scenarios for the relevant small and large design floods, unless: i. increases by more than 50% are in isolated areas where the landholder mitigates the impact on the flood wave so that the average impact across the landholding under application is no greater than 50%, and ii. flow velocity is not increased by more than 50% at the boundary of the landholding under application, or	Yes	The results show that peak velocities would generally be unchanged from existing conditions due to the proposed Project rail spur for all three design floods assessed. The isolated areas where the velocity increase would exceed this threshold are at areas of very low velocity under existing conditions.
Flood levels and impact on high-value infrastructure		
d) increase flood levels such that they impact high-value infrastructure when compared to flood levels under pre-development and existing development conditions for a range of flood scenarios including, at a minimum, scenarios for the relevant small and large design floods, or	Yes	No dwellings impacted by the Project rail spur for the 20% AEP and 5% AEP event events and one dwelling impacted for the 1% AEP event. Whitehaven has established an agreement with the owner of this impacted dwelling.
Flow velocities and soil erodibility		
e) increase flow velocity by an amount that is likely to have more than a minimal impact on soil erodibility on the landholding under application, adjacent landholdings and other landholdings that may be affected by the proposed flood work, taking into account the ground cover on those landholdings.	Yes	The results show that peak velocities would generally be unchanged from existing conditions due to the proposed Project rail spur for all three design floods assessed. The isolated areas where the velocity increase would exceed this threshold are at areas of very low velocity under existing conditions.

Contents

List of Figures

List of Tables

1 Introduction

The Vickery Extension Project (the Project) is located approximately 25 kilometres (km) north of Gunnedah in New South Wales (NSW) and involves the construction of an open-cut coal mine, associated on-site infrastructure, and rail spur. The Project rail spur connects to the Werris Creek Mungindi Railway across the Namoi River floodplain and is approximately 14 km long. The location of the Project rail spur and the regional drainage catchments to the rail are shown in Figure 1.1.

The Project Development Consent (SSD 7480) allows for the extraction of up to 10 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal, with a mine life of 25 years. The Project was approved in August 2020 by the NSW Independent Planning Commission (IPC) and in September 2021 by the Commonwealth Minister. The Project Development Consent (SSD 7480) conditions relating to the Project rail spur are as follows:

B48 - *The Applicant shall ensure that the design and construction of the project, including the Project Rail Spur and Kamilaroi Highway overpass, is consistent with the objectives of the Floodplain Management Plan for the Upper Namoi Valley Floodplain 2019 to the satisfaction of the Planning Secretary.*

B49 - *The Project Rail Spur, Project Rail Spur bridges and any upgrade to the haul road must be designed and constructed to minimise flooding and scour impacts, in consultation with BCD and consistent with the recommendations of the Department's flood peer review. The design and construction of the Project Rail Spur must provide for its complete elevation above the 1% Average Exceedance Probability flood level west of the Namoi River, generally in accordance with the EIS. Prior to construction of the Project Rail Spur or any upgrades to the haul road, the Proponent shall undertake a flood assessment of the detailed design to confirm there would be minimal impacts as predicted in the documents listed in condition A2(c).*

BG&E, on behalf of Whitehaven Coal Limited (Whitehaven), has designed the Project Rail Spur to comply with the development consent conditions. Figure 1.2 illustrates the general arrangement of the Project rail spur and the various nearby watercourses. The Project rail spur crosses the Namoi River floodplain including its associated floodways and tributaries. The design includes bridges over the Namoi River and Stratford Creek and a continuous set of culvert structures some 9.5 km long to the west of the Namoi River that have soffits above the 1% AEP flood with climate change allowance.

This flood assessment report has been prepared to demonstrate that the proposed 100% reference design satisfies the above consent conditions, which will be issued for tender. The hydrological and hydraulic models developed for the Project Environmental Impact Statement (EIS) have been updated to be consistent with the updated Australian Rainfall and Runoff (ARR) guidelines (Ball, et. al., 2019) as well as to consider the results of the Boggabri Flood Study (WRM, 2021) completed of the Namoi River and Coxs Creek in the vicinity of the Project.

This report supersedes the flood report prepared for the existing conditions (WRM, 2023a) and the flood impact assessment prepared for the 35% reference design (WRM, 2023b). The report also addresses any relevant comments raised by the Department's flood peer review (Askew, 2020; Askew, 2023).

This report is structured as follows:

- Section 2 outlines the regulatory framework related to developments on a floodplain and provides a description of the drainage characteristics and previous studies.
- Section 3 describes the methods adopted to estimate design discharges in the various watercourses in the vicinity of the Project. This section includes flood frequency analysis results, a description of hydrological model development and validation, as well as estimated design discharges for various design events.
- Section 4 describes the methodology and results of hydraulic modelling undertaken to estimate existing conditions design flood depths, extents, levels and velocities in the vicinity of the Project.

- Section 5 describes the proposed rail spur and presents the proposed conditions design flood depths, extents, levels and velocities in the vicinity of the Project.
- Section 6 describes the flood impacts of the project rail spur and compares the results to the FMP management rules.
- Section 7 summarises the results of this assessment.
- Section 8 provides a list of references.
- Appendix A provides flood depths, extents, levels and velocities for the flood model calibration events.
- Appendix B provides flood depths, extents, levels and velocities for the existing conditions design events.
- Appendix C provides flood depths, extents, levels and velocities for the proposed conditions design events.
- Appendix D provides the flood impact mapping.
- Appendix E provides the 100% reference design drawings for the rail spur.

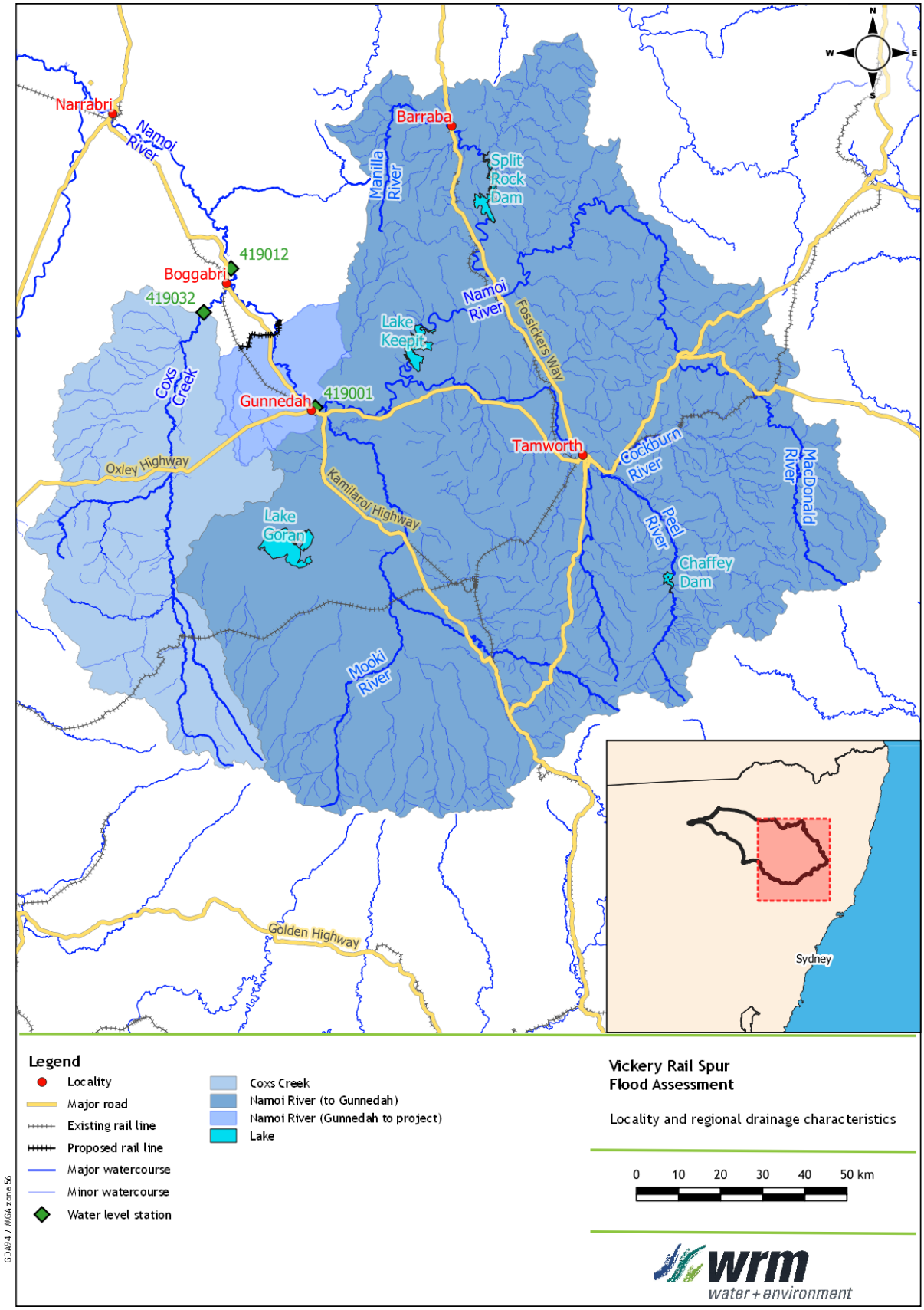


Figure 1.1 – Locality and regional drainage characteristics

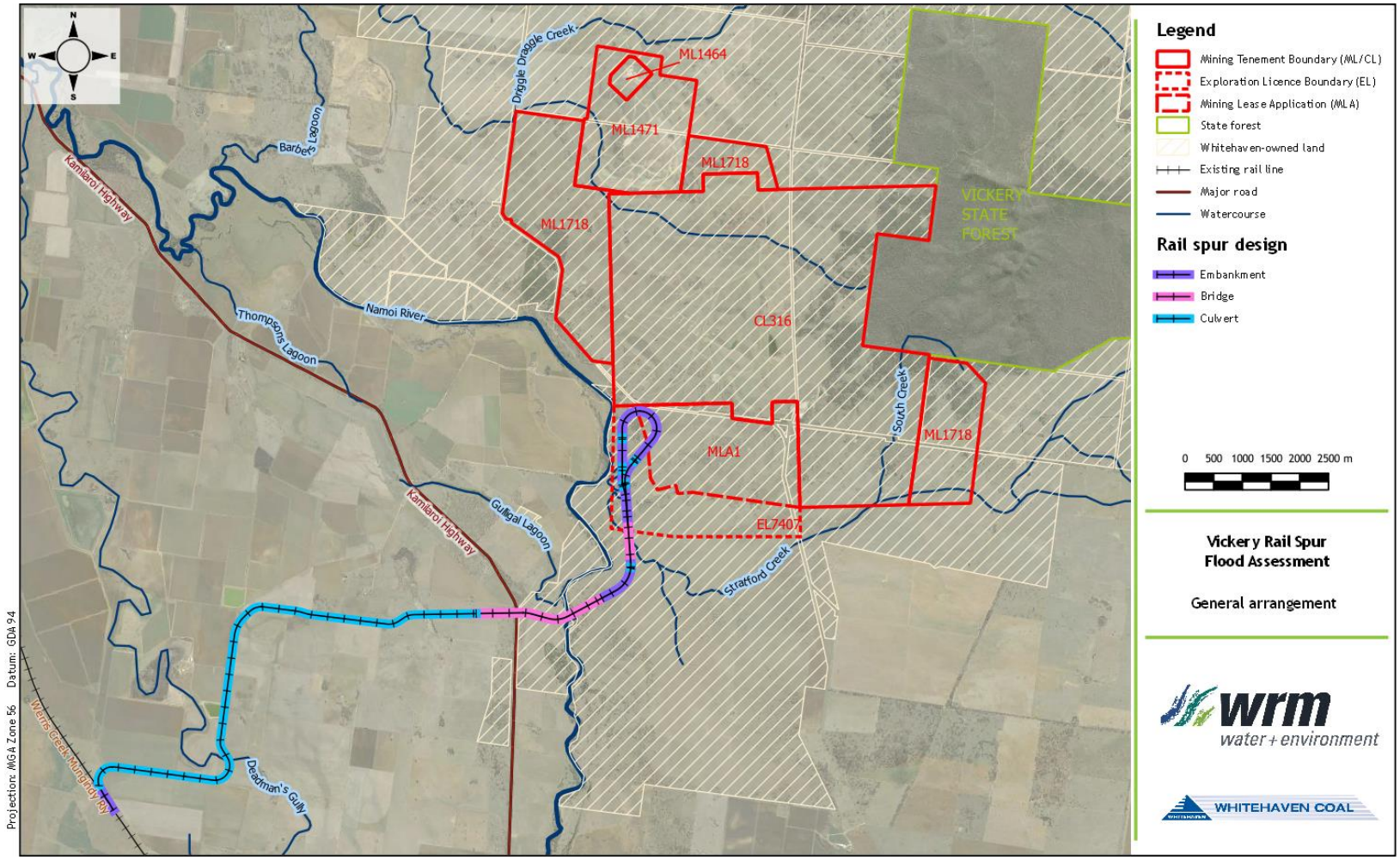


Figure 1.2 – General arrangement of the Project rail spur

2 Background

2.1 REGULATORY FRAMEWORK

2.1.1 NSW Government's Flood Prone Land Policy

The Floodplain Development Manual (NSW Government, 2005) (the Manual) has been prepared to support the NSW Government's Flood Prone Land Policy. The primary objective of the policy is to develop sustainable strategies for managing human occupation and use of the floodplain using risk management principles. The Manual provides a framework for implementing the policy to achieve the policies' primary objective. It also outlines processes for ensuring these needs are addressed through the development of Floodplain Management Plans (FMPs).

2.1.2 Floodplain Management Plan for the Upper Namoi Valley Floodplain

The NSW Department of Planning Industry and Environment (DPIE) has prepared rural FMPs using the Manual for floodplains that have been "declared" under the *Water Management (General) Regulation 2018*. These plans provide the framework for coordinating flood work development to minimise future changes to flooding behaviour, improving the environmental health of floodplains and increasing awareness of risk to life and property from the effects of flooding. A flood work means a work that is:

- situated in or in the vicinity of a river, estuary or lake, or within a floodplain and is
- of such a size or configuration that (regardless of the purpose for which it is constructed or used), it is likely to have an effect on the flow of water to or from a river, estuary or lake, or the distribution or flow of floodwater in times of flood.

Part of the Project area, including the Project rail spur, is located within the declared Upper Namoi River floodplain defined in the *Water Management (General) Regulation 2018*. The *Floodplain Management Plan for the Upper Namoi Valley Floodplain 2019* (FMP) was introduced under Section 50 of the *Water Management Act (2000)* to manage the existing and proposed future flood work on the floodplain. The objectives of this Plan are as follows—

(a) to facilitate the orderly passage of floodwaters through the Upper Namoi Valley Floodplain,
(b) to minimise the risk to life and property from the effects of flooding,
(c) to maintain flood connectivity to wetlands, other floodplain ecosystems, and areas of groundwater recharge,
(d) to contribute to the protection of the ecological assets and values of the Upper Namoi Valley Floodplain,
(e) to contribute to the protection of cultural, heritage and spiritual features of the Upper Namoi Valley Floodplain that are significant to Aboriginal people and other stakeholders.

To achieve these objectives, the FMP establishes management zones, rules and assessment criteria which provide clarity about where flood works may be constructed on the floodplain and to streamline the approval process for new and amended flood works. Descriptions of the management zones are given in Table 2.1. The locations of the zones in the vicinity of the Project are shown in Figure 2.1 which shows that the Project rail spur crosses the AD, AID, BL, C and D management zones. The AD (defined floodway) zones include the Namoi River and floodways that have been named in this report as Stratford Creek, the Ingleburn Floodway, Deadmans Gully and the Deadmans Meander Scar. The AID (ill-defined floodway) zones have been named in this report as the Loveridge and Carrigan floodways as well as Collygra Creek. The D management zone includes two disconnected meander scars adjacent to the Namoi River. Further discussion on the management zone areas impacted by the Project rail spur is given in Section 2.2.

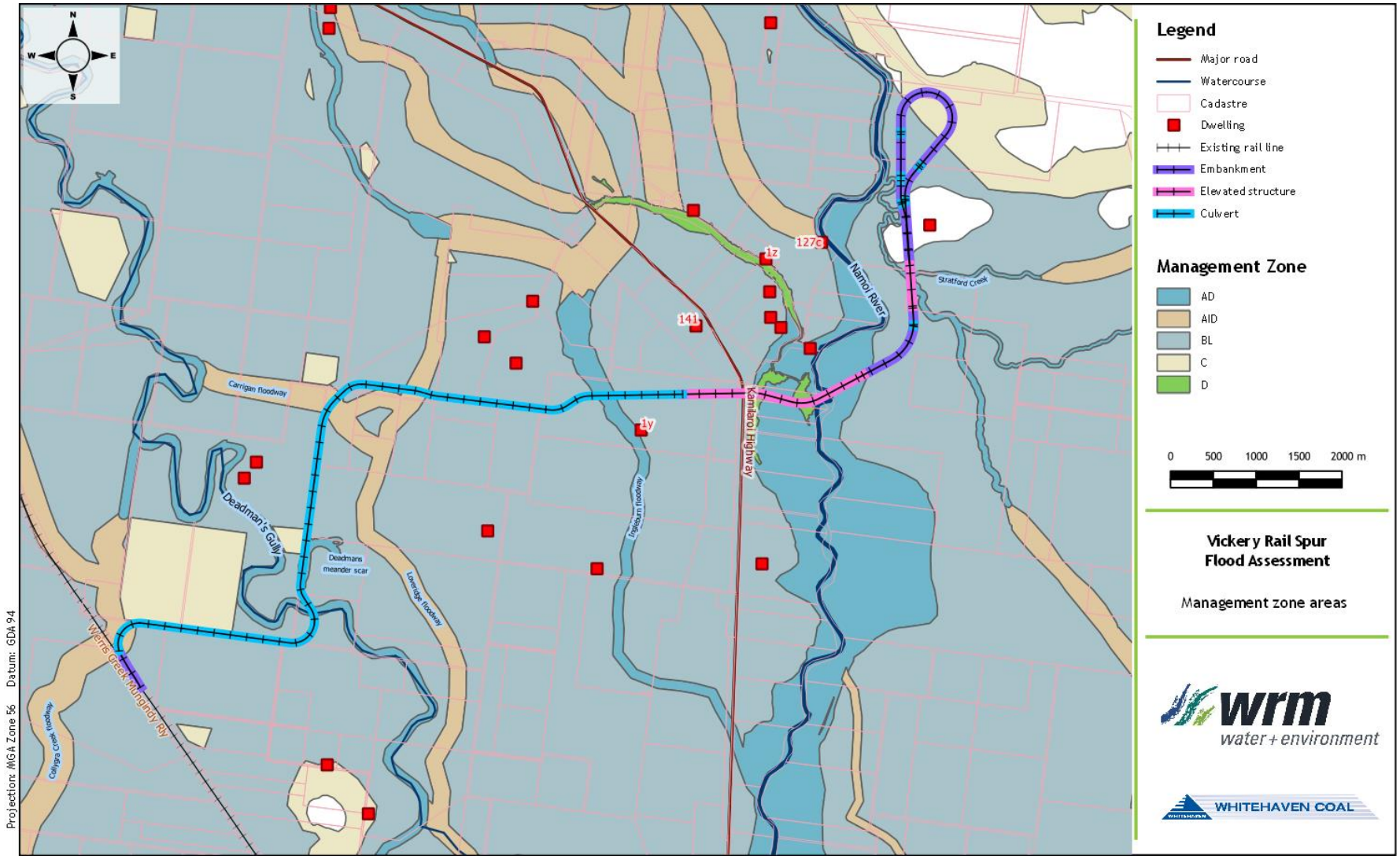


Figure 2.1 – FMP Management Zones

Table 2.1 - Upper Namoi River Management Zones, FMP

Management Zone	Description
AD (defined floodways)	Includes defined floodways with major drainage lines and other areas where a significant discharge of floodwater occurs during all flood events. These areas are generally characterised by relatively high flood flow velocity and depth.
AID (ill-defined floodways)	Includes ill-defined floodways that are major discharge areas without clear channels or banks.
(BU/BL (floodplain)	Includes areas of the Upper/Lower Liverpool Plains Floodplain that are important for the conveyance of floodwater during large flood events and for the temporary pondage of floodwaters during the passage of a flood. Its outer boundary is defined by a slope of less than or equal to 0.5%. Some areas may include existing approved flood works of limited height.
C (flood fringe)	Contains elevated areas and areas protected by existing flood work approvals of unlimited height.
CU (Urban)	Contains urban areas where there is either a flood study, flood risk management study, flood risk management plan.
D	Is a special protection zone for areas of ecological and/or cultural significance.

The assessment criteria in the FMP have been used as the basis for assessing the Project rail spur. These criteria and the management zones have been developed by assessing the flooding characteristics of a small flood represented by a 20% annual exceedance probability (AEP) design flood event or the 1992 historical flood and three large flood events represented by the 1971, 1984 and 1998 historical floods as well as the 5% AEP design flood event. For this assessment, the Project rail spur has been assessed against the 20% AEP (small flood) and the 5% AEP (large flood) as well as the 1% AEP design flood to satisfy the requirements of the previous approval.

The assessment criteria given in the FMP for each management zone have been adopted for the assessment of the Project rail spur (noting that the Project rail spur would not require a flood work approval under the *Water Management Act 2000* due to Section 4.41 of the *Environmental Planning and Assessment Act 1979*) including:

- flood levels should not increase by more than 20 centimetres on adjacent landholdings and other landholdings;
- increases in flood level and velocity should not impact on high value infrastructure (houses);
- peak flow velocity should not increase by more than 50% on adjacent landholdings and other landholdings, unless;
    - increases by more than 50% are in isolated areas where the landholder mitigates the impact of the flood wave so that the average impact across the landholding under application is no greater than 50%; and
    - flow velocity is not increased by more than 50% at the boundary of the landholding under application;
- increase flow velocity by an amount that is likely to have more than a minimal impact on soil erodibility on the landholding under application, adjacent landholdings and other landholdings that may be affected by the proposed flood work, taking into account the ground cover on those landholdings;
- peak flood flow should not be redistributed by more than 5% on adjacent landholdings and other landholdings;

- flood connectivity to ecological assets and facilitate fish passage should be maintained;
- flood connectivity to Aboriginal values and heritage sites should be maintained; and
- drainage time on adjacent land holdings within 12 hours of existing drainage times should be maintained.

The Project rail spur has been assessed against pre-development and existing conditions. Note that there is no flood works within the rail corridor or on Whitehaven owned land and as such, there is no difference between pre-development and existing conditions for this assessment.

2.2 DRAINAGE CHARACTERISTICS

2.2.1 Catchment overview

Figure 1.1 shows the regional drainage characteristics in the vicinity of the Project. The main drainage feature is the Namoi River, which drains in a northerly direction to the west of the Project mining area. The Namoi River catchment is bounded by the Great Dividing Range in the east, the Liverpool Ranges and Warrumbungle Ranges in the south, and the Nandewar Ranges and Mt. Kaputar to the north. Major tributaries of the Namoi River include the Mooki, Peel, Cockburn, Manilla, and Macdonald rivers, all of which join the Namoi upstream of Gunnedah. Cox's Creek, another significant tributary drains into the Namoi River downstream of the Project at Boggabri.

The catchment areas of the Namoi River to Gunnedah, the Project rail spur and Boggabri are as follows:

- Gunnedah - 17,641 square kilometres (km^2);
- Project rail spur – 18,358 km^2; and
- Boggabri gauge - 22,821 km^2 (includes Coxs Creek catchment area of 3,861 km^2 to confluence).

There are three major water supply dams in the catchment including Chaffey Dam on the Peel River, Split Rock Dam on the Manilla River, and Keepit Dam on the Namoi River. A description of the three dams is as follows:

- Keepit Dam, the largest water supply dam in the catchment, is located about 56 river kilometres upstream of Gunnedah. It was completed in 1960 (following a 20 year construction period) with a capacity of 425,000 megalitres (ML). The catchment area of Keepit Dam is 5,700 km^2, or about 33% of the catchment area of the Namoi River to Gunnedah.
- Chaffey Dam was completed in 1979 with a capacity of 69,000 ML. Its capacity was increased to 100,500 ML in 2016. The catchment area draining to Chaffey Dam is only 420 km^2 and therefore it does not have a significant impact on flooding at the Project site. The Peel River drains into the Namoi River downstream of Keepit Dam.
- Split Rock Dam was completed in 1987 and has a capacity of 397,390 ML. The catchment draining to Split Rock Dam is 1,650 km^2. The Manilla River drains into the Namoi River upstream of Keepit Dam.

2.2.2 Namoi River characteristics

The Namoi River adjacent to the Project is characterised by a 50 metre (m) to 70 m wide main channel that meanders along a relatively defined lower floodplain. The lower floodplain is about 500 m to 1,200 m wide and contains several remnant river channels, meander cut-offs, ridges and scroll bars, which convey the minor flood overflows from the river channel. The lower floodplain crosses the greater (upper) Namoi River floodplain from side to side. It is located on the eastern edge of the upper floodplain adjacent to the Project and on the western side adjacent to Boggabri and Gunnedah. The upper Namoi River floodplain varies in width from 6 km to 11 km in the vicinity of the Project and is generally used for intense cropping.

The Namoi River floodwater remains within the bounds of the lower floodplain upstream of the Project rail spur to Gunnedah for events up to about the 10% AEP flood. For larger events, floodwater overflows at several locations onto both the eastern and western floodplains.

For events between the 5% and 2% AEP, floodwater that overflows onto the eastern and western floodplains drains independently of the main river channel, with flood levels that are generally lower than the adjacent Namoi River flood levels. For larger events (e.g., the 1% AEP event), the floodwaters converge and flow as one water body across the entire floodplain.

2.2.3 Local drainage

Figure 2.2 shows the local drainage catchments in the vicinity of the Project rail spur. Stratford, Driggle Draggle and Bollol creeks drain into the Namoi River from the east. The lower reaches of these creeks form the eastern Namoi River upper floodplain but have extensive upper catchments that are not inundated by Namoi River flows. Stratford Creek, which drains to the Project rail spur, has been identified as Management Zone AD within the FMP.

The western upper floodplain of the Namoi River in the vicinity of the Project rail spur is broad and flat and contains a number of ancient channels of the Namoi River, including Deadmans Gully, Gulligal Lagoon (see Figure 2.1) and Thompsons Lagoon. Deadmans Gully is the most predominant channel although it has no significant channel capacity and is somewhat indistinguishable to other areas on the upper floodplain. It commences near the Namoi River channel about 6 km downstream of Gunnedah and drains into the Namoi River about 3 km upstream of Boggabri. Deadmans Gully has been identified as Management Zone AD within the FMP.

A small meander scar, which has been identified as Management Zone AD within the FMP, is located adjacent to Deadmans Gully at the location of the Project rail spur (Deadmans Gully Meander Scar). The meander scar is not an active flood channel and is not directly connected to Deadmans Gully.

The FMP has identified that a flood channel diverges from the Deadmans Gully floodway about 3 km upstream of the Project rail spur where it drains in a northerly direction along the eastern side of Deadmans Gully. This flood channel, which has been called the Loveridge Floodway in this report, has been identified as Management Zone AID within the FMP. The Loveridge floodway splits at the location of the Project rail spur where it drains westward back to Deadmans Gully (Carrigan Floodway) or continues northward towards Thompsons Lagoon.

Gulligal Lagoon is a more recent and active flood channel that has been specifically identified as an area of ecological and/or cultural significance within the Management Zone D of the FMP. It breaks out of the Namoi River immediately downstream of the Project rail spur and extends in a northwesterly direction along a well-defined channel before it loses all definition downstream of the Kamilaroi Highway. Gulligal lagoon ponds water for extended periods (DOI, 2019) with the ponded water level controlled by ground levels adjacent to the Namoi River. Available survey data suggests that the lagoon would overflow back to the Namoi River at an elevation of about 246 metres Australian Height Datum (mAHD).

The Management Zone D area associated with Gulligal Lagoon also extends to the south to include two meander scars on the lower floodplain of the Namoi River. Both meander scars are at elevations above the overflow level of Gulligal Lagoon and as such, do not form the ponded water zone of Gulligal Lagoon. The Project rail spur crosses these two meander scars.

Another flood channel breaks out of the Namoi River about 4 km upstream of the Project rail spur where it crosses the Kamilaroi Highway and drains northward to the downstream end of the Gulligal Lagoon. This floodway, which has been called the Ingleburn Floodway in this report (see Figure 2.1), is ill-defined along much of its length. The Ingleburn Floodway has been identified as Management Zone AD within the FMP where it crosses the Project rail spur but then splits to multiple drainage paths of Management Zone AID downstream of the Project rail spur.

The Ingleburn Floodway together with Gulligal Lagoon and the split flows from the Loveridge Floodway drain into Thompsons Lagoon before draining back into the Namoi River about 9 km downstream of the Project rail spur. These floodways have been identified as the Thompsons Lagoon catchment in Figure 2.2.

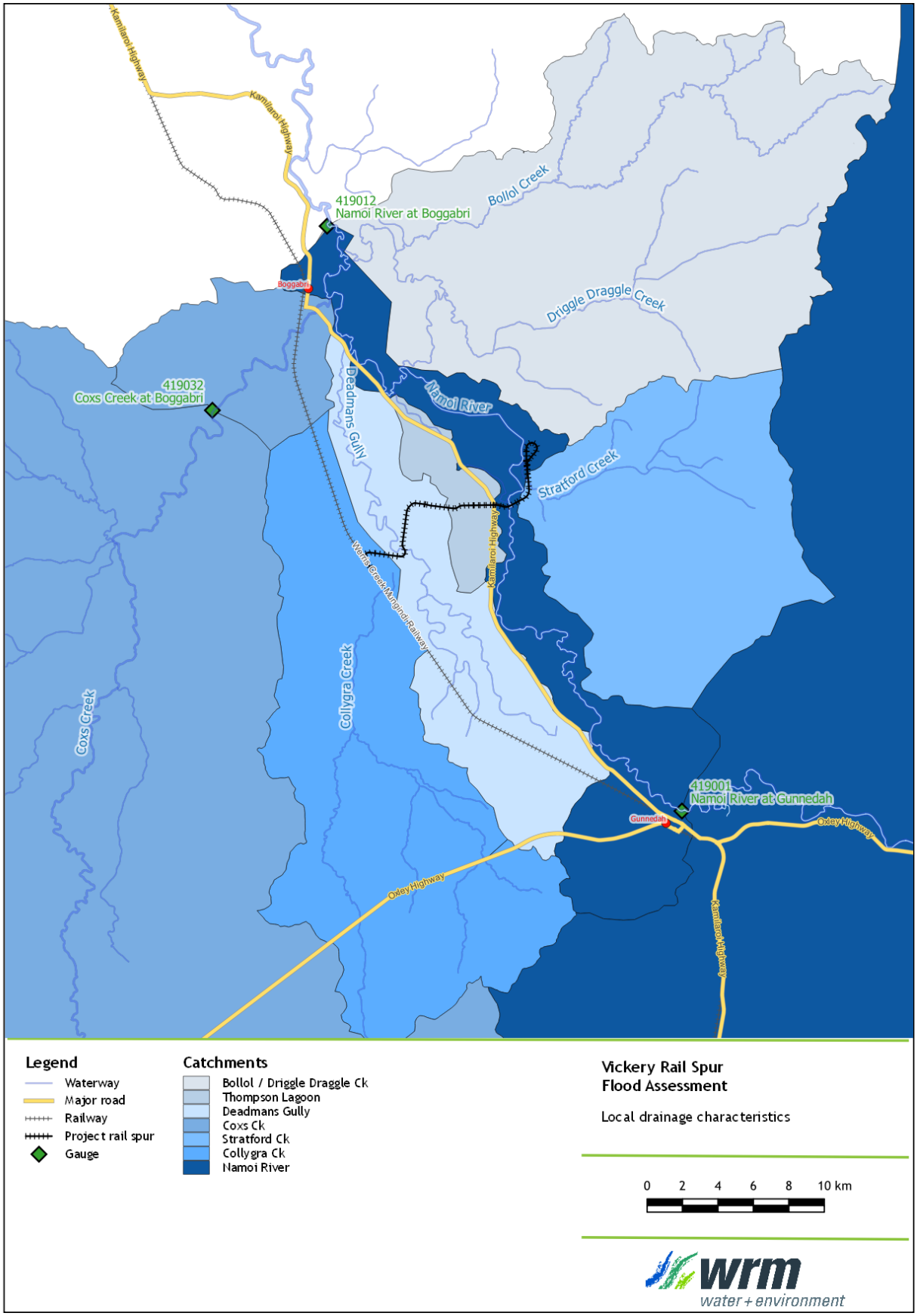


Figure 2.2 - Local drainage catchments

Collygra Creek drains into the western side of the floodplain where the Project rail spur joins with the Werris Creek Mungindi Rail. Collygra Creek drains as a broad ill-defined flow path upstream of the Werris Creek Mungindi Rail with runoff draining through the rail at multiple locations as well as in a northerly direction along the western side of the rail. Collygra Creek runoff that drains through the rail drains along the rail line (Collygra Creek floodway) or back to Deadmans Gully.

2.2.4 Existing flood works

The western floodplain of the Namoi River in the vicinity of the Project rail spur is extensively covered by existing flood works such as levees, ring tanks and supply channels. These flood works have a significant impact on flooding and drainage behaviour particularly along Collygra Creek and Deadmans Gully. The flood works surrounding the Management Zone C areas in Figure 2.1 generally provide a higher level of flood protection. The flood works across the Management Zone BL areas provide a lower level of protection for the irrigated areas or consist of supply channels.

2.3 PREVIOUS FLOOD STUDIES

A number of studies relating to flooding and drainage in and around the Project have been undertaken since the 1960's. A brief description of these studies is given below.

2.3.1 Carroll to Boggabri Flood Study and Compendium of data (SMEC, 2003)

The SMEC (2003) study was prepared to support the development of the Carroll to Boggabri FMP (DNR, 2006). Available data on recorded flood discharges and levels were reported and hydraulic modelling of the Namoi River floodplain was undertaken using the MIKE11 hydrodynamic modelling package. The model was calibrated to the 1955 and 1998 historical flood events and validated against 1984 and 2000 flood data. The estimated SMEC (2003) discharges for the 1955 event at Gunnedah has been used for model calibration in this study. Peak flood level data surveyed for the 1998 and 1955 flood were also used (see Section 4.3).

2.3.2 Background document to the Floodplain Management Plan for the Upper Namoi Valley Floodplain 2019 (NSW Dept of Industry, 2019)

This report was prepared to support the development of the Upper Namoi Valley FMP, which replaced the Carroll to Boggabri FMP. No additional data was provided in this report in relation to flooding at Boggabri. The hydraulic modelling of the Namoi River floodplain developed for the SMEC (2003) study was used for this study.

2.3.3 Vickery Extension Project Flood Assessment

WRM (2018) prepared a flood assessment for the Project. Flood models were prepared of the Namoi River, Stratford Creek, Driggle Draggle Creek, Bollol Creek, Merrygoen Creek, Deadmans Gully and Collygra Creek. The models were calibrated to the flood data available for the 1998 and 1955 flood events and then run for the 20%, 5% and 1% AEP and probable maximum flood design events.

The flood models were used to assess the impact of the infrastructure proposed as part of the approved Project. The Project rail spur was modelled as a viaduct structure for this assessment.

The flood models developed for the Project (WRM, 2018) were updated for this assessment.

2.3.4 Boggabri Flood Study

The Boggabri Flood Study (WRM, 2021) was prepared for Narrabri Shire Council to estimate design flood levels and flood hazards at the township of Boggabri and surrounding areas from Coxs Creek and the Namoi River. Available historical flood data from the previous investigations were collected and hydrological and hydraulic models were developed to define the nature and extent of the flood problems in the area. The study was prepared with financial assistance from the NSW Government's Floodplain Management Program.

The design discharges were derived from a calibrated XP-RAFTS model of the Coxs Creek and Namoi River catchment downstream of Gunnedah with Namoi River discharges upstream of Gunnedah derived from an annual series flood frequency analysis (FFA) for recorded data at

Gunnedah. Design discharges at Boggabri were verified against FFA design discharges of the recorded flows in the Coxs Creek and Namoi River gauges at Boggabri. The models were calibrated to the 1955, 1971, 1997, 1998 and 2000 historical flood events.

Design flood depths, levels and hazards were estimated from a TUFLOW two-dimensional hydraulic model developed of the Namoi River and Coxs Creek floodplain. The models were calibrated to the available recorded and anecdotal water level and discharge data for the five historical events.

The data from the Boggabri Flood Study has been used to update the flood models developed for the Project for use in this assessment.

3 Estimation of flood discharges

3.1 OVERVIEW

Namoi River design discharges were determined from an annual series FFA of the recorded flood peaks at Gunnedah. The historical flood peaks at Gunnedah were adjusted/verified during the hydraulic model calibration process (see Section 4.3) by matching predicted and recorded (surveyed) water levels and recorded discharge hydrographs at the downstream gauge at Boggabri.

Local catchment design discharges were determined using the XP-RAFTS rainfall runoff routing model using the ensemble methodology described in ARR (Ball et al, 2019). These discharges were validated against design discharges estimated using the Regional Flood Frequency Estimation (RFFE) model.

3.2 STREAMFLOW GAUGING STATION DATA

Stream water levels have been recorded in the study area at various locations by WaterNSW (and other government agencies) since 1891. Table 3.1 summarises the water level recording stations within the study area. The commencement date, highest gauged level and recorded peak level is also shown. The locations of the water level stations are shown in Figure 1.1.

Table 3.1 – Stream gauges within the study area

Station name	Station number	Commence-ment date	Highest gauged level (mAHD)	Date of highest gauging	Peak recorded level (mAHD)	Date of peak level
Namoi River						
Gunnedah	419001	Nov 1891[a] -	263.585	Jul 1998	263.867	Feb 1971[c]
Boggabri	419012	Nov 1911[b] -	239.524	Nov 2000	241.366	Feb 1955[c]
Coxs Creek						
Boggabri	419032	Jun 1965 -	248.039	Nov 2000	248.216	Nov 2000

[a] – Historical water level available for the 1864 event
[b] – Predicted peak discharge data only available post 1937, partially derived based on historic rating curves
[c] – SMEC (2003) reports higher peak flood levels occurred

The following is of note:

- The Namoi River at Gunnedah gauge (GS419001), located approximately 31.5 km along the Namoi River upstream of the Project, represents the flows from the Namoi River catchment upstream of Gunnedah (including from Rangira Creek).
- The Namoi River at Boggabri gauge (GS419012), located approximately 8 km downstream of Boggabri and 36 km along the Namoi River downstream of the Project, would represent the total discharge draining to Boggabri from both the Namoi River and Coxs Creek.
- The Coxs Creek at Boggabri gauge (GS419032), located approximately 13 km upstream of the Coxs Creek and Namoi River confluence, would represent the total Coxs Creek catchment flows.

Stream flows at each gauging station are derived from the recorded water level and a water level-discharge rating curve. The rating curve has been developed from historical stream flow measurements (gaugings). The rating curve at a station provides a reliable estimate of stream flow in the range of water levels that have stream flow gaugings. The reliability is lower in the range of water levels with no or few stream gaugings, which usually occur at higher water levels (as flood events are infrequent). Above the highest gauged level, the rating curve would be the least reliable as it relies on an extrapolation of the curve using limited ground level data and

analysis. Table 3.1 shows that the highest recorded peak water level is generally well above the highest gauged water level at all stations except for the Coxs Creek at Boggabri.

WaterNSW would create a new rating curve for a station when stream flow measurements indicate a change has occurred. These changes are mostly due to changes at low flows due to sedimentation/aggradation of the bed. However, high flow ratings are also altered when flood gaugings have been taken above or near the previous highest stream gauging. WaterNSW do not update the historical flood peaks in the dataset using the updated rating curves.

3.2.1 Namoi River at Gunnedah

Figure 3.1 shows the WaterNSW rating curve (Table 331) and historical stream flow measurements (gaugings) for the Namoi River at Gunnedah gauge. The six highest historical flood peaks at the gauge are also shown. A total of 938 gaugings have been undertaken over the period of record with the highest gauging undertaken in July 1998 at a gauge height of 8.7 mRL (263.585 mAHD) at 2,187 m^3/s. The rating curve has been extrapolated to determine the historical peak discharges above this level.

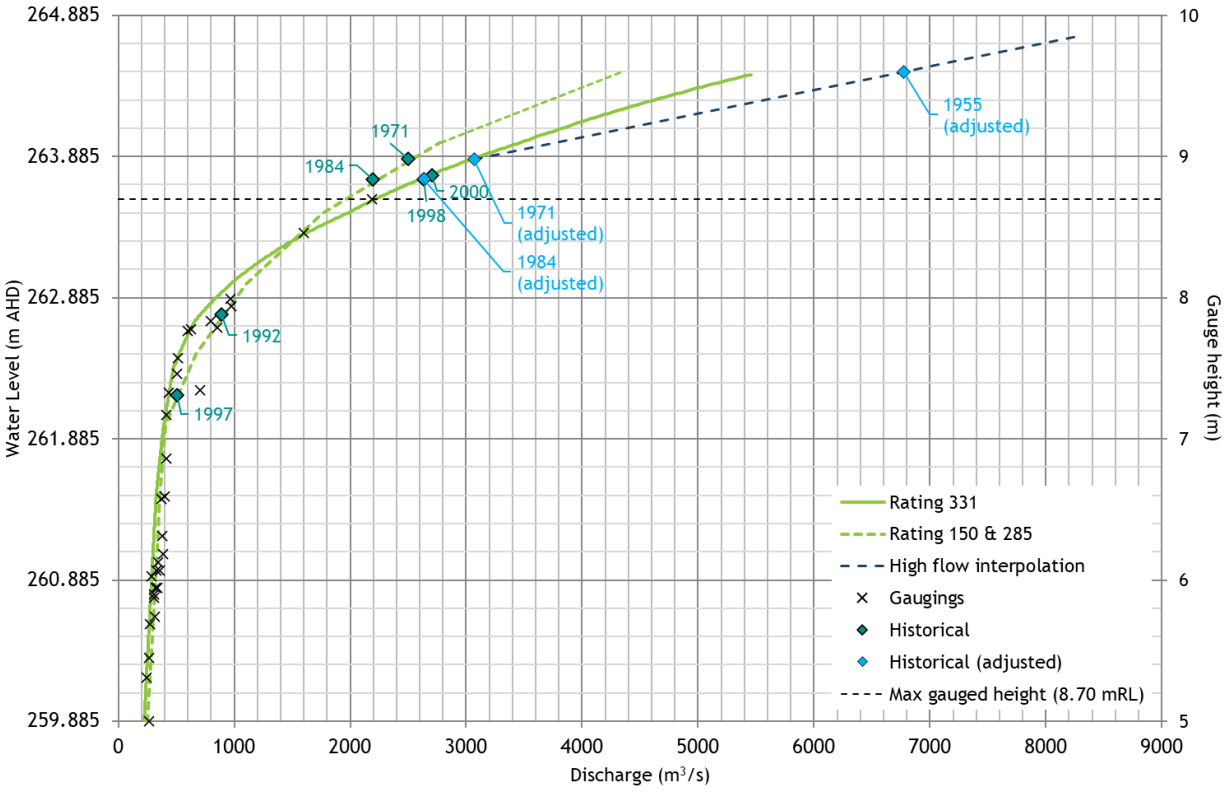


Figure 3.1 – Rating curve and gauging history for Namoi River at Gunnedah (GS419001)

The highest recorded water level (available on the WaterNSW website[1]) occurred in February 1971 at 8.982 mRL (263.867 mAHD). The review undertaken by SMEC (2003) found that flood peaks in 1864 (9.85 mRL), 1908 (9.65 mRL), 1910 (9.4 mRL) and 1955 (9.6 mRL) exceeded the 1971 flood peak.

The 1955 flood peak discharge was estimated to be 6,772 m^3/s (shown on Figure 3.1), which is higher than the peak discharge derived using the latest rating curve. It is also over twice the next highest recorded flood peak and over three times the highest stream gauging. As a result, there is a high level of uncertainty associated with this flood peak discharge estimate. An interpolated high flow curve that would be required to achieve the adopted peak discharge estimate of the 1955 event is shown in Figure 3.1.

[1] https://realtimedata.waternsw.com.au/water.stm

SMEC (2003) estimated the 1955 discharge to be over 9,000 m^3/s, which could not be justified during model calibration. Section 4.3.2 outlines how the discharge adopted for the 1955 event was derived and why the SMEC discharge estimate was not used.

Figure 3.1 also shows the rating curves used to derive the 1971 (Table 150) and 1984 (Table 285) flood discharges. Of note, the flood events in 1984, 1998 and 2000 had similar peak water levels but the peak discharges in the WaterNSW database are significantly different. The high flow rating was redefined as a result of the July 1998 high flow gaugings but the historical flood peak discharges were not adjusted in the WaterNSW database to account for the new data.

The high flow rating 285 was based on stream gaugings undertaken in the 1970's with flows above these gaugings based on an extrapolation of the curve. This extrapolation is an estimate only made difficult by the wide and two-dimensional nature of the flows. The gaugings shown in Figure 3.1 show that the channel at least is quite stable with only minor changes. A significant change to the floodplain geometry would be required to achieve the high flow rating 285, which has not occurred, and therefore an actual change in the high flow height discharge curve is unlikely to have occurred. For this study, the 1971, 1974, 1976 and 1984 historical peak discharges were adjusted using the latest high flow rating (Table 331). Note that the adjustment process increased the peak discharge estimates at Gunnedah for the larger events, which in turn lead to higher design discharge estimates in the FFA.

3.2.2 Namoi River at Boggabri

Figure 3.2 shows the latest WaterNSW rating curve (Table 139) and historical stream flow measurements (gaugings) for the Namoi River at the Boggabri stream gauge. The seven highest historical flood peaks at the gauge are also shown.

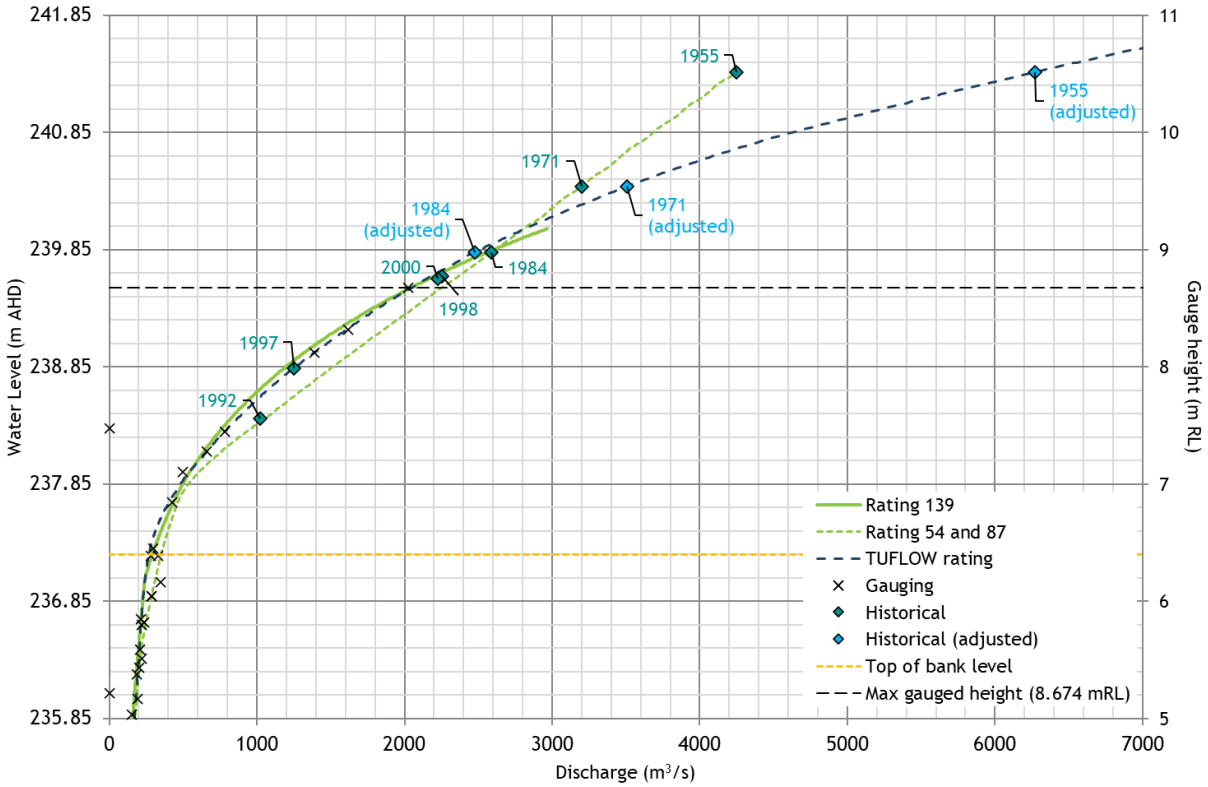


Figure 3.2 – Rating curve and gauging history for Namoi River at Boggabri (GS419012)

A total of 725 gaugings have been undertaken over the period of record with the highest gauging undertaken in November 2000 at a gauge height of 8.674m mRL (239.524 mAHD). Five of the historical flood peaks are higher than the highest stream gauging and are therefore within the extrapolated section of the rating curve. Further, the 1971 and 1955 flood peaks do not lie on

the extrapolated curve. The peak discharges for these events were derived using earlier curves (Table 54 and Table 85).

The rating curve derived using the TUFLOW hydraulic model at the gauge is also shown in Figure 3.2, indicating a very good match to the available gaugings, including to the highest gauging at 8.674 mRL. Further discussion on how this rating was derived is given in Section 4.3. The TUFLOW derived rating curve suggest that the 1971 and 1955 peak discharges were much higher than what was derived using the WaterNSW curves (Table 54 and Table 85), while the 1984 peak discharge was slightly overestimated. For the subsequent analysis, these historical discharges were adjusted using the TUFLOW derived rating curve.

Some gaps in the data meant the record was not complete. Large flood peaks prior to 1971 consisted of peak flows only, which were derived using the earlier (incorrect) rating curves. Peak water level data was not available. To overcome this problem, the historical peak water levels for the large floods were derived from their associated rating curves and the latest rating curve (or TUFLOW derived curve) was then applied to determine the adjusted historical discharge.

3.2.3 Coxs Creek at Boggabri

Figure 3.3 shows the latest WaterNSW rating curve (Table 129) and historical stream flow measurements (gaugings) for the Coxs Creek at Boggabri stream gauge. A total of 1,130 gaugings have been undertaken over the period of record with the highest gauging undertaken in November 2000 at a gauge height of 7.96 mRL (248.039 mAHD). The highest recorded water level occurred in the same month at 8.137 mRL (248.216 mAHD).

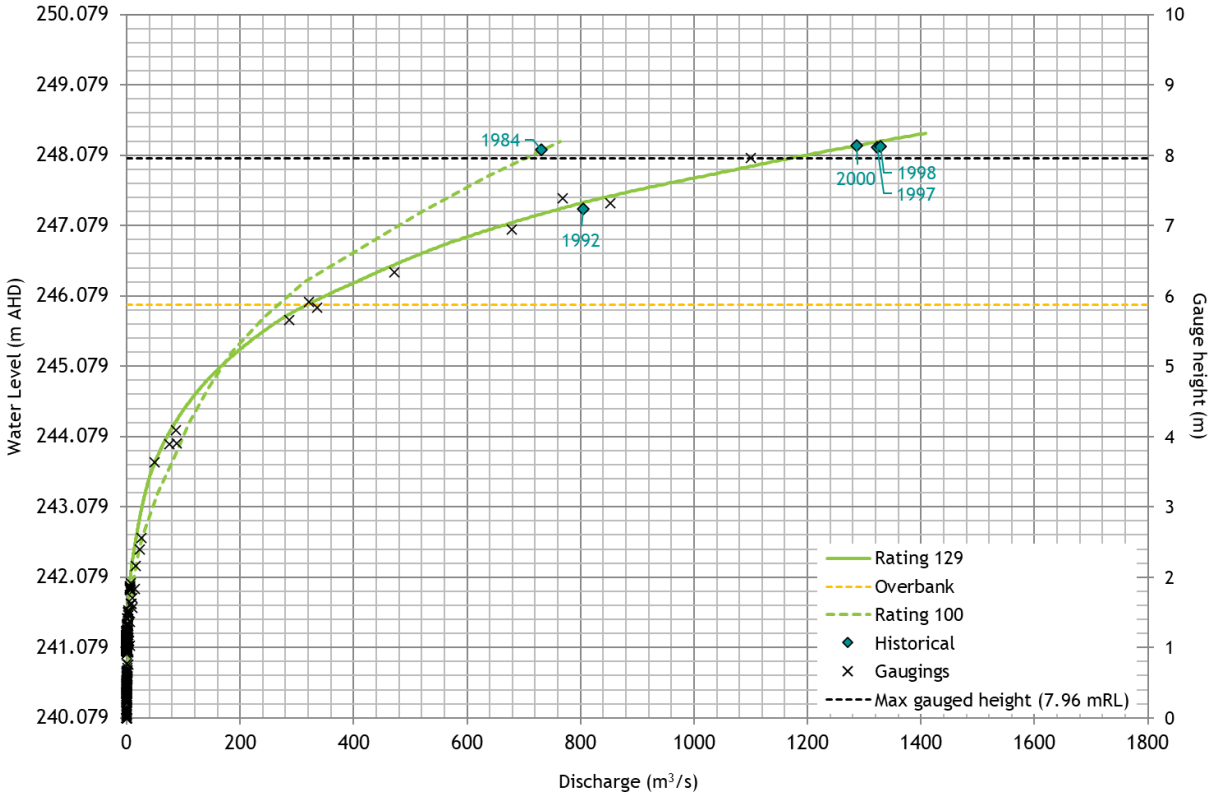


Figure 3.3 - Rating curve and gauging history for Coxs Creek at Boggabri (GS419032)

The five highest historical flood peaks are also shown in Figure 3.3. Three of these (1997, 1998 and 2000) recorded higher flood peaks than the highest stream gauging and therefore the predicted peak discharges are within the extrapolated section of the rating curve with a low level of reliability. It is of note that the 1984 peak discharge had a similar peak water level to the other three events but had a much lower reported peak discharge. The rating curve used to define the 1984 flood peak (Table 100) is shown in Figure 3.3. The high flow rating after this

time was adjusted following the July 1998 high flow gauging but the historical flood peak discharges in the WaterNSW dataset were not readjusted by WaterNSW. The 1984 peak discharge was adjusted using the latest rating as part of the Boggabri Flood Study (WRM, 2021) to estimate design discharges for the Coxs Creek catchment.

3.3 ANNUAL SERIES FLOOD FREQUENCY ANALYSIS

3.3.1 Methodology

A Log-Pearson Type III (LP III) distribution was fitted to the annual series of recorded (and adjusted) peak flood discharges at the two Namoi River gauges using the Bayesian approach recommended in ARR (Ball et al., 2019) using the FLIKE software. This methodology allows the user to consider historic data outside the gauged record, and censor low flows to improve the fit for the larger events. The FFA was based on a calendar year.

ARR recommends the use of prior information for any FFA involving the LP III distribution unless there is evidence that the regional prior is not applicable to the catchment of interest. The prior information has been developed as part of the RFFE, which calculates the mean, standard deviation and skew of the regional LP III model. The use of prior information in the FFA was found to produce a poor fit to the data and has therefore not been used for any of the gauges.

3.3.2 Namoi River at Gunnedah gauge

Table 3.2 shows the recorded and adjusted annual series data used for the FFA, together with the source of the data for the Namoi River at Gunnedah gauge. The following is of note regarding the available data:

- WaterNSW website data was used to define annual peaks from 1971 to present except for 1971, 1974, 1976 and 1984.
- The latest WaterNSW rating curve (Table 331) and the recorded peak water levels were used to adjust the peak discharges for the 1971, 1974, 1976 and 1984 events. Figure 3.1 shows that the high flow rating adopted by WaterNSW for these historical events has been superseded following more recent flood gaugings.
- Peak discharge data for 1969 and 1970 were obtained from the Pinneena database.
- Between 1891 and 1968, peak water level data supplied by WaterNSW were converted to a peak discharge using the latest WaterNSW rating curve (Table 331).
- For years between 1891 and 1968 where no instantaneous flood peaks were recorded, the peak daily discharge volume for that year, obtained from the Pinneena database, was converted to an instantaneous peak using the relationship shown in Figure 3.4. This relationship was determined by plotting the daily peak volume against the instantaneous peak discharge for years where data was available (1969 to 2020). A good fit (R^2=0.9955) was achieved for the correlation. The years where instantaneous flood peaks were not available were generally non-flood years.
- For the 1908 and 1910 events, the high flow interpolation curve in Figure 3.1 that matched the adjusted 1955 peak discharge estimate was used to estimate the peak discharge from the peak water level estimate in SMEC (2003).
- WaterNSW provided an additional peak flood level of 9.85 m for the 1864 event. SMEC (2003) note that there is no confirmation of the source of this height given that it was some 30 years prior to the gauge having been installed. With a recorded water level exceeding that of the 1955 and 1908 events, the 1864 event was included in the analysis as a historical event outside the period of record, exceeding the highest recorded value. Values between 1864 and 1893 were included as censored values.
- No peak flood level information is available between 1865 and 1890. These years were included as censored values, that is, flood peaks were assumed below the threshold defined for the 1864 flood event.
- One low flow value below 6 m^3/s was censored from the dataset using the Grubbs Beck test.

Table 3.2 – Combined data set for peak annual discharges at Namoi River at Gunnedah

Year	Peak Discharge (m^3/s)	Year	Peak Discharge (m^3/s)	Year	Peak Discharge (m^3/s)	Year	Peak Discharge (m^3/s)
1864	>9758 [s]	1923	300 [w]	1956	2639 [w]	1989	748 [p]
1891	179 [c]	1924	410 [w]	1957	38 [w]	1990	706 [p]
1892	664 [c]	1925	97 [w]	1958	442 [w]	1991	656 [p]
1893	449 [w]	1926	100 [w]	1959	137 [w]	1992	890 [p]
1894	376 [w]	1927	174 [w]	1960	460 [w]	1993	117 [p]
1895	226 [w]	1928	469 [w]	1961	196 [c]	1994	22 [p]
1896	155 [w]	1929	258 [w]	1962	1024 [w]	1995	73 [p]
1897	338 [w]	1930	410 [w]	1963	397 [w]	1996	639 [p]
1898	355 [w]	1931	1037 [c]	1964	2234 [w]	1997	503 [p]
1899	201 [w]	1932	159 [w]	1965	52 [c]	1998	2633 [p]
1900	3000 [w]	1933	536 [w]	1966	144 [c]	1999	184 [p]
1901	364 [c]	1934	680 [w]	1967	58 [c]	2000	2709 [p]
1902	120 [c]	1935	442 [w]	1968	594 [w]	2001	91 [p]
1903	542 [c]	1936	422 [w]	1969	217 [p]	2002	118 [p]
1904	369 [c]	1937	190 [w]	1970	386 [p]	2003	38 [p]
1905	94 [c]	1938	261 [w]	1971	3069 [a]	2004	405 [p]
1906	38 [c]	1939	224 [w]	1972	79 [p]	2005	110 [p]
1907	753 [c]	1940	348 [w]	1973	137 [p]	2006	46 [p]
1908	7071 [s,a]	1941	963 [c]	1974	1861 [a]	2007	169 [p]
1909	485 [c]	1942	842 [w]	1975	243 [p]	2008	836 [p]
1910	5577 [s,a]	1943	387 [w]	1976	2459 [a]	2009	23 [p]
1911	400 [c]	1944	433 [w]	1977	997 [p]	2010	705 [p]
1912	65 [w]	1945	354 [w]	1978	643 [p]	2011	874 [p]
1913	449 [w]	1946	114 [w]	1979	153 [p]	2012	987 [p]
1914	51 [w]	1947	345 [w]	1980	41 [p]	2013	309 [p]
1915	368 [w]	1948	418 [w]	1981	139 [p]	2014	55 [p]
1916	528 [w]	1949	558 [w]	1982	79 [p]	2015	32 [p]
1917	571 [w]	1950	1863 [w]	1983	233 [p]	2016	436 [p]
1918	376 [w]	1951	380 [c]	1984	2636 [a]	2017	46 [p]
1919	68 [w]	1952	680 [w]	1985	350 [p]	2018	48 [p]
1920	842 [w]	1953	107 [w]	1986	338 [p]	2019	6 [p]
1921	1299 [s]	1954	477 [w]	1987	83 [p]	2020	159 [p]
1922	126 [w]	1955	6772 [a]	1988	119 [p]	2021	2038 [w]

S – SMEC, 2003, k – Kinhill, 1991, W – WaterNSW, p – Pinneena, c – correlated, a – adjusted value.

Figure 3.5 shows the annual series FFA of recorded flows at the Namoi River at Gunnedah gauge (GS419001). The FFA has been undertaken for the full range of years from 1891 to 2021 assuming that the upstream dams do not impact on design discharge estimates. The upstream dams would impact on the annual series after 1960, when Keepit Dam was constructed as it captures about one third of the catchment. The last of these dams, Split Rock, was only completed in 1987. The FFA of the historical peaks post 1960, which considers the impact of Keepit Dam only, would reduce the peak 1% AEP discharge estimate to 5,590 m^3/s, a 17% reduction.

Further to this, the inclusion of 1864 flood peak within the FFA increased the 1% AEP design discharge by some 16%. The inclusion of the censored low flow had no impact on the estimate. Overall, the use of the full series of historical peaks (pre-dam, adjusted and anecdotal) would produce a conservative estimate of design discharges at the Project rail spur.

Note that the plotting positions for the very frequent events sit beyond the confidence limits of the FFA estimates. The reasons have not been fully assessed in this study, however, it is likely due to the flat floodplain upstream of the gauge attenuating the flood peaks for events that just exceed the channel capacity. The impact of regulation of flows from Keepit Dam to supply downstream demands may also have an impact.

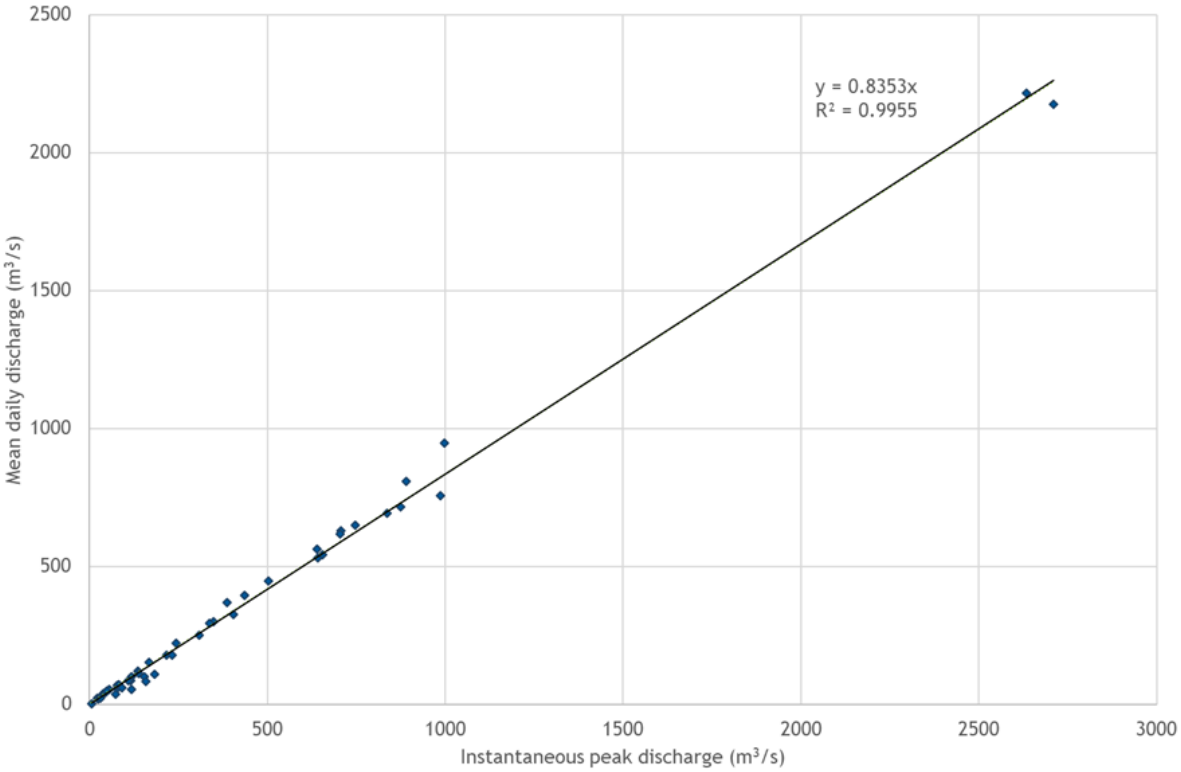


Figure 3.4 – Namoi River at Gunnedah relationship between instantaneous flood peak discharge and mean daily discharge, 1969 to 2020

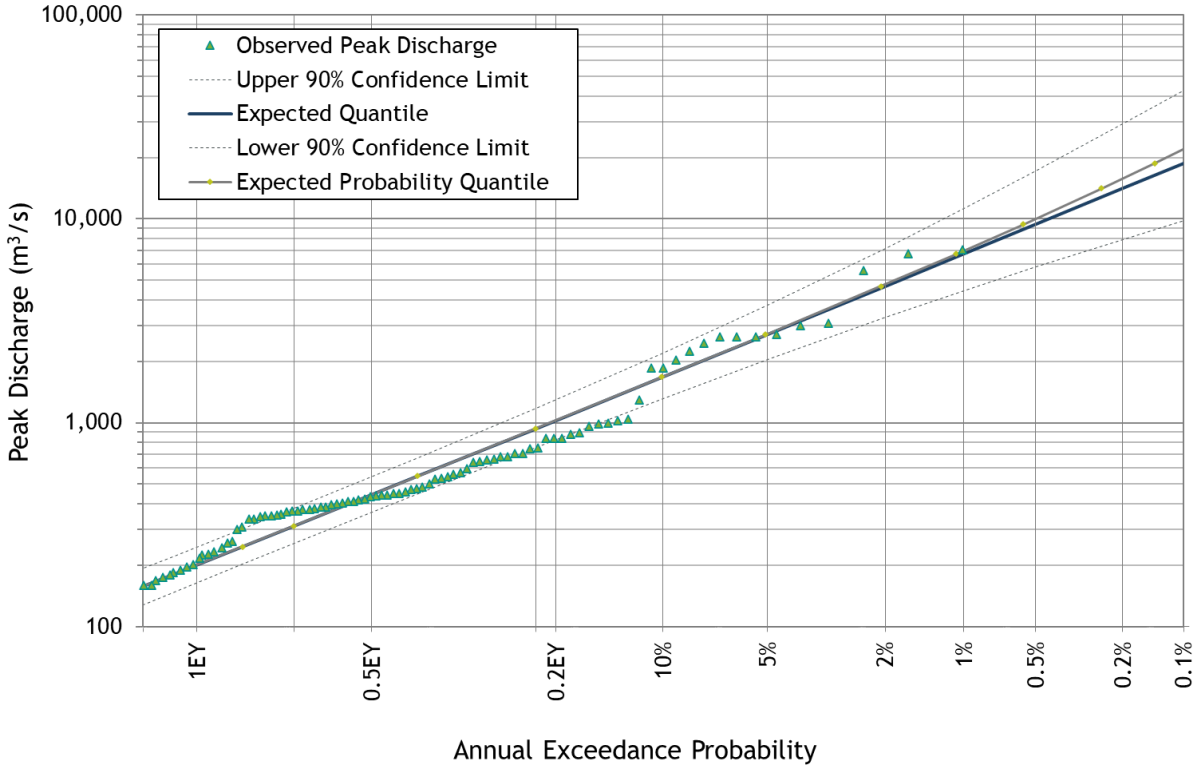


Figure 3.5 – Namoi River at Gunnedah annual series flood frequency curve, 1891 to 2021 plus 1864

Table 3.3 shows the expected range of design discharges from the FFA. Note that the Namoi River discharge peak adopted during the Project EIS (WRM, 2018) is generally unchanged for the 5% AEP peak. However, the 1% AEP discharge has reduced from 9,141 m^3/s. For the 2018 EIS study, the FFA analysis was based on the post Keepit Dam 48 year period and was calculated using the method of moments, which has now been superseded by the Bayesian approach.

Table 3.3 – FFA design discharge estimates, Namoi River at Gunnedah

AEP	FFA discharge (m^3/s)		
	Expected parameter quantile	Lower 90% confidence limit	Upper 90% confidence limit
20%	938	758	1,172
10%	1,674	1,315	2,189
5%	2,709	2,040	3,763
2%	4,667	3,280	7,175
1%	6,717	4,436	11,234
0.5%	9,382	5,797	17,197
0.2%	14,086	7,920	29,159

3.3.3 Namoi River at Boggabri gauge

Table 3.4 shows the recorded and inferred annual series data used for the FFA, together with the source of the data.

Table 3.4 – Combined data set for peak annual discharges at Namoi River at Boggabri

Year	Peak Discharge (m^3/s)	Year	Peak Discharge (m^3/s)	Year	Peak Discharge (m^3/s)	Year	Peak Discharge (m^3/s)
1910	>6270 s,a	1956	2824 K	1978	604 K	2000	2227 p
1913	241 K	1957	37 K	1979	102 p	2001	71 p
1914	34 K	1958	362 K	1980	40 p	2002	64 p
1937	139 K	1959	126 K	1981	209 p	2003	53 p
1938	201 K	1960	358 K	1982	54 p	2004	349 p
1939	176 K	1961	192 K	1983	257 p	2005	361 p
1940	216 K	1962	1377 K	1984	2479 p,a	2006	42 p
1941	793 K	1963	436 K	1985	327 p	2007	144 p
1942	1192 K	1964	2014 K	1986	285 p	2008	568 p
1943	77 K	1965	85 K	1987	141 p	2009	54 p
1944	351 K	1966	140 K	1988	202 p	2010	918 p
1945	106 K	1967	92 K	1989	940 p	2011	989 p
1946	106 K	1968	541 K	1990	721 p	2012	1145 p
1947	550 K	1969	292 K	1991	636 p	2013	278 p
1948	516 K	1970	325 K	1992	1021 p	2014	49 p
1949	654 K	1971	3505 p,a	1993	338 p	2015	23 p
1950	1863 K	1972	83 K	1994	20 p	2016	436 p
1951	300 K	1973	141 K	1995	158 p	2017	40 p
1952	1091 K	1974	2234 K	1996	430 p	2018	41 p
1953	105 K	1975	205 K	1997	1253 p	2019	47 p
1954	479 K	1976	2616 K	1998	2256 p	2020	190 p
1955	6270 p,a	1977	1366 K	1999	338 p	2021	1746 w

S – SMEC, 2003, k – Kinhill, 1991, W – WaterNSW, p – Pinneena, a – adjusted value.

The following is of note regarding the available data:

- WaterNSW website data was used to define annual peaks from 1979.
- Peak water levels for the 1955 and 1971 events were obtained from the Pinneena database and translated to discharges using the TUFLOW derived rating curve shown in Figure 3.2.
- Peak annual discharges were obtained from Kinhill (1991) for the period from 1937 to 1978 (excluding 1955 and 1971) as well as the years 1913 and 1914. The recorded water levels over this period could not be obtained from WaterNSW. This data was used without modification. No data is available to verify the Kinhill data, and as such it was adopted without change. A comparison of the Kinhill discharges to the revised discharges using the TUFLOW derived rating suggests the differences were not significant enough to warrant changing.
- SMEC (2003) provided an additional peak flood level of 10.66 m for the 1910 event. No information is given on how this data was sourced. However, it is consistent with the recorded data at Gunnedah (419001) and Narrabri (419002 & 419003). The 1910 event was assumed to be the largest event prior to 1937.
- Due to the uncertainty regarding the 1910 value, it was included in the FFA as a historical event outside the period of record, exceeding the highest recorded value. Values between 1910 and 1936 were included as censored values below the 1955 flood peak.
- Values between 1891 and 1910 were also included as censored values based on the information available at the Gunnedah gauge.
- Nine low flows below 49 m^3/s were censored from the dataset using the Grubbs Beck test.

Figure 3.6 shows the annual series FFA of the recorded flows at the Namoi River at Boggabri gauge (GS419012). The expected range of design discharges from the FFA is given in Table 3.5.

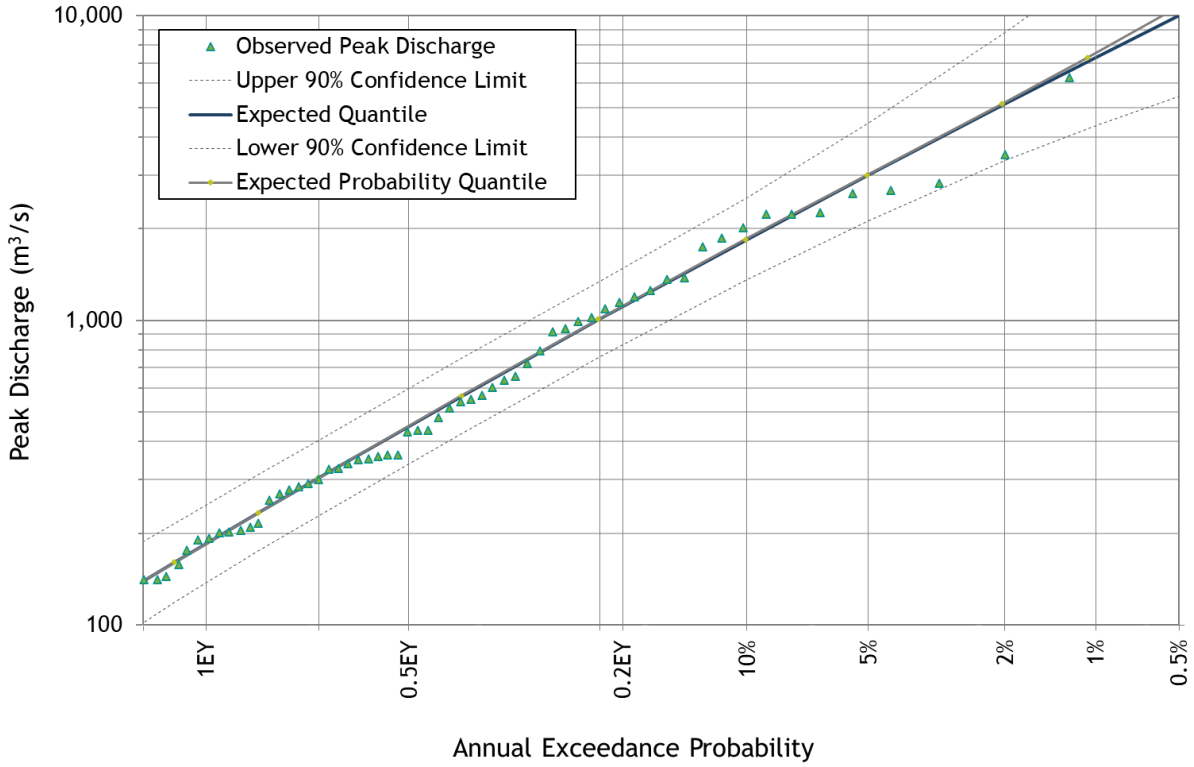


Figure 3.6 – Namoi River at Boggabri annual series flood frequency curve, 1937 to 2021 plus 1910

Table 3.5 – FFA design discharge estimates, Namoi River at Boggabri

AEP	FFA discharge (m^3/s)		
	Expected parameter quantile	Lower 90% confidence limit	Upper 90% confidence limit
20%	1,007	758	1,343
10%	1,844	1,361	2,526
5%	3,003	2,126	4,433
2%	5,138	3,343	8,821
1%	7,297	4,370	14,311
0.5%	10,009	5,440	23,043
0.2%	14,589	6,900	41,381

The inclusion of 1910 flood peak within the FFA increased the 1% AEP design discharge by some 15%. The inclusion of the censored low flows slightly increased the 1% AEP peak discharge estimate but it produced a poor fit to the plotted historical flood peaks. Overall, the use of the full series of historical peaks (pre-dam, adjusted and anecdotal) would produce a conservative estimate of design discharges at Boggabri.

Note that the Boggabri design discharges, which include Coxs Creek flows, are not relevant for the estimation of design discharges at the Project rail spur. They have been provided to ensure downstream tailwater impacts have been fully considered in the estimation of flood levels at the rail.

3.3.4 Coxs Creek at Boggabri gauge

Design discharges for the Coxs Creek were obtained from the Boggabri Flood Study (WRM, 2021).

The FFA at the Coxs Creek at Boggabri gauge was not reproduced in this report from the Boggabri Flood Study (WRM, 2021) as the design flood levels at the Project rail spur are driven by the Namoi River flows. Please refer to Section 6.3.4 of the Boggabri Flood Study (WRM, 2021) for the FFA at the Coxs Creek at Boggabri gauge, which was not changed.

Coxs Creek has no impact on design flood levels at the rail because it is located some 20 km downstream.

3.4 NAMOI RIVER TRIBUTARIES DESIGN DISCHARGES

3.4.1 Overview

The XP-RAFTS hydrological model (Innovyze (2019), Version 2018.1.3) was used to estimate the 20%, 5%, and 1% AEP design discharges in the residual catchment between the Gunnedah and Boggabri stream gauges (excluding Coxs Creek). This includes the Collygra Creek, Deadmans Gully and Stratford Creek catchments draining to the Project rail spur as well as the downstream catchments of Driggle Draggle and Bollol Creek catchments downstream of the Project rail spur.

The XP-RAFTS model uses a network of nodes to represent subcatchments and links to represent the drainage systems between subcatchments. Subcatchments are defined at each node based on total area, impervious area, average catchment slope and roughness.

The XP-RAFTS model uses initial and continuing losses to estimate the volume of runoff for a particular rainfall event. The net rainfall (after appropriate losses are deducted) is then routed through the drainage network and the result is a surface runoff hydrograph at the catchment outlet and nominated nodes.

Design discharges were determined using the ensemble methodology defined in ARR (Ball et al., 2019). An ensemble of 10 temporal patterns is modelled for each storm duration to derive a

range of estimated peak discharges for each AEP of interest. The storm temporal pattern that produced the peak discharge just above the ensemble mean peak for the critical duration was used for design event modelling.

3.4.2 XP-RAFTS model spatial configuration

Figure 3.7 shows the XP-RAFTS model subcatchment configuration delineated into local creek catchments. The hydrologic model comprises a total of 75 subcatchments ranging in size from 1.56 km^2 to 39.9 km^2, with 51 subcatchments upstream of the Project rail spur.

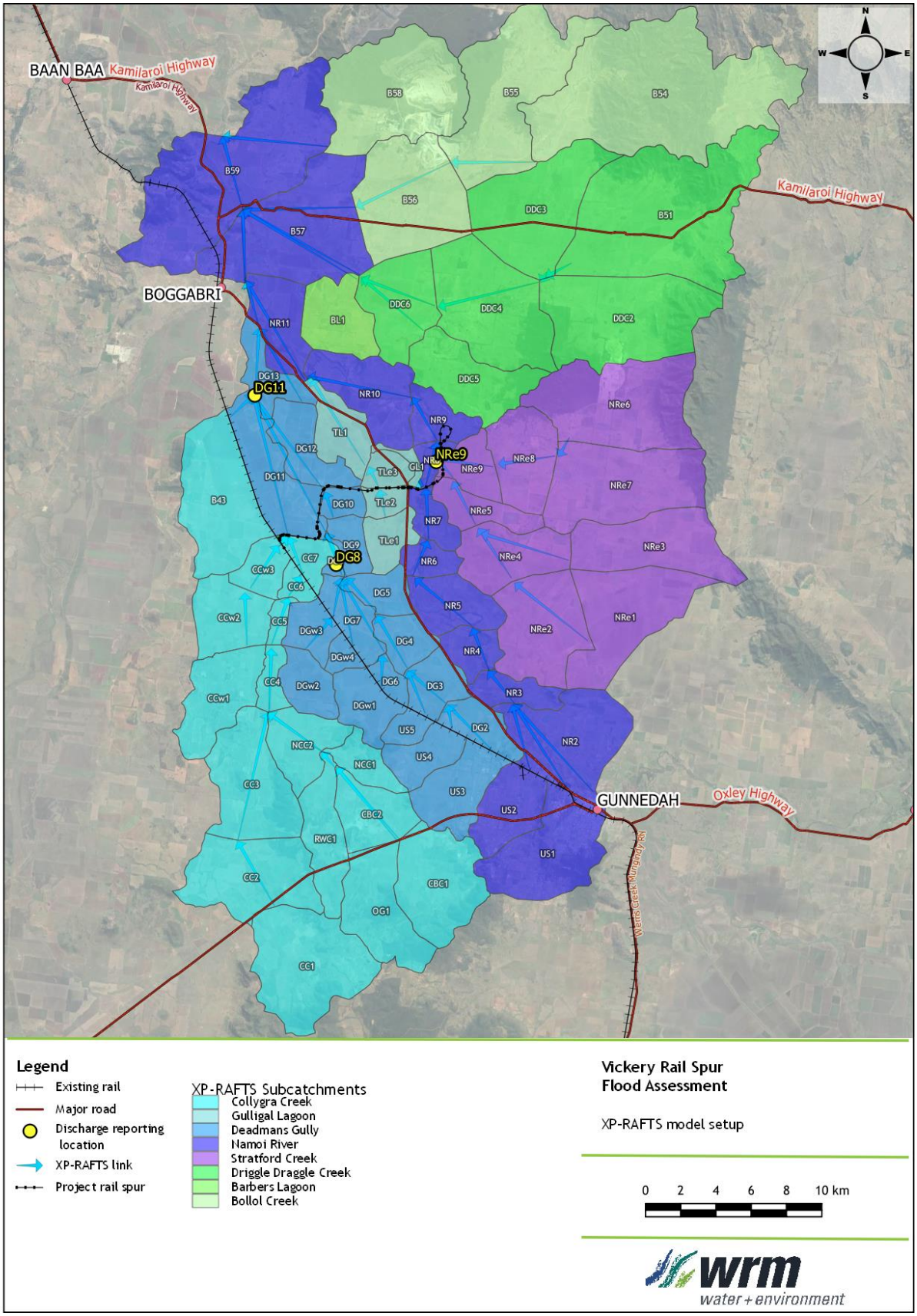


Figure 3.7 - XP-RAFTS model configuration for Namoi River tributaries

3.4.3 XP-RAFTS model parameters

Table 3.6 shows the adopted XP-RAFTS subcatchment areas and catchment slopes.

Table 3.6 – XP-RAFTs model subcatchment parameters

XP-RAFTS subcatchment	Area (km^2)	Catchment slope (%)	XP-RAFTS subcatchment	Area (km^2)	Catchment slope (%)
Collygra Creek			Deadmans Gully		
B43	31.78	0.03	DG2	8.81	0.10
CC1	35.56	0.20	DG3	9.52	0.80
CC2	28.96	0.20	DG4	8.18	0.04
CC3	27.73	0.05	DG5	7.59	0.04
CC4	4.86	0.05	DG6	3.57	0.07
CC5	2.67	0.05	DG7	9.03	0.07
CC6	3.00	0.05	DG8	1.56	0.04
CC7	5.85	0.05	DG9	5.42	0.03
CCw1	19.41	0.20	DG10	4.05	0.04
CCw2	16.02	0.20	DG11	21.48	0.03
CCw3	7.54	0.05	DG12	12.87	0.10
CBC1	26.18	0.20	DG13	9.44	0.10
CBC2	14.37	0.20	DGw1	10.85	1.20
NCC1	7.38	0.10	DGw2	9.47	0.28
NCC2	14.08	0.10	DGw3	7.67	0.28
OG1	22.29	0.10	DGw4	3.05	0.28
RWC1	15.68	0.10	US3	16.37	1.20
Stratford Creek			US4	9.85	1.20
NRe1	31.45	0.60	US5	4.04	1.20
NRe2	26.95	0.25	Driggle Draggle Creek		
NRe3	27.26	0.60	DDC2	42.52	0.10
NRe4	18.58	0.10	DDC3	36.23	0.10
NRe5	9.64	0.10	DDC4	37.18	0.10
NRe6	39.93	2.60	DDC5	21.86	0.58
NRe7	35.80	1.20	DDC6	20.70	0.11
NRe8	18.62	0.35	B51	69.12	0.10
NRe9	8.96	0.10	Barbers/Gulligal/Thompson Lagoon		
Bollol Creek			BL1	15.43	0.12
B54	84.56	1.01	GL1	1.72	0.10
B55	46.39	0.62	TL1	11.80	0.11
B56	35.96	0.51	TLe1	7.82	0.10
B58	44.41	0.61	TLe2	3.94	0.14
			TLe3	5.01	0.10

Subcatchments and catchment slopes were determined using the 5 m digital elevation model (DEM) obtained from the NSW Spatial Services (and downloaded from the ELVIS[2] website). Where no other data was available, this data was amended with SRTM topographic data. All subcatchments were assigned a fraction impervious of 0%. A PERN 'N' roughness coefficient of 0.025 was adopted for all subcatchments. Channel routing was modelled using the Muskingum method with a storage coefficient 'X' of 0.25. The subcatchment and routing link parameters were adopted from the hydrological model developed for the Boggabri Flood Study (WRM, 2021), which was calibrated to the Coxs Creek gauge, and then adjusted to suit the catchment draining to the rail.

3.4.4 Design rainfall intensities

Table 3.7 shows the design rainfalls for the 20%, 5% and 1% AEP events obtained from the BOM[3] for the centroid of the Deadmans Gully catchment to the rail (Catchment DG8, Lat: -30.9172, Lon: 150-1393). The rainfalls were confirmed to be in a similar order of magnitude to the IFDs for the Stratford Creek catchment (± 4%), and conservatively higher for the critical durations.

Table 3.7 – Local catchment design rainfall depths

Duration (hrs)	Rainfall depth (mm)			
	20% AEP	10% AEP	5% AEP	1% AEP
6	52.7	62.6	72.5	96.9
9	59.8	70.9	82	109
12	65.6	77.7	89.8	120
18	74.8	88.7	103	138
24	82.1	97.5	113	152
30	88	105	122	165
36	93	111	129	176
48	101	121	141	194
72	112	134	157	220

3.4.5 Areal reduction factors

Areal reduction factors (ARF) were determined for the Deadmans Gully catchment that drains to the Project rail spur (Catchment DG8) in accordance with the AR&R 2019 guidelines and applied across the model. These Deadmans Gully catchment factors are slightly higher (and therefore conservative) to those determined for the Stratford Creek catchment to the Project Rail Spur (Catchment NRe9). The ARF's vary according to storm duration and AEP.

3.4.6 Rainfall losses

The NSW Office of Environment and Heritage (OEH) in conjunction with WMA Water (2019) have reviewed the ARR design inputs for use in design flood estimation in NSW. This review was to address concerns raised by practitioners of the underestimation bias in the standard ARR 2019 method for deriving design events and to develop advice on any changes needed in the methods or parameters used for flood estimation in NSW.

The study recommended that practitioners use the following hierarchical approach to loss selection until further research and associated more definitive advice is made available:

1. Use the average of calibration losses from the actual study if available.

[2] https://elevation.fsdf.org.au/
[3] http://www.bom.gov.au/water/designRainfalls/revised-ifd/

2. Use the average calibration losses from other studies in the catchment if available and appropriate for the study.
3. Use the average calibration losses from other studies in the similar adjacent catchments if available and appropriate for the study.
4. Use the FFA-Reconciled Losses given in the WMA Water (2019) report for nearby similar sites. Caution should be applied when using FFA-reconciled initial loss as it may not be well calibrated with the catchment size chosen in this study. Additional scrutiny should be applied to initial loss values for catchments of 100 km^2 or less.
5. Until revised losses are generated using a better predictor equation (discussed below) use raw ARR Data Hub continuing losses with a multiplication factor of 0.4. Use the unmodified ARR Data Hub initial losses and apply additional scrutiny to them for catchment areas of 100 km^2 or less to ensure they are representative for the catchment.

There is no historical data available for the local catchments to the rail to derive calibration losses. For this study, Methodology 2 has been adopted. The Boggabri Flood Study (WRM, 2021) calibrated an XP-RAFTS model to three historical events (with short duration rainfalls) in the adjoining Coxs Creek catchment. The design losses were then derived by matching the XP-RAFTS design discharges to the FFA discharges at Coxs Creek at Boggabri gauge (GS419032). The adopted initial losses ranged from 66 millimetres (mm) for the 20% and 5% AEP events to 53 mm for the 1% AEP event. A 2 mm/hr continuing loss was used for all design events.

For this study, a 53 mm initial loss and a 2 mm/hr continuing loss were adopted for all assessed events based on the calibrated Coxs Creek losses. The median pre-burst losses from the ARR data hub were also used.

3.4.7 Design discharges

Table 3.8 shows the adopted design discharge, critical durations and temporal patterns adopted for design discharge estimation at three key reporting locations associated with the Project rail spur (see Figure 3.7) at:

- the outlet of the Deadmans Gully and Collygra Creek catchments (Subcatchment DG11),
- the Deadmans Gully catchment to the Project rail spur (Subcatchment DG8), and
- the Stratford Creek catchment to the Project rail spur (Subcatchment NRe9).

Table 3.8 – Design discharge, critical durations and temporal patterns at the three reporting locations

AEP (%)	Location ID	Design discharge (m^3/s)	Critical duration (hrs)	Critical TP	Selected TP	Difference in peak discharge
20	DG11	101	36	4	10	+15%
	DG8	46		10		-
	NRe9	100				
5	DG11	201	24	2	10	+11%
	DG8	101		10		-
	NRe9	213				
1	DG11	465	18	2		-
	DG8	199				
	NRe9	448				

The temporal patterns producing the design discharges at the Project rail spur reporting locations (DG8 and NRe9) were adopted for design discharge estimation. The temporal pattern that produced the peak discharge just greater than the mean was adopted. The adopted temporal patterns produce conservatively high discharges at the DG11 reporting location downstream of the Project rail spur (DG11) for the 20% and 5% AEP event. The pattern also produced a conservatively high design discharge at DG8 for the 5% AEP event but was adopted because it produced a suitable match at NRe9.

Figure 3.8, Figure 3.9 and Figure 3.10 show the range of design discharges presented as box and whisker plots for the 20% AEP, 5% AEP and 1% AEP design events respectively at the DG8 reporting location. The ensemble analysis at reporting locations DG11 and NRe9 is similar and therefore not shown. For each duration, the rectangle box represents the 25%ile and 75%ile (1st and 3rd quartile, the interquartile range or IQR) bound of the estimate. The horizontal lines at the top and bottom (whiskers) represent the upper and lower estimates for 1.5 times the IQR. The horizontal dotted line within the box is the median value and the solid red line represents the mean value, the value of which is shown in red. The solid green line indicates the adopted design discharge, the value of which is shown in green.

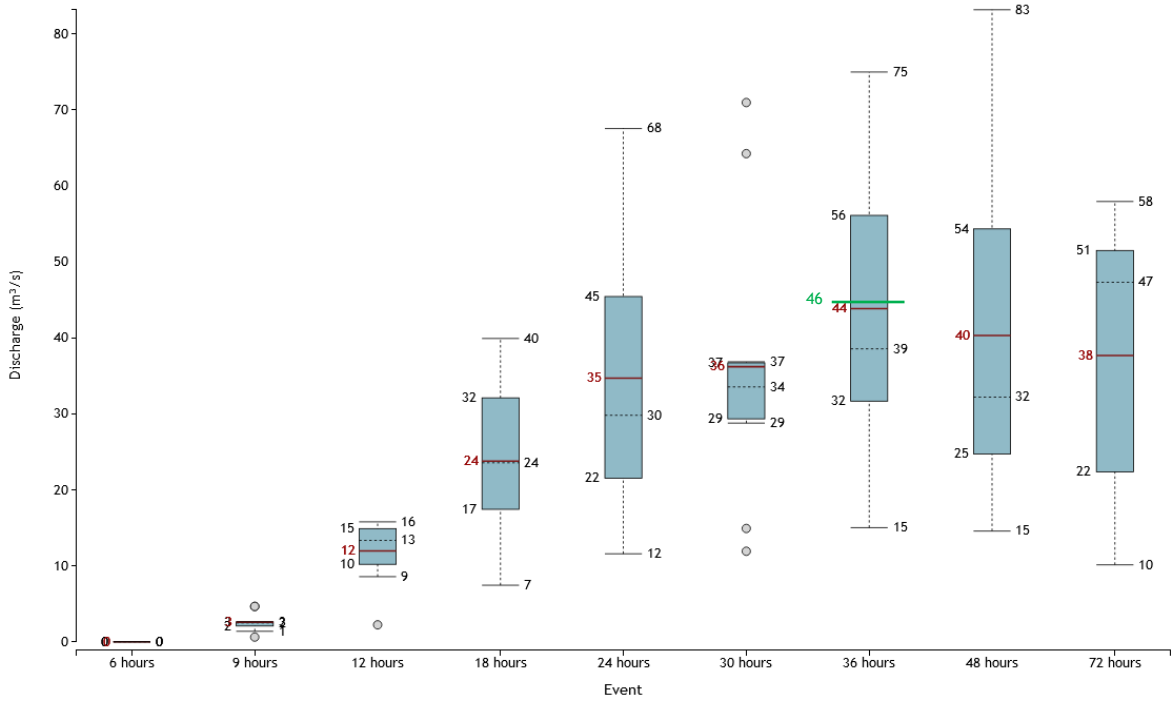


Figure 3.8 – Distribution of 20% AEP design peak discharges at Deadmans Gully to the Project Rail Spur (Catchment DG8)

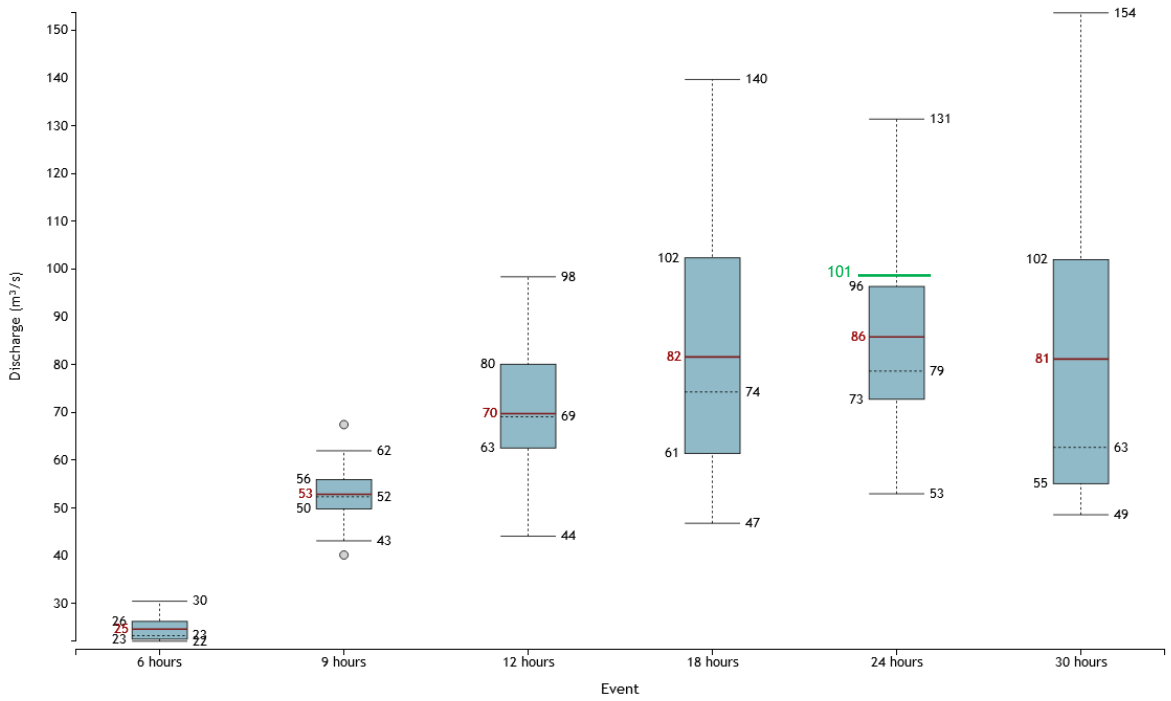


Figure 3.9 – Distribution of 5% AEP design peak discharges at Deadmans Gully to the Project Rail Spur (Catchment DG8)

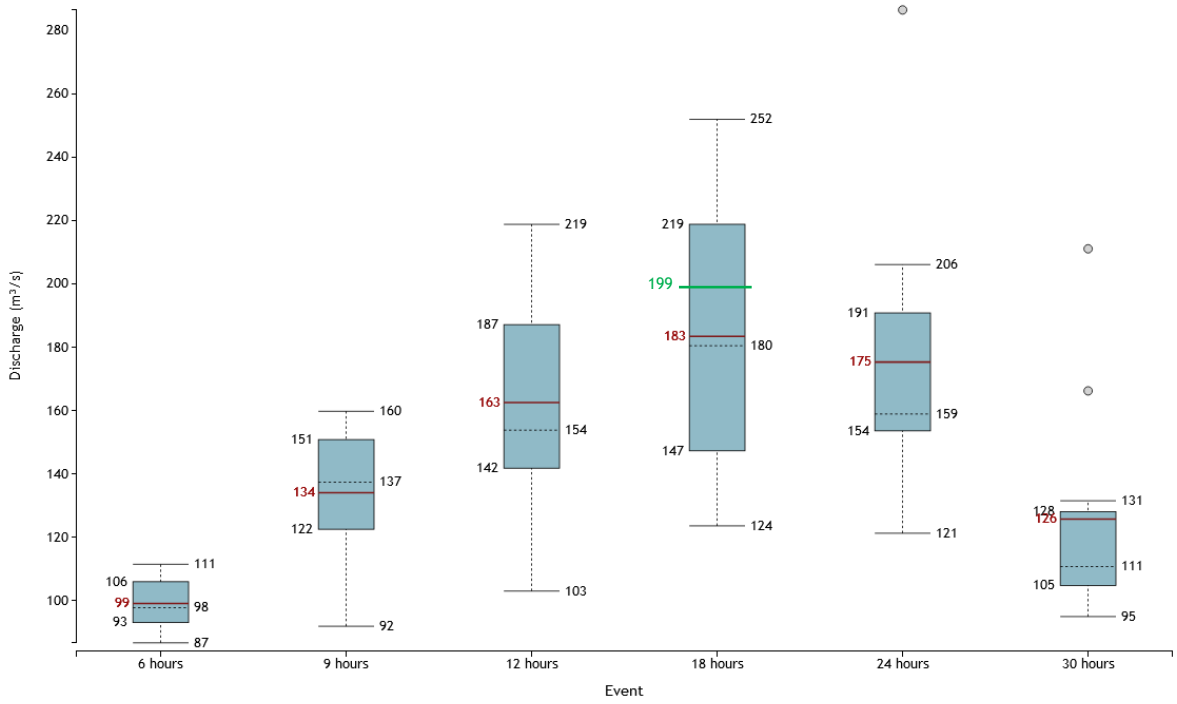


Figure 3.10 – Distribution of 1% AEP design peak discharges at Deadmans Gully to the Project Rail Spur (Catchment DG8)

3.4.8 XP-RAFTS model design discharge comparison to RFFE

Table 3.9, Table 3.10 and Table 3.11 show comparisons between XP-RAFTS design discharges and those estimated using the RFFE at the three reporting locations (Subcatchment DG11, DG8 and NRe9, refer Figure 3.7). The results indicate that the XP-RAFTS predicted peak design discharges are within the confidence limits of the RFFE flood quantiles and therefore are suitable for use in the study.

Table 3.9 – Comparison of XP-RAFTS design peak discharges with RFFE estimates at Location DG11

AEP (%)	RFFE design peak discharge (m^3/s)			XP-RAFTS design peak discharge (m^3/s)	% difference to expected RFFE discharge
	Expected	5th %ile confidence limit	95th %ile confidence limit		
20	92	38	224	101	10%
10	147	60	359	135	-8%
5	217	88	540	201	-8%
1	460	178	1200	465	1%

Table 3.10 – Comparison of XP-RAFTS design peak discharges with RFFE estimates at Location DG8

AEP (%)	RFFE design peak discharge (m^3/s)			XP-RAFTS design peak discharge (m^3/s)	% difference to expected RFFE discharge
	Expected	5th %ile confidence limit	95th %ile confidence limit		
20	40	17	98	46	13%
10	64	27	157	65	2%
5	95	39	235	101	6%
1	200	78	522	199	0%

Table 3.11 – Comparison of XP-RAFTS design peak discharges with RFFE estimates at Location NRe9

AEP (%)	RFFE design peak discharge (m^3/s)			XP-RAFTS design peak discharge (m^3/s)	% difference to expected RFFE discharge
	Expected	5th %ile confidence limit	95th %ile confidence limit		
20	88	36	211	100	14%
10	141	59	341	143	1%
5	210	86	519	213	1%
1	448	172	1180	448	0%

4 Existing conditions hydraulic modelling

4.1 OVERVIEW

The two-dimensional TUFLOW hydrodynamic model (BMT, 2020) was used to simulate the flow behaviour of the Namoi River and the local catchment tributaries in the vicinity of the Project rail spur.

TUFLOW represents hydraulic behaviour on a fixed grid by solving the full two-dimensional depth-averaged momentum and continuity equations for free surface flow. The model automatically calculates breakout points and flow directions within the study area. An adaptive time step is used by the computational engine to maintain simulation stability. The latest TUFLOW solver 2020-10-AF was adopted for the simulation.

A grid size of 15 m was adopted for this study and refined using the TUFLOW Sub-Grid-Sampling methodology to sample the underlying grid on a 3 m interval. All identified floodplain levees and embankments were modelled using z-shapes.

The model was calibrated to the recorded data for the 1955, 1971, 1997, 1998 and 2000 historical flood events. Water level and discharge hydrographs (or peaks) were available at the stream gauges together with surveyed peak flood marks, which were obtained from the WRM (2021) and the SMEC (2003) studies.

The Boggabri Flood Study (WRM, 2021) found that floodplain infiltration losses were required to match the recorded discharges at the downstream gauge at Boggabri using the inflow hydrographs at Gunnedah and from Coxs Creek. The hydraulic model could not be calibrated without the inclusion of infiltration losses. For this study, the flood storage and infiltration losses between the two gauges at the Namoi River were determined during model calibration.

A description of the development and calibration of the TUFLOW model that has been used to estimate design flood levels in the vicinity of the Project is outlined below.

4.2 EXISTING CONDITIONS MODEL CONFIGURATION

Figure 4.1 shows the extent of the hydraulic model. In comparison to the model developed for the Project EIS, the model has been extended upstream to the stream gauge at Gunnedah and extended downstream of the Boggabri Gauge to assist with model calibration. The model includes:

- a DEM of the available topographic data;
- Manning's 'n' roughness values for surfaces within the study area;
- a global soil type to account for infiltration losses;
- inflow and outflow boundaries; and
- road and rail culvert and bridge data.

Descriptions of these are given in the following sections.

4.2.1 Topographic data

Figure 4.2 shows the location and extent of the available ground level data. A description of the data is as follows:

- Whitehaven provided five sets of data:
  - The survey data in the vicinity of the Project rail spur was provided without metadata as a dxf. The file was labelled as December 2022.
  - Area 1 was provided without metadata as a Geotif file on a 1 m grid. The file was labelled as September 2015.

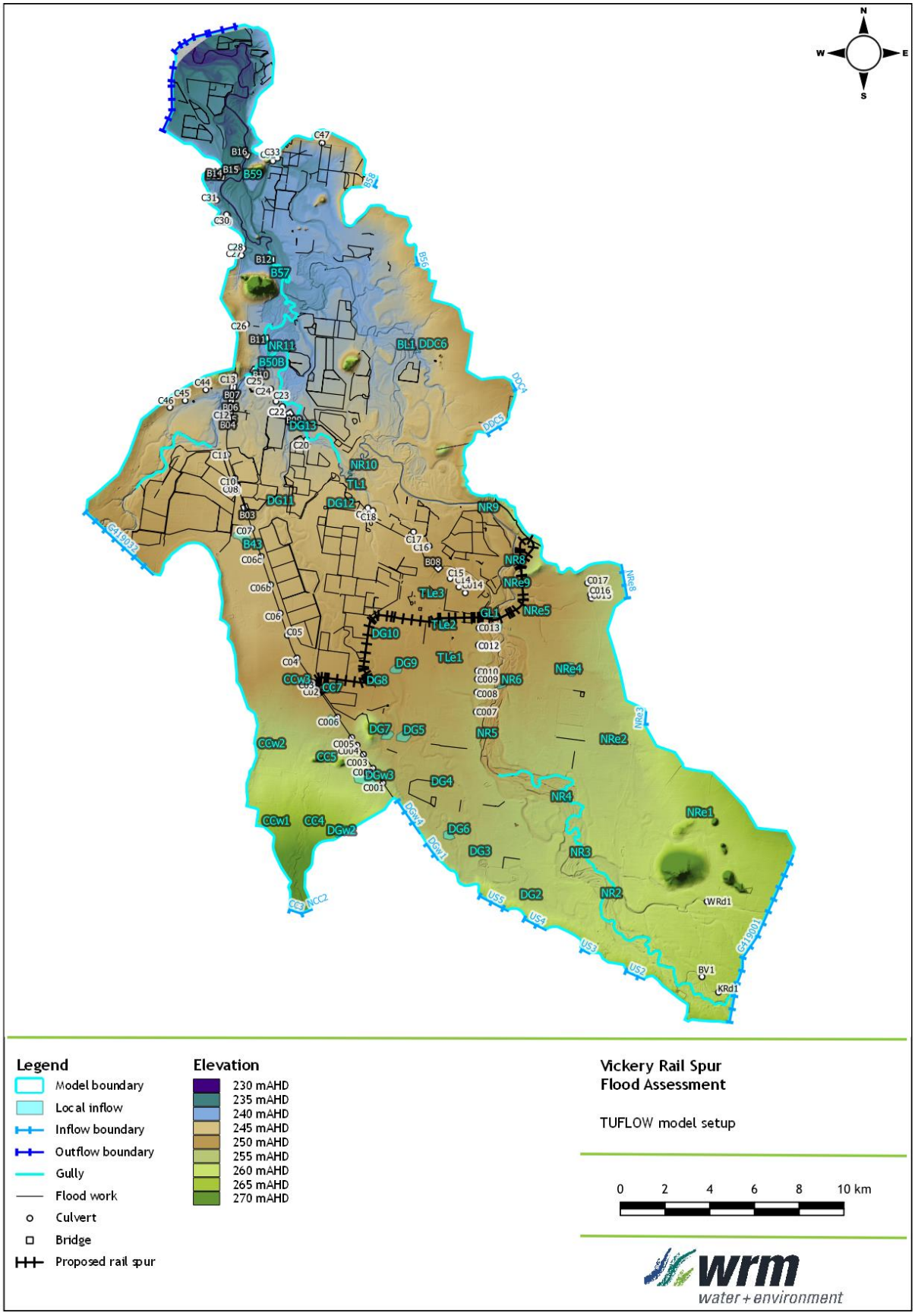


Figure 4.1 – TUFLOW model configuration, general overview

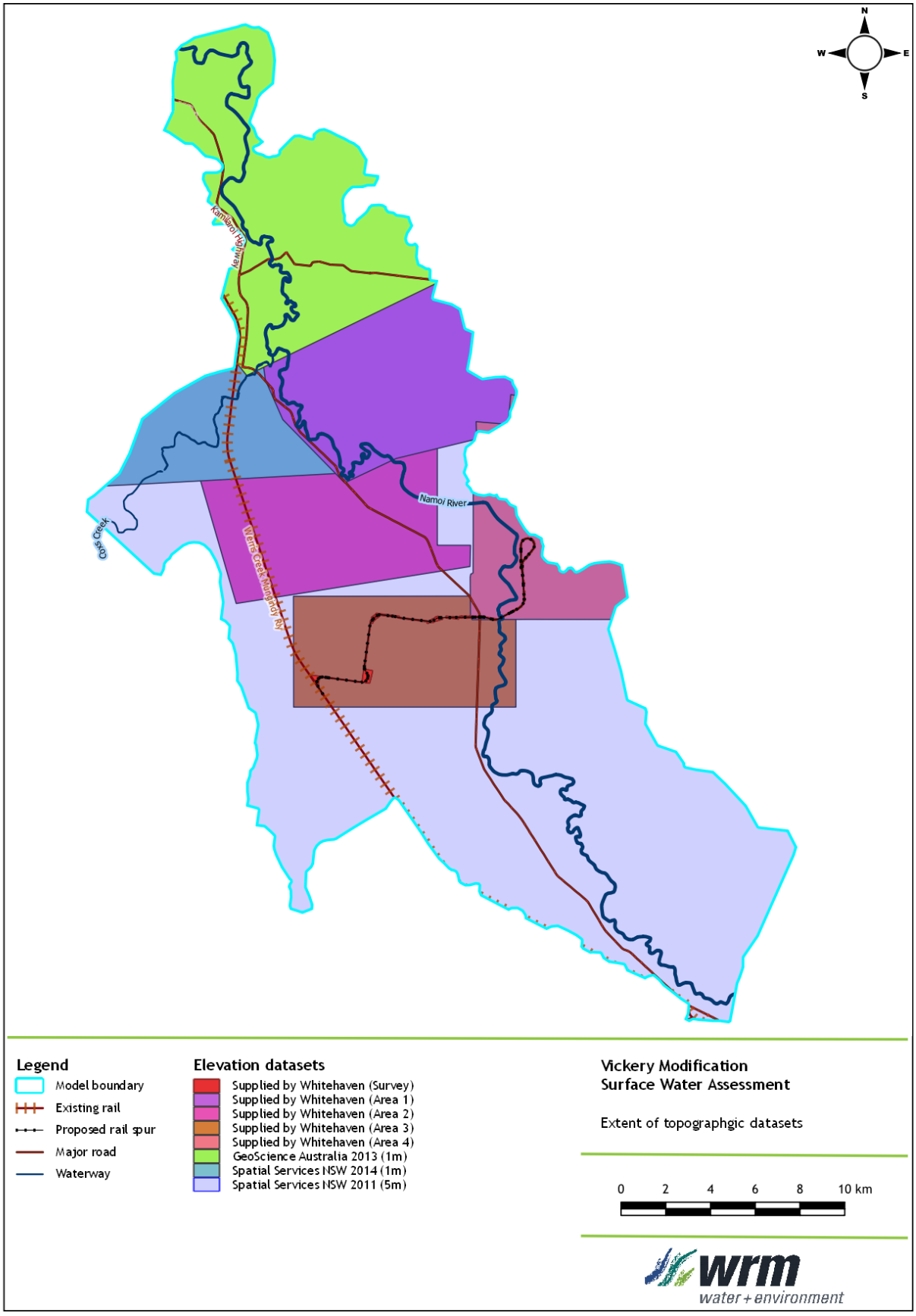


Figure 4.2 – Locations of available ground level data

- Area 2 was derived from LiDAR flown in November 2016. It has an accuracy of 0.15 m (95% CI) vertical and 0.8 m (95% CI) horizontal and was provided as an ECW file with 0.25 m resolution.
- Area 3 and Area 4 were provided without metadata as text files with points spaced at irregular intervals. The files were labelled as September 2019 and May 2019, respectively, and were converted to grids with a 1 m resolution.

- The Geoscience Australia data (sourced from the ICSM ELVIS platform[4] "Elevation and Depth – Foundation Spatial Data") was derived from LiDAR flown between September and October 2013. It has an accuracy of 0.3 m (95% CI) vertical and 0.8 m (95% CI) horizontal and was provided as an ESRI grid with a 1 m resolution.
- The Spatial Services NSW data, obtained from ELVIS covering the northern model was flown in 2014 with an accuracy of 0.3 m (95% CI) vertical and 0.8 m (95% CI) horizontal and was provided on a 1 m grid.
- The Spatial Services NSW data, obtained from ELVIS covering the southern model area was derived from photogrammetry flown between July and August 2011. It has an accuracy of 0.9 m (95% CI) vertical and 1.25 m (95% CI) horizontal and was provided as an ESRI grid with a 5 m resolution.

The 2011 NSW Spatial Services data tends to overestimate the elevation compared to the other data sources by approximately 0.4 m, on average. The use of this data will not impact on the estimation of flood levels at the Project as this area is covered by datasets supplied by Whitehaven. Care has been taken to ensure adequate transition between the datasets.

The LiDAR/DEM datasets were merged into a single DEM. The 2013 Geoscience Australia data and 2014 NSW Spatial Services data were given preference over the other datasets because the confidence limits are known. A review of the overlapping areas showed these two datasets and the Whitehaven data matched well and are therefore suitable and given preference next. There were minor differences in the overlapping Whitehaven datasets. The 2011 NSW Spatial Services data was given the lowest preference, due to its lower accuracy.

4.2.2 Bathymetric data

The LiDAR datasets are not hydrologically enforced and represent the water level in the Namoi River at the time of the survey rather than the watercourse bed.

A review of the Namoi River at Boggabri (419012) gauge cease-to-flow level showed that the depth of water at the time the survey was taken was about 2.3 m above the bed. This depth below water surface level is consistent with the overlapping areas between the 2022 survey data and the 2019 LiDAR data (see Figure 4.3). The 2019 LiDAR was taken during severe drought when there was no flow in the Namoi River.

Compared to the 2011 LiDAR data used in the southern areas, the Namoi River at Gunnedah (419001) gauge cease-to-flow level suggests the depth of water was about 0.63 m above the bed, as indicated in Figure 4.4.

To account for the flow capacity below the surveyed water level, the bed level of the Namoi River was lowered by 2.3 m over a constant width of 25 m for the entire length of the 1m datasets in the northern areas of the model, and by 0.6 m in the southern model area for the 2011 dataset. No changes were made to the Coxs Creek bed level, except for smoothing irregularities and a transition at the Namoi River confluence as it has no water in the bed at time of survey. The adjusted bathymetry was found to produce an in-channel stage-discharge curve that matched the official stream rating at the Namoi River at Boggabri gauge.

[4] https://elevation.fsdf.org.au/

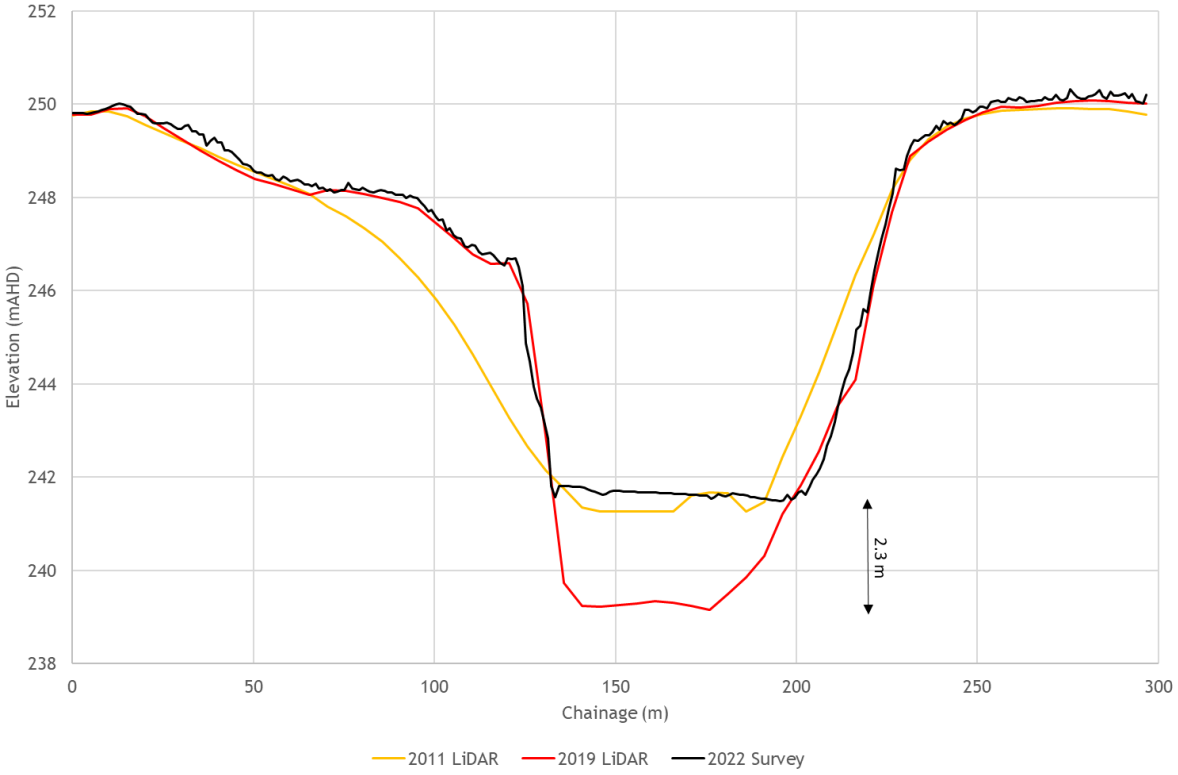


Figure 4.3 – Bathymetric adjustments for water depths within the Namoi River main channel based on drought LiDAR (cross section taken adjacent to the Project rail spur loop)

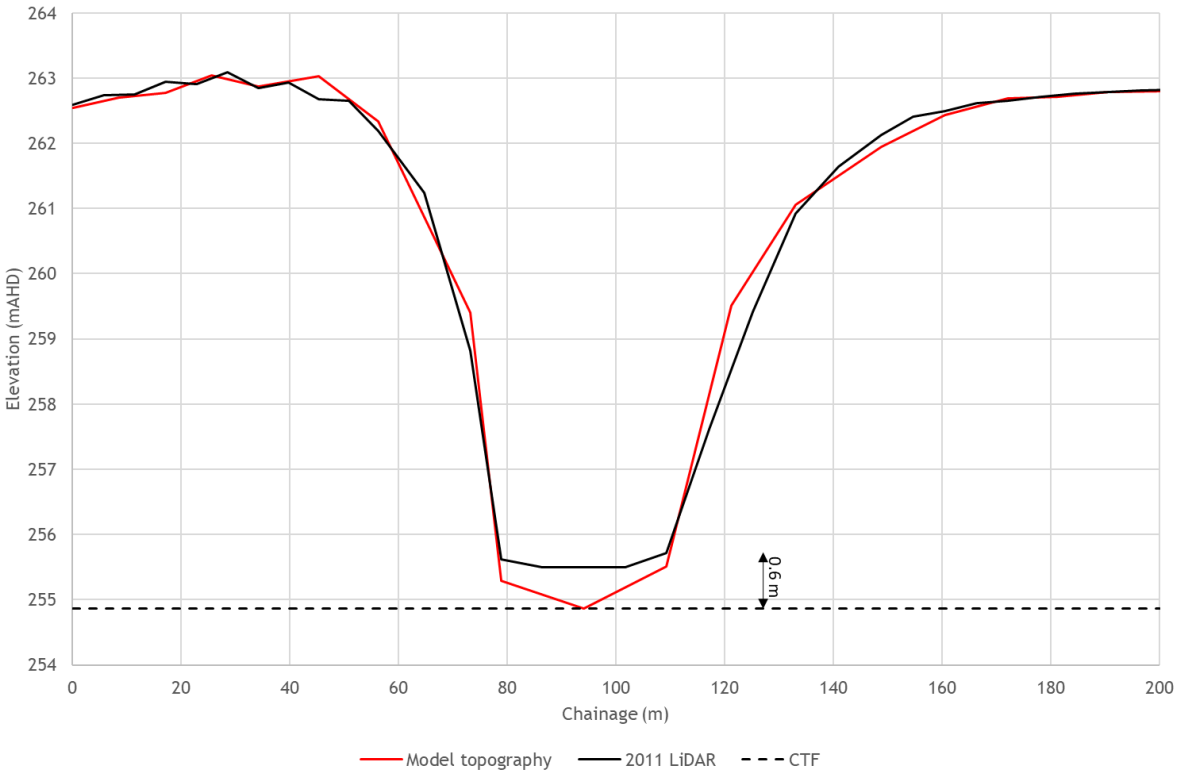


Figure 4.4 – Bathymetric adjustments for water depths within the Namoi River main channel based on cease-to-flow (cross section taken at Namoi River at Gunnedah gauge)

4.2.3 Existing levees, drains and bunds

Gullies, elevated roads and railways as well as levee structures in the project area were modelled as TUFLOW z-shape polylines with the crest or invert levels defined from the underlying DEM to avoid artificial leaks resulting from the use of SGS methodology. No ground-based survey data was available for the farm levee and drainage structures. For the 1955 and 1971 calibration events, the levees were removed from the topography as it was understood they were constructed post 1971.

4.2.4 Manning's 'n' values

The model uses Manning's 'n' values to represent hydraulic resistance (notionally channel or floodplain roughness). Discrete regions of continuous vegetation types and land uses were mapped, and appropriate roughness values assigned to each region. Vegetation and land use mapping were based on Google Satellite and ESRI Satellite imagery as well as the project DEM. The Manning's 'n' values were selected during model calibration and were applied to all model scenarios.

Table 4.1 shows the Manning's 'n' values adopted for use in the hydraulic model. Figure 4.5 shows the discrete regions where specific Manning's 'n' values have been applied. The dominant land use in the area of interest is upper floodplain (crops) and has been applied for any area not discretely mapped on Figure 4.5.

Table 4.1 – Manning's 'n' parameters

Region	Manning's 'n' value
Upper floodplain (crop area)	0.050
Channel	0.030
Lower floodplain	0.050
Vegetation	0.070
Road/rail	0.025

4.2.5 Model boundaries

Figure 4.1 shows the locations of the inflow and outflow boundaries of the hydraulic model. Sixteen inflows were located along the boundaries to represent the total regional catchment inflows from the Namoi River and Coxs Creek together with the XP-RAFTS derived inflows from the local creek catchments including Stratford Creek, Collygra Creek, Driggle Draggle Creek and Bollol Creek. A further 47 local inflows were used to represent the local subcatchment XP-RAFTS inflows within the hydrodynamic model boundary. The local catchment inflow hydrographs were derived using the XP-RAFTS hydrological model described in Section 3.4.

The upstream inflows at Gunnedah used the recorded hydrographs at the Namoi River at Gunnedah gauge (GS419001) for the calibration events. For the design events, the 1955 flood hydrograph shape at Gunnedah was factored to match the peak discharge estimated by the FFA (see Section 3.3).

The upstream inflows from Coxs Creek used the recorded hydrographs at the Coxs Creek at Boggabri gauge (GS419032) for the 1997, 1998 and 2000 events. The Boggabri Flood Study discharge hydrographs were adopted for the 1955 and 1971 events and the design events.

Nine outflow boundaries have been assigned across the Namoi River floodplain approximately 19.5 km downstream of the Namoi River at Boggabri (GS419012) gauge (measured along the Namoi River centreline). The outflow boundaries were specified as TUFLOW generated discharge-head (Q-H) relationships based on the tailwater slopes assigned as I = 0.04%. Sensitivity testing showed that the downstream boundary does not impact on water levels at the gauge or the rail.

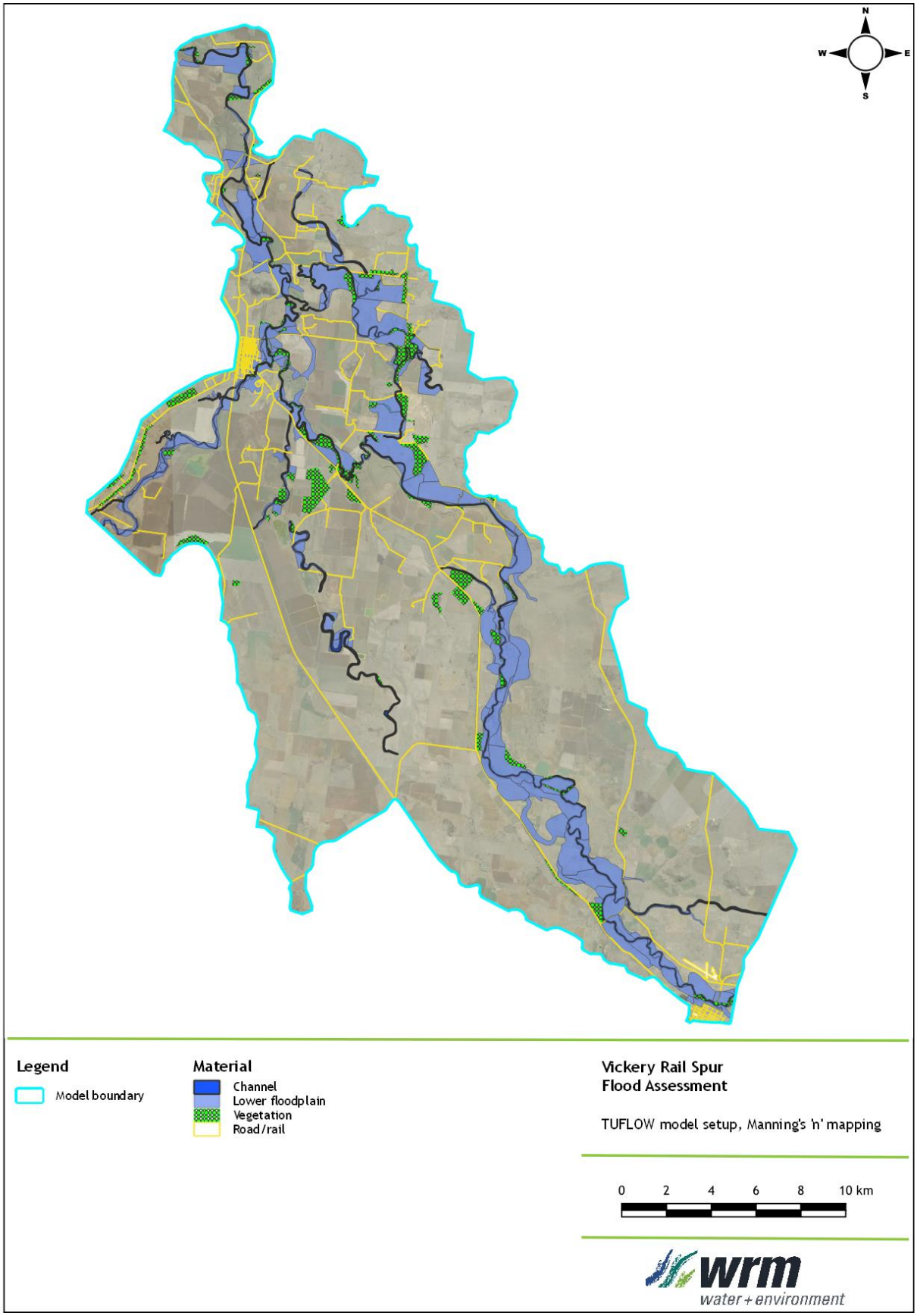


Figure 4.5 – TUFLOW model configuration and Manning's 'n' mapping

4.2.6 Infiltration losses

During model calibration, it was not possible to match the recorded Namoi River at Boggabri discharge hydrograph (peak or volume) using the recorded Namoi River at Gunnedah discharge hydrograph for any of the calibration events without the inclusion of an infiltration loss.

The Green-Ampt infiltration model inbuilt into TUFLOW was used for the assessment. This infiltration model assumes a variation of the infiltration rate over time as a result of soils saturating at a wetting front and is based on the soil's hydraulic conductivity, suction, porosity and initial soil moisture content.

According to the NSW SEED datahub (SEED, 2019), the prevailing soil type in the study area is vertosol soils with a clay content of 35%. A review of the eSPADE, the maps-based information system based on the NSW Government's Soils and Land Information System (NSW DPIE, 2021), confirms this to be the predominant soil type around the Kamilaroi Highway, while topsoils along the Namoi River are of silty/loamy nature especially in the vicinity of the Project, with some areas as pervious as sandy loams. The "silt loam" soil type as predefined by the United States Department of Agriculture (USDA) and as outlined in Table 4.2 was applied to the model as a global parameter.

Table 4.2 - Green-Ampt infiltration parameters, USDA 'silt loam' soil type

Suction (mm)	Hydraulic conductivity (mm/hr)	Porosity (fraction)	Initial soil moisture (%)
166.8	3.4	0.486	20

The initial moisture content, i.e., the fraction of the soil that is initially wet, was assumed to be 20%, which was derived during model calibration. The soil capacity is defined as the difference between the soil porosity and initial soil moisture.

To avoid the duplication of rainfall losses within the TUFLOW model area, the XP-RAFTS model was rerun with zero initial and continuing losses to define the local subcatchment inflows that are located within the TUFLOW model boundary.

4.2.7 Existing bridge and culvert structures

A total of 16 bridge structures as well as 58 relevant culvert structures were identified in the study area under existing conditions (excluding the Project rail spur). Figure 4.1 shows the locations of all existing structures. Table 4.3 summarises the key features of each culvert structure with all data obtained from the Boggabri Flood Study (WRM, 2021).

Existing culverts were modelled as 1D structures assuming entry and exit loss coefficients of 0.5 and 1.0, respectively. For pipe culverts, a roughness value of 0.014 and a width contraction coefficient of 1.0 were assumed. For box culverts, a roughness value of 0.011, a width contraction coefficient of 0.9 and a height contraction coefficient of 0.7 were assumed.

Existing bridge structures were modelled as layered flow constrictions within the 2D domain. Layer 1 represents the bridge piers and underside of the bridge. Layer 2 represents the bridge structure and is 100% blocked, and layer 3 represents the handrail. Details of the modelled bridge structures are given in Table 4.4.

Where the height of a structure was provided, this value added to the ground level was assumed as the obvert level of the structure (L1 obvert). Where this information was not supplied, a depth of the overlying layer (L2 depth) of 0.8 m was assumed. Bridge form loss coefficients for the bridge opening (layer 1), the bridge deck (layer 2) and the rail guards (layer 3) were assumed as 0.1, 1.56 and 0.5, respectively.

The Boggabri/Maules Creek rail bridge and embankment (B15) are recent developments that were not represented in the topographic data. The ground elevation has been adjusted manually to account for these changes for the post 1971 analyses.

Table 4.3 – Existing culvert details

ID	Dimensions (m) (h-height, w-width, L-length, D-diameter)	U/S invert (mAHD)	D/S invert (mAHD)	Location/ reference
BV1	0.6h x 2.4w x 66.2L	260.8	260.4	Bluevale Road
C001	1 x 0.5D x 18L	237.2	237.19	North
C002	1 x 0.5D x 22.7L	237.5	236.8	North
C003	3 x 1.21h x 2.43w x 8L	238.5	238.45	Kamilaroi Highway
C004	4 x 0.91h x 2.43w x 10.6L	237.3	237.2	Kamilaroi Highway
C005	3 x 0.92h x 1.81w x 6L	237.3	237	Kamilaroi Highway
C006	1 x 0.75D x 19L	237.8	237.6	Kamilaroi Highway
C007	2 x 1.51h x 2.48w x 18L	241.63	241.49	Kamilaroi Highway
C008	3 x 1.82h x 2.74w x 8.9L	243.8	243.4	Kamilaroi Highway
C009	1 x 0.3h x 0.7w x 41L	241.25	241	Kamilaroi Highway
C010	4 x 1.83h x 3.16w x 16.7L	246	245.5	Kamilaroi Highway
C011	3 x 0.91h x 2.44w x 8.1L	244.6	244.4	Kamilaroi Highway
C012	1 x 0.36D x 13L	242.8	242.2	Kamilaroi Highway
C013	1 x 0.375D x 14L	242.45	242.4	Kamilaroi Highway
C014	2 x 0.9D x 18L	241.63	241.49	Kamilaroi Highway
C015	1 x 1.75D x 10L	242.1	242	Kamilaroi Highway
C016	4 x 0.91h x 1.82w x 9.3L	242.7	242.4	Kamilaroi Highway
C017	2 x 0.45D x 15L	238.6	238.3	Kamilaroi Highway
C02	1 x 0.6h x 1.2w x 38.3L	262.65	262.55	Bluevale Road
C03	15 x 0.45h x 0.6w x 24.5L	255.8	255.7	Railway
C04	3 x 0.45h x 0.75w x 20L	252.6	252.5	Kamilaroi Highway
C05	2 x 0.45h x 0.75w x 20L	252.35	252.25	Kamilaroi Highway
C06	2 x 0.45h x 0.75w x 20L	252.2	252.15	Kamilaroi Highway
C06b	1 x 1D x 15.7L	244.4	242.4	Grain Valley Rd
C06c	1 x 0.5D x 10.2L	244.4	244.3	Grain Valley Rd
C07	10 x 0.45h x 0.6w x 30.3L	255.5	255.4	Railway
C08	1 x 0.45h x 0.75w x 20L	251.2	251.1	Kamilaroi Highway
C09	3 x 0.45h x 0.75w x 20L	251.18	251.12	Kamilaroi Highway
C10	1 x 0.3h x 1.22w x 20L	251.2	251.1	Kamilaroi Highway
C11	1 x 0.45h x 0.75w x 20L	251.2	251.5	Kamilaroi Highway
C12	1 x 0.45h x 0.75w x 20L	250	249.9	Kamilaroi Highway
C13	2 x 0.45h x 0.75w x 20L	249.95	249.75	Kamilaroi Highway
C14	12 x 0.45h x 0.6w x 41.9L	254.1	254	Railway
C15	1 x 0.6D x 28.7L	253.2	253	Railway
C16	15 x 0.45h x 0.6w x 20.9L	252.6	252.5	Railway

ID	Dimensions (m) (h-height, w-width, L-length, D-diameter)	U/S invert (mAHD)	D/S invert (mAHD)	Location/ reference
C17	8 x 0.45h x 0.6w x 22.8L	251.55	251.45	Railway
C18	1 x 0.3h x 0.9w x 21.5L	253.08	253	Bluevale Road
C19	1 x 0.3h x 0.9w x 19.8L	253.05	252.95	Bluevale Road
C20	1 x 0.3h x 0.9w x 15L	253.2	253.05	Bluevale Road
C21	1 x 2.2h x 4.5w x 7L	249.4	249	Railway
C22	5 x 2.2h x 5w x 7L	249	248.8	Railway
C23	1 x 1.8h x 4.5w x 7L	248.35	248.2	Railway
C24	1 x 1.8h x 4.5w x 7L	248	247.5	Railway
C25	1 x 0.9h x 6w x 7L	247.3	247.1	Railway
C26	1 x 0.9h x 6w x 13.2L	246.5	246.4	Railway
C27	2 x 0.9h x 4w x 8.5L	245.5	245.4	Railway
C28	20 x 1.5h x 2.7w x 8.3L	245.35	245.3	Railway
C29	3 x 0.9D x 8.2L	245.7	245.6	Railway
C30	2 x 0.9D x 7.7L	245.45	245.4	Railway
C31	3 x 1.4D x 10.6L	245.1	245	Railway
C32	2 x 0.45h x 0.75w x 20L	249.9	249.65	Kamilaroi Highway
C33	2 x 0.45h x 0.75w x 20L	248.45	248.4	Kamilaroi Highway
C44	2 x 0.9h x 1.2w x 5L	244.5	244.4	Railway
C45	1 x 0.9h x 1.8w x 17L	247.1	247	Railway
C46	1 x 0.5D x 7.7L	242.05	241.96	Railway
C47	0.6h x 2.4w x 28.3L	259	258	Bluevale Road
KRd1	4 x 0.6h x 2.1w x 16.3L	244	243.6	North
WRd1	1 x 0.5D x 13.2L	244.2	244.1	Grain Valley Rd

Table 4.4 – Existing bridge details

ID	Width (m)	Length (m)	Layer 1 (underside of bridge)		Layer 2 (bridge structure)		Layer 3 (handrail)		Location/ reference
			Obvert (mAHD)	% blockage	Structure depth (m)	% blockage	Depth (m)	% blockage	
B03	3.2	14	247	10.5	0.4	100	-	-	Western rail line
B04	3.2	21	243.9	-	0.4	100	-	-	Western rail line
B05	4	28	243.6	10.5	0.8	100	-	-	Western rail line
B06	3.66	156	244.1	6.15	0.8	100	-	-	Coxs Creek viaduct
B07	3.66	87	243.07	8.2	1.43	100	-	-	Coxs Creek overflow
B08	10	35	249.7	4.6	0.8	100	0.5	50	Kamilaroi Highway
B09	8.73	41	242.8	5.9	0.8	100	0.5	50	Deadmans Gully
B10	11.1	261	244.4 to 245.18	3.7	0.8	100	1	50	Coxs Creek
B11	3.2	63	242.19	4	0.5	100	3	15	Boston Street bridge
B12	5	130	239.8	1.25	0.8	100	2	50	Iron Bridge
B13	8	54	245.6 to 246.1	3	1	100	2	10	Kamilaroi Highway
B14	8	72	243.8	2.3	2	100	3	45	Kamilaroi Highway
B15	4	1020	244.5 to 243.8	1.9	2	100	1	15	Boggabri/Maules rail spur
B16	10	55	235.8	2	0.8	100	-	-	Boggabri/Maules access

4.3 MODEL CALIBRATION

The hydraulic model was calibrated to available data for five historical events:

- February 1955;
- February 1971;
- February 1997;
- July 1998; and
- November 2000.

The purpose of the model calibration was to match as closely as possible the recorded flood levels and discharges at the Namoi River at Boggabri gauge (GS419012) using the recorded discharge hydrographs at the Namoi River at Gunnedah gauge (GS410001) and Coxs Creek at Boggabri gauge (GS419032) together with the residual catchment inflows between the gauges derived using the XP-RAFTS model for each event. Further validation of the model was undertaken by comparing predicted and surveyed peak flood levels across the floodplain available for each event. The surveyed peak flood levels have been sourced from SMEC (2003), noting that the location of the floodmarks is approximate only.

Table 4.5 shows the recorded or derived peak flood discharges at the stream gauges for the calibration events. There is a high level of uncertainty associated with the peak flood discharge for the 1955 event because it is well above the highest gauging. The 1955 event has been included because it is the largest flood on record and there are surveyed peak flood levels in the vicinity of the Project rail spur. Of note, the flood peaks between Gunnedah and Boggabri vary considerably depending upon the contribution of Coxs Creek.

Table 4.5 – Recorded/derived peak discharge at each stream gauge, calibration events

Event	Peak discharge (m^3/s)		
	Namoi River at Gunnedah (419001)	Coxs Creek at Boggabri (419032)	Namoi River at Boggabri (419012)
1955	9,030[a]	1,747[b]	6,270[c]
1971	3,069	2,336[b]	3,505[c]
1997	503	1,271	1,253
1998	2,633	1,276	2,256
2000	2,709	1,287	2,227

[a] value estimated by SMEC (2003) [b] values obtained from WRM (2021) [c] adjusted based on TUFLOW rating

Figure A1 to A5 in Appendix A shows the flood depths, extents, and levels across the study area for the 1955, 1971, 1997, 1998 and 2000 flood events respectively. A discussion of the model calibration for each event is given below.

4.3.1 Namoi River at Boggabri rating curve

The stream flow rating curve at the Namoi River at Boggabri gauge (see Figure 3.2) was used as the primary calibration data for the model. The in-channel and lower floodplain Mannings's 'n' values were adjusted so that the water level discharge behaviour matched the stream flow gaugings and the WaterNSW rating curve as close as possible. It was not possible to match the WaterNSW rating curve for the upper floodplain cropping areas without using very high Manning's values that were outside the range of credibility. The upper floodplain parameters, given in Table 4.1, were determined by calibrating the peak water level to the available surveyed floodplain flood marks for each event. The adopted values are also consistent with expected values for a cropped floodplain. Figure 3.2 shows the revised high flow rating curve at the gauge derived using the hydraulic model. The peak discharges adopted for the 1955 and 1971 events were adjusted up using the revised curve.

4.3.2 February 1955 event

The February 1955 flood was the largest on record. Data available for the calibration includes intermittent (manually read) peak flood levels at the Namoi River at Boggabri gauge as well as at 10 flood marks surveyed throughout Boggabri sourced from survey conducted by the then NSW Water Resources Commission (year unknown). Some of these flood marks (B1 to B5) were associated with Coxs Creek flooding, which were used to calibrate the 1955 Coxs Creek discharge hydrograph in the Boggabri Flood Study. An additional 11 peak flood levels were sourced from SMEC (2003) and a Boggabri Coal (WRM, 2009) flood study.

There is considerable uncertainty surrounding the Namoi River peak discharge at Gunnedah for the February 1955 event. SMEC (2003) estimated the peak discharge at Gunnedah to be 9,260 m^3/s whereas the current rating curve suggests it was around 5,550 m^3/s. The peak discharge at the Boggabri gauge was 6,270 m^3/s, which was derived using the estimated peak water level and the TUFLOW rating curve shown in Figure 3.2. For this event, the Coxs Creek flood peak was estimated to be 1,747 m^3/s obtained from the Boggabri Flood Study (WRM, 2021) which did not coincide with the Namoi flood peak arriving from Gunnedah.

During model calibration, it was not possible to match the recorded Namoi River at Boggabri flood levels, the adjusted (higher) peak discharge or the surveyed peak flood marks using the Namoi River at Gunnedah discharge hydrograph estimated by SMEC (2003). The flood peak could not be attenuated sufficiently to reduce from over 9,000 m^3/s at Gunnedah to 6,270 m^3/s at Boggabri even by removing all Coxs Creek flows. There was an average bias of over 0.3 m at the surveyed locations unaffected by Coxs Creek. The opposite was true if the rating curve derived (low) peak discharge was used.

To reconcile the modelling results with the recorded water levels and the peak Boggabri discharge, the Namoi River at Gunnedah peak discharge was adjusted to 6,772 m^3/s (a 27% reduction from the SMEC estimate and a 22% increase from the rating curve estimate). Figure 4.6 shows the recorded and predicted peak water level hydrographs at the Namoi River at Boggabri gauge, indicating a good match in timing (-2.8 hours) and peak level (+0.03 m) using the adjusted inflow hydrograph.

Table 4.6 show comparisons of TUFLOW predicted flood levels at the surveyed peak flood level locations across the floodplain for the 1955 flood using the adjusted hydrograph. The source of the surveyed flood peaks is also shown. The approximate locations of the surveyed points are shown in Figure A1 in Appendix A. There is some uncertainty in the location of each flood mark due to it being taken some time after the flood event occurred. Notwithstanding, the reduced flood peak discharge at Gunnedah produced a good fit to the recorded peak flood level data with an average difference between surveyed and modelled peak flood levels of 0.01 m.

Note that the peak levels at the Gunnedah gauge were not reconciled because of the unknown distribution of flow between the river and the northern floodplain at this location. The model would need to extend further upstream to model this flow distribution correctly. Further, the 2011 photogrammetry data was used for Gunnedah, which has a vertical accuracy of 0.9 m only.

4.3.3 February 1971 event

Namoi River at Boggabri data was obtained from the Pinneena database obtained from WaterNSW but with the peak discharges adjusted to the TUFLOW rating curve shown in Figure 3.2.

Figure 4.7 shows the recorded and predicted peak water level hydrographs at the Namoi River at Boggabri gauge for the 1971 event, indicating a good match in peak level and acceptable timing given the uncertainty and timestep of the recorded data. Table 4.7 shows comparisons of the predicted peak flood levels and the surveyed peak flood at the gauge and another location identified by DNR. The location of the gauge and the surveyed peak level are shown in Figure A2 in Appendix A.

The Coxs Creek flows significantly contributed to the Namoi River flood peak for this event. Coxs Creek discharge hydrograph was obtained from the Boggabri Flood Study (WRM, 2021).

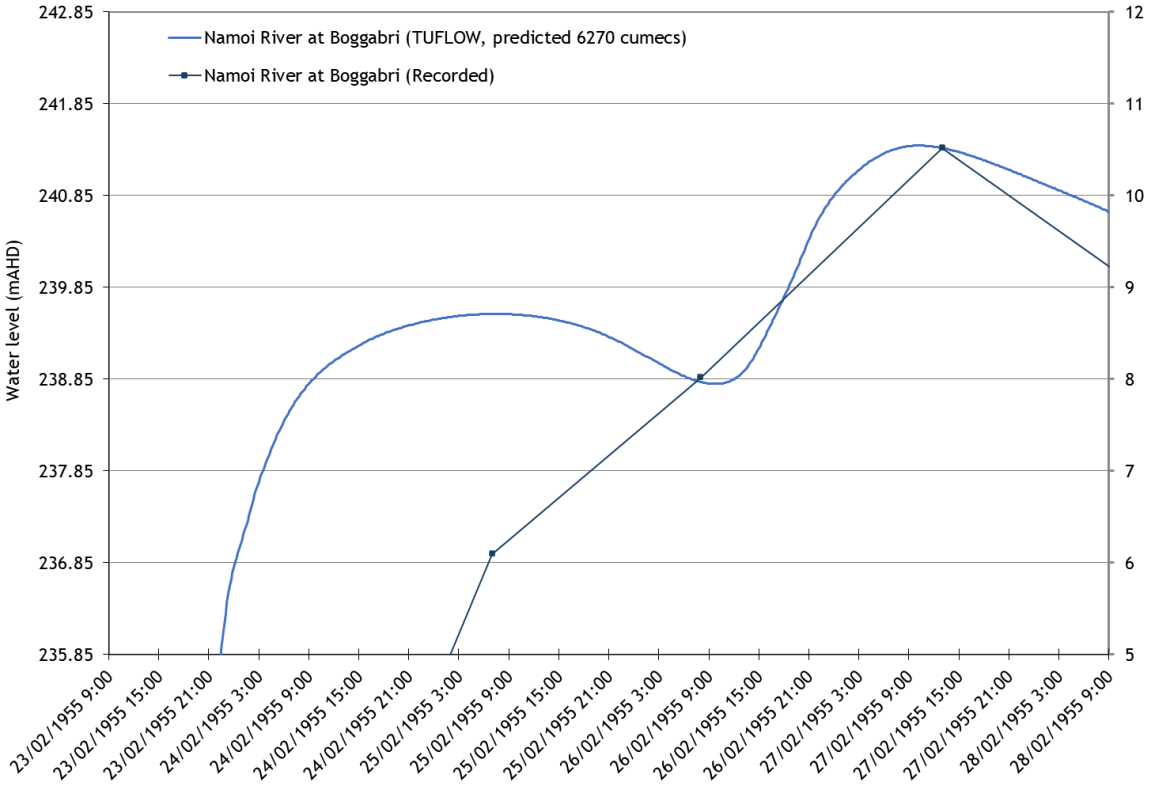


Figure 4.6 – Recorded and predicted Namoi River at Boggabri water level hydrographs, February 1955 event

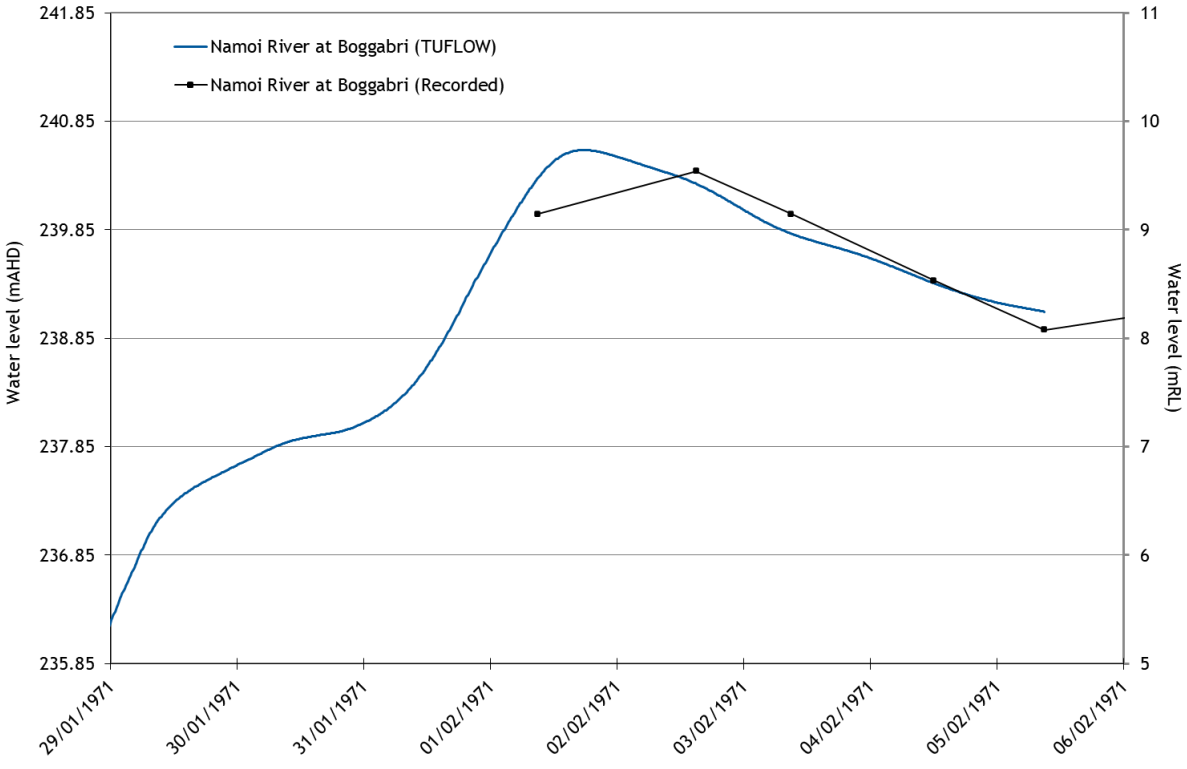


Figure 4.7 – Recorded and predicted Namoi River at Boggabri water level hydrographs, February 1971 event

Table 4.6 – Comparison between surveyed and predicted peak flood levels, 1955 event

Surveyed point	Location	Source	Surveyed level (mAHD)	Predicted flood level (mAHD)	Difference (m)
G1	Gunnedah	S	264.54	264.20	-0.34
419001b	Gauge 419001	P	264.49	264.24	-0.25
G2	Gunnedah	S	264.11	264.01	-0.10
DMG1	Deadmans	S	253.46	253.61	+0.15
DMG2	Deadmans	S	248.54	249.47	+0.93
TL1	Gulligal	S	249.96	250.32	+0.36
NR1	Namoi	S	250.92	251.04	+0.12
NR2	Namoi	S	249.64	250.15	+0.51
DMG3	Namoi	S	246.32	246.58	+0.26
CC1	Boggabri	DNR	243.73	243.76	+0.03
CC2	Boggabri	DNR	243.65	243.71	+0.06
B1 [a]	Derby Street	DNR	243.50	243.45	-0.05
B2 [a]	Frome Street	DNR	243.45	243.36	-0.09
B3 [a]	Grantham Street	DNR	243.35	243.07	-0.28
B4a [a]	Clare Street	DNR	243.30	243.02	-0.28
B5a [a]	Caxton Street	DNR	243.20	242.97	-0.23
B6	Brent Street	DNR	243.10	242.97	-0.13
B7	Dalton Street	DNR	242.90	242.79	-0.11
B8a	Boston Street	DNR	242.50	242.50	+0.00
419012	Gauge 419012	P	241.37	241.39	+0.02
NR3	Downstream	S	240.30	240.47	+0.17
NR4	Downstream	S	239.30	239.47	+0.17
NR5	Downstream	W	239.24	239.48	+0.24
NR6	Downstream	S	240.00	239.23	-0.77
BL1	Downstream	S	240.80	240.75	-0.05

D – DNR, 2007 (flood map), S – SMEC, 2003, WRM –2009, P-Pinneena,
[a] peak flood levels controlled by Coxs Creek (not Namoi River).

Table 4.7 – Comparison between surveyed and predicted peak flood levels,1971 event

Surveyed point	Location	Source	Surveyed level (mAHD)	Predicted flood level (mAHD)	Difference (m)
419012	Gauge 419012	P	240.39	240.58	+0.19
A-71	Boggabri	DNR	242.04	242.90	+0.86

The calibration to the A-71 peak flood level is poor. It would appear that this level is not associated with the flood peak. Based on the notes supplied with the DNR flood map of Boggabri (refer WRM (2021), Figure 3.1), the flood extent shown on the map was taken of the 1971 event when the flood level at the Boggabri gauge was 0.4 m below the peak. The predicted flood level and flood extent corresponds very well with the surveyed flood peak and flood extent at this time.

4.3.4 February 1997 event

Figure 4.8 shows the recorded and predicted peak water level hydrographs at the Namoi River at Boggabri gauge for the 1997 event. The predicted water level peak is within 0.11 m of the recorded peak for this event. This was a relatively small Namoi River event that did not overflow between Gunnedah and the proposed Project rail spur. Most flows were generated from Coxs Creek and the local catchments. The Boggabri Flood Study (WRM, 2021) found that the 1997 Coxs Creek event was between a 10% AEP and 5% AEP flood. It is likely that the flood mapping shown in Figure A3 in Appendix A would represent a significant local catchment flood event at the proposed Project rail spur.

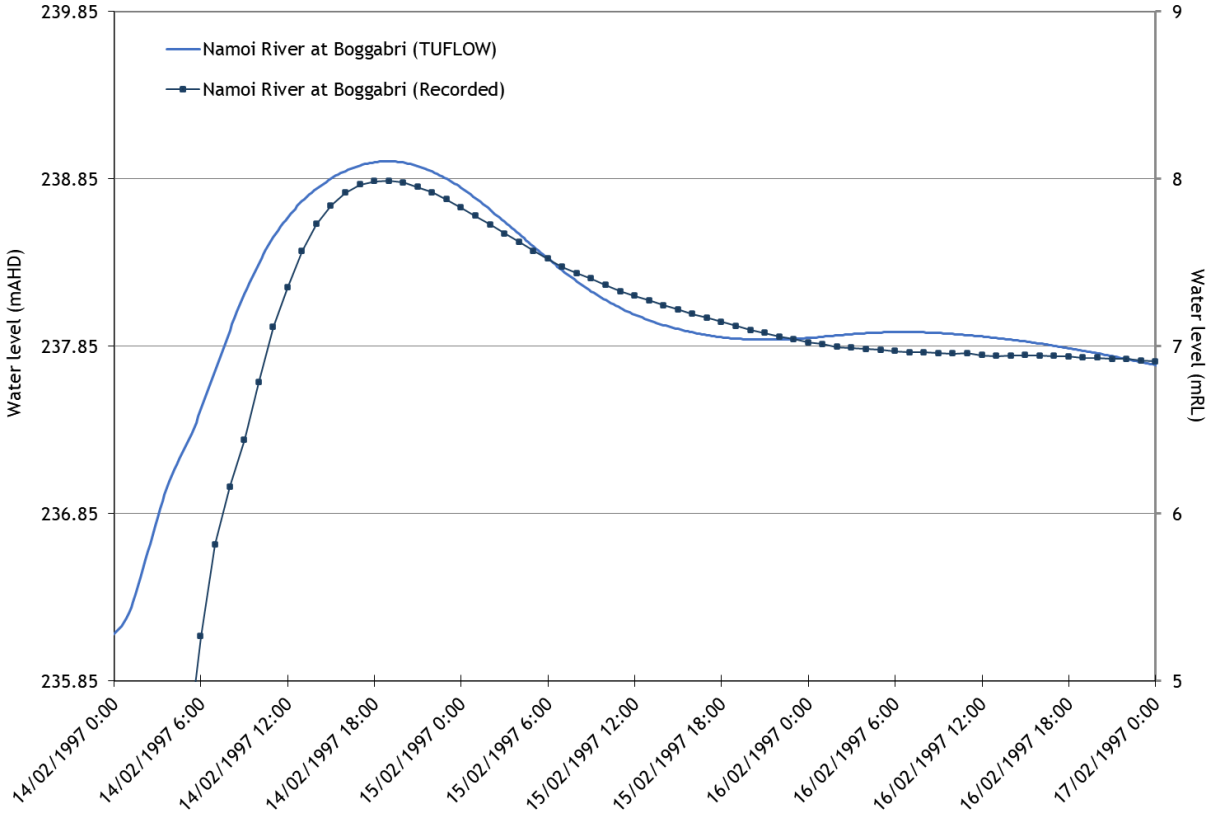


Figure 4.8 – Recorded and predicted Namoi River at Boggabri water level hydrographs, February 1997 event

4.3.5 July 1998 event

Figure 4.9 shows the recorded and predicted peak water level hydrographs at the Namoi River at Boggabri gauge for the 1998 event. Table 4.8 show comparisons of TUFLOW predicted flood levels and the surveyed peak flood across the floodplain for the event. The source of the surveyed flood peaks is also shown. The locations of the gauge and the surveyed peak level are shown in Figure A4 in Appendix A. Note again that there is some uncertainty in the location of each flood mark and there will always be some uncertainty surrounding the survey of a flood mark post the event.

A good calibration was achieved for the 1998 flood with predicted timings and peak flood levels in good agreement with the recorded values at the Namoi River at Boggabri gauge (+0.07 m).

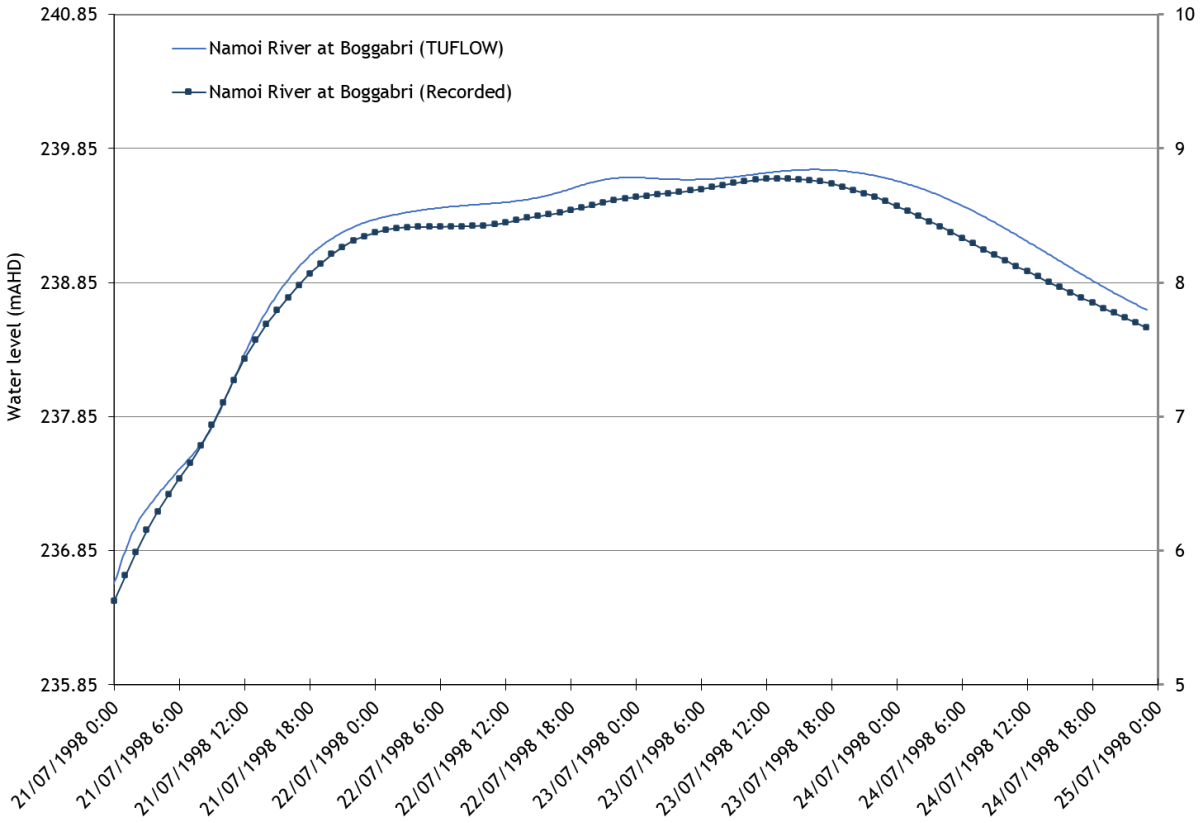


Figure 4.9 – Recorded and predicted Namoi River at Boggabri water level hydrographs, July 1998 event

Table 4.8 – Comparison between surveyed and predicted peak flood levels for the 1998 event

Surveyed point	Location	Source	Surveyed level (mAHD)	Predicted flood level (mAHD)	Difference (m)
419001	Gauge 419001	P	263.72	263.56	-0.17
NR1	Gunnedah	S	261.52	261.56	+0.04
NR3	US	S	253.48	253.46	-0.02
SC2	Stratford	S	250.58	250.56	-0.02
NR4	Namoi D/S	S	248.90	249.19	+0.29
NR5	Namoi D/S	S	245.77	245.83	+0.06
NR6 [a]	DS	S	240.04	240.65	+0.61
NR7 [a]	DS	S	239.66	240.64	+0.98
G2	Gunnedah	S	263.28	262.96	-0.32
G4	US	S	263.38	262.77	-0.61
CC1	Boggabri	S	242.02	242.27	+0.25
CC2	Boggabri	S	242.12	242.27	+0.15
419012	Gauge 419012	P	239.63	239.69	+0.06

[a] appear to be in error; located on the same property at same location

The two surveyed locations NR6 and NR7 are located next to each other on the same property and appear to be in error. The comment provided with NR6 reads “Nail in post at trough, west of house.” The comment provided with NR7 reads “Nail in tree, west of house.” Without these surveyed points, the average difference between the surveyed and modelled peak flood levels is 0.03 m.

4.3.6 November 2000 event

Figure 4.10 shows the recorded and predicted peak water level hydrographs at the Namoi River at Boggabri gauge for the 2000 event. The predicted water level peaks are within 0.29 m and 0.13 m of the recorded peaks for this event, with a reasonable match in hydrograph shape.

Table 4.9 compares the predicted peak flood levels and the surveyed peak flood at the gauge and another location identified by SMEC near Gunnedah. The locations of the gauge and the surveyed peak level are shown in Figure A5 in Appendix A. There is a high level of uncertainty in the estimation of flood levels at the Gunnedah surveyed flood mark because the distribution of flow between the river channel and floodplain is not known and the 2011 photogrammetry data was used for Gunnedah, which has a vertical accuracy of 0.9 m only.

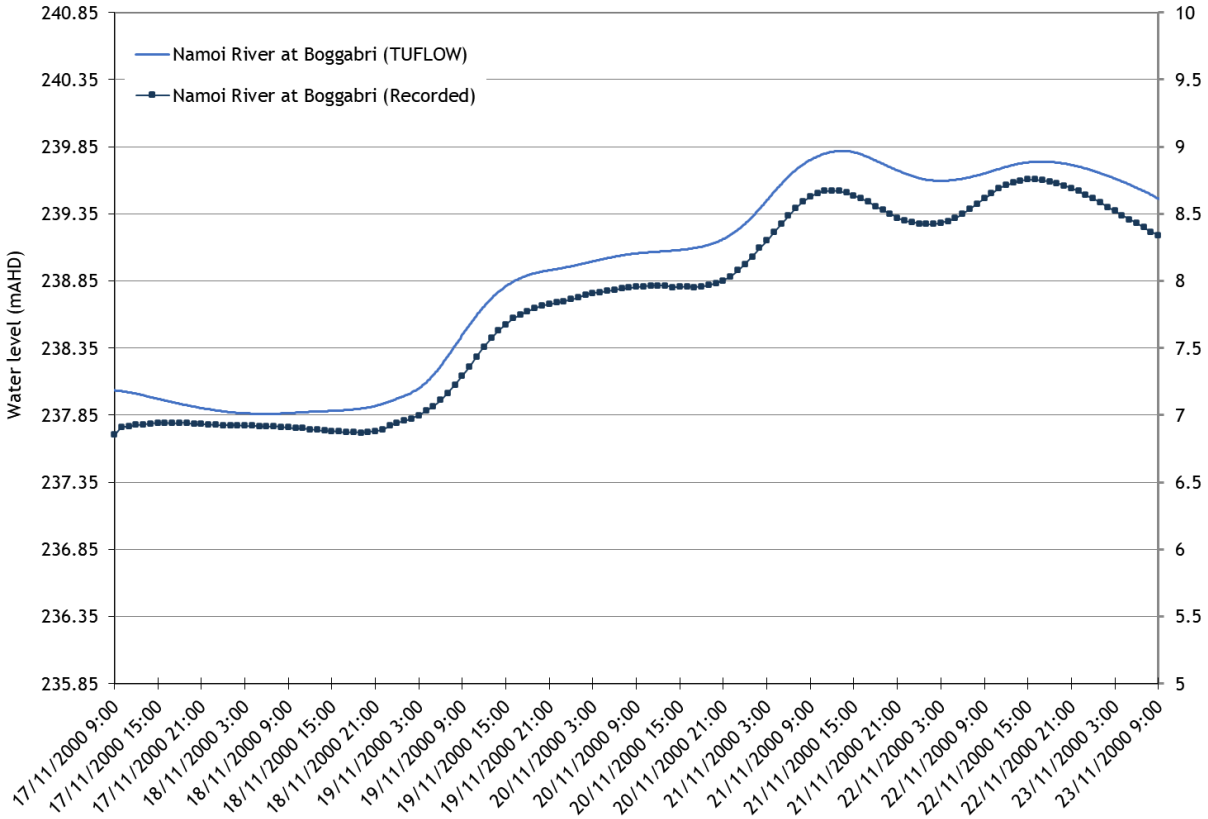


Figure 4.10 – Recorded and predicted Namoi River at Boggabri water level hydrographs, November 2000 event

Table 4.9 – Comparison between surveyed and predicted peak flood levels, 2000 eventU

Surveyed point	Location	Source	Surveyed level (mAHD)	Predicted flood level (mAHD)	Difference (m)
419012	Gauge 419012	P	239.61	239.82	+0.21
G1	Gunnedah	S	263.46	262.79	-0.67

4.3.7 Summary

Table 4.10 shows the predicted peak discharges at the Namoi River at Boggabri gauge using the TUFLOW model for the five calibration events. Overall, the predicted peak discharge corresponds well to the recorded data for all events, which suggests that the infiltration loss parameters adopted for the floodplain between Gunnedah and Boggabri are reasonable.

Table 4.10 – Historical peak discharge comparison for Namoi River at Boggabri (419012)

Event	Peak discharge (m^3/s)		Difference (%)
	Recorded	TUFLOW	
1955	6,270 [a]	6,280	0.2%
1971	3,505 [b]	3,813	8.8%
1997	1,249	1,232	-1.4%
1998	2,255	2,194	-2.7%
2000	2,227	2,260	1.5%

[a] adjusted from 4,247 using WRM rating (see Figure 3.2)
[b] adjusted from 3,199 using WRM rating (see Figure 3.2)

The 1955 event peak discharge at Boggabri in Table 4.10 was based on the adopted reduced peak discharge at Gunnedah of 6,772 m^3/s (as described in Section 4.3.2). The reduced peak discharge provided a much better fit to the surveyed peak flood level data producing a peak discharge of 6,280 m^3/s (+0.2%) at Boggabri.

4.4 EXISTING CONDITIONS MODEL RESULTS

4.4.1 Adopted Namoi River design discharges at Gunnedah

The design discharges in Table 3.3 have been adopted for the assessment, which is based on the FFA using the full period of record without adjustments for the construction of the upstream dams (Keepit, Split Rock and Chaffey). These discharges are potentially conservatively high.

4.4.2 Flood levels

Figure B1 to B3 in Appendix B show the predicted peak flood depths and extents in the vicinity of the Project rail spur for the 20%, 5% and 1% AEP design events, respectively.

The following is of note with respect to existing conditions:

- For the 20% AEP event,
  - the Namoi River does not overflow between Gunnedah and the Project rail spur but overflows downstream via Gulligal Lagoon;
  - flooding along the western floodplain in the vicinity of the Project rail spur is due to local catchment flows only (Collygra Creek and Deadmans Gully), which have been input via the local XP-RAFTS subcatchments;
  - flooding along Stratford Creek is due to Stratford Creek flows and local catchment flows only,
  - flooding along the Ingleburn floodway is shown to commence just upstream of the rail spur due to the location of the inflow boundary. In reality, shallow flooding would extend upstream; and
  - broad overbank flooding occurs from Collygra Creek, which drains both sides of the Werris Creek Mungindi Rail to Deadmans Gully and along the Collygra Creek floodway.
- For the 5% AEP event, the Namoi River overflows onto the eastern floodplain to Stratford Creek as well as to the western floodplain. The floodplain flows are generally shallow except for the Ingleburn floodway, Deadmans Gully and Stratford Creek where flows exceed 1 m deep.

- Existing floodplain infrastructure appears to have a significant impact on flood behaviour for the 5% AEP event, with a significant build-up of floodwater particularly against the levees immediately downstream of the Project rail spur along the Loveridge and Carrigan floodways.
- For the 1% AEP event, floodwater covers much of the floodplain to depths exceeding 1 m, overtopping most of the existing flood works.

Figure 4.11 shows a longitudinal profile of the 1% AEP peak flood depths along the alignment of the project rail spur between the Mungindi Railway line and the Kamilaroi Highway across the western floodplain. Peak flood depths vary from just over 2 m within the Ingleburn Floodway to about 0.5 m. The average flood depth along the alignment is 1 m.

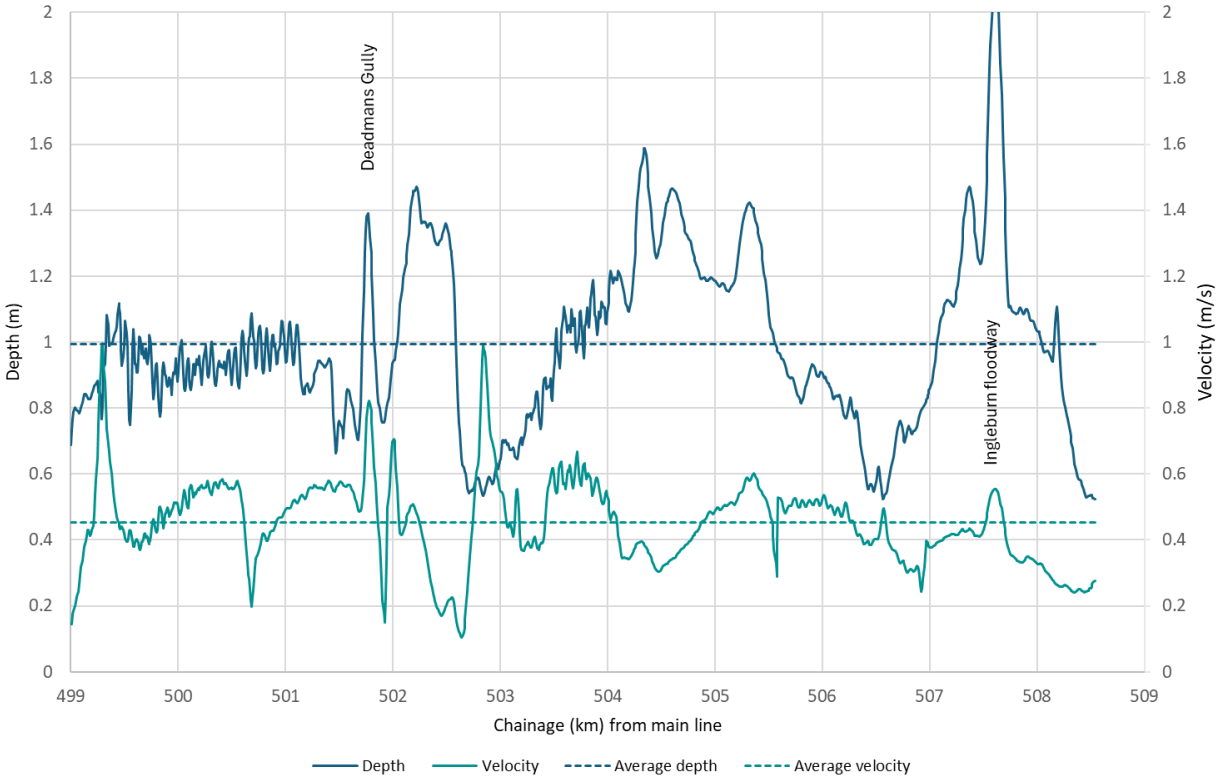


Figure 4.11 – Existing flood depth and velocity along the proposed rail spur west of the Kamilaroi Highway

4.4.3 Flood velocities

Figure B4 to B6 in Appendix B show the predicted peak flood velocities in the vicinity of the Project rail spur for the 20%, 5% and 1% AEP design events, respectively.

The following is of note with respect to existing conditions:

- For the 20% AEP event, peak velocities across the floodplain are generally less than 0.25 m/s with higher velocities along the Namoi River channel.
- For the 5% AEP event, peak velocities vary as follows:
  - between 1 m/s to 2 m/s for the Namoi River channel;
  - between 0.5 m/s and 1 m/s for Stratford Creek, Gulligal Lagoon and the floodways downstream of Gulligal Lagoon;
  - between 0.25 m/s and 0.5 m/s for the Deadmans Gully, Collygra Creek and Ingleburn floodways; and

- generally less than 0.25 m/s for the other areas of floodplain including the Carrigan and Loveridge floodways.

- For the 1% AEP event, the velocities across much of the western floodplain are between 0.25 m/s to 0.75 m/s with the velocities up to 1.2 m/s within Deadmans Gully and Loveridge floodways and in the floodway downstream of Gulligal Lagoon. Higher velocities also occur across the downstream flood works because they are being overtopped and would likely erode.

Figure 4.11 shows a longitudinal profile of the 1% AEP peak flood velocities along the alignment of the project rail spur between the Mungindi Railway line and the Kamilaroi Highway across the western floodplain. The average flood velocity along the alignment is 0.45m/s varying between 0.1 m/s and 1 m/s.

4.5 CLIMATE CHANGE

4.5.1 Overview

The Surface Water Assessment prepared for the Project (Appendix B of the EIS) summarises climate change predictions for the Project region in consideration of the *New England North West Region Climate Change Snapshot (OEH, 2014) and Climate Change in Australia Projections for Australia's Natural Resource Management Regions* (Ekström, M. et al., 2015).

With respect to annual/seasonal rainfall, the predictions indicate that in the near future (2030) natural variability is projected to predominate over trends. Late in the century, climate model results indicate decreasing winter rainfall with high confidence. Decreases are also projected in spring, with medium confidence.

With respect to rainfall intensity, the predictions indicate with high confidence a future increase in the intensity of extreme rainfall events, although the magnitude of the increases cannot be confidently projected. The interim climate change factors for the Namoi River catchment obtained from the ARR Data hub suggests that rainfall intensities would increase by 7.3% for representative concentration pathway (RCP) 4.5 (moderate increase) and by 10.1% for RCP 8.5 (large increase) to 2050.

For this assessment, the rainfall intensities within the XP-RAFTS model were increased by 10.1% to represent the RCP 8.5 (large increase) to estimate local catchment flows in the Namoi River tributaries. The magnitude of any changes in catchment flows for the Namoi River is more uncertain given that no hydrological model has been developed. It was assumed that the Namoi River discharges at Gunnedah would increase by 10% by 2050 to be somewhat consistent with the RCP 8.5 pathway.

Figure B4 in Appendix B show the predicted peak flood depths and extents in the vicinity of the Project rail spur for the 1% plus climate change event.

4.5.2 Climate change impacts

Figure 4.12 shows the 1% AEP peak water levels along the Project rail spur and the potential increases in peak water levels due to the 10% increase in Namoi River flow and local catchment rainfalls expected due to climate change by 2050 (RCP 8.5). Results indicate an increase in peak water levels of up to 0.11 m along the Project rail spur.

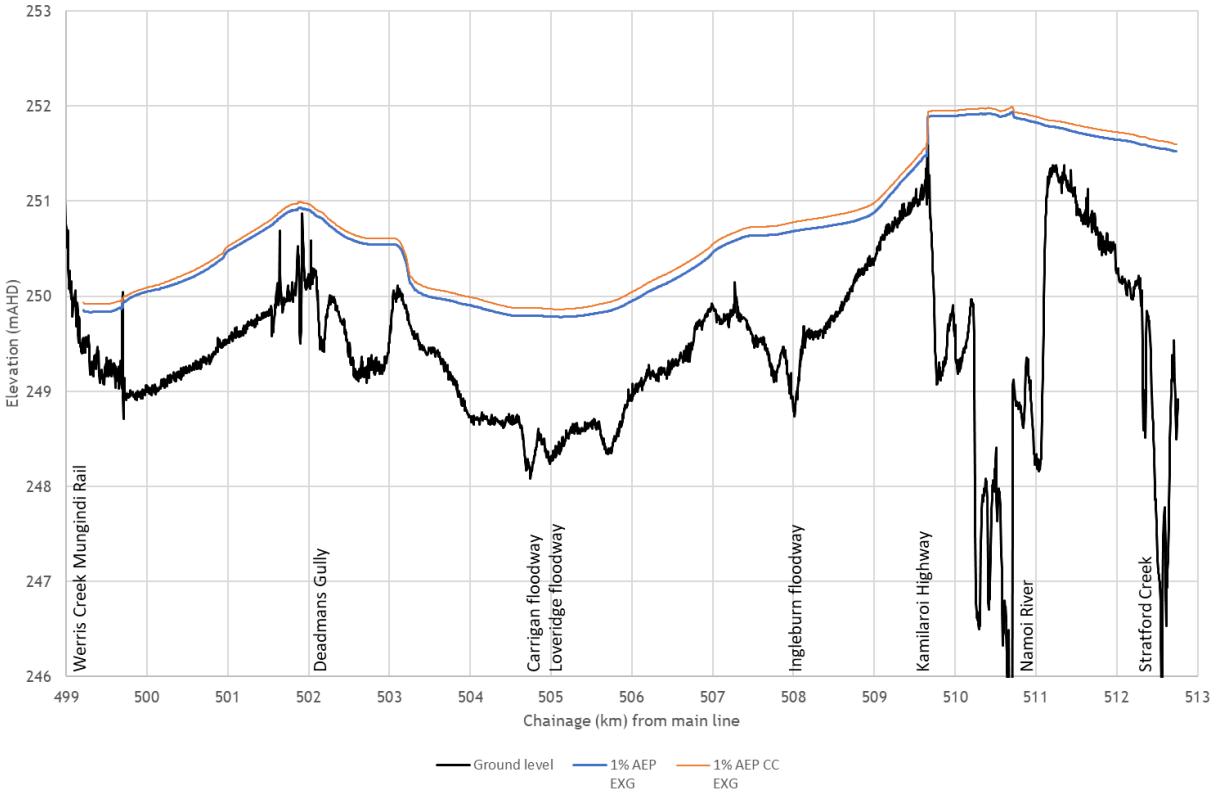


Figure 4.12 – Peak water level along the Project rail spur and potential impacts due to climate change to 2050, 1% AEP event

5 Project rail spur conditions hydraulic modelling

5.1 OVERVIEW

The Project rail spur for the approved EIS and associated development consent conditions were based on a bridge across Stratford Creek and another bridge (viaduct) extending across the Namoi River and the western floodplain. The current design for the Project rail spur consists of similar bridge structures across the Namoi River and Stratford Creek. However, the bridge viaduct structure across the western floodplain is proposed to change to a conventional culvert and embankment design that is continuous across the western floodplain (9.5 km of culverts). The soffit levels of the bridge and culvert structures are proposed to be elevated above the 1% AEP event (to satisfy the development consent condition (B49)) with a further allowance for climate change and settlement.

Figure 5.1 shows the alignment of the proposed Project rail spur and the approximate locations of the bridges and culverts as per the 100% design drawings by BG&E dated 14 August 2023. The proposed Project rail spur is generally along the alignment of the approved rail spur. The rail spur including the bridges and culverts has been designed to an issue for tender level sufficient to demonstrate that the proposed strategy can satisfy the objectives of the FMP. The 100% design drawings of the proposed Project rail spur are given in Appendix F.

The proposed Project rail spur will generally consist of the following:

- the Namoi River bridge that:
  - is 2,195 m long;
  - has a bridge soffit above the 1% AEP with climate change flood level;
  - has a single 1800 mm wide pier headstock sitting on twin 1200 mm diameter piers at 28.15 m spacing; and
  - has 2.57 m high bridge deck and girders between the piers.
- the Stratford Creek bridge that:
  - is 476 m long;
  - has a bridge soffit above the 1% AEP with climate change flood level;
  - has twin 1050 mm diameter piers at 8 m spacing; and
  - has 2.57 m bridge deck and girders between the piers.
- a traditional embankment and ballasted rail to the west of the Namoi River with:
  - a continuous series of 2.4 m wide connected culverts some 9.5 km long across the floodplain to convey the flood flows; and
  - the soffit level of the culverts above the 1% AEP with climate change flood level.
- Four dedicated ramps to allow farm vehicles and animals to cross (to address local landholder requirements).

Further details of the culvert and bridge modelling approach is given below.

An unsealed access road will be constructed adjacent to the rail spur. The access road will be constructed no more than 0.15m in height above the natural surface level to satisfy the requirements of the FMP.

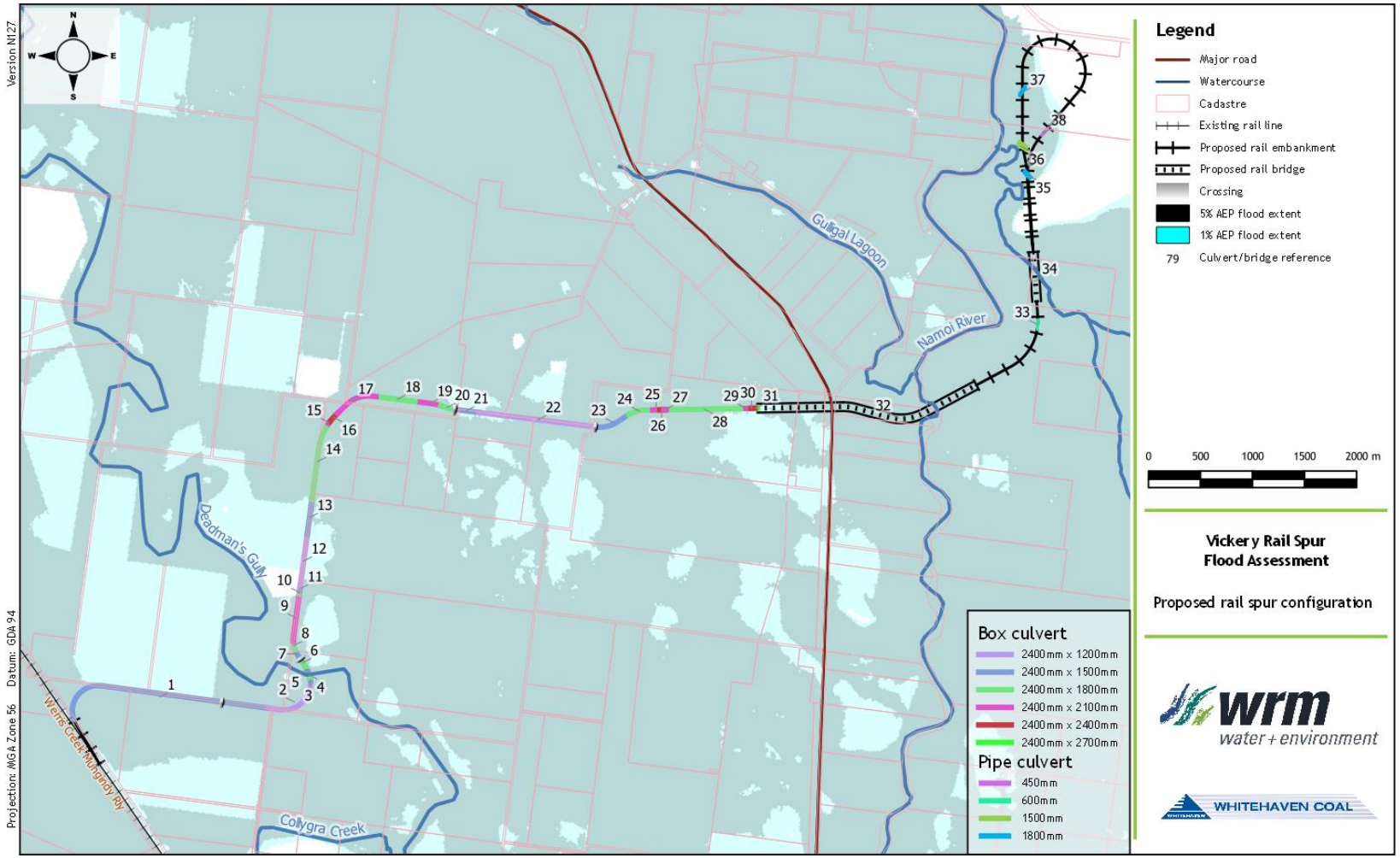


Figure 5.1 – Proposed Project rail spur alignment and culvert and bridge section locations

5.2 RAIL SPUR MODELLING METHODOLOGY

Given the number of culverts and the fact that the culvert soffit will be above the 1% AEP flood levels, the bridges and culvert structures were modelled as layered flow constrictions.

The embankment sections at the ARTC turnout and eastern floodplain were included as a design TIN (provided on 11 August 2023), superimposed by a z-shape to ensure adequate representation of the rail. The top of formation of the embankment is typically 6 m wide with 1V:1.5H ballast batters on 1V:2H embankment batters. The track structure will be placed above the embankment.

Four farm access crossings at indicative locations were included as design TINs in the model (provided on 8 February 2023).

5.2.1 Namoi River and Stratford Creek bridges

Table 5.1 shows the modelled configurations of the Namoi River (ref 32) and Stratford Creek bridges (ref 34). The locations of the bridges are shown in Figure 5.1. The Namoi River bridge will be one single structure that extends across the lower floodplain of the river, across the Kamilaroi Highway and onto the western floodplain.

Bridge structures were modelled as layered flow constrictions within the 2D domain. Layer 1 represents the bridge piers and underside of the bridge. Layer 2 represents the bridge structure and is 100% blocked. Layer 3 represents the handrail, which is not modelled as the bridges are not overtopped for any of the design events assessed.

Piers have been modelled using a form loss coefficient (FLC) determined in accordance with the recommendations in Austroads (2019), assuming single rectangular piers for the Namoi River west section of the bridge where pier heads are close to ground level, and twin circular piers in the remaining sections. An additional 5% blockage has been included to account for miscellaneous debris.

Table 5.1 – Proposed Project rail spur bridge details

Name	Width (m)	Length (m)	Layer 1 (underside of bridge)			Layer 2 (bridge structure)		
			Obvert (mAHD)	% blockage	Form loss	Structure depth (m)	% blockage	Form loss
Namoi River	5.85	2,195	251.64 to 258.53 to 252.09	5	0.099	2.57	100	1.56
Stratford Creek	5.85	476	252.085	5	0.096	2.57	100	1.56

5.2.2 Proposed western floodplain box culverts

Table 5.2 shows details of the proposed culverts across the western floodplain. The culverts will consist of a continuous set of 2.4 m wide reinforced concrete box culverts (RCBC) between the Namoi River bridge and the Mungindi Rail (some 9.5 km long). The height of each culvert set has been determined so that the soffit is above the 1% AEP flood level with consideration of climate change and settlement. That is, the only obstruction for the 1% AEP event would be due to the cross-sectional area of the box culvert leg.

Given this, the culverts have been modelled as 2D lfcsh structures with points defining the rail and culvert soffit levels in 5-metre intervals. Culvert base slabs of 4.1 m width were included in the model and invert levels enforced as z-shapes.

Blockage of the culvert leg (pier) was calculated to range between 12.5% and 13.5% (depending upon the curvature of the embankment based on 2,400 mm spans with typical 160 mm leg width. An additional FLC of 0.351 was adopted based on the culvert leg shape and blockage as recommended in Austroads (2019). This, in effect, double counts the pier losses, to provide a conservative impact assessment for the Project.

Table 5.2 – Proposed western floodplain RCBC culverts

Culvert bank	Start chainage	Indicative length (m)	Number	Dimensions	Slab level
BANK 1	499395	2120	773	2400mm x 1500mm	249 to 249.7
BANK 2	501515	575	213	2400mm x 1200mm	250.1
BANK 3	502095	25	11	2400mm x 1500mm	249.8
BANK 4	502125	65	26	2400mm x 1800mm	249.5
BANK 5	502195	35	15	2400mm x 1500mm	249.8
BANK 6	502235	105	40	2400mm x 1800mm	250.1
BANK 7	502345	85	33	2400mm x 1500mm	249.8
BANK 8	502440	75	28	2400mm x 1800mm	249.5
BANK 9	502515	455	166	2400mm x 2100mm	249.2
BANK 10	502975	25	11	2400mm x 1800mm	249.5
BANK 11	503010	30	14	2400mm x 1500mm	249.8
BANK 12	503045	505	186	2400mm x 1200mm	249.5 to 250
BANK 13	503550	335	124	2400mm x 1500mm	249.2
BANK 14	503890	750	275	2400mm x 1800mm	248.7 to 248.8
BANK 15	504640	20	10	2400mm x 2100mm	248.4
BANK 16	504675	100	38	2400mm x 2400mm	248.1
BANK 17	504780	420	153	2400mm x 2100mm	248.4
BANK 18	505205	425	157	2400mm x 1800mm	248.7
BANK 19	505635	195	72	2400mm x 2100mm	248.4
BANK 20	505835	135	52	2400mm x 1800mm	248.7
BANK 21	505975	220	82	2400mm x 1500mm	249
BANK 22	506200	1165	430	2400mm x 1200mm	249.3 to 249.8
BANK 23	507370	315	116	2400mm x 1500mm	249.6
BANK 24	507690	230	86	2400mm x 1800mm	249.3
BANK 25	507925	60	24	2400mm x 2100mm	249
BANK 26	507990	40	15	2400mm x 2400mm	248.7
BANK 27	508035	15	8	2400mm x 2100mm	249
BANK 28	508055	760	279	2400mm x 1800mm	249.3 to 250.5
BANK 29	508820	45	17	2400mm x 2100mm	250.2 to 250.6
BANK 30	508870	30	13	2400mm x 2400mm	250.3 to 250.6
BANK 31	508905	25	10	2400mm x 2700mm	250.3 to 250.5
Total		9,385	3,477		

5.2.3 Proposed eastern floodplain culverts

Table 5.3 shows the proposed eastern floodplain culvert details. These culverts are all corrugated metal culverts (CMP). The culverts were modelled as single-barrel structures located approximately as shown in Figure 5.1. Invert levels of the culverts were supplied by BG&E and confirmed against the ground survey data. The earthworks design TIN provided on 26 September 2022 included longitudinal drainage along the embankment to direct flows to each culvert.

Eastern culverts were modelled as 1D structures assuming entry and exit loss coefficients of 0.5 and 1.0, respectively. A roughness value of 0.024 and a width contraction coefficient of 1.0 were assumed.

Table 5.3 – Eastern floodplain CMP culvert details

Culvert bank	Start chainage (m)	End chainage (m)	Number	Diameter (mm)
BANK 33	512000	512013	10	600
BANK 35*	513435	513455	4	1800
BANK 36	513710	513750	10	1500
BANK 37	514235	514275	10	1800
BANK 38	516110	516135	20	450

* extends through both embankments

5.2.4 Debris blockage of hydraulic structures

Blockage of hydraulic structures (culverts and bridges) for design events was determined based on guidelines in Book 6 – Chapter 6 of AR&R 2019 (Ball et al., 2019). The following is of note regarding the proposed design blockage factors:

- The adopted blockage factors for culverts and bridges were determined individually depending on the size and configuration of each structure.
- The debris potential classification for structures within the model extent was determined as "Low", based on assessment of the following:
  - An "L_{10}" value of 3 m for the main channel (representing large tree branches) and 0.5 m for the floodplain (representing stubble) were adopted. This was estimated as the average length of the longest 10% of the debris that could potentially contribute to the various areas along the proposed Project rail spur. Given the velocities and extent of vegetation on the floodplain, the use of larger debris could not be justified.
  - The "debris availability" classification was determined as "medium" for the river channel and "low" for the floodplain areas, based on the modelled streams having very flat slopes with stable bed and banks, and floodplains consisting of well-maintained rural lands and paddocks with some state forest areas.
  - The "debris mobility" classification was determined as "low", based on the receiving streams overtopping only infrequently and large, flat catchments.
  - The "debris transportability" was determined as "medium" for the river channel with slightly higher channel velocities and "Low" for the floodplain, based on the bed slopes and stream velocities in the meandering streams being low and the temporal variability of maximum stream flows being low.
- For culverts across the eastern floodplain, the debris potential would be low. However, given that the adopted L_{10} value would be greater than the height of the smaller culverts the following blockage factors were adopted:
  - a blockage factor of 25% for culverts with barrel clear widths of less than 0.6 m ($<L_{10}$); and
  - a blockage factor of 0% was adopted for the remaining culverts.

- For the Namoi River and Stratford Creek bridges, the debris potential would be low requiring no additional blockage for debris noting that the afflux associated with the bridge piers was included as a form loss coefficient (see Table 5.1). However, an additional 5% blockage factor was applied to be conservative.
- For the culverts across the western floodplain (modelled as 2D layered flow constrictions), the debris potential would also be low requiring no additional blockage for debris. Note that the physical cross sectional area blockage of 12.5% to 13.5% is effectively double counts the pier losses. That is, the afflux associated with the culvert legs was included as a form loss coefficient and the physical blockage of the cross sectional area of the culvert leg. In effect, physical cross sectional area blockage could be used to represent a debris blockage factor of 12.5% to 13.5%.

5.3 PROPOSED CONDITIONS MODEL RESULTS

Figure C1 to C4 in Appendix C show the proposed conditions predicted peak flood depths and extents in the vicinity of the proposed Project rail spur for the 20%, 5%, 1% AEP design events and the 1% AEP plus climate change event.

Figure C5 to C8 in Appendix C show the proposed conditions predicted peak flood velocities.

The proposed conditions flood levels, extents and velocities are generally similar to existing conditions.

5.4 VALIDATION OF FORM LOSS COEFFICIENTS ADOPTED FOR THE WESTERN FLOODPLAIN CULVERTS

A HEC-RAS one dimensional model was developed for a typical section of the western floodplain culverts to validate the model results and in particular, the adopted form loss coefficients. The HEC-RAS model was developed to mimic the 1% AEP event floodplain behaviour as close as practical noting that there is a significant variability in depth and velocity (see Figure 4.11). A review of the model results for the 1% AEP event (Appendix C) showed the following:

- The hydraulic gradient of the floodplain flows was approximately 0.05%,
- The average depth of flow within the western culverts is 0.99 m (see Figure 4.11),
- The average velocity of flow within the western culverts is 0.45m/s (see Figure 4.11), and
- The average peak discharge per unit width across the western floodplain is 0.38 m^3/m, which decreases to 0.28 m^3/m along the alignment of the Project Rail spur culverts taking into account the culvert alignment.

The HEC-RAS model consisted of a series of 68.5 m wide cross sections at a constant bed slope of 0.05% and a Manning's 'n' value of 0.05. These values are consistent with the Tuflow modelling and results. A series of 25 culverts, 2.4 m wide, were modelled at 2.74m centres (2 x 0.16m leg width plus 0.02m gap) for a total section width of 68.5 m. The model was run for a no culvert and a culvert scenario to determine the afflux generated by the bridge at the average flow depth and velocity experienced across the floodplain.

A longitudinal profile of the HEC-RAS model showing the peak flood level for the no culvert and a culvert scenario is shown in Figure 5.2. To achieve the average depth and velocity predicted in the TUFLOW model, the average discharge per unit width was increased to 0.47 m^3/s. The results show the afflux (increase in peak water level) of about 0.007 m upstream of the culverts, which is not significant.

As discussed in Section 6.2, this afflux compares reasonably well with the TUFLOW predicted afflux with higher afflux predicted in some locations due to the additional blockage of 12.5% to 13.5% adopted for the assessment.

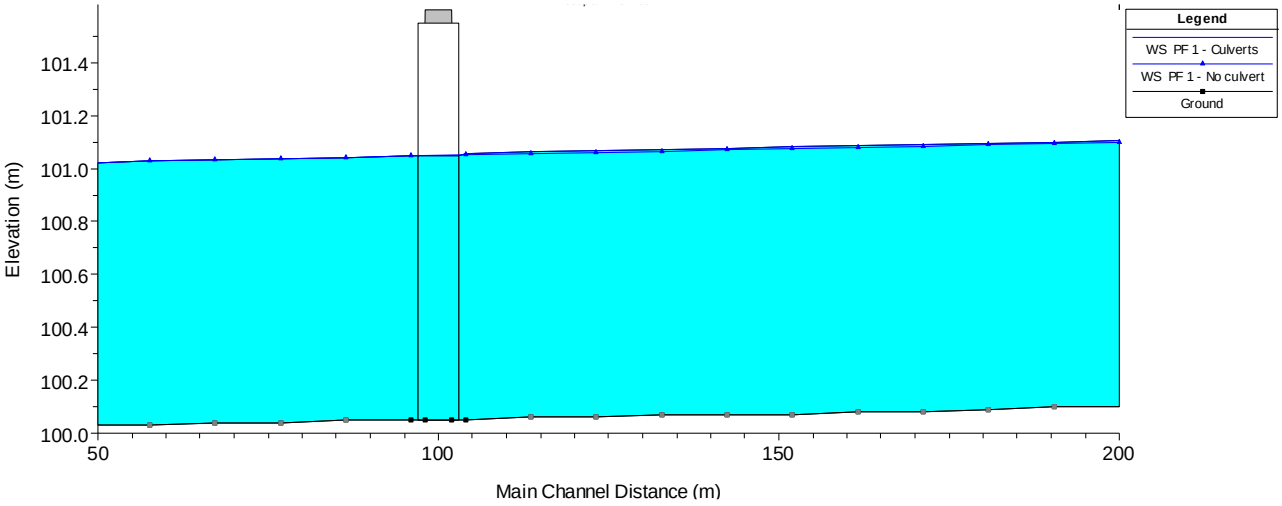


Figure 5.2 – HEC-RAS model 1% AEP longitudinal profile, Western Floodplain culvert validation

5.5 SENSITIVITY TO ADDITIONAL BLOCKAGE

The western floodplain box culverts were modelled assuming a pier form loss coefficient of 0.351 and an additional blockage factor of 12.5% to 13.5%. In response to a request from the peer reviewer, the model was rerun by doubling the blockage factor to 25% (with unchanged form loss coefficients) to test the sensitivity on upstream flood levels. Note that this equates to an additional 1,200 m^2 of blockage for the 1% AEP event when considering the culvert length of 9.5 km and an average flow depth of 1 m.

For the 1% AEP event, the peak flood levels upstream of the rail generally do not change above the proposed conditions levels. A minor increase of 0.005 m (5 mm) was predicted at the rail spur bend adjacent to the Werris Creek Mungindi rail and 0.003 m (3 mm) was predicted at the bend along the Loveridge floodway (refer to Figure 2.1). That is, the model results are not overly sensitive to additional blockage.

6 Flood impact assessment

6.1 OVERVIEW

The proposed Project rail spur has been assessed against the assessment criteria given in the FMP (see Section 2.1.2) using the 20% AEP design event as a representative small flood and the 5% AEP design event as the representative large flood. The impact of the proposed Project rail spur on the 1% AEP design event and the 1% AEP plus climate change has also been assessed.

6.2 IMPACTS ON PEAK FLOOD LEVELS

Figure D1 to D4 in Appendix D show the impact on peak flood levels due to the proposed Project rail spur. The impacts have been determined by subtracting the existing conditions peak flood levels from the proposed conditions peak flood levels. The impacts have been represented on a colour scale with no colour representing a change in level of less than 0.01 m. Dark blue represents a reduction in peak flood level whereas the light blues, greens, yellow and reds represent an increase in peak flood level.

The results show the following:

- For the 20% AEP event,
  - peak flood levels on adjacent landholdings or other landholdings would not change or would be within 0.05 m of existing conditions; and
  - changes in peak flood levels are limited to minor localised areas.
- For the 5% AEP event,
  - peak flood levels on adjacent landholdings or other landholdings would not change or would be within 0.05 m of existing conditions; and
  - an increase in peak flood level above 0.2 m would occur on Whitehaven owned land on the downstream side of the embankment between the Namoi River and Stratford Creek bridges and on the eastern side of the proposed rail loop.

On this basis, the proposed Project rail spur would satisfy the flood level impact assessment criteria.

For the 1% AEP event and 1% AEP plus climate change event, peak flood levels would not increase by more than 0.02 m on any other adjacent landholdings or other landholdings.

6.3 IMPACTS ON HIGH VALUE INFRASTRUCTURE

For this assessment, it has been assumed that high value infrastructure would include inhabited dwellings and potentially trafficability of the highway. The locations of the dwellings are shown in Figure D1 to D4 in Appendix D.

- The Project rail spur would not impact on peak flood levels along the Kamilaroi Highway for any event. The highway is not trafficable for the 5% AEP event under existing conditions.
- There would be no dwellings impacted by the Project rail spur for the 20% AEP and 5% AEP event events. There are a number of dwellings that are surrounded by floodwater under existing conditions for the 5% AEP event, but it is not known if they would be flooded above floor level because floor level data is not available. On this basis, the proposed Project rail spur would satisfy the high value infrastructure impact management rule.
- For the 1% AEP event,
  - there would be one dwelling impacted by the proposed Project rail (dwelling No. 127c). The peak flood depth above ground level would increase from 0.48 m to 0.50 m (0.02 m increase) at this location. Whitehaven has established an agreement with the

owner of dwelling 127c regarding the predicted increase in the 1% AEP flood level (0.02 m).

- The yard at dwelling No. 1z (Whitehaven owned), the peak flood depth above ground level would increase from 0.35 m to 0.36 m (0.01 m increase) but there would be no impact at the location of the actual house or shed.

- For the 1% AEP plus climate change event,
  - Dwelling No. 127c. would be impacted by 0.02 m;
  - Dwelling No. 1z (Whitehaven owned) would be impacted by 0.01 m but again, there would be no impact at the location of the actual house or shed.
  - The uninhabited dwelling No. 1y would be impacted by 0.011 m. The peak flood depth above ground level would increase from 0.90 m to 0.91 m.

6.4 IMPACTS ON FLOOD VELOCITIES

Figure C5 to C8 in Appendix C show the proposed conditions peak flood velocities and the locations where proposed conditions peak flood velocities are more than 50% of the existing conditions peak flood velocities. This was determined by comparing the predicted flood velocities post the construction of the Project rail spur with the existing velocities. The isolated areas of flood velocity increasing by more than 50% are located within the Management Zone BL. Figures 6.1 to 6.3 show these locations together with the management zones and the locations of the adjoining landholdings. The average impact across the adjacent landholdings remain below 50% at all locations predicted and therefore would satisfy clause 45(6)(c)(i) of the FMP.

The results show that peak velocities would generally be unchanged from existing conditions due to the proposed Project rail spur for all three design floods assessed. The isolated areas where the velocity increase would exceed this threshold are at areas of very low velocity under existing conditions.

For the 5% AEP event, the locations where the project conditions peak velocity exceeds the 50% increase threshold, the peak velocities are predicted to be less than 0.35 m/s, which is well below other velocities encountered across the floodplain for this event, with the exception of the following areas:

- At the turnout of the proposed Project rail spur from the Mungindi Railway line, peak velocities would increase from 0.30 m/s to 0.60 m/s due to the confinement between the existing and proposed rail alignments. Scour protection is proposed to manage this increase.
- At the southern and northern Stratford Creek bridge abutments, peak velocities would increase from 0.45 m/s to 1.10 m/s and from 0.24 m/s to 0.92 m/s, respectively. Scour protection around the bridge abutments is proposed to manage this increase.

On this basis, the proposed Project rail spur would satisfy the flood velocity impact management rule.

For the 1% AEP event, peak velocity increases exceed this threshold in the following locations:

- At the turnout of the proposed Project rail spur from the Mungindi Railway line, peak velocities would increase from 0.25 m/s to 0.80 m/s;
- At the southern and northern Stratford Creek bridge abutments, peak velocities would increase from 0.50 m/s to 1.25 m/s and from 0.70 m/s to 1.40 m/s, respectively.

Minor velocity increases occur at the flood fringe, where absolute velocities are near-zero. The increased peak velocity is the same as most locations across the Namoi River floodplain and lower than much of the floodplain both upstream and downstream of the proposed Project rail spur. Given this, the increased flow velocity is likely to have a minimal impact on soil erodibility on the landholding under application or adjacent landholdings.

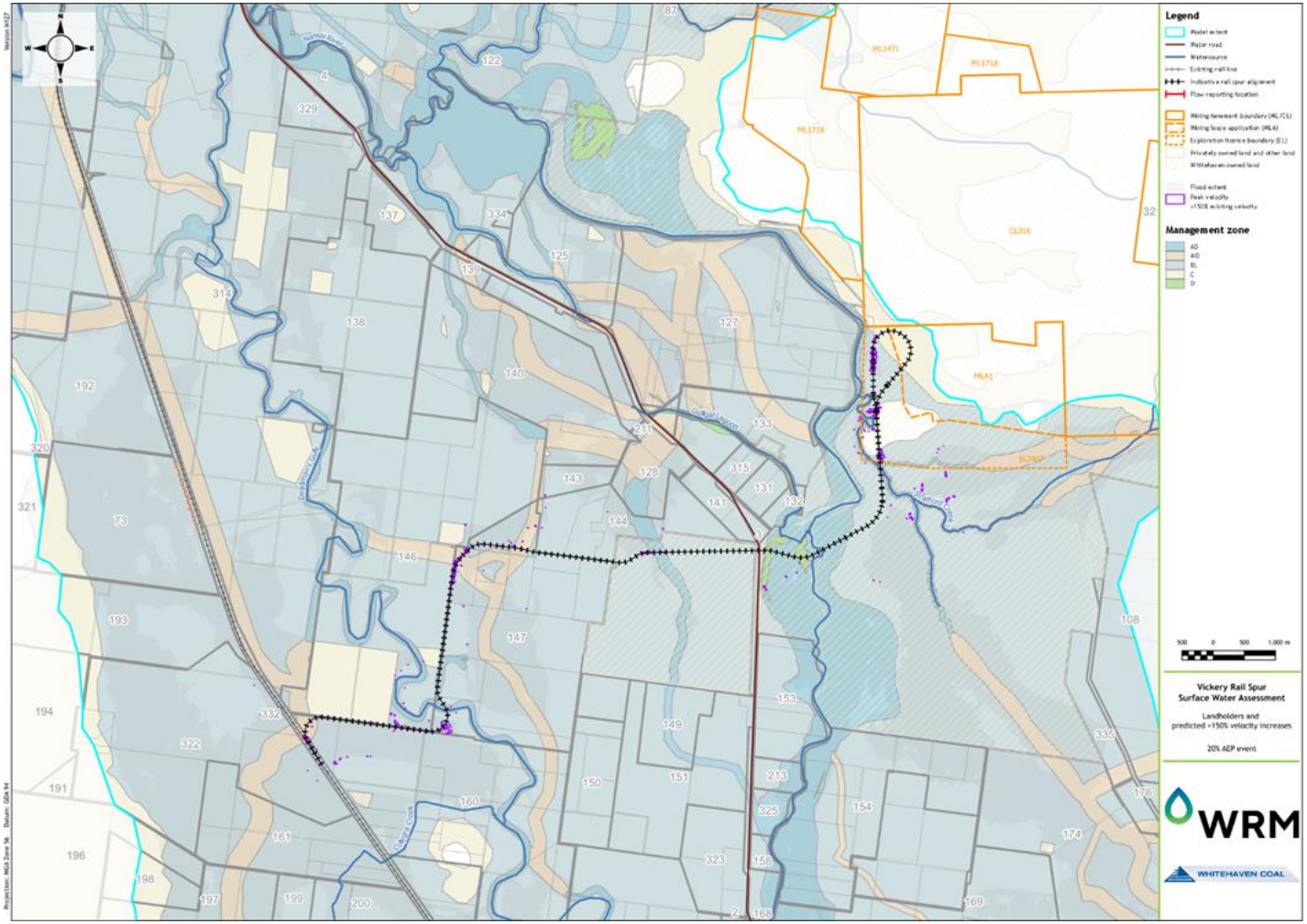


Figure 6.1 – Landholders and predicted >150% velocity increases (20%AEP)

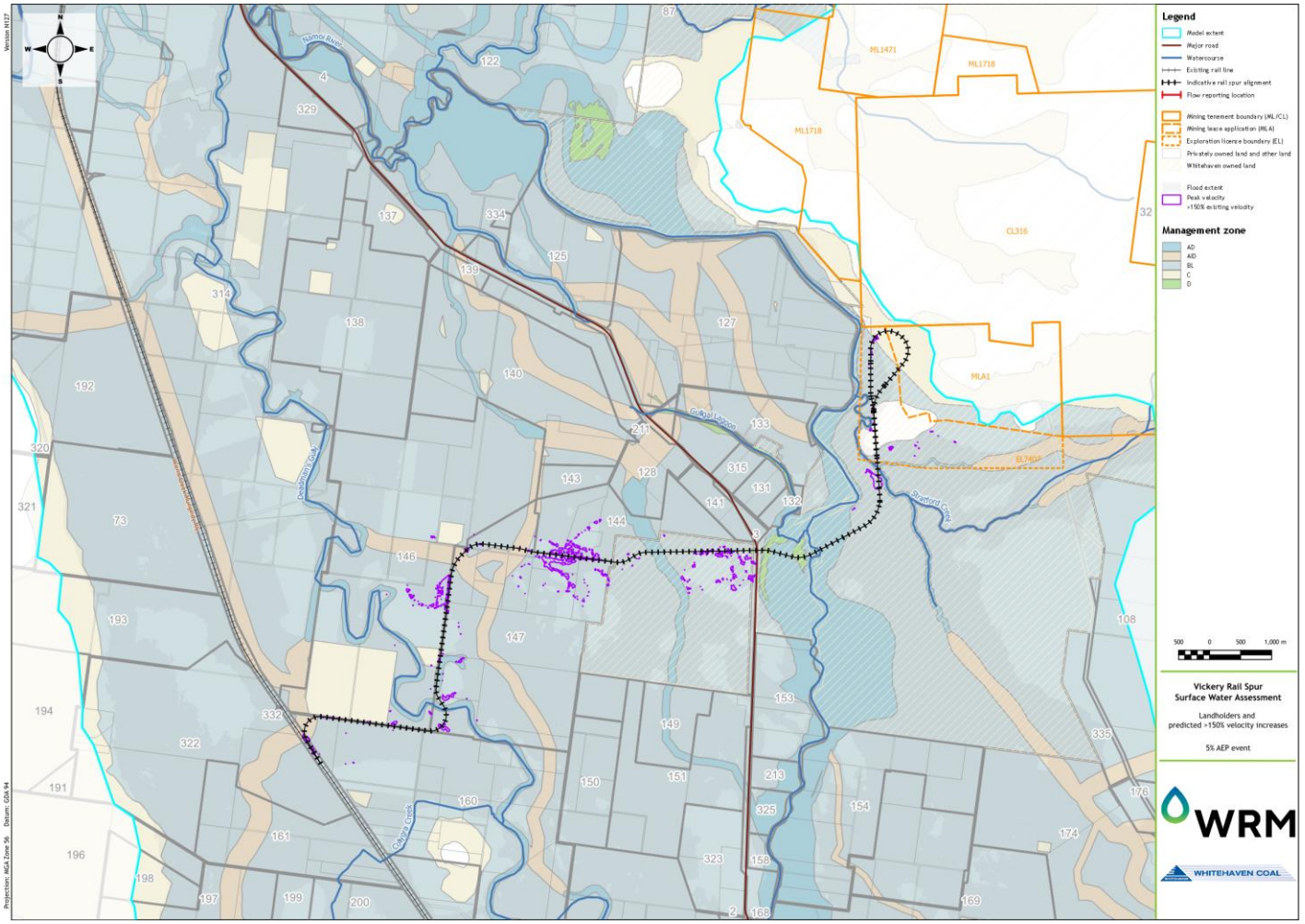


Figure 6.2 – Landholders and predicted >150% velocity increases (5%AEP)

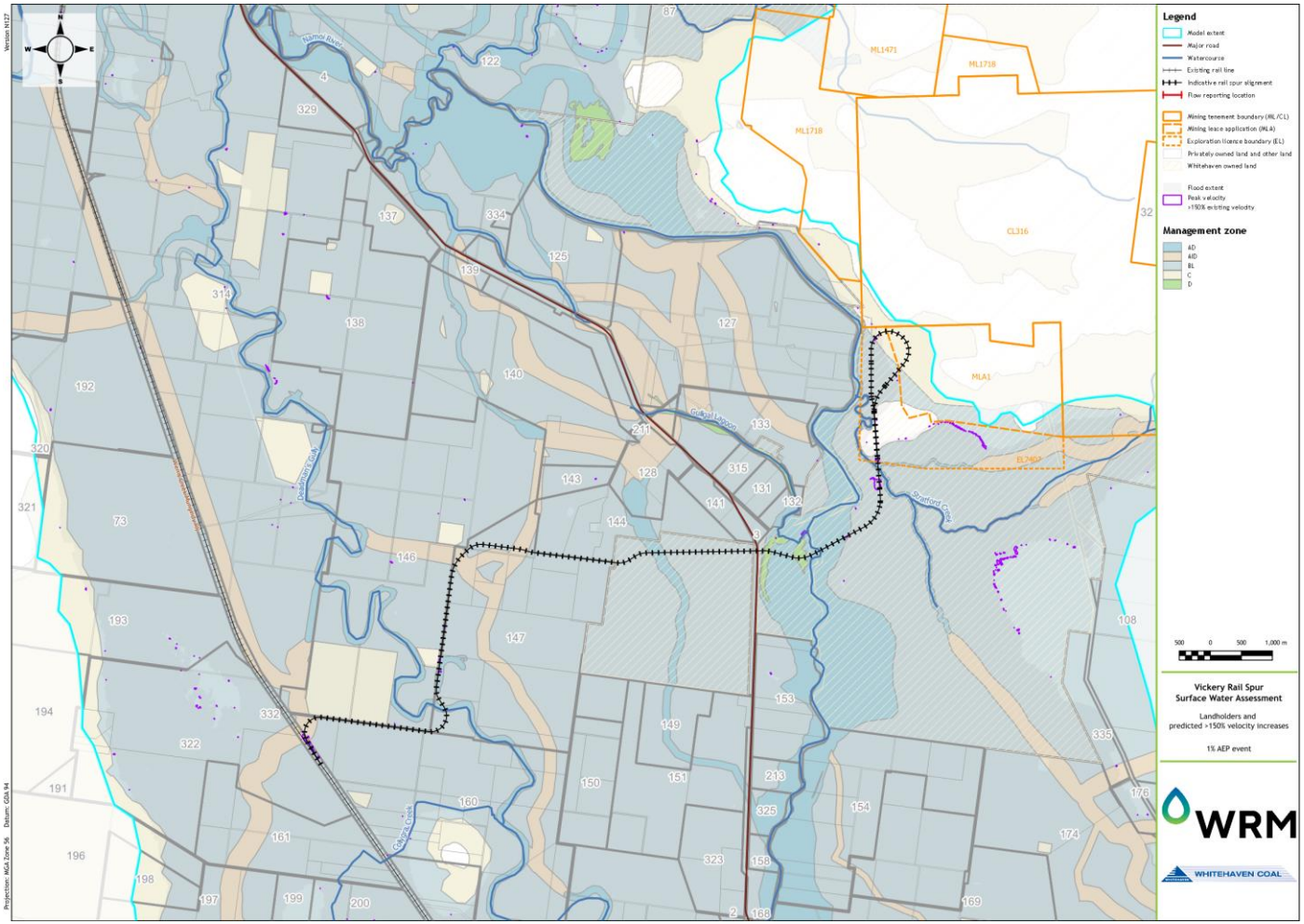


Figure 6.3 – Landholders and predicted >150% velocity increases (1%AEP)

6.5 IMPACT ON FLOW DISTRIBUTION

6.5.1 Across the floodplain

Given the flat nature of the Namoi River floodplain, the FMP has recognised that it is important to maintain the existing distribution of flood flows across the floodplain for both relevant small and large design events. For the purposes of this assessment, the Namoi River floodplain was delineated into the following FMP floodway flow paths:

- Bluevale/Stratford Creek (BV)
- Namoi River (NR)
- Ingleburn floodway (ING);
- Gulligal Lagoon (GL);
- Deadmans Gully (DMG);
- Carrigan Floodway (CA); and
- Collygra Creek (CC).

The floodways and the flow distribution reporting locations are shown in Figure 6.4. The property landholdings (each landholding is identified by a number) are also shown. As shown, the cross sections generally align with the direction of flow, which was mostly offset from the property boundaries and the existing approved levee system.

Table 6.1 shows the distribution of flow at each of the cross section reporting locations along each of the floodways both upstream and downstream of the proposed Project rail spur for existing and proposed conditions and for the three design events. The percentage change in the distribution in flow is also shown.

The results show that flows are not predicted to increase by more than 5% at any flow reporting location. The distribution of flow across the floodplain is not significantly altered by the proposed Project rail spur for the two design events identified in the FMP or for the larger 1% AEP event. On this basis, the proposed Project rail spur would satisfy the flow distribution impact management rule.

6.5.2 On adjacent landholdings

The Department of Climate Change, Energy, the Environment and Water (DCEEW) advised on 3 July 2024, “DCEEW Water supports the peer review comments that the flow distribution lines should be revised to be aligned with property boundaries while maintaining their direction perpendicular to the flow" (DCEEW reference OUT24/9982).

In response to the request from DCEEW, additional flow reporting locations were included in the hydraulic model to assess the flow distribution across individual landholdings.

Reporting locations were generally aligned with the property boundaries. Where required, additional reporting locations were included along the contour lines to ensure reporting was reasonably perpendicular to the direction of flow.

Figure 6.5 shows the locations of the additional flow reporting locations, the property landholdings (each landholding is identified by a number), and the water level contours for the 1% AEP and 5% AEP events. Figure 6.5 – Flow distribution reporting locations at individual landholdings

Table 6.2 shows the distribution of flow at each of the cross section reporting locations both upstream and downstream of the proposed Project rail spur for existing and proposed conditions and for the three design events. The percentage change in the distribution in flow is also shown. The flow reporting IDs have been aligned with the landholding reference numbers.

The results show that flows are not predicted to increase by more than 5% at any flow reporting location. The distribution of flow would not result in a consequential effect to neighbouring properties for the two design events identified in the FMP or for the larger 1% AEP event. On this basis, the proposed Project rail spur would satisfy the flow distribution impact management rule.

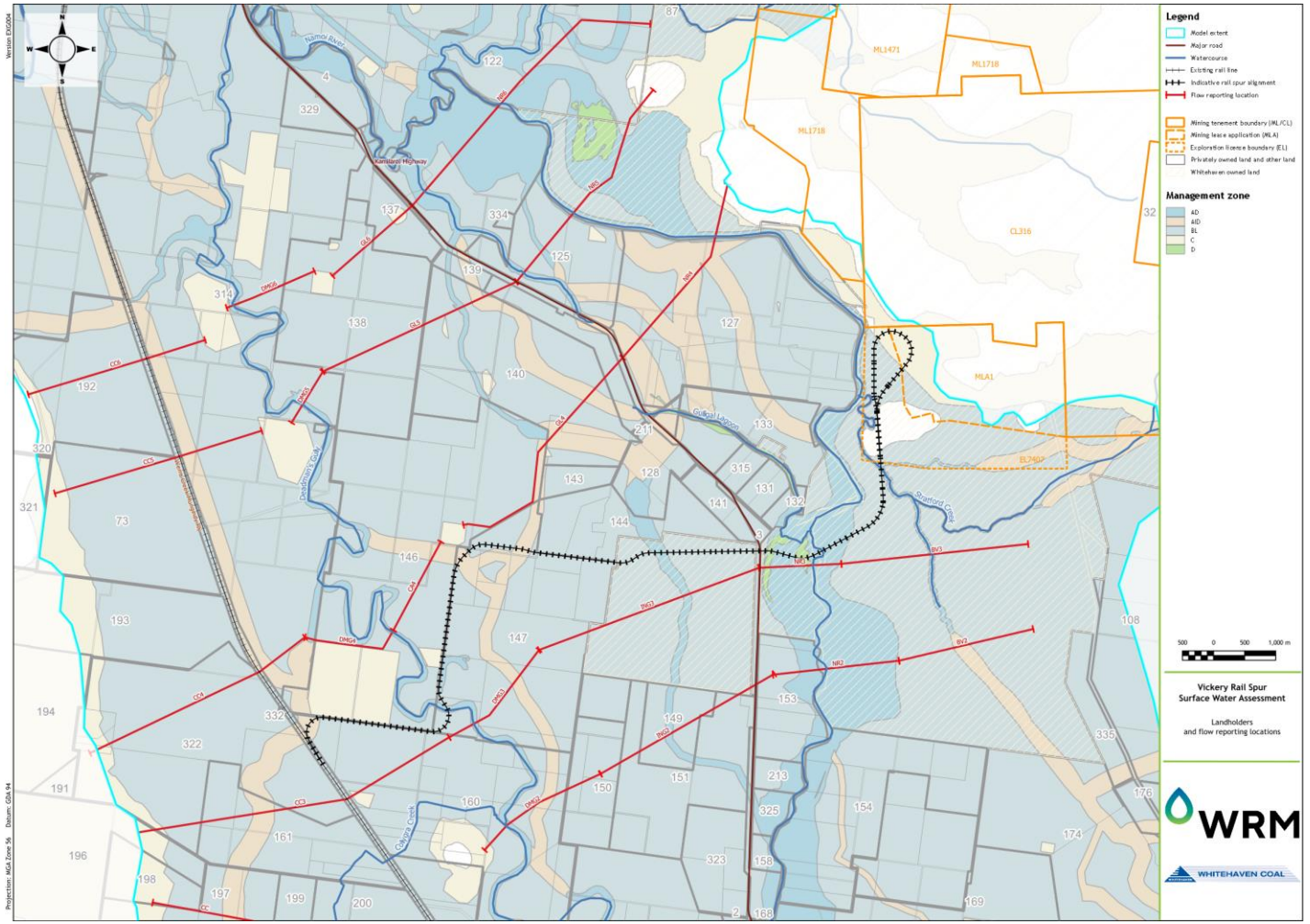


Figure 6.4 – FMP Management Zones, flow distribution reporting locations across the floodplain

Table 6.1 – Floodway flow distributions and differences between existing and proposed conditions

5Y				20Y				100Y			
ID	Existing	Proposed	Diff (%)	ID	Existing	Proposed	Diff (%)	ID	Existing	Proposed	Diff (%)
CC	49.1	49.1	0%	**CC**	105	105	0%	**CC**	249	249	0%
CC3	47.7	47.7	0%	**CC3**	129	129	-0.2%	**CC3**	764	764	-0.1%
CC4	39.7	39.9	0.6%	**CC4**	85.0	85.0	0.1%	**CC4**	620	620	0%
CC5	21.7	21.8	0.5%	**CC5**	45.6	45.7	0.1%	**CC5**	677	677	0%
CC6	12.1	12.2	0.6%	**CC6**	30.3	30.3	0.2%	**CC6**	616	616	0%
DM2	20.2	20.2	0%	**DM2**	125	125	0%	**DM2**	1,579	1,579	0%
DMG3	14.9	14.9	0%	**DMG3**	84.8	85.2	0%	**DMG3**	1,019	1,020	0.1%
DMG4	14.4	14.2	-1.6%	**DMG4**	47.2	47.5	0.5%	**DMG4**	358	358	-0.1%
DMG5	11.4	11.2	-1.5%	**DMG5**	42.0	42.6	1.4%	**DMG5**	334	335	0.6%
DMG6	9.4	9.4	-0.7%	**DMG6**	33.3	33.7	1.2%	**DMG6**	529	532	0.6%
CA4	0.08	0.07	-19%	**CA4**	16.7	17.2	3.4%	**CA4**	542	544	0.4%
ING2	0	0	0%	**ING2**	46.9	47.4	1.2%	**ING2**	992	995	0.2%
ING3	5.7	5.7	0%	**ING3**	31.2	31.8	1.9%	**ING3**	1,181	1,190	0.7%
GL4	36.2	36.3	0%	**GL4**	365	369	0.9%	**GL4**	2,040	2,054	0.7%
GL5	25.9	25.9	0%	**GL5**	328	331	1.0%	**GL5**	2,328	2,339	0.5%
GL6	4.7	4.7	0%	**GL6**	60.2	61.7	2.4%	**GL6**	1,008	1,011	0.3%
NR2	868	868	0%	**NR2**	2,173	2,172	0%	**NR2**	3,272	3,270	-0.1%
NR3	858	858	0%	**NR3**	2,128	2,125	-0.1%	**NR3**	2,836	2,831	-0.2%
NR4	802	802	0%	**NR4**	1,856	1,851	-0.3%	**NR4**	2,969	2,951	-0.6%
NR5	787	787	0%	**NR5**	1,865	1,860	-0.3%	**NR5**	3,086	3,071	-0.5%
NR6	802	802	0%	**NR6**	2,110	2,107	-0.1%	**NR6**	4,179	4,171	-0.2%
BV2	31.0	31.0	0%	**BV2**	93.1	93.2	0.1%	**BV2**	629	629	0%
BV3	28.1	28.1	0%	**BV3**	125	127	1.7%	**BV3**	871	866	-0.5%

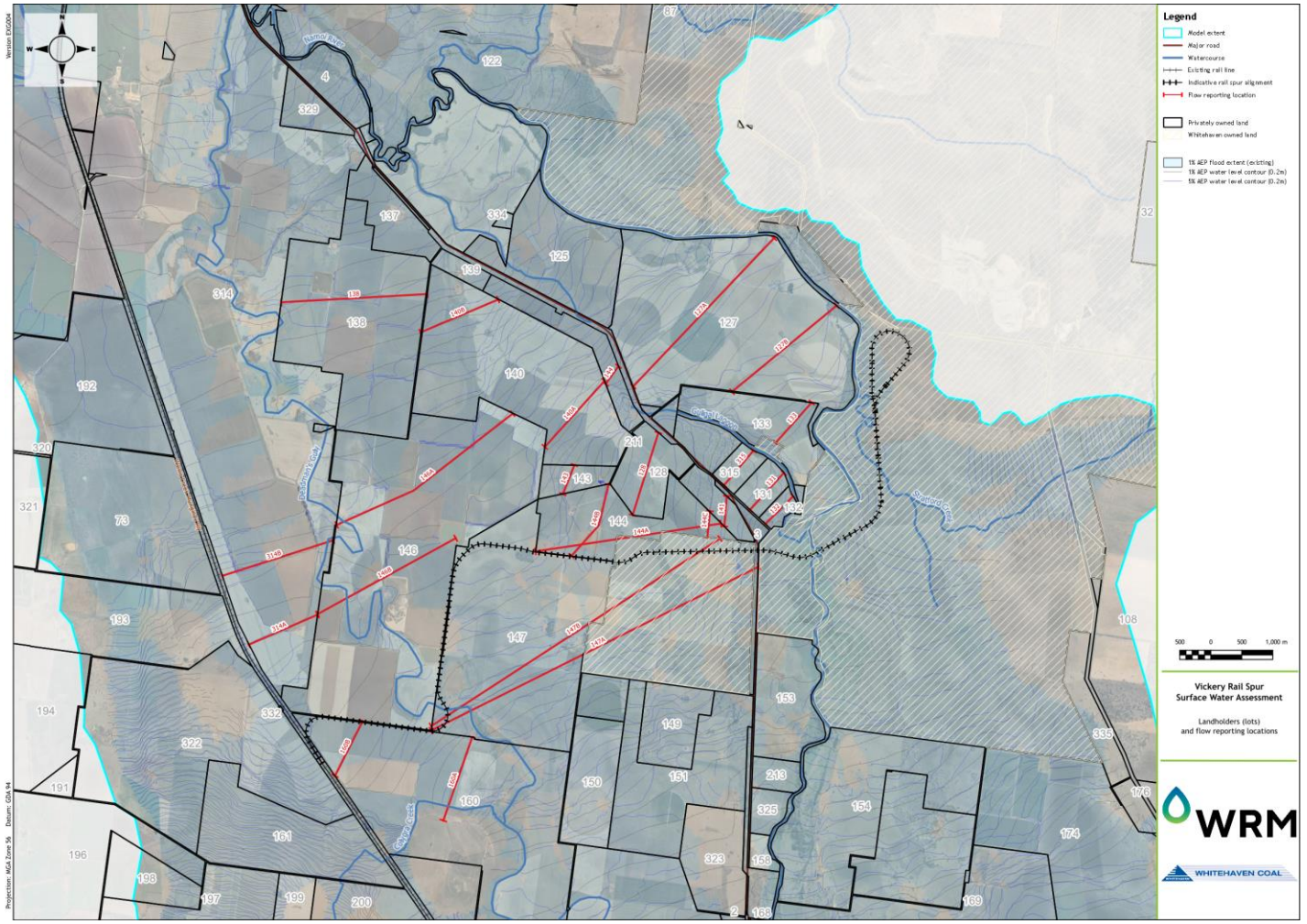


Figure 6.5 – Flow distribution reporting locations at individual landholdings

Table 6.2 – Landholding flow distributions and differences between existing and proposed conditions

5Y				20Y				100Y			
ID	Existing	Proposed	Diff (%)	ID	Existing	Proposed	Diff (%)	ID	Existing	Proposed	Diff (%)
127A	129	129	0%	127A	991	988	0%	127A	2,086	2,071	-1%
127B	96.4	96.4	0%	127B	764	762	0%	127B	1,748	1,739	-1%
128	2.3	2.3	0%	128	240	243	1%	128	720	728	1%
131	2.3	2.3	0%	131	88.0	89.9	2%	131	266	270	1%
132	26.1	26.1	0%	132	198	200	1%	132	411	415	1%
133	0.0	0.0	0%	133	178	182	3%	133	531	552	4%
138	0.2	0.2	0%	138	47.5	48.7	2%	138	1,337	1,343	0%
140A	27.9	27.9	0%	140A	215	217	1%	140A	640	646	1%
140B	25.8	25.8	0%	140B	314	317	1%	140B	1,204	1,210	0%
141	0.0	0.0	0%	141	63.4	64.3	1%	141	153	156	1%
143	3.9	3.9	0%	143	130	132	1%	143	355	358	1%
144	6.0	6.0	0%	144	15.3	15.4	0%	144	43	43	1%
144A	7.5	7.5	0%	144A	46.2	47.1	2%	144A	887	899	1%
144B	0.3	0.3	0%	144B	62.2	63.8	3%	144B	549	555	1%
144C	0.0	0.0	0%	144C	40.9	41.6	2%	144C	119	121	2%
146A	16.7	16.6	-1%	146A	240	243	1%	146A	2,025	2,035	1%
146B	10.8	10.6	-2%	146B	58.6	59.2	1%	146B	769	771	0%
147A	20.1	20.1	0%	147A	119	120	1%	147A	2,248	2,256	0%
147B	20.0	20.0	0%	147B	116	116	1%	147B	2,254	2,263	0%
160A	6.3	6.3	0%	160A	49.0	49.0	0%	160A	658	659	0%
160B	7.1	7.3	3%	160B	32.2	31.9	-1%	160B	283	283	0%
314A	18.1	18.3	1%	314A	30.6	30.6	0%	314A	527	527	0%
314B	21.0	21.1	0%	314B	44.0	43.9	0%	314B	634	634	0%

6.6 IMPACT ON CONNECTIVITY AND FISH PASSAGE

The proposed Project rail spur has been designed to satisfy the connectivity requirements of the FMP. Bridges are proposed across the main water features of the Namoi River and Stratford Creek. Although not material to fish passage, each of the floodways identified in the FMP are connected by large box culverts that have inverts at ground level to convey flood flows without impounding or redirecting floodwater.

The proposed Project rail spur has been designed to satisfy the fish passage requirements of the FMP. The culvert and bridge structures will be designed in accordance with DPI Fisheries Policy and Guidelines for Fish Habitat Conservation and Management (Update 2013) (DPI Fisheries 2013).

The proposed Project rail spur crosses an area of Management Done D located on the lower Namoi River floodplain just to the south of Gulligal Lagoon (seeFigure 6.6). These Management Zone D locations contain little to no remnant vegetation but have been identified as a semi-permanent wetland in the FMP that would potentially provide a ponded refuge for short periods following flood events. These locations are not connected to the flood dependent woodland vegetation associated with Gulligal Lagoon.

Figure 6.6 shows the locations of the proposed piers within Zone AD (piers shown to scale). As can be seen, the piers will have no material impact on connectivity within Zone AD.

6.7 IMPACT ON HERITAGE VALUES

The aboriginal cultural heritage and historic heritage values along the proposed Project rail spur were defined and assessed for the Project EIS. Given that the proposed alignment is generally consistent with the Project EIS alignment, the adopted mitigation, management and monitoring measures detailed in the EIS will be adopted for the proposed Project rail spur.

6.8 IMPACT ON DRAINAGE TIMES

The proposed Project rail spur has been designed with culvert levels set at the surrounding ground levels with minor swale drains constructed either side of the proposed Project rail to ensure that local catchment runoff free drains and does not pond water.

To assess the impact on drainage times, the flood modelling run time was extended for five days past the flood peak to determine time through the simulation that the floodplain depths fell below 0.1 m under existing and proposed conditions. The results show that there are no drainage impacts at any adjacent landholdings and other landholdings for the three design events. Figure 6.7 and Figure 6.8 show the pre and post development hydrographs at key reporting locations downstream of the Project rail spur (refer Figure 6.4) for the 5% AEP and the 1% AEP design events, respectively, indicating that drainage times would not be adversely affected as a result of the proposed Project rail spur.

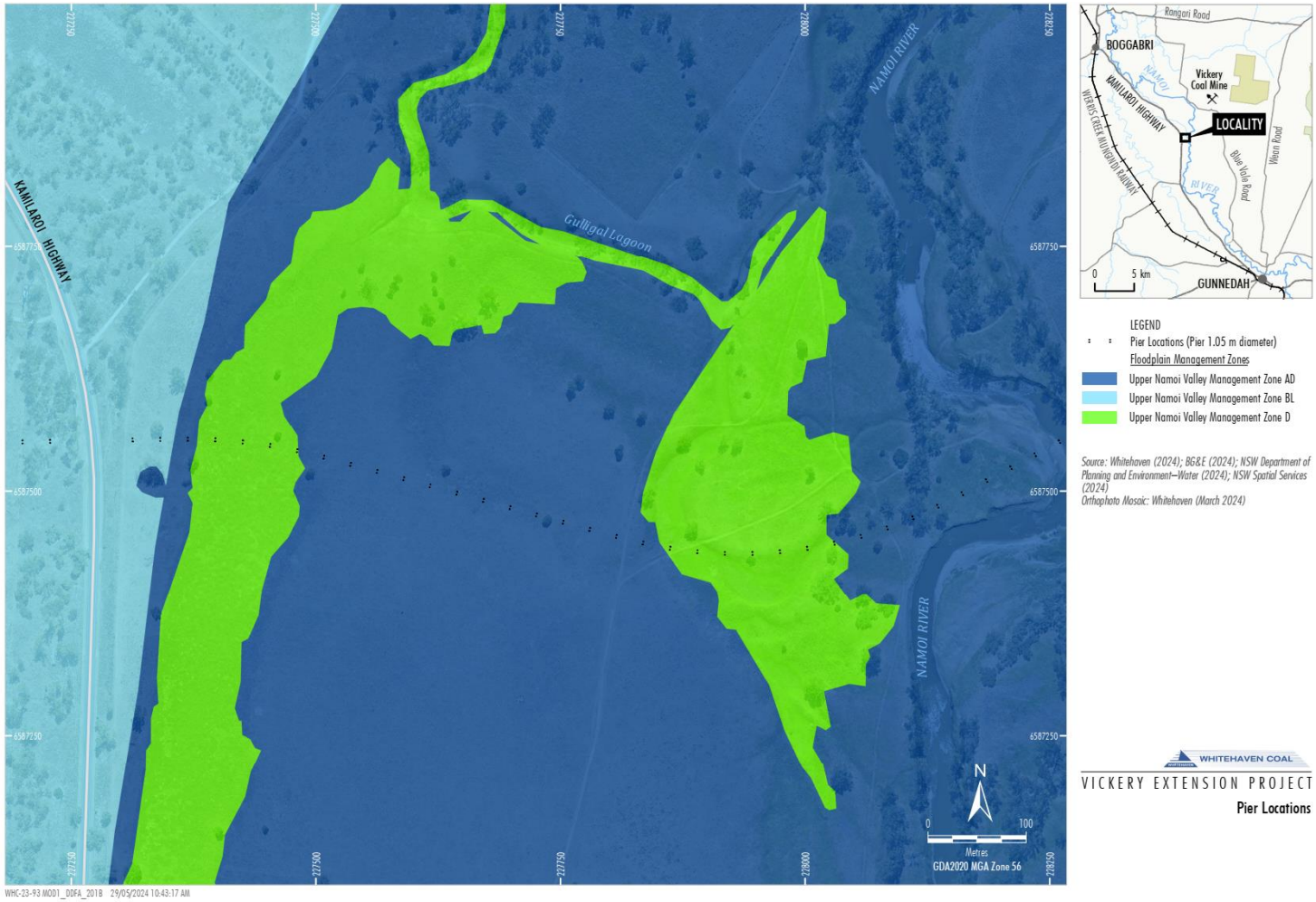


Figure 6.6 – Location of piers within Zone AD

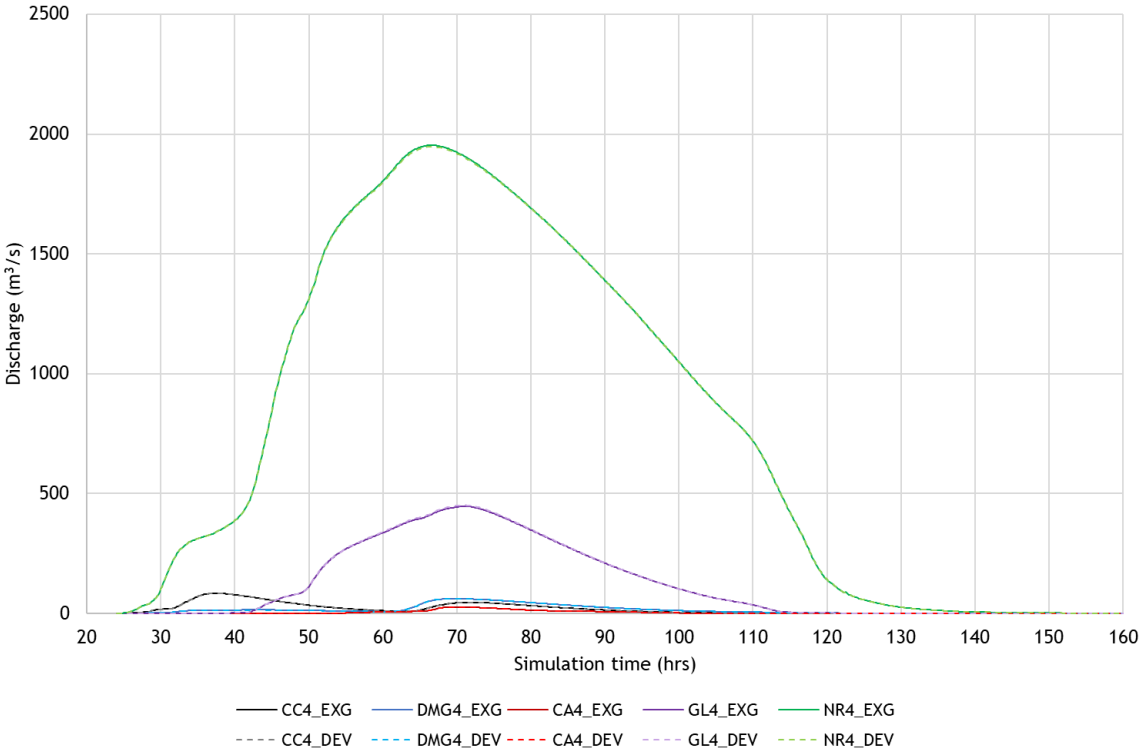


Figure 6.7 – Comparison of drainage times (existing and developed conditions) downstream of the Project rail spur, 5% AEP event

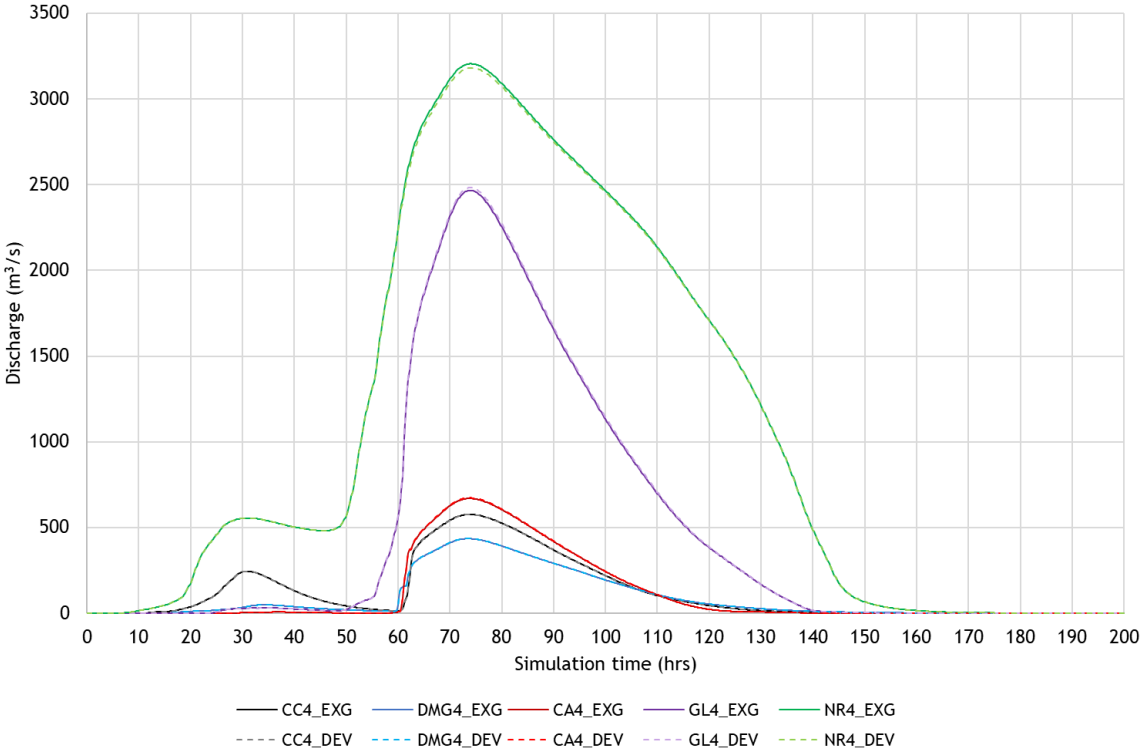


Figure 6.8 – Comparison of drainage times (existing and developed conditions) downstream of the Project rail spur, 1% AEP event

6.9 ASSESSMENT AGAINST PREDEVELOPMENT CONDITIONS

The assessment comparing the Project rail spur against existing conditions with all floodplain infrastructure in place showed negligible impact across the western floodplain and only minor impacts on the eastern floodplain. On this basis, it is expected that similar impacts would occur for Project conditions minus pre-development conditions compared to existing conditions minus pre-development conditions.

As shown in Figures C2 and C3 in Appendix C, the existing (approved) floodplain infrastructure, particularly on the western floodplain, would likely exceed the flood impact thresholds in the FMP. As a result, a no worsening of the existing conditions flooding has been adopted for the Project rail spur design in this area. There is less floodplain infrastructure adjacent to the Namoi River where some (very minor) impacts are proposed.

On this basis, the proposed Project rail spur would not make the existing conditions impacts any worse compared to predevelopment conditions.

7 Summary of findings

The Project rail spur crosses the Namoi River floodplain including its associated floodways and tributaries. The design includes bridges over the Namoi River and Stratford Creek and a continuous set of culvert structures some 9.5 km long to the west of the Namoi River that have soffits above the 1% AEP flood. The proposed alignment and design are generally in accordance with the design that was approved as part of the EIS.

The Project rail spur is located on the declared floodplain of the Upper Namoi Valley defined under the *Water Management (General) Regulation 2011*. The NSW Government's FMP for the Upper Namoi Valley Floodplain sets out objectives, rules and assessment criteria to coordinate the approval of new flood works or amendments to existing flood works on the floodplain (noting that the Project would not require a flood work approval under the *Water Management Act 2000* due to section 4.41 of the Environmental Planning and Assessment Act 1979).

The flood assessment was undertaken using the updated flood models that were originally developed for the Vickery Extension EIS (EIS). The hydrological model was updated to be consistent with the Boggabri Flood Study model parameters and revised to provide greater detail of the study area. Local catchment design event hydrology was devised in accordance with the latest ARR guidelines. Namoi River design discharges, estimated using the flood frequency analysis (FFA) methodology, were updated to incorporate all available flow data back to 1864, extending the flow dataset used in the EIS by some 100 years. The inclusion of additional data (and further validation of the historical peak discharges) reduced the estimated 1% annual exceedance probability (AEP) design discharge at the rail by some 27% from the EIS.

The hydraulic model was extended to the township of Gunnedah and updated to include soil infiltration losses (to match flood volume losses between Gunnedah and Boggabri). The latest modelling techniques using sub-grid-sampling were used to improve the floodplain topography resolution. All floodplain levees were included as identifiable structures. The model was then calibrated to five historical flood events using data from the streamflow gauges and surveyed flood marks across the floodplain, providing a significantly improved model calibration compared to that given in the EIS.

The proposed Project rail spur has been assessed against the assessment criteria given in the Floodplain Management Plan (FMP) using the 20% AEP design event as a representative small flood and the 5% AEP design event as the representative large flood. The rail spur has further been assessed against the 1% AEP and 1% AEP with climate change design floods.

The existing conditions flooding characteristics in the vicinity of the Project rail spur are summarised as follows:

- For the 20% AEP event, the Namoi River does not overflow upstream of the Project rail spur but overflows downstream via Gulligal Lagoon. Peak flows on the western floodplain are generated by local catchment flows only with velocities generally less than 0.25 m/s.
- For the 5% AEP event, the Namoi River overflows to inundate the eastern and western floodplains to shallow depths with the exception of deeper flows over 1 m along the Stratford Creek, Ingleburn floodway and Deadmans Gully. Peak velocities on the western floodplain vary from 0.25 m/s to 0.5 m/s.
- For the 1% AEP event and 1% AEP plus climate change events, floodwater covers much of the floodplain to depths exceeding 1 m and overtops most of the existing flood works. The velocities across much of the western floodplain are between 0.5 m/s to 0.75 m/s, with peak velocities up to 1.3 m/s within Deadmans Gully and Loveridge floodways and in the floodway downstream of Gulligal Lagoon. Higher velocities also occur across the downstream flood works, which would suggest they are overtopped and will likely erode.

The Project rail spur described in this study has been designed to satisfy the objectives and assessment criteria of the FMP. The location and configurations of the Project rail spur will be refined as part of detailed design following landholder and regulator consultation.

A summary of the potential impacts of the proposed Project rail spur design is outlined below.

- For the 20% AEP event,
  - peak flood levels on adjacent landholdings or other landholdings would not change or would be within 0.05 m of existing conditions; and
  - changes in peak flood levels are limited to minor localised areas.
- For the 5% AEP event,
  - peak flood levels on adjacent landholdings or other landholdings would not change or would be within 0.05 m of existing conditions; and
  - an increase in peak flood level above 0.2 m would occur on Whitehaven owned land on the downstream side of the embankment between the Namoi River and Stratford Creek bridges and on the eastern side of the proposed rail loop.
- Peak flood levels would not increase by more than 0.02 m on adjacent landholdings or other landholdings for the 1% AEP event.
- There would be no dwellings impacted for the 20% AEP or the 5% AEP events.
- There would be no change to peak flood levels or the trafficability of the Kamilaroi Highway.
- One dwelling would potentially be impacted by the proposed Project rail spur for the 1% AEP event by up to 0.02 m and another uninhabited dwelling impacted by up to 0.01 m by the 1%AEP plus climate change event.
- Peak velocities would generally be unchanged from existing conditions due to the proposed Project rail spur for all design events assessed. The isolated areas where the velocity increase would exceed this threshold are at locations areas of very low velocity under existing conditions or are adjacent to the rail where scour protection is proposed.
- The distribution of flow between the various floodways would not increase by more than 5% for any of the events investigated.
- The proposed Project rail spur has been designed to satisfy the connectivity and fish passage requirements of the FMP.
- There would be no change to the drainage times more than 12 hours across the floodplain due to the Project Rail spur for any of the events investigated.

Overall, the proposed Project rail spur would satisfy the objectives of the FMP.

- The orderly passage of floodwaters through the Upper Namoi Valley Floodplain has been maintained.
- The risk to life and property from the effects of flooding due to the rail spur have been minimised.
- The flood connectivity to wetlands, other floodplain ecosystems, and areas of groundwater recharge have been maintained.
- The ecological assets and values of the Upper Namoi Valley Floodplain have been maintained.
- The cultural, heritage and spiritual features of the Upper Namoi Valley Floodplain that are significant to Aboriginal people and other stakeholders have been maintained.

8 References

Askew, 2020	*'Vickery Coal Extension Project – Further Peer Review of Flood Assessment'*, prepared for NSW Department of Planning, Industry and Environment by WMAwater, 2020.
Askew, 2023	*'Vickery Coal (SSD-7480-PA-) Post Approval Review'*, prepared for NSW Department of Planning, Industry and Environment by WMAwater, 2023.
Austroads, 2019	*'Guide to Bridge Technology Part 8: Hydraulic design of Waterway Structures' Austroads Pty Ltd 2019*
Ball et al., 2019	*'Australian Rainfall and Runoff – A Guide to Flood Estimation'*, Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors), © Commonwealth of Australia (Geoscience Australia), 2019.
BMT, 2020	TUFLOW (software), BMT, version 2020-01-AB, 2020.
DNR, 2006	*'Carrol to Boggabri Floodplain Management Plan'*, NSW Department of Natural Resources, Sydney NSW, September 2006.
DOI, 2019	'Background document to the Floodplain Management Plan for the Upper Namoi Valley Floodplain 2019—Appendices', NSW Department of Industry May 2019
Ekström, M. et al., 2015	Climate Change in Australia Projections for Australia's Natural Resource Management Regions: Cluster Reports, eds. Ekström, M. et al., CSIRO and Bureau of Meteorology, Australia.
Geoscience Australia, 2019	AR&R Data Hub (software), Geoscience Australia, Version 2019_v1, April 2019, <http://data.arr-software.org/>.
Innovyze, 2019	XP-RAFTS (software), Innoyvze, Version 2018.1.3, 2019.
Kinhill, 1991	*'Narrabri Flood Study: Final Report'*, Kinhill Engineers Pty Ltd, NSW, May 1991.
NSW Department of Industry, 2019	'Background document to the Floodplain Management Plan for the Upper Namoi Valley Floodplain 2019'. State of NSW through the Department of Industry.
NSW DPIE, 2021	*'eSPADE v2.1'*, NSW and Department of Planning, Industry and Environment, <https://www.environment.nsw.gov.au/eSpade2Webapp>, November 2021.
NSW Government, 2005	*'Floodplain Development Manual – the management of flood liable land'*, New South Wales Government, Department of Infrastructure, Planning and Natural Resources, NSW, April 2005.
OEH, 2014	*'New South Wales Climate change snapshot'*, New South Wales Government, Office of Environment and Heritage, NSW, November 2014.
NSW Government, 2019	'Floodplain Risk Management Guide: Incorporating 2016 Australian Rainfall and Runoff in studies', NSW Government, Office of Environment and Heritage, NSW, January 2019.
NSW OEH & NSW DPI, 2016	*'Floodplain Management Plan for the Upper Namoi Valley Floodplain'*, New South Wales Office of Environmental Heritage and New South Wales Department of Infrastructure, 2016.

SEED, 2019 'The Central Resource for Sharing and Enabling Environmental Data in NSW (SEED)', NSW Government, <https://geo.seed.nsw.gov.au>, June 2020.

SMEC, 1999 'Gunnedah and Carrol Floodplain Management Study', Gunnedah Shire Council, December 1999.

SMEC, 2003 *'Carroll to Boggabri Flood Study and Compendium of Data'*. SMEC Australia Pty Ltd: Report prepared for the Department of Land and Water Conservation.

WMA Water, 2019 *'Review of ARR design Inputs for NSW Final Report'*, Report prepared for the NSW Office of Environment and Heritage by WMA Water, February 2019.

WRM, 2009 *'Continuation of Boggabri Coal Mine – Namoi River Flood Impact Assessment'* Report prepared for Hansen Bailey on behalf of Boggabri Coal Pty Limited by WRM Water & Environment Pty Ltd, December 2009

WRM, 2018 *'Vickery Extension Project Flood Assessment'*, Report prepared for Whitehaven Coal Limited by WRM Water & Environment Pty Ltd, August 2018.

WRM, 2021 *'Boggabri Flood Study'*, Report prepared for Narrabri Shire Council by WRM Water & Environment Pty Ltd, January 2021.

WRM, 2023a *'Vickery Rail Spur Existing Conditions Flood Assessment'*, Report prepared for Whitehaven Coal Limited by WRM Water & Environment Pty Ltd, January 2023.

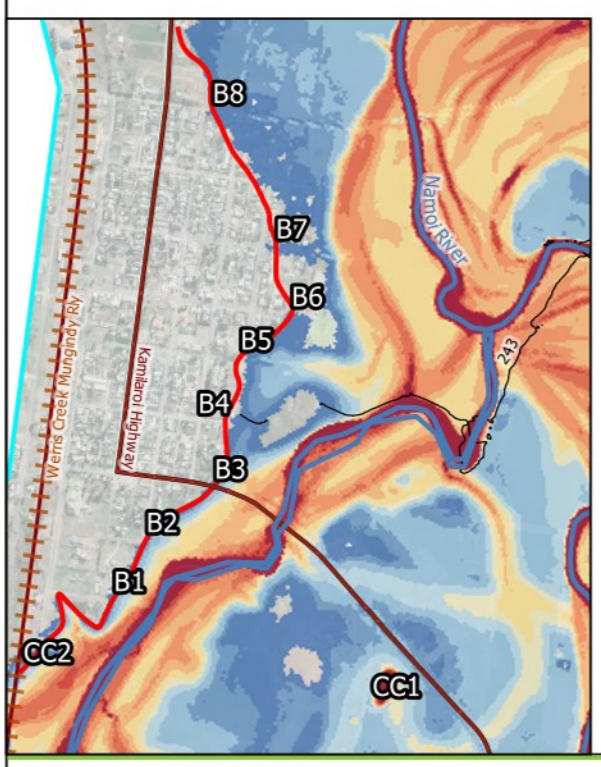
WRM, 2023b *'Vickery Rail Spur (35% design) Flood Assessment'*, Report prepared for Whitehaven Coal Limited by WRM Water & Environment Pty Ltd, March 2023.

Appendix A - Hydrodynamic model calibration event flood depths, extents and levels

N
W
E
S

Kamilaroi Highway

NR6
NR4
NR5
BL1
NR3
Kamilaroi Highway
419012
B8
B7
B5
B6
B2
CC2
B1
CC1
Boggabri
DMG3
Namoi River
NR2
NR1
TL1
Wems Creek Mungindy Rly
DMG2
DMG1
Gunnedah
419001
G2
G1



Legend

- Model code boundary
- Major road
- Existing rail line
- Watercourse
- AB1 Flood mark reference
- DNR flood extent 1955

Peak depth (m)

- 0.00 m - 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m

Water level contour (1m interval)

Projection: AMG Zone 55 Datum: AGD 66

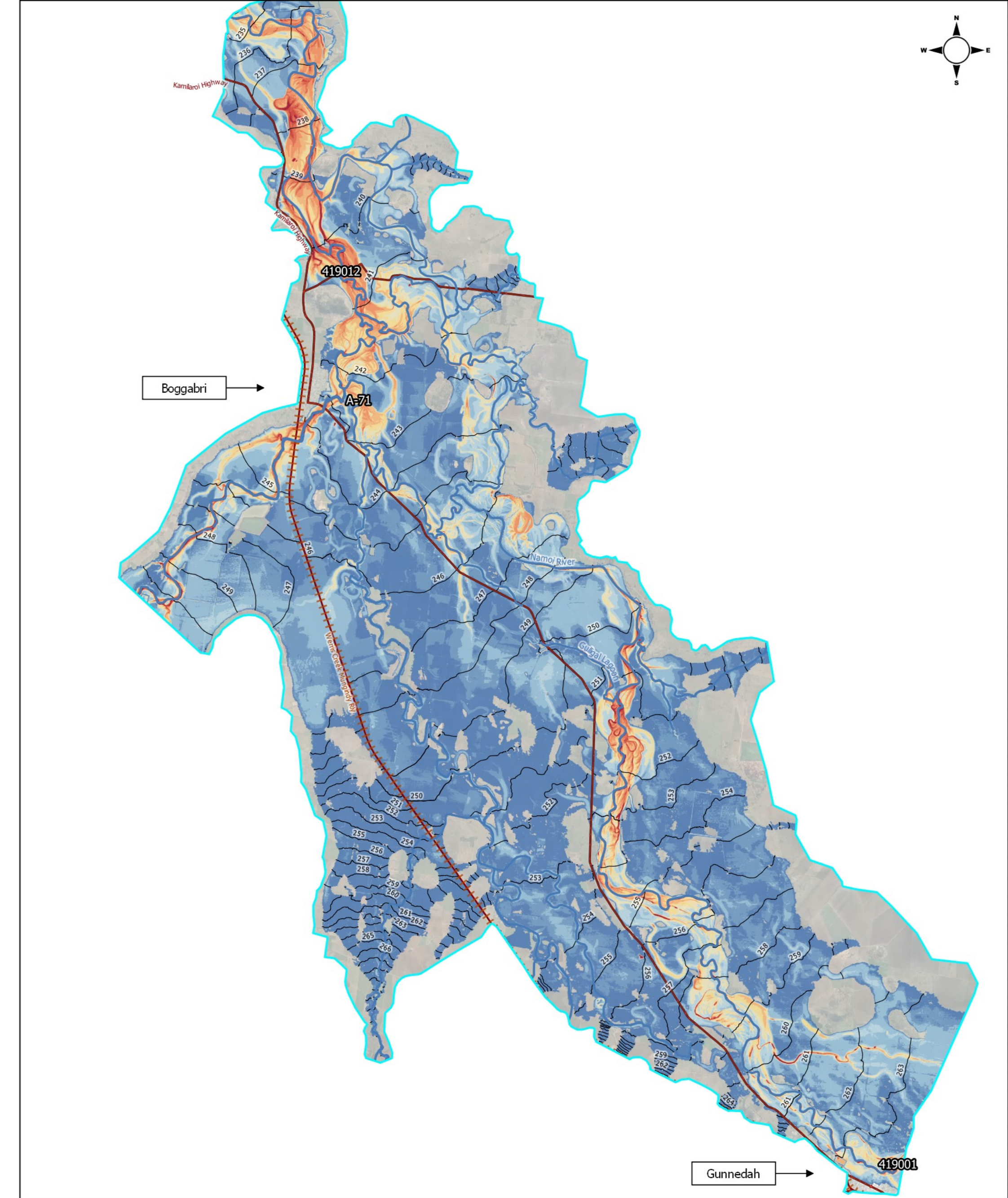
Vickery Rail Spur Flood Assessment
Figure A1

Predicted flood extent, level and depth
1955 calibration event (reduced inflow)

0 2 4 6 8 10 km

wrm water + environment

WHITEHAVEN COAL



Legend

- Model code boundary
- Major road
- Existing rail line
- Watercourse
- AB1 Flood mark reference

Peak depth (m)

- 0.00 m - 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m

Water level contour (1m interval)

Projection: AMG Zone 55 Datum: AGD 66

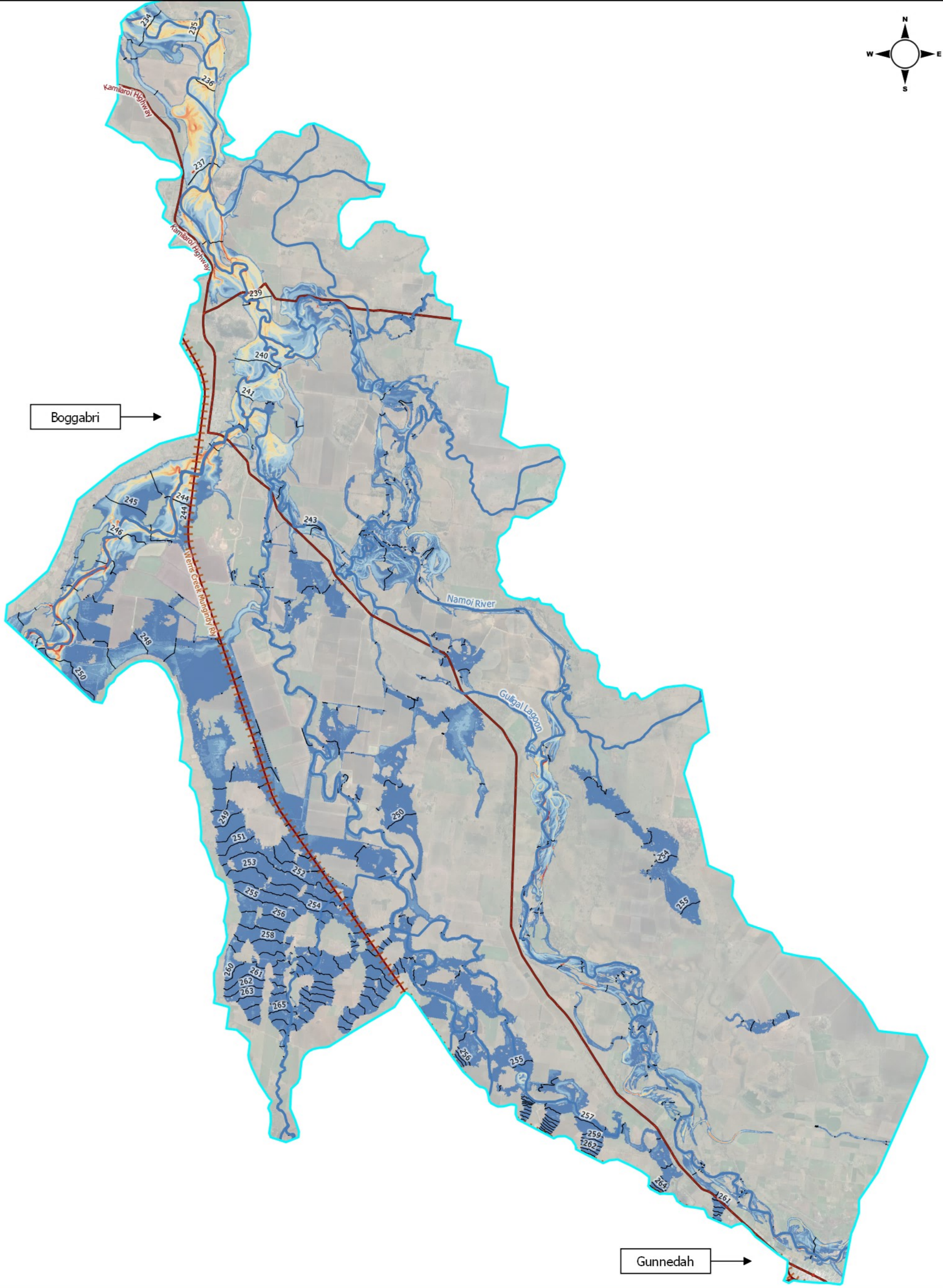
Vickery Rail Spur Flood Assessment
Figure A2

Predicted flood extent, level and depth
1971 calibration event

0 2 4 6 8 10 km

wrm water + environment

WHITEHAVEN COAL



Legend

- Model code boundary
- Major road
- Existing rail line
- Watercourse
- AB1 Flood mark reference

Peak depth (m)

- 0.00 m - 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m

Water level contour (1m interval)

Projection: AMG Zone 55 Datum: AGD 66

Vickery Rail Spur Flood Assessment
Figure A3

Predicted flood extent, level and depth
1997 calibration event

0 2 4 6 8 10 km

wrm water + environment

WHITEHAVEN COAL

N
W
E
S

Boggabri

Gunnedah

Kamilaroi Highway

Namoi River

Gulligal Lagoon

Werris Creek Mungandy Rd

419012

419001

CC2

NR7

NR6

NR5

NR4

NR3

NR1

SC2

G4

G2

Legend

- Model code boundary
- Major road
- Existing rail line
- Watercourse
- AB1 Flood mark reference

Peak depth (m)

- 0.00 m - 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m

Water level contour (1m interval)

Projection: AMG Zone 55 Datum: AGD 66

Vickery Rail Spur Flood Assessment
Figure A4

Predicted flood extent, level and depth
1998 calibration event

0 2 4 6 8 10 km

wrm water + environment

WHITEHAVEN COAL

N
W
E
S

Boggabri

Kamilaroi Highway

Kamilaroi Highway

419012

Were Creek Nungindy Rly

Namoi River

Gulligal Lagoon

G1

419001

Gunnedah

Legend

- Model code boundary
- Major road
- Existing rail line
- Watercourse
- AB1 Flood mark reference

Peak depth (m)

- 0.00 m - 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m
- Water level contour (1m interval)

Projection: AMG Zone 55 Datum: AGD 66

Vickery Rail Spur Flood Assessment
Figure A5

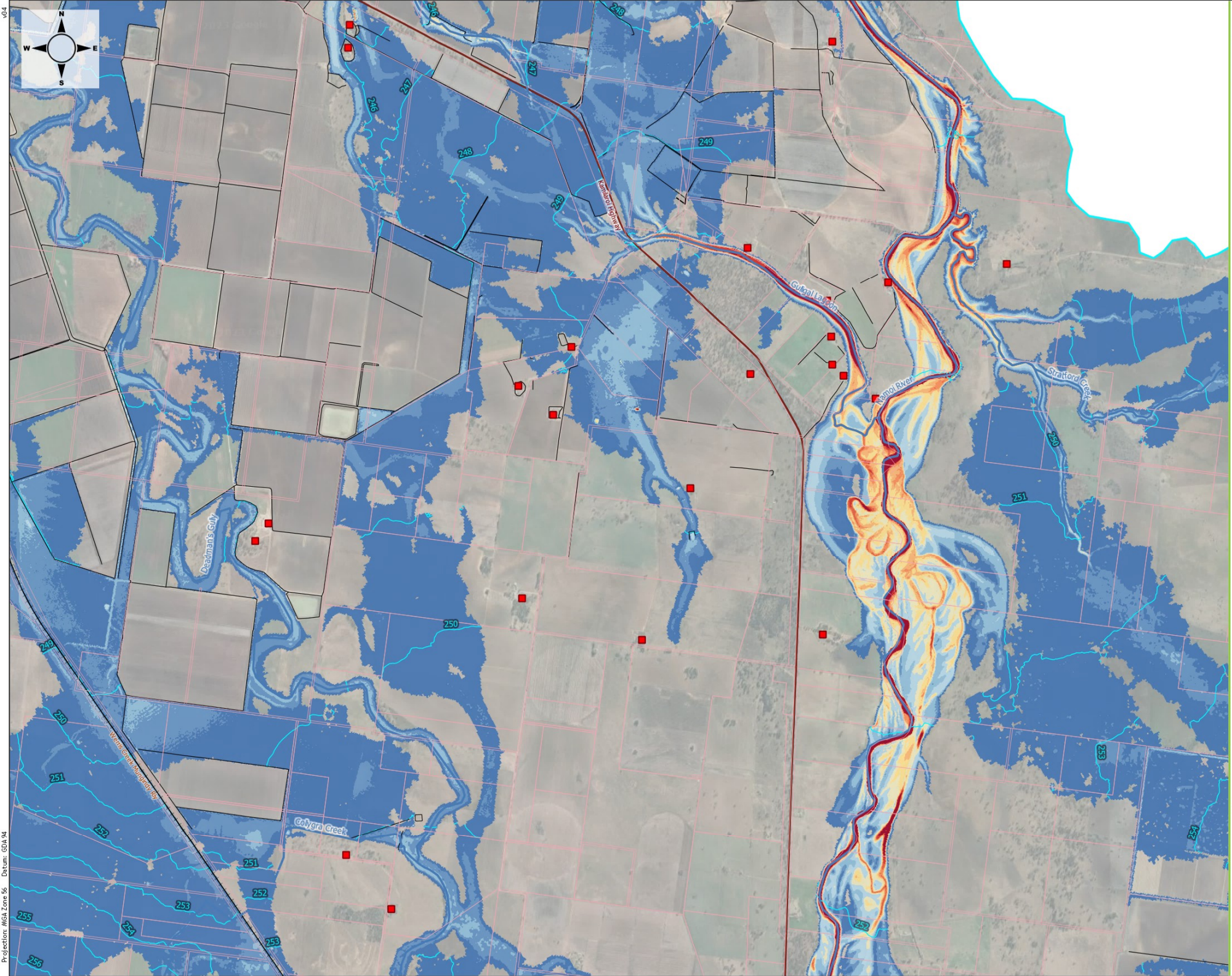
Predicted flood extent, level and depth
2000 calibration event

0 2 4 6 8 10 km

wrm water + environment

WHITEHAVEN COAL

Appendix B - Existing condition design event flood depths, extents, levels and velocities



Vickery Rail Spur Flood Assessment

Figure B1

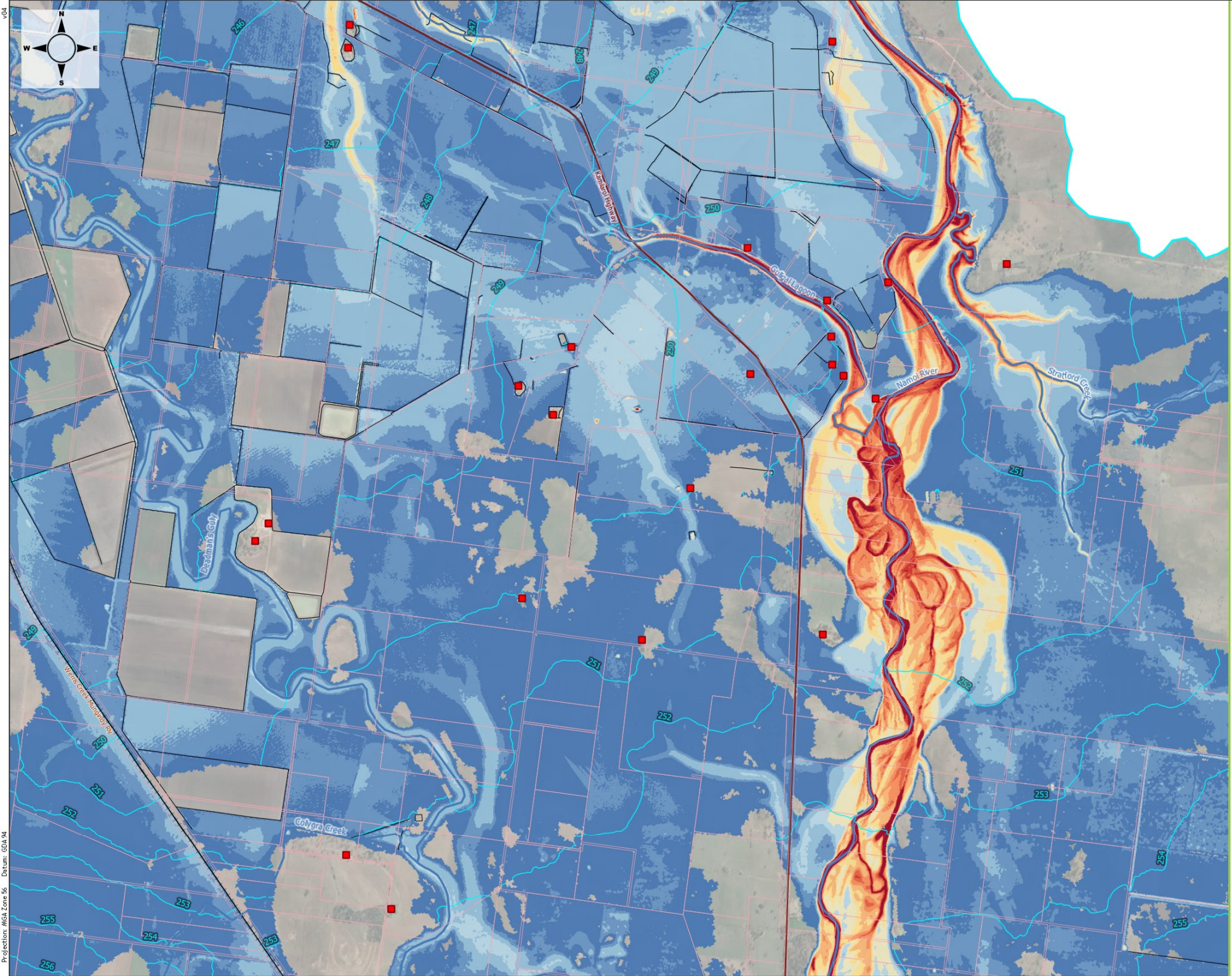
Predicted flood depth existing conditions 20% AEP event

wrm water + environment

WHITEHAVEN COAL

Projection: MGA Zone 56 Datum: GDA 94

v04



Legend

- Model code boundary
- Major road
- Existing rail line
- Major road
- Watercourse
- Flood work
- Cadastre
- Dwelling

Peak depth (m)

- <= 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m
- Water level contour (1m interval)

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure B2

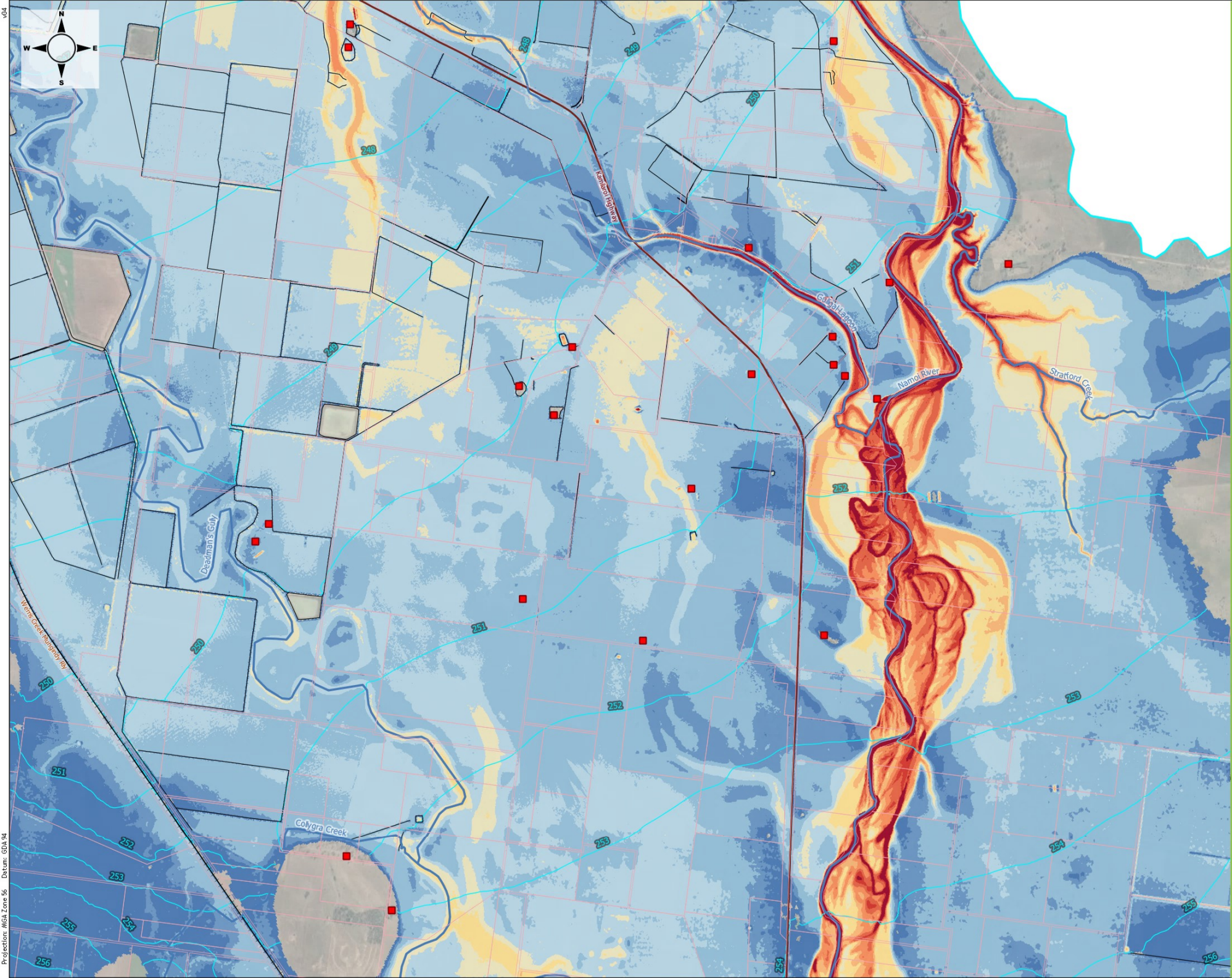
Predicted flood depth
existing conditions
5% AEP event

wrm water + environment

WHITEHAVEN COAL

v04

Projection: MGA Zone 56 Datum: GDA 94



Legend

- Model code boundary
- Major road
- Existing rail line
- Major road
- Watercourse
- Flood work
- Cadastre
- Dwelling

Peak depth (m)

- <= 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m
- Water level contour (1 m interval)

0 250 500 750 1000 m

Vickery Rail Spur Flood Assessment

Figure B3

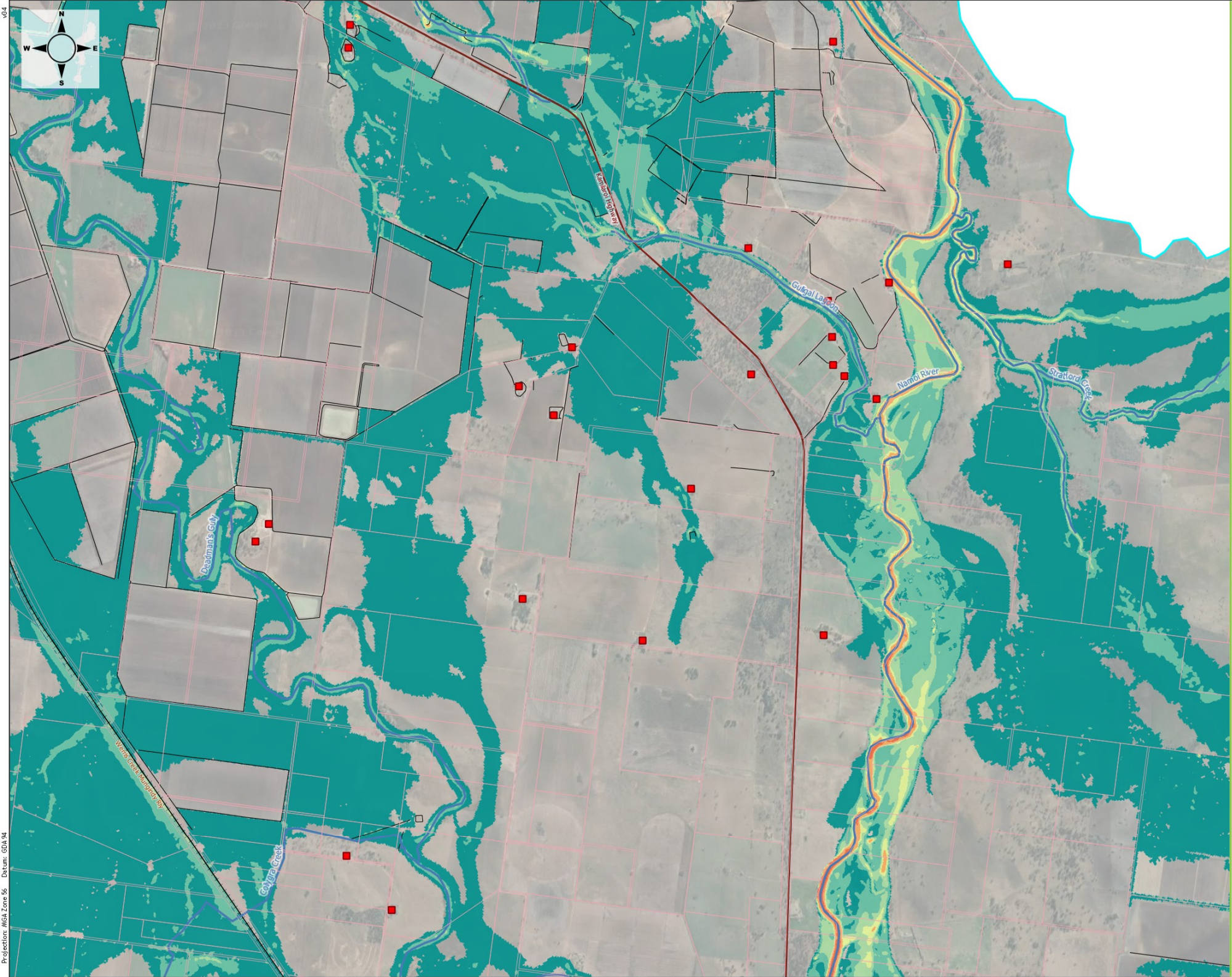
Predicted flood depth existing conditions 1% AEP event

wrm water + environment

WHITEHAVEN COAL

v04

Projection: MGA Zone 56 Datum: GDA 94



Legend

- Model code boundary
- Major road
- Existing rail line
- Major road
- Watercourse
- Flood work
- Cadastre
- Dwelling

Peak velocity (m/s)

- up to 0.25 m/s
- 0.25 to 0.5 m/s
- 0.5 to 0.75 m/s
- 0.75 to 1.0 m/s
- 1.0 to 1.5 m/s
- 1.5 to 2.0 m/s
- 2.0 to 3.0 m/s
- > 3 m/s

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure B4

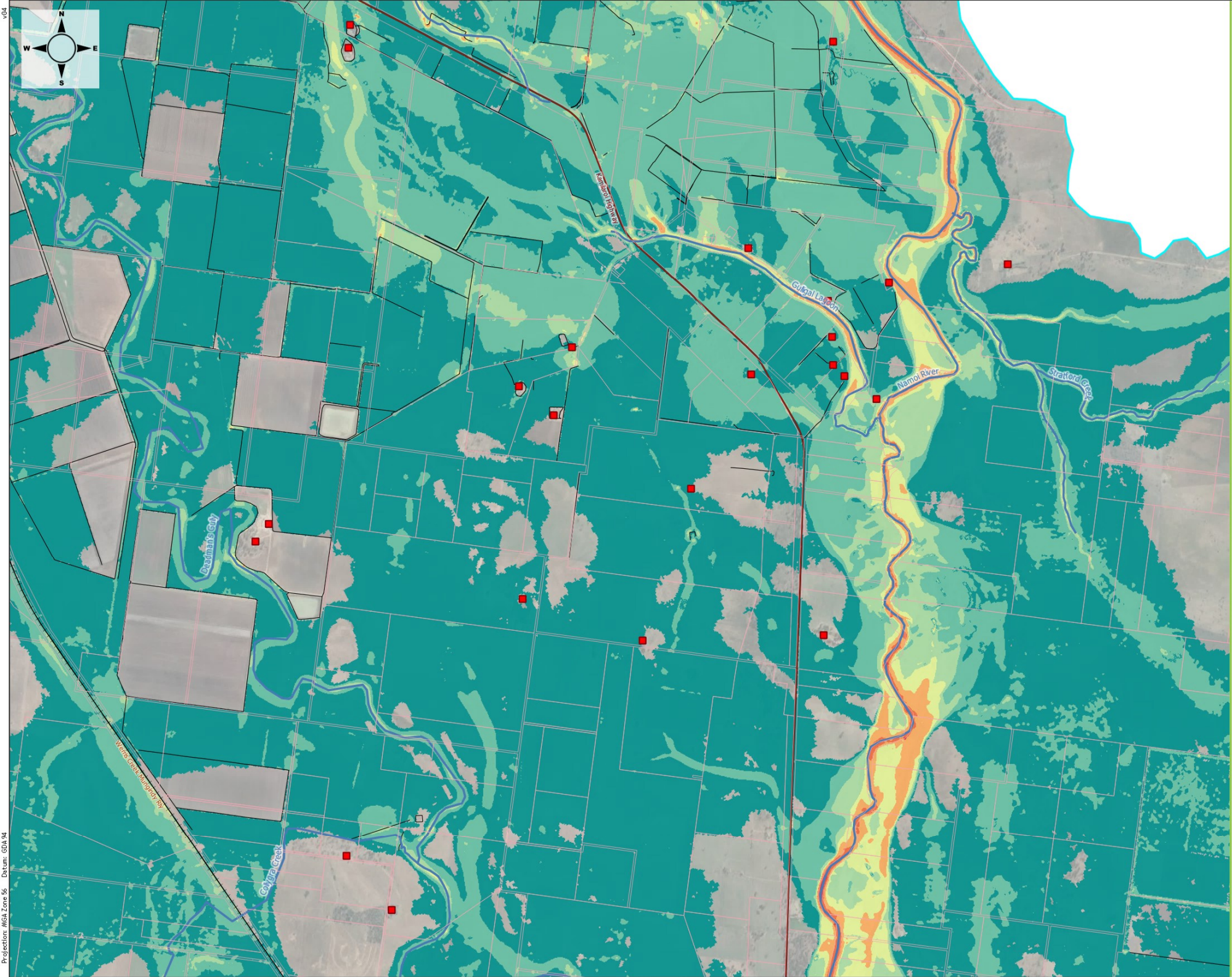
Predicted peak velocity
existing conditions
20% AEP event

wrm water + environment

WHITEHAVEN COAL

v04

Projection: MGA Zone 56 Datum: GDA 94



Legend

- Model code boundary
- Major road
- Existing rail line
- Major road
- Watercourse
- Flood work
- Cadastre
- Dwelling

Peak velocity (m/s)

- up to 0.25 m/s
- 0.25 to 0.5 m/s
- 0.5 to 0.75 m/s
- 0.75 to 1.0 m/s
- 1.0 to 1.5 m/s
- 1.5 to 2.0 m/s
- 2.0 to 3.0 m/s
- > 3 m/s

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure B5

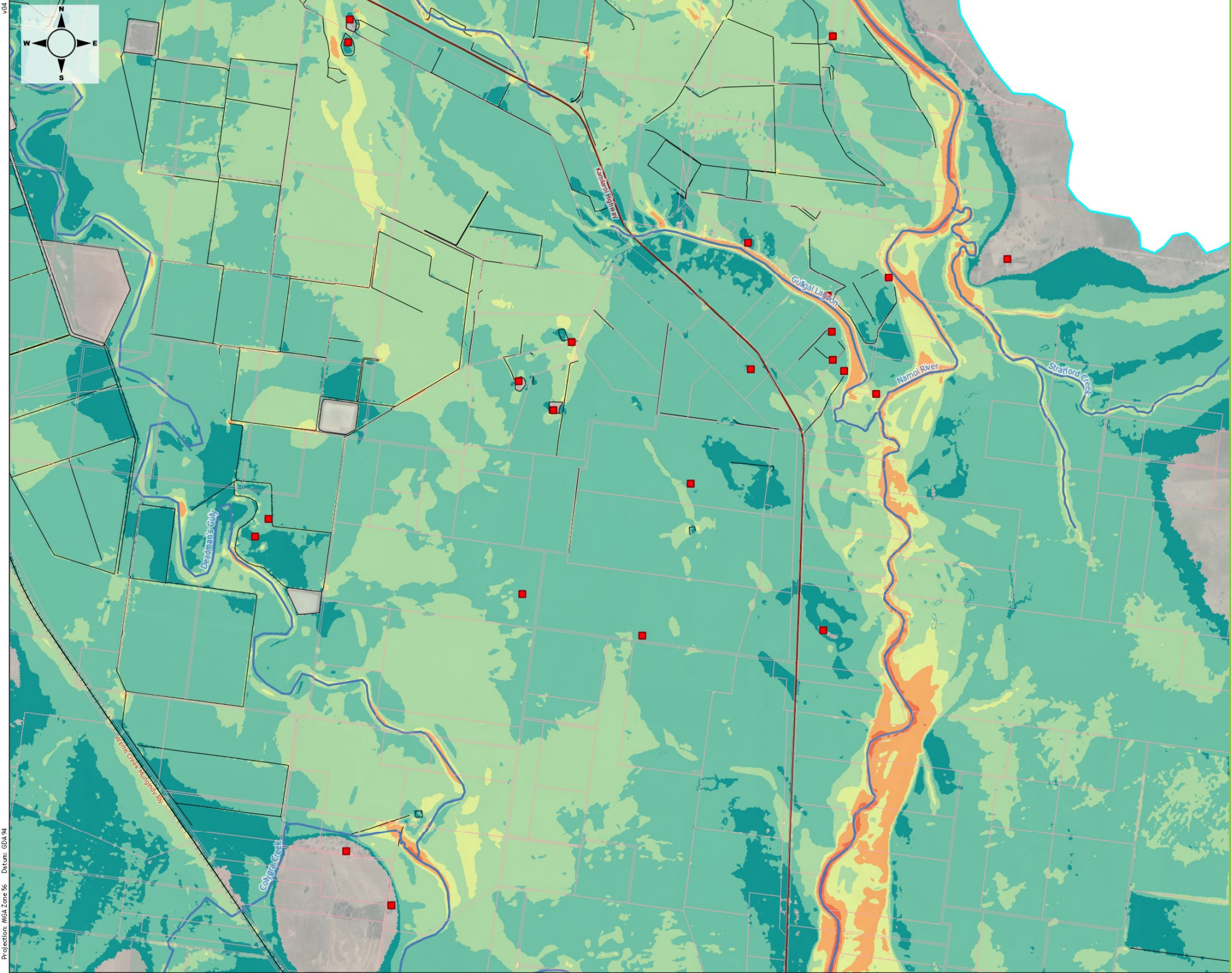
Predicted peak velocity
existing conditions
5% AEP event

wrm water + environment

WHITEHAVEN COAL

v04

Projection: MGA Zone 56 Datum: GDA 94



Legend

- Model code boundary
- Major road
- Existing rail line
- Major road
- Watercourse
- Flood work
- Cadastre
- Dwelling

Peak velocity (m/s)

- up to 0.25 m/s
- 0.25 to 0.5 m/s
- 0.5 to 0.75 m/s
- 0.75 to 1.0 m/s
- 1.0 to 1.5 m/s
- 1.5 to 2.0 m/s
- 2.0 to 3.0 m/s
- > 3 m/s

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure B6

Predicted peak velocity
existing conditions
1% AEP event

wrm water+environment

WHITEHAVEN COAL

v04

Projection: MGA Zone 56 Datum: GDA 94

Appendix C - Proposed conditions design event flood depths and levels

N126

Kamilaroi Highway

Gulligal Lagoon

Namoi River

Stratford Creek

Deadman's Gully

Werris Creek Mungindy Rly

Colygra Creek

246 247 248 249 250 251 252 253 254 255 256

N W E S

Legend

- Model code boundary
- Proposed elevated structure
- Proposed embankment
- Proposed culvert
- Existing rail line
- Major road
- Watercourse
- Cadastre
- Crossing

Peak depth (m)

- <= 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m

Water level contour (1m interval)

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure C1

Predicted flood depth
proposed conditions
20% AEP event

wrm water + environment

WHITEHAVEN COAL

Projection: MGA Zone 56 Datum: GDA 94

N126

Projection: MGA Zone 56 Datum: GDA 94

Legend

- Model code boundary
- Proposed elevated structure
- Proposed embankment
- Proposed culvert
- Existing rail line
- Major road
- Watercourse
- Cadastre
- Crossing

Peak depth (m)

- <= 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m

Water level contour (1m interval)

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure C2

Predicted flood depth
proposed conditions
5% AEP event

wrm water + environment

WHITEHAVEN COAL

N126

Kamilaroi Highway
Gunidgal Lagoon
Namoi River
Stratford Creek
Deadman's Guly
Werris Creek Nullamidy Rv
Collygra Creek

248 249 250 251 252 253 254 255 256

Legend

- Model code boundary
- Proposed elevated structure
- Proposed embankment
- Proposed culvert
- Existing rail line
- Major road
- Watercourse
- Cadastre
- Crossing

Peak depth (m)

- <= 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m
- Water level contour (1m interval)

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure C3

Predicted flood depth
proposed conditions
1% AEP event

wrm water + environment

WHITEHAVEN COAL

Projection: MGA Zone 56 Datum: GDA 94

N127

Projection: MGA Zone 56 Datum: GDA 94

Legend

- Model code boundary
- Proposed elevated structure
- Proposed embankment
- Proposed culvert
- Existing rail line
- Major road
- Watercourse
- Cadastre
- Crossing

Peak depth (m)

- <= 0.25 m
- 0.25 m - 0.50 m
- 0.50 m - 1.00 m
- 1.00 m - 1.50 m
- 1.50 m - 2.00 m
- 2.00 m - 2.50 m
- 2.50 m - 3.00 m
- 3.00 m - 3.50 m
- 3.50 m - 4.00 m
- 4.00 m - 4.50 m
- > 4.50 m
- Water level contour (1m interval)

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure C4

Predicted flood depth
proposed conditions
1% AEP with climate change event

wrm water + environment

WHITEHAVEN COAL

N127

Projection: MGA Zone 56 Datum: GDA 94

N
W
E
S

Kamilaroi Highway
Gulgai Lagoon
Namoi River
Stratford Creek
Deadmans Gully
Were Creek
Mundaroo Rd
Gowrie Creek

0.50
0.05
0.90
0.10
0.07
0.01
0.35
0.19
0.22
0.13
0.45
0.25

Legend

- Model code boundary
- Proposed elevated structure
- Proposed embankment
- Proposed culvert
- Existing rail line
- Major road
- Watercourse
- Cadastre
- Crossing
- Flow direction
- Peak developed velocity >150% existing velocity
- 0.4 Velocity (EXG)
- 0.4 Velocity (DEV)

Peak velocity (m/s)

- up to 0.25 m/s
- 0.25 to 0.5 m/s
- 0.5 to 0.75 m/s
- 0.75 to 1.0 m/s
- 1.0 to 1.5 m/s
- 1.5 to 2.0 m/s
- 2.0 to 3.0 m/s
- > 3 m/s

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure C5

Proposed conditions peak velocities and predicted >150% increases 20% AEP event

wrm water+environment

WHITEHAVEN COAL

N127

N
W
E
S

Kamilaroi Highway
Gulgal Lagoon
Namoi River
Stratford Creek
Deadmans Gully
Wenis Creek (Mungindi) Rly
Collins Creek

0.08
0.04
0.02
0.01
0.10
0.02
0.24
0.16
0.26
0.16
0.60
0.30
0.92
0.24
0.45
0.25
1.10
0.45

Legend

- Model code boundary
- Proposed elevated structure
- Proposed embankment
- Proposed culvert
- Existing rail line
- Major road
- Watercourse
- Cadastre
- Crossing
- Flow direction
- Peak developed velocity >150% existing velocity
- 0.4 Velocity (EXG)
- 0.4 Velocity (DEV)

Peak velocity (m/s)

- up to 0.25 m/s
- 0.25 to 0.5 m/s
- 0.5 to 0.75 m/s
- 0.75 to 1.0 m/s
- 1.0 to 1.5 m/s
- 1.5 to 2.0 m/s
- 2.0 to 3.0 m/s
- > 3 m/s

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure C6

Proposed conditions peak velocities and predicted >150% increases 5% AEP event

wrm water+environment

WHITEHAVEN COAL

Projection: MGA Zone 56 Datum: GDA 94

N127

Kamilaroi Highway

Gulligal Lagoon

Namoi River

Stratford Creek

Deadman's Gully

Wens Creek

Mungandy Rly

Conargo Creek

1:40
0.70

1:25
0.50

0.80
0.25

N

W

E

S

Legend

- Model code boundary
- Proposed elevated structure
- Proposed embankment
- Proposed culvert
- Existing rail line
- Major road
- Watercourse
- Cadastre
- Crossing
- Flow direction

Peak developed velocity >150% existing velocity

0.4 Velocity (EXG)
0.4 Velocity (DEV)

Peak velocity (m/s)

- up to 0.25 m/s
- 0.25 to 0.5 m/s
- 0.5 to 0.75 m/s
- 0.75 to 1.0 m/s
- 1.0 to 1.5 m/s
- 1.5 to 2.0 m/s
- 2.0 to 3.0 m/s
- > 3 m/s

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure C7

Proposed conditions peak velocities and predicted >150% increases 1% AEP event

wrm water + environment

WHITEHAVEN COAL

Projection: MGA Zone 56 Datum: GDA 94

N127

Kamilaroi Highway

Gulligal Lagoon

Namoi River

Strakord Creek

Deadman's Guly

Werris Creek Nundle Rly

Coly Gra Creek

1.40
0.75

1.25
0.50

0.85
0.25

Legend

- Model code boundary
- Proposed elevated structure
- Proposed embankment
- Proposed culvert
- Existing rail line
- Major road
- Watercourse
- Cadastre
- Crossing
- Flow direction

Peak developed velocity >150% existing velocity

0.4 Velocity (EXG)
0.4 Velocity (DEV)

Peak velocity (m/s)

- up to 0.25 m/s
- 0.25 to 0.5 m/s
- 0.5 to 0.75 m/s
- 0.75 to 1.0 m/s
- 1.0 to 1.5 m/s
- 1.5 to 2.0 m/s
- 2.0 to 3.0 m/s
- > 3 m/s

0 250 500 750 1000 m

Vickery Rail Spur
Flood Assessment

Figure C8

Proposed conditions peak velocities and predicted >150% increases 1% AEP with climate change event

wrm water + environment

WHITEHAVEN COAL

Projection: MGA Zone 56 Datum: GDA 94

Appendix D - Flood impact mapping

Version N127

Projection: MGA Zone 56 Datum: GDA 94

N

W E

S

Kamilaroi Highway

Gulgai Lagoon

1276

1z

1y

Namoi River

Stratford Creek

Deadman's Gully

White Creek

Mungandy Rly

Colygra Creek

Legend

- Model extent
- Whitehaven-owned land
- Major road
- Watercourse
- Existing rail line
- Proposed rail line
- Proposed elevated structure
- Dwelling

Box culvert (west)

- 2400mm x 1200mm
- 2400mm x 1500mm
- 2400mm x 1800mm
- 2400mm x 2100mm
- 2400mm x 2400mm
- 2400mm x 2700mm
- Crossing

Pipe culvert (east)

- 450mm
- 600mm
- 1500mm
- 1800mm

Predicted afflux (m)

- dWL < -0.20m
- -0.20m < dWL < -0.10m
- -0.10m < dWL < -0.01m
- -0.01m < dWL < 0.01m
- 0.01m < dWL < 0.05m
- 0.05m < dWL < 0.10m
- 0.10m < dWL < 0.15m
- 0.15m < dWL < 0.20m
- dWL > 0.20m
- Was wet now dry
- Was dry now wet

0 250 500 750 1000 m

Vickery Rail Spur
Surface Water Assessment

100% design
Predicted flood level increase due to rail spur

20% AEP event

WRM

WHITEHAVEN COAL

Version N127

Projection: MGA Zone 56 Datum: GDA 94

N

W E

S

Kamilaroi Highway

Gulgal Lagoon

127c

1z

1y

Namoi River

Stratford Creek

Deadman's Gully

Wirrie Creek

Mungindy Rly

Colygra Creek

Legend

- Model extent
- Whitehaven-owned land
- Major road
- Watercourse
- Existing rail line
- Proposed rail line
- Proposed elevated structure
- Dwelling

Box culvert (west)

- 2400mm x 1200mm
- 2400mm x 1500mm
- 2400mm x 1800mm
- 2400mm x 2100mm
- 2400mm x 2400mm
- 2400mm x 2700mm
- Crossing

Pipe culvert (east)

- 450mm
- 600mm
- 1500mm
- 1800mm

Predicted afflux (m)

- dWL < -0.20m
- -0.20m < dWL < -0.10m
- -0.10m < dWL < -0.01m
- -0.01m < dWL < 0.01m
- 0.01m < dWL < 0.05m
- 0.05m < dWL < 0.10m
- 0.10m < dWL < 0.15m
- 0.15m < dWL < 0.20m
- dWL > 0.20m
- Was wet now dry
- Was dry now wet

0 250 500 750 1000 m

Vickery Rail Spur
Surface Water Assessment

100% design
Predicted flood level increase due to rail spur

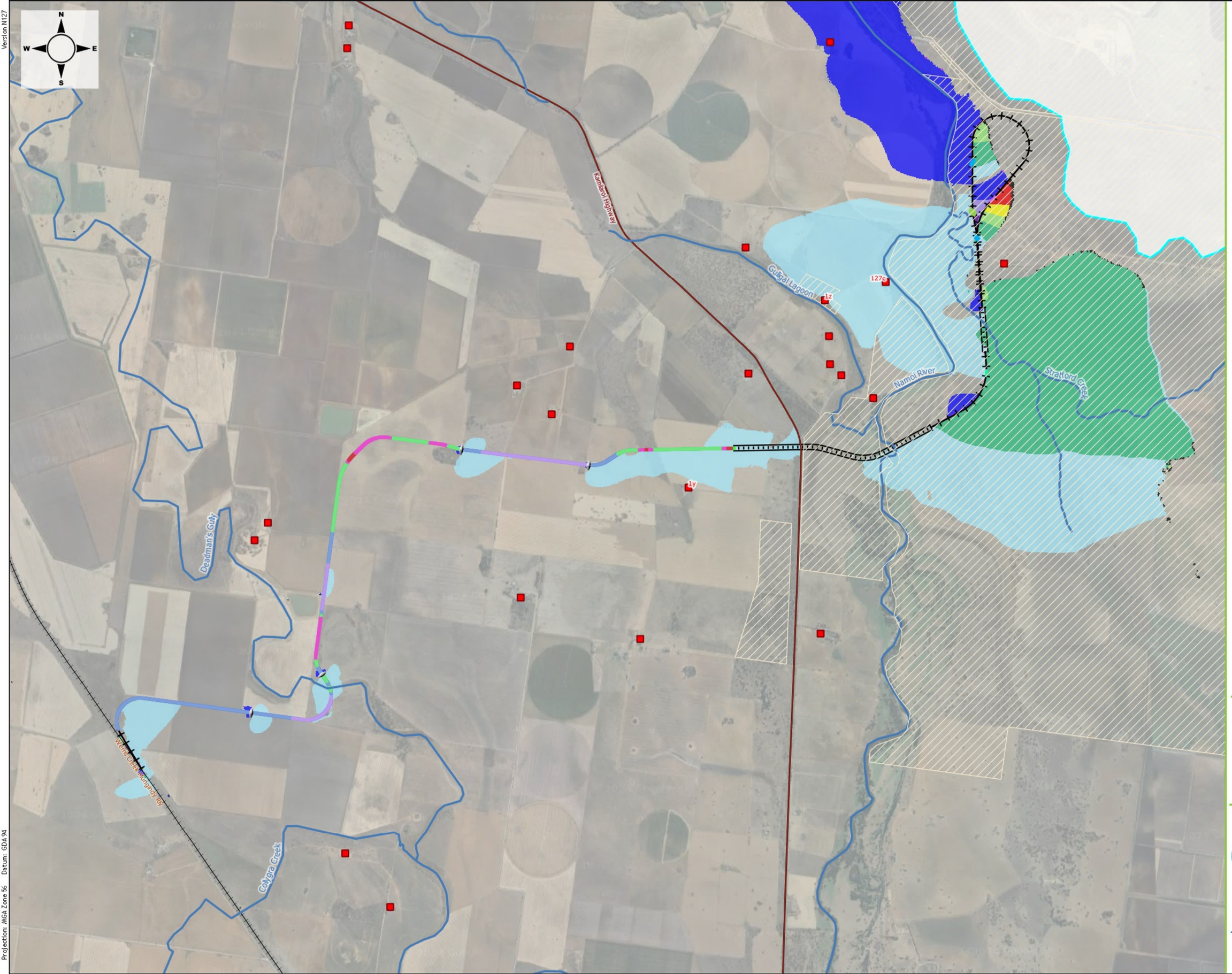
5% AEP event

WRM

WHITEHAVEN COAL

Version N127

Projection: MGA Zone 56 Datum: GDA 94



Legend

- Model extent
- Whitehaven-owned land
- Major road
- Watercourse
- Existing rail line
- Proposed rail line
- Proposed elevated structure
- Dwelling

Box culvert (west)

- 2400mm x 1200mm
- 2400mm x 1500mm
- 2400mm x 1800mm
- 2400mm x 2100mm
- 2400mm x 2400mm
- 2400mm x 2700mm
- Crossing

Pipe culvert (east)

- 450mm
- 600mm
- 1500mm
- 1800mm

Predicted afflux (m)

- dWL < -0.20m
- -0.20m < dWL < -0.10m
- -0.10m < dWL < -0.01m
- -0.01m < dWL < 0.01m
- 0.01m < dWL < 0.05m
- 0.05m < dWL < 0.10m
- 0.10m < dWL < 0.15m
- 0.15m < dWL < 0.20m
- dWL > 0.20m
- Was wet now dry
- Was dry now wet

0 250 500 750 1000 m

Vickery Rail Spur
Surface Water Assessment

100% design
Predicted flood level increase due to rail spur

1% AEP event

WRM

WHITEHAVEN COAL

Version N127

Projection: MGA Zone 56 Datum: GDA 94

N

W E

S

Kamilaroi Highway

Gulgal Lagoon

127c

1z

1y

Namoi River

Stratford Creek

Deadman's Gully

Weins Creek

Mungindi Rly

Cobbora Creek

Legend

- Model extent
- Whitehaven-owned land
- Major road
- Watercourse
- Existing rail line
- Proposed rail line
- Proposed elevated structure
- Dwelling

Box culvert (west)

- 2400mm x 1200mm
- 2400mm x 1500mm
- 2400mm x 1800mm
- 2400mm x 2100mm
- 2400mm x 2400mm
- 2400mm x 2700mm
- Crossing

Pipe culvert (east)

- 450mm
- 600mm
- 1500mm
- 1800mm

Predicted afflux (m)

- dWL < -0.20m
- -0.20m < dWL < -0.10m
- -0.10m < dWL < -0.01m
- -0.01m < dWL < 0.01m
- 0.01m < dWL < 0.05m
- 0.05m < dWL < 0.10m
- 0.10m < dWL < 0.15m
- 0.15m < dWL < 0.20m
- dWL > 0.20m
- Was wet now dry
- Was dry now wet

0 250 500 750 1000 m

Vickery Rail Spur
Surface Water Assessment

100% design
Predicted flood level increase due to rail spur

1% AEP with climate change event

WRM

WHITEHAVEN COAL

Appendix E - Project Rail Spur design drawings (100% design)

VICKERY EXTENSION PROJECT
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

NEW BRIDGE - 2023

DESIGN STANDARD:	AS(/NZS) 5100 2017 SERIES - BRIDGE DESIGN
DESIGN LIFE:	25 YEARS

RAILWAY TRAFFIC LOADING: QR5000 LOCOS HAULING 120T QR QHCH COAL WAGONS (ARTC ETE-09-02)

No OF TRACKS:	1
DESIGN TRAFFIC SPEED:	50km/h
WALKWAY LOAD :	2.5kPa.

FATIGUE LOADING:

NUMBER OF LOAD CYCLES TO AS5100.2 ADJUSTED FOR 25 YEAR DESIGN LIFE	
TRACK CATEGORY:	HEAVY HAUL FREIGHT
BASE NUMBER OF CYCLES Ct:	1.5 x 10^5

FLOODING DATA

100 YEAR FLOOD LEVEL:	RL 252.100
2000 YEAR FLOOD LEVEL:	RL 253.800
100 YEAR FLOOD VELOCITY:	1.35 m/s MAX
2000 YEAR FLOOD VELOCITY:	1.80 m/s MAX
DEBRIS MAT DEPTH:	1.5m

WIND LOADING:

WIND TERRAIN CATEGORY:	TC2
WIND REGION:	A3
WIND VELOCITY ULS:	48m/s
WIND VELOCITY SLS:	37m/s
AVERAGE RECURRENCE INTERVAL (ARI) ULS:	R = 2000 YEARS
AVERAGE RECURRENCE INTERVAL (ARI) SLS:	R = 20 YEARS

EARTHQUAKE LOADING:

BRIDGE CLASSIFICATION:	BEDC-3
DESIGN PERFORMANCE LEVEL:	DAMAGE CONTROL
PROBABILITY FACTOR kp:	1.3
SEISMIC HAZARD FACTOR Z:	0.09
SITE SUBSOIL CLASS:	De
DESIGN DUCTILITY FACTOR μ:	3.0

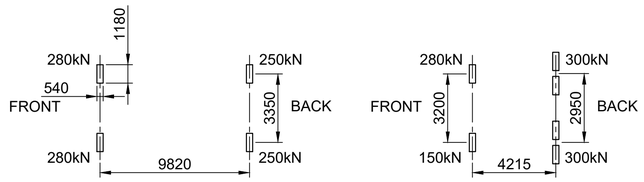
DIFFERENTIAL SETTLEMENT

10mm TOTAL BETWEEN ADJACENT SUPPORTS

REFERENCE DESIGN REPORTS

BRIDGE DESIGN REPORT:	BE22007-6670-RPT-BR-5901
BRIDGE DESIGN CRITERIA:	BE22007-6670-RPT-BR-5912
GEOTECHNICAL FACTUAL REPORT:	C-858.02 R2, C-0858.02 R3
GEOTECHNICAL FACTUAL REPORT:	C-858.02 R2, C-0858.02 R3
FLOODING ASSESMENT REPORT:	0800-12-J, 7 MARCH 2023 0800-12-K, 29 JUNE 2023

CONSTRUCTION LOADING



LOADS REPRESENT MAXIMUM WORKING WHEEL LOADS.
DESIGN DYNAMIC LOAD ALLOWANCE NOT INCLUDED IN THESE LOADS.

THE DESIGN ADOPTS A DYNAMIC LOAD ALLOWANCE OF 1.0 AND AN ULTIMATE LIMIT STATE LOAD FACTOR OF 1.5.

VEHICLE SPEED IS RESTRICTED TO 10km/h ON THE BRIDGE.

ALL CONSTRUCTION TRUCKS ARE TO BE RESTRICTED TO ONE VEHICLE AT ANY TIME RUNNING WITHIN THE CENTRAL 5m OF DECK WITH NO CO-EXISTING LOADING.

FOR THE 773 VEHICLE, THE WHEEL CONTACT AREAS ARE ASSUMED TO BE 750mm (TRANSVERSE) x 250mm (LONGITUDINAL).

DIAL BEFORE YOU DIG

THE CONTRACTOR MUST, BEFORE COMMENCING ANY WORKS:

(i) DETERMINE THE EXTENT OF EXISTING UTILITY SURVEY AND INFORMATION REFERENCED ON THESE DRAWINGS;

(ii) OBTAIN CURRENT DIAL BEFORE YOU DIG PLANS AND INFORMATION BY TELEPHONING 1100 OR FAX 1300 682 077 TO ASCERTAIN THE EXACT LOCATION OF UTILITIES;

DIAL BEFORE YOU DIG® www.1100.com.au

(iii) MAKE ANY OTHER ENQUIRIES AS THE CONTRACTOR CONSIDERS NECESSARY TO SATISFY ITSELF TO THE EXACT LOCATION OF UTILITY DEVICES; AND

(iv) ENSURE THAT THE ADOPTED WORK METHOD WILL AVOID DAMAGE TO ALL UTILITIES.

JACKING OF BRIDGE DECK FOR BEARING REPLACEMENT

THE DESIGN INCLUDES THE FOLLOWING REQUIREMENTS FOR BEARING REPLACEMENT:
- THE BRIDGE SHALL BE CLOSED TO ALL TRAFFIC.
- SEE ABUTMENT AND PIER DRAWINGS FOR JACKING LOCATIONS AND LOADS.
- ALL JACKS SHALL BE HYDRAULICALLY LINKED AND HAVE A CENTRAL MECHANISM TO ENSURE THAT THE SAME VERTICAL DISPLACEMENTS OCCUR AT EACH JACKING POINT AT ALL TIMES DURING THE JACKING OPERATION.
- BRIDGE BEARINGS ARE DESIGNED TO BE REPLACED USING LIFTS OF NOT GREATER THAN 10mm.
- STEEL PLATES SHALL BE PLACED BETWEEN CONCRETE BEARING SURFACE AND HYDRAULIC JACK.
- MAXIMUM ALLOWABLE CONTACT PRESSURE BETWEEN CONCRETE SURFACE AND STEEL PLATE SHALL BE 10MPa

LOCALITY PLAN

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
COVER SHEET

FILE No. BE22007-6670-DRG-BR-7001 | SHEET: 1 OF 1 | A1
STATUS: 100% DESIGN | ©
DRG No. BE22007-6670-DRG-BR-7001 | B | EDMS No. - | -

SCHEDULE OF DRAWINGS

7001	COVER SHEET
7005	SCHEDULE OF DRAWINGS
7010	GENERAL ARRANGEMENT - SHEET A
7011	GENERAL ARRANGEMENT - SHEET B
7012	GENERAL ARRANGEMENT - SHEET C
7013	GENERAL ARRANGEMENT - SHEET D
7014	GENERAL ARRANGEMENT - SHEET E
7015	GENERAL ARRANGEMENT - SHEET F
7016	GENERAL ARRANGEMENT - SHEET G
7017	GENERAL ARRANGEMENT - SHEET H
7018	GENERAL ARRANGEMENT - SHEET J
7019	GENERAL ARRANGEMENT - SHEET K
7020	GENERAL ARRANGEMENT - SHEET L
7021	GENERAL ARRANGEMENT - SHEET M
7022	GENERAL ARRANGEMENT - SHEET N
7023	GENERAL ARRANGEMENT - SHEET P
7024	GENERAL ARRANGEMENT - SHEET Q
7025	GENERAL ARRANGEMENT - SHEET R
7026	GENERAL ARRANGEMENT - SHEET S
7027	GENERAL ARRANGEMENT - SHEET T
7028	GENERAL ARRANGEMENT - SHEET U
7029	GENERAL ARRANGEMENT - SHEET V
7030	GENERAL ARRANGEMENT - SHEET W
7050	PILE LAYOUT - SHEET A
7051	PILE LAYOUT - SHEET B
7052	PILE LAYOUT - SHEET C
7053	PILE LAYOUT - SHEET D
7054	PILE LAYOUT - SHEET E
7055	PILE LAYOUT - SHEET F
7070	PILE DETAILS - SHEET A
7071	PILE DETAILS - SHEET B
7072	PILE DETAILS - SHEET C
7100	ABUTMENT CONCRETE - SHEET A
7101	ABUTMENT CONCRETE - SHEET B
7102	ABUTMENT CONCRETE - SHEET C
7150	ABUTMENT REINFORCEMENT - SHEET A
7151	ABUTMENT REINFORCEMENT - SHEET B
7152	ABUTMENT REINFORCEMENT - SHEET C
7170	PIER CONCRETE - SHEET A
7171	PIER CONCRETE - SHEET B
7172	PIER CONCRETE - SHEET C
7200	PIER REINFORCEMENT - SHEET A
7201	PIER REINFORCEMENT - SHEET B
7202	PIER REINFORCEMENT - SHEET C
7203	PIER REINFORCEMENT - SHEET D
7300	BEARING - SHEET A
7301	BEARING - SHEET B
7302	BEARING - SHEET C
7303	BEARING - SHEET D
7304	BEARING - SHEET E
7305	BEARING - SHEET F
7306	BEARING - SHEET G
7307	BEARING - SHEET H
7400	PSC GIRDER CONCRETE - SHEET A
7401	PSC GIRDER CONCRETE - SHEET B
7402	PSC GIRDER CONCRETE - SHEET C
7403	PSC GIRDER CONCRETE - SHEET D
7404	PSC GIRDER CONCRETE - SHEET E
7405	PSC GIRDER CONCRETE - SHEET F
7406	PSC GIRDER CONCRETE - SHEET G
7407	PSC GIRDER CONCRETE - SHEET H
7450	PSC GIRDER REINFORCEMENT - SHEET A
7451	PSC GIRDER REINFORCEMENT - SHEET B
7452	PSC GIRDER REINFORCEMENT - SHEET C
7453	PSC GIRDER REINFORCEMENT - SHEET D
7500	DECK CONCRETE - SHEET A
7501	DECK CONCRETE - SHEET B
7502	DECK CONCRETE - SHEET C
7503	DECK CONCRETE - SHEET D
7550	DECK REINFORCEMENT - SHEET A
7551	DECK REINFORCEMENT - SHEET B
7552	DECK REINFORCEMENT - SHEET C
7570	PRECAST BALLAST WALL CONCRETE - SHEET A
7571	PRECAST BALLAST WALL CONCRETE - SHEET B
7572	PRECAST BALLAST WALL CONCRETE - SHEET C
7573	PRECAST BALLAST WALL CONCRETE - SHEET D
7575	PRECAST BALLAST WALL REINFORCEMENT
7580	EXPANSION JOINT COVER PLATE DETAILS
7600	APPROACH SLAB - SHEET A
7601	APPROACH SLAB - SHEET B
7610	APPROACH SLAB REINFORCEMENT
7650	SAFETY SCREENS - SHEET A
7651	SAFETY SCREENS - SHEET B
7652	WALKWAY AND HANDRAILS DETAILS - SHEET A
7653	WALKWAY AND HANDRAILS DETAILS - SHEET B
7654	WALKWAY AND HANDRAILS DETAILS - SHEET C
7655	WALKWAY AND HANDRAILS DETAILS - SHEET D
7656	WALKWAY AND HANDRAILS DETAILS - SHEET E
7700	BAR SHAPES DIAGRAM

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

SCHEDULE OF DRAWINGS

FILE No. BE22007-6670-DRG-BR-7005	SHEET: 1 OF 1	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7005	B	EDMS No. -

GENERAL NOTES

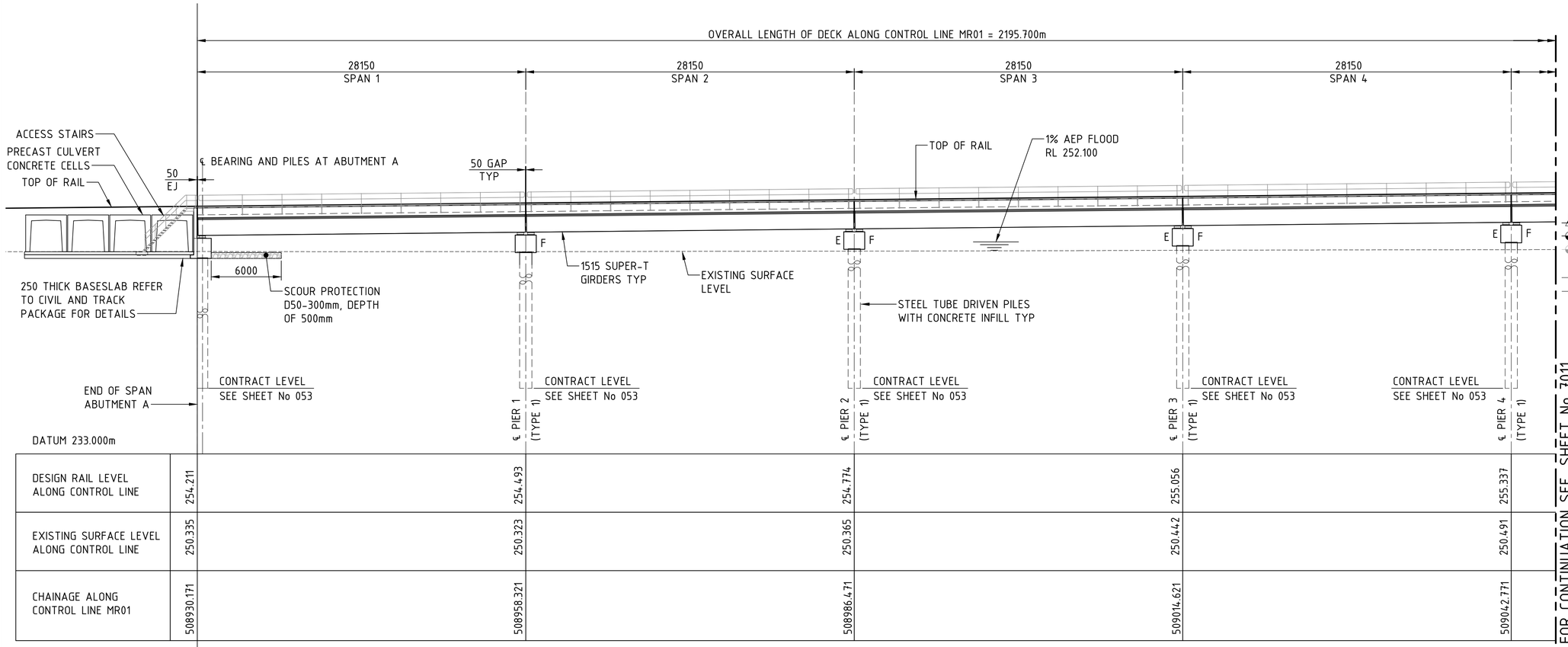
DIMENSIONS ARE IN MILLIMETRES.
CHAINAGES AND REDUCED LEVELS ARE IN METRES.
REDUCED LEVELS ARE TO AUSTRALIAN HEIGHT DATUM.
CO-ORDINATES ARE TO MAP GRID OF AUSTRALIA (MGA) ZONE 56.

LEGEND

F DENOTES FIXED BEARING.
E DENOTES EXPANSION BEARING.
TSR DENOTES TRAVEL STOCK ROUTE.
RMAR DENOTES RAIL MAINTENANCE ACCESS ROAD

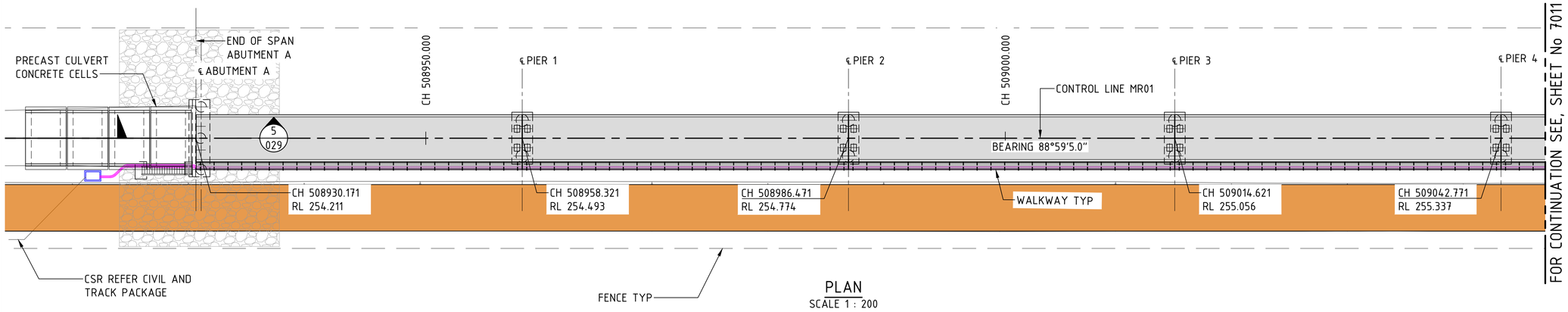
DENOTES PROPOSED CPT
DENOTES PROPOSED BOREHOLE
DENOTES EXISTING BOREHOLE

DENOTES FENCE
DENOTES EXISTING OVERHEAD WIRING



DESIGN RAIL LEVEL ALONG CONTROL LINE	254.211	254.493	254.774	255.056	255.337
EXISTING SURFACE LEVEL ALONG CONTROL LINE	250.335	250.323	250.365	250.442	250.491
CHAINAGE ALONG CONTROL LINE MR01	508930.171	508958.321	508986.471	509014.621	509042.771

ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	-
A	ISSUED FOR 35% DESIGN	K.U 31.01.23	R.P 31.01.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

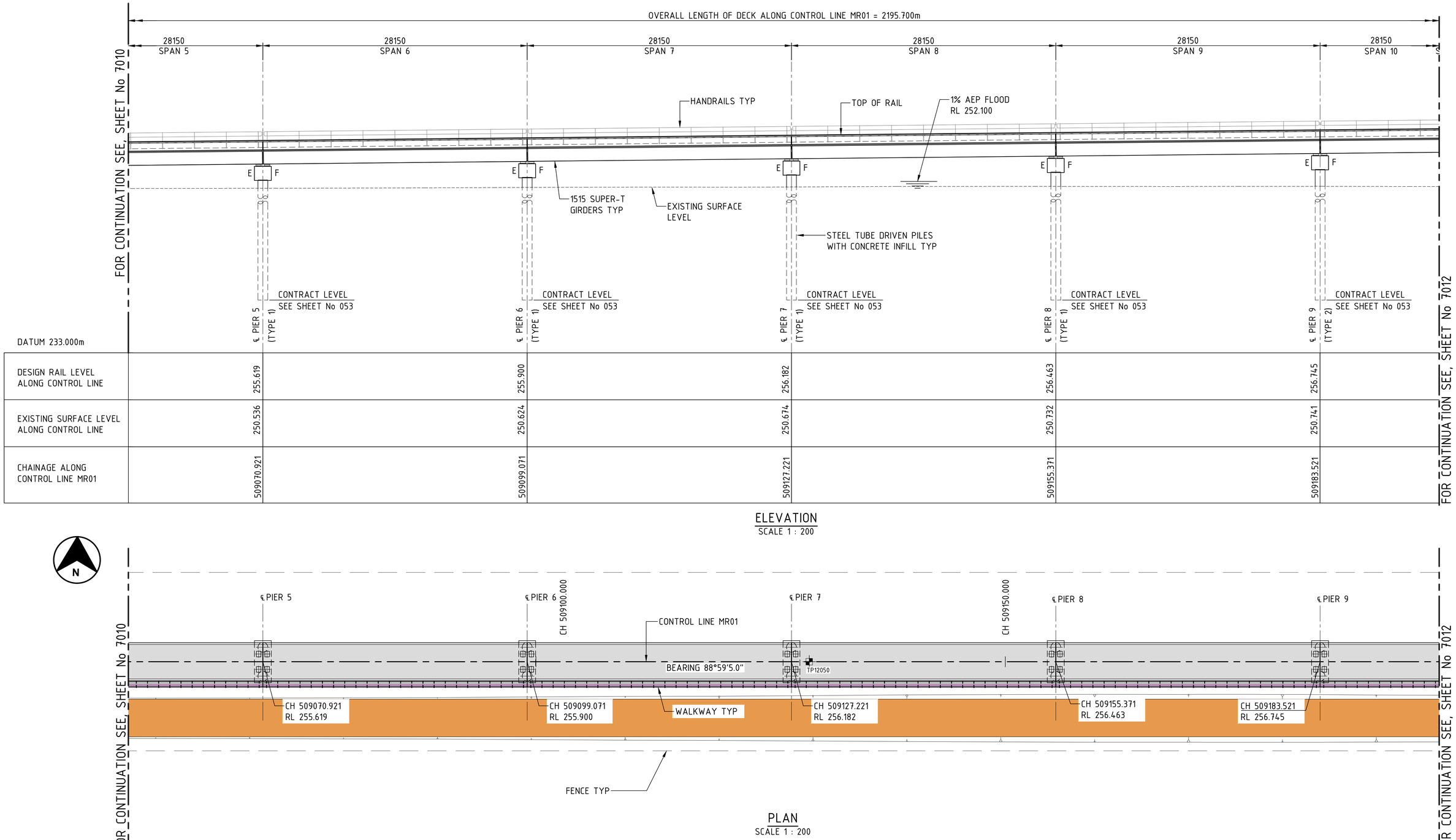
BG&E STRUCTURAL

DRAWN	M.CHAVAN	23/02/2023
DESIGNED	K.UNDHEIM	23/02/2023
DRG CHECK	R.SAFARIAN	23/02/2023
DESIGN CHECK	R.PAN	23/02/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
GENERAL ARRANGEMENT
SHEET A

FILE No. BE22007-6670-DRG-BR-7010	SHEET: 1 OF 21	A1
STATUS: 35% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7010	B	EDMS No. -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

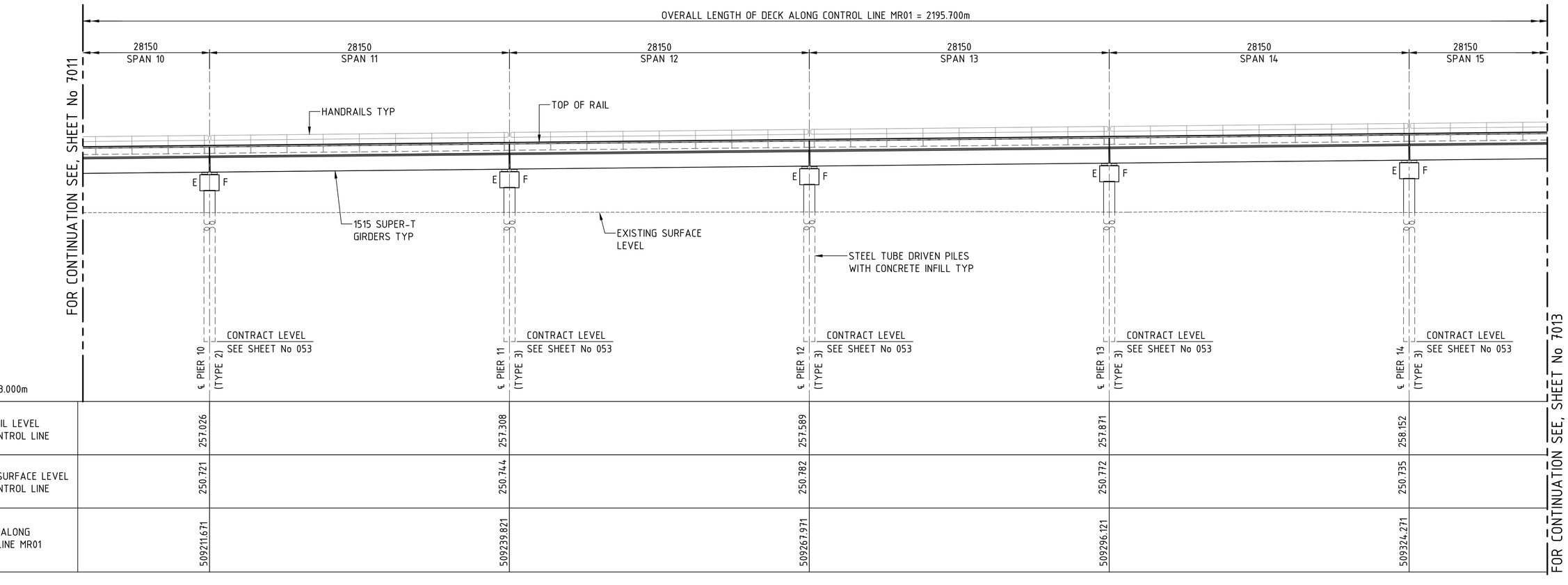
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET B

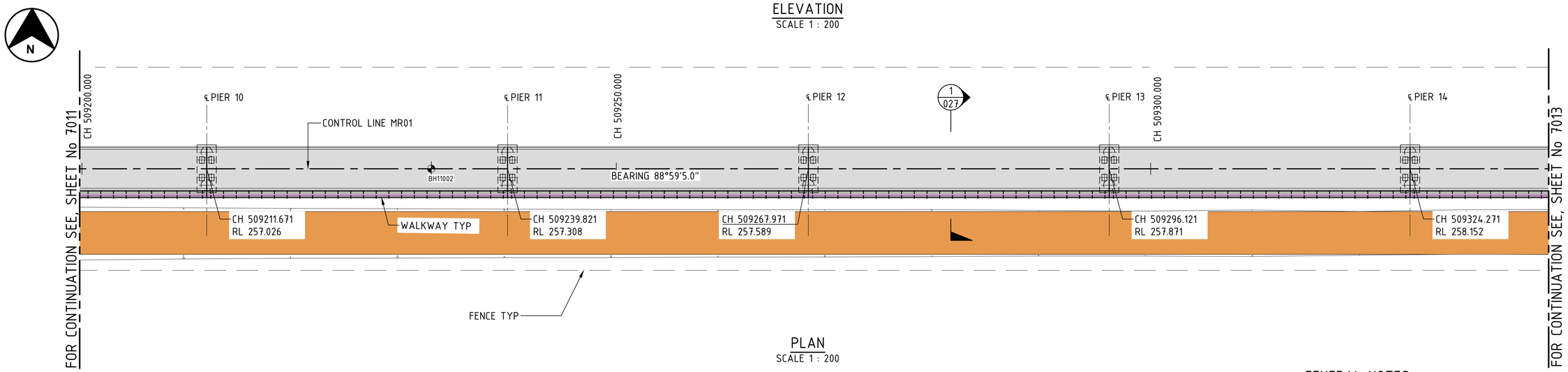
FILE No. BE22007-6670-DRG-BR-7011 | SHEET: 2 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7011 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

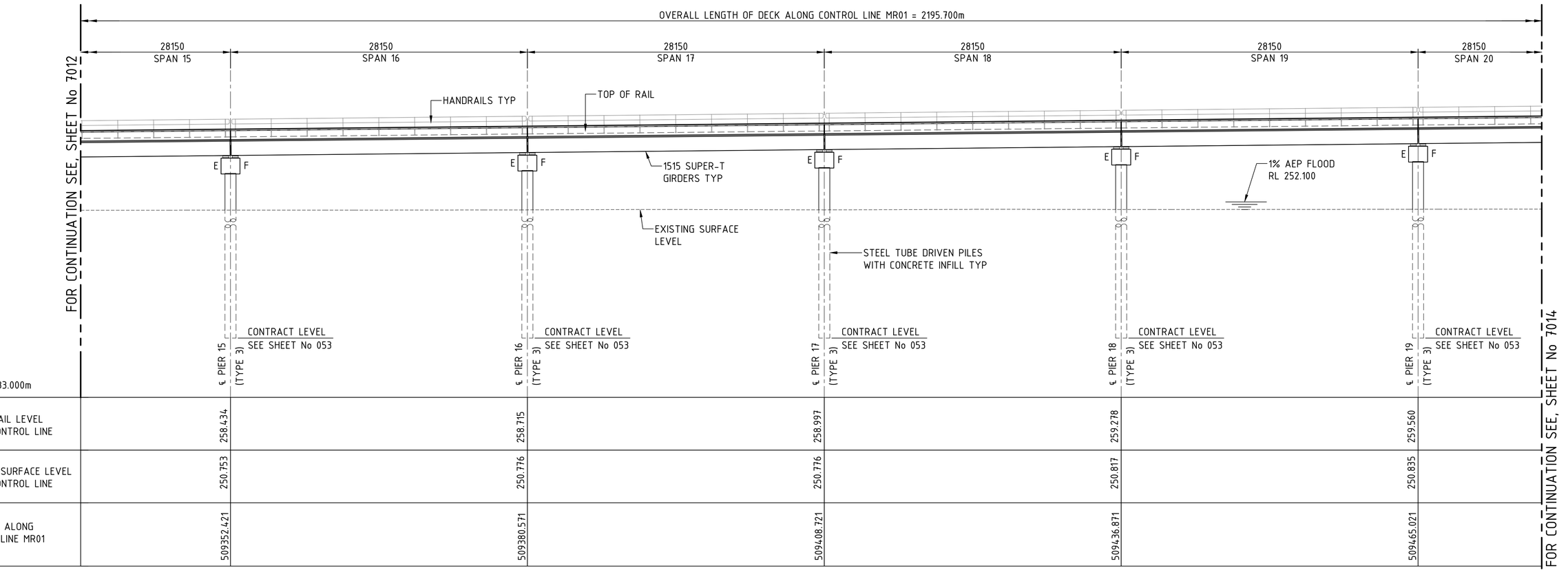
GENERAL ARRANGEMENT

SHEET C

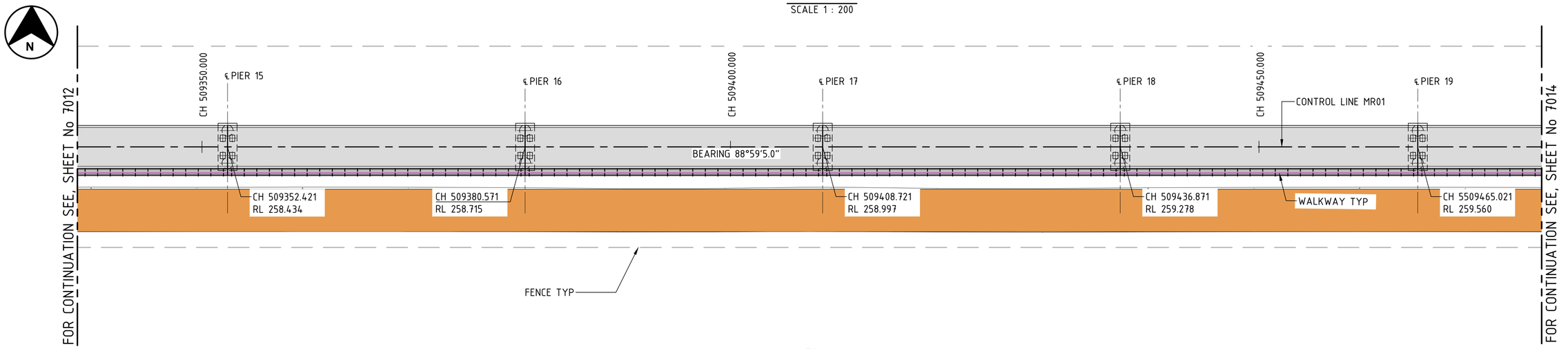
FILE No. BE22007-6670-DRG-BR-7012 | SHEET: 3 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7012 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

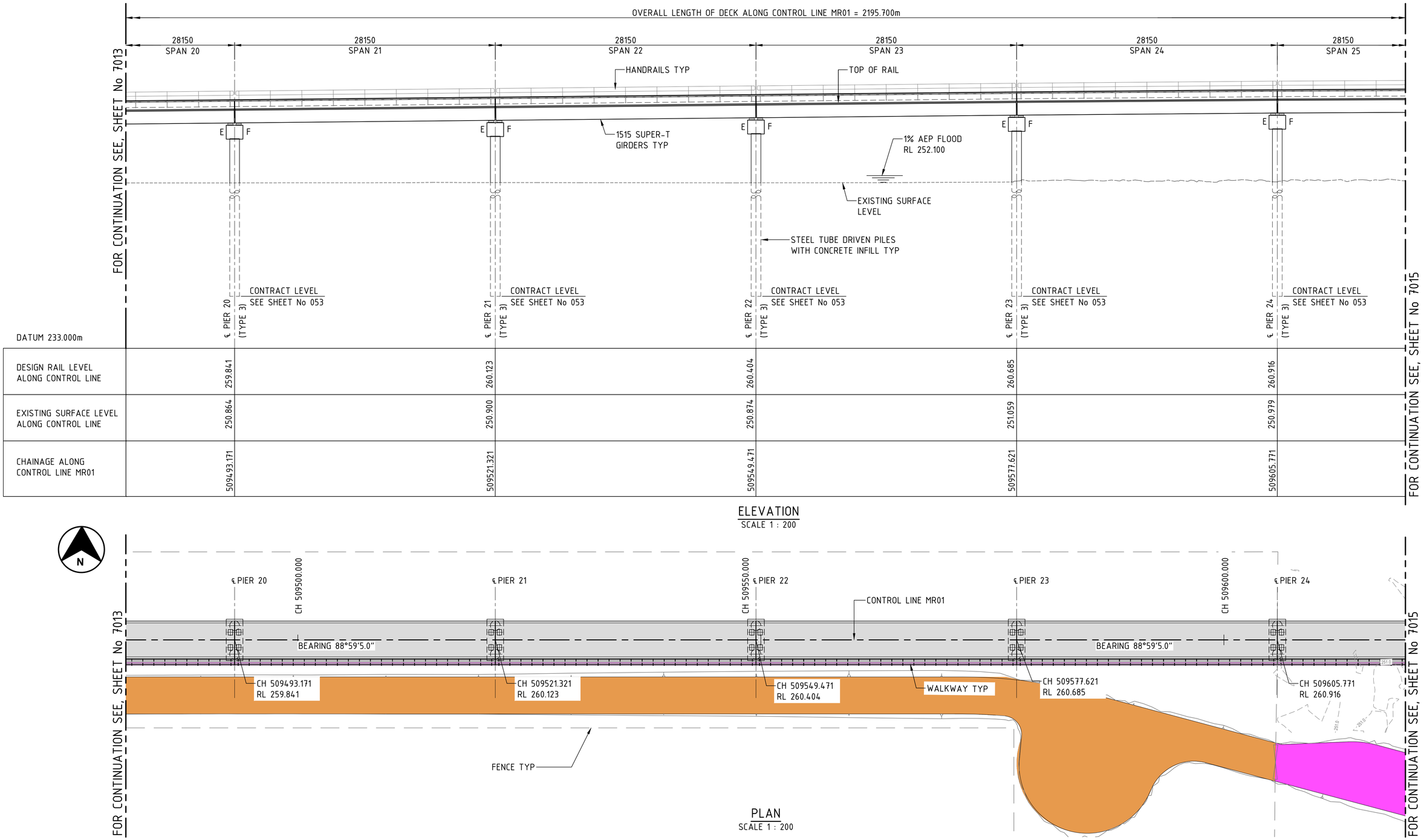
RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

GENERAL ARRANGEMENT

SHEET D

FILE No. BE22007-6670-DRG-BR-7013	SHEET: 4 OF 21	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7013	B	EDMS No. -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

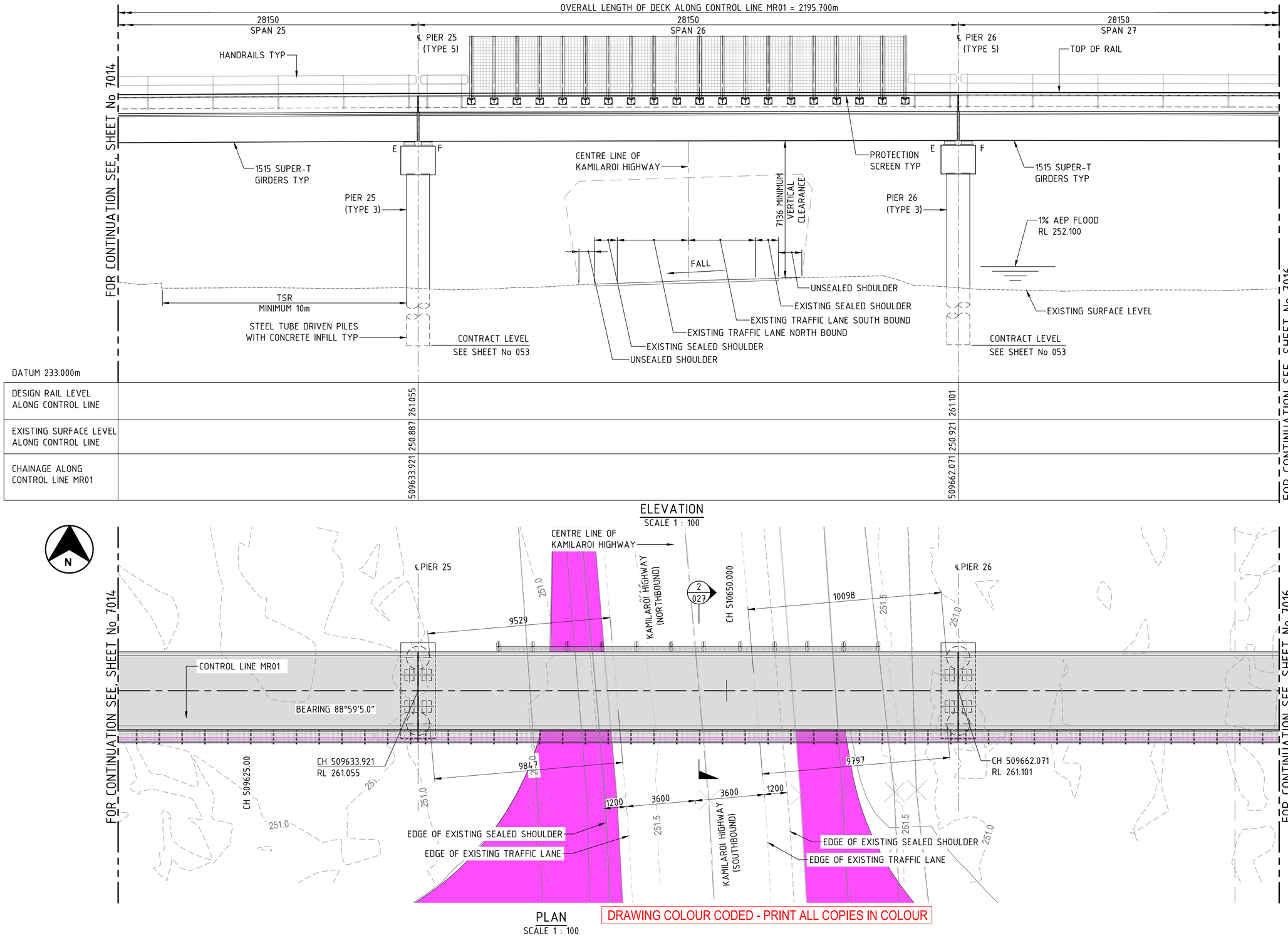
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET E

FILE No. BE22007-6670-DRG-BR-7014 | SHEET: 5 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7014 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 100

PLAN
SCALE 1 : 100

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:100 @ A1 0 1 2 3 4 5 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

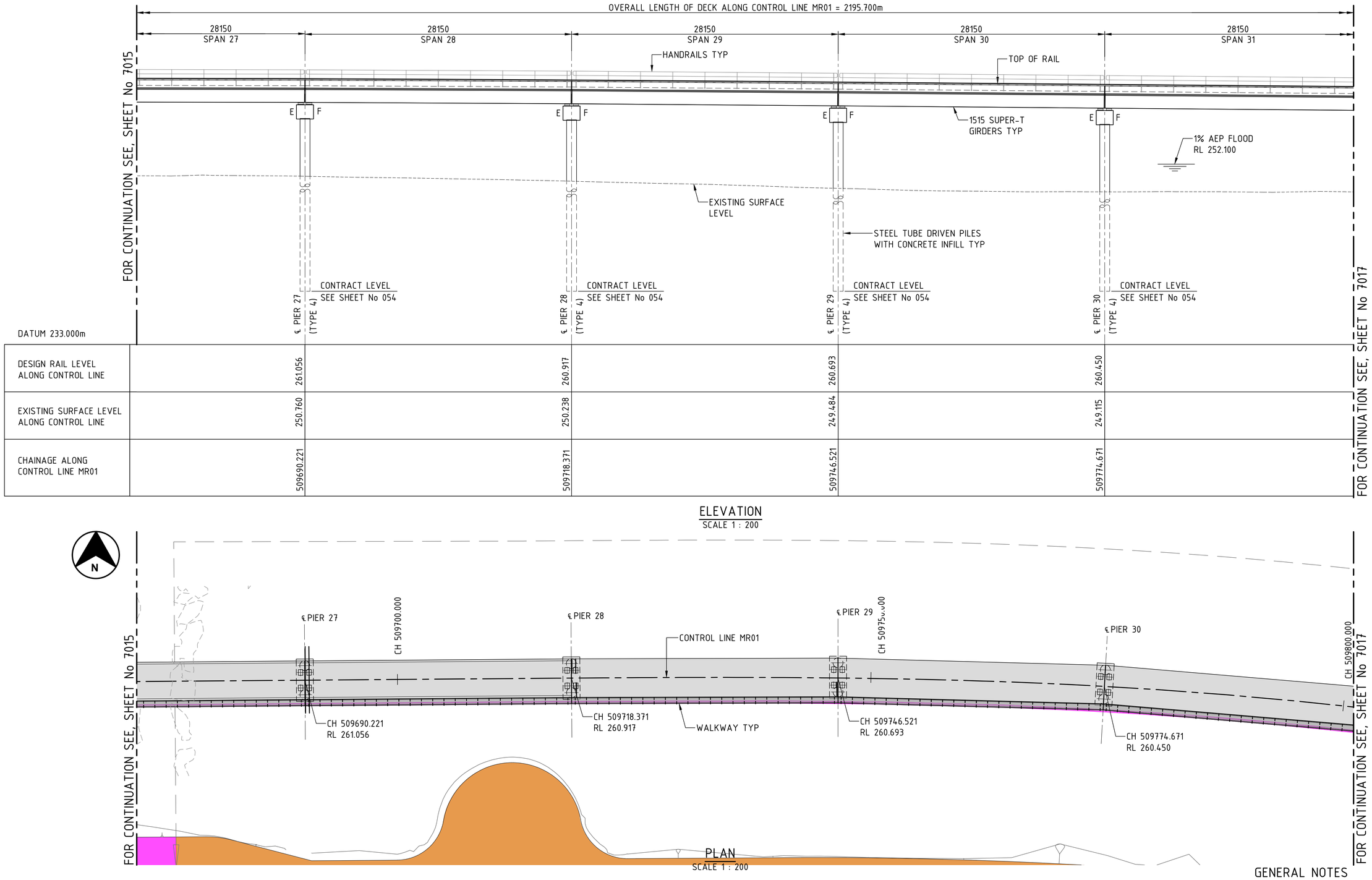
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET F

FILE No. BE22007-6670-DRG-BR-7015 | SHEET: 6 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7015 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

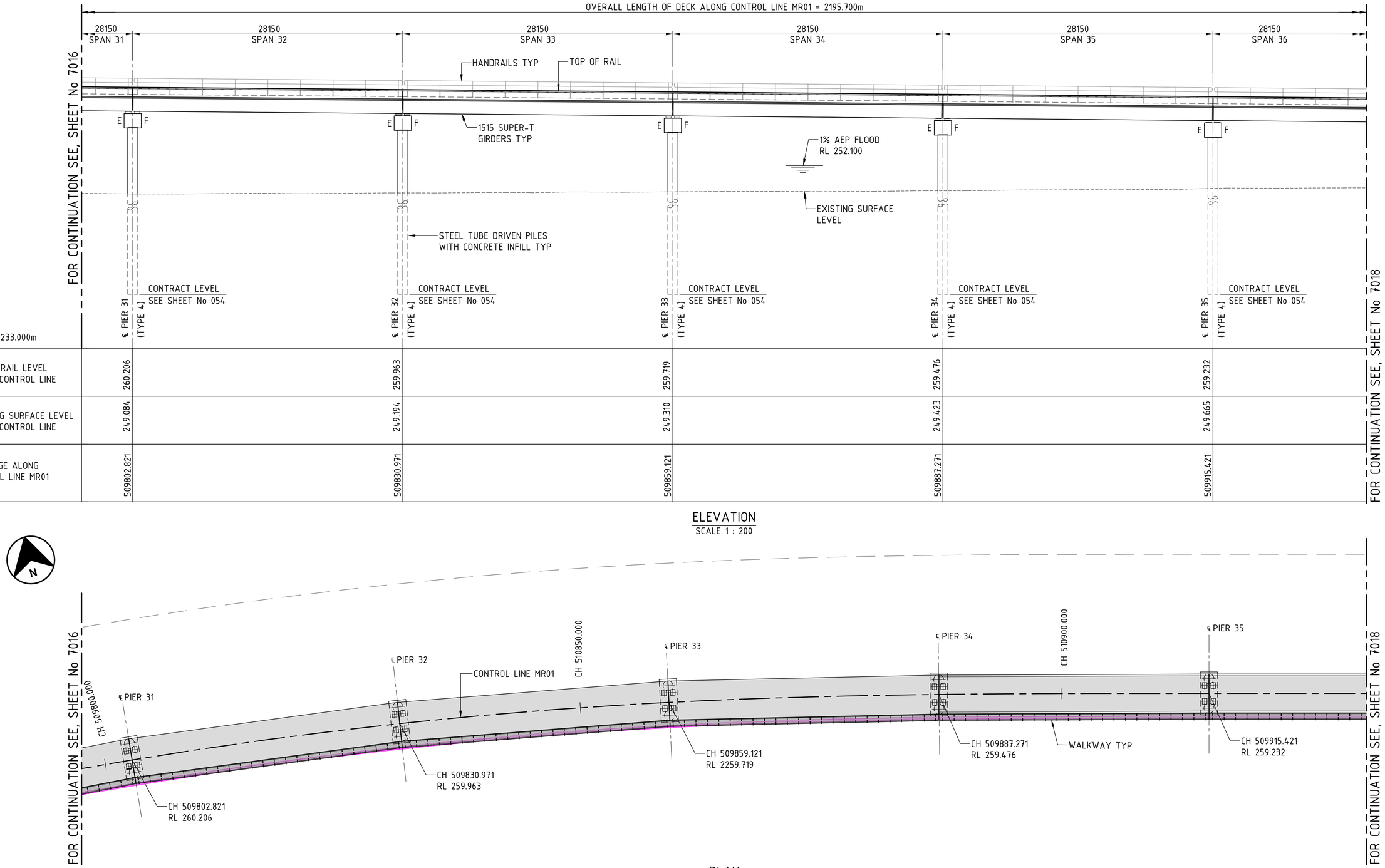
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET G

FILE No. BE22007-6670-DRG-BR-7016	SHEET: 7 OF 21	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7016	B	EDMS No. -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

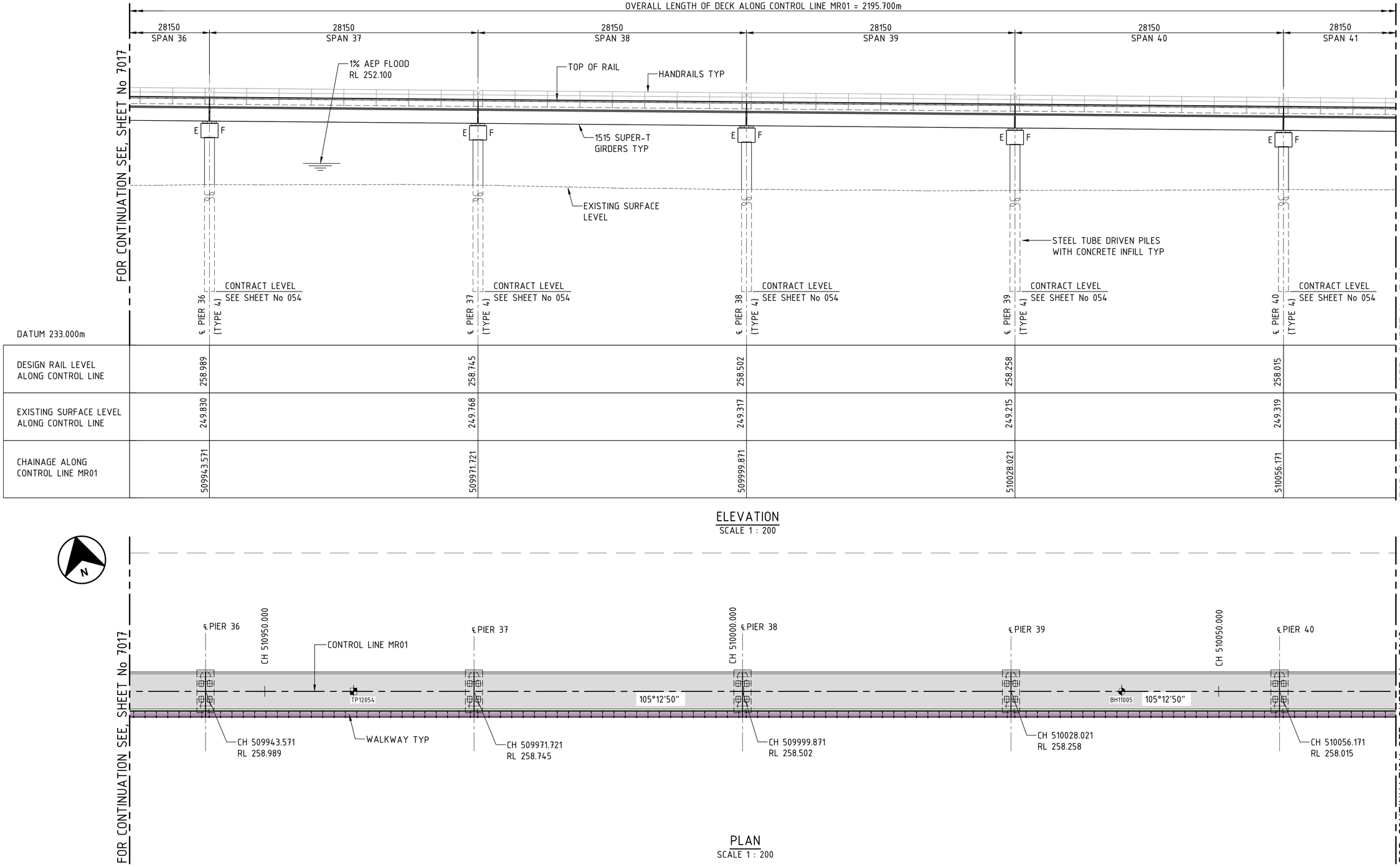
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET H

FILE No. BE22007-6670-DRG-BR-7017 | SHEET: 8 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7017 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

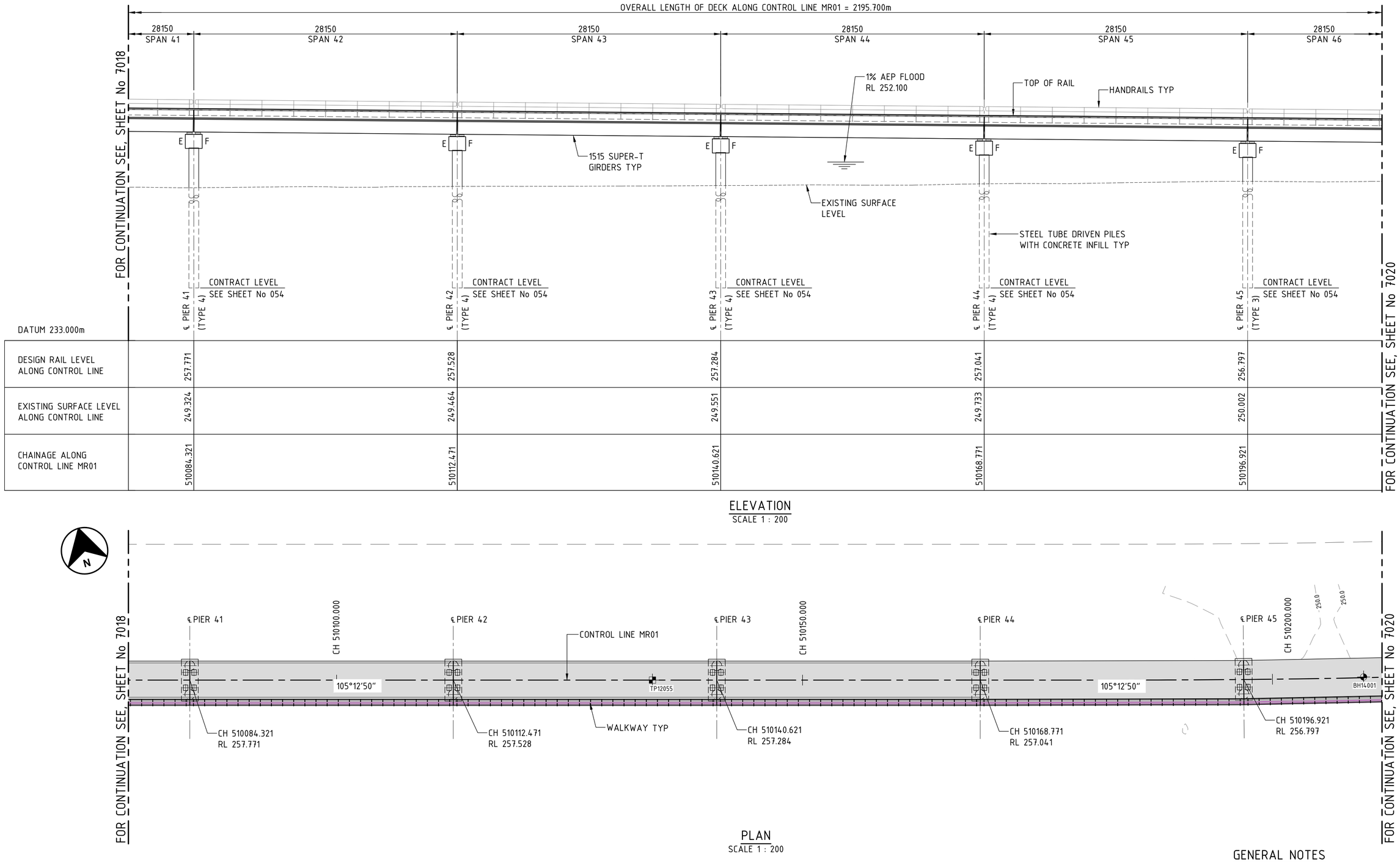
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET J

FILE No. BE22007-6670-DRG-BR-7018 | SHEET: 9 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7018 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

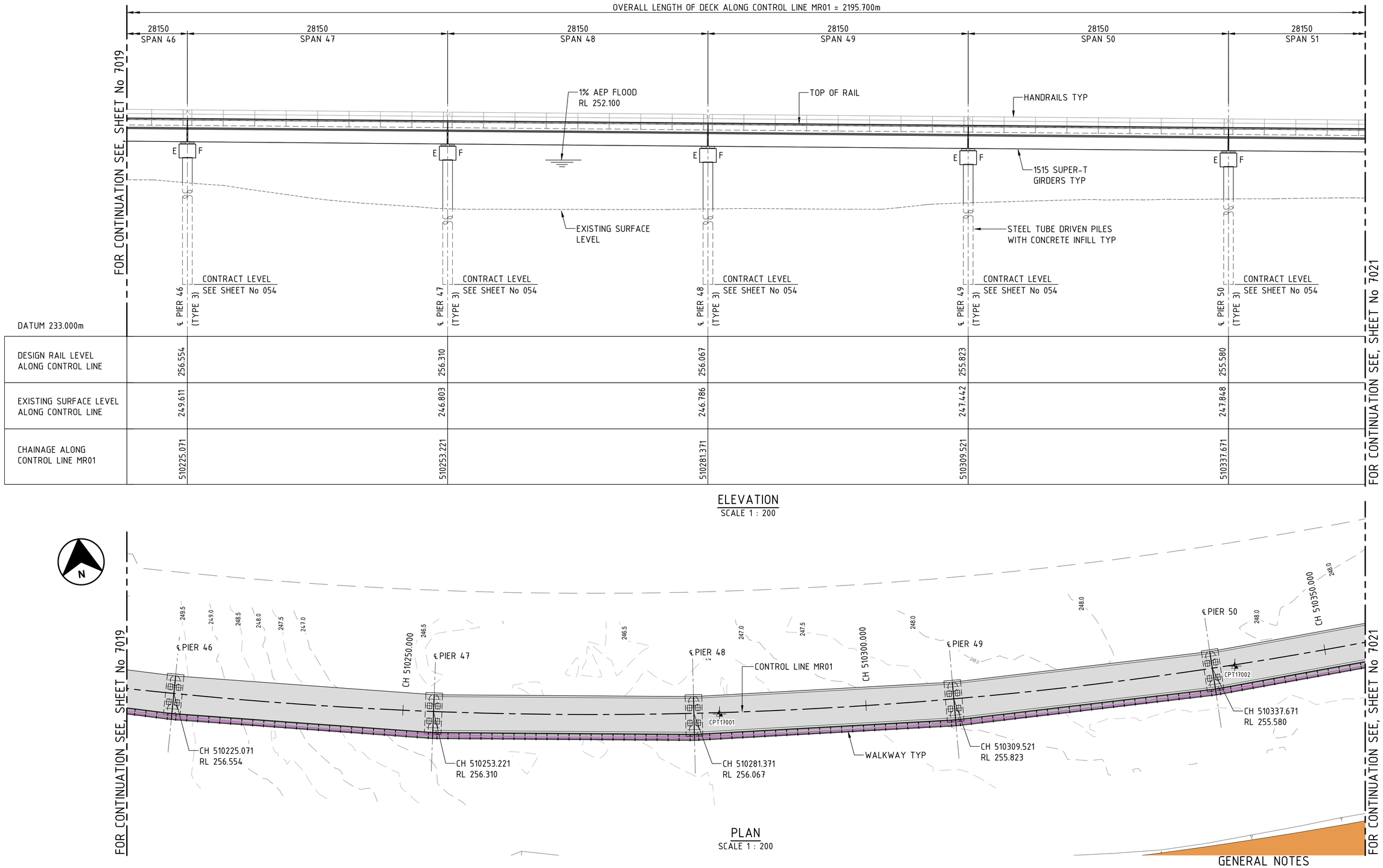
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET K

FILE No. BE22007-6670-DRG-BR-7019 | SHEET: 10 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7019 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

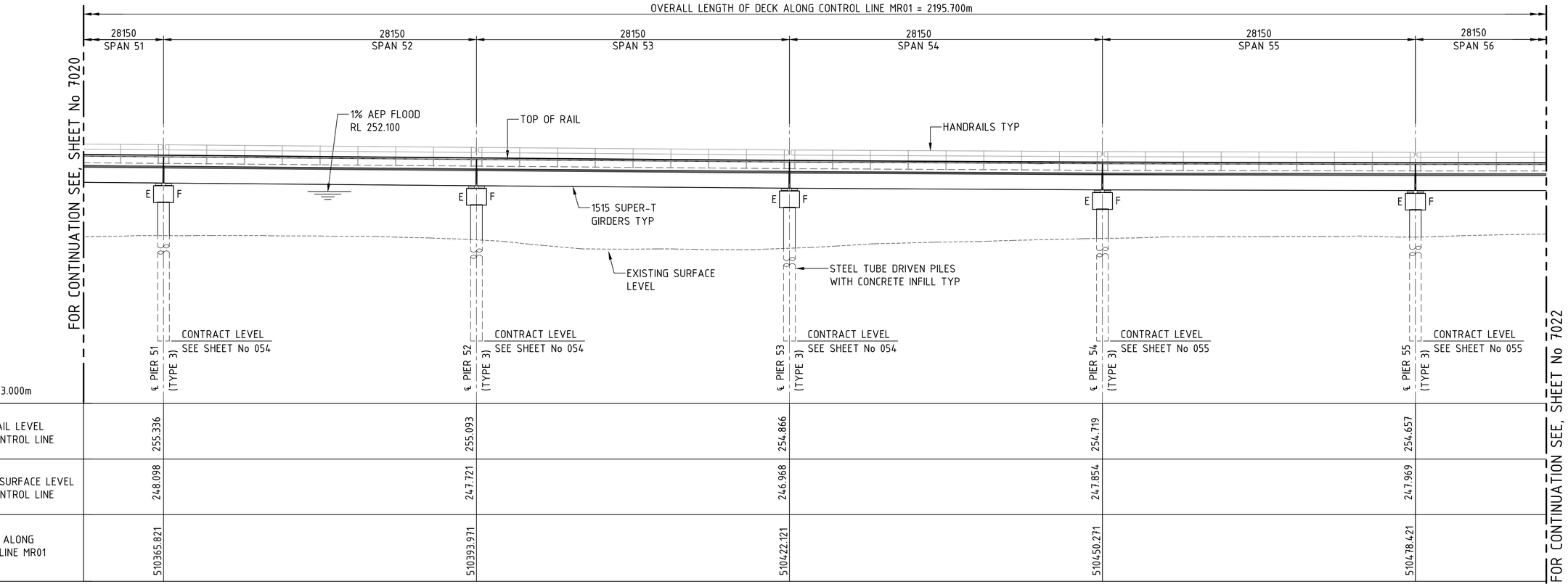
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET L

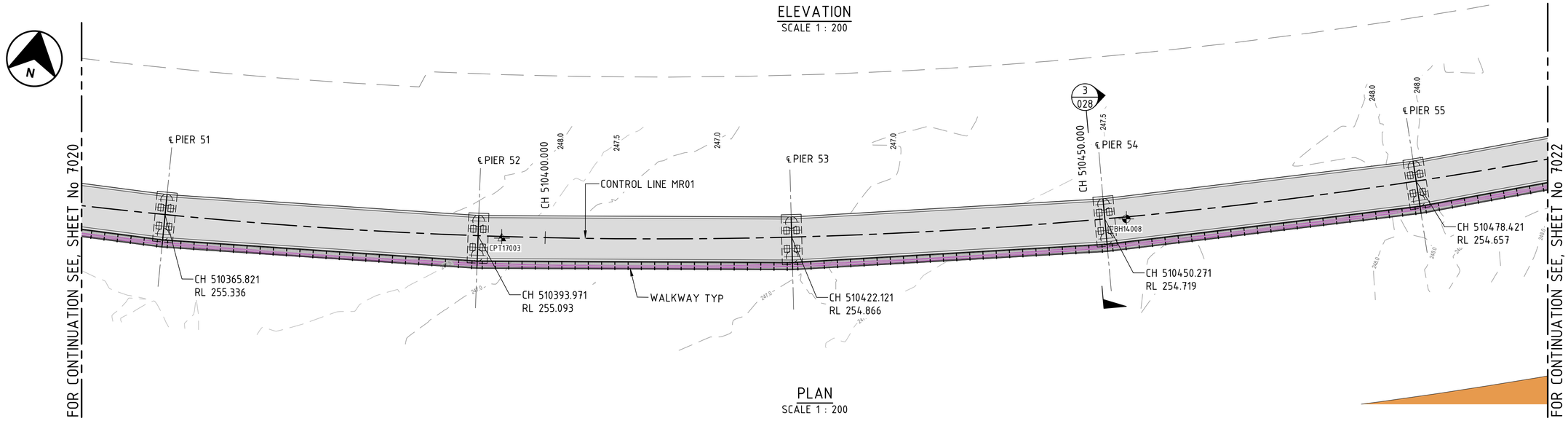
FILE No. BE22007-6670-DRG-BR-7020 | SHEET: 11 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7020 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

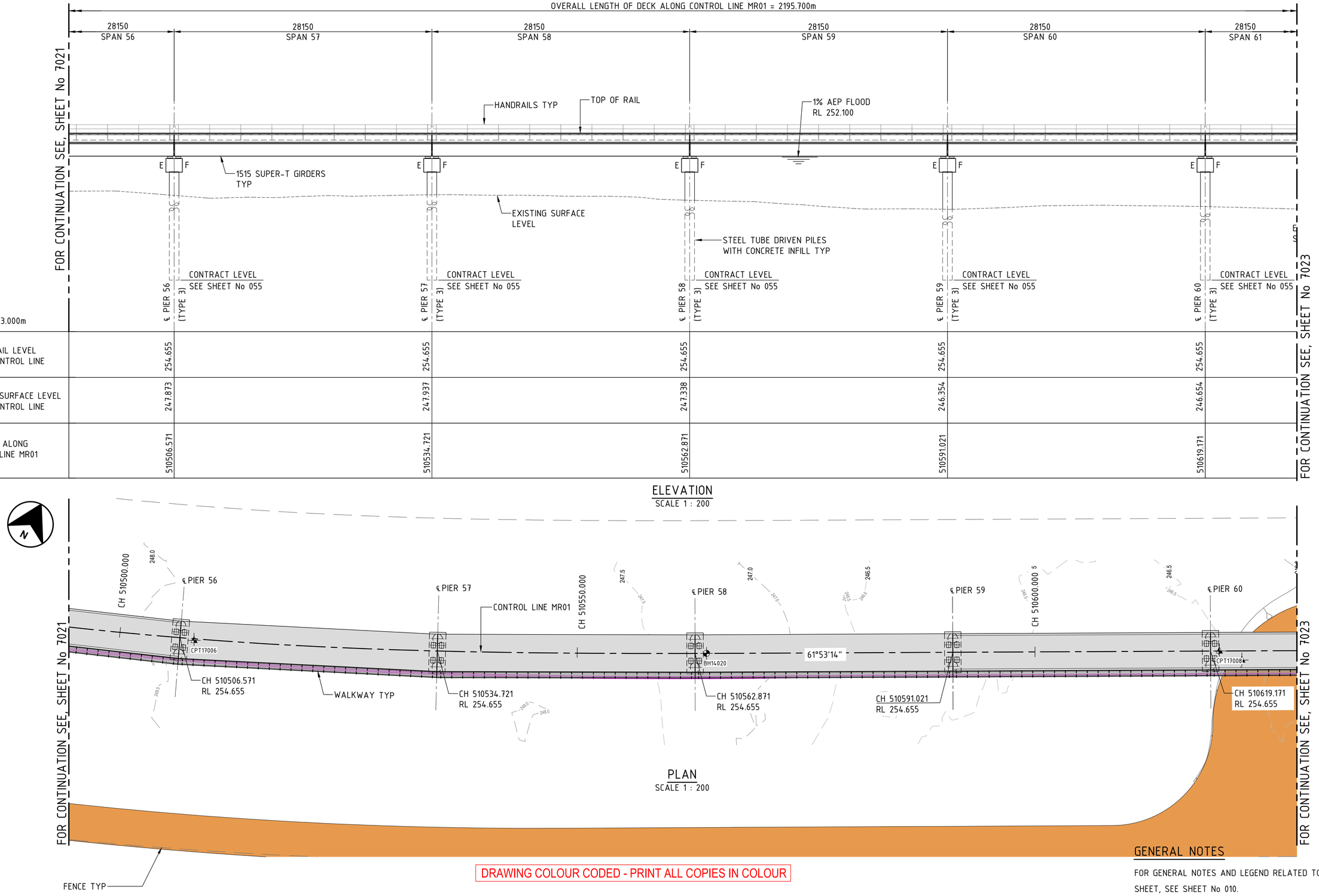
GENERAL ARRANGEMENT

SHEET M

FILE No. BE22007-6670-DRG-BR-7021 | SHEET: 12 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7021 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

1:200 @ A1 0 2 4 6 8 10 m

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

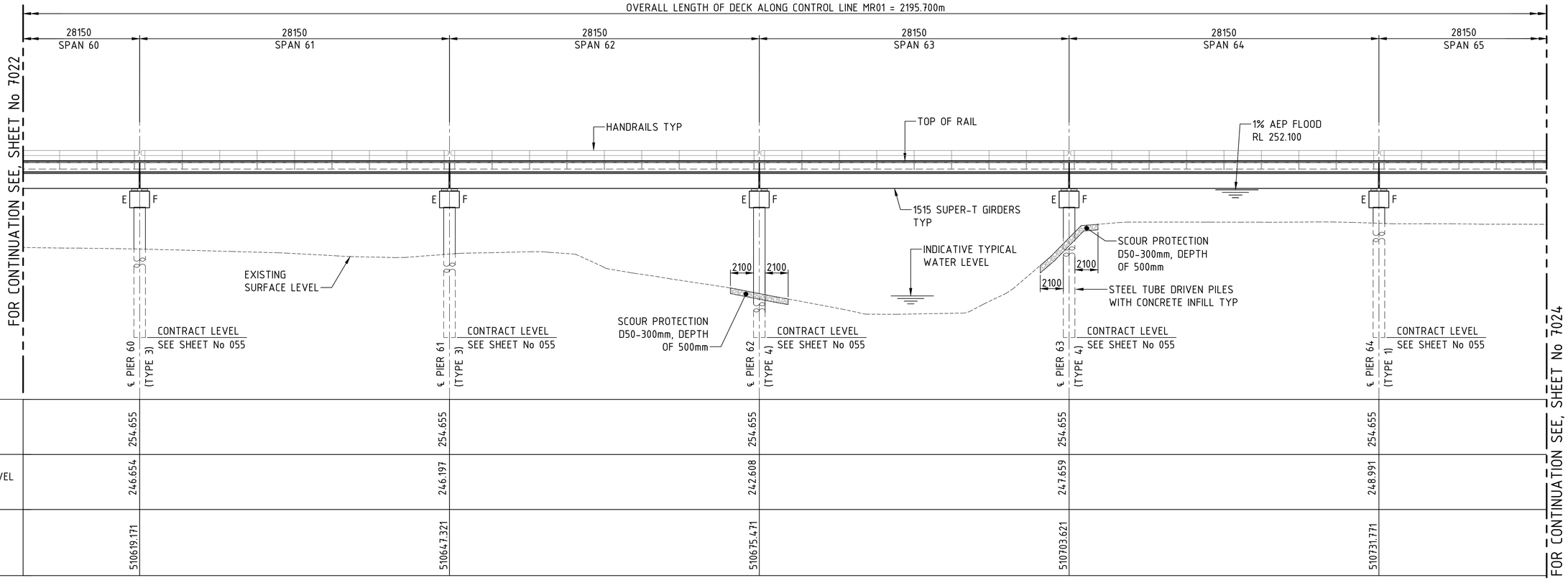
GENERAL ARRANGEMENT

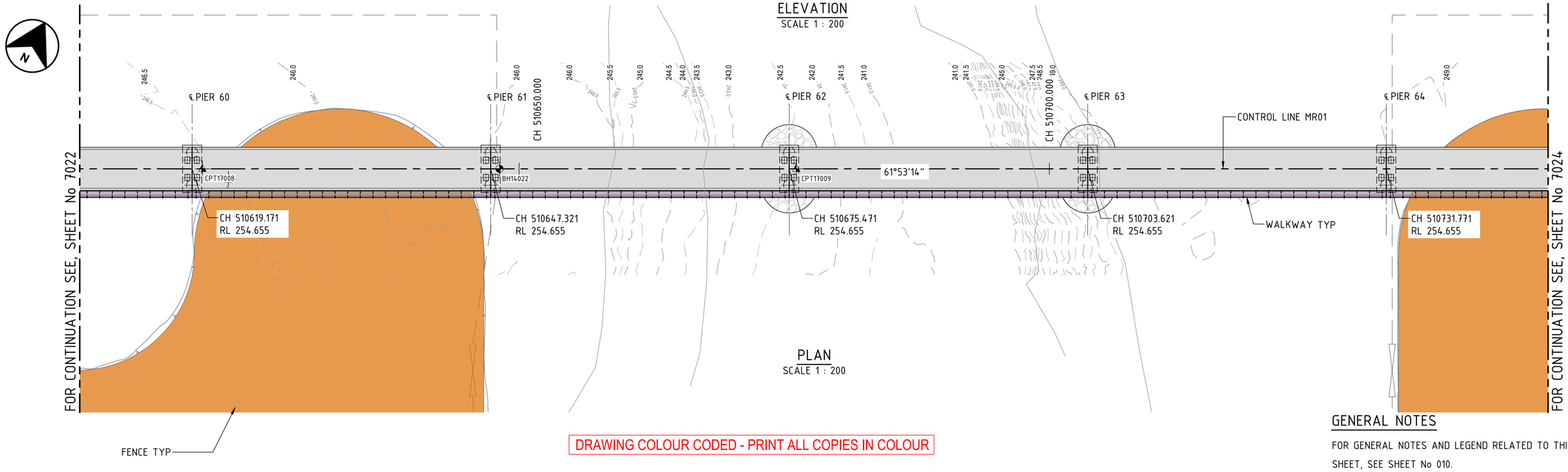
SHEET N

FILE No. BE22007-6670-DRG-BR-7022 | SHEET: 13 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7022 | B | EDMS No. - | -





DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

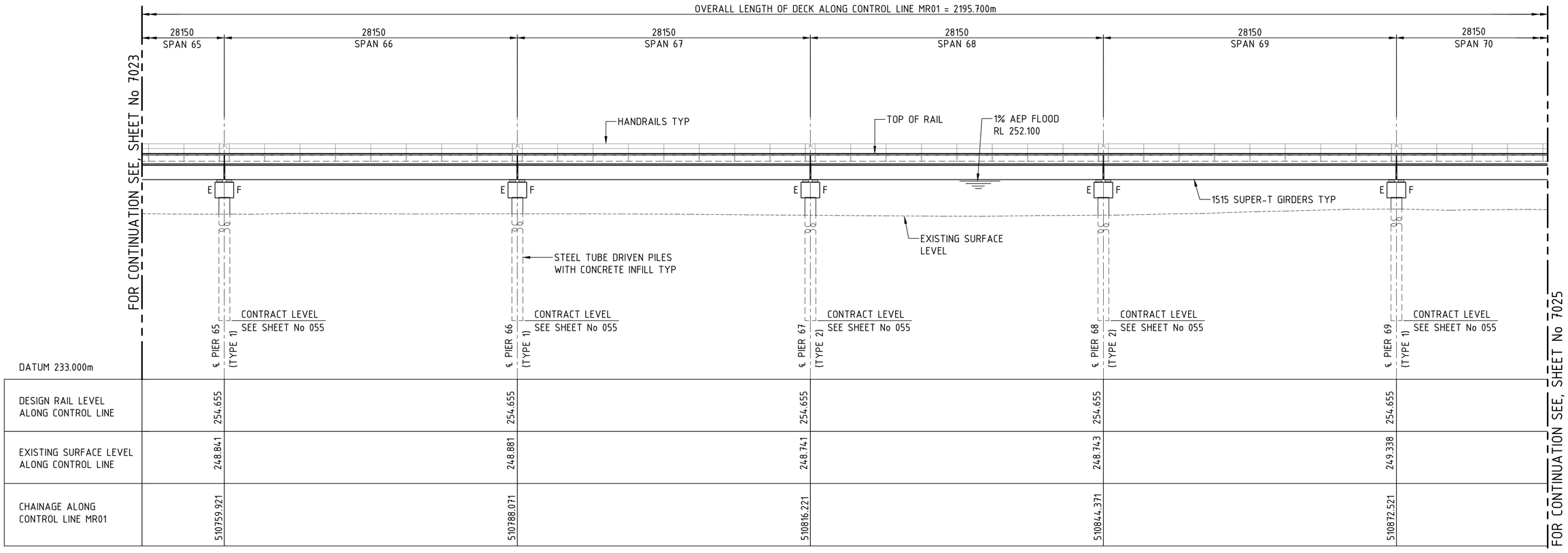
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

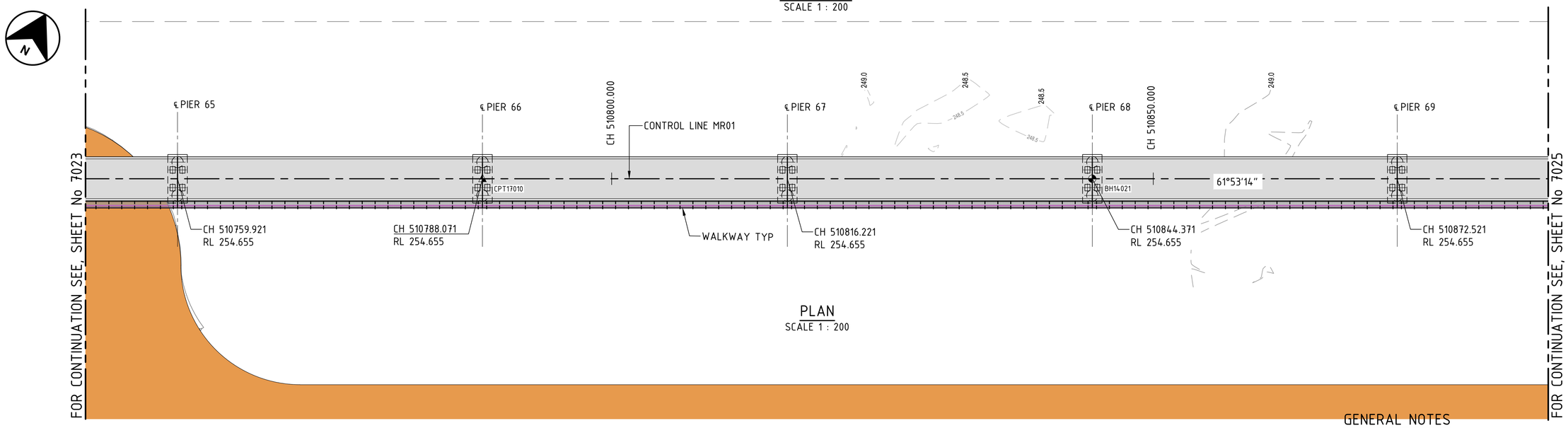
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET P

FILE No. BE22007-6670-DRG-BR-7023	SHEET: 14 OF 21	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7023	B	EDMS No. -



ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

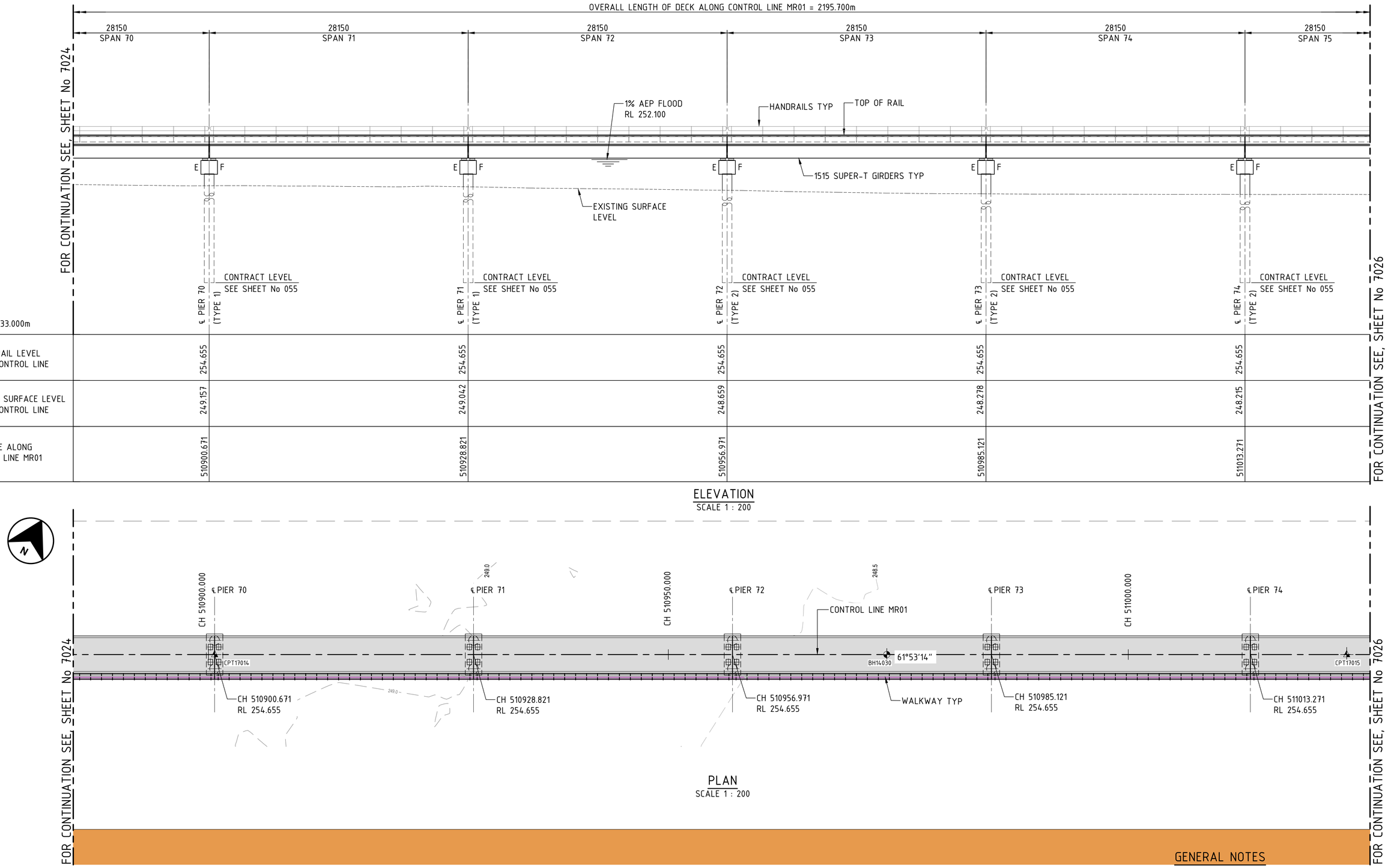
WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
GENERAL ARRANGEMENT
SHEET Q

FILE No. BE22007-6670-DRG-BR-7024 | SHEET: 15 OF 21 | A1
STATUS: 100% DESIGN | ©
DRG No. BE22007-6670-DRG-BR-7024 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200

PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

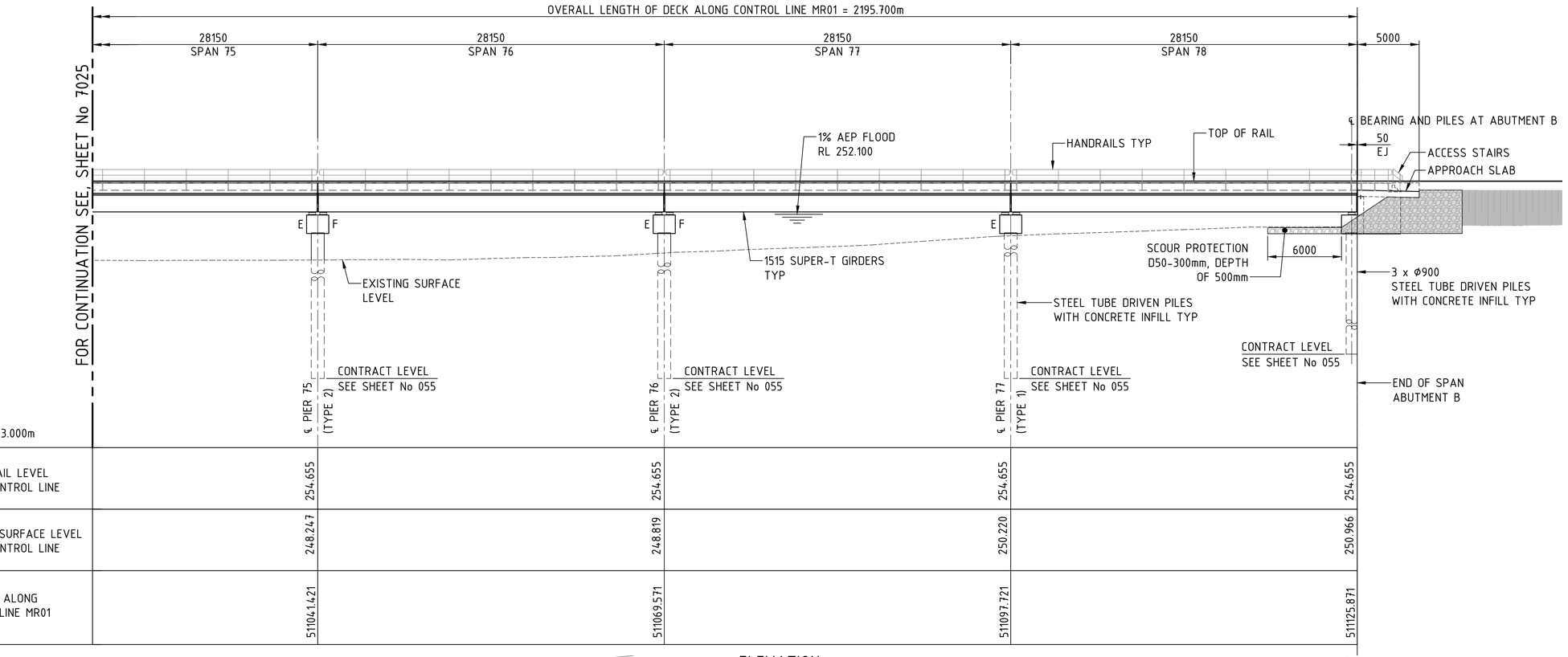
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET R

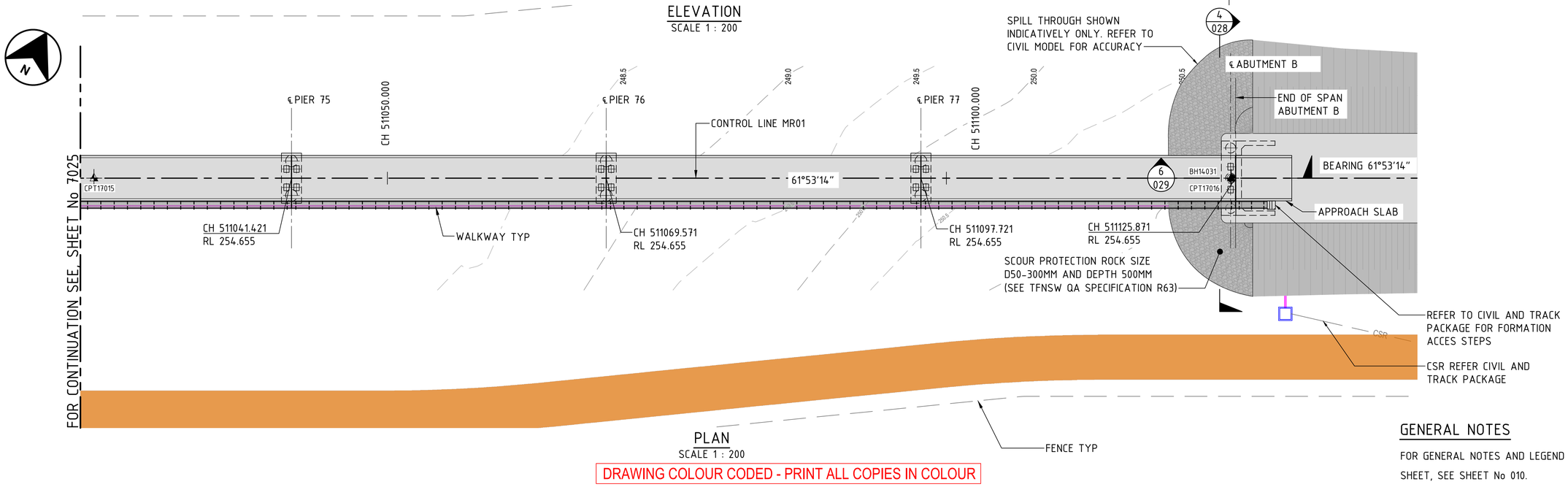
FILE No. BE22007-6670-DRG-BR-7025 | SHEET: 16 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7025 | B | EDMS No. - | -



ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

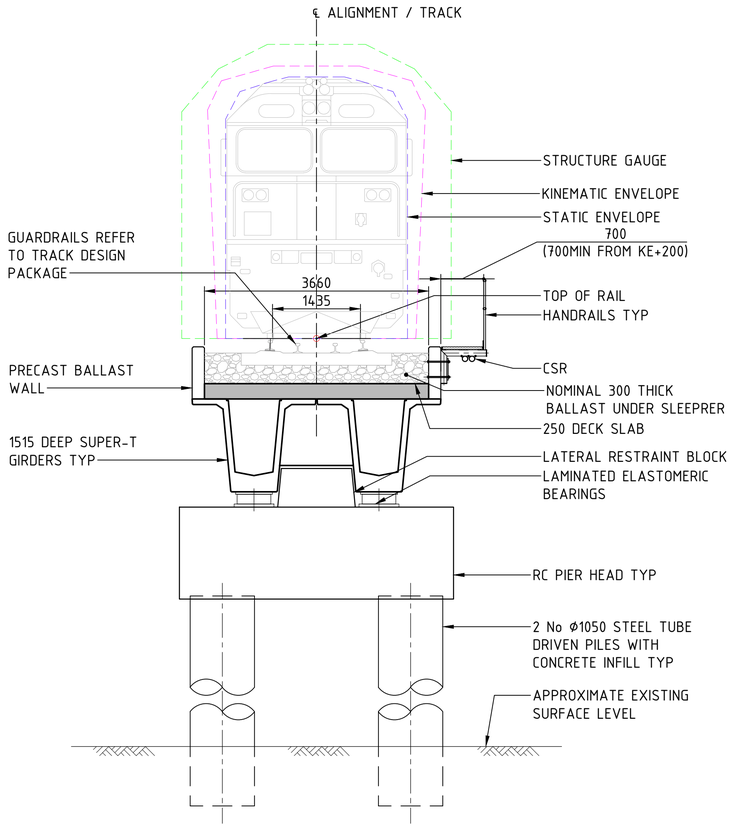
DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
GENERAL ARRANGEMENT
SHEET S

FILE No. BE22007-6670-DRG-BR-7026 | SHEET: 17 OF 21 | A1
STATUS: 100% DESIGN
DRG No. BE22007-6670-DRG-BR-7026 | B | EDMS No. - | -

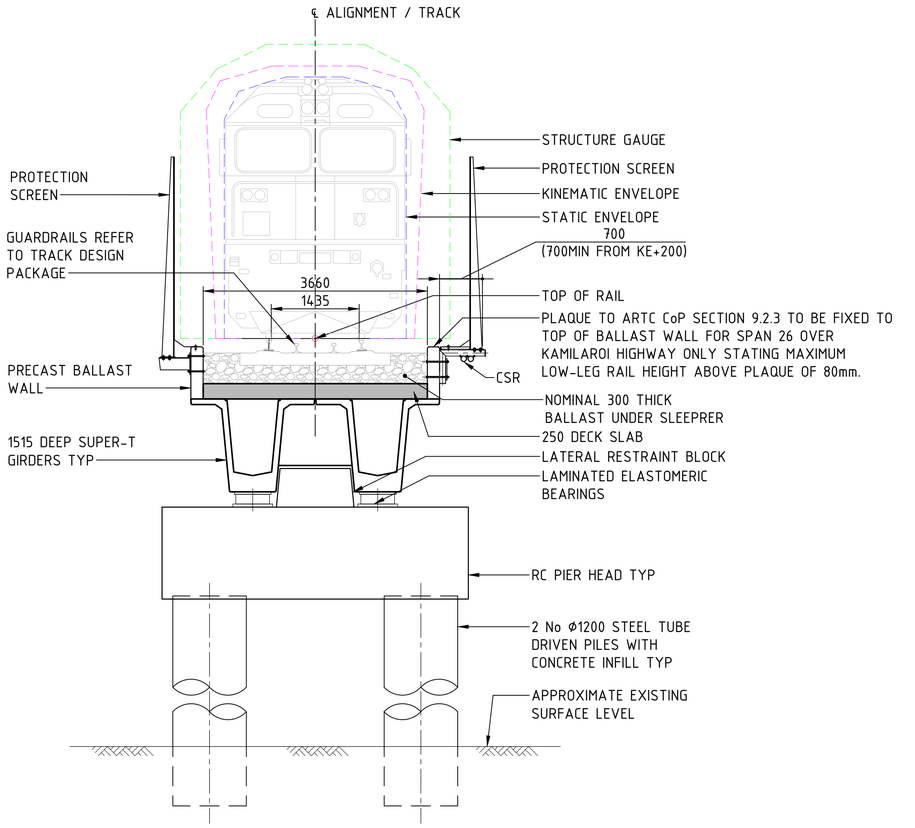
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.



SECTION 1 / 012
SCALE 1 : 50

(SECTION AT STRAIGHT ALIGNMENT)



SECTION 2 / 015
SCALE 1 : 50

(SECTION AT KAMILAROI HIGHWAY)

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

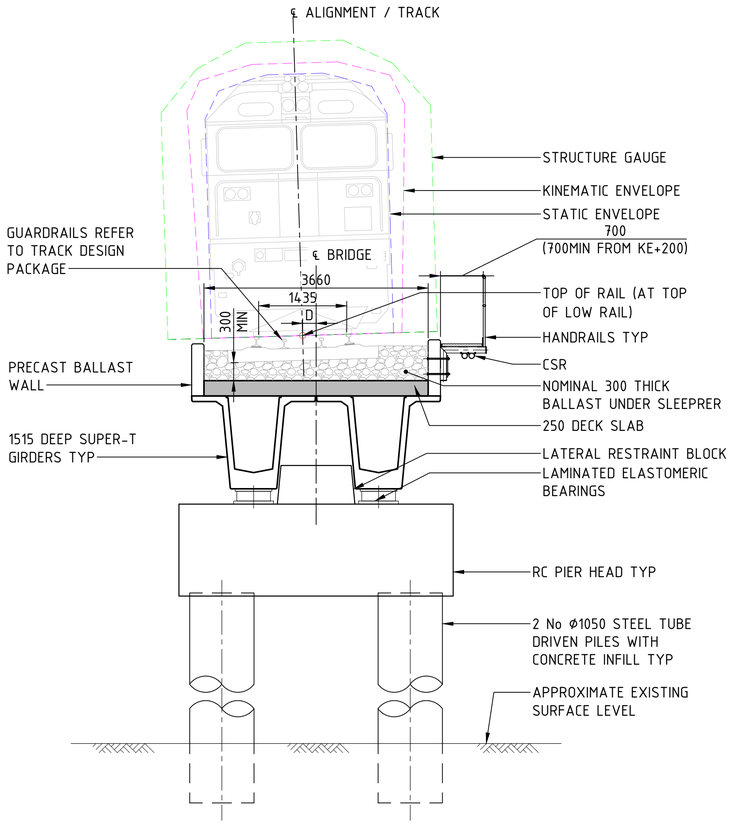
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET T

FILE No. BE22007-6670-DRG-BR-7027	SHEET: 18 OF 21	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7027	B	EDMS No. - / -

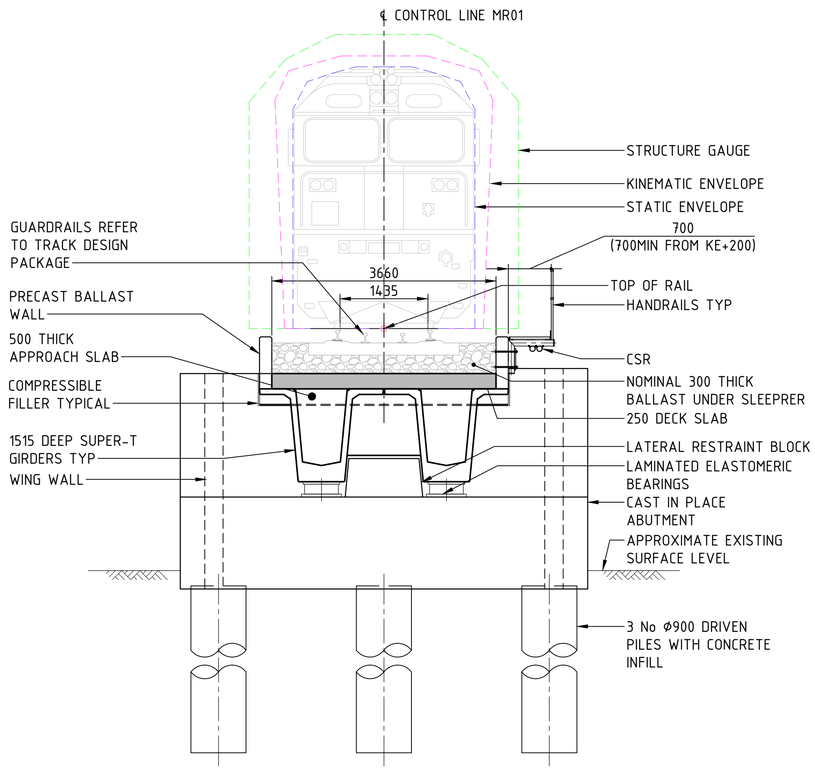
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.



SECTION 3 / 021
SCALE 1 : 50

(SECTION AT CURVED ALIGNMENT)



SECTION 4 / 026
SCALE 1 : 50

(SECTION AT ABUTMENT B)

DIMENSION AT CONTROL MR01 AND DECK ℄

PIER NO	DIMENSION 'D' (mm)
P29	65
P30	198
P31	198
P32	198
P33	198
P46	132
P47	220
P48	220
P49	220
P50	220
P51	220
P52	220
P53	220
P54	220
P55	220
P56	220
P57	200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	19/05/2023
DESIGNED	K.UNDHEIM	19/05/2023
DRG CHECK	R.SAFARIAN	19/05/2023
DESIGN CHECK	R.PAN	19/05/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

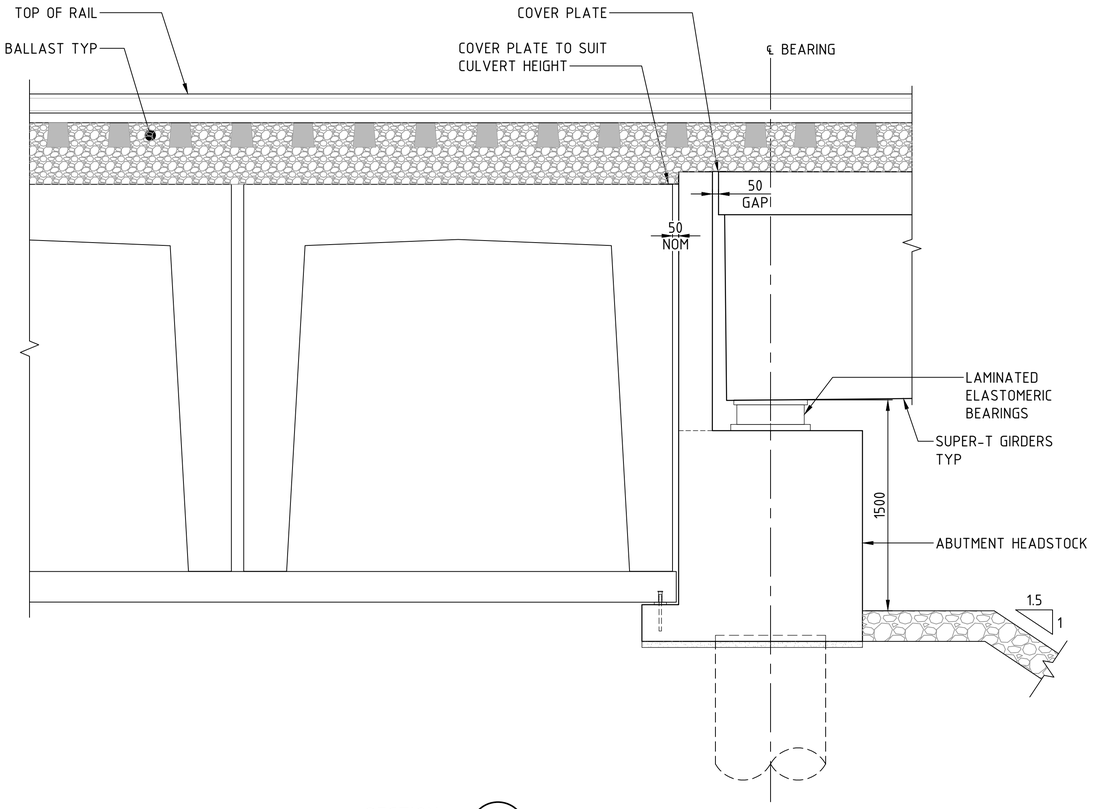
GENERAL ARRANGEMENT

SHEET U

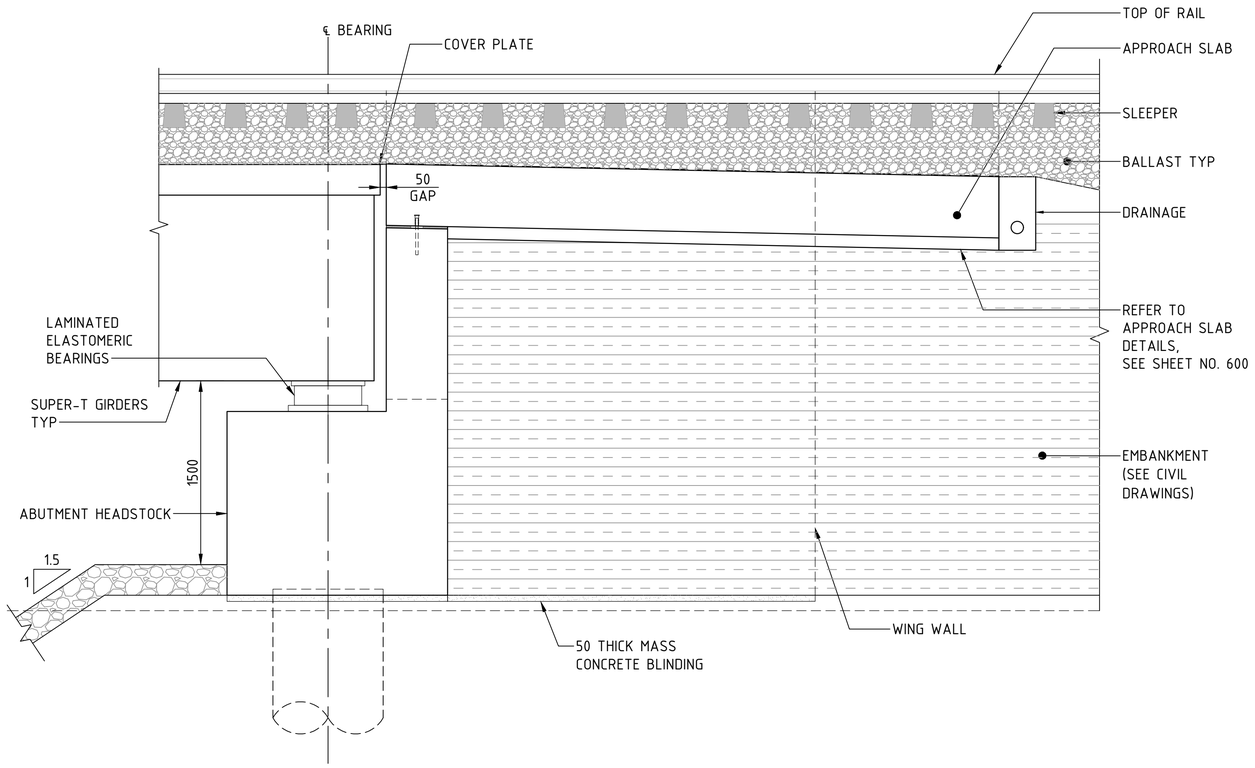
FILE No. BE22007-6670-DRG-BR-7028	SHEET: 19 OF 21	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7028	B	EDMS No. -

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.



SECTION 5 (010)
SCALE 1 : 25



SECTION 6 (026)
SCALE 1 : 25

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER GENERAL ARRANGEMENT

SHEET V

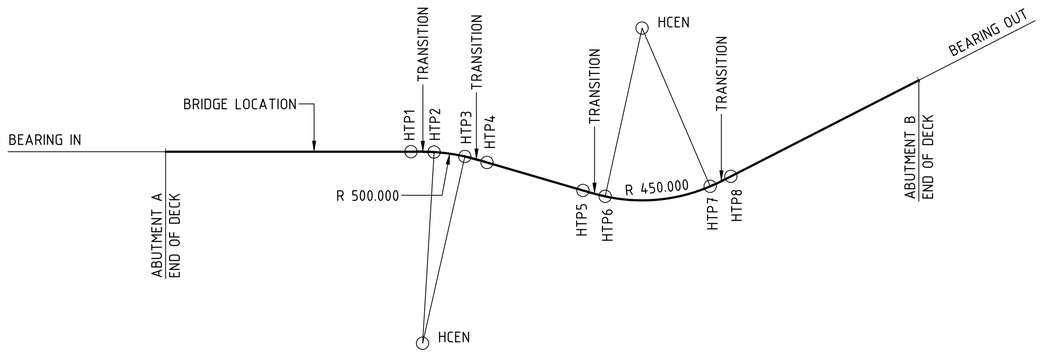
FILE No. BE22007-6670-DRG-BR-7029 | SHEET: 20 OF 21 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7029 | B | EDMS No. - | -

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.



HORIZONTAL ALIGNMENT DIAGRAM
RAIL ALIGNMENT (CONTROL LINE MR01)
NOT TO SCALE

HORIZONTAL ALIGNMENT DATA FOR CONTROL MR01

POINT	CHAINAGE	CO-ORDINATES		BEARING IN	BEARING OUT	RADIUS (m)
		EASTING	NORTHING			
ABUTMENT A	508930.171	226552.742	6587540.136	88°59'50"	-	-
HTP1	509712.824	227335.272	6587554.003	-	-	-
HTP2	509772.824	227395.262	6587553.861	-	-	-
HCEN	-	227374.011	6587054.312	-	-	500
HTP3	509854.218	227475.942	6587543.812	-	-	-
HTP4	509914.218	227534.135	6587529.236	-	-	-
HTP5	510175.226	227785.996	6587460.741	-	-	-
HTP6	510235.226	227844.219	6587446.297	-	-	-
HCEN	-	227932.979	6587887.456	-	-	450
HTP7	510515.226	228117.980	6587477.243	-	-	-
HTP8	510575.226	228171.510	6587504.320	-	-	-
ABUTMENT B	511125.871	228657.191	6587763.790	-	61°53'14"	-

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

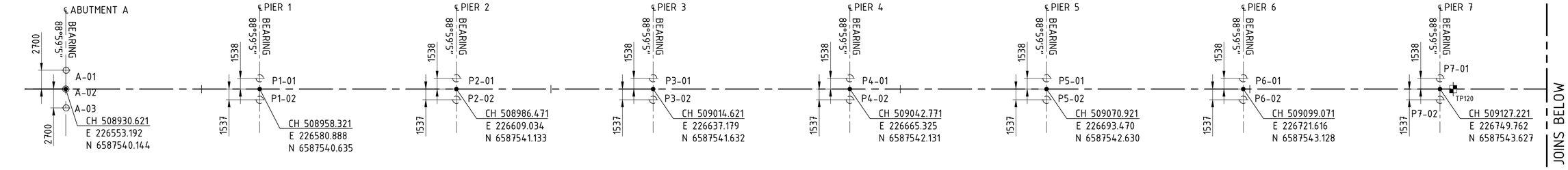
RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
GENERAL ARRANGEMENT
SHEET W

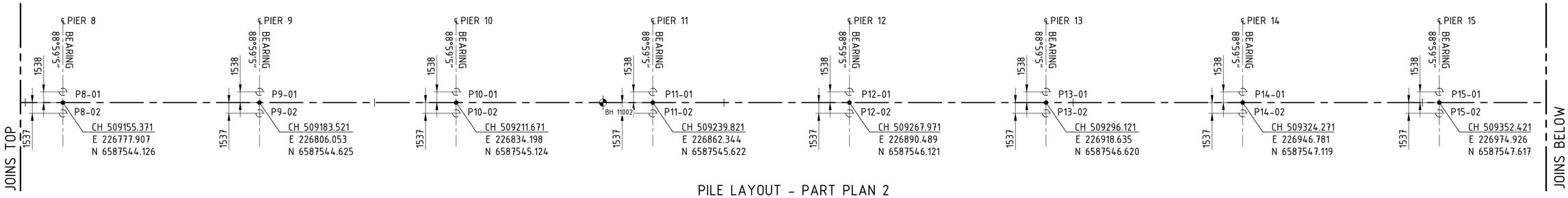
FILE No. BE22007-6670-DRG-BR-7030 | SHEET: 21 OF 21 | A1

STATUS: 100% DESIGN ©

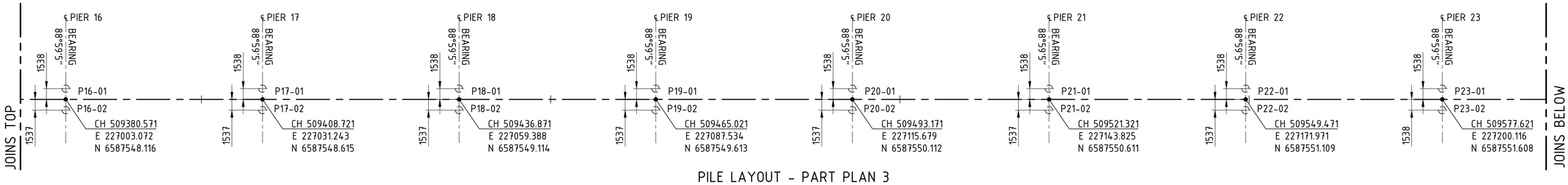
DRG No. BE22007-6670-DRG-BR-7030 | B | EDMS No. - | -



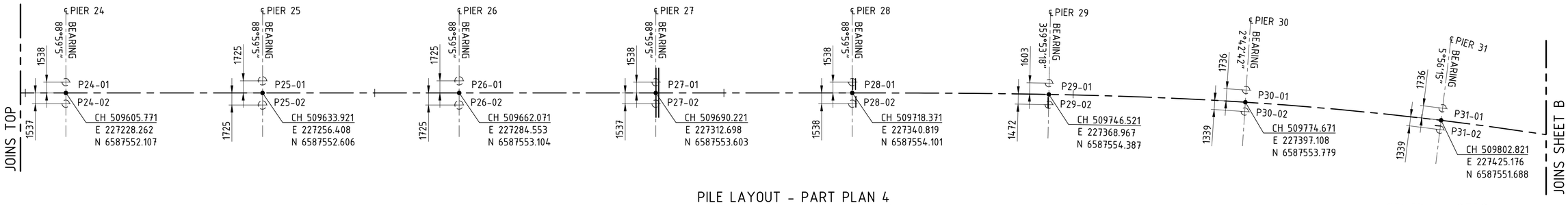
PILE LAYOUT - PART PLAN 1
1 : 300



PILE LAYOUT - PART PLAN 2
1 : 300



PILE LAYOUT - PART PLAN 3
1 : 300



PILE LAYOUT - PART PLAN 4
1 : 300

GENERAL NOTES

FOR OTHER GENERAL NOTES RELATING TO THIS SHEET, SEE SHEET No 052.

LEGEND

EXISTING BOREHOLE

DESIGN PHASE BOREHOLE

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:300 @ A1 0 3 6 9 12 15 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.05.23	R.P 21.05.23	
A	ISSUED FOR 35% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

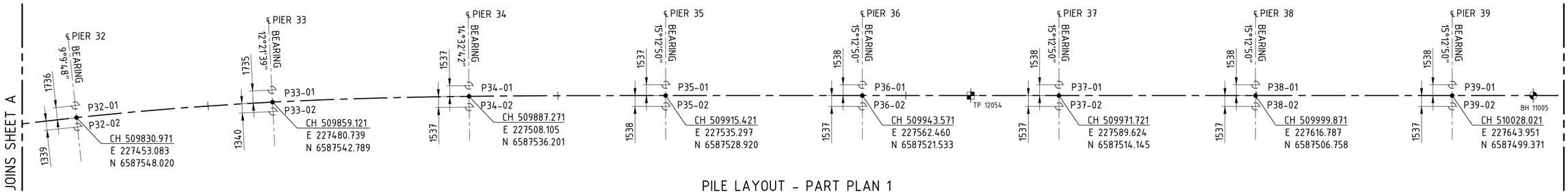
PILE LAYOUT

SHEET A

FILE No. BE22007-6670-DRG-BR-7050 | SHEET: 1 OF 6 | A1

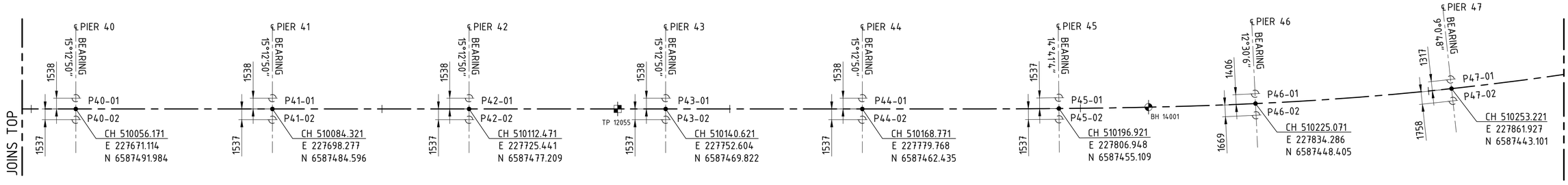
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7050 | B | EDMS No. - | -



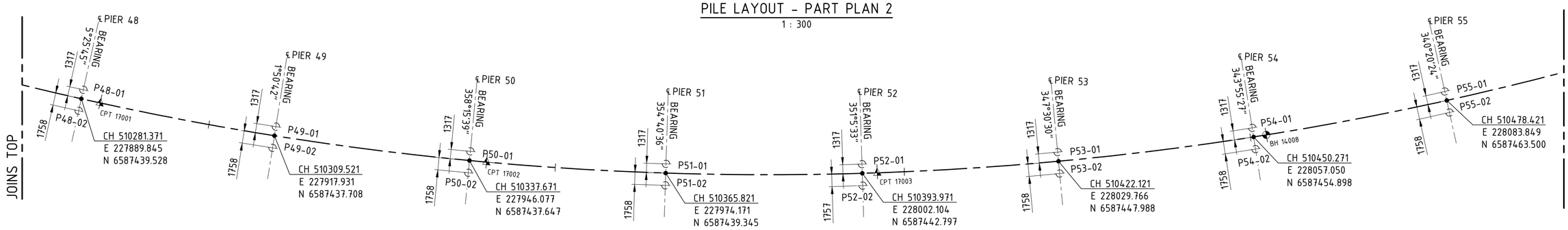
PILE LAYOUT - PART PLAN 1

1 : 300



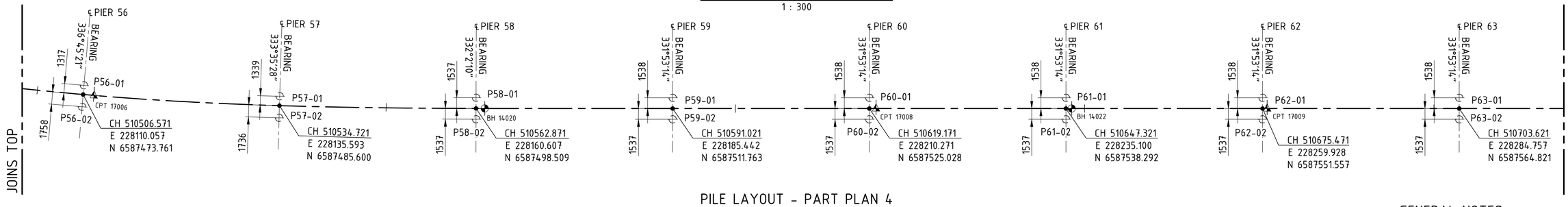
PILE LAYOUT - PART PLAN 2

1 : 300



PILE LAYOUT - PART PLAN 3

1 : 300



PILE LAYOUT - PART PLAN 4

1 : 300

GENERAL NOTES

FOR OTHER GENERAL NOTES RELATING TO THIS SHEET, SEE SHEET No 052.

LEGEND

EXISTING BOREHOLE

DESIGN PHASE BOREHOLE

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:300 @ A1 0 3 6 9 12 15 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.05.23	R.P 21.05.23	
A	ISSUED FOR 35% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

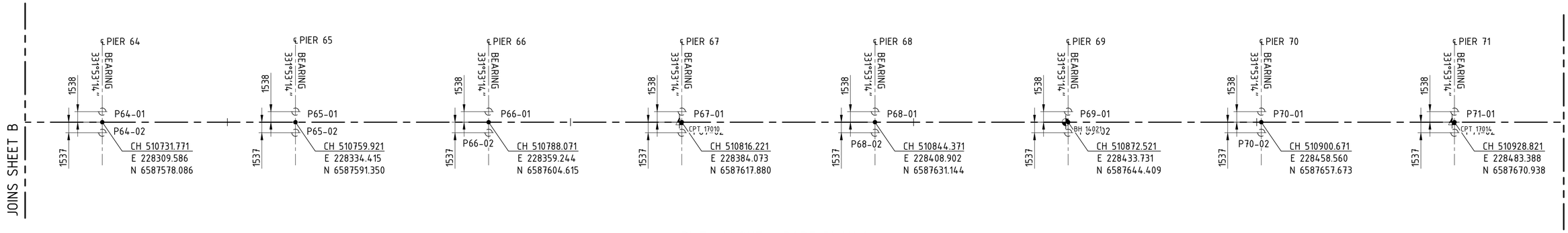
PILE LAYOUT

SHEET B

FILE No. BE22007-6670-DRG-BR-7051 | SHEET: 2 OF 6 | A1

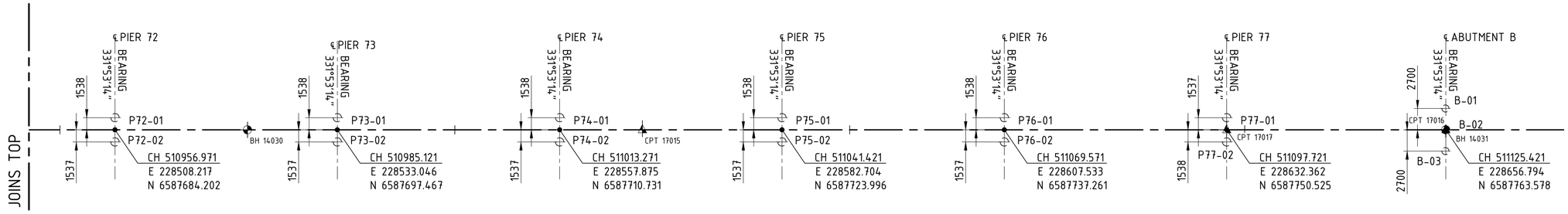
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7051 | B | EDMS No. - | -



PILE LAYOUT - PART PLAN 1

1 : 300



PILE LAYOUT - PART PLAN 2

1 : 300

GENERAL NOTES

PRIOR TO UNDERTAKING PILING WORKS THE CONTRACTOR SHALL CARRY OUT GEOTECHNICAL INVESTIGATIONS TO ENSURE COMPLIANCE TO CLAUSE 1.6.2 IN AS5100.3-2017.
THE GEOTECHNICAL INVESTIGATION REPORT SHALL BE SUBMITTED TO DESIGNER FOR CONFIRMING THE PILE DESIGN.
FOR CONCRETE EXPOSURE CLASSIFICATION DETAILS, SEE DRAWING No 070.
FOR MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE, SEE DRAWING No 070.
ALL SET-OUT CO-ORDINATES TO BE CONFIRMED ON SITE PRIOR TO ANY PHYSICAL WORKS BEGINNING.
THE PLACEMENT OF CONCRETE IN PILES SHALL BE CARRIED OUT IN ONE CONTINUOUS OPERATION UNLESS SPECIFIED OTHERWISE.
PILES SHALL BE INSTALLED IN ACCORDANCE WITH TFNSW SPECIFICATION B54 FOR DRIVEN PILES.
REFER TO GEOTECHNICAL FACTUAL REPORT AND GEOTECHNICAL INTERPRETATIVE REPORT FOR MORE INFORMATION.
ESTIMATED PILE CONTRACT LEVELS IN TABLE 1 ON SHEET No 053 ARE BASED ON AN INTERPRETATION OF AVAILABLE BORE DATA AND MAY VARY ON SITE.
GEOTECHNICAL ENGINEER IS TO BE ENGAGED AS DEFINED IN TFNSW SPECIFICATION D&C B54 TO CERTIFY ANY WORKING PLATFORMS OR SUPPORTS REQUIRED TO KEEP PILING RIG STABLE AND SAFE DURING PILING OPERATIONS ON SITE.
ALL PILES SHALL BE DRIVEN TO RESISTANCE AND ALSO ACHIEVE THE PILES MINIMUM PENETRATION LENGTH TO CONTRACT LEVELS INDICATED IN TABLE 1, SEE DRAWING No 053.
A GEOTECHNICAL STRENGTH REDUCTION FACTOR ΦG OF 0.75 CALCULATED IN ACCORDANCE WITH AS2159. THIS REQUIRES DYNAMIC TESTING OF 10% OF THE TOTAL NUMBER OF PILES.
STEEL TUBE SHALL BE GRADE 350 TO AS/NZS 3678 OR APPROVED EQUIVALENT.
WELDING SYMBOLS SHALL COMPLY WITH AS1101.3.
ALL WELDING SHALL CONFORM TO THE REQUIREMENTS OF AS1554.1 AND TFNSW SPECIFICATION B204.
THE WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554.1 AND TFNSW SPECIFICATION B204.
BUTT WELDS SHALL BE FULL PENETRATION.
THOROUGHLY CLEAN THE PILE SHAFT (FOR THE CONCRETE PLUG SECTION ONLY) OF ALL LOOSE MATERIAL INCLUDING MATERIAL ADHERING TO THE INSIDE OF THE CASING BEFORE REINFORCEMENT IS PLACED.
A METHOD STATEMENT OF THE CLEANING PROCESS SHALL BE SUBMITTED TO THE PRINCIPAL FOR REVIEW PRIOR TO CONSTRUCTION.
PILE INTEGRITY TESTING SHALL BE UNDERTAKEN IN ACCORDANCE WITH AS2159-2009 AND RMS BTD2011/08 ON MINIMUM 32 NOMINTED PILES.

PILES ARE TO BE DRIVEN TO RESISTANCE WITH DRIVING ENERGY AND SET DETERMINED BY THE APPLICABLE REPRESENTATIVE PILE. THE CALCULATED SET AND ENERGY SHOWN ON TABLE 1 ARE INDICATIVE ONLY AND ARE NOT TO BE USED AS DRIVING PARAMETERS.
DRIVING STRESSES SHALL NOT EXCEED 0.9 x fsy (OR 0.8 x fsy DURING SUSTAINED HARD DRIVING). MAXIMUM DRIVING ENERGY TO LIMIT DRIVING STRESSES ARE TO BE ADJUSTED AS REQUIRED BASED ON MONITORING AND TESTING OF REPRESENTATIVE PILES.
THE PILING CONTRACTOR SHALL ASSESS THE DRIVING CONDITIONS AND MAY INCREASE THE WALL THICKNESS OF THE STEEL TUBULAR PILE AND ADJUST THE DRIVING SHOE DETAIL TO SUIT THEIR ASSESSMENT. ANY PROPOSED CHANGE TO THE DRIVING SHOE SHALL BE SUBMITTED TO PRINCIPAL FOR APPROVAL.
WHERE A PILE ACHIEVES THE REQUIRED DRIVING RESISTANCE BASED ON THE PARAMETERS SET BY THE REPRESENTATIVE PILE(S) AT A GREATER DEPTH THAN 1.0M HIGHER THAN THE CONTRACT LEVEL, THE PILING CONTRACTOR SHALL CONDUCT DYNAMIC TESTING OF THE PILE TO PROVE SUFFICIENT CAPACITY HAS BEEN ACHIEVED IN ACCORDANCE WITH TFNSW SPECIFICATION D&C B54. INSPECTION OF PILES TO BE IN ACCORDANCE WITH TFNSW SPECIFICATION D&C B54. PROPOSED BOREHOLES ARE TO BE COMPLETED AND PROVIDED TO THE DESIGNER FOR REVIEW PRIOR TO CONSTRUCTING PILES.
FINISHED RL 'B' MAY VARY TO ACHIEVE SPECIFIED DIMENSION TO GROUND LEVEL.

* DENOTES THE MINIMUM NETT ENERGY IS BASED ON 13mm SET FOR 10 BLOWS.
** DENOTES THE MINIMUM LENGTH BASED ON SATISFYING SERVICEABILITY AND LATERAL CAPACITY BELOW CLAYS. IT IS NOT THE ESTIMATED PILE PENETRATION LENGTH.
\# POSITIVE VALUE DENOTE COMPRESSIVE FORCES, NEGATIVE VALUES DENOTE TENSILE FORCES IN PILES.

LEGEND

EXISTING BOREHOLE

DESIGN PHASE BOREHOLE

GEOTECHNICAL RISK

DENSE GRAVEL LAYERS MAY BE ENCOUNTERED DURING DRIVING OPERATIONS LEADING TO EARLY REFUSAL ABOVE THE NOMINATED PILE CONTRACT LEVEL. IF THIS IS ENCOUNTERED PREBORING MAY BE REQUIRED TO ACHIEVE REQUIRED PILE DEPTH.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:300 @ A1 0 3 6 9 12 15 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.05.23	R.P 21.05.23	
A	ISSUED FOR 35% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

PILE LAYOUT

SHEET C

FILE No. BE22007-6670-DRG-BR-7052 | SHEET: 3 OF 6 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7052 | B | EDMS No. - | -

TABLE 1 - PILE DATA

LOCATION	PILE No	EASTING	NORTHING	PILE LEVELS (m)		ANTICIPATED LENGTH OF PILE 'L' (m)	FOUNDING MATERIAL	TOP OF FOUNDING MATERIAL, 'RL' (m)	MINIMUM NETT ENERGY (kJ)	MAXIMUM NETT ENERGY (kJ) (AT 0.9 fsy)	MAXIMUM 2000 YEAR ARI SCOUR DEPTH FROM EXISTING SURFACE LEVEL (M)	MINIMUM PENETRATION LENGTH (m)	DESIGN MAXIMUM AXIAL COMPRESSION LOAD AT TOP OF PILE		DESIGN MAXIMUM BENDING MOMENT ULS (kNm)	PILE TESTING	PILE DIAMETER (mm)	CONCRETE INFILL LENGTH 'Lc'	REINFORCEMENT	
				ANTICIPATED CONTRACT LEVEL RL 'A'	TOP OF PILE RL 'B'								ULS (kN)	SLS (kN)					'x'	'y'
ABUTMENT A	A-01	226553.145	6587542.842		249.794	15	UNIT 5 - D-VD SANDY GRAVEL	234.794	CONFIRM BY DRIVEABILITY STUDY	CONFIRM BY DRIVEABILITY STUDY	2.530	0	2360	1810	1660	PILE DYNAMIC TESTING (10% OF PILES)	900	6000	1	2
	A-02	226553.192	6587540.144																3	4
	A-03	226553.240	6587537.444																5	6
PIER 1	P1-01	226580.861	6587542.172		250.292	17		233.792			2.900	0.500	5690	4500	1450		1050	7000	7	8
	P1-02	226580.915	6587539.097																9	10
PIER 2	P2-01	226609.006	6587542.671		250.573	17		234.073			2.900	0.500	5690	4500	1450		1050	7000	11	12
	P2-02	226609.061	6587539.596																13	14
PIER 3	P3-01	226637.152	6587543.169		250.855	17		234.355			2.900	0.500	5690	4500	1450		1050	7000	15	16
	P3-02	226637.207	6587540.095																17	18
PIER 4	P4-01	226665.298	6587543.668		251.136	17		234.636			2.900	0.500	5690	4500	1450		1050	7000	19	20
	P4-02	226665.352	6587540.594																21	22
PIER 5	P5-01	226693.443	6587544.167		251.418	17		234.918			2.900	0.500	5690	4500	1450		1050	7000	23	24
	P5-02	226693.498	6587541.093																25	26
PIER 6	P6-01	226721.589	6587544.666		251.699	17		235.199			2.900	0.500	5690	4500	1450		1050	7000	27	28
	P6-02	226721.643	6587541.591																29	30
PIER 7	P7-01	226749.734	6587545.165		251.981	17		235.481			2.900	0.500	5690	4500	1450		1050	7000	31	32
	P7-02	226749.789	6587542.090																33	34
PIER 8	P8-01	226777.880	6587545.663		252.262	17		235.762			2.900	0.500	5690	4500	1450		1050	7000	35	36
	P8-02	226777.934	6587542.589																37	38
PIER 9	P9-01	226806.026	6587546.162		250.941	17		234.441			2.900	0.500	6140	4890	2320		1050	7000	39	40
	P9-02	226806.080	6587543.088																41	42
PIER 10	P10-01	226834.171	6587546.661		250.921	17		234.421			2.900	0.500	6140	4890	2320		1050	7000	43	44
	P10-02	226834.226	6587543.586																45	46
PIER 11	P11-01	226862.317	6587547.160		250.944	17		234.444			2.900	0.500	6140	4890	2320		1050	7000	47	48
	P11-02	226862.371	6587544.085																49	50
PIER 12	P12-01	226890.462	6587547.659		250.982	17		234.482			2.900	0.500	6140	4890	2320		1050	7000	51	52
	P12-02	226890.517	6587544.584																53	54
PIER 13	P13-01	226918.608	6587548.157		250.972	17		234.472			2.900	0.500	6140	4890	2320		1050	7000	55	56
	P13-02	226918.662	6587545.083																57	58
PIER 14	P14-01	226946.753	6587548.656		250.935	17		234.435			2.900	0.500	6140	4890	2320		1050	7000	59	60
	P14-02	226946.808	6587545.582																61	62
PIER 15	P15-01	226974.899	6587549.155		250.953	17		234.453			2.900	0.500	6140	4890	2320		1050	7000	63	64
	P15-02	226974.953	6587546.080																65	66
PIER 16	P16-01	227003.045	6587549.654		250.976	17		234.476			2.900	0.500	6140	4890	2320		1050	7000	67	68
	P16-02	227003.099	6587546.579																69	70
PIER 17	P17-01	227031.215	6587550.153		250.976	17		234.476			2.900	0.500	6140	4890	2320		1050	7000	71	72
	P17-02	227031.270	6587547.078																73	74
PIER 18	P18-01	227059.361	6587550.652		251.017	17		234.517			2.900	0.500	6140	4890	2320		1050	7000	75	76
	P18-02	227059.415	6587547.577																77	78
PIER 19	P19-01	227087.507	6587551.150		251.035	17		234.535			2.900	0.500	6140	4890	2320		1050	7000	79	80
	P19-02	227087.561	6587548.076																81	82
PIER 20	P20-01	227115.652	6587551.649		251.064	17		234.564			2.900	0.500	6140	4890	2320		1050	7000	83	84
	P20-02	227115.707	6587548.575																85	86
PIER 21	P21-01	227143.798	6587552.148		251.100	17		234.6			2.900	0.500	6140	4890	2320		1050	7000	87	88
	P21-02	227143.852	6587549.073																89	90
PIER 22	P22-01	227171.943	6587552.647		251.074	17		234.574			2.900	0.500	6140	4890	2320		1050	7000	91	92
	P22-02	227171.998	6587549.572																93	94
PIER 23	P23-01	227200.089	6587553.146		251.258	17		234.758			2.900	0.500	6140	4890	2320		1050	7000	95	96
	P23-02	227200.143	6587550.071																97	98
PIER 24	P24-01	227228.234	6587553.644		251.189	17		234.689			2.900	0.500	6140	4890	2320		1050	7000	99	100
	P24-02	227228.289	6587550.570																101	102
PIER 25	P25-01	227256.377	6587554.331		251.087	17		234.587			2.900	0.500	6240	4830	5500		1200	12000	103	104
	P25-02	227256.438	6587550.881																105	106
PIER 26	P26-01	227284.522	6587554.829		251.122	17		234.622			2.900	0.500	6240	4890	2320		1200	12000	107	108
	P26-02	227284.583	6587551.380																109	110

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

PILE LAYOUT

SHEET D

FILE No. BE22007-6670-DRG-BR-7053 | SHEET: 4 OF 6 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7053 | B | EDMS No. - | -

TABLE 1 - PILE DATA

LOCATION	PILE No	EASTING	NORTHING	PILE LEVELS (m)		ANTICIPATED LENGTH OF PILE 'L' (m)	FOUNDING MATERIAL	TOP OF FOUNDING MATERIAL, 'RL' (m)	MINIMUM NETT ENERGY (kJ)	MAXIMUM NETT ENERGY (kJ) (AT 0.9 fsy)	MAXIMUM 2000 YEAR ARI SCOUR DEPTH FROM EXISTING SURFACE LEVEL (M)	MINIMUM PENETRATION LENGTH (m)	DESIGN MAXIMUM AXIAL COMPRESSION LOAD AT TOP OF PILE		DESIGN MAXIMUM BENDING MOMENT ULS (kNm)	PILE TESTING	PILE DIAMETER (mm)	CONCRETE INFILL LENGTH 'Lc'	REINFORCEMENT	
				ANTICIPATED CONTRACT LEVEL RL 'A'	TOP OF PILE RL 'B'								ULS (kN)	SLS (kN)					'x'	'y'
PIER 27	P27-01	227312.671	6587555.141		250.960	18	UNIT 5 - D-VD SANDY GRAVEL	233.46	CONFIRM BY DRIVEABILITY STUDY	CONFIRM BY DRIVEABILITY STUDY	2.900	0.500	6340	5000	2580	PILE DYNAMIC TESTING (10% OF PILES)	1050	7000	111	112
	P27-02	227312.726	6587552.066																113	114
PIER 28	P28-01	227340.791	6587555.638		250.438	18		232.938			2.900	0.500	6340	5000	2580		1050	7000	115	116
	P28-02	227340.846	6587552.563																117	118
PIER 29	P29-01	227368.970	6587555.989		249.683	18		232.183			2.900	0.500	6340	5000	2580		1050	7000	119	120
	P29-02	227368.964	6587552.914																121	122
PIER 30	P30-01	227397.190	6587555.512		249.315	18		231.815			2.900	0.500	6340	5000	2580		1050	7000	123	124
	P30-02	227397.045	6587552.441																125	126
PIER 31	P31-01	227425.356	6587553.414		249.284	18		231.784			2.900	0.500	6340	5000	2580		1050	7000	127	128
	P31-02	227425.038	6587550.355																129	130
PIER 32	P32-01	227453.359	6587549.734		249.394	18		231.894			2.900	0.500	6340	5000	2580		1050	7000	131	132
	P32-02	227452.870	6587546.698																133	134
PIER 33	P33-01	227481.110	6587544.485		249.509	18		232.009			2.900	0.500	6340	5000	2580		1050	7000	135	136
	P33-02	227480.452	6587541.481																137	138
PIER 34	P34-01	227508.491	6587537.690		249.623	18		232.123			2.900	0.500	6340	5000	2580		1050	7000	139	140
	P34-02	227507.719	6587534.713																141	142
PIER 35	P35-01	227535.700	6587530.403		249.865	18		232.365			2.900	0.500	6340	5000	2580		1050	7000	143	144
	P35-02	227534.893	6587527.436																145	146
PIER 36	P36-01	227562.864	6587523.016		250.029	18		232.529			2.900	0.500	6340	5000	2580		1050	7000	147	148
	P36-02	227562.057	6587520.049																149	150
PIER 37	P37-01	227590.027	6587515.629		249.968	18		232.468			2.900	0.500	6340	5000	2580		1050	7000	151	152
	P37-02	227589.220	6587512.662																153	154
PIER 38	P38-01	227617.191	6587508.242		249.517	18		232.017			2.900	0.500	6340	5000	2580		1050	7000	155	156
	P38-02	227616.384	6587505.274																157	158
PIER 39	P39-01	227644.354	6587500.854		249.415	18		231.915			2.900	0.500	6340	5000	2580		1050	7000	159	160
	P39-02	227643.547	6587497.887																161	162
PIER 40	P40-01	227671.517	6587493.467		249.519	18		232.019			2.900	0.500	6340	5000	2580		1050	7000	163	164
	P40-02	227670.710	6587490.500																165	166
PIER 41	P41-01	227698.681	6587486.080		249.524	18		232.024			2.900	0.500	6340	5000	2580		1050	7000	167	168
	P41-02	227697.874	6587483.113																169	170
PIER 42	P42-01	227725.844	6587478.693		249.664	18		232.164			2.900	0.500	6340	5000	2580		1050	7000	171	172
	P42-02	227725.037	6587475.726																173	174
PIER 43	P43-01	227753.008	6587471.306		249.751	18		232.251			2.900	0.500	6340	5000	2580		1050	7000	175	176
	P43-02	227752.201	6587468.338																177	178
PIER 44	P44-01	227780.171	6587463.918		249.933	18		232.433			2.900	0.500	6340	5000	2580		1050	7000	179	180
	P44-02	227779.364	6587460.951																181	182
PIER 45	P45-01	227807.337	6587456.596		250.202	19.200		232			2.900	1	6060	4750	1810		1050	7000	183	184
	P45-02	227806.558	6587453.621																185	186
PIER 46	P46-01	227834.590	6587449.778		249.811	18.600		232.2			2.900	1	6060	4750	1810		1050	7000	187	188
	P46-02	227833.925	6587446.776																189	190
PIER 47	P47-01	227862.134	6587444.402		247.003	17		232.4			2.900	2	6190	4860	2060		1050	7000	191	192
	P47-02	227861.652	6587441.365																193	194
PIER 48	P48-01	227889.970	6587440.839		246.986	16.500		232.6			2.900	2	6190	4860	2060		1050	7000	195	196
	P48-02	227889.679	6587437.778																197	198
PIER 49	P49-01	227917.974	6587439.024		247.642	16.500		232.7			2.900	2	6190	4860	2060		1050	7000	199	200
	P49-01	227917.875	6587435.951																201	202
PIER 50	P50-01	227946.037	6587438.963		248.048	17		232.8			2.900	2	6190	4860	2060		1050	7000	203	204
	P50-02	227946.130	6587435.890																205	206
PIER 51	P51-01	227974.049	6587440.657		248.300	17		233			2.900	2	6190	4860	2060		1050	7000	207	208
	P51-02	227974.334	6587437.595																209	210
PIER 52	P52-01	228001.900	6587444.098		247.923	17		233.2			2.900	2	6190	4860	2060		1050	7000	211	212
	P52-02	228002.376	6587441.060																213	214
PIER 53	P53-01	228029.481	6587449.274		247.167	16		233.4			2.900	2	6190	4860	2060		1050	7000	215	216
	P53-02	228030.147	6587446.272																217	218

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

PILE LAYOUT

SHEET E

FILE No. BE22007-6670-DRG-BR-7054 | SHEET: 5 OF 6 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7054 | B | EDMS No. - | -

TABLE 1 - PILE DATA

LOCATION	PILE No	EASTING	NORTHING	PILE LEVELS (m)		ANTICIPATED LENGTH OF PILE 'L' (m)	FOUNDING MATERIAL	TOP OF FOUNDING MATERIAL, 'RL' (m)	MINIMUM NETT ENERGY (kJ)	MAXIMUM NETT ENERGY (kJ) (AT 0.9 fsy)	MAXIMUM 2000 YEAR ARI SCOUR DEPTH FROM EXISTING SURFACE LEVEL (M)	MINIMUM PENETRATION LENGTH (m)	DESIGN MAXIMUM AXIAL COMPRESSION LOAD AT TOP OF PILE		DESIGN MAXIMUM BENDING MOMENT ULS (kNm)	PILE TESTING	PILE DIAMETER (mm)	CONCRETE INFILL LENGTH 'Lc'	REINFORCEMENT	
				ANTICIPATED CONTRACT LEVEL RL 'A'	TOP OF PILE RL 'B'								ULS (kN)	SLS (kN)					'x'	'y'
PIER 54	P54-01	228056.686	6587456.164		248.054	16	UNIT 5 - D-VD SANDY GRAVEL	234.09	CONFIRM BY DRIVEABILITY STUDY	CONFIRM BY DRIVEABILITY STUDY	2.900	2	6190	4860	2060	PILE DYNAMIC TESTING (10% OF PILES)	1050	7000	219	220
	P54-02	228057.537	6587453.209																221	222
PIER 55	P55-01	228083.406	6587464.741		248.168	17		232.95			2.900	2	6190	4860	2060		1050	7000	223	224
	P55-02	228084.440	6587461.845																225	226
PIER 56	P56-01	228109.537	6587474.972		248.073	18		231.8			2.900	2	6190	4860	2060		1050	7000	227	228
	P56-02	228110.751	6587472.146																229	230
PIER 57	P57-01	228134.997	6587486.799		248.136	17		233.4			2.900	0	6190	4860	2060		1050	7000	231	232
	P57-02	228136.365	6587484.045																233	234
PIER 58	P58-01	228159.886	6587499.867		247.538	15		235			2.900	2	6190	4860	2060		1050	7000	235	236
	P58-02	228161.328	6587497.151																237	238
PIER 59	P59-01	228184.717	6587513.119		246.554	14		234.6			2.900	2	6190	4860	2060		1050	7000	239	240
	P59-02	228186.166	6587510.407																241	242
PIER 60	P60-01	228209.546	6587526.384		246.853	15		234.2			2.900	2	6190	4860	2060		1050	7000	243	244
	P60-02	228210.995	6587523.672																245	246
PIER 61	P61-01	228234.375	6587539.648		246.397	15		233.6			2.900	2	6190	4860	2060		1050	7000	247	248
	P61-02	228235.824	6587536.936																249	250
PIER 62	P62-01	228259.204	6587552.913		242.810	15		233.6			2.900	5.8	6430	5160	2740		1050	7000	251	252
	P62-02	228260.653	6587550.201																253	254
PIER 63	P63-01	228284.033	6587566.177		247.951	15		235			2.900	2	6430	5160	2740		1050	7000	255	256
	P63-02	228285.482	6587563.465																257	258
PIER 64	P64-01	228308.862	6587579.442		250.454	16.9		235.1			2.900	1.500	5800	4600	1630		1050	7000	259	260
	P64-02	228310.311	6587576.730																261	262
PIER 65	P65-01	228333.691	6587592.707		250.454	16.8		235.2			2.900	1.500	5800	4600	1630		1050	7000	263	264
	P65-02	228335.140	6587589.994																265	266
PIER 66	P66-01	228358.519	6587605.971		250.454	16.7		235.3			2.900	1.500	5800	4600	1630		1050	7000	267	268
	P66-02	228359.968	6587603.259																269	270
PIER 67	P67-01	228383.348	6587619.236		248.941	15		235.44			2.900	1.500	5800	4600	1630		1050	7000	271	272
	P67-02	228384.797	6587616.524																273	274
PIER 68	P68-01	228408.177	6587632.500		248.943	15		236			2.900	2.100	5800	4600	1630		1050	7000	275	276
	P68-02	228409.626	6587629.788																277	278
PIER 69	P69-01	228433.006	6587645.765		250.454	16.2		235.8			2.900	1.500	5800	4600	1630		1050	7000	279	280
	P69-02	228434.455	6587643.053																281	282
PIER 70	P70-01	228457.835	6587659.029		250.454	16.4		235.6			2.900	1.500	5800	4600	1630		1050	7000	283	284
	P70-02	228459.284	6587656.317																285	286
PIER 71	P71-01	228482.664	6587672.294		250.454	16.6		235.4			2.900	1.500	5800	4600	1630		1050	7000	287	288
	P71-02	228484.113	6587669.582																289	290
PIER 72	P72-01	228507.493	6587685.559		248.859	15.000		236.3			2.900	2.400	5800	4600	1630		1050	7000	291	292
	P72-02	228508.942	6587682.846																293	294
PIER 73	P73-01	228532.322	6587698.823		248.478	14		237.2			2.900	2.700	5800	4600	1630		1050	7000	295	296
	P73-02	228533.771	6587696.111																297	298
PIER 74	P74-01	228557.151	6587712.088		248.415	14		238			2.900	3.600	5800	4600	1630		1050	7000	299	300
	P74-02	228558.600	6587709.375																301	302
PIER 75	P75-01	228581.980	6587725.352		248.447	14		238.7			2.900	4.300	5800	4600	1630		1050	7000	303	304
	P75-02	228583.428	6587722.640																305	306
PIER 76	P76-01	228606.808	6587738.617		249.020	14		238.7			2.900	3.700	5800	4600	1630		1050	7000	307	308
	P76-02	228608.257	6587735.905																309	310
PIER 77	P77-01	228631.637	6587751.881		250.454	14		238.7			2.900	2.200	5800	4600	1630		1050	7000	311	312
	P77-02	228633.086	6587749.169																313	314
ABUTMENT B	B-01	228655.522	6587765.959		250.454	14		238.7			4.000	2.200	2650	2020	1770		900	6000	315	316
	B-02	228656.794	6587763.578																317	318
	B-03	228658.066	6587761.196																319	320

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

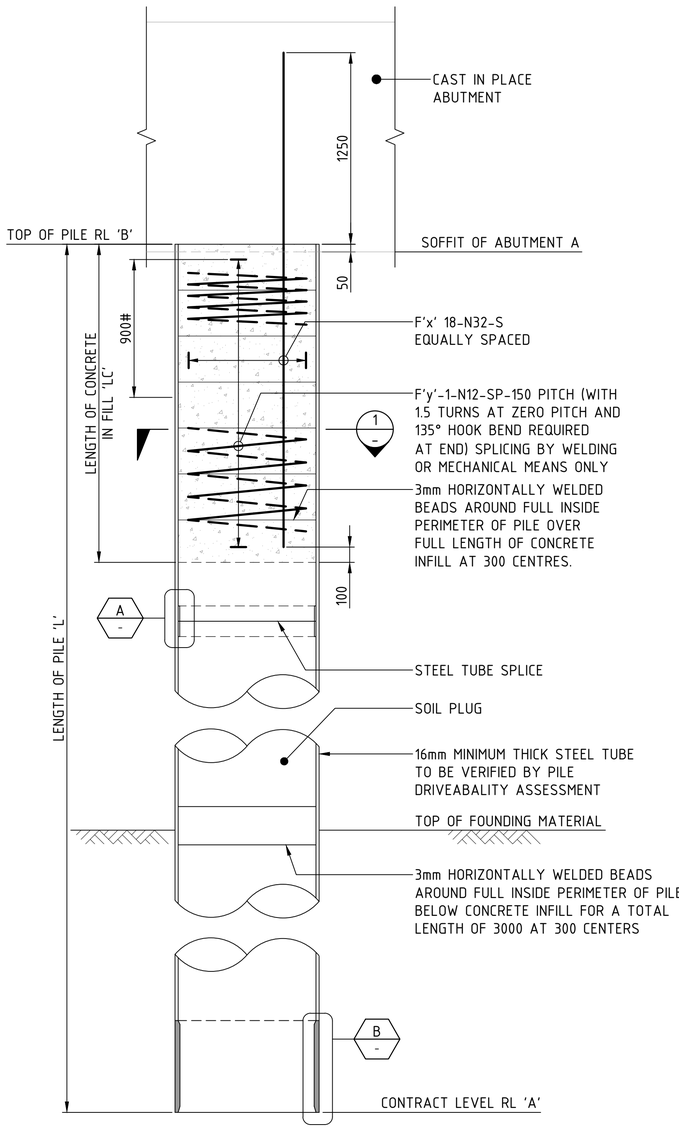
PILE LAYOUT

SHEET F

FILE No. BE22007-6670-DRG-BR-7055 | SHEET: 6 OF 6 | A1

STATUS: 100% DESIGN ©

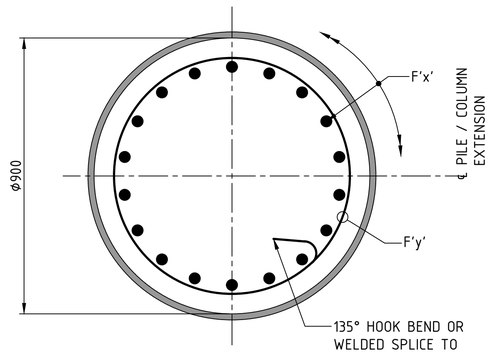
DRG No. BE22007-6670-DRG-BR-7055 | B | EDMS No. - | -



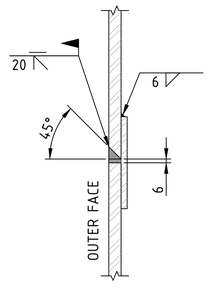
ELEVATION - Ø900 STEEL TUBE DRIVEN PILES

SCALE 1 : 20
(ABUTMENT A AND B)

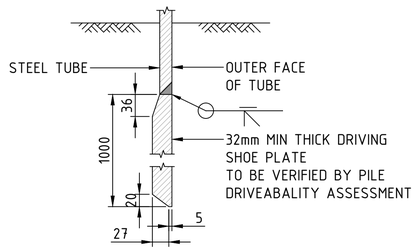
#DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 1 / - SCALE 1 : 10



DETAIL A / - SCALE 1 : 5



DETAIL B / - SCALE 1 : 5

GENERAL NOTES

SCALE AS SHOWN
FOR OTHER GENERAL NOTES RELATING TO THIS SHEET, SEE SHEET No 050.
CONCRETE EXPOSURE CLASSIFICATION: B1
ALL CONCRETE WORK SHALL COMPLY WITH TfNSW SPECIFICATION D&C B80.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE TO BE 40 MPa.
PILES SHALL BE CONSTRUCTED WITHIN +/- 75mm IN PLAN FROM THE DESIGN POSITION.
STEEL CAGES SHALL BE PLACED IN SUCH ORIENTATION THAT FACILITATE INSTALLATION OF LONGITUDINAL REINFORCEMENT IN HEADSTOCK.
MAXIMUM CONCRETE PLACEMENT TEMPERATURE OF 32°C FOR PILES WITH A DIAMETER UP TO 1200mm.

REINFORCEMENT NOTES

UNLESS SPECIFIED OTHERWISE, REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SHALL BE 45mm FOR PILES.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT SHALL BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS SHOWN OTHERWISE ON THE DRAWINGS LAPS ON THE ADJACENT BARS ON ANY FACE SHALL BE STAGGERED BY NO LESS THAN THE LAP LENGTH. UNLESS OTHERWISE SPECIFIED, THE MINIMUM LENGTH OF LAPS ARE AS FOLLOWS:

BAR SIZE	N12	N16	N20	N24	N28	N32	N36	N40
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR	450	650	950	1250	1600	1950	2350	2750
b) OTHER BARS:	350	500	750	950	1250	1500	1800	2150

WHERE SPLICE LOCATIONS ARE DETAILED ON THE DRAWINGS, THE CONTRACTOR MUST SEEK APPROVAL FROM THE DESIGN ENGINEER TO SPLICE AT ALTERNATE LOCATIONS. WHERE BARS ARE DETAILED WITHOUT LAPS AND THE BAR LENGTH DICTATES THAT LAPS ARE REQUIRED, THE CONTRACTOR MAY ADOPT LAP LOCATIONS AS REQUIRED TO ENSURE MINIMUM LAP LENGTHS ARE ACHIEVED.
CLEAR DISTANCE BETWEEN LAPPED BARS DOES NOT EXCEED 3 x THE BAR DIAMETER.
HELICAL REINFORCEMENT TO BE SPLICED WITHIN ITS LENGTH EITHER BY WELDING OR MECHANICAL MEANS. ALTERNATIVELY BY LAPPING THE HELIX ONE TURN AND BENDING THE HELIX END INTO THE PILE CORE FOR AN EXTENSION OF 25 X THE HELIX DIAMETER. SPLICE WELDS TO CONSIST OF A SINGLE LAP SPLICE WELD WITH BARS SUPERIMPOSED IN ACCORDANCE WITH JOINT IDENTIFICATION L-d TO AS 1544.3. WELD SIZES TO HELIX SHALL BE:
- Φ16 BAR – 4mm X 160mm LONG.
- Φ12 BAR – 3mm X 120mm LONG.

HELIX ANCHORAGE TO BE PROVIDED AT TOP AND BOTTOM OF PILE BY PROVIDING 1.5 EXTRA TURNS OF THE HELIX AT ZERO PITCH AND EITHER A HOOK AROUND A MAIN LONDITUDINAL REINFORCING BAR OR BY WELDING.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm
1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

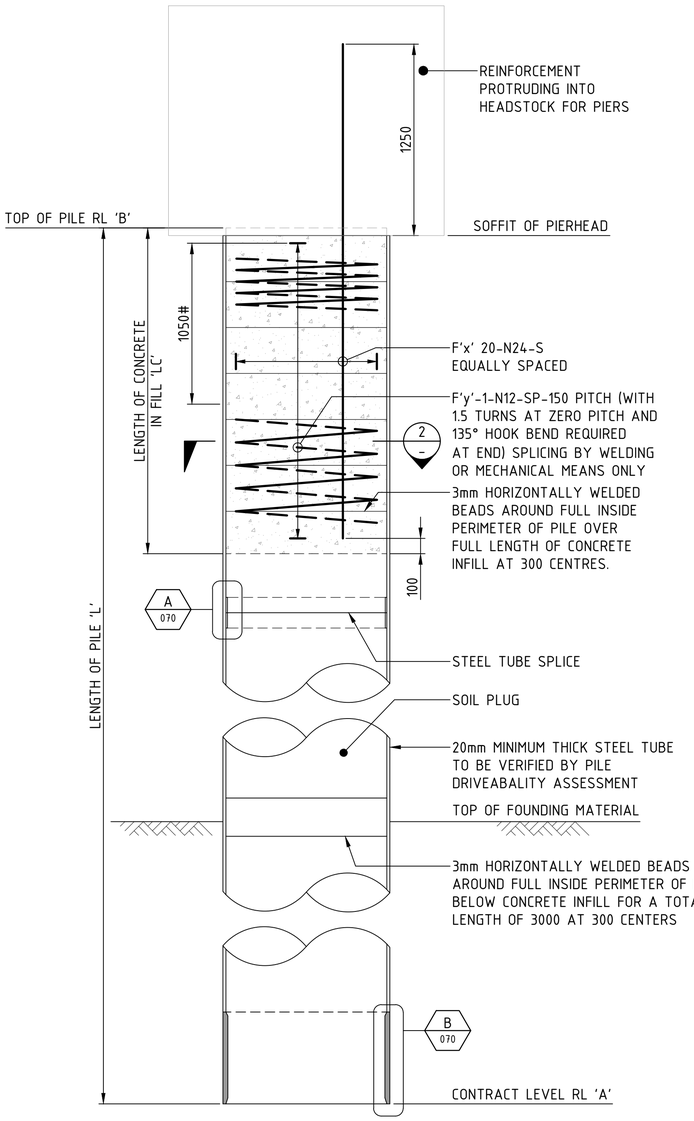
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PILE DETAIL
SHEET A

FILE No. BE22007-1570-DRG-BR-7070 | SHEET: 1 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-1570-DRG-BR-7070 | B | EDMS No. - | -

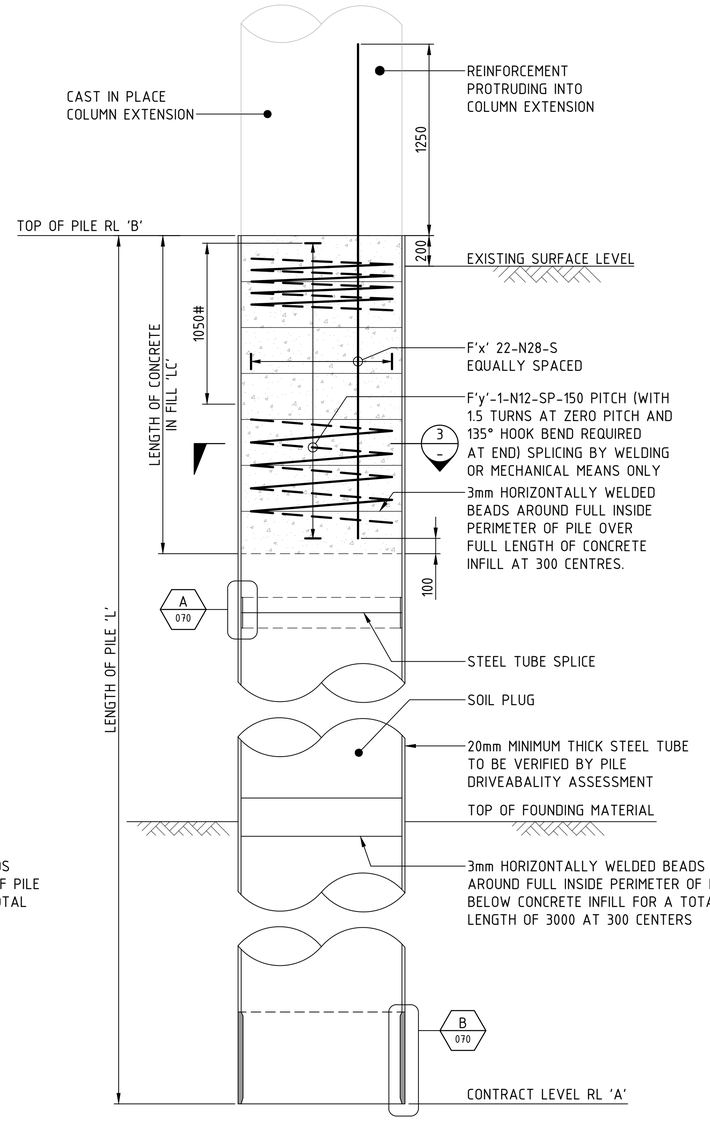


ELEVATION - ⌀1050 STEEL TUBE DRIVEN PILES

SCALE 1 : 20

(PIERS 1 TO 8, 64 TO 66, 69 TO 71 AND 77)

\# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN

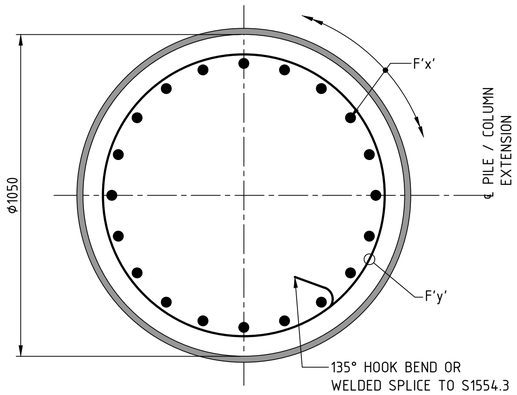


ELEVATION - ⌀1050 STEEL TUBE DRIVEN PILES

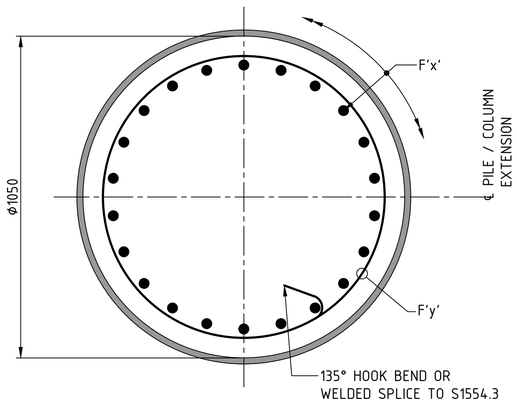
SCALE 1 : 20

(PIERS 9 TO 24, 45 TO 61, 67, 68 AND 72 TO 76)

\# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 2 / - SCALE 1 : 10



SECTION 3 / - SCALE 1 : 10

GENERAL NOTES

FOR GENERAL NOTES RELATED TO THIS SHEET, SEE SHEET No 070.

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

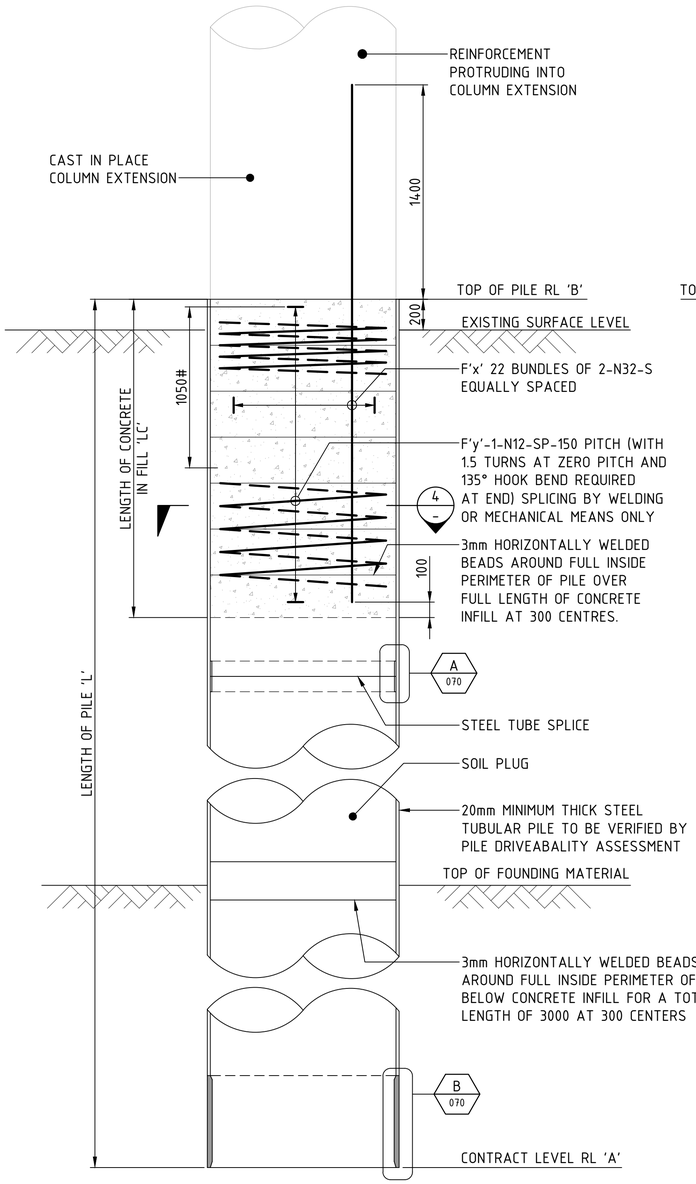
PILE DETAIL

SHEET B

FILE No. BE22007-6670-DRG-BR-7071 | SHEET: 2 OF 3 | A1

STATUS: 100% DESIGN ©

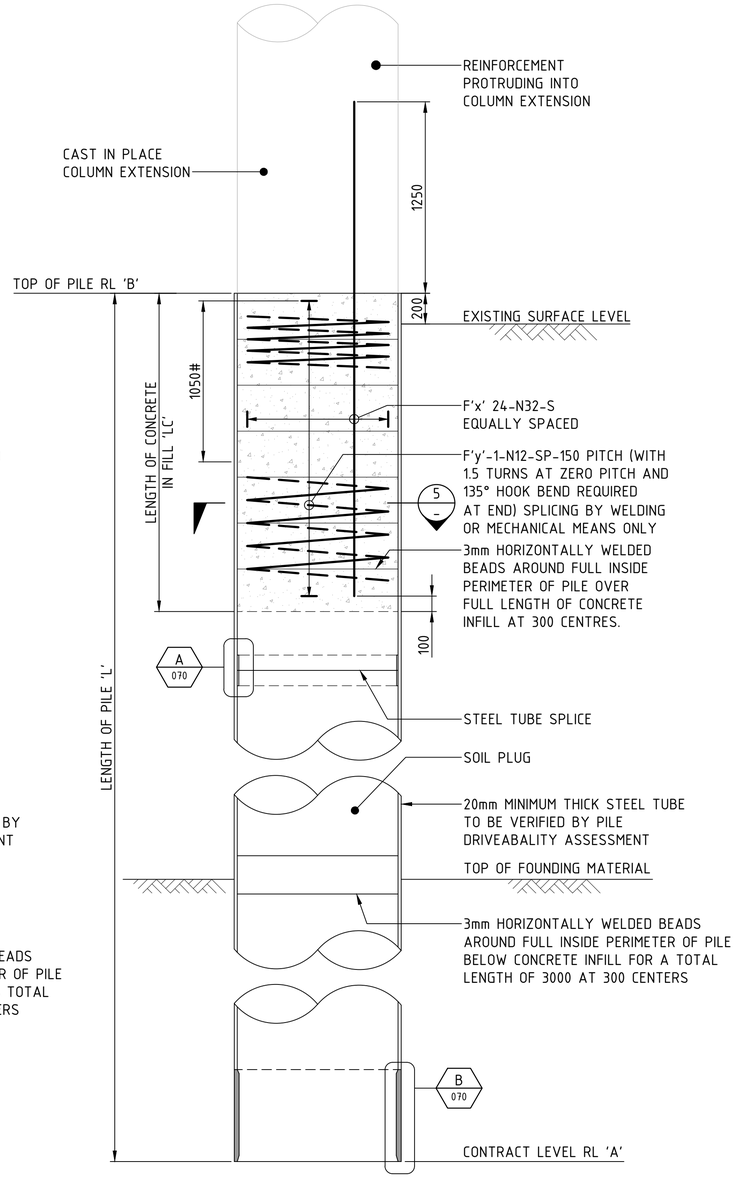
DRG No. BE22007-6670-DRG-BR-7071 | B | EDMS No. - | -



ELEVATION – ϕ1200 STEEL TUBE DRIVEN PILES

SCALE 1 : 20

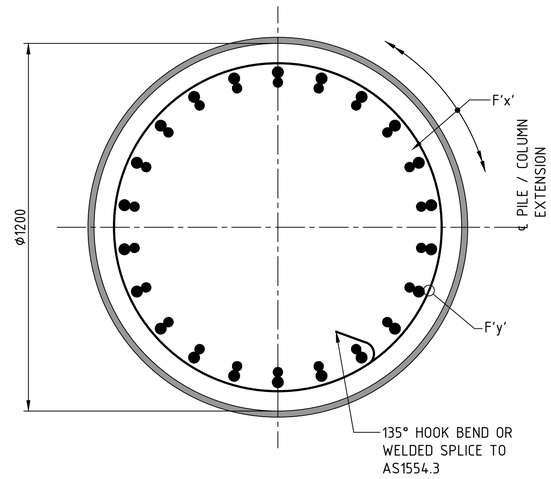
(PIERS 25 AND 26)



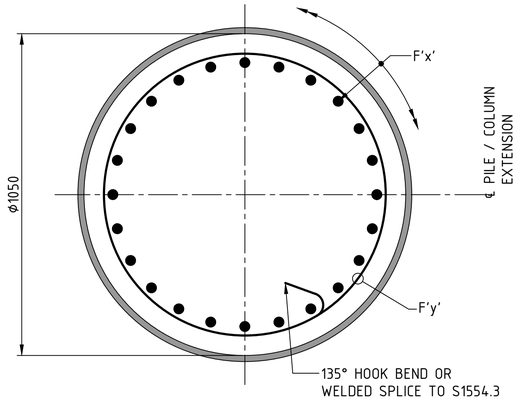
ELEVATION – ϕ1050 STEEL TUBE DRIVEN PILES

SCALE 1 : 20

(PIERS 27 TO 44, 62 AND 63)



SECTION 4 – SCALE 1 : 10



SECTION 5 – SCALE 1 : 10

GENERAL NOTES

FOR GENERAL NOTES RELATED TO THIS SHEET, SEE SHEET No 070.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

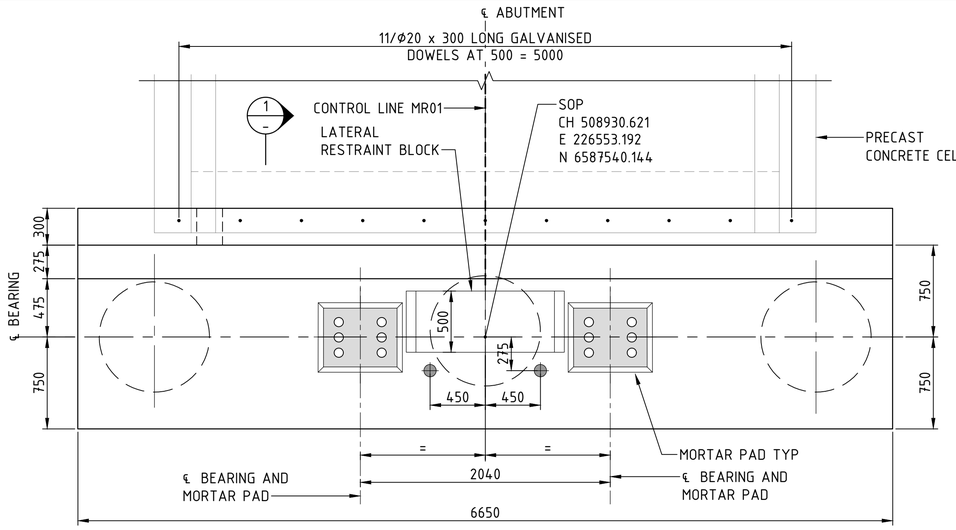
PILE DETAIL

SHEET C

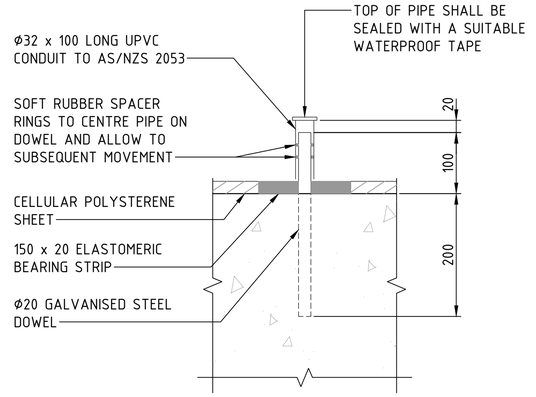
FILE No. BE22007-6670-DRG-BR-7072 | SHEET: 3 OF 3 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7072 | B | EDMS No. - | -



PLAN – ABUTMENT A
SCALE 1 : 25



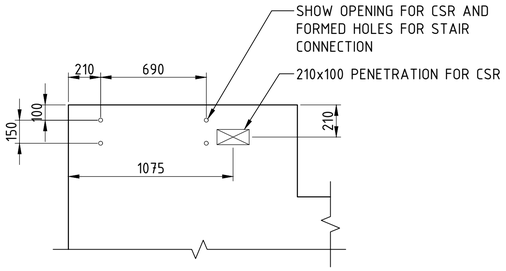
DETAIL B
SCALE 1 : 5

GENERAL NOTES

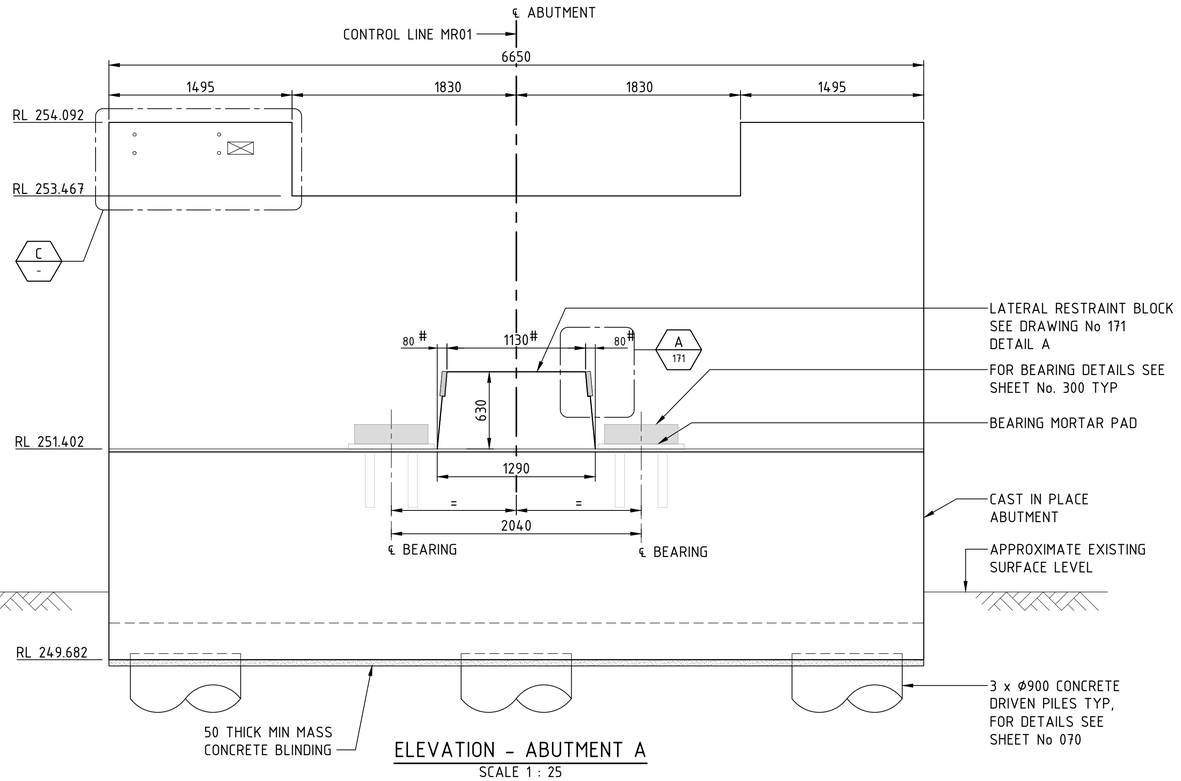
CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF ALL CONCRETE TO BE 40 MPa.
CONCRETE MIX DESIGN TO TfNSW SPECIFICATION D&C 3211 PERMITTED IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B80.
MINIMUM THICKNESS OF MASS CONCRETE SHALL BE 50mm WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 20MPa UNLESS SPECIFIED OTHERWISE.
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
EDGES TO BE CHAMFERED 20 x 20mm AND RE-ENTRANT ANGLES FILLETED 20 x 20mm UNLESS SPECIFIED OTHERWISE.
NFC DENOTES NO CHAMFER OR FILLET.
CJ DENOTES CONSTRUCTION JOINT.
GALVANISED DOWELS FOR APPROACH SLABS SHALL BE IN ACCORDANCE WITH AS 4680.
BEARINGS SHALL BE SET OUT FROM SOP ONLY.
CELLULAR POLYSTYRENE SHEET TO BE CLASS H IN ACCORDANCE WITH AS1366.3.

MAXIMUM LOADS PER JACK ARE
SLS = 920kN
ULS = 1250kN

⊕ DENOTES JACKING POINT



DETAIL C
SCALE 1 : 20



ELEVATION – ABUTMENT A
SCALE 1 : 25

SECTION 1
SCALE 1 : 25

DIMENSIONS SHOWN AT TOP OF RESTRAINT BLOCK ARE INDICATIVE ONLY. LATERAL RESTRAINT BLOCKS TO BE CONSTRUCTED AFTER ERECTION OF GIRDERS TO ACHIEVE BETTER FIT.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm
1:5 @ A1 0 50 100 150 200 250 mm
1:20 @ A1 0 200 400 600 800 1000 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

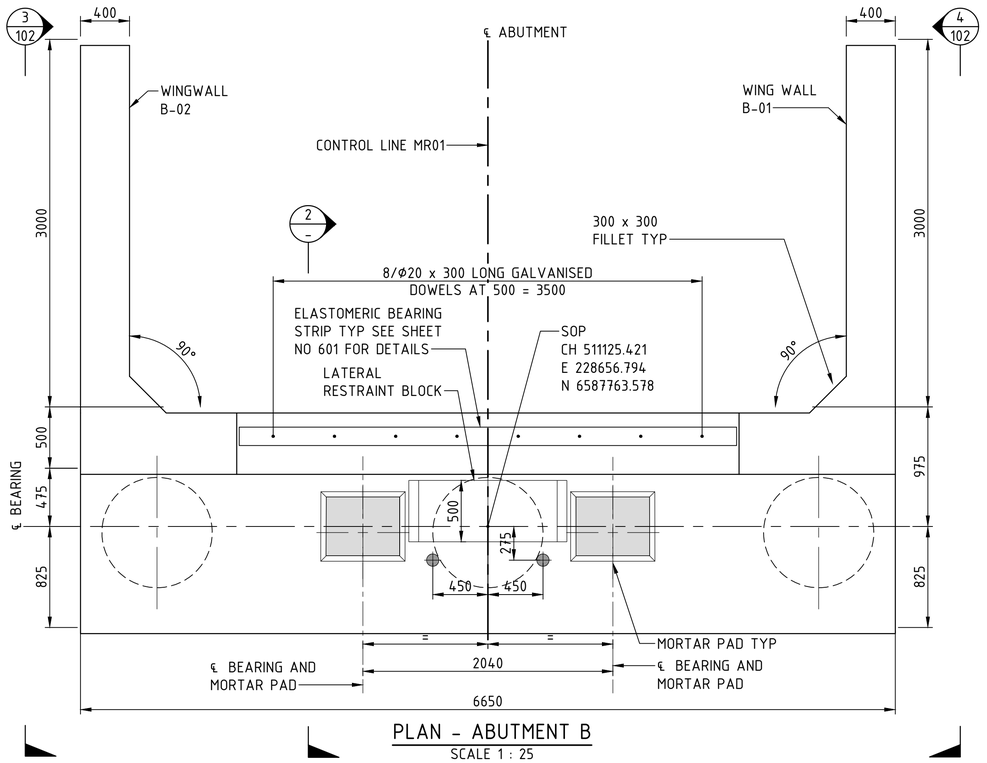
WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER ABUTMENT CONCRETE
SHEET A

FILE No. BE22007-6670-DRG-BR-7100	SHEET: 1 OF 3	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7100	B	EDMS No. -

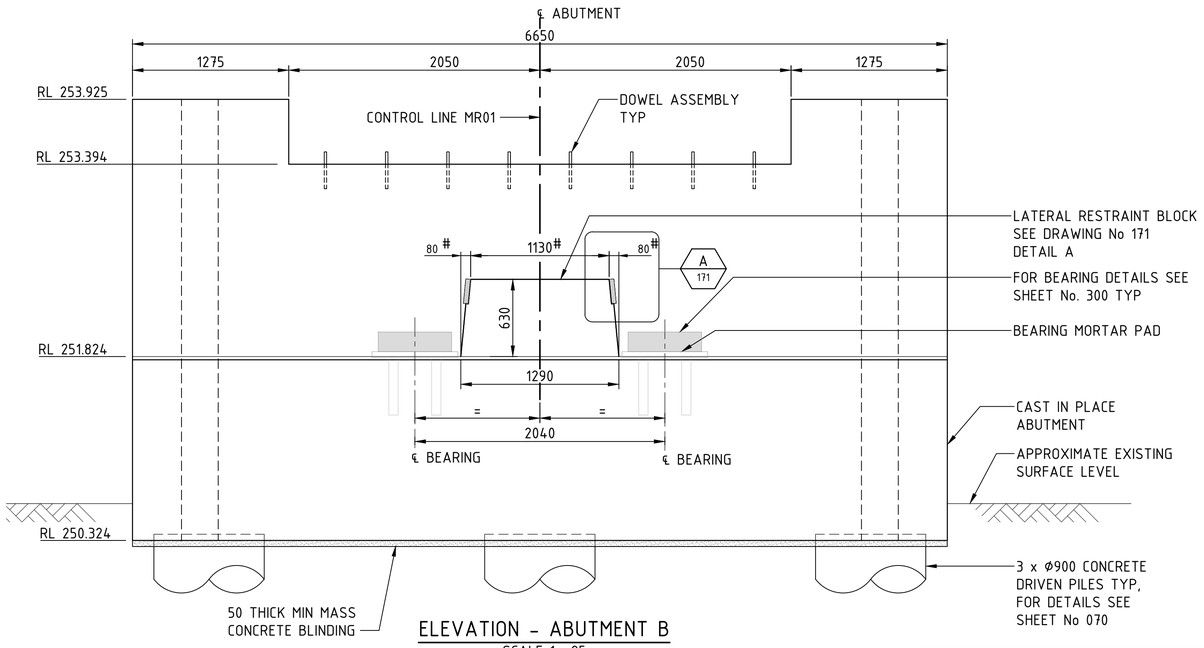


PLAN - ABUTMENT B

SCALE 1 : 25

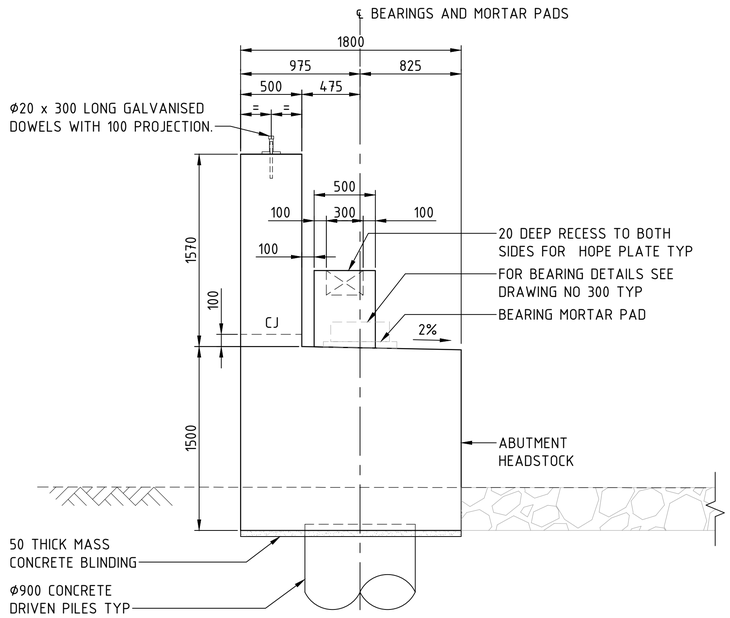
GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 100.



ELEVATION - ABUTMENT B

SCALE 1 : 25



SECTION 2 / -

SCALE 1 : 25

DIMENSIONS SHOWN AT TOP OF RESTRAINT BLOCK ARE INDICATIVE ONLY. LATERAL RESTRAINT BLOCKS TO BE CONSTRUCTED AFTER ERECTION OF GIRDERS TO ACHIEVE BETTER FIT.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER ABUTMENT CONCRETE

SHEET B

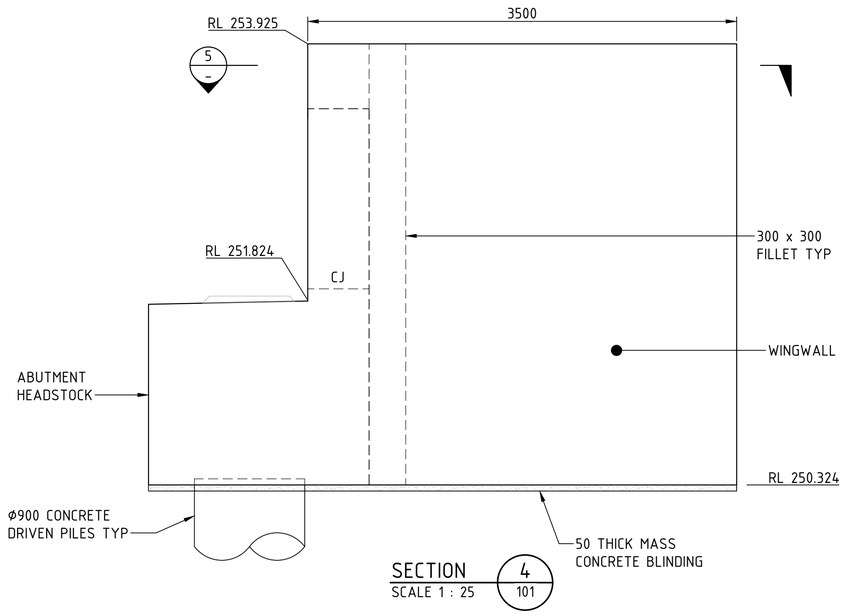
FILE No. BE22007-6670-DRG-BR-7101 | SHEET: 2 OF 3 | A1

STATUS: 100% DESIGN ©

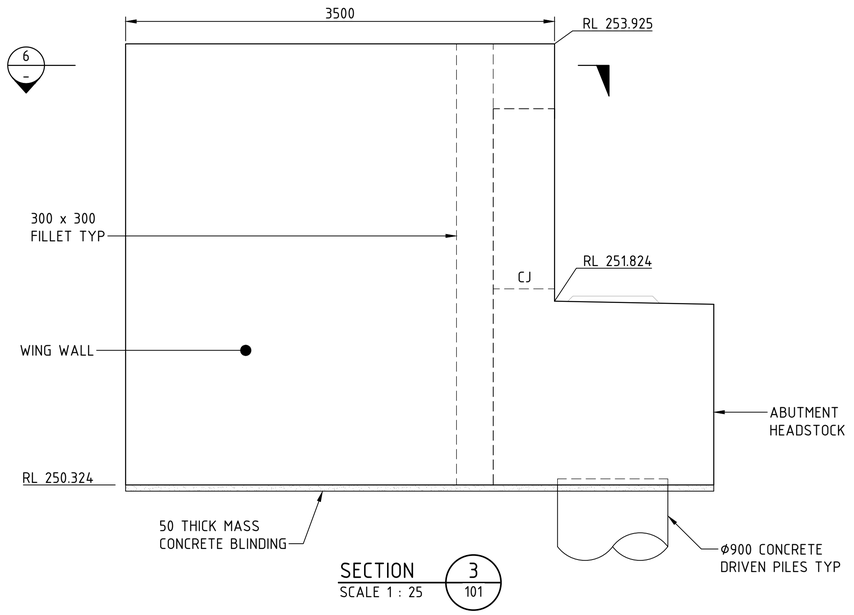
DRG No. BE22007-6670-DRG-BR-7101 | B | EDMS No. - | -

GENERAL NOTES

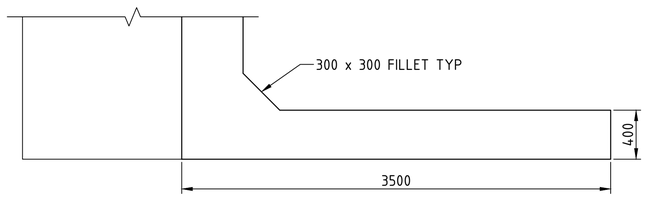
FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 100.



SECTION 4 / 101
SCALE 1 : 25



SECTION 3 / 101
SCALE 1 : 25



SECTION 5 / -
SCALE 1 : 25

VIEW 6 / - SIMILAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

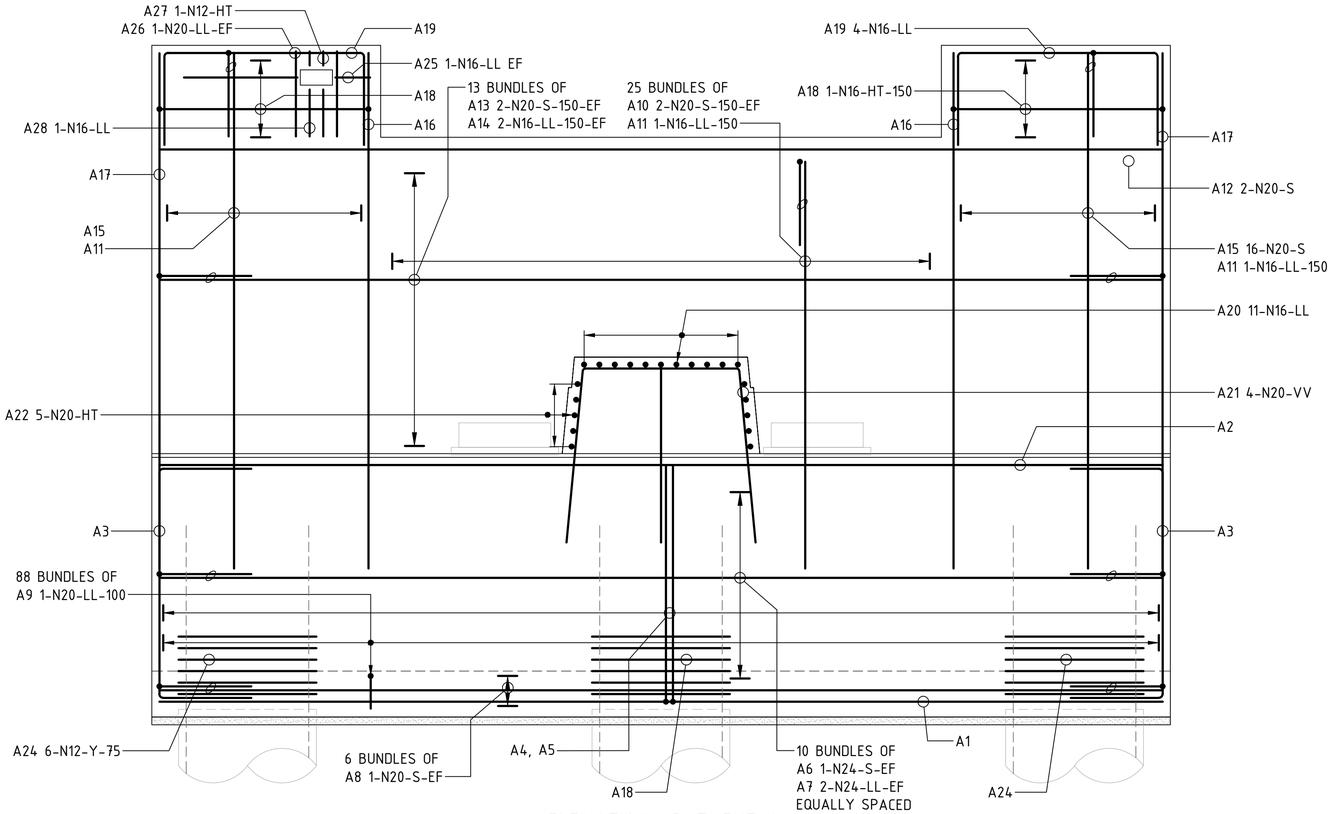
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER ABUTMENT CONCRETE

SHEET C

FILE No. BE22007-6670-DRG-BR-7102 | SHEET: 3 OF 3 | A1

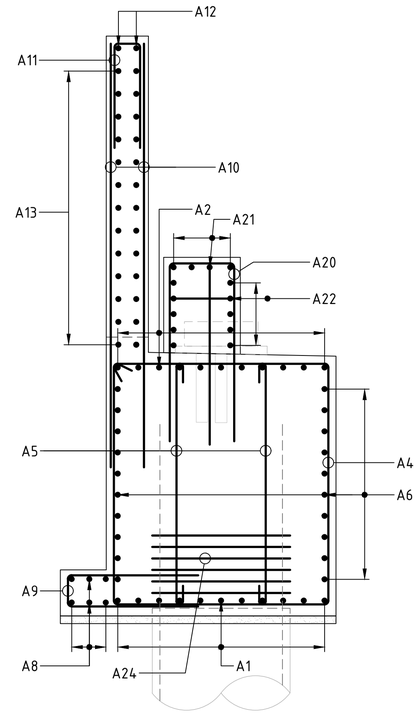
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7102 | B | EDMS No. - | -



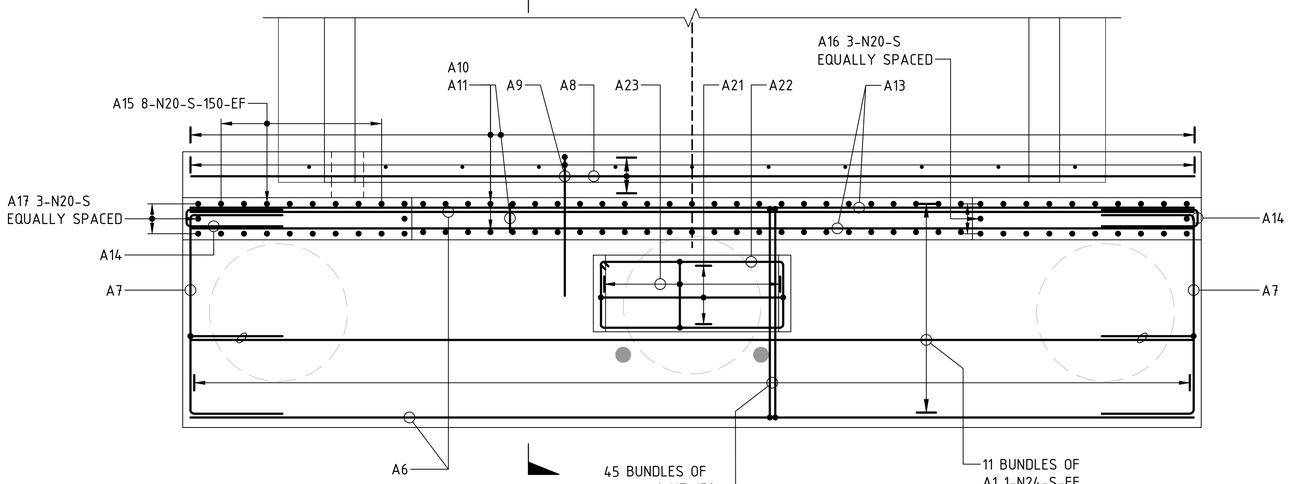
ELEVATION ABUTMENT A

SCALE 1 : 20



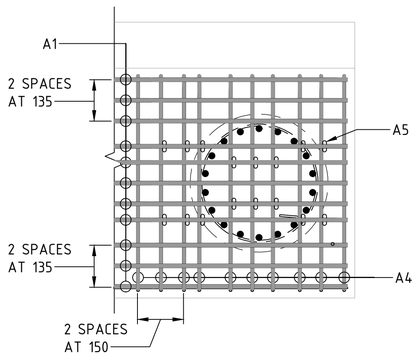
SECTION 1 / -

SCALE 1 : 20



PLAN ABUTMENT A

SCALE 1 : 20



REINFORCEMENT ARANGEMENT AT PILE TO ABUTMENT INTERSECTION

SCALE 1 : 20

ABUTMENT REINFORCEMENT TO BE DISPLACED AS NECESSARY TO AVOID PROJECTING PILE REINFORCEMENT

GENERAL NOTES

THE REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE MUST BE 45mm OR 75mm IF CAST AGAINST GROUND.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT MUST BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS OTHERWISE SHOWN ON THE DRAWINGS, LAPS ON ADJACENT BARS ON ANY FACE MUST BE STAGGERED (OFFSET) BY NO LESS THAN THE LAP LENGTH.
UNLESS SPECIFIED OTHERWISE, THE MINIMUM DEVELOPMENT LENGTHS AND LENGTH OF LAPS MUST BE:

BAR SIZE:	N12	N16	N20	N24	N28	N32
a) LAP LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	800	1100	1400	1750	2100
b) LAP LENGTH OTHER BARS:	400	600	850	1100	1350	1600
c) DEVELOPMENT LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	650	850	1150	1400	1650
d) DEVELOPMENT LENGTH OTHER BARS:	350	500	700	900	1100	1300

THE CLEAR DISTANCE BETWEEN LAPPED BARS MUST NOT EXCEED 3x THE BAR DIAMETER.
REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR DOWELS, ANCHOR BOLTS, FORMED HOLES AND RECESSES.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

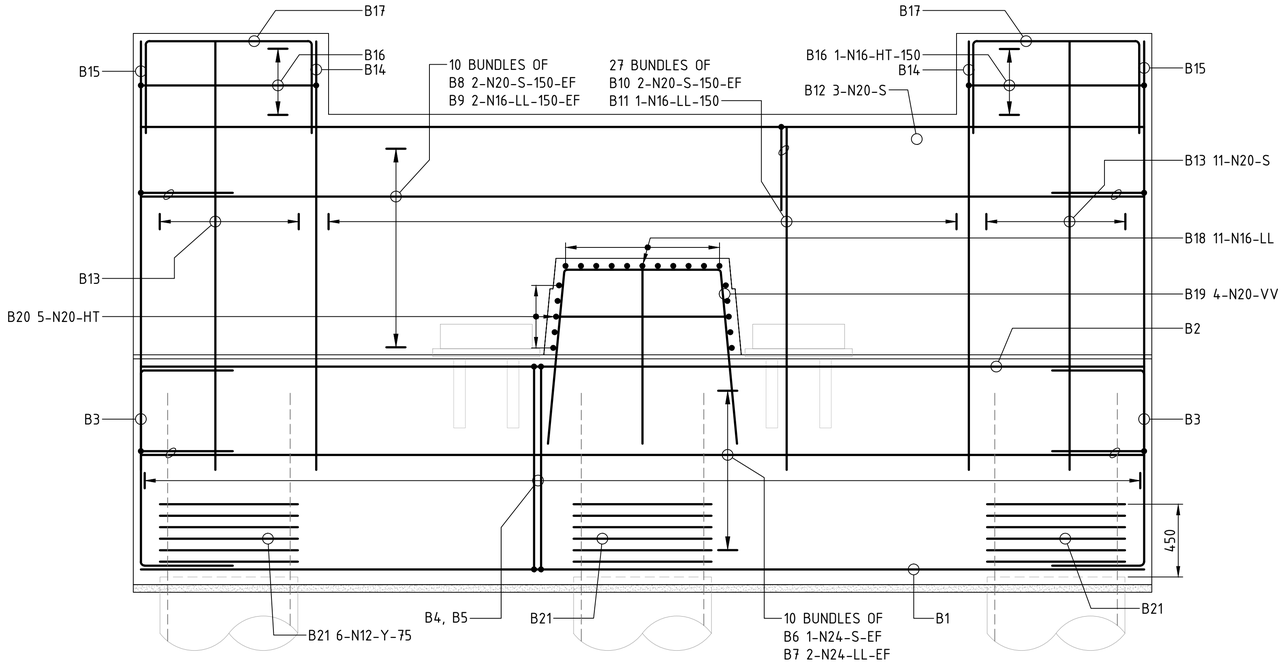
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER ABUTMENT REINFORCEMENT

SHEET A

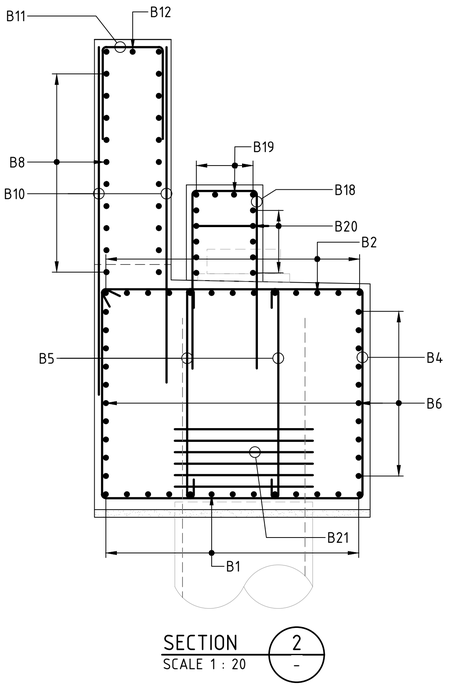
FILE No. BE22007-6670-DRG-BR-7150 | SHEET: 1 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7150 | B | EDMS No. - | -

GENERAL NOTES

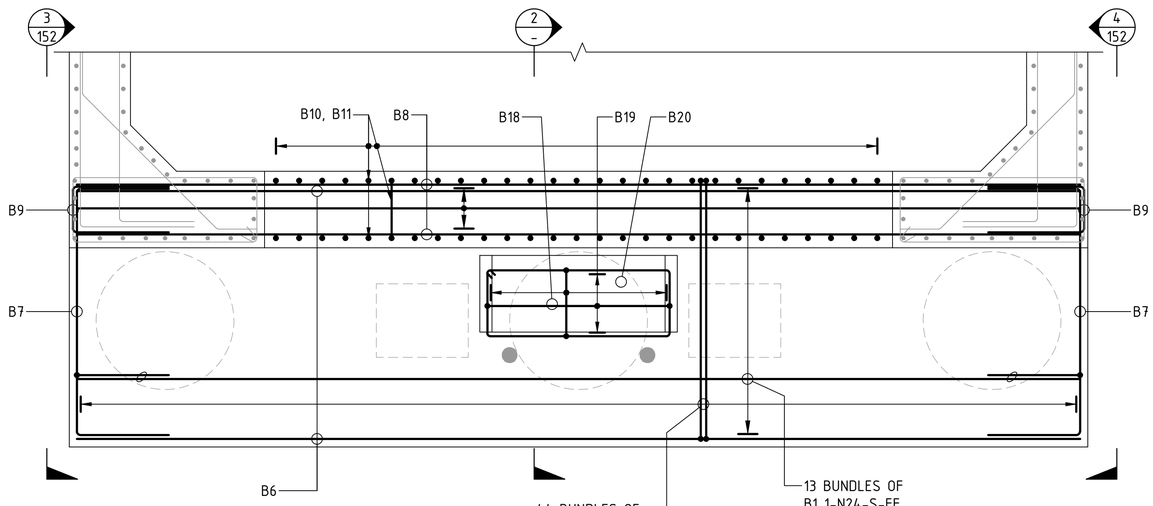
FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 150.



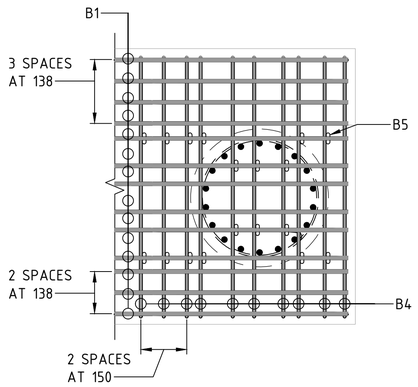
ELEVATION ABUTMENT B
SCALE 1 : 20



SECTION 2 / -
SCALE 1 : 20



PLAN ABUTMENT B
SCALE 1 : 20



REINFORCEMENT ARANGEMENT AT PILE TO ABUTMENT INTERSECTION
SCALE 1 : 20

ABUTMENT REINFORCEMENT TO BE DISPLACED AS NECESSARY TO AVOID PROJECTING PILE REINFORCEMENT

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

ABUTMENT REINFORCEMENT

SHEET B

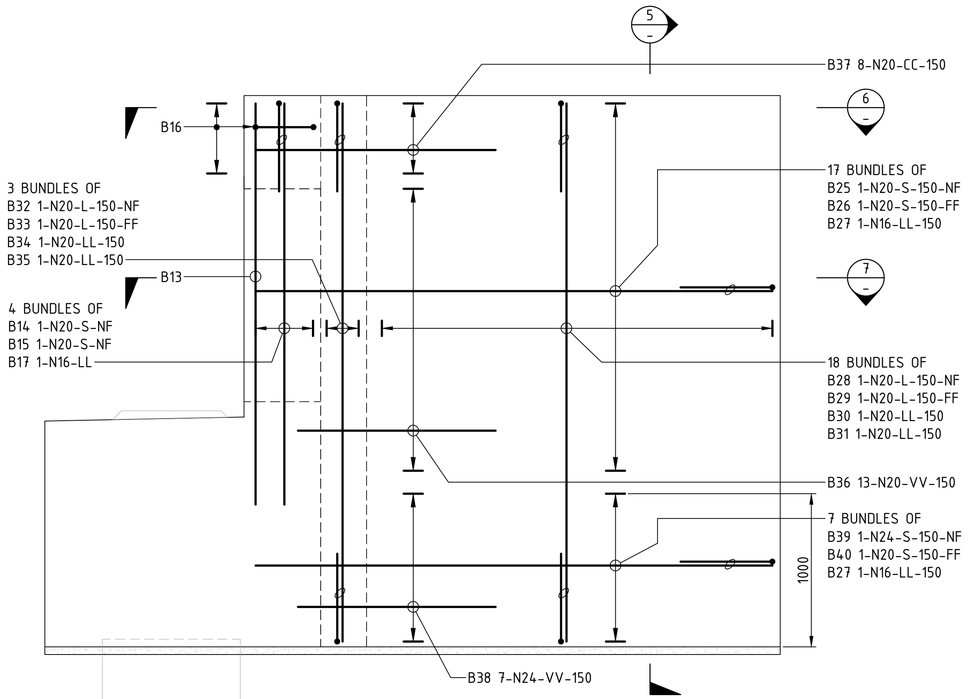
FILE No. BE22007-6670-DRG-BR-7151 | SHEET: 2 OF 3 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7151 | B | EDMS No. - | -

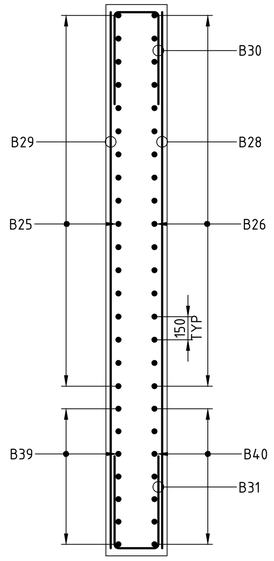
GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 150.

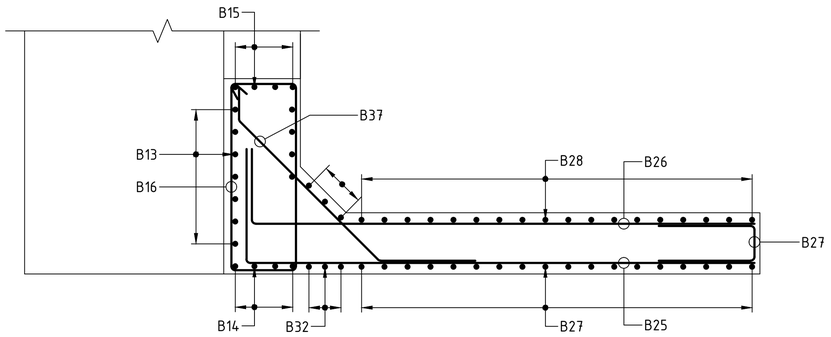


VIEW 4 / SCALE 1 : 20 / 151

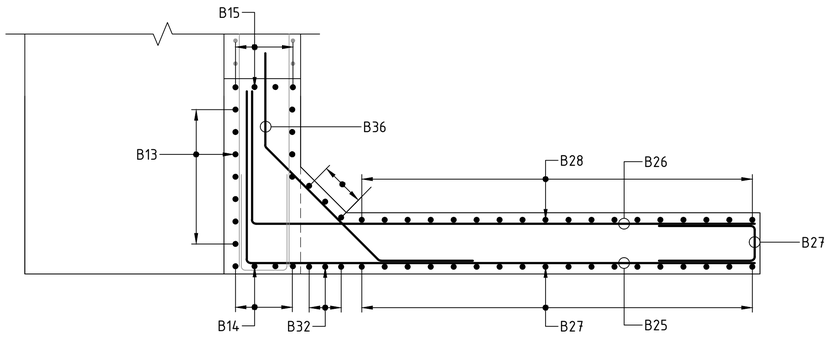
VIEW 3 / 151 SIMILAR



SECTION 5 / SCALE 1 : 20 / -



SECTION 6 / SCALE 1 : 20 / -



SECTION 7 / SCALE 1 : 20 / -

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER ABUTMENT REINFORCEMENT

SHEET C

FILE No. BE22007-6670-DRG-BR-7152 | SHEET: 3 OF 3 | A1

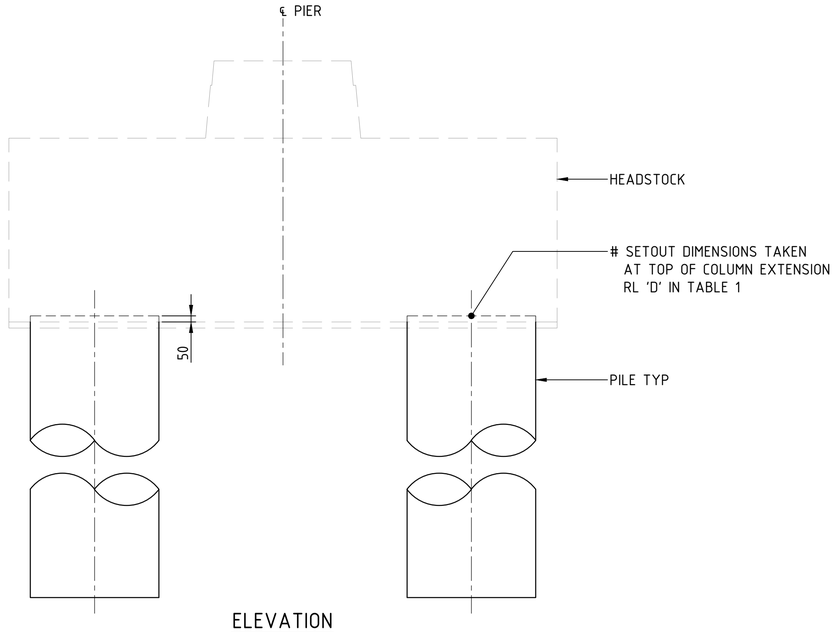
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7152 | B | EDMS No. - | -

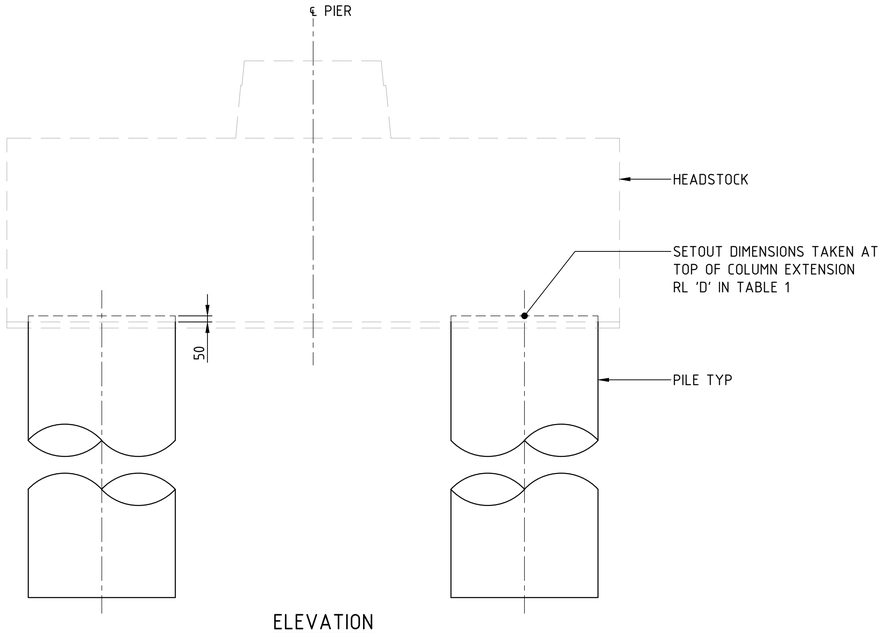
File Plotted C:\12dSdata\AUR2DSYN01\BE22007 (B20175) VEP_101100 DRAWINGS\103 Br & Spec Sh\AutoCAD\AutoCAD GDA 2020\BE22007-6670-DWG-BR-7151-7152.dwg

Plot Date & Time 7/20/2023 5:55 PM

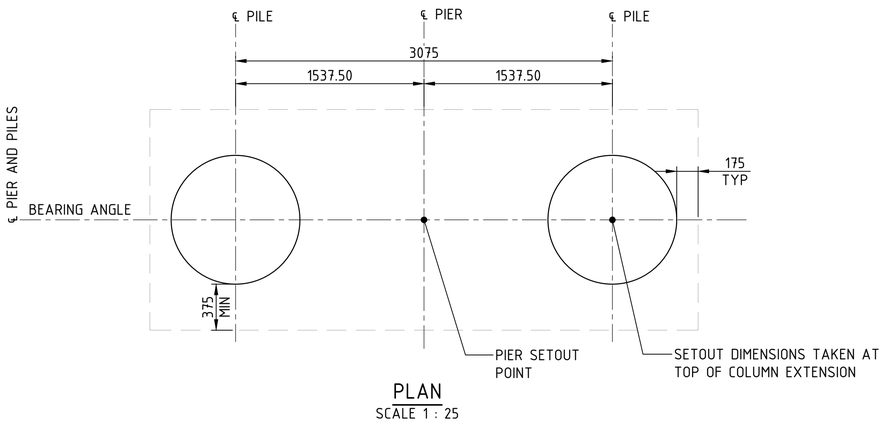
Plotted by CHRISTSAAC.ESMILLA



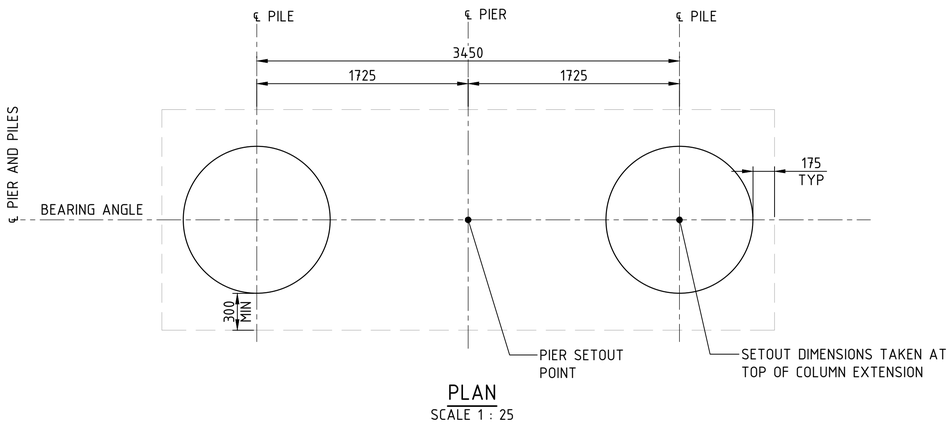
ELEVATION
SCALE 1 : 25



ELEVATION
SCALE 1 : 25



PLAN
SCALE 1 : 25



PLAN
SCALE 1 : 25

FOR PIER No 1 TO 8, 64 TO 66, 69 TO 71 AND 77 SETOUT DIMENSIONS TAKEN AT TOP OF PILE RL 'B' IN TABLE 1 SEE DRAWING No 7053 TO 7055

GENERAL NOTES:

SCALE AS SHOWN.
CONCRETE EXPOSURE CLASSIFICATION: B1.
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF ALL CONCRETE TO BE 40MPa.
EDGES TO BE CHAMFERED 20mm x 20mm AND RE-ENTRANT ANGLES FILLETED 20mm x 20mm UNLESS SPECIFIED OTHERWISE.
CJ DENOTES CONSTRUCTION JOINT.

HEAT OF HYDRATION LIMITS:

CONCRETE MIX DESIGNS AND FACTORS THAT INFLUENCE PEAK AND DIFFERENTIAL HEAT OF HYDRATION TEMPERATURES ACROSS A RESTRAINED CONCRETE MEMBER WITH A LEAST DIMENSION OF 500mm OR MORE AND THE VOLUME BEING PLACES IS GREATER THAN 5m^3, SHALL INCLUDE MEASURES TO LIMIT TEMPERATURES DURING THE CURING PERIOD TO:
- PEAK TEMPERATURE TO A MAXIMUM 70°C
- DIFFERENT TEMPERATURE ACROSS THE CROSS-SECTION, TO 25°C

TWO THERMOCOUPLES ARE REQUIRED WITHIN THE CONCRETE MEMBER, ONE AT THE EDGE REINFORCEMENT AND ONE AT CENTRAL REINFORCEMENT USED TO MONITOR THE MAXIMUM AND DIFFERENTIAL TEMPERATURES ACROSS THE CONCRETE MEMBER.

CRACK CONTROL RECOMMENDATIONS INCLUDE:

MAXIMUM CONCRETE TEMPERATURE AT PLACEMENT TO BE 28°C.
36mm THICK PLYWOOD FORMWORK WITH A LAYER OF POLYETHYLENE SHEET TAPED TO THE FORMWORK OVER THE TOP SURFACE FORMING A 20mm AIR GAP OR APPROVED EQUIVALENT.
RETAIN THE FORMWORK / INSULATION IN PLACE FOR A PERIOD OF AT LEAST 7 DAYS OR UNTIL THE TEMPERATURE DIFFERENTIAL HAS BEEN CONFIRMED AS BELOW 25°C BY IN-SITU TEMPERATURE MONITORING AND WILL REMAIN BELOW 25°C IF THE FORMWORK IS REMOVED.
THE FORMWORK/INSULATION TO BE REMOVED DURING THE DAY WHEN THE TEMPERATURE IS HIGH AND NOT EARLY IN THE MORNING.
IF A MINIMUM OF 7 DAYS CURING HAS NOT BEEN ACHIEVED APPLY SUBSEQUENT WET OR SEAL CURING IN ACCORDANCE WITH TfNSW D&C SPECIFICATION B80.
WHERE CURING COMPOUNDS ARE PROPOSED, THE COVER MUST BE INCREASED BY 5 MM FOR CLASSIFICATION B1.
CONCRETE MIX DESIGN TO TfNSW 3211 PERMITTED IN ACCORDANCE WITH TfNSW D&C SPECIFICATION B80.

MAXIMUM LOADS PER JACK ARE

SLS = 920kN
ULS = 1250kN

⊕ DENOTES JACKING POINT

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

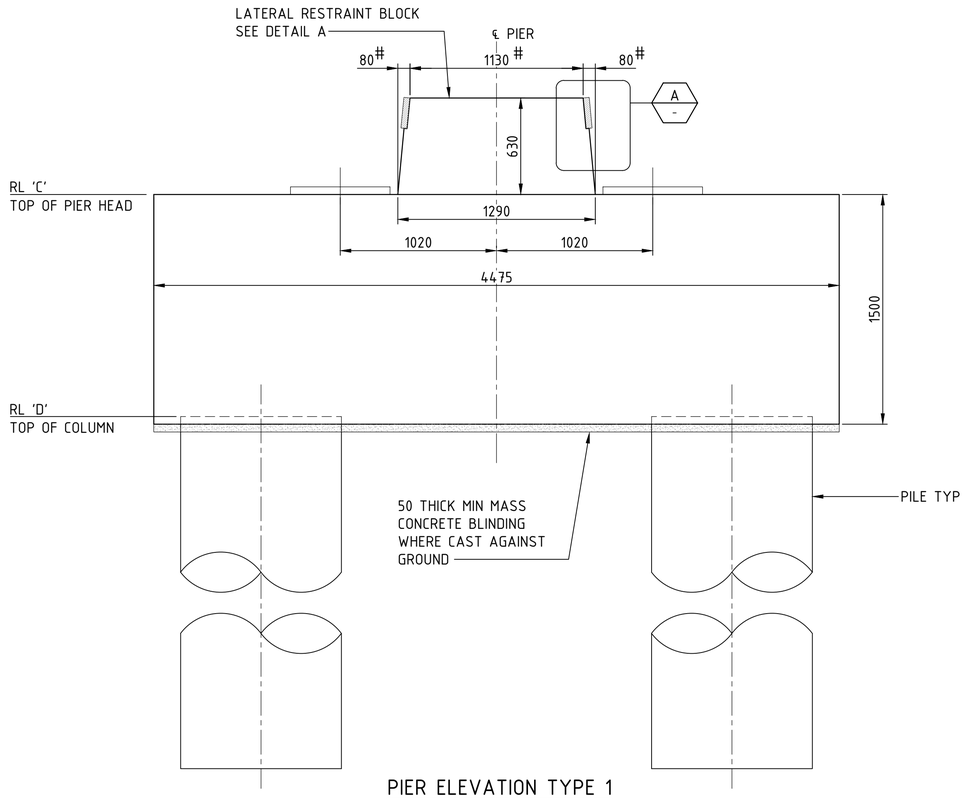
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PIER CONCRETE
SHEET A

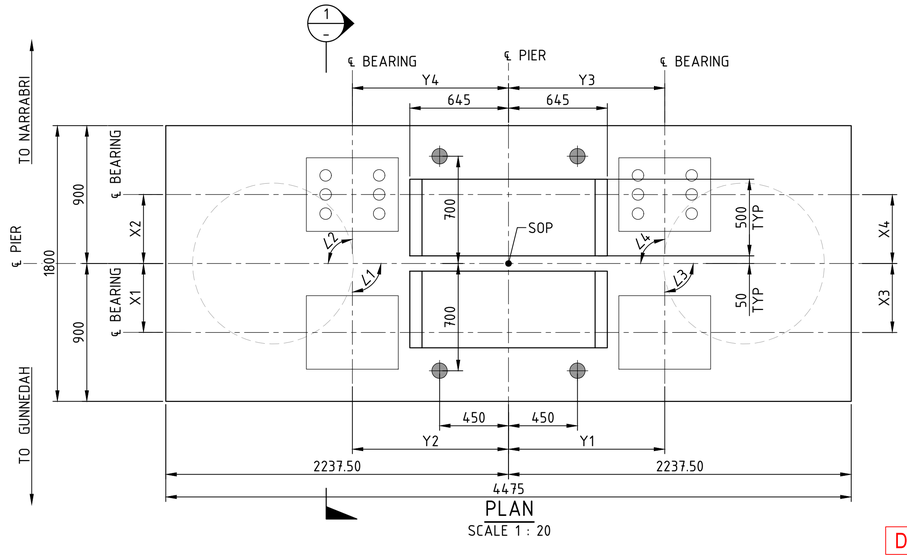
FILE No. BE22007-6670-DRG-BR-7170 | SHEET: 1 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7170 | B | EDMS No. - | -



PIER ELEVATION TYPE 1

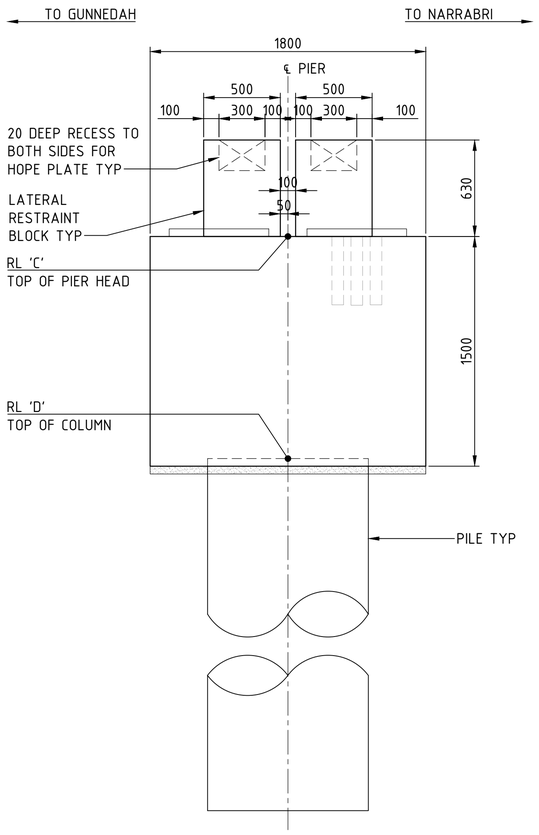
SCALE 1 : 20

DIMENSIONS SHOWN AT TOP OF RESTRAINT BLOCK ARE INDICATIVE ONLY. LATERAL RESTRAINT BLOCKS TO BE CONSTRUCTED AFTER ERECTION OF GIRDERS TO ACHIEVE BETTER FIT.



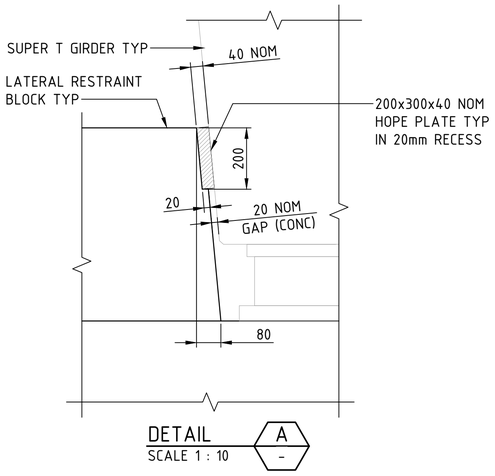
PLAN

SCALE 1 : 20



SECTION 1 / -

SCALE 1 : 20



DETAIL A / -

SCALE 1 : 10

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 170.

TABLE 1 - PIER SETOUT

PIER NO.	RL 'C'	RL 'D'
9	253.913	252.464
10	254.195	252.745
11	254.476	253.027
12	254.758	253.308
13	255.039	253.590
14	255.321	253.871
15	255.602	254.153
16	255.784	254.434
17	256.165	254.715
18	256.447	254.997
19	256.728	255.279
20	254.010	255.560
21	257.291	255.842
22	257.573	256.123
23	257.854	256.404
24	258.085	256.635
25	258.224	256.774
26	258.270	256.820
27	258.225	256.775
28	258.086	256.636
29	257.862	256.412
30	257.619	256.169
31	257.375	255.925
32	257.132	255.682
33	256.828	255.438
34	256.645	255.195
35	256.407	254.951
36	256.158	254.708
37	255.914	254.464
38	256.671	254.221
39	255.427	253.977

TABLE 1 - PIER SETOUT

PIER NO.	RL 'C'	RL 'D'
40	255.184	253.734
41	254.940	253.490
42	254.697	253.247
43	254.453	253.003
44	254.210	252.760
45	253.966	254.516
46	253.723	252.273
47	253.479	252.029
48	253.236	251.786
49	252.992	251.542
50	252.749	251.299
51	252.505	251.055
52	252.262	250.812
53	252.035	250.585
54	251.888	250.438
55	251.826	250.376
56	251.824	250.374
57	251.824	250.374
58	251.824	250.374
59	251.824	250.374
60	251.824	250.374
61	251.824	250.374
62	251.824	250.374
63	251.824	250.374
67	251.824	250.374
68	251.824	250.374
72	251.824	250.374
73	251.824	250.374
74	251.824	250.374
75	251.824	250.374
76	251.824	250.374

FOR PIER No 1 TO 8, 64 TO 66, 69 TO 71 AND 77
SETOUT DIMENSIONS TAKEN AT TOP OF PILE
RL 'B' IN TABLE 1 SEE DRAWING No 053 TO 055

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

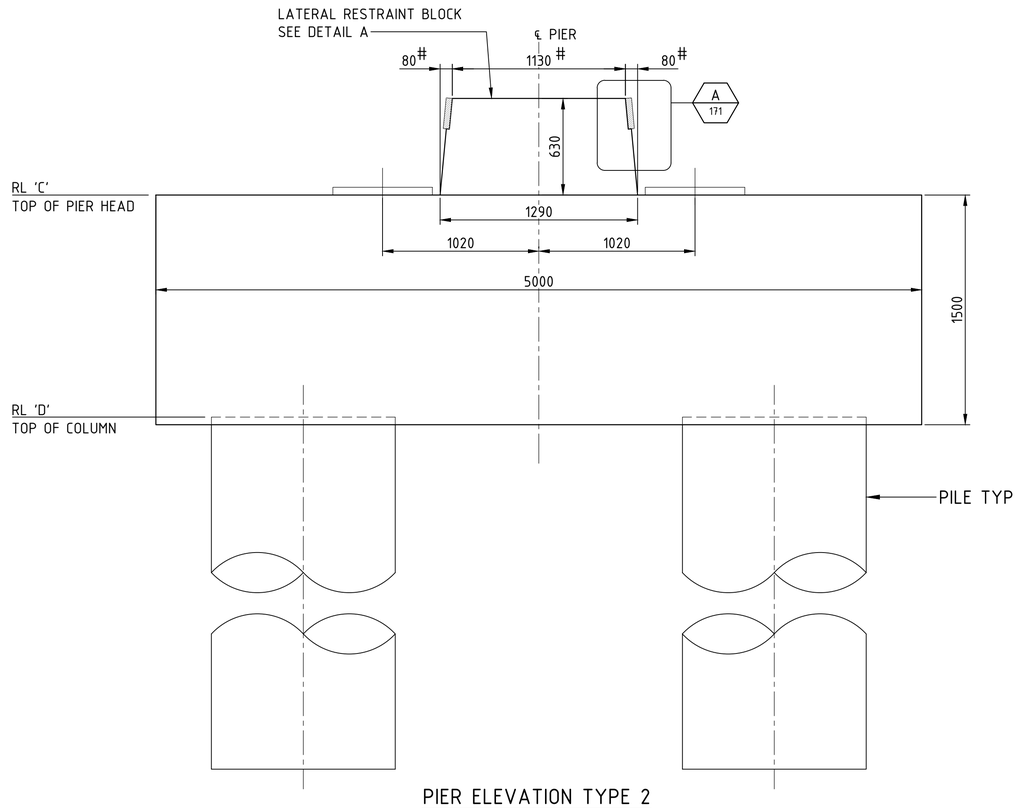
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PIER CONCRETE
SHEET B

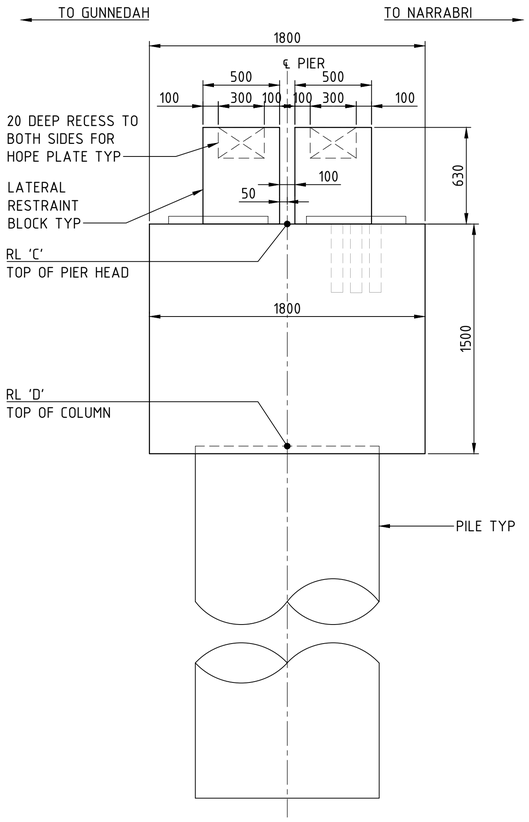
FILE No. BE22007-6670-DRG-BR-7171 | SHEET: 2 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7171 | B | EDMS No. - | -



PIER ELEVATION TYPE 2

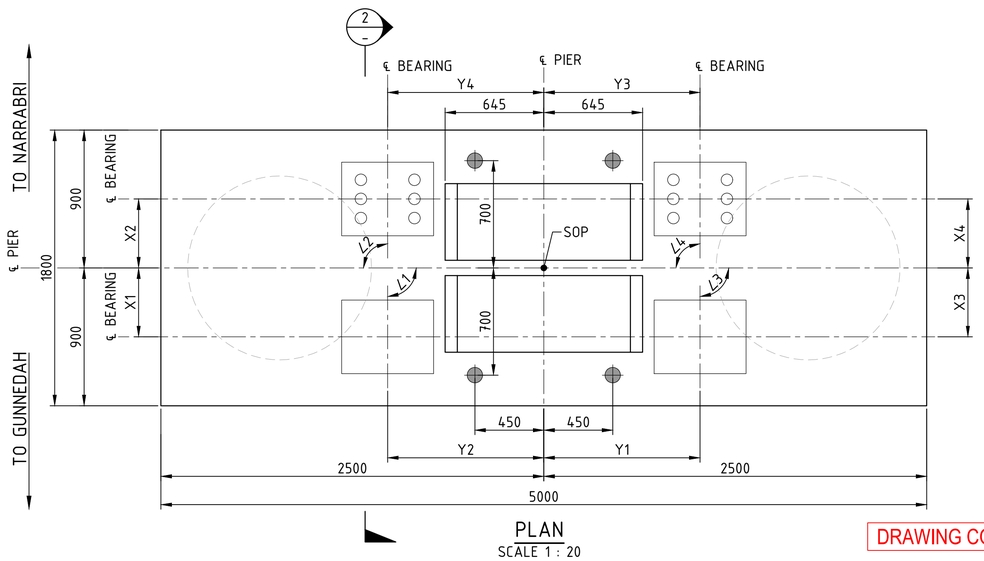
SCALE 1 : 20

DIMENSIONS SHOWN AT TOP OF RESTRAINT BLOCK ARE INDICATIVE ONLY. LATERAL RESTRAINT BLOCKS TO BE CONSTRUCTED AFTER ERECTION OF GIRDERS TO ACHIEVE BETTER FIT.



SECTION 2 / -

SCALE 1 : 20



PLAN

SCALE 1 : 20

TABLE 1 - BEARING OFFSET FROM PIER CL

PIER NO.	X1	X2	X3	X4	Y1	Y2	Y3	Y4	∠1	∠2	∠3	∠4
1 TO 27	450	450	450	450	1020	1020	1020	1020	90°	90°	90°	90°
28	450	450	450	450	1020	1020	1020	1020	90°	90°	90°	90°
29	448	481	518	501	962	1079	963	1078	90.137°	91.545°	89.863°	88.455°
30	481	482	496	500	837	1205	836	1205	91.681°	91.613°	88.319°	88.387°
31 TO 33	482	482	500	500	836	1205	836	1205	91.613°	91.613°	88.387°	88.387°
34	450	450	450	450	1020	1020	1020	1020	90°	90°	90°	90°
35 TO 43	450	450	450	450	1020	1020	1020	1020	90°	90°	90°	90°
44	450	450	450	450	1020	1020	1020	1020	90°	90°	90°	90°
45	443	517	457	465	1017	1023	1015	1026	89.61°	89.35°	90.39°	90.65°
46	496	502	474	480	1140	901	1140	902	84.496°	88.502°	91.504°	91.498°
47	492	497	487	485	1124	817	1126	816	88.041°	88.208°	91.959°	91.792°
48 TO 55	498	497	487	486	1126	816	1126	816	88.208°	88.208°	91.792°	91.792°
56	498	498	487	485	1126	816	1126	815	88.208°	88.255°	91.792°	91.745°
57	503	504	478	478	1207	834	1208	833	88.597°	88.62°	91.403°	91.38°
58 TO 77	450	450	450	450	1020	1020	1020	1020	90°	90°	90°	90°

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 170.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

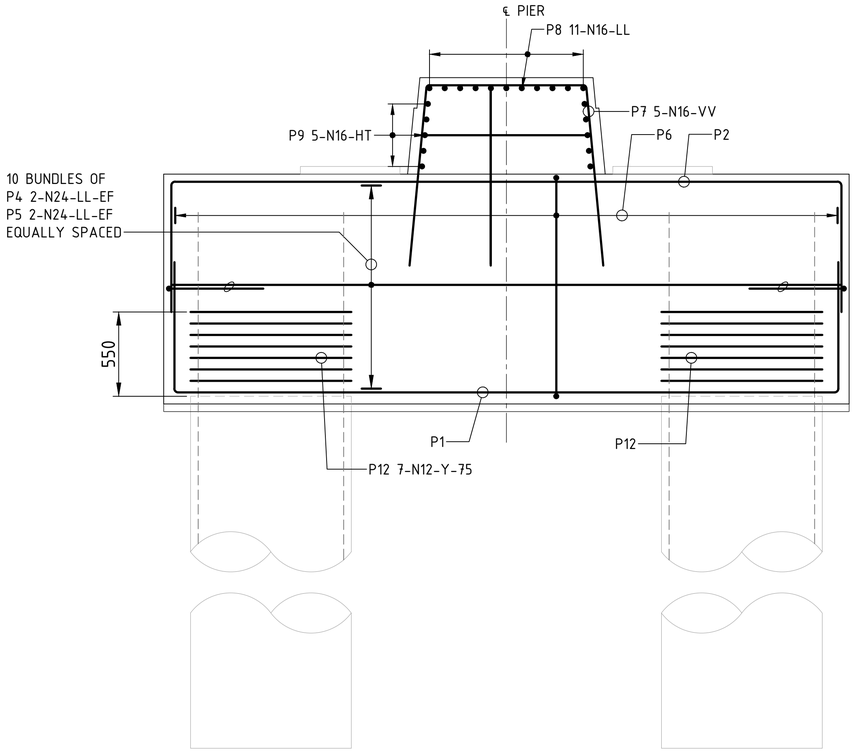
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER PIER CONCRETE

SHEET C

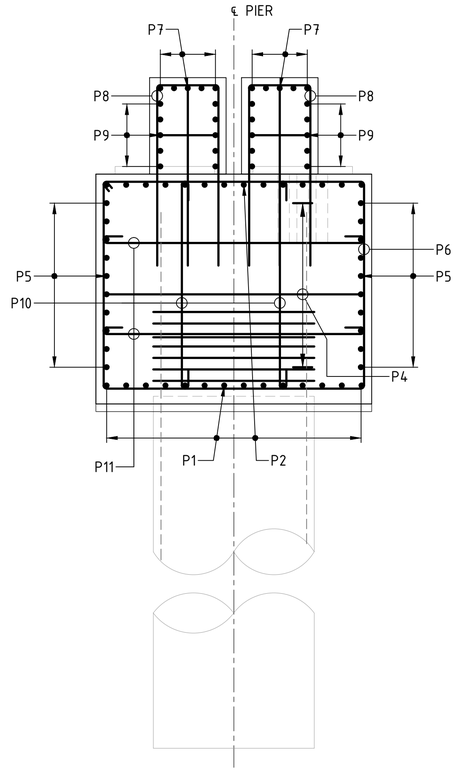
FILE No. BE22007-6670-DRG-BR-7172 | SHEET: 3 OF 3 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7172 | B | EDMS No. - | -



SECTION 1
SCALE 1 : 20



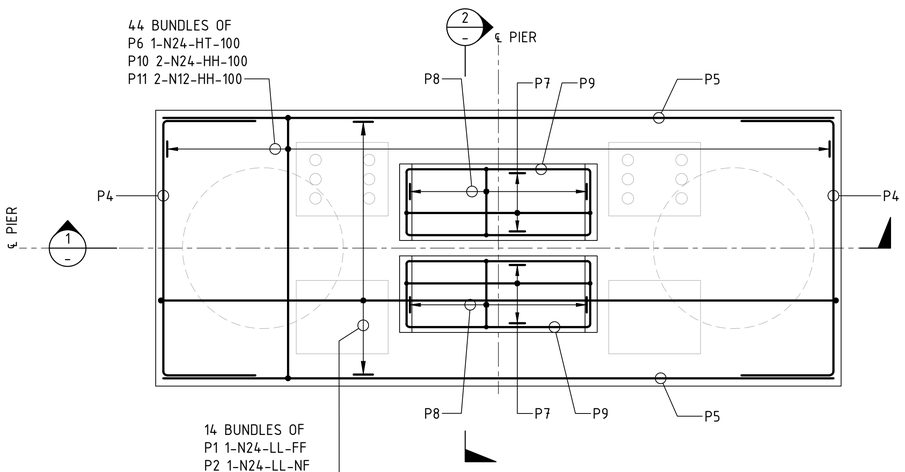
SECTION 2
SCALE 1 : 20

GENERAL NOTES

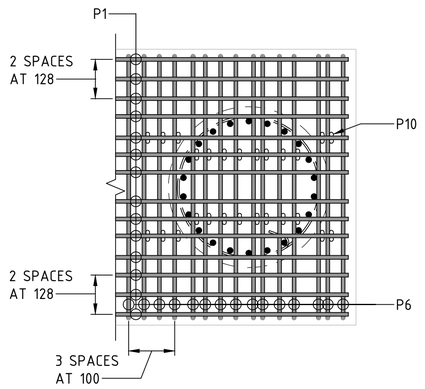
THE REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE MUST BE 45mm OR 75mm IF CAST AGAINST GROUND.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT MUST BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS OTHERWISE SHOWN ON THE DRAWINGS, LAPS ON ADJACENT BARS ON ANY FACE MUST BE STAGGERED (OFFSET) BY NO LESS THAN THE LAP LENGTH.
UNLESS SPECIFIED OTHERWISE, THE MINIMUM DEVELOPMENT LENGTHS AND LENGTH OF LAPS MUST BE:

BAR SIZE:	N12	N16	N20	N24	N28	N32
a) LAP LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	800	1100	1400	1750	2100
b) LAP LENGTH OTHER BARS:	400	600	850	1100	1350	1600
c) DEVELOPMENT LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	650	850	1150	1400	1650
d) DEVELOPMENT LENGTH OTHER BARS:	350	500	700	900	1100	1300

THE CLEAR DISTANCE BETWEEN LAPPED BARS MUST NOT EXCEED 3x THE BAR DIAMETER.
REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR DOWELS, ANCHOR BOLTS, FORMED HOLES AND RECESSES.



PIER PLAN
SCALE 1 : 20



REINFORCEMENT ARANGEMENT AT
COLUMN/PILE TO HEADSTOCK INTERSECTION
SCALE 1 : 20
HEADSTOCK REINFORCEMENT TO BE DISPLACED AS NECESSARY TO AVOID PROJECTING PILE REINFORCEMENT

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

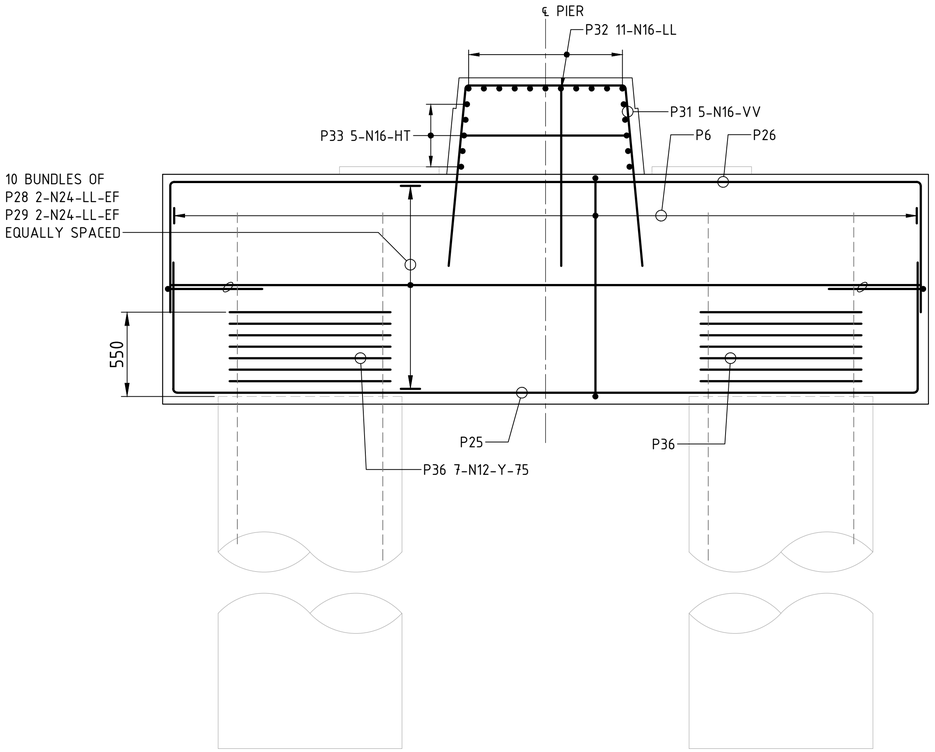
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

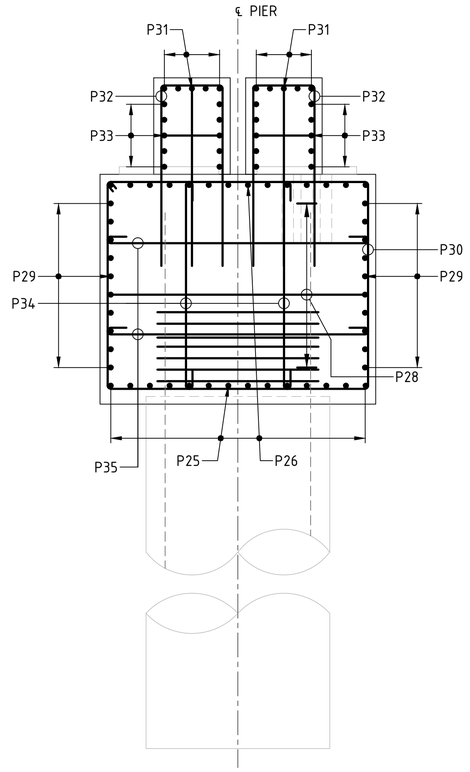
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PIER REINFORCEMENT
SHEET A

FILE No. BE22007-6670-DWG-BR-7200 | SHEET: 1 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DWG-BR-7200 | B | EDMS No. - | -



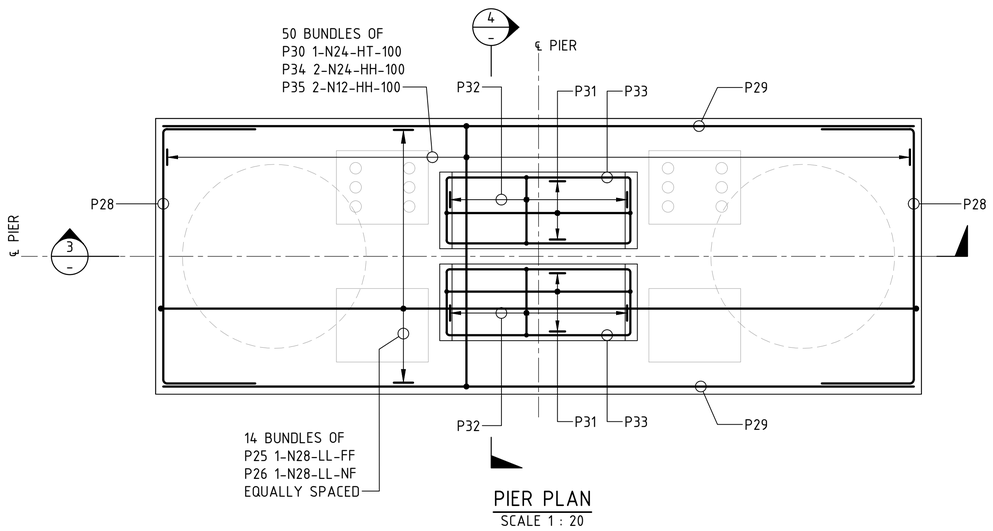
SECTION 3
SCALE 1 : 20



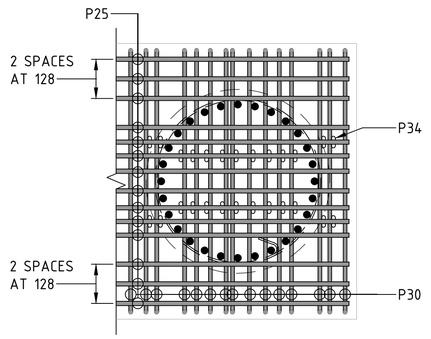
SECTION 4
SCALE 1 : 20

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 200.



PIER PLAN
SCALE 1 : 20



REINFORCEMENT ARANGEMENT AT
COLUMN/PILE TO HEADSTOCK INTERSECTION
SCALE 1 : 20
HEADSTOCK REINFORCEMENT TO BE DISPLACED AS NECESSARY TO AVOID PROJECTING PILE REINFORCEMENT

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

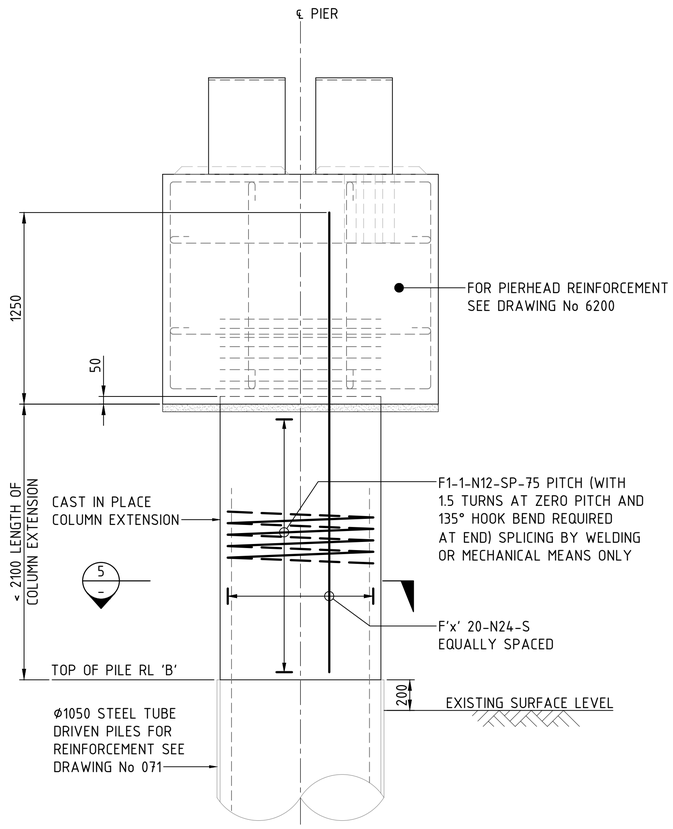
RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PIER REINFORCEMENT
SHEET B

FILE No. BE22007-6670-DWG-BR-7201 | SHEET: 2 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DWG-BR-7201 | B | EDMS No. - | -

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 200.

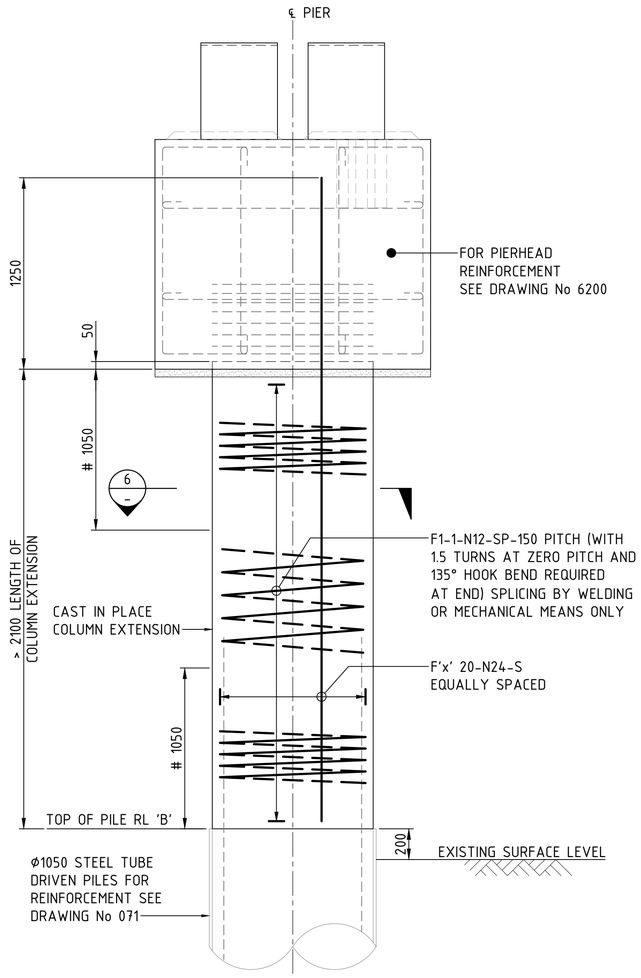


ELEVATION - ϕ1050 COLUMN EXTENSION

SCALE 1 : 20

(PIER TYPE 2)

(PIERS 9,10,67,68 AND 72 TO 76)



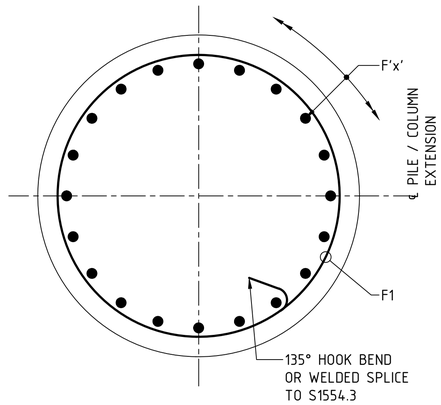
ELEVATION - ϕ1050 COLUMN EXTENSION

SCALE 1 : 20

(PIER TYPE 3)

(PIERS 11 TO 24 AND 45 TO 61)

# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 5 / - SCALE 1 : 10

SECTION 6 / - SIMILAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER PIER REINFORCEMENT

SHEET C

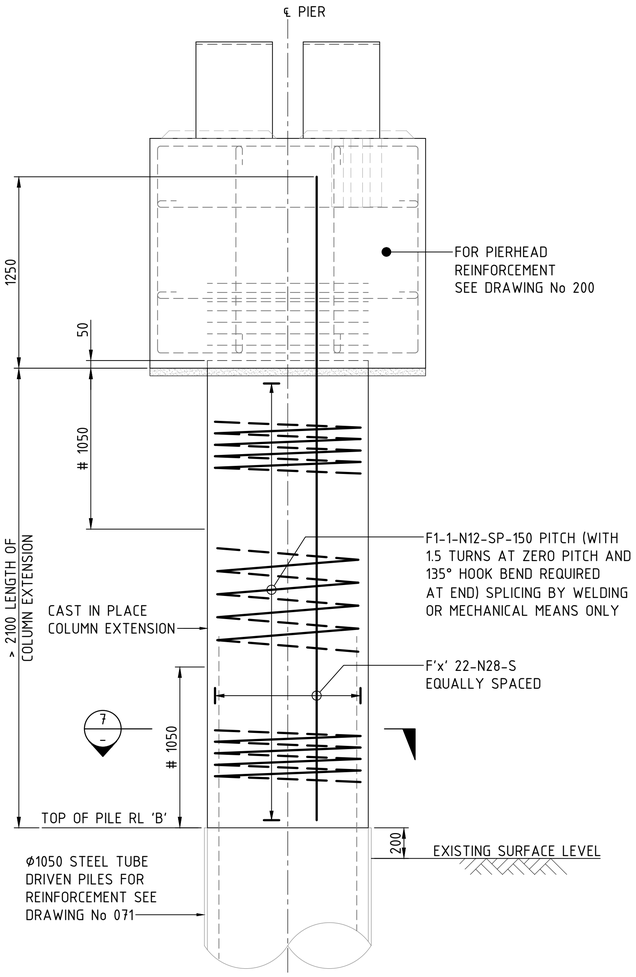
FILE No. BE22007-6670-DWG-BR-7202 | SHEET: 3 OF 4 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DWG-BR-7202 | B | EDMS No. - | -

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 200.



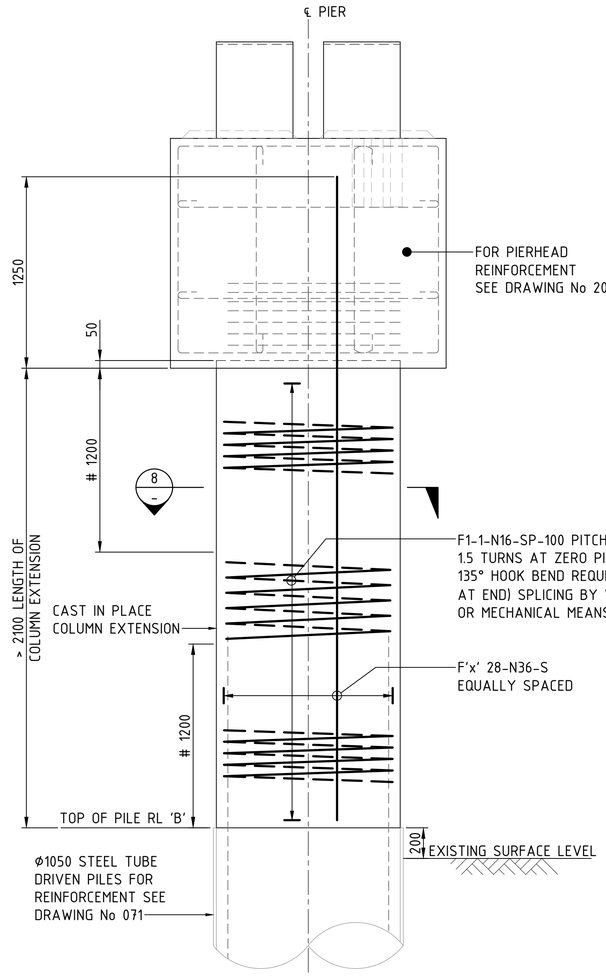
ELEVATION - Ø1050 COLUMN EXTENSION

SCALE 1 : 20

(PIER TYPE 4)

(PIERS 27 TO 44 AND 62 TO 63)

# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



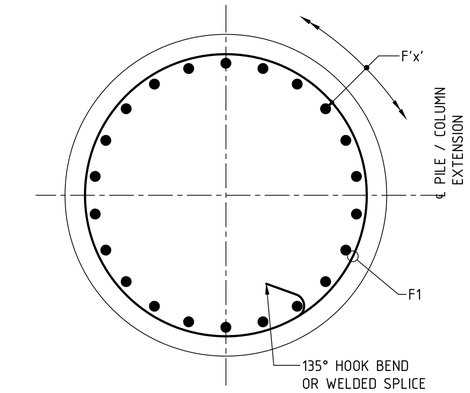
ELEVATION - Ø1200 COLUMN EXTENSION

SCALE 1 : 20

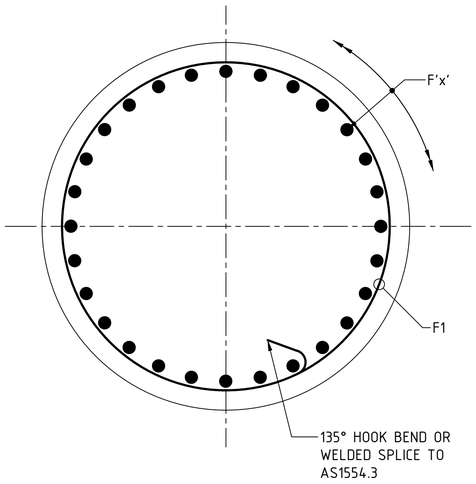
(PIER TYPE 5)

(PIERS 25 AND 26)

# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 7 / - SCALE 1 : 10



SECTION 8 / - SCALE 1 : 10

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

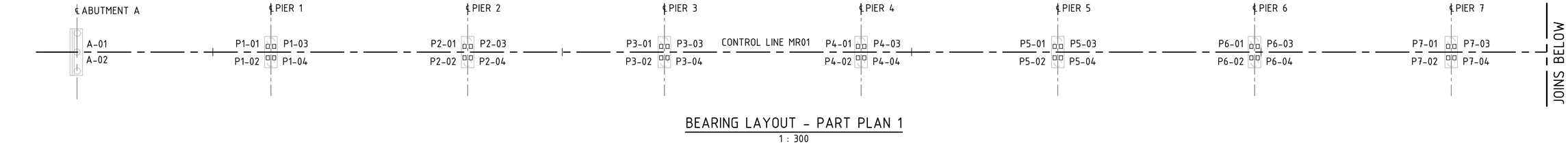
PIER REINFORCEMENT

SHEET D

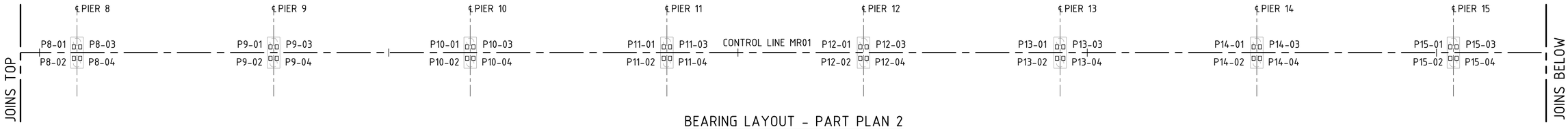
FILE No. BE22007-6670-DWG-BR-7203 | SHEET: 4 OF 4 | A1

STATUS: 100% DESIGN ©

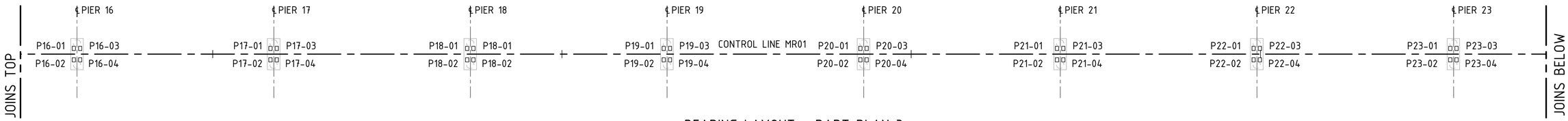
DRG No. BE22007-6670-DWG-BR-7203 | B | EDMS No. - | -



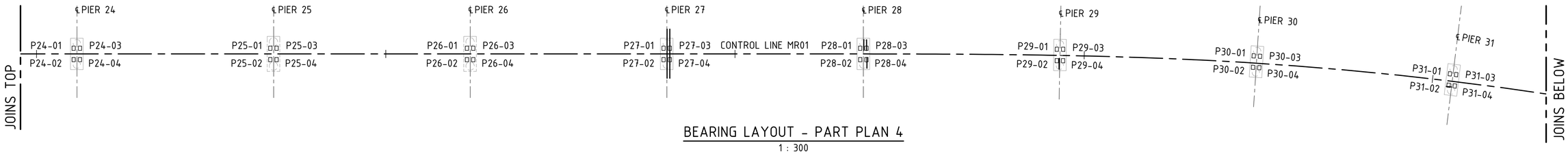
BEARING LAYOUT - PART PLAN 1
1 : 300



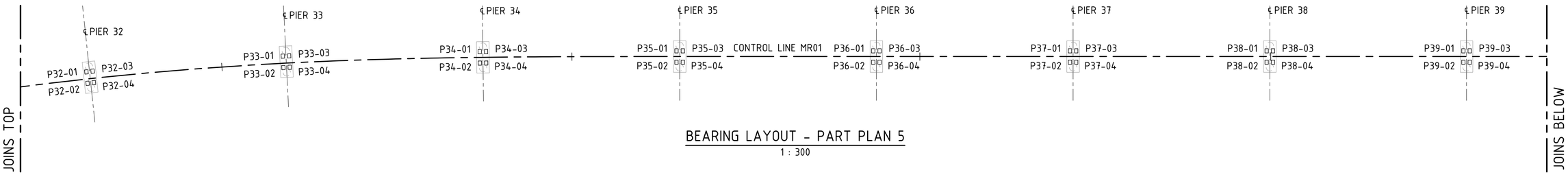
BEARING LAYOUT - PART PLAN 2
1 : 300



BEARING LAYOUT - PART PLAN 3
1 : 300



BEARING LAYOUT - PART PLAN 4
1 : 300



BEARING LAYOUT - PART PLAN 5
1 : 300

GENERAL NOTES

FOR OTHER GENERAL NOTES RELATING TO THIS SHEET, SEE SHEET No 302.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:300 @ A1 0 3 6 9 12 15 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 35% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

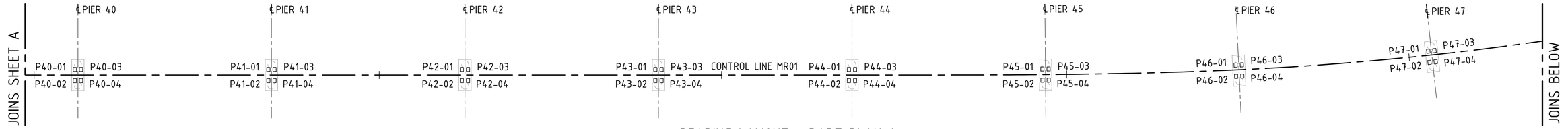
WHITEHAVEN COAL

BG&E STRUCTURAL

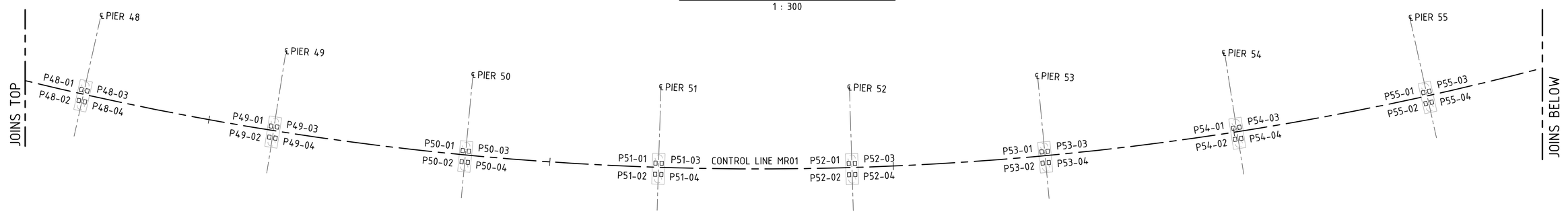
DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED M.GRAHAM -

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
BEARING LAYOUT
SHEET A

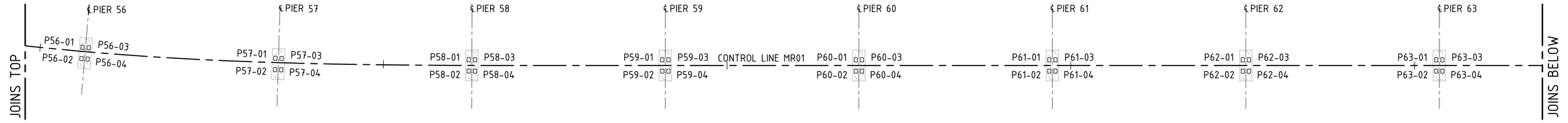
FILE No. BE22007-6670-DWG-BR-7300 | SHEET: 1 OF 8 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DWG-BR-7300 | B | EDMS No. - | -



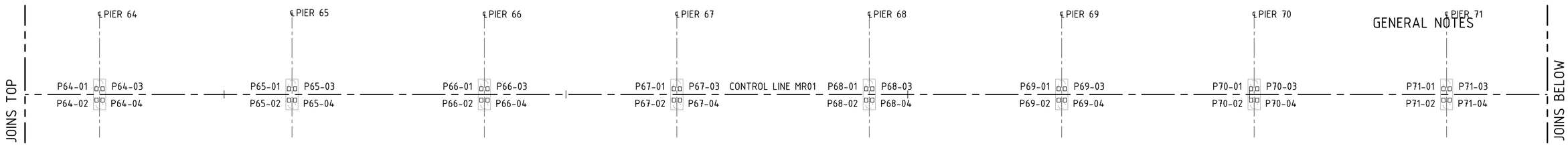
BEARING LAYOUT - PART PLAN 6
1 : 300



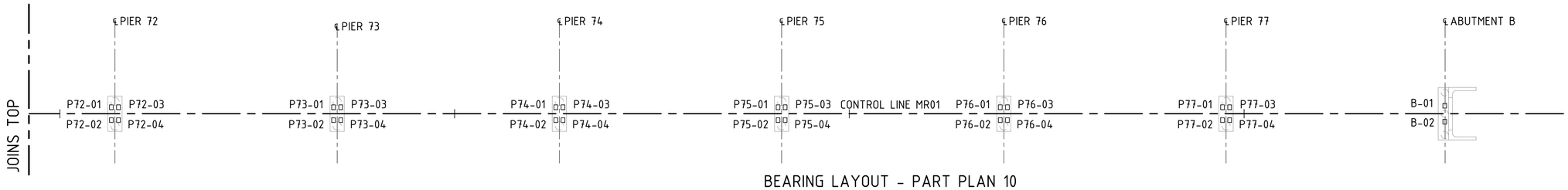
BEARING LAYOUT - PART PLAN 7
1 : 300



BEARING LAYOUT - PART PLAN 8
1 : 300



BEARING LAYOUT - PART PLAN 9
1 : 300



BEARING LAYOUT - PART PLAN 10
1 : 300

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR OTHER GENERAL NOTES RELATING TO THIS SHEET, SEE SHEET No 302.

1:300 @ A1 0 3 6 9 12 15 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
BEARING LAYOUT
SHEET B

FILE No. BE22007-6670-DWG-BR-7301 | SHEET: 2 OF 8 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DWG-BR-7301 | B | EDMS No. - | -

GENERAL NOTES

MINIMUM 28 DAY COMPRESSIVE STRENGTH OF EPOXY MORTAR AND CEMENT MORTAR MUST BE 40MPa PRIOR TO BEARING INSTALLATION.
CONCRETE EXPOSURE CLASSIFICATION B1.
THE MIX RATIO OF EPOXY AND SAND AND THE TYPE OF SAND FOR THE PRE-MOULDED EPOXY MORTAR BLOCK SHALL BE IN ACCORDANCE WITH THE EPOXY MANUFACTURER'S SPECIFICATION.
TOP OF PRE-MOULDED EPOXY MORTAR BLOCK SHALL HAVE A WIRE BRUSH FINISH PRIOR TO BEING GLUED TO GIRDER.
EPOXY MORTAR BLOCKS MUST BE CONSTRUCTED NOT MORE THAN 2 WEEKS PRIOR TO THE ERECTION OF THE GIRDER.
THE SIDES OF THE EPOXY MORTAR PAD SHALL BE FORMED VERTICAL AND FINISHED SMOOTH. EPOXY MORTAR BLOCKS TO BE TAGGED APPROPRIATELY.
STEEL PLATES SHALL BE GRADE 250 TO AS/NZS 3678.
THE WELD CATEGORY SHALL BE SP IN ACCORDANCE TO AS/NZS 1554 PART 1.
WELDING SYMBOLS COMPLY WITH AS 1101 PART 3.
ALL EXPOSED WELDS SHALL BE GROUND FLUSH.
ALL FASTENERS SHALL CONFORM TO THE REQUIREMENTS OF TfNSW SPECIFICATION D&C B240.
SECURING BOLTS SHALL BE PRODUCT GRADE C IN ACCORDANCE WITH AS/NZS 1111.1.
HEXAGON HEAD SCREWS SHALL BE PRODUCT GRADE C IN ACCORDANCE WITH AS/NZS 1111.2.
THE BOLTING CATEGORY FOR PRODUCT GRADE C BOLTS AND SCREWS SHALL BE 8.8/S IN ACCORDANCE WITH AS 5100.6.
TAPERED WASHERS MUST CONFORM WITH MATERIAL PROPERTIES AS SPECIFIED IN AS/NZS 1237.1.
ATTACHMENT PLATES WITH BOLTS AND WASHERS SHALL BE HOT-DIP GALVANISED TO TfNSW SPECIFICATION D&C B220 AFTER FABRICATION.
EXPOSED EDGES OF STEEL PLATES SHALL BE ROUNDED TO A RADIUS OF 2mm PRIOR TO GALVANISING IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B201.
BOLTS AND TAPERED WASHERS SHALL BE HOT-DIP GALVANISED IN ACCORDANCE WITH AS 1214.
DAMAGED GALVANISED SURFACES SHALL BE RENOVATED IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B220.
FABRICATION AND WELDING, INCLUDING SUPPLY OF STEEL PLATES TO BE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B201 AND AS/NZS 1554.1
RECESS FOR ANCHORS IN TOP SURFACE MUST BE FILLED WITH APPROVED SEALANT SUCH AS PARCHEM PU40 AFTER TIGHTENING AS PER BTD 2008/11.

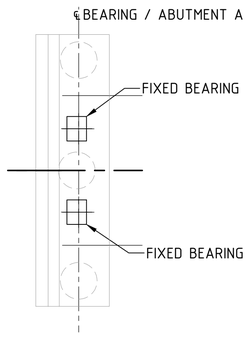
EXPANSION BEARING INSTALLATION SEQUENCE

1. PRIOR TO CONSTRUCTING GROUT PADS AND EPOXY MORTAR BLOCKS, SUBMIT DOCUMENTATION FOR HOLD POINT RELEASE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B284.
2. MEASURE THE GIRDER HOGS NOT MORE THAN 2 WEEKS PRIOR TO ERECTION OF GIRDER.
3. CONSTRUCT THE GROUT PAD WITH BOTTOM ATTACHMENT PLATES ONLY WHEN EARTHWORKS FILL BEHIND THE ABUTMENT CURTAIN WALL HAS BEEN COMPLETED UP TO THE UNDERSIDE OF THE APPROACH SLAB.
4. CAST EPOXY MORTAR BLOCK DIRECTLY ON TOP OF THE TOP STEEL ATTACHMENT PLATE TO THE DIMENSIONS GIVEN IN TABLE 2 TO SUIT MEASURED HOG.
5. INSTALL ELASTOMERIC BEARINGS ONTO GROUT PAD.
6. THE ATTACHMENT PLATE WITH EPOXY MORTAR BLOCK SHALL BE FIXED TO THE SOFFIT OF THE GIRDER BY BUTTERING A SUITABLE EPOXY PASTE EVENLY ON THE FULL SURFACE AREA OF THE TOP OF THE EPOXY MORTAR BLOCK, EXCEPT OVER THE PREDRILLED HOLES TO ENSURE FULL CONTACT.
7. BOLT EPOXY BLOCK TO SOFFIT OF GIRDER.
8. EXCESS EPOXY PASTE SHALL BE WIPED CLEAN.
9. CARRY OUT FINAL CHECK OF a1 - b4 DIMENSIONS PRIOR TO EPOXY PASTE HARDENING AND IMMEDIATELY AFTER INSTALLATION.
10. ERECT GIRDER ON TOP OF ELASTOMERIC BEARINGS AND BRACE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B201. BRACING SHALL BE DESIGNED TO RESTRAIN GIRDERS AGAINST ROLLING ABOUT THEIR LONGITUDINAL AXIS AND SHALL BE ADJUSTED TO ENSURE THAT THERE IS NO MEASURABLE ROTATION DEFORMATION OF THE BEARING ABOUT THIS AXIS.

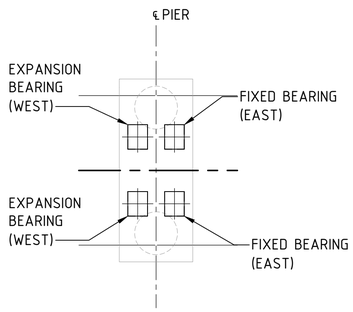
FIXED BEARING INSTALLATION SEQUENCE

1. PRIOR TO CONSTRUCTING GROUT PADS AND EPOXY MORTAR BLOCKS, SUBMIT DOCUMENTATION FOR HOLD POINT RELEASE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B284.
2. MEASURE THE GIRDER HOGS NOT MORE THAN 2 WEEKS PRIOR TO ERECTION OF GIRDER.
3. CAST EPOXY MORTAR BLOCK DIRECTLY ON TOP OF THE TOP STEEL ATTACHMENT PLATE TO THE DIMENSIONS GIVEN IN TABLE 2 TO SUIT MEASURED HOG.
4. INSTALL BOTTOM STEEL ATTACHMENT PLATE WITH DOWEL TO THE REQUIRED LEVEL USING STEEL LEVELING PACKERS/BOLTS.
5. INSTALL ELASTOMERIC BEARING ON TO BOTTOM ATTACHMENT PLATES.
6. THE ATTACHMENT PLATE WITH EPOXY MORTAR BLOCK SHALL BE FIXED TO THE SOFFIT OF THE GIRDER BY BUTTERING A SUITABLE EPOXY PASTE EVENLY ON THE FULL SURFACE AREA OF THE TOP OF EPOXY MORTAR BLOCK, EXCEPT OVER THE PREDRILLED HOLES TO ENSURE FULL CONTACT.
7. BOLT EPOXY BLOCK TO SOFFIT OF GIRDER.
8. EXCESS EPOXY PASTE SHALL BE WIPED CLEAN.
9. CARRY OUT FINAL CHECK OF a1 - b4 DIMENSIONS PRIOR TO EPOXY PASTE HARDENING AND IMMEDIATELY AFTER INSTALLATION.
10. ERECT GIRDER ON TOP OF ELASTOMERIC BEARINGS AND BRACE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B201. BRACING SHALL BE DESIGNED TO SUPPORT AND RESTRAIN GIRDERS AGAINST ROLLING ABOUT THEIR LONGITUDINAL AXIS AND SHALL BE ADJUSTED TO ENSURE THAT THERE IS NO MEASURABLE ROTATION DEFORMATION OF THE BEARING ABOUT THIS AXIS.
11. CLEAN THE RECESSES AND SET AND FIX THE BASE PLATE, THEN FILL THE VOID BENEATH THE BEARING BASE PLATE AND THE DOWEL RECESS BY FORMING AROUND THE BASE PLATE AND INJECTING SHRINKAGE COMPENSATED HIGH FLOW CEMENTITOUS GROUT EPIREZ SUPER FLOW HL OR APPROVED EQUIVALENT. SUITABLE GROUT VENTS SHALL BE PROVIDED TO ENSURE THERE IS NO AIR ENTRAPMENT.

FROM GUNNEDAH

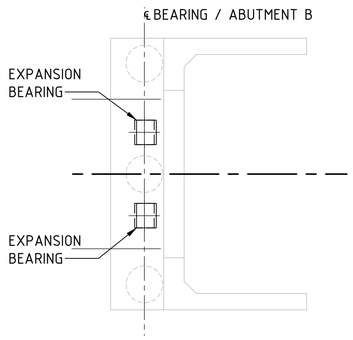


ABUTMENT A BEARING PLAN
SCALE 1 : 75



TYPICAL PIER BEARING PLAN
SCALE 1 : 75

FROM NARRABRI



ABUTMENT B BEARING PLAN
SCALE 1 : 75

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:75 @ A1 0 0.75 1.5 2.25 3 3.75 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

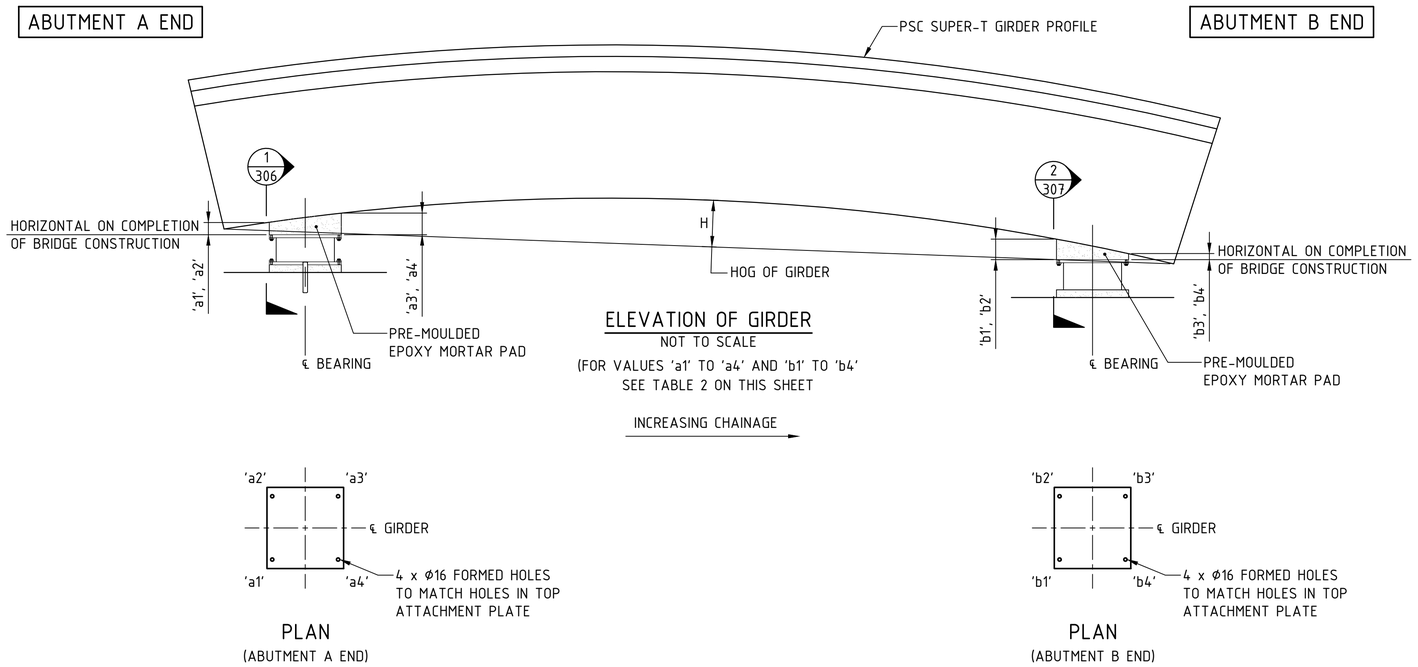
BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
BEARING
SHEET C

FILE No. BE22007-6670-DRG-BR-7302 | SHEET: 3 OF 8 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7302 | B | EDMS No. - | -



GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 302.
THE DIMENSIONS OF THE PRE-MOULDED EPOXY MORTAR BLOCKS THAT HAVE BEEN DERIVED BY THE DESIGNER HAVE TAKEN INTO ACCOUNT THE FOLLOWING:

- THE HOG OF THE GIRDER SHALL BE MEASURED NOT MORE THAN TWO WEEKS PRIOR TO GIRDER ERECTION.
- THE DEFLECTION OF THE GIRDER DUE TO THE CAST-IN-PLACE CONCRETE DECK.
- THE CROSSFALL AND THE LONGITUDINAL GRADE OF THE GIRDER BETWEEN SUPPORTED ENDS.

THE VALUES OF 'a1' TO 'a4' AND 'b1' TO 'b4' SHALL BE INTERPOLATED FOR INTERMEDIATE MEASURED HOGS. IF MEASURED HOG IS OUTSIDE OF THE RANGE OF HOGS GIVEN, THE VALUES OF 'a1' TO 'a4' AND 'b1' TO 'b4' SHALL BE ADJUSTED BY THE PRINCIPAL.

TABLE 2 - PRE-MOULDED EPOXY MORTAR PAD VALUES

GIRDER BY SPAN	GIRDER HOG 'H'	EPOXY MORTAR PAD DIMENSIONS							
		a1'	a2'	a3'	a4'	b1'	b2'	b3'	b4'
SPAN 1 TO 24	45	76	76	82	82	70	70	74	74
	93	28	28	37	37	22	22	23	23
SPAN 25	45	74	74	77	77	72	72	74	74
	93	26	26	32	32	26	26	24	24
SPAN 26 AND 27	45	72	72	73	73	75	75	74	74
	93	24	24	28	28	30	30	26	26
SPAN 28	45	72	72	70	70	79	79	76	76
	93	22	22	24	24	34	34	28	28
SPAN 29 TO 53	45	71	71	68	68	83	83	78	78
	93	20	20	20	20	38	38	30	30
SPAN 54	45	72	72	70	70	79	79	76	76
	93	22	22	24	24	34	34	28	28
SPAN 55 TO 78	45	72	72	73	73	75	75	74	74
	93	24	24	28	28	30	30	26	26

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER BEARING

SHEET D

FILE No. BE22007-6670-DRG-BR-7303 | SHEET: 4 OF 8 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7303 | B | EDMS No. - | -

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 1	A-01	FIXED	251.410
	A-02	FIXED	251.410
	P1-01	EXPANSION	251.722
	P1-02	EXPANSION	251.722
SPAN 2	P1-03	FIXED	251.692
	P1-04	FIXED	251.692
	P2-01	EXPANSION	252.003
	P2-02	EXPANSION	252.003
SPAN 3	P2-03	FIXED	251.973
	P2-04	FIXED	251.973
	P3-01	EXPANSION	252.285
	P3-02	EXPANSION	252.285
SPAN 4	P3-03	FIXED	252.255
	P3-04	FIXED	252.255
	P4-01	EXPANSION	252.566
	P4-02	EXPANSION	252.566
SPAN 5	P4-03	FIXED	252.536
	P4-04	FIXED	252.536
	P5-01	EXPANSION	252.848
	P5-02	EXPANSION	252.848
SPAN 6	P5-03	FIXED	252.818
	P5-04	FIXED	252.818
	P6-01	EXPANSION	253.129
	P6-02	EXPANSION	253.129
SPAN 7	P6-03	FIXED	253.099
	P6-04	FIXED	253.099
	P7-01	EXPANSION	253.411
	P7-02	EXPANSION	253.411
SPAN 8	P7-03	FIXED	253.381
	P7-04	FIXED	253.381
	P8-01	EXPANSION	253.692
	P8-02	EXPANSION	253.692
SPAN 9	P8-03	FIXED	253.662
	P8-04	FIXED	253.662
	P9-01	EXPANSION	253.974
	P9-02	EXPANSION	253.974
SPAN 10	P9-03	FIXED	253.944
	P9-04	FIXED	253.944
	P10-01	EXPANSION	254.255
	P10-02	EXPANSION	254.255
SPAN 11	P10-03	FIXED	254.225
	P10-04	FIXED	254.225
	P11-01	EXPANSION	254.537
	P11-02	EXPANSION	254.537
SPAN 12	P11-03	FIXED	254.507
	P11-04	FIXED	254.507
	P12-01	EXPANSION	254.818
	P12-02	EXPANSION	254.818
SPAN 13	P12-03	FIXED	254.788
	P12-04	FIXED	254.788
	P13-01	EXPANSION	255.100
	P13-02	EXPANSION	255.100

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 14	P13-03	FIXED	255.070
	P13-04	FIXED	255.070
	P14-01	EXPANSION	255.381
	P14-02	EXPANSION	255.381
SPAN 15	P14-03	FIXED	255.351
	P14-04	FIXED	255.351
	P15-01	EXPANSION	255.663
	P15-02	EXPANSION	255.663
SPAN 16	P15-03	FIXED	255.633
	P15-04	FIXED	255.633
	P16-01	EXPANSION	255.944
	P16-02	EXPANSION	255.944
SPAN 17	P16-03	FIXED	255.914
	P16-04	FIXED	255.914
	P17-01	EXPANSION	256.226
	P17-02	EXPANSION	256.226
SPAN 18	P17-03	FIXED	256.196
	P17-04	FIXED	256.196
	P18-01	EXPANSION	256.507
	P18-02	EXPANSION	256.507
SPAN 19	P18-03	FIXED	256.477
	P18-04	FIXED	256.477
	P19-01	EXPANSION	256.789
	P19-02	EXPANSION	256.789
SPAN 20	P19-03	FIXED	256.759
	P19-04	FIXED	256.759
	P20-01	EXPANSION	257.070
	P20-02	EXPANSION	257.070
SPAN 21	P20-03	FIXED	257.040
	P20-04	FIXED	257.040
	P21-01	EXPANSION	257.352
	P21-02	EXPANSION	257.352
SPAN 22	P21-03	FIXED	257.322
	P21-04	FIXED	257.322
	P22-01	EXPANSION	257.633
	P22-02	EXPANSION	257.633
SPAN 23	P22-03	FIXED	257.603
	P22-04	FIXED	257.603
	P23-01	EXPANSION	257.914
	P23-02	EXPANSION	257.914
SPAN 24	P23-03	FIXED	257.884
	P23-04	FIXED	257.884
	P24-01	EXPANSION	258.145
	P24-02	EXPANSION	258.145
SPAN 25	P24-03	FIXED	258.115
	P24-04	FIXED	258.115
	P25-01	EXPANSION	258.284
	P25-02	EXPANSION	258.284
SPAN 26	P25-03	FIXED	258.254
	P25-04	FIXED	258.254
	P26-01	EXPANSION	258.330
	P26-02	EXPANSION	258.330

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 27	P13-03	FIXED	258.300
	P13-04	FIXED	258.300
	P14-01	EXPANSION	258.285
	P14-02	EXPANSION	258.285
SPAN 28	P14-03	FIXED	258.255
	P14-04	FIXED	258.255
	P15-01	EXPANSION	258.146
	P15-02	EXPANSION	258.146
SPAN 29	P15-03	FIXED	258.116
	P15-04	FIXED	258.116
	P16-01	EXPANSION	257.922
	P16-02	EXPANSION	257.922
SPAN 30	P16-03	FIXED	257.892
	P16-04	FIXED	257.892
	P17-01	EXPANSION	257.679
	P17-02	EXPANSION	257.679
SPAN 31	P17-03	FIXED	257.649
	P17-04	FIXED	257.649
	P18-01	EXPANSION	257.435
	P18-02	EXPANSION	257.435
SPAN 32	P18-03	FIXED	257.405
	P18-04	FIXED	257.405
	P19-01	EXPANSION	257.192
	P19-02	EXPANSION	257.192
SPAN 33	P19-03	FIXED	257.162
	P19-04	FIXED	257.162
	P20-01	EXPANSION	256.948
	P20-02	EXPANSION	256.948
SPAN 34	P20-03	FIXED	256.918
	P20-04	FIXED	256.918
	P21-01	EXPANSION	256.705
	P21-02	EXPANSION	256.705
SPAN 35	P21-03	FIXED	256.675
	P21-04	FIXED	256.675
	P22-01	EXPANSION	256.461
	P22-02	EXPANSION	256.461
SPAN 36	P22-03	FIXED	256.431
	P22-04	FIXED	256.431
	P23-01	EXPANSION	256.218
	P23-02	EXPANSION	256.218
SPAN 37	P23-03	FIXED	256.188
	P23-04	FIXED	256.188
	P24-01	EXPANSION	255.974
	P24-02	EXPANSION	255.974
SPAN 38	P24-03	FIXED	255.944
	P24-04	FIXED	255.944
	P25-01	EXPANSION	255.731
	P25-02	EXPANSION	255.731
SPAN 39	P25-03	FIXED	255.701
	P25-04	FIXED	255.701
	P26-01	EXPANSION	255.487
	P26-02	EXPANSION	255.487

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 302.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER BEARING

SHEET E

FILE No. BE22007-6670-DRG-BR-7304 | SHEET: 5 OF 8 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7304 | B | EDMS No. - | -

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 302.

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 40	P39-03	FIXED	255.457
	P39-04	FIXED	255.457
	P40-01	EXPANSION	255.244
	P40-02	EXPANSION	255.244
SPAN 41	P40-03	FIXED	255.214
	P40-04	FIXED	255.214
	P41-01	EXPANSION	255.000
	P41-02	EXPANSION	255.000
SPAN 42	P41-03	FIXED	254.970
	P41-04	FIXED	254.970
	P42-01	EXPANSION	254.757
	P42-02	EXPANSION	254.757
SPAN 43	P42-03	FIXED	254.727
	P42-04	FIXED	254.727
	P43-01	EXPANSION	254.513
	P43-02	EXPANSION	254.513
SPAN 44	P43-03	FIXED	254.483
	P43-04	FIXED	254.483
	P44-01	EXPANSION	254.270
	P44-02	EXPANSION	254.270
SPAN 45	P45-03	FIXED	254.240
	P45-04	FIXED	254.240
	P46-01	EXPANSION	254.026
	P46-02	EXPANSION	254.026
SPAN 46	P46-03	FIXED	253.996
	P46-04	FIXED	253.996
	P47-01	EXPANSION	253.783
	P47-02	EXPANSION	253.783
SPAN 47	P47-03	FIXED	253.753
	P47-04	FIXED	253.753
	P48-01	EXPANSION	253.539
	P48-02	EXPANSION	253.539
SPAN 48	P48-03	FIXED	253.509
	P48-04	FIXED	253.509
	P49-01	EXPANSION	253.296
	P49-02	EXPANSION	253.296
SPAN 49	P49-03	FIXED	253.266
	P49-04	FIXED	253.266
	P50-01	EXPANSION	253.052
	P50-02	EXPANSION	253.052
SPAN 50	P50-03	FIXED	253.022
	P50-04	FIXED	253.022
	P51-01	EXPANSION	252.809
	P51-02	EXPANSION	252.809
SPAN 51	P51-03	FIXED	252.779
	P51-04	FIXED	252.779
	P52-01	EXPANSION	252.565
	P52-02	EXPANSION	252.565
SPAN 52	P52-03	FIXED	252.535
	P52-04	FIXED	252.535
	P53-01	EXPANSION	252.322
	P53-02	EXPANSION	252.322

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 53	P53-03	FIXED	252.292
	P53-04	FIXED	252.292
	P54-01	EXPANSION	252.095
	P54-02	EXPANSION	252.095
SPAN 54	P54-03	FIXED	252.065
	P54-04	FIXED	252.065
	P55-01	EXPANSION	251.948
	P55-02	EXPANSION	251.948
SPAN 55	P55-03	FIXED	251.918
	P55-04	FIXED	251.918
	P56-01	EXPANSION	251.886
	P56-02	EXPANSION	251.886
SPAN 56	P56-03	FIXED	251.856
	P56-04	FIXED	251.856
	P57-01	EXPANSION	251.884
	P57-02	EXPANSION	251.884
SPAN 57	P57-03	FIXED	251.854
	P57-04	FIXED	251.854
	P58-01	EXPANSION	251.884
	P58-02	EXPANSION	251.884
SPAN 58	P58-03	FIXED	251.854
	P58-04	FIXED	251.854
	P59-01	EXPANSION	251.884
	P59-02	EXPANSION	251.884
SPAN 59	P59-03	FIXED	251.854
	P59-04	FIXED	251.854
	P60-01	EXPANSION	251.884
	P60-02	EXPANSION	251.884
SPAN 60	P60-03	FIXED	251.854
	P60-04	FIXED	251.854
	P61-01	EXPANSION	251.884
	P61-02	EXPANSION	251.884
SPAN 61	P61-03	FIXED	251.854
	P61-04	FIXED	251.854
	P62-01	EXPANSION	251.884
	P62-02	EXPANSION	251.884
SPAN 62	P62-03	FIXED	251.854
	P62-04	FIXED	251.854
	P63-01	EXPANSION	251.884
	P63-02	EXPANSION	251.884
SPAN 63	P63-03	FIXED	251.854
	P63-04	FIXED	251.854
	P64-01	EXPANSION	251.884
	P64-02	EXPANSION	251.884
SPAN 64	P64-03	FIXED	251.854
	P64-04	FIXED	251.854
	P65-01	EXPANSION	251.884
	P65-02	EXPANSION	251.884
SPAN 65	P65-03	FIXED	251.854
	P65-04	FIXED	251.854
	P66-01	EXPANSION	251.884
	P66-02	EXPANSION	251.884

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 66	P66-03	FIXED	251.854
	P66-04	FIXED	251.854
	P67-01	EXPANSION	251.884
	P67-02	EXPANSION	251.884
SPAN 67	P67-03	FIXED	251.854
	P67-04	FIXED	251.854
	P68-01	EXPANSION	251.884
	P68-02	EXPANSION	251.884
SPAN 68	P68-03	FIXED	251.854
	P68-04	FIXED	251.854
	P69-01	EXPANSION	251.884
	P69-02	EXPANSION	251.884
SPAN 69	P69-03	FIXED	251.854
	P69-04	FIXED	251.854
	P70-01	EXPANSION	251.884
	P70-02	EXPANSION	251.884
SPAN 70	P70-03	FIXED	251.854
	P70-04	FIXED	251.854
	P71-01	EXPANSION	251.884
	P71-02	EXPANSION	251.884
SPAN 71	P71-03	FIXED	251.854
	P71-04	FIXED	251.854
	P72-01	EXPANSION	251.884
	P72-02	EXPANSION	251.884
SPAN 72	P72-03	FIXED	251.854
	P72-04	FIXED	251.854
	P73-01	EXPANSION	251.884
	P73-02	EXPANSION	251.884
SPAN 73	P73-03	FIXED	251.854
	P73-04	FIXED	251.854
	P74-01	EXPANSION	251.884
	P74-02	EXPANSION	251.884
SPAN 74	P74-03	FIXED	251.854
	P74-04	FIXED	251.854
	P75-01	EXPANSION	251.884
	P75-02	EXPANSION	251.884
SPAN 75	P75-03	FIXED	251.854
	P75-04	FIXED	251.854
	P76-01	EXPANSION	251.884
	P76-02	EXPANSION	251.884
SPAN 76	P76-03	FIXED	251.854
	P76-04	FIXED	251.854
	P77-01	EXPANSION	251.884
	P77-02	EXPANSION	251.884
SPAN 77	P77-03	FIXED	251.854
	P77-04	FIXED	251.854
	P78-01	EXPANSION	251.884
	P78-02	EXPANSION	251.884
SPAN 78	P78-03	FIXED	251.854
	P78-04	FIXED	251.854
	B-01	EXPANSION	251.884
	B-02	EXPANSION	251.884

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER BEARING

SHEET F

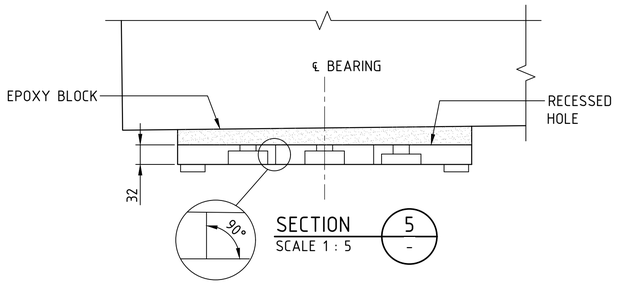
FILE No. BE22007-6670-DRG-BR-7305 | SHEET: 6 OF 8 | A1

STATUS: 100% DESIGN ©

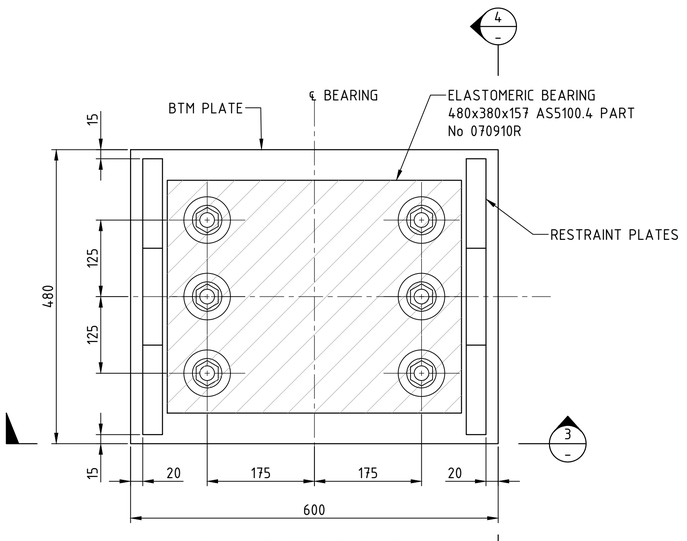
DRG No. BE22007-6670-DRG-BR-7305 | B | EDMS No. - | -

GENERAL NOTES

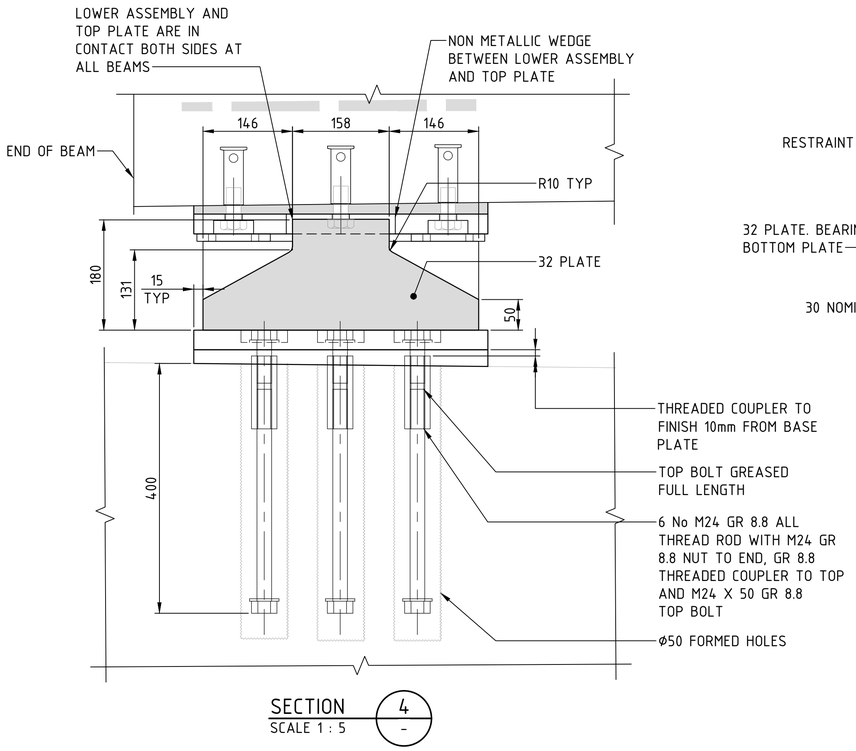
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 302.



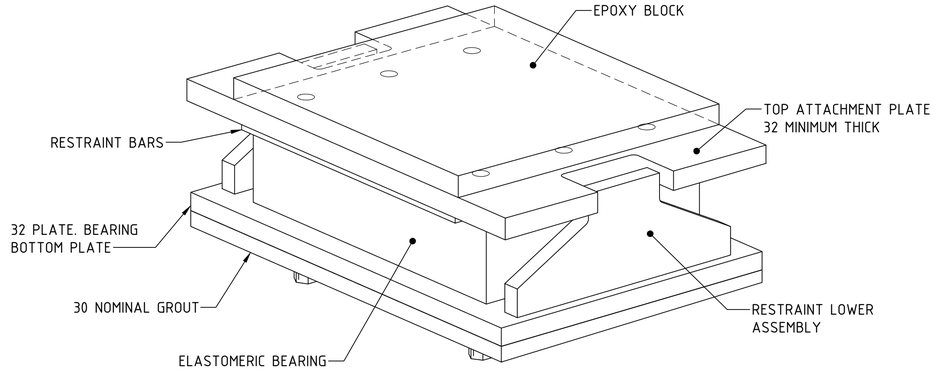
SECTION 5 / SCALE 1 : 5



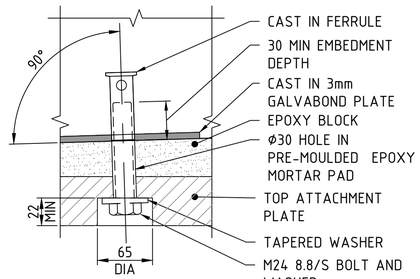
PLAN FIXED BEARING LOWER ASSEMBLY
SCALE 1:5



SECTION 4 / SCALE 1 : 5

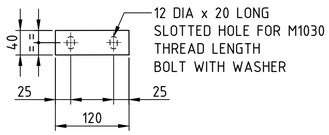


ISOMETRIC - BEARING FIXED
SCALE N.T.S.

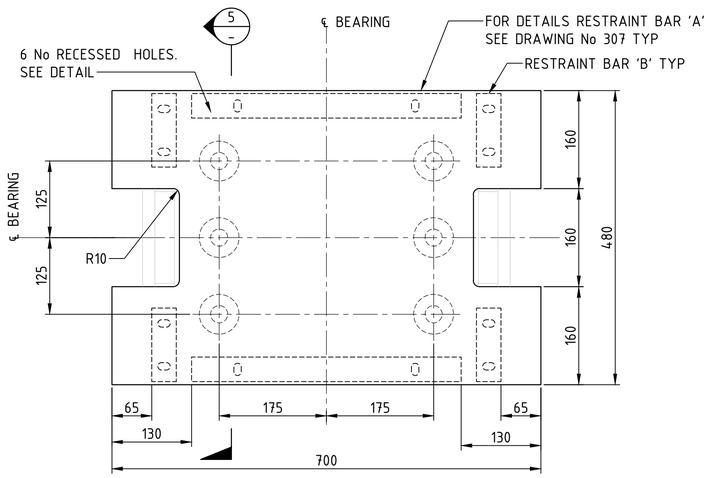


DETAIL-RECESSED HOLE
SCALE 1:2

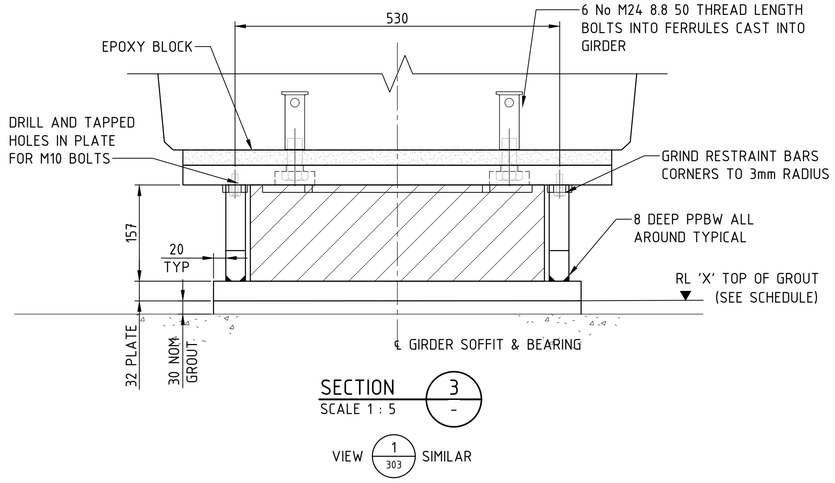
DETAIL SHOWN FOR TAPERED TOP PLATES RECESSED HOLE DETAIL FOR LOWER ASSEMBLY SIMILAR



RESTRAINT BAR 'B' FIXED (640 No)
SCALE 1:5



PLAN FIXED BEARING TOP ASSEMBLEY
SCALE 1:5



SECTION 3 / SCALE 1 : 5

VIEW 1/303 SIMILAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

1:2 @ A1 0 20 40 60 80 100 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

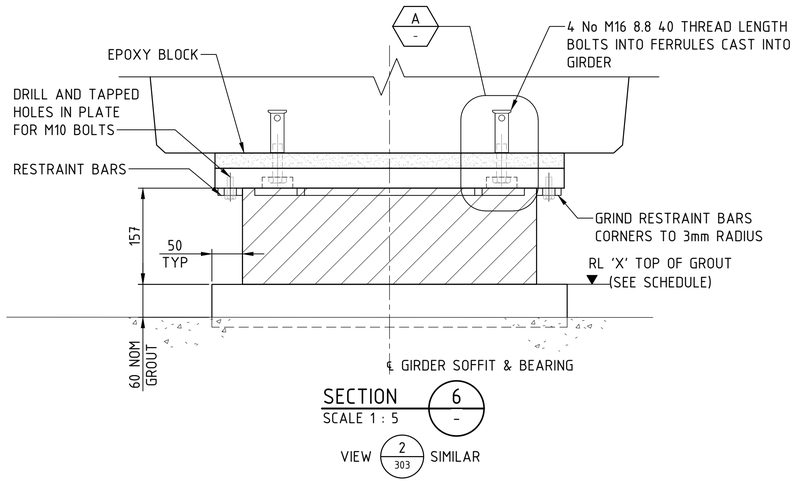
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER BEARING

SHEET G

FILE No. BE22007-6670-DRG-BR-7306 | SHEET: 7 OF 8 | A1

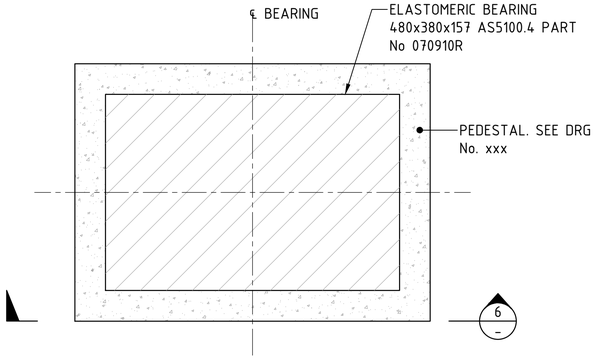
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7306 | B | EDMS No. - | -



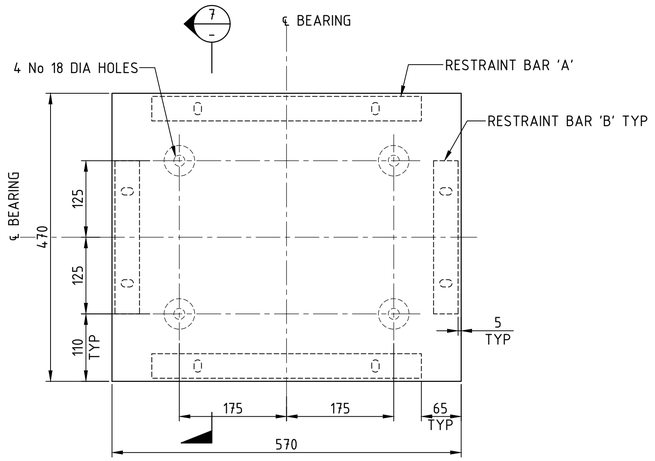
SECTION 6/- SCALE 1 : 5

VIEW 2/303 SIMILAR



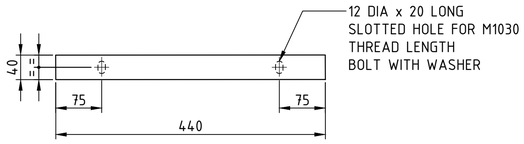
PLAN EXPANSION BEARING LOWER ASSEMBLY

SCALE 1:5



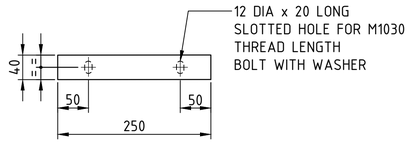
PLAN EXPANSION BEARING TOP ASSEMBLY

SCALE 1:5



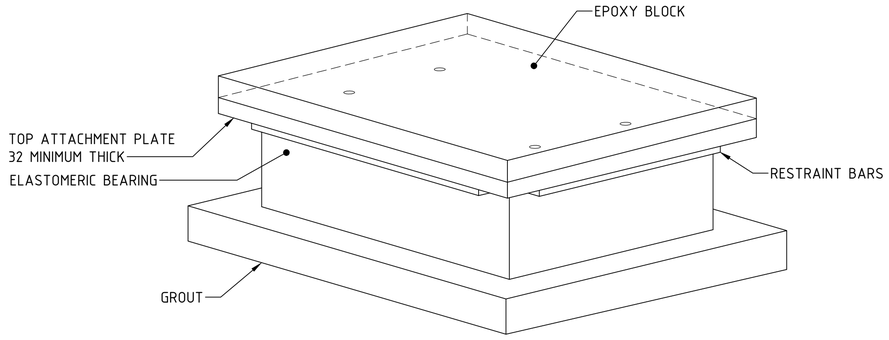
RESTRAINT BAR 'A' EXPANSION (1280 No)

SCALE 1:5



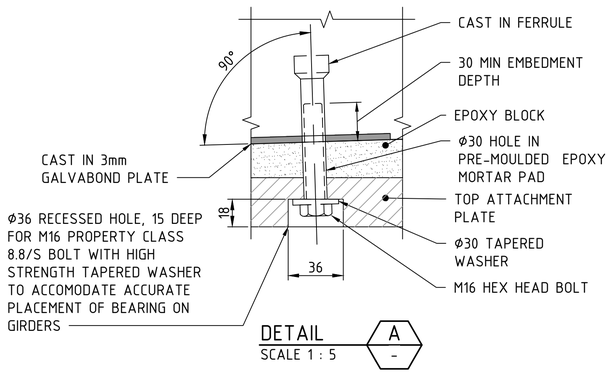
RESTRAINT BAR 'B' EXPANSION (640 No)

SCALE 1:5

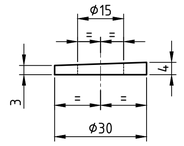


ISOMETRIC - BEARING FREE

SCALE N.T.S.

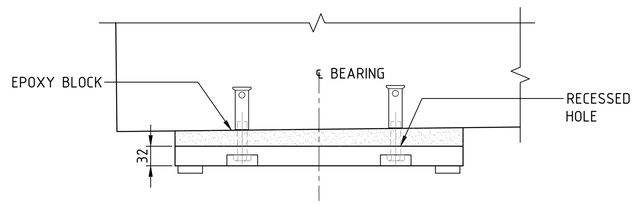


DETAIL A/- SCALE 1 : 5

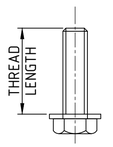


ELEVATION TAPERED WASHER

SCALE 1:1



SECTION 7/- SCALE 1 : 5



TYPICAL BEARING PLATE BOLT DETAIL

SCALE 1:2

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 302.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

1:2 @ A1 0 20 40 60 80 100 mm

1:1 @ A1 0 10 20 30 40 50 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	19/05/2023
DESIGNED	K.UNDHEIM	19/05/2023
DRG CHECK	R.SAFARIAN	19/05/2023
DESIGN CHECK	R.PAN	19/05/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER BEARING

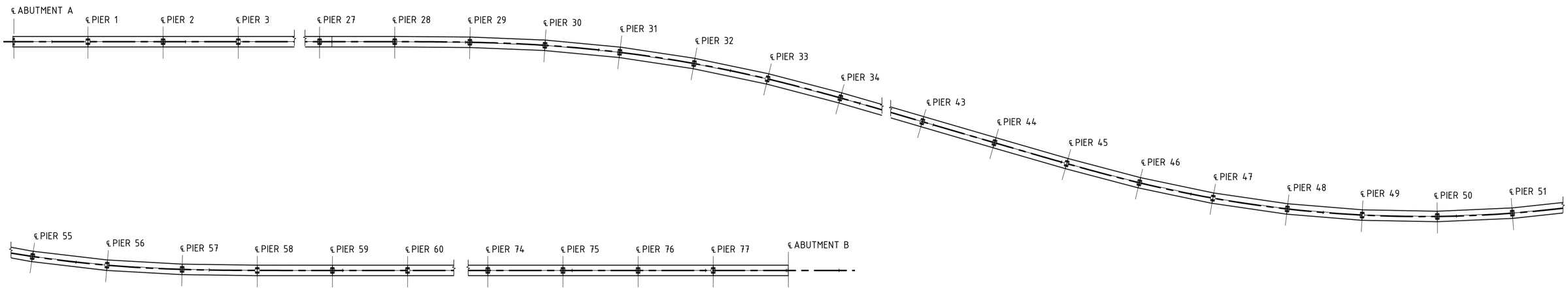
SHEET H

FILE No. BE22007-6670-DRG-BR-7307	SHEET: 8 OF 8	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7307	B	EDMS No. -

FROM GUNNEDAH

N

FROM NARRABRI



GIRDER LAYOUT KEY PLAN

SCALE 1 : 750

GIRDER NUMBER AND ENDS SHALL BE MARKED BY MANUFACTURER TO FACILITATE ERECTION

CALCULATED HOG OF GIRDERS AT:

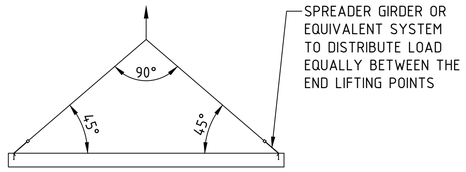
GIRDERS	TRANSFER	30 DAYS	60 DAYS	100 DAYS	MID SPAN DEFLECTION OF GIRDERS DUE TO WEIGHT OF DECK SLAB
TYPE 01 ON TYPE 02	45	61	69	74	-19

PRESTRESSING NOTES

STRANDS SHALL BE 7-WIRE ORDINARY OF NOMINAL DIAMETER 15.7mm AND NOMINAL TENSILE STRENGTH OF 1860MPa, RELAX 2, TO AS 4672.1.
MINIMUM BREAKING LOAD OF 15.7mm DIAMETER STRANDS SHALL BE 279kN.
THE FORCE REMAINING IN EACH STRAND IMMEDIATELY AFTER RELEASE OF THE TENSIONING JACK SHALL BE 212kN.
AFTER TRANSFER OF PRESTRESS, STRANDS SHALL BE CUT FLUSH WITH THE ENDS OF GIRDER AND EXPOSED STRANDS SHALL BE SEALED AGAINST CORROSION BY THE APPLICATION OF AN APPROVED EPOXY RESIN.
THE FOLLOWING ASSUMPTIONS HAVE BEEN MADE IN CALCULATION OF HOGS IN TABLE ON THIS SHEET

- DENSITY = 2550kg/m^3
- ELASTIC MODULUS AT TRANSFER = 32800 MPa.
- NO LOADS EXCEPT GIRDER SELF WEIGHT.
- ELEVATED TEMPERATURE CURING AT 70°C FOR 8 HOURS AFTER CASTING.
- NO LOADS EXCEPT GIRDER SELF WEIGHT.

RELEASE OF THE STRANDS SHALL BE DONE SYMMETRICALLY ABOUT THE GIRDER CENTERLINE STARTING WITH THE OUTER STRANDS. THE STRANDS IN THE TOP SHALL BE RELEASED AFTER 4 STRANDS IN THE BOTTOM FLANGE HAVE BEEN RELEASED.



LIFTING DIAGRAM

LIFTING DEVICE DESIGNED AND CERTIFIED BY PRECAST SUPPLIERS

GENERAL NOTES

EXTERNAL CONCRETE EXPOSURE CLASSIFICATION: B1
INTERNAL CONCRETE EXPOSURE CLASSIFICATION: A
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 50MPa.
MINIMUM COMPRESSIVE STRENGTH OF CONCRETE AT TRANSFER OF PRESTRESS SHALL BE 40MPa.
MAXIMUM NOMINAL AGGREGATE SIZE SHALL NOT BE LESS THAN 14mm
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
ALL SURFACES IN CONTACT WITH CAST-IN-PLACE CROSS GIRDER AND DECK SLAB CONCRETE SHALL BE ROUGHENED DURING MANUFACTURE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B80.
INTERNAL EDGES ON THE TOP FLANGE SHALL BE FINISHED SMOOTH.
EDGES SHALL BE CHAMFERED 12 x 12 AND RE-ENTRANT ANGLES SHALL BE FILLETED 12 x 12 UNLESS SPECIFIED OTHERWISE.
CONCRETE SHALL NOT BE DRILLED OR OTHERWISE DISTURBED ONCE INITIAL SET HAS OCCURRED UNTIL TRANSFER STRENGTH HAS BEEN ACHIEVED.
DRILLING IS ONLY PERMITTED IN THE TOP FLANGE. DRILLING IN OTHER LOCATIONS NOT PERMITTED UNLESS APPROVED BY THE PRINCIPAL.
STEAM CURING OF THE PRE-TENSIONED GIRDERS SHALL BE IN ACCORDANCE WITH THE TfNSW SPECIFICATION D&C B80.
BLOCKOUTS FOR TEMPORARY HANDRAILS SHALL BE PROVIDED TO CONTRACTOR'S REQUIREMENTS.
PRESTRESSED GIRDER SHALL BE A MINIMUM AGE OF 28 DAYS BEFORE ERECTION AND PRIOR TO MEASUREMENTS IN ACCORDANCE WITH B80 AND B110.
LENGTH OF GIRDER GIVEN IS THE REQUIRED LENGTH OF FINISHED PRODUCT.
MANUFACTURER SHALL MAKE ALLOWANCE FOR ELASTIC SHORTENING.

\# DENOTES OUTER 150mm OF GIRDER FLANGE TO BE FINISHED WITH SMOOTH SURFACE.
◇ DENOTES DIMENSION MAY VARY TO SUIT CASTING YARD, BUT TO REMAIN WITHIN LIMITS SPECIFIED ON TfNSW STANDARD DRAWING B0211.

LIFTING AND HANDLING (PRECAST GIRDER)

THE MASS OF GIRDERS IS BASED ON A DENSITY OF 2550 kg/m^3 AND SHALL BE VERIFIED BY THE MANUFACTURER AND MARKED ON THE GIRDERS.
DURING STORAGE, TRANSPORT AND HANDLING GIRDERS SHALL BE IN AN UPRIGHT POSITION AND TEMPORARY SUPPORTS SHALL BE LOCATED BETWEEN 300mm AND NOT MORE THAN 1000mm FROM EACH END.
LIFTING DEVICES/HOOKS SHALL BE DESIGNED BY THE MANUFACTURER. LIFTING DETAILS SHALL BE SUBMITTED TO THE STRUCTURAL DESIGN REPRESENTATIVE PRIOR TO CASTING GIRDERS.
CONTRACTOR TO ENSURE GIRDER STABILITY DURING CONSTRUCTION PRIOR TO COMPLETION OF THE END CROSS GIRDERS.
DURING ERECTION OF GIRDER CARE SHALL BE TAKEN TO PREVENT ACCIDENTAL OVERTURNING.
EACH GIRDER SHALL BE BRACED AGAINST OVERTURNING PRIOR TO RELEASE BY THE CRANE OR OTHER LIFTING DEVICE.
ANCHORS SHALL BE HOT DIP GALVANISED IN ACCORDANCE WITH AS 1650.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:750 @ A1 0 7.5 15 22.5 30 37.5 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

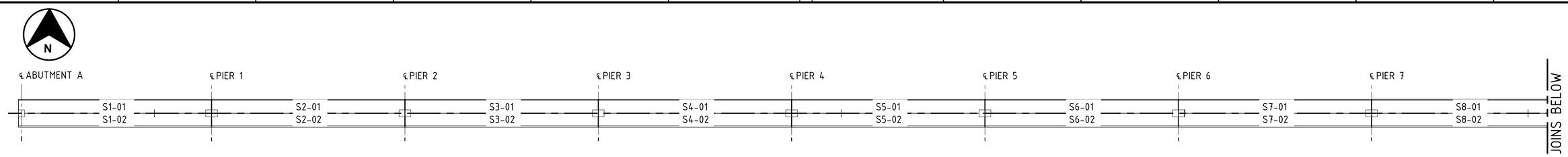
DRAWN	M.CHAVAN	19/05/2023
DESIGNED	K.UNDHEIM	19/05/2023
DRG CHECK	R.SAFARIAN	19/05/2023
DESIGN CHECK	R.PAN	19/05/2023
APPROVED		-

WORK IN PROGRESS

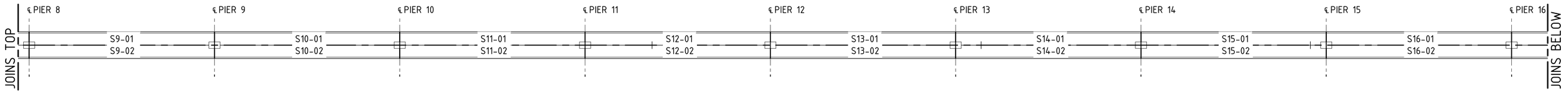
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PSC GIRDER CONCRETE
SHEET A

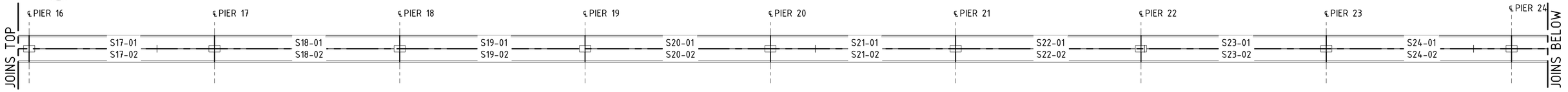
FILE No. BE22007-6670-DRG-BR-7400	SHEET: 1 OF 8	A1
STATUS: 85% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7400	A	EDMS No. -



GIRDER MARKING - PART PLAN 1
SCALE 1 : 300

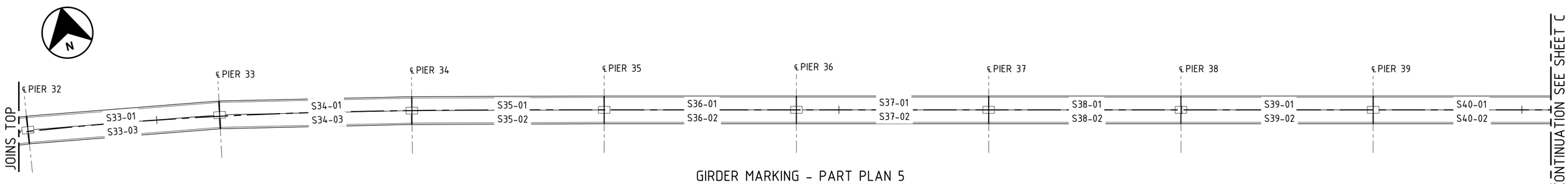


GIRDER MARKING - PART PLAN 2
SCALE 1 : 300



GIRDER MARKING - PART PLAN 3
SCALE 1 : 300

GIRDER MARKING - PART PLAN 4
SCALE 1 : 300



GIRDER MARKING - PART PLAN 5
SCALE 1 : 300

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.

1:300 @ A1 0 3 6 9 12 15 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

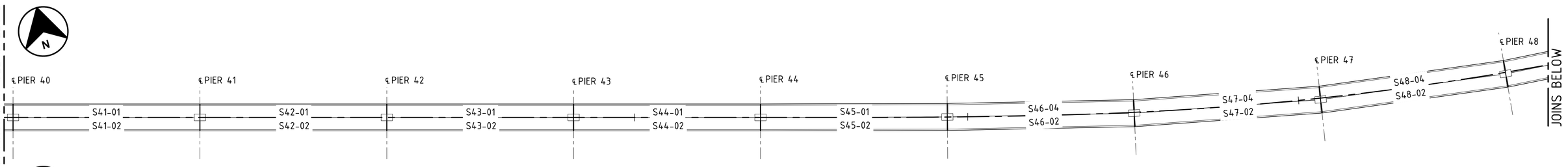
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

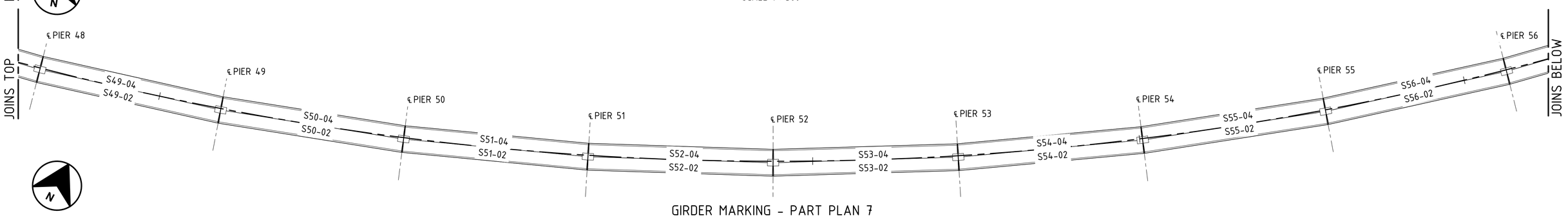
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PSC GIRDER CONCRETE
SHEET B

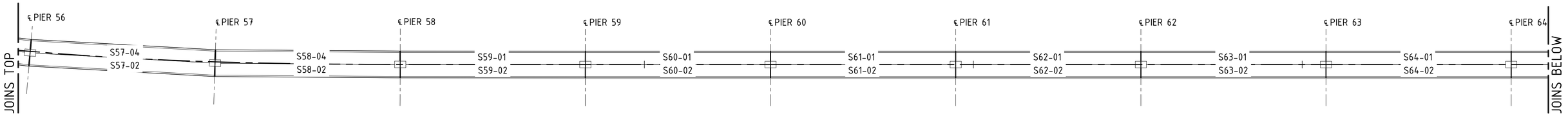
FILE No. BE22007-6670-DRG-BR-7401 | SHEET: 2 OF 8 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7401 | B | EDMS No. - | -



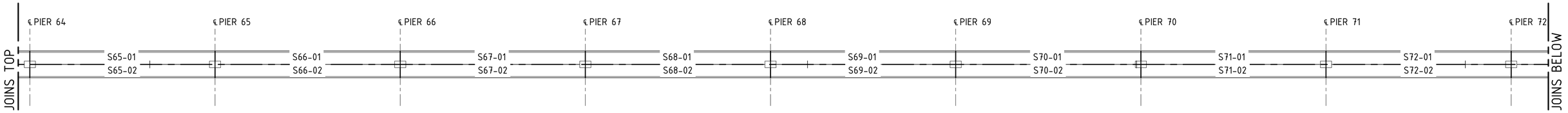
GIRDER MARKING - PART PLAN 6
SCALE 1 : 300



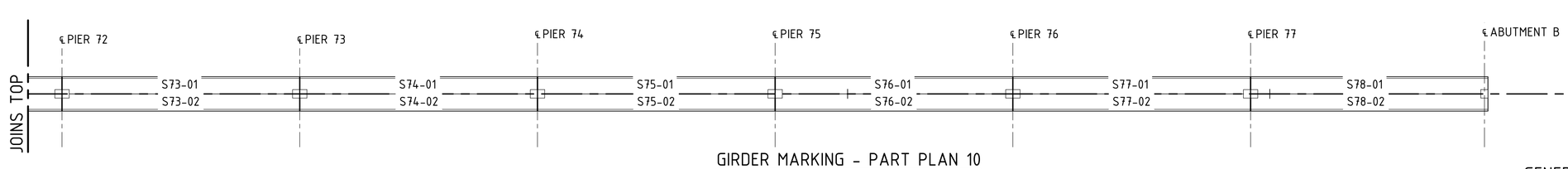
GIRDER MARKING - PART PLAN 7
SCALE 1 : 300



GIRDER MARKING - PART PLAN 8
SCALE 1 : 300



GIRDER MARKING - PART PLAN 9
SCALE 1 : 300



GIRDER MARKING - PART PLAN 10
SCALE 1 : 300

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.

1:300 @ A1 0 3 6 9 12 15 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 85% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

PSC GIRDER CONCRETE

SHEET C

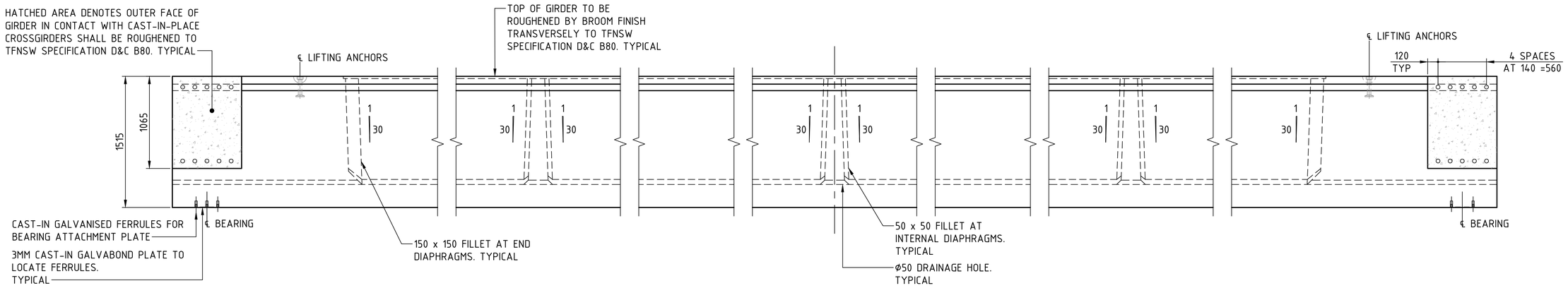
FILE No. BE22007-6670-DRG-BR-7402 | SHEET: 3 OF 8 | A1

STATUS: 100% DESIGN ©

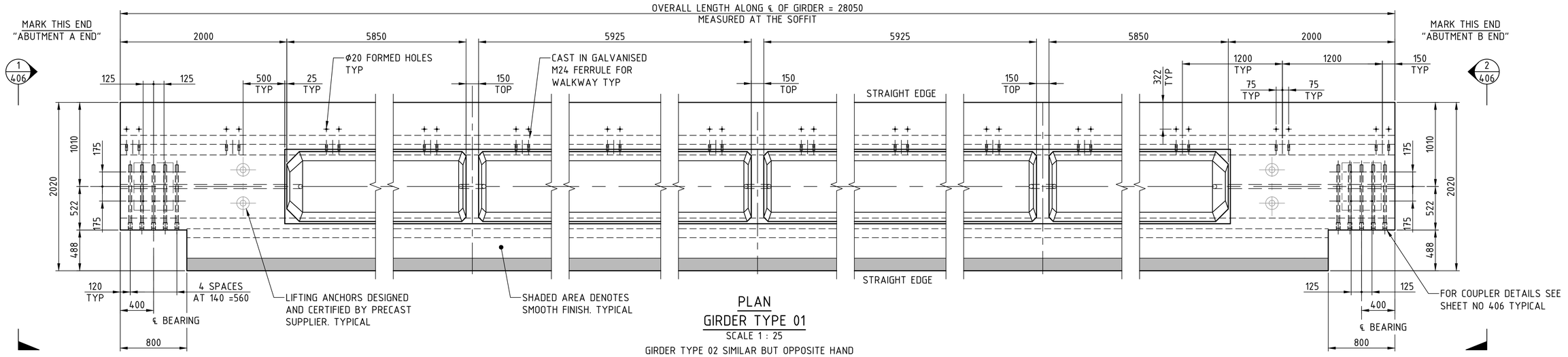
DRG No. BE22007-6670-DRG-BR-7402 | B | EDMS No. - | -

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



ELEVATION
SCALE 1 : 25



PLAN
GIRDER TYPE 01
SCALE 1 : 25

GIRDER TYPE 02 SIMILAR BUT OPPOSITE HAND
32 No GIRDER REQUIRED
APPROXIMATE MASS = 52.90 TONNES

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

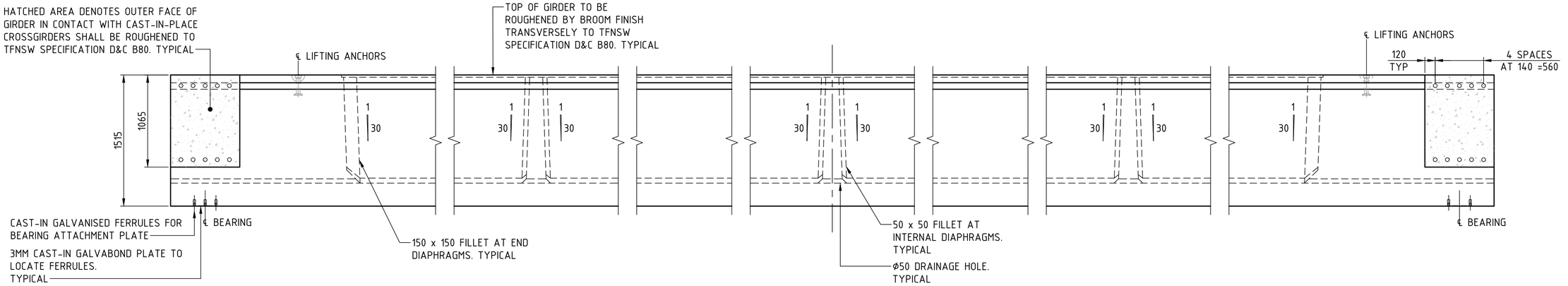
PSC GIRDER CONCRETE

SHEET D

FILE No. BE22007-6670-DRG-BR-7403	SHEET: 4 OF 8	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7403	B	EDMS No. -

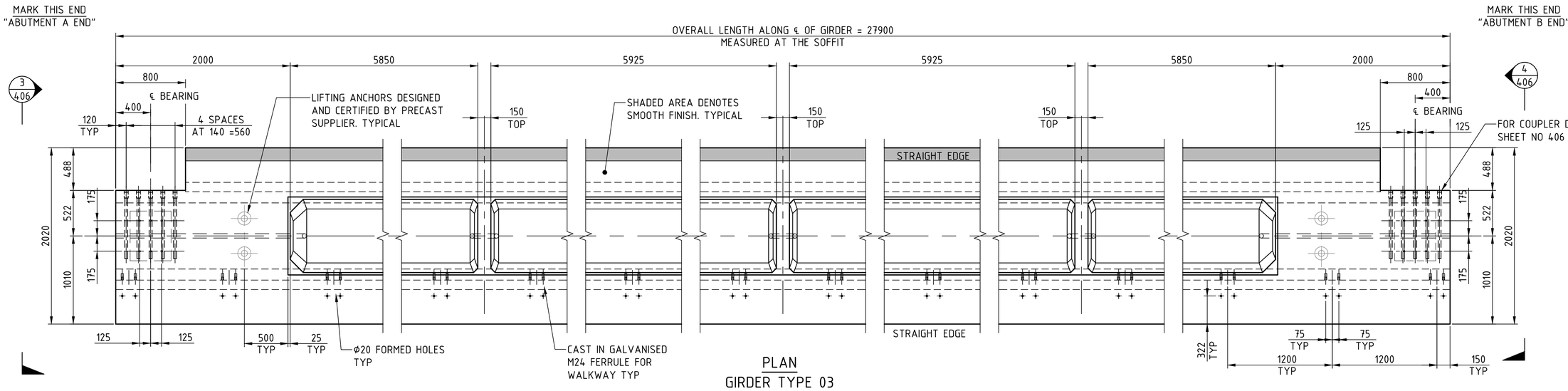
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



ELEVATION

SCALE 1 : 25



PLAN

GIRDER TYPE 03

SCALE 1 : 25

GIRDER TYPE 04 SIMILAR BUT OPPOSITE HAND
32 No GIRDER REQUIRED
APPROXIMATE MASS = 52.90 TONNES

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

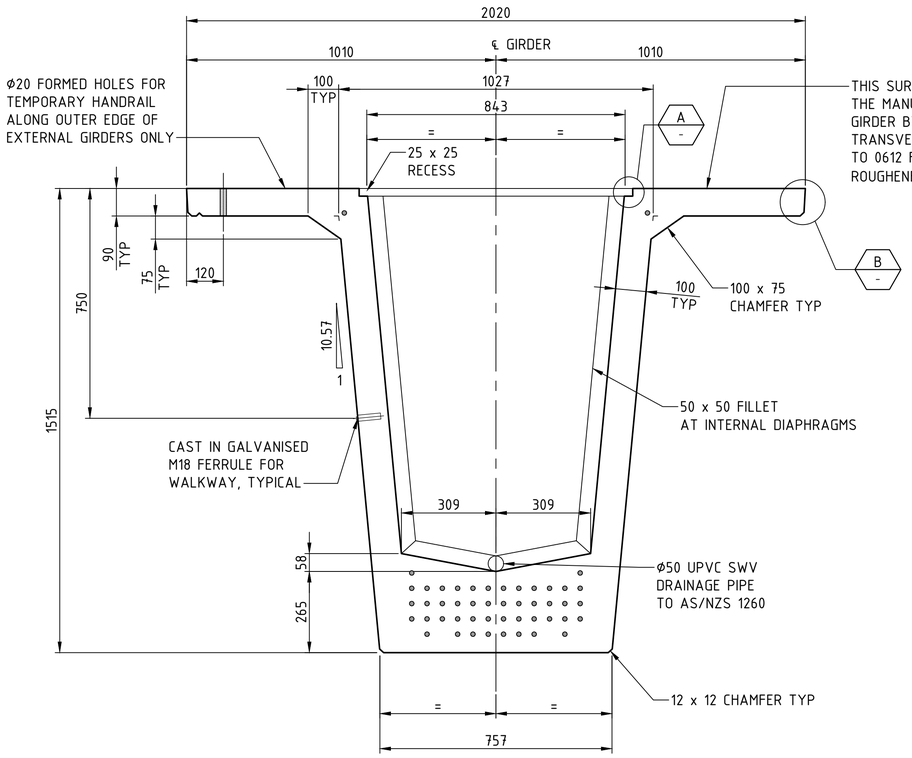
PSC GIRDER CONCRETE

SHEET E

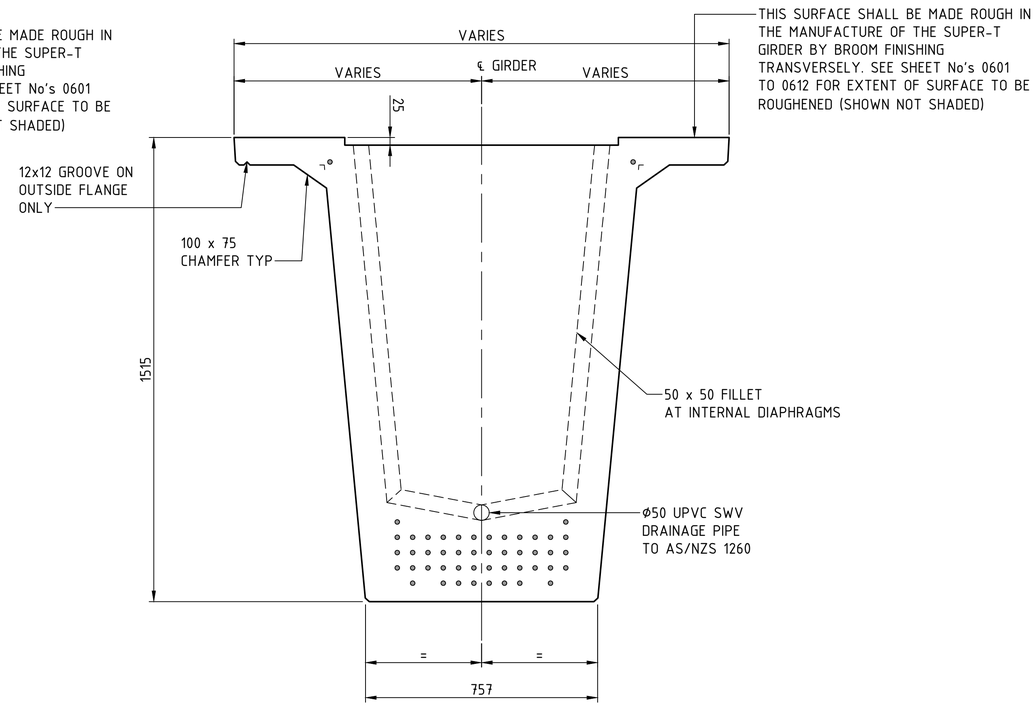
FILE No. BE22007-6670-DRG-BR-7404	SHEET: 5 OF 8	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7404	B	EDMS No. -

GENERAL NOTES

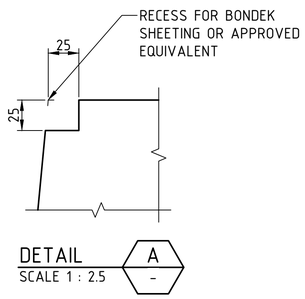
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



TYPICAL SUPER-T GIRDER SECTION
SCALE 1 : 10

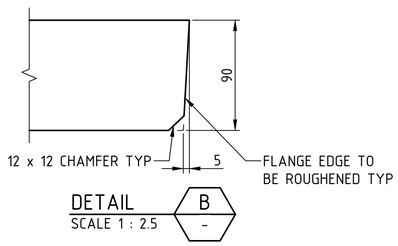


INTERNAL DIAPHRAGM
SCALE 1 : 10



DETAIL A
SCALE 1 : 2.5

TYPICAL INTERNAL RECESS DETAIL



DETAIL B
SCALE 1 : 2.5

TYPICAL FLANGE EDGE DETAIL

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

1:2.5 @ A1 0 25 50 75 100 125 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	19/05/2023
DESIGNED	K.UNDHEIM	19/05/2023
DRG CHECK	R.SAFARIAN	19/05/2023
DESIGN CHECK	R.PAN	19/05/2023
APPROVED	-	-

WORK IN PROGRESS

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

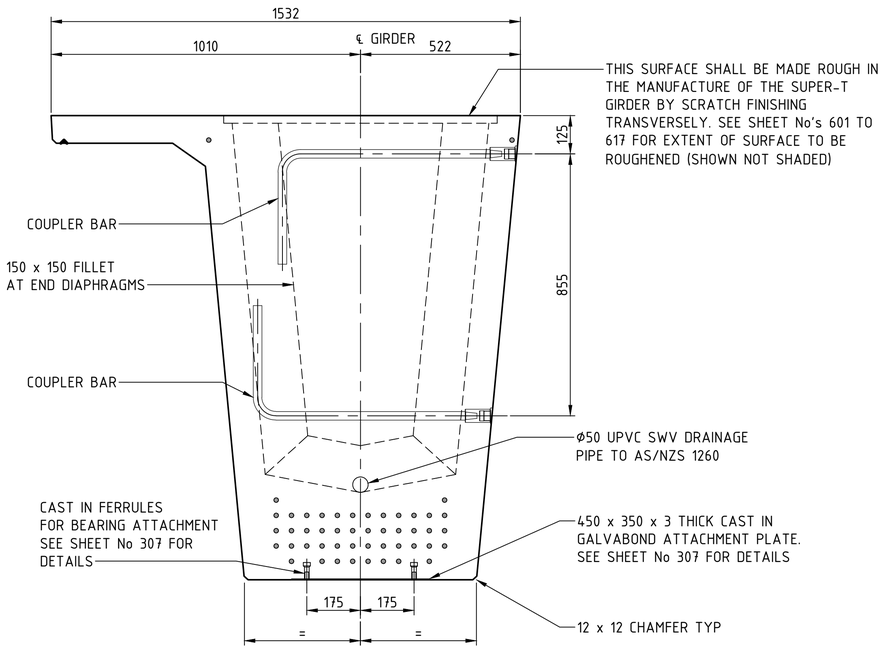
PSC GIRDER CONCRETE

SHEET F

FILE No. BE22007-6670-DRG-BR-7405	SHEET: 6 OF 8	A1
STATUS: 85% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7405	A	EDMS No. -

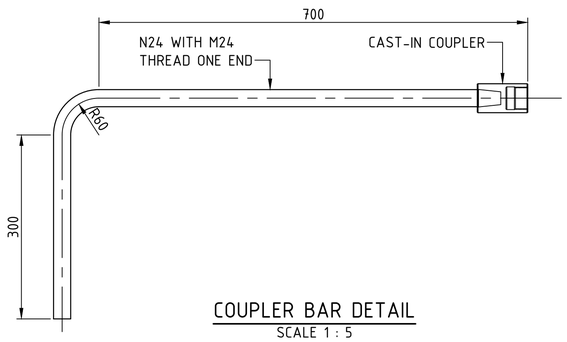
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



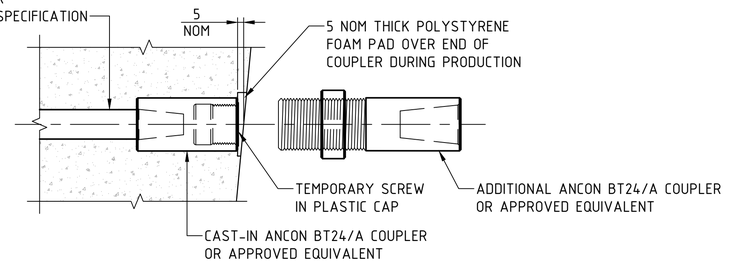
VIEW 1/403 3/404
SCALE 1 : 10

VIEW 2/403 4/404 SIMILAR



COUPLER BAR DETAIL
SCALE 1 : 5

BARS TO BE THREADED TO SUIT THE COUPLER IN ACCORDANCE WITH THE COUPLER MANUFACTURERS SPECIFICATION



FULL ENGAGEMENT MECHANICAL POSITION COUPLER FOR CROSS GIRDER BARS
SCALE 1 : 2.5

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm
1:2.5 @ A1 0 25 50 75 100 125 mm

A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-
AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 19/05/2023
DESIGNED K.UNDHEIM 19/05/2023
DRG CHECK R.SAFARIAN 19/05/2023
DESIGN CHECK R.PAN 19/05/2023
APPROVED -

WORK IN PROGRESS

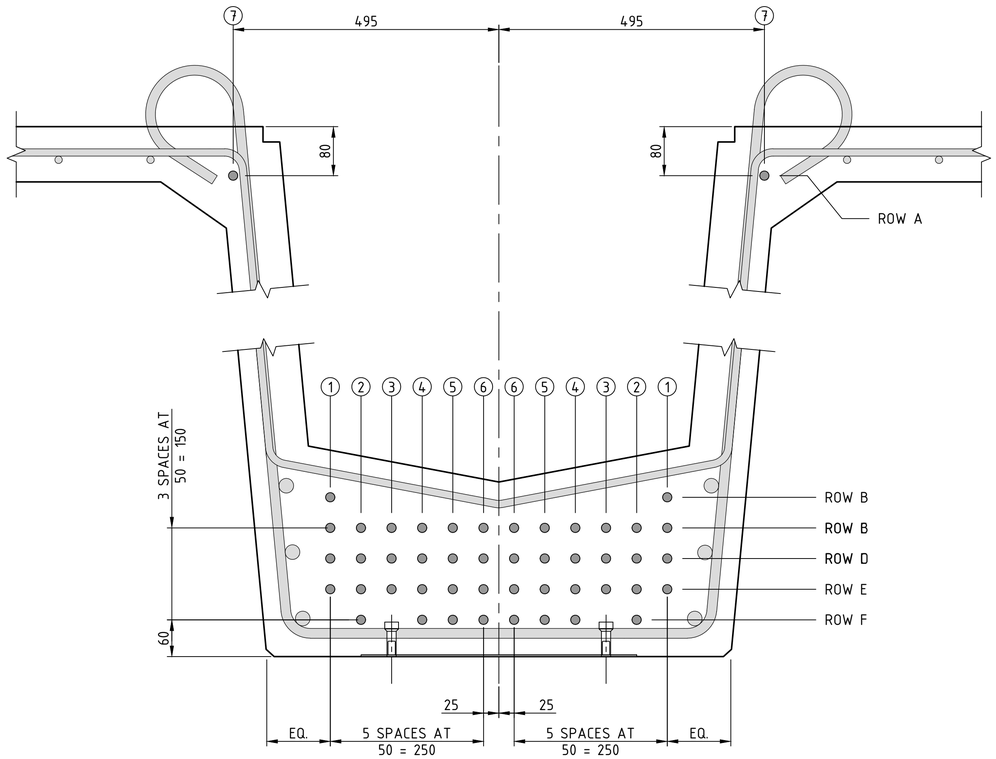
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PSC GIRDER CONCRETE
SHEET G

FILE No. BE22007-6670-DRG-BR-7406	SHEET: 7 OF 8	A1
STATUS: 85% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7406	A	EDMS No. -

File Plotted C:\Users\chrisstsaac.esmilla\Desktop\PROJECT\Vickery\Kamilaroi and Namoi\20230530\BE22007-6670-DWG-BR-7406.dwg
Plot Date & Time 5/30/2023 4:43 PM
Plotted by CHRISTSAAC.ESMILLA



STRAND LAYOUT

SCALE 1 : 5

(SEE SCHEDULES FOR STRAND DEBONDING VALUES)

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.

STRAND DEBONDING LEGEND

0	STRAND WITH NO DEBONDING
2000	STRAND WITH DEBONDING LENGTH
	NO STRAND

NOTE: STRANDS SPECIFIED IN SCHEDULE TO BE DEBONDED AT BOTH ENDS FOR THE DISTANCE SHOWN (MEASURED ALONG GIRDER CENTRELINE FROM END OF GIRDER).

STRAND DEBONDING SCHEDULE FOR GIRDERS

STRAND	LOCATION AND DEBONDING LENGTH							STRANDS PER ROW
	1	2	3	4	5	6	7	
ROW A							0	2
ROW B	0							2
ROW C	0	5000	0	0	0	0		12
ROW D	0	0	5000	0	8000	0		12
ROW E	0	2500	0	2500	0	0		12
ROW F		0		0	0	0		8

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 19/05/2023
DESIGNED K.UNDHEIM 19/05/2023
DRG CHECK R.SAFARIAN 19/05/2023
DESIGN CHECK R.PAN 19/05/2023
APPROVED - -

WORK IN PROGRESS

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

PSC GIRDER CONCRETE

SHEET H

FILE No. BE22007-6670-DRG-BR-7407 | SHEET: 8 OF 8 | A1

STATUS: 85% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7407 | A | EDMS No. - | -

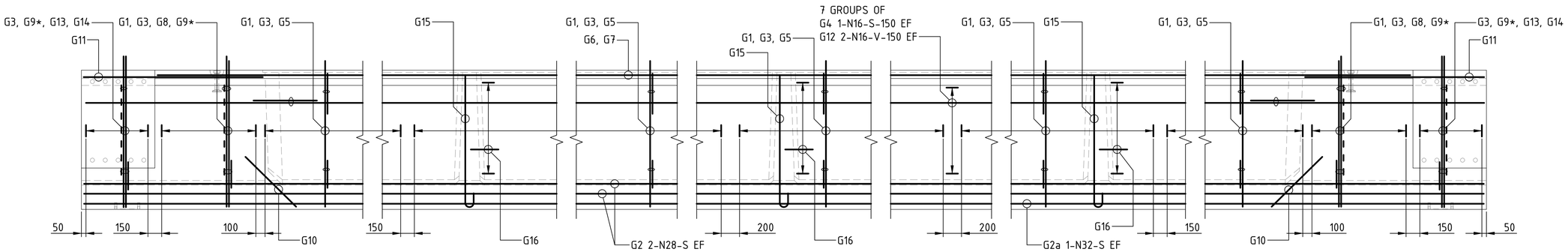
File Plotted C:\Users\christsaac.esmilla\Desktop\PROJECT\Vickery\Kamilaroi and Namoi\20230530\BE22007-6670-DWG-BR-7407.dwg

Plot Date & Time 5/30/2023 4:44 PM

Plotted by CHRISTSAAC.ESMILLA

GENERAL NOTES

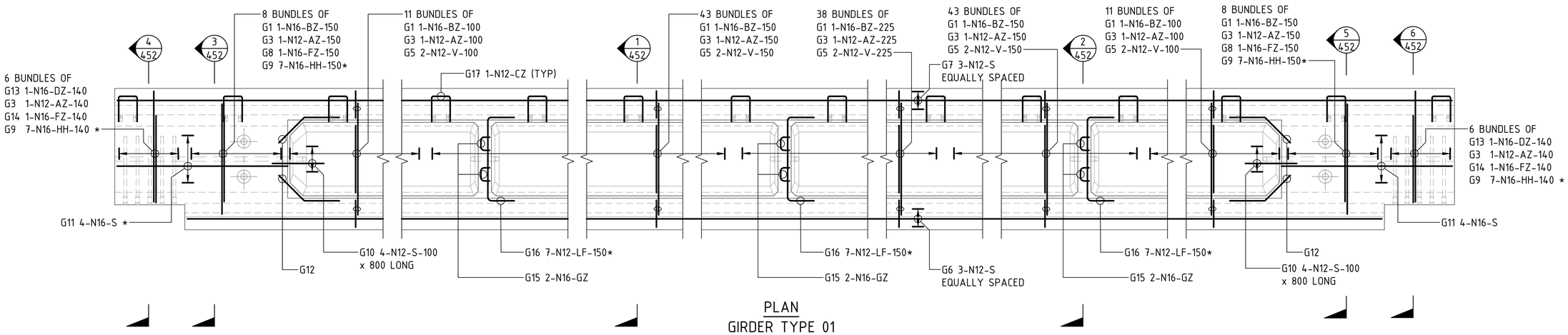
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 453.



ELEVATION
SCALE 1 : 25

ABUTMENT A END

ABUTMENT B END



PLAN
GIRDER TYPE 01
SCALE 1 : 25

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-
AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 19/05/2023
DESIGNED K.UNDHEIM 19/05/2023
DRG CHECK R.SAFARIAN 19/05/2023
DESIGN CHECK R.PAN 19/05/2023
APPROVED -

WORK IN PROGRESS

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER PSC GIRDER REINFORCEMENT

SHEET A

FILE No. BE22007-6670-DRG-BR-7450	SHEET: 1 OF 4	A1
STATUS: 85% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7450	A	EDMS No. -	-

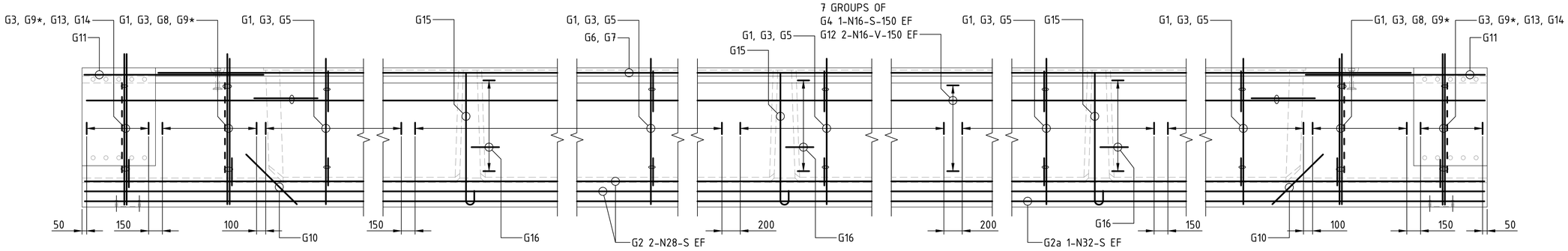
File Plotted C:\Users\christsaac.esmilla\Desktop\PROJECT\Vickery\Kamilaroi and Namoi\20230530\BE22007-6670-DWG-BR-7450.dwg

Plot Date & Time 5/30/2023 4:44 PM

Plotted by CHRISTSAAC.ESMILLA

GENERAL NOTES

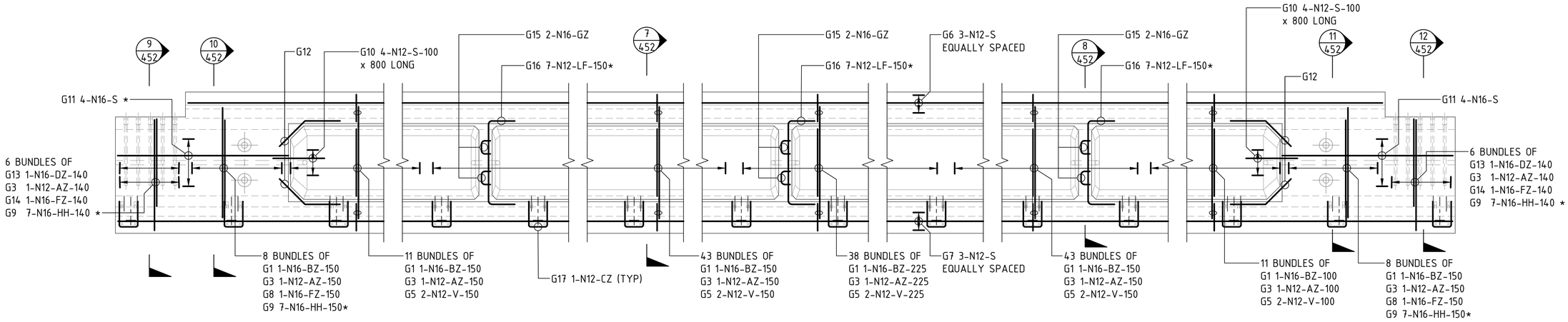
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 453.



ELEVATION
SCALE 1 : 25

ABUTMENT A END

ABUTMENT B END



PLAN
GIRDER TYPE 02
SCALE 1 : 25

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1
0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 19/05/2023
DESIGNED K.UNDHEIM 19/05/2023
DRG CHECK R.SAFARIAN 19/05/2023
DESIGN CHECK R.PAN 19/05/2023
APPROVED -

WORK IN PROGRESS

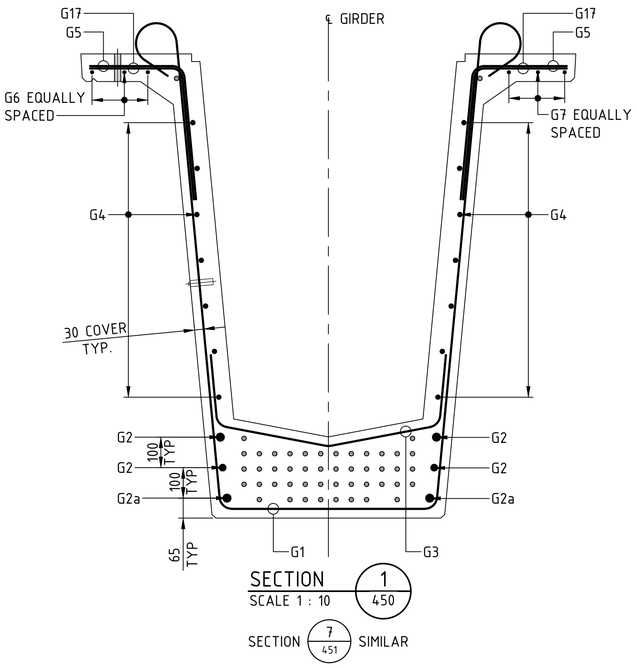
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER PSC GIRDER REINFORCEMENT

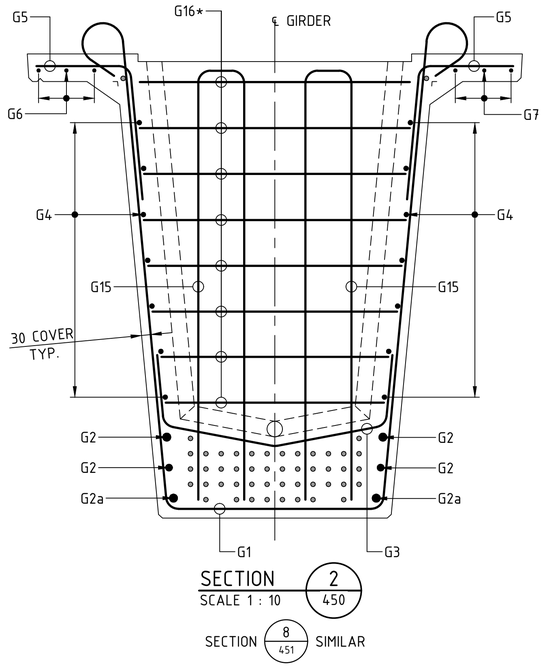
SHEET B

FILE No. BE22007-6670-DRG-BR-7451	SHEET: 2 OF 4	A1
STATUS: 85% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7451	A	EDMS No. -	-



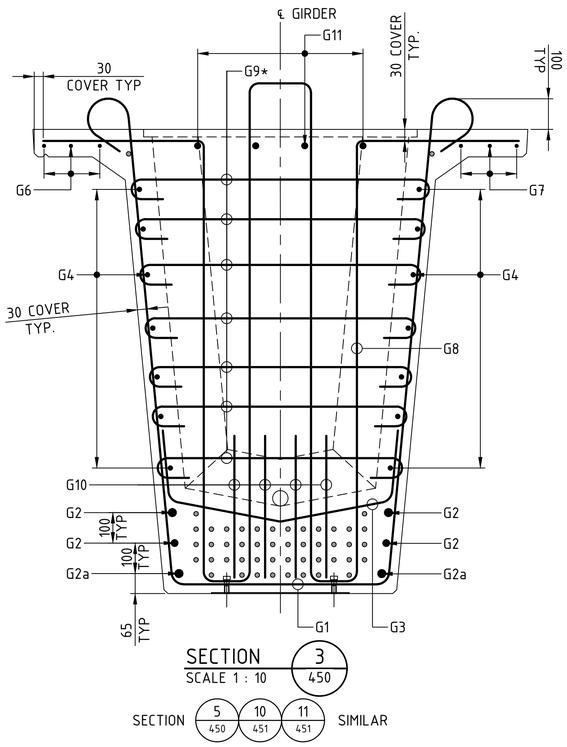
SECTION 1 / 450
SCALE 1 : 10

SECTION 7 / 451 SIMILAR



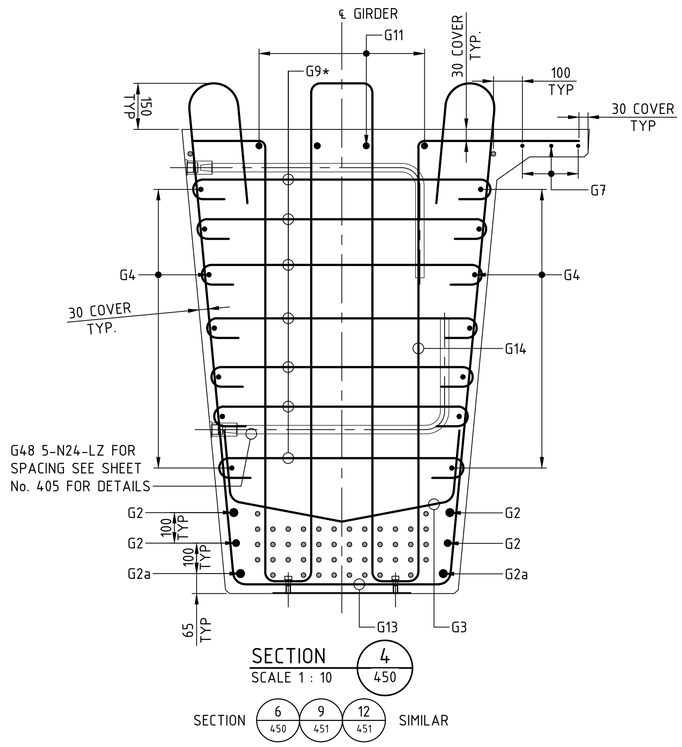
SECTION 2 / 450
SCALE 1 : 10

SECTION 8 / 451 SIMILAR



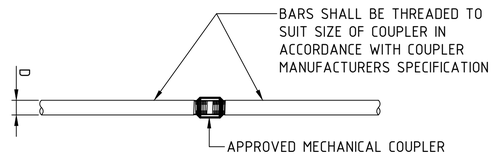
SECTION 3 / 450
SCALE 1 : 10

SECTION 5 / 450, 10 / 451, 11 / 451 SIMILAR



SECTION 4 / 450
SCALE 1 : 10

SECTION 6 / 450, 9 / 451, 12 / 451 SIMILAR



BOTTOM FLANGE REINFORCECING BAR SPLICE DETAIL (G2 AND G2a)
SCALE 1 : 5

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 453.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM:GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

PSC GIRDER REINFORCEMENT

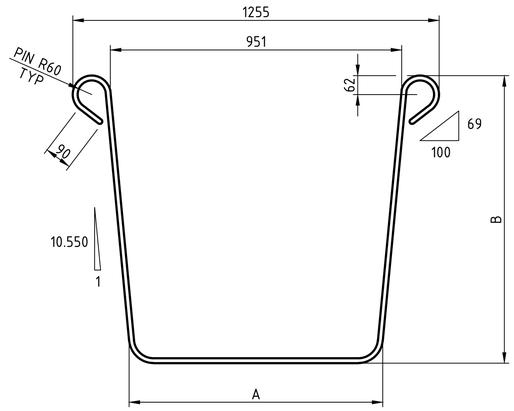
SHEET C

FILE No. BE22007-6670-DRG-BR-7452 | SHEET: 3 OF 4 | A1

STATUS: 100% DESIGN ©

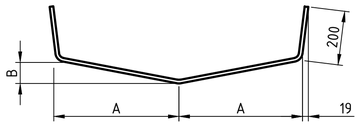
DRG No. BE22007-6670-DRG-BR-7452 | B | EDMS No. - | -

PSC GIRDER BAR SHAPES DIAGRAM

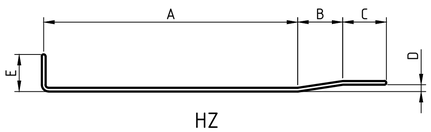


BZ

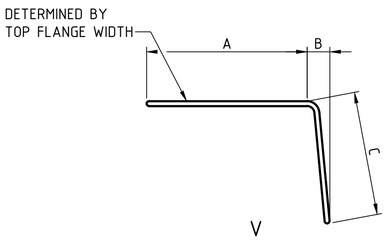
S



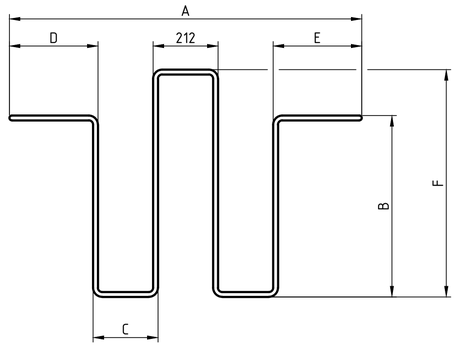
AZ



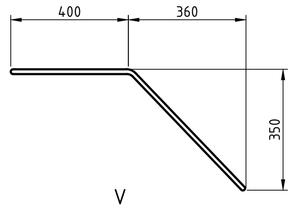
HZ



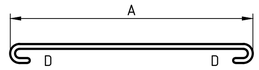
V



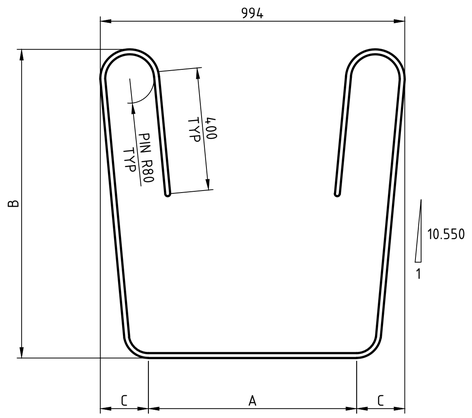
FZ



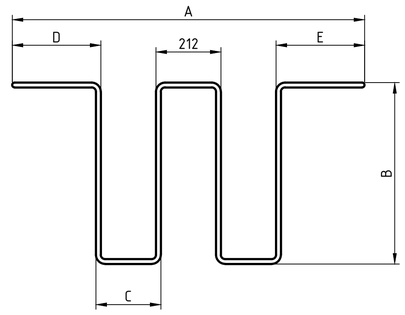
V



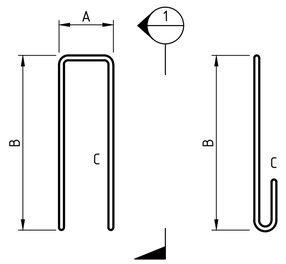
HH



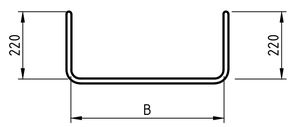
DZ



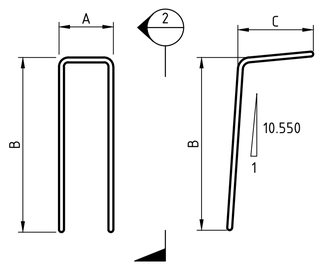
EZ



GZ



LF



CZ

BAR MARKING LEGEND

THE METHOD USED TO DESCRIBE REINFORCEMENT ON THE DRAWINGS IS AS FOLLOWS:

'Fx'G1 10-N16-S-300EF

- INFORMATION FOR PLACING
- SPACE ALONG LIMIT LINE
- BAR SHAPE CODE
- BAR SIZE IN MILLIMETRES
- BAR STRUCTURAL PROPERTIES
- NUMBER OF BARS IN THE SET
- BAR NUMBER IN SEQUENCE
- STRUCTURE ELEMENT DENOTATION
- DENOTES GIRDER TYPE WHERE REQUIRED

WHERE THE BAR SPACING IS APPROXIMATE ONLY, THE FOLLOWING FORMAT SHALL BE USED:
G1 10-N16-S-300EF APPROX

REINFORCEMENT NOTES

1 AUSTRALIAN STANDARD BAR SHAPES ARE IN ACCORDANCE WITH AS 1100.501.
2 BAR SIZE IS THE NOMINAL DIAMETER IN MILLIMETRES
3 THE GRADE OF REINFORCEMENT, IF NOT STATED ON THE DRAWINGS, SHALL BE D500N TO AS/NZS 4671.
4 DIMENSIONS SHOWN ON BAR SHAPES DIAGRAMS ARE MEASURED FROM THE OUTSIDE FACES OF THE BARS AND ARE IN MILLIMETRES.
5 THE INCLUDED ANGLE OF ANY BEND SHALL BE A RIGHT ANGLE IF NO DIMENSION SHOWN.
6 BARS OF DIAMETER GREATER THAN 24mm SHALL NOT BE REBENT.
7 ALL BENDS SHALL BE FITMENT BENDS IN ACCORDANCE WITH AS5100 UNLESS SPECIFIED OTHERWISE.

GENERAL NOTES

REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE:
INTERNAL SURFACE: 30mm,
EXTERNAL SURFACE: 30mm UNLESS SPECIFIED OTHERWISE.
RIGID STEEL FORMWORK AND INTENSE COMPACTION SHALL BE USED.
REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR LIFTING ANCHORS, FORMED HOLES AND RECESSES.
UNLESS OTHERWISE SPECIFIED, THE MINIMUM LENGTHS OF LAPS SHALL BE :

BAR SIZE	N12	N16	N20	N24	N28	N32
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR	450	700	950	1250	1550	1850
b) OTHER BARS:	350	550	750	950	1200	1450

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3 x THE BAR DIAMETER.
CONCRETE SHALL BE CURED IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B80 AND AS5100.5.
THE REQUIRED COVER DOES NOT INCLUDE ALLOWANCE FOR THE USE OF CURING COMPOUNDS.
NF DENOTES NEAR FACE
FF DENOTES FAR FACE
EF DENOTES EACH FACE
✳ DENOTES VARIABLE LENGTH BAR
◩ DENOTES COUPLED BAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

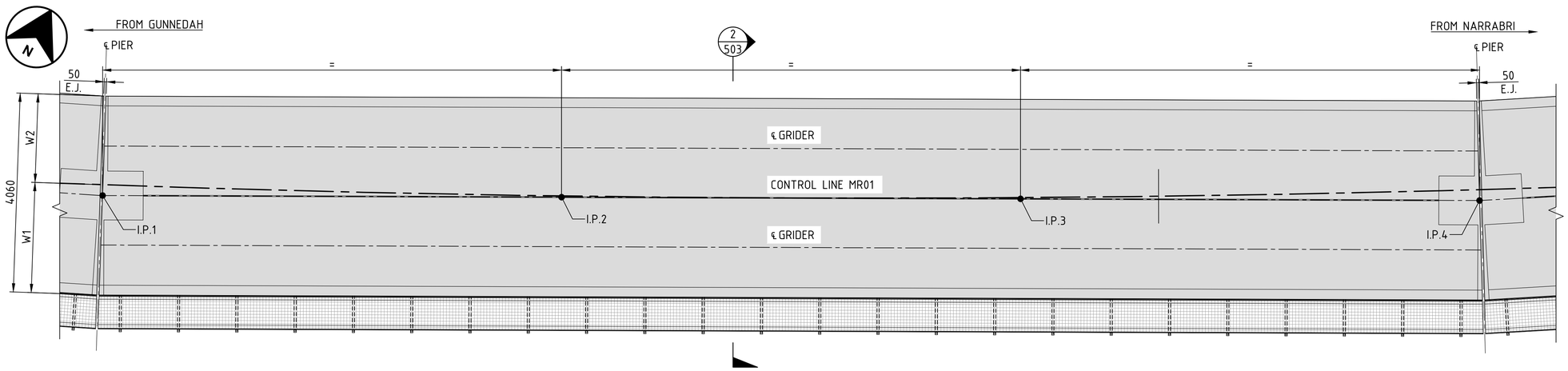
DRAWN	M.CHAVAN	19/05/2023
DESIGNED	K.UNDHEIM	19/05/2023
DRG CHECK	R.SAFARIAN	19/05/2023
DESIGN CHECK	R.PAN	19/05/2023
APPROVED		-

WORK IN PROGRESS

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PSC GIRDER REINFORCEMENT
SHEET D

FILE No. BE22007-6670-DRG-BR-7453	SHEET: 4 OF 4	A1
STATUS: 85% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7453	A	EDMS No. - / -



TYPICAL CURVED DECK PLAN

SCALE 1 : 50

GENERAL NOTES

CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 40MPa.
CONCRETE WORKS TO COMPLY WITH TFNSW SPECIFICATION D&C B80.
THE CONCRETE MIX MUST BE DESIGNED TO ACHIEVE A MAXIMUM TARGET STRENGTH NOT EXCEEDING 48MPa NOTWITHSTANDING THE MAXIMUM TARGET STRENGTH SPECIFIED IN TfNSW SPECIFICATION D&C B80.
EDGES SHALL BE CHAMFERED 20 x 20 AND RE-ENTRANT ANGLES FILLETED 20 x 20 UNLESS SPECIFIED OTHERWISE.
NCF DENOTES NO CHAMFER OR FILLET.
CJ DENOTES CONSTRUCTION JOINT.
CALCULATED MID-SPAN DEFLECTION OF GIRDERS DUE TO THE WEIGHT OF CAST-IN-PLACE CONCRETE IS PROVIDED IN TABLE 1 ON DRG No 400.
VALUES PROVIDED IN SETOUT TABLES ARE TO CONCRETE LEVEL. DECK THICKNESS SHALL BE INCREASED WHERE REQUIRED TO ALLOW FOR VARIATION IN THE HOG OF THE GIRDERS AND THE VERTICAL ALIGNMENT.

TABLE 1 - RADIAL SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 29	509718.396	227340.845	6587554.101	260.181	260.681	260.181
	509727.763	227350.209	6587554.249	260.115	260.615	260.115
	509737.129	227359.575	6587554.354	260.039	260.539	260.039
	509746.496	227368.942	6587554.387	259.958	260.458	259.958
SPAN 30	509746.446	227368.992	6587554.387	259.957	260.457	259.957
	509755.913	227378.358	6587554.320	259.876	260.376	259.876
	509765.279	227387.723	6587554.127	259.795	260.295	259.795
	509774.646	227397.083	6587553.780	259.714	260.214	259.714
SPAN 31	509774.696	227397.133	6587553.777	259.714	260.214	259.714
	509784.063	227406.485	6587553.257	259.633	260.133	259.633
	509793.429	227415.826	6587552.561	259.552	260.052	259.552
	509802.796	227425.152	6587551.690	259.471	259.971	259.471
SPAN 32	509802.846	227425.201	6587551.685	259.470	259.970	259.470
	509812.213	227434.509	6587550.639	259.389	259.889	259.389
	509821.579	227443.796	6587549.418	259.308	259.808	259.308
	509830.946	227453.058	6587548.024	259.227	259.727	259.227
SPAN 33	509830.996	227453.107	6587548.016	259.227	259.727	259.227
	509840.363	227462.342	6587546.448	259.146	259.646	259.146
	509849.729	227471.545	6587544.707	259.065	259.565	259.065
	509859.096	227480.714	6587542.795	258.984	259.484	258.984
SPAN 34	509859.146	227480.763	6587542.784	258.983	259.483	258.983
	509868.513	227489.899	6587540.713	258.902	259.402	258.902
	509877.879	227499.005	6587538.512	258.821	259.321	258.821
	509887.246	227508.085	6587536.207	258.740	259.240	258.740
SPAN 35	509887.296	227508.129	6587536.195	258.740	259.240	258.740
	509896.663	227517.188	6587533.813	258.659	259.159	258.659
	509906.029	227526.234	6587531.381	258.578	259.078	258.578
	509915.396	227535.273	6587528.926	257.497	258.997	257.497

TABLE 2 - RADIAL SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 45	510168.796	227779.792	6587462.428	256.305	256.805	256.305
	510178.163	227788.830	6587459.970	256.224	256.724	256.224
	5101187.529	227797.872	6587457.523	256.143	256.643	256.143
	510196.896	227806.923	6587455.115	256.062	256.562	256.062
SPAN 46	510196.946	227806.972	6587455.102	256.061	256.561	256.061
	510206.313	227816.042	6587452.763	255.980	256.480	255.980
	510215.679	227825.136	6587450.523	255.899	256.399	255.899
	510225.046	227834.262	6587448.411	255.818	256.318	255.818
SPAN 47	510225.096	227834.310	6587448.400	255.818	256.318	255.818
	510234.463	227843.471	6587446.448	255.737	256.237	255.737
	510243.829	227852.669	6587444.680	255.656	256.156	255.656
	510253.196	227861.903	6587443.105	255.575	256.075	255.575
SPAN 48	510253.246	227861.952	6587443.097	255.574	256.074	255.574
	510262.613	227871.216	6587441.715	255.493	255.993	255.493
	510271.979	227880.507	6587440.526	255.412	255.912	255.412
	510281.346	227889.820	6587439.530	255.331	255.831	255.331
SPAN 49	510281.396	227889.870	6587439.526	255.331	255.831	255.331
	510290.763	227899.202	6587438.725	255.250	255.750	255.250
	510300.129	227908.549	6587438.120	255.169	255.669	255.169
	510309.496	227917.907	6587437.708	255.088	255.588	255.088
SPAN 50	510309.546	227917.957	6587437.707	255.087	255.587	255.087
	510318.913	227927.321	6587437.492	255.006	255.506	255.006
	510328.279	227936.687	6587437.471	254.925	255.425	254.925
	510337.646	227946.052	6587437.646	254.844	255.344	254.844
SPAN 51	510337.696	227946.102	6587437.647	254.844	255.344	254.844
	510347.063	227955.461	6587438.018	254.763	255.263	254.763
	510356.429	227964.811	6587438.583	254.682	255.182	254.682
	510365.796	227974.146	6587439.343	254.601	255.101	254.601

TABLE 3 - RADIAL SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 52	510365.846	227974.196	6587439.348	254.600	255.100	254.600
	510375.263	227983.513	6587440.302	254.519	255.019	254.519
	510384.629	227992.809	6587441.451	254.438	254.938	254.438
	510393.996	228002.079	6587442.793	254.357	254.857	254.357
SPAN 53	510394.046	228002.129	6587442.801	254.357	254.857	254.357
	510403.413	228011.369	6587444.336	254.276	254.776	254.276
	510412.779	228020.574	6587446.064	254.198	254.698	254.198
	510422.146	228029.742	6587447.983	254.130	254.630	254.130
SPAN 54	510422.196	228029.791	6587447.993	254.130	254.630	254.130
	510431.563	228038.917	6587450.104	254.072	254.572	254.072
	510440.929	228047.997	6587452.403	254.022	254.522	254.022
	510450.296	228057.027	6587454.891	253.983	254.483	253.983
SPAN 55	510450.346	228057.074	6587454.905	253.983	254.483	253.983
	510459.713	228066.050	6587457.582	253.953	254.453	253.953
	510469.079	228074.969	6587460.444	253.932	254.432	253.932
	510478.446	228083.825	6587463.492	253.921	254.421	253.921
SPAN 56	510478.496	228083.873	6587463.509	253.921	254.421	253.921
	510487.863	228092.664	6587466.741	253.919	254.419	253.919
	510497.229	228101.386	6587470.156	253.919	254.419	253.919
	510506.596	228110.035	6587473.752	253.919	254.419	253.919
SPAN 57	510506.646	228110.080	6587473.771	253.919	254.419	253.919
	510516.013	228118.652	6587477.547	253.919	254.419	253.919
	510525.379	228127.146	6587481.494	253.919	254.419	253.919
	510534.746	228135.570	6587485.589	253.919	254.419	253.919
SPAN 58	510534.796	228135.615	6587485.611	253.919	254.419	253.919
	510544.163	228143.980	6587489.825	253.919	254.419	253.919
	510553.529	228152.299	6587494.130	253.919	254.419	253.919
	510562.896	228160.585	6587498.497	253.919	254.419	253.919
SPAN 59	510562.946	228160.629	6587498.521	253.919	254.419	253.919
	510572.313	228168.896	6587502.924	253.919	254.419	253.919
	510581.679	228177.158	6587507.338	253.919	254.419	253.919
	510591.046	228185.420	6587511.751	253.919	254.419	253.919

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

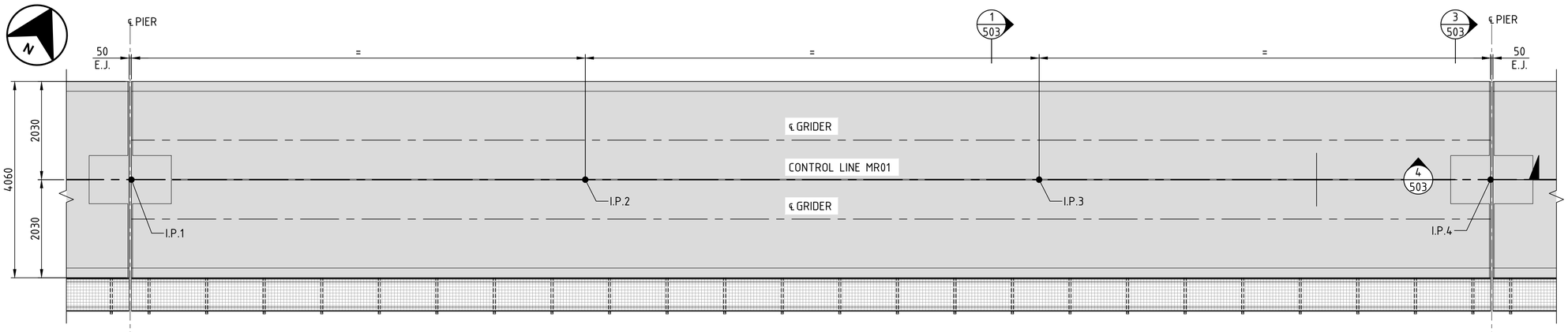
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER DECK CONCRETE

SHEET A

FILE No. BE22007-6670-DRG-BR-7500 | SHEET: 1 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7500 | B | EDMS No. - | -



TYPICAL STRAIGHT DECK PLAN
SCALE 1 : 50

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 500.

TABLE 1 - CROSS SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 1	508930.171	226552.742	6587540.136	253.711	254.211	253.711
	508939.546	226562.116	6587540.302	253.569	254.069	253.569
	508948.921	226571.490	6587540.468	253.663	254.163	253.663
	508958.296	226580.863	6587540.634	253.756	254.256	253.756
SPAN 2	508958.346	226580.913	6587540.635	253.757	254.257	253.757
	508967.713	226590.278	6587540.801	253.850	254.350	253.850
	508977.079	226599.643	6587540.967	253.944	254.444	253.944
	508986.446	226609.009	6587541.133	254.038	254.538	254.038
SPAN 3	508986.496	226609.059	6587541.134	254.038	254.538	254.038
	508995.863	226618.424	6587541.300	254.132	254.632	254.132
	509005.229	226627.789	6587541.466	254.226	254.726	254.226
	509014.596	226637.154	6587541.632	254.419	254.819	254.419
SPAN 4	509014.646	226637.204	6587541.633	254.320	254.820	254.320
	509024.013	226646.569	6587541.798	254.413	254.913	254.413
	509033.379	226655.935	6587541.964	254.507	255.007	254.507
	509042.746	226665.300	6587542.130	254.501	255.101	254.501
SPAN 5	509042.796	226665.350	6587542.131	254.501	255.101	254.501
	509052.163	226674.715	6587542.297	254.695	255.195	254.695
	509061.529	226684.080	6587542.463	254.789	255.289	254.789
	509070.896	226693.445	6587542.629	254.882	255.382	254.882
SPAN 6	509070.946	226693.495	6587542.630	254.883	255.383	254.883
	509080.313	226702.861	6587542.796	254.976	255.476	254.976
	509089.679	226712.226	6587542.962	255.070	255.570	255.070
	509099.046	226721.591	6587543.128	255.164	255.664	255.164
SPAN 7	509099.096	226721.641	6587543.129	255.164	255.664	255.164
	509108.463	226731.006	6587543.295	255.258	255.758	255.258
	509117.829	226740.371	6587543.461	255.352	255.852	255.352
	509127.196	226749.737	6587543.627	255.445	255.945	255.445
SPAN 8	509127.246	226749.787	6587543.628	255.446	255.946	255.446
	509136.613	226759.152	6587543.794	255.539	256.039	255.539
	509145.979	226768.517	6587543.960	255.633	256.133	255.633
	509155.346	226777.882	6587544.126	255.727	256.227	255.727
SPAN 9	509155.396	226777.932	6587544.126	255.727	256.227	255.727
	509164.763	226787.297	6587544.292	255.821	256.321	255.821
	509174.129	226796.663	6587544.458	255.915	256.415	255.915
	509183.496	226806.028	6587544.624	256.008	256.508	256.008

TABLE 2 - CROSS SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 10	509183.546	226806.078	6587544.625	256.009	256.509	256.009
	509192.913	226815.443	6587544.791	256.102	256.602	256.102
	509202.279	226824.808	6587544.957	256.196	256.696	256.196
	509211.646	226834.173	6587545.123	256.290	256.790	256.290
SPAN 11	509211.696	226834.223	6587545.124	256.290	256.790	256.290
	509221.063	226843.589	6587545.290	256.384	256.884	256.384
	509230.429	226852.954	6587545.456	256.478	256.978	256.478
	509239.796	226862.319	6587545.622	256.571	257.071	256.571
SPAN 12	509239.846	226862.369	6587545.623	256.572	257.072	256.572
	509249.213	226871.734	6587545.789	256.665	257.165	256.665
	509258.579	226881.099	6587545.955	256.759	257.259	256.759
	509267.946	226890.465	6587546.121	256.853	257.353	256.853
SPAN 13	509267.996	226890.514	6587546.122	256.853	257.353	256.853
	509277.363	226899.880	6587546.288	256.947	257.447	256.947
	509286.729	226909.245	6587546.453	257.041	257.541	257.041
	509296.096	226918.610	6587546.619	257.134	257.634	257.134
SPAN 14	509296.146	226918.660	6587546.620	257.135	257.635	257.135
	509305.513	226928.025	6587546.786	257.228	257.728	257.228
	509314.879	226937.390	6587546.952	257.322	257.822	257.322
	509324.246	226946.756	6587547.118	257.416	257.916	257.416
SPAN 15	509324.296	226946.806	6587547.119	257.416	257.916	257.416
	509333.663	226956.171	6587547.285	257.510	258.010	257.510
	509343.029	226965.536	6587547.451	257.604	258.104	257.604
	509352.396	226974.901	6587547.617	257.697	258.197	257.697
SPAN 16	509352.446	226974.951	6587547.618	257.698	258.198	257.698
	509361.813	226984.316	6587547.784	257.791	258.291	257.791
	509371.179	226993.682	6587547.950	257.885	258.385	257.885
	509380.546	227003.047	6587548.116	257.979	258.479	257.979
SPAN 17	509380.596	227003.097	6587548.117	257.979	258.479	257.979
	509389.963	227012.462	6587548.283	258.073	258.573	258.073
	509399.329	227021.827	6587548.449	258.167	258.667	258.167
	509408.696	227031.192	6587548.615	258.260	258.760	258.260
SPAN 18	509408.746	227031.242	6587548.615	258.261	258.761	258.261
	509418.113	227040.608	6587548.781	258.354	258.854	258.354
	509427.479	227049.973	6587548.947	258.448	258.948	258.448
	509436.846	227059.338	6587549.113	258.542	259.042	258.542

TABLE 3 - CROSS SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 19	509436.896	227059.388	6587549.114	258.542	259.042	258.542
	509446.263	227068.753	6587549.280	258.636	259.136	258.636
	509455.629	227078.118	6587549.446	258.730	259.230	258.730
	509464.996	227087.484	6587549.612	258.823	259.323	258.823
SPAN 20	509465.046	227087.534	6587549.613	258.824	259.324	258.824
	509474.413	227096.899	6587549.779	258.917	259.417	258.917
	509483.779	227106.264	6587549.945	259.011	259.511	259.011
	509493.146	227115.629	6587550.111	259.105	259.605	259.105
SPAN 21	509493.196	227115.679	6587550.112	259.105	259.605	259.105
	509502.563	227125.044	6587550.278	259.199	259.699	259.199
	509511.929	227134.410	6587550.444	259.293	259.793	259.293
	509521.296	227143.775	6587550.610	259.386	259.886	259.386
SPAN 22	509521.346	227143.825	6587550.611	259.387	259.887	259.387
	509530.713	227153.190	6587550.777	259.480	259.980	259.480
	509540.079	227162.555	6587550.942	259.574	260.074	259.574
	509549.446	227171.920	6587551.108	259.668	260.168	259.668
SPAN 23	509549.496	227171.970	6587551.109	259.668	260.168	259.668
	509558.863	227181.335	6587551.275	259.762	260.262	259.762
	509568.229	227190.701	6587551.441	259.856	260.356	259.856
	509577.596	227200.066	6587551.607	259.949	260.449	259.949
SPAN 24	509577.646	227200.116	6587551.608	259.949	260.449	259.949
	509587.013	227209.481	6587551.774	260.036	260.536	260.036
	509596.379	227218.846	6587551.940	260.113	260.613	260.113
	509605.746	227228.211	6587552.106	260.180	260.680	260.180
SPAN 25	509605.796	227228.261	6587552.107	260.180	260.680	260.180
	509615.163	227237.627	6587552.273	260.237	260.737	260.237
	509624.529	227246.992	6587552.439	260.283	260.783	260.283
	509633.896	227256.357	6587552.605	260.319	260.819	260.319
SPAN 26	509633.946	227256.407	6587552.606	260.319	260.819	260.319
	509643.313	227265.772	6587552.772	260.344	260.844	260.344
	509652.679	227275.137	6587552.938	260.360	260.860	260.360
	509662.046	227284.503	6587553.104	260.365	260.865	260.365
SPAN 27	509662.096	227284.553	6587553.104	260.365	260.865	260.365
	509671.463	227293.918	6587553.270	260.361	260.861	260.361
	509680.829	227303.283	6587553.436	260.346	260.846	260.346
	509690.196	227312.648	6587553.602	260.320	260.820	260.320

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
DECK CONCRETE
SHEET B

FILE No. BE22007-6670-DRG-BR-7501 | SHEET: 2 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7501 | B | EDMS No. - | -

File Plotted: C:\12dSdata\AUR2DS\YN01\BE22007 (B20175) VEP_101\100 DRAWINGS\103 Br & Spec Sht\AutoCAD\AutoCAD GDA 2020\BE22007-6670-DWG-BR-7501 - 7502.dwg
Plot Date & Time: 7/24/2023 2:04 PM
Plotted by: CHRISTSAAC.ESMILLA

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 500.

TABLE 4 - CROSS SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 28	509690.246	227312.698	6587553.603	260.319	260.819	260.319
	509699.713	227322.063	6587553.769	260.283	260.783	260.283
	509709.079	227331.429	6587553.935	260.237	260.737	260.237
	509718.446	227340.794	6587554.100	260.181	260.681	260.181
SPAN 29	509718.496	227340.844	6587554.101	260.181	260.681	260.181
	509727.863	227350.209	6587554.249	260.115	260.615	260.115
	509737.229	227359.575	6587554.354	260.039	260.539	260.039
	509746.596	227368.942	6587554.387	259.958	260.458	259.958
SPAN 36	509915.546	227535.321	6587528.913	258.496	258.996	258.496
	509924.913	227544.359	6587526.455	258.415	258.915	258.415
	509934.279	227553.398	6587523.997	258.334	258.834	258.334
	509943.646	227562.436	6587521.539	258.253	258.753	258.253
SPAN 37	509943.696	227562.484	6587521.526	258.253	258.753	258.253
	509953.063	227571.523	6587519.068	258.172	258.672	258.172
	509962.429	227580.561	6587516.610	258.091	258.591	258.091
	509971.796	227589.600	6587514.152	258.010	258.510	258.010
SPAN 38	509971.846	227589.648	6587514.139	258.009	258.509	258.009
	509981.213	227598.686	6587511.681	257.928	258.428	257.928
	509990.579	227607.725	6587509.223	257.847	258.347	257.847
	509999.946	227616.763	6587506.765	257.766	258.266	257.766
SPAN 39	509999.996	227616.811	6587506.752	257.766	258.266	257.766
	510009.363	227625.850	6587504.293	257.685	258.185	257.685
	510018.729	227634.888	6587501.835	257.604	258.104	257.604
	510028.096	227643.926	6587499.377	257.523	258.023	257.523
SPAN 40	510028.146	227643.975	6587499.364	257.522	258.022	257.522
	510037.513	227653.013	6587496.906	257.441	257.941	257.441
	510046.879	227662.051	6587494.448	257.360	257.860	257.360
	510056.246	227671.090	6587491.990	257.279	257.779	257.279
SPAN 41	510056.296	227671.138	6587491.977	257.279	257.779	257.279
	510065.663	227680.176	6587489.519	257.198	257.698	257.198
	510075.029	227689.215	6587487.061	257.117	257.617	257.117
	510084.396	227698.253	6587484.603	257.036	257.536	257.036
SPAN 42	510084.446	227698.301	6587484.590	257.035	257.535	257.035
	510093.813	227707.340	6587482.132	256.954	257.454	256.954
	510103.179	227716.378	6587479.674	256.873	257.373	256.873
	510112.546	227725.417	6587477.216	256.792	257.292	256.792
SPAN 43	510112596	227725.465	6587477.203	256.792	257.292	256.792
	510121.963	227734.503	6587474.745	256.711	257.211	256.711
	510131.329	227743.542	6587472.286	256.630	257.130	256.630
	510140.696	227752.580	6587469.828	256.549	257.049	256.549
SPAN 44	510140.746	227752.628	6587469.815	256.548	257.048	256.548
	510150.113	227761.667	6587467.357	256.467	256.967	256.467
	510159.479	227770.705	6587464.899	256.386	256.886	256.386
	510168.846	227779.743	6587462.441	256.305	256.805	256.305

TABLE 5 - CROSS SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 60	510591.146	228185.464	6587511.775	253.919	254.419	253.919
	510600.513	228193.725	6587516.189	253.919	254.419	253.919
	510609.879	228201.987	6587520.602	253.919	254.419	253.919
	510619.246	228210.249	6587525.016	253.919	254.419	253.919
SPAN 61	510619.296	228210.293	6587525.039	253.919	254.419	253.919
	510628.663	228218.554	6587529.453	253.919	254.419	253.919
	510638.029	228226.816	6587533.867	253.919	254.419	253.919
	510647.396	228235.077	6587538.280	253.919	254.419	253.919
SPAN 62	510647.446	228235.122	6587538.304	253.919	254.419	253.919
	510656.813	228243.383	6587542.718	253.919	254.419	253.919
	510666.179	228251.645	6587547.131	253.919	254.419	253.919
	510675.546	228259.906	6587551.545	253.919	254.419	253.919
SPAN 63	510675.596	228259.950	6587551.569	253.919	254.419	253.919
	510684.963	228268.212	6587555.982	253.919	254.419	253.919
	510694.329	228276.474	6587560.396	253.919	254.419	253.919
	510703.696	228284.735	6587564.810	253.919	254.419	253.919
SPAN 64	510703.746	228284.779	6587564.833	253.919	254.419	253.919
	510713.113	228293.041	6587569.247	253.919	254.419	253.919
	510722.479	228301.303	6587573.660	253.919	254.419	253.919
	510731.846	228309.564	6587578.074	253.919	254.419	253.919
SPAN 65	510731.896	228309.608	6587578.098	253.919	254.419	253.919
	510741.263	228317.870	6587582.511	253.919	254.419	253.919
	510750.629	228326.131	6587586.925	253.919	254.419	253.919
	510759.996	228334.393	6587591.339	253.919	254.419	253.919
SPAN 66	510760.046	228334.437	6587591.362	253.919	254.419	253.919
	510769.413	228342.699	6587595.776	253.919	254.419	253.919
	510778.779	228350.960	6587600.190	253.919	254.419	253.919
	510788.146	228359.222	6587604.603	253.919	254.419	253.919
SPAN 67	510788.196	228359.266	6587604.627	253.919	254.419	253.919
	510797.563	228367.528	6587609.040	253.919	254.419	253.919
	510806.929	228375.789	6587613.454	253.919	254.419	253.919
	510816.296	228384.051	6587617.868	253.919	254.419	253.919
SPAN 68	510816.346	228384.095	6587617.891	253.919	254.419	253.919
	510825.713	228392.357	6587622.305	253.919	254.419	253.919
	510835.079	228400.618	6587626.719	253.919	254.419	253.919
	510844.446	228408.880	6587631.132	253.919	254.419	253.919
SPAN 69	510844.496	228408.924	6587631.156	253.919	254.419	253.919
	510853.863	228417.185	6587635.570	253.919	254.419	253.919
	510863.229	228425.447	6587639.983	253.919	254.419	253.919
	510872.596	228433.709	6587644.397	253.919	254.419	253.919
SPAN 70	510872.646	228433.753	6587644.420	253.919	254.419	253.919
	510882.013	228442.014	6587648.834	253.919	254.419	253.919
	510891.379	228450.276	6587653.248	253.919	254.419	253.919
	510900.746	228458.538	6587657.661	253.919	254.419	253.919

TABLE 6 - CROSS SECTIONS

LOCATION	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 71	510900.796	228458.582	6587657.685	254.419	254.419	254.419
	510910.163	228466.843	6587662.099	254.419	254.419	254.419
	510919.529	228475.105	6587666.512	254.419	254.419	254.419
	510928.896	228483.366	6587670.926	254.419	254.419	254.419
SPAN 72	510928.946	228483.411	6587670.950	254.419	254.419	254.419
	510938.313	228491.672	6587675.363	254.419	254.419	254.419
	510947.679	228499.934	6587679.777	254.419	254.419	254.419
	510957.046	228508.195	6587684.191	254.419	254.419	254.419
SPAN 73	510957.096	228508.239	6587684.214	254.419	254.419	254.419
	510966.463	228516.501	6587688.628	254.419	254.419	254.419
	510975.829	228524.763	6587693.041	254.419	254.419	254.419
	510985.196	228533.024	6587697.455	254.419	254.419	254.419
SPAN 74	510985.246	228533.068	6587697.479	254.419	254.419	254.419
	510994.613	228541.330	6587701.892	254.419	254.419	254.419
	511003.979	228549.592	6587706.306	254.419	254.419	254.419
	511013.346	228557.853	6587710.720	254.419	254.419	254.419
SPAN 75	511013.396	228557.897	6587710.743	254.419	254.419	254.419
	511022.763	228566.159	6587715.157	254.419	254.419	254.419
	511032.129	228574.420	6587719.571	254.419	254.419	254.419
	511041.496	228582.682	6587723.984	254.419	254.419	254.419
SPAN 76	511041.546	228582.726	6587724.008	254.419	254.419	254.419
	511050.913	228590.988	6587728.421	254.419	254.419	254.419
	511060.279	228599.249	6587732.835	254.419	254.419	254.419
	511069.646	228607.511	6587737.249	254.419	254.419	254.419
SPAN 77	511069.696	228607.555	6587737.272	254.419	254.419	254.419
	511079.063	228615.817	6587741.686	254.419	254.419	254.419
	511088.329	228624.078	6587746.100	254.419	254.419	254.419
	511097.696	228632.340	6587750.513	254.419	254.419	254.419
SPAN 78	511097.746	228632.384	6587750.537	254.419	254.419	254.419
	511107.121	228640.645	6587754.951	254.419	254.419	254.419
	511116.496	228648.907	6587759.364	254.419	254.419	254.419
	511125.871	228657.169	6587763.778	254.419	254.419	254.419

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

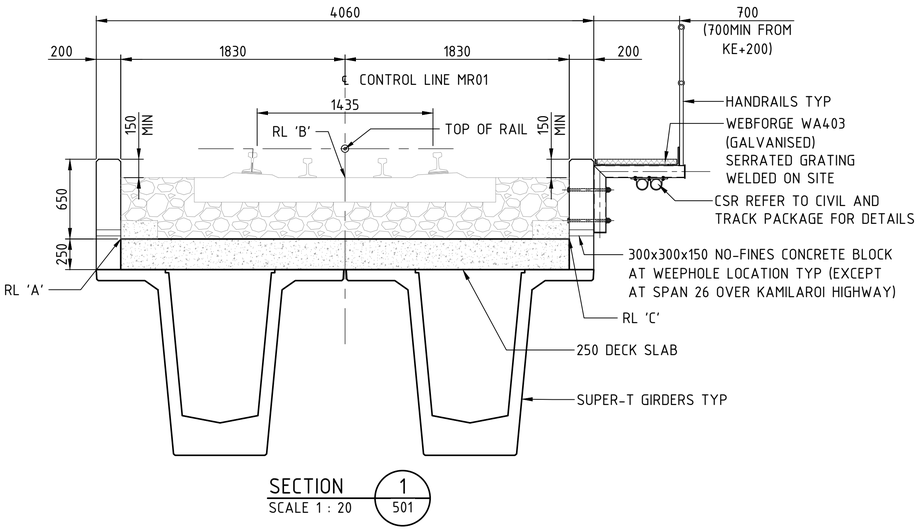
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER DECK CONCRETE

SHEET C

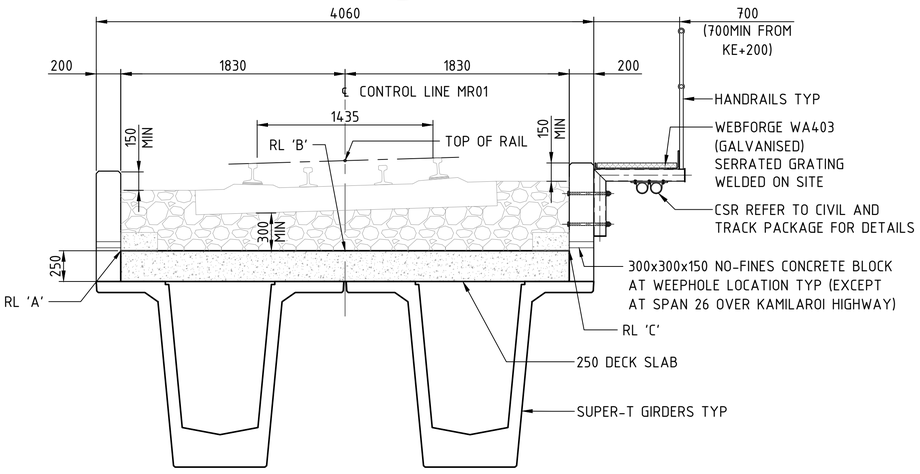
FILE No. BE22007-6670-DRG-BR-7502 | SHEET: 3 OF 4 | A1

STATUS: 100% DESIGN ©

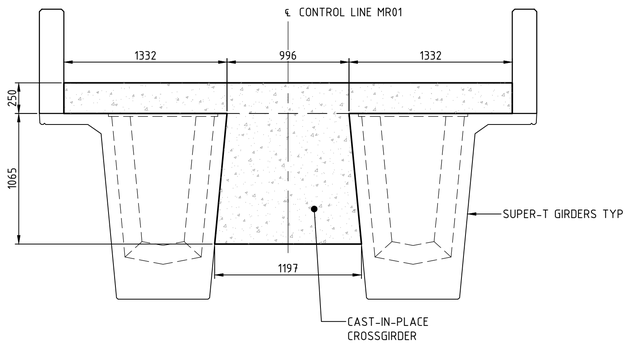
DRG No. BE22007-6670-DRG-BR-7502 | B | EDMS No. - | -



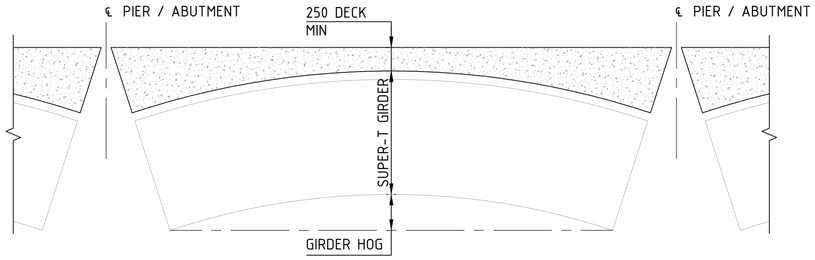
SECTION 1 / 501
SCALE 1 : 20



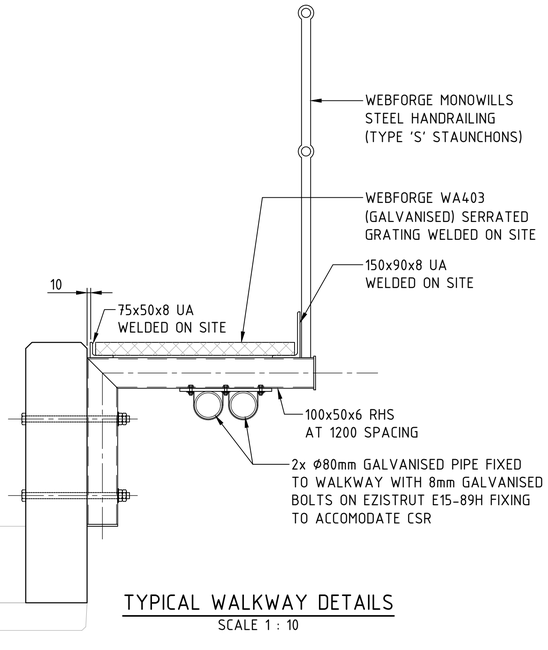
SECTION 2 / 500
SCALE 1 : 20



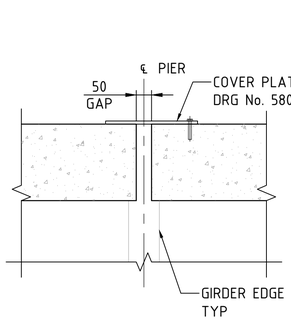
SECTION 3 / 501
SCALE 1 : 20



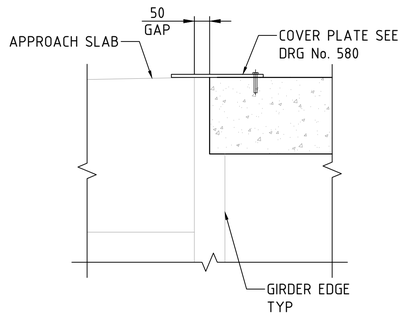
TYPICAL SECTION ALONG DECK CENTERLINE
NTS



TYPICAL WALKWAY DETAILS
SCALE 1 : 10



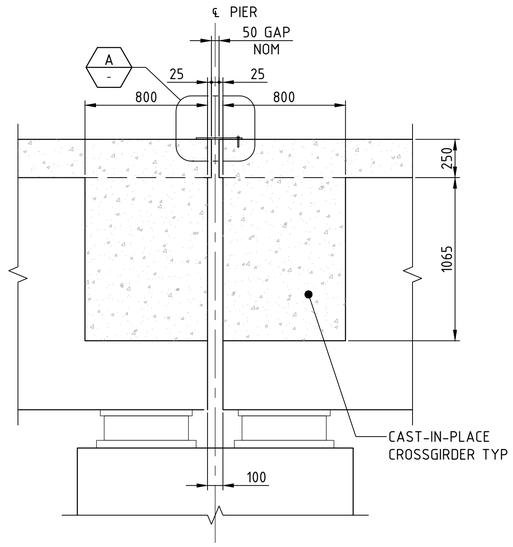
DETAIL A / -
SCALE 1 : 10



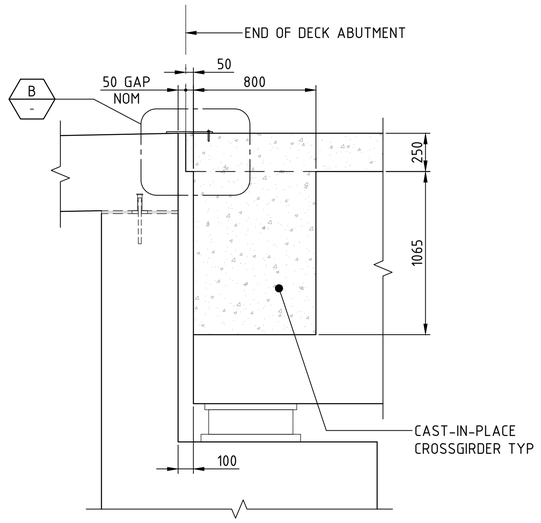
DETAIL B / -
SCALE 1 : 10

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 500.
DECK SURFACE TO BE CONSTRUCTED WITHIN 0mm/-5mm TOLERANCE



SECTION 4 / 501
SCALE 1 : 20



TYPICAL SECTION AT ABUTMENT
SCALE 1 : 20

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

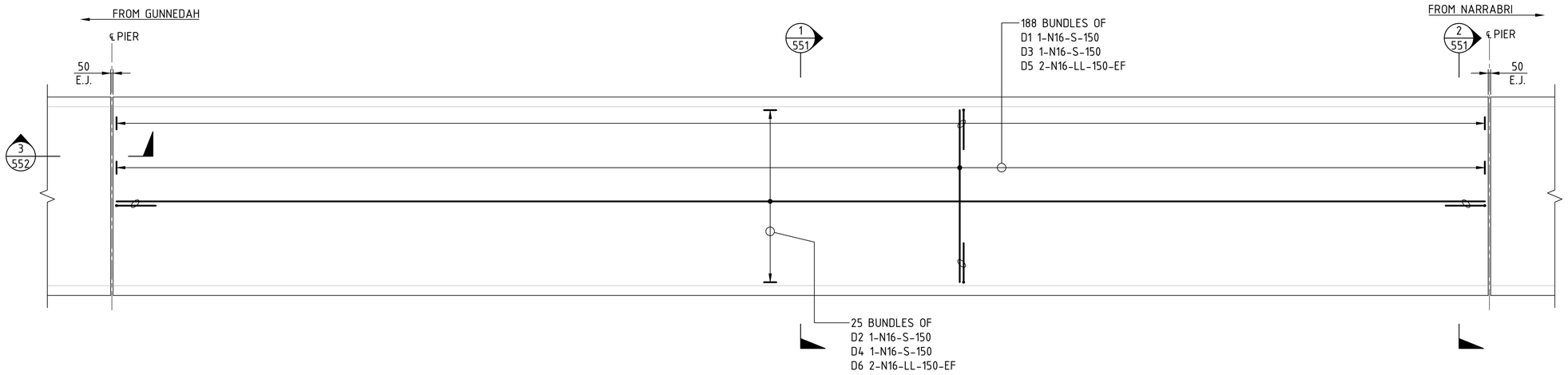
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
DECK CONCRETE
SHEET D

FILE No. BE22007-6670-DRG-BR-7503 | SHEET: 4 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7503 | B | EDMS No. - | -



TYPICAL STRAIGHT DECK PLAN - TYPICAL REINFORCEMENT

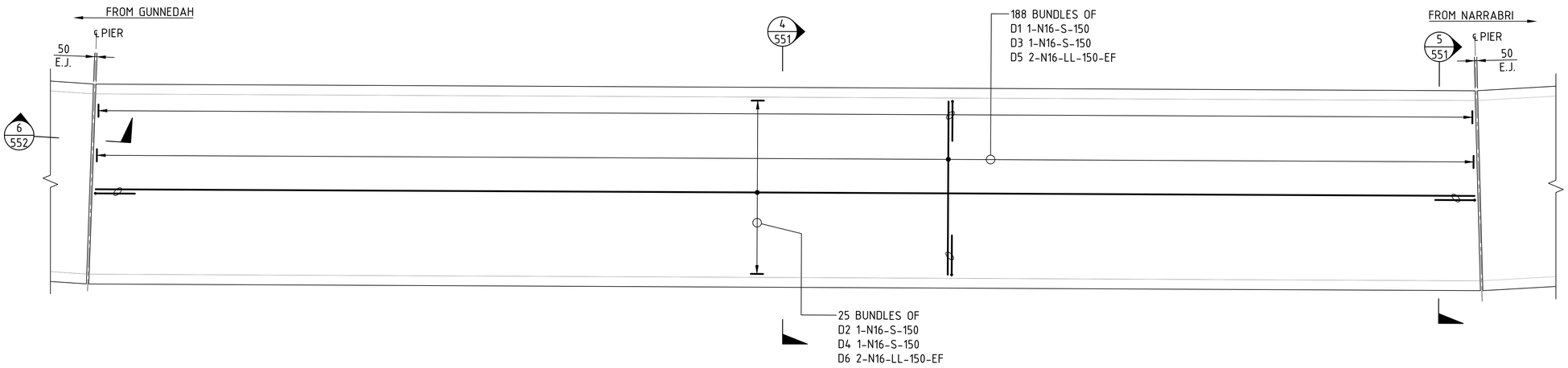
SCALE 1 : 50

GENERAL NOTES

REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 45mm UNLESS SPECIFIED OTHERWISE.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT MUST BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS OTHERWISE SHOWN ON THE DRAWINGS, LAPS ON ADJACENT BARS ON ANY FACE MUST BE STAGGERED (OFFSET) BY NO LESS THAN THE LAP LENGTH.
UNLESS SPECIFIED OTHERWISE, THE MINIMUM DEVELOPMENT LENGTHS AND LENGTH OF LAPS MUST BE:

BAR SIZE:	N12	N16	N20	N24	N28	N32
a) LAP LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	800	1100	1400	1750	2100
b) LAP LENGTH OTHER BARS:	400	600	850	1100	1350	1600

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3 x THE BAR DIAMETER. REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR BARS FROM BARS PRECAST BALLAST WALLS, FORMED HOLES AND GENERAL FITMENTS.
THE REQUIRED CONCRETE COVER IS BASED ON A MINIMUM OF 7 DAYS OF EFFECTIVE, CONTINUOUS AND UNINTERRUPTED WET CURING IN ACCORDANCE WITH AS 5100.5-2017. CURING COMPOUNDS SHALL NOT BE USED.
EF - DENOTES EACH FACE
FF - DENOTES FAR FACE
NF - DENOTES NEAR FACE
LV - DENOTES VARIABLE LENGTH BAR



TYPICAL CURVED DECK PLAN - TYPICAL REINFORCEMENT

SCALE 1 : 50

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

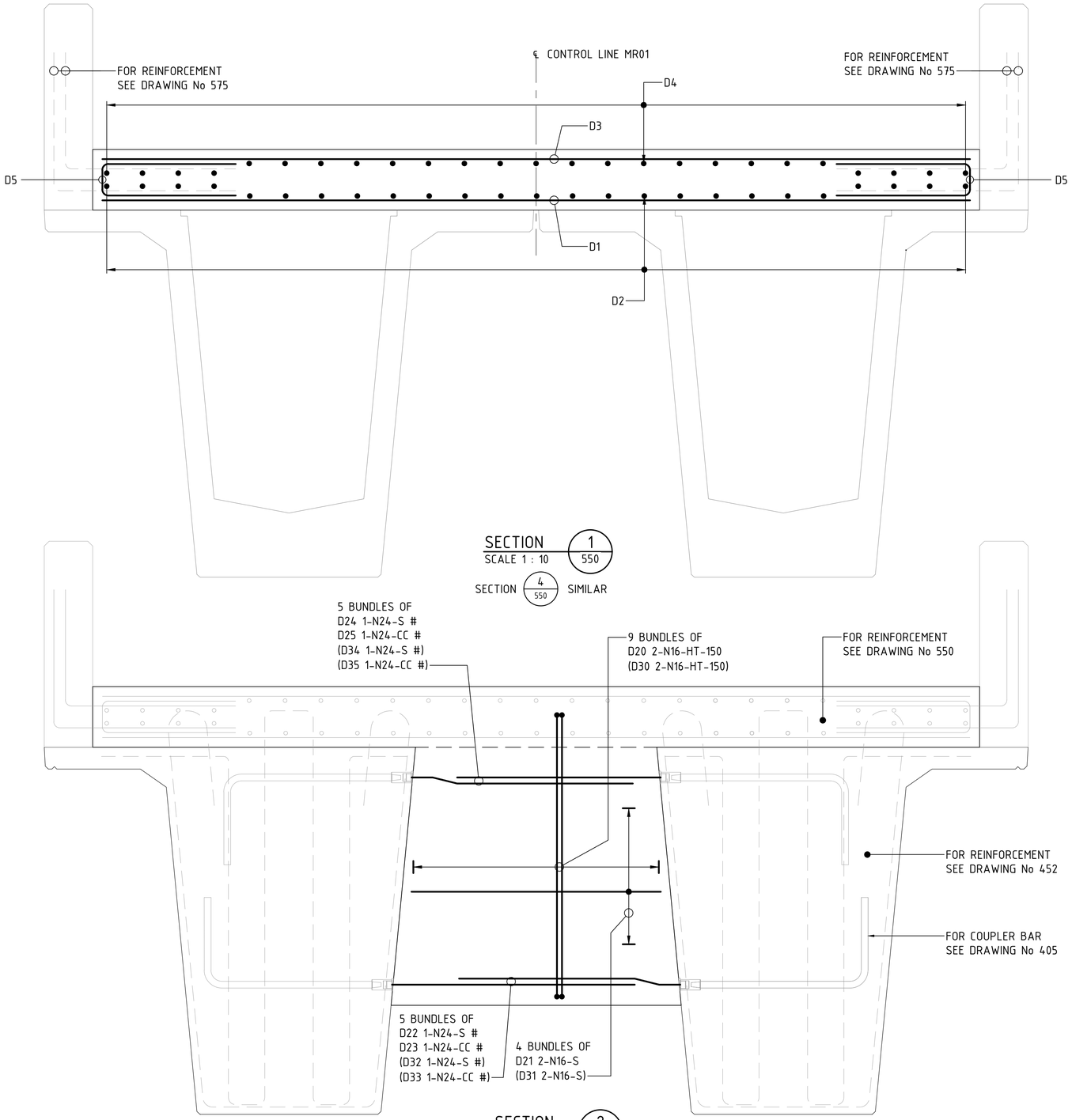
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER DECK REINFORCEMENT

SHEET A

FILE No. BE22007-6670-DRG-BR-7550 | SHEET: 1 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7550 | B | EDMS No. - | -

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 550.



SECTION 1 / SCALE 1 : 10 / 550

SECTION 4 / 550 SIMILAR

SECTION 2 / SCALE 1 : 10 / 550

SECTION 5 / 550 SIMILAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 — 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER DECK REINFORCEMENT

SHEET B

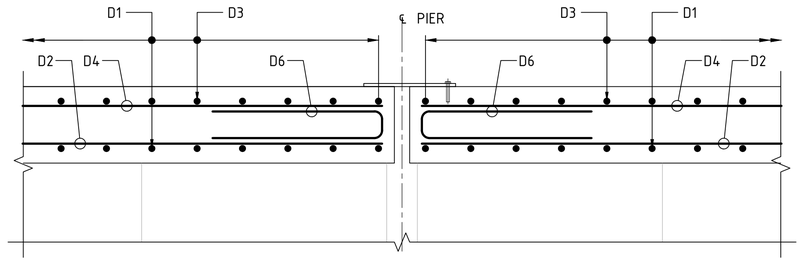
FILE No. BE22007-6670-DRG-BR-7551 | SHEET: 2 OF 3 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7551 | B | EDMS No. - | -

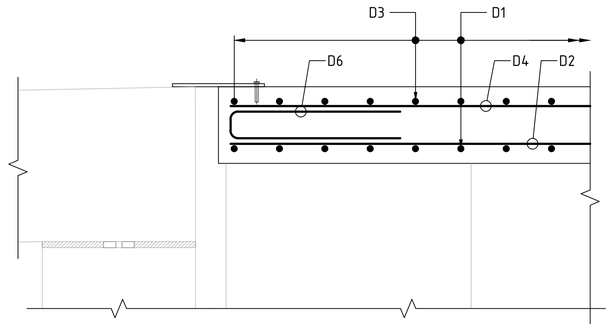
GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 550.

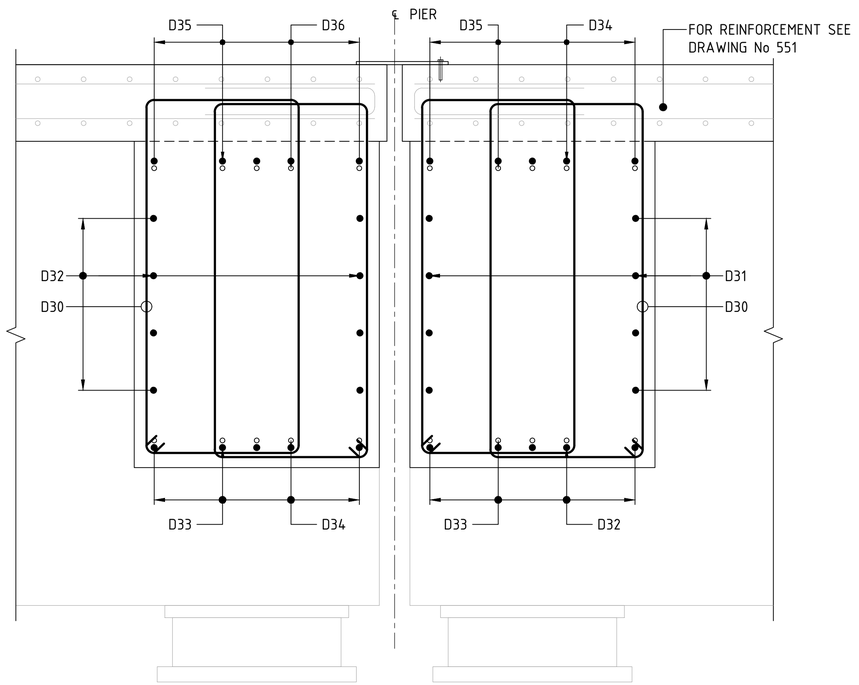


SECTION 3 / 550
SCALE 1 : 10

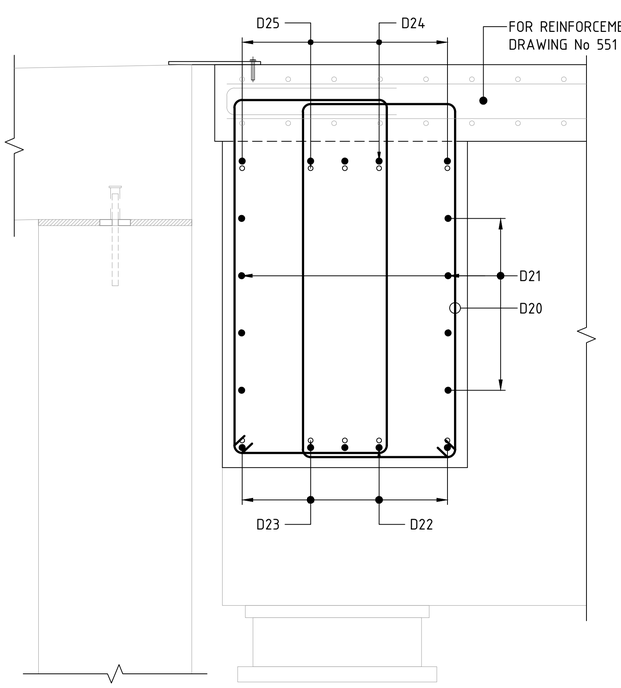
SECTION 6 / 550 SIMILAR



TYPICAL DECK REINFORCEMENT AT ABUTMENT
SCALE 1 : 10



TYPICAL DIAPHRAGM REINFORCEMENT AT PIER
SCALE 1 : 10



TYPICAL DIAPHRAGM REINFORCEMENT AT ABUTMENT
SCALE 1 : 10

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

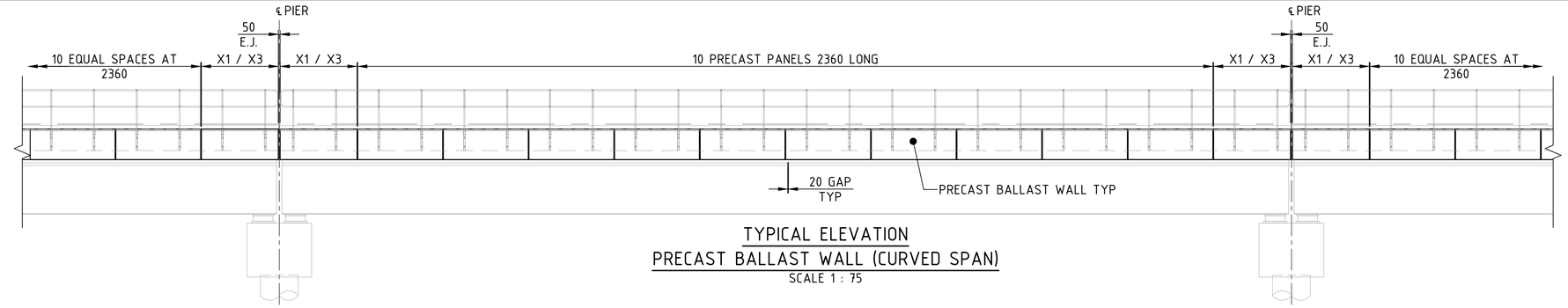
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER DECK REINFORCEMENT

SHEET C

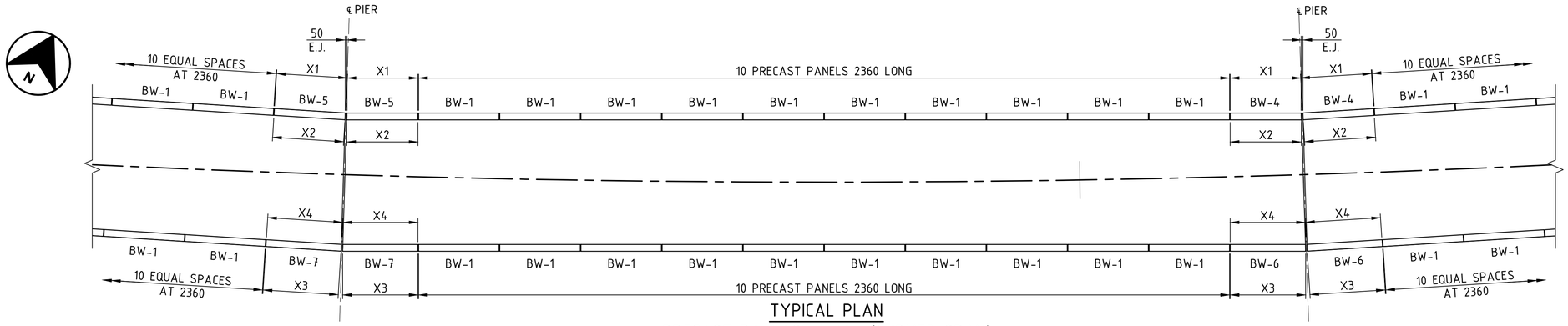
FILE No. BE22007-6670-DRG-BR-7552 | SHEET: 3 OF 3 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7552 | B | EDMS No. - | -



TYPICAL ELEVATION
PRECAST BALLAST WALL (CURVED SPAN)
SCALE 1 : 75



TYPICAL PLAN
PRECAST BALLAST WALL (CURVED SPAN)
SCALE 1 : 75

GENERAL NOTES

CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
CONCRETE EXPOSURE CLASSIFICATION: B1
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 50 MPa.
EDGES SHALL BE CHAMFERED 10 x 10 AND RE-ENTRANT ANGLES FILLETED 10 x 10 UNLESS SPECIFIED OTHERWISE.
NCF DENOTES NO CHAMFER OR FILLET.
ALL SURFACES IN CONTACT WITH CAST-IN-PLACE STITCH POUR CONCRETE SHALL BE ROUGHENED DURING MANUFACTURE TO CONSTRUCTION JOINT SPECIFICATIONS IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B80.
REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 35mm.
REQUIRED COVER IS BASED ON A MINIMUM OF 7 DAYS EFFECTIVE, CONTINUOUS AND UNINTERRUPTED WET OR SEALED CURING IN ACCORDANCE WITH AS 5100.5-2017. WHERE CURING COMPOUNDS ARE PROPOSED, THE COVER MUST BE INCREASED BY 5 mm FOR CLASSIFICATION B1.
RIGID STEEL FORMWORK AND INTENSE COMPACTION SHALL BE USED.
REINFORCEMENT MAY BE DISPLACED SLIGHTLY TO CLEAR ANCHOR BOLTS, FORMED HOLES AND RECESSES.
DIMENSIONS ARE TO THE CENTRE OF THE BAR UNLESS NOTED OTHERWISE.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT SHALL BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS SPECIFIED OTHERWISE, THE LENGTH OF LAPS AND DEVELOPMENT TO BE AS FOLLOWS:

BAR SIZE	N12	N16	N20	N24	N28	N32	N36	N40
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR	450	650	950	1250	1600	1950	2350	2750
b) OTHER BARS:	350	500	750	950	1250	1500	1800	2150

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3x THE BAR DIAMETER.
FOR ADDITIONAL REINFORCEMENT NOTES AND BAR MARKING LEGEND, SEE SHEET No 001

LIFTING AND HANDLING

LIFTING ANCHORS SHALL BE DESIGNED BY THE PRECAST SUPPLIER.
CAPACITY OF LIFTING ANCHORS TO BE DESIGNED ASSUMING ONLY TWO ANCHORS CARRY FULL MASS OF PRECAST UNIT WITH DYNAMIC EFFECTS.
MINIMUM FACTOR OF SAFETY TO BE 5.
MINIMUM TWO ANCHORS REQUIRED PER UNIT.
ANCHOR RECESSES SHALL BE FILLED WITH SHRINKAGE COMPENSATED CEMENTITIOUS GROUT UPON COMPLETION OF INSTALLATION.
ALL LIFTING ANCHORS SHALL BE HOT DIP GALVANISED.
⊕ DENOTES LOCATION OF LIFTING ANCHORS

TABLE 1 - CURVED SPANS PRECAST BALLAST WALL

LOCATION	TYPE	PRECAST BALLAST WALL DIMENSIONS (mm)			
		X1	X2	X3	X4
SPAN 29	BW4	2147	2146		
	BW5	2147	2146		
	BW6			2133	2133
	BW7			2133	2133
SPAN 30	BW4	2200	2194		
	BW5	2200	2194		
	BW6			2085	2091
	BW7			2085	2091
SPAN 31	BW4	2201	2195		
	BW5	2201	2195		
	BW6			2087	2092
	BW7			2087	2092
SPAN 32	BW4	2201	2195		
	BW5	2201	2195		
	BW6			2087	2092
	BW7			2087	2092
SPAN 33	BW4	2201	2195		
	BW5	2201	2195		
	BW6			2087	2092
	BW7			2087	2092
SPAN 34	BW4	2201	2195		
	BW5	2201	2195		
	BW6			2087	2092
	BW7			2087	2092

TABLE 1 - CURVED SPANS PRECAST BALLAST WALL

LOCATION	TYPE	PRECAST BALLAST WALL DIMENSIONS (mm)			
		X1	X2	X3	X4
SPAN 35	BW4	2140	2140		
	BW5	2140	2140		
	BW6			2140	2140
	BW7			2140	2140
SPAN 45	BW4	2131	2130		
	BW5	2131	2130		
	BW6			2199	2148
	BW7			2199	2148
SPAN 46	BW4	2103	2106		
	BW5	2103	2106		
	BW6			2179	2175
	BW7			2179	2175
SPAN 47	BW4	2082	2088		
	BW5	2082	2088		
	BW6			2204	2198
	BW7			2204	2198
SPAN 48	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203
SPAN 49	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203

TABLE 1 - CURVED SPANS PRECAST BALLAST WALL

LOCATION	TYPE	PRECAST BALLAST WALL DIMENSIONS (mm)			
		X1	X2	X3	X4
SPAN 50	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203
SPAN 51	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203
SPAN 52	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203
SPAN 53	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203
SPAN 54	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203
SPAN 55	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203

TABLE 1 - CURVED SPANS PRECAST BALLAST WALL

LOCATION	TYPE	PRECAST BALLAST WALL DIMENSIONS (mm)			
		X1	X2	X3	X4
SPAN 56	BW4	2080	2087		
	BW5	2080	2087		
	BW6			2209	2203
	BW7			2209	2203
SPAN 57	BW4	2088	2094		
	BW5	2088	2094		
	BW6			2250	2244
	BW7			2200	2194
SPAN 58	BW4	2113	2113		
	BW5	2113	2117		
	BW6			2131	2130
	BW7			2210	2206
SPAN 59	BW4	2188	2188		
	BW5	2138	2138		
	BW6			2142	2142
	BW7			2142	2142

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:75 @ A1 0 0.75 1.5 2.25 3 3.75 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

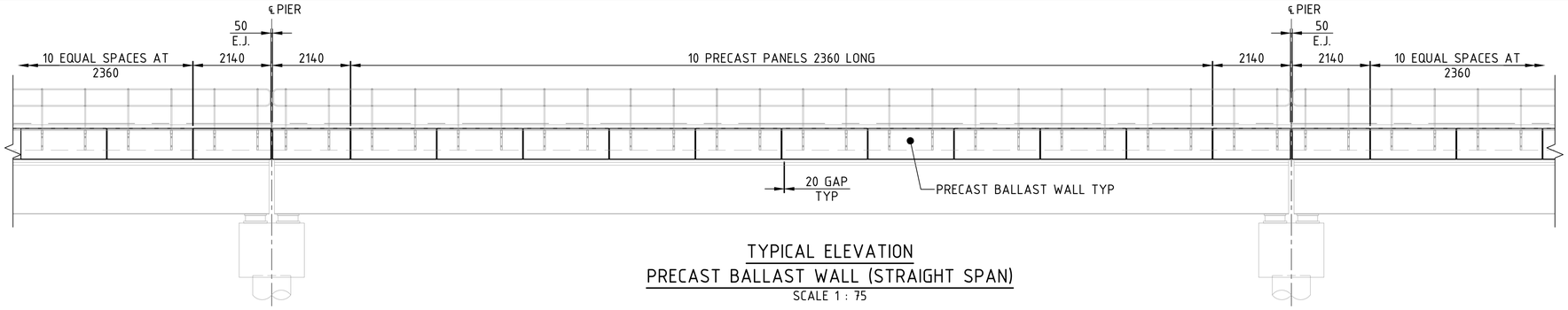
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
PRECAST BALLAST WALL CONCRETE
SHEET A

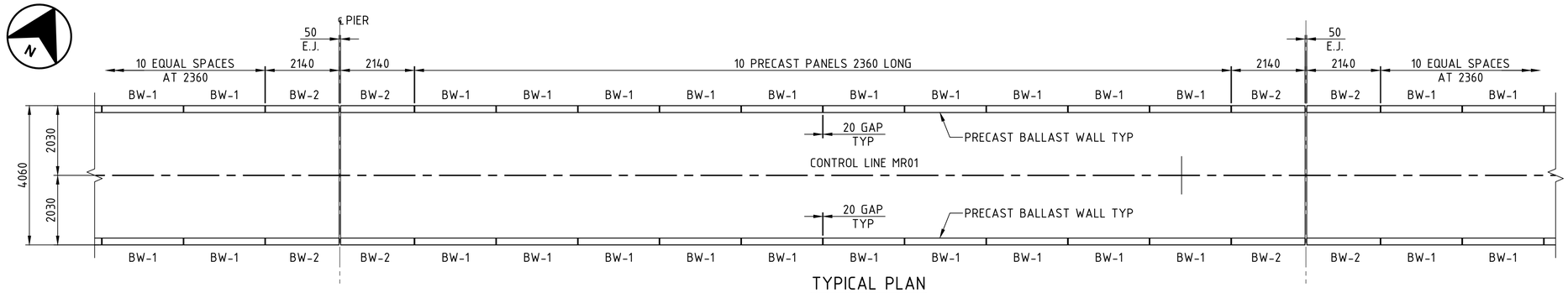
FILE No. BE22007-6670-DRG-BR-7570 | SHEET: 1 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7570 | B | EDMS No. - | -

GENERAL NOTES

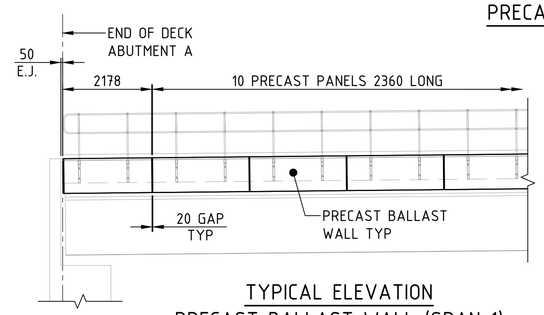
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 570.



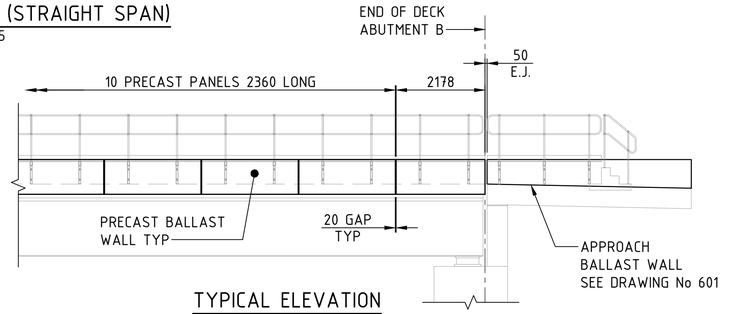
TYPICAL ELEVATION
PRECAST BALLAST WALL (STRAIGHT SPAN)
SCALE 1 : 75



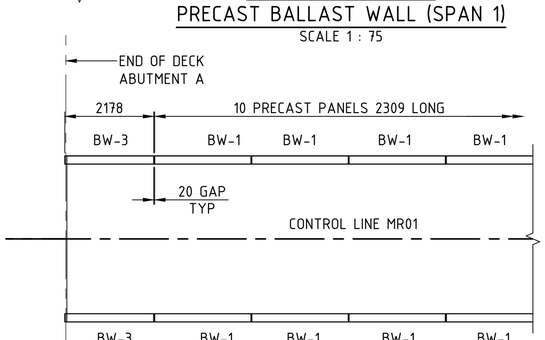
TYPICAL PLAN
PRECAST BALLAST WALL (STRAIGHT SPAN)
SCALE 1 : 75



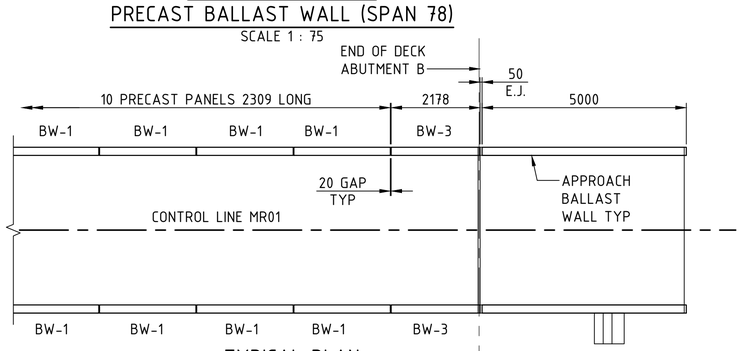
TYPICAL ELEVATION
PRECAST BALLAST WALL (SPAN 1)
SCALE 1 : 75



TYPICAL ELEVATION
PRECAST BALLAST WALL (SPAN 78)
SCALE 1 : 75



TYPICAL PLAN
PRECAST BALLAST WALL (SPAN 1)
SCALE 1 : 75



TYPICAL PLAN
PRECAST BALLAST WALL (SPAN 78)
SCALE 1 : 75

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:75 @ A1 0 0.75 1.5 2.25 3 3.75 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER PRECAST BALLAST WALL CONCRETE

SHEET B

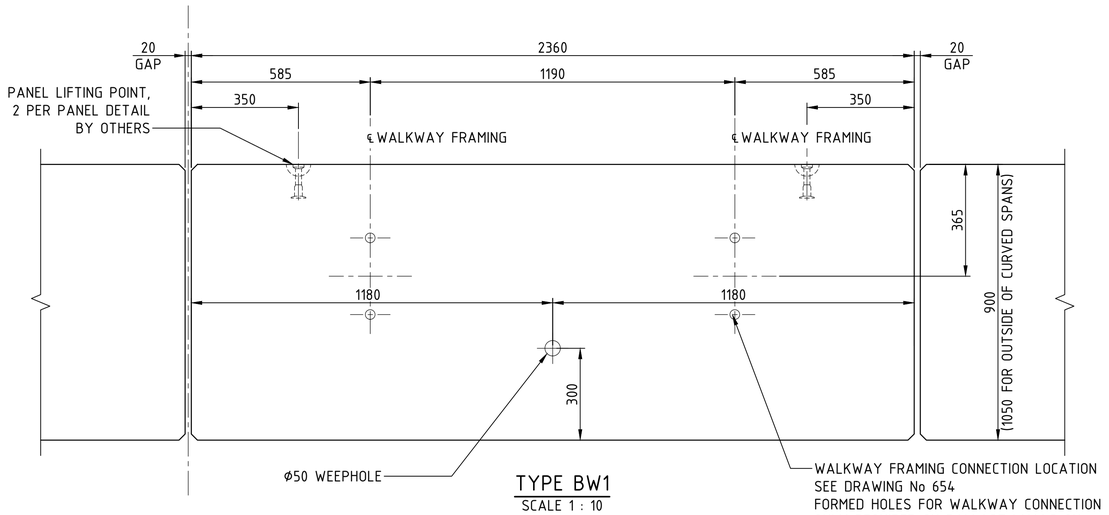
FILE No. BE22007-6670-DRG-BR-7571 | SHEET: 2 OF 4 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7571 | B | EDMS No. - | -

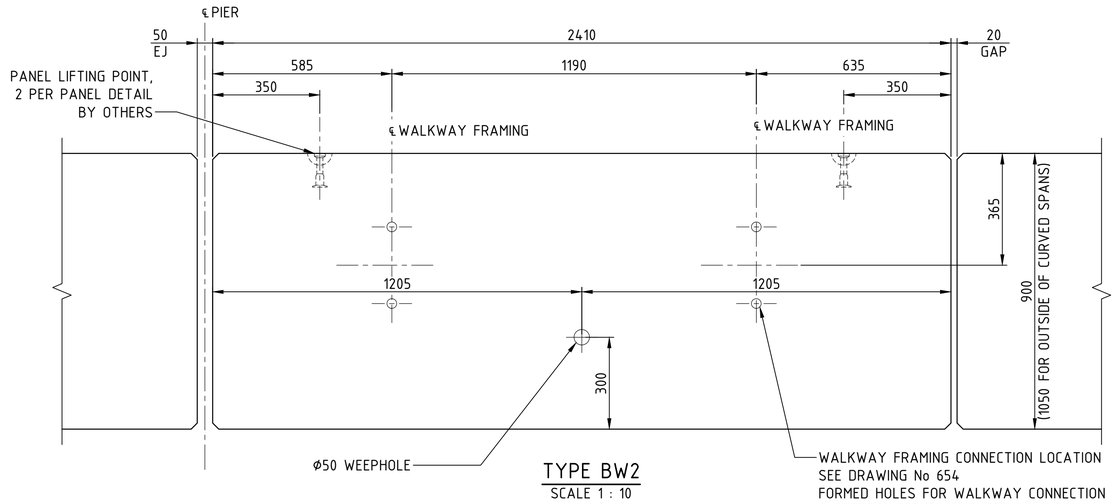
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 570.



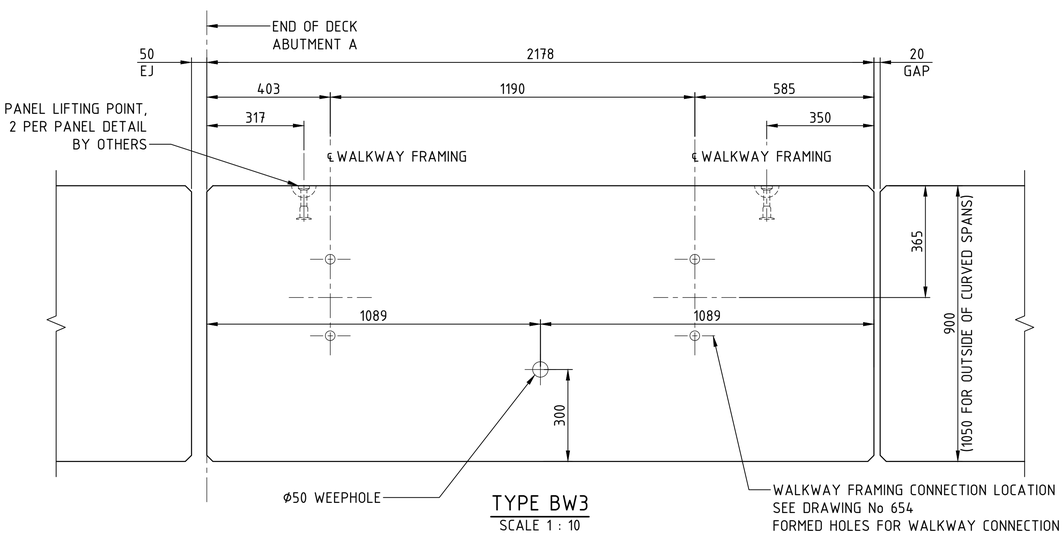
TYPE BW1
SCALE 1 : 10

NO WEEPJOLES TO BE FORMED IN BALLAST WALLS FOR SPAN 26 OVER KAMILAROI HIGHWAY ONLY.

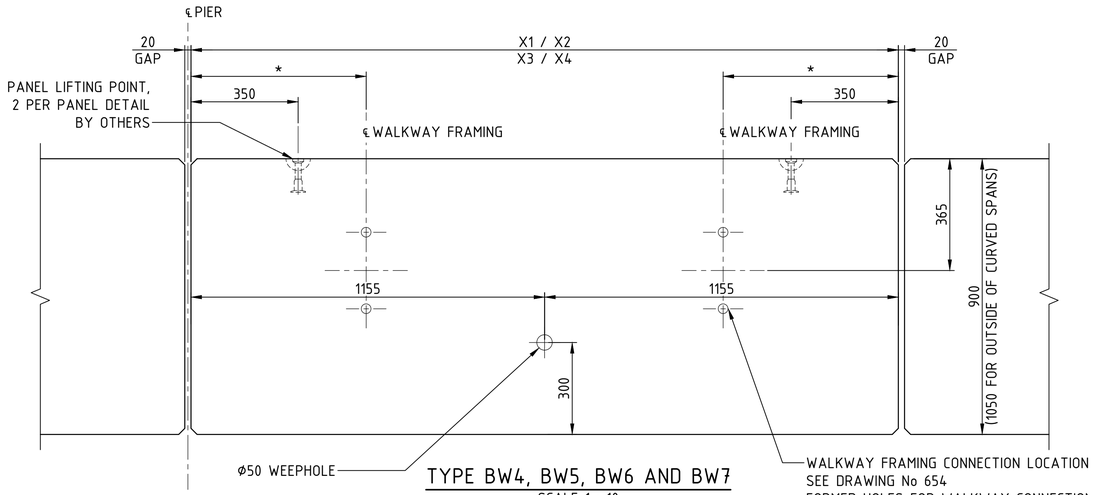


TYPE BW2
SCALE 1 : 10

NO WEEPJOLES TO BE FORMED IN BALLAST WALLS FOR SPAN 26 OVER KAMILAROI HIGHWAY ONLY.



TYPE BW3
SCALE 1 : 10



TYPE BW4, BW5, BW6 AND BW7
SCALE 1 : 10

FOR DIMENSIONS X1 TO X4 SEE TABLE-1 ON DRAWING No 570
* DENOTES DIMENSIONS SEE DRAWING No 650

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER PRECAST BALLAST WALL CONCRETE

SHEET C

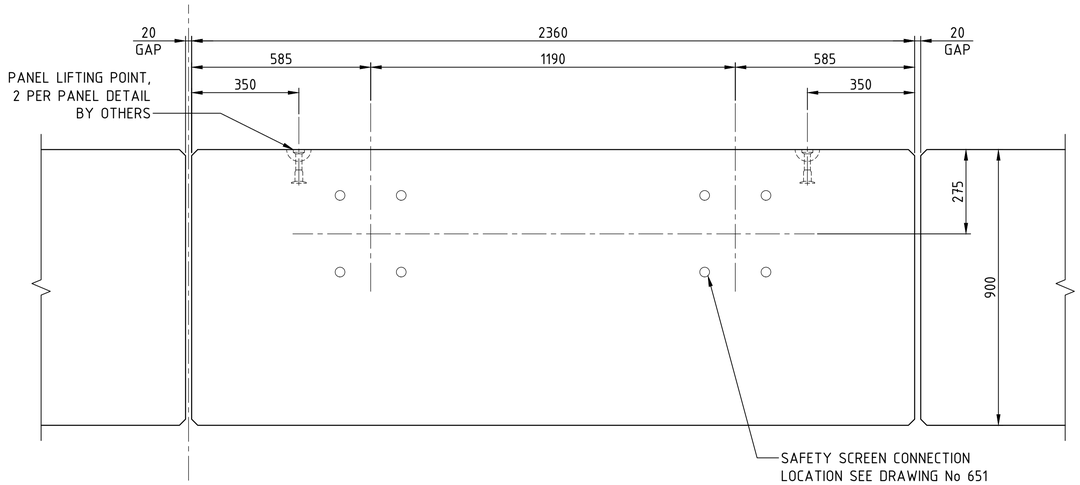
FILE No. BE22007-6670-DRG-BR-7572 | SHEET: 3 OF 4 | A1

STATUS: 100% DESIGN ©

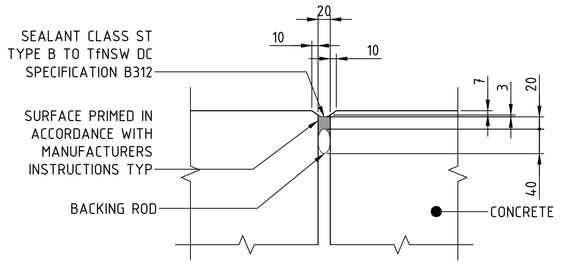
DRG No. BE22007-6670-DRG-BR-7572 | B | EDMS No. - | -

GENERAL NOTES

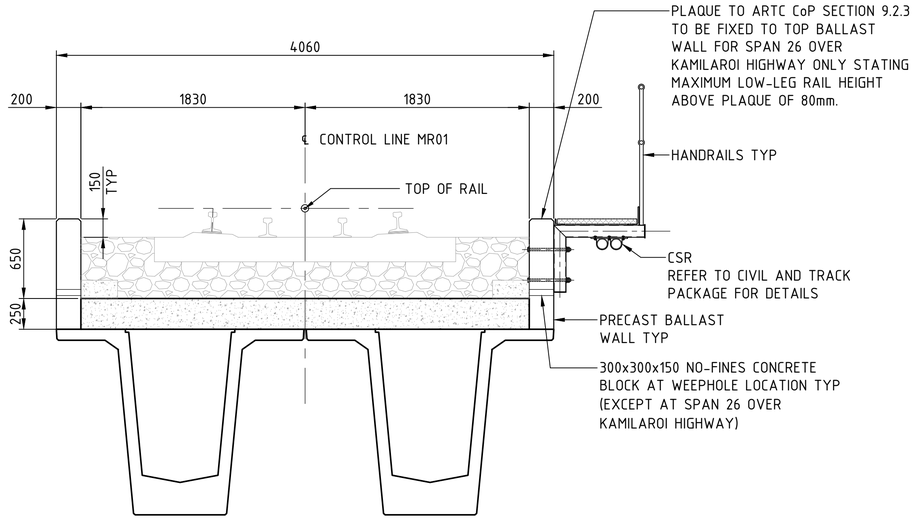
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 570.



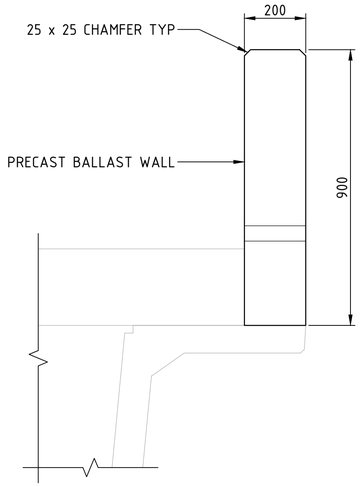
TYPE BW1 (SPAN 26 NORTH SIDE ONLY)
SCALE 1 : 10



TYPICAL JOINT SEAL BETWEEN BALLAST WALLS
APPLIED ON BOTH SIDES OF GAP BETWEEN PANELS
SCALE 1 : 5



SECTION 1 / 573
SCALE 1 : 25



TYPICAL PRECAST BALLAST WALL DETAILS
SCALE 1 : 10
HAND RAIL AND WALKWAY NOT SHOWN FOR CLARITY

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm
1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER PRECAST BALLAST WALL CONCRETE

SHEET D

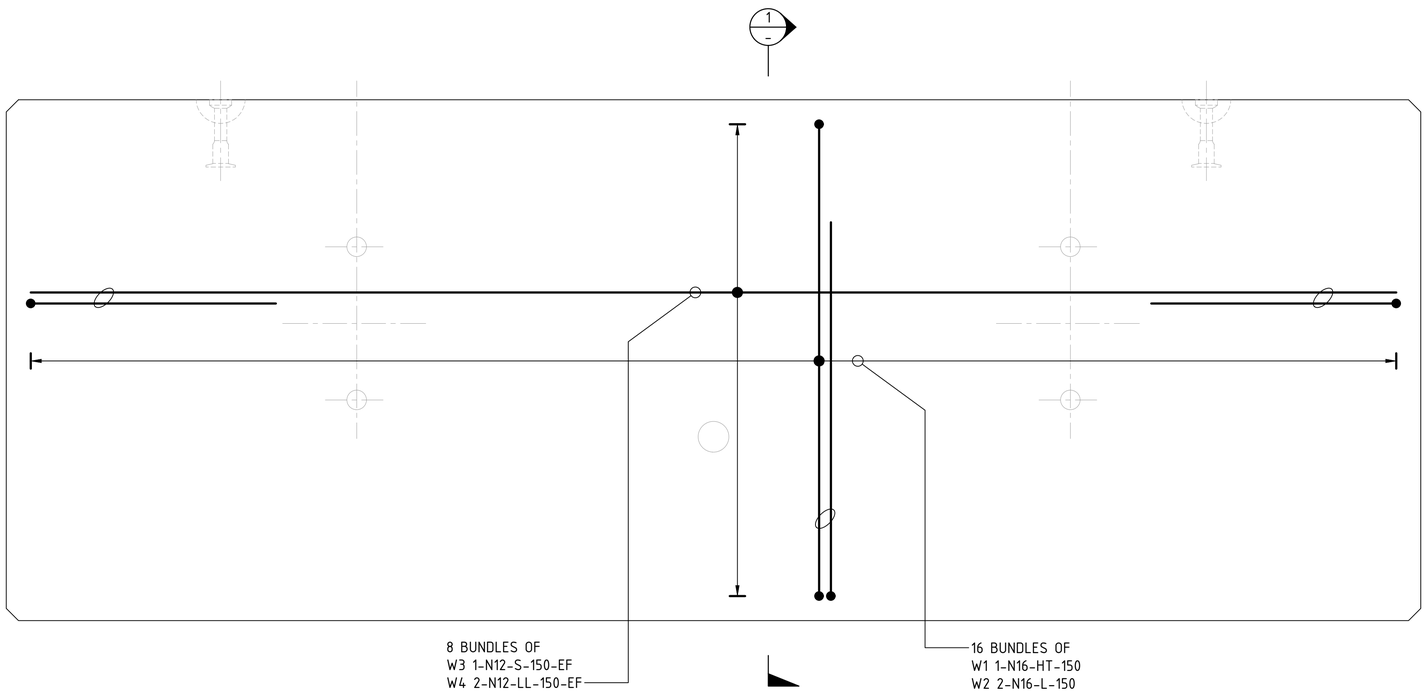
FILE No. BE22007-6670-DRG-BR-7573 | SHEET: 4 OF 4 | A1

STATUS: 100% DESIGN ©

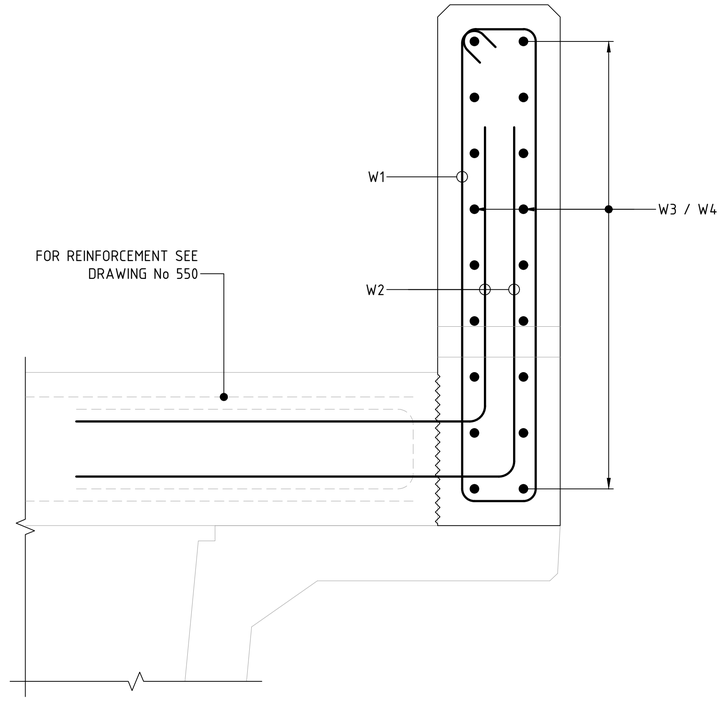
DRG No. BE22007-6670-DRG-BR-7573 | B | EDMS No. - | -

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 550.



TYPICAL REINFORCEMENT FOR PRECAST BALLAST WALL
SCALE 1 : 5



SECTION 1 / SCALE 1 : 5

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

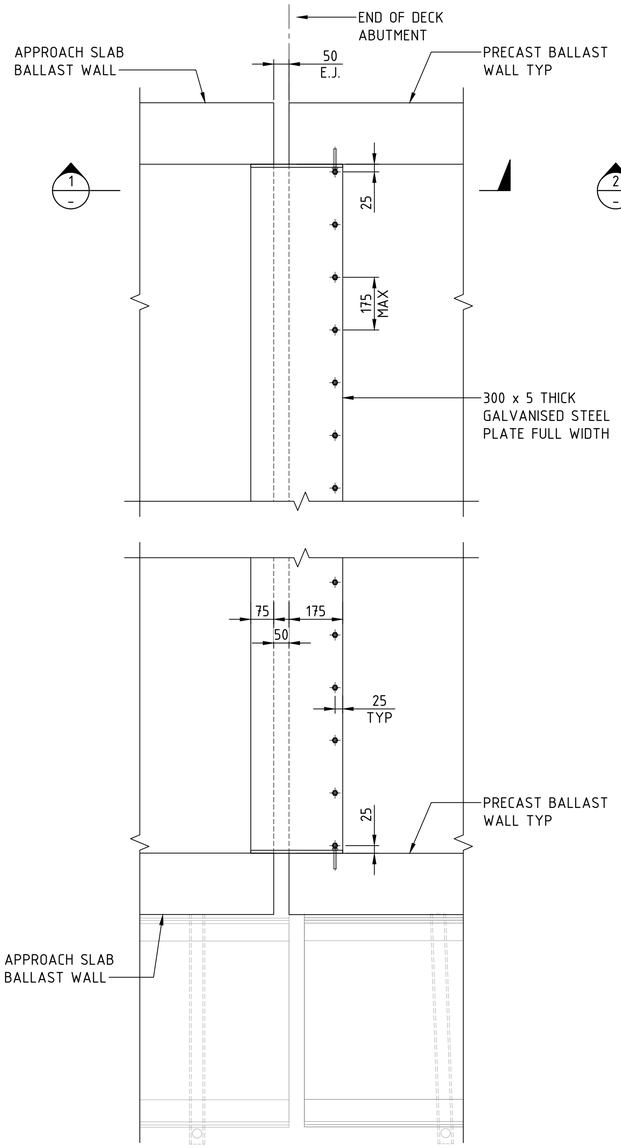
DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

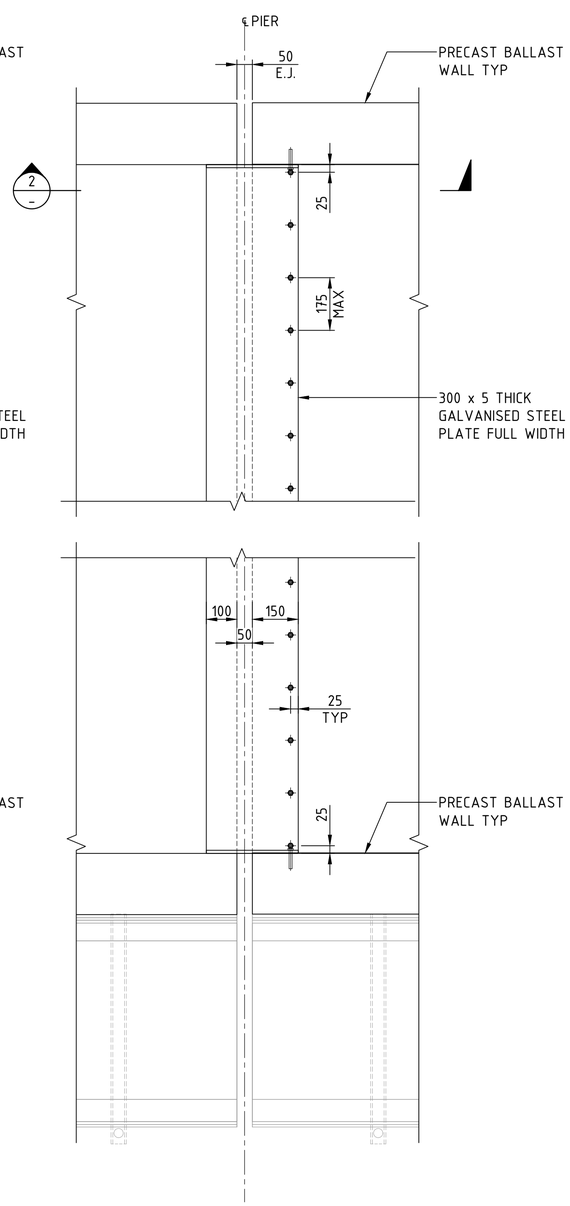
RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER PRECAST BALLAST WALL REINFORCEMENT

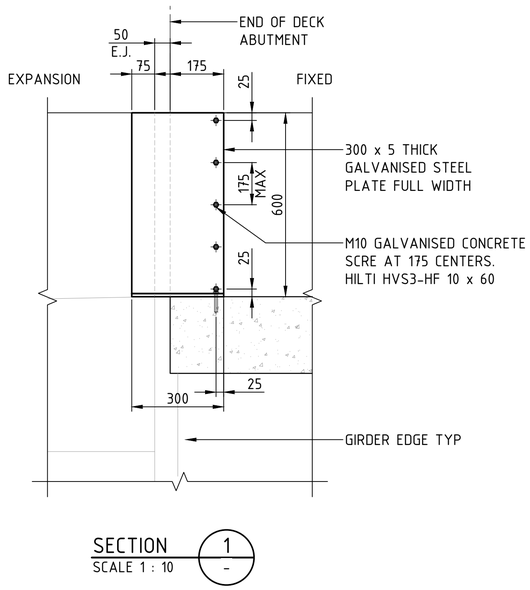
FILE No. BE22007-6670-DRG-BR-7575	SHEET: 1 OF 1	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-7575	B	EDMS No. -



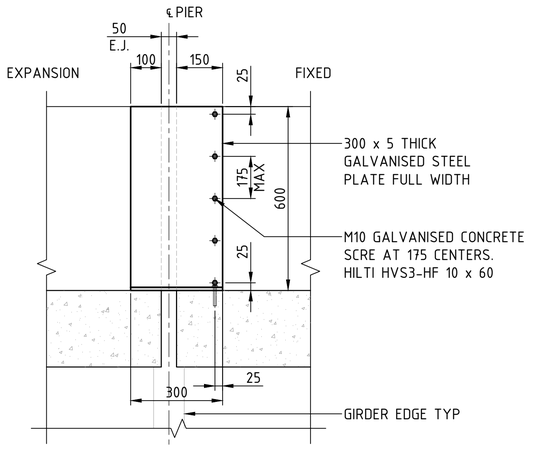
TYPICAL ABUTMENT COVER PLATE PLAN
SCALE 1 : 10



TYPICAL PIER COVER PLATE PLAN
SCALE 1 : 10



SECTION 1
SCALE 1 : 10



SECTION 2
SCALE 1 : 10

GENERAL NOTES

EXPANSION JOINT PLATE NOTES

COVER PLATE MUST BE FABRICATED FROM 10 THICK GRADE 250 GALVANIZED CHEQUER PLATE TO AS/NZS 3678-2016.
SLIDING PLATE MUST BE FABRICATED FROM 10 THICK GRADE 250 GALVANIZED PLATE TO AS/NZS 2678-2016.
CROSS SECTION DIMENSIONS ARE GIVEN TO OUTSIDE SURFACE OF PLATE.
STAINLESS STEEL FERRULES MUST BE GRADE 316 IN ACCORDANCE WITH ASTM A276.
STAINLESS STEEL COUNTERSUNK HEAD SCREWS MUST BE GRADE 316 IN ACCORDANCE WITH ASTM A879.
ALL FASTENER MUST CONFORM TO THE REQUIREMENTS OF TfNSW SPECIFICATION D&C B240.
AFTER FABRICATION ALL EXPOSED STEELWORK EXCEPT STAINLESS STEEL ITEMS MUST BE PROTECTED WITH A HDG600 COATING SYSTEM IN ACCORDANCE WITH AS/NZS4680 AND TfNSW SPECIFICATION D&C B220.
EDGES TO BE PROTECTIVE TREATED MUST BE ROUNDED TO A RADIUS OF 2 UNLESS SPECIFIED OTHERWISE.

1:10 @ A1 0 100 200 300 400 500 mm

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

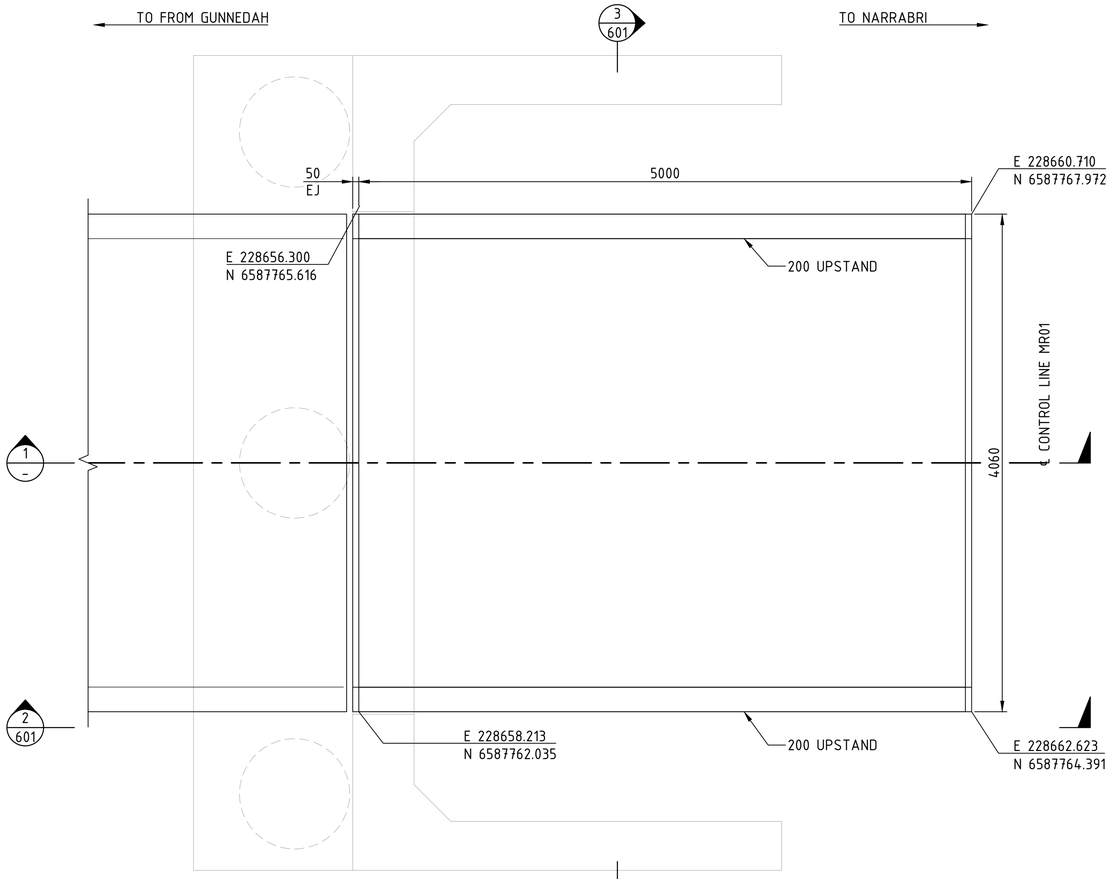
DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

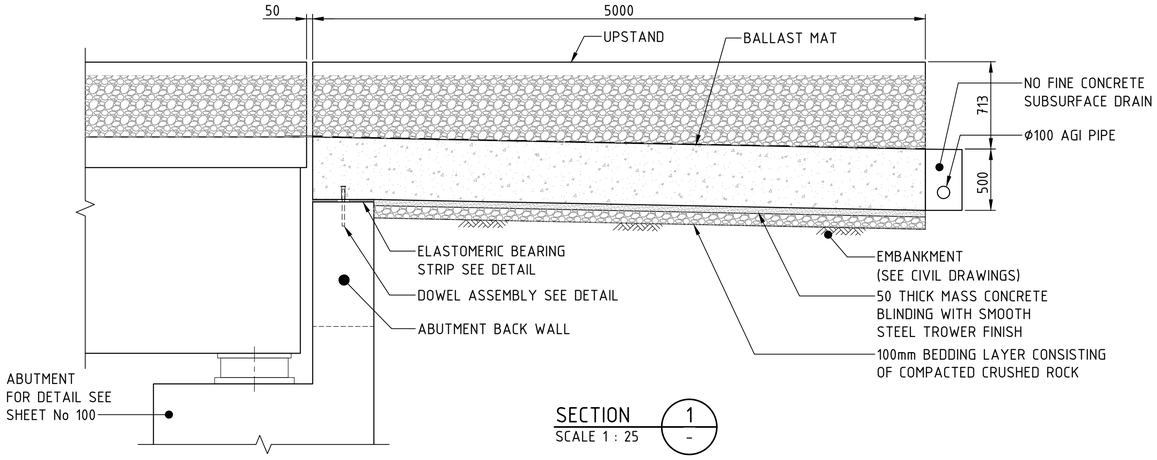
RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER EXPANSION JOINT COVER PLATE DETAILS

FILE No. BE22007-6670-DRG-BR-7580 | SHEET: 1 OF 1 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7580 | B | EDMS No. - | -



ABUTMENT 'B' APPROACH SLAB PLAN
SCALE 1 : 25



SECTION 1 / –
SCALE 1 : 25

GENERAL NOTES

CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 40MPa.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF MASS CONCRETE SHALL BE 20MPa.
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
EDGES SHALL BE CHAMFERED 20 x 20 AND RE-ENTRANT ANGLES FILLETED 20 x 20 UNLESS SPECIFIED OTHERWISE.

REINFORCEMENT NOTES

REINFORCEMENT SHALL BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 45mm UNLESS SPECIFIED OTHERWISE.
REQUIRED COVER IS BASED ON A MINIMUM OF 7 DAYS EFFECTIVE, CONTINIOUS AND UNINTERUPTED WET OR SEALED CURING IN ACCORDANCE WITH AS5100.5.
WHERE CURING COMPOUNDS ARE PROPOSED, THE COVER MUST BE INCREASED BY 5mm FOR CLASSIFICATION B1. CURING COMPOUNDS ARE NOT PERMITTED.
UNLESS OTHERWISE SHOWN ON THE DRAWINGS, LAPS ON ADJACENT BARS ON ANY FACE SHALL BE STAGGERED (OFFSET) BY NO LESS THAN THE LAP LENGTH.
UNLESS OTHERWISE SPECIFIED, THE MINIMUM LENGTHS OF LAPS SHALL BE:

BAR SIZE: mm	N12	N16	N20	N24	N28	N32	N36	N40
a) HORIZONTAL BARS WITH>300mm OF CONCRETE CAST BELOW THE BAR:	500	750	1050	1350	1700	2050	2450	2800
b) OTHER BARS:	350	600	800	1050	1300	1600	1900	2150

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3 x THE BAR DIAMETER.

REINFORCEMENT NOTES

REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR GALVANISED STEEL DOWELS AND EXPANSION JOINT ANCHOR BOLTS.
WHERE SPLICE LOCATIONS ARE DETAILED ON THE DRAWINGS. THE CONTRACTOR MUST SEEK APPROVAL FROM THE DESIGN ENGINEER TO SPLICE AT ALTERNATE LOCATIONS. WHERE BARS ARE DETAILED WITHOUT LAPS AND THE BARS LENGTH DICTATES THAT LAPS ARE REQUIRED. THE CONTRACTOR MAY ADOPT LAP LOCATIONS AS REQUIRED TO ENSURE MINIMUM LAP LENGTHS ARE ACHIEVED.
PLACEMENT OF TOP AND BOTTOM REINFORCEMENT LAYERS ARE TO BE ALIGNED

EF DENOTES EACH FACE.
FF DENOTES FAR FACE.
NF DENOTES NEAR FACE.
NTS DENOTES NOT TO SCALE.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

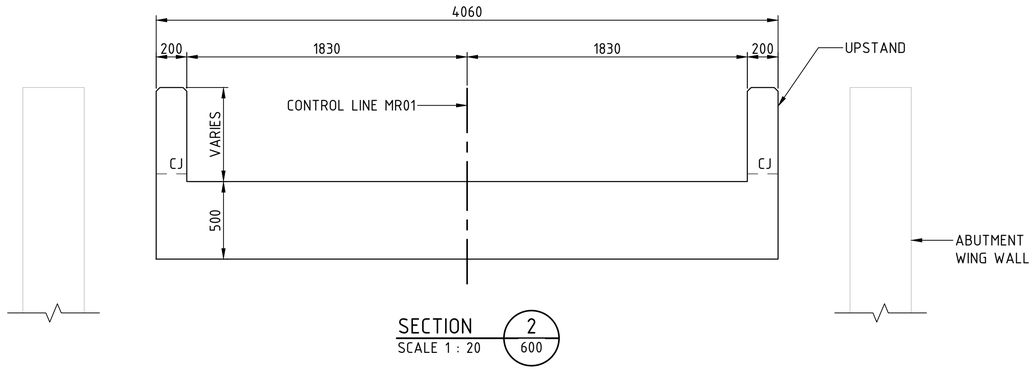
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

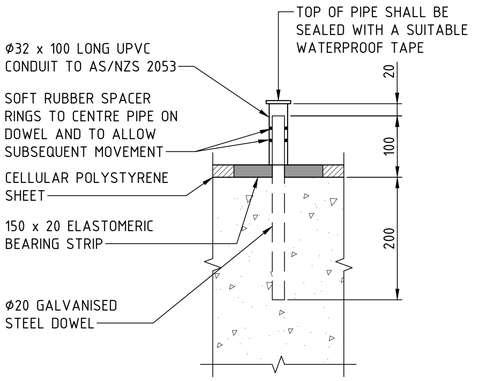
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
APPROACH SLAB
SHEET A

FILE No. BE22007-6670-DRG-BR-7600 | SHEET: 1 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7600 | B | EDMS No. - | -



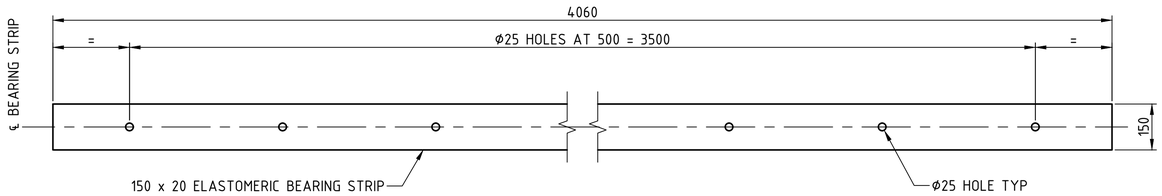
SECTION 2 / 600
SCALE 1 : 20



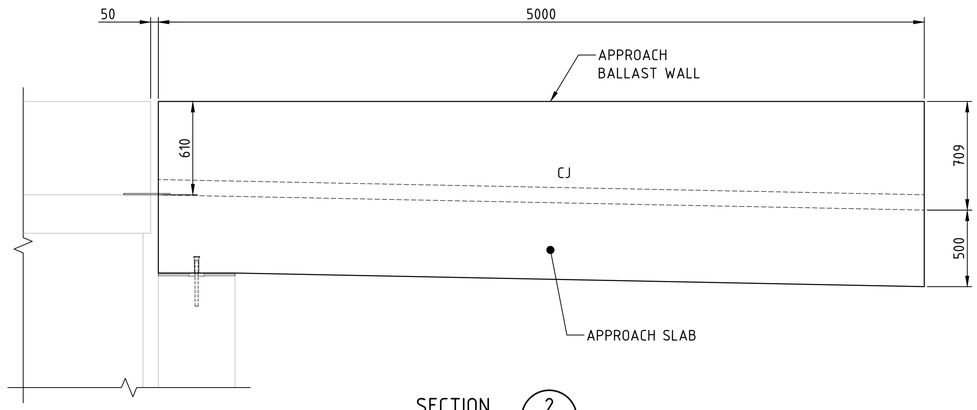
DOWEL ASSEMBLY
SCALE 1 : 5

A SUITABLE ALTERNATIVE TYPE OF DOWEL CAP MAY BE USED
14 NO REQUIRED

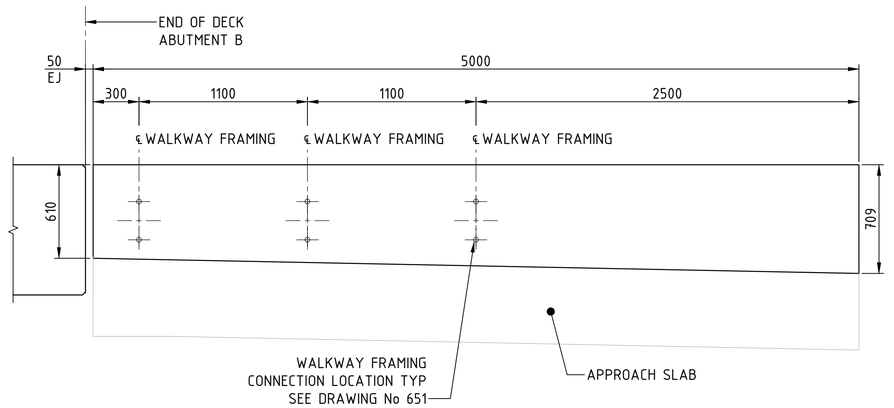
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 600.



TYPICAL ELASTOMERIC BEARING STRIP
SCALE 1 : 10
2 No REQUIRED



SECTION 2 / 600
SCALE 1 : 20



APPROACH BALLAST WALL DETAIL
AT ABUTMENT B SIDE
SCALE 1 : 20

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm
1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

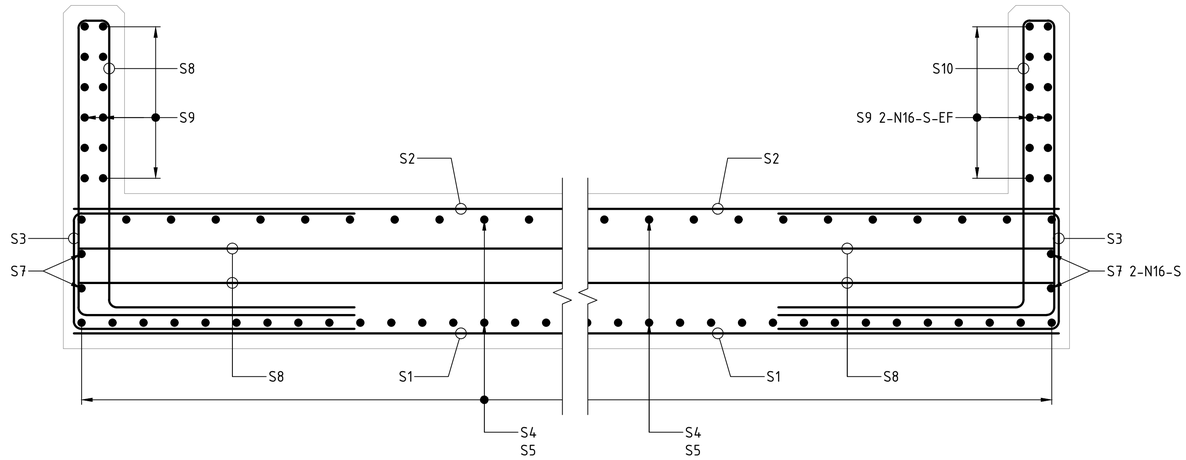
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER APPROACH SLAB

SHEET B

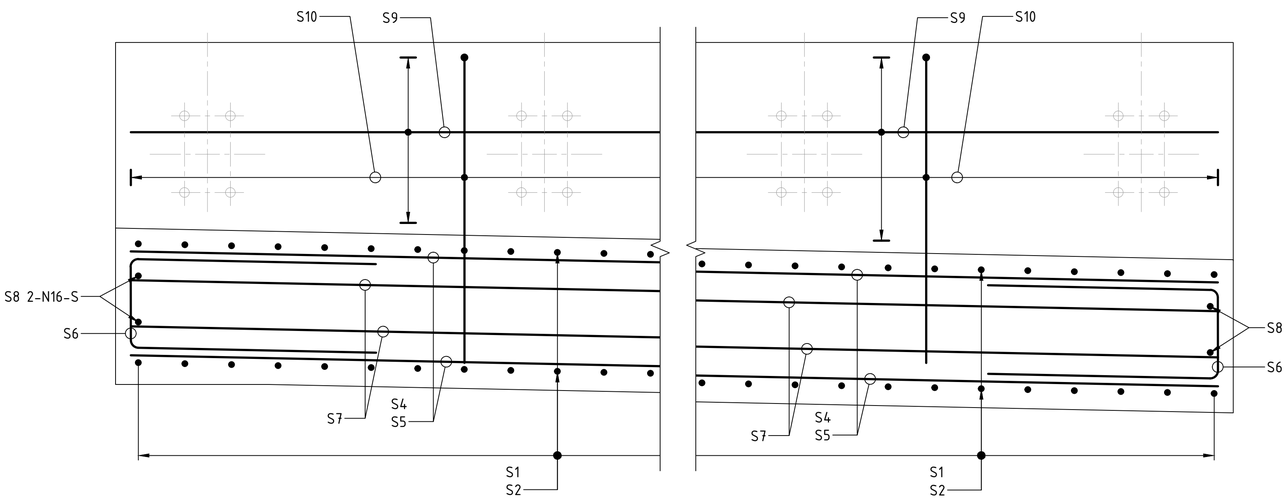
FILE No. BE22007-6670-DRG-BR-7601 | SHEET: 2 OF 2 | A1

STATUS: 100% DESIGN ©

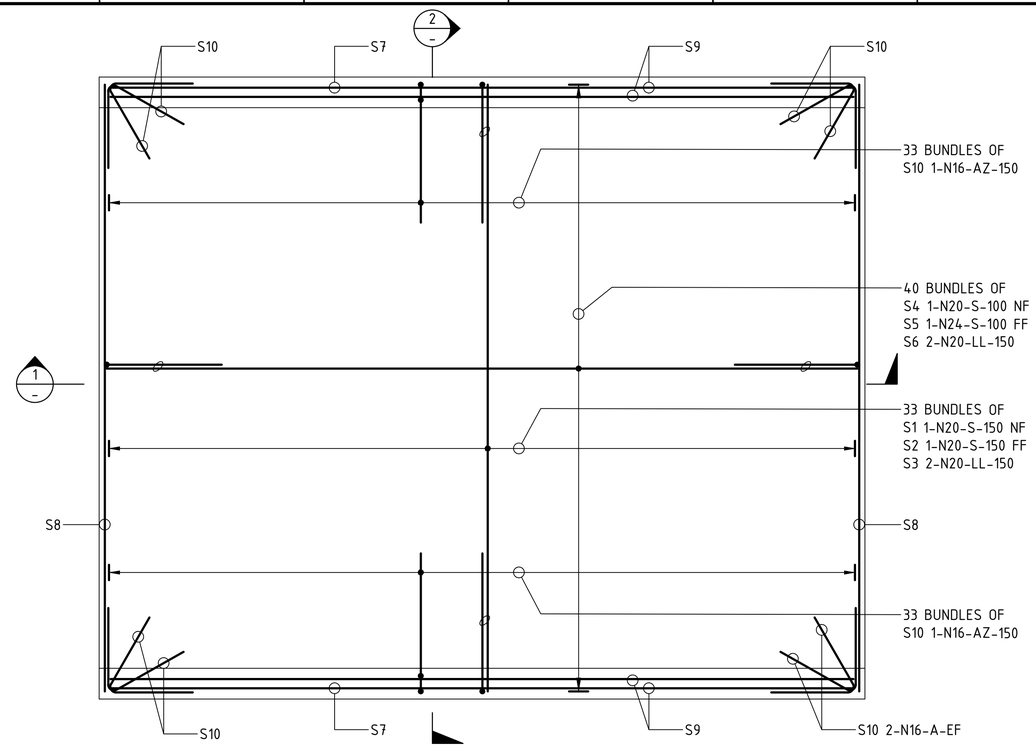
DRG No. BE22007-6670-DRG-BR-7601 | B | EDMS No. - | -



SECTION 2 / SCALE 1 : 10



SECTION 1 / SCALE 1 : 10



ABUTMENT B APPROACH SLAB REINFORCEMENT PLAN
SCALE 1 : 20

GENERAL NOTES

CONCRETE EXPOSURE CLASSIFICATION: B1
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 40MPa
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF MASS CONCRETE SHALL BE 20MPa
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
EDGES SHALL BE CHAMFERED 20 x 20 AND RE-ENTRANT ANGLES FILLETED 20 x 20 UNLESS SPECIFIED OTHERWISE.
REINFORCEMENT SHALL BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671
REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE:
BASE OF APPROACH SLAB - 75mm
ALL OTHER SIDES - 45mm
REQUIRED COVER ARE BASED ON A MINIMUM OF 7 DAYS EFFECTIVE, CONTINUOUS AND UNINTERRUPTED WET CURING IN ACCORDANCE WITH AS 5100.5 AND TfNSW SPECIFICATION D&C B80. CURING COMPOUNDS SHALL NOT BE USED.
UNLESS OTHERWISE SPECIFIED, THE MINIMUM LENGTH OF LAPS SHALL BE

BAR SIZE	N12	N16	N20	N24	N28	N32	N36	N40
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR	450	650	950	1250	1600	1950	2350	2750
b) OTHER BARS:	350	500	750	950	1250	1500	1800	2150

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3 x THE BAR DIAMETER
REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR STAINLESS STEEL DOWELS AND EXPANSION JOINT ANCHOR BOLTS.
TOP AND BOTTOM REINFORCEMENT MATS SHALL BE ALIGNED, TO FACILITATE FUTURE CORING/JACKING.
EF - DENOTES EACH FACE
FF - DENOTES FAR FACE
NF - DENOTES NEAR FACE
LV - DENOTES VARIABLE LENGTH BAR
* - DENOTES RL's GIVEN TO TOP OF APPROACH SLAB UPSTAND

SEALANT JOINTS

ALL SEALANTS SHALL BE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B312.
CELLULAR POLYSTYRENE SHEET SHALL BE CLASS H IN ACCORDANCE WITH AS1366.3
COLOUR CODED, SELF ADHESIVE PRESSURE SENSITIVE TAPES MADE FROM NON-STICKING MATERIAL SUCH AS TEFLON OR POLYETHYLENE OR NEOPRENE SHALL BE USED AS BOND BREAKERS.
BACKING RODS SHALL BE NON-ABSORBENT, CLOSED CELL POLYSTYRENE OR NEOPRENE (PARBURY'S EXPANDAFORM BACKER ROD OR APPROVED EQUIVALENT) INSTALLED WITH 25% COMPRESSION.
SEALANT SHALL BE APPLIED AS PER MATERIAL SPECIFICATION.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm
1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

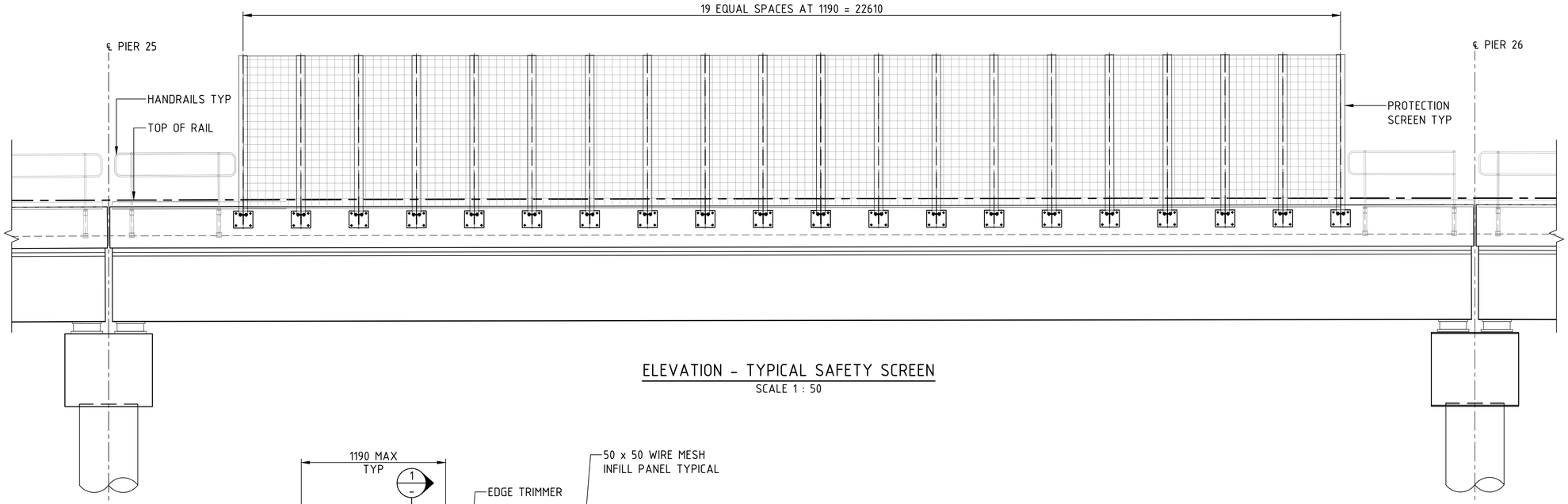
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

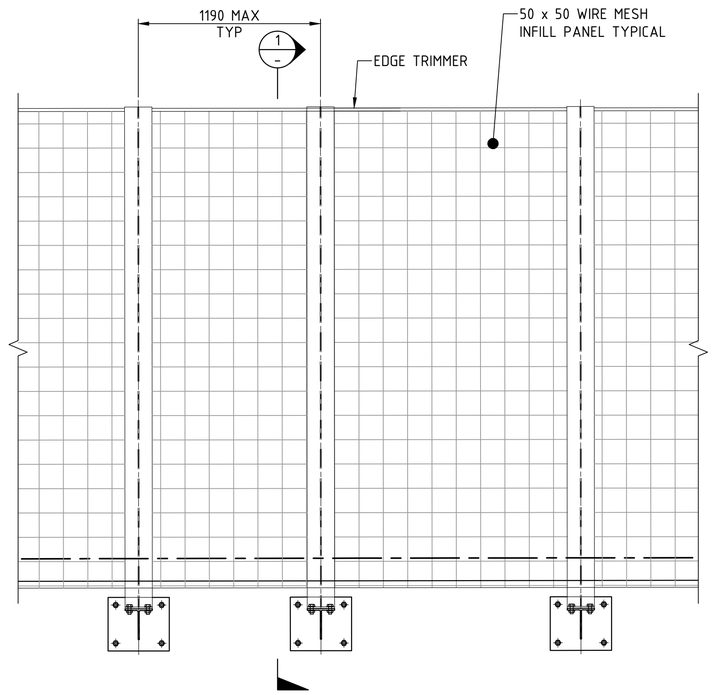
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER
APPROACH SLAB REINFORCEMENT

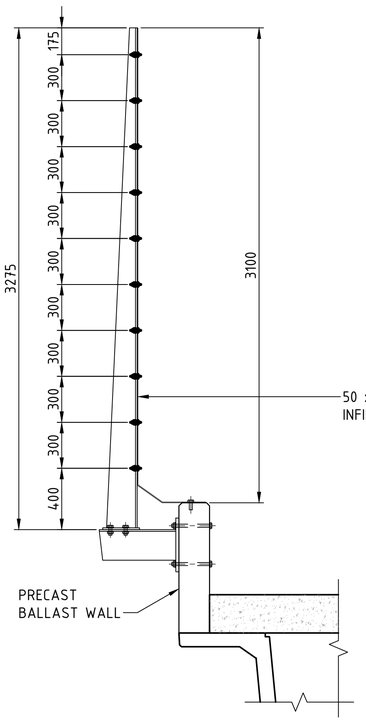
FILE No. BE22007-6670-DRG-BR-7610 | SHEET: 1 OF 1 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-7610 | B | EDMS No. - | -



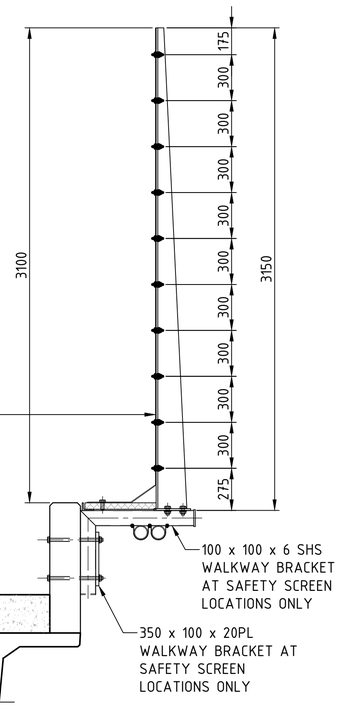
ELEVATION - TYPICAL SAFETY SCREEN
SCALE 1 : 50



ELEVATION - TYPICAL SAFETY SCREEN
SCALE 1 : 20



SECTION 1/-
SCALE 1 : 20



CONNECTION AT WALKWAY
SCALE 1 : 20

GENERAL NOTES

HOT ROLLED SECTIONS SHALL CONFORM TO AS/NZS 3679.1, GRADE 300.
HOLLOW SECTIONS SHALL CONFORM TO AS/NZS 1163, GRADE 300.
STEEL PLATE SHALL CONFORM TO AS/NZS 3678, GRADE 250.
DIMENSIONS AND SHAPE FOR CUP HEAD BOLTS SHALL BE IN ACCORDANCE WITH AS/NZS 1390.
HIGH STRENGTH STEEL CUP HEAD BOLTS FOR STRUCTURAL ENGINEERING SHALL BE PROPERTY CLASS 8.8 WITH MECHANICAL PROPERTIES IN ACCORDANCE WITH AS/NZS 1252 AND SHALL BE MARKED DURING MANUFACTURE TO DESIGNATE THEM AS HIGH STRENGTH STEEL BOLTS.
HIGH STRENGTH STEEL NUTS SHALL BE PROPERTY CLASS 8 TO AS/NZS 1252.
BOLTING CATEGORY FOR HIGH STRENGTH STEEL BOLTS SHALL BE 8.8/S IN ACCORDANCE WITH AS 5100.6.
STEEL WASHERS SHALL CONFORM TO AS 1237.1, PRODUCT GRADE A.
OVERSIZED WASHERS SHALL BE USED TO FULLY COVER THE SLOTTED HOLES IN THE BASE PLATE.
ALL STEEL COMPONENTS TO SAFETY SCREENS SHALL BE HOT-DIP GALVANISED AFTER FABRICATION IN ACCORDANCE WITH TfNSW D&C SPECIFICATION B220.
BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANISED IN ACCORDANCE WITH AS 1214.
ALL WELDING SHALL CONFORM TO AS/NZS 1554.1
THE WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS/NZS 1554.1.
WELDING SYMBOLS TO COMPLY WITH AS 1101.3.
EDGED TO BE PROTECTIVE TREATED SHALL BE ROUNDED TO A RADIUS OF
1.5 mm UNLESS SPECIFIED OTHERWISE.
STEEL MESH PANELS TO BE ϕ4 mm GALVANISED WIRE AT 50 x 50 SPACING.
DAMAGED GALVANISED SURFACES SHALL BE RENOVATED IN ACCORDANCE WITH TfNSW D&C SPECIFICATION B220.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm
1:20 @ A1 0 200 400 600 800 1000 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

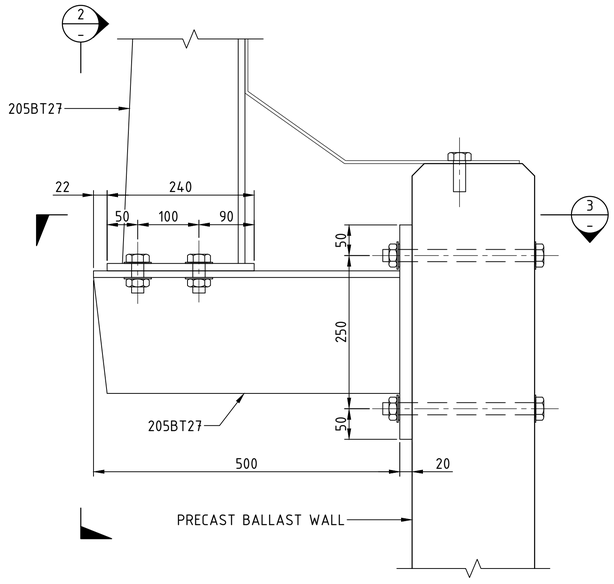
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER SAFETY SCREENS

SHEET A

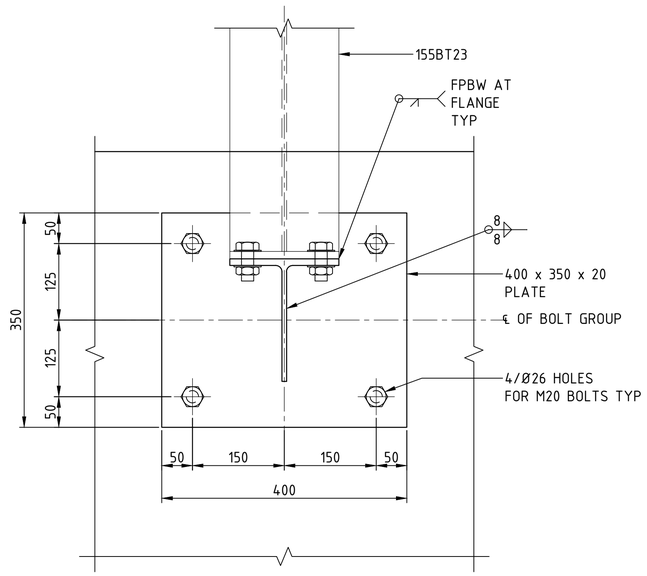
FILE No. BE22007-6670-DWG-BR-7650 | SHEET: 1 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DWG-BR-7650 | B | EDMS No. - | -

GENERAL NOTES

FOR OTHER GENERAL NOTES RELATING TO THIS SHEET, SEE SHEET No 650.

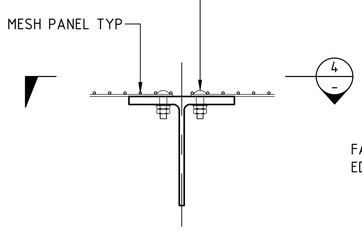


TYPICAL POST CONNECTION DETAIL
SCALE 1 : 5

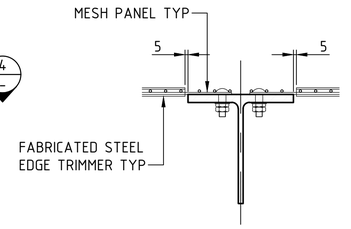


SECTION 2 - SCALE 1 : 5

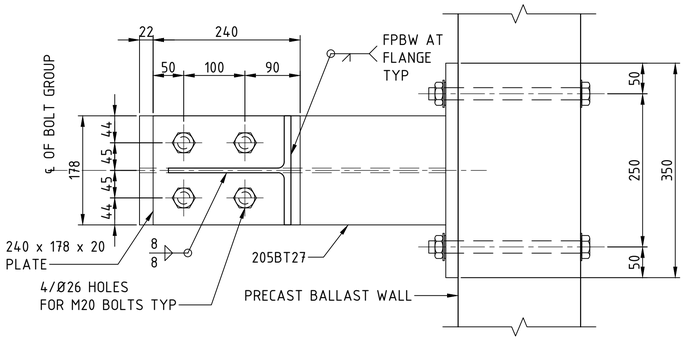
MESH PANELS FIXED TO POSTS WITH M6 x 30 LONG PROPERTY CLASS 4.6/S CUP HEAD BOLT AND LOCK NUT AT 300 MAX CTRS. FINGER TIGHTEN NUT THEN RELEASE HALF-TURN BEFORE SECURING LOCK NUT.



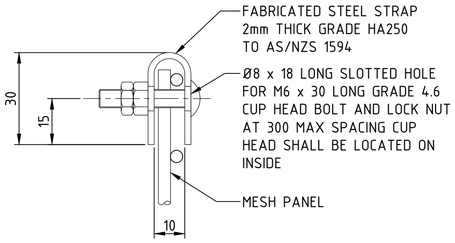
TYPICAL MESH CONNECTION AT POST DETAIL
SCALE 1 : 5



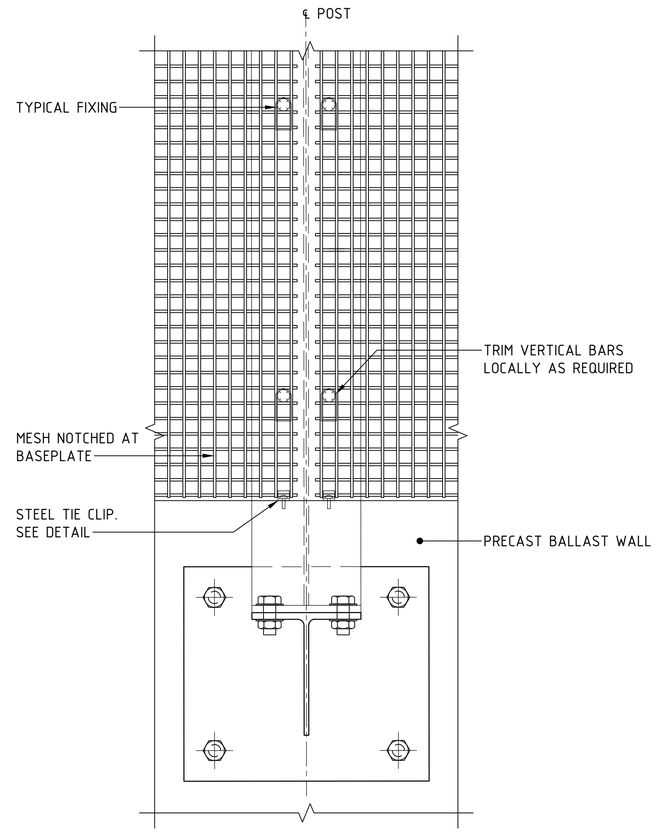
EDGE TRIMMER CONNECTION AT POST DETAILS
SCALE 1 : 5



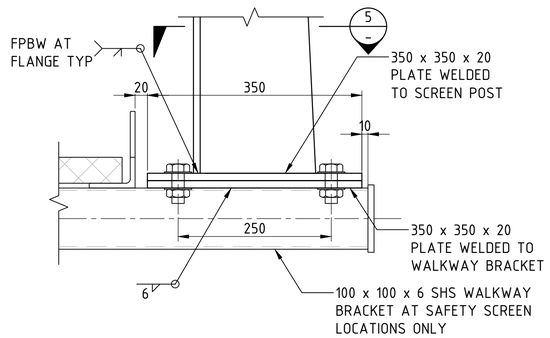
SECTION 3 - SCALE 1 : 5



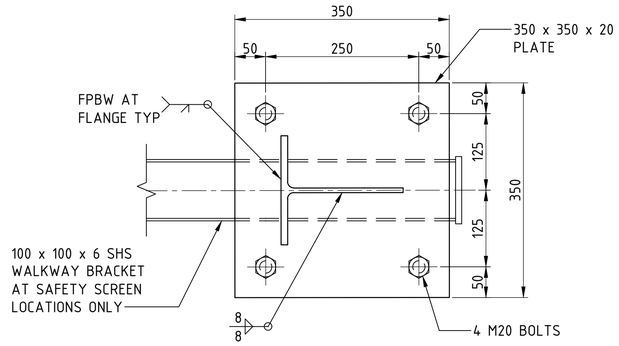
EDGE TRIMMER
SCALE 1 : 1



VIEW 4 - SCALE 1 : 5



POST CONNECTION DETAIL ON WALKWAY SIDE
SCALE 1 : 5



SECTION 5 - SCALE 1 : 5

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

1:1 @ A1 0 10 20 30 40 50 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

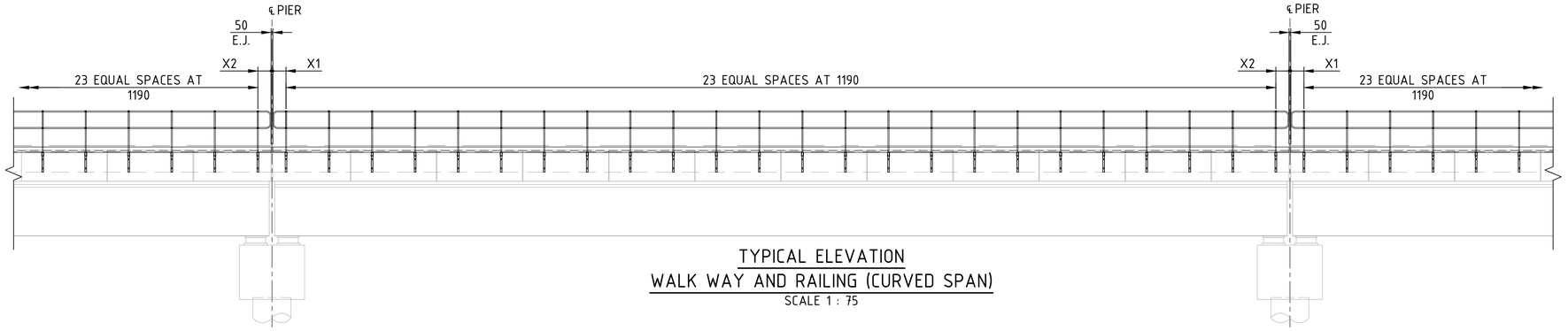
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

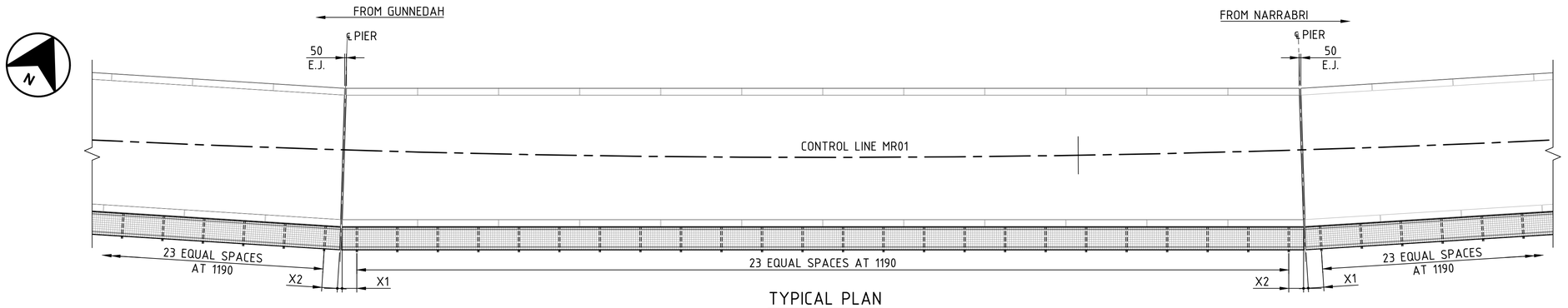
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER SAFETY SCREENS

SHEET B

FILE No. BE22007-6670-DWG-BR-7651	SHEET: 2 OF 2	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DWG-BR-7651	B	EDMS No. -



TYPICAL ELEVATION
WALK WAY AND RAILING (CURVED SPAN)
SCALE 1 : 75



TYPICAL PLAN
WALK WAY AND RAILING (CURVED SPAN)
SCALE 1 : 75

TABLE 1 - CURVED SPANS HANDRAIL

LOCATION	HANDRAIL EDGE DIMENSIONS (mm)	
	X1	X2
SPAN 29	360	355
SPAN 30	312	309
SPAN 31	312	312
SPAN 32	312	312
SPAN 33	312	312
SPAN 34	312	312
SPAN 35	365	365
SPAN 45	377	372
SPAN 46	406	401
SPAN 47	432	427
SPAN 48	433	435
SPAN 50	433	435
SPAN 51	433	435
SPAN 52	433	435
SPAN 53	433	435
SPAN 54	433	435
SPAN 55	433	435
SPAN 56	433	435
SPAN 57	434	416
SPAN 58	420	371
SPAN 59	370	365

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 650.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:75 @ A1 0 0.75 1.5 2.25 3 3.75 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

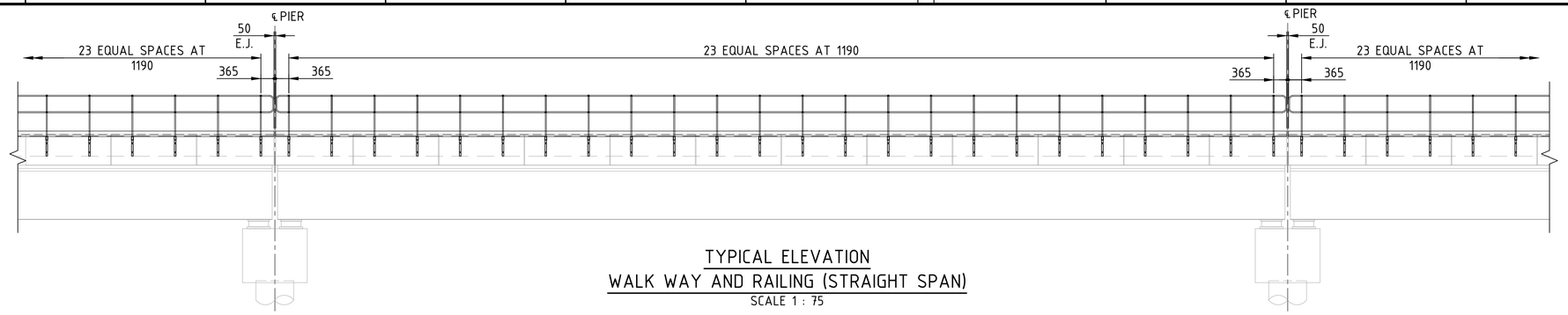
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER WALKWAY AND HANDRAIL DETAILS

SHEET A

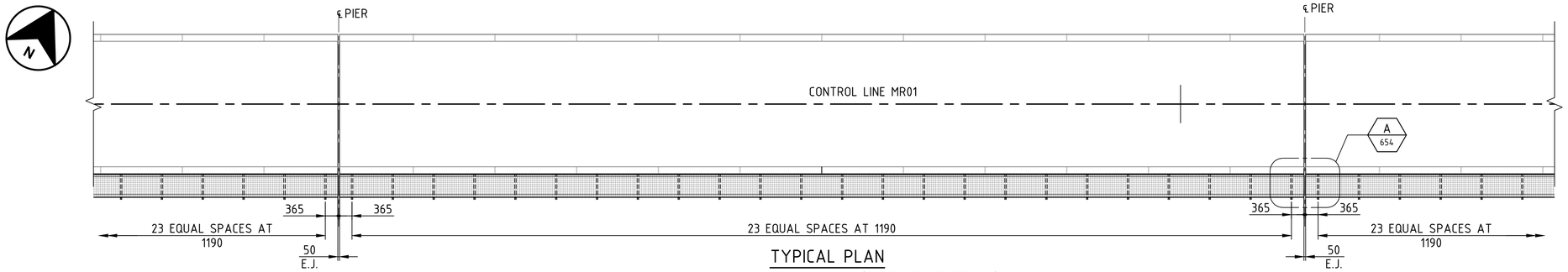
FILE No. BE22007-6670-DRG-BR-7652 | SHEET: 1 OF 5 | A1

STATUS: 100% DESIGN ©

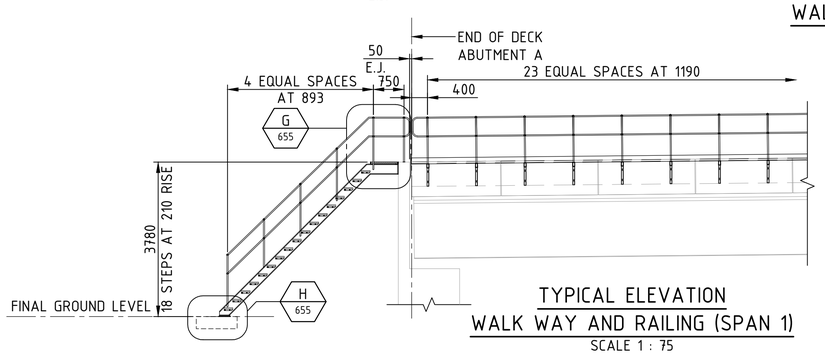
DRG No. BE22007-6670-DRG-BR-7652 | B | EDMS No. - | -



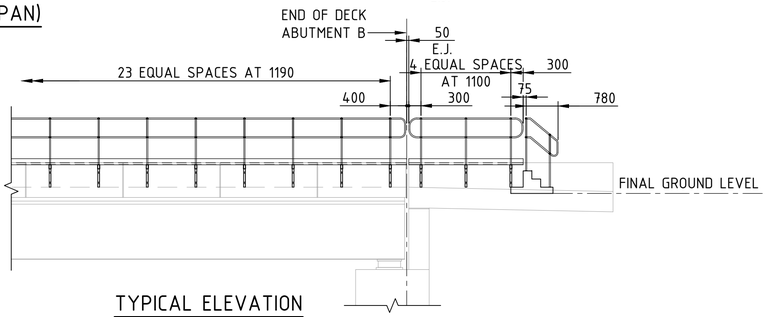
TYPICAL ELEVATION
WALK WAY AND RAILING (STRAIGHT SPAN)
SCALE 1 : 75



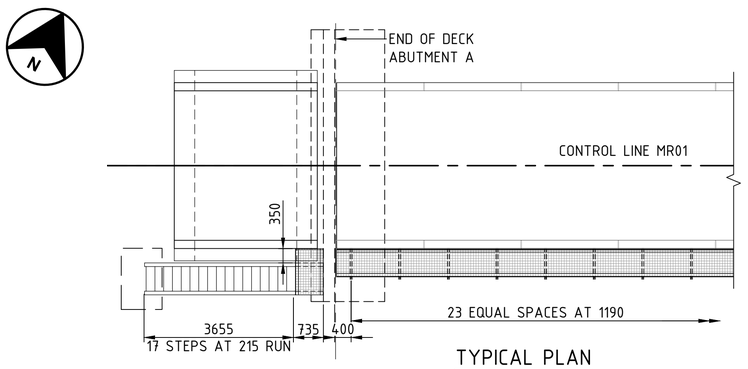
TYPICAL PLAN
WALK WAY AND RAILING (STRAIGHT SPAN)
SCALE 1 : 75



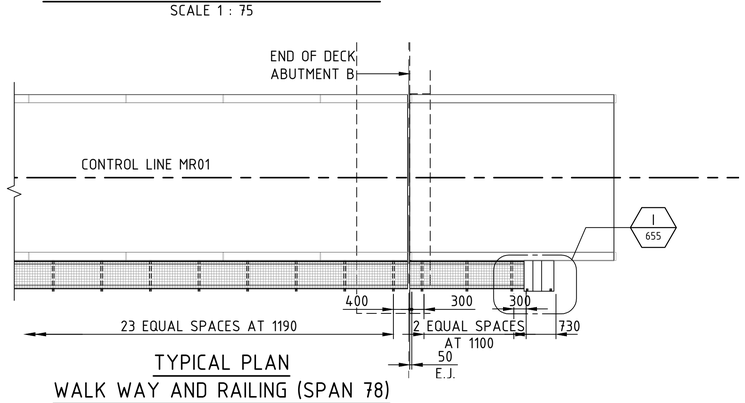
TYPICAL ELEVATION
WALK WAY AND RAILING (SPAN 1)
SCALE 1 : 75



TYPICAL ELEVATION
WALK WAY AND RAILING (SPAN 78)
SCALE 1 : 75



TYPICAL PLAN
WALK WAY AND RAILING (SPAN 1)
SCALE 1 : 75



TYPICAL PLAN
WALK WAY AND RAILING (SPAN 78)
SCALE 1 : 75

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:75 @ A1 0 0.75 1.5 2.25 3 3.75 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER WALKWAY AND HANDRAIL DETAILS

SHEET B

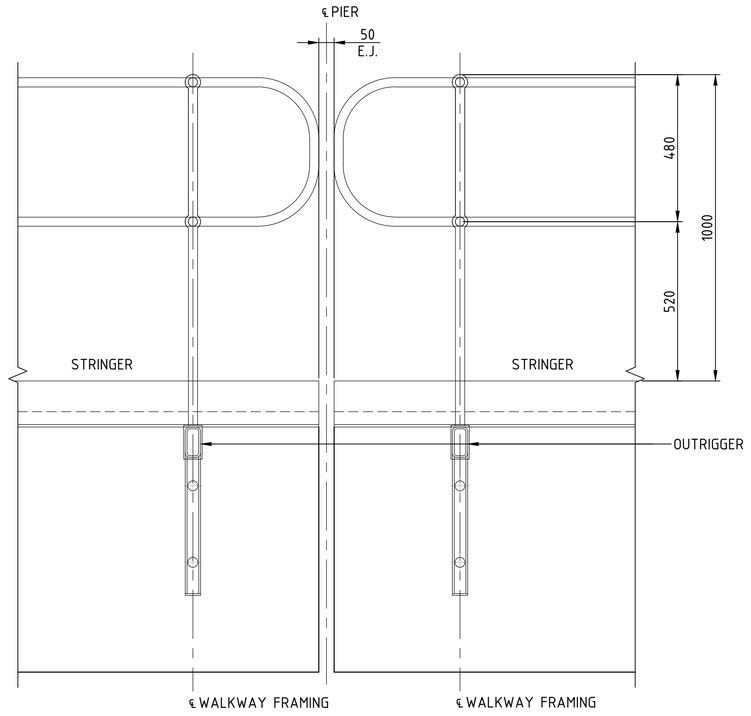
FILE No. BE22007-6670-DRG-BR-7653 | SHEET: 2 OF 5 | A1

STATUS: 85% DESIGN ©

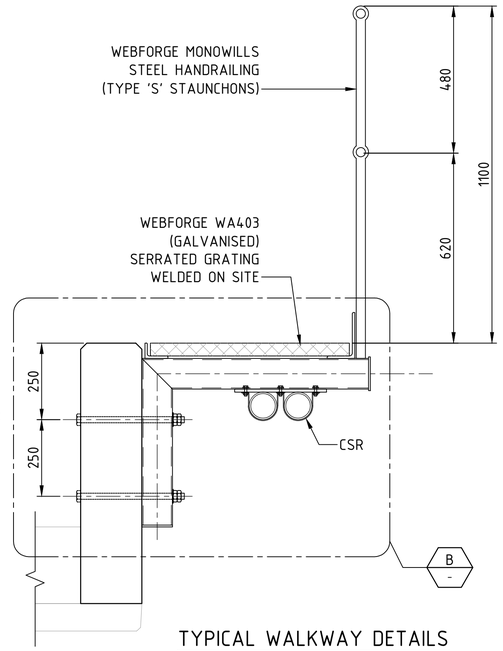
DRG No. BE22007-6670-DRG-BR-7653 | B | EDMS No. - | -

GENERAL NOTES

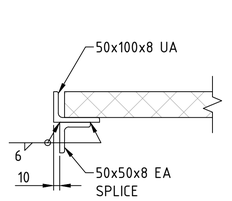
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 650.



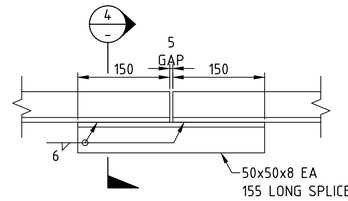
SECTION 1
SCALE 1 : 10



TYPICAL WALKWAY DETAILS
SCALE 1 : 10



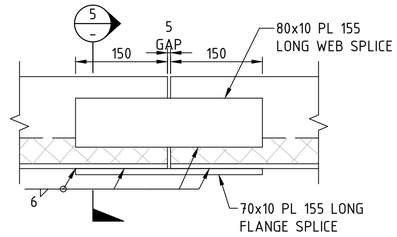
SECTION 4
SCALE 1 : 5



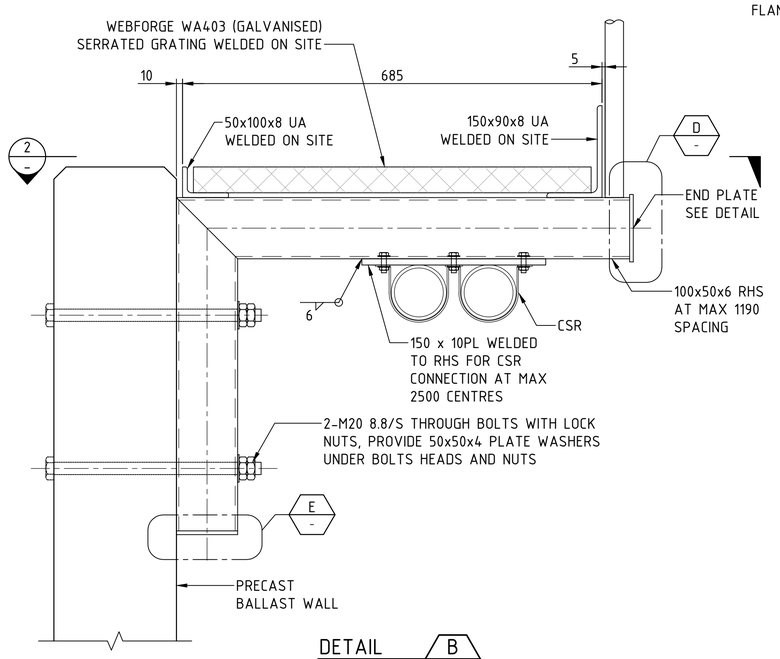
INNER STRINGER SPLICE DETAILS
SCALE 1 : 5

GENERAL NOTES

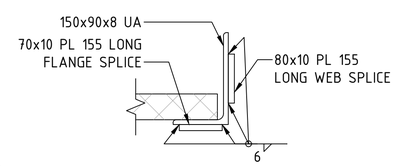
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 650



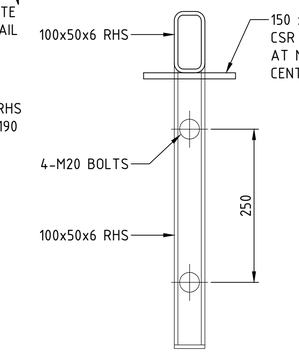
OUTER STRINGER SPLICE DETAILS
SCALE 1 : 5



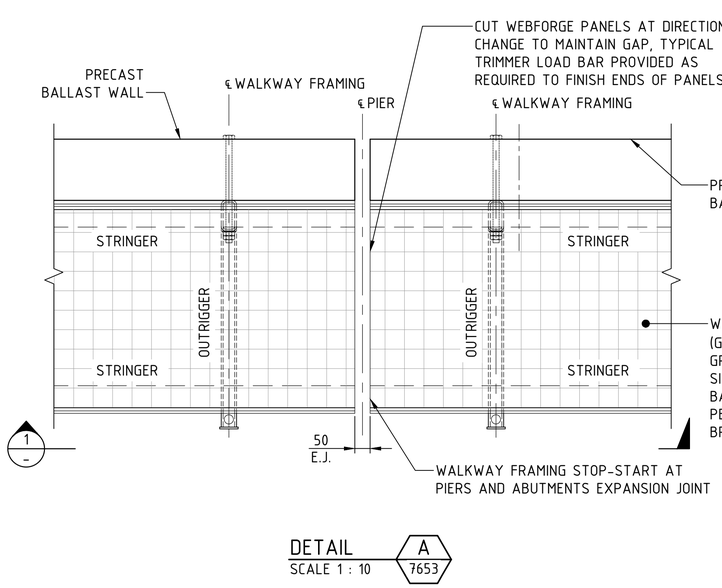
DETAIL B
SCALE 1 : 5



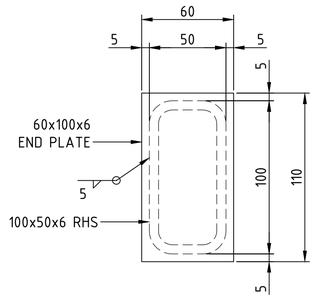
SECTION 5
SCALE 1 : 5



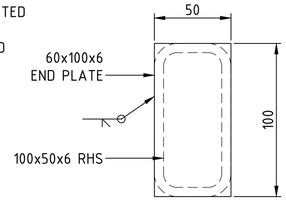
SECTION 3
SCALE 1 : 5



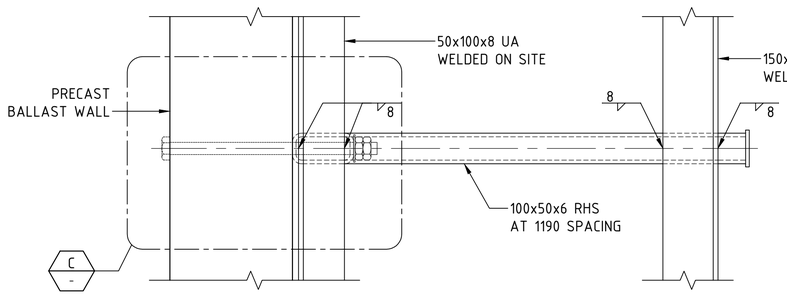
DETAIL A
SCALE 1 : 10
7653



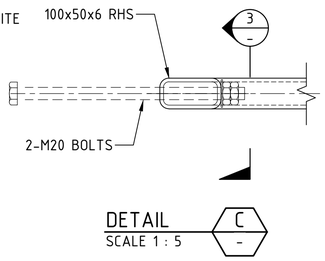
DETAIL D
SCALE 1 : 2



DETAIL E
SCALE 1 : 2



SECTION 2
SCALE 1 : 5



DETAIL C
SCALE 1 : 5

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm
1:2 @ A1 0 20 40 60 80 100 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER WALKWAY AND HANDRAIL DETAILS

SHEET C

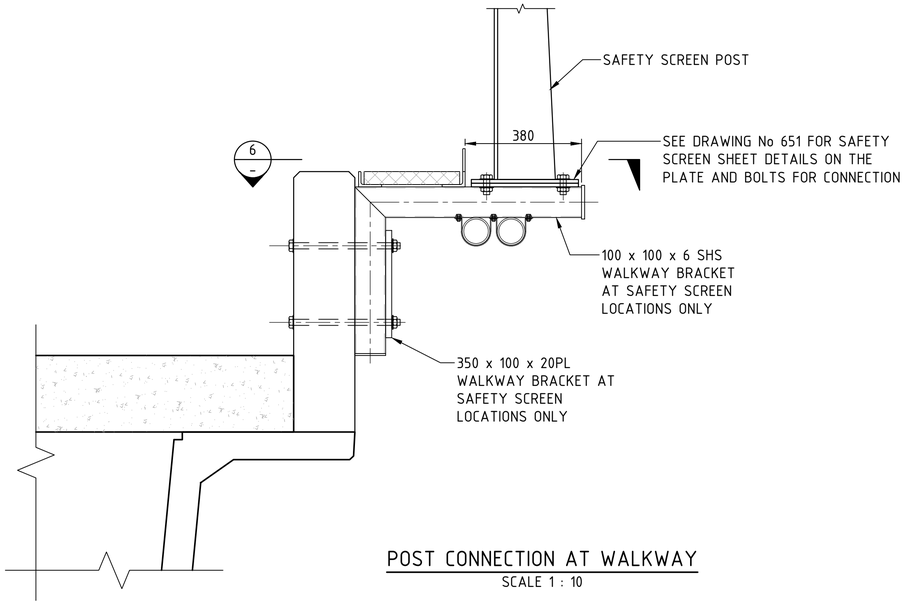
FILE No. BE22007-6670-DRG-BR-7654 | SHEET: 3 OF 5 | A1

STATUS: 100% DESIGN ©

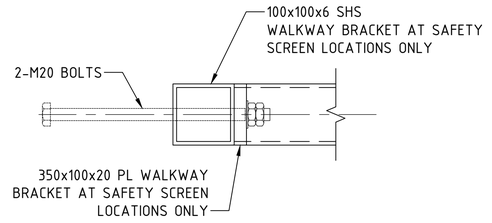
DRG No. BE22007-6670-DRG-BR-7654 | B | EDMS No. - | -

GENERAL NOTES

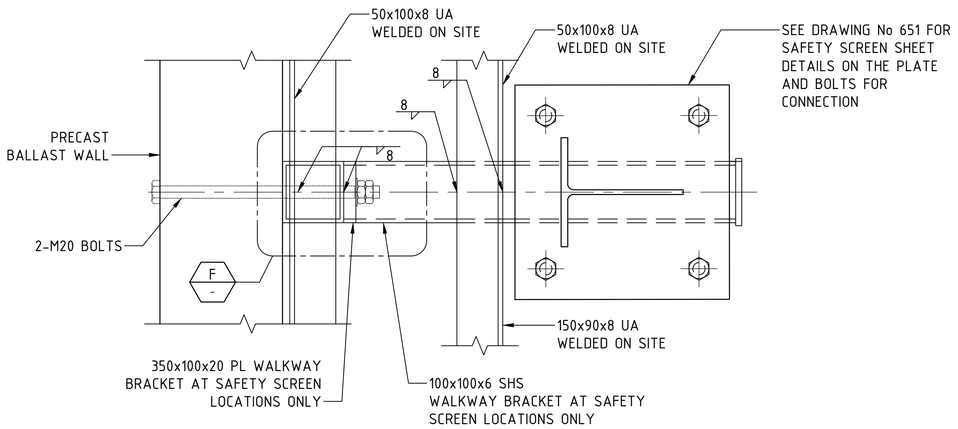
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 650.



POST CONNECTION AT WALKWAY
SCALE 1 : 10



DETAIL F
SCALE 1 : 5



SECTION 6
SCALE 1 : 5

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

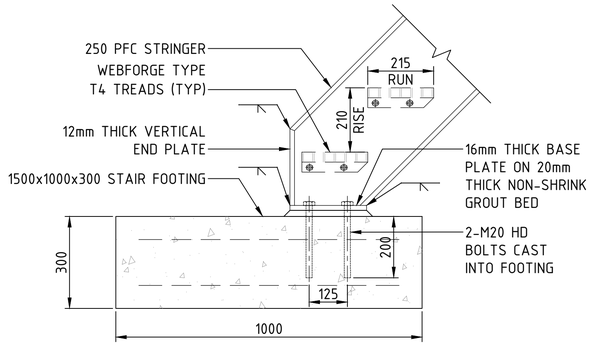
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER WALKWAY AND HANDRAIL DETAILS

SHEET D

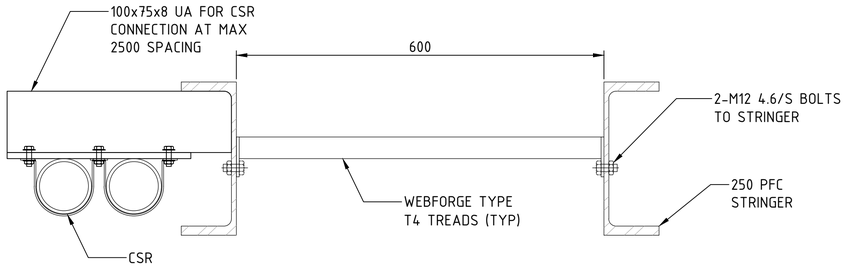
FILE No. BE22007-6670-DRG-BR-7655 | SHEET: 4 OF 5 | A1

STATUS: 100% DESIGN ©

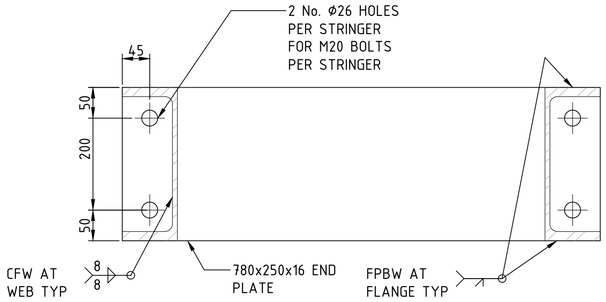
DRG No. BE22007-6670-DRG-BR-7655 | B | EDMS No. - | -



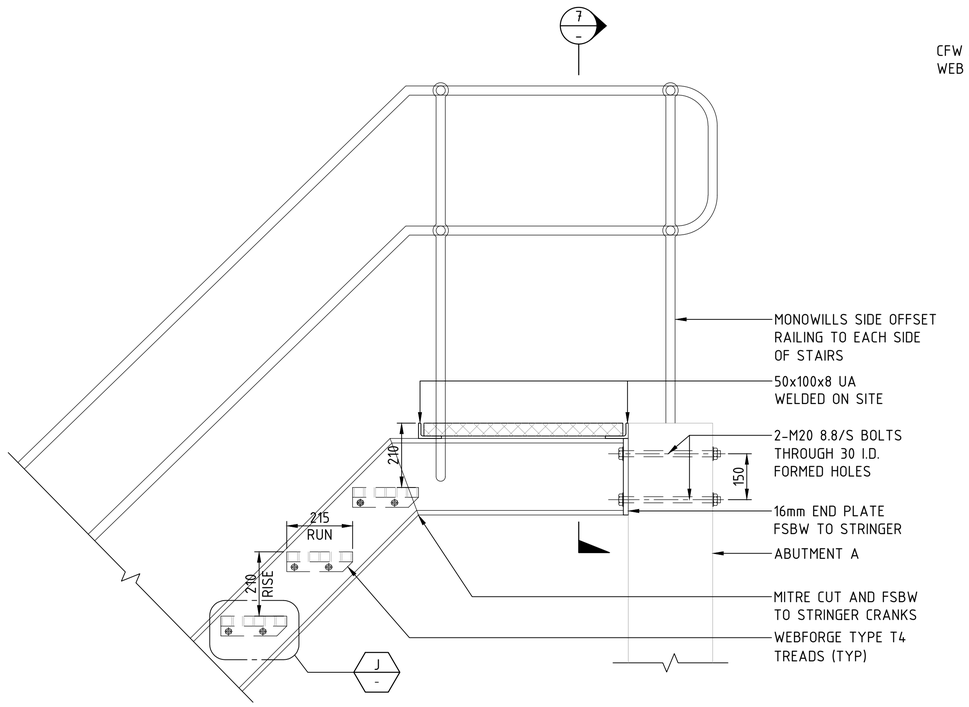
DETAIL H
SCALE 1 : 10 — 7653



DETAIL K
SCALE 1 : 5 — -



TYPICAL STRINGER END PLATE DETAIL AT ABUTMENT AND BASE CONNECTION
SCALE 1 : 5



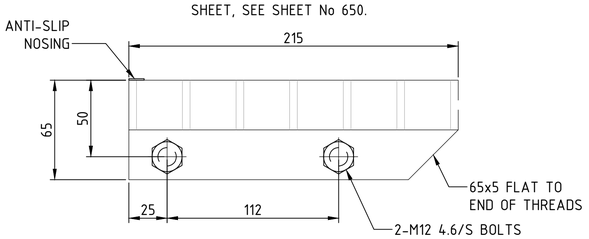
DETAIL G
SCALE 1 : 10 — 7653

SECTION 7
SCALE 1 : 10 — -

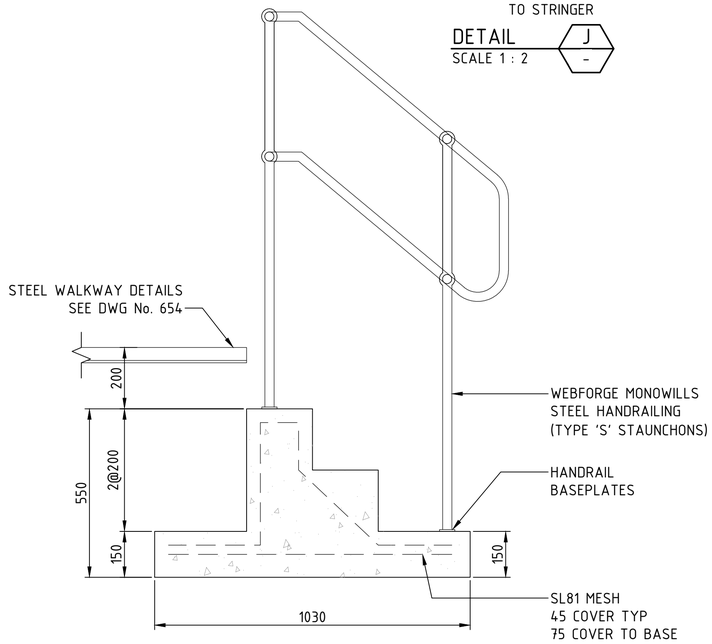
DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

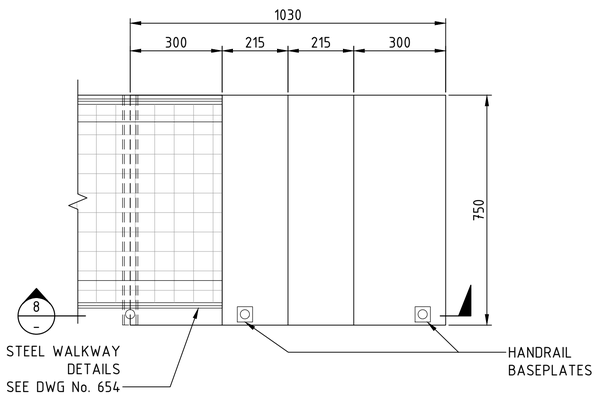
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 650.



DETAIL J
SCALE 1 : 2 — -



SECTION 8
SCALE 1 : 10 — -



DETAIL I
SCALE 1 : 10 — 7653

1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm
1:2 @ A1 0 20 40 60 80 100 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

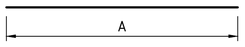
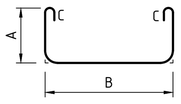
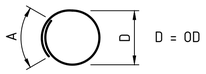
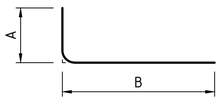
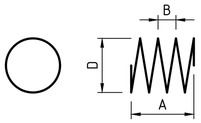
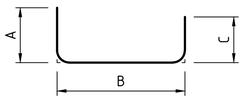
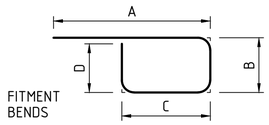
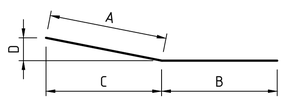
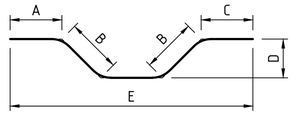
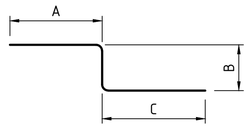
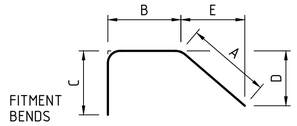
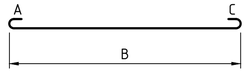
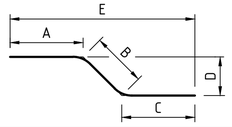
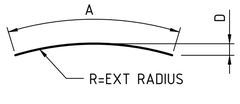
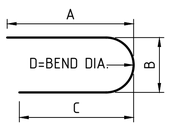
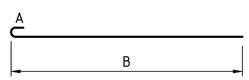
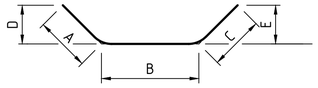
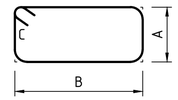
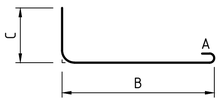
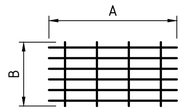
RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER WALKWAY AND HANDRAIL DETAILS

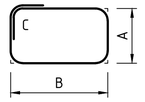
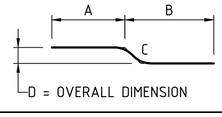
SHEET D

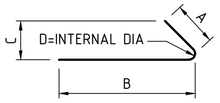
FILE No. BE22007-6670-DRG-BR-7656 | SHEET: 5 OF 5 | A1

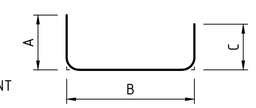
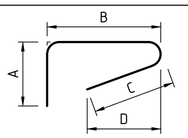
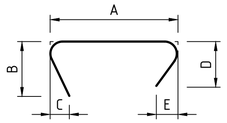
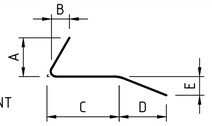
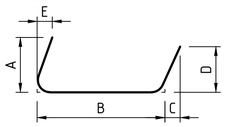
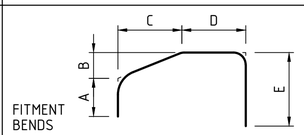
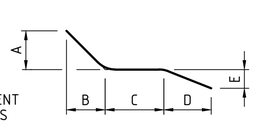
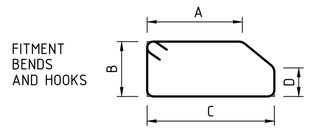
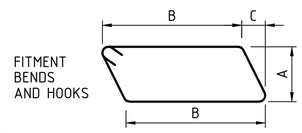
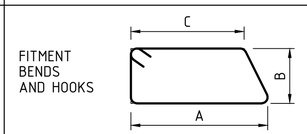
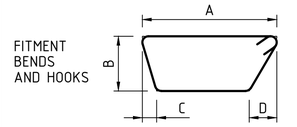
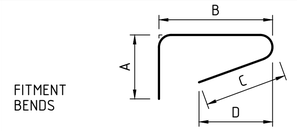
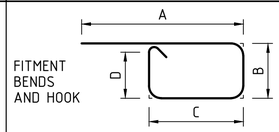
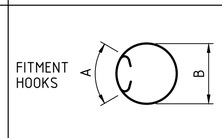
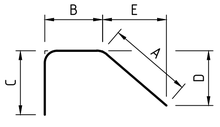
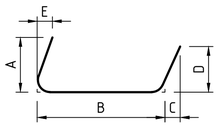
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7656 | B | EDMS No. - | -

SHAPE CODE	AUSTRALIAN STANDARD SHAPE
S	
SH	
CT	
L	
SP	
LL	
XT	
V	
JJ	
RC	
VL	
HH	
J	
R	
U	
H	
VV	
HT	
LH	
F	

SHAPE CODE	AUSTRALIAN STANDARD SHAPE
T	
CC	

SHAPE CODE	AUSTRALIAN STANDARD SHAPE
A	

SHAPE CODE	TRANSPORT FOR NEW SOUTH WALES STANDARD SHAPE
LF	
LA	
AA	
KL	
AV	
LG	
KH	
GT	
TT	
PT	
QT	
KF	
XH	
ST	
VF	
AF	

BAR MARKING LEGEND

THE METHOD USED TO DESCRIBE REINFORCEMENT ON THE DRAWINGS IS AS FOLLOWS:

A1 10-N16-S-300EF

- A1 — STRUCTURE ELEMENT DENOTATION
- 10 — BAR NUMBER IN SEQUENCE
- N16 — NUMBER OF BARS IN THE SET
- S — BAR STRUCTURAL PROPERTIES
- 300 — BAR SIZE IN MILLIMETRES
- E — BAR SHAPE CODE
- F — SPACE ALONG LIMIT LINE
- INFORMATION FOR PLACING

WHERE THE BAR SPACING IS APPROXIMATE ONLY, THE FOLLOWING FORMAT SHALL BE USED:

PB1 10-N12-S-300EF APPROX

GENERAL NOTES

STRUCTURE ELEMENT DENOTATION:

A – FOR ABUTMENT A
B – FOR ABUTMENT B
G – FOR PSC GIRDERS
D – FOR DECK
S – FOR APPROACH SLABS
PB – FOR PRECAST BARRIERS

INFORMATION FOR PLACING:

NF – NEAR FACE
FF – FAR FACE
EF – EACH FACE
LV – LENGTH VARIES

REINFORCEMENT NOTES

1. AUSTRALIAN STANDARD BAR SHAPES ARE IN ACCORDANCE WITH AS 1100.501.
2. BAR SIZE IS THE NOMINAL DIAMETER IN MILLIMETRES, OR THE AS/NZS 4671 FABRIC NUMBER.
3. THE GRADE OF REINFORCEMENT, IF NOT STATES ON THE DRAWINGS, SHALL BE D500N TO AS/NZS 4671.
4. DIMENSIONS SHOWN ON BAR SHAPES DIAGRAMS ARE MEASURED FROM THE OUTSIDE FACES OF THE BARS AND ARE IN MILLIMETRES.
5. THE INCLUDED ANGLE OF ANY BEND SHALL BE A RIGHT ANGLE IF NO DIMENSIONS SHOWN.
6. BAR OF DIAMETER GREATER THAN 24mm SHALL NOT BE REBENT.
7. BAR BENDING AND HOOK DETAILS SHALL BE IN ACCORDANCE WITH SECTION 5, 13 OF AS 5100-BRIDGE DESIGN.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER KAMILAROI HWY AND NAMOI RIVER

BAR SHAPES DIAGRAM

FILE No. BE22007-6670-DRG-BR-7700 | SHEET: 1 OF 1 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-7700 | B | EDMS No. - | -

VICKERY EXTENSION PROJECT
RAIL BRIDGE OVER STRATFORD CREEK

NEW BRIDGE - 2023

DESIGN STANDARD:	AS(/NZS) 5100 2017 SERIES - BRIDGE DESIGN
DESIGN LIFE:	25 YEARS

RAILWAY TRAFFIC LOADING: QR5000 LOCOS HAULING 120T QR QHCH COAL WAGONS (ARTC ETE-09-02)

No OF TRACKS:	1
DESIGN TRAFFIC SPEED:	50km/h
WALKWAY LOAD :	2.5kPa.

FATIGUE LOADING:

NUMBER OF LOAD CYCLES TO AS5100.2 ADJUSTED FOR 25 YEAR DESIGN LIFE	
TRACK CATEGORY:	HEAVY HAUL FREIGHT
BASE NUMBER OF CYCLES Ct:	1.5 x 10^5

FLOODING DATA

100 YEAR FLOOD LEVEL:	RL 251.800
2000 YEAR FLOOD LEVEL:	RL 253.800
100 YEAR FLOOD VELOCITY:	1.40 m/s MAX
2000 YEAR FLOOD VELOCITY:	3.10 m/s MAX
DEBRIS MAT DEPTH:	1.5m

WIND LOADING:

WIND TERRAIN CATEGORY:	TC2
WIND REGION:	A3
WIND VELOCITY ULS:	48m/s
WIND VELOCITY SLS:	37m/s
AVERAGE RECURRENCE INTERVAL (ARI) ULS:	R = 2000 YEARS
AVERAGE RECURRENCE INTERVAL (ARI) SLS:	R = 20 YEARS

EARTHQUAKE LOADING:

BRIDGE CLASSIFICATION:	BEDC-3
DESIGN PERFORMANCE LEVEL:	DAMAGE CONTROL
PROBABILITY FACTOR kp:	1.3
SEISMIC HAZARD FACTOR Z:	0.09
SITE SUBSOIL CLASS:	De
DESIGN DUCTILITY FACTOR μ:	3.0

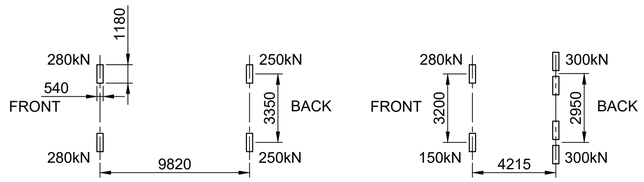
DIFFERENTIAL SETTLEMENT

10mm TOTAL BETWEEN ADJACENT SUPPORTS

REFERENCE DESIGN REPORTS

BRIDGE DESIGN REPORT:	BE22007-6670-RPT-BR-5901
BRIDGE DESIGN CRITERIA:	BE22007-6670-RPT-BR-5912
GEOTECHNICAL FACTUAL REPORT:	C-0858.02 R4
GEOTECHNICAL INTERPRETIVE REPORT:	C-0858.02 R10
FLOODING ASSESMENT REPORT:	0800-12-J, 7 MARCH 2023 0800-12-J, 7 MARCH 2023

CONSTRUCTION LOADING



LOADS REPRESENT MAXIMUM WORKING WHEEL LOADS.
DESIGN DYNAMIC LOAD ALLOWANCE NOT INCLUDED IN THESE LOADS.

THE DESIGN ADOPTS A DYNAMIC LOAD ALLOWANCE OF 1.0 AND AN ULTIMATE LIMIT STATE LOAD FACTOR OF 1.5.

VEHICLE SPEED IS RESTRICTED TO 10km/h ON THE BRIDGE.

ALL CONSTRUCTION TRUCKS ARE TO BE RESTRICTED TO ONE VEHICLE AT ANY TIME RUNNING WITHIN THE CENTRAL 5m OF DECK WITH NO CO-EXISTING LOADING.

FOR THE 773 VEHICLE, THE WHEEL CONTACT AREAS ARE ASSUMED TO BE 750mm (TRANSVERSE) x 250mm (LONGITUDINAL).

DIAL BEFORE YOU DIG

THE CONTRACTOR MUST, BEFORE COMMENCING ANY WORKS:

(i) DETERMINE THE EXTENT OF EXISTING UTILITY SURVEY AND INFORMATION REFERENCED ON THESE DRAWINGS;

(ii) OBTAIN CURRENT DIAL BEFORE YOU DIG PLANS AND INFORMATION BY TELEPHONING 1100 OR FAX 1300 682 077 TO ASCERTAIN THE EXACT LOCATION OF UTILITIES;

DIAL BEFORE YOU DIG® www.1100.com.au

(iii) MAKE ANY OTHER ENQUIRIES AS THE CONTRACTOR CONSIDERS NECESSARY TO SATISFY ITSELF TO THE EXACT LOCATION OF UTILITY DEVICES; AND

(iv) ENSURE THAT THE ADOPTED WORK METHOD WILL AVOID DAMAGE TO ALL UTILITIES.

JACKING OF BRIDGE DECK FOR BEARING REPLACEMENT

THE DESIGN INCLUDES THE FOLLOWING REQUIREMENTS FOR BEARING REPLACEMENT:
- THE BRIDGE SHALL BE CLOSED TO ALL TRAFFIC.
- SEE ABUTMENT AND PIER DRAWINGS FOR JACKING LOCATIONS AND LOADS.
- ALL JACKS SHALL BE HYDRAULICALLY LINKED AND HAVE A CENTRAL MECHANISM TO ENSURE THAT THE SAME VERTICAL DISPLACEMENTS OCCUR AT EACH JACKING POINT AT ALL TIMES DURING THE JACKING OPERATION.
- BRIDGE BEARINGS ARE DESIGNED TO BE REPLACED USING LIFTS OF NOT GREATER THAN 10mm.
- STEEL PLATES SHALL BE PLACED BETWEEN CONCRETE BEARING SURFACE AND HYDRAULIC JACK.
- MAXIMUM ALLOWABLE CONTACT PRESSURE BETWEEN CONCRETE SURFACE AND STEEL PLATE SHALL BE 10MPa

LOCALITY PLAN

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	K.U 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
COVER SHEET

FILE No. BE22007-6670-DRG-BR-6001	SHEET: 1 OF 1	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-6001	B	EDMS No. -

SCHEDULE OF DRAWINGS

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK

SCHEDULE OF DRAWINGS

FILE No. BE22007-6670-DRG-BR-6005 | SHEET: 1 OF 1 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6005 | B | EDMS No. - | -

File Plotted C:\12&5\data\AURZ\DSYN\018BE22007 (B20175) VEP_101\100 DRAWINGS\103 Br & Spec Sh\AutoCAD\AutoCAD GDA 2020\BE22007-6670-DWG-BR-6005.dwg

Plot Date & Time 7/19/2023 11:26 AM

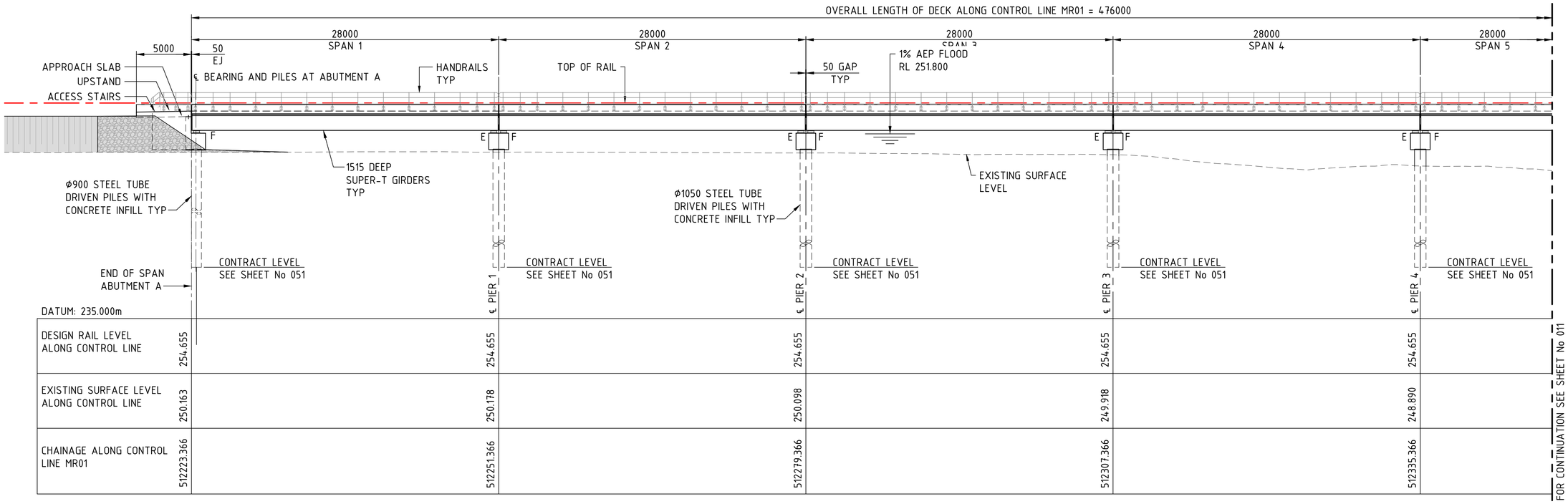
Plotted by CHRISTSAAC.ESMILLA

GENERAL NOTES

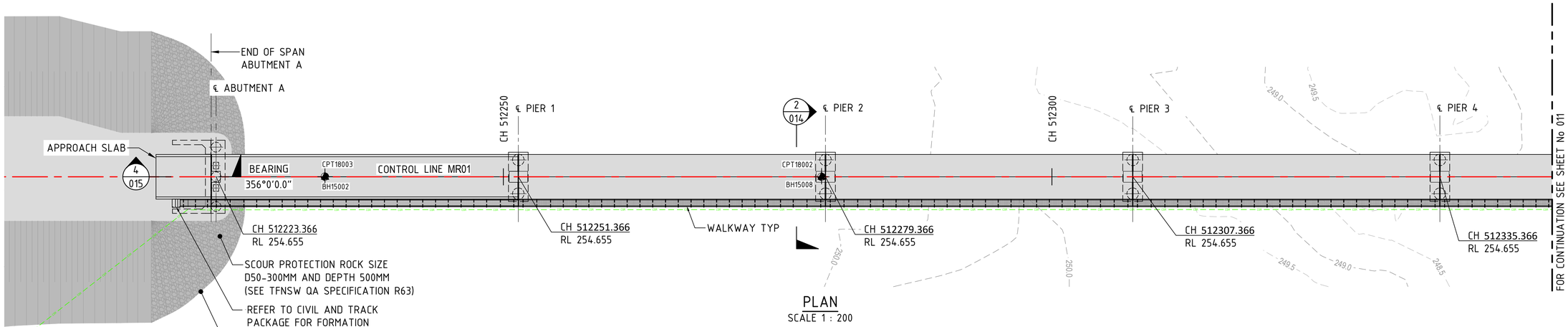
DIMENSIONS ARE IN MILLIMETRES.
CHAINAGES AND REDUCED LEVELS ARE IN METRES.
REDUCED LEVELS ARE TO AUSTRALIAN HEIGHT DATUM.
CO-ORDINATES ARE TO MAP GRID OF AUSTRALIA (MGA) ZONE 56.
RSW DENOTES REINFORCED SOIL WALL.
F DENOTES FIXED BEARING.
E DENOTES EXPANSION BEARING.

LEGEND

F DENOTES FIXED BEARING.
E DENOTES EXPANSION BEARING.
EXISTING BOREHOLE
DESIGN PHASE BOREHOLE
CSR (INDICATIVE PLAN LOCATION)
DENOTES FENCE



ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

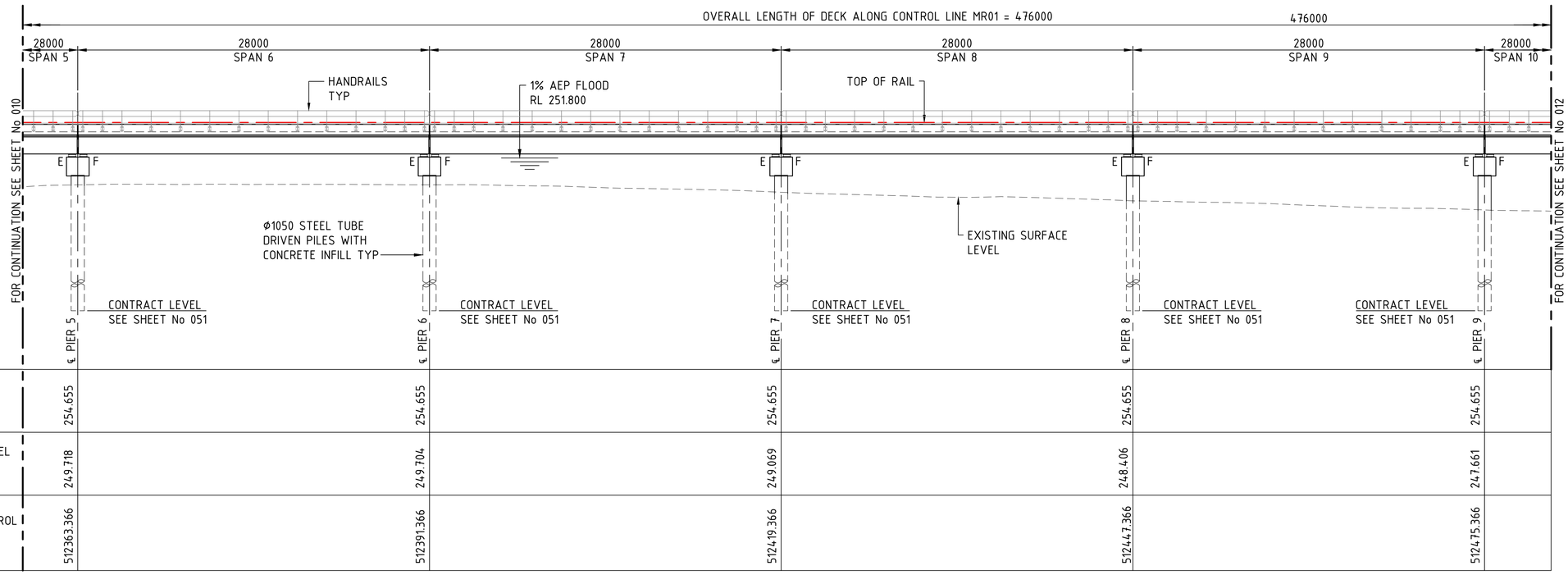
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
GENERAL ARRANGEMENT
SHEET A

FILE No. BE22007-6670-DRG-BR-6010 | SHEET: 1 OF 6 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6010 | B | EDMS No. - | -

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.

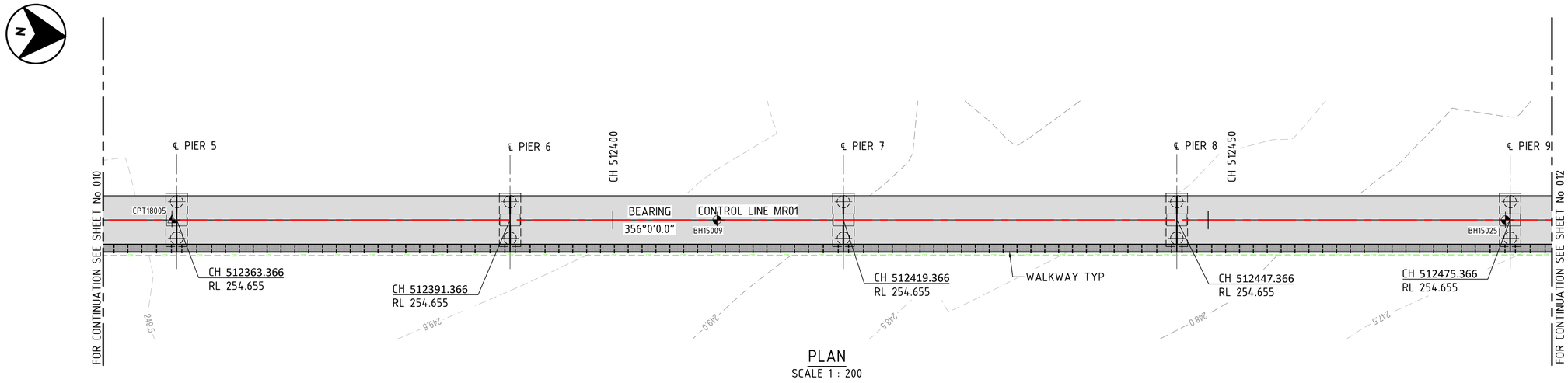


DATUM: 235.000m

	℄ PIER 5	℄ PIER 6	℄ PIER 7	℄ PIER 8	℄ PIER 9
DESIGN RAIL LEVEL ALONG CONTROL LINE	254.655	254.655	254.655	254.655	254.655
EXISTING SURFACE LEVEL ALONG CONTROL LINE	249.718	249.704	249.069	248.406	247.661
CHAINAGE ALONG CONTROL LINE MR01	512363.366	512391.366	512419.366	512447.366	512475.366

ELEVATION

SCALE 1 : 200



PLAN

SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK GENERAL ARRANGEMENT

SHEET B

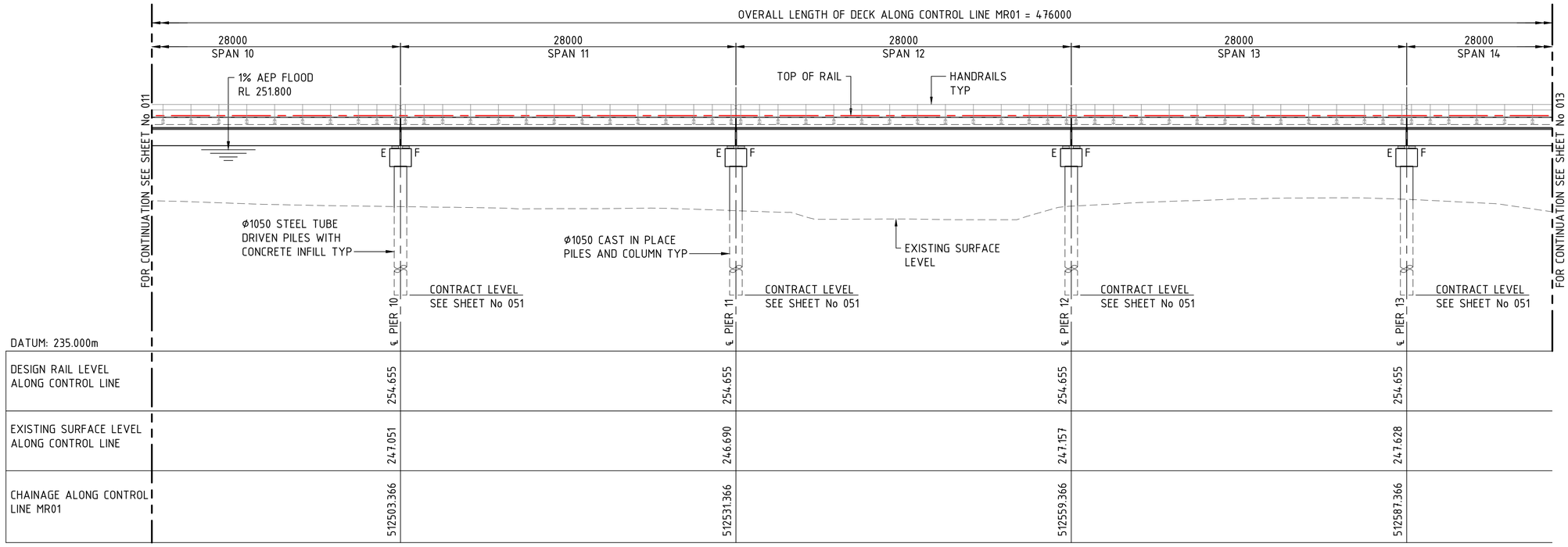
FILE No. BE22007-6670-DRG-BR-6011 | SHEET: 2 OF 6 | A1

STATUS: 100% DESIGN ©

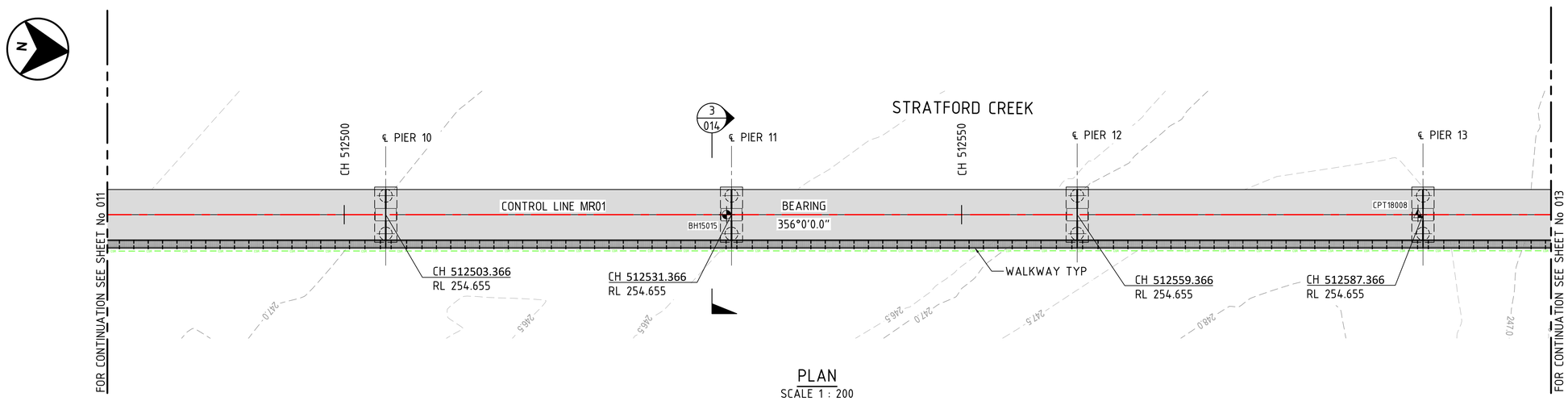
DRG No. BE22007-6670-DRG-BR-6011 | B | EDMS No. - | -

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.



ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK GENERAL ARRANGEMENT

SHEET C

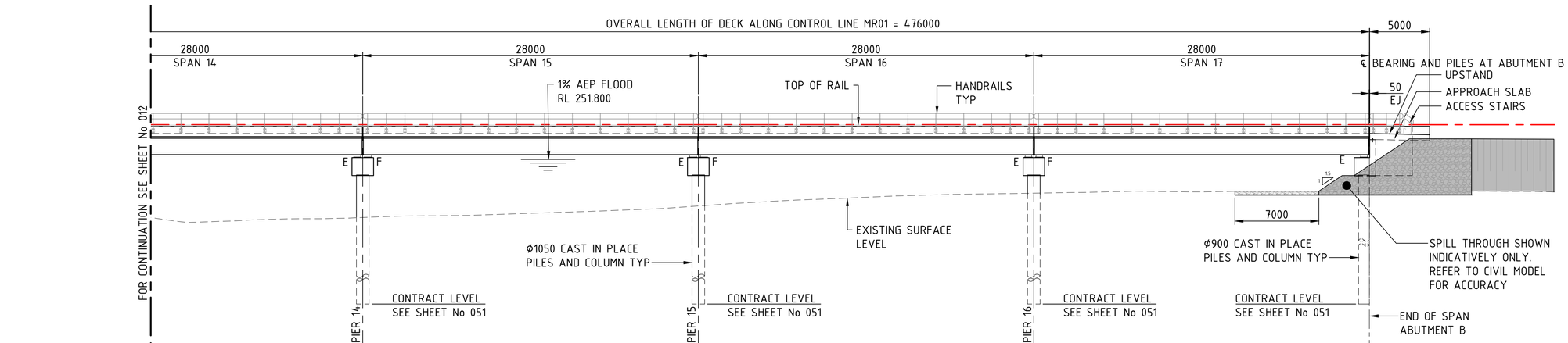
FILE No. BE22007-6670-DRG-BR-6012 | SHEET: 3 OF 6 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6012 | B | EDMS No. - | -

GENERAL NOTES

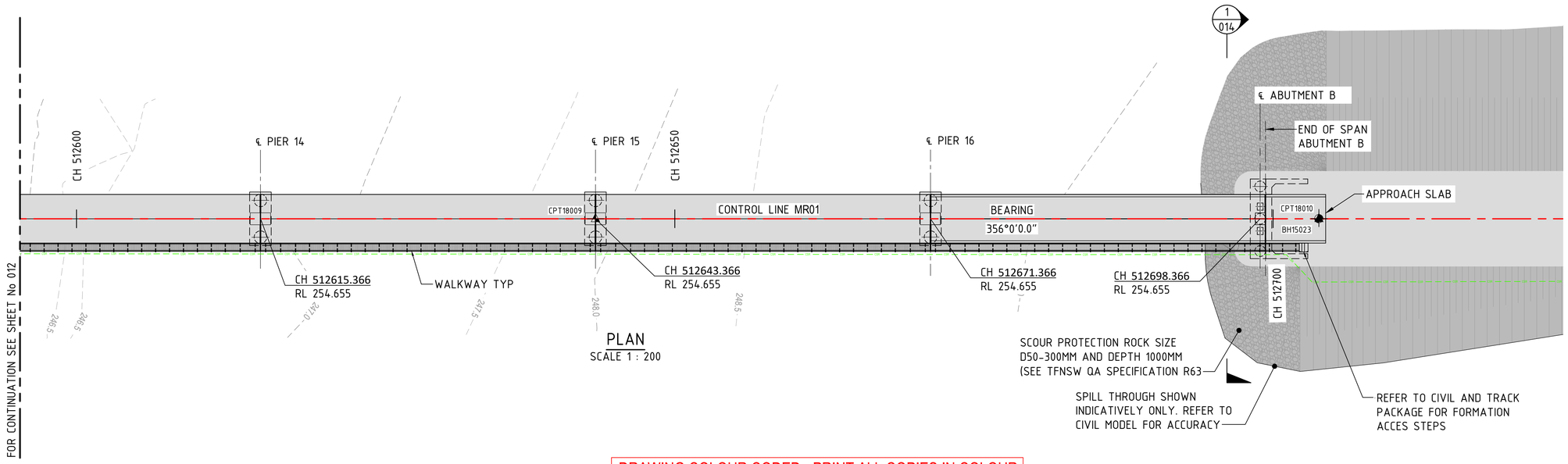
FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.



DATUM: 235.000m

	℄ PIER 14	℄ PIER 15	℄ PIER 16	
DESIGN RAIL LEVEL ALONG CONTROL LINE	254.655	254.655	254.655	254.655
EXISTING SURFACE LEVEL ALONG CONTROL LINE	246.947	247.940	248.953	249.121
CHAINAGE ALONG CONTROL LINE MR01	512615.366	512643.366	512671.366	512699.366

ELEVATION
SCALE 1 : 200



PLAN
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK GENERAL ARRANGEMENT

SHEET D

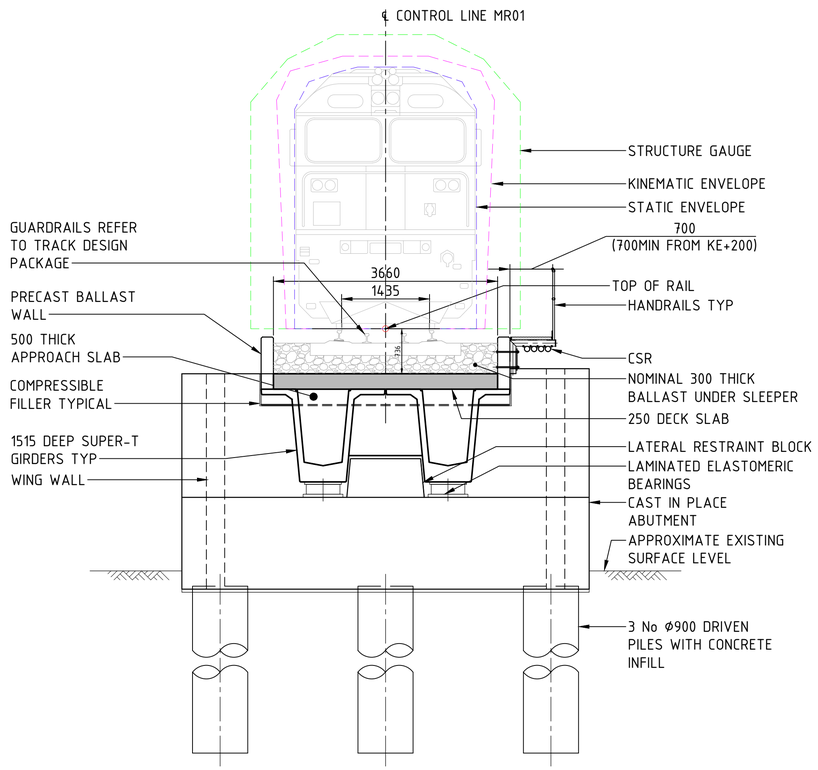
FILE No. BE22007-6670-DRG-BR-6013 | SHEET: 4 OF 6 | A1

STATUS: 100% DESIGN ©

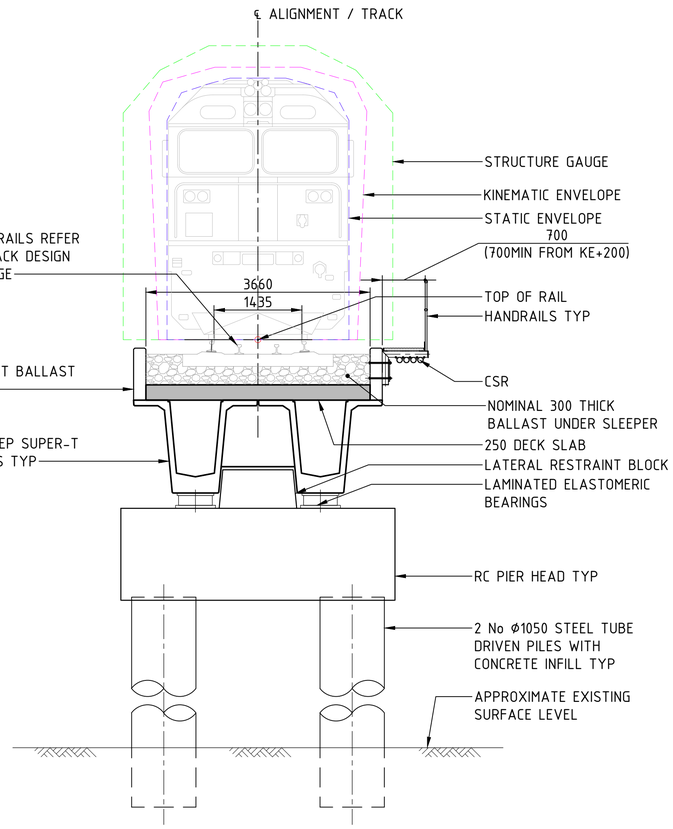
DRG No. BE22007-6670-DRG-BR-6013 | B | EDMS No. - | -

GENERAL NOTES

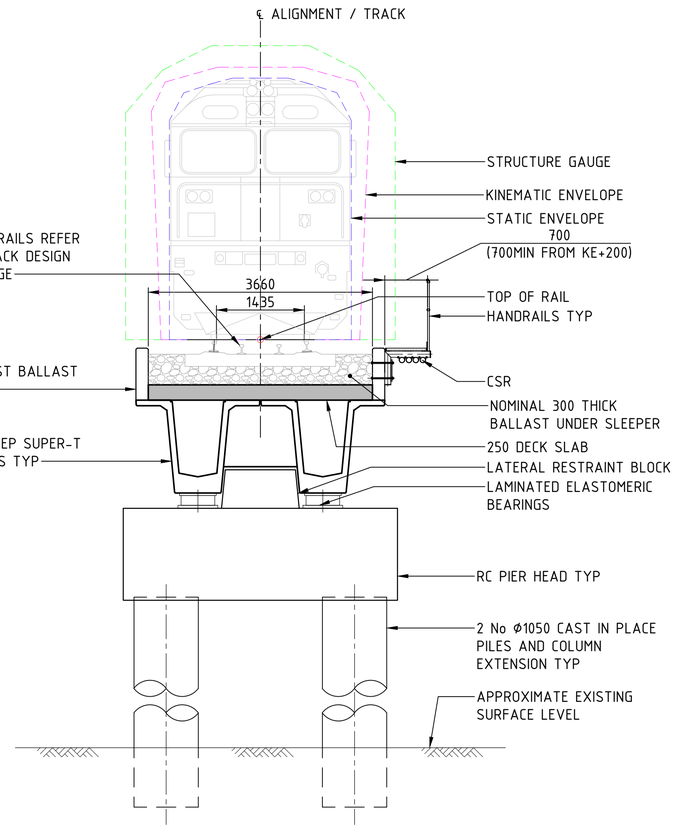
FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.



SECTION 1 / 013
SCALE 1 : 50



SECTION 2 / 010
SCALE 1 : 50



SECTION 3 / 012
SCALE 1 : 50

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 85% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK GENERAL ARRANGEMENT

SHEET E

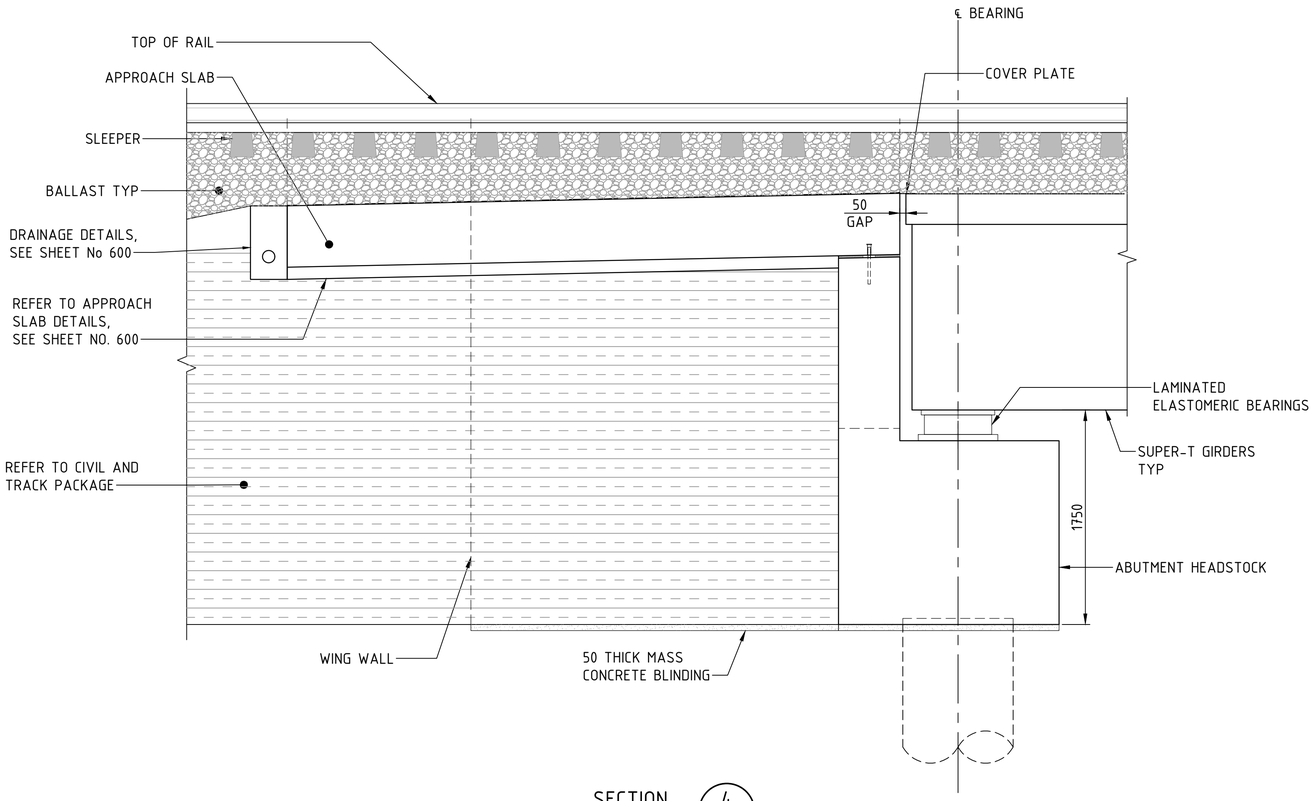
FILE No. BE22007-6670-DRG-BR-6014 | SHEET: 5 OF 6 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6014 | B | EDMS No. - | -

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 010.



SECTION 4 / 010
SCALE 1 : 25

(ABUTMENT A SHOWN, ABUTMENT B MIRRORED)

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK GENERAL ARRANGEMENT

SHEET F

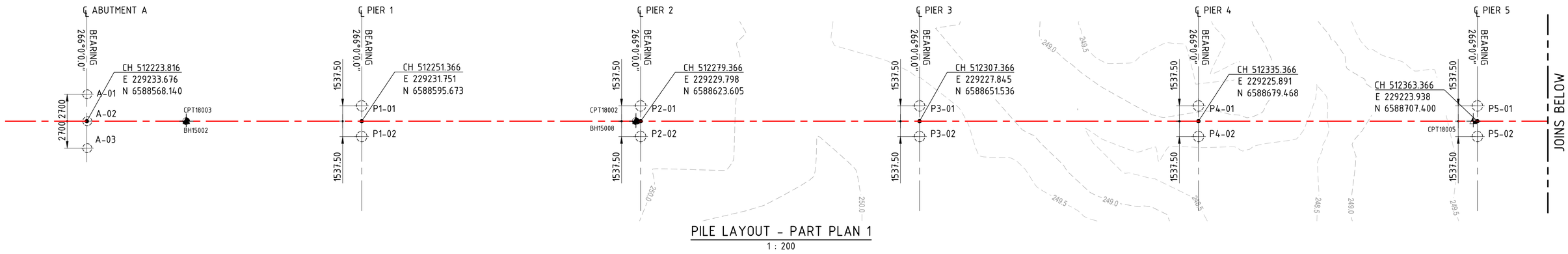
FILE No. BE22007-6670-DRG-BR-6015 | SHEET: 6 OF 6 | A1

STATUS: 100% DESIGN ©

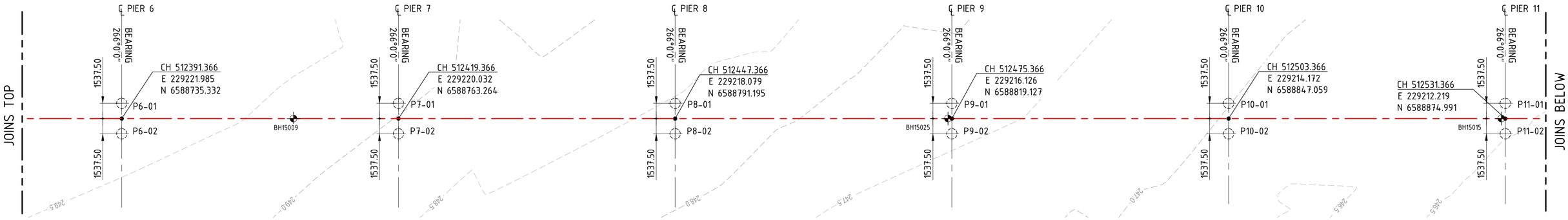
DRG No. BE22007-6670-DRG-BR-6015 | B | EDMS No. - | -

GENERAL NOTES

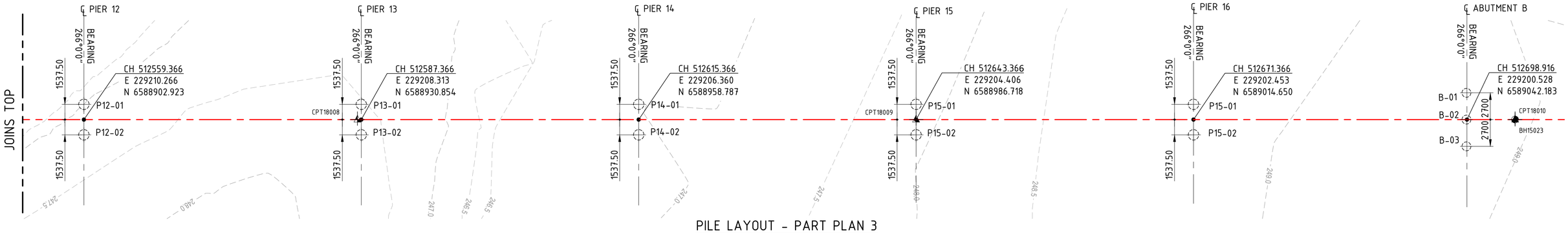
FOR OTHER GENERAL NOTES, LEGENDS RELATING TO THIS SHEET, SEE SHEET No 051.



PILE LAYOUT - PART PLAN 1
1 : 200



PILE LAYOUT - PART PLAN 2
1 : 200



PILE LAYOUT - PART PLAN 3
1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PILE LAYOUT
SHEET A

FILE No. BE22007-6670-DRG-BR-6050 | SHEET: 1 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6050 | B | EDMS No. - | -

TABLE 1 - PILE DATA

LOCATION	PILE No	EASTING	NORTHING	PILE LEVELS (m)		ANTICIPATED LENGTH OF PILE 'L' (m)	FOUNDING MATERIAL	TOP OF FOUNDING MATERIAL, 'RL' (m)	MINIMUM NETT ENERGY (kJ) ✳	MAXIMUM NETT ENERGY (kJ) (AT 0.9 fsy)	MAXIMUM 2000 YEAR ARI SCOUR DEPTH FROM EXISTING SURFACE LEVEL (M)	MINIMUM PENETRATION LENGTH (m) ✳✳	# DESIGN MAXIMUM AXIAL COMPRESSION LOAD AT TOP OF PILE		DESIGN MAXIMUM BENDING MOMENT ULS (kNm)	PILE TESTING	PILE DIAMETER (mm)	PILE TYPE	CONCRETE INFILL LENGTH 'Lc'	REINFORCEMENT	
				ANTICIPATED CONTRACT LEVEL RL 'A'	TOP OF PILE RL 'B'								ULS (kN)	SLS (kN)						'x'	'y'
ABUTMENT A	A-01	229230.983	6588567.952	224.400	250.374	26.000	UNIT 5 - VD-D SANDY GRAVEL	225	CONFIRM BY DRIVEABILITY STUDY	CONFIRM BY DRIVEABILITY STUDY	8.50	0.546	2560	1970	1750	PILE DYNAMIC TESTING (10% OF PILES)	900	STEEL TUBE DRIVEN PILES WITH CONCRETE INFILL	6000	1	2
	A-02	229233.676	6588568.140		250.374															3	4
	A-03	229236.370	6588568.328		250.374															5	6
PIER 1	P1-01	229230.217	6588595.566	225.400	250.374	25		225.9			3.500	0.446	5950	4720	1650		1050		7000	7	8
	P1-02	229233.285	6588595.780		250.374															9	10
PIER 2	P2-01	229228.264	6588623.497	225.400	250.374	25		226.55			3.400	1.096	5950	4720	1650		1050		7000	11	12
	P2-02	229231.332	6588623.712		250.374															13	14
PIER 3	P3-01	229226.311	6588651.429	225.400	250.374	25		227.3			3.200	1.846	5950	4720	1650		1050		7000	15	16
	P3-02	229229.378	6588651.644		250.374															17	18
PIER 4	P4-01	229229.378	6588679.361	229.100	249.112	20		232.8			2.500	3.688	5950	4720	1650		1050		7000	19	20
	P4-02	229227.425	6588679.576		249.112															21	22
PIER 5	P5-01	229222.404	6588707.293	230.400	250.374	20		232.3			2.800	1.846	5950	4720	1650		1050		7000	23	24
	P5-02	229225.472	6588707.507		250.374															25	26
PIER 6	P6-01	229220.451	6588735.225	230.400	250.374	20		232.2			3.000	1.746	5950	4720	1650		1050		7000	27	28
	P6-02	229223.519	6588735.439		250.374															29	30
PIER 7	P7-01	229218.498	6588763.156	229.400	250.374	21	UNIT 6 - XWM	231.5			2.700	2.046	5950	4720	1650		1050		7000	31	32
	P7-02	229221.566	6588763.371		250.374															33	34
PIER 8	P8-01	229216.545	6588791.088	227.600	248.621	21		230.7			2.500	3.079	5950	4720	1650		1050		7000	35	36
	P8-02	229219.612	6588791.303		248.621															37	38
PIER 9	P9-01	229214.592	6588819.020	226.900	247.900	21		230			2.500	3.1	5950	4720	1650		1050		7000	39	40
	P9-02	229217.659	6588819.235		247.900															41	42
PIER 10	P10-01	229212.639	6588846.952	226.200	247.266	21		229.3			2.500	3.034	5950	4720	1650		1050		7000	43	44
	P10-02	229215.706	6588847.166		247.266															45	46
PIER 11	P11-01	229210.685	6588874.884	223.900	246.928	23	UNIT 7 - HW - MW BEDROCK	225	N/A	N/A	2.500	1.072	6160	4730	1960		1050	CAST IN PLACE PILES	-	47	48
	P11-02	229213.753	6588875.098		246.928														-	49	50
PIER 12	P12-01	229208.732	6588902.815	228.300	247.304	19		230			2.500	1.696	6160	4730	1960		1050		-	51	52
	P12-02	229211.800	6588903.030		247.304														-	53	54
PIER 13	P13-01	229206.779	6588930.747	228.300	247.879	19		230			2.500	1.121	6160	4730	1960		1050		-	55	56
	P13-02	229209.847	6588930.962		247.879														-	57	58
PIER 14	P14-01	229204.826	6588958.679	230.100	247.105	17		233.5			2.500	3.395	6160	4730	1960		1050		-	59	60
	P14-02	229207.893	6588958.894		247.105														-	61	62
PIER 15	P15-01	229202.387	6588986.611	231	248.068	17		233.9			2.500	2.832	6160	4730	1960		1050		-	63	64
	P15-02	229205.940	6588986.825		248.068														-	65	66
PIER 16	P16-01	229200.920	6589014.543	239.400	250.374	11		241.4			3.100	1.946	6160	4730	1960		1050		-	67	68
	P16-02	229203.987	6589014.757		250.374														-	69	70
ABUTMENT B	B-01	229197.835	6589041.994	240.400	250.374	10		242.4			14.700	1.946	2810	2250	1750		900		-	71	72
	B-02	229200.528	6589042.183		250.374														-	73	74
	B-03	229203.221	6589042.371		250.374														-	75	76

GENERAL NOTES

PRIOR TO UNDERTAKING PILING WORKS THE CONTRACTOR SHALL CARRY OUT GEOTECHNICAL INVESTIGATIONS TO ENSURE COMPLIANCE TO CLAUSE 1.6.2 IN AS5100.3-2017. THE GEOTECHNICAL INVESTIGATION REPORT SHALL BE SUBMITTED TO DESIGNER FOR CONFIRMING THE PILE DESIGN.
FOR CONCRETE EXPOSURE CLASSIFICATION DETAILS, SEE DRAWING No 070.
FOR MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE, SEE DRAWING No 070.
ALL SET-OUT CO-ORDINATES TO BE CONFIRMED ON SITE PRIOR TO ANY PHYSICAL WORKS BEGINNING.
THE PLACEMENT OF CONCRETE IN PILES SHALL BE CARRIED OUT IN ONE CONTINUOUS OPERATION UNLESS SPECIFIED OTHERWISE.
PILES SHALL BE INSTALLED IN ACCORDANCE WITH TFNSW SPECIFICATION B54 FOR DRIVEN PILES.
REFER TO GEOTECHNICAL FACTUAL REPORT AND GEOTECHNICAL INTERPRETATIVE REPORT FOR MORE INFORMATION.
ESTIMATED PILE CONTRACT LEVELS IN TABLE 1 ON SHEET No 053 ARE BASED ON AN INTERPRETATION OF AVAILABLE BORE DATA AND MAY VARY ON SITE.
GEOTECHNICAL ENGINEER IS TO BE ENGAGED AS DEFINED IN TFNSW SPECIFICATION D&C B54 TO CERTIFY ANY WORKING PLATFORMS OR SUPPORTS REQUIRED TO KEEP PILING RIG STABLE AND SAFE DURING PILING OPERATIONS ON SITE.
ALL PILES SHALL BE DRIVEN TO RESISTANCE AND ALSO ACHIEVE THE PILES MINIMUM PENETRATION LENGTH TO CONTRACT LEVELS INDICATED IN TABLE 1, SEE DRAWING No 053.
A GEOTECHNICAL STRENGTH REDUCTION FACTOR ΦG OF 0.75 FOR DRIVEN PILES AND 0.71 FOR BORED PILES CALCULATED IN ACCORDANCE WITH AS2159. THIS REQUIRES DYNAMIC TESTING OF 10% OF THE TOTAL NUMBER OF PILES. STEEL TUBE SHALL BE GRADE 350 TO AS/NZS 3678 OR APPROVED EQUIVALENT.

WELDING SYMBOLS SHALL COMPLY WITH AS1101.3.
ALL WELDING SHALL CONFORM TO THE REQUIREMENTS OF AS1554.1 AND TFNSW SPECIFICATION B204.
THE WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS1554.1 AND TFNSW SPECIFICATION B204.
BUTT WELDS SHALL BE FULL PENETRATION.
THOROUGHLY CLEAN THE PILE SHAFT (FOR THE CONCRETE PLUG SECTION ONLY) OF ALL LOOSE MATERIAL INCLUDING MATERIAL ADHERING TO THE INSIDE OF THE CASING BEFORE REINFORCEMENT IS PLACED.
A METHOD STATEMENT OF THE CLEANING PROCESS SHALL BE SUBMITTED TO THE PRINCIPAL FOR REVIEW PRIOR TO CONSTRUCTION.
PILE INTEGRITY TESTING SHALL BE UNDERTAKEN IN ACCORDANCE WITH AS2159-2009 AND RMS BTD2011/08 ON MINIMUM 8 NOMINATED PILES.
PILES ARE TO BE DRIVEN TO RESISTANCE WITH DRIVING ENERGY AND SET DETERMINED BY THE APPLICABLE REPRESENTATIVE PILE. THE CALCULATED SET AND ENERGY SHOWN ON TABLE 1 ARE INDICATIVE ONLY AND ARE NOT TO BE USED AS DRIVING PARAMETERS.
DRIVING STRESSES SHALL NOT EXCEED 0.9 x fsy (OR 0.8 x fsy DURING SUSTAINED HARD DRIVING).
MAXIMUM DRIVING ENERGY TO LIMIT DRIVING STRESSES ARE TO BE ADJUSTED AS REQUIRED BASED ON MONITORING AND TESTING OF REPRESENTATIVE PILES. IN ACCORDANCE WITH TFNSW SPECIFICATION D&C B54. THE PILING CONTRACTOR SHALL ASSESS THE DRIVING CONDITIONS AND MAY INCREASE THE WALL THICKNESS OF THE STEEL TUBULAR PILE AND ADJUST THE DRIVING SHOE DETAIL TO SUIT THEIR ASSESSMENT.

ANY PROPOSED CHANGE TO THE DRIVING SHOE SHALL BE SUBMITTED TO PRINCIPAL FOR APPROVAL.
WHERE A PILE ACHIEVES THE REQUIRED DRIVING RESISTANCE BASED ON THE PARAMETERS SET BY THE REPRESENTATIVE PILE(S) AT A GREATER DEPTH THAN 1.0M HIGHER THAN THE CONTRACT LEVEL, THE PILING CONTRACTOR SHALL CONDUCT DYNAMIC TESTING OF THE PILE TO PROVE SUFFICIENT CAPACITY HAS BEEN ACHIEVED.
INSPECTION OF PILES TO BE IN ACCORDANCE WITH TFNSW SPECIFICATION D&C B54.
PROPOSED BOREHOLES ARE TO BE COMPLETED AND PROVIDED TO THE DESIGNER FOR REVIEW PRIOR TO CONSTRUCTING PILES.
FINISHED RL 'B' MAY VARY TO ACHIEVE SPECIFIED DIMENSION TO GROUND LEVEL.
✳ DENOTES THE MINIMUM NETT ENERGY IS BASED ON 13mm SET FOR 10 BLOWS.
✳✳ DENOTES THE MINIMUM LENGTH BASED ON SATISFYING SERVICEABILITY AND LATERAL CAPACITY BELOW CLAYS. IT IS NOT THE ESTIMATED PILE PENETRATION LENGTH.
POSITIVE VALUE DENOTE COMPRESSIVE FORCES, NEGATIVE VALUES DENOTE TENSILE FORCES IN PILES.

GEOTECHNICAL RISK

DENSE GRAVEL LAYERS MAY BE ENCOUNTERED DURING DRIVING OPERATIONS LEADING TO EARLY REFUSAL ABOVE THE NOMINATED PILE CONTRACT LEVEL. IF THIS IS ENCOUNTERED PREBORING MAY BE REQUIRED TO ACHIEVE REQUIRED PILE DEPTH.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

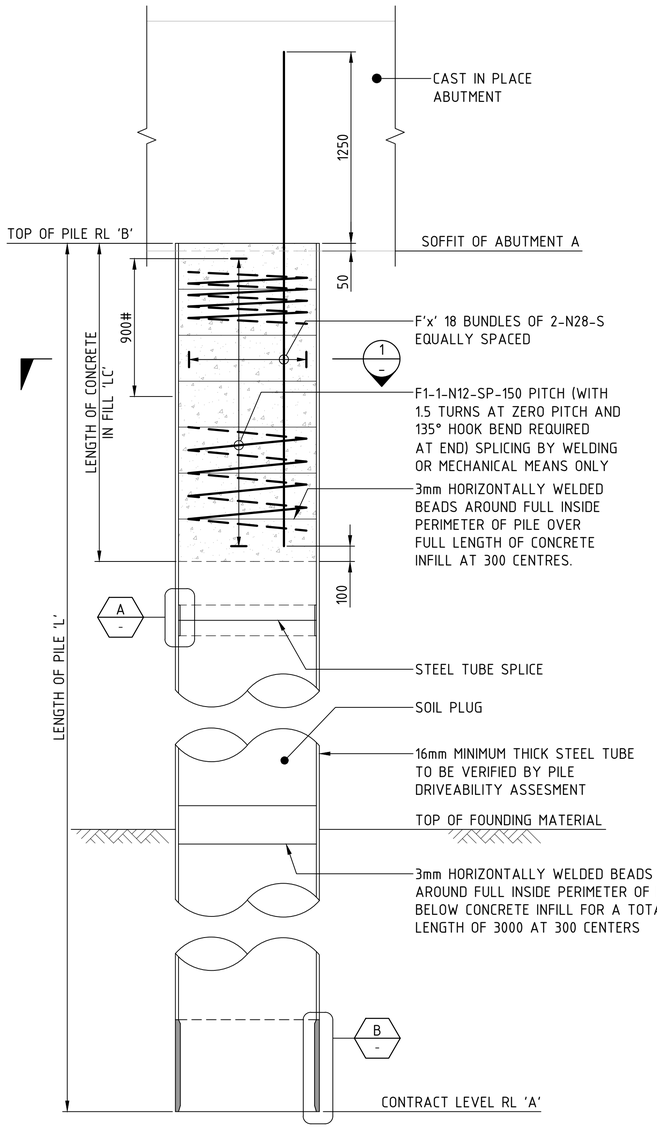
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PILE LAYOUT
SHEET B

FILE No. BE22007-6670-DRG-BR-6051 | SHEET: 2 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6051 | B | EDMS No. - | -

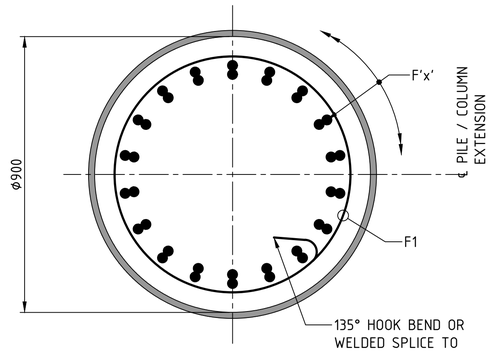


ELEVATION – Φ900 STEEL TUBE DRIVEN PILES

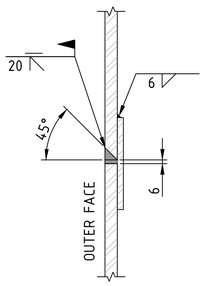
SCALE 1 : 20

(ABUTMENT A)

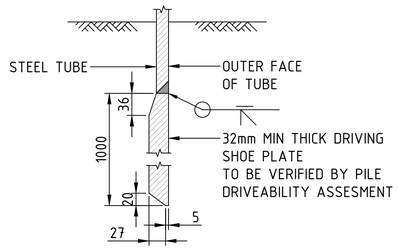
# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 1 / - SCALE 1 : 10



DETAIL A / - SCALE 1 : 5



DETAIL B / - SCALE 1 : 5

GENERAL NOTES

SCALE AS SHOWN
FOR OTHER GENERAL NOTES RELATING TO THIS SHEET, SEE SHEET No 050.
CONCRETE EXPOSURE CLASSIFICATION: B1
ALL CONCRETE WORK SHALL COMPLY WITH TfNSW SPECIFICATION D&C B80.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE TO BE 40 MPa.
PILES SHALL BE CONSTRUCTED WITHIN +/- 75mm IN PLAN FROM THE DESIGN POSITION.
STEEL CAGES SHALL BE PLACED IN SUCH ORIENTATION THAT FACILITATE INSTALLATION OF LONGITUDINAL REINFORCEMENT IN HEADSTOCK.
MAXIMUM CONCRETE PLACEMENT TEMPERATURE OF 32°C FOR PILES WITH A DIAMETER UP TO 1200mm.

REINFORCEMENT NOTES

UNLESS SPECIFIED OTHERWISE, REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SHALL BE 45mm FOR PILES.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT SHALL BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS SHOWN OTHERWISE ON THE DRAWINGS LAPS ON THE ADJACENT BARS ON ANY FACE SHALL BE STAGGERED BY NO LESS THAN THE LAP LENGTH. UNLESS OTHERWISE SPECIFIED, THE MINIMUM LENGTH OF LAPS ARE AS FOLLOWS:

BAR SIZE	N12	N16	N20	N24	N28	N32	N36	N40
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR	450	650	950	1250	1600	1950	2350	2750
b) OTHER BARS:	350	500	750	950	1250	1500	1800	2150

WHERE SPLICE LOCATIONS ARE DETAILED ON THE DRAWINGS, THE CONTRACTOR MUST SEEK APPROVAL FROM THE DESIGN ENGINEER TO SPLICE AT ALTERNATE LOCATIONS. WHERE BARS ARE DETAILED WITHOUT LAPS AND THE BAR LENGTH DICTATES THAT LAPS ARE REQUIRED, THE CONTRACTOR MAY ADOPT LAP LOCATIONS AS REQUIRED TO ENSURE MINIMUM LAP LENGTHS ARE ACHIEVED.
CLEAR DISTANCE BETWEEN LAPPED BARS DOES NOT EXCEED 3 x THE BAR DIAMETER.
HELICAL REINFORCEMENT TO BE SPLICED WITHIN ITS LENGTH EITHER BY WELDING OR MECHANICAL MEANS. ALTERNATIVELY BY LAPPING THE HELIX ONE TURN AND BENDING THE HELIX END INTO THE PILE CORE FOR AN EXTENSION OF 25 X THE HELIX DIAMETER. SPLICE WELDS TO CONSIST OF A SINGLE LAP SPLICE WELD WITH BARS SUPERIMPOSED IN ACCORDANCE WITH JOINT IDENTIFICATION L-d TO AS 1544.3. WELD SIZES TO HELIX SHALL BE:
- Φ16 BAR – 4mm X 160mm LONG.
- Φ12 BAR – 3mm X 120mm LONG.

HELIX ANCHORAGE TO BE PROVIDED AT TOP AND BOTTOM OF PILE BY PROVIDING 1.5 EXTRA TURNS OF THE HELIX AT ZERO PITCH AND EITHER A HOOK AROUND A MAIN LONDITUDINAL REINFORCING BAR OR BY WELDING.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm
1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM:GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

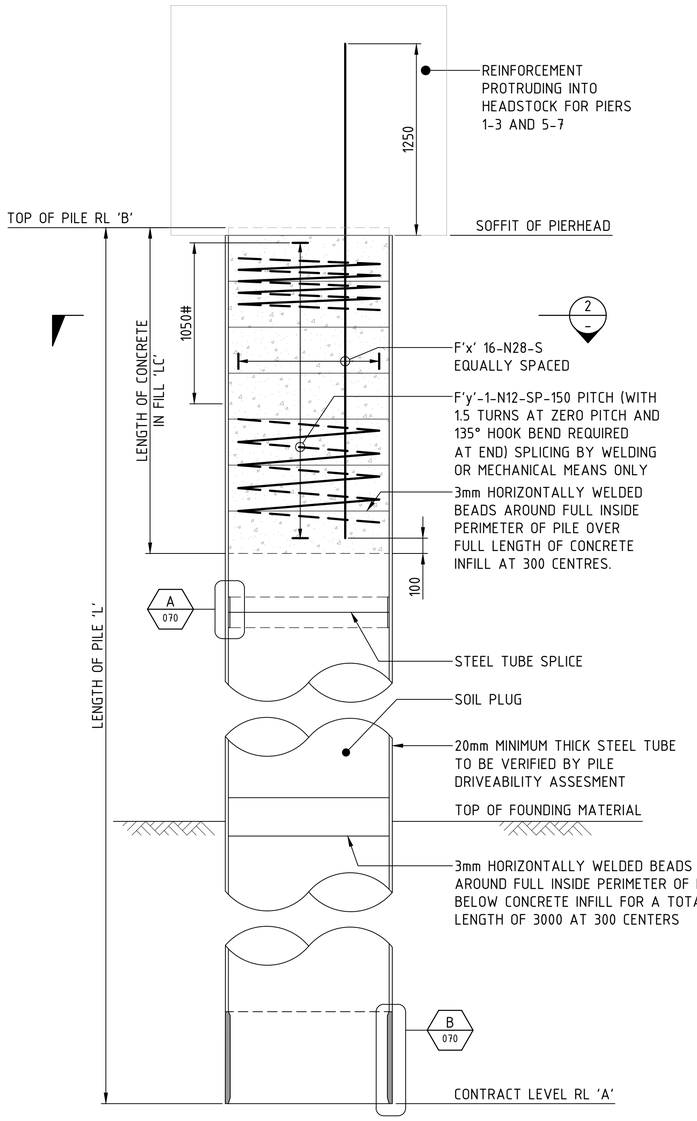
BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PILE DETAIL
SHEET A

FILE No. BE22007-6670-DRG-BR-6070 | SHEET: 1 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6070 | B | EDMS No. - | -

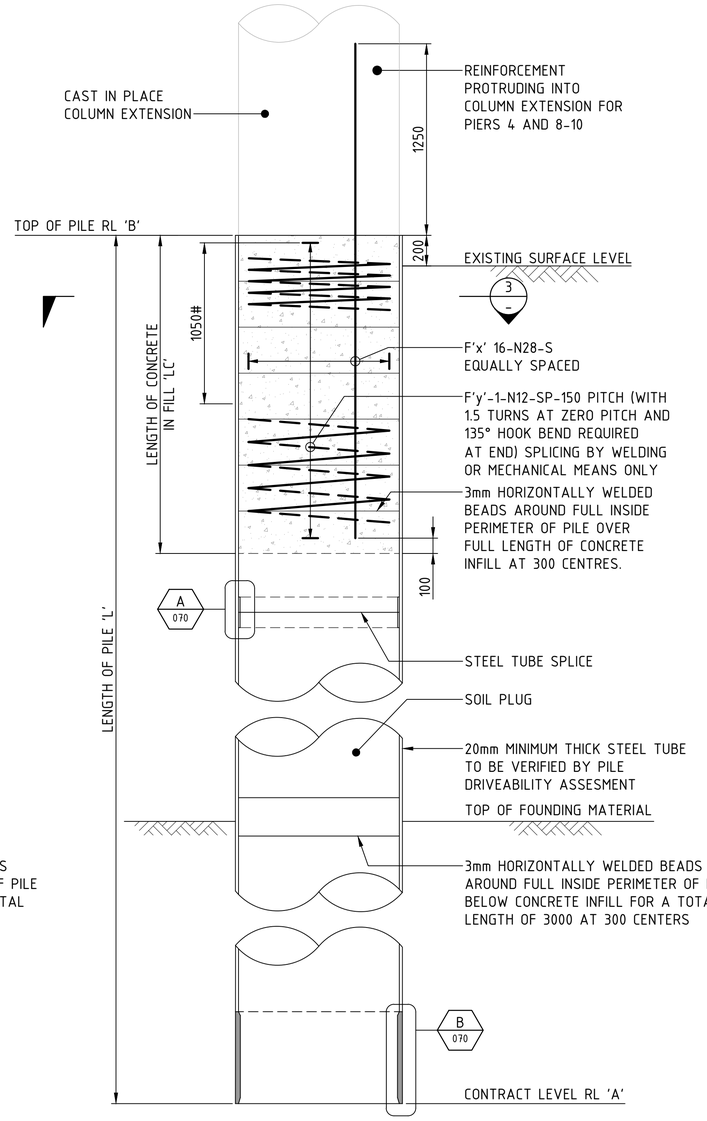


ELEVATION - ø1050 STEEL TUBE DRIVEN PILES

SCALE 1 : 20

(PIERS 1 TO 3 AND 5 TO 7)

\# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN

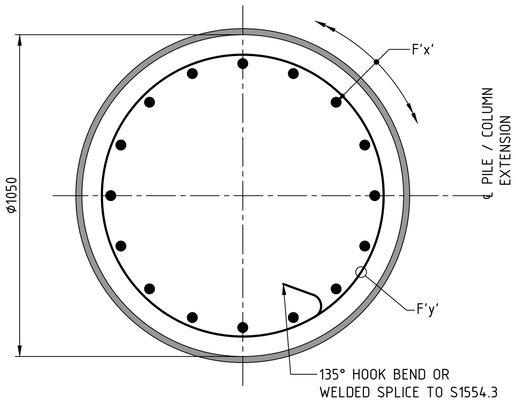


ELEVATION - ø1050 STEEL TUBE DRIVEN PILES

SCALE 1 : 20

(PIERS 4 AND 8 TO 10)

\# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 2 / - SCALE 1 : 10

SECTION 3 / - SIMILAR

GENERAL NOTES

FOR GENERAL NOTES RELATED TO THIS SHEET, SEE SHEET No 070.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK

PILE DETAIL

SHEET B

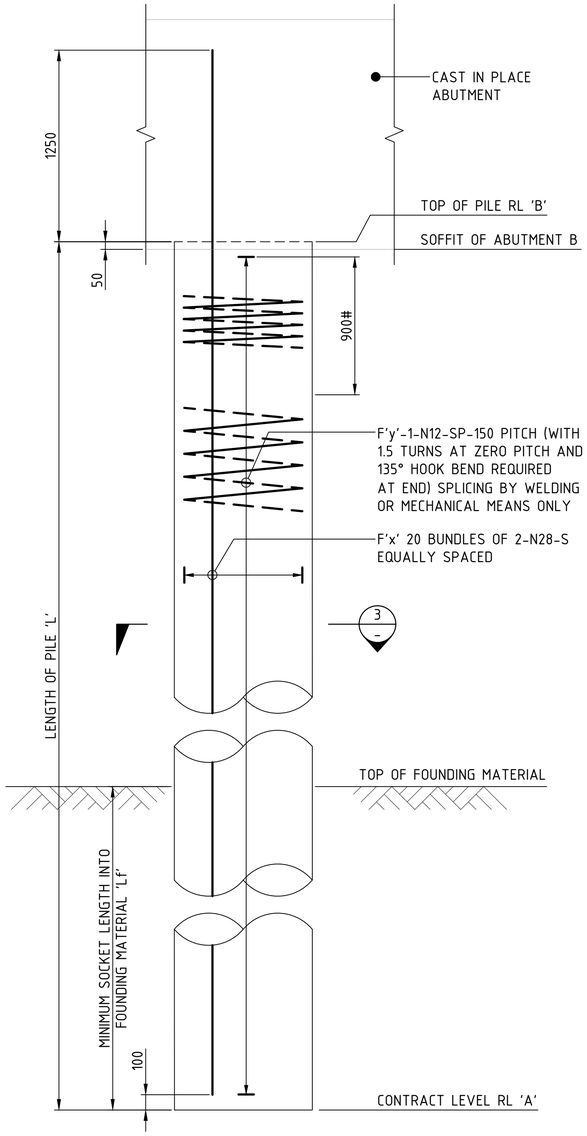
FILE No. BE22007-6670-DRG-BR-6071 | SHEET: 2 OF 3 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6071 | B | EDMS No. - | -

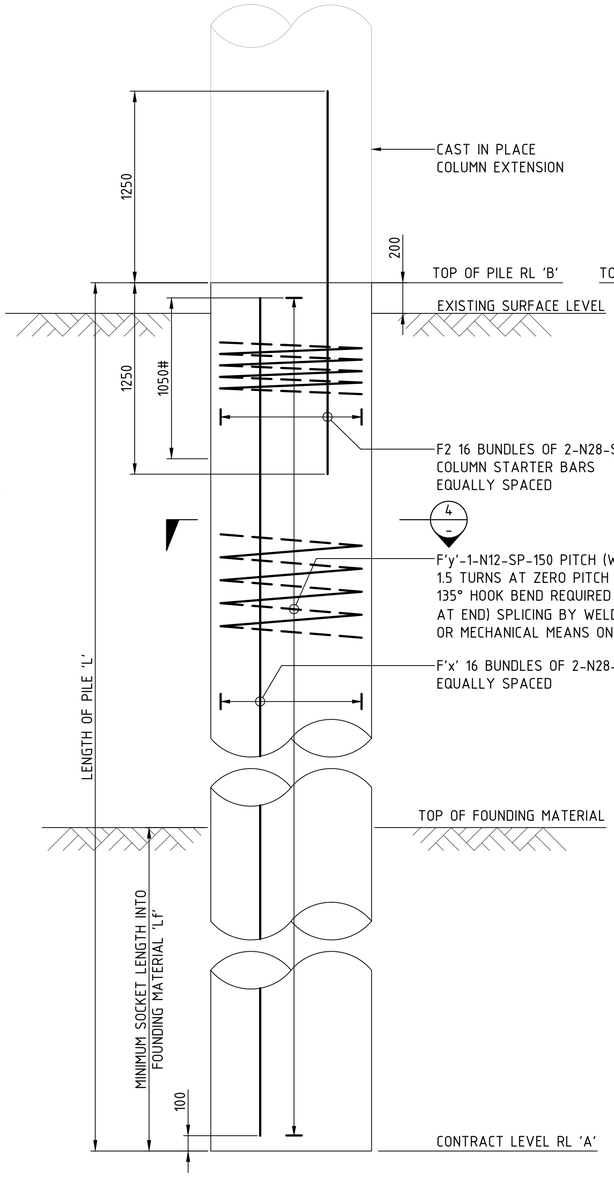
GENERAL NOTES

FOR GENERAL NOTES RELATED TO THIS SHEET,
SEE SHEET No 070.



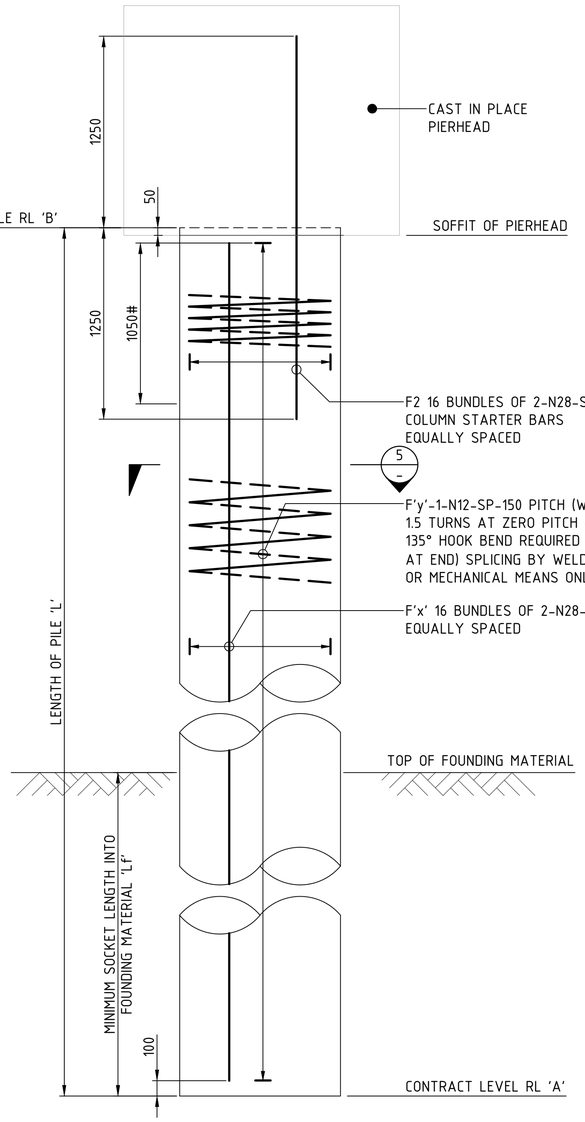
ELEVATION – ϕ900 BORED PILES AT ABUTMENT
SCALE 1 : 20
(ABUTMENT B)

# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



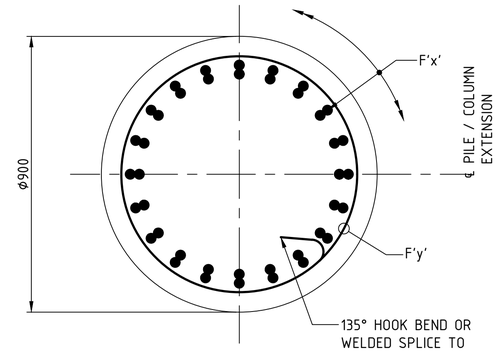
ELEVATION – ϕ1050 BORED PILES AT PIER
SCALE 1 : 20
(PIERS 11 TO 15)

# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN

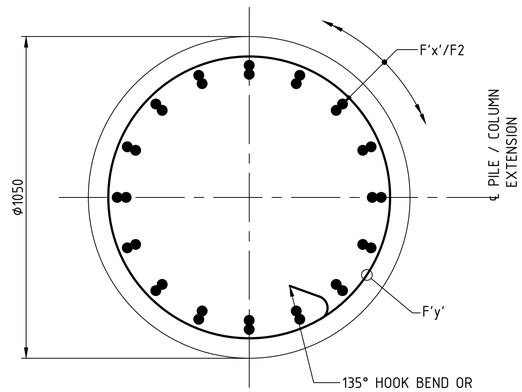


ELEVATION – ϕ1050 BORED PILES AT PIER
SCALE 1 : 20
(PIERS 16)

# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 3
SCALE 1 : 10



SECTION 4
SCALE 1 : 10

SECTION 5 SIMILAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

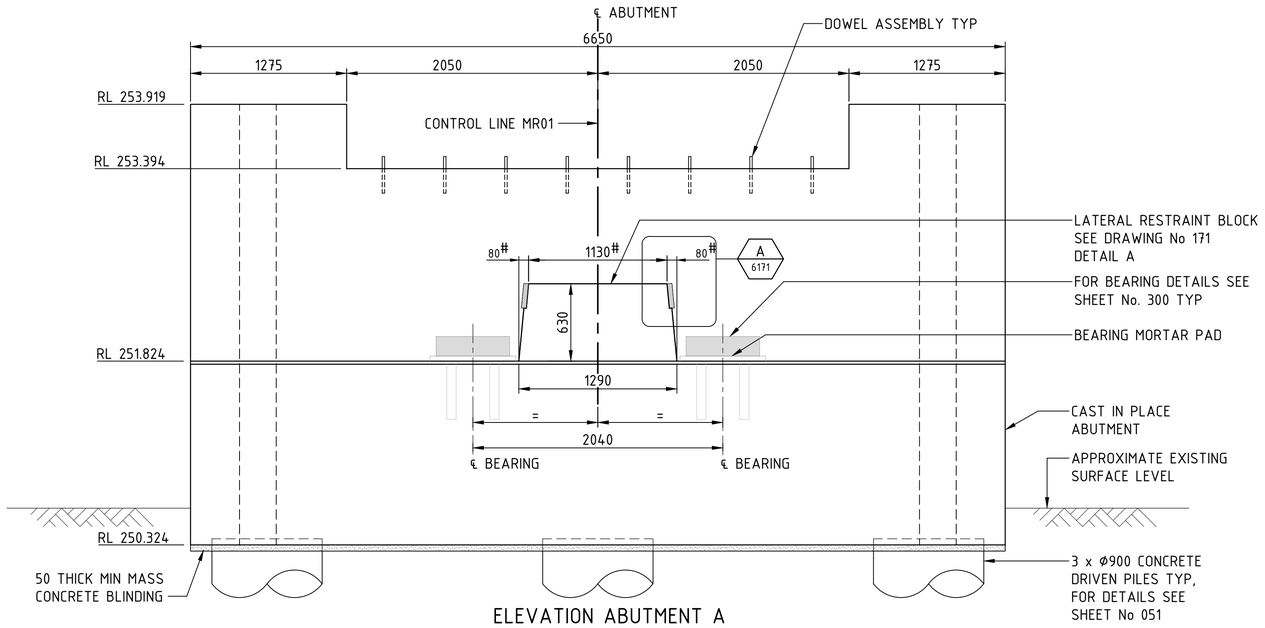
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PILE DETAIL
SHEET C

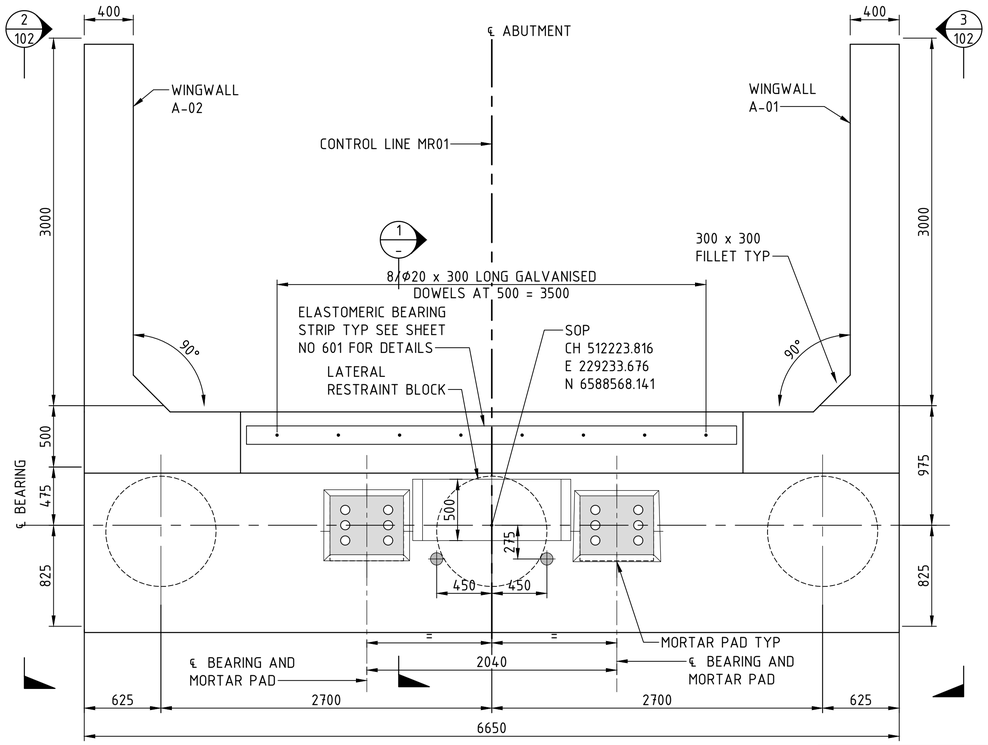
FILE No. BE22007-6670-DRG-BR-6072 | SHEET: 3 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6072 | B | EDMS No. - | -



ELEVATION ABUTMENT A

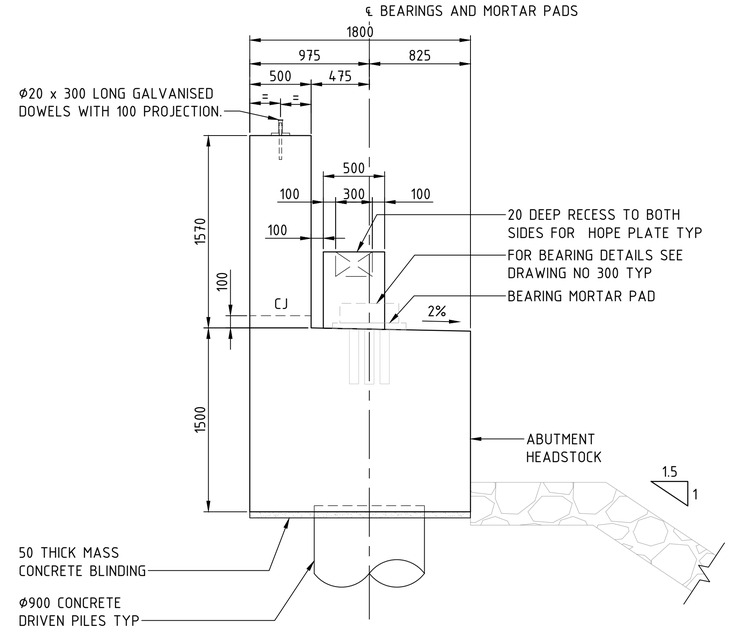
SCALE 1 : 25

DIMENSIONS SHOWN AT TOP OF RESTRAINT BLOCK ARE INDICATIVE ONLY. LATERAL RESTRAINT BLOCKS TO BE CONSTRUCTED AFTER ERECTION OF GIRDERS TO ACHIEVE BETTER FIT.



PLAN - ABUTMENT A

SCALE 1 : 25



SECTION 1/-

SCALE 1 : 25

GENERAL NOTES

CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF ALL CONCRETE TO BE 40 MPa.
CONCRETE MIX DESIGN TO TfNSW SPECIFICATION D&C 3211 PERMITTED IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B80.
MINIMUM THICKNESS OF MASS CONCRETE SHALL BE 50mm WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 20MPa UNLESS SPECIFIED OTHERWISE.
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
EDGES TO BE CHAMFERED 20 x 20mm AND RE-ENTRANT ANGLES FILLETED 20 X 20mm UNLESS SPECIFIED OTHERWISE.
NFC DENOTES NO CHAMFER OR FILLET.
CJ DENOTES CONSTRUCTION JOINT.
GALVANISED DOWELS FOR APPROACH SLABS SHALL BE IN ACCORDANCE WITH AS 4680.
BEARINGS SHALL BE SET OUT FROM SOP ONLY.
CELLULAR POLYSTYRENE SHEET TO BE CLASS H IN ACCORDANCE WITH AS1366.3.

MAXIMUM LOADS PER JACK ARE

SLS = 920kN
ULS = 1250kN

⊕ DENOTES JACKING POINT

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

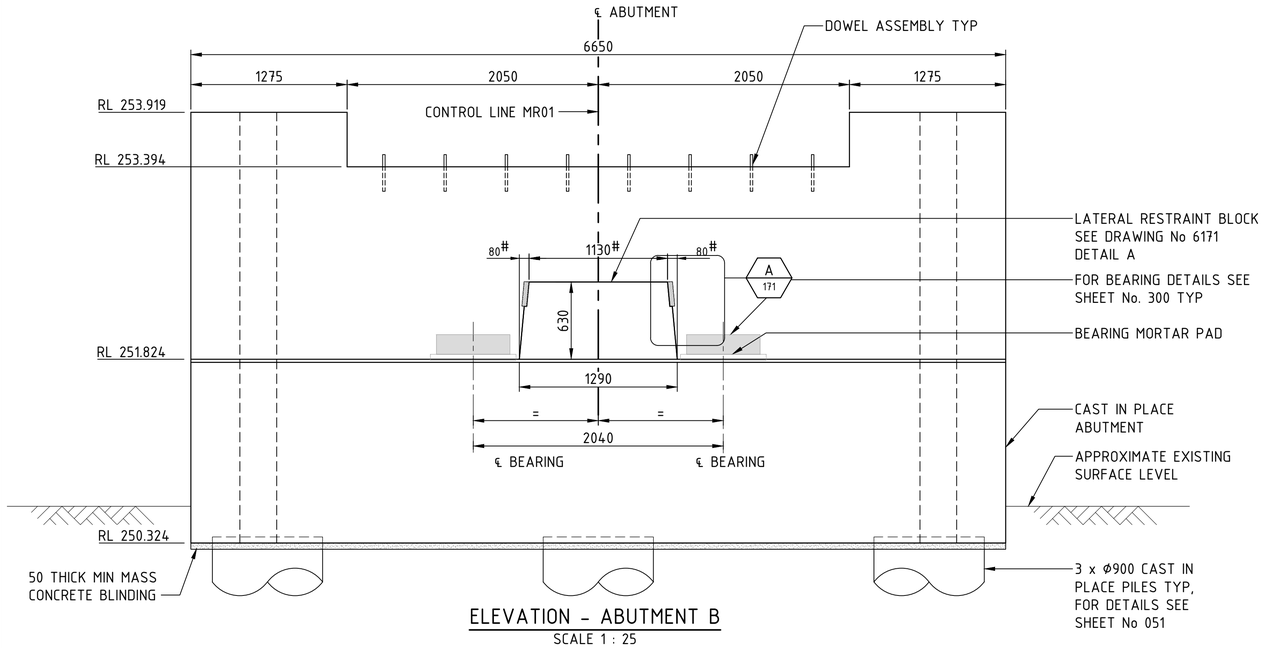
BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
ABUTMENT CONCRETE
SHEET A

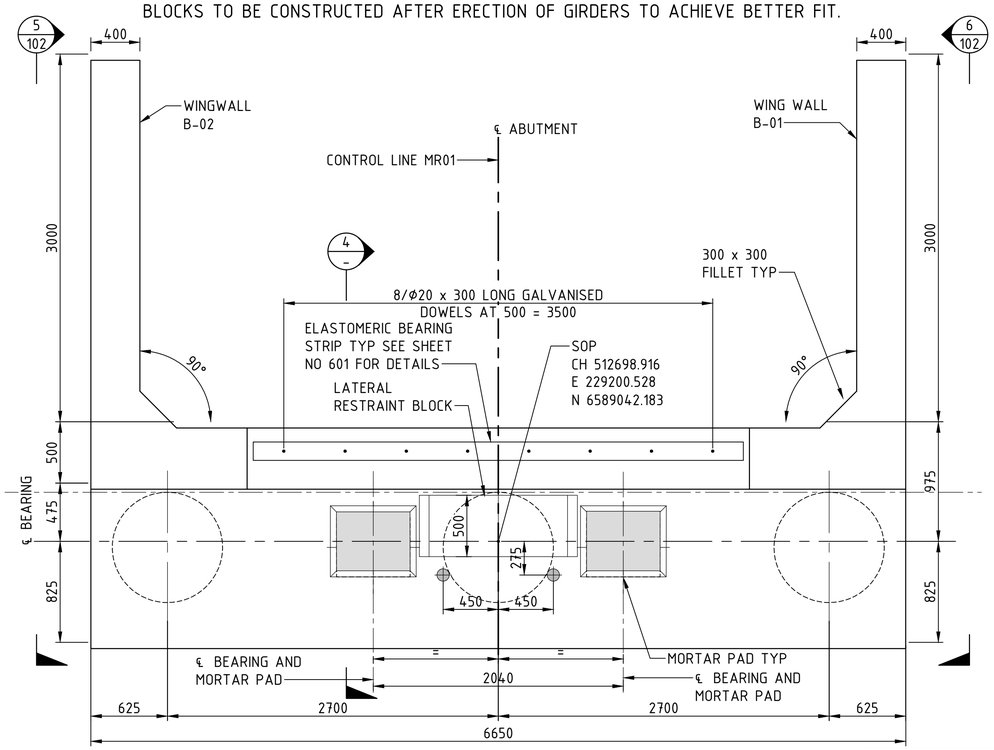
FILE No. BE22007-6670-DRG-BR-6100 | SHEET: 1 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6100 | B | EDMS No. - | -



ELEVATION - ABUTMENT B

SCALE 1 : 25

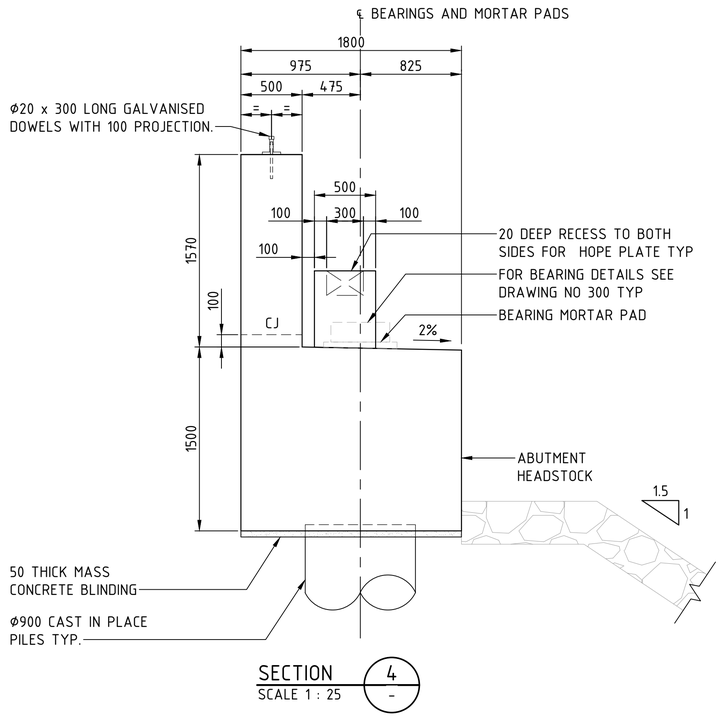
DIMENSIONS SHOWN AT TOP OF RESTRAINT BLOCK ARE INDICATIVE ONLY. LATERAL RESTRAINT BLOCKS TO BE CONSTRUCTED AFTER ERECTION OF GIRDERS TO ACHIEVE BETTER FIT.



PLAN - ABUTMENT B

SCALE 1 : 25

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR



SECTION 4 / -

SCALE 1 : 25

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 100.

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

WHITEHAVEN COAL

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

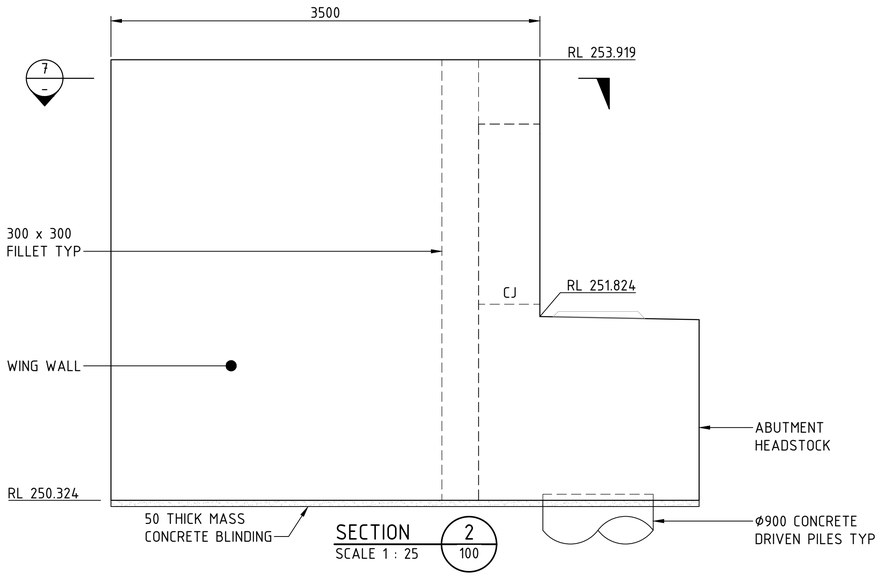
RAIL BRIDGE OVER STRATFORD CREEK ABUTMENT CONCRETE

SHEET B

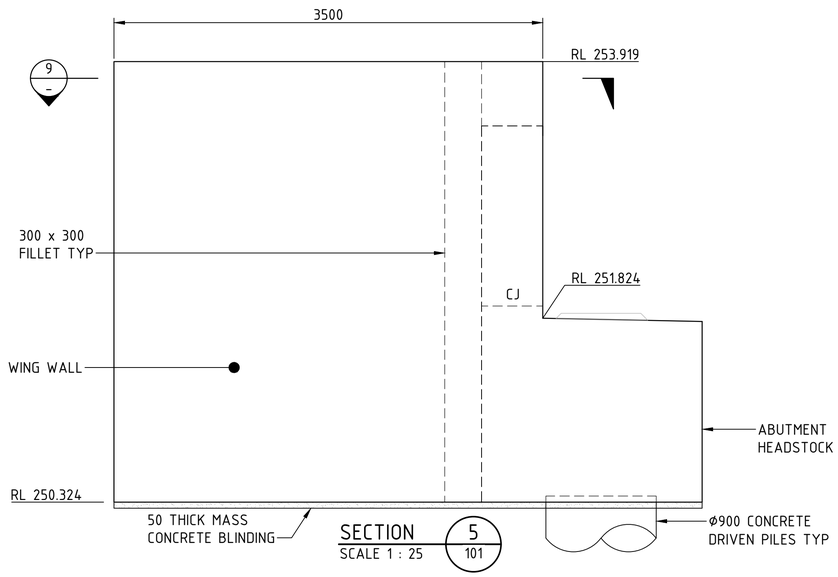
FILE No. BE22007-6670-DRG-BR-6101 | SHEET: 2 OF 3 | A1

STATUS: 100% DESIGN ©

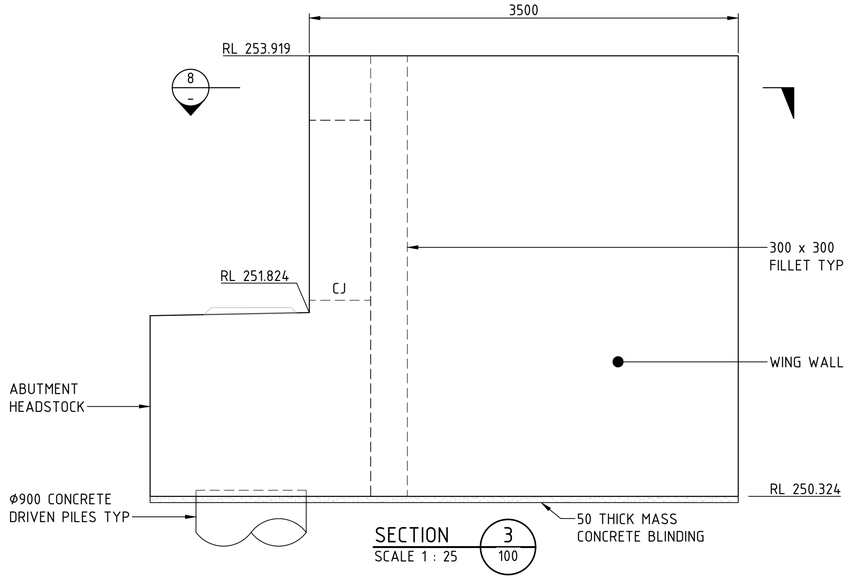
DRG No. BE22007-6670-DRG-BR-6101 | B | EDMS No. - | -



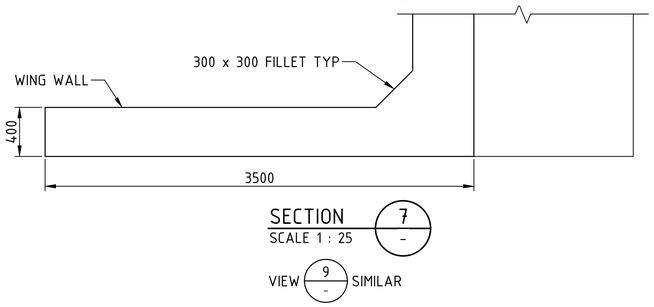
SECTION 2 / 100
SCALE 1 : 25



SECTION 5 / 101
SCALE 1 : 25

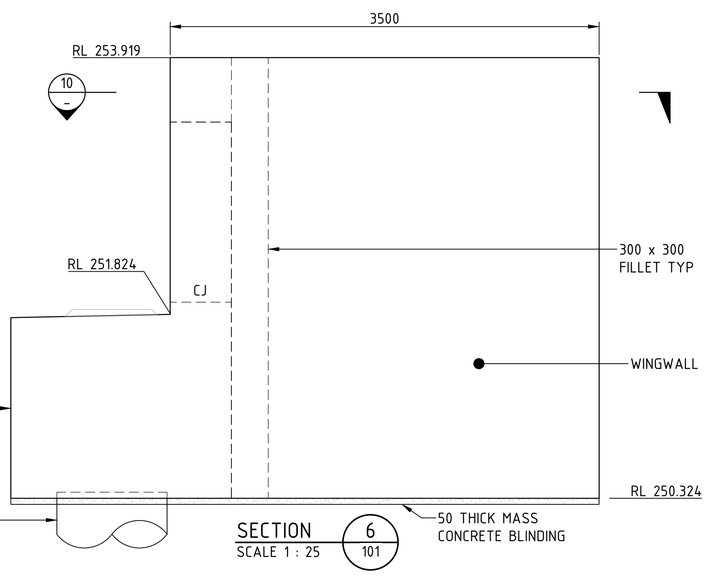


SECTION 3 / 100
SCALE 1 : 25

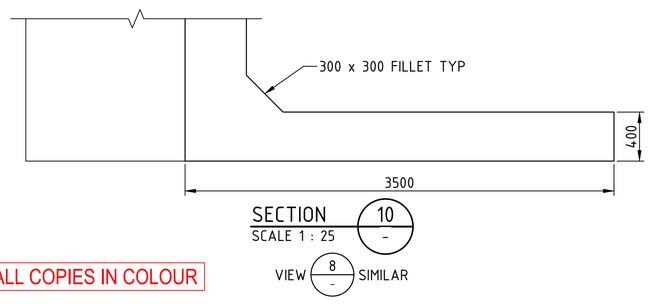


SECTION 7 / -
SCALE 1 : 25

VIEW 9 / - SIMILAR



SECTION 6 / 101
SCALE 1 : 25



SECTION 10 / -
SCALE 1 : 25

VIEW 8 / - SIMILAR

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 100.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

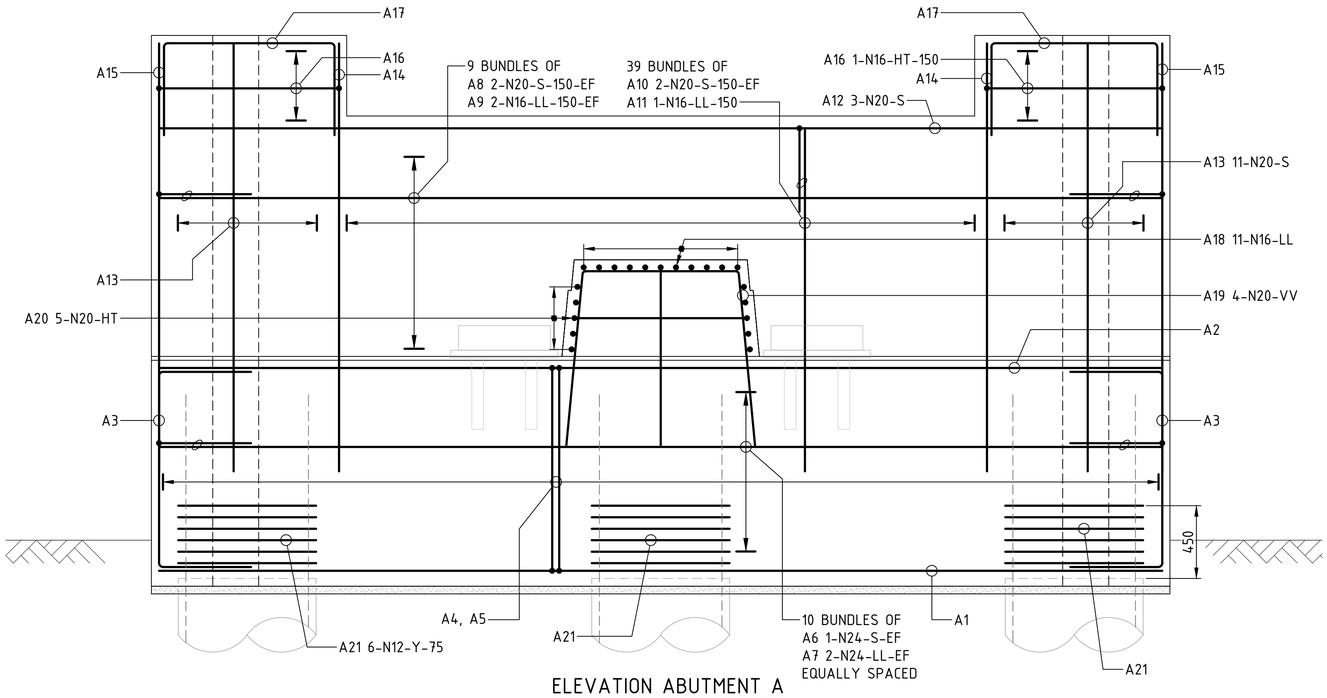
RAIL BRIDGE OVER STRATFORD CREEK ABUTMENT CONCRETE

SHEET C

FILE No. BE22007-6670-DRG-BR-6102 | SHEET: 3 OF 3 | A1

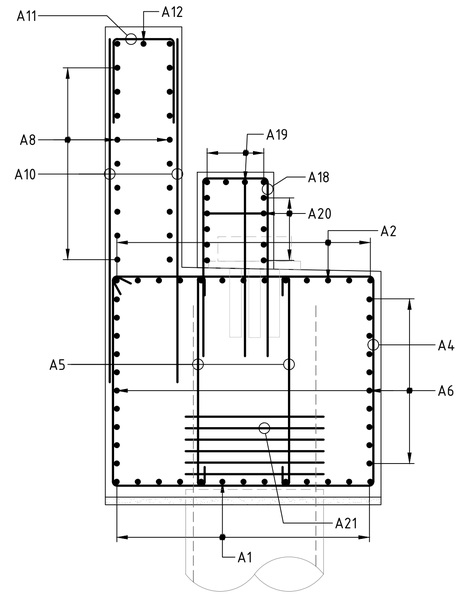
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6102 | B | EDMS No. - | -



ELEVATION ABUTMENT A

SCALE 1 : 20



SECTION 1 / -

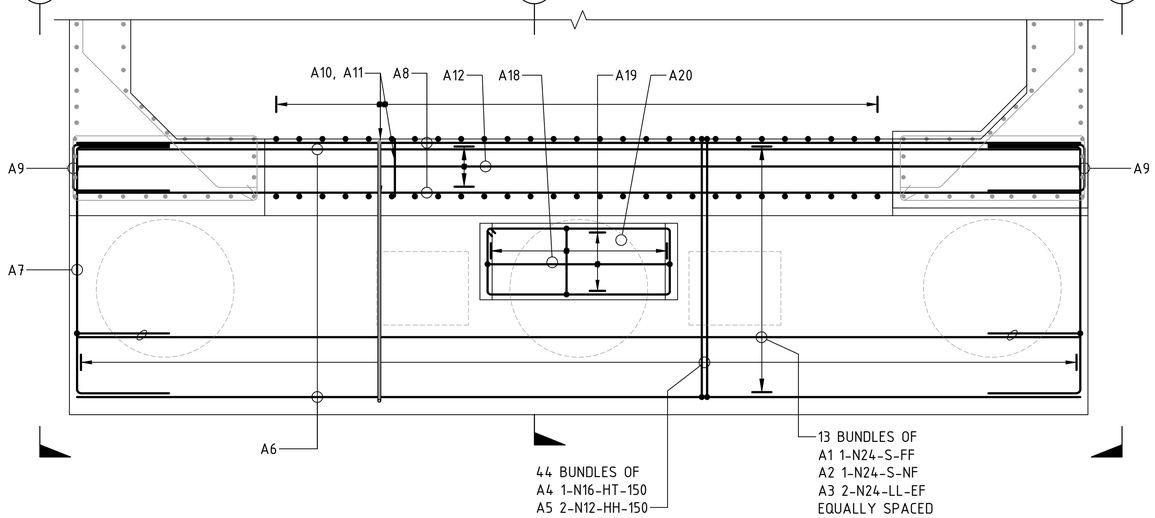
SCALE 1 : 20

GENERAL NOTES

THE REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE MUST BE 45mm OR 75mm IF CAST AGAINST GROUND.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT MUST BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS OTHERWISE SHOWN ON THE DRAWINGS, LAPS ON ADJACENT BARS ON ANY FACE MUST BE STAGGERED (OFFSET) BY NO LESS THAN THE LAP LENGTH.
UNLESS SPECIFIED OTHERWISE, THE MINIMUM DEVELOPMENT LENGTHS AND LENGTH OF LAPS MUST BE:

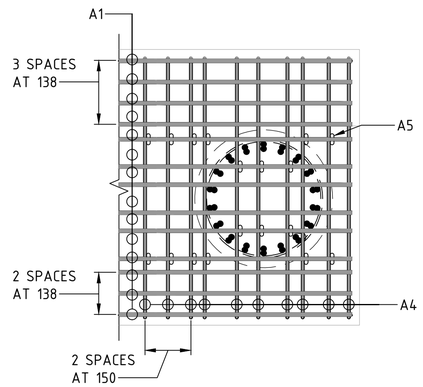
BAR SIZE:	N12	N16	N20	N24	N28	N32
a) LAP LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	800	1100	1400	1750	2100
b) LAP LENGTH OTHER BARS:	400	600	850	1100	1350	1600
c) DEVELOPMENT LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	650	850	1150	1400	1650
d) DEVELOPMENT LENGTH OTHER BARS:	350	500	700	900	1100	1300

THE CLEAR DISTANCE BETWEEN LAPPED BARS MUST NOT EXCEED 3x THE BAR DIAMETER.
REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR DOWELS, ANCHOR BOLTS, FORMED HOLES AND RECESSES.



PLAN - ABUTMENT A

SCALE 1 : 20



REINFORCEMENT ARANGEMENT AT PILE TO ABUTMENT INTERSECTION

SCALE 1 : 20

ABUTMENT REINFORCEMENT TO BE DISPLACED AS NECESSARY TO AVOID PROJECTING PILE REINFORCEMENT

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

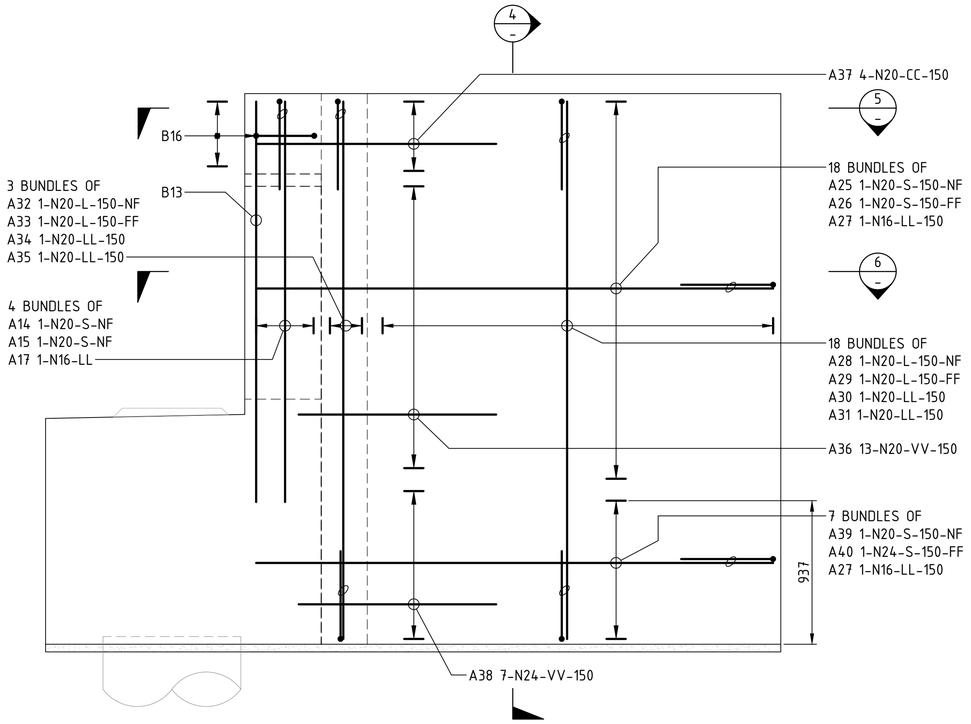
RAIL BRIDGE OVER STRATFORD CREEK ABUTMENT REINFORCEMENT

SHEET A

FILE No. BE22007-6670-DRG-BR-6150 | SHEET: 1 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6150 | B | EDMS No. - | -

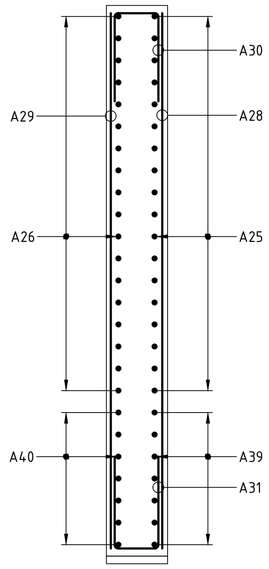
GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 150.

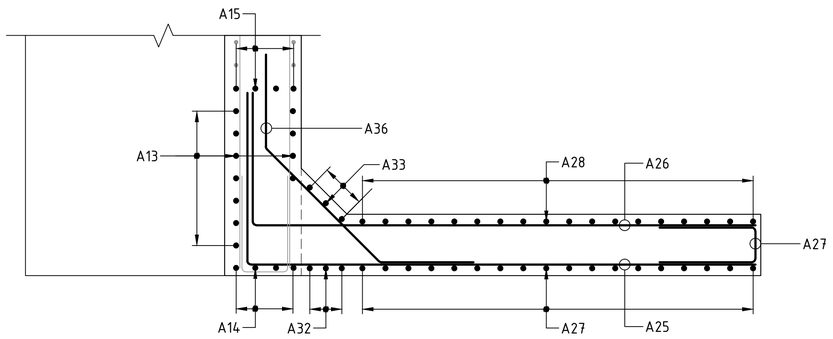


VIEW 3 / SCALE 1 : 20 — 150

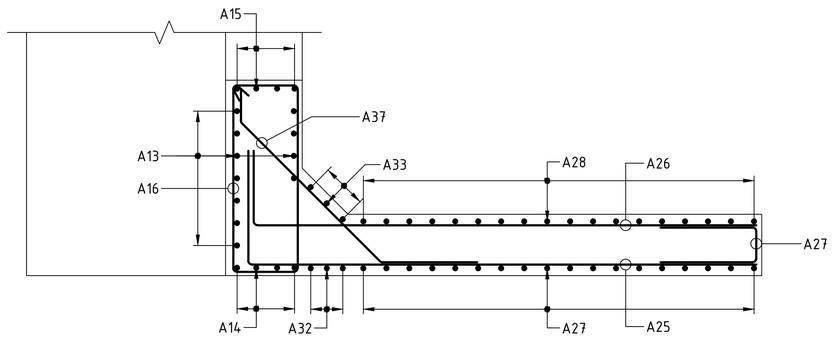
VIEW 2 / 150 SIMILAR



SECTION 4 / SCALE 1 : 20 — -



SECTION 5 / SCALE 1 : 20 — -



SECTION 6 / SCALE 1 : 20 — -

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 — 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R. PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK ABUTMENT REINFORCEMENT

SHEET B

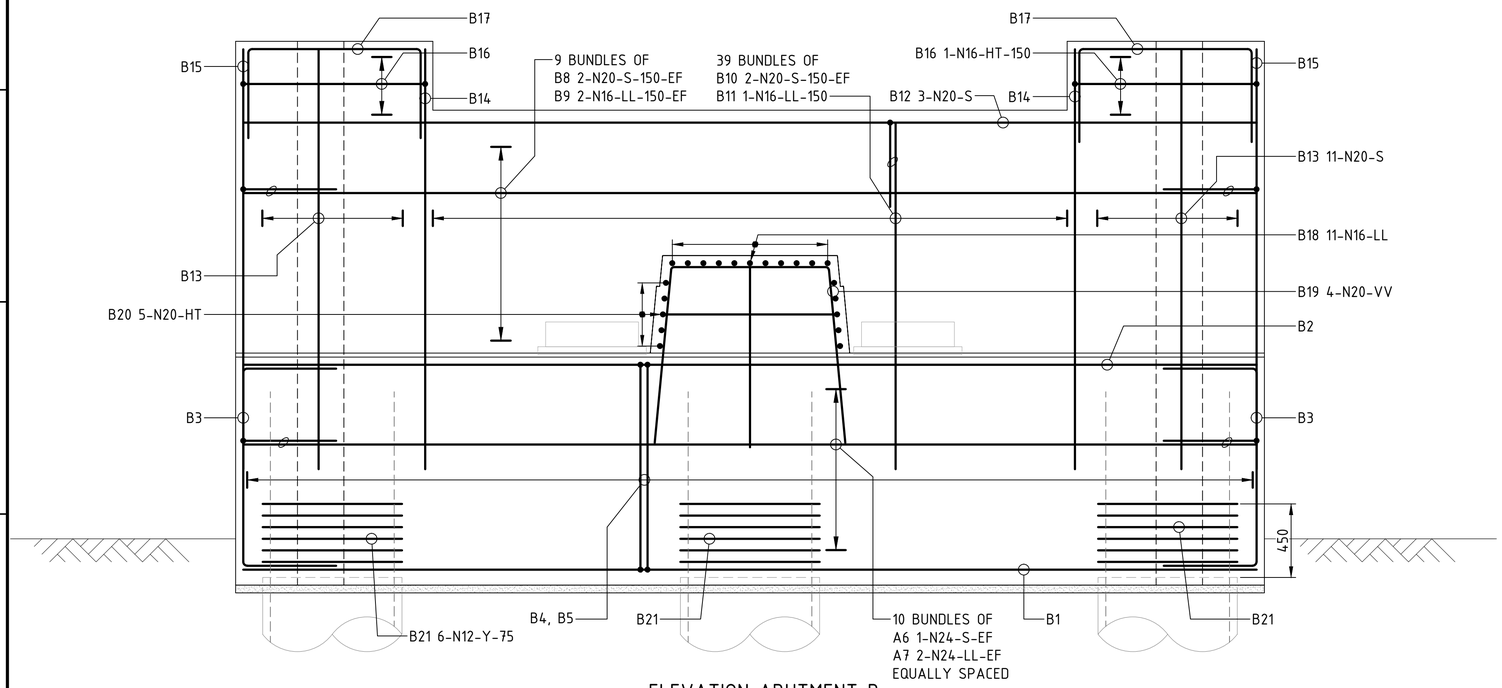
FILE No. BE22007-6670-DRG-BR-6151 | SHEET: 2 OF 4 | A1

STATUS: 100% DESIGN ©

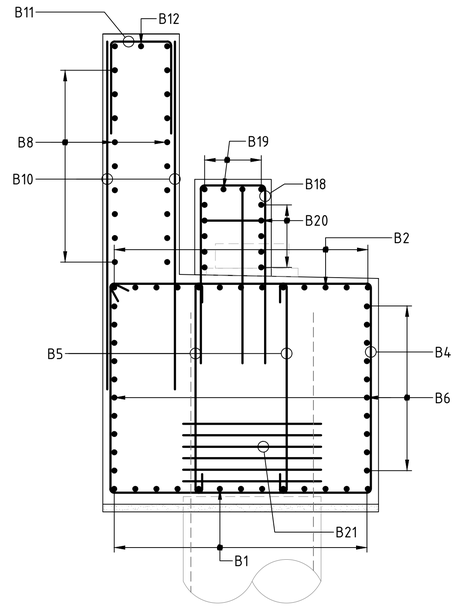
DRG No. BE22007-6670-DRG-BR-6151 | B | EDMS No. - | -

GENERAL NOTES

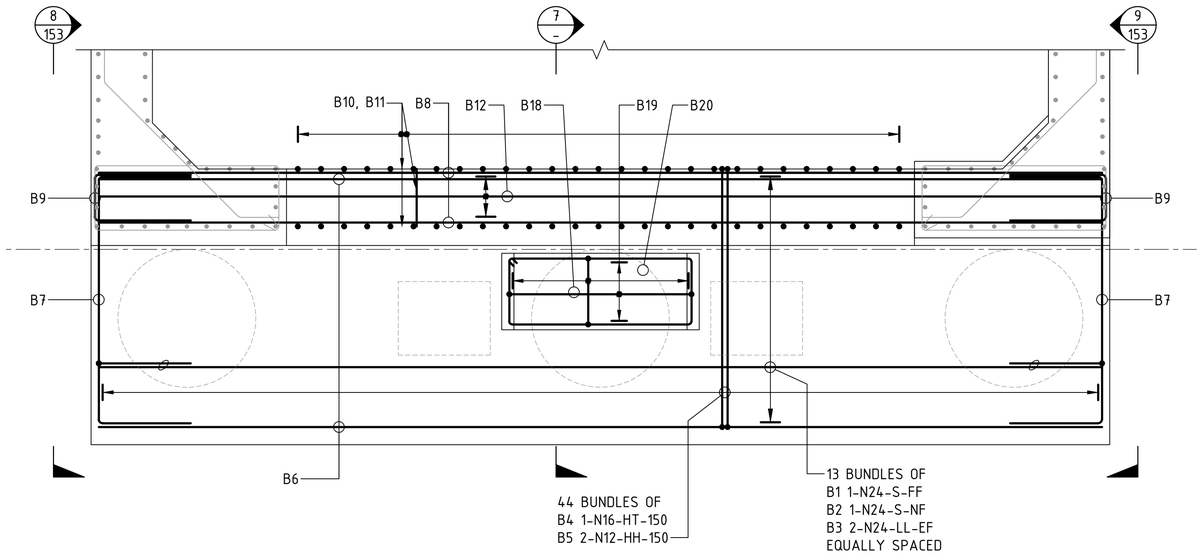
FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 150.



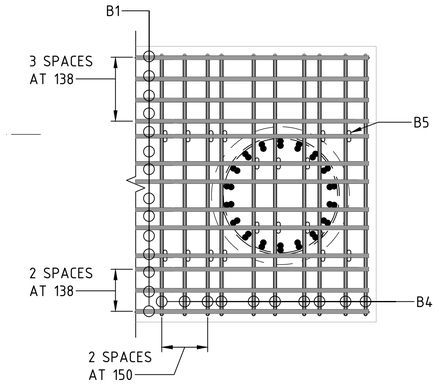
ELEVATION ABUTMENT B
SCALE 1 : 20



SECTION 7 / -
SCALE 1 : 20



PLAN - ABUTMENT B
SCALE 1 : 20



REINFORCEMENT ARANGEMENT AT
PILE TO ABUTMENT INTERSECTION
SCALE 1 : 20
ABUTMENT REINFORCEMENT TO BE DISPLACED AS NECESSARY TO AVOID PROJECTING PILE REINFORCEMENT

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R. PAN 21/07/2023
APPROVED - -

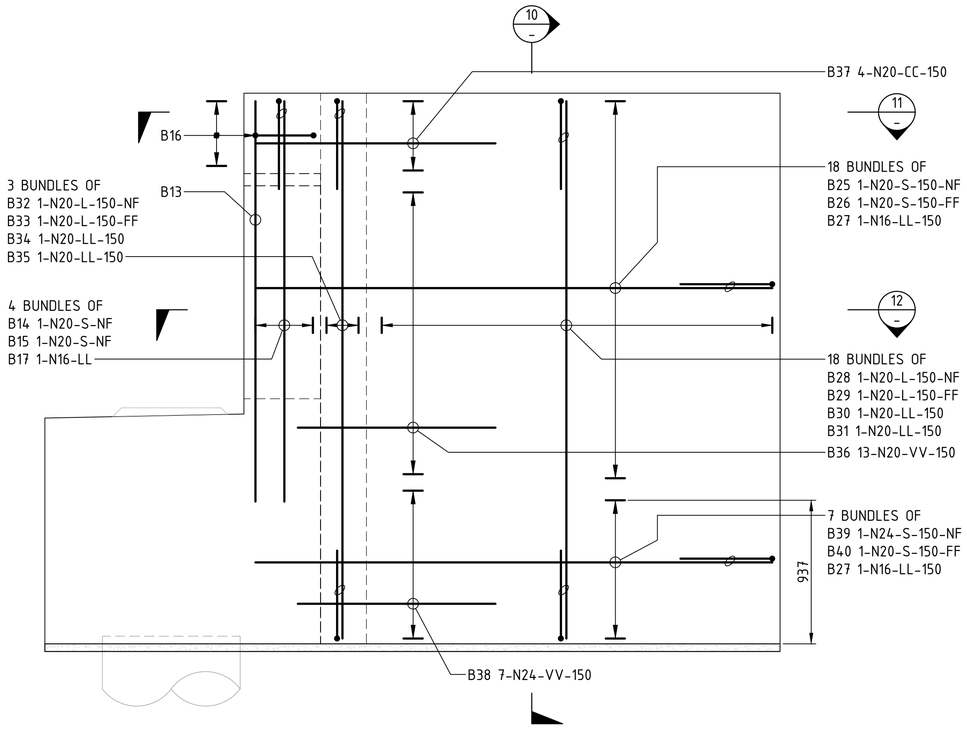
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
ABUTMENT REINFORCEMENT
SHEET C

FILE No. BE22007-6670-DRG-BR-6152 | SHEET: 3 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6152 | B | EDMS No. - | -

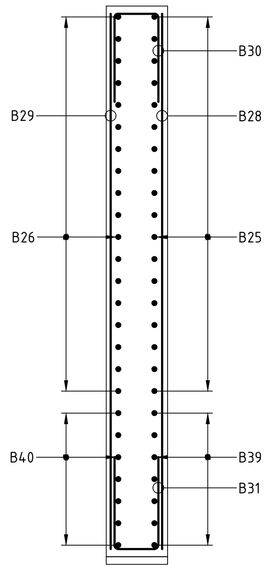
GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 150.

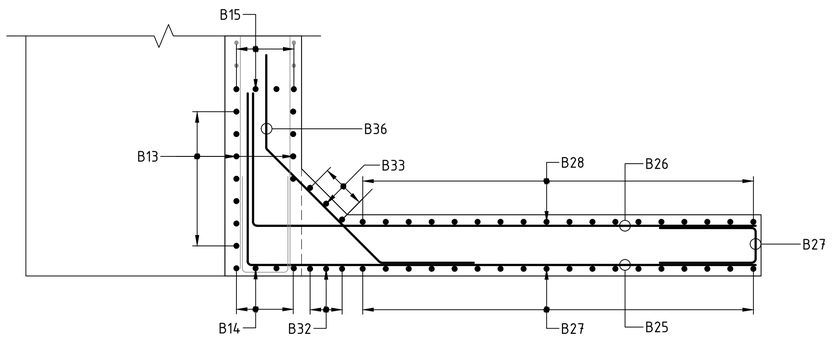


VIEW 9/152
SCALE 1 : 20

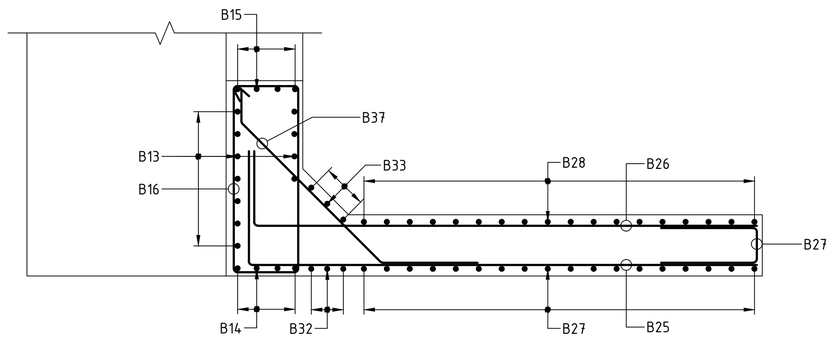
VIEW 8/152 SIMILAR



SECTION 10/–
SCALE 1 : 20



SECTION 11/–
SCALE 1 : 20



SECTION 12/–
SCALE 1 : 20

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-
AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R. PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

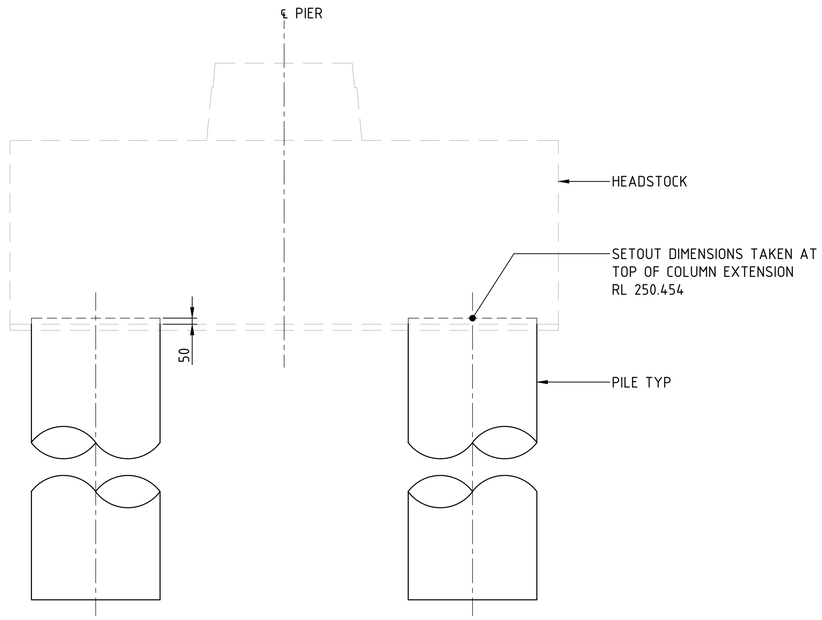
RAIL BRIDGE OVER STRATFORD CREEK ABUTMENT REINFORCEMENT

SHEET D

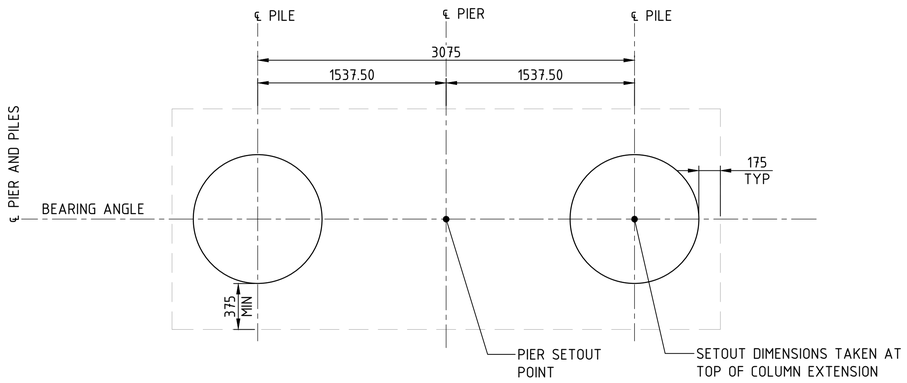
FILE No. BE22007-6670-DRG-BR-6153 | SHEET: 4 OF 4 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6153 | B | EDMS No. - | -



ELEVATION - PIER
SCALE 1 : 25



PLAN
SCALE 1 : 25

GENERAL NOTES:

SCALE AS SHOWN.
CONCRETE EXPOSURE CLASSIFICATION: B1.
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF ALL CONCRETE TO BE 40MPa.
EDGES TO BE CHAMFERED 20mm x 20mm AND RE-ENTRANT ANGLES FILLETED 20mm x 20mm UNLESS SPECIFIED OTHERWISE.
CJ DENOTES CONSTRUCTION JOINT.

HEAT OF HYDRATION LIMITS:

CONCRETE MIX DESIGNS AND FACTORS THAT INFLUENCE PEAK AND DIFFERENTIAL HEAT OF HYDRATION TEMPERATURES ACROSS A RESTRAINED CONCRETE MEMBER WITH A LEAST DIMENSION OF 500mm OR MORE AND THE VOLUME BEING PLACES IS GREATER THAN $5m^3$, SHALL INCLUDE MEASURES TO LIMIT TEMPERATURES DURING THE CURING PERIOD TO:
- PEAK TEMPERATURE TO A MAXIMUM 70°C
- DIFFERENT TEMPERATURE ACROSS THE CROSS-SECTION, TO 25°C

TWO THERMOCOUPLES ARE REQUIRED WITHIN THE CONCRETE MEMBER, ONE AT THE EDGE REINFORCEMENT AND ONE AT CENTRAL REINFORCEMENT USED TO MONITOR THE MAXIMUM AND DIFFERENTIAL TEMPERATURES ACROSS THE CONCRETE MEMBER.

CRACK CONTROL RECOMMENDATIONS INCLUDE:

MAXIMUM CONCRETE TEMPERATURE AT PLACEMENT TO BE 28°C.
36mm THICK PLYWOOD FORMWORK WITH A LAYER OF POLYETHYLENE SHEET TAPED TO THE FORMWORK OVER THE TOP SURFACE FORMING A 20mm AIR GAP OR APPROVED EQUIVALENT.
RETAIN THE FORMWORK / INSULATION IN PLACE FOR A PERIOD OF AT LEAST 7 DAYS OR UNTIL THE TEMPERATURE DIFFERENTIAL HAS BEEN CONFIRMED AS BELOW 25°C BY IN-SITU TEMPERATURE MONITORING AND WILL REMAIN BELOW 25°C IF THE FORMWORK IS REMOVED.
THE FORMWORK/INSULATION TO BE REMOVED DURING THE DAY WHEN THE TEMPERATURE IS HIGH AND NOT EARLY IN THE MORNING.
IF A MINIMUM OF 7 DAYS CURING HAS NOT BEEN ACHIEVED APPLY SUBSEQUENT WET OR SEAL CURING IN ACCORDANCE WITH TfNSW D&C SPECIFICATION B80.
WHERE CURING COMPOUNDS ARE PROPOSED, THE COVER MUST BE INCREASED BY 5 MM FOR CLASSIFICATION B1.
CONCRETE MIX DESIGN TO TfNSW 3211 PERMITTED IN ACCORDANCE WITH TfNSW D&C SPECIFICATION B80.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

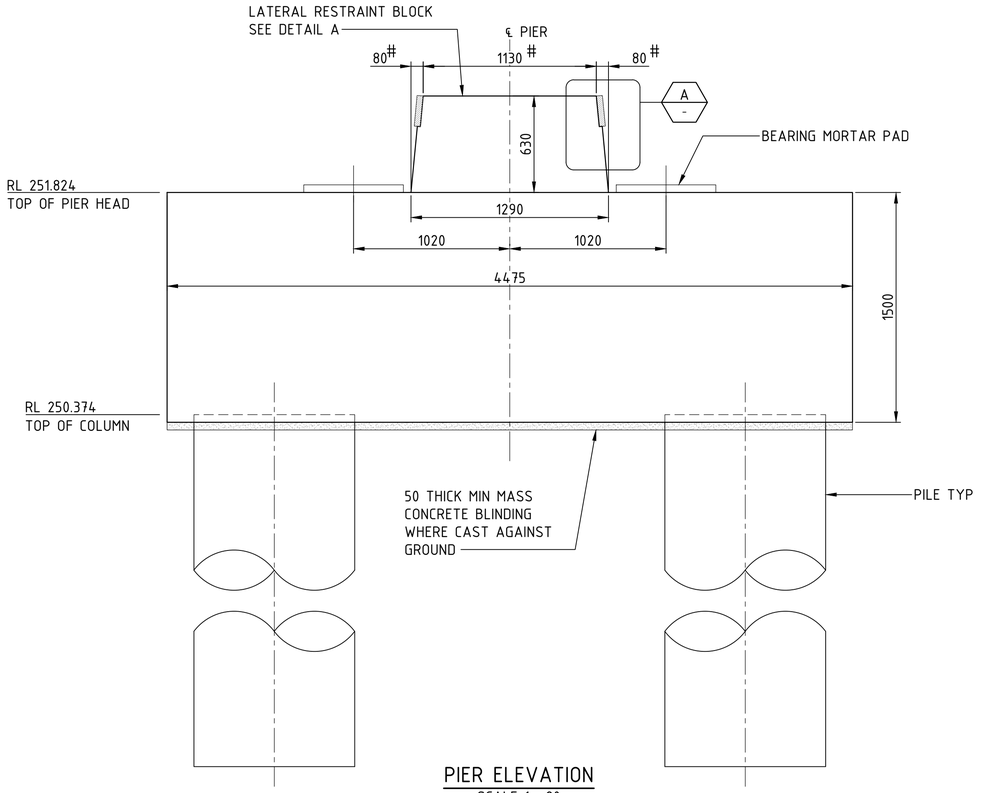
WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

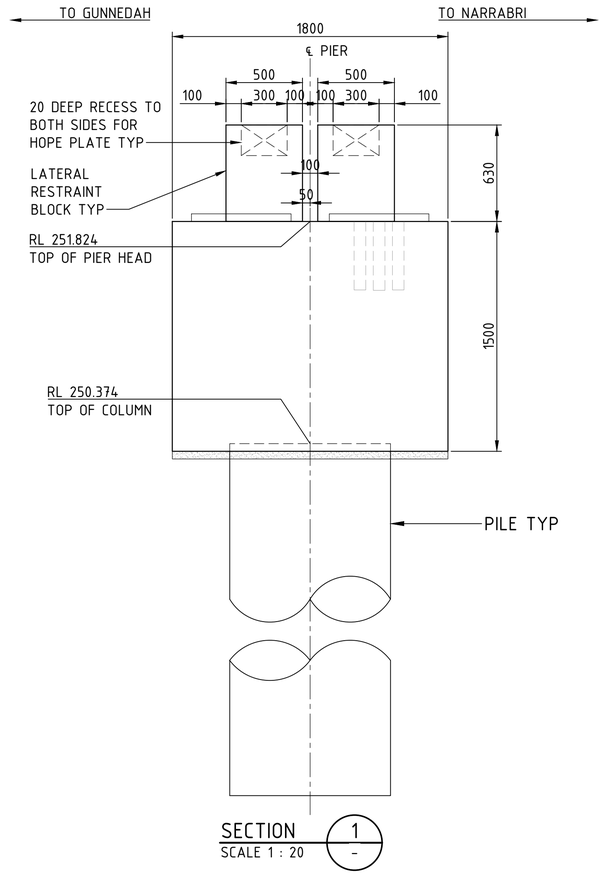
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PIER CONCRETE
SHEET A

FILE No. BE22007-6670-DRG-BR-6170 | SHEET: 1 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6170 | B | EDMS No. - | -



PIER ELEVATION
SCALE 1 : 20

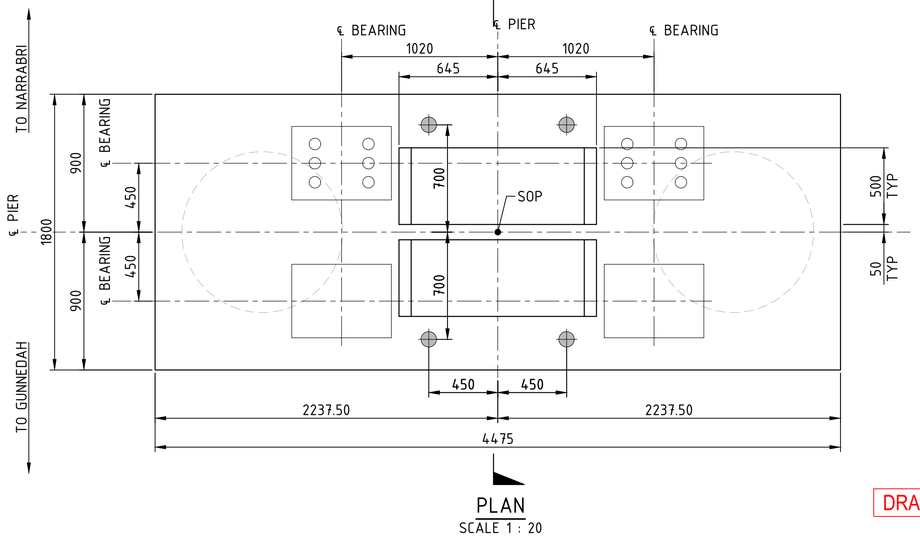
DIMENSIONS SHOWN AT TOP OF RESTRAINT BLOCK ARE INDICATIVE ONLY. LATERAL RESTRAINT BLOCKS TO BE CONSTRUCTED AFTER ERECTION OF GIRDERS TO ACHIEVE BETTER FIT.



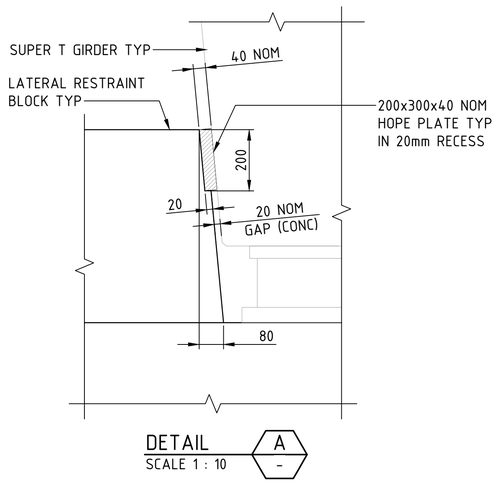
SECTION 1 / -
SCALE 1 : 20

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 170.



PLAN
SCALE 1 : 20



DETAIL A / -
SCALE 1 : 10

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

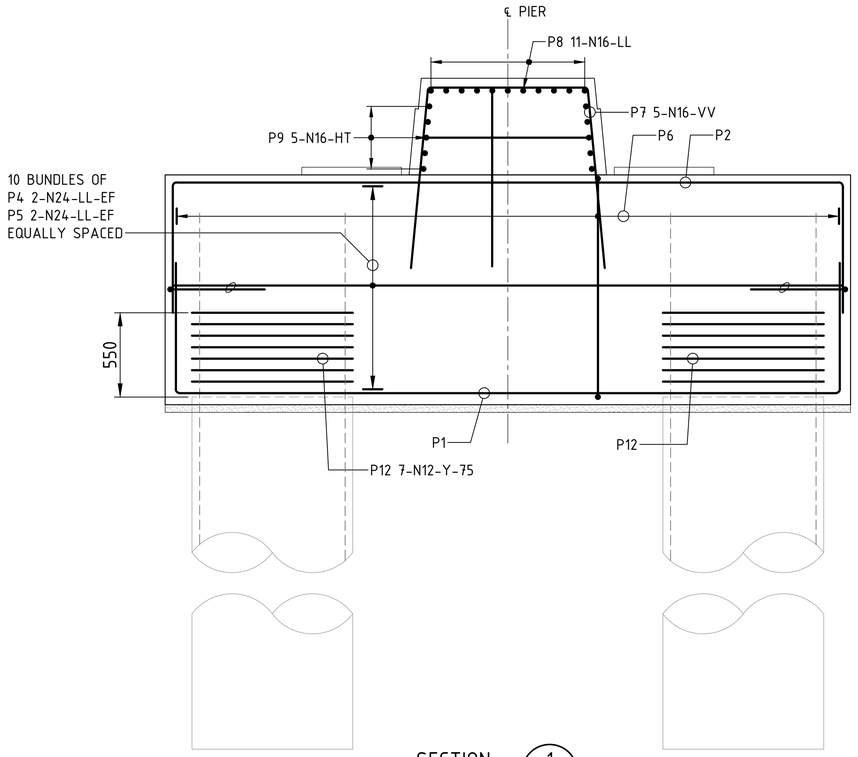
RAIL BRIDGE OVER STRATFORD CREEK PIER CONCRETE

SHEET B

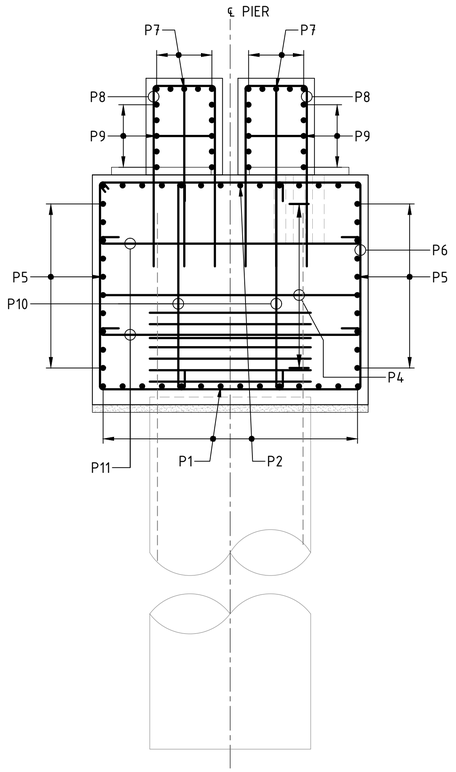
FILE No. BE22007-6670-DRG-BR-6171 | SHEET: 2 OF 2 | A1

STATUS: 100% DESIGN ©

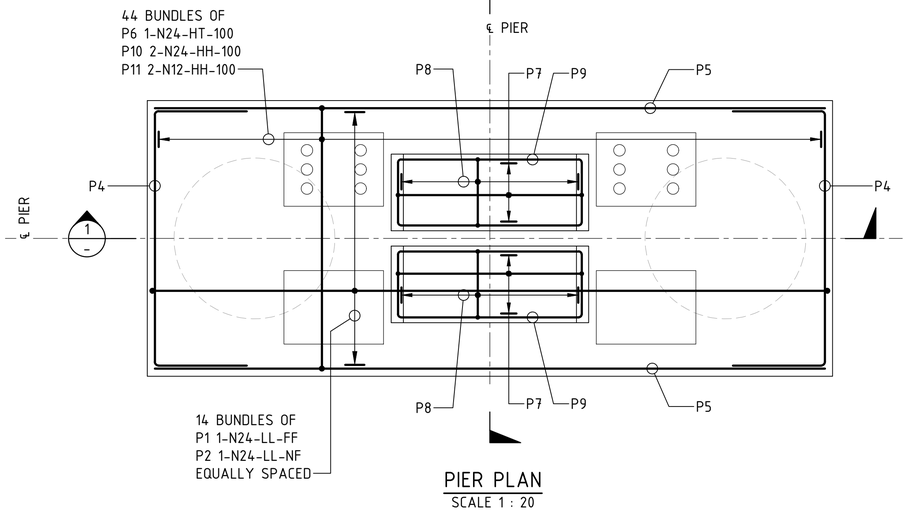
DRG No. BE22007-6670-DRG-BR-6171 | B | EDMS No. - | -



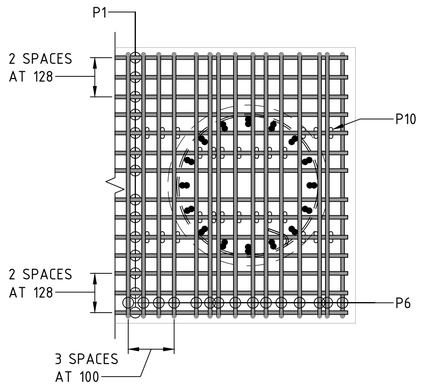
SECTION 1
SCALE 1 : 20



SECTION 2
SCALE 1 : 20



PIER PLAN
SCALE 1 : 20



REINFORCEMENT ARANGEMENT AT
COLUMN/PILE TO HEADSTOCK INTERSECTION
SCALE 1 : 20
HEADSTOCK REINFORCEMENT TO BE DISPLACED AS NECESSARY TO AVOID PROJECTING PILE REINFORCEMENT

GENERAL NOTES

THE REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE MUST BE 45mm OR 75mm IF CAST AGAINST GROUND.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT MUST BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS OTHERWISE SHOWN ON THE DRAWINGS, LAPS ON ADJACENT BARS ON ANY FACE MUST BE STAGGERED (OFFSET) BY NO LESS THAN THE LAP LENGTH.
UNLESS SPECIFIED OTHERWISE, THE MINIMUM DEVELOPMENT LENGTHS AND LENGTH OF LAPS MUST BE:

BAR SIZE:	N12	N16	N20	N24	N28	N32
a) LAP LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	800	1100	1400	1750	2100
b) LAP LENGTH OTHER BARS:	400	600	850	1100	1350	1600
c) DEVELOPMENT LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	650	850	1150	1400	1650
d) DEVELOPMENT LENGTH OTHER BARS:	350	500	700	900	1100	1300

THE CLEAR DISTANCE BETWEEN LAPPED BARS MUST NOT EXCEED 3x THE BAR DIAMETER.
REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR DOWELS, ANCHOR BOLTS, FORMED HOLES AND RECESSES.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

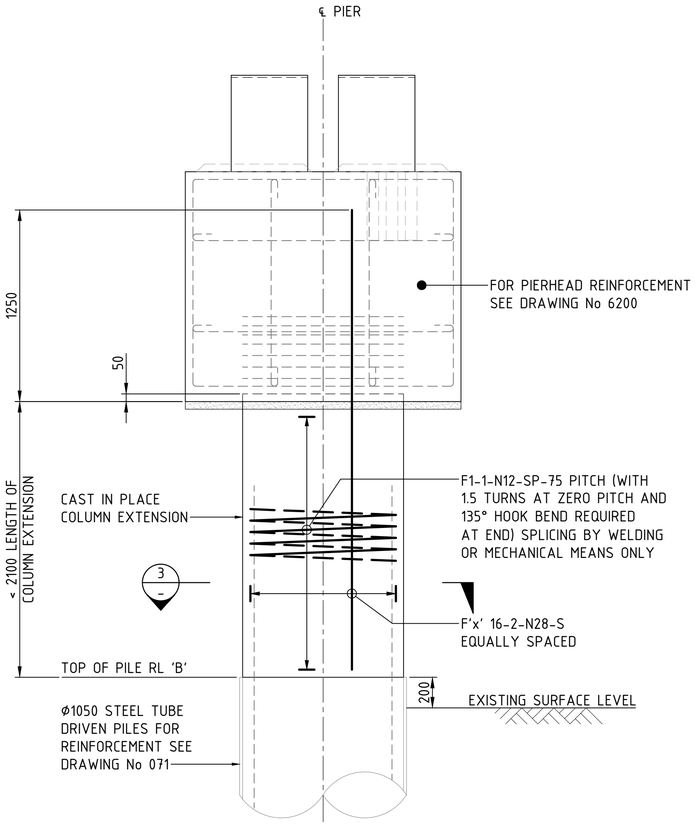
DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PIER REINFORCEMENT
SHEET A

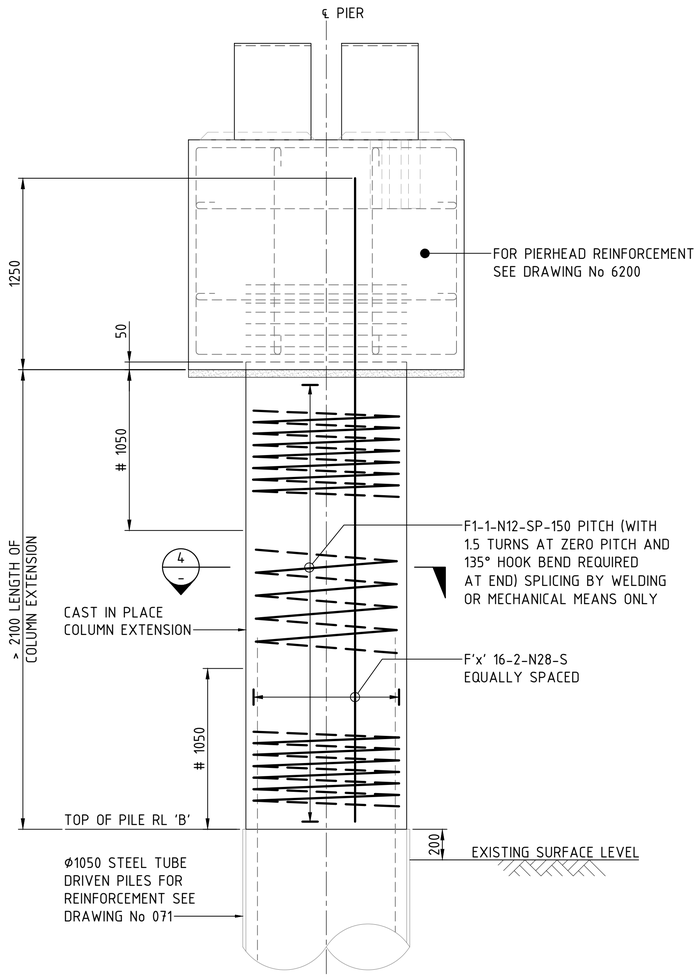
FILE No. BE22007-6670-DRG-BR-6200 | SHEET: 1 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6200 | B | EDMS No. - | -

GENERAL NOTES

FOR GENERAL NOTES RELATED TO THIS SHEET,
SEE SHEET No 200.

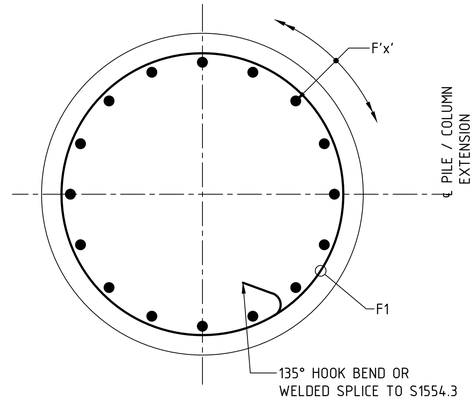


ELEVATION – ϕ1050 COLUMN EXTENSION
SCALE 1 : 20
(PIER 4)



ELEVATION – ϕ1050 COLUMN EXTENSION
SCALE 1 : 20
(PIER 8 TO 10)

# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 3 / SCALE 1 : 10

SECTION 4 SIMILAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

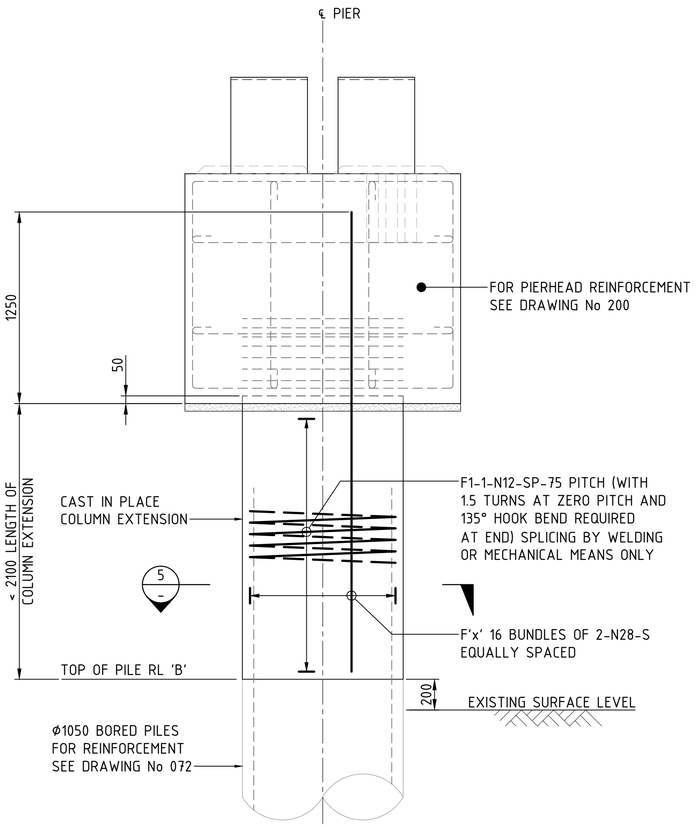
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PIER REINFORCEMENT
SHEET B

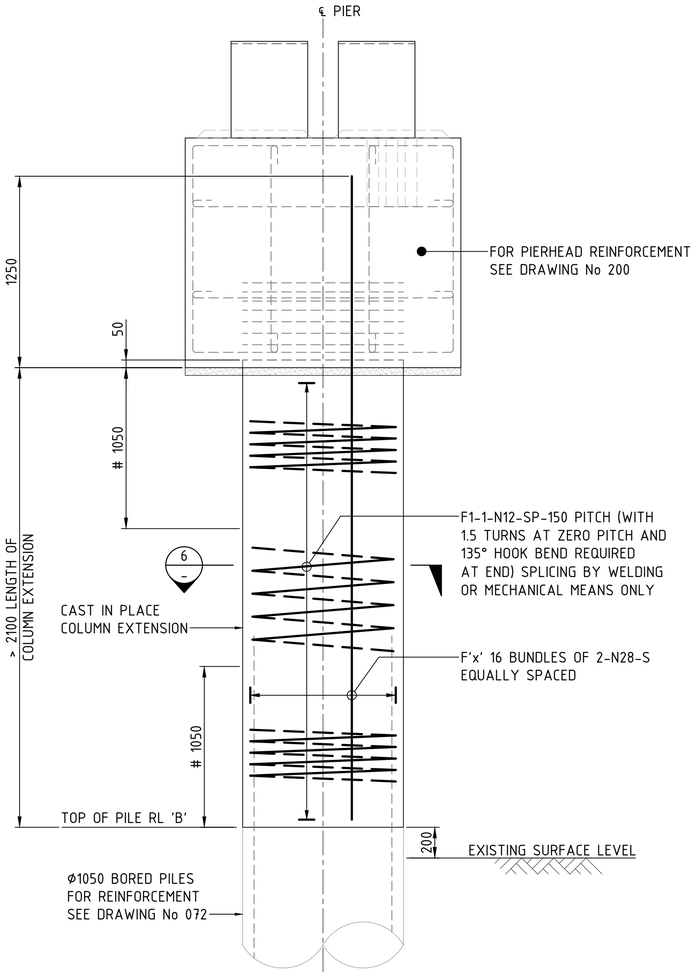
FILE No. BE22007-6670-DRG-BR-6201 | SHEET: 2 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6201 | B | EDMS No. - | -

GENERAL NOTES

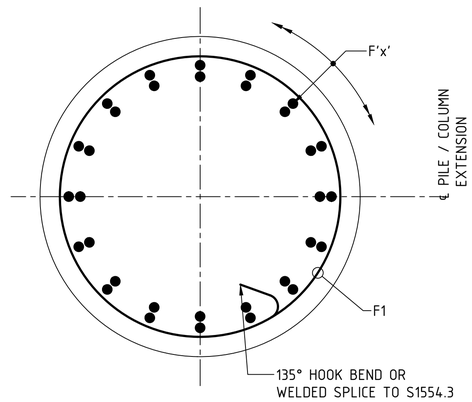
FOR GENERAL NOTES RELATED TO THIS SHEET,
SEE SHEET No 200.



ELEVATION - ø1050 COLUMN EXTENSION
SCALE 1 : 20
(PIER 15)



ELEVATION - ø1050 COLUMN EXTENSION
SCALE 1 : 20
(PIER 11 TO 14)
# DENOTES SPIRAL PITCH REDUCED TO 75 OVER EXTENT SHOWN



SECTION 5 / - SCALE 1 : 10

SECTION 6 / - SIMILAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

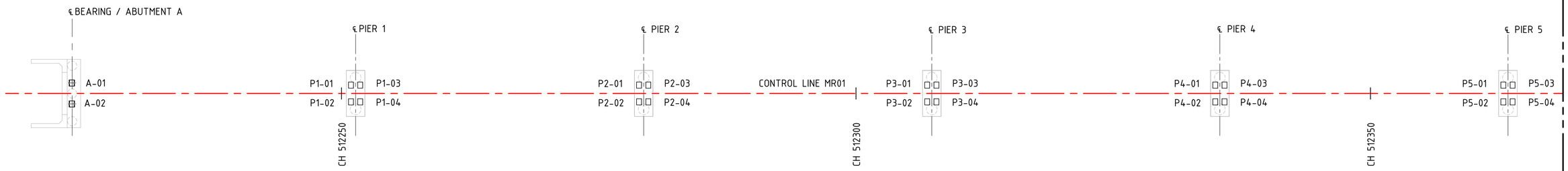
RAIL BRIDGE OVER STRATFORD CREEK
PIER REINFORCEMENT
SHEET C

FILE No. BE22007-6670-DRG-BR-6202	SHEET: 3 OF 3	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-6202	B	EDMS No. - / -

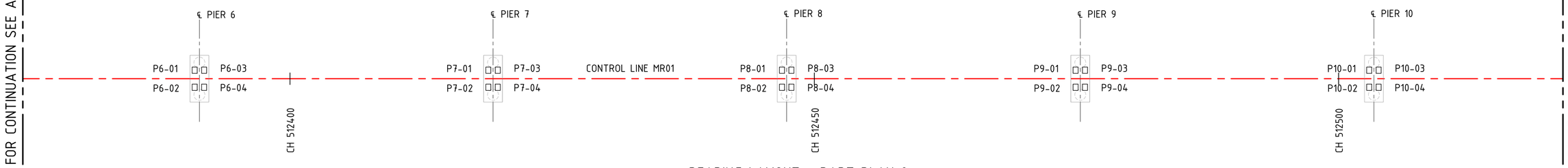
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 301.

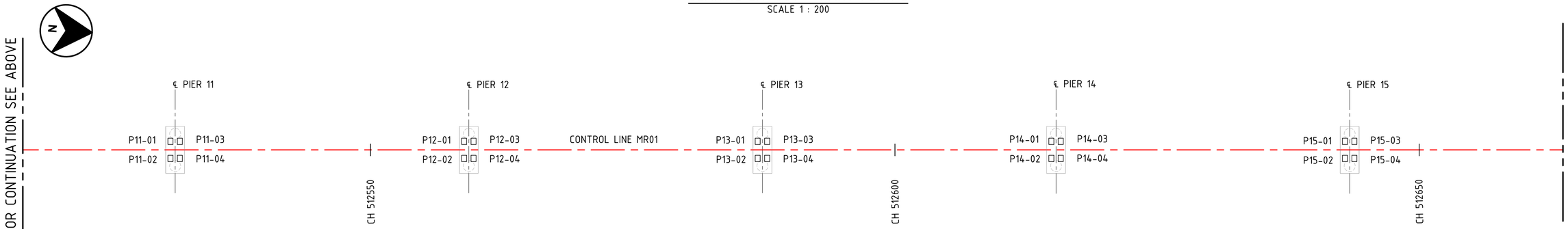
FROM GUNNEDAH



BEARING LAYOUT - PART PLAN 1
SCALE 1 : 200

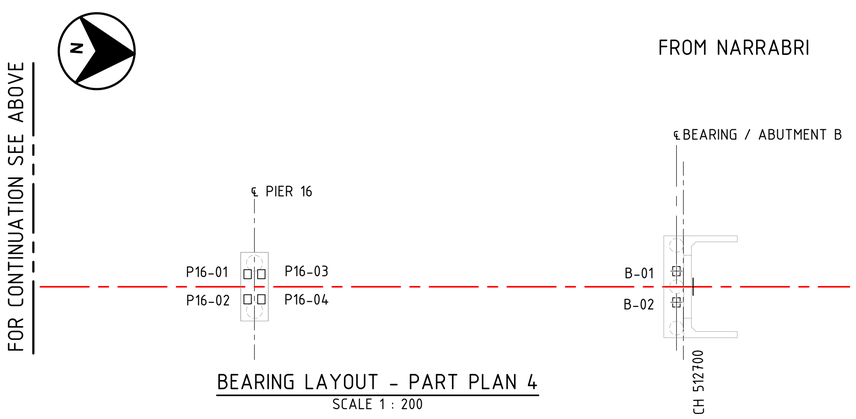


BEARING LAYOUT - PART PLAN 2
SCALE 1 : 200



BEARING LAYOUT - PART PLAN 3
SCALE 1 : 200

FROM NARRABRI



BEARING LAYOUT - PART PLAN 4
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK BEARING

SHEET A

FILE No. BE22007-6670-DRG-BR-6300 | SHEET: 1 OF 5 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6300 | B | EDMS No. - | -

GENERAL NOTES

MINIMUM 28 DAY COMPRESSIVE STRENGTH OF EPOXY MORTAR AND CEMENT MORTAR MUST BE 40MPa PRIOR TO BEARING INSTALLATION.
CONCRETE EXPOSURE CLASSIFICATION B1.
THE MIX RATIO OF EPOXY AND SAND AND THE TYPE OF SAND FOR THE PRE-MOULDED EPOXY MORTAR BLOCK SHALL BE IN ACCORDANCE WITH THE EPOXY MANUFACTURER'S SPECIFICATION.
TOP OF PRE-MOULDED EPOXY MORTAR BLOCK SHALL HAVE A WIRE BRUSH FINISH PRIOR TO BEING GLUED TO GIRDER.
EPOXY MORTAR BLOCKS MUST BE CONSTRUCTED NOT MORE THAN 2 WEEKS PRIOR TO THE ERECTION OF THE GIRDER.
THE SIDES OF THE EPOXY MORTAR PAD SHALL BE FORMED VERTICAL AND FINISHED SMOOTH. EPOXY MORTAR BLOCKS TO BE TAGGED APPROPRIATELY.
STEEL PLATES SHALL BE GRADE 250 TO AS/NZS 3678.
THE WELD CATEGORY SHALL BE SP IN ACCORDANCE TO AS/NZS 1554 PART 1.
WELDING SYMBOLS COMPLY WITH AS 1101 PART 3.
ALL EXPOSED WELDS SHALL BE GROUND FLUSH.
ALL FASTENERS SHALL CONFORM TO THE REQUIREMENTS OF TfNSW SPECIFICATION D&C B240.
SECURING BOLTS SHALL BE PRODUCT GRADE C IN ACCORDANCE WITH AS/NZS 1111.1.
HEXAGON HEAD SCREWS SHALL BE PRODUCT GRADE C IN ACCORDANCE WITH AS/NZS 1111.2.
THE BOLTING CATEGORY FOR PRODUCT GRADE C BOLTS AND SCREWS SHALL BE 8.8/S IN ACCORDANCE WITH AS 5100.6.
TAPERED WASHERS MUST CONFORM WITH MATERIAL PROPERTIES AS SPECIFIED IN AS/NZS 1237.1.
ATTACHMENT PLATES WITH BOLTS AND WASHERS SHALL BE HOT-DIP GALVANISED TO TfNSW SPECIFICATION D&C B220 AFTER FABRICATION.
EXPOSED EDGES OF STEEL PLATES SHALL BE ROUNDED TO A RADIUS OF 2mm PRIOR TO GALVANISING IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B201.
BOLTS AND TAPERED WASHERS SHALL BE HOT-DIP GALVANISED IN ACCORDANCE WITH AS 1214.
DAMAGED GALVANISED SURFACES SHALL BE RENOVATED IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B220.
FABRICATION AND WELDING, INCLUDING SUPPLY OF STEEL PLATES TO BE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B201 AND AS/NZS 1554.1
RECESS FOR ANCHORS IN TOP SURFACE MUST BE FILLED WITH APPROVED SEALANT SUCH AS PARCHEM PU40 AFTER TIGHTENING AS PER BTD 2008/11.

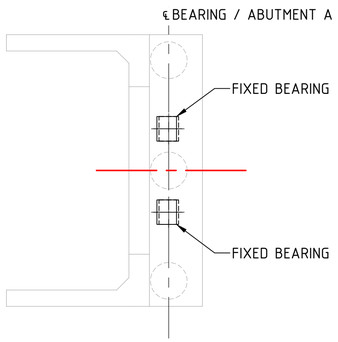
EXPANSION BEARING INSTALLATION SEQUENCE

1. PRIOR TO CONSTRUCTING GROUT PADS AND EPOXY MORTAR BLOCKS, SUBMIT DOCUMENTATION FOR HOLD POINT RELEASE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B284.
2. MEASURE THE GIRDER HOGS NOT MORE THAN 2 WEEKS PRIOR TO ERECTION OF GIRDER.
3. CONSTRUCT THE GROUT PAD WITH BOTTOM ATTACHMENT PLATES ONLY WHEN EARTHWORKS FILL BEHIND THE ABUTMENT CURTAIN WALL HAS BEEN COMPLETED UP TO THE UNDERSIDE OF THE APPROACH SLAB.
4. CAST EPOXY MORTAR BLOCK DIRECTLY ON TOP OF THE TOP STEEL ATTACHMENT PLATE TO THE DIMENSIONS GIVEN IN TABLE 2 TO SUIT MEASURED HOG.
5. INSTALL ELASTOMERIC BEARINGS ONTO GROUT PAD.
6. THE ATTACHMENT PLATE WITH EPOXY MORTAR BLOCK SHALL BE FIXED TO THE SOFFIT OF THE GIRDER BY BUTTERING A SUITABLE EPOXY PASTE EVENLY ON THE FULL SURFACE AREA OF THE TOP OF THE EPOXY MORTAR BLOCK, EXCEPT OVER THE PREDRILLED HOLES TO ENSURE FULL CONTACT.
7. BOLT EPOXY BLOCK TO SOFFIT OF GIRDER.
8. EXCESS EPOXY PASTE SHALL BE WIPED CLEAN.
9. CARRY OUT FINAL CHECK OF a1 – b4 DIMENSIONS PRIOR TO EPOXY PASTE HARDENING AND IMMEDIATELY AFTER INSTALLATION.
10. ERECT GIRDER ON TOP OF ELASTOMERIC BEARINGS AND BRACE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B201. BRACING SHALL BE DESIGNED TO RESTRAIN GIRDERS AGAINST ROLLING ABOUT THEIR LONGITUDINAL AXIS AND SHALL BE ADJUSTED TO ENSURE THAT THERE IS NO MEASURABLE ROTATION DEFORMATION OF THE BEARING ABOUT THIS AXIS.

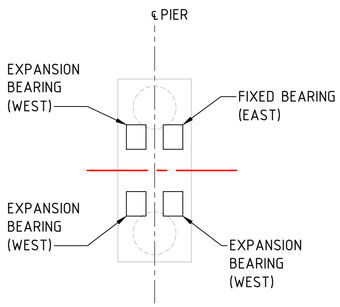
FIXED BEARING INSTALLATION SEQUENCE

1. PRIOR TO CONSTRUCTING GROUT PADS AND EPOXY MORTAR BLOCKS, SUBMIT DOCUMENTATION FOR HOLD POINT RELEASE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B284.
2. MEASURE THE GIRDER HOGS NOT MORE THAN 2 WEEKS PRIOR TO ERECTION OF GIRDER.
3. CAST EPOXY MORTAR BLOCK DIRECTLY ON TOP OF THE TOP STEEL ATTACHMENT PLATE TO THE DIMENSIONS GIVEN IN TABLE 2 TO SUIT MEASURED HOG.
4. INSTALL BOTTOM STEEL ATTACHMENT PLATE WITH DOWEL TO THE REQUIRED LEVEL USING STEEL LEVELING PACKERS/BOLTS.
5. INSTALL ELASTOMERIC BEARING ON TO BOTTOM ATTACHMENT PLATES.
6. THE ATTACHMENT PLATE WITH EPOXY MORTAR BLOCK SHALL BE FIXED TO THE SOFFIT OF THE GIRDER BY BUTTERING A SUITABLE EPOXY PASTE EVENLY ON THE FULL SURFACE AREA OF THE TOP OF EPOXY MORTAR BLOCK, EXCEPT OVER THE PREDRILLED HOLES TO ENSURE FULL CONTACT.
7. BOLT EPOXY BLOCK TO SOFFIT OF GIRDER.
8. EXCESS EPOXY PASTE SHALL BE WIPED CLEAN.
9. CARRY OUT FINAL CHECK OF a1 – b4 DIMENSIONS PRIOR TO EPOXY PASTE HARDENING AND IMMEDIATELY AFTER INSTALLATION.
10. ERECT GIRDER ON TOP OF ELASTOMERIC BEARINGS AND BRACE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B201. BRACING SHALL BE DESIGNED TO SUPPORT AND RESTRAIN GIRDERS AGAINST ROLLING ABOUT THEIR LONGITUDINAL AXIS AND SHALL BE ADJUSTED TO ENSURE THAT THERE IS NO MEASURABLE ROTATION DEFORMATION OF THE BEARING ABOUT THIS AXIS.
11. CLEAN THE RECESSES AND SET AND FIX THE BASE PLATE, THEN FILL THE VOID BENEATH THE BEARING BASE PLATE AND THE DOWEL RECESS BY FORMING AROUND THE BASE PLATE AND INJECTING SHRINKAGE COMPENSATED HIGH FLOW CEMENTITOUS GROUT EPIREZ SUPER FLOW HL OR APPROVED EQUIVALENT. SUITABLE GROUT VENTS SHALL BE PROVIDED TO ENSURE THERE IS NO AIR ENTRAPMENT.

FROM GUNNEDAH

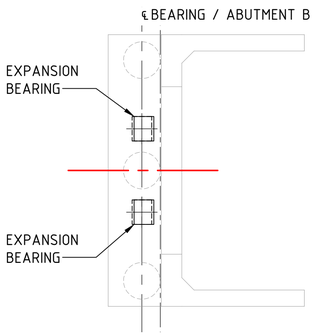


ABUTMENT A BEARING PLAN
SCALE 1 : 75



TYPICAL PIER BEARING PLAN
SCALE 1 : 75

FROM NARRABRI



ABUTMENT B BEARING PLAN
SCALE 1 : 75

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:75 @ A1 0 0.75 1.5 2.25 3 3.75 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
BEARING
SHEET B

FILE No. BE22007-6670-DRG-BR-6301 | SHEET: 2 OF 5 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6301 | B | EDMS No. - | -

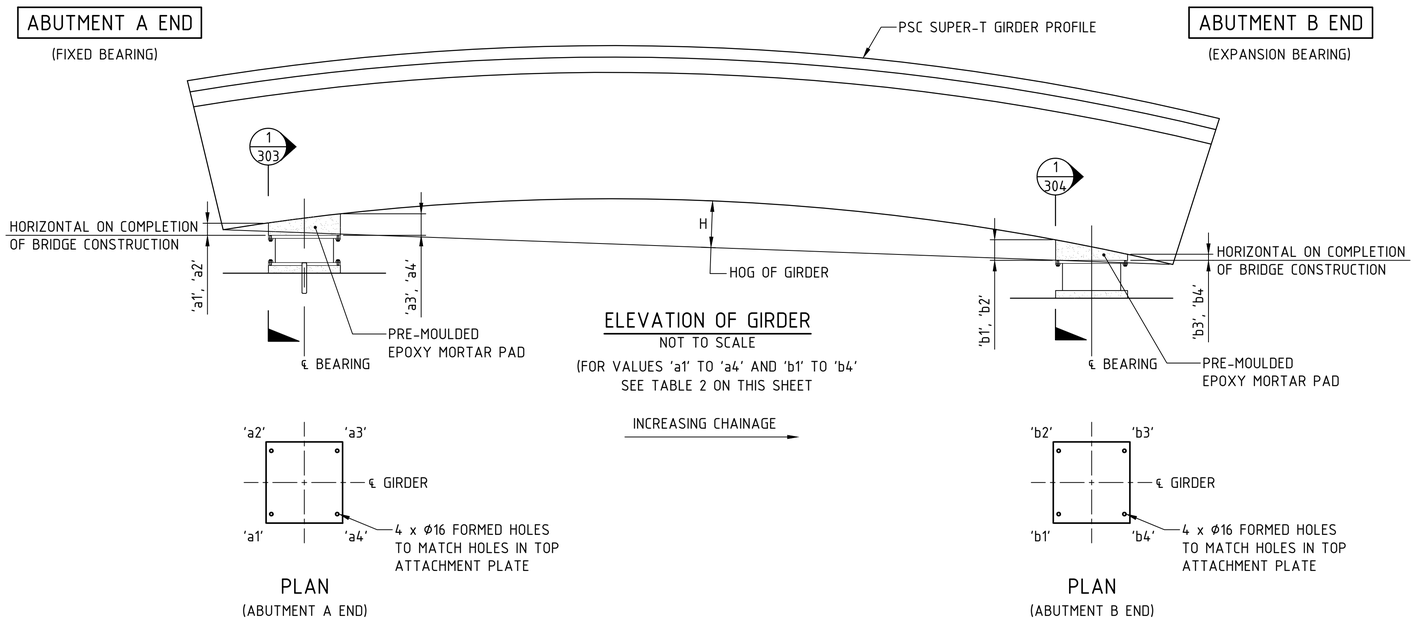


TABLE 2 - PRE-MOULDED EPOXY MORTAR PAD VALUES

GIRDER NUMBER	MEASURED HOG 'H' (mm)	EPOXY MORTAR PAD DIMENSIONS							
		a1'	a2'	a3'	a4'	b1'	b2'	b3'	b4'
ALL GIRDERS	45	72		73		75		74	
	93	24		28		30		26	

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 301.

THE DIMENSIONS OF THE PRE-MOULDED EPOXY MORTAR BLOCKS THAT HAVE BEEN DERIVED BY THE DESIGNER HAVE TAKEN INTO ACCOUNT THE FOLLOWING:

- THE HOG OF THE GIRDER SHALL BE MEASURED NOT MORE THAN TWO WEEKS PRIOR TO GIRDER ERECTION.
- THE DEFLECTION OF THE GIRDER DUE TO THE CAST-IN-PLACE CONCRETE DECK.
- THE CROSSFALL AND THE LONGITUDINAL GRADE OF THE GIRDER BETWEEN SUPPORTED ENDS.

THE VALUES OF 'a1' TO 'a4' AND 'b1' TO 'b4' SHALL BE INTERPOLATED FOR INTERMEDIATE MEASURED HOGS. IF MEASURED HOG IS OUTSIDE OF THE RANGE OF HOGS GIVEN, THE VALUES OF 'a1' TO 'a4' AND 'b1' TO 'b4' SHALL BE ADJUSTED BY THE PRINCIPAL.

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 1	A-01	FIXED	251.854
	A-02		
	P1-01	EXPANSION	251.884
	P1-02		
SPAN 2	P1-03	FIXED	251.854
	P1-04		
	P2-01	EXPANSION	251.884
	P2-02		
SPAN 3	P2-03	FIXED	251.854
	P2-04		
	P3-01	EXPANSION	251.884
	P3-02		
SPAN 4	P3-03	FIXED	251.854
	P3-04		
	P4-01	EXPANSION	251.884
	P4-02		
SPAN 5	P4-03	FIXED	251.854
	P4-04		
	P5-01	EXPANSION	251.884
	P5-02		
SPAN 6	P5-03	FIXED	251.854
	P5-04		
	P6-01	EXPANSION	251.884
	P6-02		

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 7	P6-03	FIXED	251.854
	P6-04		
	P7-01	EXPANSION	251.884
	P7-02		
SPAN 8	P7-03	FIXED	251.854
	P7-04		
	P8-01	EXPANSION	251.884
	P8-02		
SPAN 9	P8-03	FIXED	251.854
	P8-04		
	P9-01	EXPANSION	251.884
	P9-02		
SPAN 10	P9-03	FIXED	251.854
	P9-04		
	P10-01	EXPANSION	251.884
	P10-02		
SPAN 11	P10-03	FIXED	251.854
	P10-04		
	P11-01	EXPANSION	251.884
	P11-02		
SPAN 12	P11-03	FIXED	251.854
	P11-04		
	P12-01	EXPANSION	251.884
	P12-02		

TABLE 1 - BEARING DATA

LOCATION	BEARING NUMBER	TYPE	RL 'X' (m)
SPAN 13	P12-03	FIXED	251.854
	P12-04		
	P13-01	EXPANSION	251.884
	P13-02		
SPAN 14	P13-03	FIXED	251.854
	P13-04		
	P14-01	EXPANSION	251.884
	P14-02		
SPAN 15	P14-03	FIXED	251.854
	P14-04		
	P15-01	EXPANSION	251.884
	P15-02		
SPAN 16	P15-03	FIXED	251.854
	P15-04		
	P16-01	EXPANSION	251.884
	P16-02		
SPAN 17	P16-03	FIXED	251.854
	P16-04		
	B-01	EXPANSION	251.884
	B-02		

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

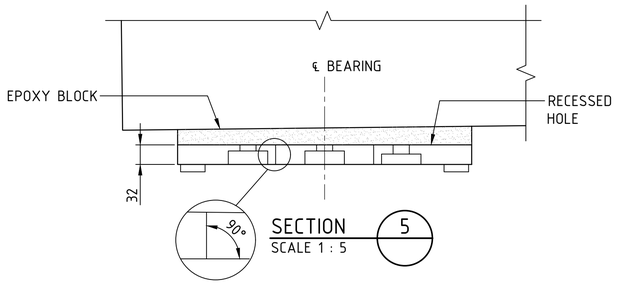
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
BEARING
SHEET C

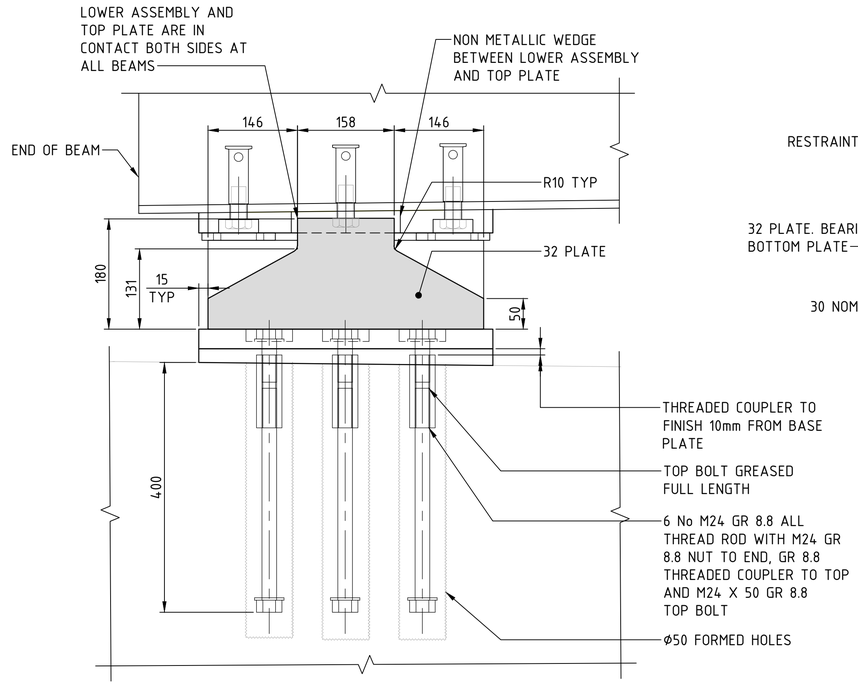
FILE No. BE22007-6670-DRG-BR-6302 | SHEET: 3 OF 5 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6302 | B | EDMS No. - | -

GENERAL NOTES

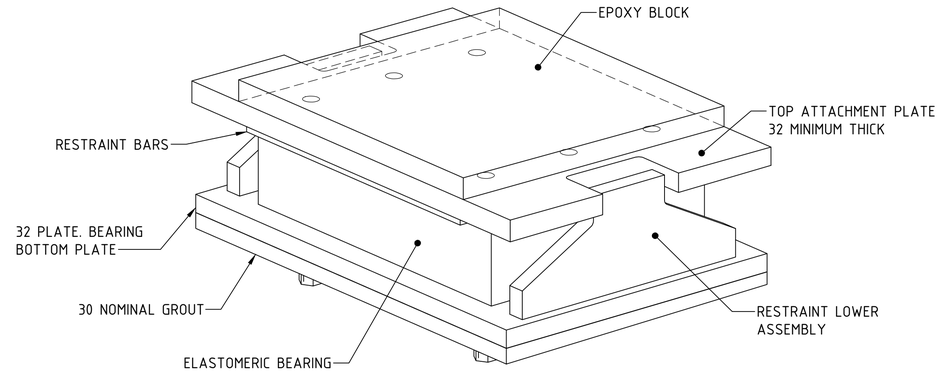
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 301.



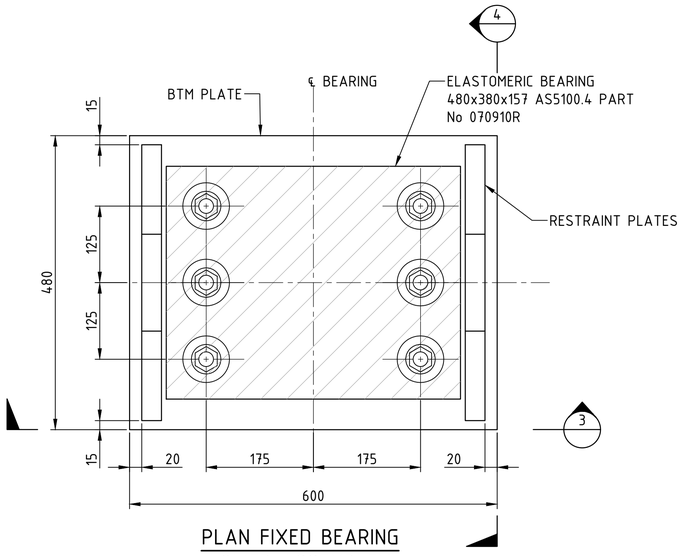
SECTION 5
SCALE 1 : 5



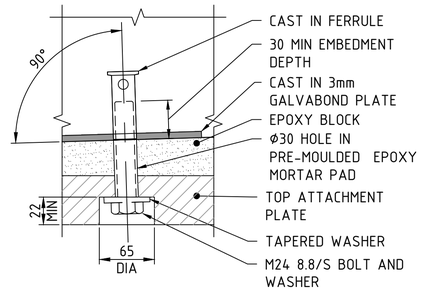
SECTION 4
SCALE 1 : 5



ISOMETRIC - BEARING FIXED
SCALE N.T.S.

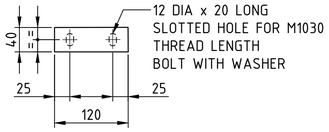


PLAN FIXED BEARING
LOWER ASSEMBLEY
SCALE 1:5

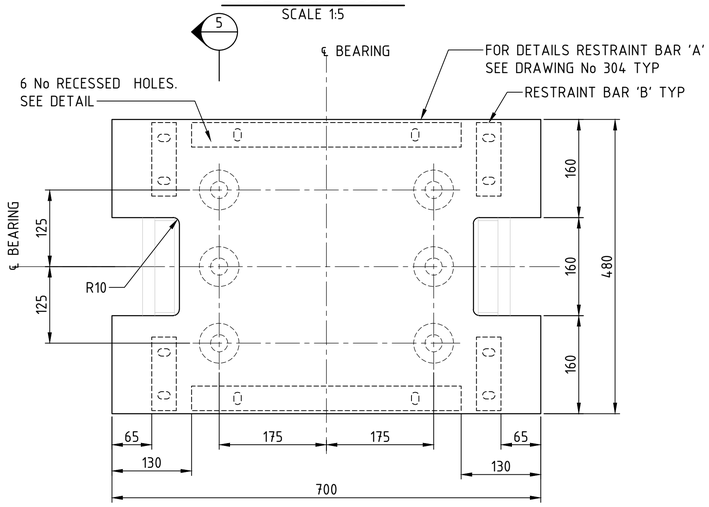


DETAIL-RECESSED HOLE
SCALE 1:2

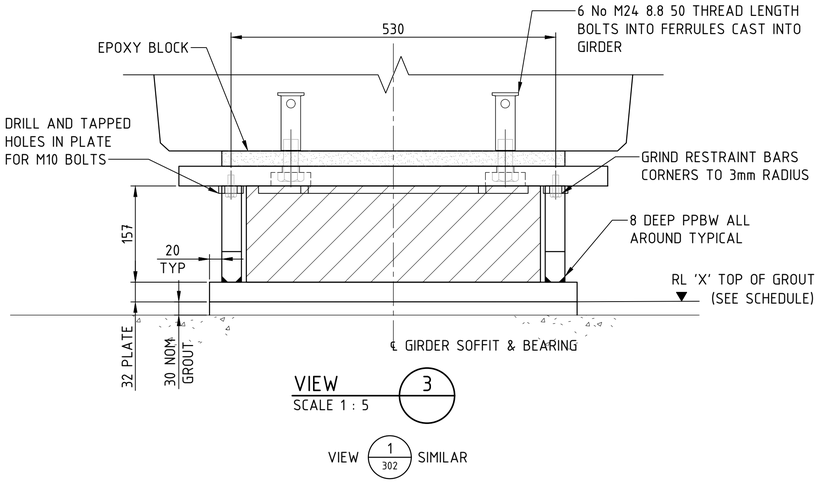
DETAIL SHOWN FOR TAPERED TOP PLATES RECESSED HOLE DETAIL FOR LOWER ASSEMBLY SIMILAR



RESTRAINT BAR 'B' FIXED (136 No)
SCALE 1:5



PLAN FIXED BEARING
TOP ASSEMBLEY
SCALE 1:5



VIEW 3
SCALE 1 : 5

VIEW 1/302 SIMILAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

1:2 @ A1 0 20 40 60 80 100 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

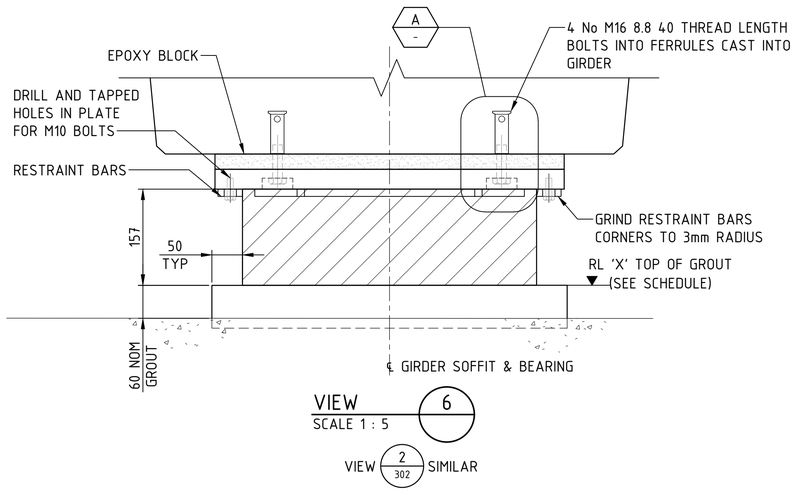
RAIL BRIDGE OVER STRATFORD CREEK BEARING

SHEET D

FILE No. BE22007-6670-DRG-BR-6303 | SHEET: 4 OF 5 | A1

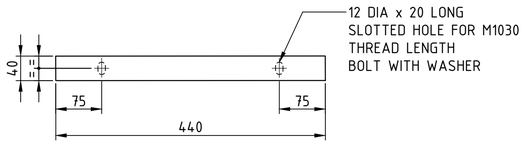
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6303 | B | EDMS No. - | -

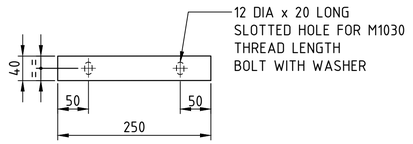


VIEW 6
SCALE 1 : 5

VIEW 2/302 SIMILAR



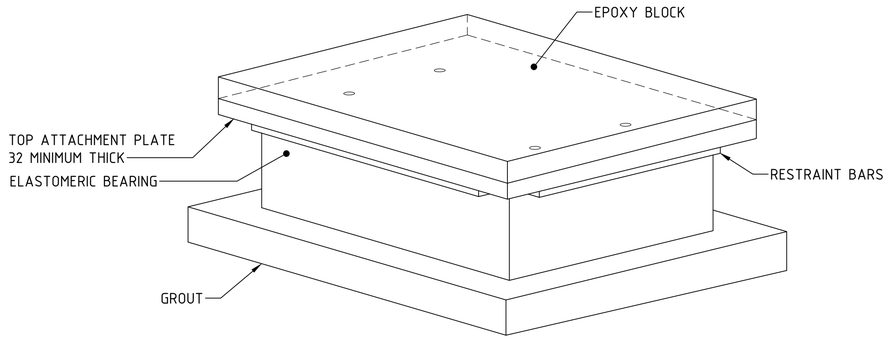
RESTRAINT BAR 'A' EXPANSION (272 No)
SCALE 1:5



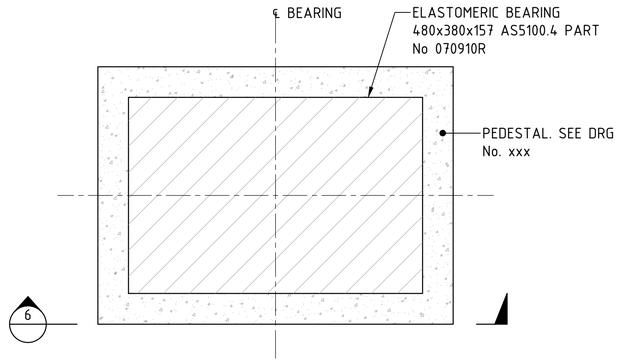
RESTRAINT BAR 'B' EXPANSION (136 No)
SCALE 1:5

GENERAL NOTES

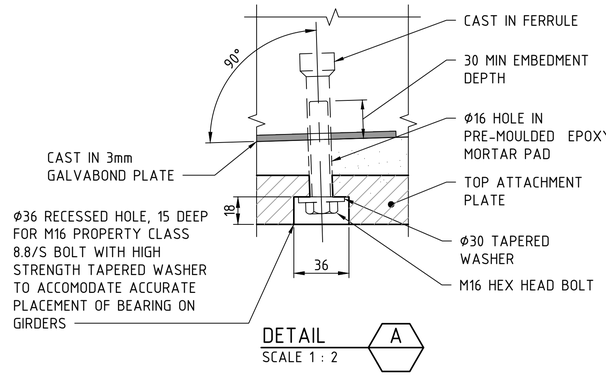
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 301.



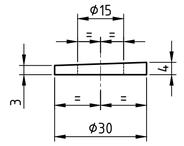
ISOMETRIC - BEARING FREE
SCALE N.T.S.



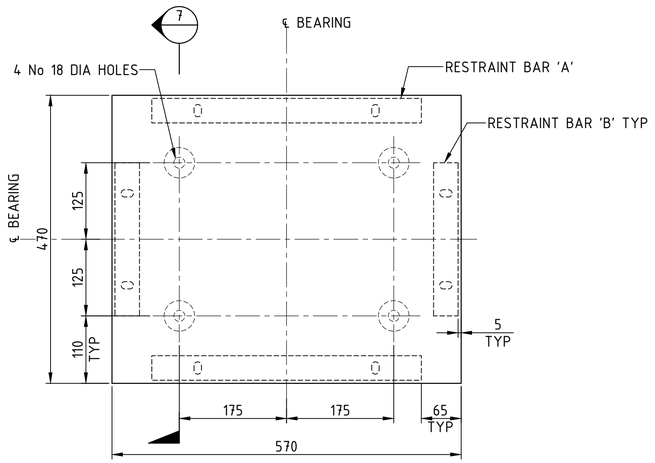
PLAN EXPANSION BEARING
LOWER ASSEMBLEY
SCALE 1:5



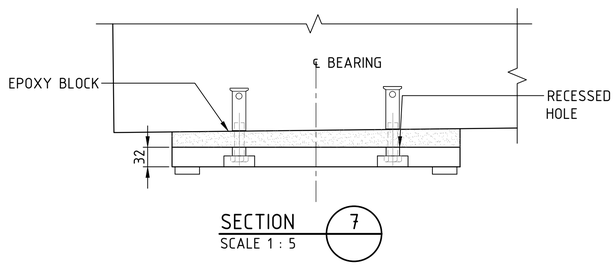
DETAIL A
SCALE 1 : 2



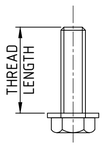
ELEVATION
TAPERED WASHER
SCALE 1:1



PLAN EXPANSION BEARING
TOP ASSEMBLEY
SCALE 1:5



SECTION 7
SCALE 1 : 5



TYPICAL BEARING PLATE BOLT DETAIL
SCALE 1:2

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

1:2 @ A1 0 20 40 60 80 100 mm

1:1 @ A1 0 10 20 30 40 50 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK

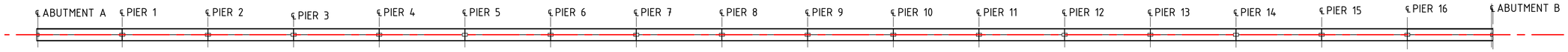
BEARING

SHEET E

FILE No. BE22007-6670-DRG-BR-6304	SHEET: 5 OF 5	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-6304	B	EDMS No. -

FROM GUNNEDAH

FROM NARRABRI



GIRDER LAYOUT KEY PLAN

SCALE 1 : 1250

GIRDER NUMBER AND ENDS SHALL BE MARKED BY MANUFACTURER TO FACILITATE ERECTION

CALCULATED HOG OF GIRDERS AT:

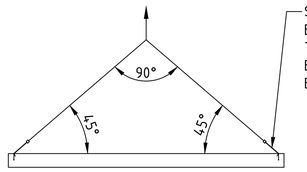
GIRDERS	TRANSFER	30 DAYS	60 DAYS	100 DAYS	MID SPAN DEFLECTION OF GIRDERS DUE TO WEIGHT OF DECK SLAB
TYPE 01 ON TYPE 02	45	61	69	74	-19

PRESTRESSING NOTES

STRANDS SHALL BE 7-WIRE ORDINARY OF NOMINAL DIAMETER 15.7mm AND NOMINAL TENSILE STRENGTH OF 1860MPa, RELAX 2, TO AS 4672.1.
MINIMUM BREAKING LOAD OF 15.7mm DIAMETER STRANDS SHALL BE 279kN.
THE FORCE REMAINING IN EACH STRAND IMMEDIATELY AFTER RELEASE OF THE TENSIONING JACK SHALL BE 212kN.
AFTER TRANSFER OF PRESTRESS, STRANDS SHALL BE CUT FLUSH WITH THE ENDS OF GIRDER AND EXPOSED STRANDS SHALL BE SEALED AGAINST CORROSION BY THE APPLICATION OF AN APPROVED EPOXY RESIN.
THE FOLLOWING ASSUMPTIONS HAVE BEEN MADE IN CALCULATION OF HOGS IN TABLE ON THIS SHEET

- DENSITY = 2550kg/m^3
- ELASTIC MODULUS AT TRANSFER = 32800 MPa.
- NO LOADS EXCEPT GIRDER SELF WEIGHT.
- ELEVATED TEMPERATURE CURING AT 70°C FOR 8 HOURS AFTER CASTING.
- NO LOADS EXCEPT GIRDER SELF WEIGHT.

RELEASE OF THE STRANDS SHALL BE DONE SYMMETRICALLY ABOUT THE GIRDER CENTERLINE STARTING WITH THE OUTER STRANDS. THE STRANDS IN THE TOP SHALL BE RELEASED AFTER 4 STRANDS IN THE BOTTOM FLANGE HAVE BEEN RELEASED.



LIFTING DIAGRAM

LIFTING DEVICE DESIGNED AND CERTIFIED BY PRECAST SUPPLIERS

GENERAL NOTES

EXTERNAL CONCRETE EXPOSURE CLASSIFICATION: B1
INTERNAL CONCRETE EXPOSURE CLASSIFICATION: A
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 50MPa.
MINIMUM COMPRESSIVE STRENGTH OF CONCRETE AT TRANSFER OF PRESTRESS SHALL BE 40MPa.
MAXIMUM NOMINAL AGGREGATE SIZE SHALL NOT BE LESS THAN 14mm
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
ALL SURFACES IN CONTACT WITH CAST-IN-PLACE CROSS GIRDER AND DECK SLAB CONCRETE SHALL BE ROUGHENED DURING MANUFACTURE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B80.
INTERNAL EDGES ON THE TOP FLANGE SHALL BE FINISHED SMOOTH.
EDGES SHALL BE CHAMFERED 12 x 12 AND RE-ENTRANT ANGLES SHALL BE FILLETED 12 x 12 UNLESS SPECIFIED OTHERWISE.
CONCRETE SHALL NOT BE DRILLED OR OTHERWISE DISTURBED ONCE INITIAL SET HAS OCCURRED UNTIL TRANSFER STRENGTH HAS BEEN ACHIEVED.
DRILLING IS ONLY PERMITTED IN THE TOP FLANGE. DRILLING IN OTHER LOCATIONS NOT PERMITTED UNLESS APPROVED BY THE PRINCIPAL.
STEAM CURING OF THE PRE-TENSIONED GIRDERS SHALL BE IN ACCORDANCE WITH THE TfNSW SPECIFICATION D&C B80.
BLOCKOUTS FOR TEMPORARY HANDRAILS SHALL BE PROVIDED TO CONTRACTOR'S REQUIREMENTS.
PRESTRESSED GIRDER SHALL BE A MINIMUM AGE OF 28 DAYS BEFORE ERECTION AND PRIOR TO MEASUREMENTS IN ACCORDANCE WITH B80 AND B110.
LENGTH OF GIRDER GIVEN IS THE REQUIRED LENGTH OF FINISHED PRODUCT.
MANUFACTURER SHALL MAKE ALLOWANCE FOR ELASTIC SHORTENING.

\# DENOTES OUTER 150mm OF GIRDER FLANGE TO BE FINISHED WITH SMOOTH SURFACE.
◇ DENOTES DIMENSION MAY VARY TO SUIT CASTING YARD, BUT TO REMAIN WITHIN LIMITS SPECIFIED ON TfNSW STANDARD DRAWING B0211.

LIFTING AND HANDLING (PRECAST GIRDER)

THE MASS OF GIRDERS IS BASED ON A DENSITY OF 2550 kg/m^3 AND SHALL BE VERIFIED BY THE MANUFACTURER AND MARKED ON THE GIRDERS.
DURING STORAGE, TRANSPORT AND HANDLING GIRDERS SHALL BE IN AN UPRIGHT POSITION AND TEMPORARY SUPPORTS SHALL BE LOCATED BETWEEN 300mm AND NOT MORE THAN 1000mm FROM EACH END.
LIFTING DEVICES/HOOKS SHALL BE DESIGNED BY THE MANUFACTURER. LIFTING DETAILS SHALL BE SUBMITTED TO THE STRUCTURAL DESIGN REPRESENTATIVE PRIOR TO CASTING GIRDERS.
CONTRACTOR TO ENSURE GIRDER STABILITY DURING CONSTRUCTION PRIOR TO COMPLETION OF THE END CROSS GIRDERS.
DURING ERECTION OF GIRDER CARE SHALL BE TAKEN TO PREVENT ACCIDENTAL OVERTURNING.
EACH GIRDER SHALL BE BRACED AGAINST OVERTURNING PRIOR TO RELEASE BY THE CRANE OR OTHER LIFTING DEVICE.
ANCHORS SHALL BE HOT DIP GALVANISED IN ACCORDANCE WITH AS 1650.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:1250 @ A1 0 12.5 25 37.5 50 62.5 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

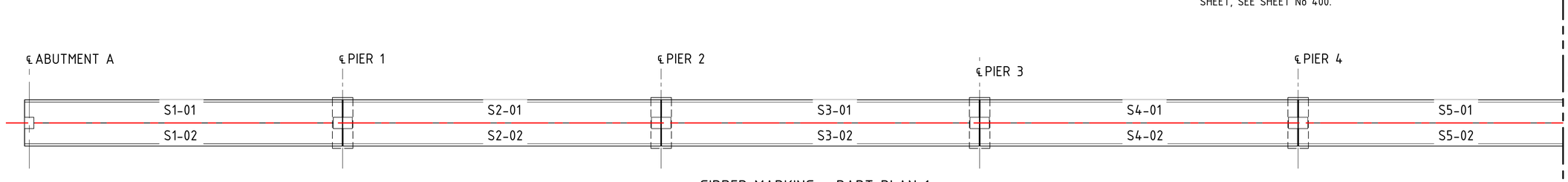
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PSC GIRDER CONCRETE
SHEET A

FILE No. BE22007-6670-DRG-BR-6400 | SHEET: 1 OF 7 | A1
STATUS: 100% DESIGN | ©
DRG No. BE22007-6670-DRG-BR-6400 | B | EDMS No. - | -

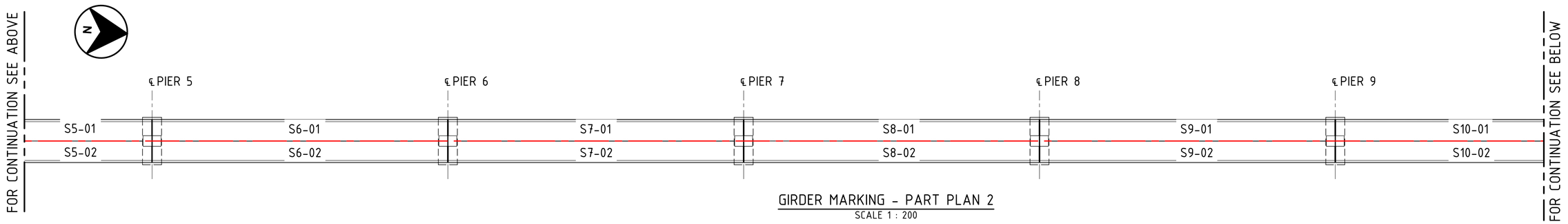
File Plotted C:\12dSdata\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\103 Br & Spec Sh\AutoCAD\AutoCAD\BE22007-6670-DWG-BR-6400.dwg
Plot Date & Time 7/24/2023 4:06 PM
Plotted by CHRISTSAAC.ESMILLA

GENERAL NOTES

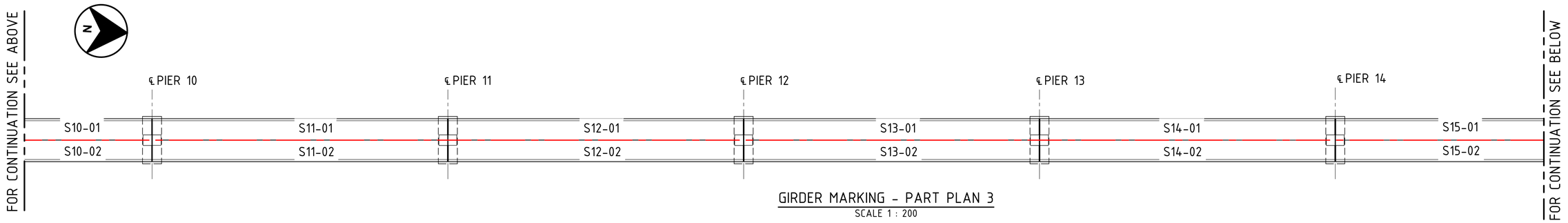
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



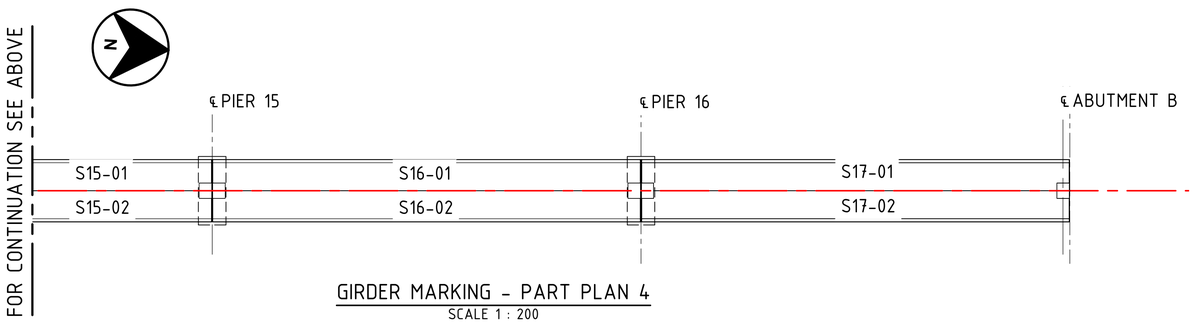
GIRDER MARKING - PART PLAN 1
SCALE 1 : 200



GIRDER MARKING - PART PLAN 2
SCALE 1 : 200



GIRDER MARKING - PART PLAN 3
SCALE 1 : 200



GIRDER MARKING - PART PLAN 4
SCALE 1 : 200

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:200 @ A1 0 2 4 6 8 10 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

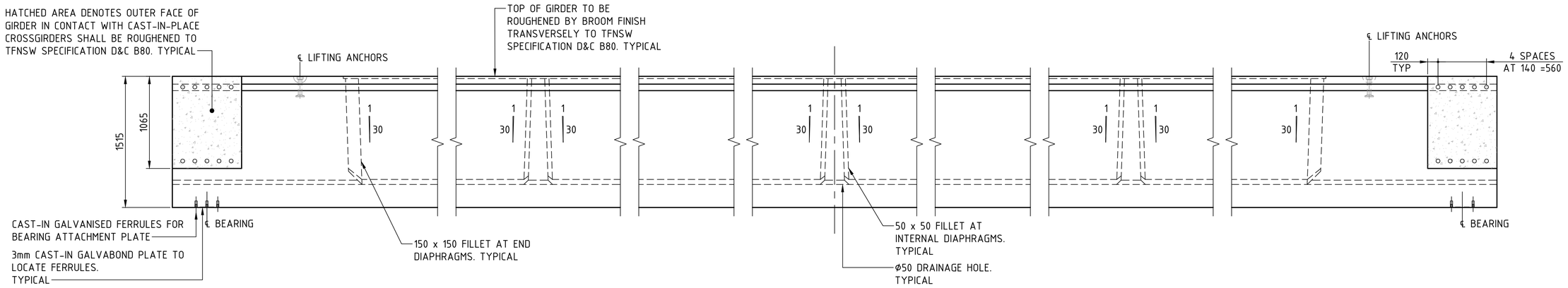
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PSC GIRDER CONCRETE
SHEET B

FILE No. BE22007-6670-DRG-BR-6401 | SHEET: 2 OF 7 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6401 | B | EDMS No. - | -

File Plotted C:\12tkSdata\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\103 Br & Spec Sht\AutoCAD\AutoCAD GDA 2020\BE22007-6670-DWG-BR-6401.dwg
Plot Date & Time 7/24/2023 4:06 PM
Plotted by: CHRISTSAAC.ESMILLA

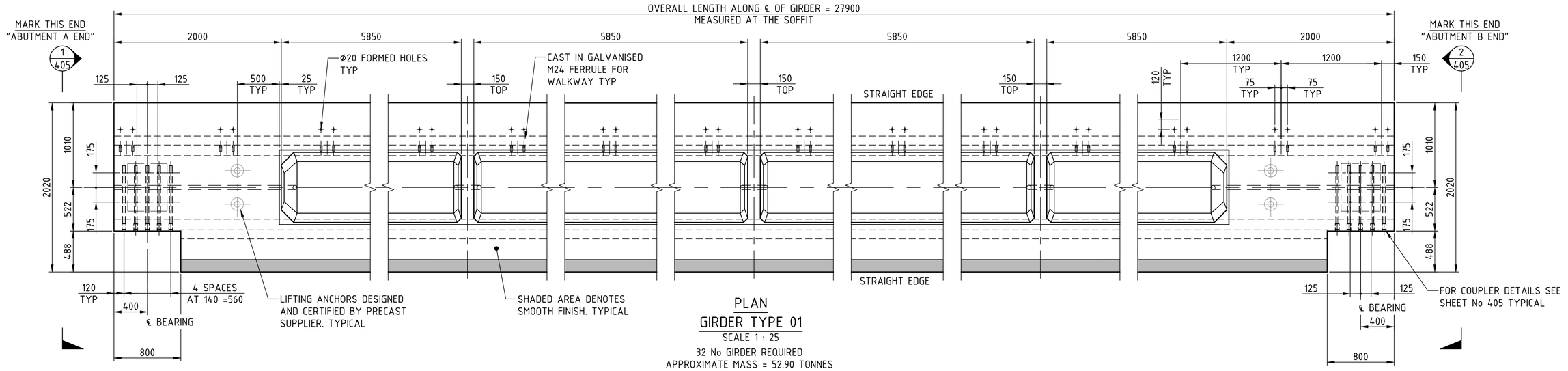
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



ELEVATION

SCALE 1 : 25



PLAN
GIRDER TYPE 01

SCALE 1 : 25

32 No GIRDER REQUIRED
APPROXIMATE MASS = 52.90 TONNES

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK
PSC GIRDER CONCRETE

SHEET C

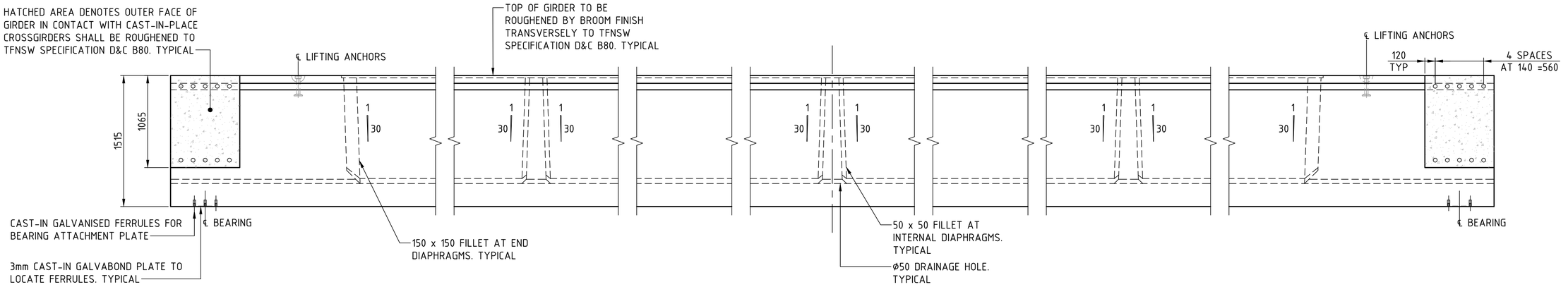
FILE No. BE22007-6670-DRG-BR-6402 | SHEET: 3 OF 7 | A1

STATUS: 100% DESIGN ©

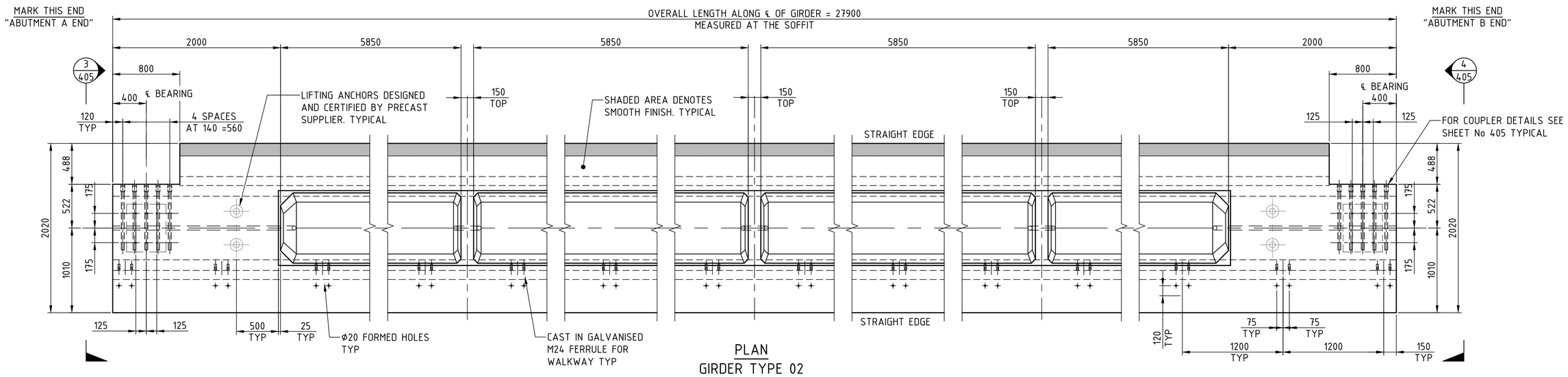
DRG No. BE22007-6670-DRG-BR-6402 | B | EDMS No. - | -

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



ELEVATION
SCALE 1 : 25



PLAN
GIRDER TYPE 02
SCALE 1 : 25
32 No GIRDER REQUIRED
APPROXIMATE MASS = 52.90 TONNES

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

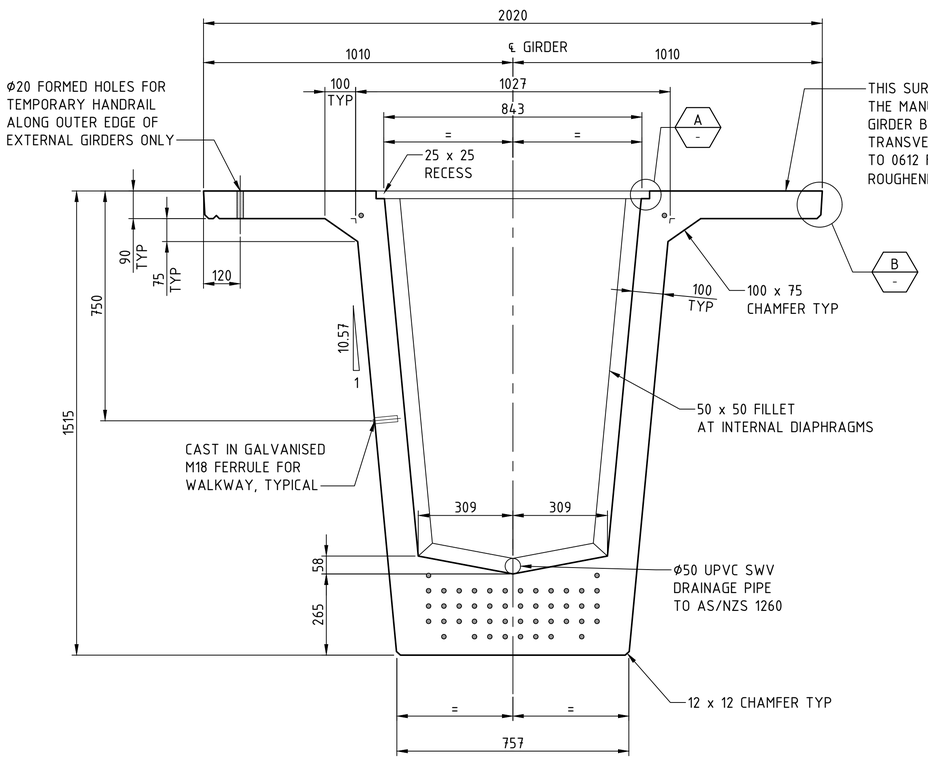
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PSC GIRDER CONCRETE
SHEET D

FILE No. BE22007-6670-DRG-BR-6403 | SHEET: 4 OF 7 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6403 | B | EDMS No. - | -

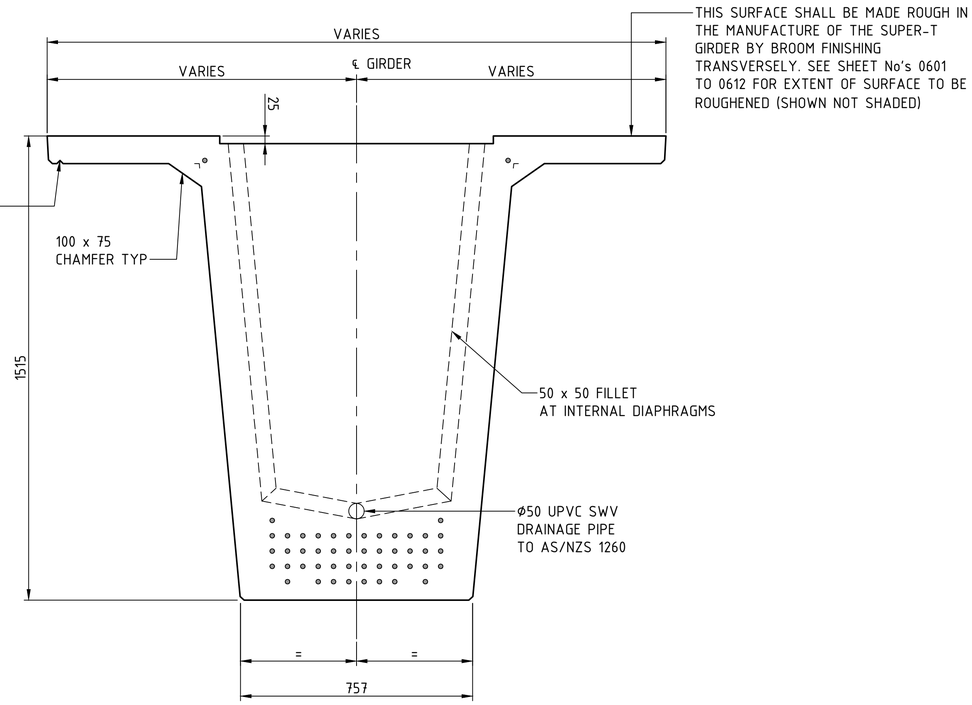
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



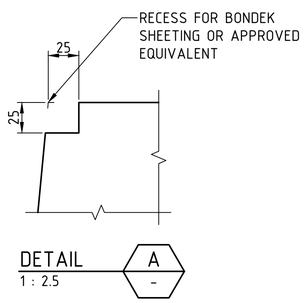
TYPICAL SUPER-T GIRDER SECTION

SCALE 1 : 10



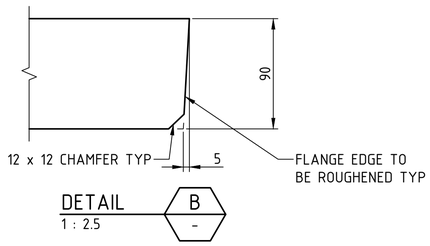
INTERNAL DIAPHRAGM

SCALE 1 : 10



DETAIL A
1 : 2.5

TYPICAL INTERNAL RECESS DETAIL



DETAIL B
1 : 2.5

TYPICAL FLANGE EDGE DETAIL

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

1:2.5 @ A1 0 25 50 75 100 125 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK PSC GIRDER CONCRETE

SHEET E

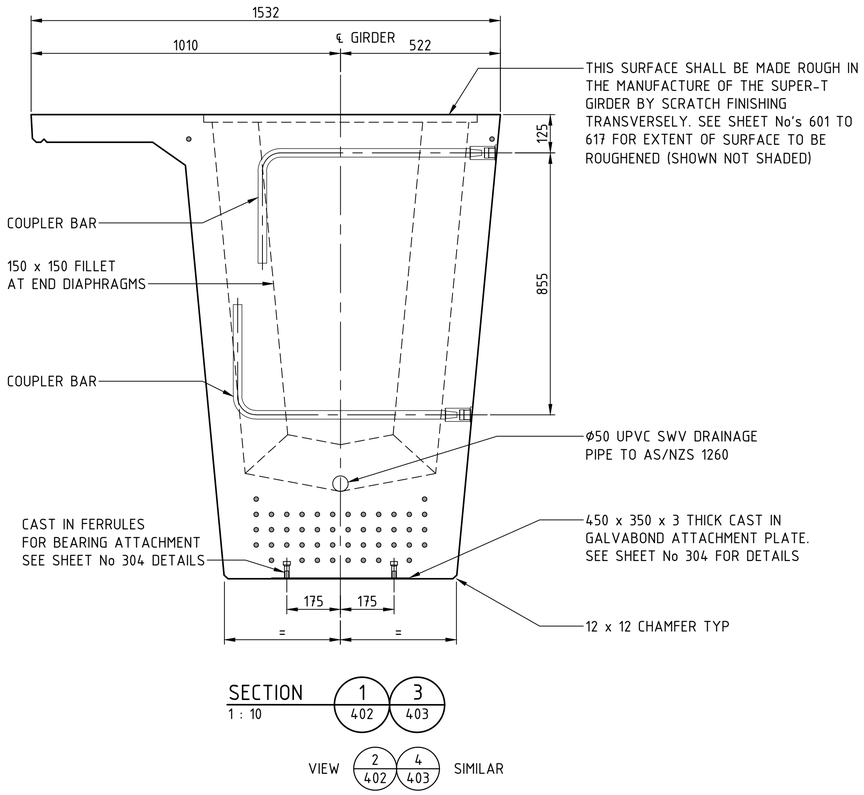
FILE No. BE22007-6670-DRG-BR-6404 | SHEET: 5 OF 7 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6404 | B | EDMS No. - | -

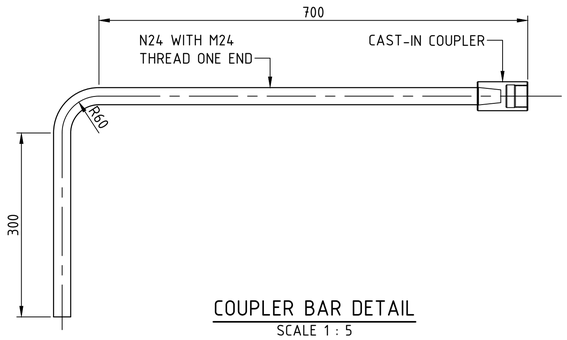
GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.



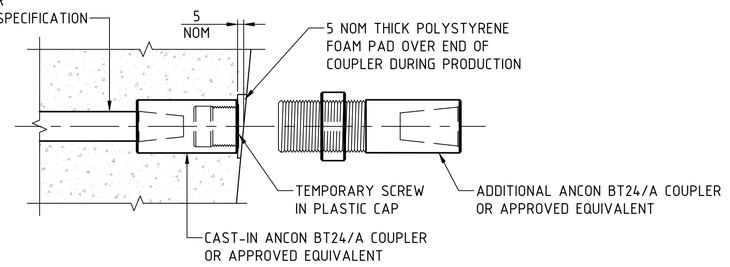
SECTION 1 : 10 — 1/402 3/403

VIEW 2/402 4/403 SIMILAR



COUPLER BAR DETAIL
SCALE 1 : 5

BARS TO BE THREADED TO SUIT THE COUPLER IN ACCORDANCE WITH THE COUPLER MANUFACTURERS SPECIFICATION



FULL ENGAGEMENT MECHANICAL POSITION COUPLER FOR CROSS GIRDER BARS
SCALE 1 : 2.5

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

1:2.5 @ A1 0 25 50 75 100 125 mm

1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

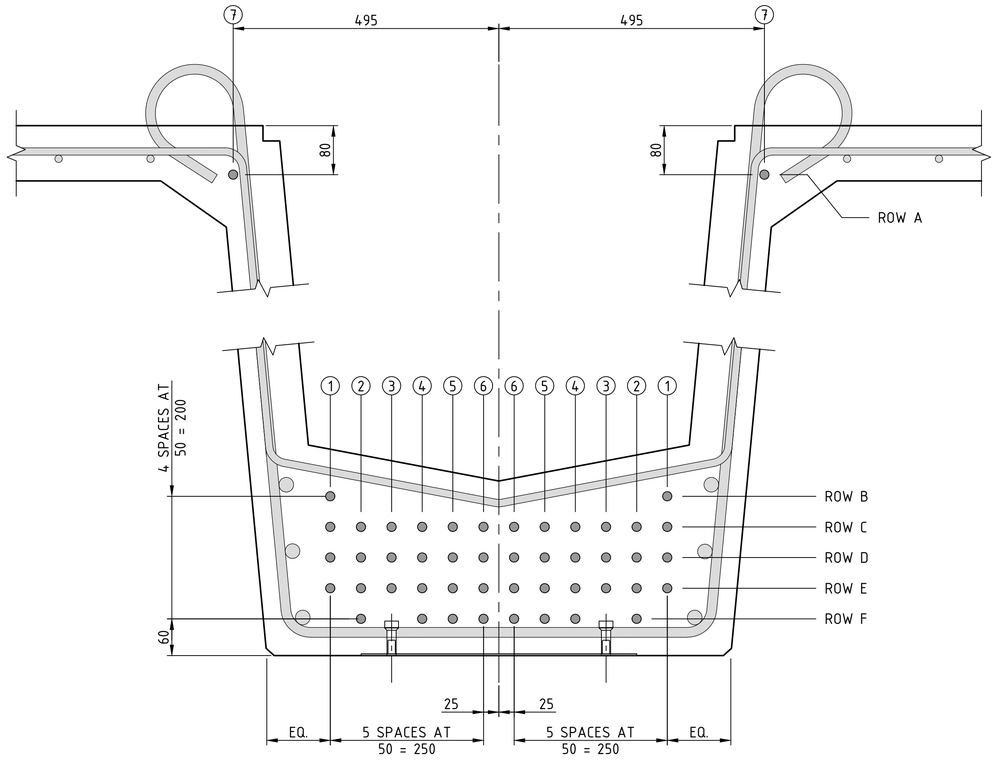
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PSC GIRDER CONCRETE
SHEET F

FILE No. BE22007-6670-DRG-BR-6405 | SHEET: 6 OF 7 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6405 | B | EDMS No. - | -



STRAND LAYOUT

SCALE 1 : 5

(SEE SCHEDULES FOR STRAND DEBONDING VALUES)

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 400.

STRAND DEBONDING LEGEND

0	STRAND WITH NO DEBONDING
2000	STRAND WITH DEBONDING LENGTH
	NO STRAND

NOTE: STRANDS SPECIFIED IN SCHEDULE TO BE DEBONDED AT BOTH ENDS FOR THE DISTANCE SHOWN (MEASURED ALONG GIRDER CENTRELINE FROM END OF GIRDER).

STRAND DEBONDING SCHEDULE FOR GIRDERS

STRAND	LOCATION AND DEBONDING LENGTH							STRANDS PER ROW
	1	2	3	4	5	6	7	
ROW A							0	2
ROW B	0							2
ROW C	0	5000	0	0	0	0		12
ROW D	0	0	5000	0	8000	0		12
ROW E	0	2500	0	2500	0	0		12
ROW F		0		0	0	0		8

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK

PSC GIRDER CONCRETE

SHEET G

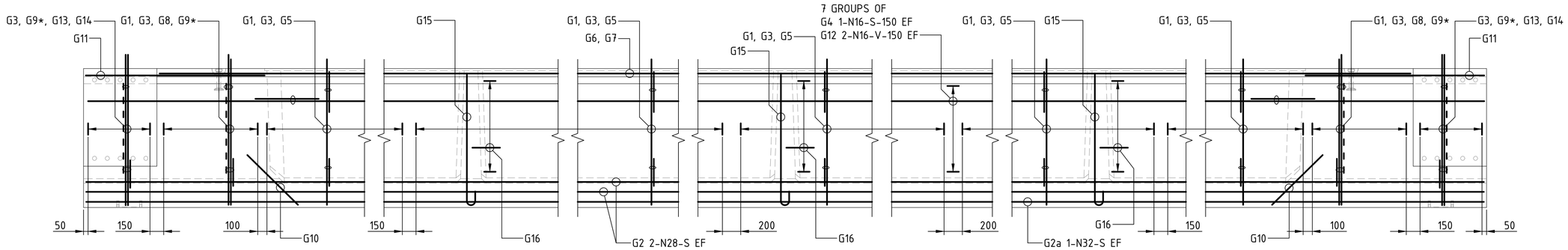
FILE No. BE22007-6670-DRG-BR-6406 | SHEET: 7 OF 7 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6406 | B | EDMS No. - | -

GENERAL NOTES

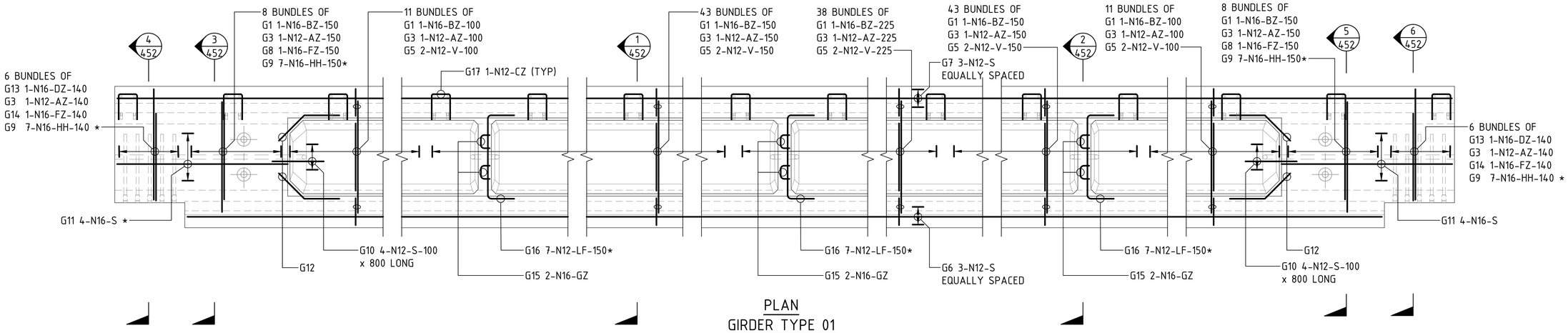
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 453.



ELEVATION
SCALE 1 : 25

ABUTMENT A END

ABUTMENT B END



PLAN
GIRDER TYPE 01
SCALE 1 : 25

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK
PSC GIRDER REINFORCEMENT

SHEET A

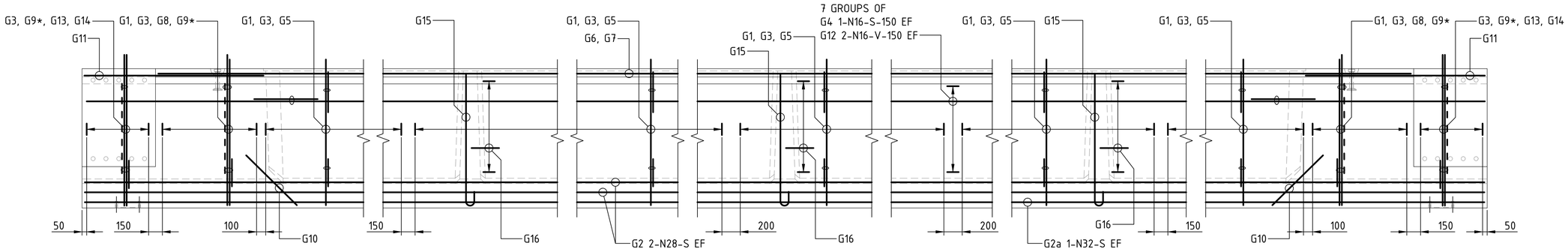
FILE No. BE22007-6670-DRG-BR-6450 | SHEET: 1 OF 4 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6450 | B | EDMS No. - | -

GENERAL NOTES

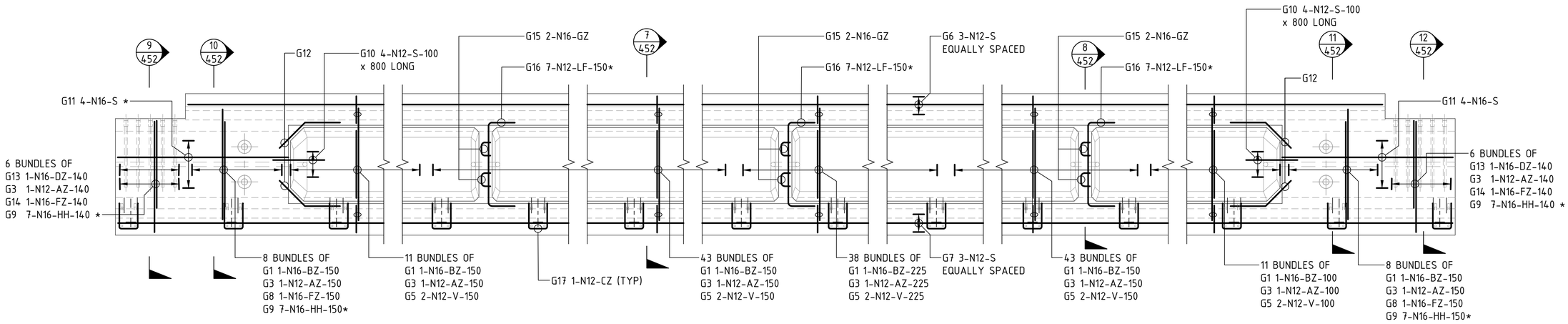
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 453.



ELEVATION
SCALE 1 : 25

ABUTMENT A END

ABUTMENT B END



PLAN
GIRDER TYPE 02
SCALE 1 : 25

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

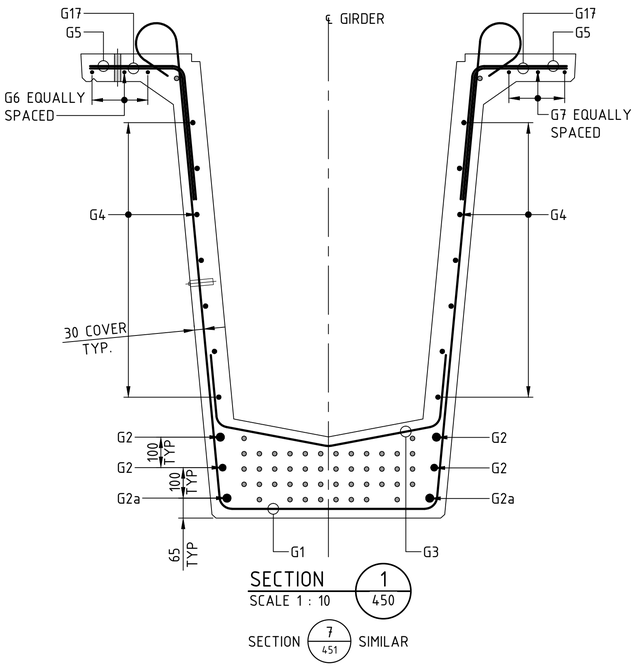
DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PSC GIRDER REINFORCEMENT
SHEET B

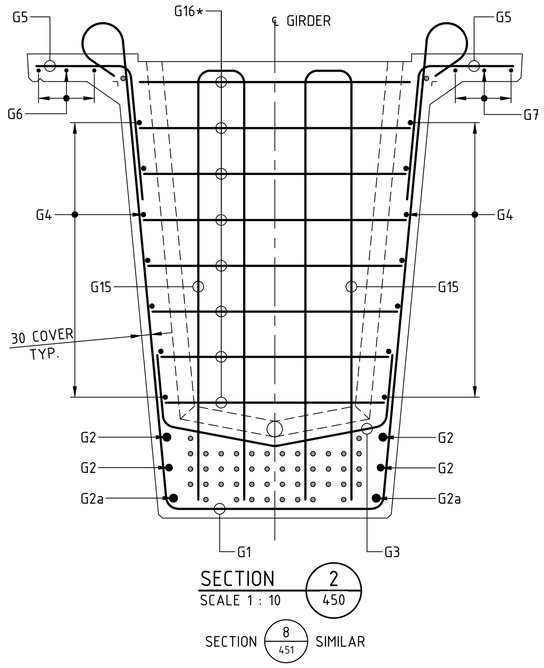
FILE No. BE22007-6670-DRG-BR-6451 | SHEET: 2 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6451 | B | EDMS No. - | -

File Plotted C:\12345data\AUR20SYN01\BE22007 (B20175) VEP_ 101\100 DRAWINGS\103 Br & Spec S\AutoCAD\AutoCAD 2020\BE22007-6670-DWG-BR-6451.dwg
Plot Date & Time 7/24/2023 4:21 PM
Plotted by CHRISTSAAC.ESMILLA



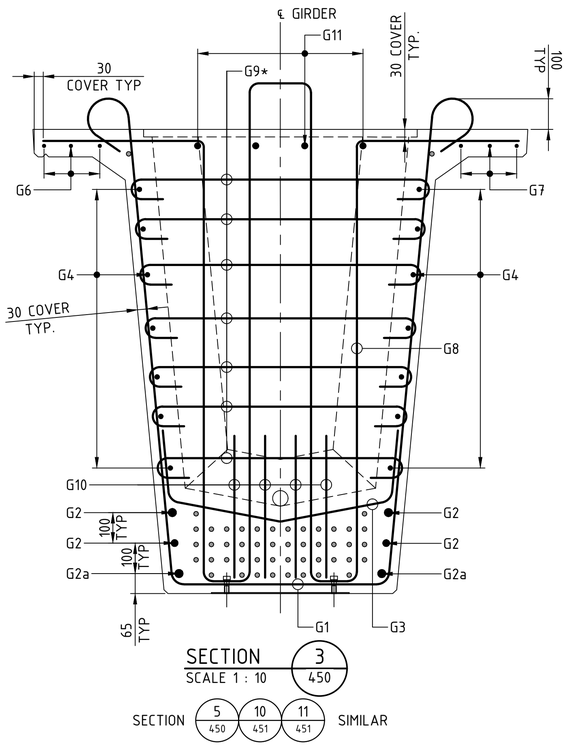
SECTION 1 / 450
SCALE 1 : 10

SECTION 7 / 451 SIMILAR



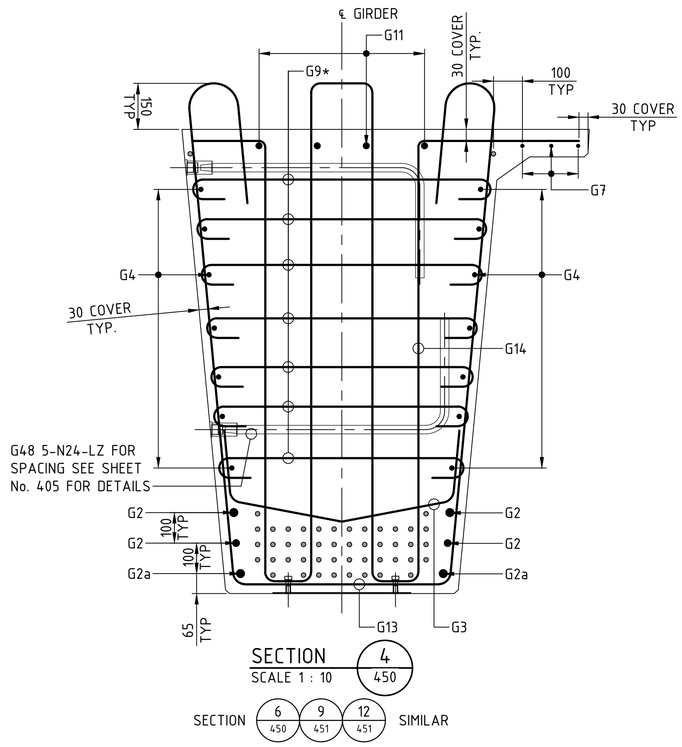
SECTION 2 / 450
SCALE 1 : 10

SECTION 8 / 451 SIMILAR



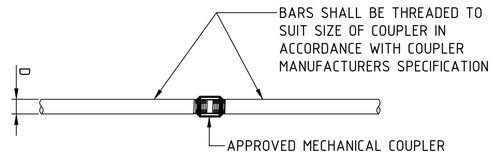
SECTION 3 / 450
SCALE 1 : 10

SECTION 5 / 450 10 / 451 11 / 451 SIMILAR



SECTION 4 / 450
SCALE 1 : 10

SECTION 6 / 450 9 / 451 12 / 451 SIMILAR



BOTTOM FLANGE REINFORCECING BAR SPLICE DETAIL (G2 AND G2a)
SCALE 1 : 5

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 453.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM:GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

RAIL BRIDGE OVER STRATFORD CREEK PSC GIRDER REINFORCEMENT

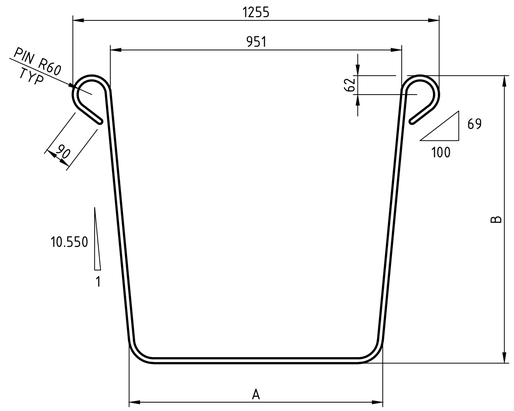
SHEET C

FILE No. BE22007-6670-DRG-BR-6452 | SHEET: 3 OF 4 | A1

STATUS: 100% DESIGN ©

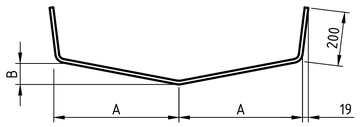
DRG No. BE22007-6670-DRG-BR-6452 | B | EDMS No. - | -

PSC GIRDER BAR SHAPES DIAGRAM

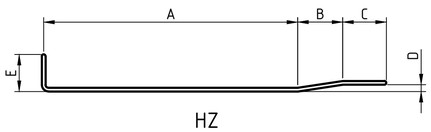


BZ

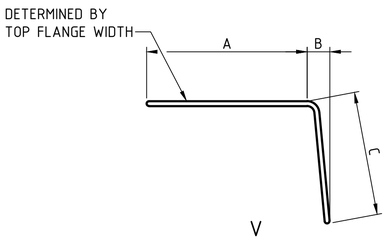
S



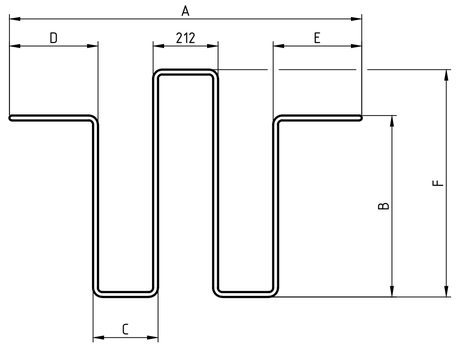
AZ



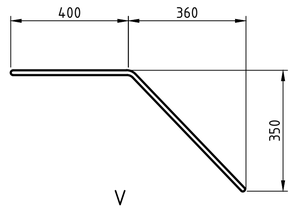
HZ



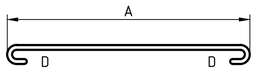
V



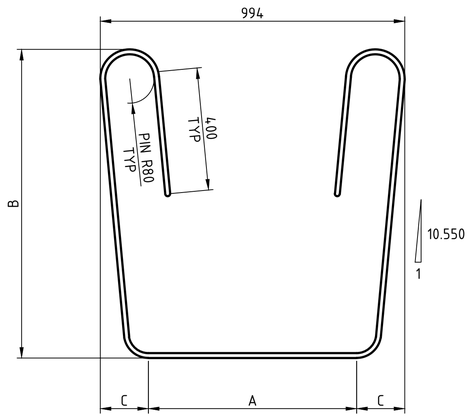
FZ



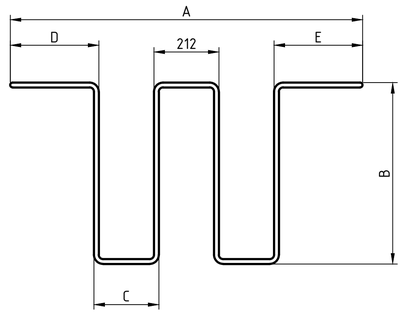
V



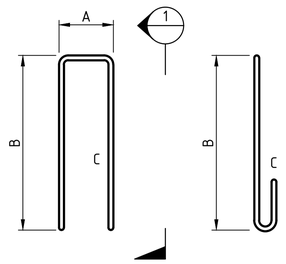
HH



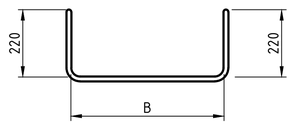
DZ



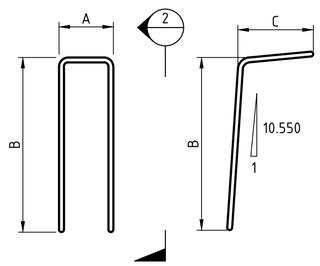
EZ



GZ



LF



CZ

BAR MARKING LEGEND

THE METHOD USED TO DESCRIBE REINFORCEMENT ON THE DRAWINGS IS AS FOLLOWS:

'Fx'G1 10-N16-S-300EF

- INFORMATION FOR PLACING
- SPACE ALONG LIMIT LINE
- BAR SHAPE CODE
- BAR SIZE IN MILLIMETRES
- BAR STRUCTURAL PROPERTIES
- NUMBER OF BARS IN THE SET
- BAR NUMBER IN SEQUENCE
- STRUCTURE ELEMENT DENOTATION
- DENOTES GIRDER TYPE WHERE REQUIRED

WHERE THE BAR SPACING IS APPROXIMATE ONLY, THE FOLLOWING FORMAT SHALL BE USED:
G1 10-N16-S-300EF APPROX

REINFORCEMENT NOTES

1 AUSTRALIAN STANDARD BAR SHAPES ARE IN ACCORDANCE WITH AS 1100.501.
2 BAR SIZE IS THE NOMINAL DIAMETER IN MILLIMETRES
3 THE GRADE OF REINFORCEMENT, IF NOT STATED ON THE DRAWINGS, SHALL BE D500N TO AS/NZS 4671.
4 DIMENSIONS SHOWN ON BAR SHAPES DIAGRAMS ARE MEASURED FROM THE OUTSIDE FACES OF THE BARS AND ARE IN MILLIMETRES.
5 THE INCLUDED ANGLE OF ANY BEND SHALL BE A RIGHT ANGLE IF NO DIMENSION SHOWN.
6 BARS OF DIAMETER GREATER THAN 24mm SHALL NOT BE REBENT.
7 ALL BENDS SHALL BE FITMENT BENDS IN ACCORDANCE WITH AS5100 UNLESS SPECIFIED OTHERWISE.

GENERAL NOTES

REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE:
INTERNAL SURFACE: 30mm,
EXTERNAL SURFACE: 30mm UNLESS SPECIFIED OTHERWISE.
RIGID STEEL FORMWORK AND INTENSE COMPACTION SHALL BE USED.
REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR LIFTING ANCHORS, FORMED HOLES AND RECESSES.
UNLESS OTHERWISE SPECIFIED, THE MINIMUM LENGTHS OF LAPS SHALL BE :

BAR SIZE	N12	N16	N20	N24	N28	N32
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR	450	700	950	1250	1550	1850
b) OTHER BARS:	350	550	750	950	1200	1450

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3 x THE BAR DIAMETER.
CONCRETE SHALL BE CURED IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B80 AND AS5100.5.
THE REQUIRED COVER DOES NOT INCLUDE ALLOWANCE FOR THE USE OF CURING COMPOUNDS.
NF DENOTES NEAR FACE
FF DENOTES FAR FACE
EF DENOTES EACH FACE
✳ DENOTES VARIABLE LENGTH BAR
◩ DENOTES COUPLED BAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

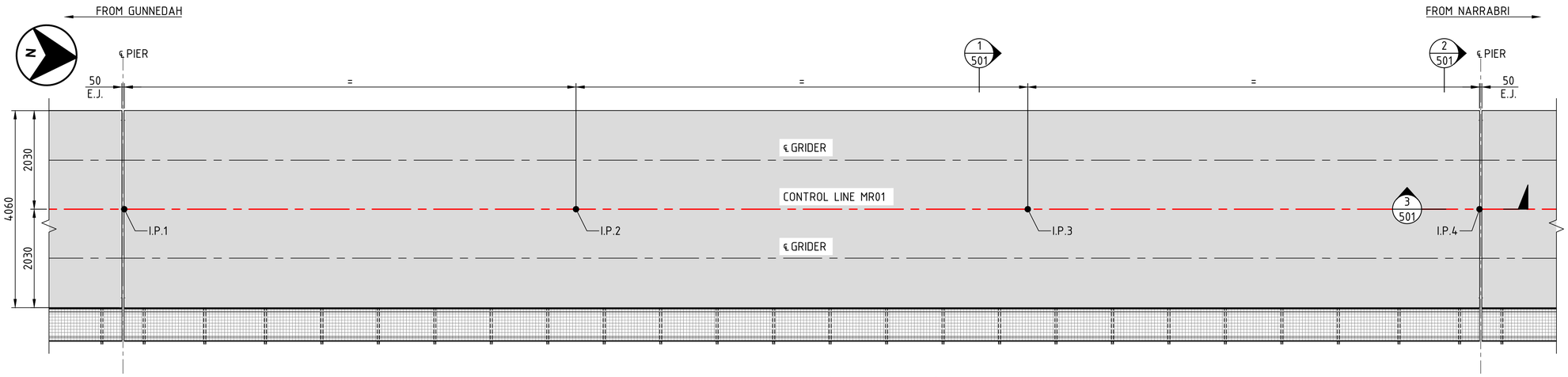
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PSC GIRDER REINFORCEMENT
SHEET D

FILE No. BE22007-6670-DRG-BR-6453 | SHEET: 4 OF 4 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6453 | B | EDMS No. - | -



TYPICAL DECK PLAN (SPAN 1 TO 17)

SCALE 1 : 50

GENERAL NOTES

CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 40MPa.
CONCRETE WORKS TO COMPLY WITH TFNSW SPECIFICATION D&C B80.
THE CONCRETE MIX MUST BE DESIGNED TO ACHIEVE A MAXIMUM TARGET STRENGTH NOT EXCEEDING 48MPa NOTWITHSTANDING THE MAXIMUM TARGET STRENGTH SPECIFIED IN TfNSW SPECIFICATION D&C B80.
EDGES SHALL BE CHAMFERED 20 x 20 AND RE-ENTRANT ANGLES FILLETED 20 x 20 UNLESS SPECIFIED OTHERWISE.
NCF DENOTES NO CHAMFER OR FILLET.
CJ DENOTES CONSTRUCTION JOINT.
CALCULATED MID-SPAN DEFLECTION OF GIRDERS DUE TO THE WEIGHT OF CAST-IN-PLACE CONCRETE IS PROVIDED IN TABLE 1 ON DRG No 400.
VALUES PROVIDED IN SETOUT TABLES ARE TO CONCRETE LEVEL.
DECK THICKNESS SHALL BE INCREASED WHERE REQUIRED TO ALLOW FOR VARIATION IN THE HOG OF THE GIRDERS AND THE VERTICAL ALIGNMENT.

TABLE 1 - DECK LEVEL TABLE

LOCATION	POINT	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 1	I.P.1	512223.366	229233.704	6588567.741	253.919	254.419	253.919
	I.P.2	512232.691	229233.054	6588577.043	253.919	254.419	253.919
	I.P.3	512242.016	229232.403	6588586.346	253.919	254.419	253.919
	I.P.4	512251.341	229231.753	6588595.648	253.919	254.419	253.919
SPAN 2	I.P.1	512251.391	229231.749	6588595.698	253.919	254.419	253.919
	I.P.2	512260.708	229231.099	6588604.992	253.919	254.419	253.919
	I.P.3	512270.024	229230.449	6588614.286	253.919	254.419	253.919
	I.P.4	512279.341	229229.799	6588623.580	253.919	254.419	253.919
SPAN 3	I.P.1	512279.391	229229.796	6588623.630	253.919	254.419	253.919
	I.P.2	512288.708	229229.146	6588632.924	253.919	254.419	253.919
	I.P.3	512298.024	229228.496	6588642.218	253.919	254.419	253.919
	I.P.4	512307.341	229227.846	6588651.512	253.919	254.419	253.919
SPAN 4	I.P.1	512307.391	229227.843	6588651.561	253.919	254.419	253.919
	I.P.2	512316.708	229227.193	6588660.855	253.919	254.419	253.919
	I.P.3	512326.024	229226.543	6588670.149	253.919	254.419	253.919
	I.P.4	512335.341	229225.893	6588679.443	253.919	254.419	253.919
SPAN 5	I.P.1	512335.391	229225.890	6588679.493	253.919	254.419	253.919
	I.P.2	512344.708	229225.240	6588688.787	253.919	254.419	253.919
	I.P.3	512354.024	229224.590	6588698.081	253.919	254.419	253.919
	I.P.4	512363.341	229223.940	6588707.375	253.919	254.419	253.919
SPAN 6	I.P.1	512363.391	229223.936	6588707.425	253.919	254.419	253.919
	I.P.2	512372.708	229223.287	6588716.719	253.919	254.419	253.919
	I.P.3	512382.024	229222.637	6588726.013	253.919	254.419	253.919
	I.P.4	512391.341	229221.987	6588735.307	253.919	254.419	253.919

TABLE 2 - DECK LEVEL TABLE

LOCATION	POINT	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 7	I.P.1	512391.391	229221.983	6588735.357	253.919	254.419	253.919
	I.P.2	512400.708	229221.333	6588744.651	253.919	254.419	253.919
	I.P.3	512410.024	229220.684	6588753.945	253.919	254.419	253.919
	I.P.4	512419.341	229220.034	6588763.239	253.919	254.419	253.919
SPAN 8	I.P.1	512419.391	229220.030	6588763.289	253.919	254.419	253.919
	I.P.2	512428.708	229219.380	6588772.583	253.919	254.419	253.919
	I.P.3	512438.024	229218.730	6588781.877	253.919	254.419	253.919
	I.P.4	512447.341	229218.080	6588791.171	253.919	254.419	253.919
SPAN 9	I.P.1	512447.391	229218.077	6588791.220	253.919	254.419	253.919
	I.P.2	512456.708	229217.427	6588800.514	253.919	254.419	253.919
	I.P.3	512466.024	229216.777	6588809.808	253.919	254.419	253.919
	I.P.4	512475.341	229216.127	6588819.102	253.919	254.419	253.919
SPAN 10	I.P.1	512475.391	229216.124	6588819.152	253.919	254.419	253.919
	I.P.2	512484.708	229215.474	6588828.446	253.919	254.419	253.919
	I.P.3	512494.024	229214.824	6588837.740	253.919	254.419	253.919
	I.P.4	512503.341	229214.174	6588847.034	253.919	254.419	253.919
SPAN 11	I.P.1	512503.391	229214.171	6588847.084	253.919	254.419	253.919
	I.P.2	512512.708	229213.521	6588856.378	253.919	254.419	253.919
	I.P.3	512522.024	229212.871	6588865.672	253.919	254.419	253.919
	I.P.4	512531.341	229212.221	6588874.966	253.919	254.419	253.919
SPAN 12	I.P.1	512531.391	229212.217	6588875.016	253.919	254.419	253.919
	I.P.2	512540.708	229211.568	6588884.310	253.919	254.419	253.919
	I.P.3	512550.024	229210.918	6588893.604	253.919	254.419	253.919
	I.P.4	512559.341	229210.268	6588902.898	253.919	254.419	253.919

TABLE 3 - DECK LEVEL TABLE

LOCATION	POINT	CHAINAGE	EASTING	NORTHING	RL 'A'	RL 'B'	RL 'C'
SPAN 13	I.P.1	512559.391	229210.264	6588902.948	253.919	254.419	253.919
	I.P.2	512568.708	229209.614	6588912.242	253.919	254.419	253.919
	I.P.3	512578.024	229208.964	6588921.536	253.919	254.419	253.919
	I.P.4	512587.341	229208.315	6588930.829	253.919	254.419	253.919
SPAN 14	I.P.1	512587.391	229208.311	6588930.879	253.919	254.419	253.919
	I.P.2	512596.708	229207.661	6588940.173	253.919	254.419	253.919
	I.P.3	512606.024	229207.011	6588949.467	253.919	254.419	253.919
	I.P.4	512615.341	229206.361	6588958.761	253.919	254.419	253.919
SPAN 15	I.P.1	512615.391	229206.358	6588958.812	253.919	254.419	253.919
	I.P.2	512624.708	229205.708	6588968.106	253.919	254.419	253.919
	I.P.3	512634.024	229205.058	6588977.400	253.919	254.419	253.919
	I.P.4	512643.341	229204.408	6588986.694	253.919	254.419	253.919
SPAN 16	I.P.1	512643.391	229204.405	6588986.742	253.919	254.419	253.919
	I.P.2	512652.708	229203.755	6588996.036	253.919	254.419	253.919
	I.P.3	512662.024	229203.105	6589005.330	253.919	254.419	253.919
	I.P.4	512671.341	229202.455	6589014.624	253.919	254.419	253.919
SPAN 17	I.P.1	512671.391	229202.452	6589014.675	253.919	254.419	253.919
	I.P.2	512680.716	229201.801	6589023.977	253.919	254.419	253.919
	I.P.3	512690.041	229201.151	6589033.279	253.919	254.419	253.919
	I.P.4	512699.366	229200.500	6589042.582	253.919	254.419	253.919

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

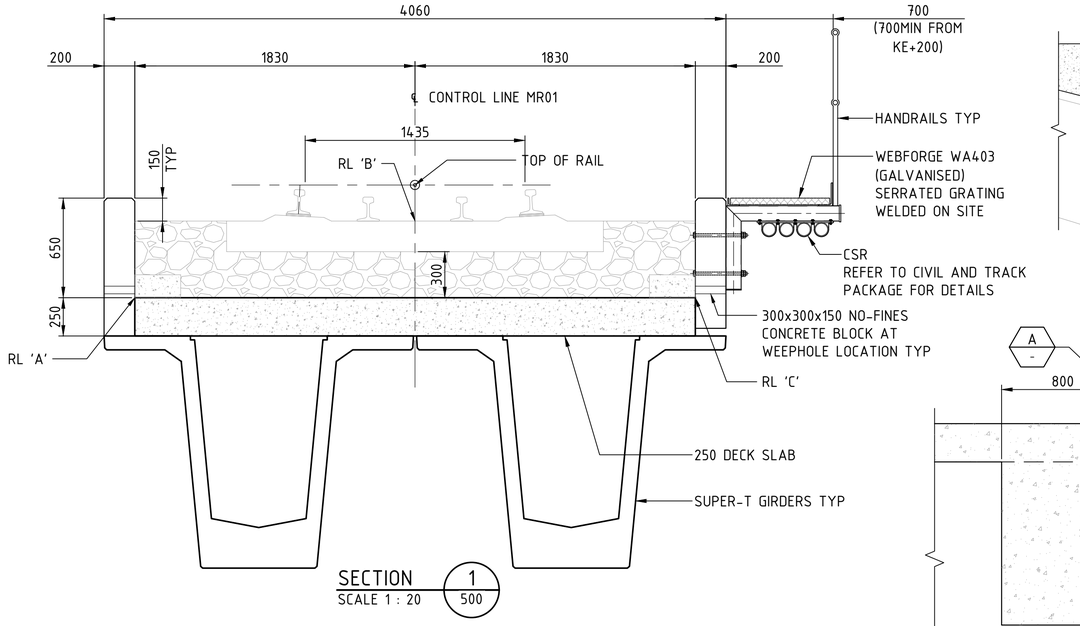
RAIL BRIDGE OVER STRATFORD CREEK DECK CONCRETE

SHEET A

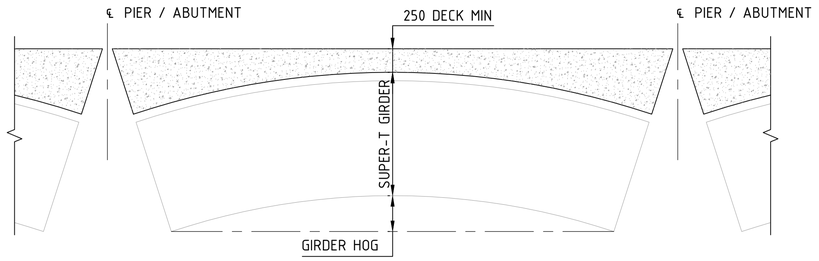
FILE No. BE22007-6670-DRG-BR-6500 | SHEET: 1 OF 2 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6500 | B | EDMS No. - | -



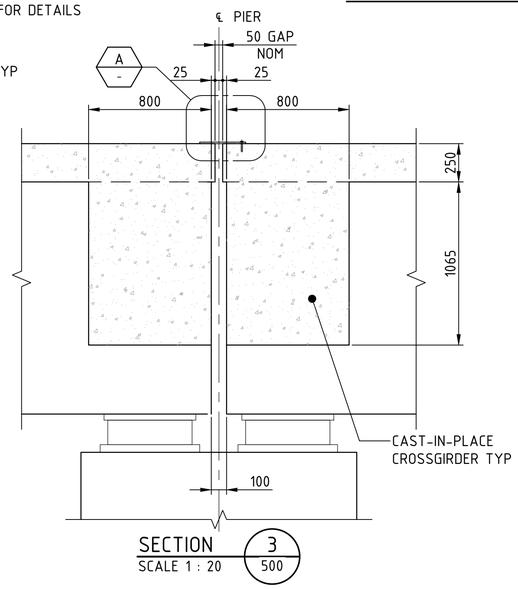
SECTION 1 / SCALE 1 : 20 / 500



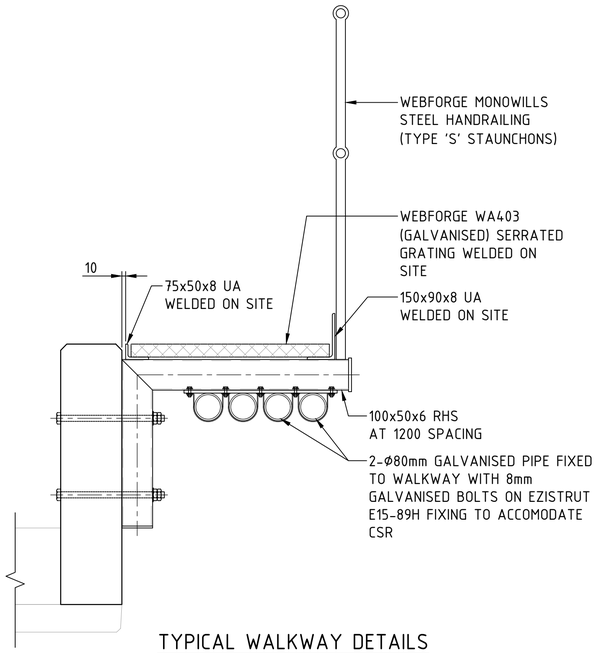
TYPICAL SECTION ALONG DECK CENTERLINE
NTS

GENERAL NOTES

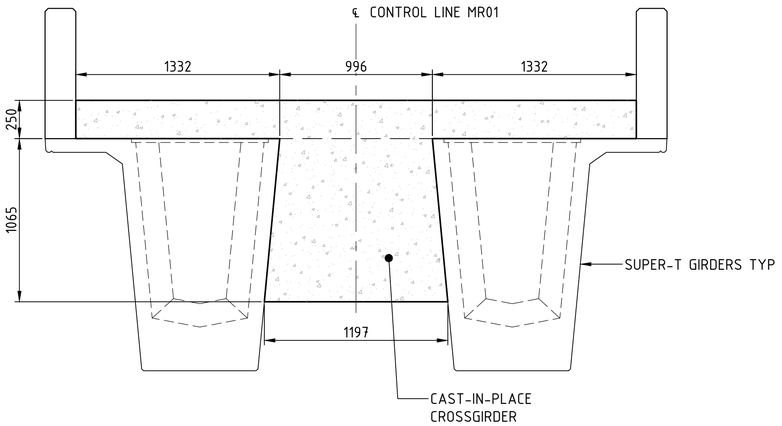
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 500.
DECK SURFACE TO BE CONSTRUCTED WITHIN 0mm/-5mm TOLERANCE



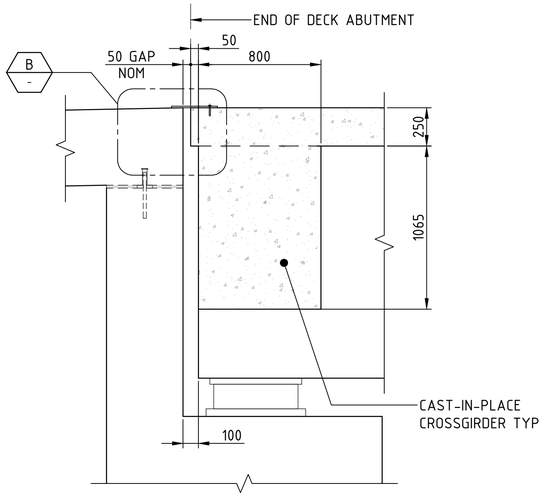
SECTION 3 / SCALE 1 : 20 / 500



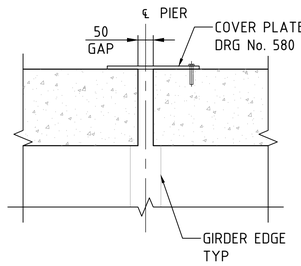
TYPICAL WALKWAY DETAILS
SCALE 1 : 10



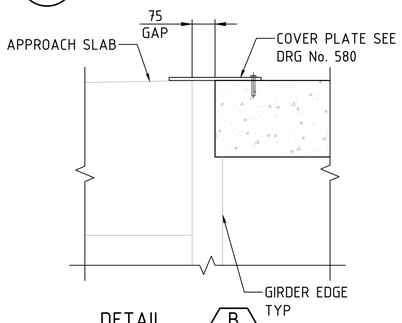
SECTION 2 / SCALE 1 : 20 / 500



TYPICAL SECTION AT ABUTMENT
SCALE 1 : 20



DETAIL A / SCALE 1 : 10



DETAIL B / SCALE 1 : 10

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

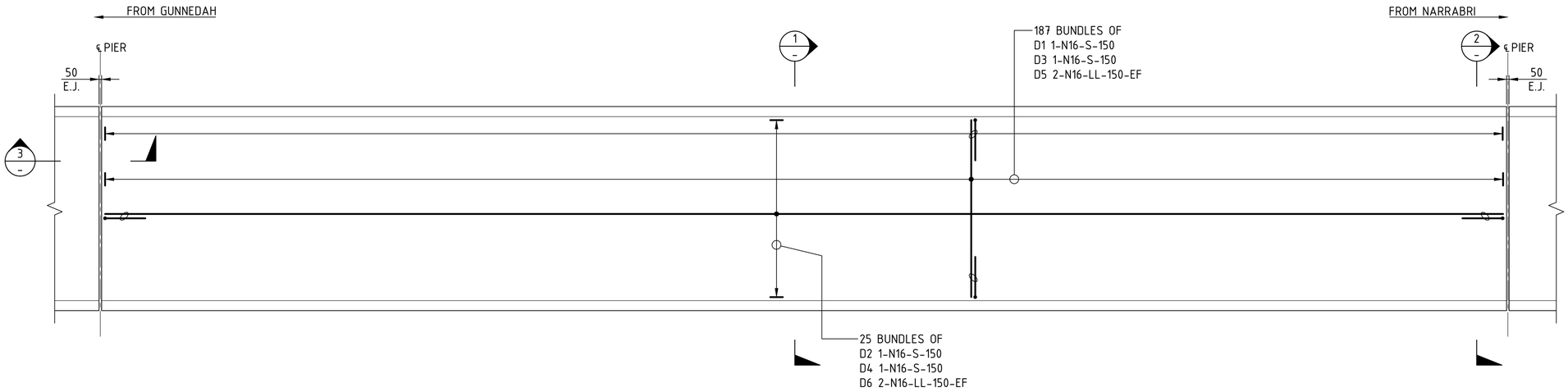
DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
DECK CONCRETE
SHEET B

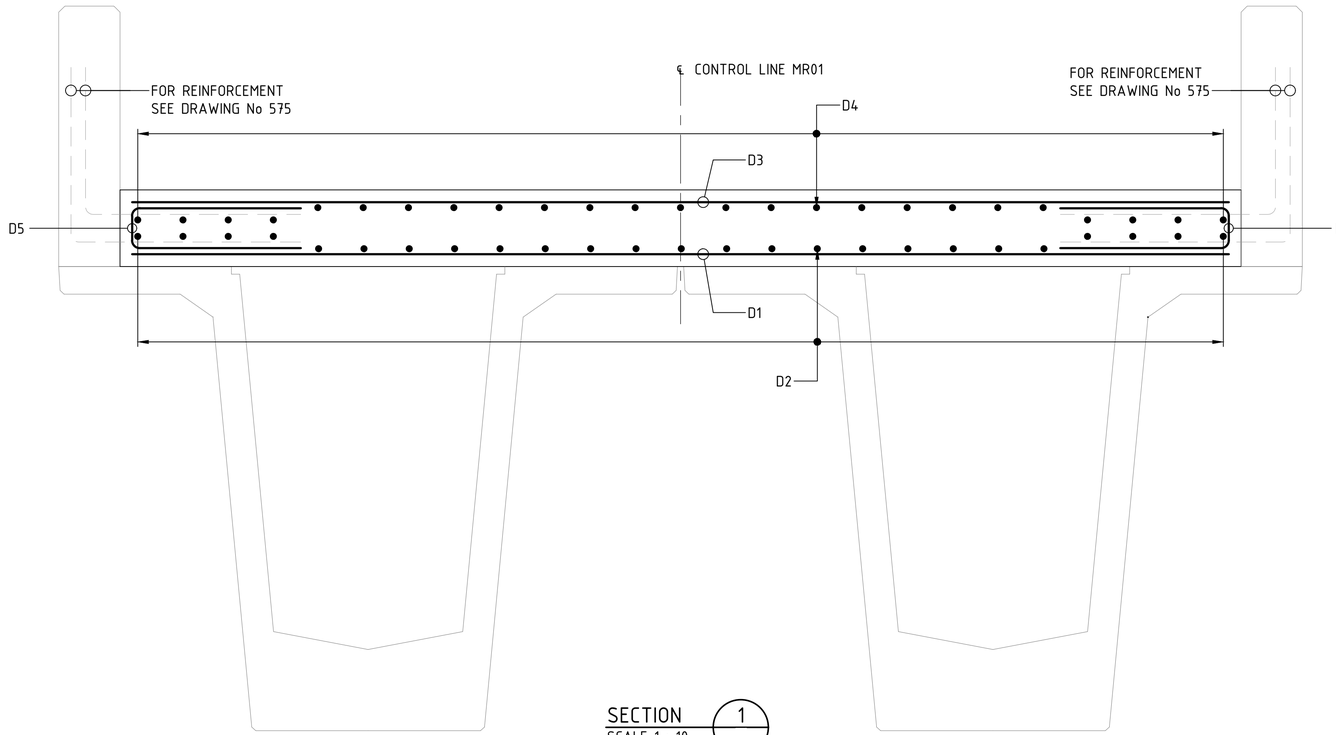
FILE No. BE22007-6670-DRG-BR-6501 | SHEET: 2 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6501 | B | EDMS No. - | -

File Plotted C:\12dSdata\AUR2\DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\103 Br & Spec Sht\AutoCAD\AutoCAD GDA 2020\BE22007-6670-DWG-BR-6501.dwg
Plot Date & Time 7/19/2023 5:45 PM
Plotted by CHRISTSAAC-ESMILLA

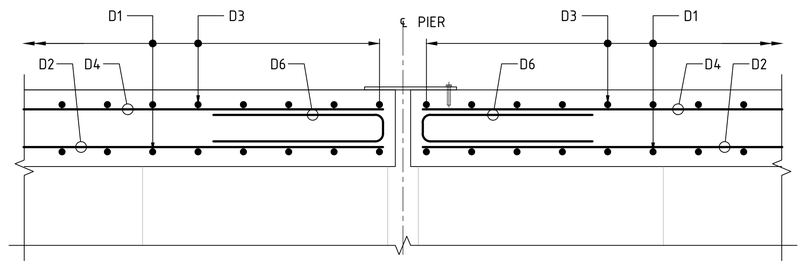


DECK PLAN - TYPICAL REINFORCEMENT (SPAN 1 TO 17)

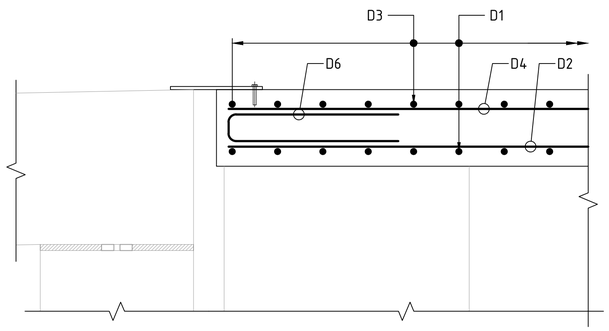
SCALE 1 : 50



SECTION 1
SCALE 1 : 10



SECTION 3
SCALE 1 : 10



TYPICAL DECK REINFORCEMENT AT ABUTMENT
SCALE 1 : 10

GENERAL NOTES

REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 45mm UNLESS SPECIFIED OTHERWISE.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT MUST BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS OTHERWISE SHOWN ON THE DRAWINGS, LAPS ON ADJACENT BARS ON ANY FACE MUST BE STAGGERED (OFFSET) BY NO LESS THAN THE LAP LENGTH.
UNLESS SPECIFIED OTHERWISE, THE MINIMUM DEVELOPMENT LENGTHS AND LENGTH OF LAPS MUST BE:

BAR SIZE:	N12	N16	N20	N24	N28	N32
a) LAP LENGTH (HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR)	500	800	1100	1400	1750	2100
b) LAP LENGTH OTHER BARS:	400	600	850	1100	1350	1600

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3 x THE BAR DIAMETER. REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR BARS FROM BARS FROM PRECAST BALLAST WALLS, FORMED HOLES AND GENERAL FITMENTS.
THE REQUIRED CONCRETE COVER IS BASED ON A MINIMUM OF 7 DAYS OF EFFECTIVE, CONTINUOUS AND UNINTERRUPTED WET CURING IN ACCORDANCE WITH AS 5100.5-2017. CURING COMPOUNDS SHALL NOT BE USED.
EF - DENOTES EACH FACE
FF - DENOTES FAR FACE
NF - DENOTES NEAR FACE
LV - DENOTES VARIABLE LENGTH BAR

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:50 @ A1 0 500 1000 1500 2000 2500 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

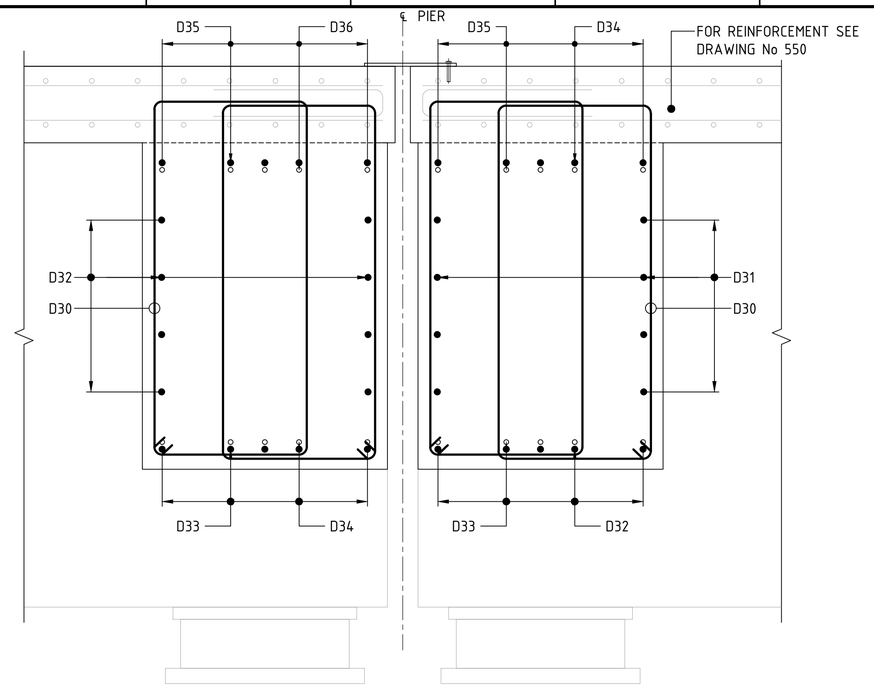
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

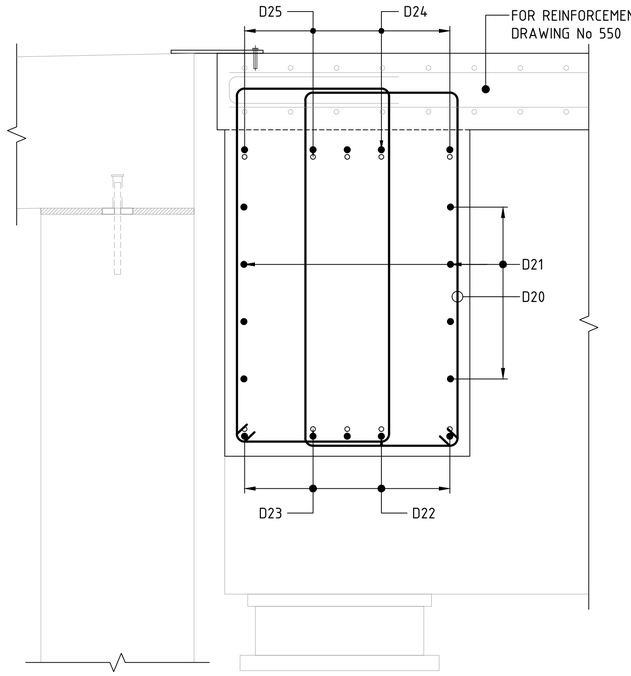
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
DECK REINFORCEMENT
SHEET A

FILE No. BE22007-6670-DRG-BR-6550 | SHEET: 1 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6550 | B | EDMS No. - | -



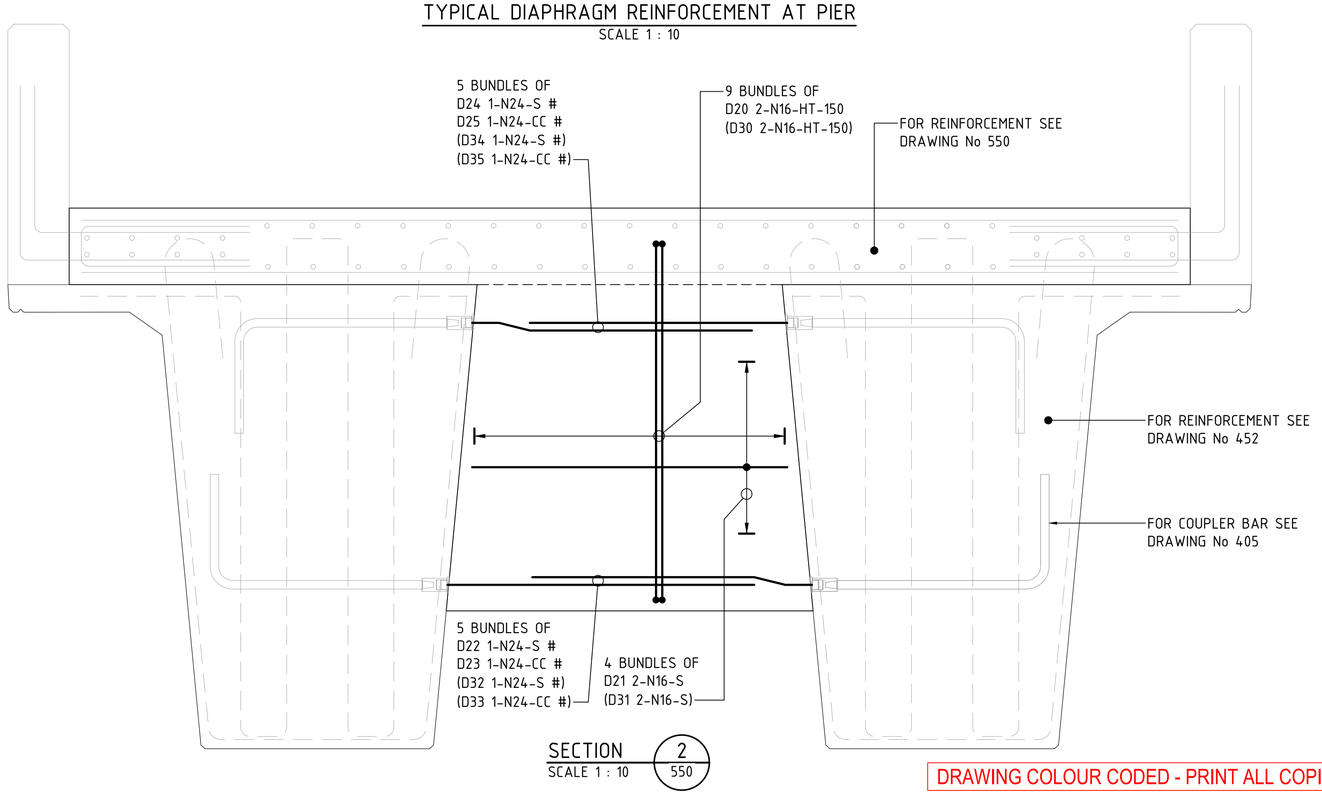
TYPICAL DIAPHRAGM REINFORCEMENT AT PIER
SCALE 1 : 10



TYPICAL DIAPHRAGM REINFORCEMENT AT ABUTMENT
SCALE 1 : 10

GENERAL NOTES

FOR GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 550.



SECTION 2/550
SCALE 1 : 10

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

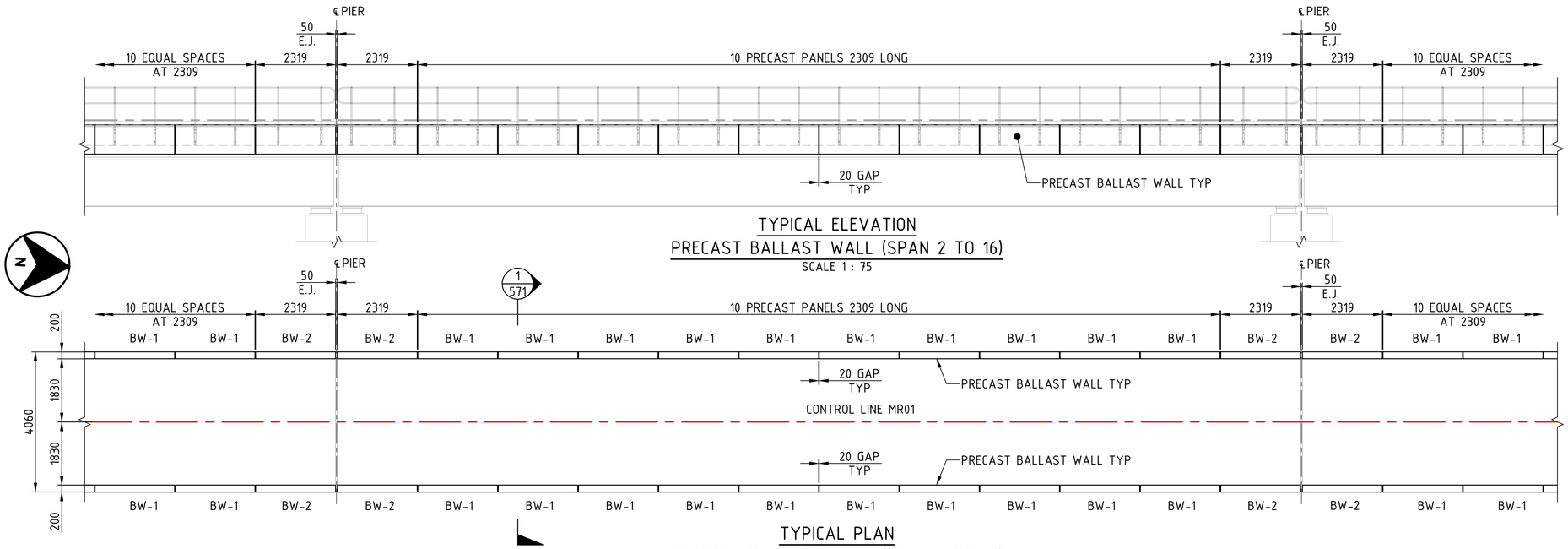
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

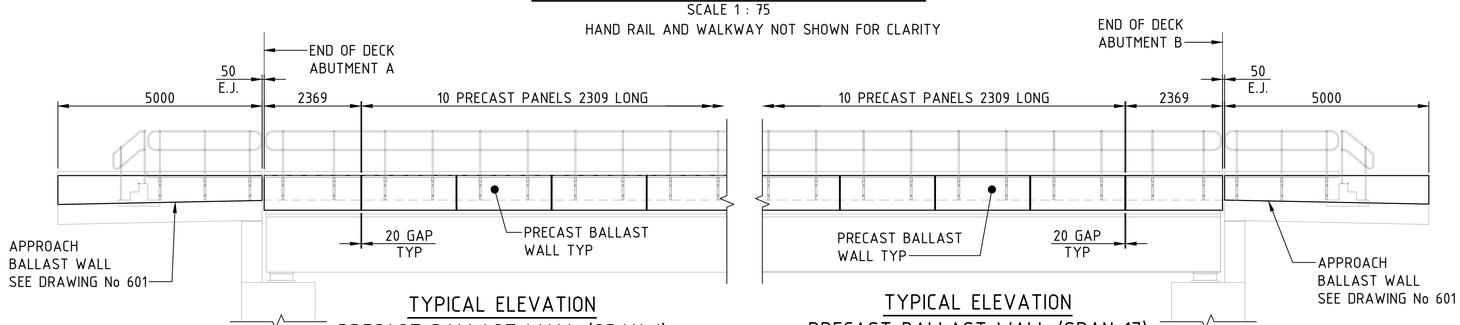
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
DECK REINFORCEMENT
SHEET B

FILE No. BE22007-6670-DRG-BR-6551 | SHEET: 2 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6551 | B | EDMS No. - | -



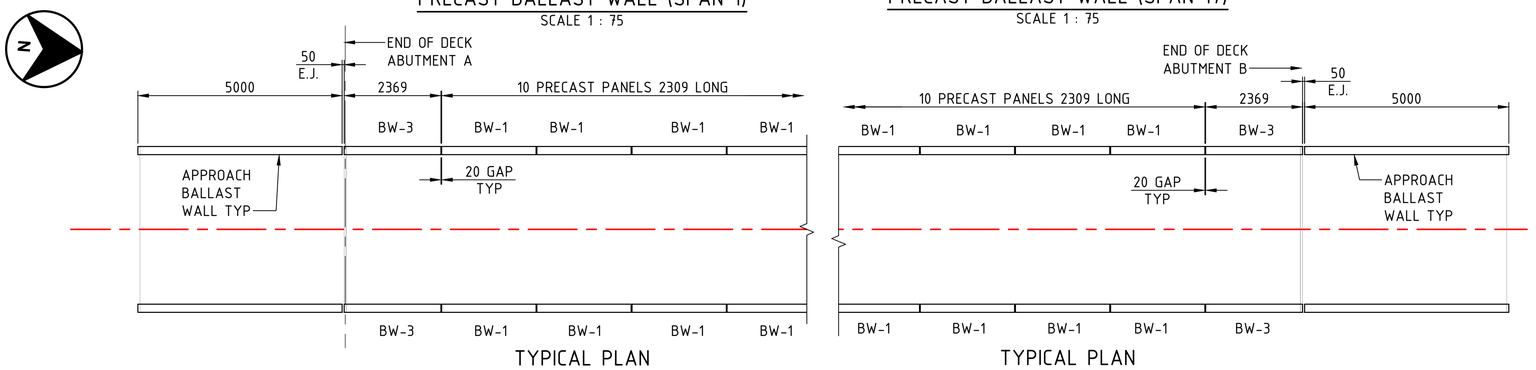
TYPICAL ELEVATION
PRECAST BALLAST WALL (SPAN 2 TO 16)
SCALE 1 : 75

TYPICAL PLAN
PRECAST BALLAST WALL (SPAN 2 TO 16)
SCALE 1 : 75
HAND RAIL AND WALKWAY NOT SHOWN FOR CLARITY



TYPICAL ELEVATION
PRECAST BALLAST WALL (SPAN 1)
SCALE 1 : 75

TYPICAL ELEVATION
PRECAST BALLAST WALL (SPAN 17)
SCALE 1 : 75



TYPICAL PLAN
PRECAST BALLAST WALL (SPAN 1)
SCALE 1 : 75

TYPICAL PLAN
PRECAST BALLAST WALL (SPAN 17)
SCALE 1 : 75

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
CONCRETE EXPOSURE CLASSIFICATION: B1
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 50 MPa.
EDGES SHALL BE CHAMFERED 10 x 10 AND RE-ENTRANT ANGLES FILLETED 10 x 10 UNLESS SPECIFIED OTHERWISE.
NCF DENOTES NO CHAMFER OR FILLET.
ALL SURFACES IN CONTACT WITH CAST-IN-PLACE STITCH POUR CONCRETE SHALL BE ROUGHENED DURING MANUFACTURE TO CONSTRUCTION JOINT SPECIFICATIONS IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B80.
REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 35mm.
REQUIRED COVER IS BASED ON A MINIMUM OF 7 DAYS EFFECTIVE, CONTINUOUS AND UNINTERRUPTED WET OR SEALED CURING IN ACCORDANCE WITH AS 5100.5-2017. WHERE CURING COMPOUNDS ARE PROPOSED, THE COVER MUST BE INCREASED BY 5 mm FOR CLASSIFICATION B1.
RIGID STEEL FORMWORK AND INTENSE COMPACTION SHALL BE USED.
REINFORCEMENT MAY BE DISPLACED SLIGHTLY TO CLEAR ANCHOR BOLTS, FORMED HOLES AND RECESSES.
DIMENSIONS ARE TO THE CENTRE OF THE BAR UNLESS NOTED OTHERWISE.
UNLESS SPECIFIED OTHERWISE, REINFORCEMENT SHALL BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
UNLESS SPECIFIED OTHERWISE, THE LENGTH OF LAPS AND DEVELOPMENT TO BE AS FOLLOWS:

BAR SIZE	N12	N16	N20	N24	N28	N32	N36	N40
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR	450	650	950	1250	1600	1950	2350	2750
b) OTHER BARS:	350	500	750	950	1250	1500	1800	2150

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3x THE BAR DIAMETER.
FOR ADDITIONAL REINFORCEMENT NOTES AND BAR MARKING LEGEND, SEE SHEET No 001

LIFTING AND HANDLING

LIFTING ANCHORS SHALL BE DESIGNED BY THE PRECAST SUPPLIER. CAPACITY OF LIFTING ANCHORS TO BE DESIGNED ASSUMING ONLY TWO ANCHORS CARRY FULL MASS OF PRECAST UNIT WITH DYNAMIC EFFECTS.
MINIMUM FACTOR OF SAFETY TO BE 5.
MINIMUM TWO ANCHORS REQUIRED PER UNIT.
ANCHOR RECESSES SHALL BE FILLED WITH SHRINKAGE COMPENSATED CEMENTITIOUS GROUT UPON COMPLETION OF INSTALLATION.
ALL LIFTING ANCHORS SHALL BE HOT DIP GALVANISED.
⊕ DENOTES LOCATION OF LIFTING ANCHORS

1:75 @ A1 0 0.75 1.5 2.25 3 3.75 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

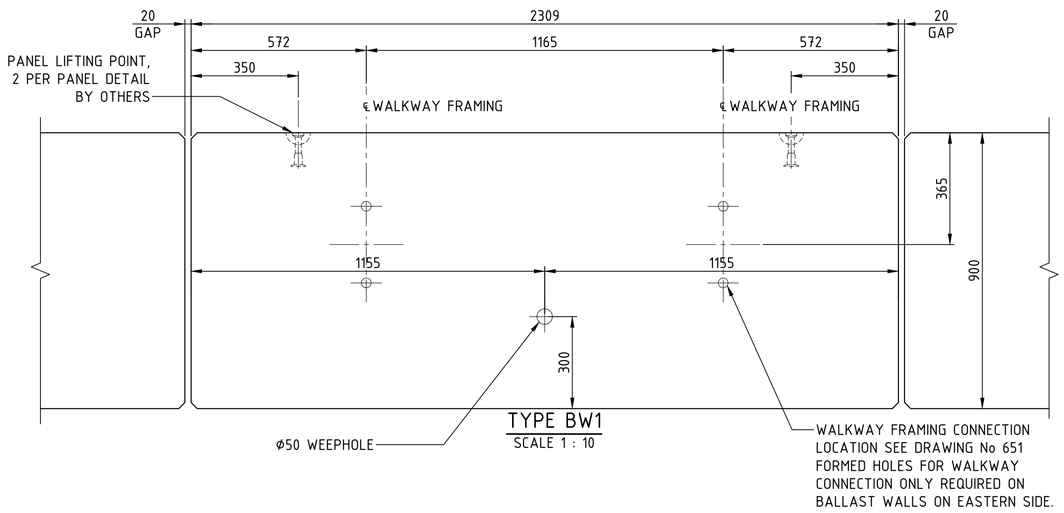
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK PRECAST BALLAST WALL CONCRETE
SHEET A

FILE No. BE22007-6670-DRG-BR-6570 | SHEET: 1 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6570 | B | EDMS No. - | -

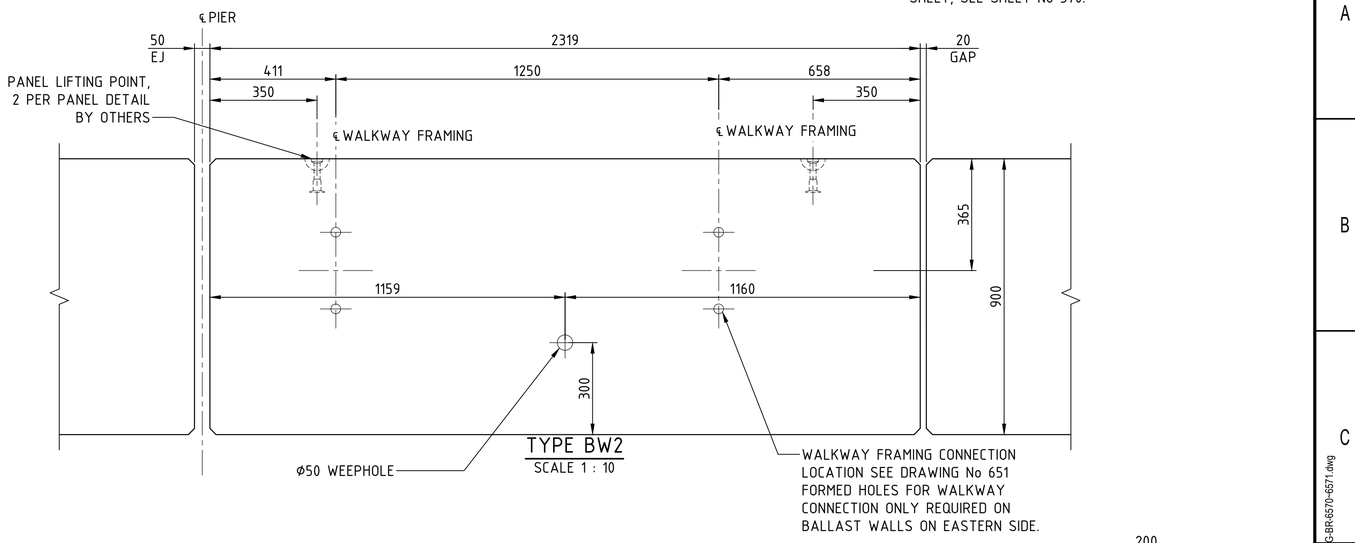
File Plotted C:\126\Sdata\AUR2DSYN01\BE22007 (B20175) \VEP_101\100 DRAWINGS\103 Br & Spec Str\AutoCAD\AutoCAD GDA 2020\BE22007-6670-DWG-BR-6570-6571.dwg
Plot Date & Time 7/19/2023 5:51 PM
Plotted by CHRISTSAAC.ESMILLA

GENERAL NOTES

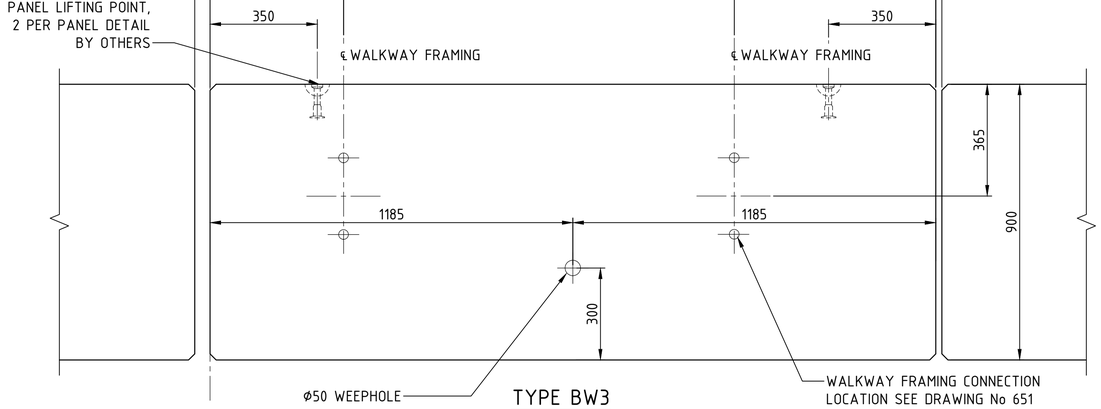
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 570.



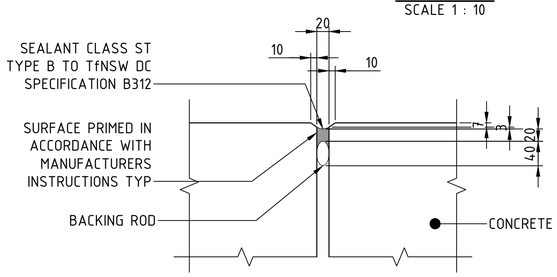
TYPE BW1
SCALE 1 : 10



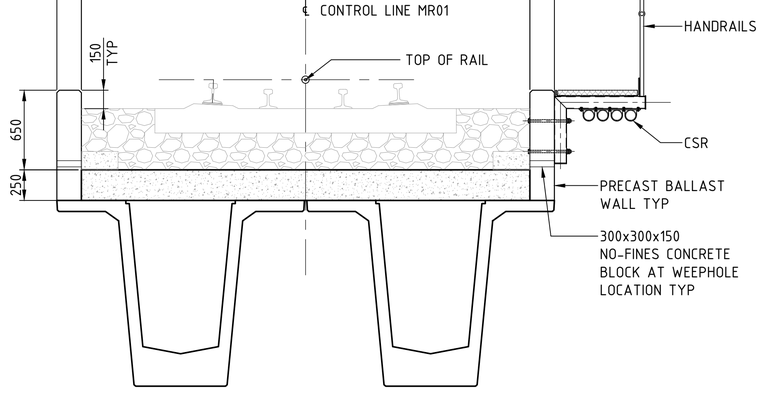
TYPE BW2
SCALE 1 : 10



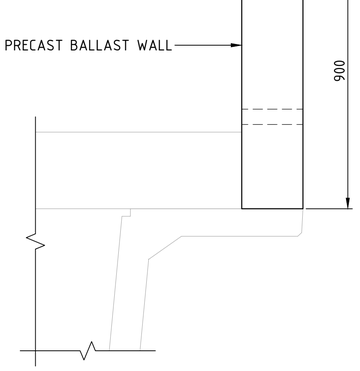
TYPE BW3
SCALE 1 : 10



TYPICAL JOINT SEAL BETWEEN BALLAST WALLS APPLIED ON BOTH SIDES OF GAP BETWEEN PANELS
SCALE 1 : 5



SECTION 1/571
SCALE 1 : 25



TYPICAL PRECAST BALLAST WALL DETAILS
SCALE 1 : 10
HAND RAIL AND WALKWAY NOT SHOWN FOR CLARITY

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 0 250 500 750 1000 1250 mm

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN	M.CHAVAN	21/07/2023
DESIGNED	K.UNDHEIM	21/07/2023
DRG CHECK	R.SAFARIAN	21/07/2023
DESIGN CHECK	R.PAN	21/07/2023
APPROVED	-	-

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

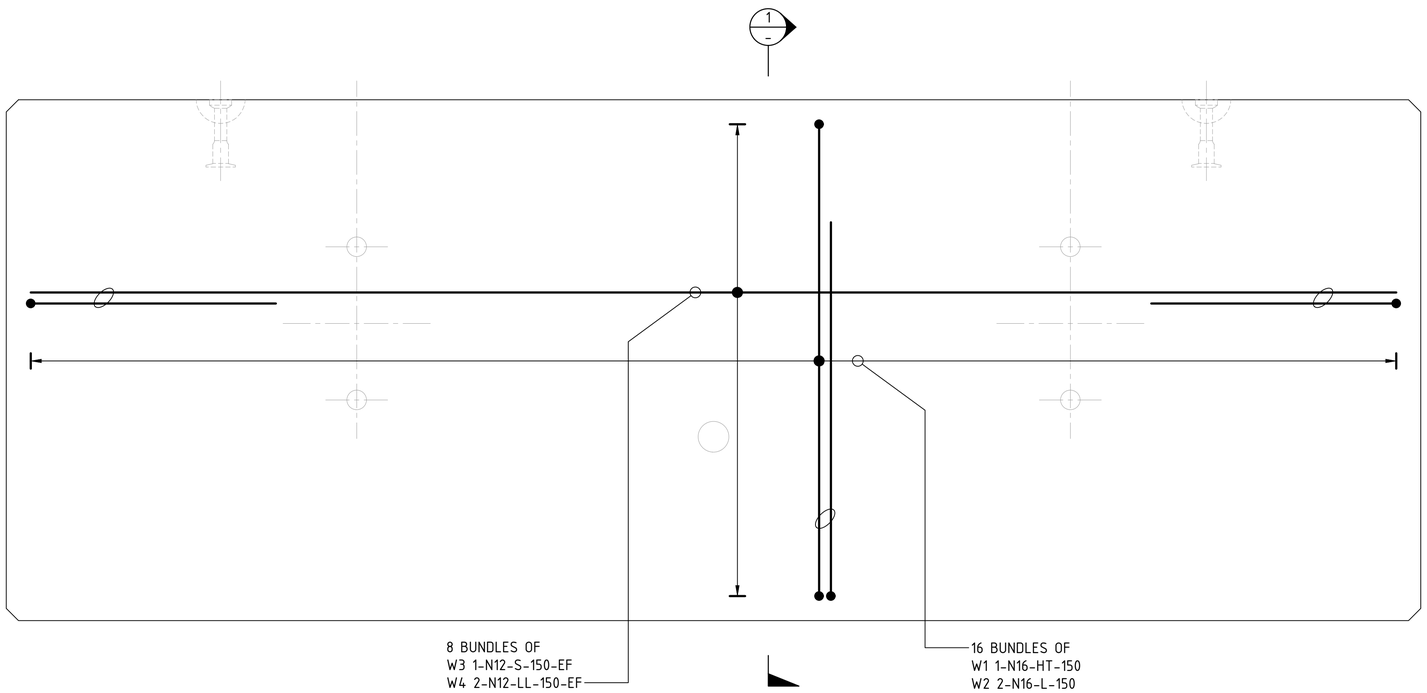
RAIL BRIDGE OVER STRATFORD CREEK PRECAST BALLAST WALL CONCRETE

SHEET B

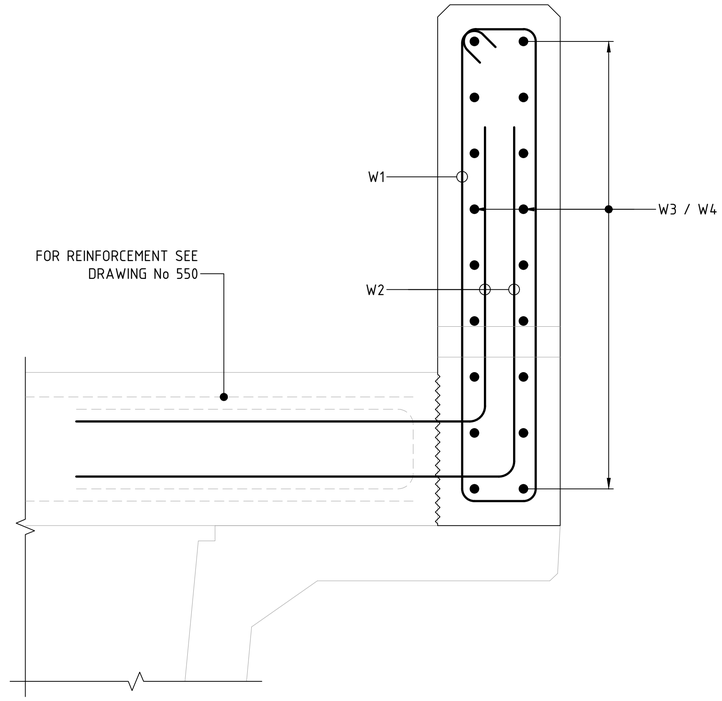
FILE No. BE22007-6670-DRG-BR-6571	SHEET: 2 OF 2	A1
STATUS: 100% DESIGN		©
DRG No. BE22007-6670-DRG-BR-6571	B	EDMS No. -

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 550.



TYPICAL REINFORCEMENT FOR PRECAST BALLAST WALL
SCALE 1 : 5



SECTION 1 / SCALE 1 : 5

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

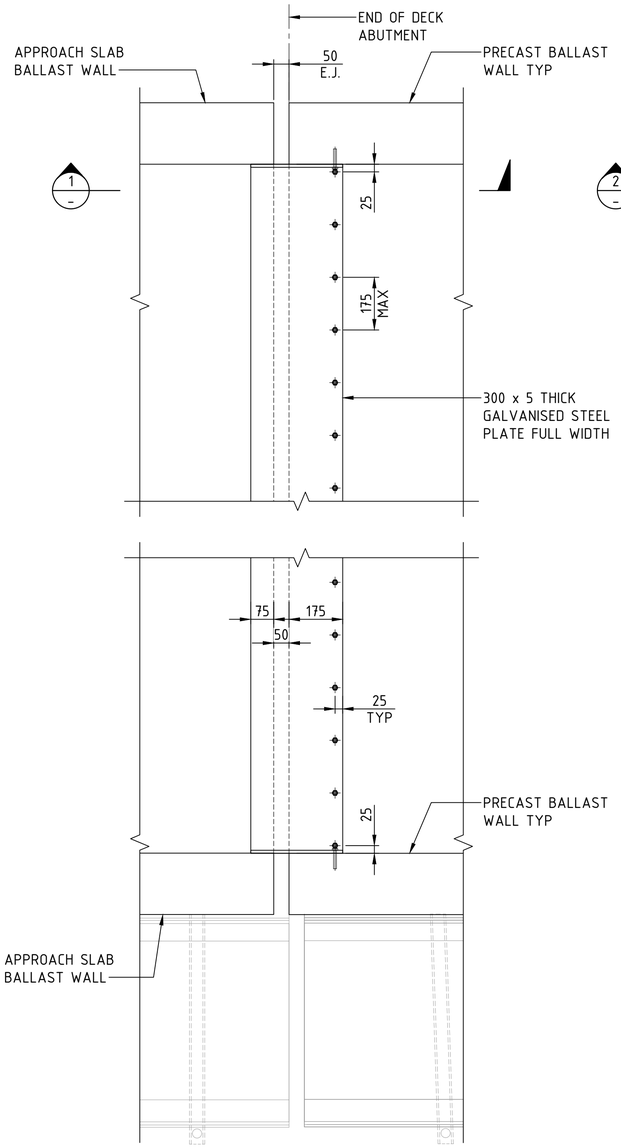
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

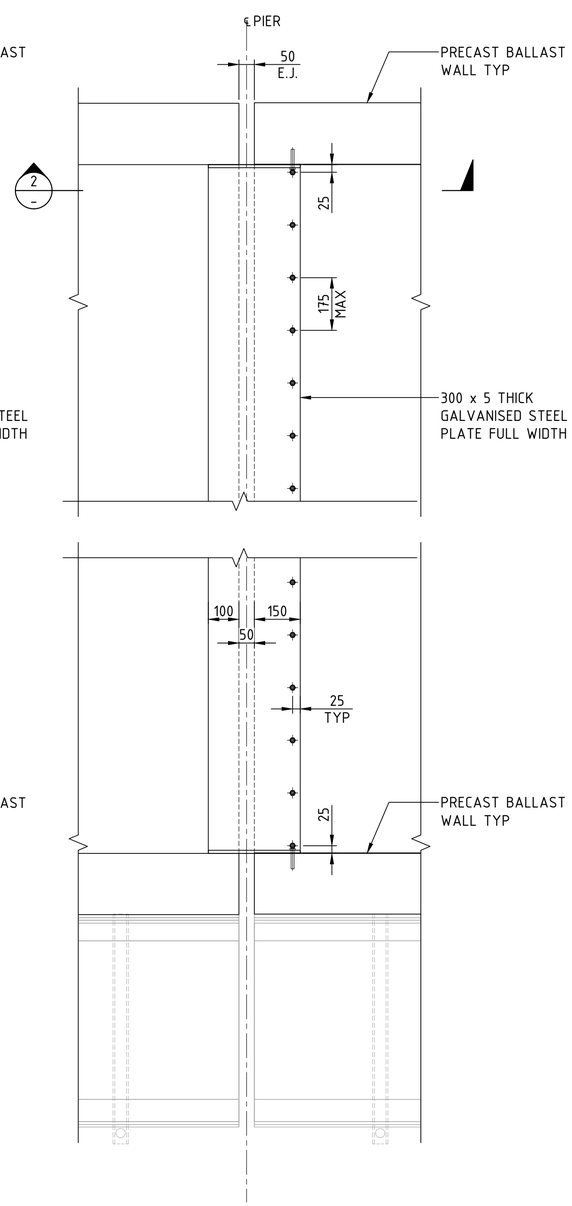
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
PRECAST BALLAST WALL REINFORCMENT

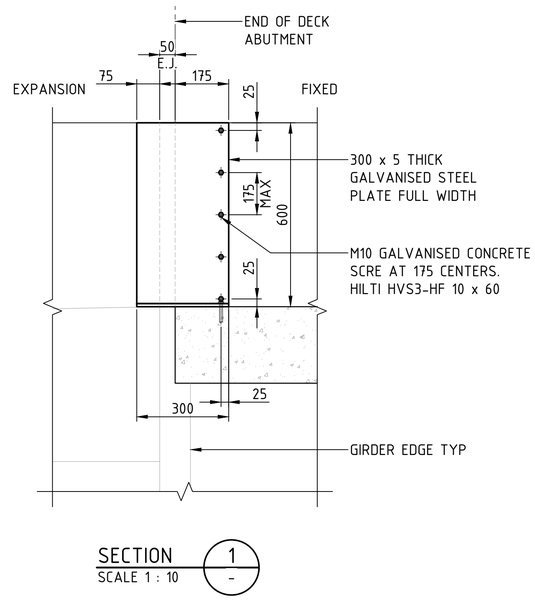
FILE No. BE22007-6670-DRG-BR-6575 | SHEET: 1 OF 1 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6575 | B | EDMS No. - | -



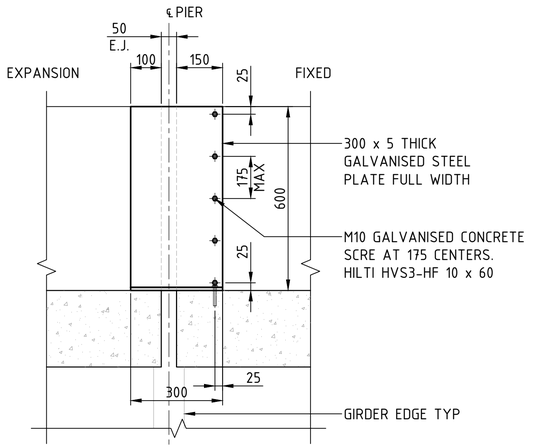
TYPICAL ABUTMENT COVER PLATE PLAN
SCALE 1 : 10



TYPICAL PIER COVER PLATE PLAN
SCALE 1 : 10



SECTION 1
SCALE 1 : 10



SECTION 2
SCALE 1 : 10

GENERAL NOTES

EXPANSION JOINT PLATE NOTES

COVER PLATE MUST BE FABRICATED FROM 10 THICK GRADE 250 GALVANIZED CHEQUER PLATE TO AS/NZS 3678-2016.
SLIDING PLATE MUST BE FABRICATED FROM 10 THICK GRADE 250 GALVANIZED PLATE TO AS/NZS 2678-2016.
CROSS SECTION DIMENSIONS ARE GIVEN TO OUTSIDE SURFACE OF PLATE.
STAINLESS STEEL FERRULES MUST BE GRADE 316 IN ACCORDANCE WITH ASTM A276.
STAINLESS STEEL COUNTERSUNK HEAD SCREWS MUST BE GRADE 316 IN ACCORDANCE WITH ASTM A879.
ALL FASTENER MUST CONFORM TO THE REQUIREMENTS OF TfNSW SPECIFICATION D&C B240.
AFTER FABRICATION ALL EXPOSED STEELWORK EXCEPT STAINLESS STEEL ITEMS MUST BE PROTECTED WITH A HDG600 COATING SYSTEM IN ACCORDANCE WITH AS/NZS4680 AND TfNSW SPECIFICATION D&C B220.
EDGES TO BE PROTECTIVE TREATED MUST BE ROUNDED TO A RADIUS OF 2 UNLESS SPECIFIED OTHERWISE.

1:10 @ A1 0 100 200 300 400 500 mm

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

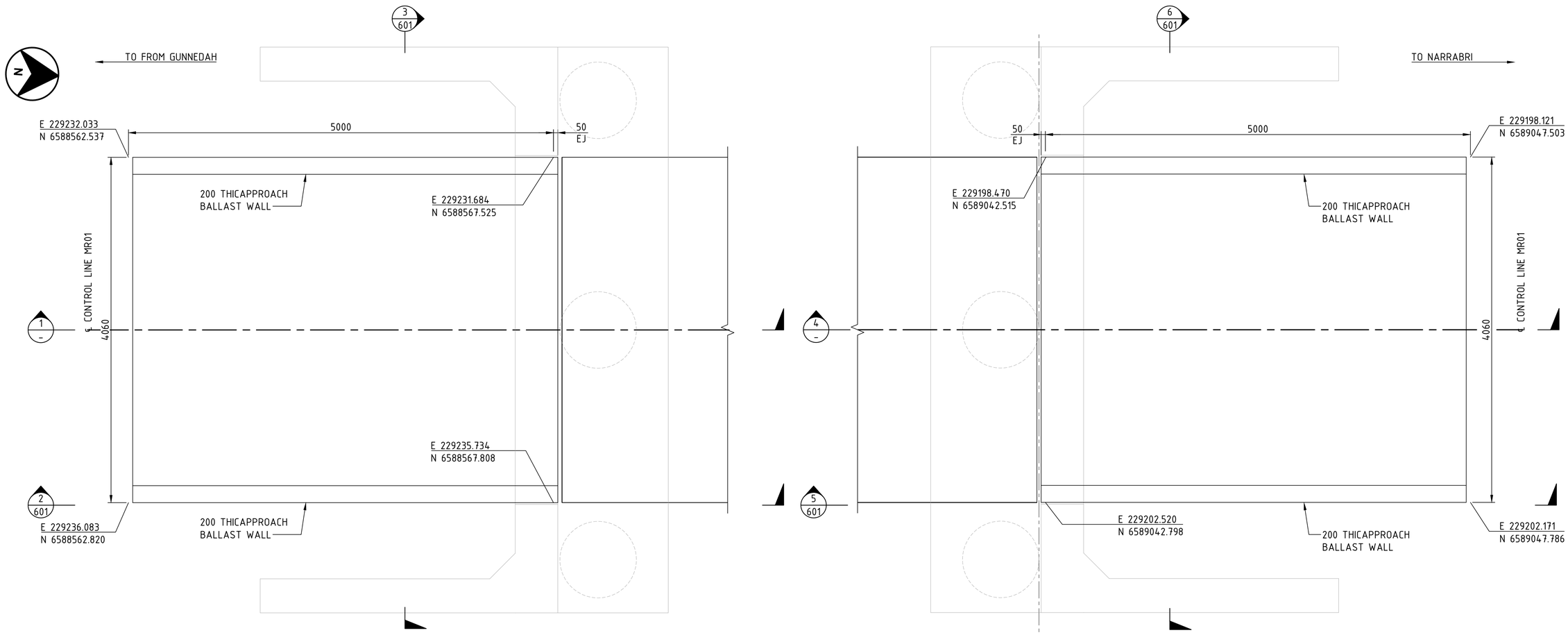
DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

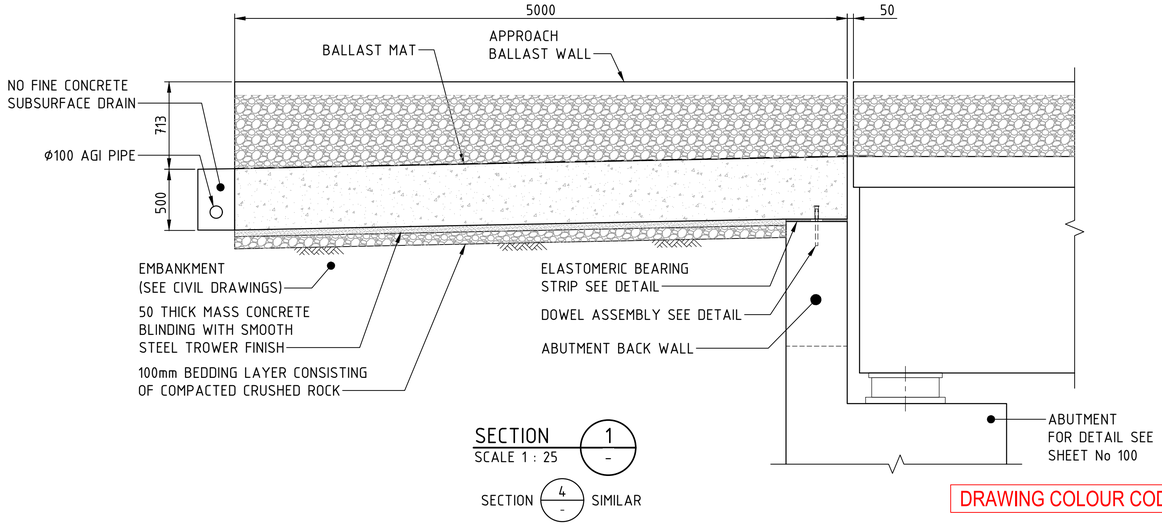
RAIL BRIDGE OVER STRATFORD CREEK EXPANSION JOINT COVER PLATE DETAILS

FILE No. BE22007-6670-DRG-BR-6580 | SHEET: 1 OF 1 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6580 | B | EDMS No. - | -



ABUTMENT 'A' APPROACH SLAB PLAN

SCALE 1 : 25



SECTION 1 – SCALE 1 : 25

SECTION 4 – SIMILAR

ABUTMENT 'B' APPROACH SLAB PLAN

SCALE 1 : 25

GENERAL NOTES

CONCRETE EXPOSURE CLASSIFICATION: B1.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 40MPa.
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF MASS CONCRETE SHALL BE 20MPa.
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
EDGES SHALL BE CHAMFERED 20 x 20 AND RE-ENTRANT ANGLES FILLETED 20 x 20 UNLESS SPECIFIED OTHERWISE.

REINFORCEMENT NOTES

REINFORCEMENT SHALL BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671.
REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE 45mm UNLESS SPECIFIED OTHERWISE.
REQUIRED COVER IS BASED ON A MINIMUM OF 7 DAYS EFFECTIVE, CONTINIOUS AND UNINTERUPTED WET OR SEALED CURING IN ACCORDANCE WITH AS5100.5.
WHERE CURING COMPOUNDS ARE PROPOSED, THE COVER MUST BE INCREASED BY 5mm FOR CLASSIFICATION B1. CURING COMPOUNDS ARE NOT PERMITTED.
UNLESS OTHERWISE SHOWN ON THE DRAWINGS, LAPS ON ADJACENT BARS ON ANY FACE SHALL BE STAGGERED (OFFSET) BY NO LESS THAN THE LAP LENGTH.
UNLESS OTHERWISE SPECIFIED, THE MINIMUM LENGTHS OF LAPS SHALL BE:

BAR SIZE: mm	N12	N16	N20	N24	N28	N32	N36	N40
a) HORIZONTAL BARS WITH>300mm OF CONCRETE CAST BELOW THE BAR:	500	750	1050	1350	1700	2050	2450	2800
b) OTHER BARS:	350	600	800	1050	1300	1600	1900	2150

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3 x THE BAR DIAMETER.

REINFORCEMENT NOTES

REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR GALVANISED STEEL DOWELS AND EXPANSION JOINT ANCHOR BOLTS.
WHERE SPLICE LOCATIONS ARE DETAILED ON THE DRAWINGS. THE CONTRACTOR MUST SEEK APPROVAL FROM THE DESIGN ENGINEER TO SPLICE AT ALTERNATE LOCATIONS. WHERE BARS ARE DETAILED WITHOUT LAPS AND THE BARS LENGTH DICTATES THAT LAPS ARE REQUIRED. THE CONTRACTOR MAY ADOPT LAP LOCATIONS AS REQUIRED TO ENSURE MINIMUM LAP LENGTHS ARE ACHIEVED.
PLACEMENT OF TOP AND BOTTOM REINFORCEMENT LAYERS ARE TO BE ALIGNED

EF DENOTES EACH FACE.
FF DENOTES FAR FACE.
NF DENOTES NEAR FACE.
NTS DENOTES NOT TO SCALE.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:25 @ A1 — 0 250 500 750 1000 1250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

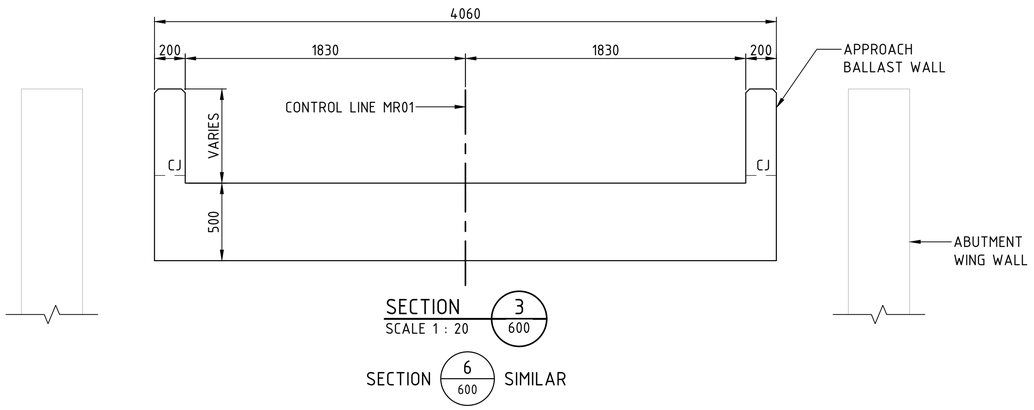
RAIL BRIDGE OVER STRATFORD CREEK APPROACH SLAB

SHEET A

FILE No. BE22007-6670-DRG-BR-6600 | SHEET: 1 OF 2 | A1

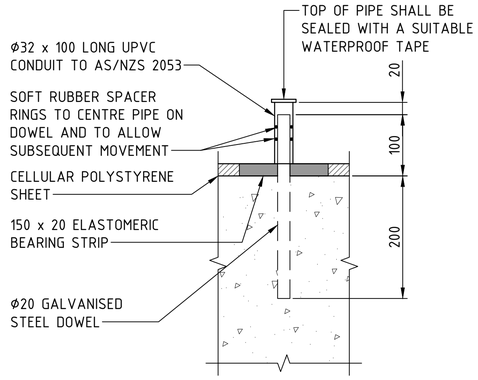
STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6600 | B | EDMS No. - | -



SECTION 3/600
SCALE 1 : 20

SECTION 6/600 SIMILAR

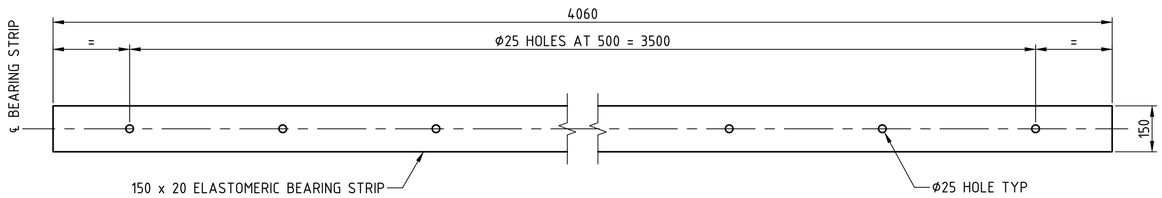


DOWEL ASSEMBLY
SCALE 1 : 5

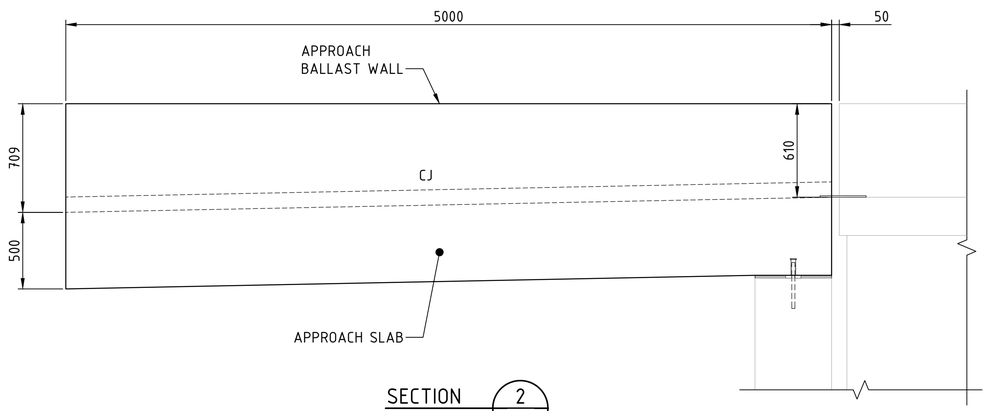
A SUITABLE ALTERNATIVE TYPE OF DOWEL CAP MAY BE USED
14 NO REQUIRED

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 600.

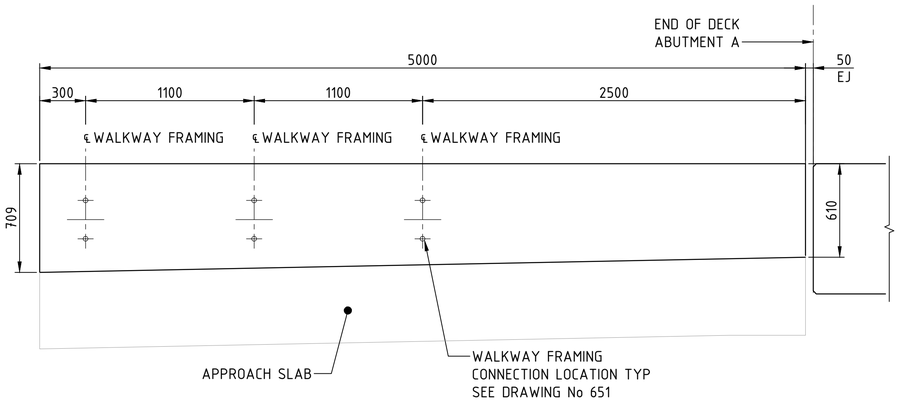


TYPICAL ELASTOMERIC BEARING STRIP
SCALE 1 : 10
2 No REQUIRED



SECTION 2/600
SCALE 1 : 20

SECTION 5/600 SIMILAR OPPOSITE HAND



APPROACH BALLAST WALL DETAIL AT ABUTMENT A SIDE
SCALE 1 : 20

AT ABUTMENT B SIDE SIMILAR OPPOSITE HANDED

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm
1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

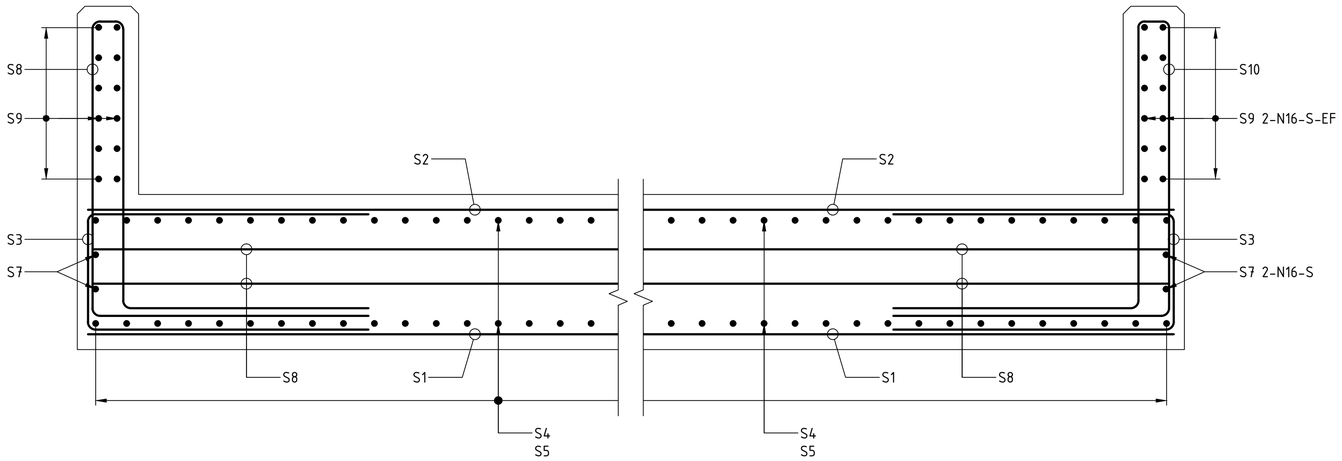
WHITEHAVEN COAL

BG&E STRUCTURAL

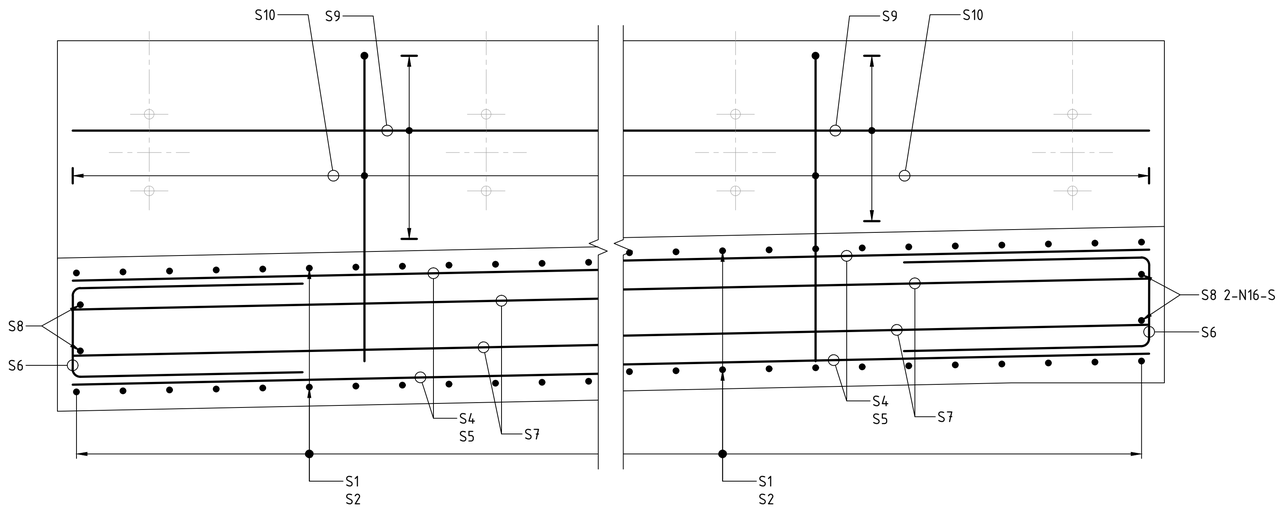
DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
APPROACH SLAB
SHEET B

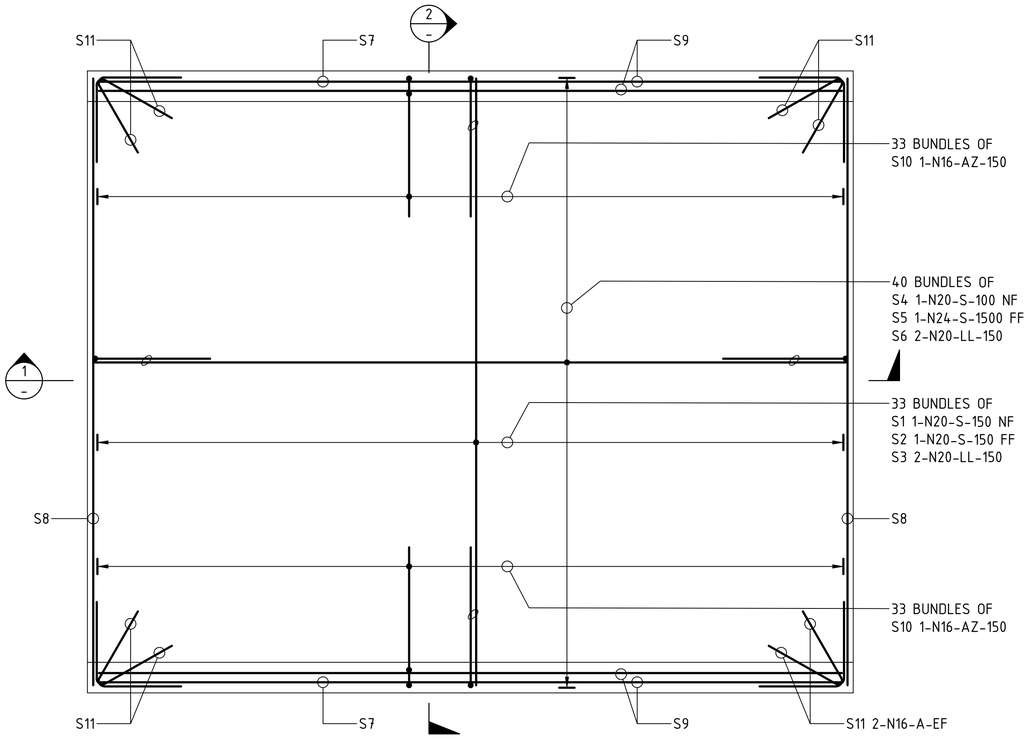
FILE No. BE22007-6670-DRG-BR-6601 | SHEET: 2 OF 2 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6601 | B | EDMS No. - | -



SECTION 2 / SCALE 1 : 10



SECTION 1 / SCALE 1 : 10



ABUTMENT B APPROACH SLAB PLAN
SCALE 1 : 20

GENERAL NOTES

CONCRETE EXPOSURE CLASSIFICATION: B1
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 40MPa
MINIMUM 28 DAY COMPRESSIVE STRENGTH OF MASS CONCRETE SHALL BE 20MPa
CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
EDGES SHALL BE CHAMFERED 20 x 20 AND RE-ENTRANT ANGLES FILLETED 20 x 20 UNLESS SPECIFIED OTHERWISE.
REINFORCEMENT SHALL BE GRADE D500N IN ACCORDANCE WITH AS/NZS 4671
REQUIRED COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE SHALL BE:
BASE OF APPROACH SLAB - 75mm
ALL OTHER SIDES - 45mm
REQUIRED COVER ARE BASED ON A MINIMUM OF 7 DAYS EFFECTIVE, CONTINUOUS AND UNINTERRUPTED WET CURING IN ACCORDANCE WITH AS 5100.5 AND TfNSW SPECIFICATION D&C B80. CURING COMPOUNDS SHALL NOT BE USED.
UNLESS OTHERWISE SPECIFIED, THE MINIMUM LENGTH OF LAPS SHALL BE

BAR SIZE	N12	N16	N20	N24	N28	N32	N36	N40
a) HORIZONTAL BARS WITH >300mm OF CONCRETE CAST BELOW THE BAR	450	650	950	1250	1600	1950	2350	2750
b) OTHER BARS:	350	500	750	950	1250	1500	1800	2150

CLEAR DISTANCE BETWEEN LAPPED BARS SHALL NOT EXCEED 3 x THE BAR DIAMETER
REINFORCEMENT MAY BE DISPLACED SLIGHTLY WHERE NECESSARY TO CLEAR STAINLESS STEEL DOWELS AND EXPANSION JOINT ANCHOR BOLTS.
TOP AND BOTTOM REINFORCEMENT MATS SHALL BE ALIGNED, TO FACILITATE FUTURE CORING/JACKING.
EF - DENOTES EACH FACE
FF - DENOTES FAR FACE
NF - DENOTES NEAR FACE
LV - DENOTES VARIABLE LENGTH BAR
* - DENOTES RL's GIVEN TO TOP OF APPROACH SLAB UPSTAND

SEALANT JOINTS

ALL SEALANTS SHALL BE IN ACCORDANCE WITH TfNSW SPECIFICATION D&C B312.
CELLULAR POLYSTYRENE SHEET SHALL BE CLASS H IN ACCORDANCE WITH AS1366.3
COLOUR CODED, SELF ADHESIVE PRESSURE SENSITIVE TAPES MADE FROM NON-STICKING MATERIAL SUCH AS TEFLON OR POLYETHYLENE OR NEOPRENE SHALL BE USED AS BOND BREAKERS.
BACKING RODS SHALL BE NON-ABSORBENT, CLOSED CELL POLYSTYRENE OR NEOPRENE (PARBURY'S EXPANDAFORM BACKER ROD OR APPROVED EQUIVALENT) INSTALLED WITH 25% COMPRESSION.
SEALANT SHALL BE APPLIED AS PER MATERIAL SPECIFICATION.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:20 @ A1 0 200 400 600 800 1000 mm
1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

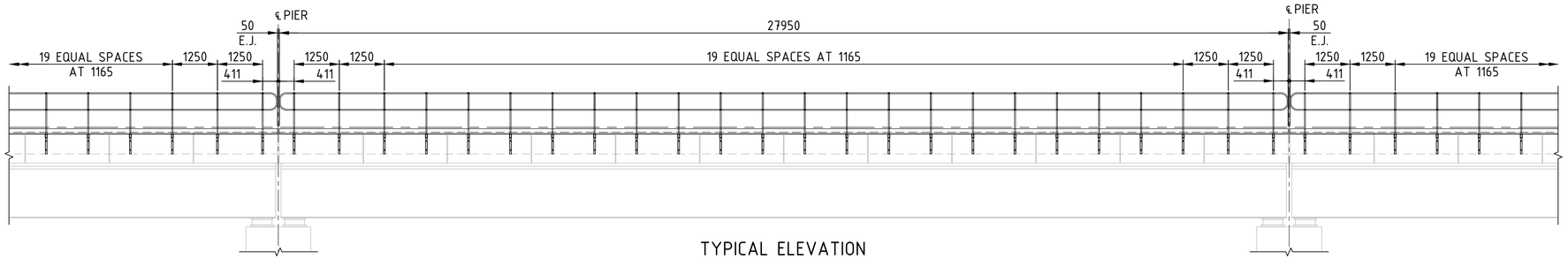
WHITEHAVEN COAL

BG&E STRUCTURAL

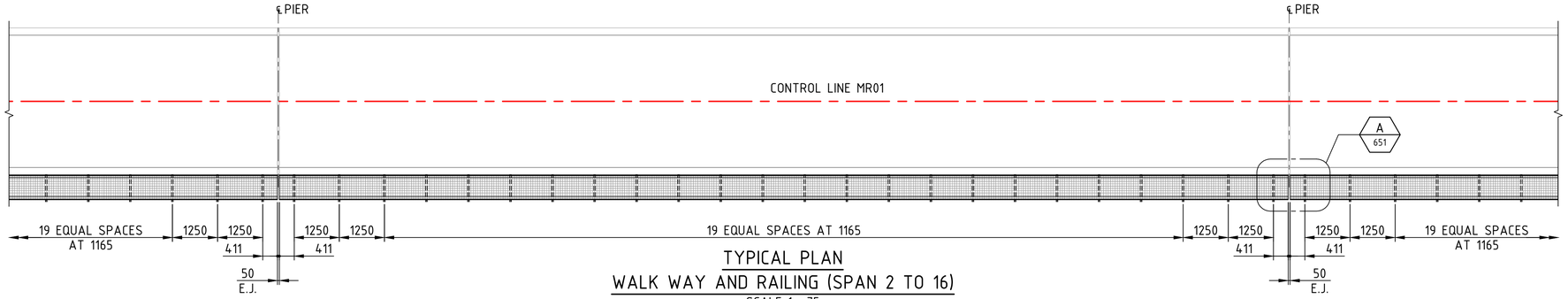
DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R. PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
APPROACH SLAB REINFORCEMENT

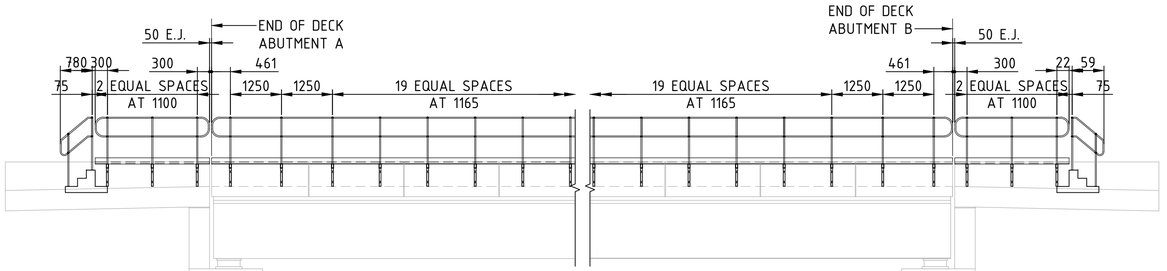
FILE No. BE22007-6670-DRG-BR-6610 | SHEET: 1 OF 1 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6610 | B | EDMS No. - | -



TYPICAL ELEVATION
WALK WAY AND RAILING (SPAN 2 TO 16)
SCALE 1 : 75

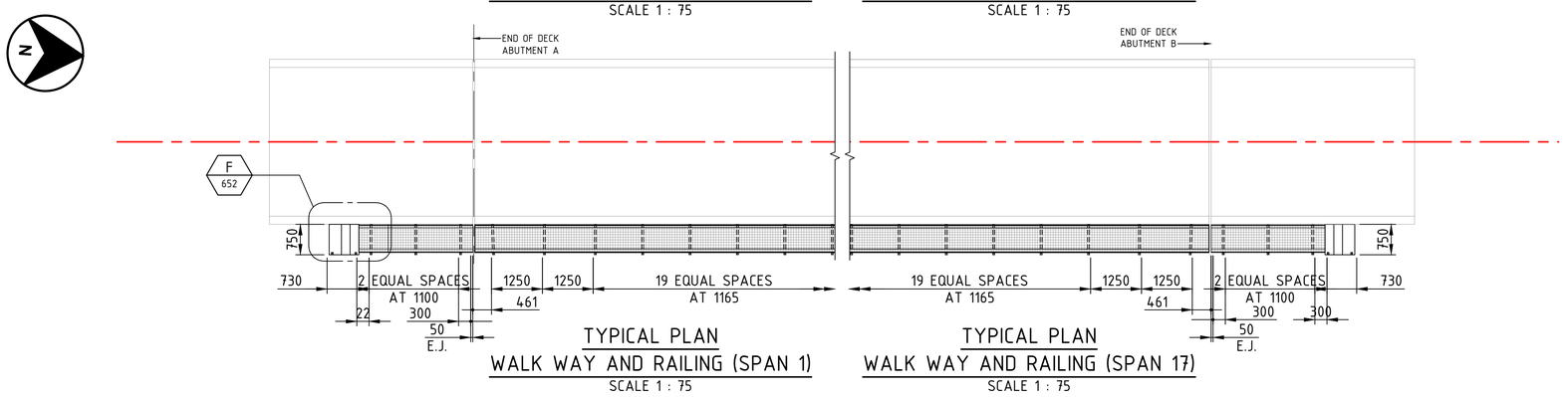


TYPICAL PLAN
WALK WAY AND RAILING (SPAN 2 TO 16)
SCALE 1 : 75



TYPICAL ELEVATION
WALK WAY AND RAILING (SPAN 1)
SCALE 1 : 75

TYPICAL ELEVATION
WALK WAY AND RAILING (SPAN 17)
SCALE 1 : 75



TYPICAL PLAN
WALK WAY AND RAILING (SPAN 1)
SCALE 1 : 75

TYPICAL PLAN
WALK WAY AND RAILING (SPAN 17)
SCALE 1 : 75

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

GENERAL NOTES

CONCRETE WORKS TO COMPLY WITH TfNSW SPECIFICATION D&C B80.
HOT ROLLED SECTIONS SHALL CONFORM TO AS/NZS 3679.1, GRADE 300.
STEEL PLATE SHALL CONFORM TO AS/NZS3678, GRADE 250.
HOLLOW SECTIONS SHALL CONFORM TO AS/NZS 1163, GRADE 300.
DIMENSIONS AND SHAPE FOR CUP HEAD BOLTS SHALL BE IN ACCORDANCE WITH AS/NZS 1390.
HIGH STRENGTH STEEL CUP HEAD BOLTS FOR STRUCTURAL ENGINEERING SHALL BE PROPERTY CLASS 8.8 WITH MECHANICAL PROPERTIES IN ACCORDANCE WITH AS/NZS 1252 AND SHALL BE MARKED DURING MANUFACTURE TO DESIGNATE THEM AS HIGH STRENGTH STEEL BOLTS.
HIGH STRENGTH STEEL NUTS SHALL BE PROPERTY CLASS 8 TO AS/NZS 1252.
BOLTING CATEGORY FOR HIGH STRENGTH STEEL BOLTS SHALL BE 8.8/S IN ACCORDANCE WITH AS 5100.6.
STEEL WASHERS SHALL BE CONFORM TO AS 1237.1, PRODUCT GRADE A.
OVERSIZED WASHERS SHALL BE USED TO FULLY COVER THE SLOTTED HOLES IN THE BASE PLATE.
ALL STEEL COMPONENTS TO SAFETY SCREENS SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH TfNSW D&C SPECIFICATION B220.
BOLTS, NUTS AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AS 1214.
ALL WELDING SHALL CONFORM TO AS/NZS 1554.1.
THE WELD CATEGORY SHALL BE SP IN ACCORDANCE WITH AS/NZS 1554.1.
WELDING SYMBOLS TO COMPLY WITH AS 1101.3.
EDGED TO BE PROTECTIVE TREATED SHALL BE ROUNDED TO A RADIUS OF 1.5mm UNLESS SPECIFIED OTHERWISE.

1:75 @ A1 0 0.75 1.5 2.25 3 3.75 m

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

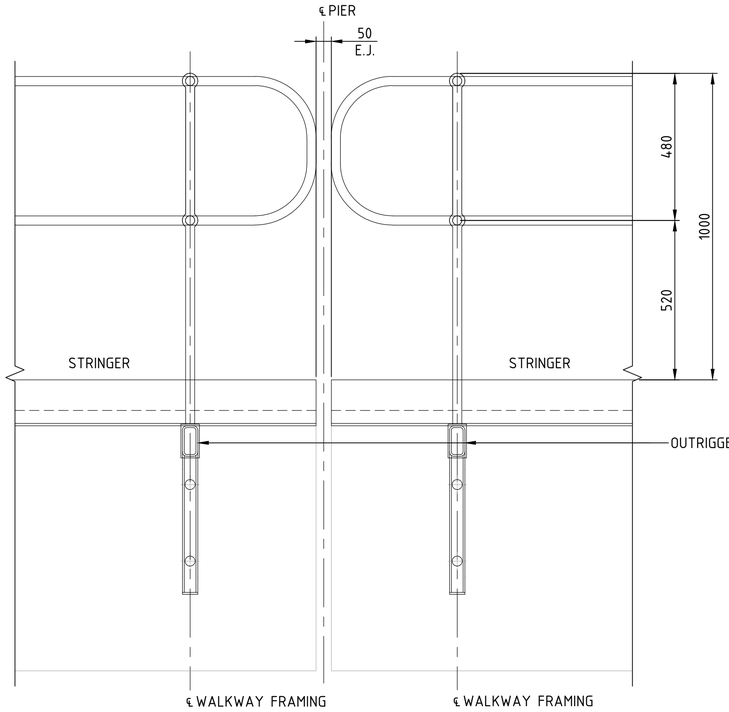
BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

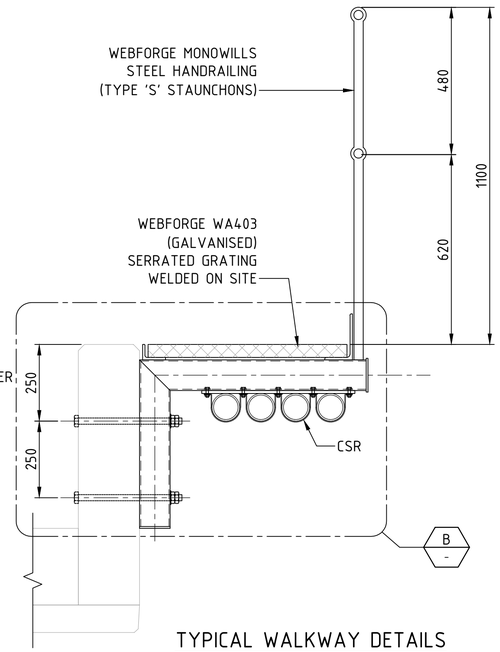
VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE
RAIL BRIDGE OVER STRATFORD CREEK
WALKWAY AND HANDRAIL DETAILS
SHEET A

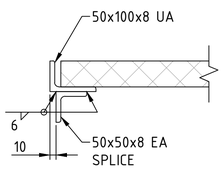
FILE No. BE22007-6670-DRG-BR-6650 | SHEET: 1 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6650 | B | EDMS No. - | -



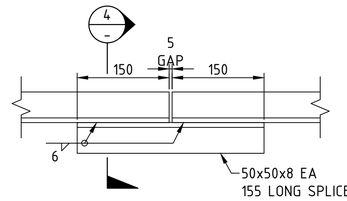
SECTION 1
SCALE 1 : 10



TYPICAL WALKWAY DETAILS
SCALE 1 : 10



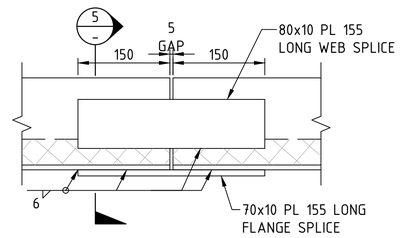
SECTION 4
SCALE 1 : 5



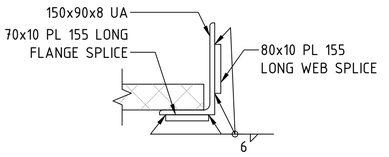
INNER STRINGER SPLICE DETAILS
SCALE 1 : 5

GENERAL NOTES

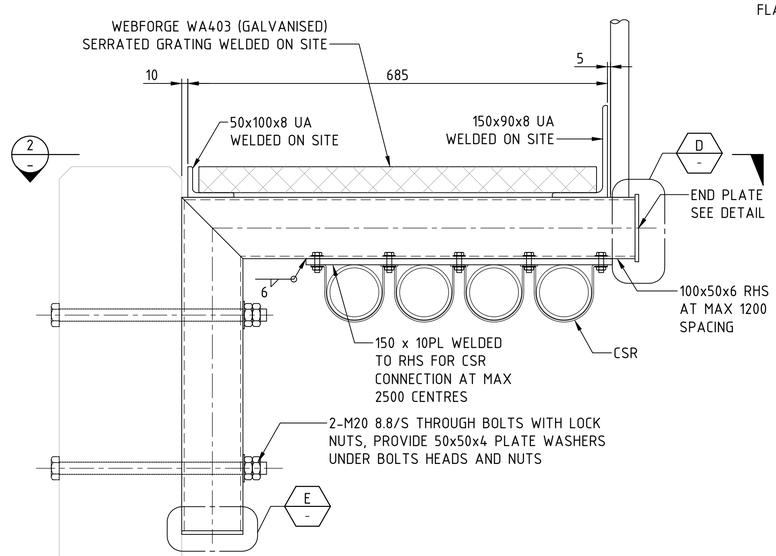
FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 650



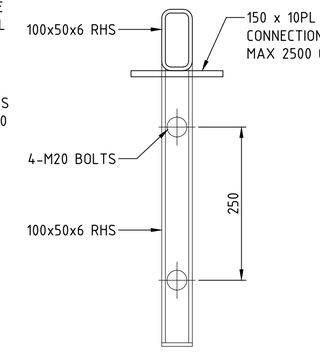
OUTER STRINGER SPLICE DETAILS
SCALE 1 : 5



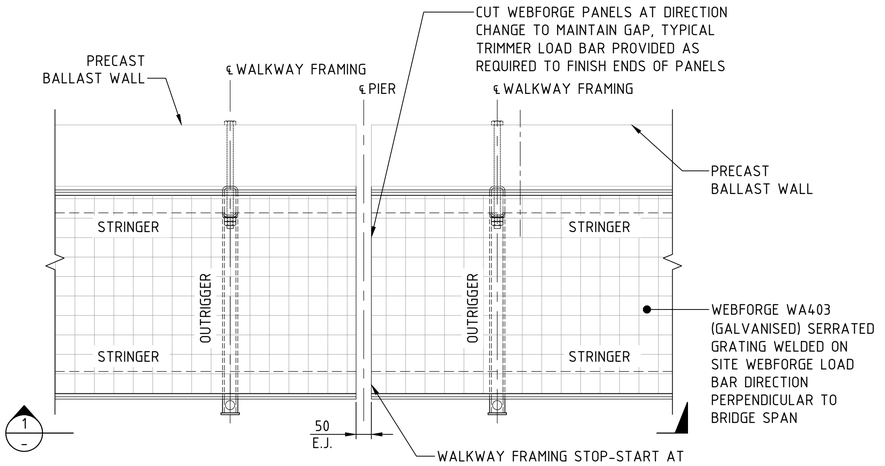
SECTION 5
SCALE 1 : 5



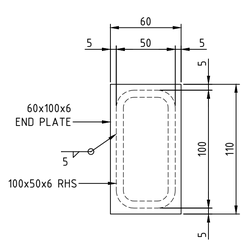
DETAIL B
SCALE 1 : 5



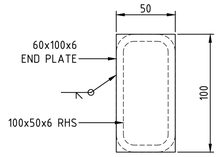
SECTION 3
SCALE 1 : 5



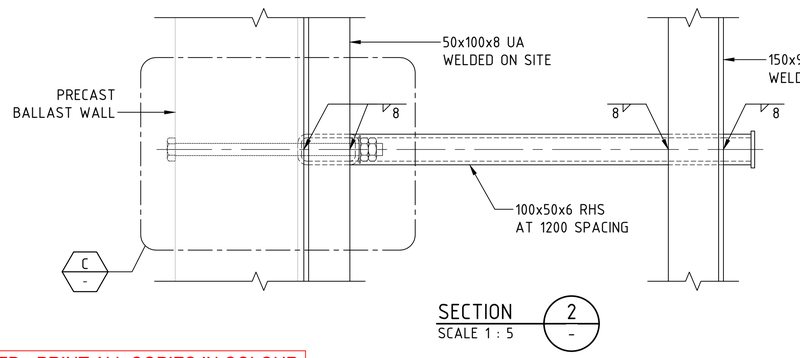
DETAIL A 6650
SCALE 1 : 10



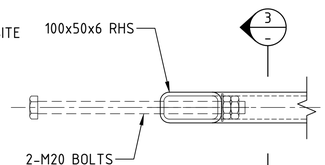
DETAIL D
SCALE 1 : 2



DETAIL E
SCALE 1 : 2



SECTION 2
SCALE 1 : 5



DETAIL C
SCALE 1 : 5

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm
1:5 @ A1 0 50 100 150 200 250 mm
1:2 @ A1 0 20 40 60 80 100 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

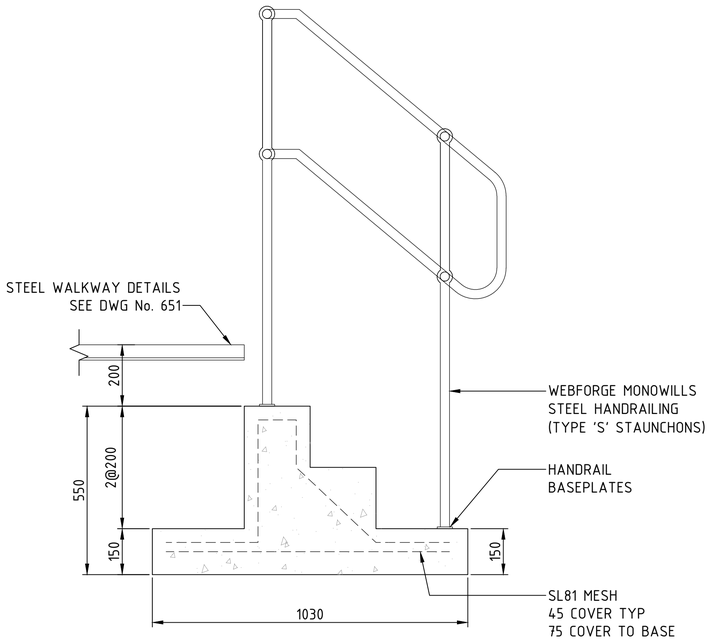
RAIL BRIDGE OVER STRATFORD CREEK WALKWAY AND HANDRAIL DETAILS

SHEET B

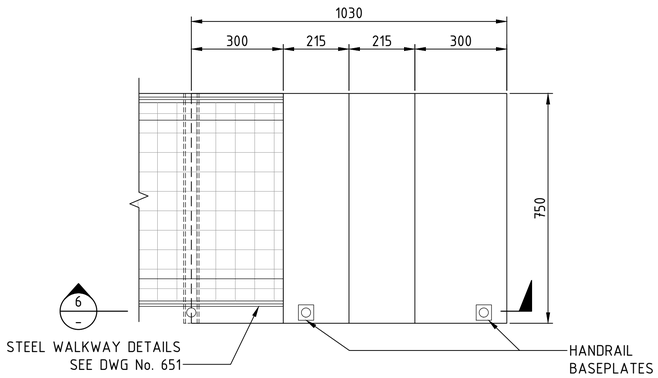
FILE No. BE22007-6670-DRG-BR-6651 | SHEET: 2 OF 3 | A1
STATUS: 100% DESIGN ©
DRG No. BE22007-6670-DRG-BR-6651 | B | EDMS No. - | -

GENERAL NOTES

FOR OTHER GENERAL NOTES AND LEGEND RELATED TO THIS SHEET, SEE SHEET No 650



SECTION 6 / - SCALE 1 : 10



DETAIL F / 6650 SCALE 1 : 10

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

1:10 @ A1 0 100 200 300 400 500 mm

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

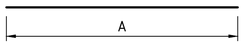
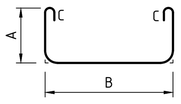
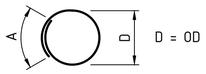
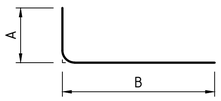
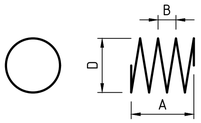
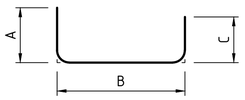
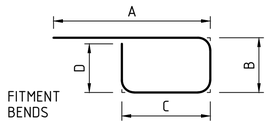
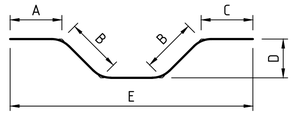
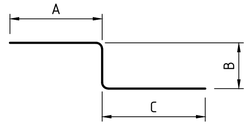
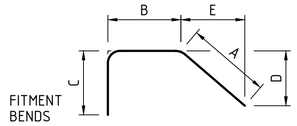
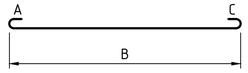
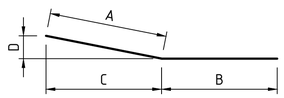
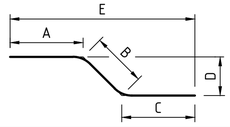
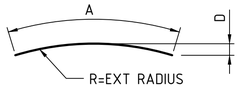
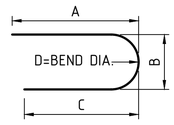
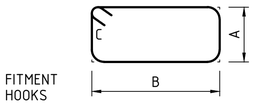
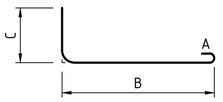
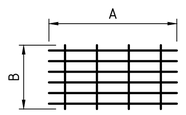
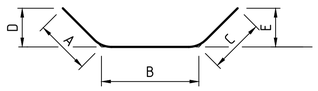
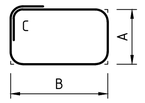
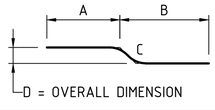
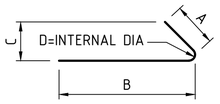
RAIL BRIDGE OVER STRATFORD CREEK WALKWAY AND HANDRAIL DETAILS

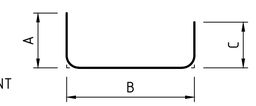
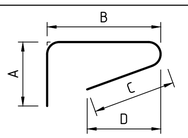
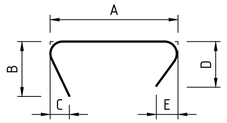
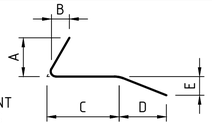
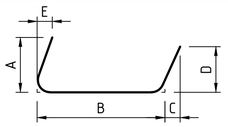
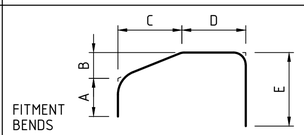
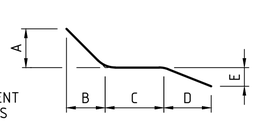
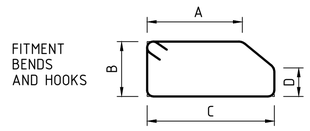
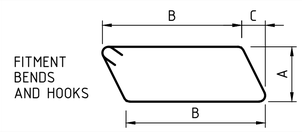
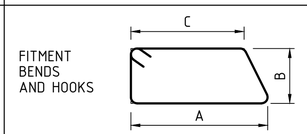
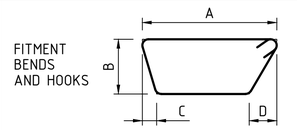
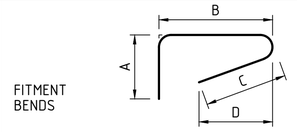
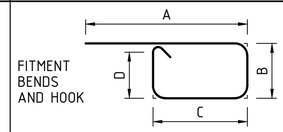
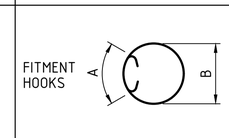
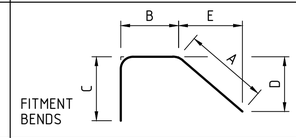
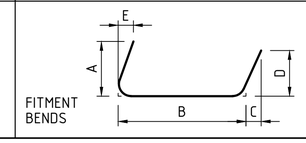
SHEET C

FILE No. BE22007-6670-DRG-BR-6652 | SHEET: 3 OF 3 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6652 | B | EDMS No. - | -

SHAPE CODE	AUSTRALIAN STANDARD SHAPE
S	
SH	
CT	
L	
SP	
LL	
XT	
JJ	
RC	
VL	
HH	
V	
J	
R	
U	
HT	
LH	
F	 'A' IS IN THE DIRECTION OF THE MAIN BARS
VV	
HT	
T	
CC	
A	

SHAPE CODE	TRANSPORT FOR NEW SOUTH WALES STANDARD SHAPE
LF	
LA	
AA	
KL	
AV	
LG	
KH	
GT	
TT	
PT	
QT	
KF	
XH	
ST	
VF	
AF	

BAR MARKING LEGEND

THE METHOD USED TO DESCRIBE REINFORCEMENT ON THE DRAWINGS IS AS FOLLOWS:

A1 10-N16-S-300EF

- A1 — STRUCTURE ELEMENT DENOTATION
- 10 — BAR NUMBER IN SEQUENCE
- N — NUMBER OF BARS IN THE SET
- 16 — BAR STRUCTURAL PROPERTIES
- S — BAR SIZE IN MILLIMETRES
- 300 — BAR SHAPE CODE
- E — SPACE ALONG LIMIT LINE
- F — INFORMATION FOR PLACING

WHERE THE BAR SPACING IS APPROXIMATE ONLY, THE FOLLOWING FORMAT SHALL BE USED:

PB1 10-N12-S-300EF APPROX

GENERAL NOTES

STRUCTURE ELEMENT DENOTATION:

A – FOR ABUTMENT A
B – FOR ABUTMENT B
G – FOR PSC GIRDERS
D – FOR DECK
S – FOR APPROACH SLABS
PB – FOR PRECAST BARRIERS

INFORMATION FOR PLACING:

NF – NEAR FACE
FF – FAR FACE
EF – EACH FACE
LV – LENGTH VARIES

REINFORCEMENT NOTES

1. AUSTRALIAN STANDARD BAR SHAPES ARE IN ACCORDANCE WITH AS 1100.501.
2. BAR SIZE IS THE NOMINAL DIAMETER IN MILLIMETRES, OR THE AS/NZS 4671 FABRIC NUMBER.
3. THE GRADE OF REINFORCEMENT, IF NOT STATES ON THE DRAWINGS, SHALL BE D500N TO AS/NZS 4671.
4. DIMENSIONS SHOWN ON BAR SHAPES DIAGRAMS ARE MEASURED FROM THE OUTSIDE FACES OF THE BARS AND ARE IN MILLIMETRES.
5. THE INCLUDED ANGLE OF ANY BEND SHALL BE A RIGHT ANGLE IF NO DIMENSIONS SHOWN.
6. BAR OF DIAMETER GREATER THAN 24mm SHALL NOT BE REBENT.
7. BAR BENDING AND HOOK DETAILS SHALL BE IN ACCORDANCE WITH SECTION 5, 13 OF AS 5100-BRIDGE DESIGN.

DRAWING COLOUR CODED - PRINT ALL COPIES IN COLOUR

AMD	DESCRIPTION	DESIGNER SIGN./DATE	VERIFIED SIGN./DATE	APPROVED SIGN./DATE
B	ISSUED FOR 100% DESIGN	K.U 21.07.23	R.P 21.07.23	
A	ISSUED FOR 85% DESIGN	K.U 19.05.23	R.P 19.05.23	-

CO-ORDINATE SYSTEM: GDA/94 ZONE 56 | HEIGHT DATUM: AHD | SCALE: AS SHOWN

WHITEHAVEN COAL

BG&E STRUCTURAL

DRAWN M.CHAVAN 21/07/2023
DESIGNED K.UNDHEIM 21/07/2023
DRG CHECK R.SAFARIAN 21/07/2023
DESIGN CHECK R.PAN 21/07/2023
APPROVED - -

VICKERY EXTENSION PROJECT

RAIL INFRASTRUCTURE

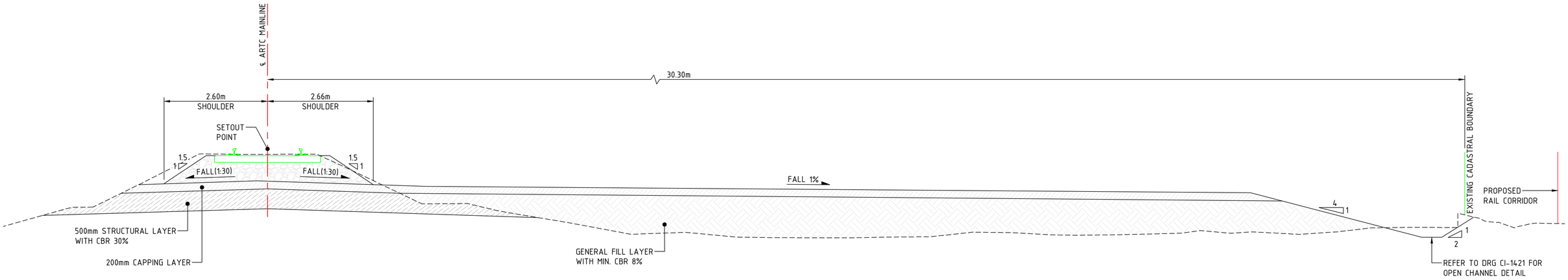
RAIL BRIDGE OVER STRATFORD CREEK

BAR SHAPES DIAGRAM

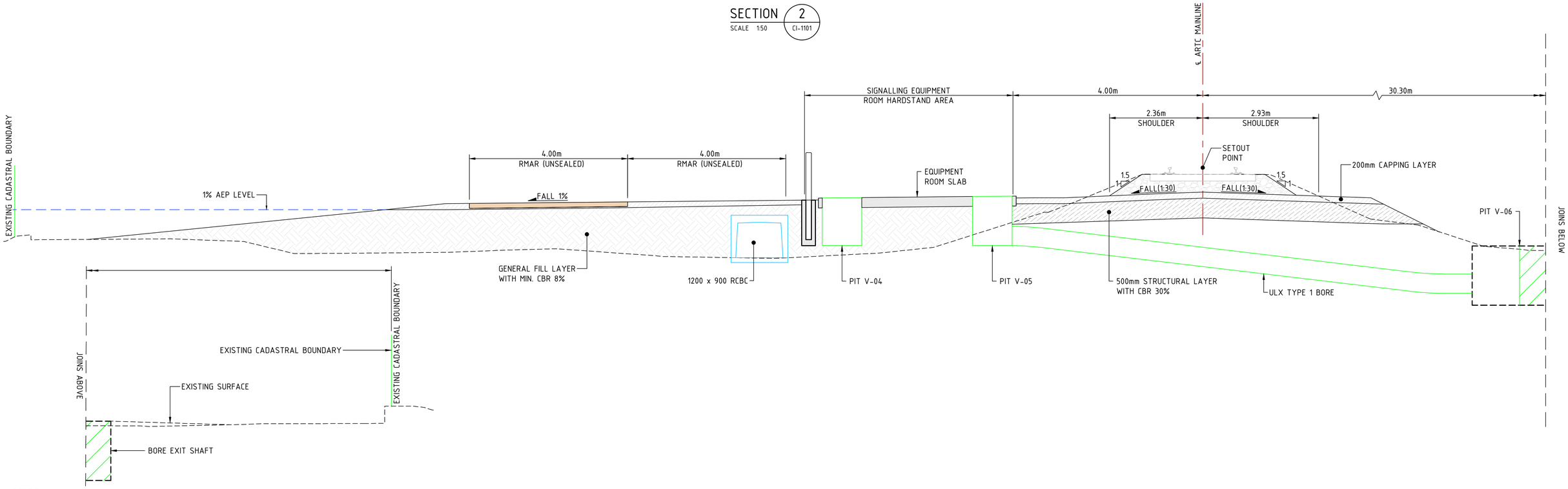
FILE No. BE22007-6670-DRG-BR-6700 | SHEET: 1 OF 1 | A1

STATUS: 100% DESIGN ©

DRG No. BE22007-6670-DRG-BR-6700 | B | EDMS No. - | -



SECTION 2
SCALE 1:50
CI-1101



SECTION 1
SCALE 1:50
CI-1101

NOTES

1. MIN. SUBGRADE STRENGTH Su = 100kPa (VSt OR BETTER).
   TYPE A GROUND TREATMENT WHERE Su < 100kPa
2. REFER TO DRG CI-1007 FOR TRACK STRUCTURAL DETAILS
3. REFER TO DRG CI-1201 TO CI-1204 AND CI-1251 FOR
   GROUND IMPROVEMENT DETAILS
4. REFER TO DRG CI-1811 FOR BALLAST KERB HEIGHT

0 0.5 1.0 1.5 2.0 2.5 3.0m
SCALE 1:50 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

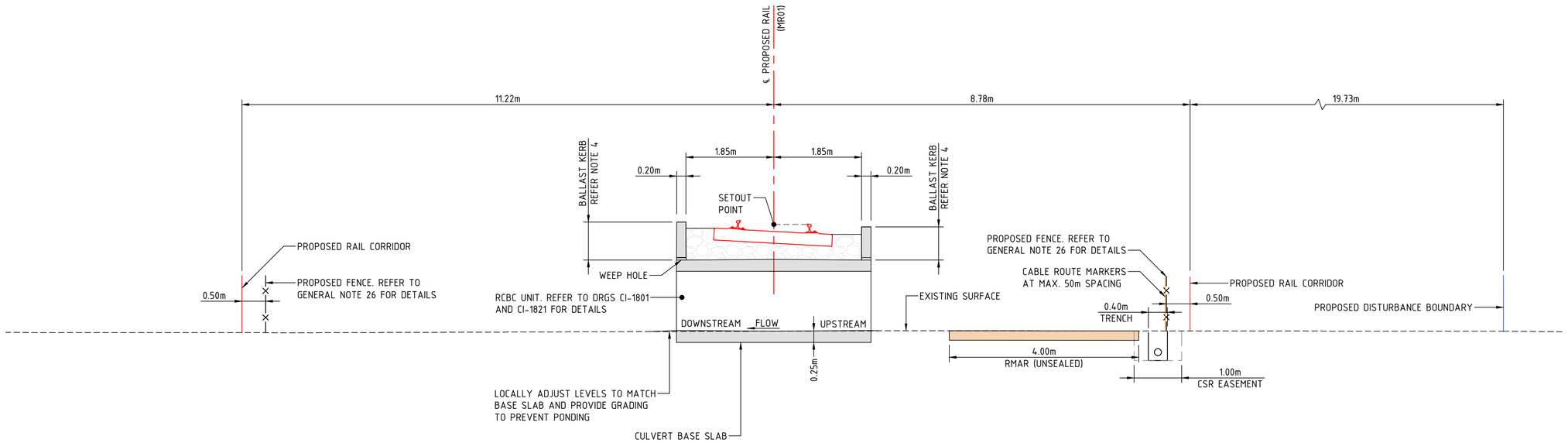
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

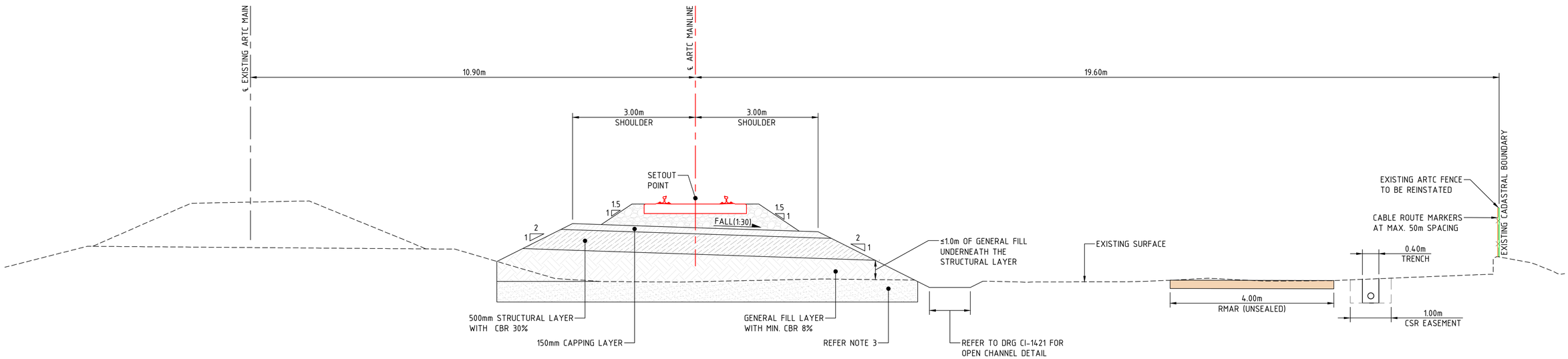
TITLE: DETAILED SECTIONS
SHEET 1

PROJECT No. BE22007-6610 | DRAWING No. CI-1151 | REV. B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1151 - CI-1157.DWG
26/07/2023 4:25:44 PM



SECTION 4
SCALE 1:50
CI-1102



SECTION 3
SCALE 1:50
CI-1101

NOTES

1. MIN. SUBGRADE STRENGTH Su = 100kPa (VSt OR BETTER). TYPE A GROUND TREATMENT WHERE Su < 100kPa
2. REFER TO DRG CI-1007 FOR TRACK STRUCTURAL DETAILS
3. REFER TO DRG CI-1201 TO CI-1204 AND CI-1251 FOR GROUND IMPROVEMENT DETAILS
4. REFER TO DRG CI-1811 FOR BALLAST KERB HEIGHT

0 0.5 1.0 1.5 2.0 2.5 3.0m
SCALE 1:50 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				
		REVISIONS				REVISIONS	

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

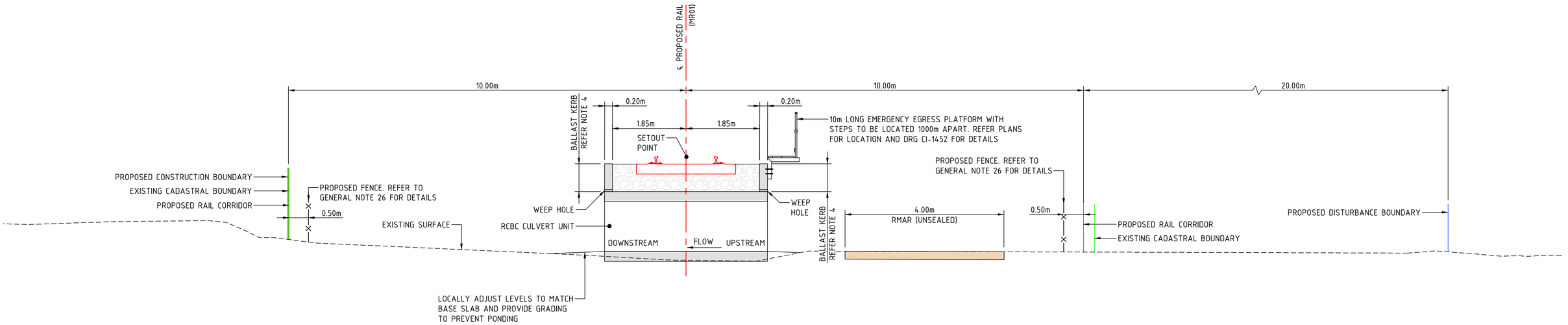
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

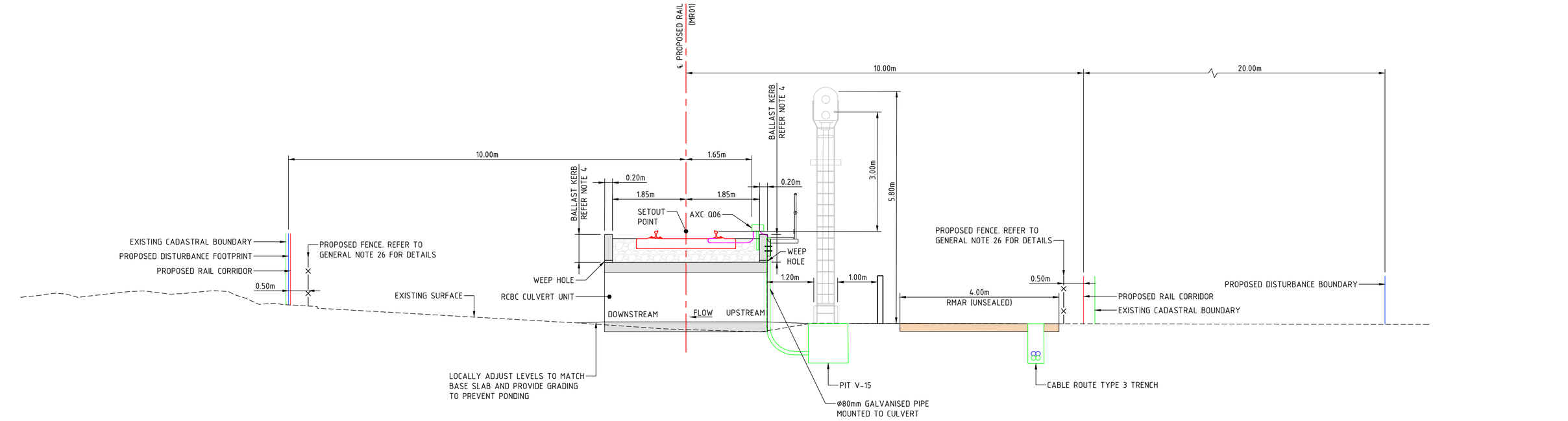
TITLE: DETAILED SECTIONS SHEET 2

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1152	B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B201751 VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1151 - CI-1157.DWG
26/07/2023 4:25:42 PM



SECTION 6
SCALE 1:50
CI-1104



SECTION 5
SCALE 1:50
CI-1102

NOTES

1. MIN. SUBGRADE STRENGTH Su = 100kPa (VSt OR BETTER). TYPE A GROUND TREATMENT WHERE Su < 100kPa
2. REFER TO DRG CI-1007 FOR TRACK STRUCTURAL DETAILS
3. REFER TO DRG CI-1201 TO CI-1204 AND CI-1251 FOR GROUND IMPROVEMENT DETAILS
4. REFER TO DRG CI-1811 FOR BALLAST KERB HEIGHT

0 0.5 1.0 1.5 2.0 2.5 3.0m
SCALE 1:50 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				
REVISIONS				REVISIONS			

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

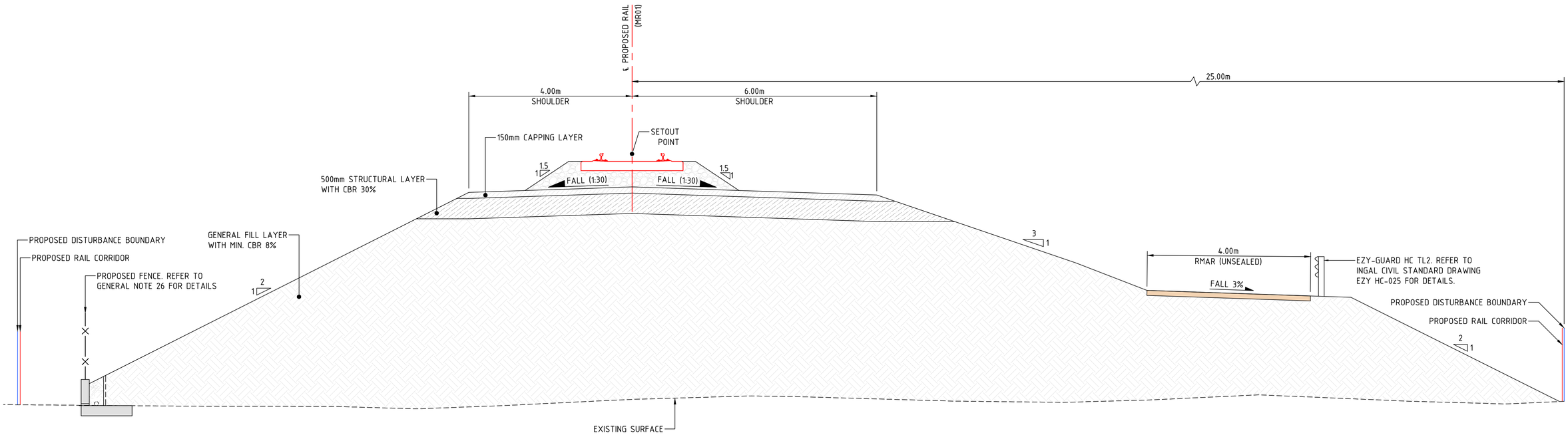
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

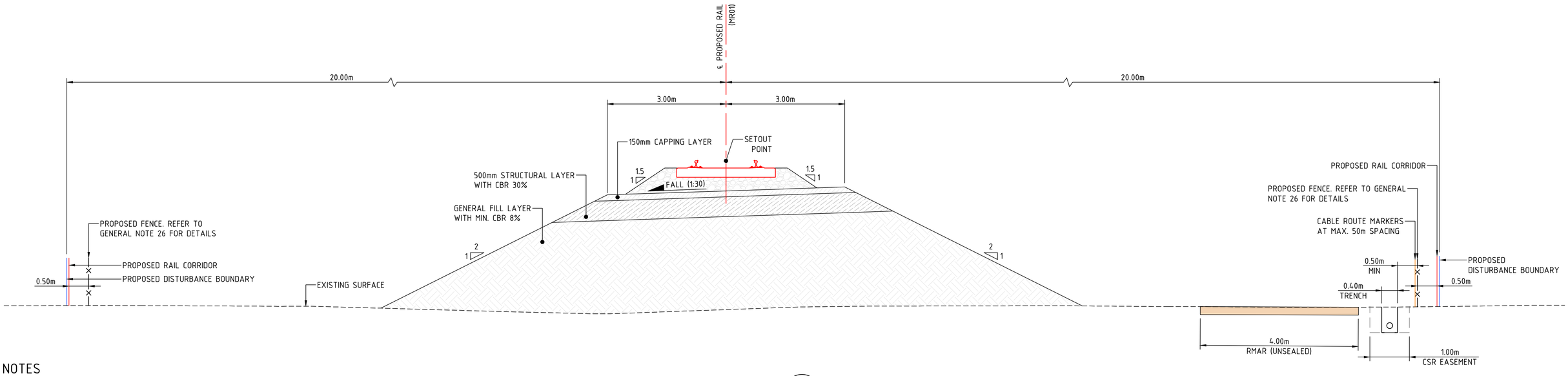
TITLE: DETAILED SECTIONS SHEET 3

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1153	B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1151 - CI-1157.DWG
26/07/2023 4:25:46 PM



SECTION 8
SCALE 1:50 CI-1123



SECTION 7
SCALE 1:50 CI-1121

NOTES

1. MIN. SUBGRADE STRENGTH Su = 100kPa (VSt OR BETTER). TYPE A GROUND TREATMENT WHERE Su < 100kPa
2. REFER TO DRG CI-1007 FOR TRACK STRUCTURAL DETAILS
3. REFER TO DRG CI-1201 TO CI-1204 AND CI-1251 FOR GROUND IMPROVEMENT DETAILS
4. REFER TO DRG CI-1811 FOR BALLAST KERB HEIGHT

0 0.5 1.0 1.5 2.0 2.5 3.0m
SCALE 1:50 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

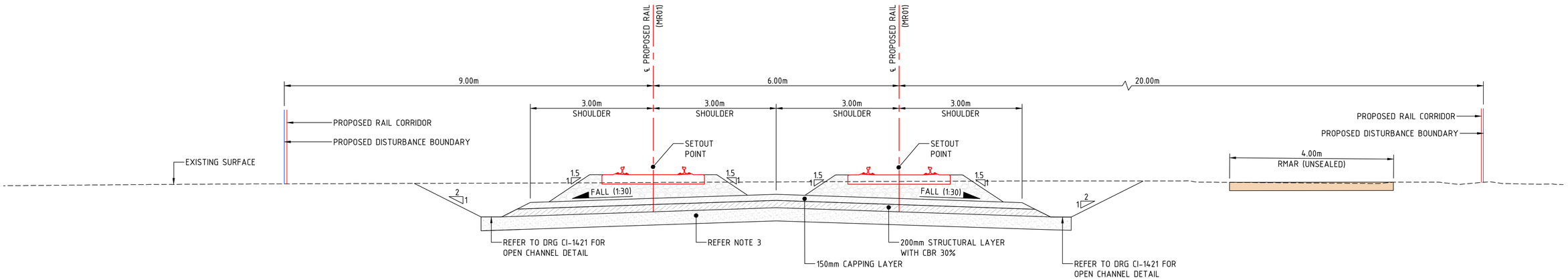
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

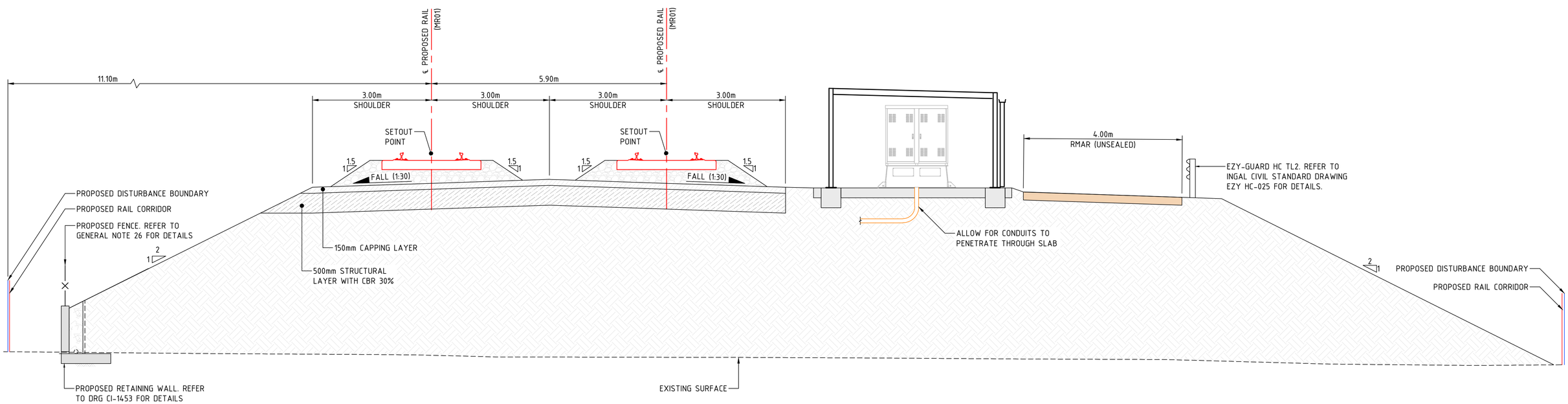
TITLE: DETAILED SECTIONS SHEET 4

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1154	B

C:\12DS\DATA\AUR2DSYN01\BE22007 IB201751 VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1151 - CI-1157.DWG
26/07/2023 4:25:39 PM



SECTION 10
SCALE 1:50 CI-1123



SECTION 9
SCALE 1:50 CI-1123

NOTES

1. MIN. SUBGRADE STRENGTH Su = 100kPa (VSt OR BETTER). TYPE A GROUND TREATMENT WHERE Su < 100kPa
2. REFER TO DRG CI-1007 FOR TRACK STRUCTURAL DETAILS
3. REFER TO DRG CI-1201 TO CI-1204 AND CI-1251 FOR GROUND IMPROVEMENT DETAILS
4. REFER TO DRG CI-1811 FOR BALLAST KERB HEIGHT

0 0.5 1.0 1.5 2.0 2.5 3.0m
SCALE 1:50 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				
REVISIONS				REVISIONS			

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

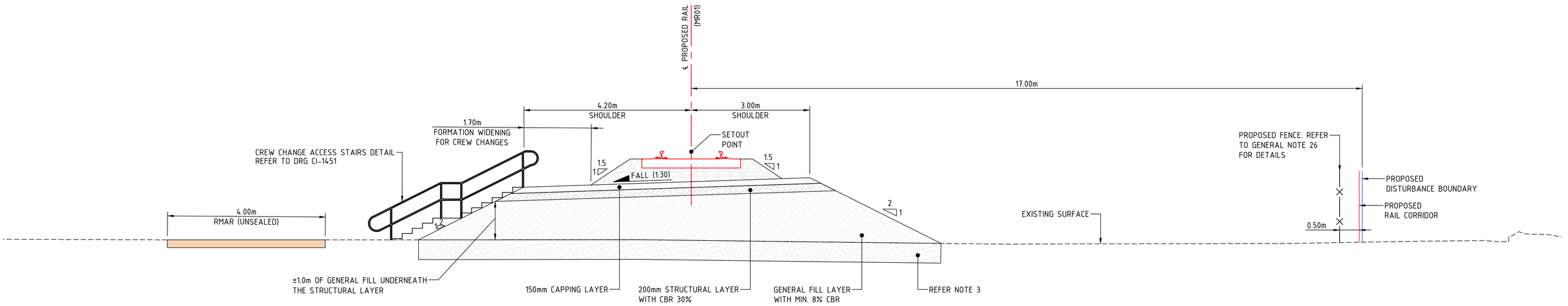
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

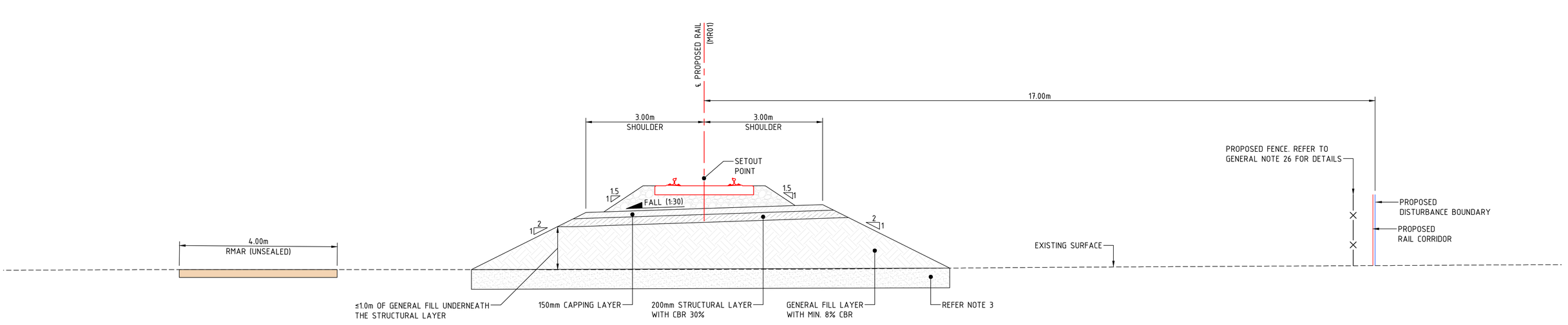
TITLE: DETAILED SECTIONS SHEET 5

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1155	B

C:\12DS\DATA\AURIZDSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1151 - CI-1157.DWG
26/07/2023 4:25:41 PM



SECTION 12
SCALE 1:50 CI-1125



SECTION 11
SCALE 1:50 CI-1125

NOTES

1. MIN. SUBGRADE STRENGTH Su = 100kPa (VSt OR BETTER). TYPE A GROUND TREATMENT WHERE Su < 100kPa
2. REFER TO DRG CI-1007 FOR TRACK STRUCTURAL DETAILS
3. REFER TO DRG CI-1201 TO CI-1204 AND CI-1251 FOR GROUND IMPROVEMENT DETAILS
4. REFER TO DRG CI-1811 FOR BALLAST KERB HEIGHT

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				
REVISIONS				REVISIONS			

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

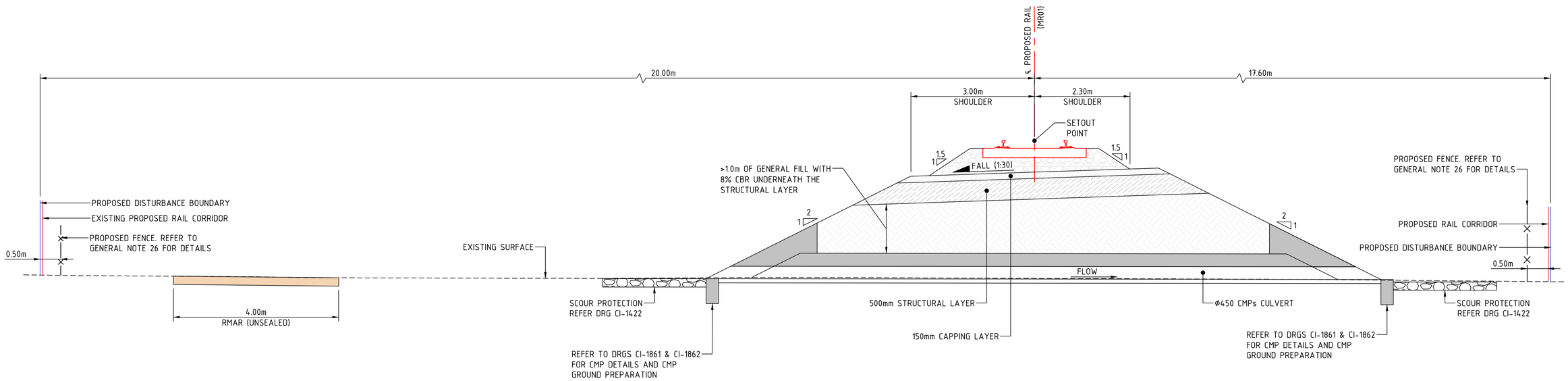
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

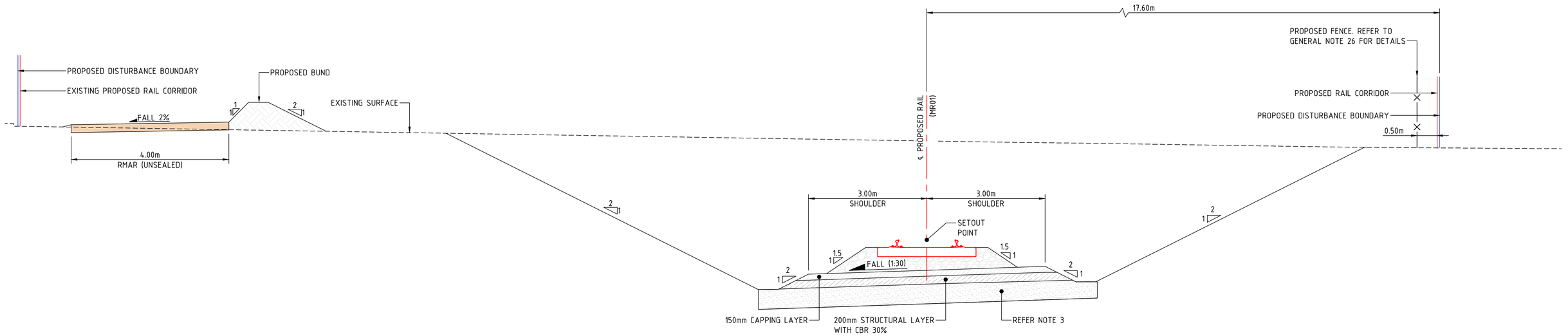
TITLE: DETAILED SECTIONS SHEET 6

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1156	B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B201751 VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1151 - CI-1157.DWG
26/07/2023 4:25:42 PM



SECTION 14
SCALE 1:50
CI-1130



SECTION 13
SCALE 1:50
CI-1127

NOTES

1. MIN. SUBGRADE STRENGTH Su = 100kPa (VSt OR BETTER). TYPE A GROUND TREATMENT WHERE Su < 100kPa
2. REFER TO DRG CI-1007 FOR TRACK STRUCTURAL DETAILS
3. REFER TO DRG CI-1201 TO CI-1204 AND CI-1251 FOR GROUND IMPROVEMENT DETAILS
4. REFER TO DRG CI-1811 FOR BALLAST KERB HEIGHT

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS | REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

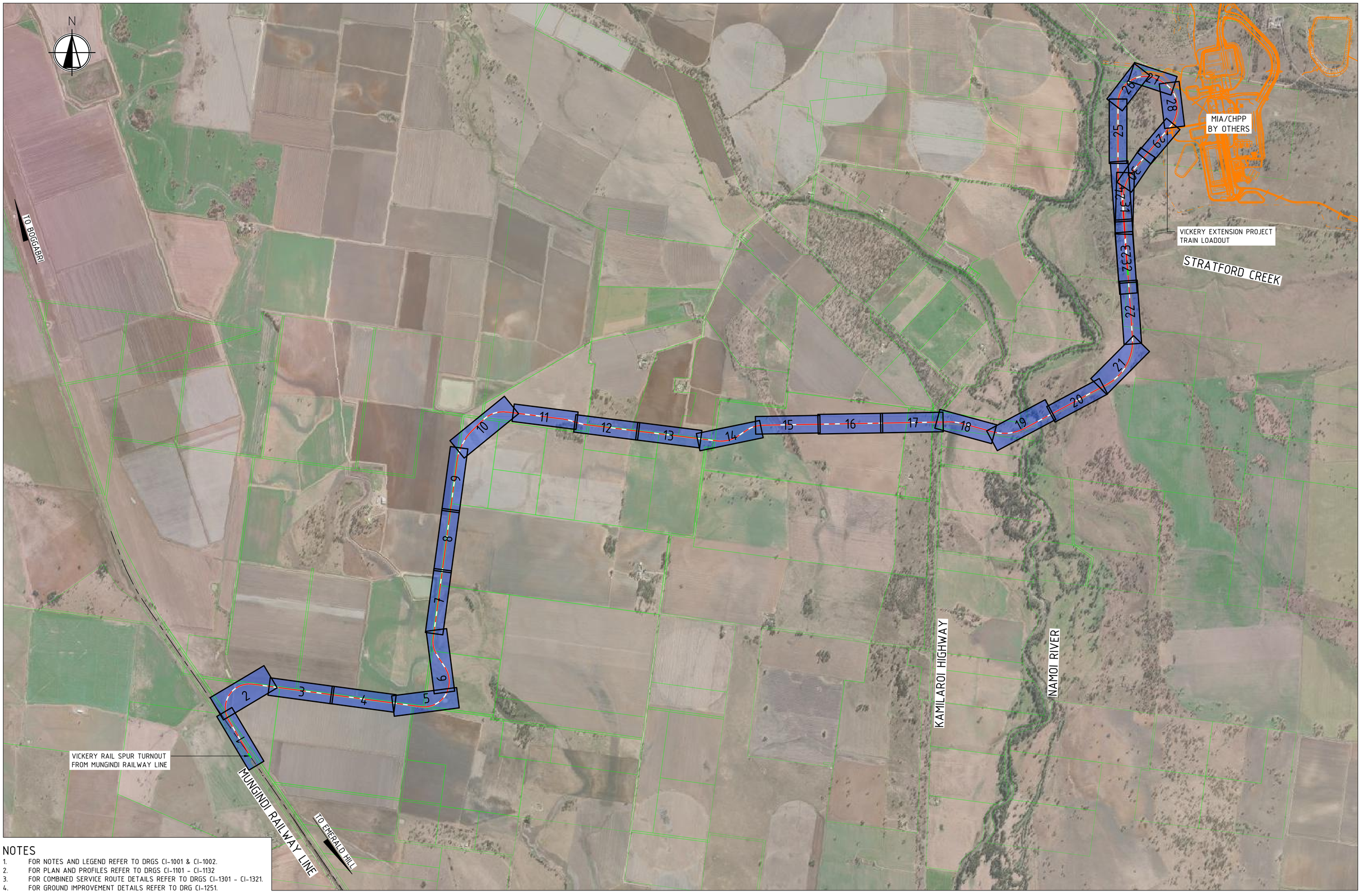
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: DETAILED SECTIONS SHEET 7

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1157	B

C:\12DS\DATA\AURORDSYN01\BE22007 IB201751 VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1151 - CI-1157.DWG
26/07/2023 4:25:45 PM



NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR PLAN AND PROFILES REFER TO DRGS CI-1101 - CI-1132
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1321.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

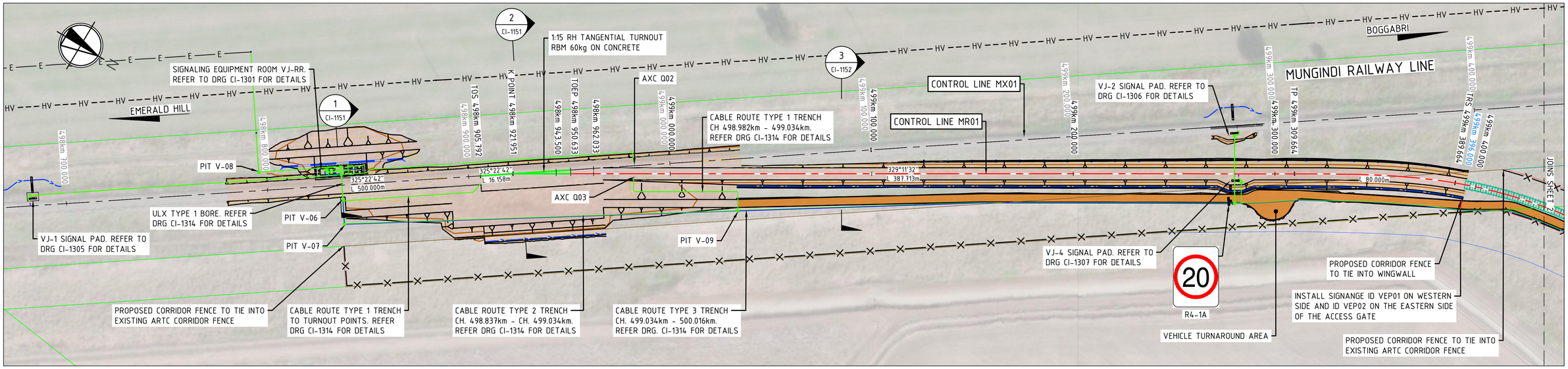
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	NTS	AT A1 SIZE

TITLE: PLAN AND PROFILE
SHEET LAYOUT

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1100	B

C:\12DS\DATA\AURZDSYN01\BE22007 (B2017S) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1100.DWG
28/07/2023 2:20:22 PM

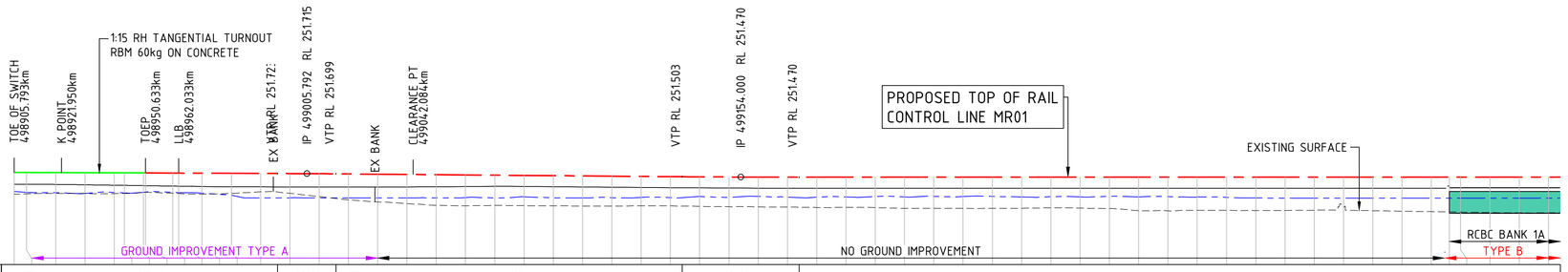


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — — (red)	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - -	EXISTING SURFACE
— · — · (blue)	1% AEP FLOOD LEVEL



DATUM 245.5

GRADES: -0.0754% 90.0000m | V.C.20.00m R22194.8625 | -0.1655% 118.2076m | V.C.40.00m R24167.5661

HORIZONTAL CURVES: 80m

CULVERT BASE SLAB LEVEL															
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.805	0.805	0.805	0.823	0.845	0.853	0.867	0.869	0.889	0.894	0.911	0.926	0.921	0.915	0.905
PROPOSED RAIL LEVELS	251.791	251.788	251.780	251.772	251.765	251.762	251.757	251.757	251.750	251.748	251.742	251.735	251.727	251.719	251.708
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.986	250.982	250.975	250.950	250.920	250.910	250.890	250.888	250.861	250.854	250.831	250.809	250.807	250.804	250.802
NATURAL SURFACE LEVELS	250.320	250.327	250.356	250.352	250.351	250.359	250.429	250.438	250.370	250.353	250.317	250.360	250.467	250.363	250.145
CHAINAGE	498905.792	498910	498920	498930	498940	498943.5	498950	498950.633	498960	498962.033	498970	498980	498990	499000	499010

CULVERT BASE SLAB LEVEL															
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.892	0.878	0.856	0.827	0.798	0.769	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	251.692	251.675	251.659	251.642	251.626	251.609	251.592	251.576	251.559	251.543	251.526	251.510	251.494	251.482	251.474
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.800	250.798	250.803	250.815	250.827	250.840	250.837	250.821	250.804	250.788	250.771	250.755	250.739	250.727	250.719
NATURAL SURFACE LEVELS	249.925	249.774	249.669	249.546	249.515	249.539	249.519	249.506	249.498	249.498	249.508	249.503	249.479	249.451	249.440
CHAINAGE	499020	499030	499040	499050	499060	499070	499080	499090	499100	499110	499120	499130	499140	499150	499160

CULVERT BASE SLAB LEVEL															
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715
NATURAL SURFACE LEVELS	249.426	249.396	249.406	249.389	249.343	249.338	249.339	249.338	249.348	249.375	249.356	249.325	249.177	249.169	249.209
CHAINAGE	499170	499180	499190	499200	499210	499220	499230	499240	499250	499260	499270	499280	499290	499300	499310

CULVERT BASE SLAB LEVEL									249.000	249.000	249.000	249.000	249.000
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.730	0.730	0.730	0.730	0.730
PROPOSED RAIL LEVELS	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.715	250.740	250.740	250.740	250.740	250.740
NATURAL SURFACE LEVELS	249.204	249.185	249.194	249.213	249.461	249.178	249.143	249.115	249.097	249.084	249.053	249.035	249.033
CHAINAGE	499320	499330	499340	499350	499360	499370	499380	499390	499396.115	499400	499410	499420	499430

PROPOSED RAIL PROFILE (MR01)

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

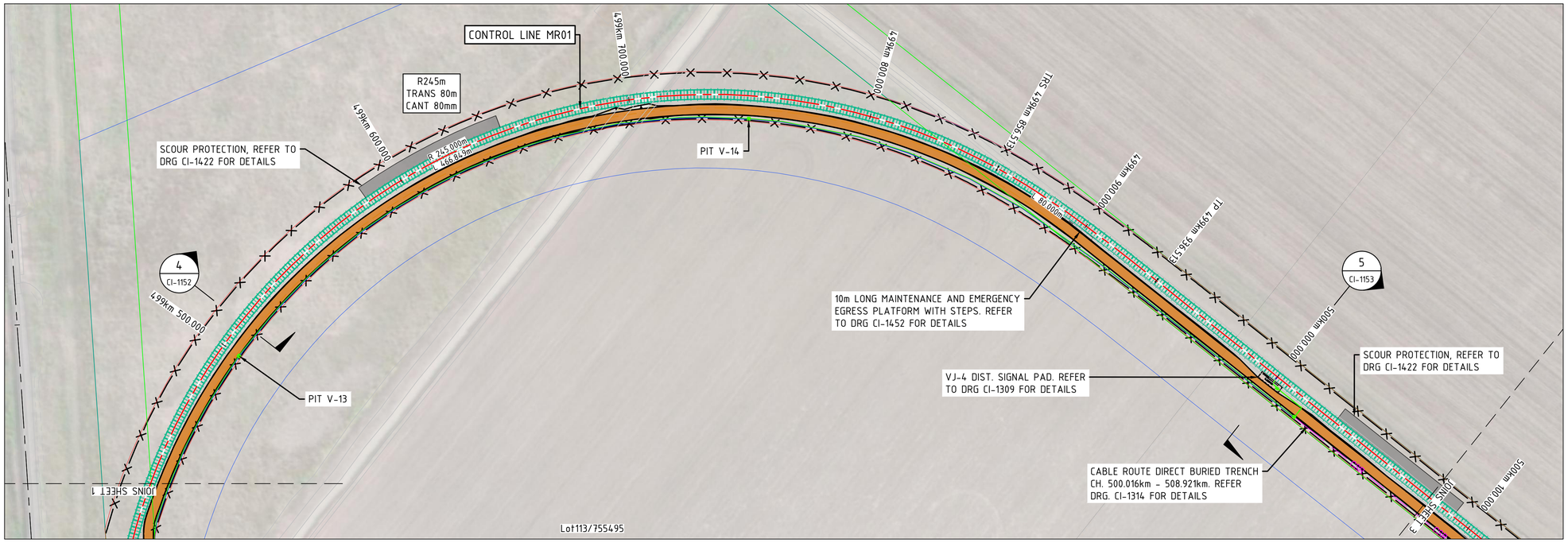
DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 1

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1101	B

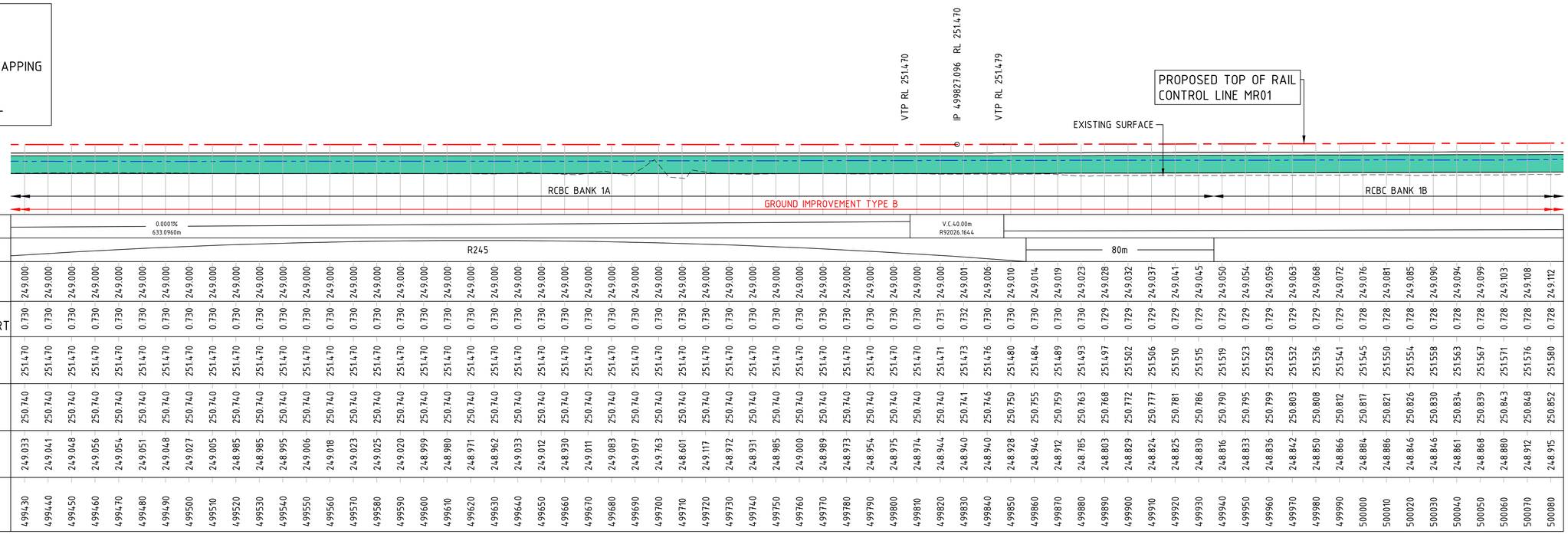
26/07/2023 4:22:54 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:22:54 PM



PLAN

SCALE 1:1000



DATUM 245.5

GRADES	0.0001% 633.0960m; V.C.40.00m R92026.1644
HORIZONTAL CURVES	R245; 80m

CHAINAGE	CULVERT BASE SLAB LEVEL	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
499430	249.000	0.730	251.470	250.740	249.033
499440	249.000	0.730	251.470	250.740	249.041
499450	249.000	0.730	251.470	250.740	249.048
499460	249.000	0.730	251.470	250.740	249.056
499470	249.000	0.730	251.470	250.740	249.054
499480	249.000	0.730	251.470	250.740	249.051
499490	249.000	0.730	251.470	250.740	249.048
499500	249.000	0.730	251.470	250.740	249.027
499510	249.000	0.730	251.470	250.740	249.005
499520	249.000	0.730	251.470	250.740	248.985
499530	249.000	0.730	251.470	250.740	248.985
499540	249.000	0.730	251.470	250.740	248.995
499550	249.000	0.730	251.470	250.740	249.006
499560	249.000	0.730	251.470	250.740	249.018
499570	249.000	0.730	251.470	250.740	249.023
499580	249.000	0.730	251.470	250.740	249.025
499590	249.000	0.730	251.470	250.740	249.020
499600	249.000	0.730	251.470	250.740	248.999
499610	249.000	0.730	251.470	250.740	248.980
499620	249.000	0.730	251.470	250.740	248.971
499630	249.000	0.730	251.470	250.740	248.962
499640	249.000	0.730	251.470	250.740	249.033
499650	249.000	0.730	251.470	250.740	249.012
499660	249.000	0.730	251.470	250.740	248.930
499670	249.000	0.730	251.470	250.740	249.011
499680	249.000	0.730	251.470	250.740	249.083
499690	249.000	0.730	251.470	250.740	249.097
499700	249.000	0.730	251.470	250.740	249.763
499710	249.000	0.730	251.470	250.740	248.601
499720	249.000	0.730	251.470	250.740	249.117
499730	249.000	0.730	251.470	250.740	248.972
499740	249.000	0.730	251.470	250.740	248.931
499750	249.000	0.730	251.470	250.740	248.985
499760	249.000	0.730	251.470	250.740	249.000
499770	249.000	0.730	251.470	250.740	248.989
499780	249.000	0.730	251.470	250.740	248.973
499790	249.000	0.730	251.470	250.740	248.954
499800	249.000	0.730	251.470	250.740	248.975
499810	249.000	0.730	251.470	250.740	248.974
499820	249.000	0.730	251.470	250.740	248.944
499830	249.000	0.730	251.470	250.741	248.940
499840	249.000	0.730	251.470	250.746	248.940
499850	249.000	0.730	251.470	250.750	248.928
499860	249.000	0.730	251.470	250.755	248.946
499870	249.000	0.730	251.470	250.759	248.912
499880	249.000	0.730	251.470	250.763	248.785
499890	249.000	0.730	251.470	250.768	248.803
499900	249.000	0.730	251.470	250.772	248.829
499910	249.000	0.730	251.470	250.777	248.824
499920	249.000	0.730	251.470	250.781	248.825
499930	249.000	0.730	251.470	250.786	248.830
499940	249.000	0.730	251.470	250.790	248.816
499950	249.000	0.730	251.470	250.795	248.833
499960	249.000	0.730	251.470	250.799	248.836
499970	249.000	0.730	251.470	250.803	248.842
499980	249.000	0.730	251.470	250.808	248.850
499990	249.000	0.730	251.470	250.812	248.866
500000	249.000	0.730	251.470	250.817	248.884
500010	249.000	0.728	251.470	250.821	248.886
500020	249.000	0.728	251.470	250.826	248.846
500030	249.000	0.728	251.470	250.830	248.846
500040	249.000	0.728	251.470	250.834	248.861
500050	249.000	0.728	251.470	250.839	248.868
500060	249.000	0.728	251.470	250.843	248.880
500070	249.000	0.728	251.470	250.848	248.912
500080	249.000	0.728	251.470	250.852	248.915

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

SCALE 1:200 AT A1 SIZE

SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

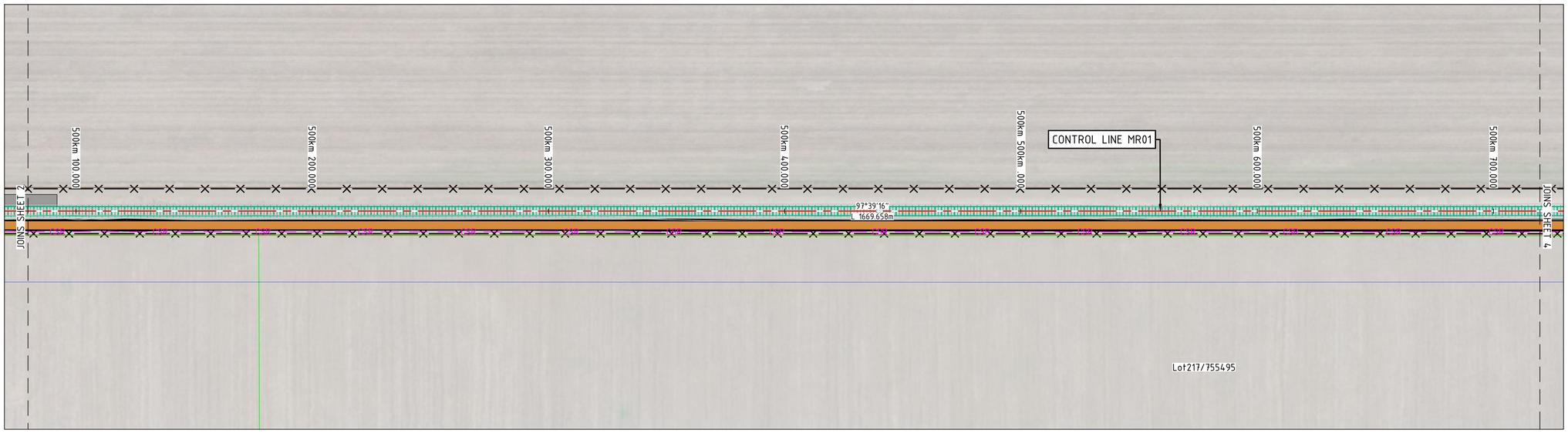
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: PLAN AND PROFILE SHEET 2

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1102	B

C:\12DS\DATA\AURZDSYN01\BE22007 (B2017S) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:23:17 PM

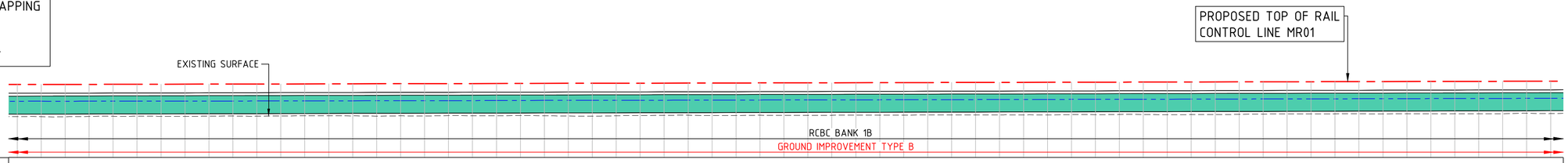


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- — — — RAIL CENTRELINE
- ═══ TOP OF CULVERT / CAPPING
- - - - - EXISTING SURFACE
- — · — 1% AEP FLOOD LEVEL



DATUM 245.5

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.112	249.116	249.121	249.125	249.130	249.134	249.139	249.143	249.148	249.152	249.156	249.161	249.165
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.728	0.728	0.728	0.727	0.727	0.727	0.727	0.727	0.727	0.727	0.727	0.727	0.727
PROPOSED RAIL LEVELS	251.580	251.584	251.589	251.593	251.597	251.602	251.606	251.610	251.615	251.619	251.623	251.628	251.632
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.852	250.857	250.861	250.866	250.870	250.874	250.879	250.883	250.888	250.892	250.897	250.901	250.905
NATURAL SURFACE LEVELS	248.915	248.903	248.899	248.923	248.940	248.942	248.935	248.927	248.942	248.956	248.940	248.963	248.977
CHAINAGE	500080	500090	500100	500110	500120	500130	500140	500150	500160	500170	500180	500190	500200

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.170	249.174	249.179	249.183	249.187	249.192	249.196	249.201	249.205	249.210	249.214	249.219	249.223
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.727	0.726	0.726	0.726	0.726	0.726	0.726	0.726	0.726	0.726	0.726	0.726	0.725
PROPOSED RAIL LEVELS	251.636	251.641	251.645	251.649	251.654	251.658	251.663	251.667	251.671	251.676	251.680	251.684	251.689
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.910	250.914	250.919	250.923	250.928	250.932	250.937	250.941	250.945	250.950	250.954	250.959	250.963
NATURAL SURFACE LEVELS	248.977	248.971	248.952	248.973	248.964	248.991	248.985	248.982	248.997	248.980	248.959	248.952	248.976
CHAINAGE	500210	500220	500230	500240	500250	500260	500270	500280	500290	500300	500310	500320	500330

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.227	249.232	249.236	249.241	249.245	249.250	249.254	249.258	249.263	249.267	249.272	249.276	249.281
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.725	0.724	0.724	0.724
PROPOSED RAIL LEVELS	251.693	251.697	251.702	251.706	251.710	251.715	251.719	251.723	251.728	251.732	251.736	251.741	251.745
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.968	250.972	250.976	250.981	250.985	250.990	250.994	250.999	251.003	251.008	251.012	251.016	251.021
NATURAL SURFACE LEVELS	248.997	249.012	249.021	248.995	248.994	249.021	249.016	249.017	249.022	249.030	249.035	249.035	249.046
CHAINAGE	500340	500350	500360	500370	500380	500390	500400	500410	500420	500430	500440	500450	500460

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.285	249.290	249.294	249.298	249.303	249.307	249.312	249.316	249.321	249.325	249.330	249.334	249.338
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.724	0.723	0.723	0.723	0.723	0.723
PROPOSED RAIL LEVELS	251.749	251.754	251.758	251.762	251.767	251.771	251.776	251.780	251.784	251.789	251.793	251.797	251.802
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.025	251.030	251.034	251.039	251.043	251.047	251.052	251.056	251.061	251.065	251.070	251.074	251.079
NATURAL SURFACE LEVELS	249.051	249.042	249.053	249.055	249.050	249.075	249.071	249.088	249.082	249.067	249.077	249.085	249.096
CHAINAGE	500470	500480	500490	500500	500510	500520	500530	500540	500550	500560	500570	500580	500590

GRADES											0.0435% 1684.8003m		
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.343	249.347	249.352	249.356	249.361	249.365	249.369	249.374	249.378	249.383	249.387	249.392	249.396
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.723	0.723	0.723	0.723	0.723	0.723	0.722	0.722	0.722	0.722	0.722	0.722	0.722
PROPOSED RAIL LEVELS	251.806	251.810	251.815	251.819	251.823	251.828	251.832	251.836	251.841	251.845	251.849	251.854	251.858
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.083	251.087	251.092	251.096	251.101	251.105	251.110	251.114	251.118	251.123	251.127	251.132	251.136
NATURAL SURFACE LEVELS	249.117	249.126	249.125	249.137	249.146	249.135	249.146	249.145	249.148	249.153	249.152	249.187	249.159
CHAINAGE	500600	500610	500620	500630	500640	500650	500660	500670	500680	500690	500700	500710	500720

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

REV	DATE	DESCRIPTION	RVD

REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

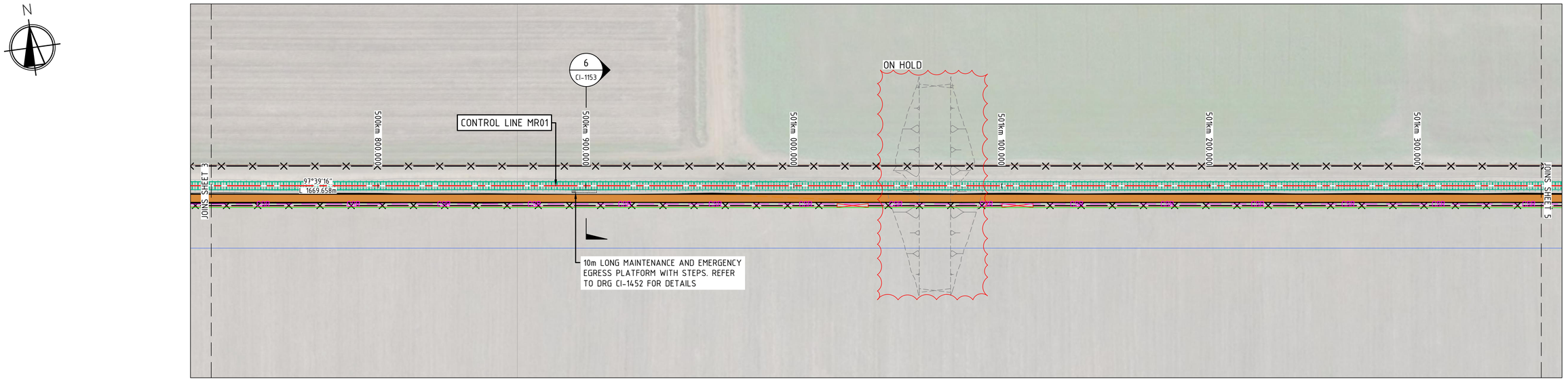
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 3

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1103	B



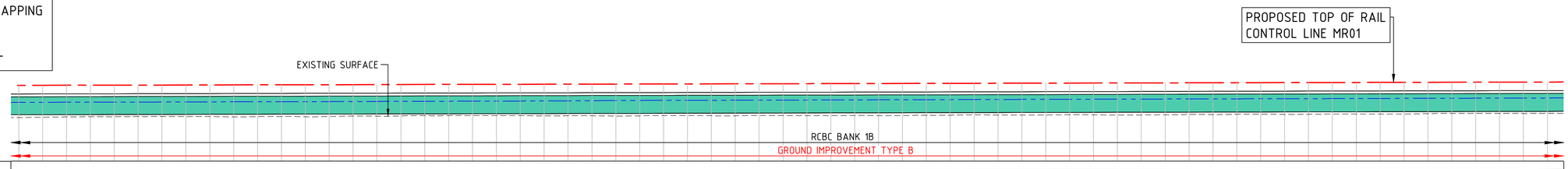
10m LONG MAINTENANCE AND EMERGENCY EGRESS PLATFORM WITH STEPS. REFER TO DRG CI-1452 FOR DETAILS

PLAN

SCALE 1:1000

LEGEND (PROFILE)

🟥 — — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL



DATUM 245.5

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.396	249.401	249.405	249.409	249.414	249.418	249.423	249.427	249.432	249.436	249.440	249.445	249.449
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.722	0.722	0.722	0.722	0.722	0.721	0.721	0.721	0.721	0.721	0.721	0.721	0.721
PROPOSED RAIL LEVELS	251.858	251.862	251.867	251.871	251.875	251.880	251.884	251.889	251.893	251.897	251.902	251.906	251.910
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.136	251.141	251.145	251.150	251.154	251.158	251.163	251.167	251.172	251.176	251.181	251.185	251.189
NATURAL SURFACE LEVELS	249.159	249.189	249.210	249.231	249.225	249.243	249.251	249.242	249.244	249.219	249.238	249.251	249.227
CHAINAGE	500720	500730	500740	500750	500760	500770	500780	500790	500800	500810	500820	500830	500840

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.454	249.458	249.463	249.467	249.472	249.476	249.480	249.485	249.489	249.494	249.498	249.503	249.507
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.721	0.721	0.721	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.720
PROPOSED RAIL LEVELS	251.915	251.919	251.923	251.928	251.932	251.936	251.941	251.945	251.949	251.954	251.958	251.962	251.967
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.194	251.198	251.203	251.207	251.212	251.216	251.221	251.225	251.229	251.234	251.238	251.243	251.247
NATURAL SURFACE LEVELS	249.254	249.282	249.274	249.296	249.314	249.321	249.335	249.335	249.325	249.300	249.310	249.308	249.290
CHAINAGE	500850	500860	500870	500880	500890	500900	500910	500920	500930	500940	500950	500960	500970

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.512	249.516	249.520	249.525	249.529	249.534	249.538	249.543	249.547	249.551	249.556	249.560	249.565
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.720	0.719	0.719	0.719	0.719	0.719	0.719	0.719	0.719	0.719	0.719	0.719	0.718
PROPOSED RAIL LEVELS	251.971	251.975	251.980	251.984	251.989	251.993	251.997	252.002	252.006	252.010	252.015	252.019	252.023
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.252	251.256	251.260	251.265	251.269	251.274	251.278	251.283	251.287	251.292	251.296	251.300	251.305
NATURAL SURFACE LEVELS	249.309	249.323	249.337	249.313	249.313	249.332	249.327	249.324	249.325	249.326	249.324	249.323	249.345
CHAINAGE	500980	500990	501000	501010	501020	501030	501040	501050	501060	501070	501080	501090	501100

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.569	249.574	249.578	249.583	249.587	249.591	249.596	249.600	249.605	249.609	249.614	249.618	249.622
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.718	0.718	0.718	0.718	0.718	0.718	0.718	0.718	0.718	0.718	0.717	0.717	0.717
PROPOSED RAIL LEVELS	252.028	252.032	252.036	252.041	252.045	252.049	252.054	252.058	252.062	252.067	252.071	252.075	252.080
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.309	251.314	251.318	251.323	251.327	251.331	251.336	251.340	251.345	251.349	251.354	251.358	251.363
NATURAL SURFACE LEVELS	249.354	249.387	249.366	249.367	249.372	249.397	249.389	249.369	249.374	249.385	249.423	249.411	249.430
CHAINAGE	501110	501120	501130	501140	501150	501160	501170	501180	501190	501200	501210	501220	501230

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.627	249.631	249.636	249.640	249.645	249.649	249.654	249.658	249.662	249.667	249.671	249.676	249.680
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.717	0.717	0.717	0.717	0.717	0.717	0.717	0.717	0.716	0.716	0.716	0.716	0.716
PROPOSED RAIL LEVELS	252.084	252.088	252.093	252.097	252.102	252.106	252.110	252.115	252.119	252.123	252.128	252.132	252.136
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.367	251.371	251.376	251.380	251.385	251.389	251.394	251.398	251.402	251.407	251.411	251.416	251.420
NATURAL SURFACE LEVELS	249.434	249.426	249.435	249.449	249.453	249.450	249.460	249.484	249.502	249.506	249.505	249.496	249.505
CHAINAGE	501240	501250	501260	501270	501280	501290	501300	501310	501320	501330	501340	501350	501360

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

26/07/2023 4:23:22 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

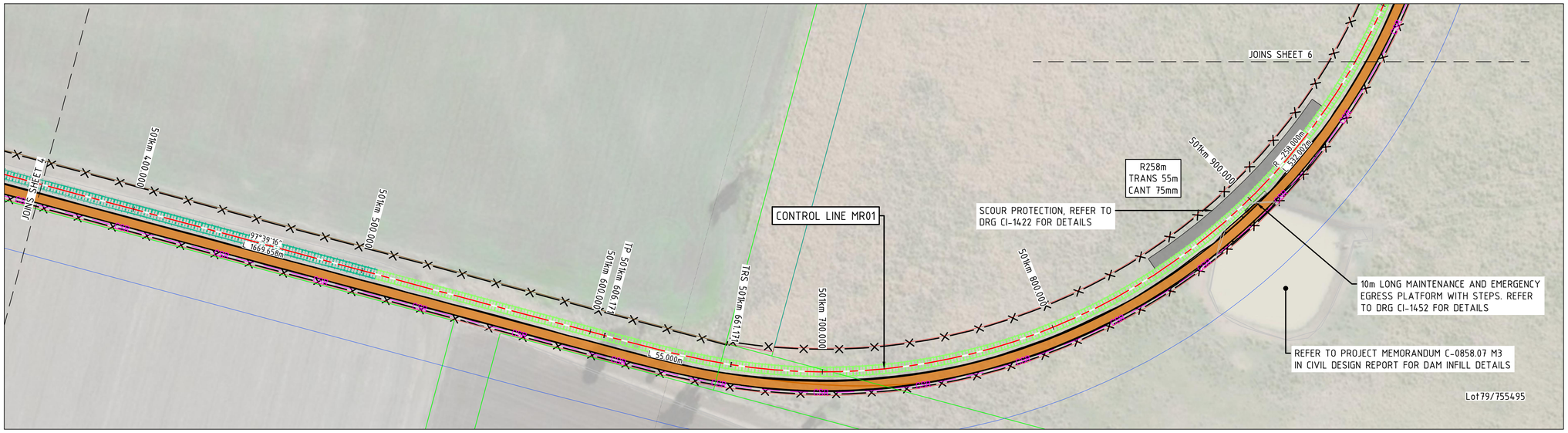
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 4

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1104	B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:23:22 PM

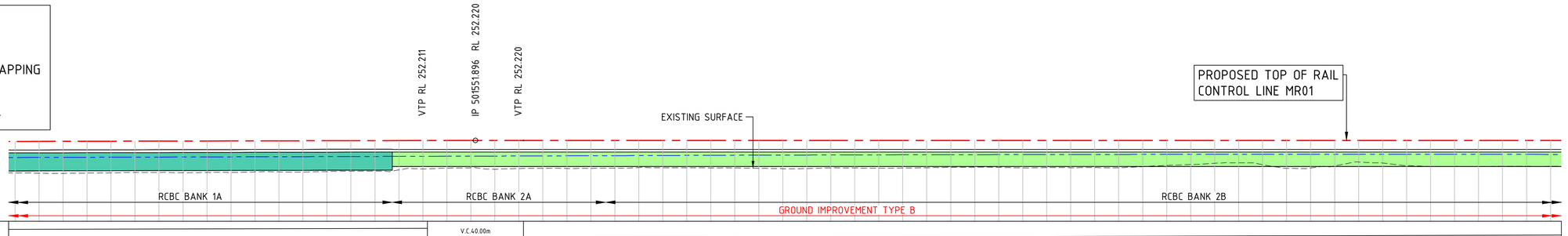


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL



DATUM 245.5

GRADES: V.C.40.00m R92026.1618

HORIZONTAL CURVES: 55m; R-258

CULVERT BASE SLAB LEVEL	249.680	249.685	249.689	249.694	249.698	249.702	249.707	249.711	249.716	249.720	249.725	249.729	249.733
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.716	0.716	0.716	0.716	0.716	0.716	0.716	0.715	0.715	0.715	0.715	0.715	0.715
PROPOSED RAIL LEVELS	252.136	252.141	252.145	252.149	252.154	252.158	252.162	252.167	252.171	252.175	252.180	252.184	252.188
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.420	251.425	251.429	251.434	251.438	251.442	251.447	251.451	251.456	251.460	251.465	251.469	251.473
NATURAL SURFACE LEVELS	249.505	249.491	249.477	249.496	249.518	249.554	249.563	249.537	249.557	249.557	249.601	249.601	249.592
CHAINAGE	501360	501370	501380	501390	501400	501410	501420	501430	501440	501450	501460	501470	501480

CULVERT BASE SLAB LEVEL	249.738	249.742	249.747	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.715	0.715	0.715	0.736	0.740	0.744	0.747	0.749	0.750	0.750	0.750	0.750	0.750
PROPOSED RAIL LEVELS	252.193	252.197	252.201	252.206	252.210	252.214	252.217	252.219	252.220	252.220	252.220	252.220	252.220
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.478	251.482	251.487	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470
NATURAL SURFACE LEVELS	249.627	249.662	249.663	249.763	249.836	249.917	249.959	249.817	249.876	249.888	249.878	249.895	249.910
CHAINAGE	501490	501500	501510	501520	501530	501540	501550	501560	501570	501580	501590	501600	501610

CULVERT BASE SLAB LEVEL	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
PROPOSED RAIL LEVELS	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470
NATURAL SURFACE LEVELS	249.964	249.950	249.943	249.931	249.931	249.900	249.867	249.879	249.937	249.924	249.911	249.923	249.947
CHAINAGE	501620	501630	501640	501650	501660	501670	501680	501690	501700	501710	501720	501730	501740

CULVERT BASE SLAB LEVEL	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
PROPOSED RAIL LEVELS	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470
NATURAL SURFACE LEVELS	249.980	249.988	249.976	249.939	249.954	249.953	249.955	249.943	250.031	250.140	250.213	250.314	250.357
CHAINAGE	501750	501760	501770	501780	501790	501800	501810	501820	501830	501840	501850	501860	501870

CULVERT BASE SLAB LEVEL	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750
PROPOSED RAIL LEVELS	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470
NATURAL SURFACE LEVELS	250.202	249.892	249.927	250.089	250.425	250.338	250.133	250.039	250.055	250.039	250.061	250.062	250.058
CHAINAGE	501880	501890	501900	501910	501920	501930	501940	501950	501960	501970	501980	501990	502000

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

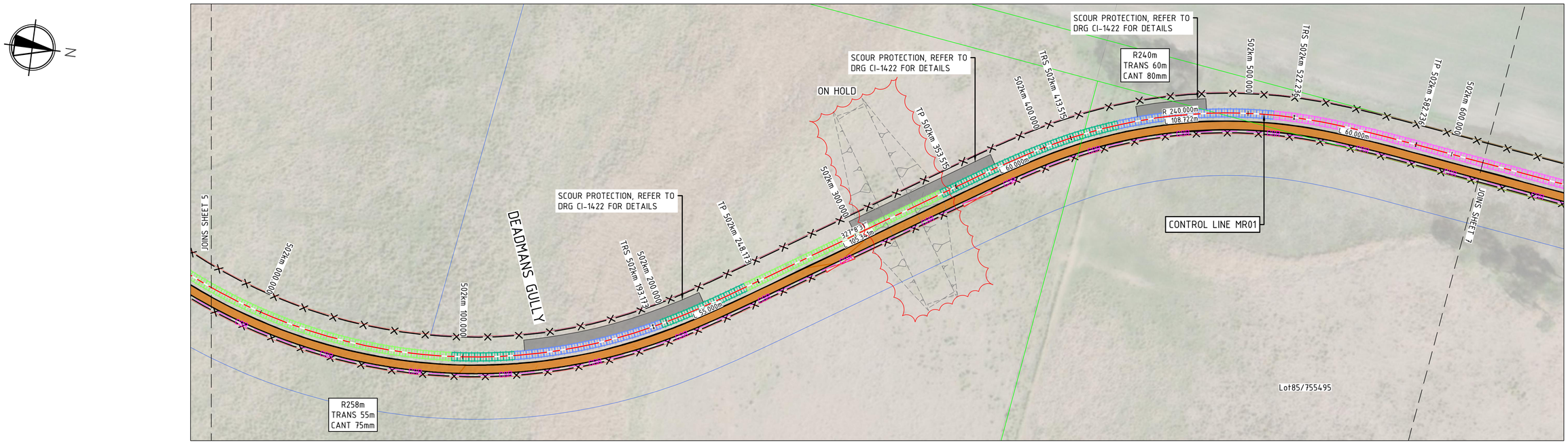
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 5

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1105	B

26/07/2023 4:23:28 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

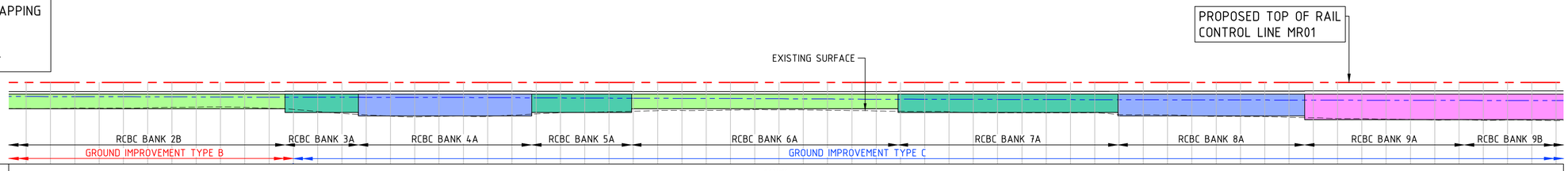


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- — — — RAIL CENTRELINE
- ═══ TOP OF CULVERT / CAPPING
- - - - - EXISTING SURFACE
- — · — · 1% AEP FLOOD LEVEL



GRADES																
HORIZONTAL CURVES																
CULVERT BASE SLAB LEVEL	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	250.050	249.750	249.750	249.750	249.450	249.450
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.750	0.730	0.730	0.730	0.710	0.710
PROPOSED RAIL LEVELS	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.470	251.490	251.490	251.490	251.510	251.510
NATURAL SURFACE LEVELS	250.062	250.058	250.096	250.094	250.103	250.127	250.165	250.188	250.197	250.159	250.093	249.993	249.820	249.659	249.544	249.444
CHAINAGE	501990	502000	502010	502020	502030	502040	502050	502060	502070	502080	502090	502100	502110	502120	502130	502140

GRADES																0.0001% 1453.4507m
HORIZONTAL CURVES								55m								
CULVERT BASE SLAB LEVEL	249.450	249.450	249.450	249.450	249.450	249.750	249.750	249.750	249.750	250.050	250.050	250.050	250.050	250.050	250.050	250.050
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.710	0.710	0.710	0.710	0.710	0.730	0.730	0.730	0.730	0.750	0.750	0.750	0.750	0.750	0.750	0.750
PROPOSED RAIL LEVELS	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.510	251.510	251.510	251.510	251.510	251.490	251.490	251.490	251.490	251.470	251.470	251.470	251.470	251.470	251.470	251.470
NATURAL SURFACE LEVELS	249.373	249.421	249.446	249.414	249.514	249.625	249.715	249.762	249.796	249.848	249.894	249.903	249.908	249.945	249.976	249.965
CHAINAGE	502150	502160	502170	502180	502190	502200	502210	502220	502230	502240	502250	502260	502270	502280	502290	502300

GRADES																
HORIZONTAL CURVES								60m								
CULVERT BASE SLAB LEVEL	250.050	250.050	250.050	250.050	249.750	249.750	249.750	249.750	249.750	249.750	249.750	249.750	249.750	249.450	249.450	249.450
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.750	0.750	0.750	0.750	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.710	0.710	0.710
PROPOSED RAIL LEVELS	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.470	251.470	251.470	251.470	251.490	251.490	251.490	251.490	251.490	251.490	251.490	251.490	251.490	251.510	251.510	251.510
NATURAL SURFACE LEVELS	249.956	249.923	249.893	249.870	249.837	249.832	249.799	249.723	249.705	249.704	249.706	249.707	249.719	249.563	249.550	249.539
CHAINAGE	502310	502320	502330	502340	502350	502360	502370	502380	502390	502400	502410	502420	502430	502440	502450	502460

GRADES																
HORIZONTAL CURVES	R240								60m							
CULVERT BASE SLAB LEVEL	249.450	249.450	249.450	249.450	249.450	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.710	0.710	0.710	0.710	0.710	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700	0.700
PROPOSED RAIL LEVELS	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220	252.220
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.510	251.510	251.510	251.510	251.510	251.520	251.520	251.520	251.520	251.520	251.520	251.520	251.520	251.520	251.520	251.520
NATURAL SURFACE LEVELS	249.478	249.418	249.414	249.398	249.340	249.302	249.238	249.228	249.199	249.162	249.118	249.133	249.096	249.123	249.101	249.058
CHAINAGE	502470	502480	502490	502500	502510	502520	502530	502540	502550	502560	502570	502580	502590	502600	502610	502620

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS
REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

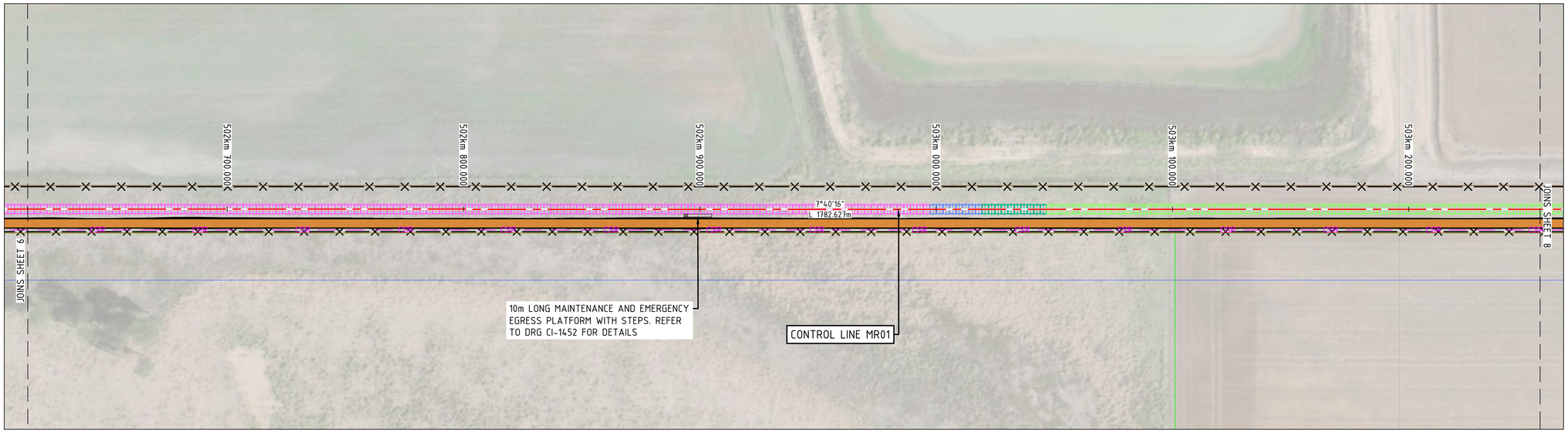
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	A1 A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 6

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1106	B

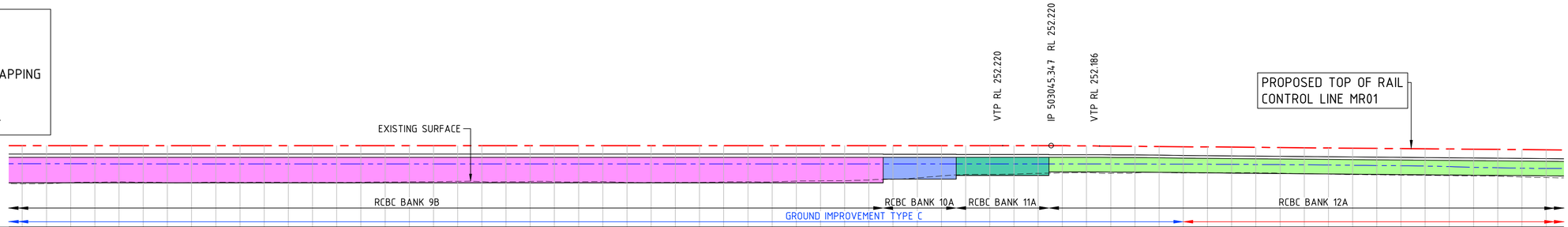


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL



CHAINAGE	GRADES	HORIZONTAL CURVES	CULVERT BASE SLAB LEVEL	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
502620			249.150	0.700	252.220	251.520	249.058
502630			249.150	0.700	252.220	251.520	249.082
502640			249.150	0.700	252.220	251.520	249.170
502650			249.150	0.700	252.220	251.520	249.201
502660			249.150	0.700	252.220	251.520	249.223
502670			249.150	0.700	252.220	251.520	249.192
502680			249.150	0.700	252.220	251.520	249.160
502690			249.150	0.700	252.220	251.520	249.164
502700			249.150	0.700	252.220	251.520	249.195
502710			249.150	0.700	252.220	251.520	249.189
502720			249.150	0.700	252.220	251.520	249.207
502730			249.150	0.700	252.220	251.520	249.187
502740			249.150	0.700	252.220	251.520	249.179
502750			249.150	0.700	252.220	251.520	249.177
502760			249.150	0.700	252.220	251.520	249.199
502770			249.150	0.700	252.220	251.520	249.221
502780			249.150	0.700	252.220	251.520	249.226
502790			249.150	0.700	252.220	251.520	249.238
502800			249.150	0.700	252.220	251.520	249.266
502810			249.150	0.700	252.220	251.520	249.244
502820			249.150	0.700	252.220	251.520	249.234
502830			249.150	0.700	252.220	251.520	249.251
502840			249.150	0.700	252.220	251.520	249.243
502850			249.150	0.700	252.220	251.520	249.222
502860			249.150	0.700	252.220	251.520	249.240
502870			249.150	0.700	252.220	251.520	249.188
502880			249.150	0.700	252.220	251.520	249.177
502890			249.150	0.700	252.220	251.520	249.183
502900			249.150	0.700	252.220	251.520	249.185
502910			249.150	0.700	252.220	251.520	249.218
502920			249.150	0.700	252.220	251.520	249.232
502930			249.150	0.700	252.220	251.520	249.226
502940			249.150	0.700	252.220	251.520	249.290
502950			249.150	0.700	252.220	251.520	249.300
502960			249.150	0.700	252.220	251.520	249.315
502970			249.150	0.700	252.220	251.520	249.377
502980			249.450	0.710	252.220	251.510	249.444
502990			249.450	0.710	252.220	251.510	249.553
503000			249.450	0.710	252.220	251.510	249.715
503010			249.750	0.730	252.220	251.490	249.834
503020			249.750	0.730	252.220	251.490	249.843
503030			249.750	0.729	252.219	251.490	249.867
503040			249.750	0.725	252.215	251.490	249.929
503050			250.050	0.737	252.207	251.470	249.957
503060			250.050	0.724	252.194	251.470	249.982
503070			250.042	0.716	252.178	251.462	249.933
503080			250.024	0.717	252.161	251.444	249.962
503090			250.006	0.717	252.143	251.426	250.009
503100			249.988	0.718	252.126	251.408	249.957
503110			249.970	0.719	252.109	251.390	249.962
503120			249.953	0.720	252.092	251.373	249.982
503130			249.935	0.720	252.075	251.355	249.970
503140			249.917	0.721	252.058	251.337	249.944
503150			249.899	0.722	252.041	251.319	249.902
503160			249.881	0.723	252.024	251.301	249.864
503170			249.863	0.723	252.007	251.283	249.826
503180			249.846	0.724	251.990	251.266	249.809
503190			249.828	0.725	251.973	251.248	249.786
503200			249.810	0.726	251.956	251.230	249.765
503210			249.792	0.726	251.939	251.212	249.739
503220			249.774	0.727	251.922	251.194	249.718
503230			249.756	0.728	251.904	251.176	249.695
503240			249.739	0.729	251.887	251.159	249.629
503250			249.721	0.730	251.870	251.141	249.578

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

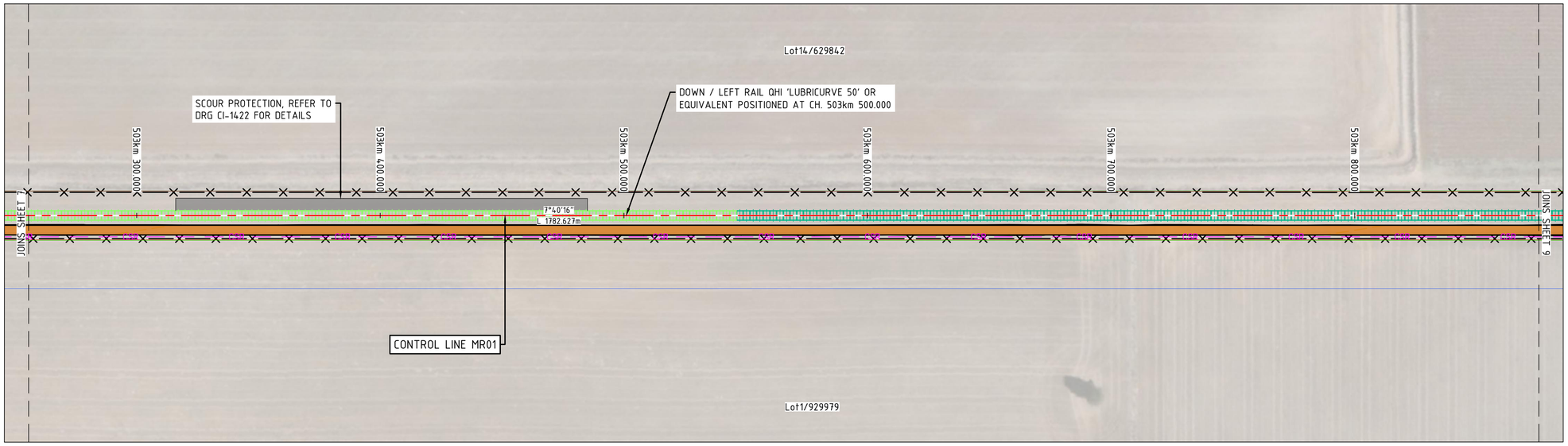
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: PLAN AND PROFILE
SHEET 7

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1107	B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B2017S) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:23:37 PM

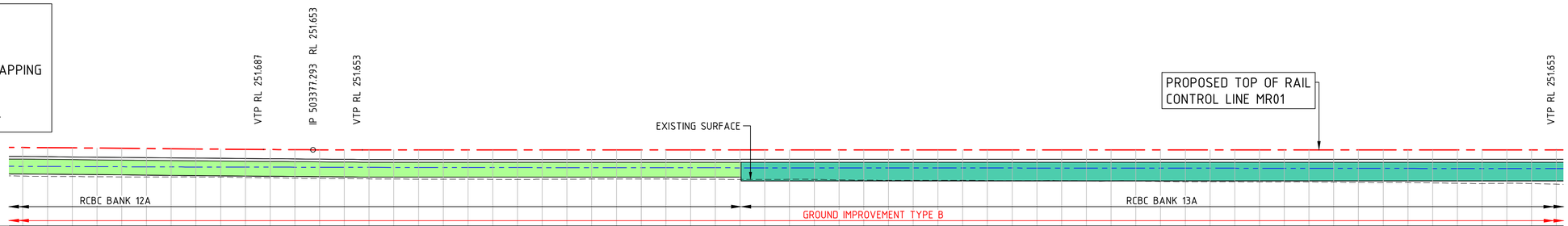


PLAN

SCALE 1:1000

LEGEND (PROFILE)

🟥 — — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL



DATUM 245.5

GRADES												V.C.40.00m R23430.0831									
HORIZONTAL CURVES																					
CULVERT BASE SLAB LEVEL	249.703	249.685	249.667	249.649	249.632	249.614	249.596	249.578	249.560	249.543	249.525	249.507	249.489	249.471	249.453	249.450	249.450	249.450	249.450	249.450	249.450
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.730	0.731	0.732	0.733	0.733	0.734	0.735	0.736	0.736	0.737	0.738	0.742	0.750	0.763	0.780	0.781	0.783	0.783	0.783	0.783	0.783
PROPOSED RAIL LEVELS	251.853	251.836	251.819	251.802	251.785	251.768	251.751	251.734	251.717	251.700	251.683	251.669	251.659	251.654	251.653	251.653	251.653	251.653	251.653	251.653	251.653
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.123	251.105	251.087	251.069	251.052	251.034	251.016	250.998	250.980	250.963	250.945	250.927	250.909	250.891	250.873	250.872	250.870	250.870	250.870	250.870	250.870
NATURAL SURFACE LEVELS	249.537	249.514	249.499	249.488	249.477	249.471	249.465	249.460	249.449	249.427	249.400	249.369	249.349	249.333	249.310	249.296	249.290	249.289	249.285	249.275	249.274
CHAINAGE	503260	503270	503280	503290	503300	503310	503320	503330	503340	503350	503360	503370	503380	503390	503400	503410	503420	503430	503440	503450	503460

GRADES																			0.0001% 482.7073m		
HORIZONTAL CURVES																					
CULVERT BASE SLAB LEVEL	249.450	249.450	249.450	249.450	249.450	249.450	249.450	249.450	249.450	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.783	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763
PROPOSED RAIL LEVELS	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.870	250.870	250.870	250.870	250.870	250.870	250.870	250.870	250.870	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890
NATURAL SURFACE LEVELS	249.277	249.283	249.297	249.306	249.299	249.294	249.289	249.279	249.270	249.261	249.276	249.269	249.233	249.217	249.204	249.198	249.199	249.202	249.182	249.160	249.169
CHAINAGE	503470	503480	503490	503500	503510	503520	503530	503540	503550	503560	503570	503580	503590	503600	503610	503620	503630	503640	503650	503660	503670

GRADES																					
HORIZONTAL CURVES																					
CULVERT BASE SLAB LEVEL	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150	249.150
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763	0.763
PROPOSED RAIL LEVELS	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653	251.653
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890	250.890
NATURAL SURFACE LEVELS	249.168	249.149	249.139	249.138	249.102	249.082	249.084	249.077	249.061	249.069	249.060	249.045	249.031	249.020	249.022	248.986	248.955	248.931	248.955	248.932	248.886
CHAINAGE	503680	503690	503700	503710	503720	503730	503740	503750	503760	503770	503780	503790	503800	503810	503820	503830	503840	503850	503860	503870	503880

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

26/07/2023 4:23:42 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS — REVISIONS

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:23:42 PM

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

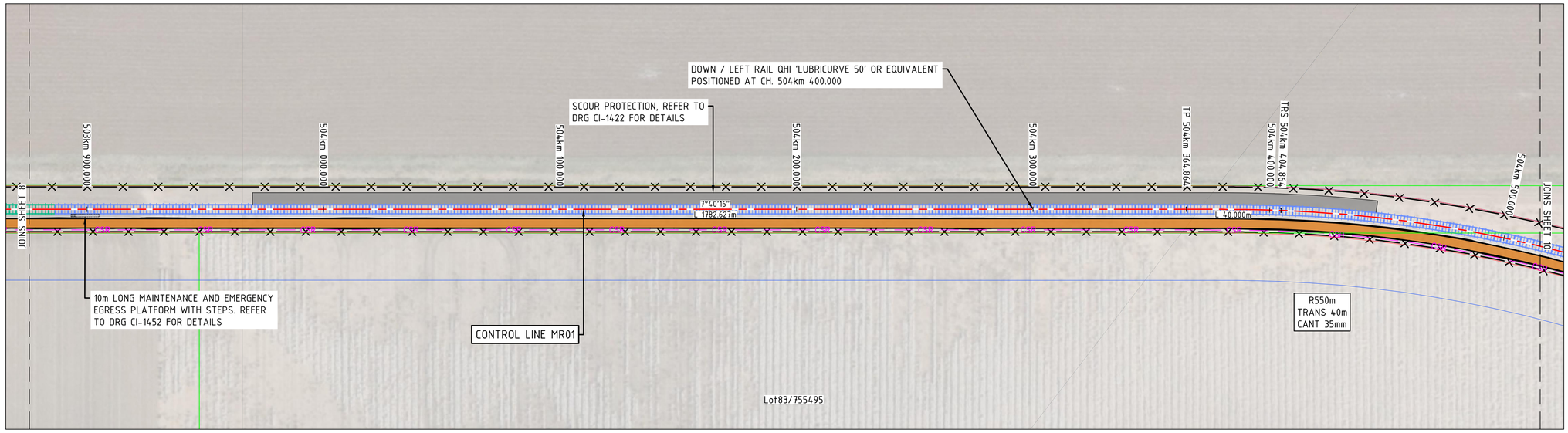
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 8

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1108	B

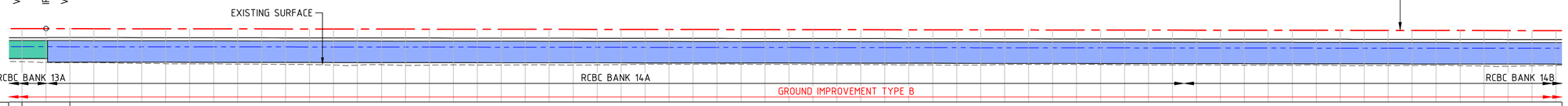


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL



DATUM 245.5

CHAINAGE	GRADES	HORIZONTAL CURVES	CULVERT BASE SLAB LEVEL	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
503880	V.C.20.00m R76200.9058		249.150	0.763	251.653	250.890	248.886
503890			249.150	0.762	251.652	250.890	248.823
503900			248.848	0.743	251.650	250.908	248.807
503910			248.845	0.743	251.648	250.905	248.817
503920			248.842	0.743	251.645	250.902	248.773
503930			248.840	0.743	251.643	250.900	248.746
503940			248.837	0.743	251.640	250.897	248.719
503950			248.834	0.743	251.637	250.894	248.710
503960			248.832	0.743	251.635	250.892	248.704
503970			248.829	0.743	251.632	250.889	248.694
503980			248.826	0.743	251.629	250.886	248.682
503990			248.824	0.743	251.627	250.884	248.665
504000			248.821	0.743	251.624	250.881	248.646
504010			248.818	0.743	251.622	250.878	248.601
504020			248.816	0.743	251.619	250.876	248.596
504030			248.813	0.743	251.616	250.873	248.633
504040			248.810	0.743	251.614	250.870	248.573
504050			248.808	0.743	251.611	250.868	248.598
504060			248.805	0.743	251.608	250.865	248.615
504070			248.802	0.743	251.606	250.862	248.614
504080			248.800	0.743	251.603	250.860	248.606
504090			248.797	0.743	251.601	250.857	248.621
504100			248.794	0.743	251.598	250.855	248.625
504110			248.792	0.743	251.595	250.852	248.602
504120			248.789	0.743	251.593	250.849	248.618
504130			248.786	0.743	251.590	250.847	248.642
504140			248.784	0.743	251.587	250.844	248.671
504150			248.781	0.743	251.585	250.841	248.672
504160			248.779	0.744	251.582	250.839	248.668
504170			248.776	0.744	251.580	250.836	248.688
504180			248.773	0.744	251.577	250.833	248.674
504190			248.771	0.744	251.574	250.831	248.659
504200			248.768	0.744	251.572	250.828	248.656
504210			248.765	0.744	251.569	250.825	248.649
504220			248.763	0.744	251.566	250.823	248.645
504230			248.760	0.744	251.564	250.820	248.647
504240			248.757	0.744	251.561	250.817	248.637
504250			248.755	0.744	251.559	250.815	248.622
504260			248.752	0.744	251.556	250.812	248.616
504270			248.749	0.744	251.553	250.809	248.614
504280			248.747	0.744	251.551	250.807	248.618
504290			248.744	0.744	251.548	250.804	248.647
504300			248.741	0.744	251.545	250.802	248.660
504310			248.739	0.744	251.543	250.799	248.653
504320			248.736	0.744	251.540	250.796	248.654
504330			248.733	0.744	251.538	250.794	248.644
504340			248.731	0.744	251.535	250.791	248.622
504350			248.728	0.744	251.532	250.788	248.607
504360	-0.0262% 734.0072m	40m	248.725	0.744	251.530	250.786	248.607
504370			248.723	0.744	251.527	250.783	248.616
504380			248.720	0.744	251.524	250.780	248.608
504390			248.717	0.744	251.522	250.778	248.595
504400			248.715	0.744	251.519	250.775	248.586
504410			248.712	0.744	251.517	250.772	248.593
504420			248.710	0.744	251.514	250.770	248.601
504430			248.707	0.744	251.511	250.767	248.571
504440			248.704	0.744	251.509	250.764	248.566
504450			248.702	0.744	251.506	250.762	248.568
504460			248.699	0.744	251.503	250.759	248.577
504470			248.696	0.744	251.501	250.756	248.587
504480			248.694	0.744	251.498	250.754	248.559
504490			248.691	0.744	251.496	250.751	248.519
504500			248.688	0.744	251.493	250.749	248.510
504510			248.686	0.744	251.490	250.746	248.551
504520			248.683	0.744	251.488	250.743	248.567

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				
REVISIONS				REVISIONS			

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

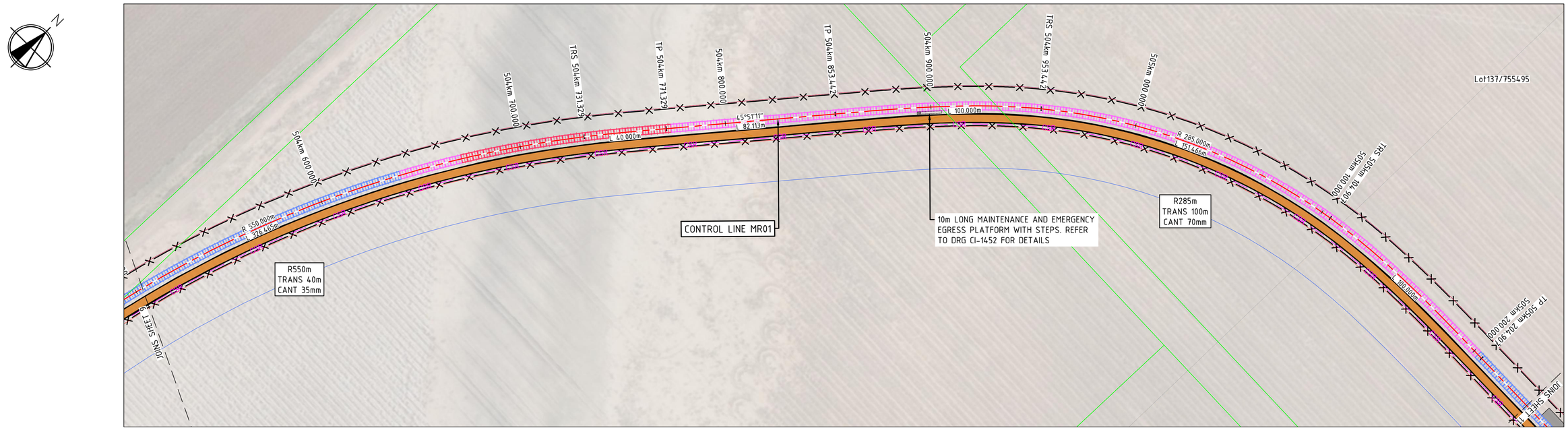
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: PLAN AND PROFILE
SHEET 9

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1109	B

C:\12DS\DATA\AUR2DSYN01\BE22007 IB201751 VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:23:47 PM



PLAN

SCALE 1:1000

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL

VTP RL 251.458
IP 504644.007 RL 251.455
IP 504654.007 RL 251.455

PROPOSED TOP OF RAIL
CONTROL LINE MR01

RCBC BANK 14B | RCBC BANK 15a | RCBC BANK 16A | RCBC BANK 17A | RCBC BANK 17B

GROUND IMPROVEMENT TYPE B

DATUM 245.5

GRADES: V.C 20.00m R16200.9246

HORIZONTAL CURVES: R550 | 40m | 100m | R285 | 100m

CHAINAGE	CULVERT BASE SLAB LEVEL	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
504530	248.680	0.744	251.485	250.741	248.620
504540	248.678	0.744	251.482	250.738	248.637
504550	248.675	0.745	251.480	250.735	248.624
504560	248.673	0.745	251.477	250.733	248.656
504570	248.670	0.745	251.475	250.730	248.652
504580	248.667	0.745	251.472	250.727	248.707
504590	248.665	0.745	251.469	250.725	248.711
504600	248.662	0.745	251.467	250.722	248.716
504610	248.659	0.745	251.464	250.719	248.694
504620	248.657	0.745	251.461	250.717	248.645
504630	248.654	0.745	251.459	250.714	248.600
504640	248.651	0.745	251.456	250.711	248.561
504650	248.350	0.735	251.455	250.720	248.512
504660	248.350	0.735	251.455	250.720	248.454
504670	248.350	0.735	251.455	250.720	248.357
504680	248.050	0.735	251.455	250.720	248.280
504690	248.050	0.735	251.455	250.720	248.263
504700	248.050	0.735	251.455	250.720	248.264
504710	248.050	0.735	251.455	250.720	248.262
504720	248.050	0.735	251.455	250.720	248.253
504730	248.050	0.735	251.455	250.720	248.216
504740	248.050	0.735	251.455	250.720	248.142
504750	248.050	0.735	251.455	250.720	248.194
504760	248.050	0.735	251.455	250.720	248.235
504770	248.050	0.735	251.455	250.720	248.285
504780	248.350	0.735	251.455	250.720	248.332
504790	248.350	0.735	251.455	250.720	248.375
504800	248.350	0.735	251.455	250.720	248.409
504810	248.350	0.735	251.455	250.720	248.454
504820	248.350	0.735	251.455	250.720	248.517
504830	248.350	0.735	251.455	250.720	248.542
504840	248.350	0.735	251.455	250.720	248.532
504850	248.350	0.735	251.455	250.720	248.522
504860	248.350	0.735	251.455	250.720	248.506
504870	248.350	0.735	251.455	250.720	248.495
504880	248.350	0.735	251.455	250.720	248.484
504890	248.350	0.735	251.455	250.720	248.473
504900	248.350	0.735	251.455	250.720	248.477
504910	248.350	0.735	251.455	250.720	248.451
504920	248.350	0.735	251.455	250.720	248.405
504930	248.350	0.735	251.455	250.720	248.369
504940	248.350	0.735	251.455	250.720	248.356
504950	248.350	0.735	251.455	250.720	248.368
504960	248.350	0.735	251.455	250.720	248.360
504970	248.350	0.735	251.455	250.720	248.335
504980	248.350	0.735	251.455	250.720	248.329
504990	248.350	0.735	251.455	250.720	248.316
505000	248.350	0.735	251.455	250.720	248.306
505010	248.350	0.735	251.455	250.720	248.315
505020	248.350	0.735	251.455	250.720	248.325
505030	248.350	0.735	251.455	250.720	248.335
505040	248.350	0.735	251.455	250.720	248.344
505050	248.350	0.735	251.455	250.720	248.335
505060	248.350	0.735	251.455	250.720	248.351
505070	248.350	0.735	251.455	250.720	248.384
505080	248.350	0.735	251.455	250.720	248.402
505090	248.350	0.735	251.455	250.720	248.414
505100	248.350	0.735	251.455	250.720	248.417
505110	248.350	0.735	251.455	250.720	248.437
505120	248.350	0.735	251.455	250.720	248.471
505130	248.350	0.735	251.455	250.720	248.476
505140	248.350	0.735	251.455	250.720	248.455
505150	248.350	0.735	251.455	250.720	248.455
505160	248.350	0.735	251.455	250.720	248.476
505170	248.350	0.735	251.455	250.720	248.482
505180	248.350	0.735	251.455	250.720	248.494
505190	248.350	0.735	251.455	250.720	248.513
505200	248.350	0.735	251.455	250.720	248.530

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

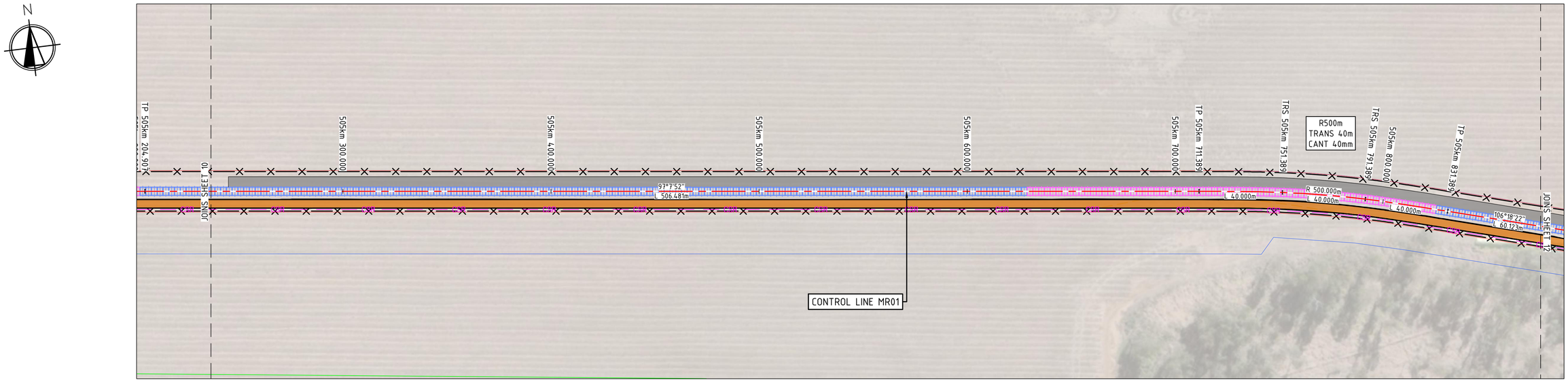
DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: PLAN AND PROFILE
SHEET 10

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1110	B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B2017S) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:23:52 PM

N

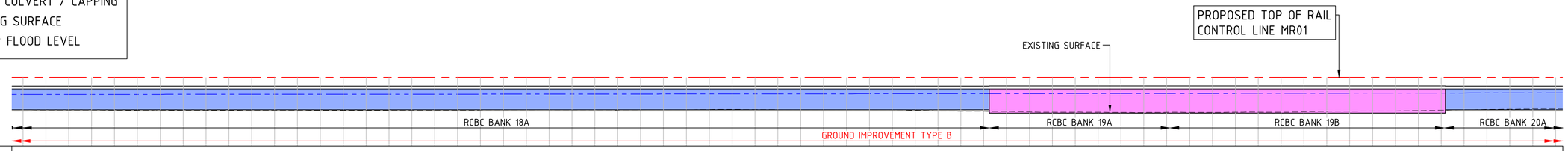


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — — — —	RAIL CENTRELINE
═══════	TOP OF CULVERT / CAPPING
- - - - - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL



DATUM 245.5

CHAINAGE	505210	505220	505230	505240	505250	505260	505270	505280	505290	505300	505310	505320	505330	505340	505350	505360	505370
GRADES	0.0001% 1516.1715m																
HORIZONTAL CURVES																	
CULVERT BASE SLAB LEVEL	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745
PROPOSED RAIL LEVELS	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710
NATURAL SURFACE LEVELS	248.543	248.556	248.556	248.559	248.579	248.599	248.612	248.579	248.583	248.597	248.608	248.609	248.605	248.596	248.593	248.592	248.600

CHAINAGE	505380	505390	505400	505410	505420	505430	505440	505450	505460	505470	505480	505490	505500	505510	505520	505530	505540
GRADES																	
HORIZONTAL CURVES																	
CULVERT BASE SLAB LEVEL	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745
PROPOSED RAIL LEVELS	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710
NATURAL SURFACE LEVELS	248.608	248.614	248.616	248.619	248.625	248.631	248.635	248.629	248.624	248.619	248.634	248.643	248.646	248.667	248.675	248.660	248.652

CHAINAGE	505550	505560	505570	505580	505590	505600	505610	505620	505630	505640	505650	505660	505670	505680	505690	505700	505710
GRADES																	
HORIZONTAL CURVES																	
CULVERT BASE SLAB LEVEL	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.350	248.350	248.350	248.350	248.350	248.350	248.350	248.350
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.735	0.735	0.735	0.735	0.735	0.735	0.735	0.735
PROPOSED RAIL LEVELS	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.720	250.720	250.720	250.720	250.720	250.720	250.720	250.720
NATURAL SURFACE LEVELS	248.646	248.648	248.649	248.646	248.634	248.593	248.545	248.530	248.517	248.508	248.465	248.442	248.447	248.437	248.422	248.413	248.434

CHAINAGE	505720	505730	505740	505750	505760	505770	505780	505790	505800	505810	505820	505830	505840	505850	505860	505870	505880
GRADES																	
HORIZONTAL CURVES	40m				R500				40m								
CULVERT BASE SLAB LEVEL	248.350	248.350	248.350	248.350	248.350	248.350	248.350	248.350	248.350	248.350	248.350	248.350	248.650	248.650	248.650	248.650	248.650
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.735	0.735	0.735	0.735	0.735	0.735	0.735	0.735	0.735	0.735	0.735	0.735	0.745	0.745	0.745	0.745	0.745
PROPOSED RAIL LEVELS	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.720	250.720	250.720	250.720	250.720	250.720	250.720	250.720	250.720	250.720	250.720	250.720	250.710	250.710	250.710	250.710	250.710
NATURAL SURFACE LEVELS	248.429	248.423	248.439	248.447	248.437	248.476	248.517	248.529	248.537	248.550	248.575	248.607	248.640	248.671	248.696	248.722	248.736

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

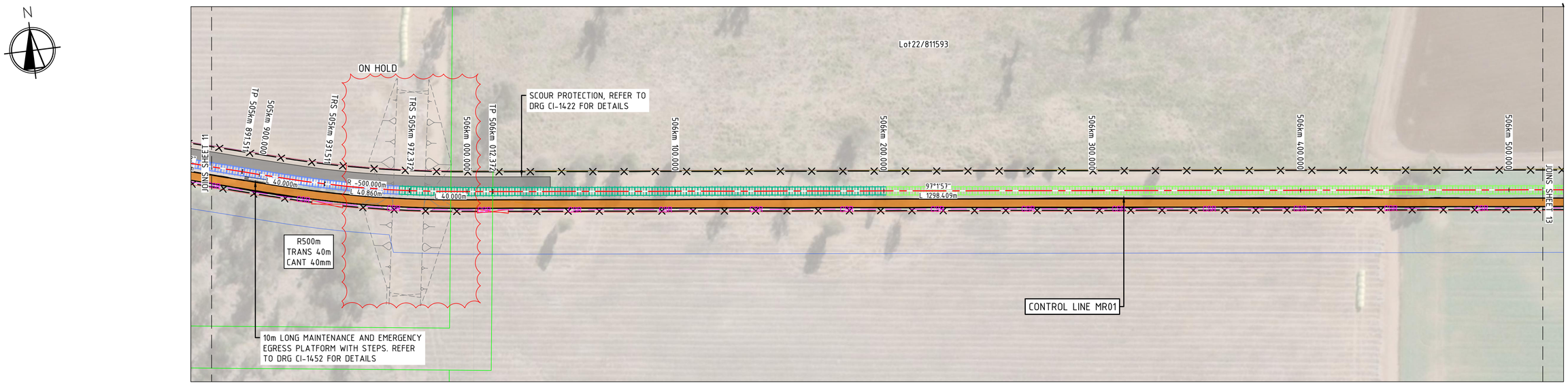
TITLE
PLAN AND PROFILE
SHEET 11

PROJECT No	DRAWING No.	REV.
BE22007-6610	CI-1111	B

26/07/2023 4:23:57 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:23:57 PM

N

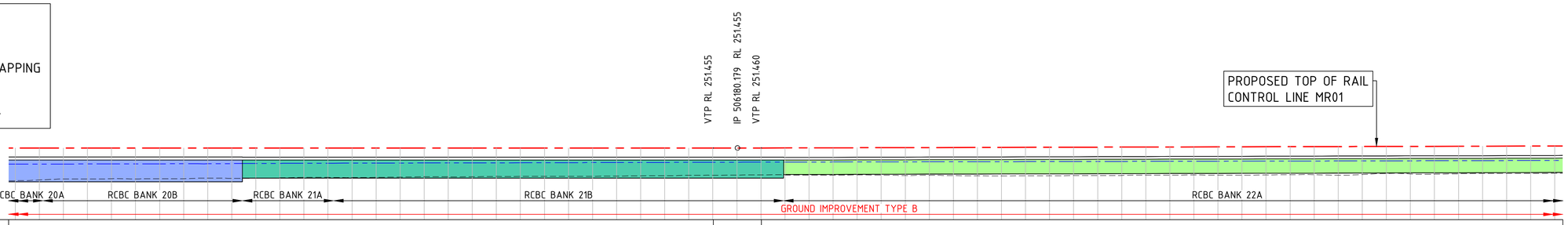


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— - —	RAIL CENTRELINE
═	TOP OF CULVERT / CAPPING
- - - -	EXISTING SURFACE
— · — ·	1% AEP FLOOD LEVEL



GRADES: V.C.20.00m R40574.4813

HORIZONTAL CURVES: 40m R-500 40m

CHAINAGE	505880	505890	505900	505910	505920	505930	505940	505950	505960	505970	505980	505990	506000	506010	506020	506030	506040	506050	506060	506070	506080	506090
CULVERT BASE SLAB LEVEL	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.650	248.950	248.950	248.950	248.950	248.950	248.950	248.950	248.950	248.950	248.950	248.950	248.950
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.745	0.765	0.765	0.765	0.765	0.765	0.765	0.765	0.765	0.765	0.765	0.765	0.765
PROPOSED RAIL LEVELS	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.710	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.690
NATURAL SURFACE LEVELS	248.736	248.796	248.877	248.884	248.905	248.885	248.903	248.904	248.949	248.935	248.943	248.974	249.008	249.008	248.999	249.010	249.038	249.072	249.059	249.067	249.096	249.094

CHAINAGE	506100	506110	506120	506130	506140	506150	506160	506170	506180	506190	506200	506210	506220	506230	506240	506250	506260	506270	506280	506290	506300	506310
CULVERT BASE SLAB LEVEL	248.950	248.950	248.950	248.950	248.950	248.950	248.950	248.950	248.950	248.950	249.250	249.255	249.261	249.266	249.271	249.276	249.281	249.286	249.291	249.296	249.302	249.307
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.765	0.765	0.765	0.765	0.765	0.765	0.765	0.765	0.766	0.770	0.795	0.794	0.794	0.794	0.794	0.794	0.793	0.793	0.793	0.793	0.793	0.792
PROPOSED RAIL LEVELS	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.455	251.456	251.460	251.465	251.470	251.475	251.480	251.485	251.490	251.494	251.499	251.504	251.509	251.514	251.519
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.690	250.670	250.675	250.681	250.686	250.691	250.696	250.701	250.706	250.711	250.716	250.722	250.727
NATURAL SURFACE LEVELS	249.105	249.104	249.106	249.122	249.139	249.154	249.182	249.190	249.205	249.221	249.215	249.198	249.196	249.215	249.196	249.175	249.180	249.165	249.145	249.140	249.147	249.148

CHAINAGE	506320	506330	506340	506350	506360	506370	506380	506390	506400	506410	506420	506430	506440	506450	506460	506470	506480	506490	506500	506510	506520
CULVERT BASE SLAB LEVEL	249.312	249.317	249.322	249.327	249.332	249.337	249.343	249.348	249.353	249.358	249.363	249.368	249.373	249.379	249.384	249.389	249.394	249.399	249.404	249.409	249.414
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.792	0.792	0.792	0.792	0.791	0.791	0.791	0.791	0.791	0.790	0.790	0.790	0.790	0.790	0.789	0.789	0.789	0.789	0.789	0.788	0.788
PROPOSED RAIL LEVELS	251.524	251.529	251.534	251.539	251.544	251.549	251.554	251.559	251.563	251.568	251.573	251.578	251.583	251.588	251.593	251.598	251.603	251.608	251.613	251.618	251.623
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.732	250.737	250.742	250.747	250.752	250.757	250.763	250.768	250.773	250.778	250.783	250.788	250.793	250.799	250.804	250.809	250.814	250.819	250.824	250.829	250.834
NATURAL SURFACE LEVELS	249.166	249.175	249.179	249.201	249.202	249.215	249.203	249.201	249.218	249.238	249.237	249.190	249.257	249.337	249.296	249.280	249.313	249.337	249.336	249.338	249.348

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

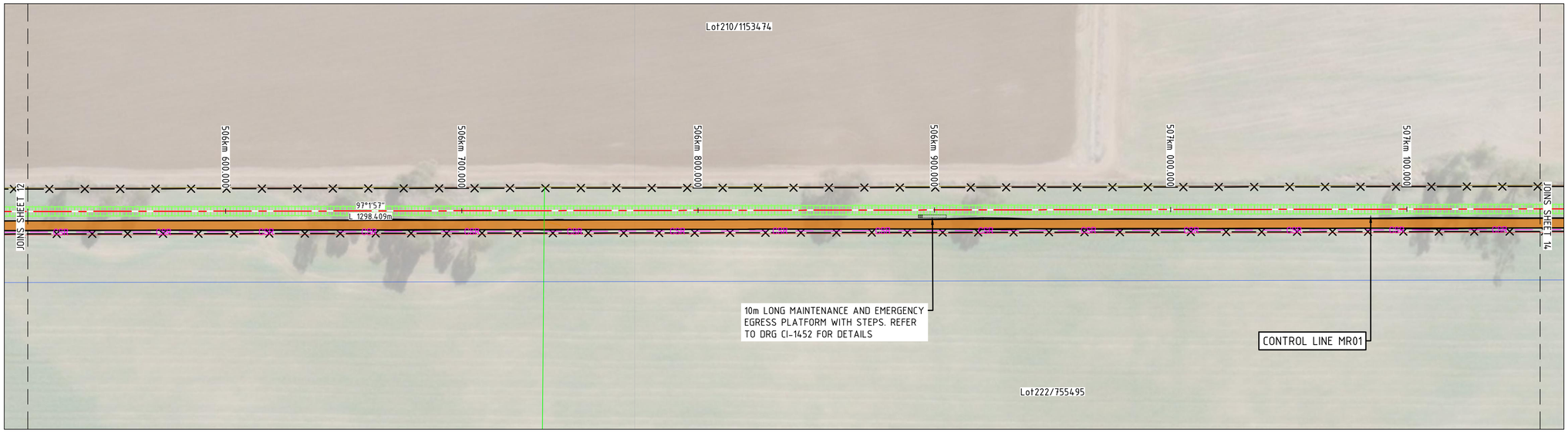
DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 12

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1112	B

26/07/2023 4:24:02 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:24:02 PM

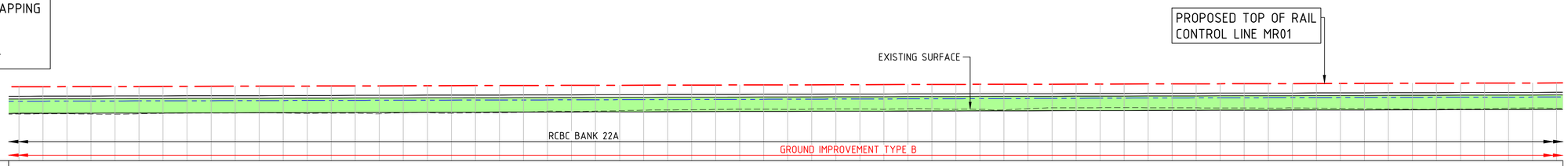


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— - — - —	RAIL CENTRELINE
═══════	TOP OF CULVERT / CAPPING
- - - - - - -	EXISTING SURFACE
— · · — · · —	1% AEP FLOOD LEVEL



DATUM 245.5

GRADES	0.0493% 1167.0066m												
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL	249.414	249.420	249.425	249.430	249.435	249.440	249.445	249.450	249.455	249.461	249.466	249.471	249.476
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.788	0.788	0.788	0.788	0.787	0.787	0.787	0.787	0.787	0.786	0.786	0.786	0.786
PROPOSED RAIL LEVELS	251.623	251.628	251.632	251.637	251.642	251.647	251.652	251.657	251.662	251.667	251.672	251.677	251.682
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.834	250.840	250.845	250.850	250.855	250.860	250.865	250.870	250.875	250.881	250.886	250.891	250.896
NATURAL SURFACE LEVELS	249.348	249.365	249.367	249.349	249.335	249.375	249.412	249.433	249.443	249.443	249.453	249.438	249.407
CHAINAGE	506520	506530	506540	506550	506560	506570	506580	506590	506600	506610	506620	506630	506640

CULVERT BASE SLAB LEVEL	249.481	249.486	249.491	249.496	249.502	249.507	249.512	249.517	249.522	249.527	249.532	249.538	249.543
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.786	0.785	0.785	0.785	0.785	0.785	0.784	0.784	0.784	0.784	0.784	0.783	0.783
PROPOSED RAIL LEVELS	251.687	251.692	251.697	251.701	251.706	251.711	251.716	251.721	251.726	251.731	251.736	251.741	251.746
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.901	250.906	250.911	250.917	250.922	250.927	250.932	250.937	250.942	250.947	250.952	250.958	250.963
NATURAL SURFACE LEVELS	249.422	249.426	249.385	249.462	249.490	249.422	249.461	249.475	249.514	249.594	249.580	249.597	249.638
CHAINAGE	506650	506660	506670	506680	506690	506700	506710	506720	506730	506740	506750	506760	506770

CULVERT BASE SLAB LEVEL	249.548	249.553	249.558	249.563	249.568	249.573	249.579	249.584	249.589	249.594	249.599	249.604	249.609
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.783	0.783	0.783	0.782	0.782	0.782	0.782	0.782	0.781	0.781	0.781	0.781	0.781
PROPOSED RAIL LEVELS	251.751	251.756	251.761	251.766	251.770	251.775	251.780	251.785	251.790	251.795	251.800	251.805	251.810
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.968	250.973	250.978	250.983	250.988	250.993	250.999	251.004	251.009	251.014	251.019	251.024	251.029
NATURAL SURFACE LEVELS	249.675	249.698	249.713	249.739	249.759	249.762	249.748	249.767	249.782	249.775	249.754	249.791	249.777
CHAINAGE	506780	506790	506800	506810	506820	506830	506840	506850	506860	506870	506880	506890	506900

CULVERT BASE SLAB LEVEL	249.614	249.620	249.625	249.630	249.635	249.640	249.645	249.650	249.655	249.661	249.666	249.671	249.676
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.780	0.780	0.780	0.780	0.780	0.779	0.779	0.779	0.779	0.779	0.778	0.778	0.778
PROPOSED RAIL LEVELS	251.815	251.820	251.825	251.830	251.835	251.839	251.844	251.849	251.854	251.859	251.864	251.869	251.874
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.035	251.040	251.045	251.050	251.055	251.060	251.065	251.070	251.076	251.081	251.086	251.091	251.096
NATURAL SURFACE LEVELS	249.741	249.744	249.710	249.799	249.876	249.879	249.887	249.904	249.883	249.875	249.874	249.862	249.861
CHAINAGE	506910	506920	506930	506940	506950	506960	506970	506980	506990	507000	507010	507020	507030

CULVERT BASE SLAB LEVEL	249.681	249.686	249.691	249.697	249.702	249.707	249.712	249.717	249.722	249.727	249.732	249.738	249.743
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.778	0.778	0.777	0.777	0.777	0.777	0.777	0.776	0.776	0.776	0.776	0.776	0.775
PROPOSED RAIL LEVELS	251.879	251.884	251.889	251.894	251.899	251.904	251.908	251.913	251.918	251.923	251.928	251.933	251.938
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.101	251.106	251.111	251.117	251.122	251.127	251.132	251.137	251.142	251.147	251.152	251.158	251.163
NATURAL SURFACE LEVELS	249.848	249.869	249.845	249.821	249.797	249.771	249.757	249.755	249.761	249.793	249.843	249.858	249.831
CHAINAGE	507040	507050	507060	507070	507080	507090	507100	507110	507120	507130	507140	507150	507160

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

REV	DATE	DESCRIPTION	RVD

REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P/ +61 7 3167 3300
E/ info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

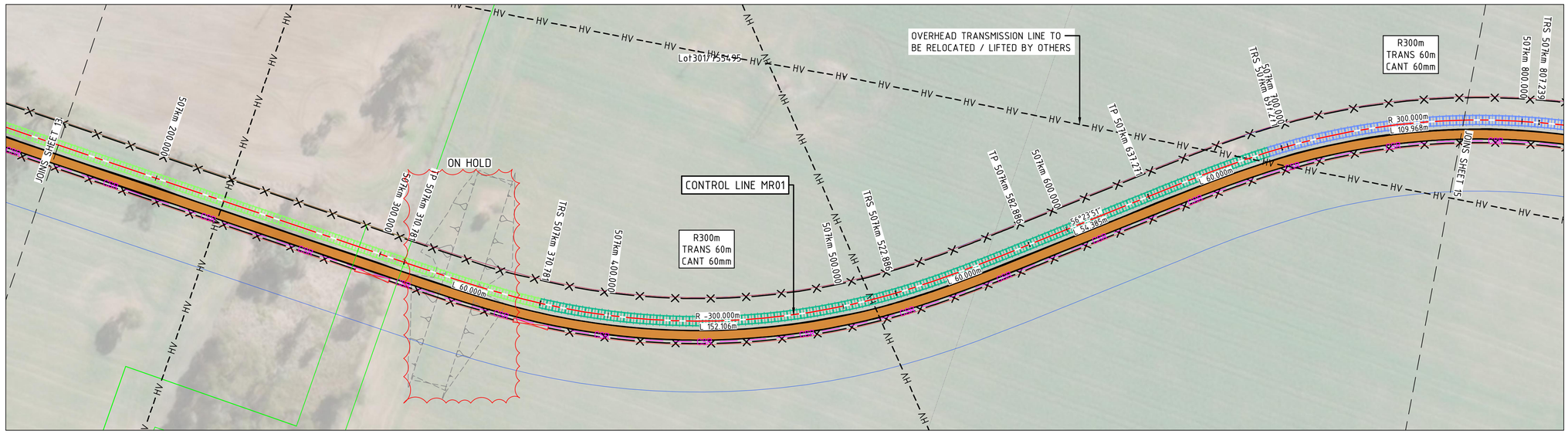
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

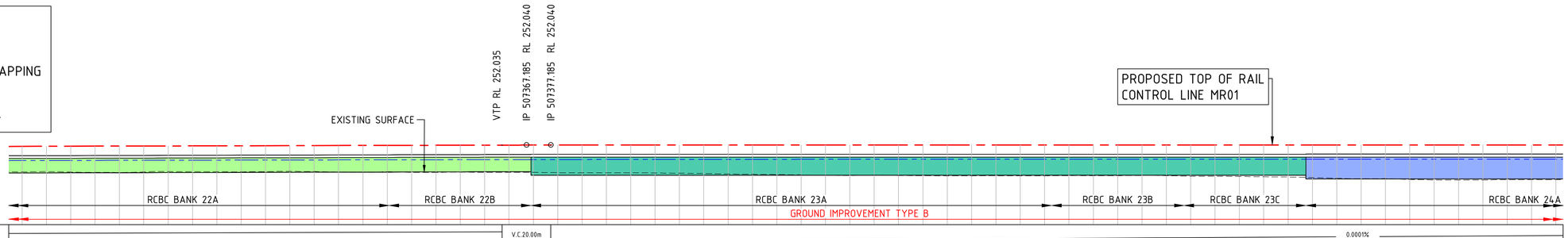
TITLE
PLAN AND PROFILE
SHEET 13

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1113	B



PLAN

SCALE 1:1000



DATUM 245.5

GRADES	V.C.20.00m R=0574.4106 ; 0.0001% 662.8147m
HORIZONTAL CURVES	60m ; R-300 ; 60m ; 60m ; R300

CHAINAGE	CULVERT BASE SLAB LEVEL	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
507160	249.743	0.775	251.938	251.163	249.831
507170	249.748	0.775	251.943	251.168	249.853
507180	249.753	0.775	251.948	251.173	249.817
507190	249.758	0.775	251.953	251.178	249.797
507200	249.763	0.775	251.958	251.183	249.783
507210	249.768	0.774	251.963	251.188	249.830
507220	249.773	0.774	251.968	251.194	249.856
507230	249.779	0.774	251.973	251.199	249.843
507240	249.784	0.774	251.978	251.204	249.845
507250	249.789	0.774	251.982	251.209	249.837
507260	249.794	0.773	251.987	251.214	249.852
507270	249.799	0.773	251.992	251.219	249.875
507280	249.804	0.773	251.997	251.224	249.856
507290	249.809	0.773	252.002	251.229	249.810
507300	249.814	0.773	252.007	251.235	249.790
507310	249.820	0.772	252.012	251.240	249.841
507320	249.825	0.772	252.017	251.245	249.797
507330	249.830	0.772	252.022	251.250	249.797
507340	249.835	0.772	252.027	251.255	249.809
507350	249.840	0.772	252.032	251.260	249.798
507360	249.845	0.771	252.037	251.265	249.796
507370	249.550	0.750	252.040	251.290	249.790
507380	249.550	0.750	252.040	251.290	249.771
507390	249.550	0.750	252.040	251.290	249.766
507400	249.550	0.750	252.040	251.290	249.764
507410	249.550	0.750	252.040	251.290	249.765
507420	249.550	0.750	252.040	251.290	249.746
507430	249.550	0.750	252.040	251.290	249.724
507440	249.550	0.750	252.040	251.290	249.701
507450	249.550	0.750	252.040	251.290	249.660
507460	249.550	0.750	252.040	251.290	249.636
507470	249.550	0.750	252.040	251.290	249.612
507480	249.550	0.750	252.040	251.290	249.583
507490	249.550	0.750	252.040	251.290	249.556
507500	249.550	0.750	252.040	251.290	249.543
507510	249.550	0.750	252.040	251.290	249.569
507520	249.550	0.750	252.040	251.290	249.544
507530	249.550	0.750	252.040	251.290	249.522
507540	249.550	0.750	252.040	251.290	249.512
507550	249.550	0.750	252.040	251.290	249.509
507560	249.550	0.750	252.040	251.290	249.515
507570	249.550	0.750	252.040	251.290	249.505
507580	249.550	0.750	252.040	251.290	249.511
507590	249.550	0.750	252.040	251.290	249.529
507600	249.550	0.750	252.040	251.290	249.532
507610	249.550	0.750	252.040	251.290	249.532
507620	249.550	0.750	252.040	251.290	249.549
507630	249.550	0.750	252.040	251.290	249.524
507640	249.550	0.750	252.040	251.290	249.481
507650	249.550	0.750	252.040	251.290	249.472
507660	249.550	0.750	252.040	251.290	249.455
507670	249.550	0.750	252.040	251.290	249.434
507680	249.550	0.750	252.040	251.290	249.413
507690	249.550	0.750	252.040	251.310	249.365
507700	249.250	0.730	252.040	251.310	249.308
507710	249.250	0.730	252.040	251.310	249.275
507720	249.250	0.730	252.040	251.310	249.277
507730	249.250	0.730	252.040	251.310	249.212
507740	249.250	0.730	252.040	251.310	249.171
507750	249.250	0.730	252.040	251.310	249.163
507760	249.250	0.730	252.040	251.310	249.170
507770	249.250	0.730	252.040	251.310	249.178
507780	249.250	0.730	252.040	251.310	249.195
507790	249.250	0.730	252.040	251.310	249.197

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m — SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m — SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

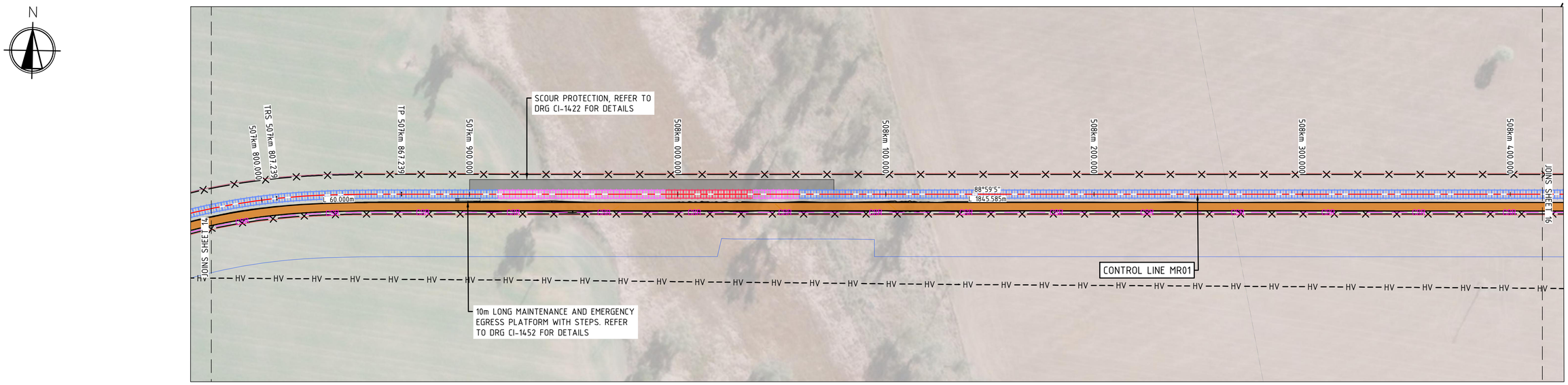
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: PLAN AND PROFILE SHEET 14

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1114	B

C:\12DS\DATA\AURZDSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:24:11 PM

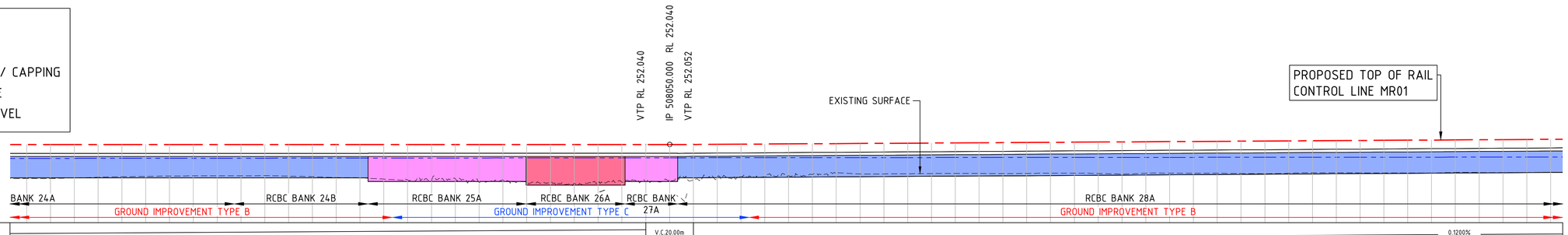


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- — — RAIL CENTRELINE
- ═ TOP OF CULVERT / CAPPING
- - - - EXISTING SURFACE
- —·— 1% AEP FLOOD LEVEL



DATUM 245.5

GRADES																
HORIZONTAL CURVES						60m										
CULVERT BASE SLAB LEVEL	249.250	249.250	249.250	249.250	249.250	249.250	249.250	249.250	249.250	249.250	249.250	249.250	249.250	249.250	249.250	248.950
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.730	0.720
PROPOSED RAIL LEVELS	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.310	251.320
NATURAL SURFACE LEVELS	249.195	249.197	249.246	249.302	249.347	249.376	249.406	249.419	249.424	249.427	249.432	249.400	249.359	249.279	249.255	249.151
CHAINAGE	507780	507790	507800	507810	507820	507830	507840	507850	507860	507870	507880	507890	507900	507910	507920	507930

GRADES											V.C.20.00m R16666.6805					
HORIZONTAL CURVES																
CULVERT BASE SLAB LEVEL	248.950	248.950	248.950	248.950	248.950	248.650	248.650	248.650	248.650	248.650	248.950	248.950	249.258	249.270	249.283	249.295
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.720	0.723	0.734	0.734	0.733	0.733
PROPOSED RAIL LEVELS	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.040	252.043	252.052	252.064	252.076	252.088
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.320	251.320	251.320	251.320	251.320	251.320	251.320	251.320	251.320	251.320	251.320	251.320	251.318	251.330	251.343	251.355
NATURAL SURFACE LEVELS	249.089	248.992	249.171	248.883	249.066	248.902	248.883	248.785	248.771	248.894	248.927	249.057	249.114	249.226	249.341	249.336
CHAINAGE	507940	507950	507960	507970	507980	507990	508000	508010	508020	508030	508040	508050	508060	508070	508080	508090

GRADES																
HORIZONTAL CURVES																
CULVERT BASE SLAB LEVEL	249.307	249.320	249.332	249.344	249.357	249.369	249.381	249.394	249.406	249.418	249.431	249.443	249.455	249.468	249.480	249.493
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.733	0.732	0.732	0.732	0.731	0.731	0.731	0.730	0.730	0.730	0.729	0.729	0.729	0.728	0.728	0.728
PROPOSED RAIL LEVELS	252.100	252.112	252.124	252.136	252.148	252.160	252.172	252.184	252.196	252.208	252.220	252.232	252.244	252.256	252.268	252.280
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.367	251.380	251.392	251.404	251.417	251.429	251.441	251.454	251.466	251.478	251.491	251.503	251.515	251.528	251.540	251.553
NATURAL SURFACE LEVELS	249.425	249.547	249.676	249.579	249.582	249.599	249.616	249.624	249.618	249.615	249.625	249.640	249.645	249.619	249.578	249.633
CHAINAGE	508100	508110	508120	508130	508140	508150	508160	508170	508180	508190	508200	508210	508220	508230	508240	508250

GRADES														0.1200% 643.4325m			
HORIZONTAL CURVES																	
CULVERT BASE SLAB LEVEL	249.505	249.517	249.530	249.542	249.554	249.567	249.579	249.591	249.604	249.616	249.628	249.641	249.653	249.665	249.678	249.690	249.702
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.727	0.727	0.727	0.726	0.726	0.726	0.725	0.725	0.725	0.724	0.724	0.724	0.723	0.723	0.723	0.722	0.722
PROPOSED RAIL LEVELS	252.292	252.304	252.316	252.328	252.340	252.352	252.364	252.376	252.388	252.400	252.412	252.424	252.436	252.448	252.460	252.472	252.484
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.565	251.577	251.590	251.602	251.614	251.627	251.639	251.651	251.664	251.676	251.688	251.701	251.713	251.725	251.738	251.750	251.762
NATURAL SURFACE LEVELS	249.648	249.641	249.637	249.621	249.597	249.642	249.675	249.682	249.665	249.654	249.657	249.661	249.705	249.702	249.698	249.700	249.710
CHAINAGE	508260	508270	508280	508290	508300	508310	508320	508330	508340	508350	508360	508370	508380	508390	508400	508410	508420

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

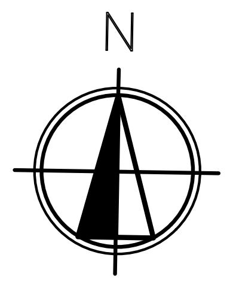
DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

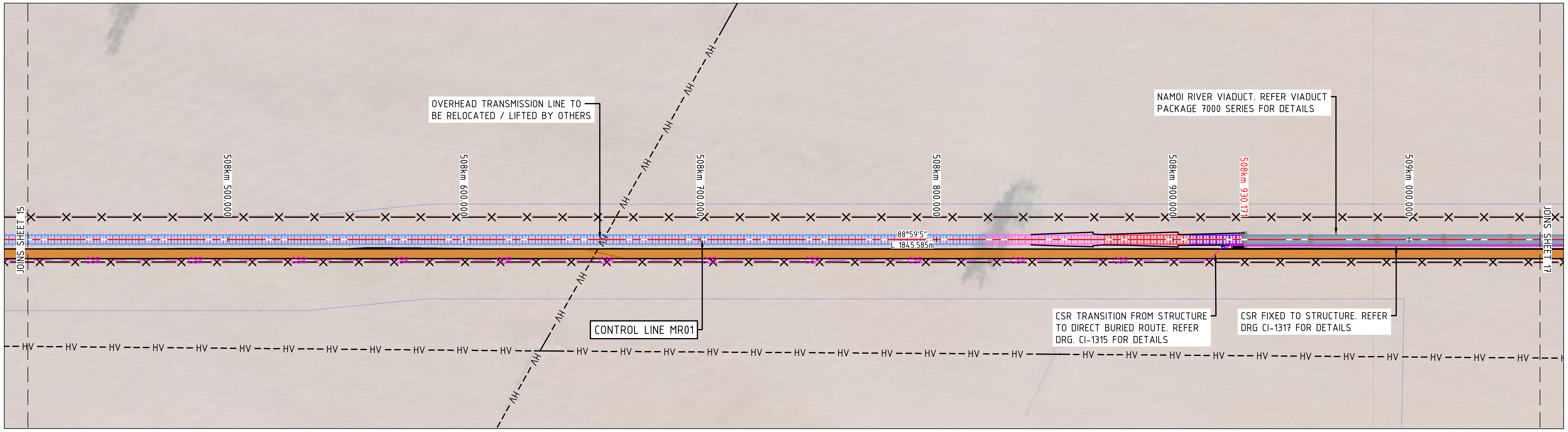
TITLE
PLAN AND PROFILE
SHEET 15

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1115	B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:24:15 PM

26/07/2023 4:24:15 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG





OVERHEAD TRANSMISSION LINE TO BE RELOCATED / LIFTED BY OTHERS

NAMOI RIVER VIADUCT. REFER VIADUCT PACKAGE 7000 SERIES FOR DETAILS

CONTROL LINE MR01

CSR TRANSITION FROM STRUCTURE TO DIRECT BURIED ROUTE. REFER DRG. CI-1315 FOR DETAILS

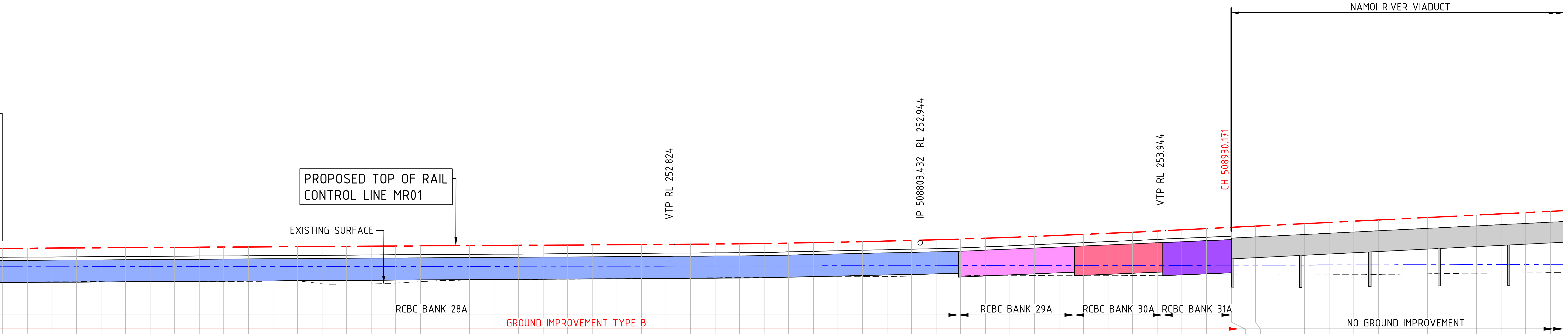
CSR FIXED TO STRUCTURE. REFER DRG CI-1317 FOR DETAILS

PLAN

SCALE 1:1000

LEGEND (PROFILE)

— - — -	RAIL CENTRELINE
═	TOP OF CULVERT / CAPPING
- - - -	EXISTING SURFACE
— · — ·	1% AEP FLOOD LEVEL



PROPOSED TOP OF RAIL CONTROL LINE MR01

DATUM 245.5

GRADES

V.C.200.00m
R22731.6217

0.9998%
319.4687m

HORIZONTAL CURVES

CHAINAGE	CULVERT BASE SLAB LEVEL	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
508420	249.702	0.722	252.484	251.762	249.710
508430	249.715	0.722	252.496	251.775	249.728
508440	249.727	0.721	252.508	251.787	249.751
508450	249.739	0.721	252.520	251.799	249.771
508460	249.752	0.721	252.532	251.812	249.785
508470	249.764	0.720	252.544	251.824	249.787
508480	249.776	0.720	252.556	251.836	249.761
508490	249.789	0.720	252.568	251.849	249.764
508500	249.801	0.719	252.580	251.861	249.785
508510	249.813	0.719	252.592	251.873	249.787
508520	249.826	0.719	252.604	251.886	249.793
508530	249.838	0.718	252.616	251.898	249.809
508540	249.850	0.718	252.628	251.910	249.828
508550	249.863	0.718	252.640	251.923	249.829
508560	249.875	0.717	252.652	251.935	249.614
508570	249.887	0.717	252.664	251.947	249.587
508580	249.900	0.717	252.676	251.960	249.604
508590	249.912	0.716	252.688	251.972	249.668
508600	249.924	0.716	252.700	251.984	249.782
508610	249.937	0.716	252.712	251.997	249.884
508620	249.949	0.715	252.724	252.009	249.921
508630	249.961	0.715	252.736	252.021	249.931
508640	249.974	0.715	252.748	252.034	249.942
508650	249.986	0.714	252.760	252.046	249.973
508660	249.998	0.714	252.772	252.058	249.978
508670	250.011	0.714	252.784	252.071	250.008
508680	250.023	0.713	252.796	252.083	250.033
508690	250.035	0.713	252.808	252.095	250.051
508700	250.048	0.713	252.820	252.108	250.066
508710	250.060	0.713	252.833	252.120	250.079
508720	250.072	0.718	252.850	252.132	250.103
508730	250.085	0.727	252.872	252.145	250.117
508740	250.107	0.730	252.898	252.167	250.134
508750	250.152	0.716	252.928	252.212	250.161
508760	250.196	0.707	252.963	252.256	250.195
508770	250.240	0.702	253.002	252.300	250.214
508780	250.284	0.701	253.045	252.344	250.210
508790	250.328	0.705	253.093	252.388	250.203
508800	250.373	0.713	253.145	252.433	250.238
508810	250.417	0.725	253.202	252.477	250.246
508820	250.166	0.728	253.263	252.536	250.256
508830	250.251	0.707	253.329	252.621	250.304
508840	250.337	0.691	253.398	252.707	250.309
508850	250.423	0.679	253.473	252.793	250.290
508860	250.509	0.672	253.551	252.879	250.298
508870	250.295	0.670	253.634	252.965	250.311
508880	250.381	0.671	253.722	253.051	250.297
508890	250.467	0.677	253.814	253.137	250.292
508900	250.553	0.687	253.910	253.223	250.297
508910	250.339	0.691	254.010	253.319	250.319
508920	250.425	0.705	254.110	253.405	250.326
508930	250.511	0.719	254.210	253.491	250.336
508930.171			254.211		250.336
508940			254.310		250.324
508950			254.410		250.329
508960			254.510		250.324
508970			254.610		250.344
508980			254.710		250.359
508990			254.810		250.373
509000			254.910		250.397
509010			255.010		250.425
509020			255.110		250.455
509030			255.210		250.475
509040			255.310		250.487
509050			255.410		250.501
509060			255.510		250.519

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS

REVISIONS

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:24:19 PM

26/07/2023 4:24:19 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

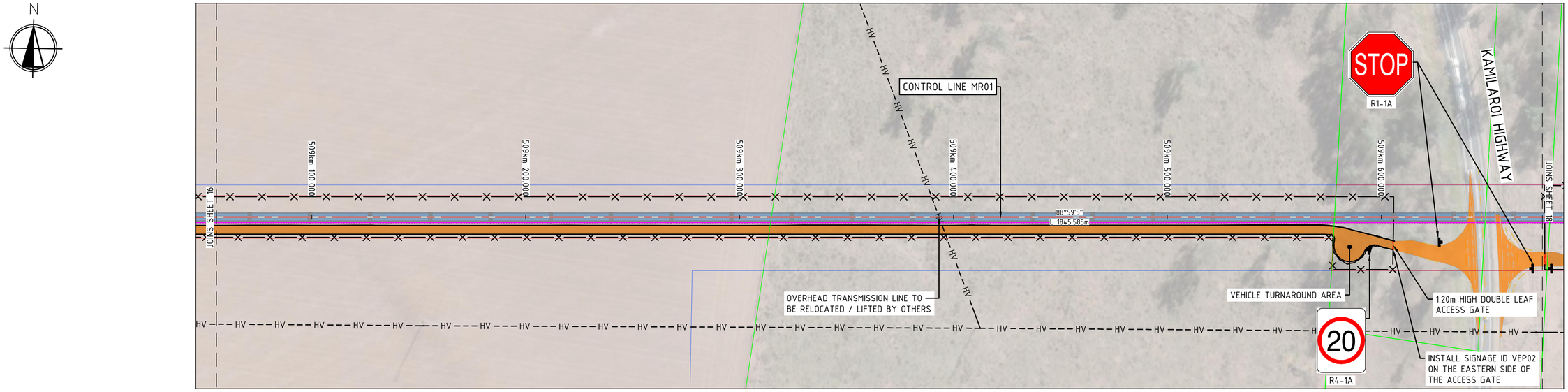
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 16

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1116	B



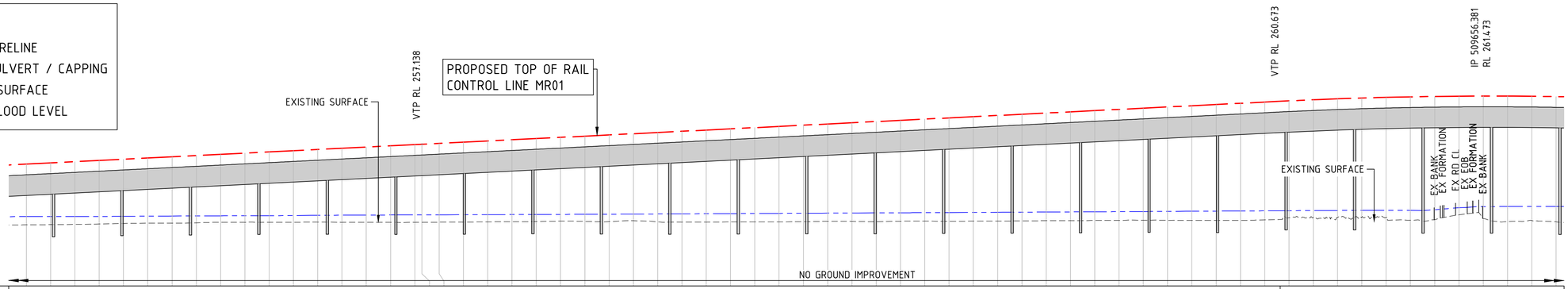
PLAN

SCALE 1:1000

NAMOI RIVER VIADUCT

LEGEND (PROFILE)

— · — · —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - - -	EXISTING SURFACE
— · · — · · —	1% AEP FLOOD LEVEL



DATUM 245.5

NO GROUND IMPROVEMENT

GRADES: 1.0000% 353.4800m; V.C.160.00m R8579.0887

HORIZONTAL CURVES

CULVERT BASE SLAB LEVEL

RAIL HEIGHT FROM FORMATION / TOP OF CULVERT

TOP OF CAPPING & TOP OF CULVERT LEVELS

CHAINAGE	PROPOSED RAIL LEVELS	NATURAL SURFACE LEVELS
509060	255.510	250.519
509070	255.610	250.534
509080	255.710	250.554
509090	255.810	250.584
509100	255.909	250.628
509110	256.009	250.657
509120	256.109	250.655
509130	256.209	250.688
509140	256.309	250.728
509150	256.409	250.734
509160	256.509	250.729
509170	256.609	250.726
509180	256.709	250.740
509190	256.809	250.726
509200	256.909	250.721
509210	257.009	250.722
509220	257.109	250.722
509222.901	257.138	250.725
509230	257.209	250.735
509240	257.309	250.744
509250	257.409	250.765
509260	257.509	250.773
509270	257.609	250.788
509280	257.709	250.825
509290	257.809	250.800
509300	257.909	250.786
509310	258.009	250.855
509320	258.109	250.767
509330	258.209	250.741
509340	258.309	250.746
509350	258.409	250.753
509360	258.509	250.753
509370	258.609	250.763
509380	258.709	250.775
509390	258.809	250.811
509400	258.909	250.801
509410	259.009	250.779
509420	259.109	250.818
509430	259.209	250.825
509440	259.309	250.814
509450	259.409	250.821
509460	259.509	250.829
509470	259.609	250.843
509480	259.709	250.858
509490	259.809	250.862
509500	259.909	250.876
509510	260.009	250.882
509520	260.109	250.899
509530	260.209	250.888
509540	260.309	250.879
509550	260.409	250.875
509560	260.509	250.884
509570	260.609	250.925
509580	260.709	251.095
509590	260.798	251.127
509600	260.877	251.129
509610	260.943	251.158
509620	260.998	251.121
509630	261.042	250.891
509640	261.073	250.941
509650	261.093	251.340
509660	261.102	251.034
509670	261.098	250.784
509680	261.084	250.869
509690	261.057	250.765

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 – CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

REV	DATE	DESCRIPTION	RVD

REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

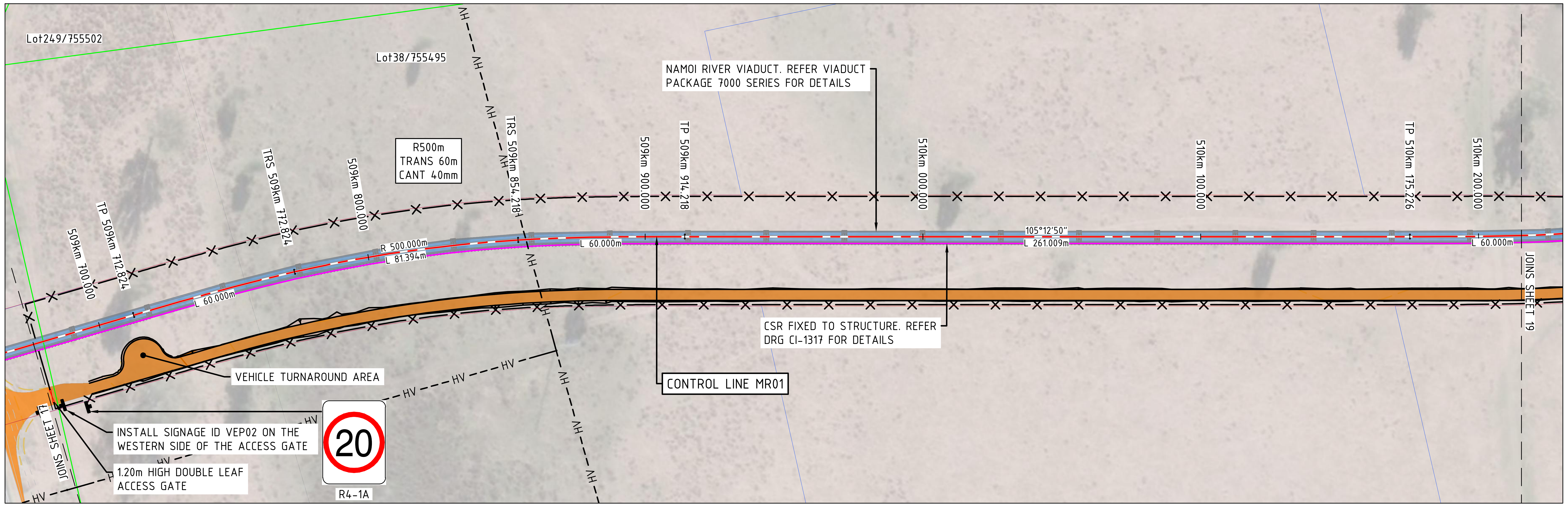
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 17

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1117	B

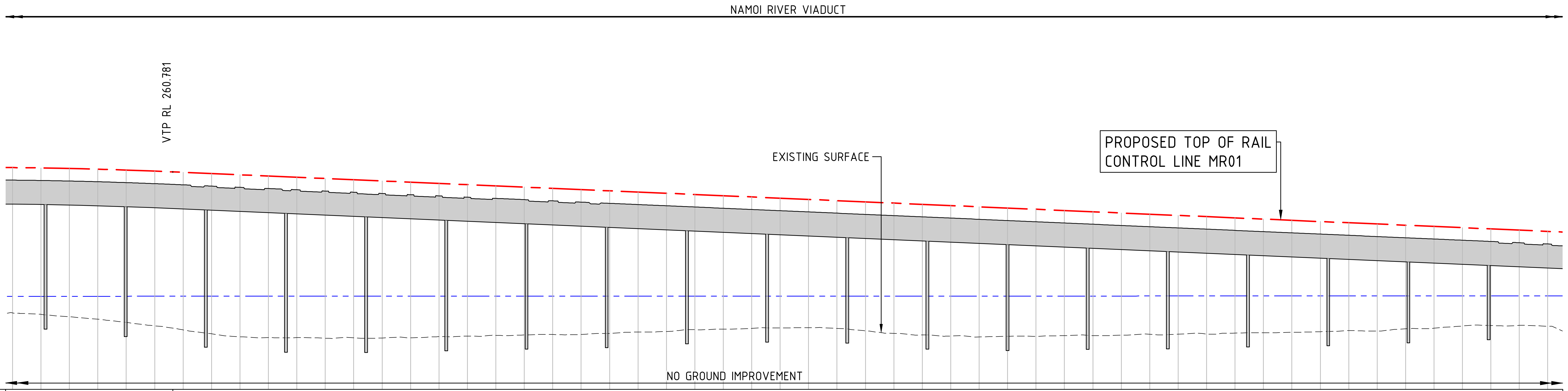


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL



DATUM 245.5

GRADES: -0.8650% 668.2197m

HORIZ. CURVES: 60m — R500 — 60m — 60m

CULVERT BASE SLAB LEVEL

RAIL HEIGHT FROM FORMATION / TOP OF CULVERT

TOP OF CAPPING & TOP OF CULVERT LEVELS

CHAINAGE	PROPOSED RAIL LEVELS	NATURAL SURFACE LEVELS
509680	261.084	250.869
509690	261.057	250.765
509700	261.019	250.597
509710	260.969	250.425
509720	260.907	250.195
509730	260.834	249.961
509740	260.750	249.676
509750	260.663	249.398
509760	260.577	249.194
509770	260.490	249.129
509780	260.404	249.132
509790	260.317	249.093
509800	260.231	249.123
509810	260.144	249.105
509820	260.058	249.113
509830	259.971	249.196
509840	259.885	249.234
509850	259.798	249.293
509860	259.712	249.316
509870	259.625	249.354
509880	259.539	249.357
509890	259.452	249.430
509900	259.366	249.521
509910	259.279	249.566
509920	259.193	249.690
509930	259.106	249.724
509940	259.020	249.786
509950	258.933	249.808
509960	258.847	249.823
509970	258.760	249.784
509980	258.674	249.601
509990	258.587	249.433
510000	258.501	249.318
510010	258.414	249.242
510020	258.328	249.176
510030	258.241	249.228
510040	258.155	249.222
510050	258.068	249.272
510060	257.982	249.270
510070	257.895	249.298
510080	257.809	249.360
510090	257.722	249.376
510100	257.636	249.370
510110	257.549	249.445
510120	257.463	249.470
510130	257.376	249.502
510140	257.290	249.548
510150	257.203	249.625
510160	257.117	249.594
510170	257.030	249.747
510180	256.944	249.794
510190	256.857	249.946
510200	256.771	249.984
510210	256.684	249.995
510220	256.598	249.932

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS | REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

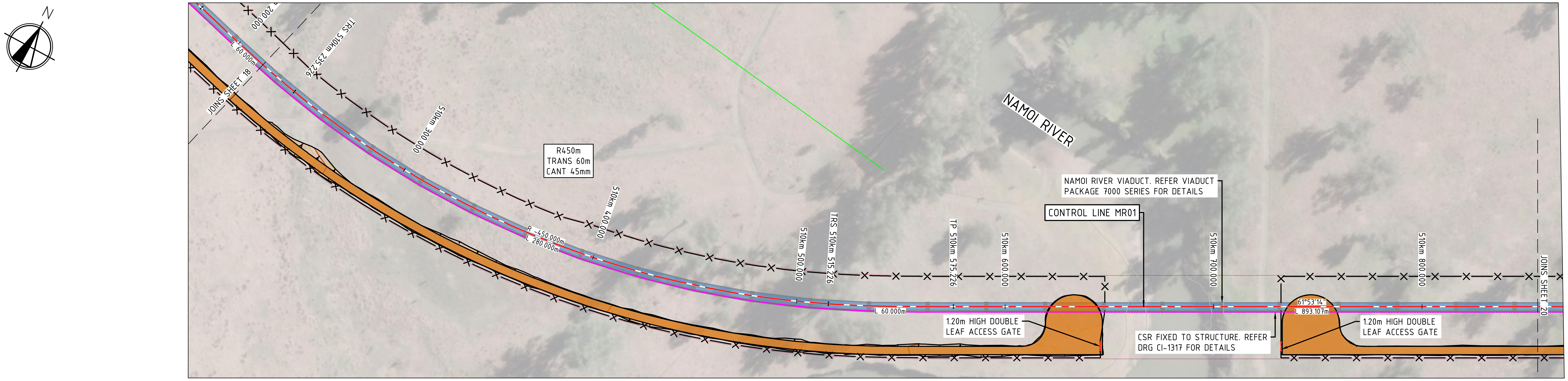
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 18

PROJECT No. BE22007-6610
DRAWING No. CI-1118
REV. B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:24:29 PM



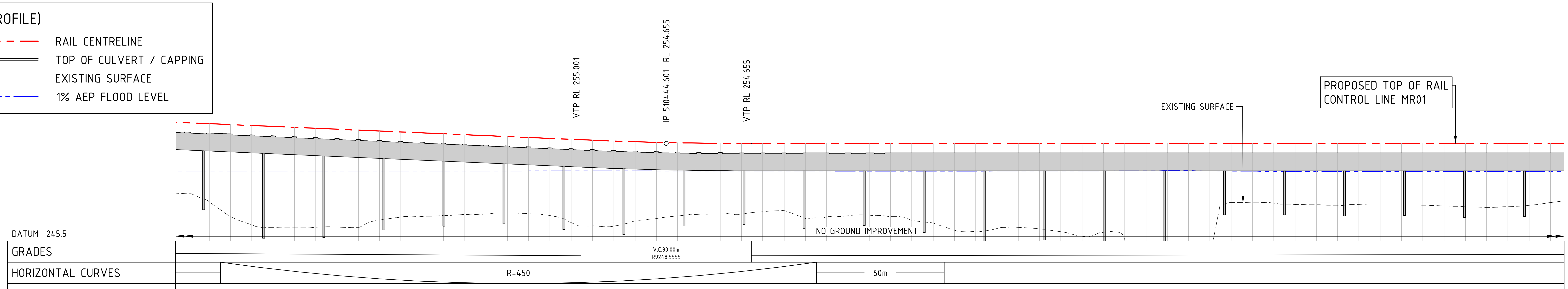
PLAN

SCALE 1:1000

NAMOI RIVER VIADUCT

LEGEND (PROFILE)

— — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL



CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT													
PROPOSED RAIL LEVELS	256.598	256.511	256.425	256.338	256.252	256.165	256.079	255.992	255.906	255.819	255.733	255.646	255.560
TOP OF CAPPING & TOP OF CULVERT LEVELS													
NATURAL SURFACE LEVELS	249.932	249.169	247.784	247.013	246.744	246.726	246.775	246.798	246.754	247.457	247.738	247.799	247.879
CHAINAGE	510220	510230	510240	510250	510260	510270	510280	510290	510300	510310	510320	510330	510340

CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT													
PROPOSED RAIL LEVELS	255.473	255.387	255.300	255.214	255.127	255.041	254.956	254.881	254.816	254.763	254.720	254.688	254.667
TOP OF CAPPING & TOP OF CULVERT LEVELS													
NATURAL SURFACE LEVELS	247.979	248.029	248.110	248.070	247.880	247.217	246.905	246.888	247.374	247.602	247.850	248.000	248.022
CHAINAGE	510350	510360	510370	510380	510390	510400	510410	510420	510430	510440	510450	510460	510470

CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT													
PROPOSED RAIL LEVELS	254.656	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS													
NATURAL SURFACE LEVELS	248.009	248.244	248.347	247.603	247.744	247.862	247.909	247.785	247.434	247.187	246.503	246.369	246.668
CHAINAGE	510480	510490	510500	510510	510520	510530	510540	510550	510560	510570	510580	510590	510600

CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT													
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS													
NATURAL SURFACE LEVELS	246.774	246.633	246.363	245.931	246.300	245.626	243.553	241.762	240.765	244.303	249.101	249.089	249.052
CHAINAGE	510610	510620	510630	510640	510650	510660	510670	510680	510690	510700	510710	510720	510730

CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT													
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS													
NATURAL SURFACE LEVELS	248.927	248.892	248.842	248.905	248.865	248.879	248.850	248.778	248.710	248.643	248.717	248.847	249.103
CHAINAGE	510740	510750	510760	510770	510780	510790	510800	510810	510820	510830	510840	510850	510860

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				
REVISIONS				REVISIONS			

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

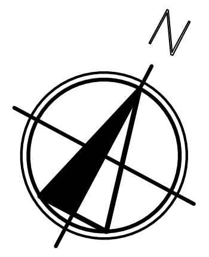
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

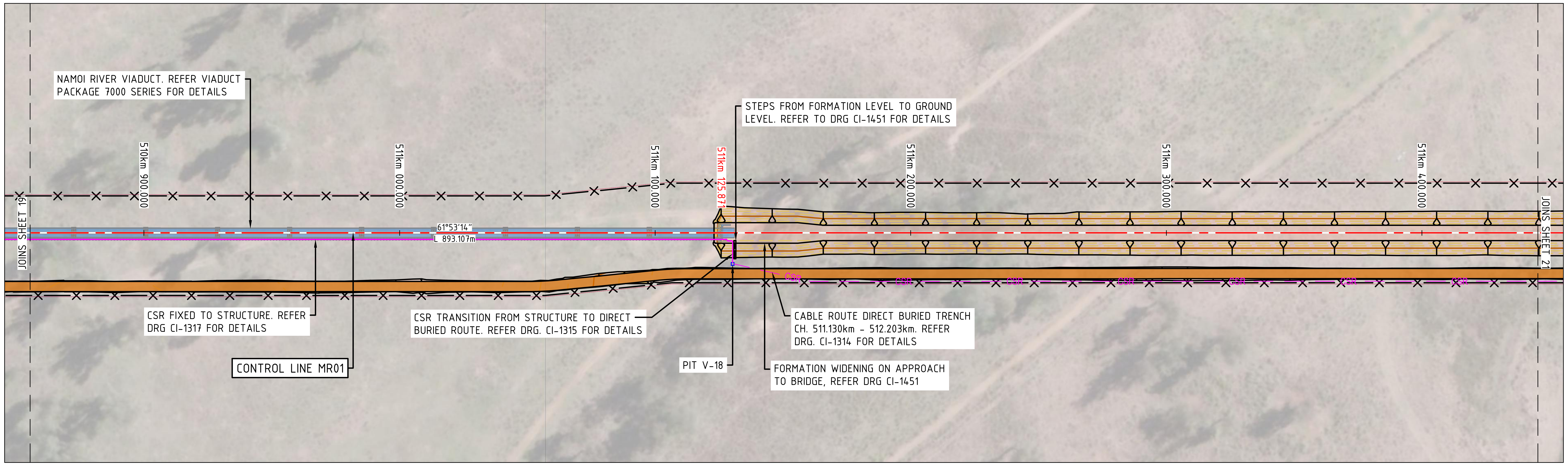
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 19

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1119	B



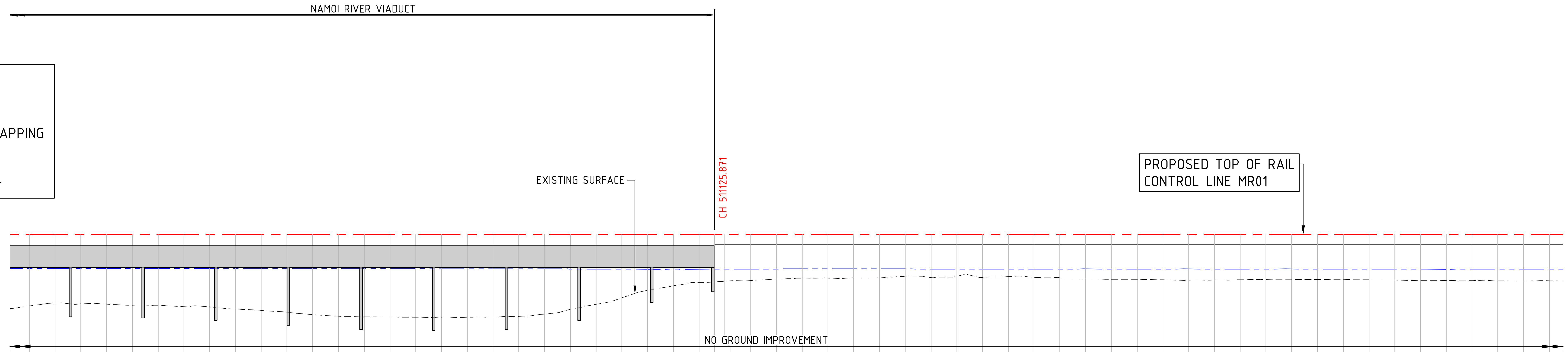


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL



DATUM 245.5

GRADES															
HORIZONTAL CURVES															
CULVERT BASE SLAB LEVEL															
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT															
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS															
NATURAL SURFACE LEVELS	249.103	249.322	249.274	249.239	249.153	249.118	249.049	249.024	248.866	248.753	248.610	248.429	248.298	248.250	248.236
CHAINAGE	510860	510870	510880	510890	510900	510910	510920	510930	510940	510950	510960	510970	510980	510990	511000

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT													0.755
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS													253.900
NATURAL SURFACE LEVELS	248.224	248.226	248.217	248.240	248.276	248.453	248.844	249.227	249.730	250.313	250.657	250.920	250.966
CHAINAGE	511010	511020	511030	511040	511050	511060	511070	511080	511090	511100	511110	511120	511125.871

GRADES																
HORIZONTAL CURVES																
CULVERT BASE SLAB LEVEL																
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900
NATURAL SURFACE LEVELS	251.021	251.069	251.185	251.264	251.261	251.277	251.291	251.408	251.303	251.404	251.317	251.371	251.312	251.277	251.204	251.171
CHAINAGE	511130	511140	511150	511160	511170	511180	511190	511200	511210	511220	511230	511240	511250	511260	511270	511280

GRADES																	
HORIZONTAL CURVES																	
CULVERT BASE SLAB LEVEL																	
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900
NATURAL SURFACE LEVELS	251.171	251.127	251.098	251.110	251.133	251.145	251.140	251.157	251.160	251.126	251.111	251.068	251.077	251.066	251.046	251.032	251.056
CHAINAGE	511290	511300	511310	511320	511330	511340	511350	511360	511370	511380	511390	511400	511410	511420	511430	511440	511450

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

REV	DATE	DESCRIPTION	RVD

REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

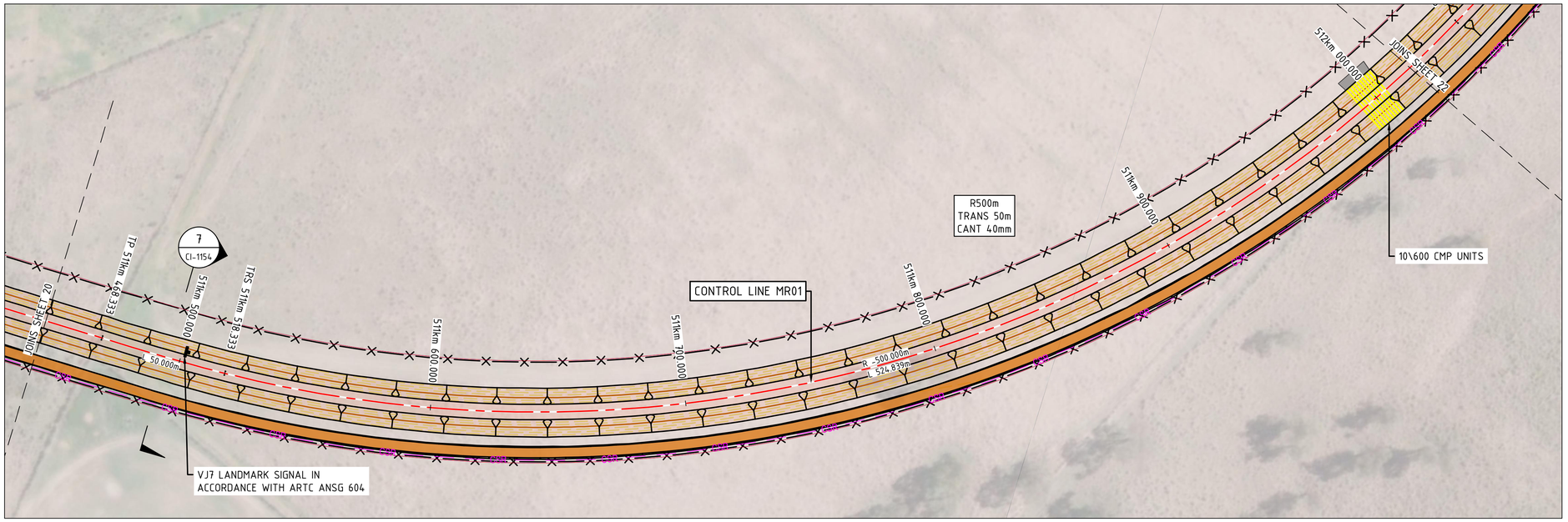
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 20

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1120	B

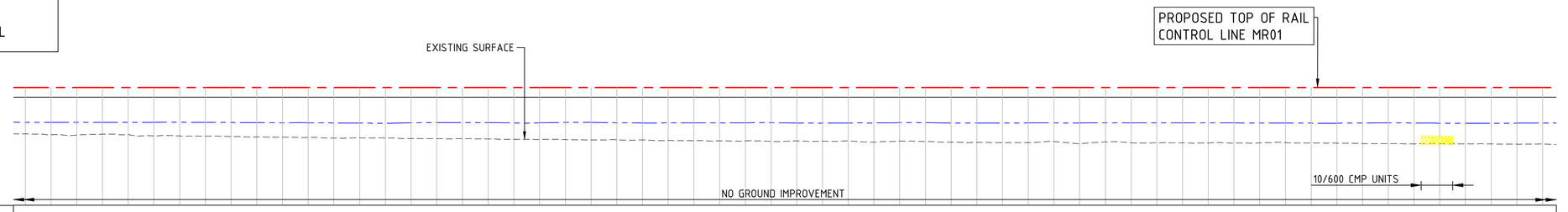


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL



GRADES: 0.0001% 2366.5209m

HORIZONTAL CURVES: 50m; R-500

CULVERT BASE SLAB LEVEL

CHAINAGE	511450	511460	511470	511480	511490	511500	511510	511520	511530	511540	511550	511560	511570	511580	511590
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900
NATURAL SURFACE LEVELS	251.056	250.996	250.967	251.032	251.007	250.906	250.895	250.881	250.853	250.822	250.800	250.787	250.732	250.751	250.735

CHAINAGE	511600	511610	511620	511630	511640	511650	511660	511670	511680	511690	511700	511710	511720	511730	511740
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900
NATURAL SURFACE LEVELS	250.694	250.686	250.680	250.671	250.632	250.621	250.609	250.580	250.597	250.576	250.540	250.537	250.510	250.506	250.479

CHAINAGE	511750	511760	511770	511780	511790	511800	511810	511820	511830	511840	511850	511860	511870	511880	511890
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900
NATURAL SURFACE LEVELS	250.507	250.489	250.510	250.419	250.496	250.464	250.418	250.395	250.382	250.382	250.464	250.301	250.427	250.368	250.359

CHAINAGE	511900	511910	511920	511930	511940	511950	511960	511970	511980	511990	512000	512010	512020	512030	512040
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900
NATURAL SURFACE LEVELS	250.355	250.352	250.341	250.355	250.376	250.342	250.334	250.302	250.291	250.279	250.289	250.280	250.273	250.253	250.269

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

SCALE 1:200 AT A1 SIZE: 0 2 4 6 8 10 12m

SCALE 1:1000 AT A1 SIZE: 0 10 20 30 40 50 60m

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

REV	DATE	DESCRIPTION	RVD

REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

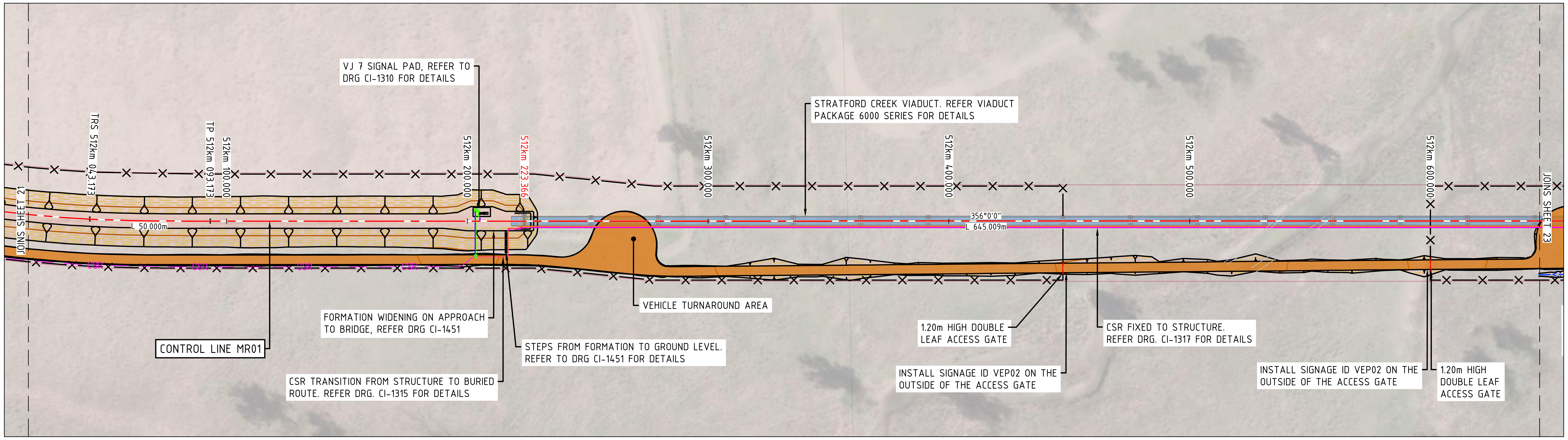
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	A1 SIZE
AHD	MGA/20-56	AS SHOWN	A1

TITLE
PLAN AND PROFILE
SHEET 21

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1121	B

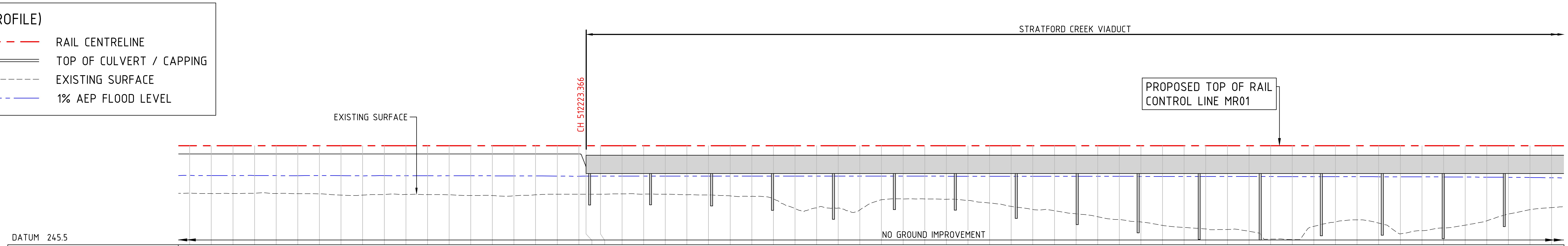


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL



GRADES												
HORIZONTAL CURVES	50m											
CULVERT BASE SLAB LEVEL												
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900	253.900
NATURAL SURFACE LEVELS	250.269	250.227	250.241	250.256	250.234	250.216	250.198	250.082	250.084	250.141	250.142	250.134
CHAINAGE	512040	512050	512060	512070	512080	512090	512100	512110	512120	512130	512140	512150

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	1.969					
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.900	253.900	253.900	253.900	252.686					
NATURAL SURFACE LEVELS	250.117	250.047	250.048	250.020	250.113	250.160	250.160	250.168	250.169	250.207	250.175	250.169	250.120
CHAINAGE	512160	512170	512180	512190	512200	512210	512220	512223.366	512230	512240	512250	512260	512270

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT													
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS													
NATURAL SURFACE LEVELS	250.100	250.018	249.972	249.754	248.843	248.899	248.890	248.716	249.655	249.735	249.735	249.702	249.602
CHAINAGE	512280	512290	512300	512310	512320	512330	512340	512350	512360	512370	512380	512390	512400

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT													
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS													
NATURAL SURFACE LEVELS	249.360	249.045	248.751	248.641	248.354	248.081	247.827	247.597	247.284	247.098	246.958	246.906	246.740
CHAINAGE	512410	512420	512430	512440	512450	512460	512470	512480	512490	512500	512510	512520	512530

GRADES														
HORIZONTAL CURVES														
CULVERT BASE SLAB LEVEL														
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT														
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS														
NATURAL SURFACE LEVELS	246.017	245.975	247.188	247.612	247.798	247.498	246.499	246.800	247.046	247.310	247.705	248.333	248.741	248.929
CHAINAGE	512540	512550	512560	512570	512580	512590	512600	512610	512620	512630	512640	512650	512660	512670

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

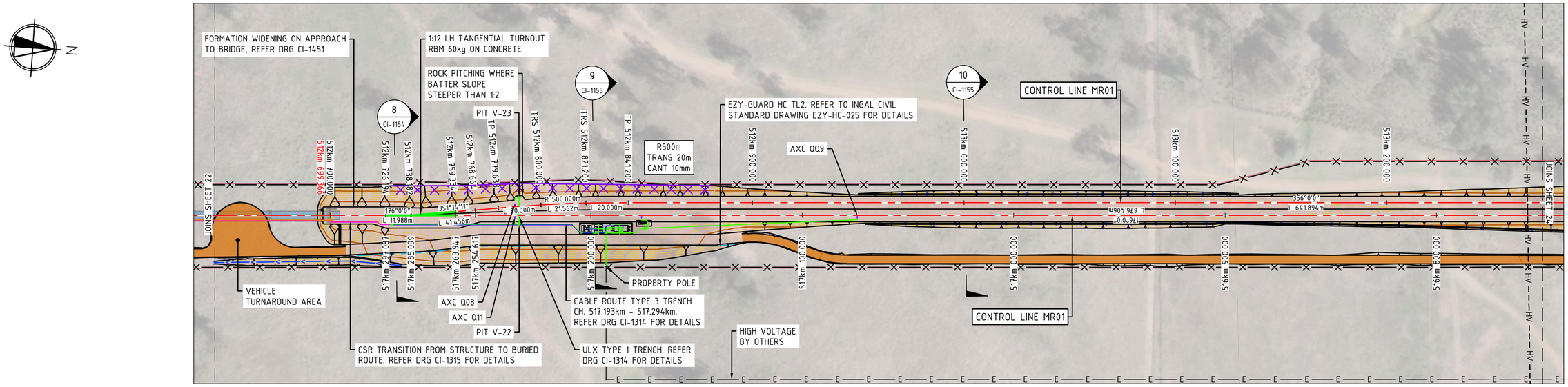
DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 22

PROJECT No. BE22007-6610
DRAWING No. CI-1122
REV. B

26/07/2023 4:24:53 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:24:53 PM

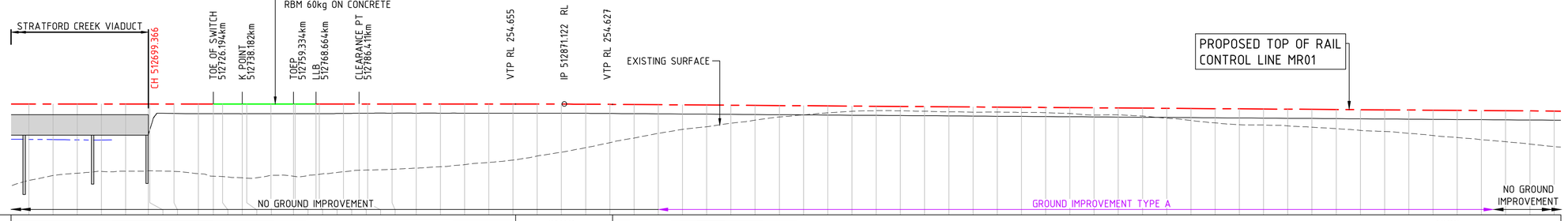


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL



DATUM 245.5

V.C.40.00m R28125.9986

20m R500 20m

-0.1422% 688.0416m

CHAINAGE	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
512650		254.655		248.333
512660		254.655		248.741
512670		254.655		248.929
512680		254.655		249.090
512690		254.655		249.103
512699.366	2.521	254.655	252.134	249.132
512700	2.101	254.655	252.554	249.130
512710	0.780	254.655	253.875	249.090
512720	0.805	254.655	253.850	248.893
512726.194	0.805	254.655	253.850	248.691
512730	0.805	254.655	253.850	248.657
512738.182	0.805	254.655	253.850	248.554
512740	0.805	254.655	253.850	248.529
512750	0.805	254.655	253.850	248.765
512759.334	0.805	254.655	253.850	248.686
512760	0.805	254.655	253.850	248.670
512768.664	0.805	254.655	253.850	248.813
512770	0.805	254.655	253.850	248.845
512780	0.780	254.655	253.875	249.057
512786.411	0.764	254.655	253.891	249.177
512790	0.755	254.655	253.900	249.204
512800	0.755	254.655	253.900	249.256
512810	0.755	254.655	253.900	249.355
512820	0.755	254.655	253.900	249.467
512830	0.755	254.655	253.900	249.641
512840	0.755	254.655	253.900	249.818
512850	0.755	254.655	253.900	250.027
512860	0.755	254.654	253.899	250.355
512870	0.755	254.649	253.894	250.676
512880	0.755	254.640	253.885	251.046
512890	0.755	254.628	253.873	251.465
512900	0.755	254.614	253.859	251.846
512910	0.755	254.600	253.845	252.229
512920	0.755	254.585	253.830	252.563
512930	0.755	254.571	253.816	252.779
512940	0.755	254.557	253.802	253.064
512950	0.755	254.543	253.788	253.319
512960	0.755	254.529	253.774	253.587
512970	0.755	254.514	253.759	253.759
512980	0.755	254.500	253.745	253.929
512990	0.755	254.486	253.731	254.054
513000	0.755	254.472	253.717	254.105
513010	0.755	254.457	253.702	254.101
513020	0.755	254.443	253.688	254.057
513030	0.755	254.429	253.674	254.015
513040	0.755	254.415	253.660	253.984
513050	0.755	254.401	253.646	253.986
513060	0.755	254.386	253.631	253.961
513070	0.755	254.372	253.617	253.943
513080	0.755	254.358	253.603	253.870
513090	0.755	254.344	253.589	253.739
513100	0.755	254.329	253.574	253.758
513110	0.755	254.315	253.560	253.661
513120	0.755	254.301	253.546	253.486
513130	0.755	254.287	253.532	253.294
513140	0.755	254.273	253.518	253.099
513150	0.755	254.258	253.503	252.950
513160	0.755	254.244	253.489	252.922
513170	0.755	254.230	253.475	252.852
513180	0.755	254.216	253.461	252.738
513190	0.755	254.202	253.447	252.616
513200	0.755	254.187	253.432	252.482
513210	0.755	254.173	253.418	252.386
513220	0.755	254.159	253.404	252.230
513230	0.755	254.145	253.390	252.048
513240	0.755	254.130	253.375	251.883
513250	0.755	254.116	253.361	251.706
513260	0.755	254.102	253.347	251.536
513270	0.755	254.088	253.333	251.345
513280	0.755	254.074	253.319	251.131

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

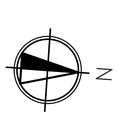
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

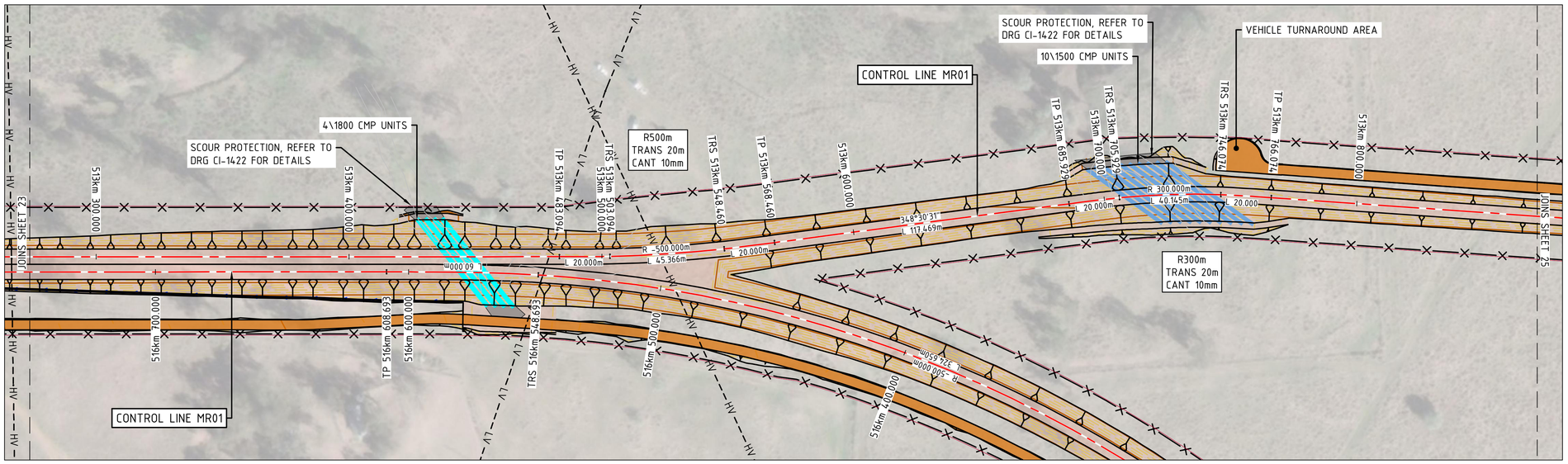
DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

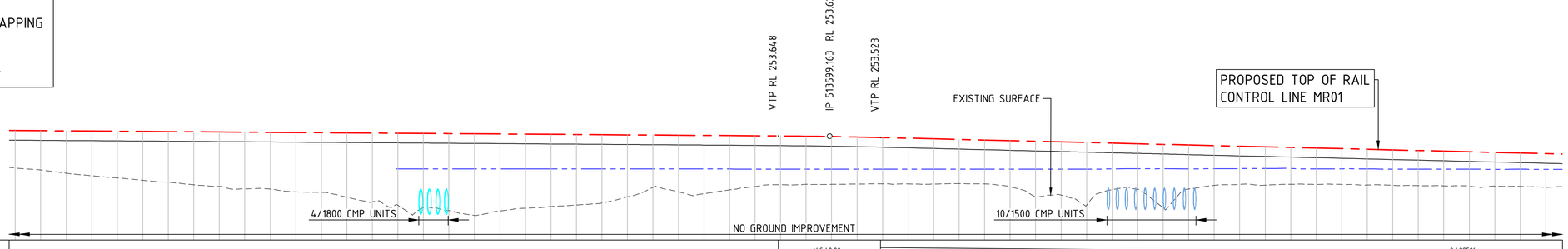
TITLE: PLAN AND PROFILE SHEET 23

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1123	B

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:24:59 PM







PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL

CULVERT BASE SLAB LEVEL																				
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.074	254.059	254.045	254.031	254.017	254.002	253.988	253.974	253.960	253.946	253.931	253.917	253.903	253.889	253.874	253.860	253.846	253.832	253.818	253.803
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.319	253.304	253.290	253.276	253.262	253.247	253.233	253.219	253.205	253.191	253.176	253.162	253.148	253.134	253.119	253.105	253.091	253.077	253.063	253.048
NATURAL SURFACE LEVELS	251.131	250.978	250.727	250.536	250.367	250.171	250.019	249.815	249.690	249.492	249.485	249.262	249.236	248.851	248.483	248.213	248.040	247.808	247.421	247.770
CHAINAGE	513280	513290	513300	513310	513320	513330	513340	513350	513360	513370	513380	513390	513400	513410	513420	513430	513440	513450	513460	513470

CULVERT BASE SLAB LEVEL																				
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	253.789	253.775	253.761	253.746	253.732	253.718	253.704	253.690	253.675	253.661	253.647	253.628	253.600	253.564	253.519	253.471	253.423	253.374	253.326	253.278
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.034	253.020	253.006	252.991	252.977	252.963	252.949	252.935	252.920	252.906	252.892	252.873	252.845	252.809	252.764	252.716	252.668	252.619	252.571	252.523
NATURAL SURFACE LEVELS	247.985	248.117	248.226	248.391	248.873	249.622	249.266	249.124	249.427	249.683	249.835	249.858	249.855	249.882	249.903	249.897	249.879	249.911	249.887	249.674
CHAINAGE	513480	513490	513500	513510	513520	513530	513540	513550	513560	513570	513580	513590	513600	513610	513620	513630	513640	513650	513660	513670

CULVERT BASE SLAB LEVEL																					
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	253.230	253.181	253.133	253.085	253.037	252.988	252.940	252.892	252.844	252.795	252.747	252.699	252.651	252.602	252.554	252.506	252.458	252.409	252.361	252.313	252.265
TOP OF CAPPING & TOP OF CULVERT LEVELS	252.475	252.426	252.378	252.330	252.282	252.233	252.185	252.137	252.089	252.040	251.992	251.944	251.896	251.847	251.799	251.751	251.703	251.654	251.606	251.558	251.510
NATURAL SURFACE LEVELS	248.891	249.020	248.226	249.436	249.466	248.026	249.492	249.771	249.854	249.800	249.869	249.846	249.853	249.800	249.781	249.756	249.738	249.716	249.715	249.694	249.627
CHAINAGE	513680	513690	513700	513710	513720	513730	513740	513750	513760	513770	513780	513790	513800	513810	513820	513830	513840	513850	513860	513870	513880

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

REV	DATE	DESCRIPTION	RVD

REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

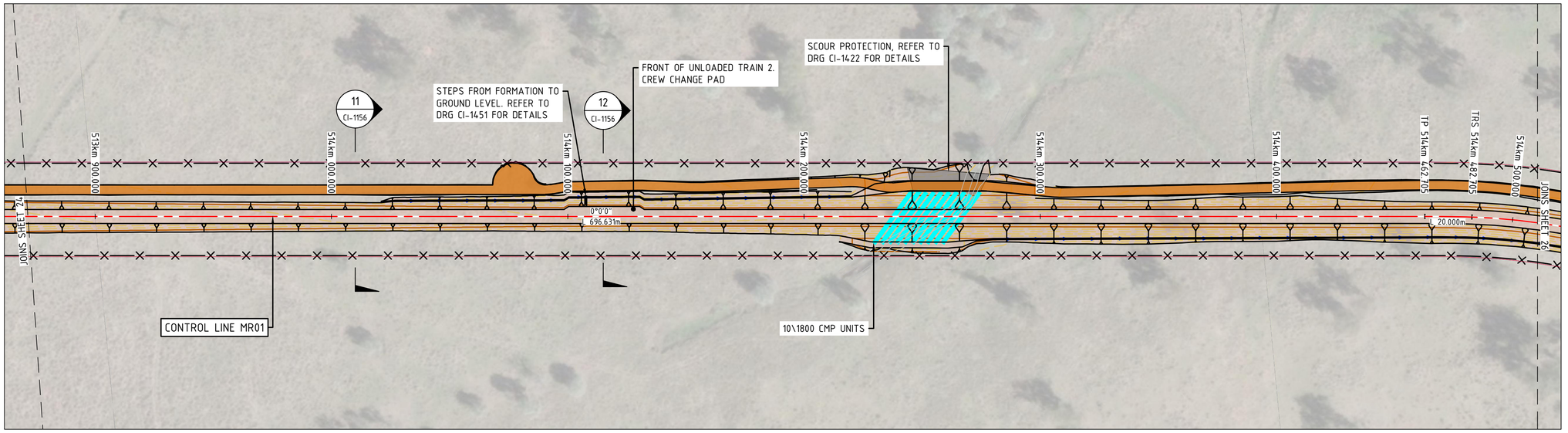
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 24

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1124	B

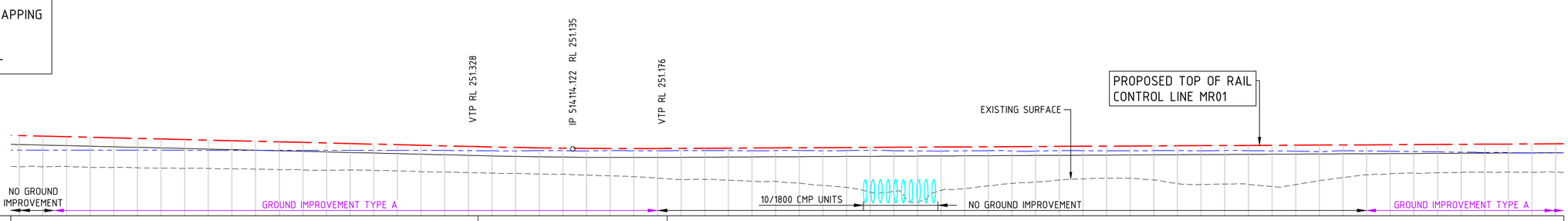


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- — — RAIL CENTRELINE
- ═ TOP OF CULVERT / CAPPING
- - - - EXISTING SURFACE
- — · — 1% AEP FLOOD LEVEL



CHAINAGE	CULVERT BASE SLAB LEVEL	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
513880		0.755	252.265	251.510	249.627
513890		0.755	252.216	251.461	249.626
513900		0.755	252.168	251.413	249.653
513910		0.755	252.120	251.365	249.579
513920		0.755	252.072	251.317	249.568
513930		0.755	252.023	251.268	249.540
513940		0.755	251.975	251.220	249.509
513950		0.755	251.927	251.172	249.493
513960		0.755	251.879	251.124	249.490
513970		0.755	251.830	251.075	249.453
513980		0.755	251.782	251.027	249.426
513990		0.755	251.734	250.979	249.386
514000		0.755	251.686	250.931	249.359
514010		0.755	251.637	250.882	249.340
514020		0.755	251.589	250.834	249.350
514030		0.755	251.541	250.786	249.324
514040		0.755	251.493	250.738	249.280
514050		0.755	251.444	250.689	249.210
514060		0.755	251.396	250.641	249.184
514070		0.755	251.348	250.593	249.143
514080		0.755	251.301	250.546	249.089
514090		0.755	251.261	250.506	249.060
514100		0.755	251.228	250.473	249.016
514110		0.755	251.202	250.447	249.003
514120		0.755	251.184	250.429	248.925
514130		0.755	251.173	250.418	248.861
514140		0.755	251.169	250.414	248.789
514150		0.755	251.173	250.418	248.664
514160		0.755	251.183	250.428	248.547
514170		0.755	251.193	250.438	248.564
514180		0.755	251.203	250.448	248.492
514190		0.755	251.214	250.459	248.408
514200		0.755	251.224	250.469	248.393
514210		0.755	251.234	250.479	248.235
514220		0.755	251.245	250.490	248.050
514230		0.755	251.255	250.500	247.874
514240		0.755	251.266	250.511	247.483
514250		0.755	251.276	250.521	247.542
514260		0.755	251.286	250.531	246.679
514270		0.755	251.297	250.542	247.628
514280		0.755	251.307	250.552	247.779
514290		0.755	251.317	250.562	248.024
514300		0.755	251.328	250.573	248.224
514310		0.755	251.338	250.583	248.348
514320		0.755	251.349	250.594	248.509
514330		0.755	251.359	250.604	248.604
514340		0.755	251.369	250.614	248.669
514350		0.755	251.380	250.625	248.654
514360		0.755	251.390	250.635	248.510
514370		0.755	251.400	250.645	248.210
514380		0.755	251.411	250.656	248.134
514390		0.755	251.421	250.666	248.170
514400		0.755	251.431	250.676	248.144
514410		0.755	251.442	250.687	247.954
514420		0.755	251.452	250.697	248.118
514430		0.755	251.463	250.708	248.461
514440		0.755	251.473	250.718	248.714
514450		0.755	251.483	250.728	248.945
514460		0.755	251.494	250.739	249.035
514470		0.755	251.504	250.749	249.090
514480		0.755	251.514	250.759	249.125
514490		0.755	251.525	250.770	249.155
514500		0.755	251.535	250.780	249.171
514510		0.755	251.546	250.791	249.179
514520		0.755	251.556	250.801	249.164
514530		0.755	251.566	250.811	249.164

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS
REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

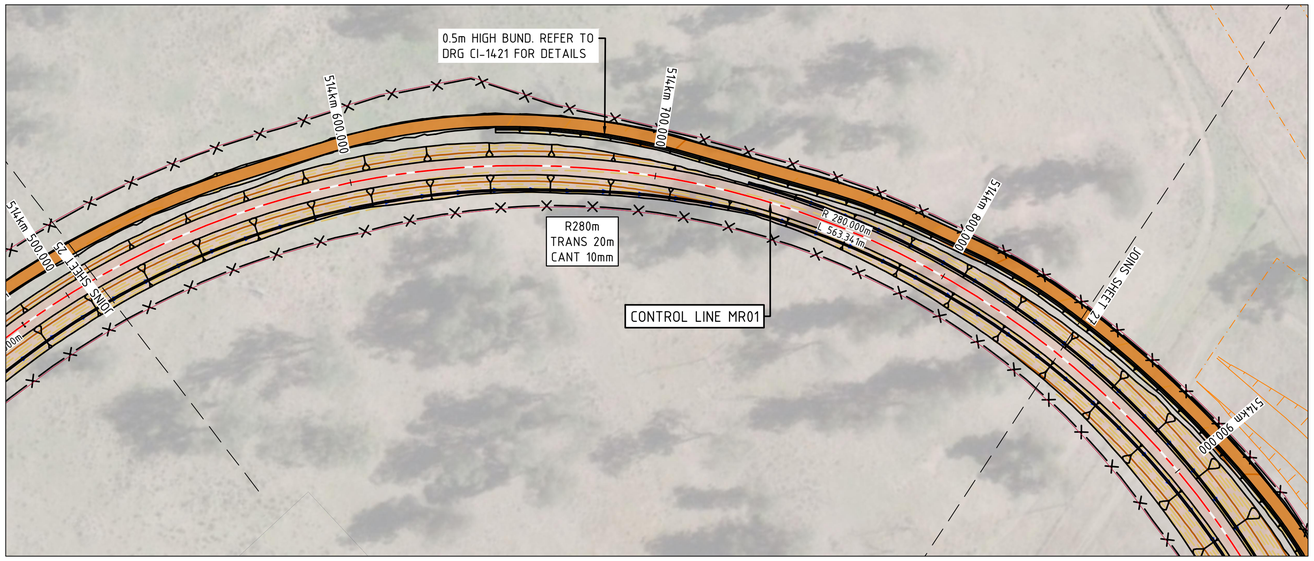
DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 25

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1125	B

26/07/2023 4:25:10 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:25:10 PM

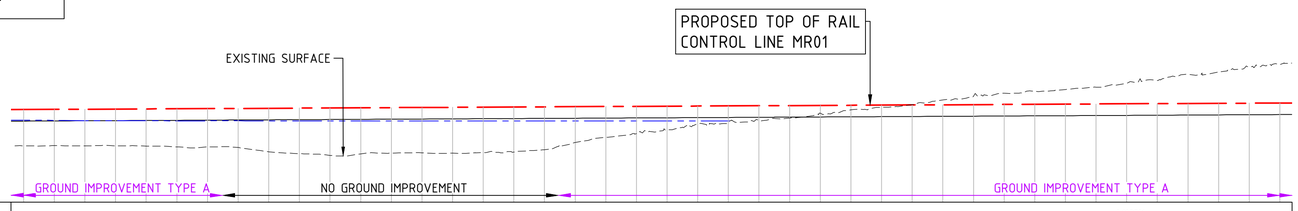


PLAN

SCALE 1:1000

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL



DATUM 245.5

GRADES: 0.1037% 1414.2377m

HORIZONTAL CURVES: R280

CULVERT BASE SLAB LEVEL:

RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	251.535	251.546	251.556	251.566	251.577	251.587	251.597	251.608	251.618	251.629	251.639	251.649	251.660	251.670	251.680	251.691	251.701	251.712	251.722	251.732	251.743
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.780	250.791	250.801	250.811	250.822	250.832	250.842	250.853	250.863	250.874	250.884	250.894	250.905	250.915	250.925	250.936	250.946	250.957	250.967	250.977	250.988
NATURAL SURFACE LEVELS	249.171	249.179	249.164	249.164	249.149	249.105	249.101	249.056	248.779	248.659	248.546	248.636	248.687	248.706	248.685	248.726	248.755	248.917	249.391	249.719	249.969
CHAINAGE	514500	514510	514520	514530	514540	514550	514560	514570	514580	514590	514600	514610	514620	514630	514640	514650	514660	514670	514680	514690	514700

RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	251.753	251.763	251.774	251.784	251.794	251.805	251.815	251.826	251.836	251.846	251.857	251.867	251.877	251.888	251.898	251.909	251.919	251.929	251.940	251.950	251.960
TOP OF CAPPING & TOP OF CULVERT LEVELS	250.998	251.008	251.019	251.029	251.039	251.050	251.060	251.071	251.081	251.091	251.102	251.112	251.122	251.133	251.143	251.154	251.164	251.174	251.185	251.195	251.205
NATURAL SURFACE LEVELS	250.198	250.595	250.723	250.806	250.979	251.304	251.511	251.687	251.849	252.155	252.416	252.601	252.730	252.846	252.999	253.251	253.435	253.838	253.982	254.287	254.462
CHAINAGE	514710	514720	514730	514740	514750	514760	514770	514780	514790	514800	514810	514820	514830	514840	514850	514860	514870	514880	514890	514900	514910

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

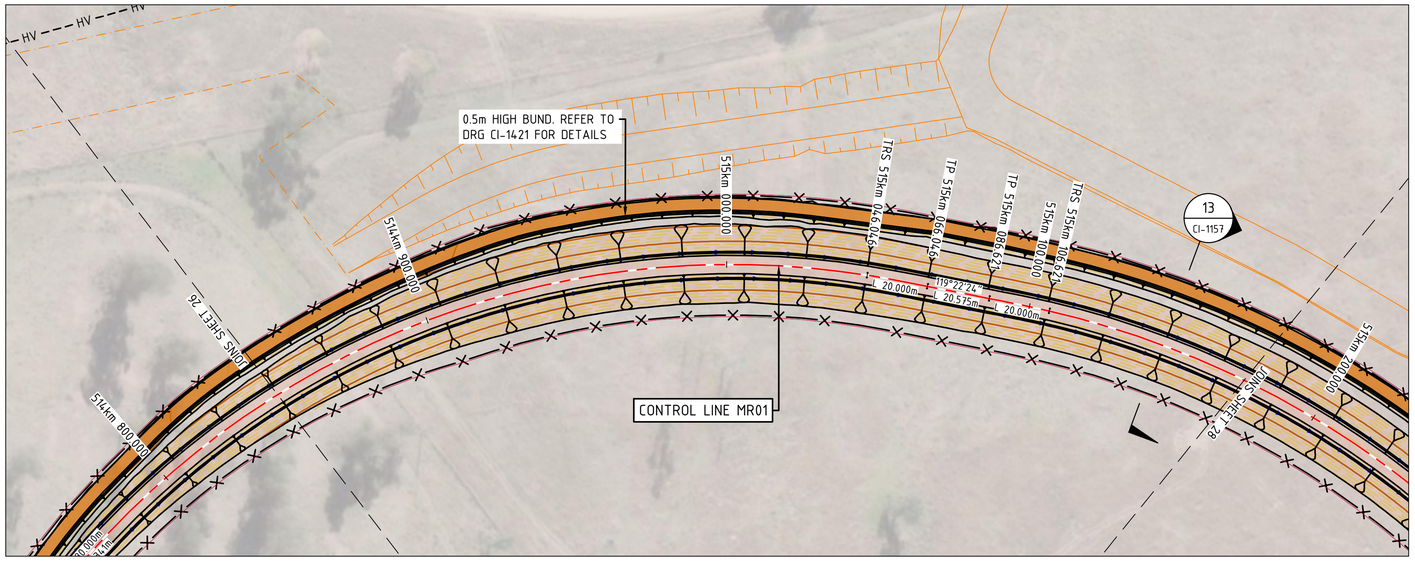
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 26

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1126	B

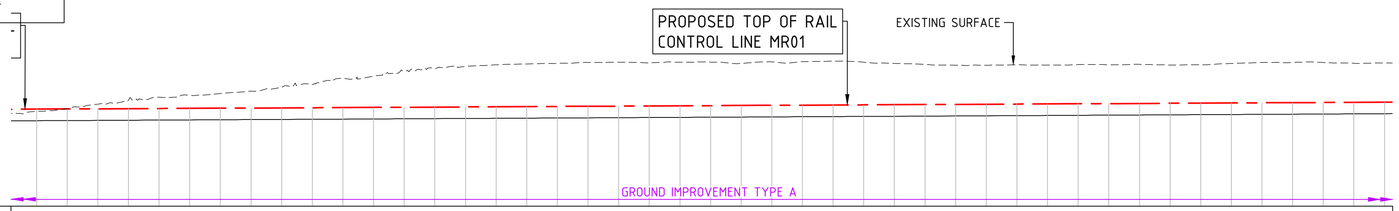


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - -	EXISTING SURFACE
— · — ·	1% AEP FLOOD LEVEL



GRADES									0.1037% 1414.2377m														
HORIZONTAL CURVES																							
CULVERT BASE SLAB LEVEL																							
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	251.826	251.836	251.846	251.857	251.867	251.877	251.888	251.898	251.909	251.919	251.929	251.940	251.950	251.960	251.971	251.981	251.992	252.002	252.012	252.023	252.033	252.043	252.054
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.071	251.081	251.091	251.102	251.112	251.122	251.133	251.143	251.154	251.164	251.174	251.185	251.195	251.205	251.216	251.226	251.237	251.247	251.257	251.268	251.278	251.288	251.299
NATURAL SURFACE LEVELS	251.687	251.849	252.155	252.416	252.601	252.730	252.846	252.999	253.251	253.435	253.838	253.982	254.287	254.462	254.616	254.722	254.778	254.816	254.875	254.892	254.847	254.894	254.900
CHAINAGE	514780	514790	514800	514810	514820	514830	514840	514850	514860	514870	514880	514890	514900	514910	514920	514930	514940	514950	514960	514970	514980	514990	515000

GRADES																						
HORIZONTAL CURVES						20m				20m												
CULVERT BASE SLAB LEVEL																						
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	252.064	252.075	252.085	252.095	252.106	252.116	252.126	252.137	252.147	252.157	252.168	252.178	252.189	252.199	252.209	252.220	252.230	252.240	252.251	252.261	252.272	252.282
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.309	251.320	251.330	251.340	251.351	251.361	251.371	251.382	251.392	251.402	251.413	251.423	251.434	251.444	251.454	251.465	251.475	251.485	251.496	251.506	251.517	251.527
NATURAL SURFACE LEVELS	254.811	254.913	254.927	254.961	254.889	254.813	254.751	254.693	254.694	254.729	254.711	254.734	254.729	254.750	254.711	254.720	254.807	254.869	254.877	254.870	254.819	254.837
CHAINAGE	515010	515020	515030	515040	515050	515060	515070	515080	515090	515100	515110	515120	515130	515140	515150	515160	515170	515180	515190	515200	515210	515220

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

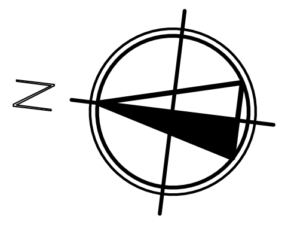
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

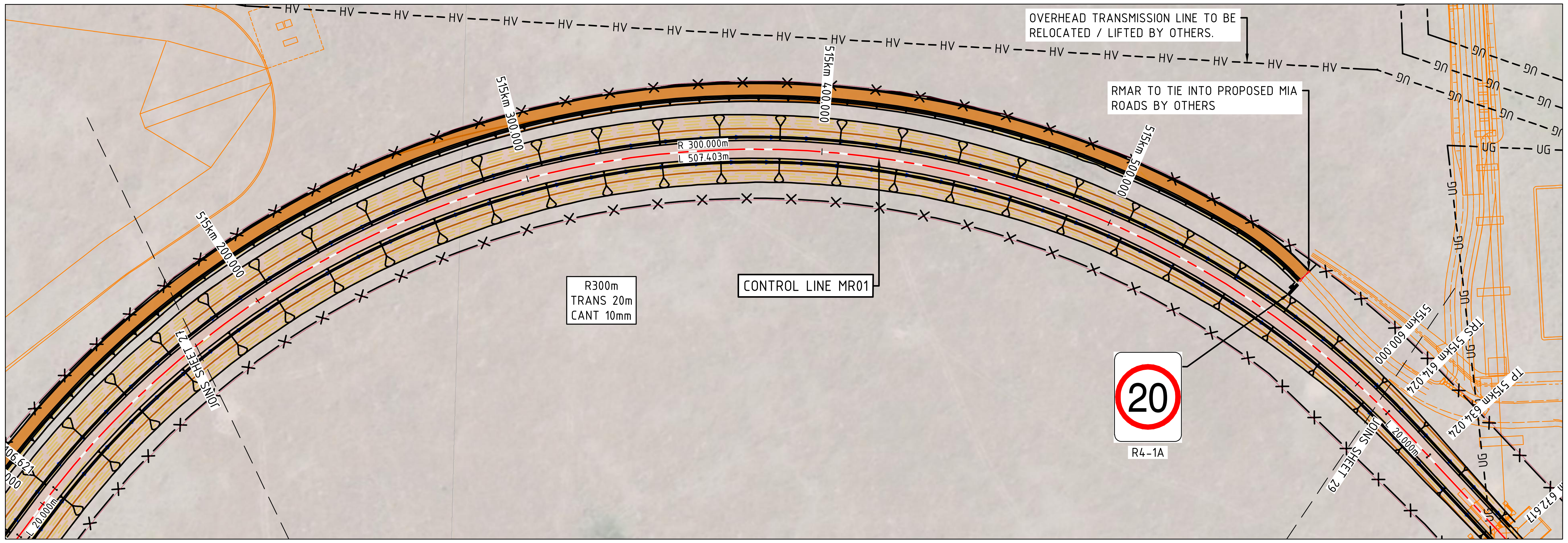
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 27

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1127	B



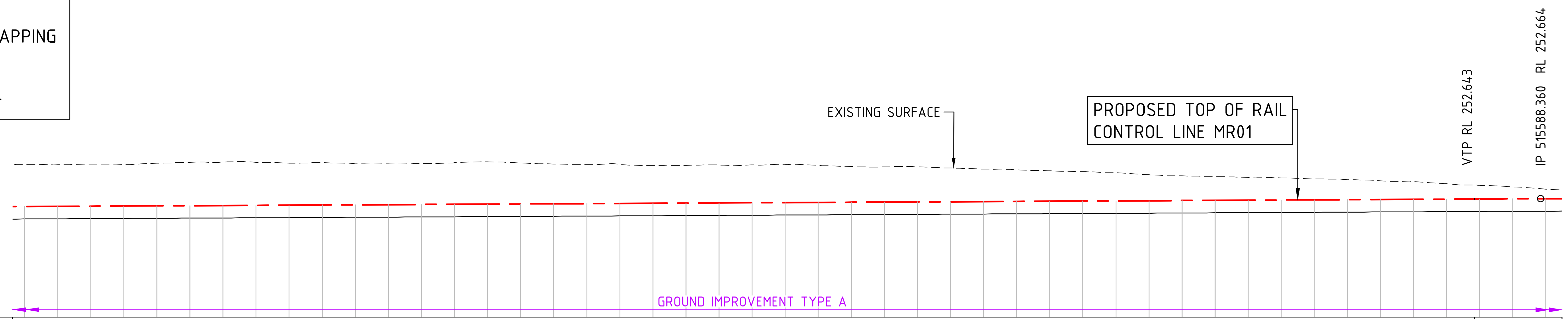


PLAN

SCALE 1:1000

LEGEND (PROFILE)

🟥 — —	RAIL CENTRELINE
═	TOP OF CULVERT / CAPPING
- - - -	EXISTING SURFACE
— · — ·	1% AEP FLOOD LEVEL



DATUM 245.5

GRADES																							
HORIZONTAL CURVES																							
CULVERT BASE SLAB LEVEL																							
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	252.189	252.199	252.209	252.220	252.230	252.240	252.251	252.261	252.272	252.282	252.292	252.303	252.313	252.323	252.334	252.344	252.355	252.365	252.375	252.386	252.396	252.406	252.417
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.434	251.444	251.454	251.465	251.475	251.485	251.496	251.506	251.517	251.527	251.537	251.548	251.558	251.568	251.579	251.589	251.600	251.610	251.620	251.631	251.641	251.651	251.662
NATURAL SURFACE LEVELS	254.729	254.750	254.711	254.720	254.807	254.869	254.877	254.870	254.819	254.837	254.805	254.817	254.793	254.838	254.893	254.830	254.764	254.724	254.743	254.677	254.681	254.703	254.709
CHAINAGE	515130	515140	515150	515160	515170	515180	515190	515200	515210	515220	515230	515240	515250	515260	515270	515280	515290	515300	515310	515320	515330	515340	515350

GRADES																								V.C.40.00m R38567.3712
HORIZONTAL CURVES	R300																							
CULVERT BASE SLAB LEVEL																								
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	252.427	252.438	252.448	252.458	252.469	252.479	252.489	252.500	252.510	252.521	252.531	252.541	252.552	252.562	252.572	252.583	252.593	252.603	252.614	252.624	252.635	252.645	252.654	252.660
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.672	251.683	251.693	251.703	251.714	251.724	251.734	251.745	251.755	251.766	251.776	251.786	251.797	251.807	251.817	251.828	251.838	251.848	251.859	251.869	251.880	251.890	251.899	251.905
NATURAL SURFACE LEVELS	254.735	254.675	254.605	254.590	254.590	254.525	254.458	254.417	254.350	254.299	254.230	254.113	254.041	254.005	253.940	253.921	253.859	253.819	253.752	253.706	253.567	253.474	253.379	253.235
CHAINAGE	515360	515370	515380	515390	515400	515410	515420	515430	515440	515450	515460	515470	515480	515490	515500	515510	515520	515530	515540	515550	515560	515570	515580	515590

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

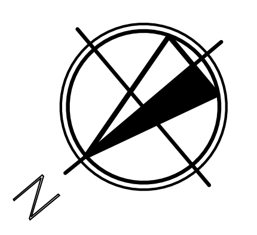
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

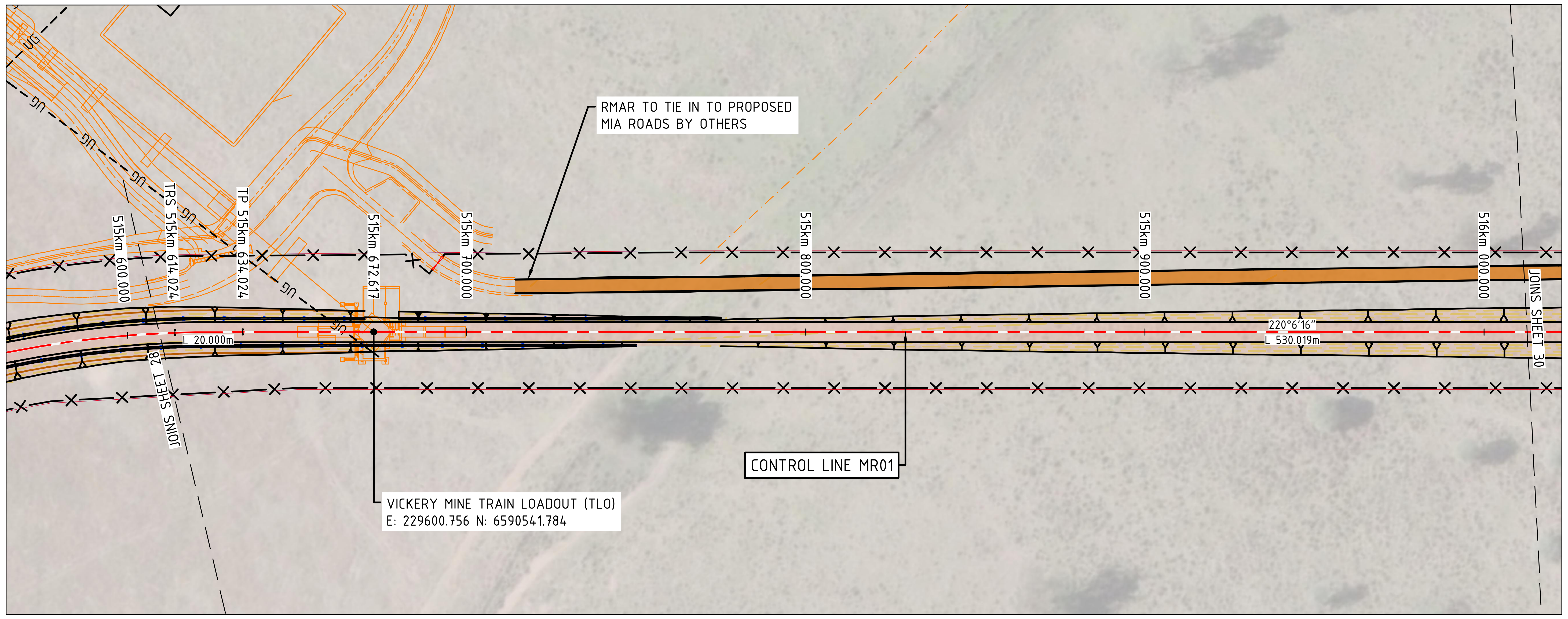
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 28

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1128	B



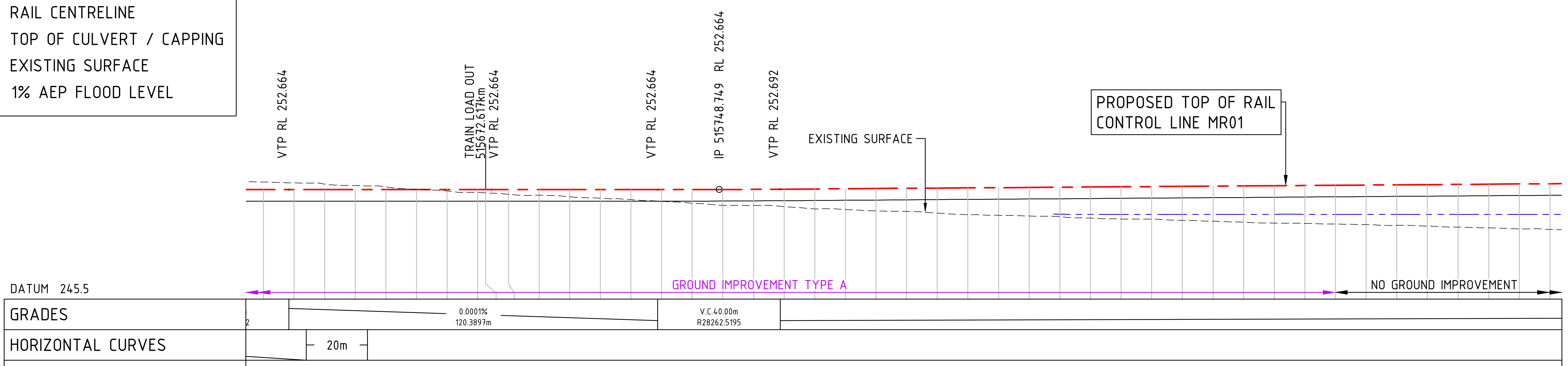


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - -	EXISTING SURFACE
— · — ·	1% AEP FLOOD LEVEL



RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	252.663	252.664	252.664	252.664	252.664	252.664	252.664	252.664	252.664	252.664	252.664	252.664	252.664	252.664	252.664
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.908	251.909	251.909	251.909	251.909	251.909	251.909	251.909	251.909	251.909	251.909	251.909	251.909	251.909	251.909
NATURAL SURFACE LEVELS	253.158	253.105	253.026	252.928	252.844	252.680	252.580	252.478	252.452	252.357	252.293	252.194	252.108	252.006	251.887
CHAINAGE	515600	515610	515620	515630	515640	515650	515660	515670	515672.617	515680	515690	515700	515710	515720	515730

RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	252.666	252.672	252.681	252.694	252.708	252.722	252.737	252.751	252.765	252.779	252.793	252.807	252.821	252.836	252.850
TOP OF CAPPING & TOP OF CULVERT LEVELS	251.911	251.917	251.926	251.939	251.953	251.967	251.982	251.996	252.010	252.024	252.038	252.052	252.066	252.081	252.095
NATURAL SURFACE LEVELS	251.772	251.633	251.624	251.558	251.402	251.365	251.275	251.246	251.121	251.025	250.982	250.937	250.890	250.809	250.745
CHAINAGE	515740	515750	515760	515770	515780	515790	515800	515810	515820	515830	515840	515850	515860	515870	515880

RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	252.864	252.878	252.892	252.906	252.921	252.935	252.949	252.963	252.977	252.991	253.005	253.020	253.034	253.048
TOP OF CAPPING & TOP OF CULVERT LEVELS	252.109	252.123	252.137	252.151	252.166	252.180	252.194	252.208	252.222	252.236	252.250	252.265	252.279	252.293
NATURAL SURFACE LEVELS	250.744	250.655	250.608	250.535	250.477	250.455	250.416	250.379	250.328	250.282	250.209	250.164	250.098	250.061
CHAINAGE	515890	515900	515910	515920	515930	515940	515950	515960	515970	515980	515990	516000	516010	516020

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

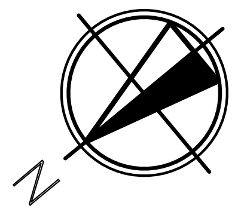
DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

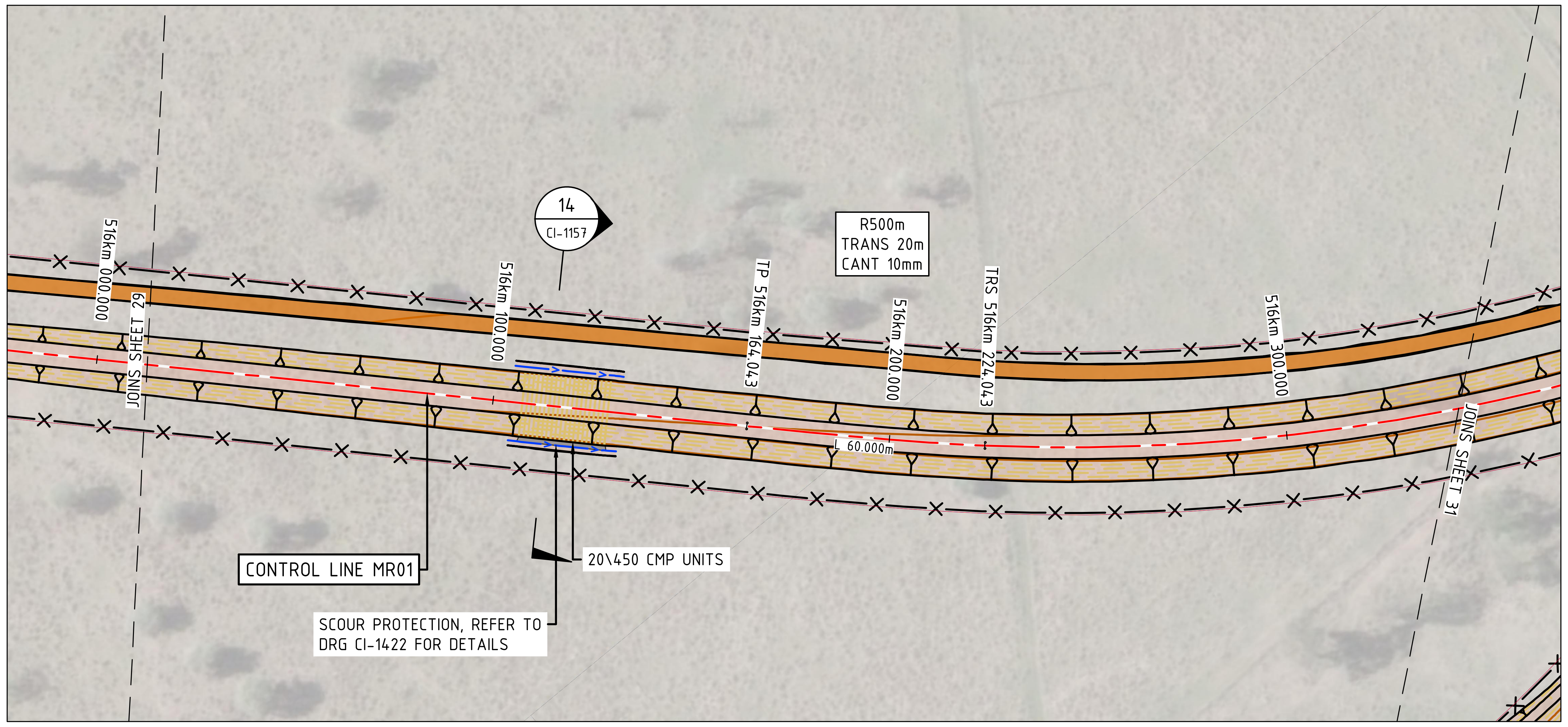
TITLE
PLAN AND PROFILE
SHEET 29

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1129	B

26/07/2023 4:22:42 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:22:42 PM



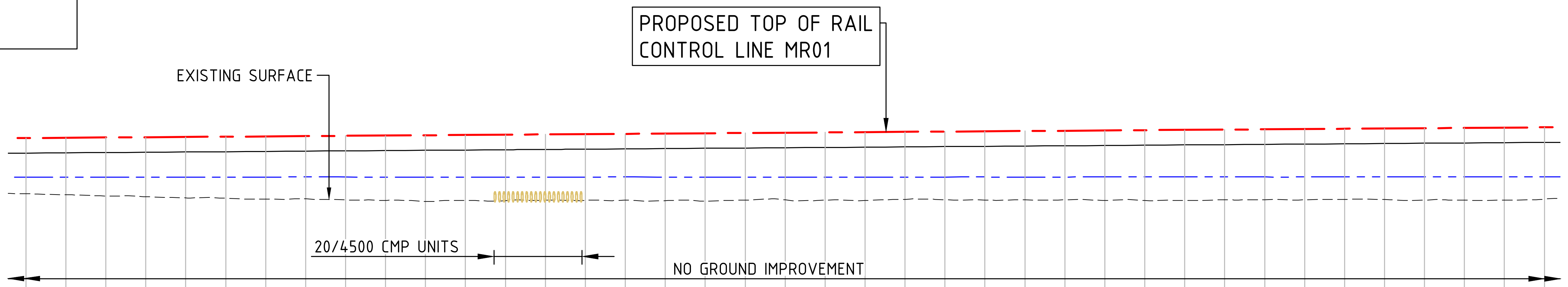


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — —— — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - - - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL



GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	253.005	253.020	253.034	253.048	253.062	253.076	253.090	253.105	253.119	253.133	253.147	253.161	253.175
TOP OF CAPPING & TOP OF CULVERT LEVELS	252.250	252.265	252.279	252.293	252.307	252.321	252.335	252.350	252.364	252.378	252.392	252.406	252.420
NATURAL SURFACE LEVELS	250.209	250.164	250.098	250.061	250.002	249.986	249.944	249.956	249.899	249.880	249.829	249.866	249.860
CHAINAGE	515990	516000	516010	516020	516030	516040	516050	516060	516070	516080	516090	516100	516110

GRADES													
HORIZONTAL CURVES								60m					
CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	253.189	253.204	253.218	253.232	253.246	253.260	253.274	253.289	253.303	253.317	253.331	253.345	253.359
TOP OF CAPPING & TOP OF CULVERT LEVELS	252.434	252.449	252.463	252.477	252.491	252.505	252.519	252.534	252.548	252.562	252.576	252.590	252.604
NATURAL SURFACE LEVELS	249.884	249.878	249.891	249.863	249.845	249.890	249.904	249.888	249.875	249.930	249.910	249.899	249.901
CHAINAGE	516120	516130	516140	516150	516160	516170	516180	516190	516200	516210	516220	516230	516240

GRADES													
HORIZONTAL CURVES													
CULVERT BASE SLAB LEVEL													
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	253.373	253.388	253.402	253.416	253.430	253.444	253.458	253.472	253.487	253.501	253.515	253.529	253.543
TOP OF CAPPING & TOP OF CULVERT LEVELS	252.618	252.633	252.647	252.661	252.675	252.689	252.703	252.717	252.732	252.746	252.760	252.774	252.788
NATURAL SURFACE LEVELS	249.901	249.876	249.867	249.874	249.904	249.911	249.906	249.927	249.921	249.893	249.892	249.898	249.941
CHAINAGE	516250	516260	516270	516280	516290	516300	516310	516320	516330	516340	516350	516360	516370

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS | REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

BG&E

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

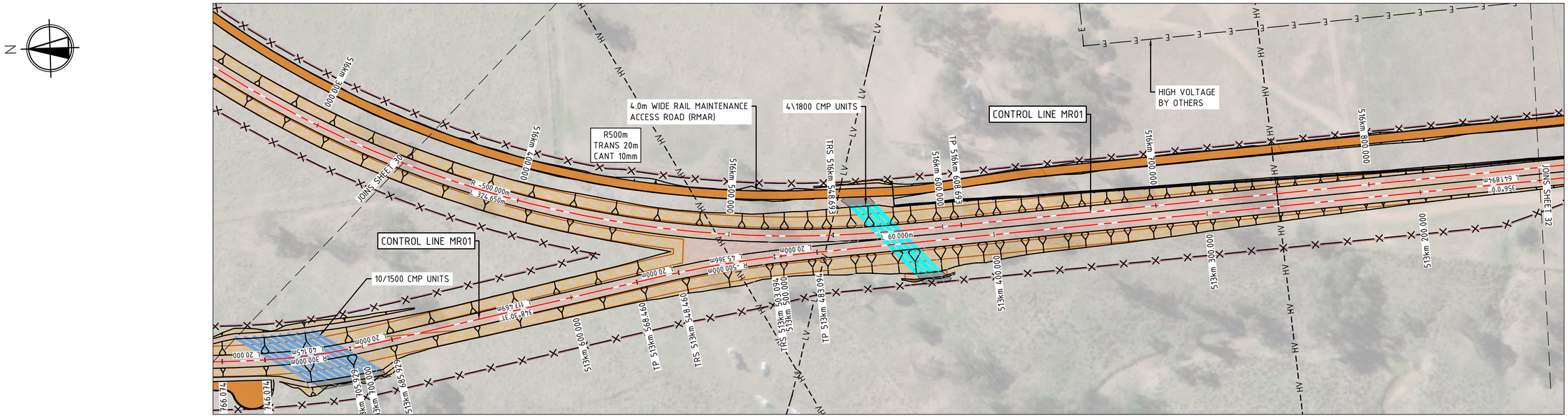
DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE
PLAN AND PROFILE
SHEET 30

PROJECT No. BE22007-6610
DRAWING No. CI-1130
REV. B

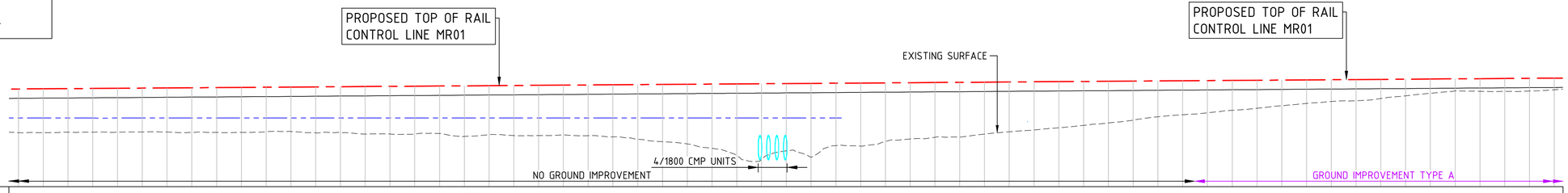
26/07/2023 4:22:49 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:22:49 PM



PLAN

SCALE 1:1000



GRADES	0.145% 1366.767m
HORIZONTAL CURVES	R-500 / 60m
CULVERT BASE SLAB LEVEL	

CHAINAGE	RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	PROPOSED RAIL LEVELS	TOP OF CAPPING & TOP OF CULVERT LEVELS	NATURAL SURFACE LEVELS
516270	0.755	253.402	252.647	249.867
516280	0.755	253.416	252.661	249.874
516290	0.755	253.430	252.675	249.904
516300	0.755	253.444	252.689	249.911
516310	0.755	253.458	252.703	249.906
516320	0.755	253.472	252.717	249.927
516330	0.755	253.487	252.732	249.921
516340	0.755	253.501	252.746	249.893
516350	0.755	253.515	252.760	249.892
516360	0.755	253.529	252.774	249.898
516370	0.755	253.543	252.788	249.941
516380	0.755	253.557	252.802	249.965
516390	0.755	253.572	252.817	249.854
516400	0.755	253.586	252.831	249.883
516410	0.755	253.600	252.845	249.754
516420	0.755	253.614	252.859	249.764
516430	0.755	253.628	252.873	249.751
516440	0.755	253.642	252.887	249.802
516450	0.755	253.656	252.901	249.567
516460	0.755	253.671	252.916	249.710
516470	0.755	253.685	252.930	249.631
516480	0.755	253.699	252.944	249.638
516490	0.755	253.713	252.958	249.687
516500	0.755	253.727	252.972	249.628
516510	0.755	253.741	252.986	249.528
516520	0.755	253.756	253.001	249.338
516530	0.755	253.770	253.015	249.139
516540	0.755	253.784	253.029	248.962
516550	0.755	253.798	253.043	248.605
516560	0.755	253.812	253.057	248.022
516570	0.755	253.826	253.071	247.704
516580	0.755	253.840	253.085	248.404
516590	0.755	253.855	253.100	247.874
516600	0.755	253.869	253.114	248.828
516610	0.755	253.883	253.128	248.776
516620	0.755	253.897	253.142	249.162
516630	0.755	253.911	253.156	249.363
516640	0.755	253.925	253.170	249.498
516650	0.755	253.940	253.185	249.521
516660	0.755	253.954	253.199	249.760
516670	0.755	253.968	253.213	249.945
516680	0.755	253.982	253.227	250.089
516690	0.755	253.996	253.241	250.265
516700	0.755	254.010	253.255	250.465
516710	0.755	254.024	253.269	250.655
516720	0.755	254.039	253.284	250.883
516730	0.755	254.053	253.298	251.153
516740	0.755	254.067	253.312	251.320
516750	0.755	254.081	253.326	251.477
516760	0.755	254.095	253.340	251.668
516770	0.755	254.109	253.354	251.843
516780	0.755	254.124	253.369	252.052
516790	0.755	254.138	253.383	252.239
516800	0.755	254.152	253.397	252.391
516810	0.755	254.166	253.411	252.447
516820	0.755	254.180	253.425	252.631
516830	0.755	254.194	253.439	252.852
516840	0.755	254.208	253.453	253.059
516850	0.755	254.223	253.468	253.239
516860	0.755	254.237	253.482	253.219
516870	0.755	254.251	253.496	253.210
516880	0.755	254.265	253.510	253.236
516890	0.755	254.279	253.524	253.338

LEGEND (PROFILE)

- RAIL CENTRELINE
- TOP OF CULVERT / CAPPING
- EXISTING SURFACE
- 1% AEP FLOOD LEVEL

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

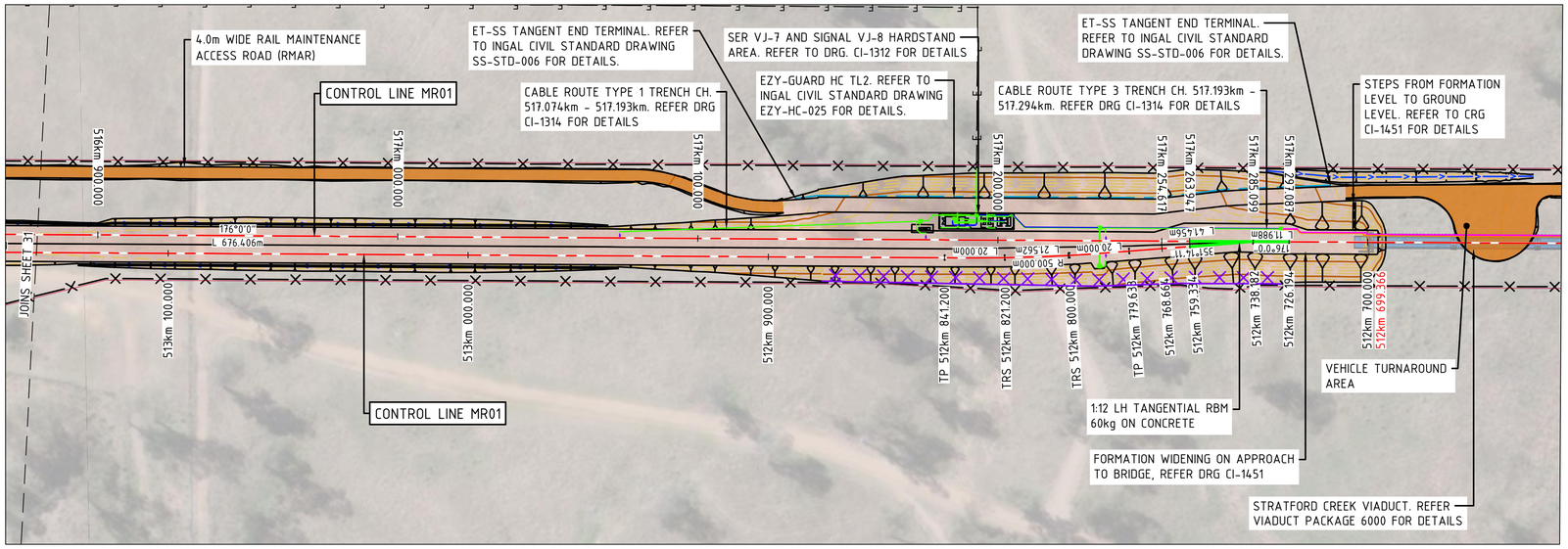
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: PLAN AND PROFILE SHEET 31

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1131	B

C:\12DS\DATA\AUR2DSYN01\BE22007 IB201751 VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1101 - CI-1132.DWG
26/07/2023 4:23:06 PM

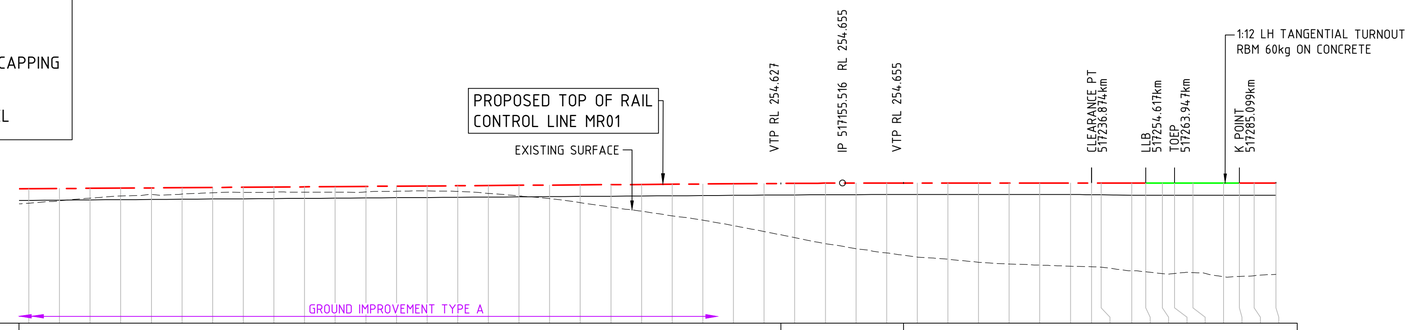


PLAN

SCALE 1:1000

LEGEND (PROFILE)

— — —— — —	RAIL CENTRELINE
═══	TOP OF CULVERT / CAPPING
- - - - - -	EXISTING SURFACE
— · — · —	1% AEP FLOOD LEVEL



DATUM 245.5

GRADES																
HORIZONTAL CURVES																
CULVERT BASE SLAB LEVEL																
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.279	254.293	254.308	254.322	254.336	254.350	254.364	254.378	254.392	254.407	254.421	254.435	254.449	254.463	254.477	254.492
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.524	253.538	253.553	253.567	253.581	253.595	253.609	253.623	253.637	253.652	253.666	253.680	253.694	253.708	253.722	253.737
NATURAL SURFACE LEVELS	253.338	253.485	253.669	253.808	253.913	253.933	254.021	254.043	254.062	254.053	254.063	254.070	254.117	254.141	254.109	253.979
CHAINAGE	516890	516900	516910	516920	516930	516940	516950	516960	516970	516980	516990	517000	517010	517020	517030	517040

GRADES											V.C.40.00m R28262.5300					
HORIZONTAL CURVES																
CULVERT BASE SLAB LEVEL																
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755	0.755
PROPOSED RAIL LEVELS	254.506	254.520	254.534	254.548	254.562	254.576	254.591	254.605	254.619	254.633	254.643	254.651	254.654	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.751	253.765	253.779	253.793	253.807	253.821	253.836	253.850	253.864	253.878	253.888	253.896	253.899	253.900	253.900	253.900
NATURAL SURFACE LEVELS	253.813	253.638	253.375	253.097	252.814	252.504	252.226	251.871	251.492	251.082	250.696	250.366	250.088	249.818	249.686	249.480
CHAINAGE	517050	517060	517070	517080	517090	517100	517110	517120	517130	517140	517150	517160	517170	517180	517190	517200

GRADES					0.0001% 121.5710m									
HORIZONTAL CURVES														
CULVERT BASE SLAB LEVEL														
RAIL HEIGHT FROM FORMATION / TOP OF CULVERT	0.755	0.755	0.755	0.765	0.772	0.798	0.805	0.805	0.805	0.805	0.805	0.805	0.805	0.805
PROPOSED RAIL LEVELS	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655	254.655
TOP OF CAPPING & TOP OF CULVERT LEVELS	253.900	253.900	253.900	253.890	253.883	253.857	253.850	253.850	253.850	253.850	253.850	253.850	253.850	253.850
NATURAL SURFACE LEVELS	249.364	249.292	249.222	249.189	249.163	248.922	248.853	248.743	248.748	248.806	248.539	248.554	248.598	248.691
CHAINAGE	517210	517220	517230	517236.874	517240	517250	517254.617	517260	517263.947	517270	517280	517285.099	517290	517297.087

PROPOSED RAIL PROFILE (MR01) CONTINUED

SCALE: H 1:1000
V 1:200

NOTES

1. FOR NOTES AND LEGEND REFER TO DRGS CI-1001 & CI-1002.
2. FOR OVERALL SHEET LAYOUT REFER TO DRG CI-1100.
3. FOR COMBINED SERVICE ROUTE DETAILS REFER TO DRGS CI-1301 - CI-1320.
4. FOR GROUND IMPROVEMENT DETAILS REFER TO DRG CI-1251.
5. FOR RCBC SCHEDULE REFER TO DRG CI-1811

0 2 4 6 8 10 12m
SCALE 1:200 AT A1 SIZE

0 10 20 30 40 50 60m
SCALE 1:1000 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
B	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
A	09.06.23	ISSUED FOR 85% DETAILED DESIGN	MP				

REVISIONS　REVISIONS

CLIENT
WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com

PROJECT
VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

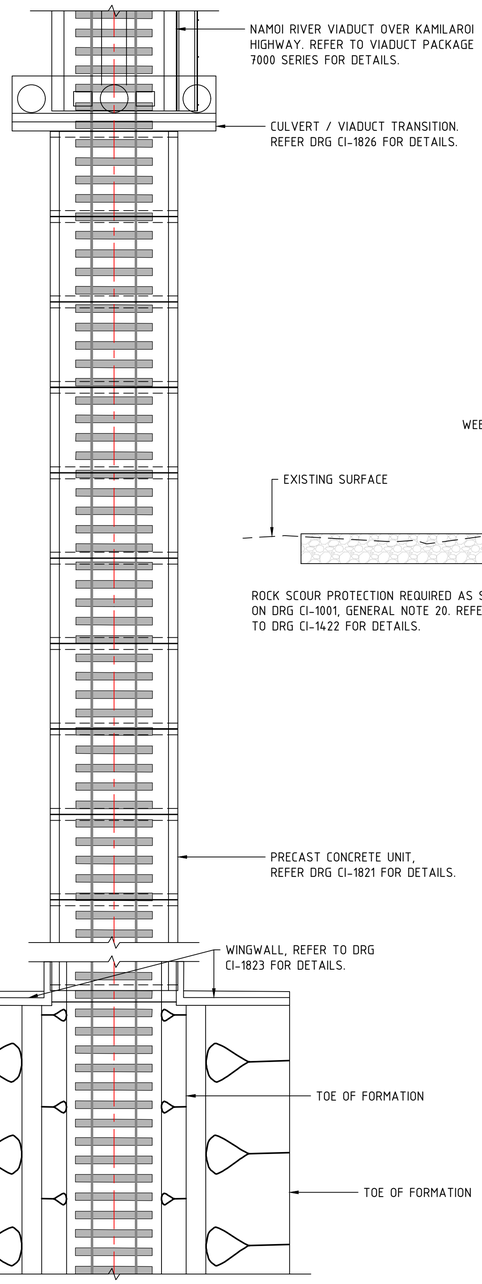
STATUS
ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

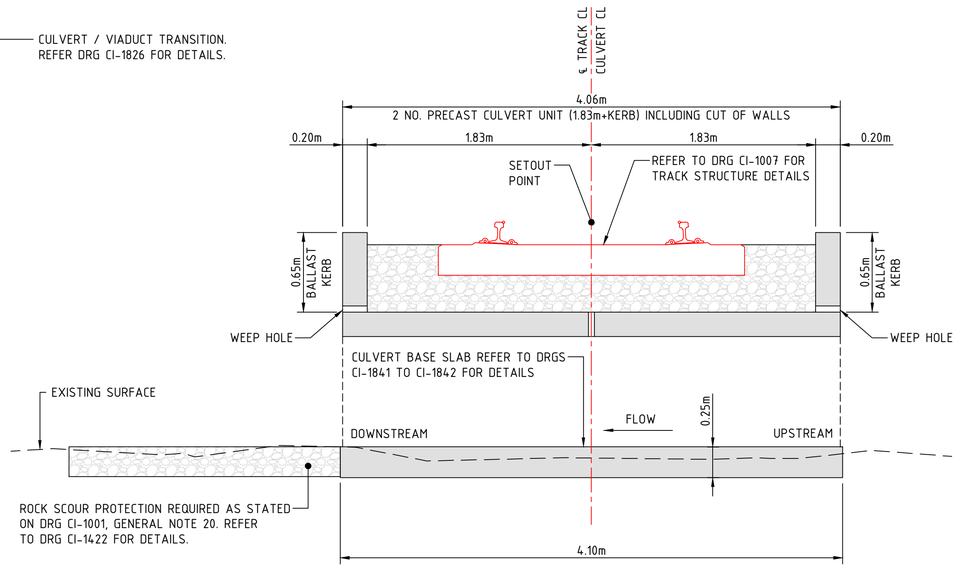
TITLE
PLAN AND PROFILE
SHEET 32

PROJECT No.	DRAWING No.	REV.
BE22007-6610	CI-1132	B



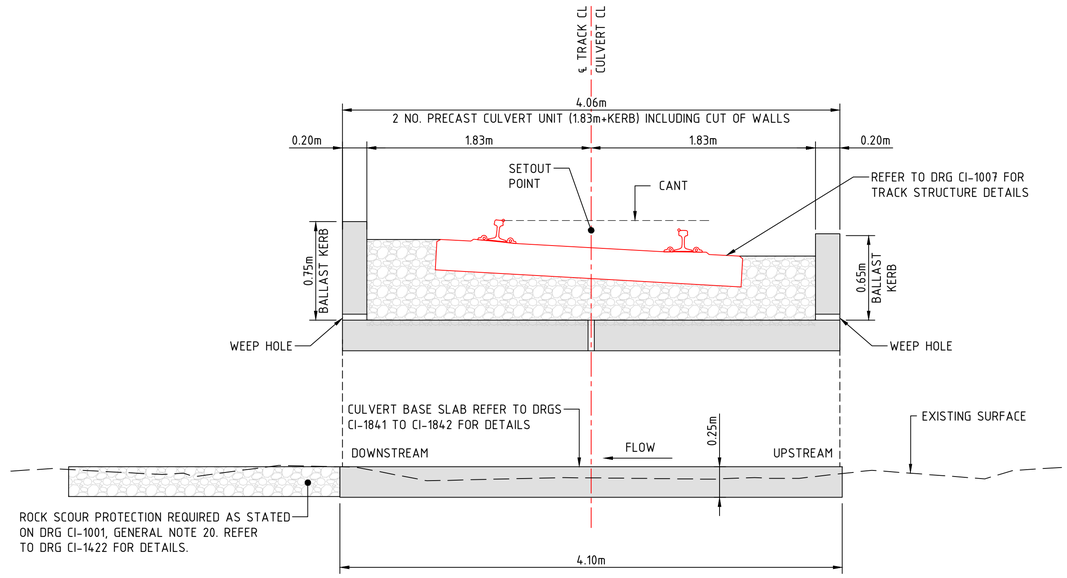
PLAN - RCBC CULVERT RAIL

SCALE 1:100



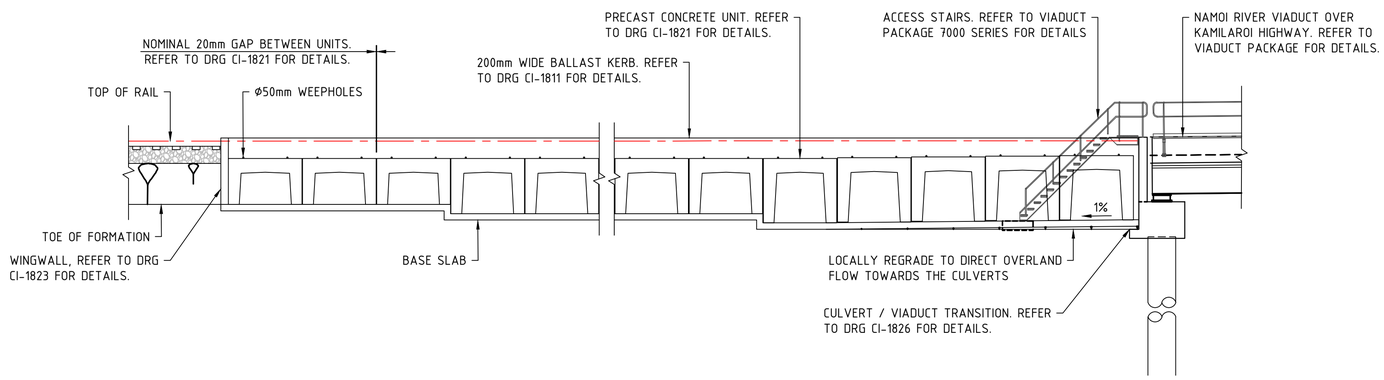
RCBC CULVERT (STRAIGHT)

SCALE 1:25



RCBC CULVERT (CURVE)

SCALE 1:25



TYPICAL ELEVATION OF RCBC CULVERT RAIL

SCALE 1:100

NOTES

1. HIGH-RESISTIVITY CRUSHED ROCK MUST COMPRISE MINIMUM OF 150mm THICK COVER OF 95% MATERIAL d=150mm WITH NO MORE THAN 1% FINES, PLACED ON ROADBASE MATERIAL.
2. REFER TO DRG CI-1251 FOR GROUND IMPROVEMENT DETAILS.

0 0.25 0.5 0.75 1.0 1.25 1.5m
SCALE 1:25 AT A1 SIZE

0 1 2 3 4 5 6m
SCALE 1:100 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: RCBC GENERAL ARRANGEMENT

PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1801	A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1801.DWG
26/07/2023 4:34:37 PM

RCBC BANKS SCHEDULE - VICKERY RAIL LINE

CULVERT BANK	CULVERT TYPE	CHAINAGE START	CHAINAGE END	CULVERT SPAN	OVERALL CULVERT WIDTH	LEG HEIGHT	BARREL LENGTH	NO.	ALIGNMENT	BALLAST KERB LEFT SIDE	BALLAST KERB RIGHT SIDE	COMMENTS
-	-	km	km	m	m	m	m	-	-	m	m	
BANK 1A	RCBC	499396.115	499936.833	2.400	2.744	1.50	4.06	197	CURVE/ TRANSITION	0.75	0.65	
BANK 1B	RCBC	499936.833	501517.377	2.400	2.744	1.50	4.06	576	STRAIGHT	0.65	0.65	
BANK 2A	RCBC	501517.377	501604.417	2.400	2.720	1.20	4.06	32	STRAIGHT	0.65	0.65	
BANK 2B	RCBC	501604.417	502096.737	2.400	2.720	1.20	4.06	181	CURVE/ TRANSITION	0.75	0.65	
BANK 3A	RCBC	502096.737	502126.921	2.400	2.744	1.50	4.06	11	CURVE/ TRANSITION	0.75	0.65	
BANK 4A	RCBC	502126.921	502198.265	2.400	2.744	1.80	4.06	26	CURVE/ TRANSITION	0.75	0.65	
BANK 5A	RCBC	502198.265	502239.425	2.400	2.744	1.50	4.06	15	CURVE/ TRANSITION	0.75	0.65	
BANK 6A	RCBC	502239.425	502349.185	2.400	2.744	1.80	4.06	40	STRAIGHT	0.65	0.65	
BANK 7A	RCBC	502349.185	502439.737	2.400	2.744	1.50	4.06	33	CURVE/ TRANSITION	0.75	0.65	
BANK 8A	RCBC	502439.737	502516.569	2.400	2.744	1.80	4.06	28	CURVE/ TRANSITION	0.750	0.65	
BANK 9A	RCBC	502516.569	502583.001	2.400	2.768	2.10	4.06	24	CURVE/ TRANSITION	0.75	0.65	
BANK 9B	RCBC	502583.001	502976.057	2.400	2.768	2.10	4.06	142	STRAIGHT	0.65	0.65	
BANK 10A	RCBC	502976.057	503006.241	2.400	2.744	1.80	4.06	11	STRAIGHT	0.65	0.65	
BANK 11A	RCBC	503006.241	503044.657	2.400	2.744	1.50	4.06	14	STRAIGHT	0.65	0.65	
BANK 12A	RCBC	503044.657	503550.577	2.400	2.720	1.20	4.06	186	STRAIGHT	0.65	0.65	
BANK 13A	RCBC	503550.577	503890.833	2.400	2.744	1.50	4.06	124	STRAIGHT	0.65	0.65	
BANK 14A	RCBC	503890.833	504365.545	2.400	2.744	1.80	4.06	173	STRAIGHT	0.65	0.65	
BANK 14B	RCBC	504365.545	504645.433	2.400	2.744	1.80	4.06	102	CURVE/ TRANSITION	0.75	0.65	
BANK 15A	RCBC	504645.433	504673.113	2.400	2.768	2.10	4.06	10	CURVE/ TRANSITION	0.75	0.65	
BANK 16A	RCBC	504673.113	504778.297	2.400	2.768	2.40	4.06	38	CURVE/ TRANSITION	0.75	0.65	
BANK 17A	RCBC	504778.297	504853.033	2.400	2.768	2.10	4.06	27	STRAIGHT	0.65	0.65	
BANK 17B	RCBC	504853.033	505201.801	2.400	2.768	2.10	4.06	126	CURVE/ TRANSITION	0.75	0.65	
BANK 18A	RCBC	505201.801	505632.609	2.400	2.744	1.80	4.06	157	STRAIGHT	0.65	0.65	
BANK 19A	RCBC	505632.609	505712.881	2.400	2.768	2.10	4.06	29	STRAIGHT	0.65	0.65	
BANK 19B	RCBC	505712.881	505831.905	2.400	2.768	2.10	4.06	43	CURVE/ TRANSITION	0.75	0.65	
BANK 20A	RCBC	505831.905	505892.273	2.400	2.744	1.80	4.06	22	STRAIGHT	0.65	0.65	
BANK 20B	RCBC	505892.273	505974.593	2.400	2.744	1.80	4.06	30	CURVE/ TRANSITION	0.75	0.65	
BANK 21A	RCBC	505974.593	506013.009	2.400	2.744	1.50	4.06	14	CURVE/ TRANSITION	0.75	0.65	
BANK 21B	RCBC	506013.009	506199.601	2.400	2.744	1.50	4.06	68	STRAIGHT	0.65	0.65	
BANK 22A	RCBC	506199.601	507312.081	2.400	2.720	1.20	4.06	409	STRAIGHT	0.65	0.65	
BANK 22B	RCBC	507312.081	507369.201	2.400	2.720	1.20	4.06	21	CURVE/ TRANSITION	0.75	0.65	
BANK 23A	RCBC	507369.201	507583.233	2.400	2.744	1.50	4.06	78	CURVE/ TRANSITION	0.75	0.65	
BANK 23B	RCBC	507583.233	507638.113	2.400	2.744	1.50	4.06	20	STRAIGHT	0.65	0.65	
BANK 23C	RCBC	507638.113	507687.505	2.400	2.744	1.50	4.06	18	CURVE/ TRANSITION	0.75	0.65	
BANK 24A	RCBC	507687.505	507868.609	2.400	2.744	1.80	4.06	66	CURVE/ TRANSITION	0.75	0.65	
BANK 24B	RCBC	507868.609	507923.489	2.400	2.744	1.80	4.06	20	STRAIGHT	0.65	0.65	
BANK 25A	RCBC	507923.489	507989.921	2.400	2.768	2.10	4.06	24	STRAIGHT	0.65	0.65	
BANK 26A	RCBC	507989.921	508031.441	2.400	2.768	2.40	4.06	15	STRAIGHT	0.65	0.65	
BANK 27A	RCBC	508031.441	508053.585	2.400	2.768	2.10	4.06	8	STRAIGHT	0.65	0.65	50mm GAP ALLOWED BETWEEN ONE SET OF CULVERTS AT THIS BANK
BANK 28A	RCBC	508053.635	508819.211	2.400	2.744	1.80	4.06	279	STRAIGHT	0.65	0.65	150mm GAP ALLOWED BETWEEN ONE SET OF CULVERTS AT THIS BANK
BANK 29A	RCBC	508819.211	508866.267	2.400	2.768	2.10	4.06	17	STRAIGHT	0.65	0.65	
BANK 30A	RCBC	508866.267	508902.251	2.400	2.768	2.40	4.06	13	STRAIGHT	0.65	0.65	
BANK 31A	RCBC	508902.251	508930.171	2.400	2.792	2.70	4.06	10	STRAIGHT	0.65	0.65	

26/07/2023 4:34:47 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1811.DWG

REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP

REVISIONS

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

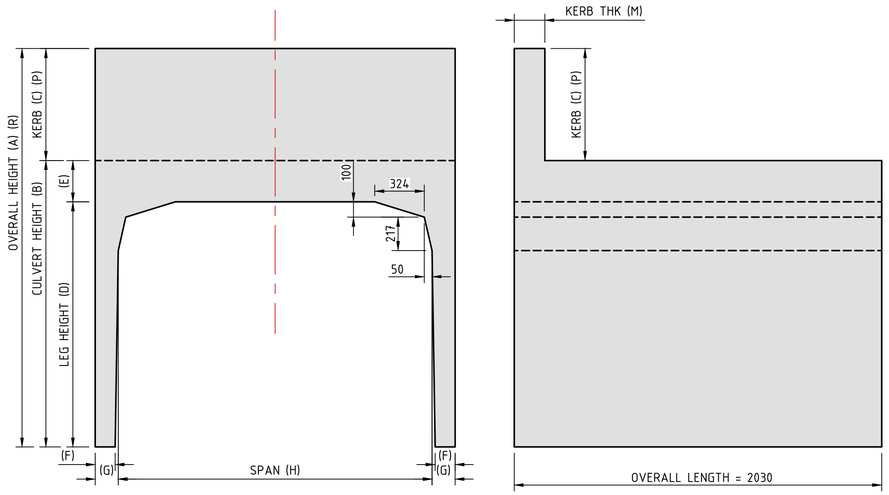
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: RCBC SCHEDULE

PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1811	A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1811.DWG
26/07/2023 4:34:47 PM

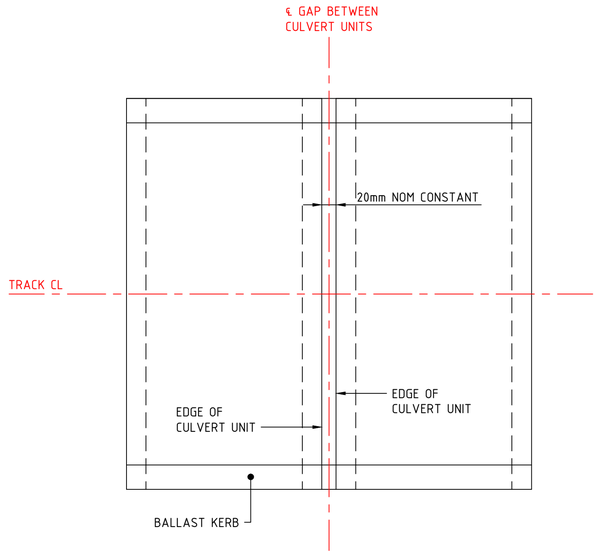


FRONT ELEVATION

SIDE ELEVATION

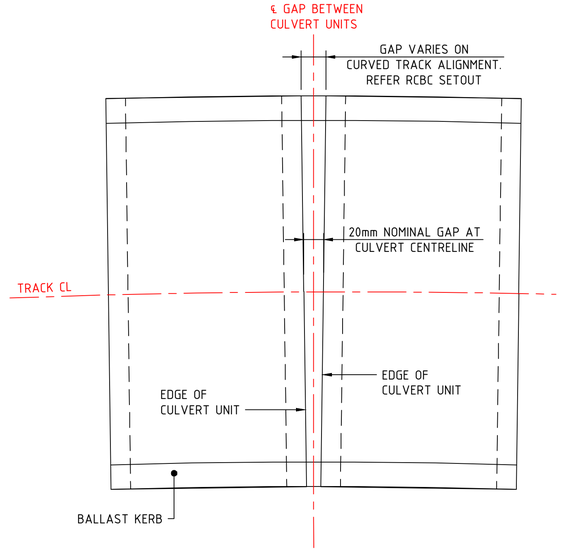
RCBC DETAIL

SCALE 1:20



CULVERT CELL SETOUT (STRAIGHT TRACK ALIGNMENT)

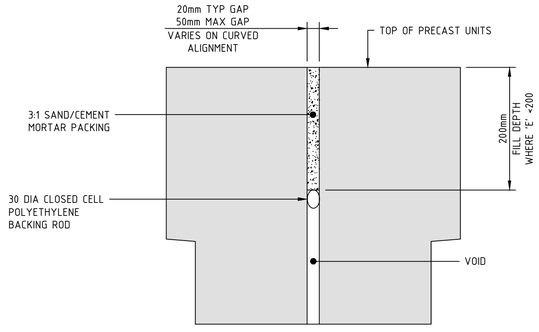
SCALE N.T.S



CULVERT CELL SETOUT (CURVED TRACK ALIGNMENT)

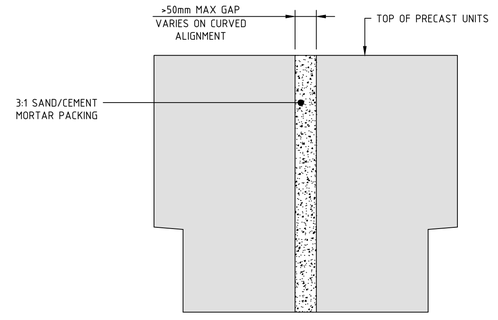
SCALE N.T.S

RCBC DIMENSION TABLE												
SIZE CLASS	SPAN (H)	LEG HEIGHT (D)	CULVERT HEIGHT. (B)	OVERALL WIDTH (J)	CROWN THK. (E)	BTM LEG WIDTH (F)	TOP LEG WIDTH (G)	OVERALL HEIGHT - STRAIGHT AND INNER CURVE (A)	OVERALL HEIGHT - OUTSIDE CURVE (R)	KERB HEIGHT - STRAIGHT AND INNER CURVE (C)	KERB HEIGHT - OUTSIDE CURVE (P)	KERB THK (M)
1200 x 900	1200	900	1075	1440	175	108	120	–	–	–	–	–
2400 x 900	2400	900	1120	2700	220	132	150	1770	1870	650	750	200
2400 x 1200	2400	1200	1420	2700	220	132	150	2070	2170	650	750	200
2400 x 1500	2400	1500	1740	2724	240	138	162	2390	2490	650	750	200
2400 x 1800	2400	1800	2060	2724	260	138	162	2710	2810	650	750	200
2400 x 2100	2400	2100	2370	2748	270	144	174	3020	3120	650	750	200
2400 x 2400	2400	2400	2670	2748	270	144	174	3320	3420	650	750	200
2400 x 2700	2400	2700	2980	2772	280	150	186	3630	3730	650	750	200



JOINT DETAIL BETWEEN CULVERT CELLS - TYPE A

SCALE 1:5



JOINT DETAIL BETWEEN CULVERT CELLS - TYPE B

SCALE 1:5

0 0.05 0.1 0.15 0.2 0.25 0.3m
SCALE 1:5 AT A1 SIZE

0 0.2 0.4 0.6 0.8 1.0 1.2m
SCALE 1:20 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

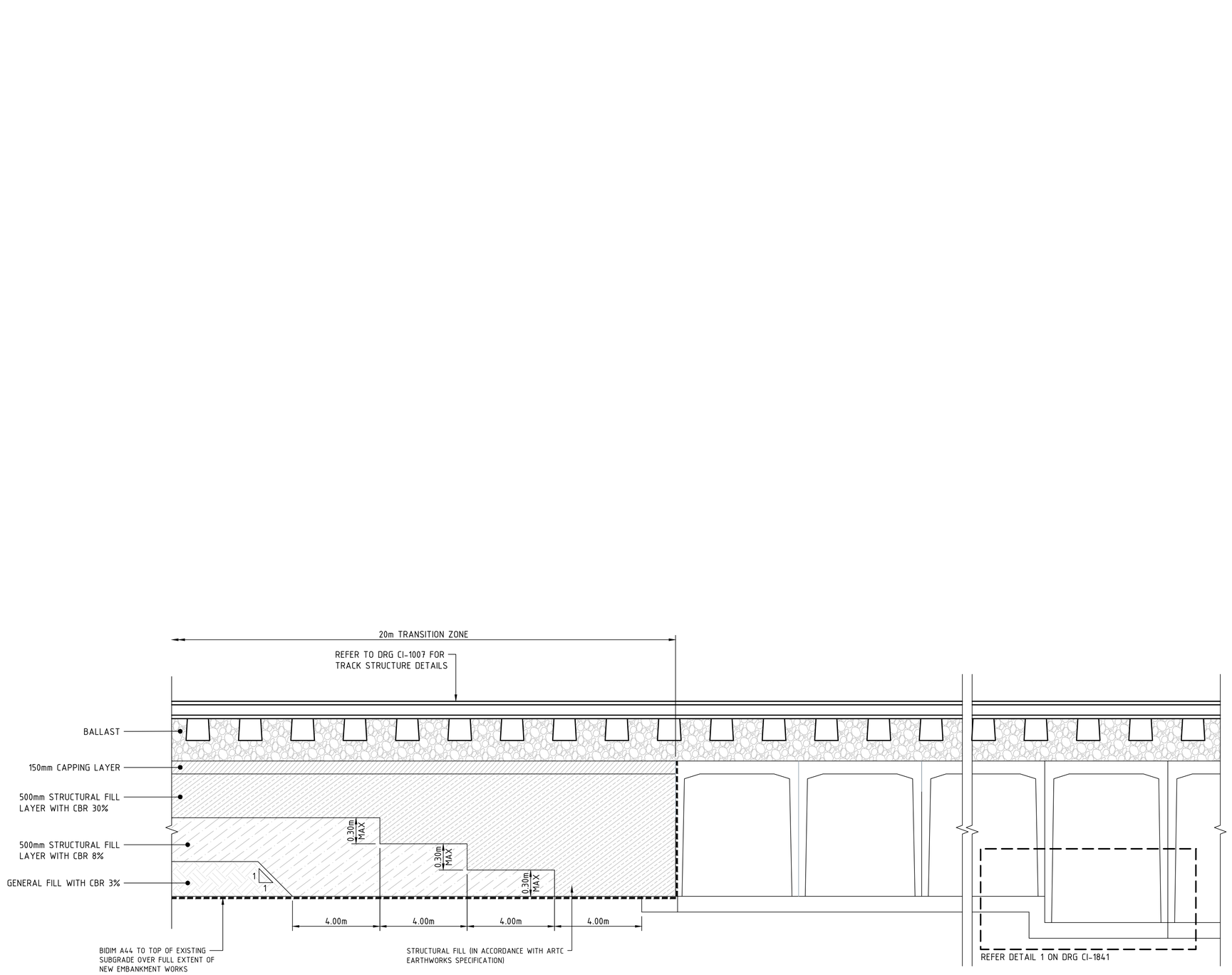
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: RCBC DETAILS SHEET 1

PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1821	A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP__101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1821 - CI-1826.DWG
26/07/2023 4:35:17 PM



TYPICAL BACKFILL DETAIL AT CULVERT TRANSITION

SCALE 1:25

NOTES

1. HIGH-RESISTIVITY CRUSHED ROCK MUST COMPRISE MINIMUM OF 150mm THICK COVER OF 95% MATERIAL d=150mm WITH NO MORE THAN 1% FINES, PLACED ON ROADBASE MATERIAL.
2. REFER TO DRG CI-1251 FOR GROUND IMPROVEMENT DETAILS.

0 0.25 0.5 0.75 1.0 1.25 1.5m
SCALE 1:25 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				

REVISIONS | REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

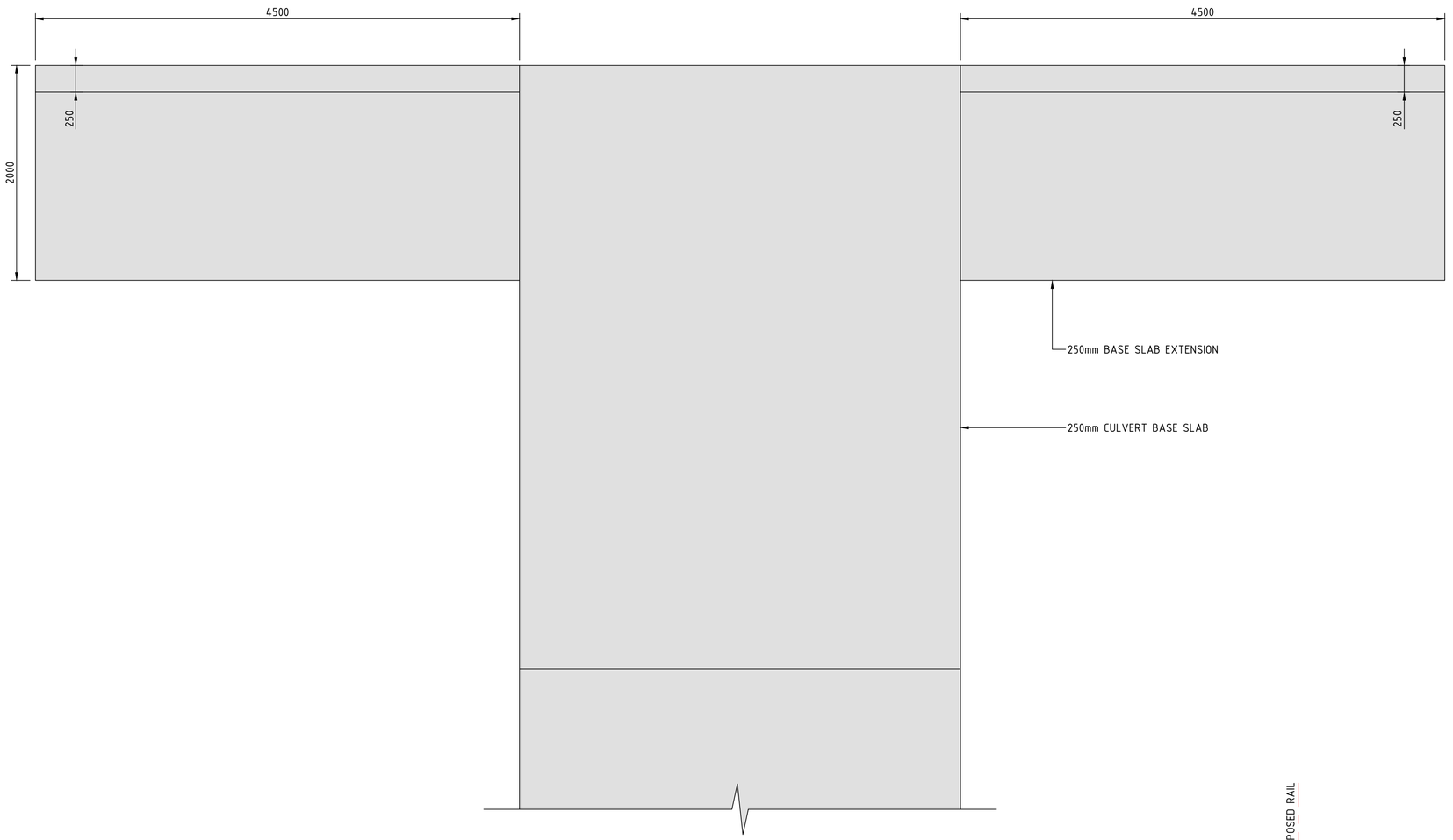
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

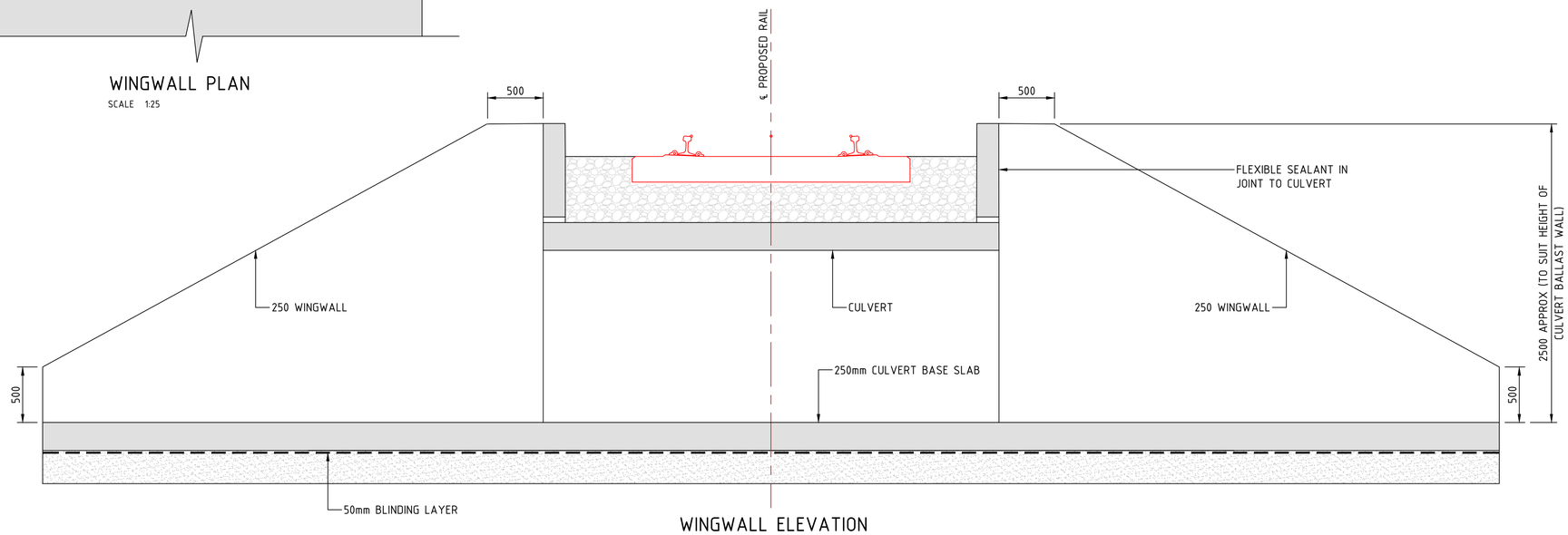
TITLE: RCBC DETAILS SHEET 2

PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1822	A

C:\12DS\DATA\AUR20DSYN01\BE22007 (B201751) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1821 - CI-1826.DWG
26/07/2023 4:35:12 PM



WINGWALL PLAN
SCALE 1:25



WINGWALL ELEVATION
SCALE 1:25

NOTES

- WALL AND BASE THICKNESS : 250mm
- CONCRETE STRENGTH : 40 MPa
- REINFORCEMENT : N20-150 EACH FACE AND EACH WAY
- COVER : 45MM TYP, 75MM CAST AGAINST GROUND

BASE SLAB AND WINGWALLS TO BE CAST MONOLITHIC WITH THE CULVERT BASE SLAB

0 0.25 0.5 0.75 1.0 1.25 1.5m
SCALE 1:25 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				

REVISIONS | REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

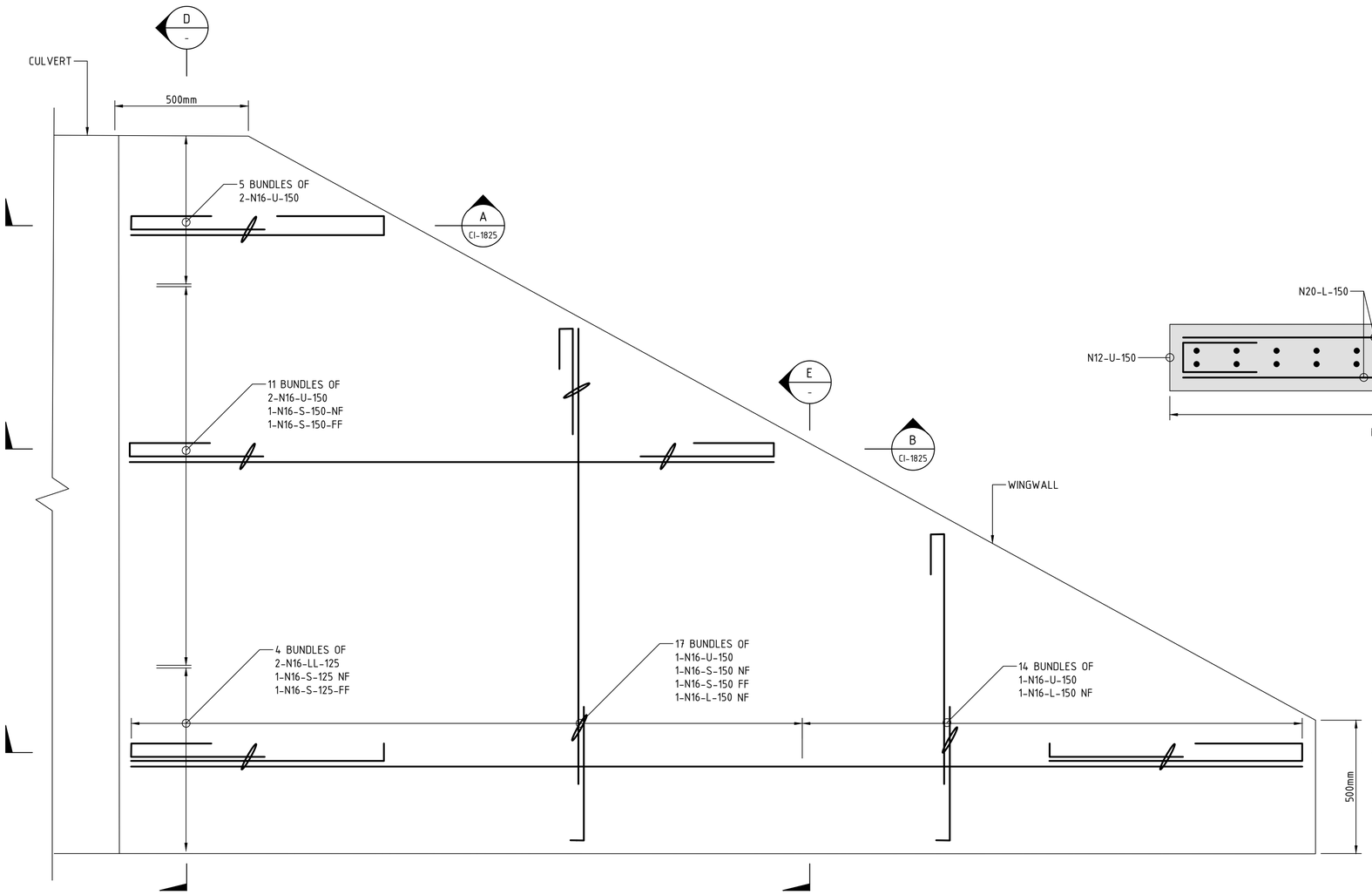
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	K. Undheim	R. Pan	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: RCBC DETAILS
SHEET 3

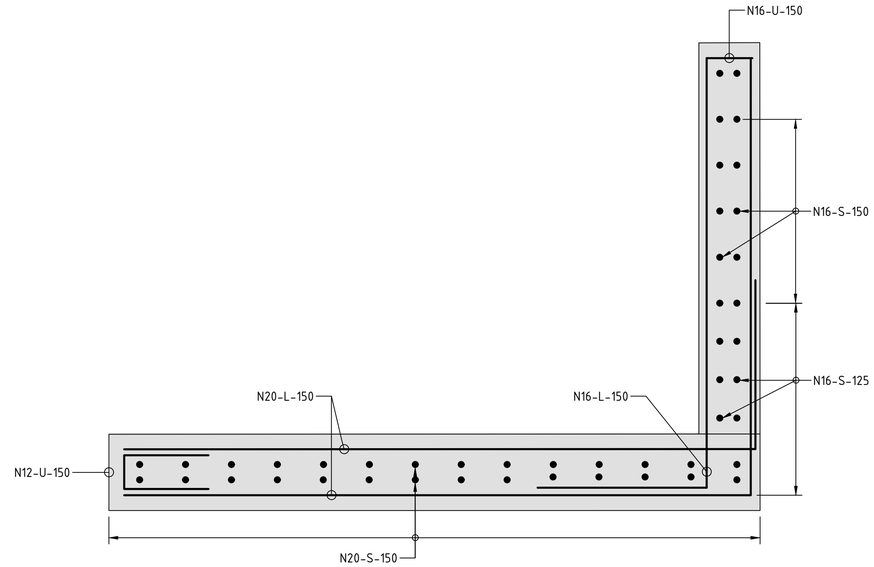
PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1823	A

C:\12DS\DATA\AURORDSYN01\BE22007 (B201715) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1821 - CI-1826.DWG
26/07/2023 4:35:20 PM



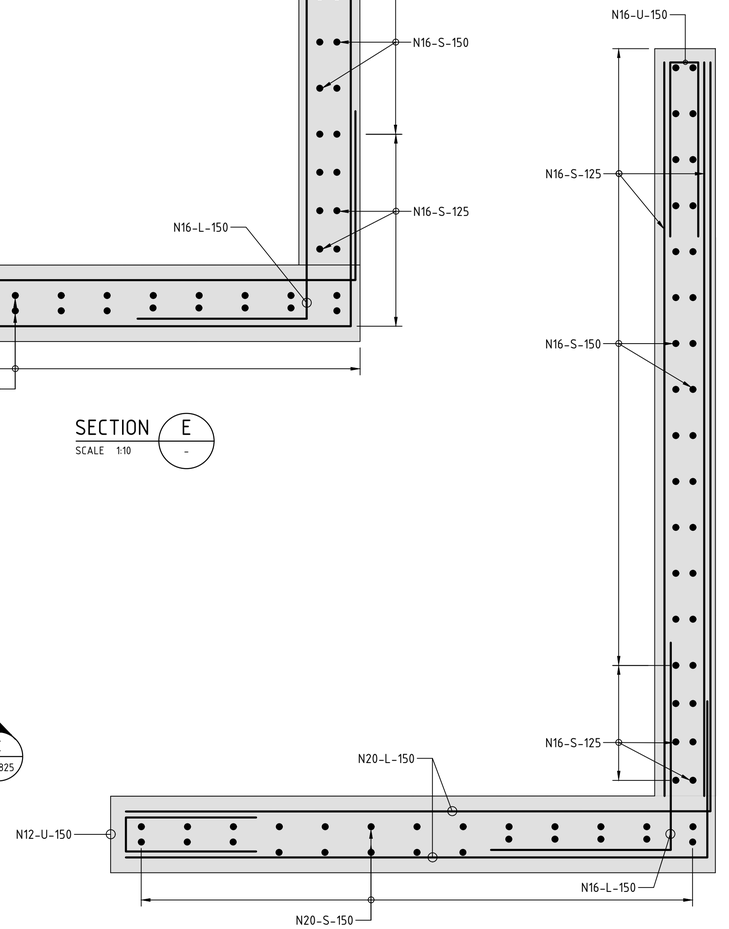
WINGWALL REINFORCEMENT PLAN

SCALE 1:10



SECTION E

SCALE 1:10



SECTION D

SCALE 1:10

0 0.1 0.2 0.3 0.4 0.5 0.6m

SCALE 1:10 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
REVISIONS				REVISIONS			

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

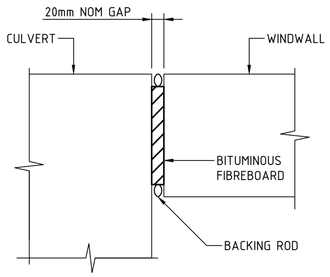
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	K. Undheim	R. Pan	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20–56	AS SHOWN	AT A1 SIZE

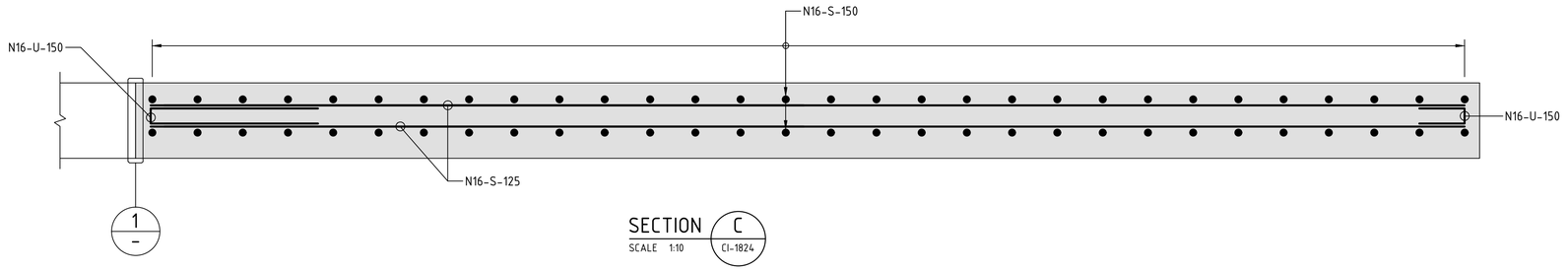
TITLE: RCBC DETAILS
SHEET 4

PROJECT No.	DRAWING No.	REV.
BE22007–6660	CI–1824	A

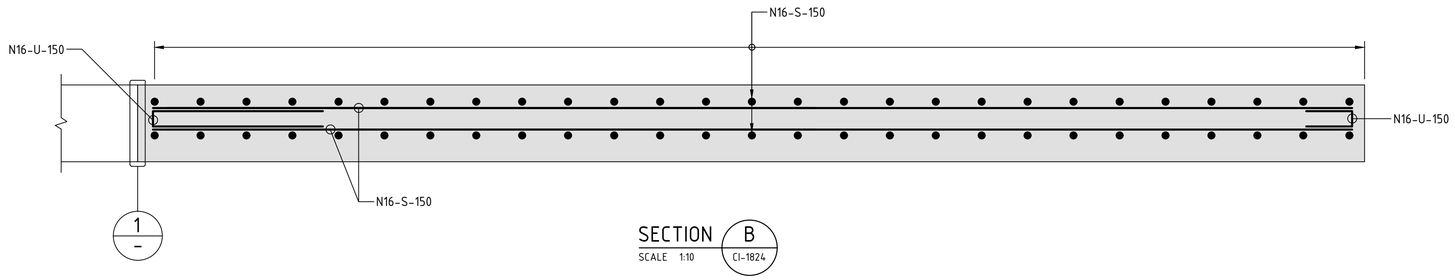
C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1821 - CI-1826.DWG
26/07/2023 4:35:04 PM



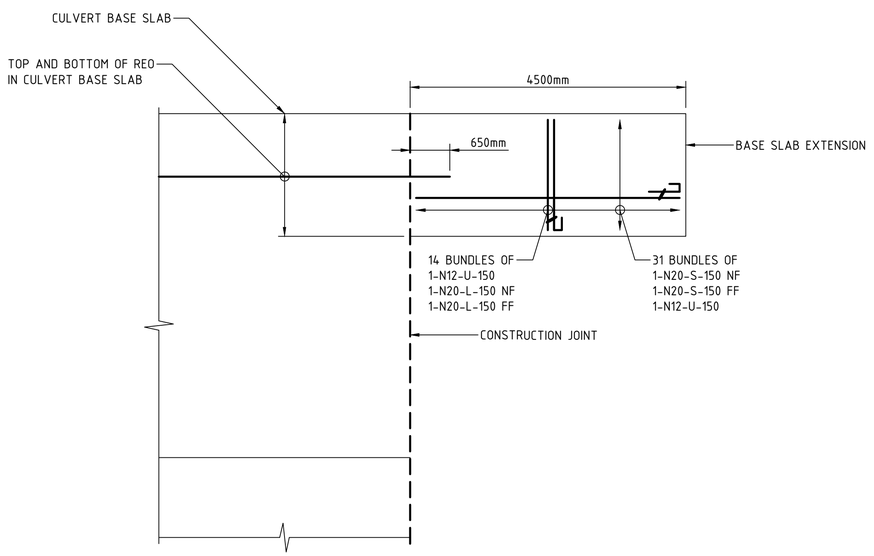
DETAIL 1 / –
SCALE 1:50



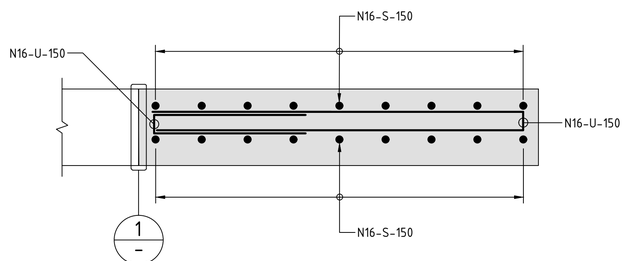
SECTION C / CI-1824
SCALE 1:10



SECTION B / CI-1824
SCALE 1:10



BASE SLAB EXTENSION REINFORCEMENT PLAN
SCALE 1:50



SECTION A / CI-1824
SCALE 1:10

NOTES

- WALL AND BASE THICKNESS : 250mm
- CONCRETE STRENGTH : 40 MPa
- REINFORCEMENT : N20-150 EACH FACE AND EACH WAY
- COVER : 45MM TYP, 75MM CAST AGAINST GROUND

BASE SLAB TO BE CAST MONOLITHIC WITH THE CULVERT BASE SLAB

0 0.1 0.2 0.3 0.4 0.5 0.6m
SCALE 1:10 AT A1 SIZE

0 0.5 1.0 1.5 2.0 2.5 3.0m
SCALE 1:50 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				

REVISIONS | REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

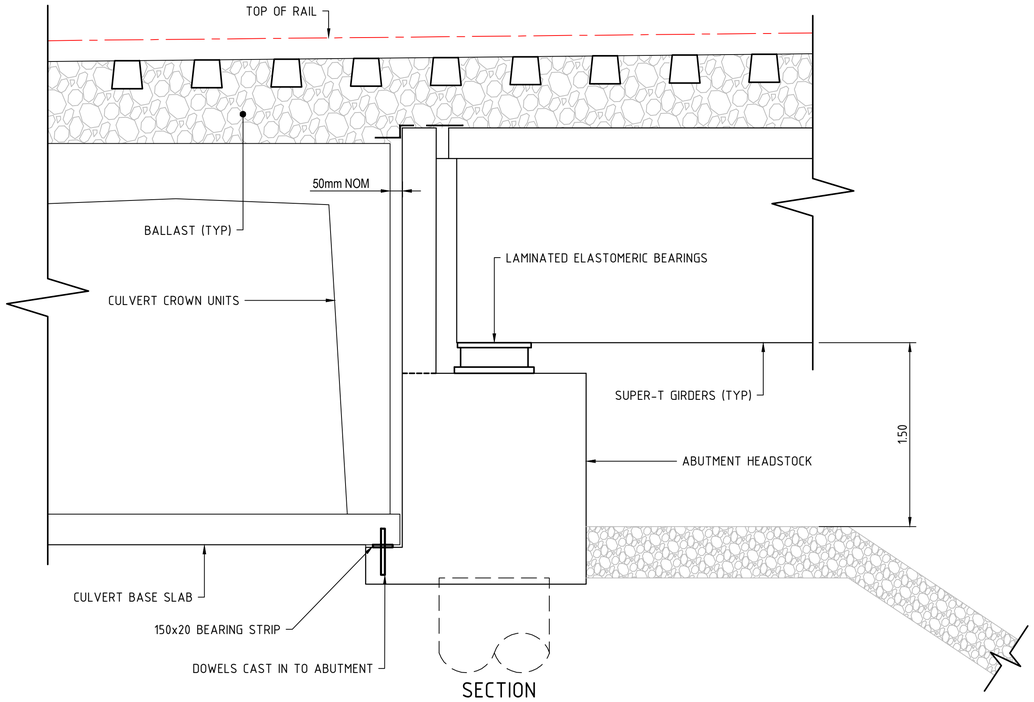
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	K. Undheim	R. Pan	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: RCBC DETAILS
SHEET 5

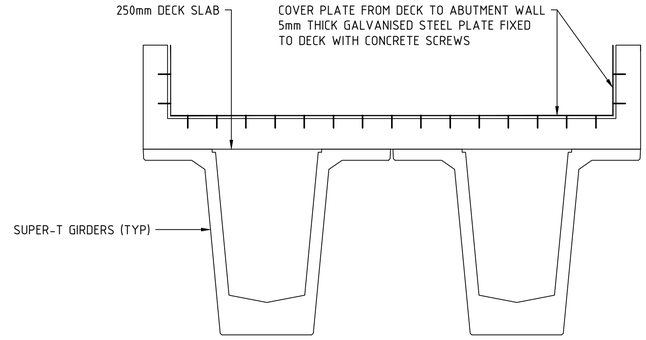
PROJECT No. BE22007-6660 | DRAWING No. CI-1825 | REV. A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP__101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1821 - CI-1826.DWG
26/07/2023 4:35:10 PM



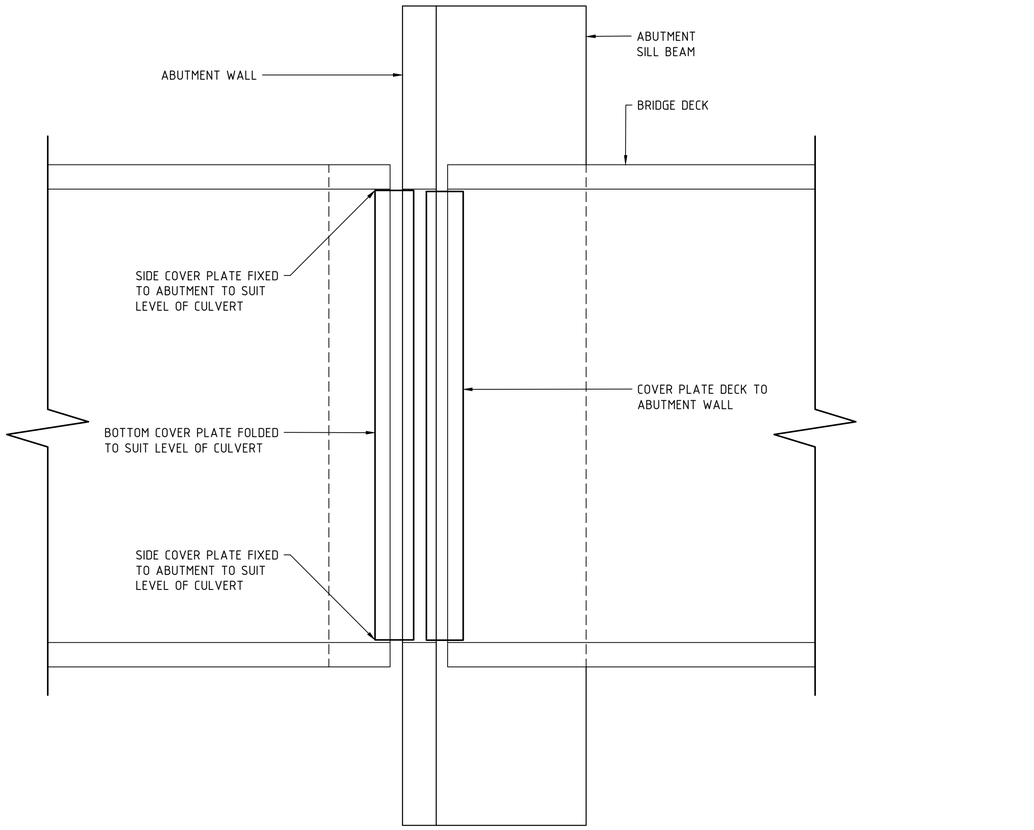
SECTION

SCALE 1:25



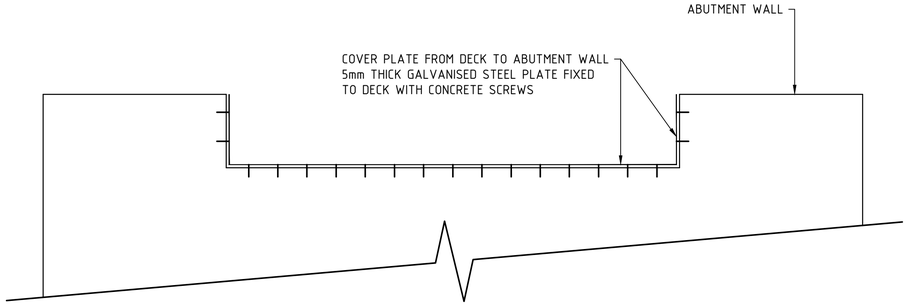
SECTION - END OF BRDIGE

SCALE 1:25



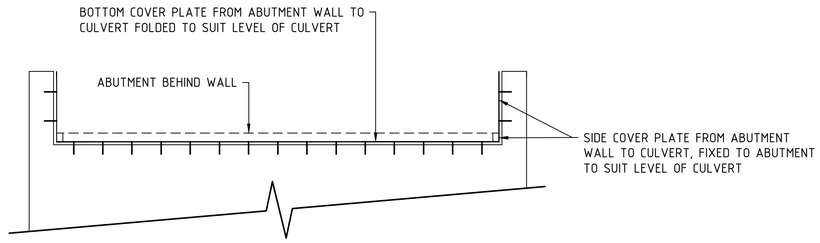
PLAN

SCALE 1:25



SECTION - ABUTMENT WALL

SCALE 1:25



SECTION - END OF CULVERT

SCALE 1:25

NOTE

REFER TO DRG CI-1251 FOR GROUND IMPROVEMENT DETAILS.

0 0.25 0.5 0.75 1.0 1.25 1.5m

SCALE 1:25 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
REVISIONS				REVISIONS			

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	K. Undheim	R. Pan	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: RCBC DETAILS
SHEET 6

PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1826	A

26/07/2023 4:35:03 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1821 - CI-1826.DWG
C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1821 - CI-1826.DWG
26/07/2023 4:35:03 PM

BASE SLAB SETOUT TABLE

CULVERT BANK	CHAINAGE START	CHAINAGE END	LHS EASTING	LHS NORTHING	LHS RL	RHS EASTING	RHS NORTHING	RHS RL
BANK 1	499396.115	501517.377	219977.662	6584545.580	249.000	219981.523	6584546.959	249.000
			221848.380	6584658.874	249.750	221847.834	6584654.811	249.750
BANK 2	501517.377	502096.737	221848.380	6584658.874	250.050	221847.834	6584654.811	250.050
			222252.478	6584920.867	250.050	222256.561	6584921.241	250.050
BANK 3	502096.737	502126.921	222252.478	6584920.868	249.750	222256.561	6584921.241	249.750
			222248.015	6584950.460	249.750	222252.026	6584951.307	249.750
BANK 4	502126.921	502198.265	222248.015	6584950.460	249.450	222252.026	6584951.307	249.450
			222224.059	6585016.822	249.450	222227.688	6585018.729	249.450
BANK 5	502198.265	502239.425	222224.058	6585016.822	249.750	222227.688	6585018.730	249.750
			222203.089	6585052.018	249.750	222206.539	6585054.232	249.750
BANK 6	502239.425	502349.185	222203.089	6585052.018	250.050	222206.539	6585054.232	250.050
			222143.548	6585144.218	250.050	222146.992	6585146.442	250.050
BANK 7	502349.185	502439.737	222143.548	6585144.218	249.750	222146.992	6585146.442	249.750
			222100.594	6585224.201	249.750	222104.462	6585225.559	249.750
BANK 8	502439.737	502516.569	222100.594	6585224.201	249.450	222104.462	6585225.559	249.450
			222086.963	6585300.145	249.450	222091.062	6585300.217	249.450
BANK 9	502516.569	502976.057	222086.963	6585300.145	249.150	222091.062	6585300.217	249.150
			222144.964	6585756.126	249.150	222149.027	6585755.579	249.150
BANK 10	502976.057	503006.241	222144.964	6585756.126	249.450	222149.027	6585755.579	249.450
			222148.993	6585786.040	249.450	222153.056	6585785.493	249.450
BANK 11	503006.241	503044.657	222148.993	6585786.040	249.750	222153.056	6585785.493	249.750
			222154.121	6585824.112	249.750	222158.184	6585823.565	249.750
BANK 12	503044.657	503550.577	222154.121	6585824.113	250.050	222158.184	6585823.565	250.050
			222221.654	6586325.505	249.450	222225.717	6586324.958	249.450
BANK 13	503550.577	503890.833	222221.654	6586325.505	249.150	222225.717	6586324.958	249.150
			222267.073	6586662.716	249.150	222271.136	6586662.169	249.150
BANK 14	503890.833	504645.433	222267.073	6586662.716	248.850	222271.136	6586662.169	248.850
			222426.965	6587393.824	248.650	222430.331	6587391.484	248.650
BANK 15	504645.433	504673.113	222426.965	6587393.824	248.350	222430.331	6587391.484	248.350
			222443.389	6587416.229	248.350	222446.634	6587413.722	248.350
BANK 16	504673.113	504778.297	222443.389	6587416.229	248.050	222446.634	6587413.723	248.050
			222514.899	6587493.611	248.050	222517.755	6587490.669	248.050

BASE SLAB SETOUT TABLE

CULVERT BANK	CHAINAGE START	CHAINAGE END	LHS EASTING	LHS NORTHING	LHS RL	RHS EASTING	RHS NORTHING	RHS RL
BANK 17	504778.297	505201.801	222514.899	6587493.611	248.350	222517.755	6587490.669	248.350
			222884.745	6587653.260	248.350	222884.237	6587649.191	248.350
BANK 18	505201.801	505632.609	222884.745	6587653.260	248.650	222884.237	6587649.191	248.650
			223312.221	6587599.780	248.650	223311.712	6587595.711	248.650
BANK 19	505632.609	505831.905	223312.221	6587599.779	248.350	223311.712	6587595.711	248.350
			223508.522	6587565.479	248.350	223507.371	6587561.543	248.350
BANK 20	505831.905	505974.593	223508.522	6587565.478	248.650	223507.371	6587561.543	248.650
			223646.207	6587529.447	248.650	223645.559	6587525.399	248.650
BANK 21	505974.593	506199.601	223646.207	6587529.447	248.950	223645.559	6587525.399	248.950
			223869.388	6587501.458	248.950	223868.887	6587497.389	248.950
BANK 22	506199.601	507369.201	223869.389	6587501.458	249.250	223868.887	6587497.389	249.250
			225030.169	6587360.125	249.850	225030.057	6587356.027	249.850
BANK 23	507369.201	507687.505	225030.169	6587360.125	249.550	225030.057	6587356.027	249.550
			225315.974	6587482.699	249.550	225317.996	6587479.132	249.550
BANK 24	507687.505	507923.489	225315.974	6587482.699	249.250	225317.997	6587479.132	249.250
			225546.031	6587524.346	249.250	225546.104	6587520.246	249.250
BANK 25	507923.489	507989.921	225546.031	6587524.346	248.950	225546.104	6587520.246	248.950
			225612.453	6587525.523	248.950	225612.526	6587521.423	248.950
BANK 26	507989.921	508031.441	225612.453	6587525.523	248.650	225612.526	6587521.423	248.650
			225653.966	6587526.258	248.650	225654.039	6587522.159	248.650
BANK 27	508031.441	508053.585	225653.966	6587526.258	248.950	225654.039	6587522.159	248.950
			225676.107	6587526.651	248.950	225676.180	6587522.551	248.950
BANK 28	508053.585	508819.211	225676.107	6587526.651	249.250	225676.180	6587522.551	249.250
			226441.613	6587540.217	250.457	226441.685	6587536.117	250.457
BANK 29	508819.211	508866.267	226441.613	6587540.217	250.158	226441.685	6587536.117	250.158
			226488.811	6587541.053	250.563	226488.884	6587536.954	250.563
BANK 30	508866.267	508902.251	226488.811	6587541.053	250.263	226488.884	6587536.954	250.263
			226524.790	6587541.691	250.572	226524.862	6587537.591	250.572
BANK 31	508902.251	508930.171	226524.790	6587541.691	250.272	226524.862	6587537.591	250.272
			226552.705	6587542.185	250.512	226552.778	6587538.086	250.512

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				

REVISIONS | REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

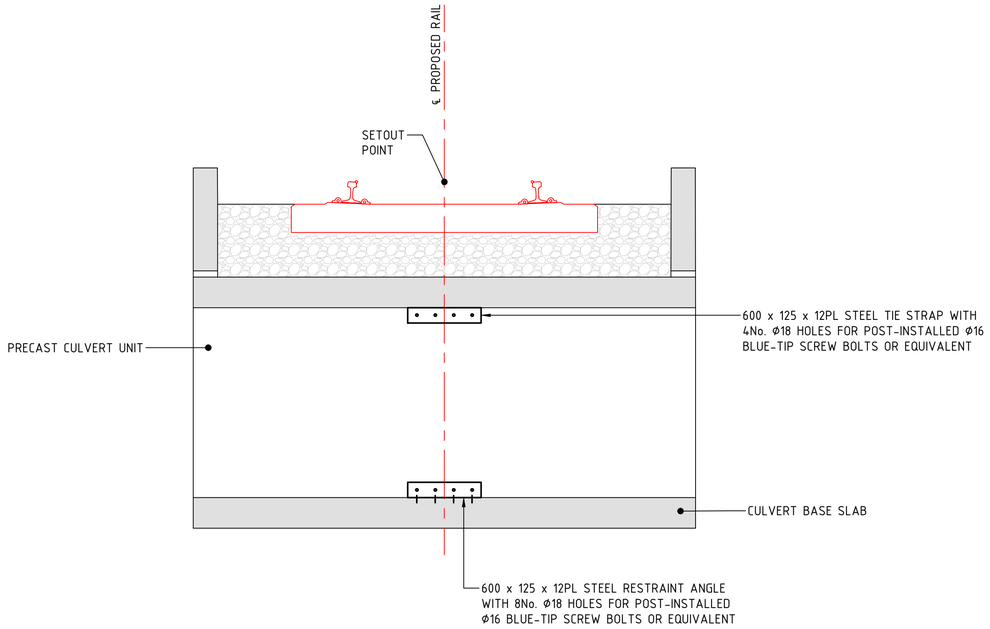
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: RCBC BASE SLAB SCHEDULE

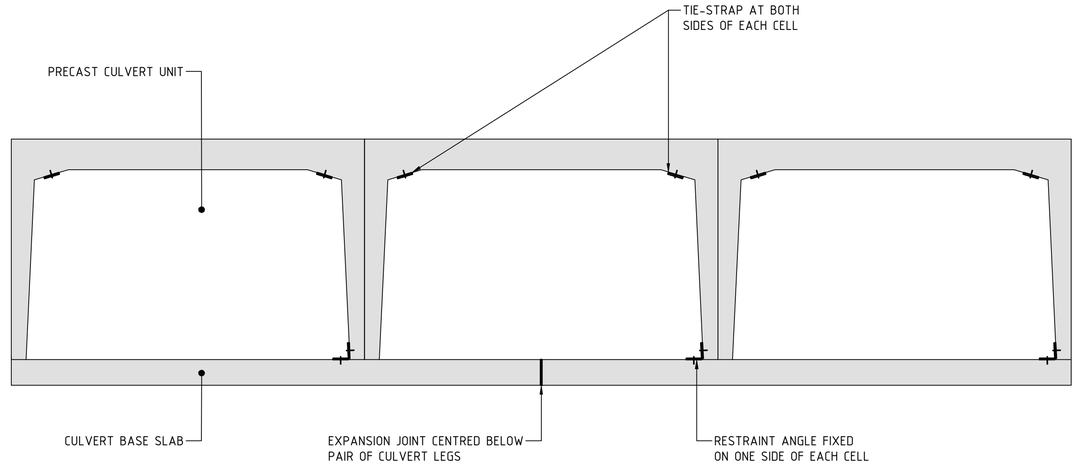
PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1831	A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP__101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1831.DWG
26/07/2023 4:35:32 PM



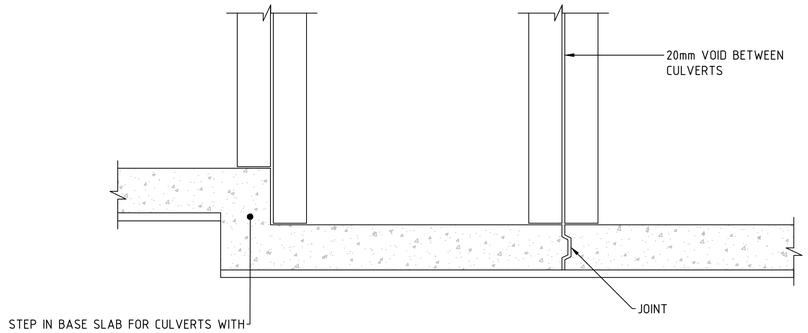
RCBC TIE STRAP TYPICAL SECTION

SCALE 1:25



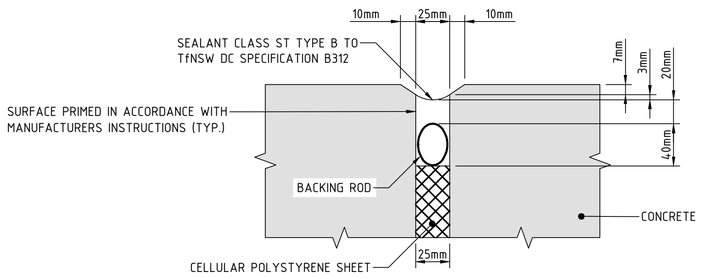
BASE SLAB EXPANSION JOINT AND RESTRAINT ANGLES TYPICAL DETAIL

SCALE 1:25



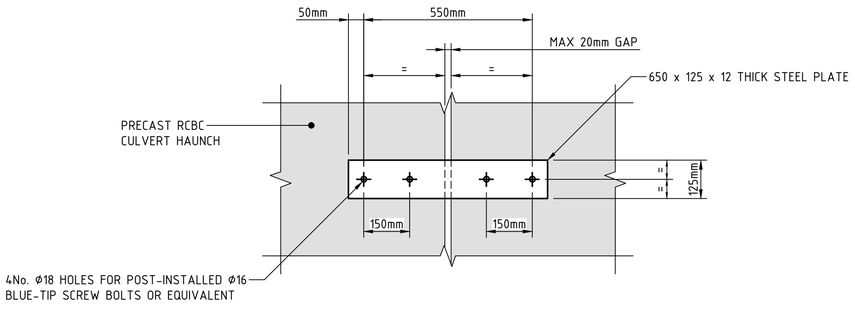
DETAIL 1 (REFER DRG CI-1822)

SCALE 1:20



BASE SLAB JOINT FILLER TYPICAL DETAIL

SCALE 1:10



RCBC TIE STRAP TYPICAL DETAIL

SCALE 1:10

NOTE

EXPANSION JOINT SPACING SHALL NOT EXCEED 15m.

0 0.1 0.2 0.3 0.4 0.5 0.6m
SCALE 1:10 AT A1 SIZE

0 0.2 0.4 0.6 0.8 1.0 1.2m
SCALE 1:20 AT A1 SIZE

0 0.25 0.5 0.75 1.0 1.25 1.5m
SCALE 1:25 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

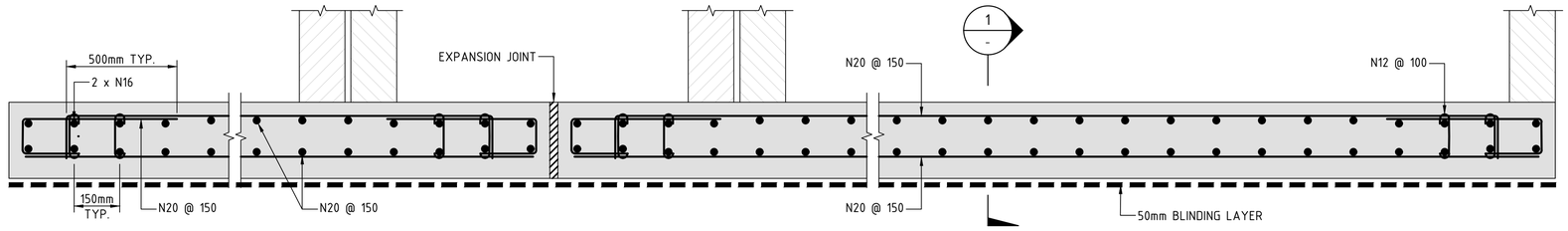
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	K. Undheim	R. Pan	B. Keith

DATUM	GRID	SCALE
AHD	MGA/20-56	AS SHOWN AT A1 SIZE

TITLE: RCBC BASE SLAB DETAILS SHEET 1

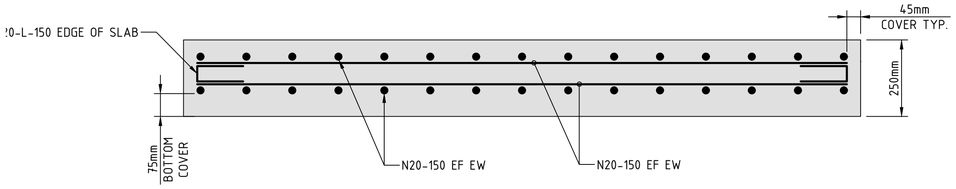
PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1841	A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B201715) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1841 - CI-1842.DWG
26/07/2023 4:35:50 PM



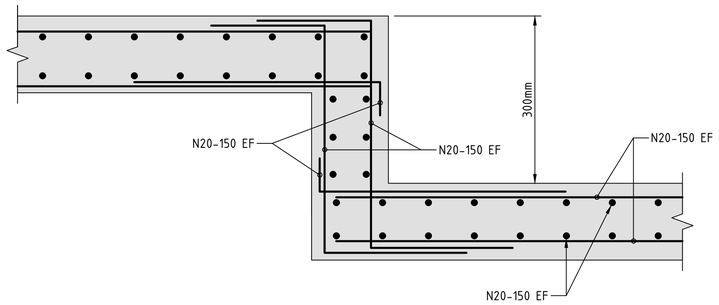
MULTIPLE CELL TYPICAL BASE SLAB REINFORCEMENT DETAIL

SCALE 1:10



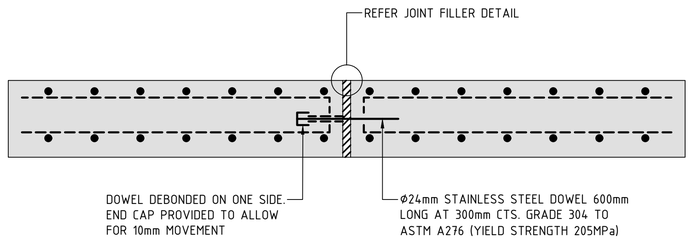
SECTION 1

SCALE 1:10



STEP IN BASE SLAB REINFORCEMENT DETAIL

SCALE 1:10



BASE SLAB EXPANSION JOINT DETAIL

SCALE 1:10

NOTE

EXPANSION JOINT TO BE PLACED AT 15m MAXIMUM.

0 0.1 0.2 0.3 0.4 0.5 0.6m
SCALE 1:10 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD	REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP				
REVISIONS				REVISIONS			

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

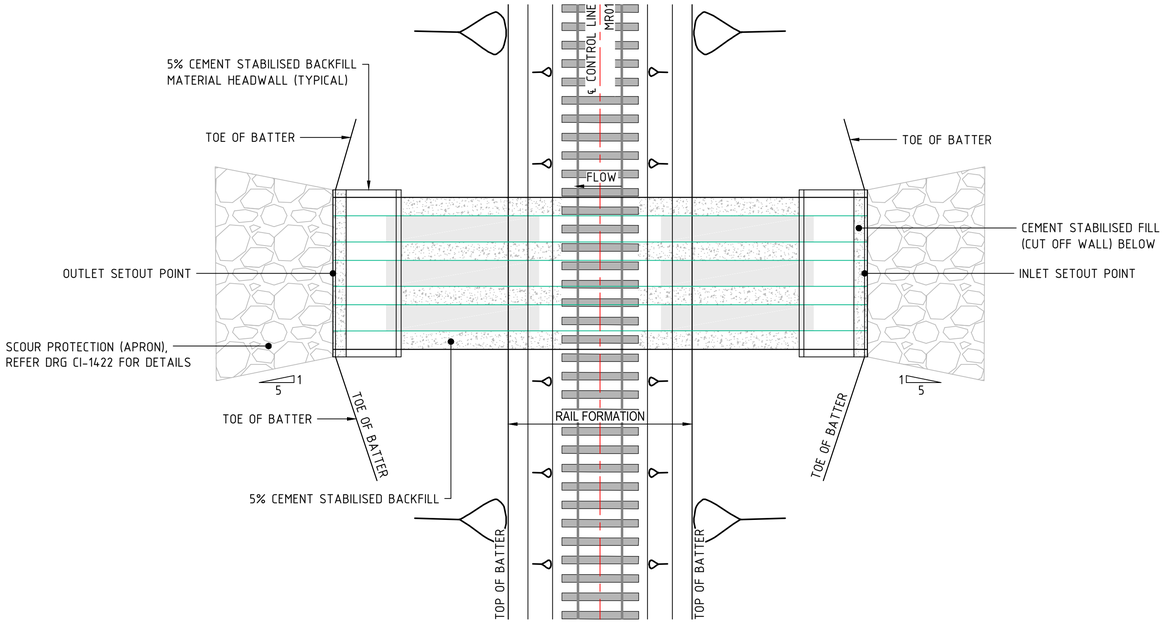
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	K. Undheim	R. Pan	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: RCBC BASE SLAB DETAILS SHEET 2

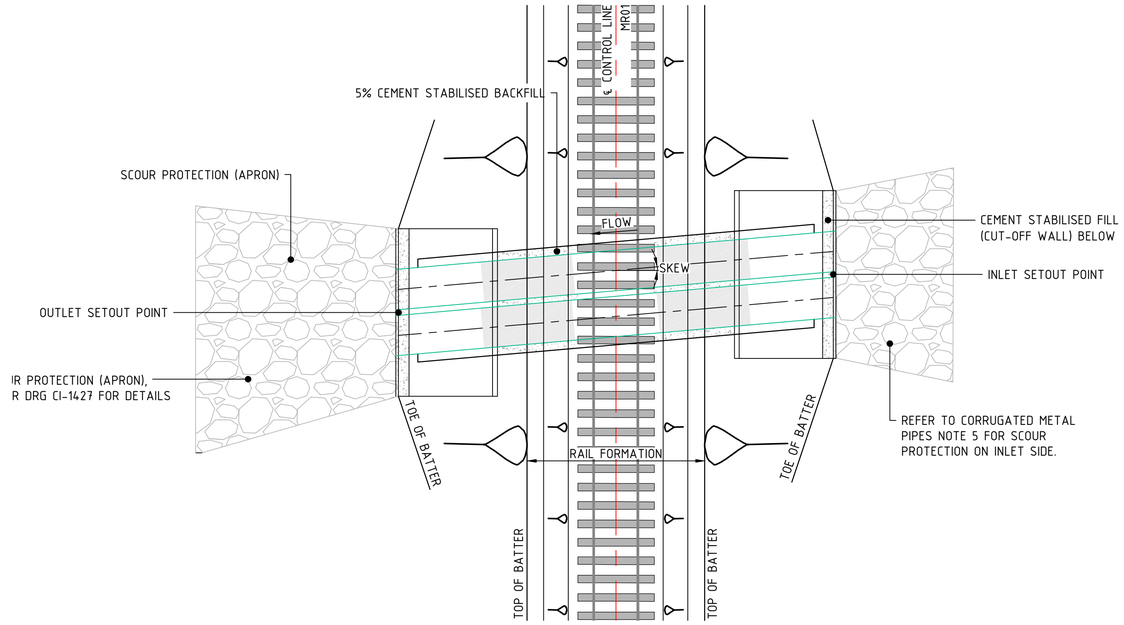
PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1842	A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1841 - CI-1842.DWG
26/07/2023 4:35:55 PM



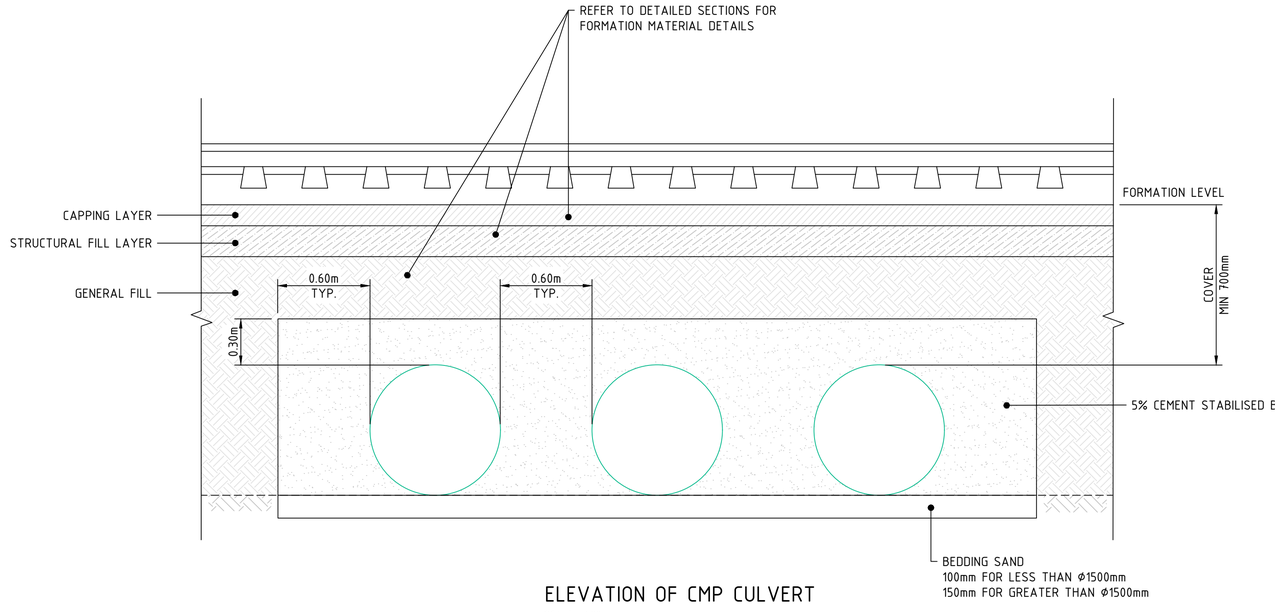
PLAN - CMP CULVERT TRANSITION WHERE FILL ABOVE CULVERT

SCALE 1:100



PLAN - TYPICAL CMP CULVERT - ON SKEW

SCALE 1:100



ELEVATION OF CMP CULVERT

SCALE 1:20

0 0.2 0.4 0.6 0.8 1.0 1.2m
SCALE 1:20 AT A1 SIZE

0 1 2 3 4 5 6m
SCALE 1:100 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP

REVISIONS

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office—*
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

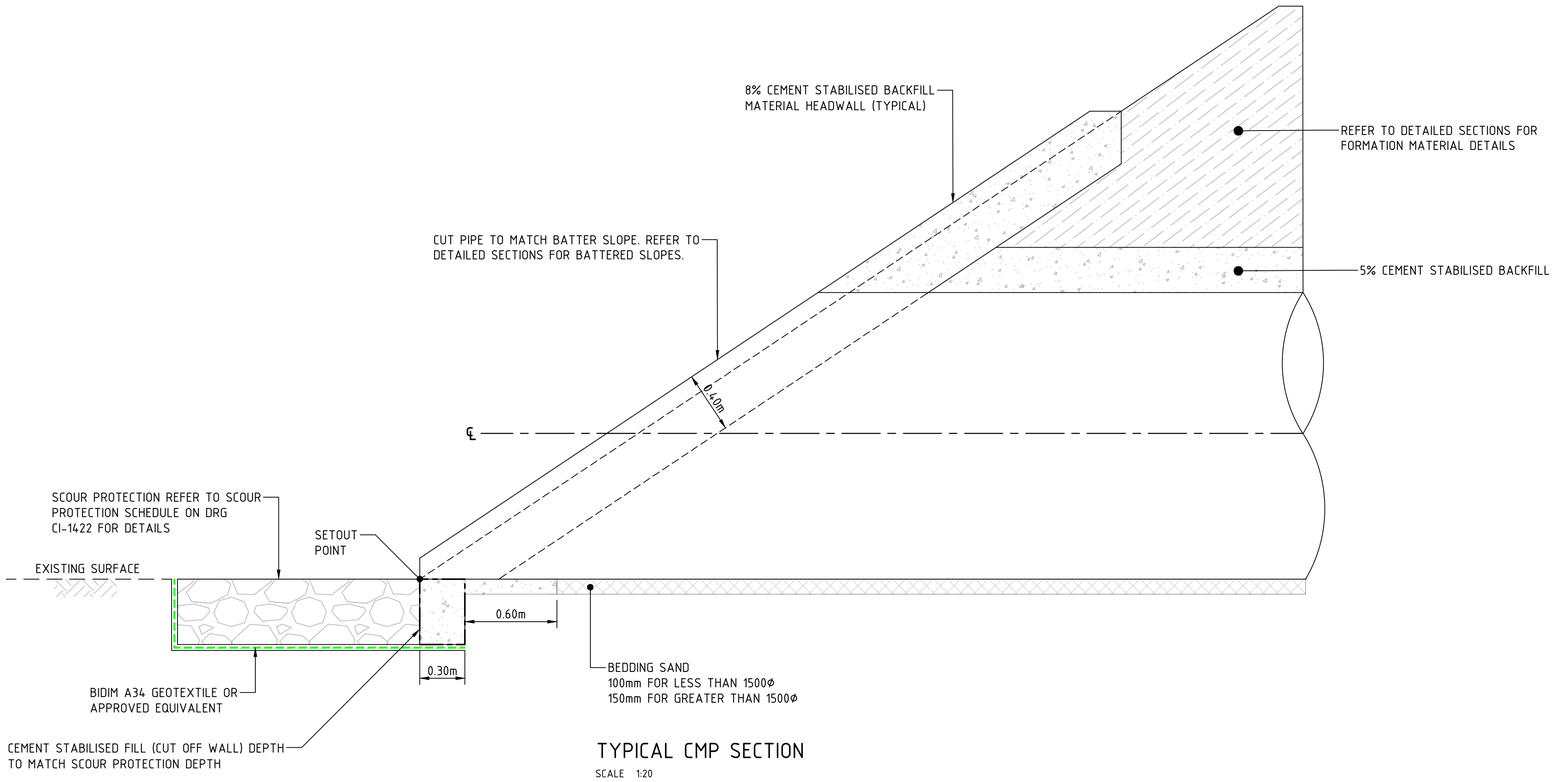
DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: CMP GENERAL ARRANGEMENT
SHEET 1

PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1861	A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B201715) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1861 - CI-1862.DWG
26/07/2023 4:36:13 PM



TYPICAL CMP SECTION

SCALE 1:20

0 0.2 0.4 0.6 0.8 1.0 1.2m
SCALE 1:20 AT A1 SIZE

REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP

REVISIONS

CLIENT: WHITEHAVEN COAL

Brisbane *Office*—
Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT: VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: CMP GENERAL ARRANGEMENT
SHEET 2

PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1862	A

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP_101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1861 - CI-1862.DWG
26/07/2023 4:36:10 PM

CMP SCHEDULE

PIT NAME	EASTING	NORTHING	PIPE US-IL	PIPE DS-IL	PIPE SIZE	DS PIT	SKEW	SKEW RAIL CL CHAINAGE
DRN01-1	229234.337	6588344.421	250.291	250.210	(10x)600	DRN01-2	0° 0' 0"	511998.935
DRN01-2	229254.968	6588343.000						
DRN02A-1	229161.408	6589796.895	248.115	247.204	1800.000	DRN02A-2	38°51'48"	513438.980
DRN02A-2	229128.747	6589766.584						
DRN02B-1	229161.346	6589800.391	248.115	247.204	1800.000	DRN02B-2	38°51'48"	513442.325
DRN02B-2	229128.369	6589769.786						
DRN02C-1	229161.250	6589803.854	248.115	247.204	1800.000	DRN02C-2	38°51'48"	513445.669
DRN02C-2	229128.134	6589773.121						
DRN02D-1	229161.144	6589807.308	248.115	247.204	1800.000	DRN02D-2	38°51'48"	513449.013
DRN02D-2	229127.874	6589776.432						
DRN03A-1	229110.100	6590060.663	248.483	247.441	1500.000	DRN03A-2	49°11'46"	513708.526
DRN03A-2	229090.796	6590029.433						
DRN03B-1	229109.705	6590064.380	248.483	247.441	1500.000	DRN03B-2	49°52'12"	513712.054
DRN03B-2	229089.883	6590032.310						
DRN03C-1	229109.361	6590068.179	248.483	247.441	1500.000	DRN03C-2	50°33'13"	513715.633
DRN03C-2	229089.244	6590035.633						
DRN03D-1	229109.060	6590072.046	248.483	247.441	1500.000	DRN03D-2	51°14'49"	513719.264
DRN03D-2	229088.655	6590039.034						
DRN03E-1	229108.775	6590075.941	248.483	247.441	1500.000	DRN03E-2	51°57' 4"	513722.951
DRN03E-2	229088.078	6590042.457						
DRN03F-1	229108.561	6590079.951	248.483	247.441	1500.000	DRN03F-2	52°39'59"	513726.696
DRN03F-2	229087.496	6590045.870						
DRN03G-1	229108.364	6590083.988	248.483	247.441	1500.000	DRN03G-2	53°23'37"	513730.504
DRN03G-2	229086.983	6590049.396						
DRN03H-1	229108.232	6590088.130	248.483	247.441	1500.000	DRN03H-2	54° 8' 1"	513734.378
DRN03H-2	229086.503	6590052.975						
DRN03J-1	229108.148	6590092.350	248.483	247.441	1500.000	DRN03J-2	54°53'13"	513738.322
DRN03J-2	229086.044	6590056.587						
DRN03K-1	229108.077	6590096.590	248.483	247.441	1500.000	DRN03K-2	55°39'17"	513742.342
DRN03K-2	229085.626	6590060.268						
DRN04A-1	229108.440	6590566.378	246.730	246.600	1800.000	DRN04A-2	36° 5'24"	514237.891
DRN04A-2	229085.818	6590582.868						
DRN04B-1	229108.348	6590569.667	246.730	246.600	1800.000	DRN04B-2	36° 5'24"	514241.114
DRN04B-2	229085.955	6590585.990						
DRN04C-1	229108.278	6590572.941	246.730	246.600	1800.000	DRN04C-2	36° 5'24"	514244.336
DRN04C-2	229086.720	6590588.656						
DRN04D-1	229108.354	6590576.108	246.730	246.600	1800.000	DRN04D-2	36° 5'24"	514247.558
DRN04D-2	229086.703	6590591.890						
DRN04E-1	229108.337	6590579.343	246.730	246.600	1800.000	DRN04E-2	36° 5'24"	514250.781
DRN04E-2	229086.666	6590595.139						
DRN04F-1	229108.284	6590582.603	246.730	246.600	1800.000	DRN04F-2	36° 5'24"	514254.003
DRN04F-2	229086.618	6590598.397						
DRN04G-1	229108.344	6590585.782	246.730	246.600	1800.000	DRN04G-2	36° 5'24"	514257.226
DRN04G-2	229086.646	6590601.599						
DRN04H-1	229108.384	6590588.976	246.730	246.600	1800.000	DRN04H-2	36° 5'24"	514260.448
DRN04H-2	229086.619	6590604.841						
DRN04J-1	229108.337	6590592.232	246.730	246.600	1800.000	DRN04J-2	36° 5'24"	514263.670
DRN04J-2	229087.741	6590607.245						
DRN04K-1	229108.379	6590595.424	246.730	246.600	1800.000	DRN04K-2	36° 5'24"	514266.893
DRN04K-2	229086.594	6590611.304						
DRN05A-1	229319.795	6590195.879	249.869	249.790	(20x)450	DRN05A-2	0° 9'44"	516118.157
DRN05A-2	229307.274	6590206.486						

26/07/2023 4:36:24 PM C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP__101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1871.DWG

REV	DATE	DESCRIPTION	RVD
A	26.07.23	ISSUED FOR 100% DETAILED DESIGN	MP

REVISIONS

REVISIONS

C:\12DS\DATA\AUR2DSYN01\BE22007 (B20175) VEP__101\100 DRAWINGS\102 CIVIL AND WATER\AUTOCAD BE22007\BE22007-DRG-CI-1871.DWG
26/07/2023 4:36:24 PM

CLIENT

WHITEHAVEN COAL

Brisbane *Office—*

Level 5, 180 Ann St, Brisbane QLD 4000
P / +61 7 3167 3300
E / info@bgeeng.com
bgeeng.com—

PROJECT

VICKERY EXTENSION PROJECT
RAIL INFRASTRUCTURE

STATUS: ISSUED FOR INFORMATION
NOT FOR CONSTRUCTION

DRAWN	DESIGNED	CHECKED	APPROVED
A. Evans	R.Robertson	M.Plesko	B. Keith

DATUM	GRID	SCALE	
AHD	MGA/20-56	AS SHOWN	AT A1 SIZE

TITLE: CMP SCHEDULE

PROJECT No.	DRAWING No.	REV.
BE22007-6660	CI-1871	A